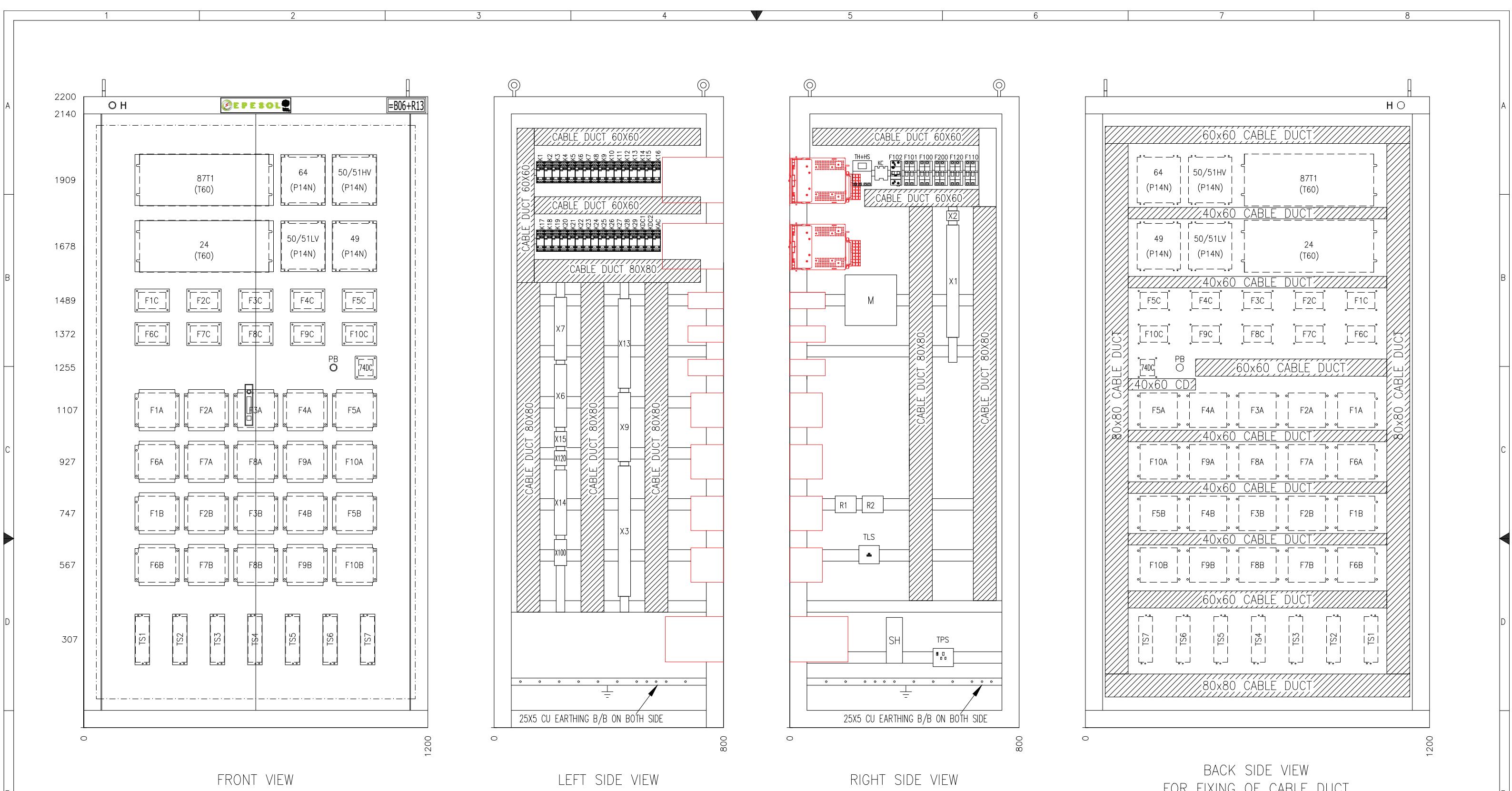


# LAYOUT DRAWING OF 500/220kV TRAFO PROTECTION PANEL TYPE =B06+R13

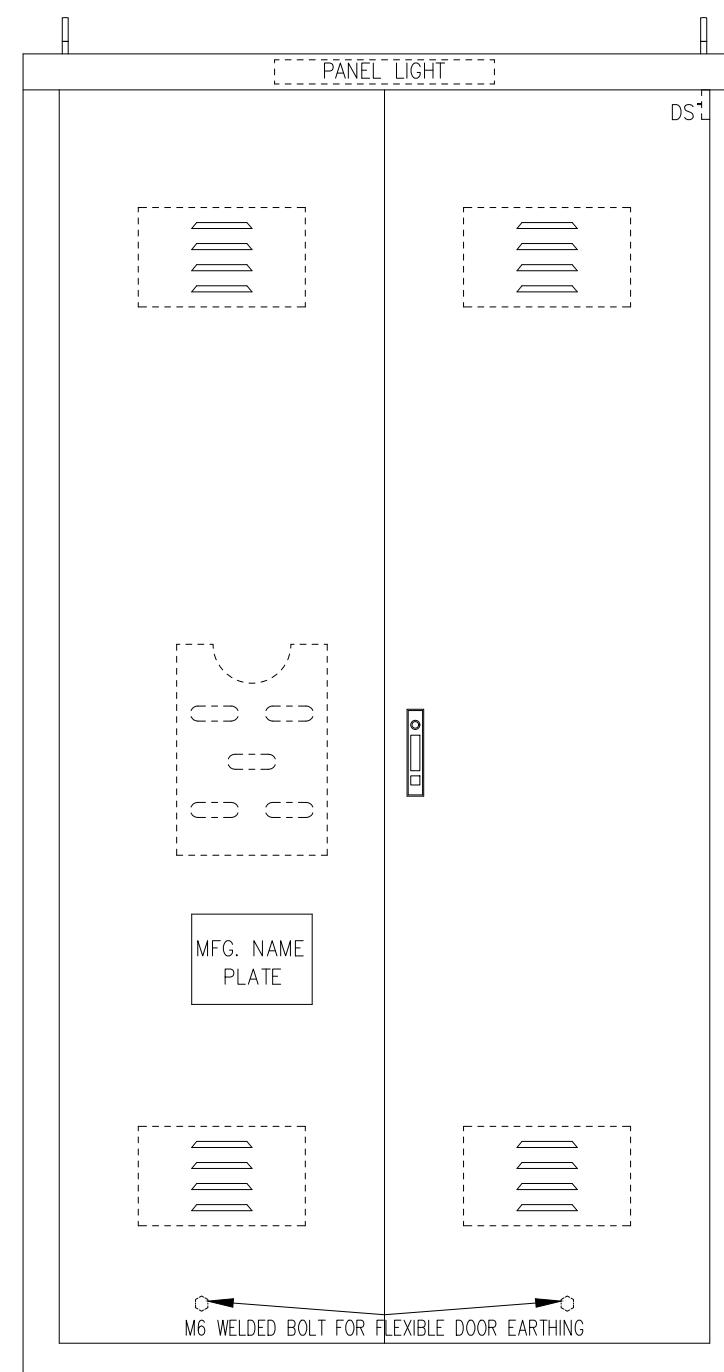
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: COVER SHEET	500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61540	SHT: 01 OF 03
NAH Q.I.	MSS M.Sohail	MUR Ilyas		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan		DATE: 07.03.2019	AS BUILT



### NOTES

1. RELAY PANEL: 1200Wx800Dx2200H mm
2. EARTHING BUSBAR 25x5 mm<sup>2</sup>
3. FLEXIBLE EARTHING STRAP 16mm<sup>2</sup>
4. COLOUR: RAL7032
5. CLASS OF PROTECTION: IP51
6. APPLICABLE SPECS: P204:2008

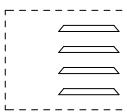
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LAYOUT DIAGRAM 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61540	SHT: 020F 03
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT



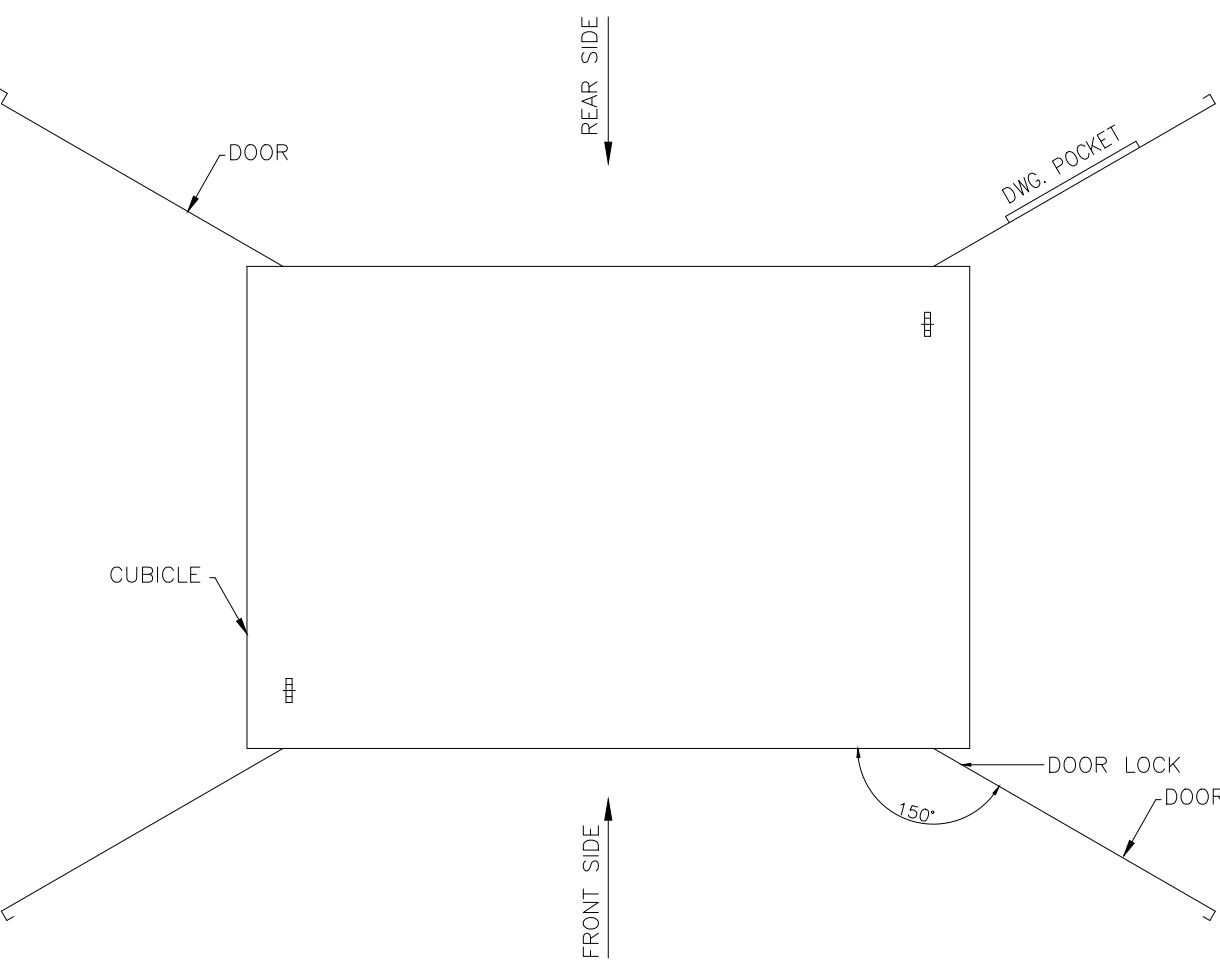
PANEL LIGHT

DS1

MFG. NAME  
PLATE



M6 WELDED BOLT FOR FLEXIBLE DOOR EARTHING



**E P E S O L** *Pvt. Ltd.*  
71-B Garden Block, New Garden Town, Lahore, Pakistan

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LAYOUT DIAGRAM 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61540	SHT: 030F 03
NAH [Signature]	MSS [Signature]	MUR [Signature]				

AS BUILT

REV: 0

DATE: 07.03.2019

# LIST OF APPARATUS

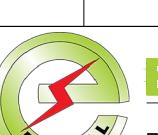
## 500/220kV TRAFO PROTECTION PANEL

### TYPE R13

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE:	COVER SHEET	DWG# EPE/ENU-18/B61541	SHT: 01 OF 04
NAH Q.I.	MSS M.Sohail	MUR Ilyas		500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPESOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

1	2	3	4	5	6	7	8				
SR.	ITEM DESIGNATION		DESCRIPTION		QTY	TYPE	MAKE	COUNTRY OF ORIGIN	ORDERING INFORMATION	SHEET NO	
A	1	87T1	DIFFERENTIAL PROTECTION RELAY		1	T60	GE	CANADA	T60-U03-HKH-F8N-H6P-		
									M8L-PXX-UXX-WXX	A	
B	2	24	OVER EXCITATION PROTECTION RELAY		1	T60	GE	CANADA	T60-U03-HKH-F8L-H6P-		
									M6P-PXX-UXX-WXX	B	
C	3	50/51LV	LV OVER CURRENT AND EARTH FAULT RELAY		1	P14N	GE	UK	P14NB1BA6C0620A		
	4	50/51HV	HV OVER CURRENT AND EARTH FAULT RELAY		1	P14N	GE	UK	P14NB1BA6C0620A		
D	5	49	THERMAL OVER LOAD RELAY		1	P14N	GE	UK	P14NB1BA6C0620A		
	6	64	REF PROTECTION RELAY		1	P14N	GE	UK	P14NB1BA6C0620A		
E	7	M	METROSIL, 1 PHASE 600-A/S1/S1088		1	-	GE	-	ZB9411570		
	8	R1, R2	RESISTOR ADJUSTABLE WIREWOUND, 1500 OHMS, 180W		2	-	GE	-	ZB9016774		
F	9	F1A, F1B, F2A, F2B	TRIP RELAY HAND AND ELECTRICAL RESET, 16 C/O CONTACTS, HIGH BURDEN, 220 VDC		20	BI-16R	ARTECHE	SPAIN	BI-16RP-HB-220VDC		
		F3A, F3B, F4A, F4B								F	
G		F5A, F5B, F6A, F6B									
		F7A, F7B, F8A, F8B								G	
H		F9A, F9B, F10A, F10B									
										H	
I	10	F1C, F2C, F3C, F4C	TRIP RELAY HAND AND ELECTRICAL RESET, 8 C/O CONTACTS, HIGH BURDEN, 220 VDC		10	BJ-8R	ARTECHE	SPAIN	BJ-8RP-HB-220VDC		
		F5C, F6C, F7C, F8C								I	
J		F9C, F10C								J	
										J	
K	11	PB	PUSH BUTTON (RESET)		1	YS-AP	YONGSUNG	SOUTH KOREA	YS-AP1-2-40-Y-D-W		
										K	
L	12	TS1	TEST BLOCK (14 FINGERS)		1	soTECH TSB 14	ARTECHE	SPAIN	TSB-14-AAAB11111AAAB		
										L	
M	13	TS2	TEST BLOCK (14 FINGERS)		1	soTECH TSB 14	ARTECHE	SPAIN	TSB-14-11111111111111		
										M	
N	14	TS7	TEST BLOCK (14 FINGERS)		1	soTECH TSB 14	ARTECHE	SPAIN	TSB-14-222221111111		
										N	
O	15	TS3, TS4, TS6	TEST BLOCK (14 FINGERS)		3	soTECH TSB 14	ARTECHE	SPAIN	TSB-14-111111111AAAB		
										O	
P	16	TS5	TEST BLOCK (14 FINGERS)		1	soTECH TSB 14	ARTECHE	SPAIN	TSB-14-11111ABABABAB		
										P	
Q	17	74DC	DC SUPERVISION RELAY 220 VDC		1	VDF-10	ARTECHE	SPAIN	VDF10-OP2-220VDC		
										Q	
R	18	H	INDICATION LAMP GREEN		1	YS	YONGSUNG	SOUTH KOREA	YS-PL-2-AL-22-G-W		
										R	
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS		TITLE:	LIST OF APPARATUS		EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61541	SHT: 02 OF 04	
NAH Q.	MSS M.	MUR B							DATE: 07.03.2019	AS BUILT	REV: 0

1	2	3	4	5	6	7	8		
SR.	ITEM DESIGNATION		DESCRIPTION	QTY	TYPE	MAKE	COUNTRY OF ORIGIN	ORDERING INFORMATION	SHEET NO
A	19	K1 TO K29, KDC1, KDC2	MINIATURE RELAY, 220 VDC, WITH 4 C/O CONTACTS	31	PRC	GE	HUNGARY/POLAND	PRC4M40DCML	
	20	KAC	MINIATURE RELAY, 240 VAC, WITH 4 C/O CONTACTS	1	PRC	GE	HUNGARY/POLAND	PRC4M40ANL	
	21	KC	CONTACTOR RELAY, 16A, 220 VDC, WITH 2NO+2NC CONTACTS	1	MCR	GE	HUNGARY/POLAND	MCRC022ATWN	
B	22	F110, F120	DC MCB, 2 POLE, 10A, 220 VDC WITH 1 C/O CONTACTS, 10KA	2	EP-100	GE	HUNGARY/POLAND	EP102UCC10+CAH(1)	
	23	F100, F101	AC MCB, 2 POLE, 6A, 240 VAC WITH 1 C/O CONTACT, 10KA	2	G60	GE	HUNGARY/POLAND	G62C06+CAH(1)	
	24	F102	RCBO, RATED 16A, 1P+N, 240V AC, WITH 1 C/O CONTACTS	1	DM100	GE	HUNGARY/POLAND	DM100C16/030+CAH(1)	
	25	F200	AC MCB, 2 POLE, 2A, 240 VAC WITH 1 C/O CONTACT, 10KA	2	G60	GE	HUNGARY/POLAND	G62C02+CAH(1)	
c	26	TH+HS	THERMOSTAT AND HUMIDISTAT	1	ELH-220	E-LABS	PAKISTAN		
	27	SH	SPACE HEATER	1	ELH-220	E-LABS	PAKISTAN		
	28	DS	DOOR SWITCH WITH COVER	1	YSP	YONGSUNG	SOUTH KOREA	YSP3315GWB+YSMS-C	
	29	TPS	240 VAC, 16A, THREE PIN SOCKET OUTLET	1		LEAR	CHINA		
D	30	TLS	TELEPHONE SOCKET	1		LOCAL	PAKISTAN		
	31	IL	PANEL LIGHT, 5W, 220 VAC	1	YS	YONGSUNG	SOUTH KOREA	YS-T8-30-5W	
	32	X1	DISCONNECTING TERMINAL BLOCKS FOR CT CIRCUIT WITH SHORTING ARRANGEMENT	48	SCB-6	CABUR	ITALY		
	33	X2	DISCONNECTING TERMINAL BLOCKS FOR VT CIRCUIT WITH ISOLATION ARRANGEMENT	4	SCB-6	CABUR	ITALY		
	34	X120	TERMINAL BLOCKS FOR DC SUPPLY DISTRIBUTION	12	CBD-4	CABUR	ITALY		
E	35	X6	TERMINAL BLOCKS FOR TRIP CIRCUIT – 1	36	CBD-4	CABUR	ITALY		
	36	X7	TERMINAL BLOCKS FOR TRIP CIRCUIT – 2	36	CBD-4	CABUR	ITALY		
	37	X13	TERMINAL BLOCKS FOR EVENT RECORDER / FAULT RECORDER CIRCUIT	48	CBD-4	CABUR	ITALY		
	38	X14	TERMINAL BLOCKS FOR SCADA CIRCUIT	36	CBD-4	CABUR	ITALY		
F	39	X17	TERMINAL BLOCKS FOR AC DISTRIBUTION	14	CBD-4	CABUR	ITALY		
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LIST OF APPARATUS 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	 <b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61541	SHT: 03 OF 04		
NAH Q.	MSS M.	MUR B.				DATE: 07.03.2019	AS BUILT	REV: 0	

1	2	3	4	5	6	7	8	
SR.	ITEM DESIGNATION	DESCRIPTION	QTY	TYPE	MAKE	COUNTRY OF ORIGIN	ORDERING INFORMATION	SHEET NO
A 40	X3	TERMINAL BLOCKS FOR CONTROL CIRCUIT	70	CBD-4	CABUR	ITALY		A
A 41	X9	TERMINAL BLOCKS FOR ANNUNCIATION CIRCUIT	38	CBD-4	CABUR	ITALY		A
A 42	X15	TERMINAL BLOCKS FOR COMMUNICATION CIRCUIT	8	CBD-4	CABUR	ITALY		A
B 43	X100	TERMINAL BLOCKS FOR AC CIRCUIT	12	CBD-4	CABUR	ITALY		B
C								C
D								D
E								E
F								F
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LIST OF APPARATUS 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61541	SHT: 04 OF 04	
NAH Q.I.	MSS M.Sohail	MUR Ilyas				DATE: 07.03.2019	AS BUILT	REV: 0

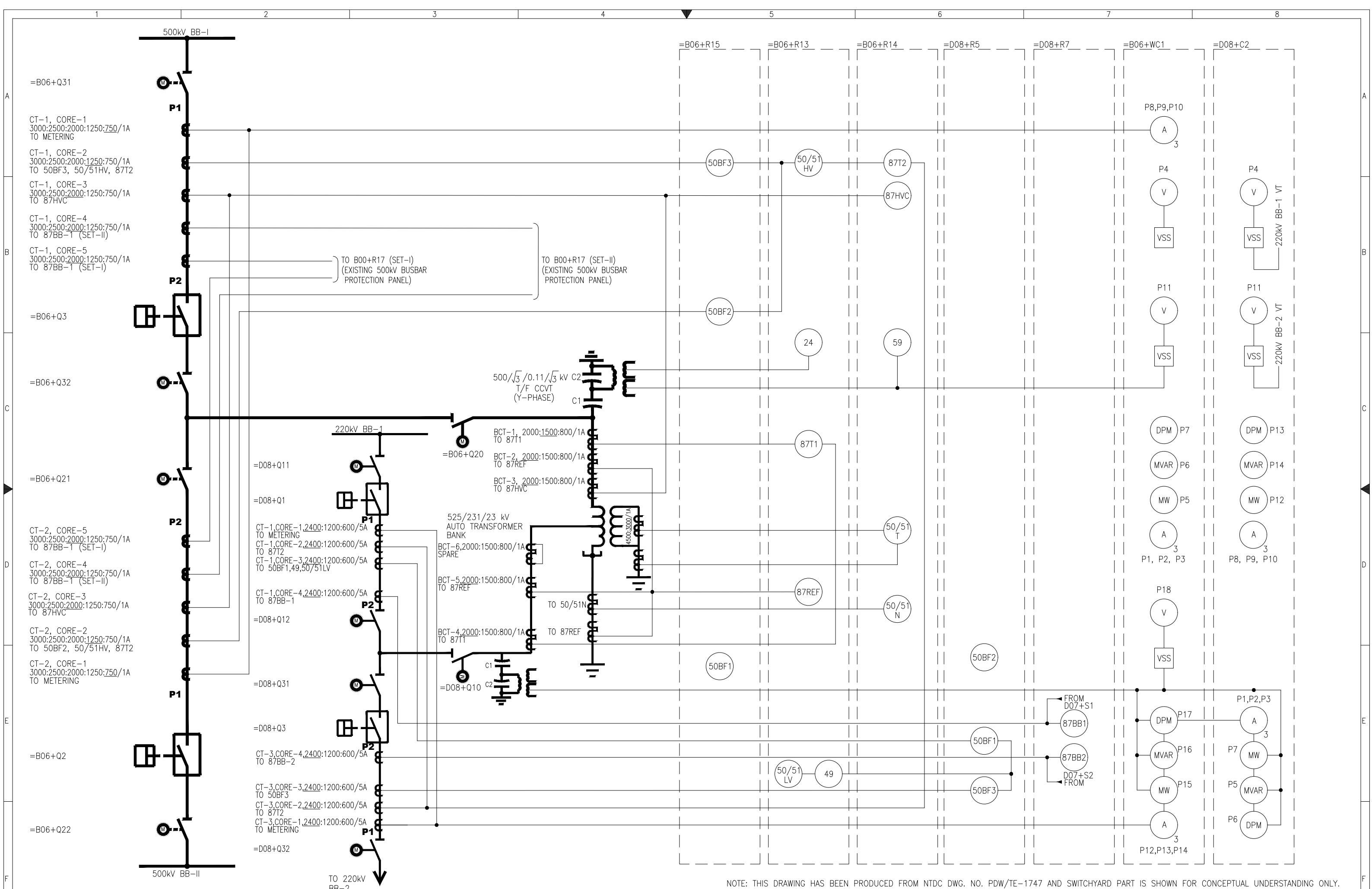
# SCHEMATIC DIAGRAM OF 500/220kV TRAFO PROTECTION PANEL TYPE R13

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: COVER SHEET 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 01 OF 66
NAH Q.	MSS M. Sohail	MUR Iy		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

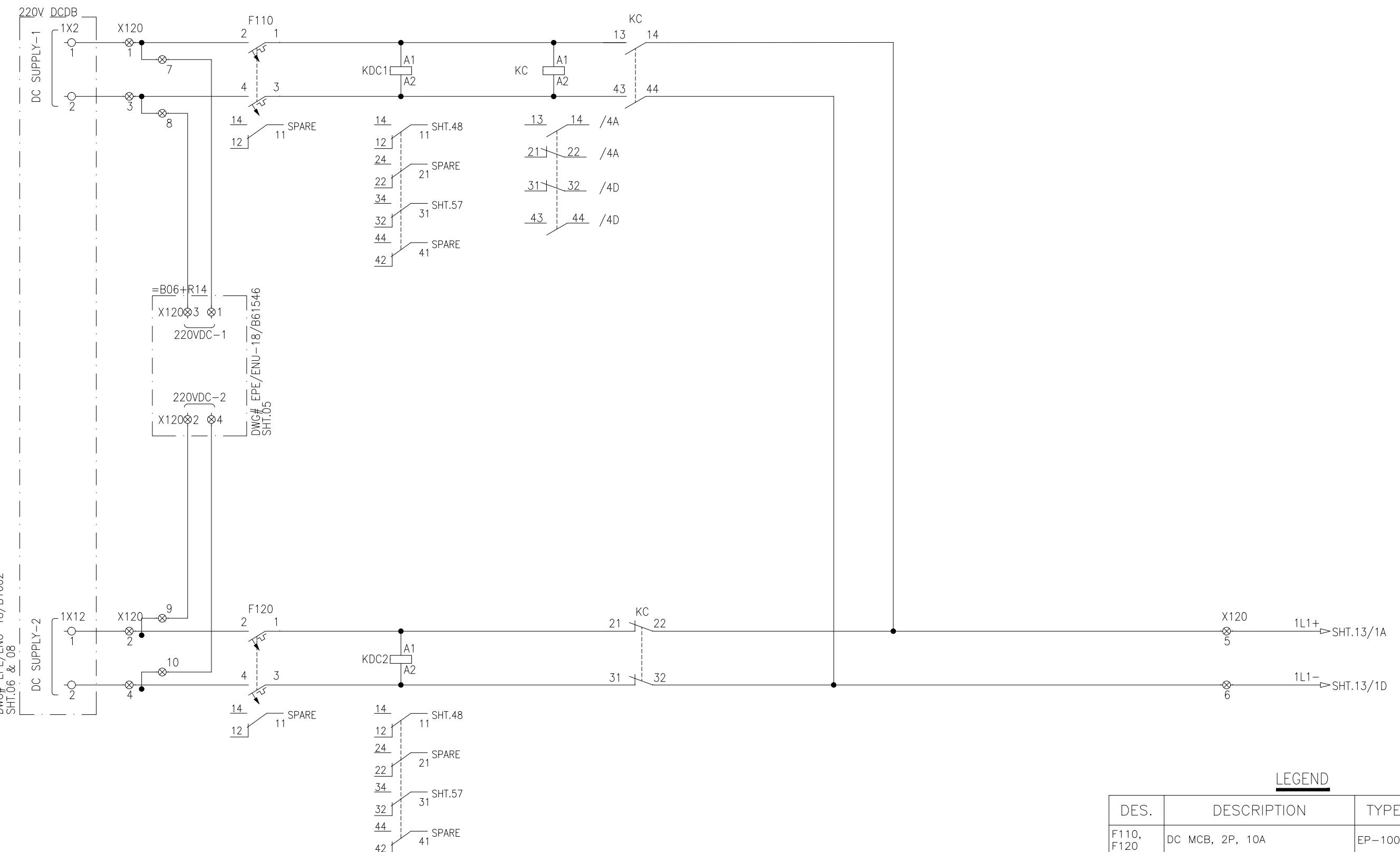
DESCRIPTION	SHEET NO	DESCRIPTION	SHEET NO	DESCRIPTION	SHEET NO
COVER SHEET	01	=B06+Q3 TRIP CIRCUIT-1	27	SCADA SIGNALING CIRCUIT	53
LIST OF CONTANTS	02	=B06+Q3 TRIP CIRCUIT-1	28	SCADA SIGNALING CIRCUIT	54
LIST OF SYMBOLS	03	=B06+Q3 TRIP CIRCUIT-2	29	SCADA SIGNALING CIRCUIT	55
SINGLE LINE DIAGRAM	04	=B06+Q3 TRIP CIRCUIT-2	30	COMMUNICATION CIRCUIT	56
DC SUPPLY DISTRIBUTION	05	=D08+Q1 TRIP CIRCUIT-1	31	AC SUPPLY DISTRIBUTION	57
CB CLOSE BLOCK CIRCUIT	06	=D08+Q1 TRIP CIRCUIT-1	32	DEVICE DETAIL FOR 87T1	58
TRAFO DIFFERENTIAL PROTECTION CT INPUT	07	=D08+Q1 TRIP CIRCUIT-2	33	DEVICE DETAIL FOR REF	59
REF PROTECTION CT CIRCUIT	08	=D08+Q1 TRIP CIRCUIT-2	34	DEVICE DETAIL FOR 50/51HV	60
LV OC PROTECTION CT CIRCUIT	09	=D08+Q3 TRIP CIRCUIT-1	35	DEVICE DETAIL FOR 49	61
HV OVERCURRENT PROTECTION CT CIRCUIT	10	=D08+Q3 TRIP CIRCUIT-1	36	DEVICE DETAIL FOR 50/51LV	62
LV OC PROTECTION CT CIRCUIT	11	=D08+Q3 TRIP CIRCUIT-2	37	DEVICE DETAIL FOR 24	63
OVERFLUXING PROTECTION VT CIRCUIT	12	=D08+Q3 TRIP CIRCUIT-2	38	DEVICE DETAIL FOR TEST BLOCK	64
TRAFO DIFFERENTIAL PROT. DC CIRCUIT	13	BREAKER FAILURE INITIATION FOR =B06+Q2	39	DEVICE DETAIL FOR TEST BLOCK	65
REF PROTECTION DC CIRCUIT	14	BREAKER FAILURE INITIATION FOR =B06+Q3	40	DEVICE DETAIL FOR TEST BLOCK	66
HV OC PROTECTION DC CIRCUIT	15	BREAKER FAILURE INITIATION FOR =D08+Q1	41		
THERMAL OVERLOAD PROT. DC CIRCUIT	16	BREAKER FAILURE INITIATION FOR =D08+Q3	42		
LV OC PROTECTION DC CIRCUIT	17	AR BLOCK FOR =B06+Q3	43		
OVERFLUXING PROTECTION DC CIRCUIT	18	AR BLOCK FOR =D08+Q3	44		
TRANSFORMER MECHANICAL PROTECTION TRIP	19	RELAY FAULTY SIGNAL MULTIPLICATION	45		
TRANSFORMER MECHANICAL PROTECTION TRIP	20	ANNUNCIATION CIRCUIT	46		
TRANSFORMER PROTECTION ALARMS	21	ANNUNCIATION CIRCUIT	47		
TRANSFORMER PROTECTION ALARMS	22	ANNUNCIATION CIRCUIT	48		
=B06+Q2 TRIP CIRCUIT-1	23	ER SIGNALLING CIRCUIT	49		
=B06+Q2 TRIP CIRCUIT-1	24	ER SIGNALLING CIRCUIT	50		
=B06+Q2 TRIP CIRCUIT-2	25	ER SIGNALLING CIRCUIT	51		
=B06+Q2 TRIP CIRCUIT-2	26	FR SIGNALLING CIRCUIT	52		

A  
B  
C  
D  
E  
F  
A  
B  
C  
D  
E  
F  
LIST OF SYMBOLS AND DESIGNATIONS

	MOTORIZED HV DISCONNECTOR		TRAFO DIFFERENTIAL PROTECTION RELAY
	HV CIRCUIT BREAKER		REF PROTECTION RELAY
	525/231/23 kV AUTO TRANSFORMER		HV OVERCURRENT PROTECTION RELAY
	CAPACITOR VOLTAGE TRANSFORMER		THERMAL OVERLOAD PROTECTION RELAY
	RELAY PANEL TERMINAL BLOCK		LV OVERCURRENT PROTECTION RELAY
	CONTROL PANEL TERMINAL BLOCK		OVERFLUXING PROTECTION RELAY
	EARTH CONNECTION	74-DC	DC CIRCUIT SUPERVISION RELAY
	NORMALLY CLOSED CONTACT	X	TERMINAL BLOCKS
	NORMALLY OPEN CONTACT	K	AUXILIARY RELAY/CONTACTOR
	CHANGE OVER CONTACT		
	MINIATURE CIRCUIT BREAKER		
	INDICATING BULB/LED/CUBICLE LIGHT		
	220V SOCKET		
	SPACE HEATER		
	COIL		
	EQUIPMENT WITHIN PANEL		
	INDEPENDENT PANEL		
	INDEPENDENT PANEL		

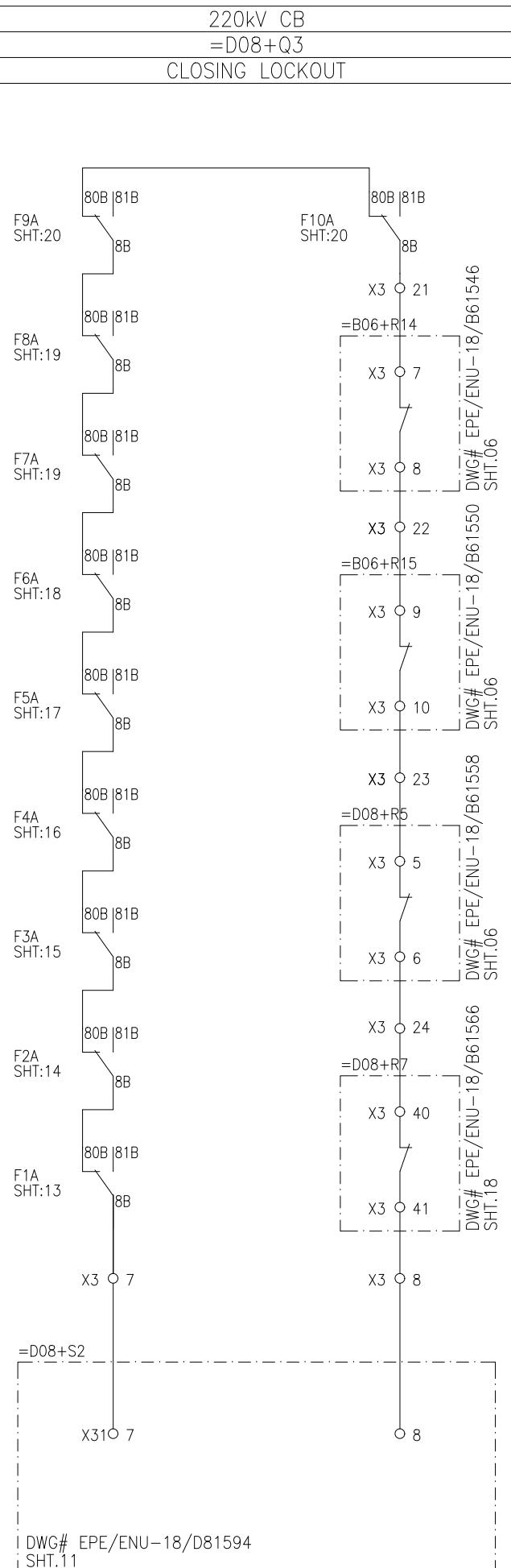
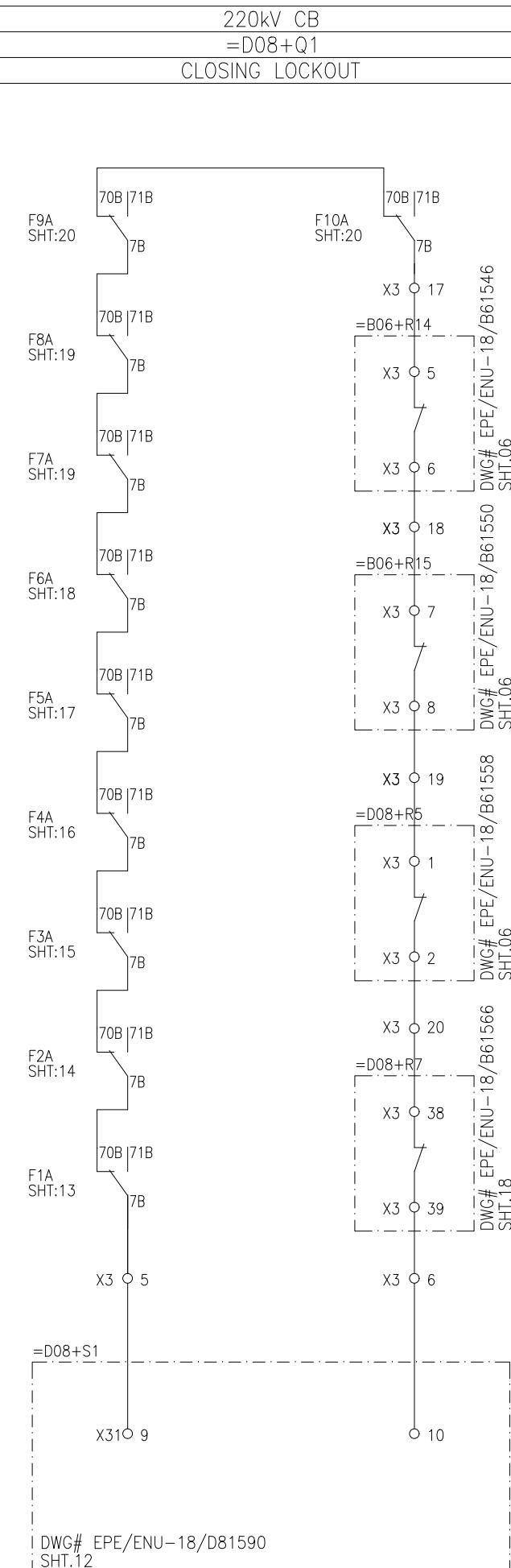
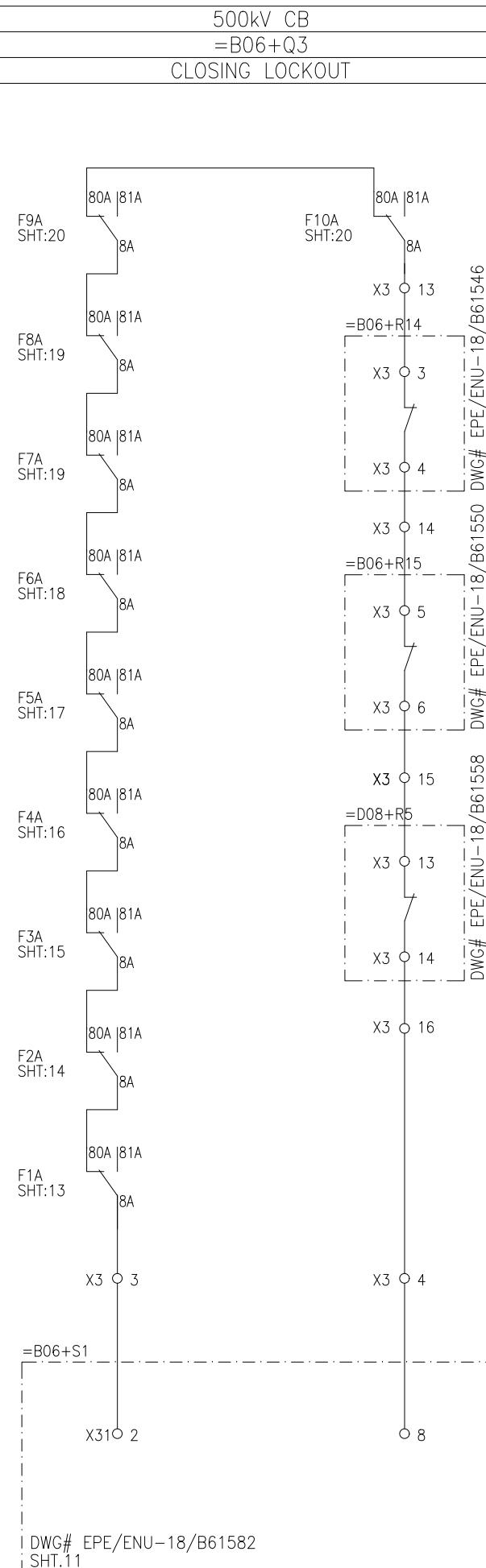
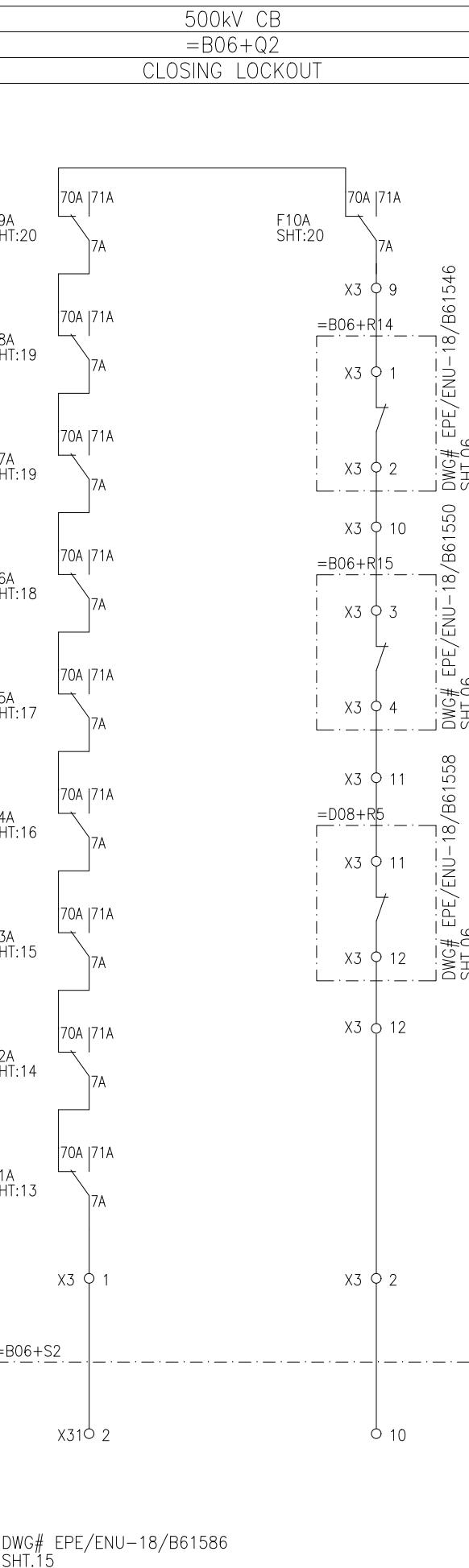


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SINGLE LINE DIAGRAM 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 04 OF 66
NAH Q.	MSS M. Sohail	MUR Iy		<b>E P E S O L P v t . L t d .</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

**LEGEND**

DES.	DESCRIPTION	TYPE	MAKE
F110, F120	DC MCB, 2P, 10A	EP-100	GE
KC	AUX. RELAY WITH AUX. CO	MCRC	GE
KDC	MINIATURE RELAY	PRC	GE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DC SUPPLY DISTRIBUTION 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 05 OF 66
NAH [Signature]	MSS [Signature]	MUR [Signature]		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
					REV: 0	



DWG# EPE/ENU-18/B61586  
SHT.15

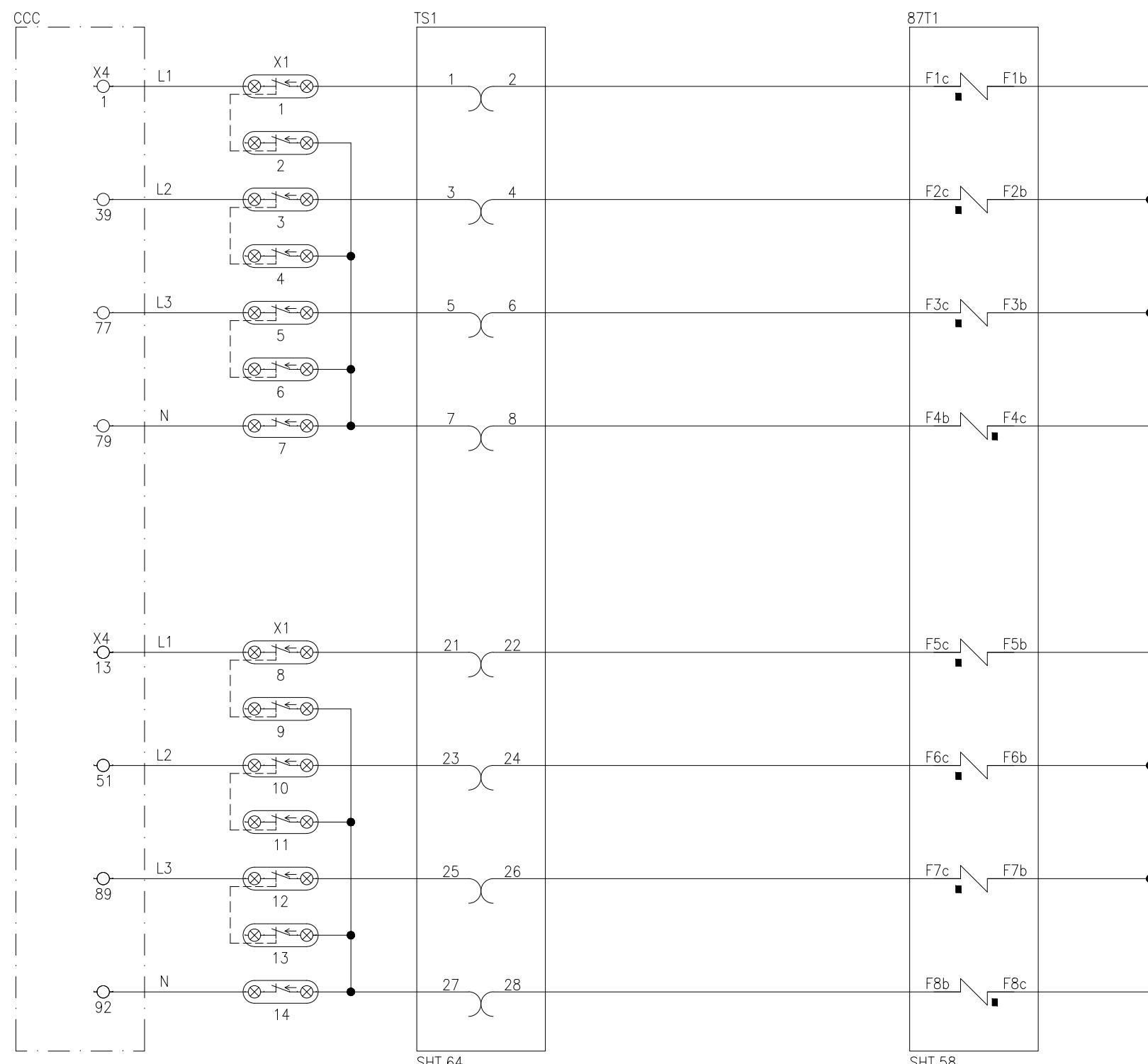
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SHT.11

DWG# EPE/ENU-18/D81590  
SHT.12

DWG# EPE/ENU-18/D81594  
SHT.11

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: CB CLOSE BLOCK CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 06 OF 66
NAH 	MSS 	MUR 				DATE: 07.03.2019	AS BUILT

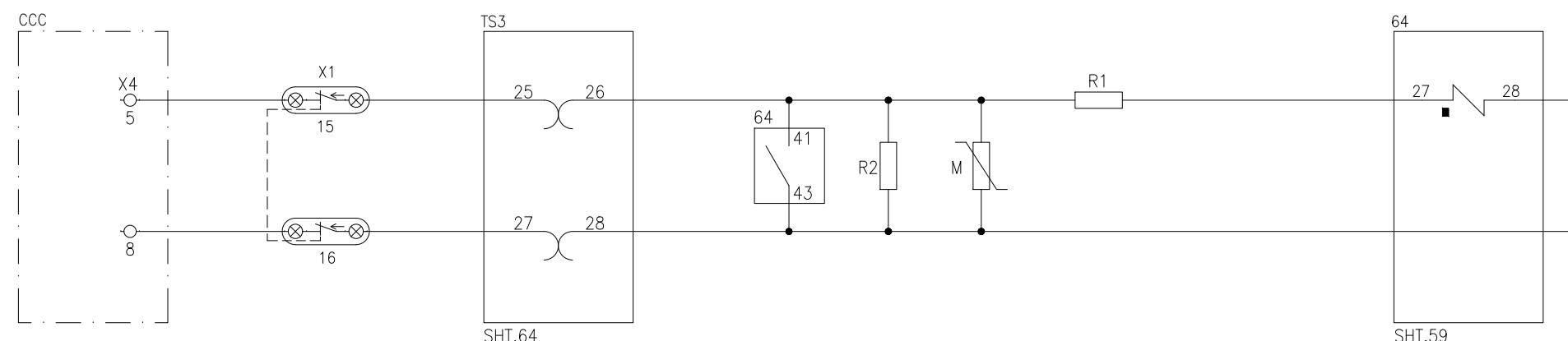
## TEST BLOCK

TRAFO. DIFF.  
SET-I

## LEGEND

DES.	DESCRIPTION	TYPE	MAKE
87T1	TRAFO. DIFF. PROT. RELAY	T60	GE
TSX	TEST BLOCK (14 FINGERS)	soTECH-TSB14	ARTECHE

## TEST BLOCK

RESTABILIZING  
RESISTORRESTRICTED EARTH FAULT  
PROTECTION RELAY

## LEGEND

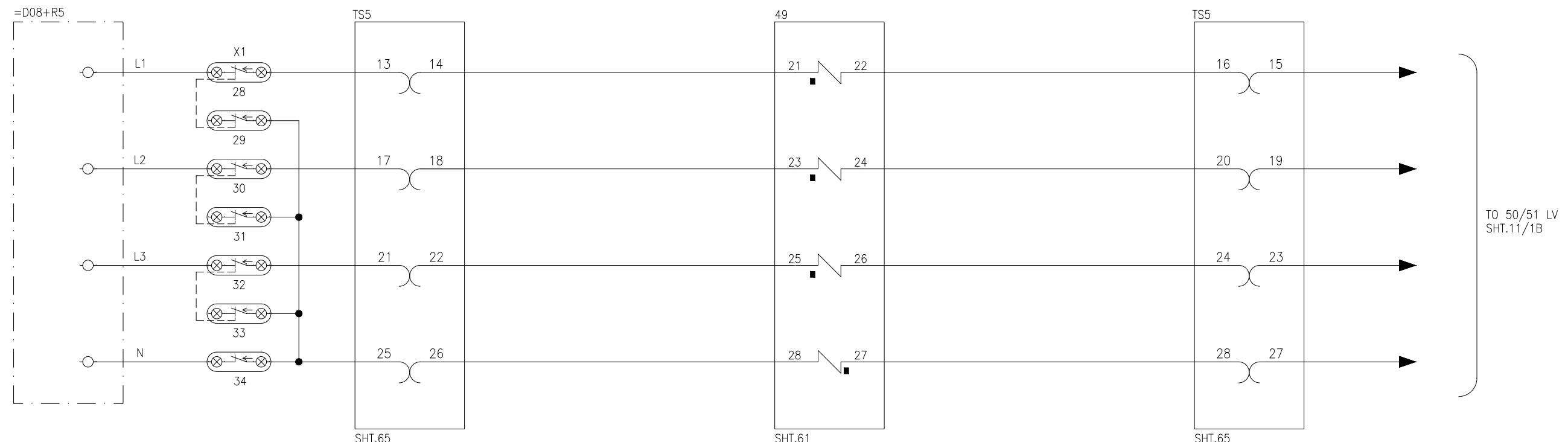
DES.	DESCRIPTION	TYPE	MAKE
64	HIF PROTECTION RELAY	P14NB	GE
R1, R2	ADJUSTABLE RESISTOR, 1.5kΩ	ZB9016774	GE
M	NON-LINEAR METROSIL RESISTOR	ZB9411570	GE
TS-X	TEST BLOCK (14 FINGERS)	sqTECH-TSB 14	ARTECHE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: REF PROTECTION CT CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 08 OF 66
NAH	MSS	MUR		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
						REV: 0

## TEST BLOCK

THERMAL OVERLOAD  
PROTECTION RELAY

## TEST BLOCK

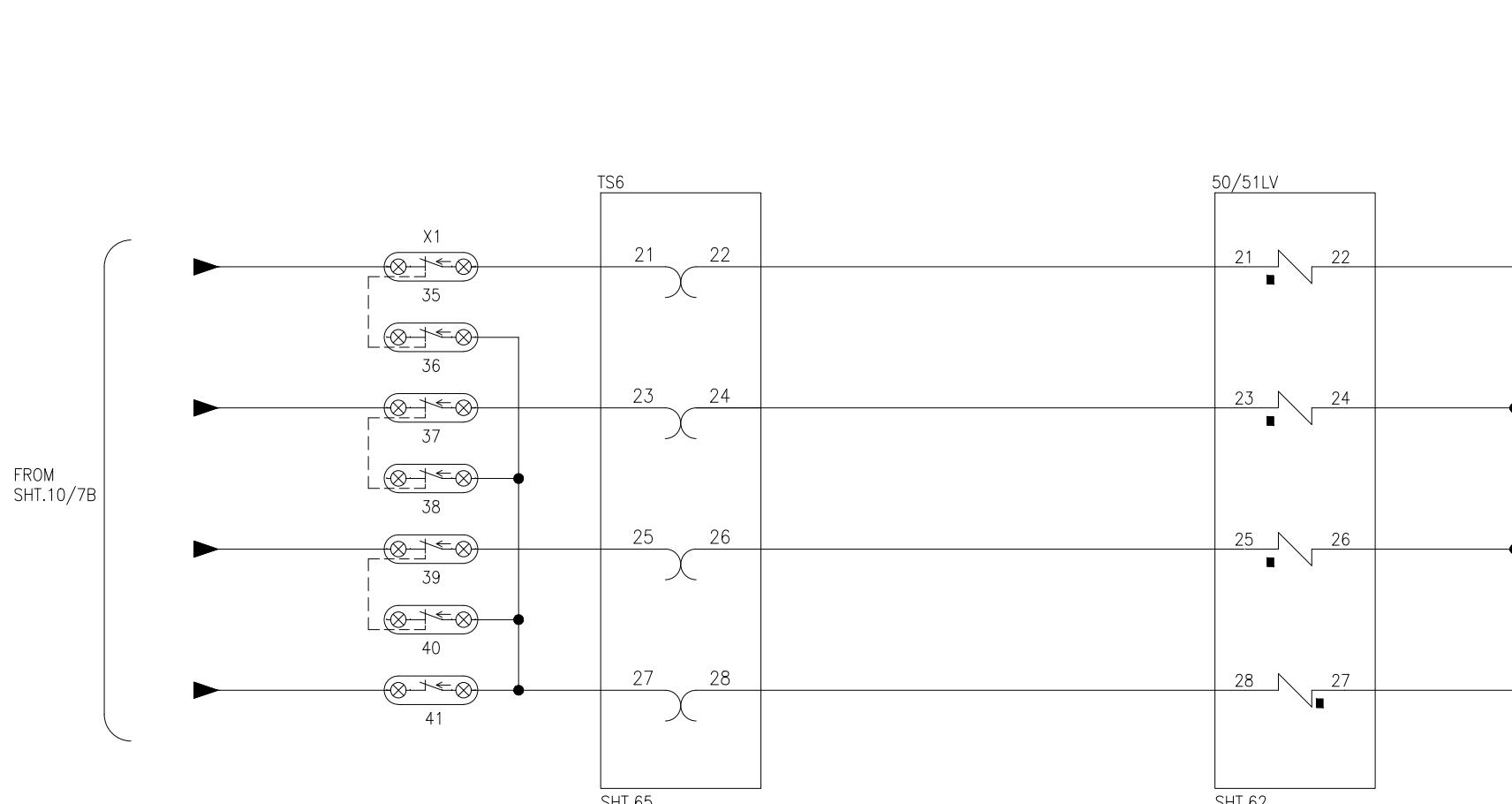


## LEGEND

DES.	DESCRIPTION	TYPE	MAKE
49	THERMAL OVERLOAD PROT. RELAY	P14N	GE
TS-X	TEST BLOCK (14 FINGERS)	soTECH-TSB 14	ARTECHE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: THERMAL OVERLOAD PROT. CT CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 10 OF 66
NAH	MSS	MUR		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
					REV: 0	

## TEST BLOCK

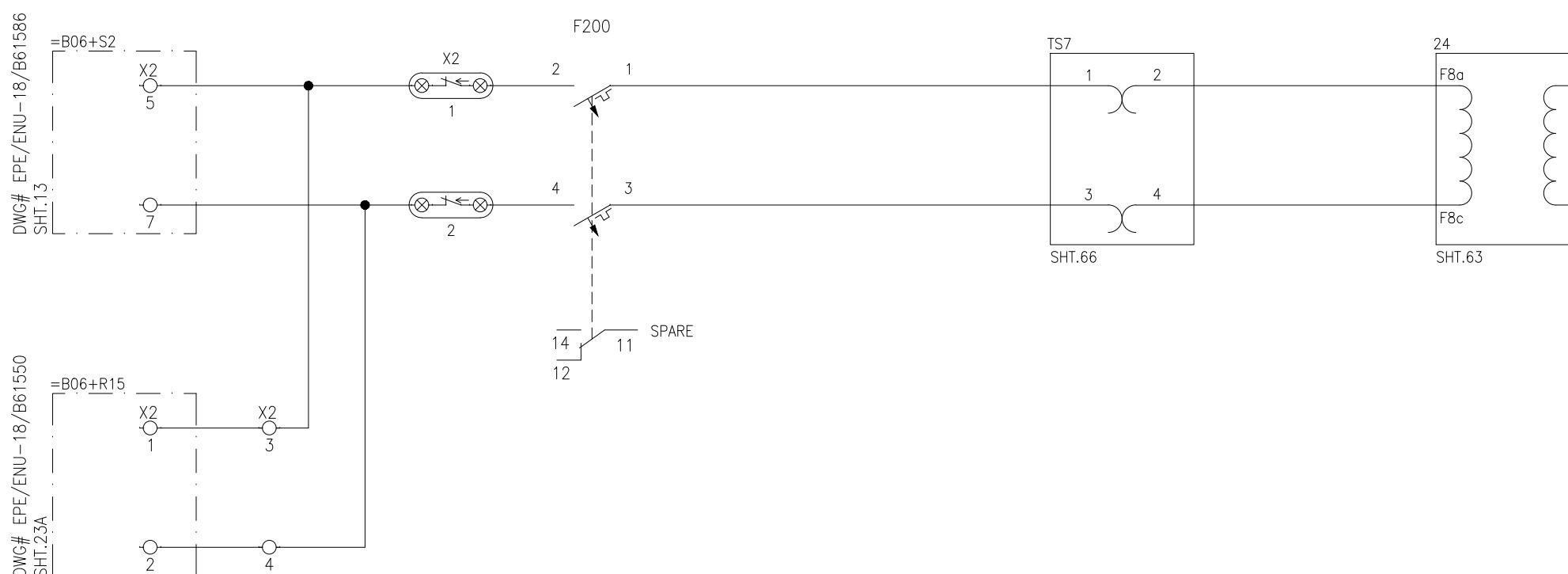
LV O/C & E/F  
PROTECTION RELAY

## LEGEND

DES.	DESCRIPTION	TYPE	MAKE
50/51LV	LV OC PROT. RELAY	P14N	GE
TS-X	TEST BLOCK (14 FINGERS)	soTECH-TSB14	ARTECHE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: LV OC PROTECTION CT CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 11 OF 66
NAH	MSS	MUR		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT
					REV: 0	

## TEST BLOCK

OVER FLUXING PROTECTION  
RELAY

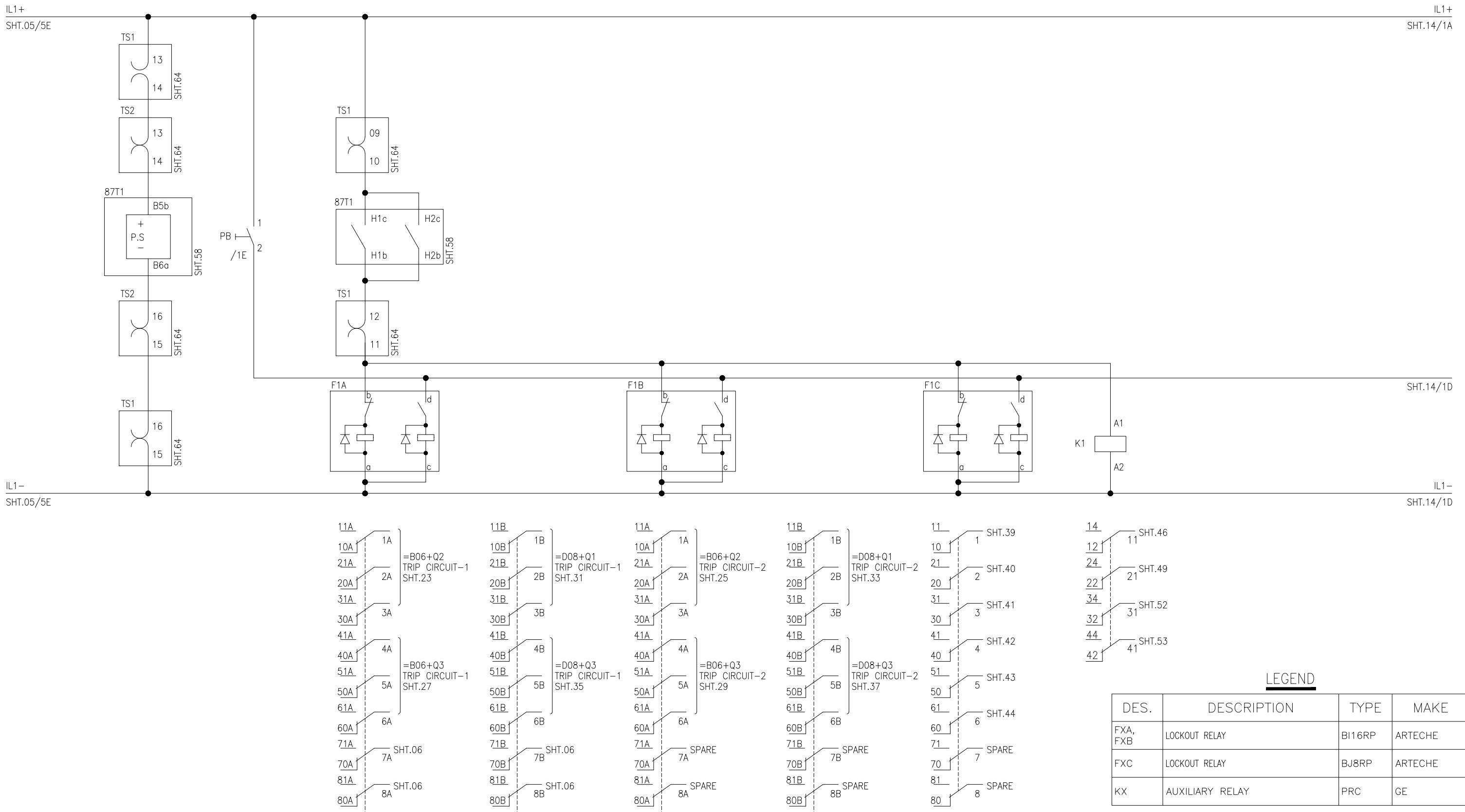
## LEGEND

DES.	DESCRIPTION	TYPE	MAKE
24	O/F PROT. RELAY	T60	GE
TS-X	TEST BLOCK (14 FINGERS)	soTECH-TSB 14	ARTECHE
F200	AC MCB, 2P, 6A	G60	GE

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: OVERFLUXING PROTECTION VT CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 12 OF 66		
NAH	MSS	MUR		E P E S O L P v t . L t d	71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT	REV: 0

DC SUPPLY  
TRAFO DIFF. RELAY

TRAFO. DIFF. PROTECTION  
TRIP



APPROVED  
NAH [Signature]  
CHECKED  
MSS [Signature]  
DRAWN  
MUR [Signature]



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

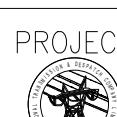
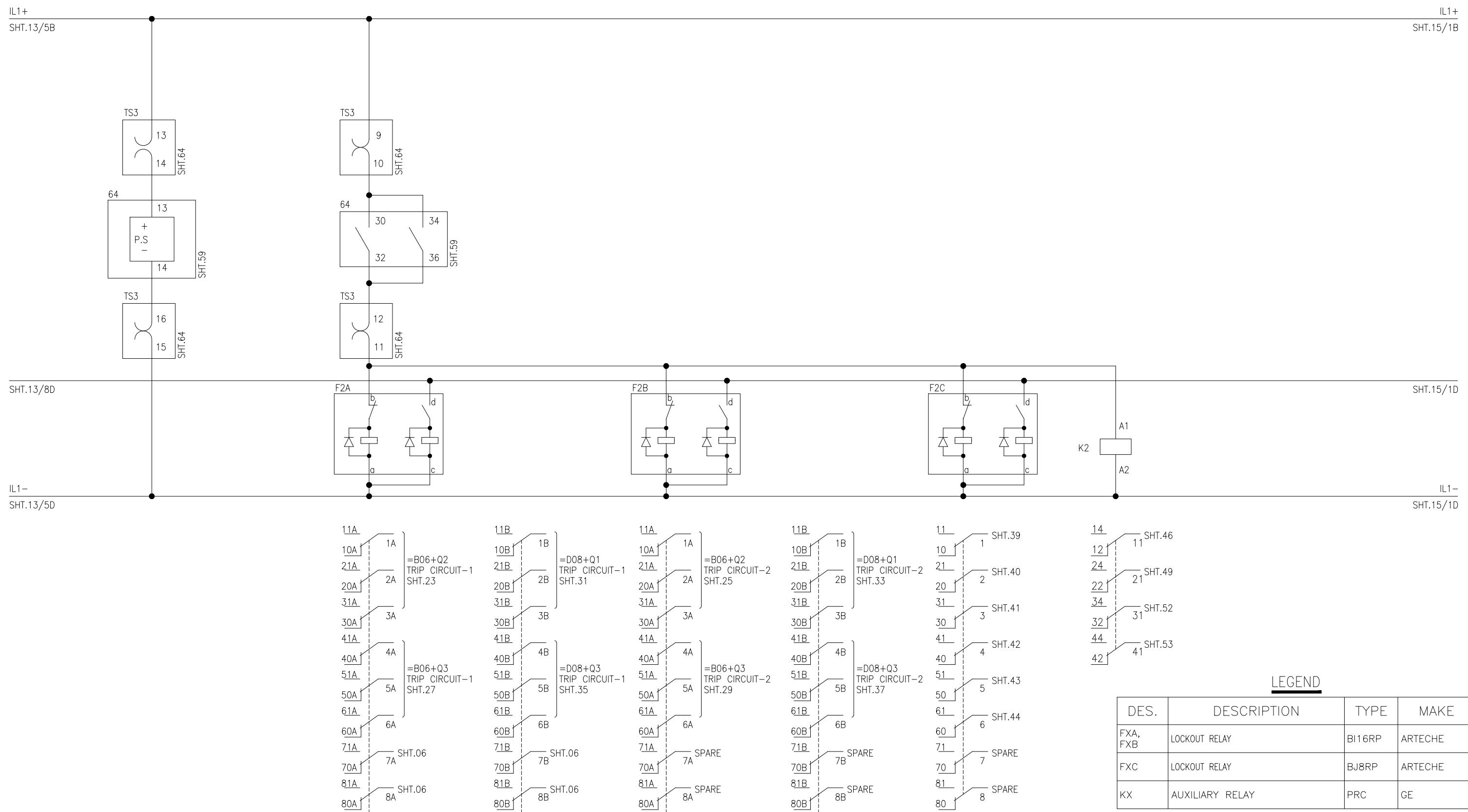
TITLE:  
TRAFO DIFFERENTIAL PROT. DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**EPESOL Pvt. Ltd.**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542 SHT: 13 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

DC SUPPLY  
REF RELAY  
REF PROTECTION RELAY  
TRIP



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:

REF PROTECTION DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

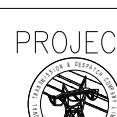
DWG# EPE/ENU-18/B61542

DATE: 07.03.2019

**AS BUILT**

SHT: 14 OF 66

REV: 0



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:

REF PROTECTION DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542

DATE: 07.03.2019

**AS BUILT**

SHT: 14 OF 66

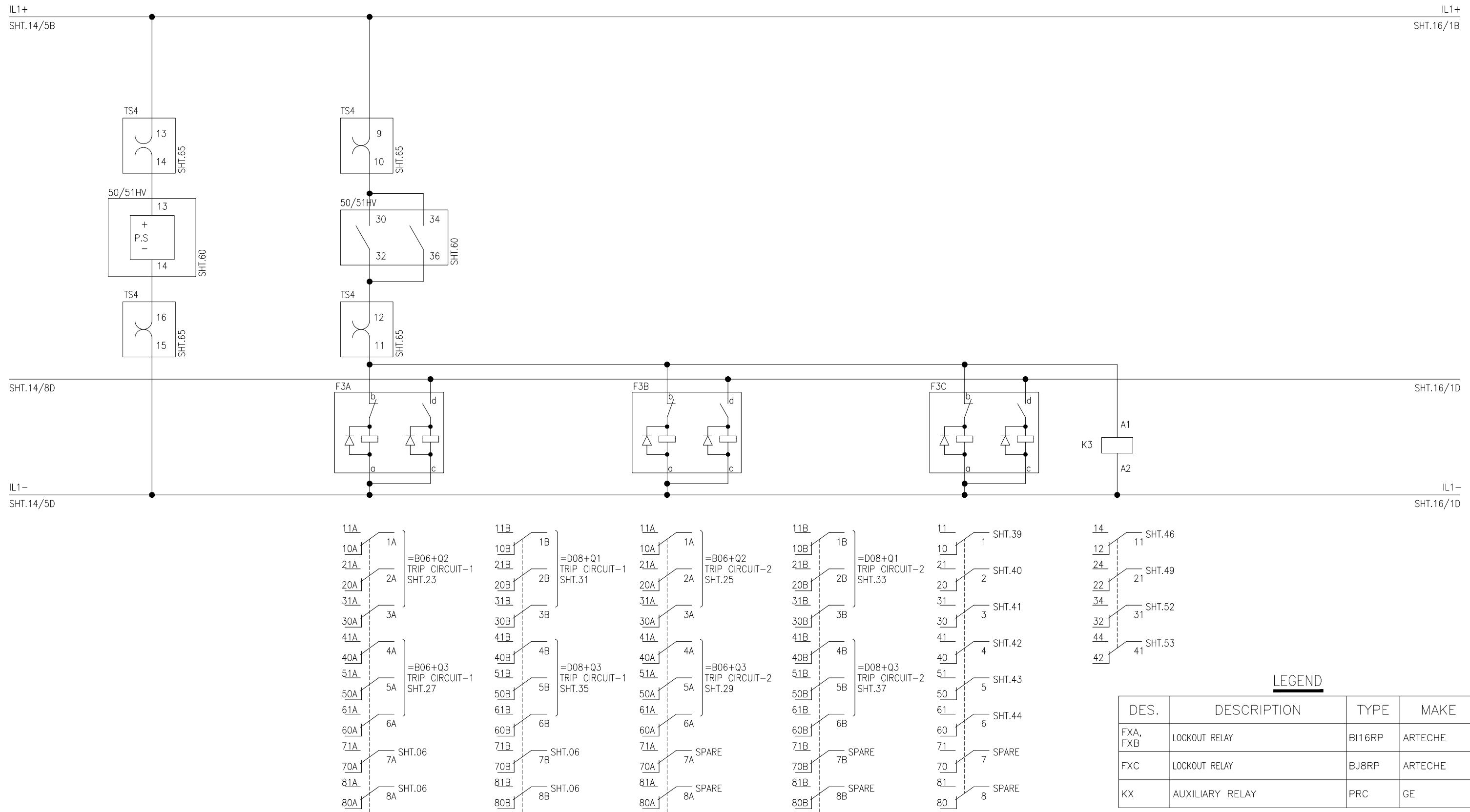
REV: 0

DC SUPPLY

HV O/C &amp; E/F PROTECTION RELAY

HV O/C &amp; E/F RELAY

TRIP

**LEGEND**

DES.	DESCRIPTION	TYPE	MAKE
FXA, FXB	LOCKOUT RELAY	BI16RP	ARTECHE
FXC	LOCKOUT RELAY	BJ8RP	ARTECHE
KX	AUXILIARY RELAY	PRC	GE

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:

HV OC PROTECTION DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**EPESOL Pvt. Ltd.**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

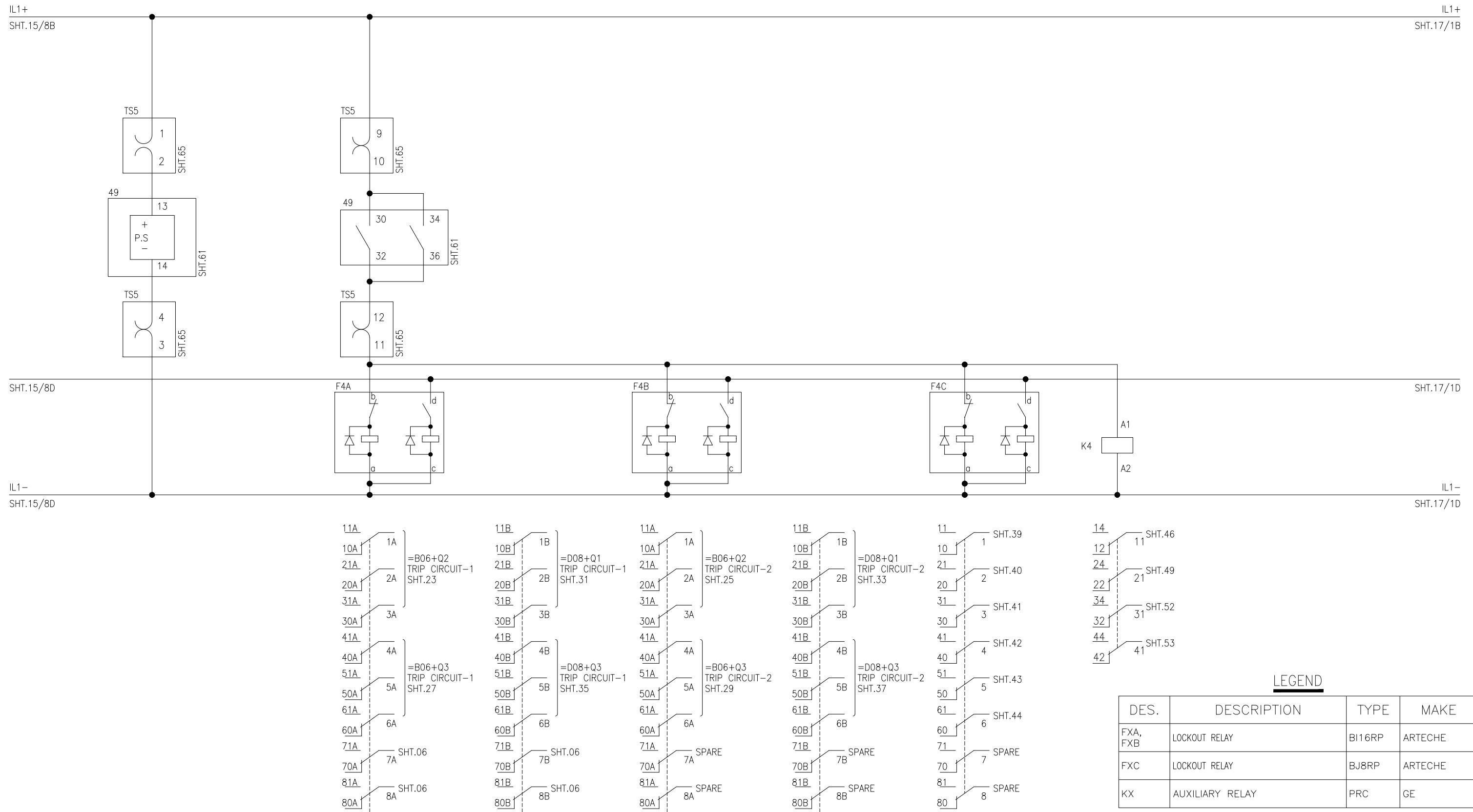
DWG# EPE/ENU-18/B61542 SHT: 15 OF 66

DATE: 07.03.2019

**AS BUILT**

REV: 0

DC SUPPLY                    THERMAL OVERLOAD PROTECTION RELAY  
 THERMAL OVERLOAD RELAY                    STAGE-II TRIP



APPROVED    CHECKED    DRAWN



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
 THERMAL OVERLOAD PROT. DC CIRCUIT  
 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



EPE SOL Pvt. Ltd.  
 71-B Garden Block, New Garden Town, Lahore, Pakistan

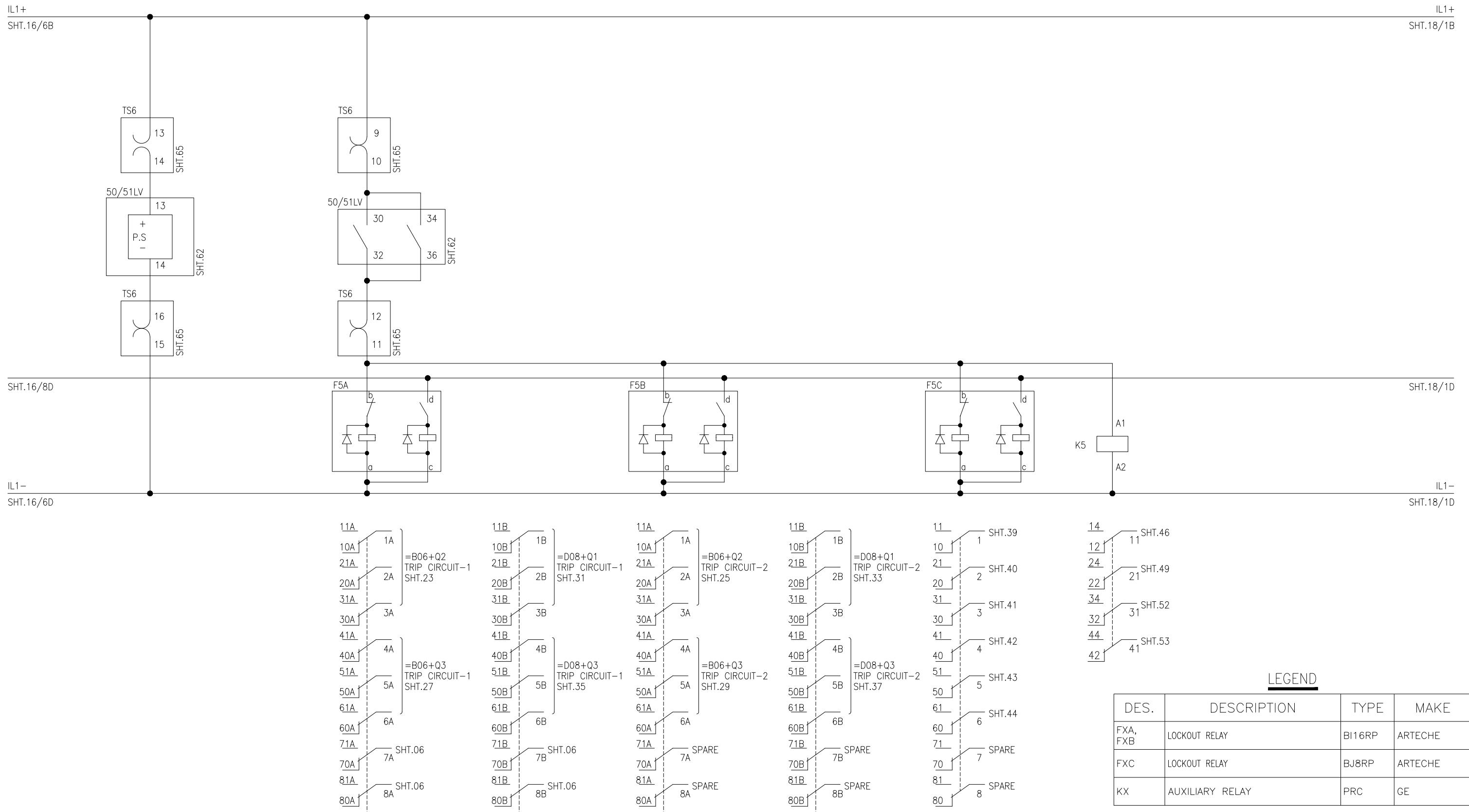
DWG# EPE/ENU-18/B61542    SHT: 16 OF 66  
 DATE: 07.03.2019    AS BUILT    REV: 0

DC SUPPLY

LV O/C &amp; E/F PROTECTION RELAY

LV O/C &amp; E/F RELAY

TRIP



APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

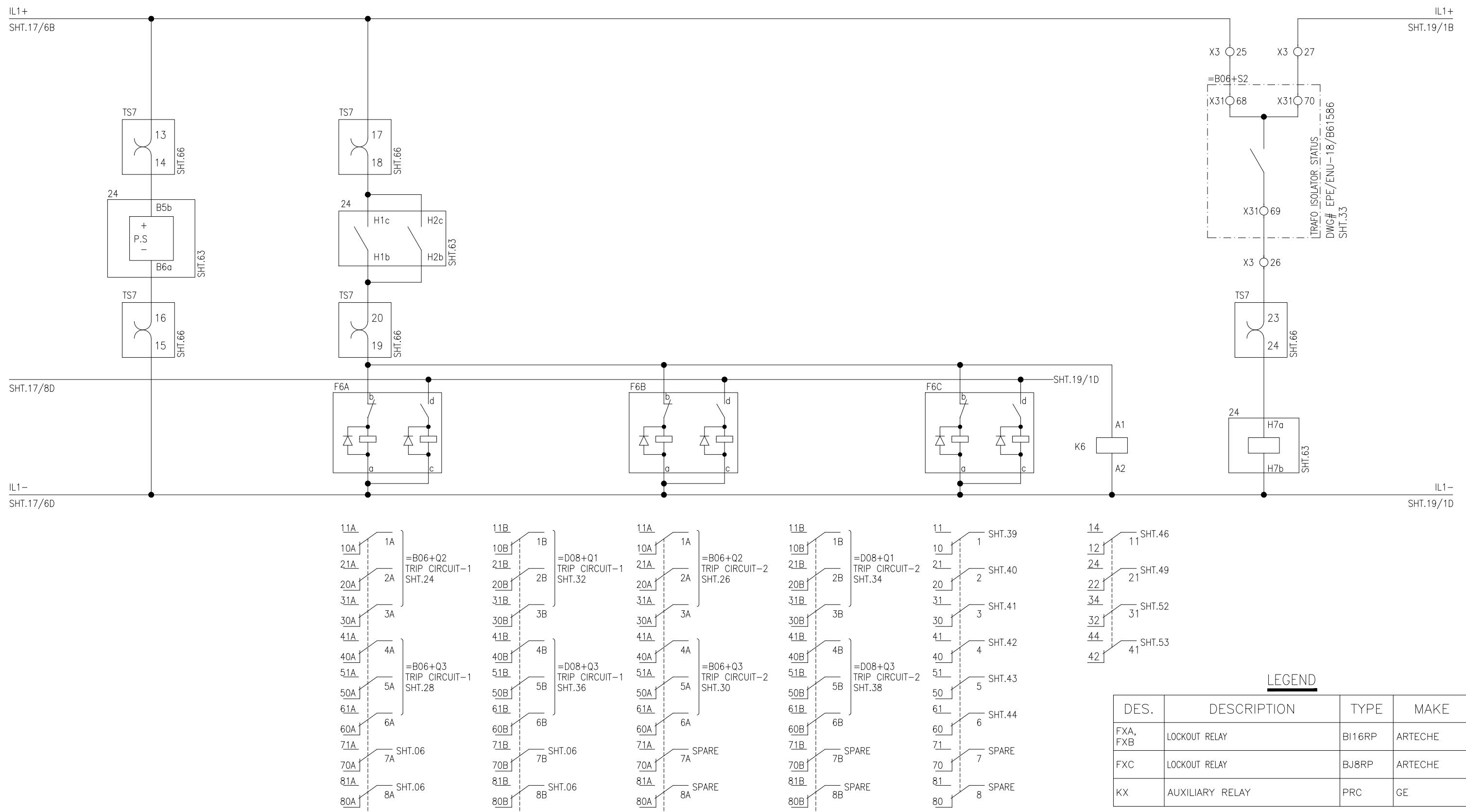
TITLE:

LV OC PROTECTION DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542	SHT: 17 OF 66
DATE: 07.03.2019	AS BUILT REV: 0

DC SUPPLY  
OVER FLUXING PROT.OVER FLUXING PROTECTION RELAY  
TRIPOVER FLUXING PROTECTION RELAY  
ENABLED

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
OVERFLUXING PROTECTION DC CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13

**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

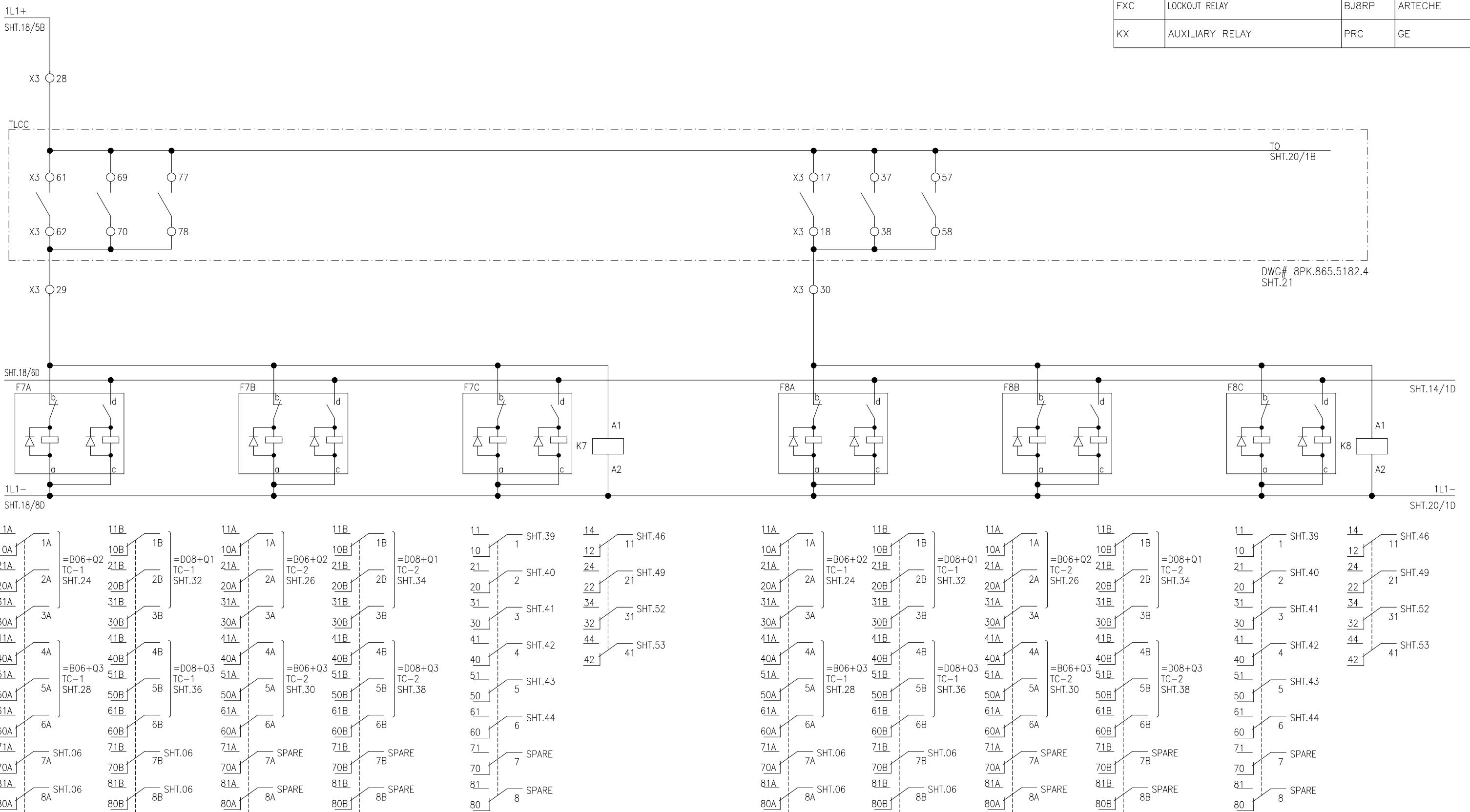
DWG# EPE/ENU-18/B61542 SHT: 18 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

TRAFO BUCHOLZ  
PROTECTION TRIP

ATR HV WINDING TEMPERATURE  
PROT. TRIP

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
FXA, FXB	LOCKOUT RELAY	BI16RP	ARTECHE
FXC	LOCKOUT RELAY	BJ8RP	ARTECHE
KX	AUXILIARY RELAY	PRC	GE



APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
TRANSFORMER MECHANICAL PROTECTION TRIP  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



DWG# EPE/ENU-18/B61542 SHT: 19 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

ATR LV WINDING TEMPERATURE  
PROT. TRIP

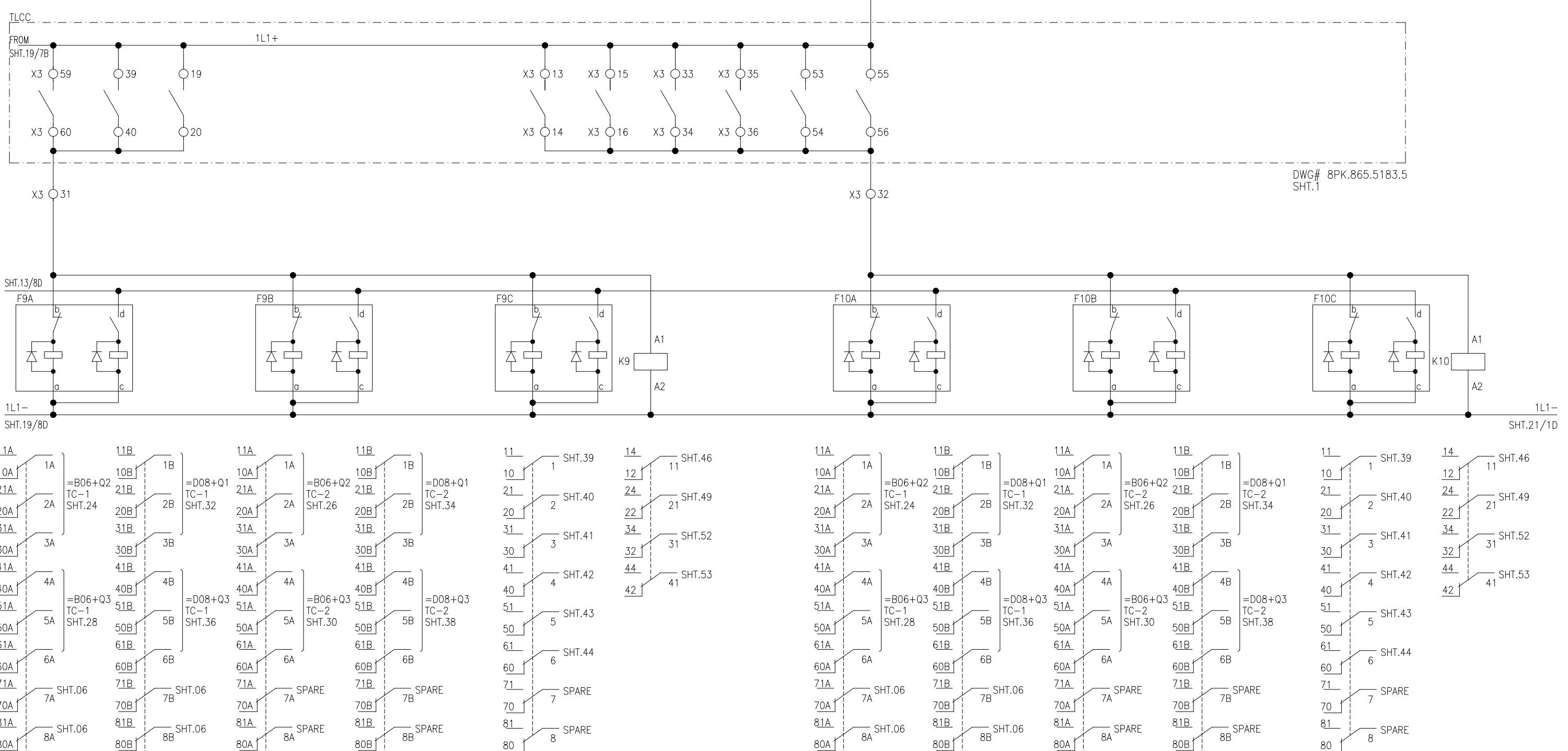
TRAFO OIL TEMPERATURE  
PROT. TRIP

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
FXA, FXB	LOCKOUT RELAY	BI16RP	ARTECHE
FXC	LOCKOUT RELAY	BJ8RP	ARTECHE
KX	AUXILIARY RELAY	PRC	GE

1L1+

SHT.21/1B



APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



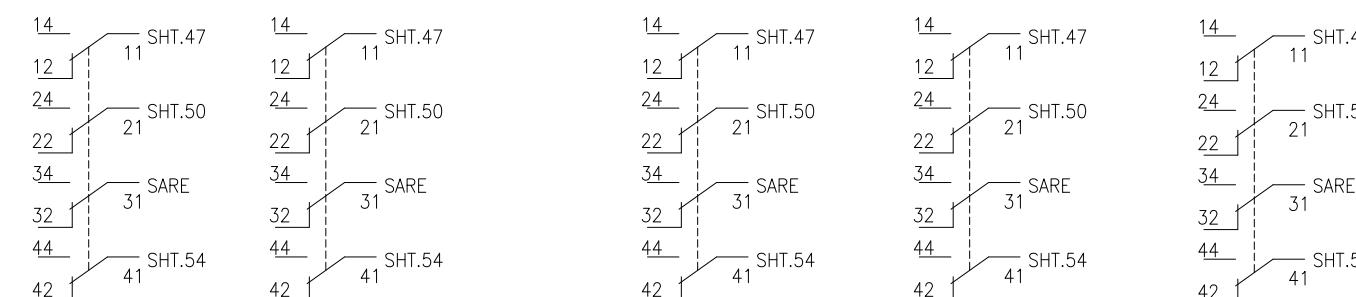
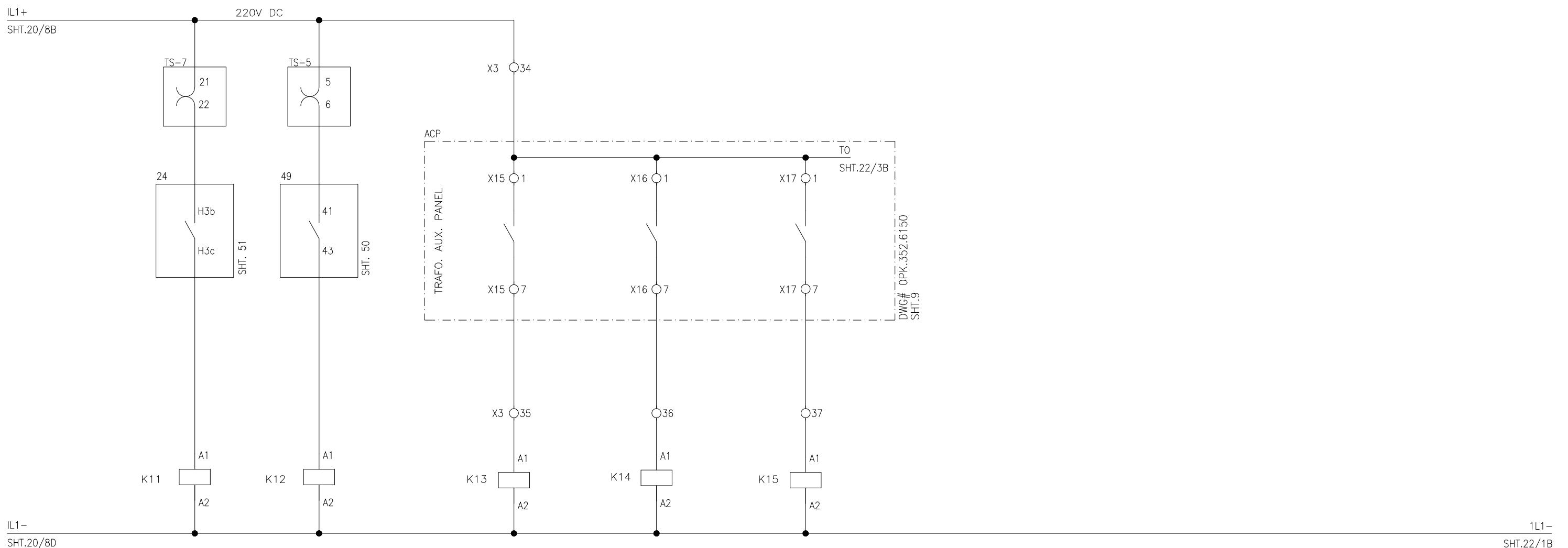
PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
TRANSFORMER MECHANICAL PROTECTION TRIP  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13

EPE SOL Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

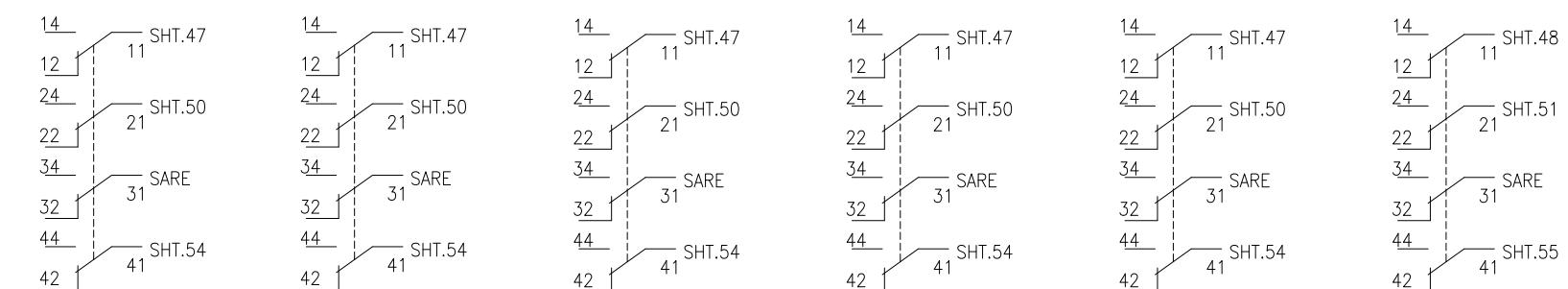
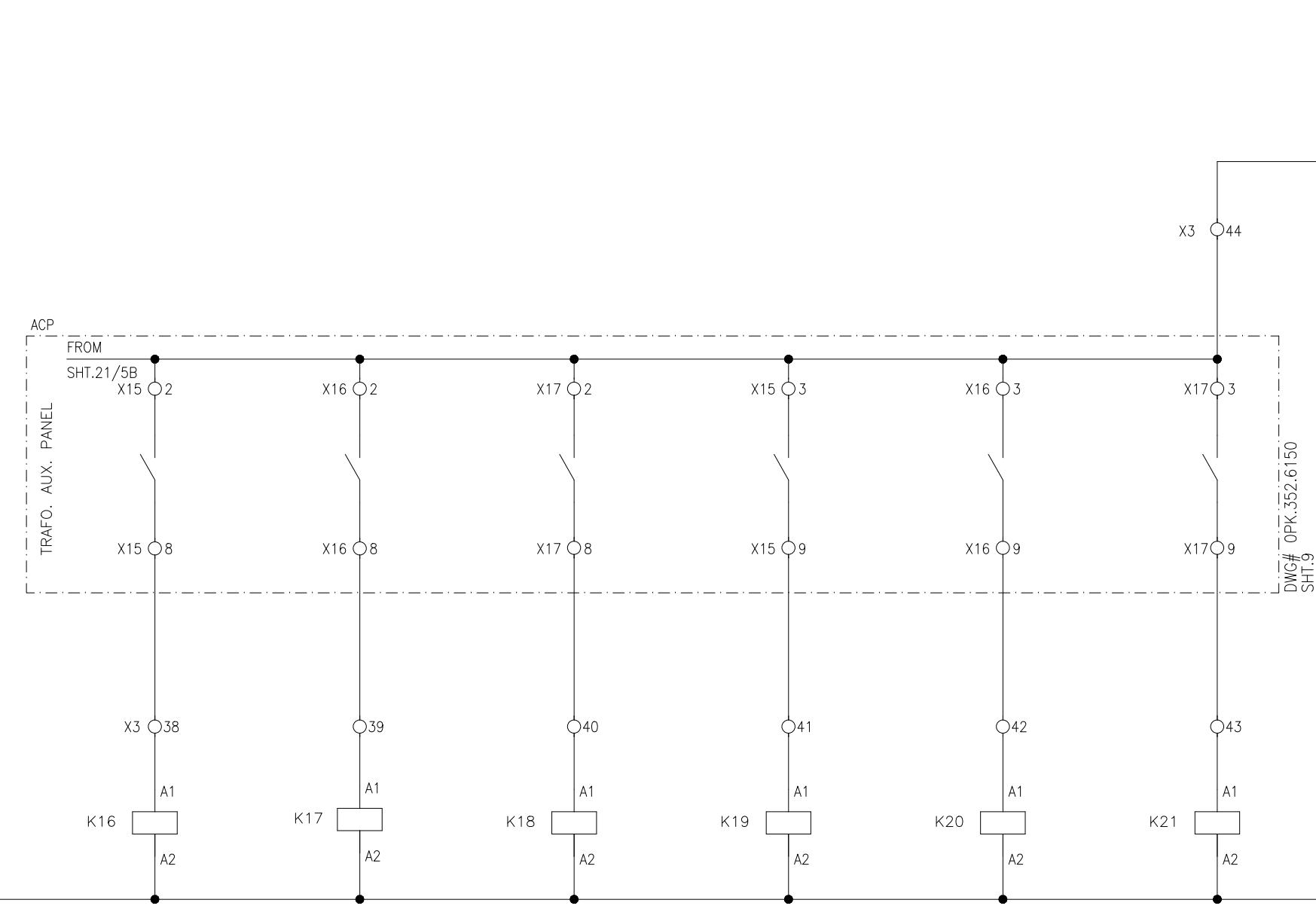
DWG# EPE/ENU-18/B61542 SHT: 20 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

OVER EXCITATION STAGE-I ALARM	OVER LOAD RELAY STAGE-I ALARM	EXCESS OIL TEMPERATURE ALARM (R-PHASE)	EXCESS OIL TEMPERATURE ALARM (Y-PHASE)	EXCESS OIL TEMPERATURE ALARM (B-PHASE)
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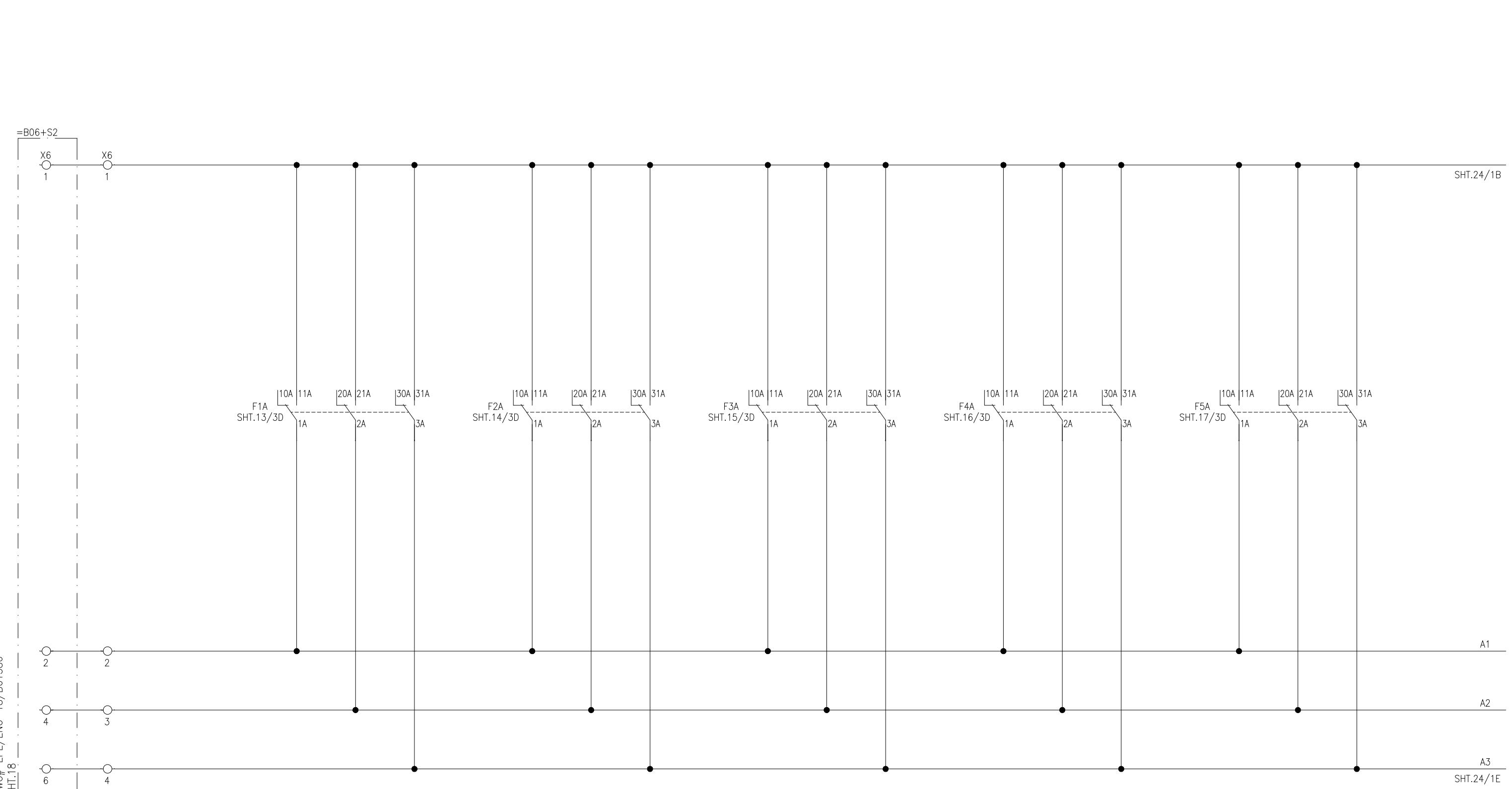
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: TRAFO MECHANICAL ALARM 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 21 OF 66
NAH [Signature]	MSS [Signature]	MUR [Signature]		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT REV: 0

EXCESS WINDING TEMPERATURE ALARM (R-PHASE)	EXCESS WINDING TEMPERATURE ALARM (Y-PHASE)	EXCESS WINDING TEMPERATURE ALARM (B-PHASE)	TRANSFORMER BUCHHLOZ ALARM (R-PHASE)	TRANSFORMER BUCHHLOZ ALARM (Y-PHASE)	TRANSFORMER BUCHHLOZ ALARM (B-PHASE)
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APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: TRAFO MECHANICAL ALARM 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 22 OF 66
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT REV: 0

500kV CB =B06+Q2 TC-1

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

DWG# EPE/ENU-18/B61586

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
=B06+Q2 TRIP CIRCUIT-1  
500kV TRAFO. PROTECTION PANEL TYPE =B06+R13



**E P E S O L P v t . L t d .**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542	SHT: 23 OF 66
DATE: 07.03.2019	AS BUILT
REV: 0	

500kV CB =B06+Q2 TC-1

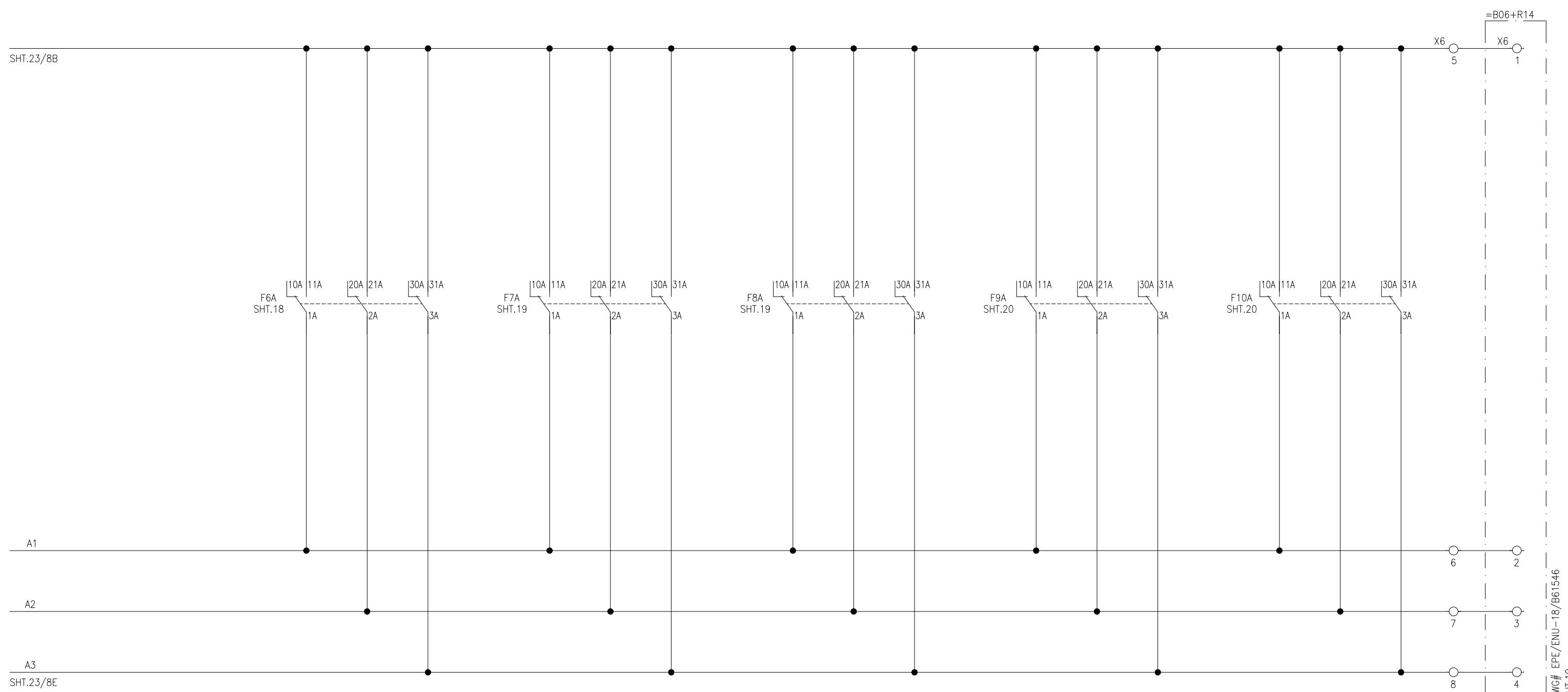
## OVER FLUXING PROTECTION TRI

TRAFO BUCHOLZ  
PROTECTION TRIP

ATR HV WINDING TEMP  
PROTECTION TRIP

ATR LV WINDING TEMP  
PROTECTION TRIP

TRAFO OIL  
TEMP PROT. TRIP



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&C/M(P)/AM-VI/E0/9417-29 DATED 14.11.2011  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY & CONTROL PANELS

TITLE

=B06+Q2 TRIP CIRCUIT-1  
500kW TRAFQ PROTECTION PANEL TYPE -B06 LP13



# **E P E S O L Pvt. Ltd.**

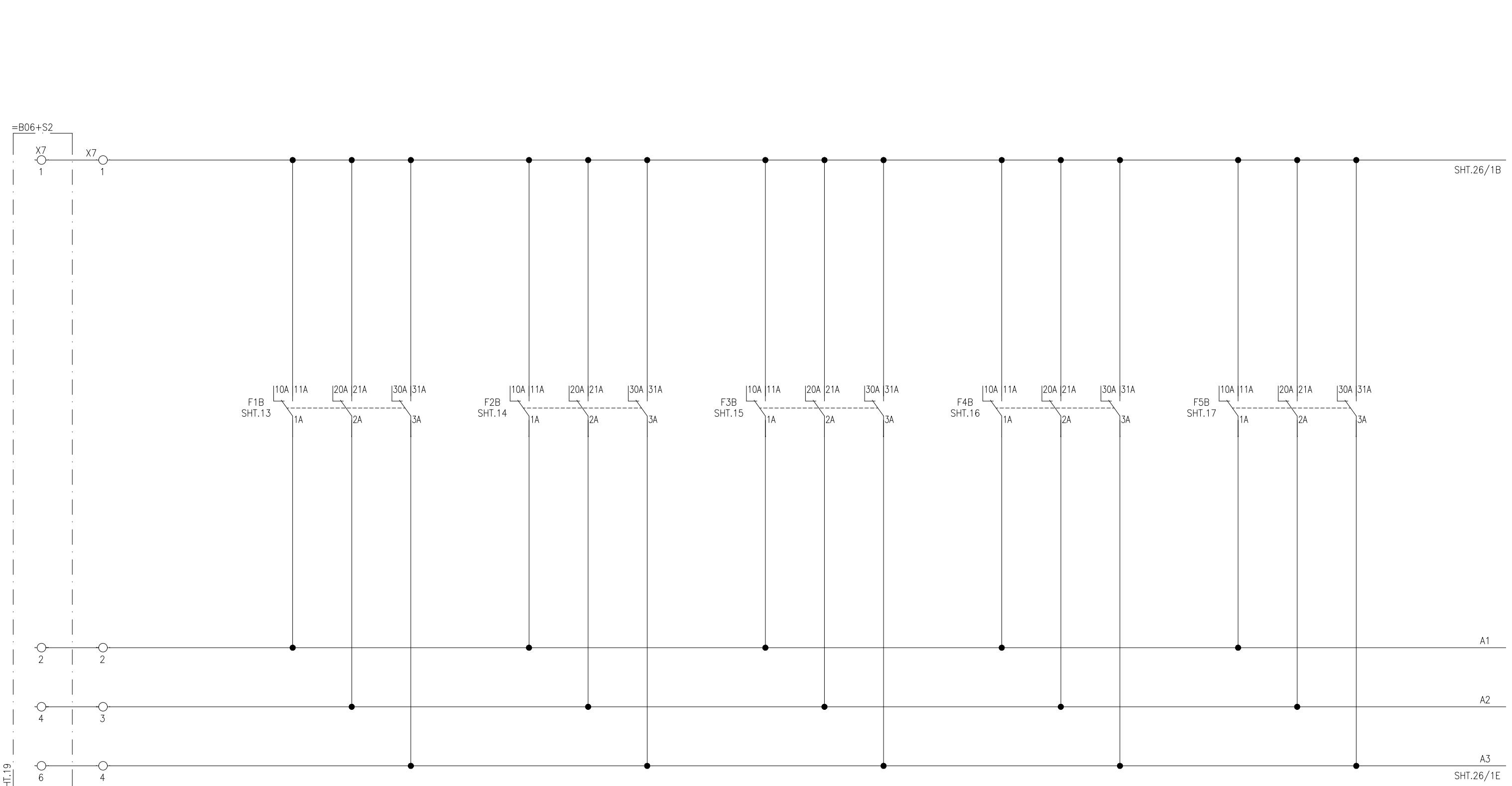
DWG# EPE/ENI-18/B6154

SWOFF ET AL.

8/B6154

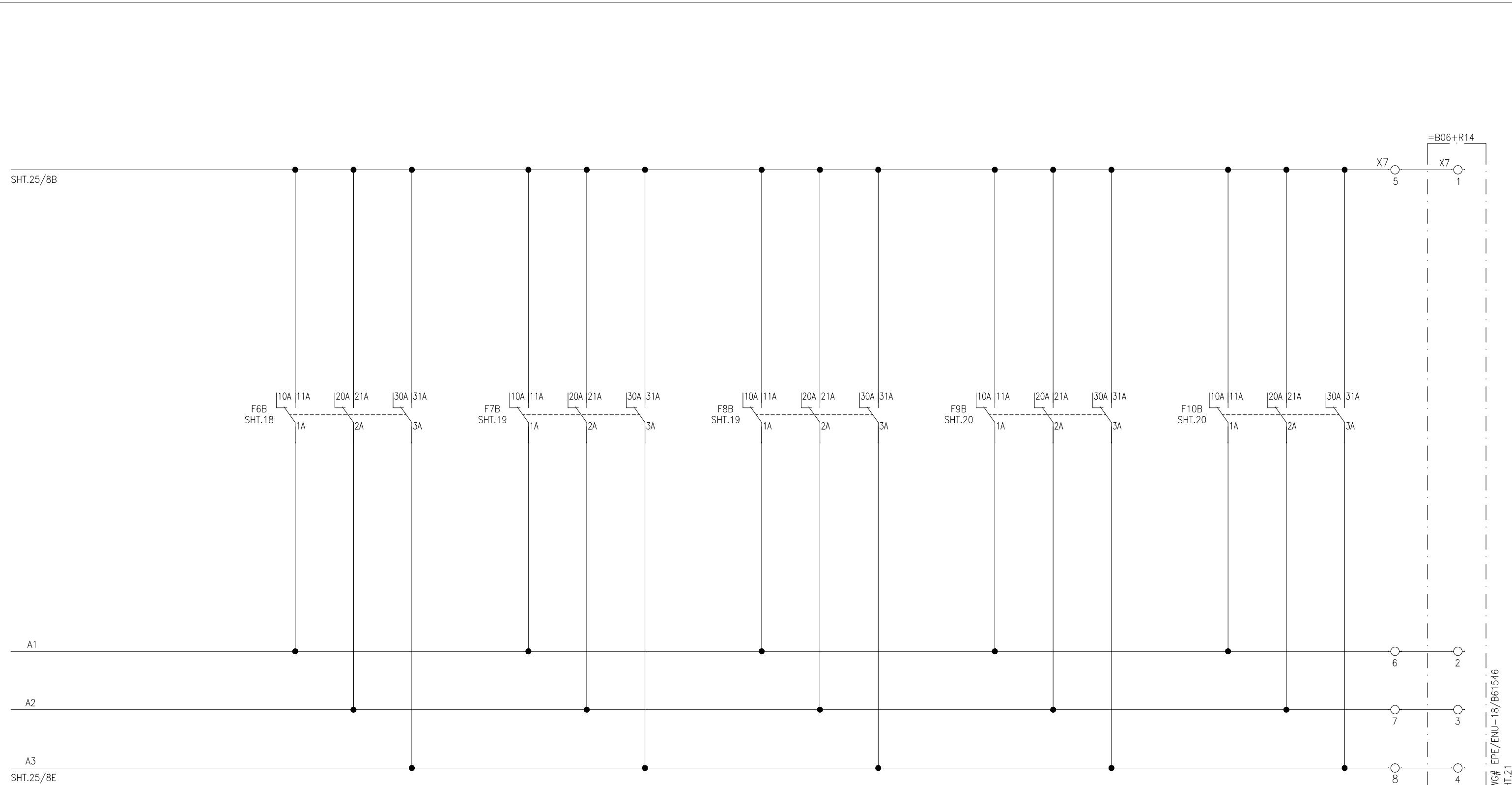
8/001542 SH. 2

## 500kV CB =B06+Q2 TC-2

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =B06+Q2 TRIP CIRCUIT-2 500kV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 25 OF 66
NAH [Signature]	MSS [Signature]	MUR [Signature]		 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

500kV CB =B06+Q2 TC-2

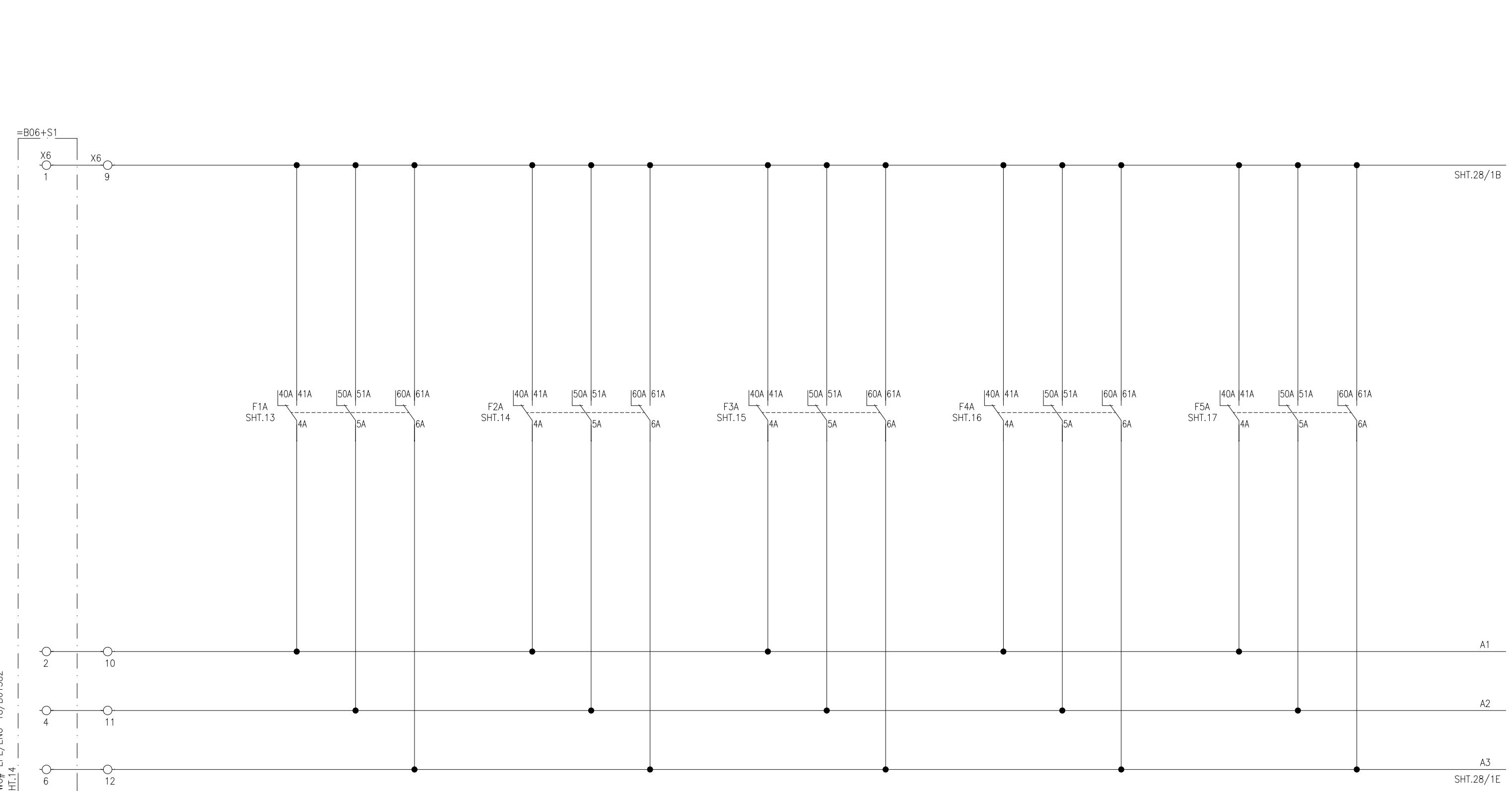
OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

SHT.21

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =B06+Q2 TRIP CIRCUIT-2 500kV TRAFO. PROTECTION PANEL TYPE =B06+R13	E P E S O L P v t . L t d. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 26 OF 66
NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT

REV: 0

## 500kV CB =B06+Q3 TC-1

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

DWG# EPE/ENU-18/B61582

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



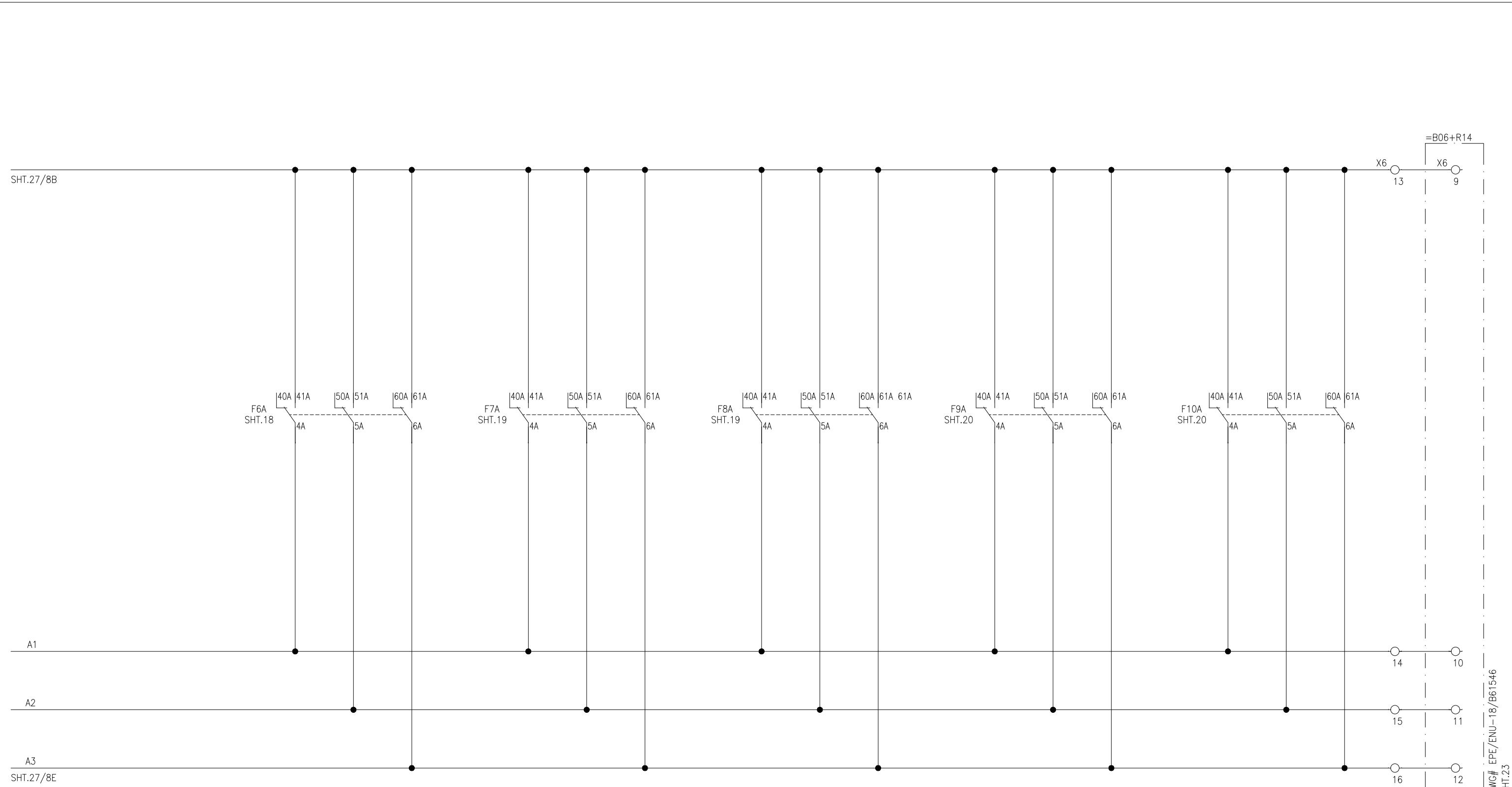
PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
=B06+Q3 TRIP CIRCUIT-1  
500kV TRAFO. PROTECTION PANEL TYPE =B06+R13

 **EPESOL Pvt. Ltd.**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

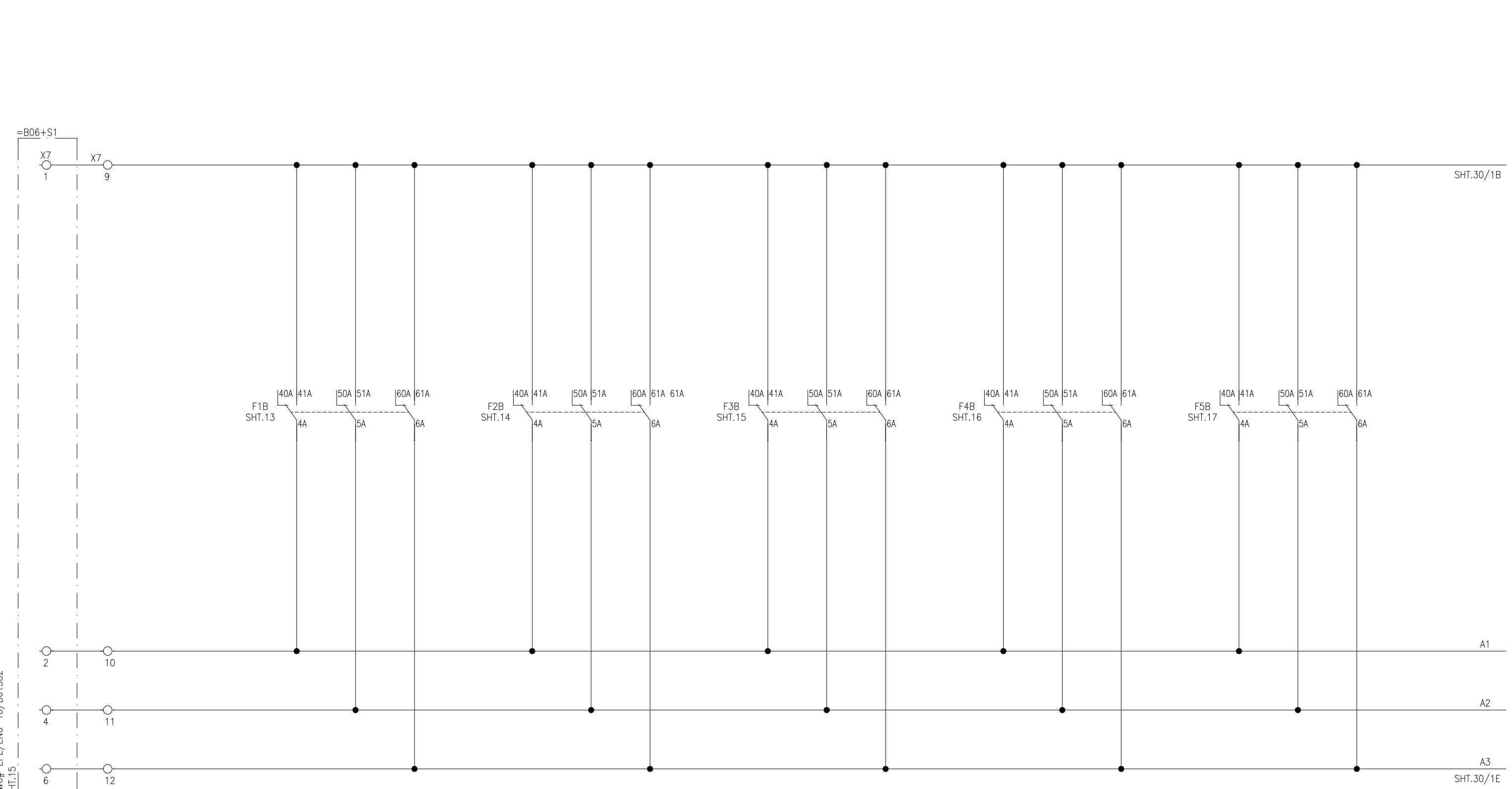
DWG# EPE/ENU-18/B61542	SHT: 27 OF 66
DATE: 07.03.2019	AS BUILT
REV: 0	

500kV CB =B06+Q3 TC-1

OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

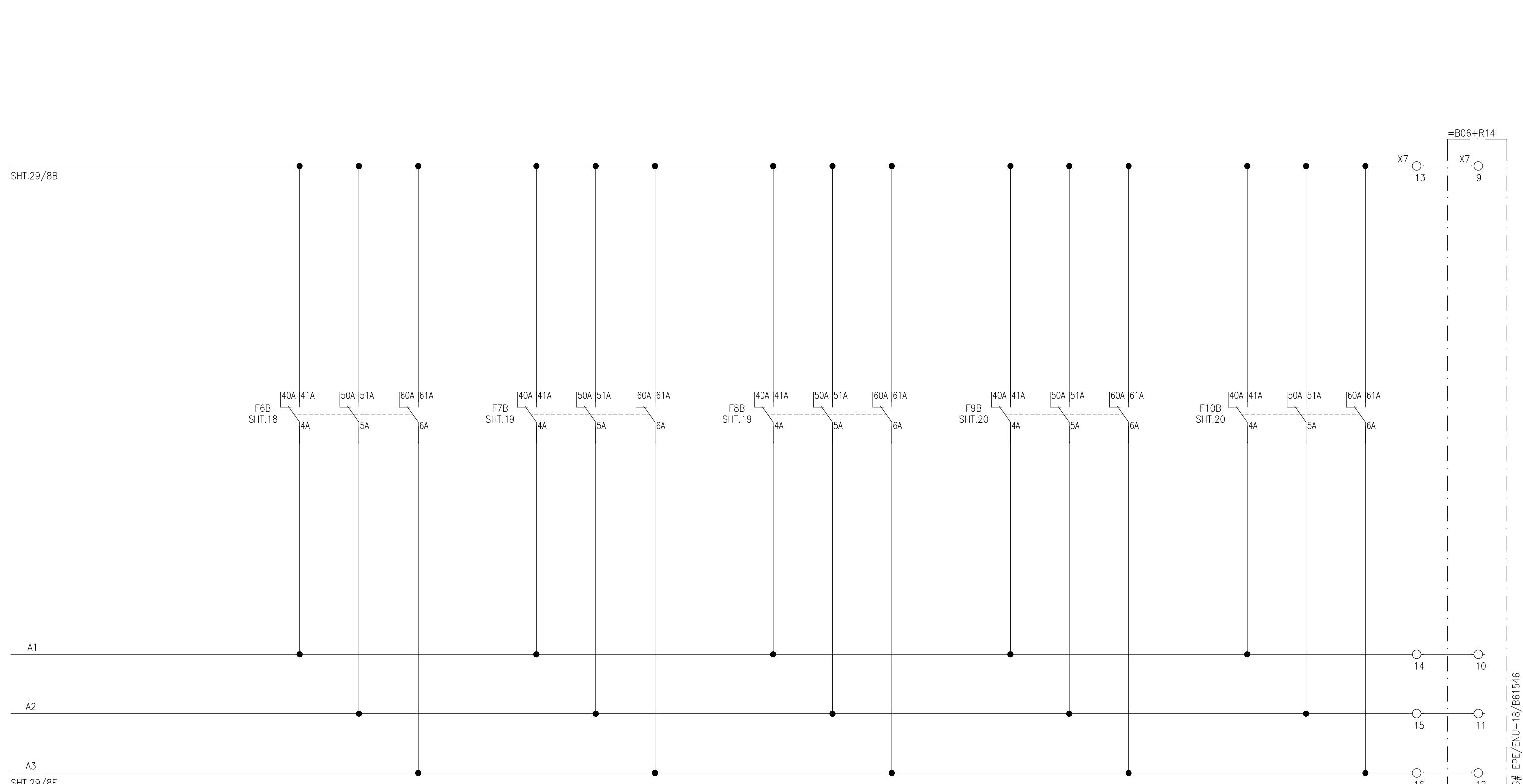
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NAH [Signature]	MSS [Signature]	MUR [Signature]	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan		DATE: 07.03.2019	AS BUILT REV: 0

## 500kV CB =B06+Q3 TC-2

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

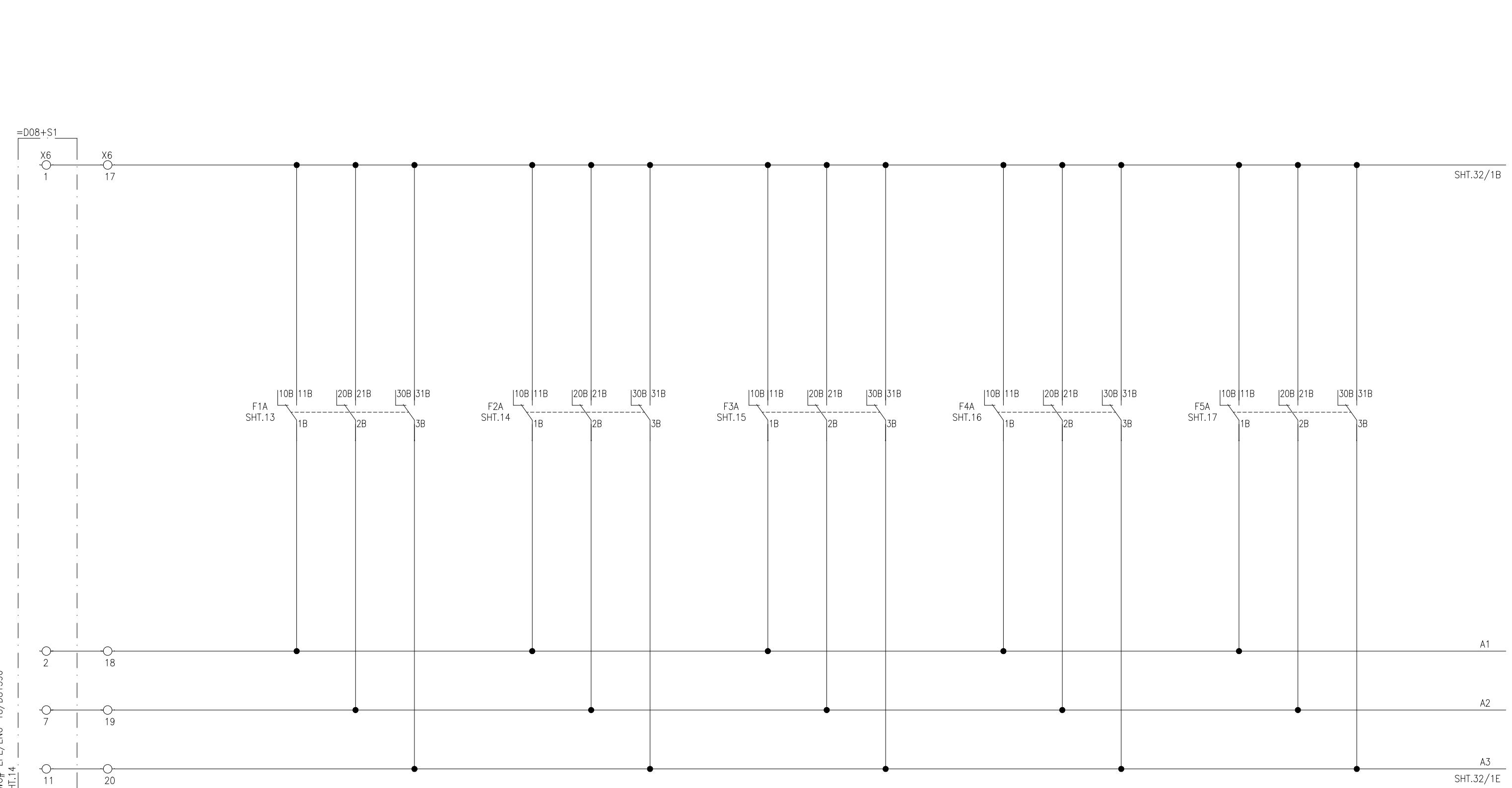
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NAH [Signature]	MSS [Signature]	MUR [Signature]		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT REV: 0

## 500kV CB =B06+Q3 TC-2

OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

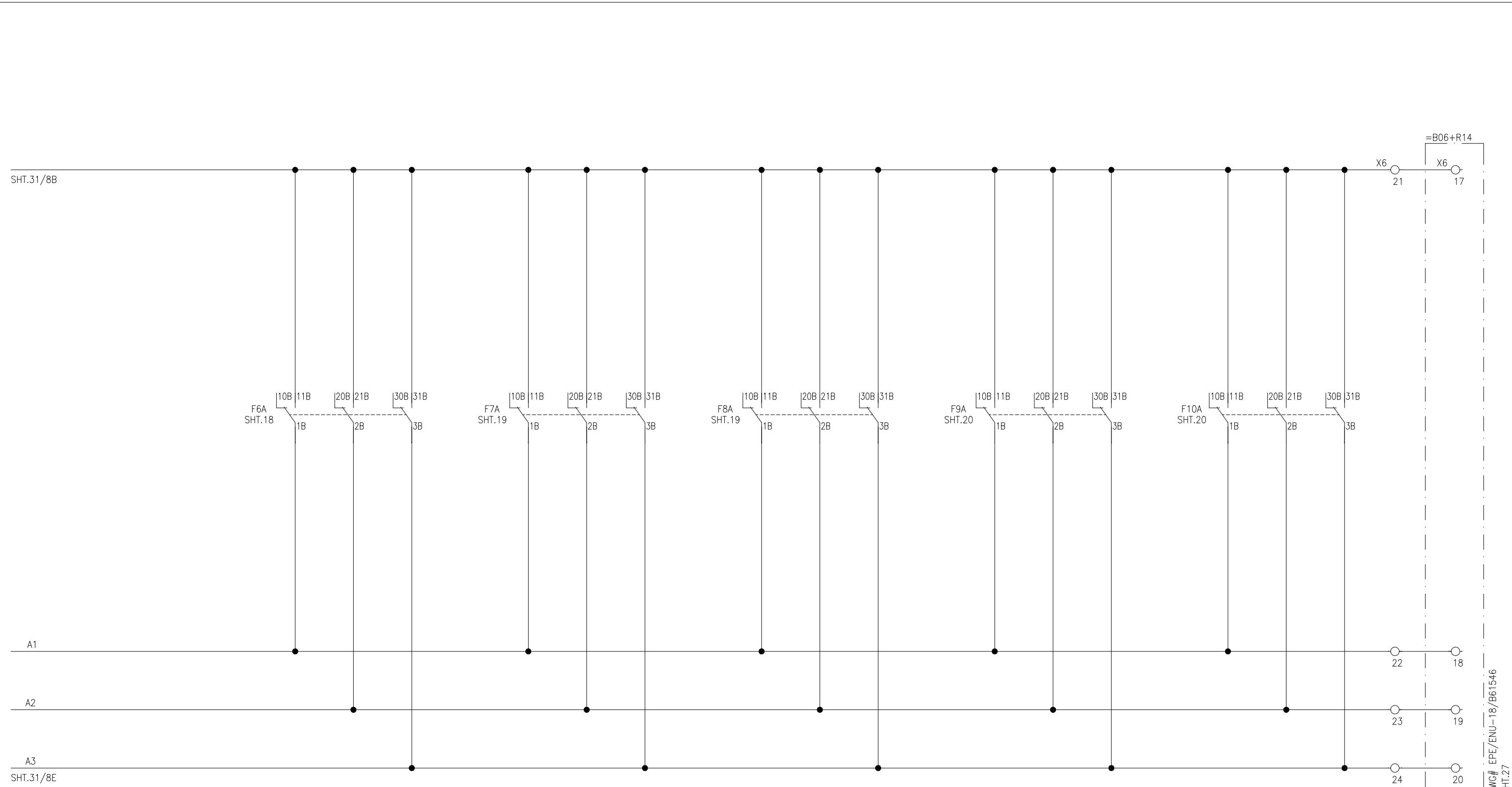
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NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT

220kV CB =D8+Q1 TC-1

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

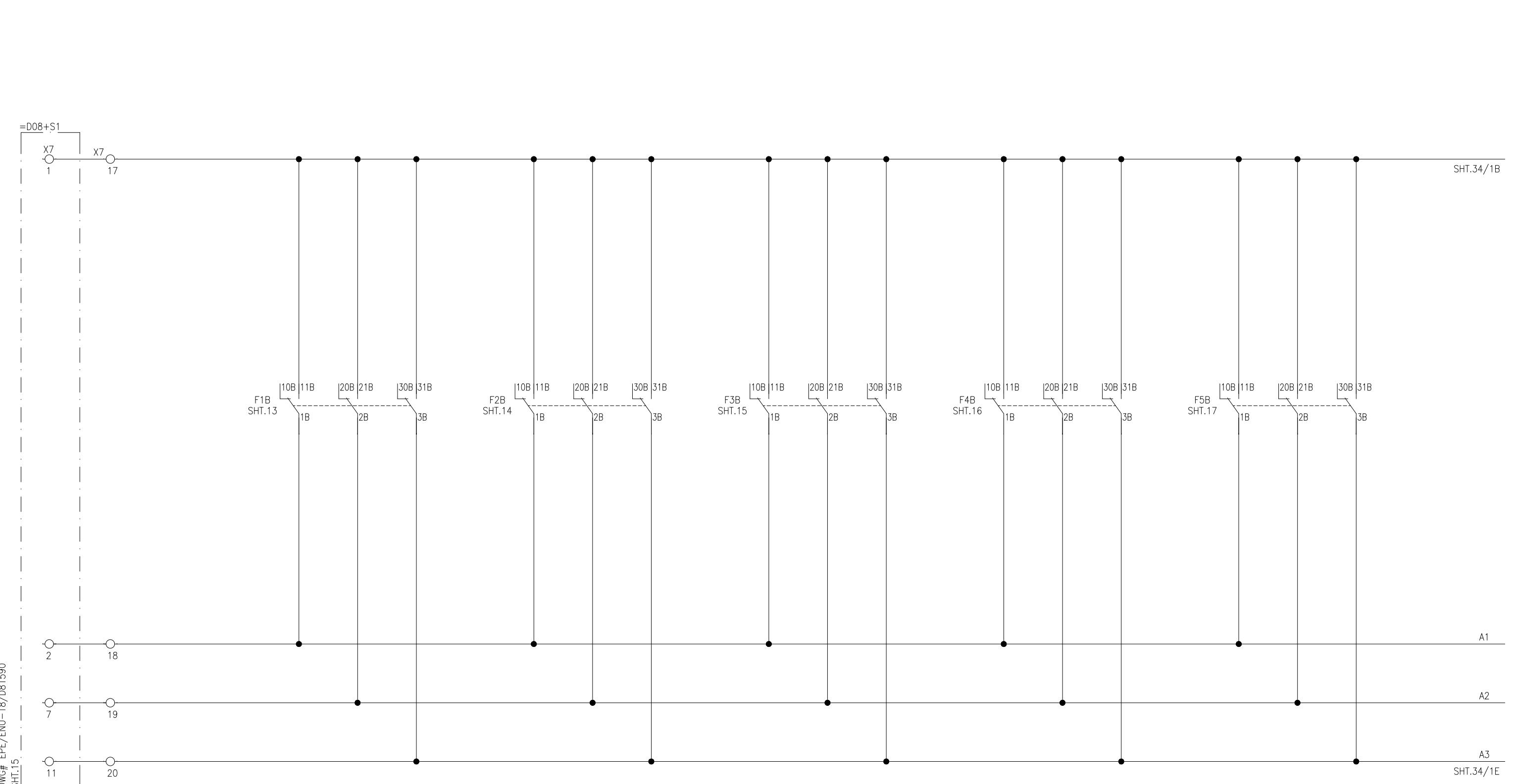
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q1 TRIP CIRCUIT-1 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 31 OF 66
NAH [Signature]	MSS [Signature]	MUR [Signature]		 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT REV: 0

220kV CB =D8+Q1 TC-1

OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

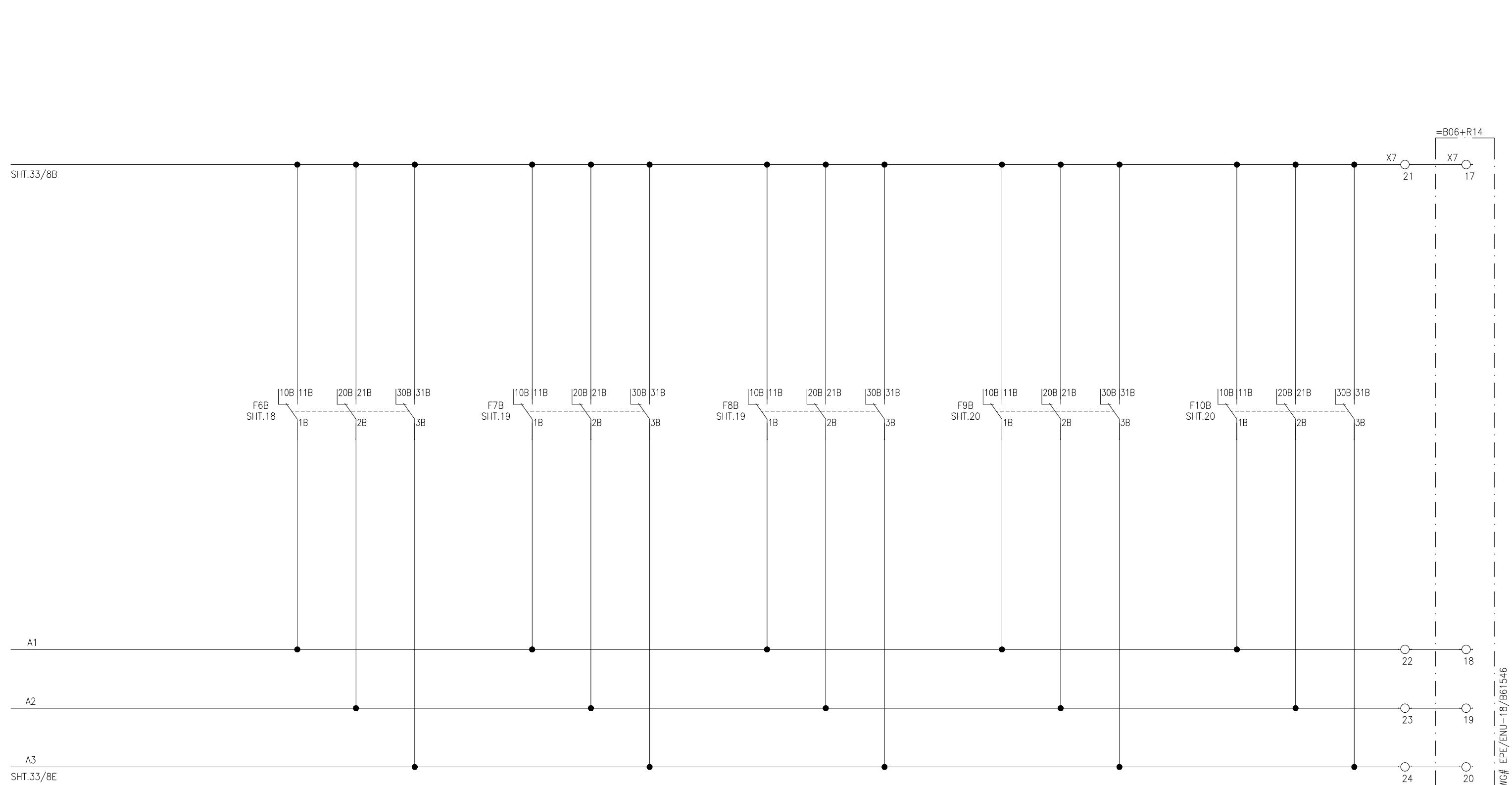
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q1 TRIP CIRCUIT-1 500kV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 32 OF 66
NAH Q.	MSS M. Sohail	MUR Iy	 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan		DATE: 07.03.2019	AS BUILT

## 220KV CB =D8+Q1 TC-2

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

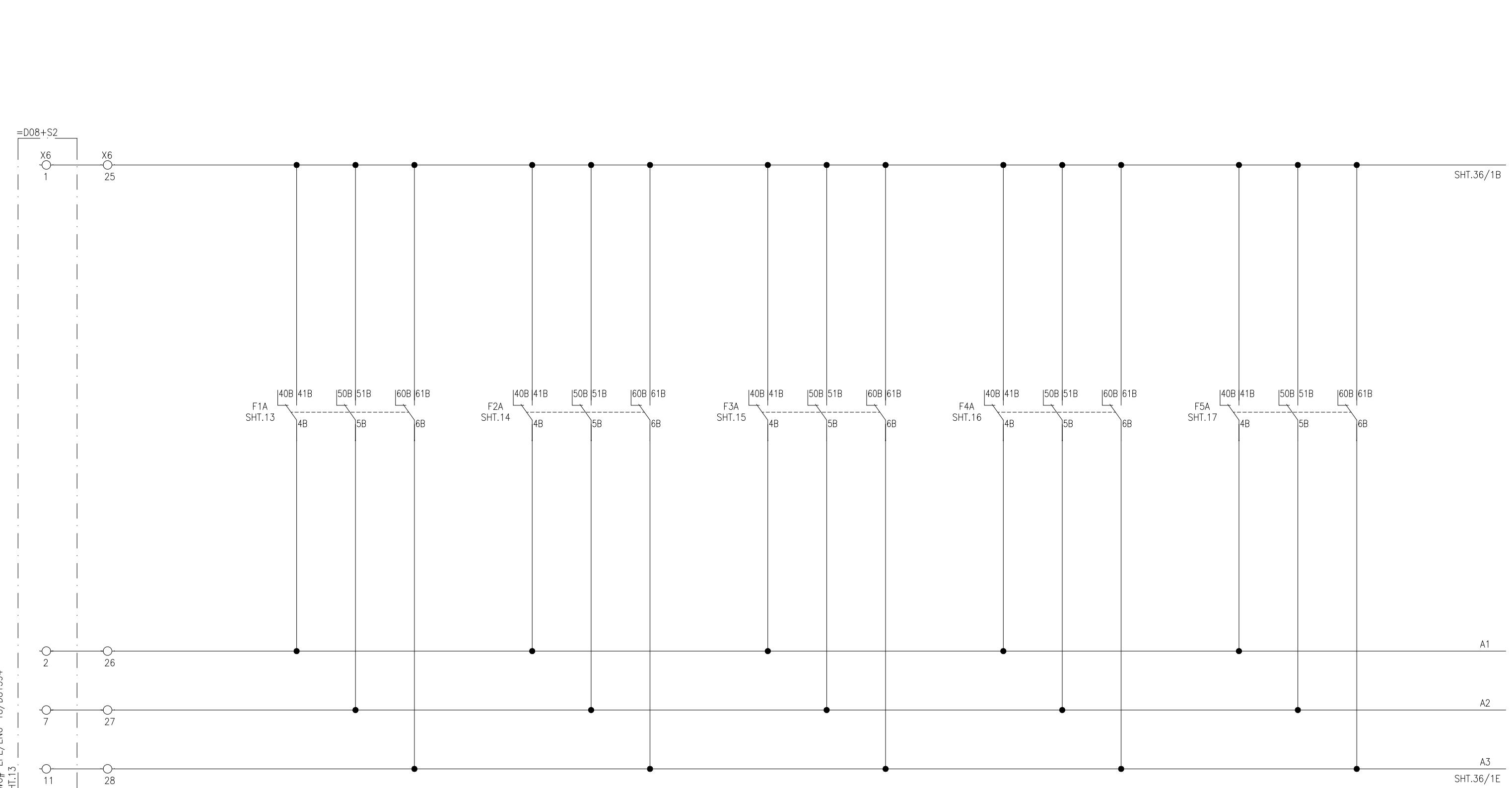
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q1 TRIP CIRCUIT-2 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 33 OF 66
NAH	MSS	MUR		 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

## 220KV CB =D8+Q1 TC-2

OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q1 TRIP CIRCUIT-2 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 34 OF 66
NAH Q.	MSS M. Sohail	MUR Iy		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

## 220kV CB =D08+Q3 TC-1

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

DWG# EPE/ENU-18/D81594

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
=D08+Q3 TRIP CIRCUIT-1  
500kV TRAFO. PROTECTION PANEL TYPE =B06+R13



**EPESOL Pvt. Ltd.**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542 SHT: 35 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

## 220kV CB =D8+Q3 TC-1

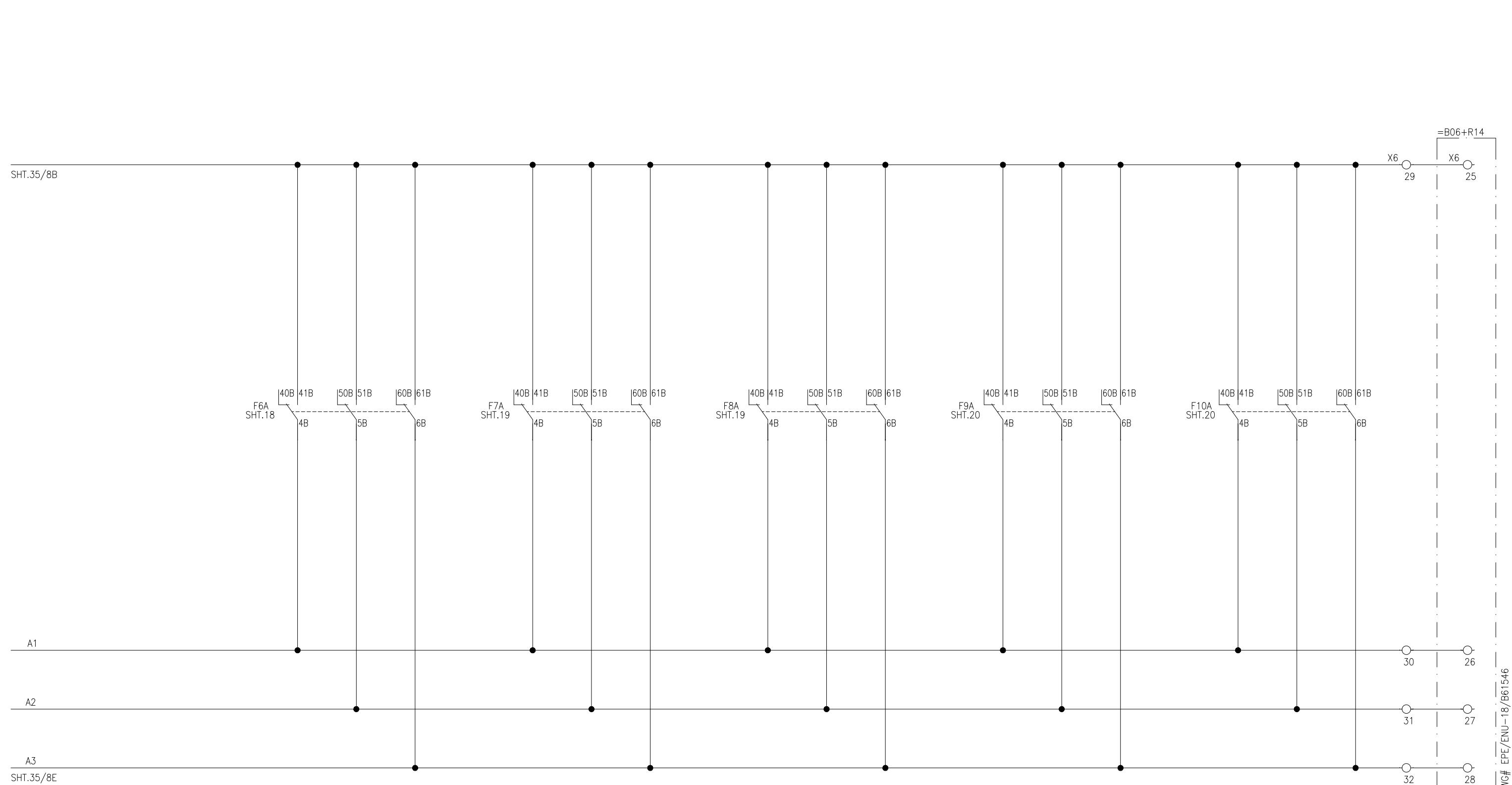
OVER FLUXING  
PROTECTION TRIP

TRAFO BUCHOLZ  
PROTECTION TRIP

ATR HV WINDING TEMP  
PROTECTION TRIP

ATR LV WINDING TEMP  
PROTECTION TRIP

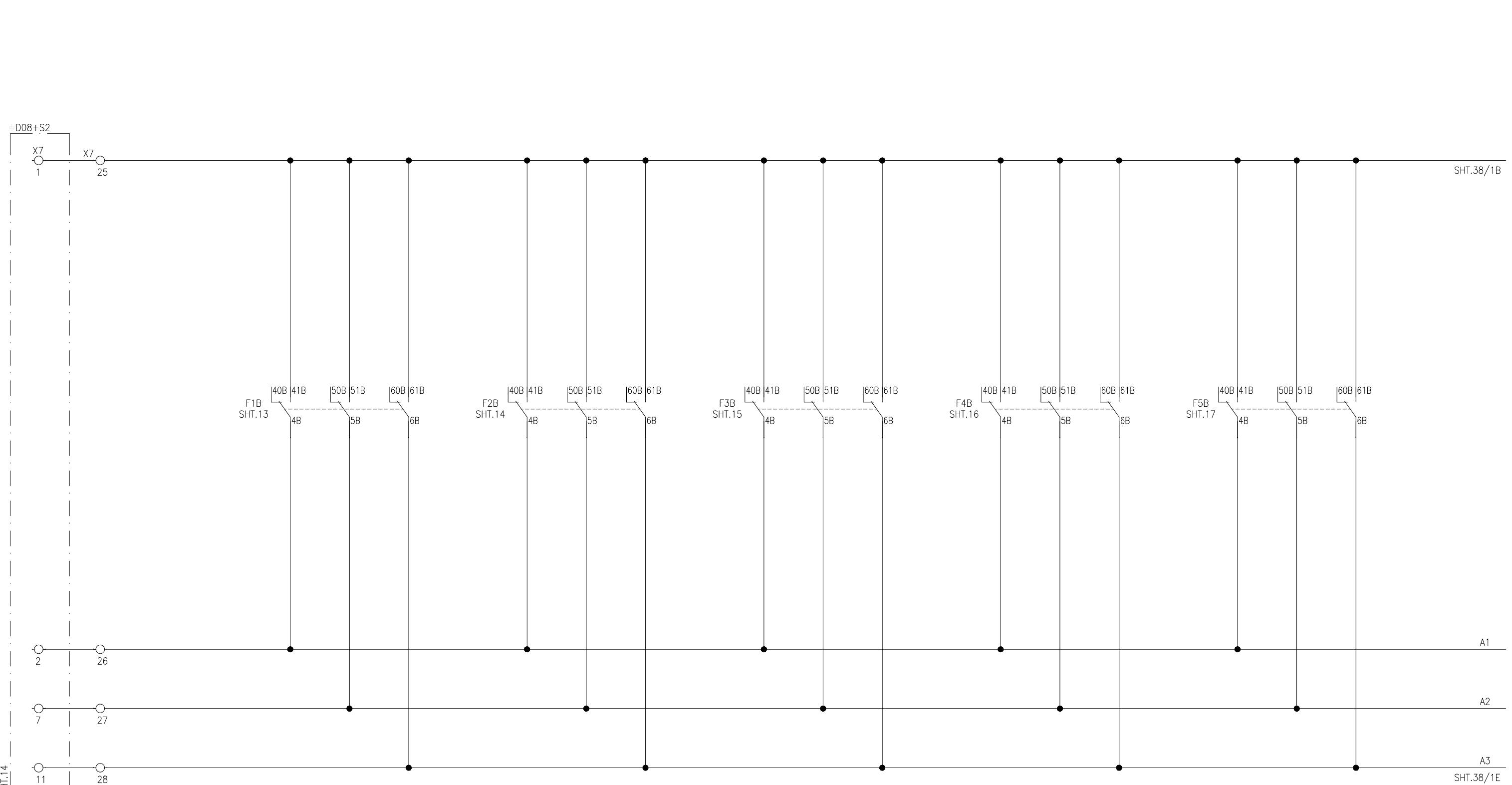
TRAFO OIL  
TEMP PROT. TRIP



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q3 TRIP CIRCUIT-1 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 36 OF 66
NAH	MSS	MUR		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

1 2 3 4 5 6 7 8

220KV CB =D8+Q3 TC-2

TRAFO. DIFFERENTIAL  
PROTECTION TRIPREF  
PROTECTION TRIPHV OVERCURRENT  
PROTECTION TRIPTHERMAL OVERLOAD  
PROTECTION TRIPLV OVERCURRENT  
PROTECTION TRIP

DWG# EPE/ENU-18/D81594

APPROVED CHECKED DRAWN

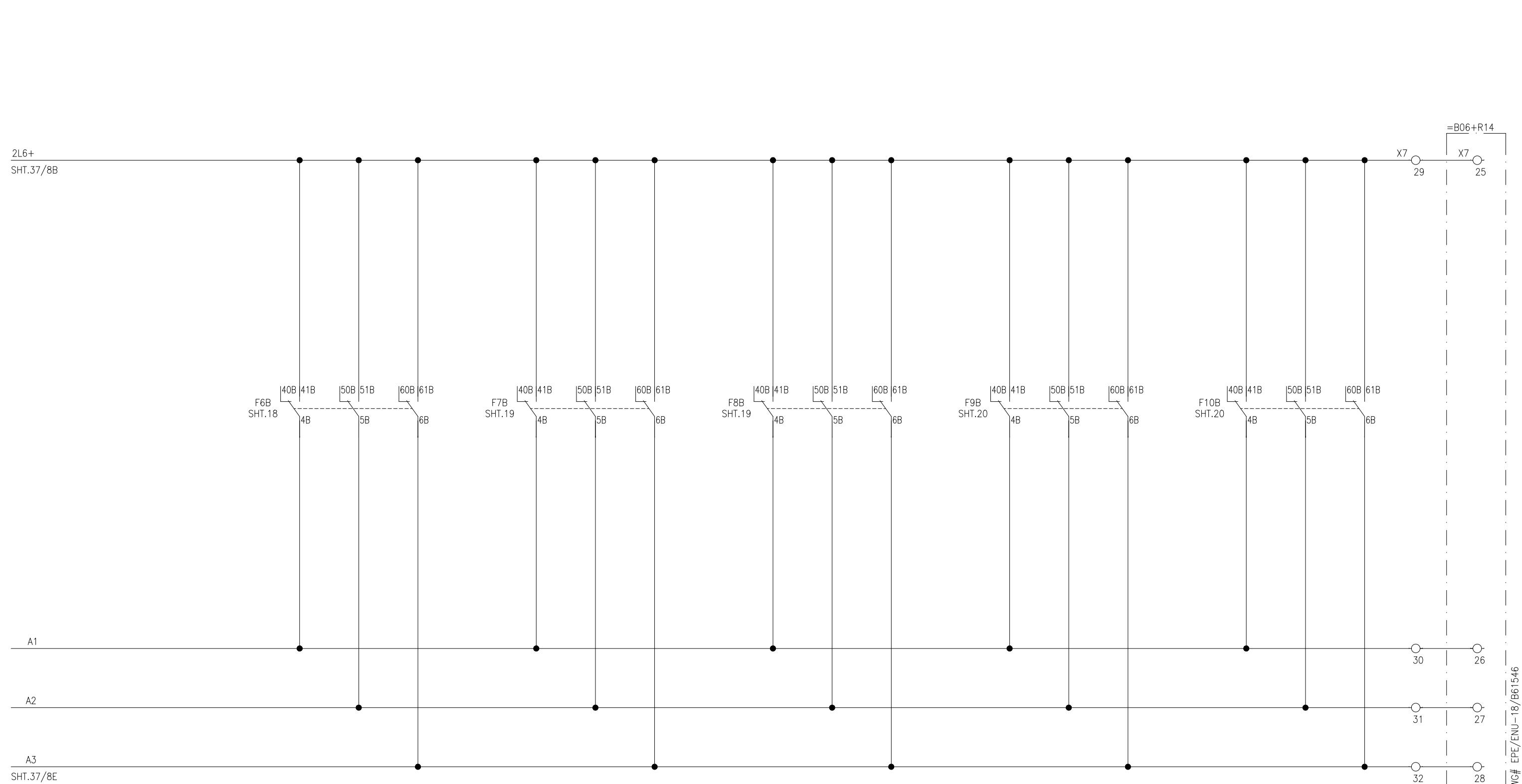


PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&amp;M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV &amp; 500KV RELAY&amp; CONTROL PANELS

TITLE:  
=D08+Q3 TRIP CIRCUIT-2  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13E P E S O L P v t . L t d.  
71-B Garden Block, New Garden Town, Lahore, PakistanDWG# EPE/ENU-18/B61542 SHT: 37 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

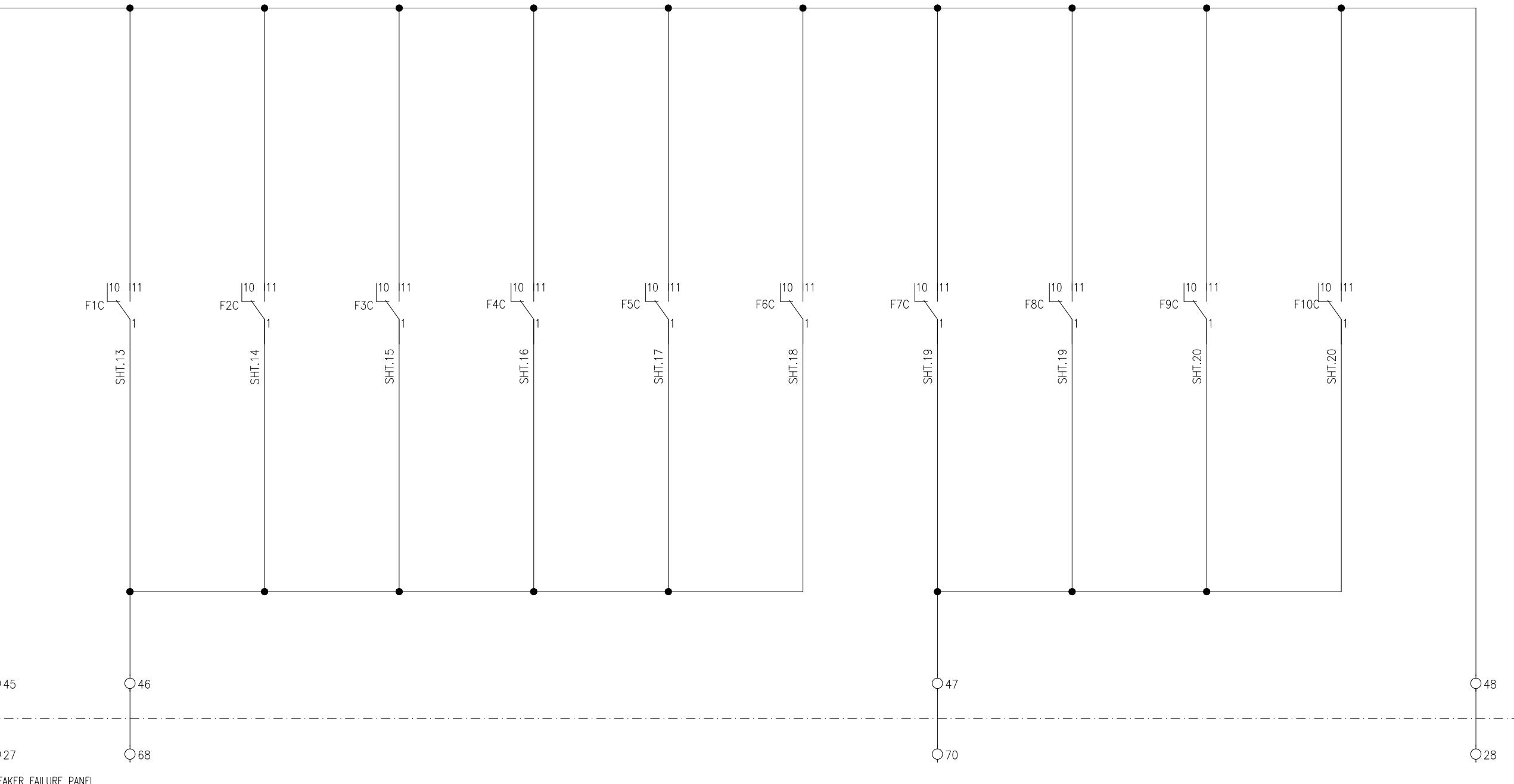
1 2 3 4 5 6 7 8

## 220KV CB =D8+Q3 TC-2

OVER FLUXING  
PROTECTION TRIPTRAFO BUCHOLZ  
PROTECTION TRIPATR HV WINDING TEMP  
PROTECTION TRIPATR LV WINDING TEMP  
PROTECTION TRIPTRAFO OIL  
TEMP PROT. TRIP

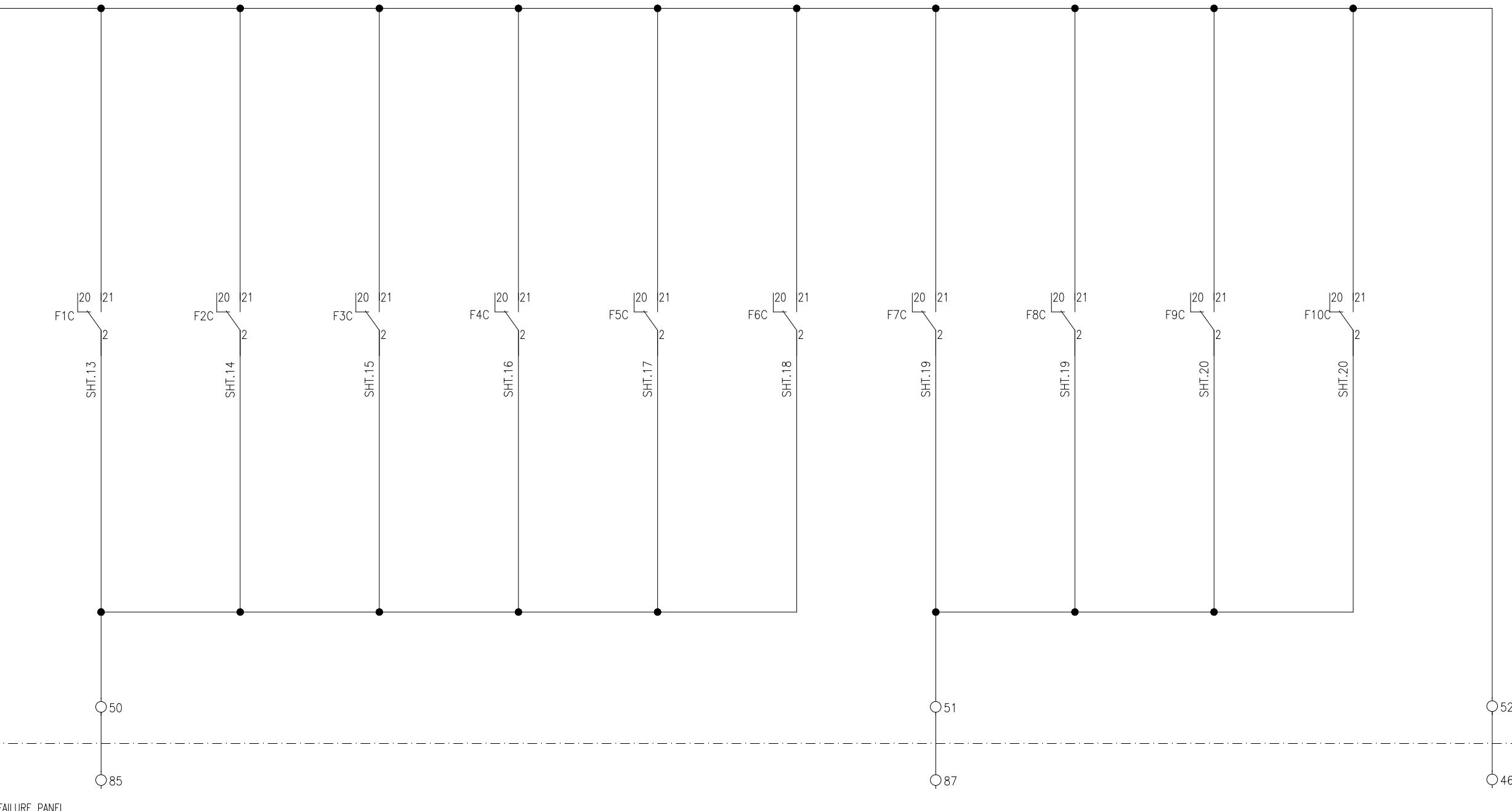
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: =D08+Q3 TRIP CIRCUIT-2 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	E P E S O L P v t . L t d. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 38 OF 66
NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	LV O/C	HV O/C	REF	OVER FLUXING	TRAFO PROTECTION	ATR	OLTC OIL	TRAFO OIL
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	THERMAL OVER LOAD	BUCHLOZ PROTRIP	HV WINDING HIGH	TEMP. HIGH	TEMP.



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE INITIATION FOR =B06+Q2 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 39 OF 66
NAH Q	MSS M	MUR		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	LV O/C	HV O/C	REF	THERMAL OVER LOAD	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	OLTC OIL TEMP. HIGH	TRAFO OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
BREAKER FAILURE INITIATION FOR =B06+Q1  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



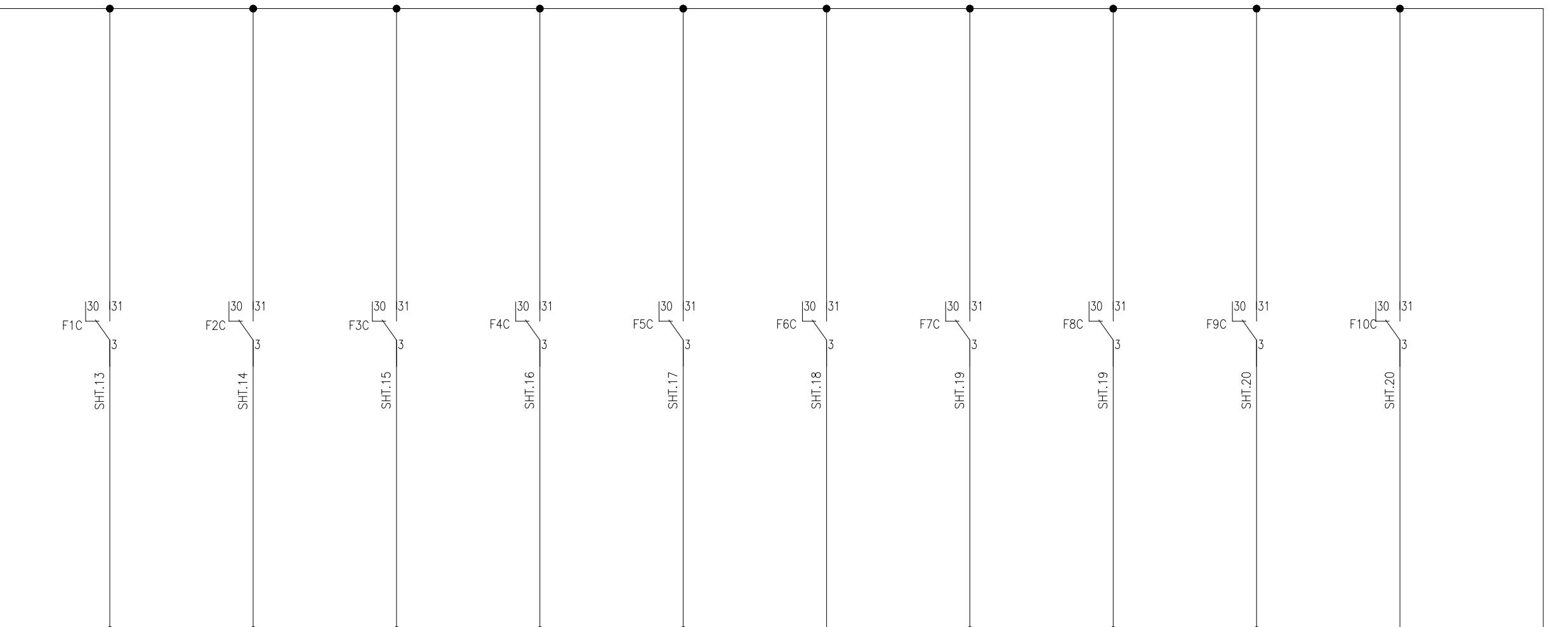
**E P E S O L P v t . L t d**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542 SHT: 40 OF 66

DATE: 07.03.2019 AS BUILT REV: 0

APPROVED: NAH  
CHECKED: MSS  
DRAWN: MUR

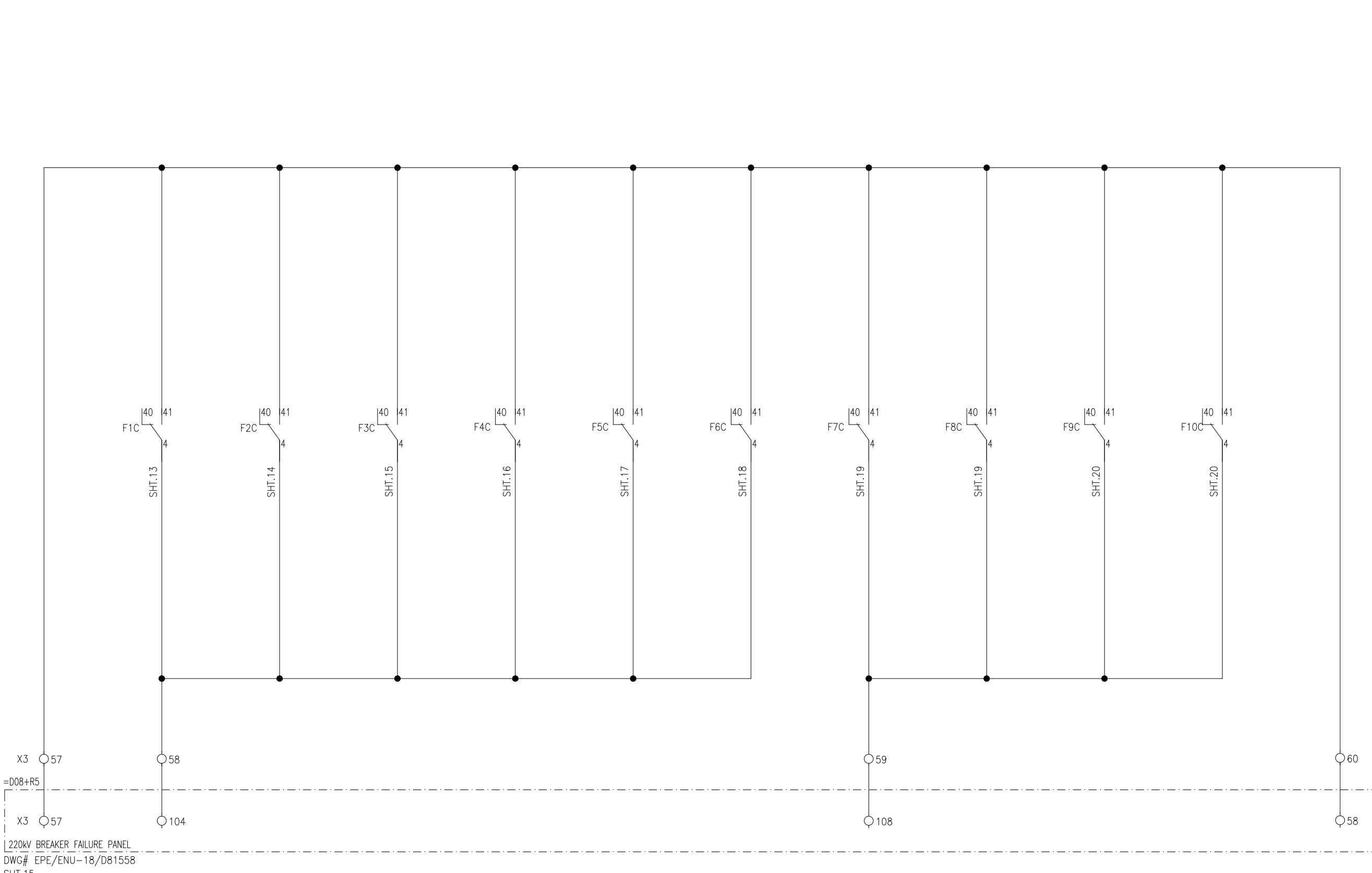
TRAFO DIFFERENTIAL	LV O/C	HV O/C	REF	OVER FLUXING	TRAFO	ATR	OLTC OIL	TRAFO OIL
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	THERMAL OVER LOAD PROTECTION	BUCHLOZ	HV WINDING HIGH	TEMP. HIGH	TEMP.
				PROT. TRIP	TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP



220KV BREAKER FAILURE PANEL  
DWG# EPE/ENU-18/B61550  
SHT.13

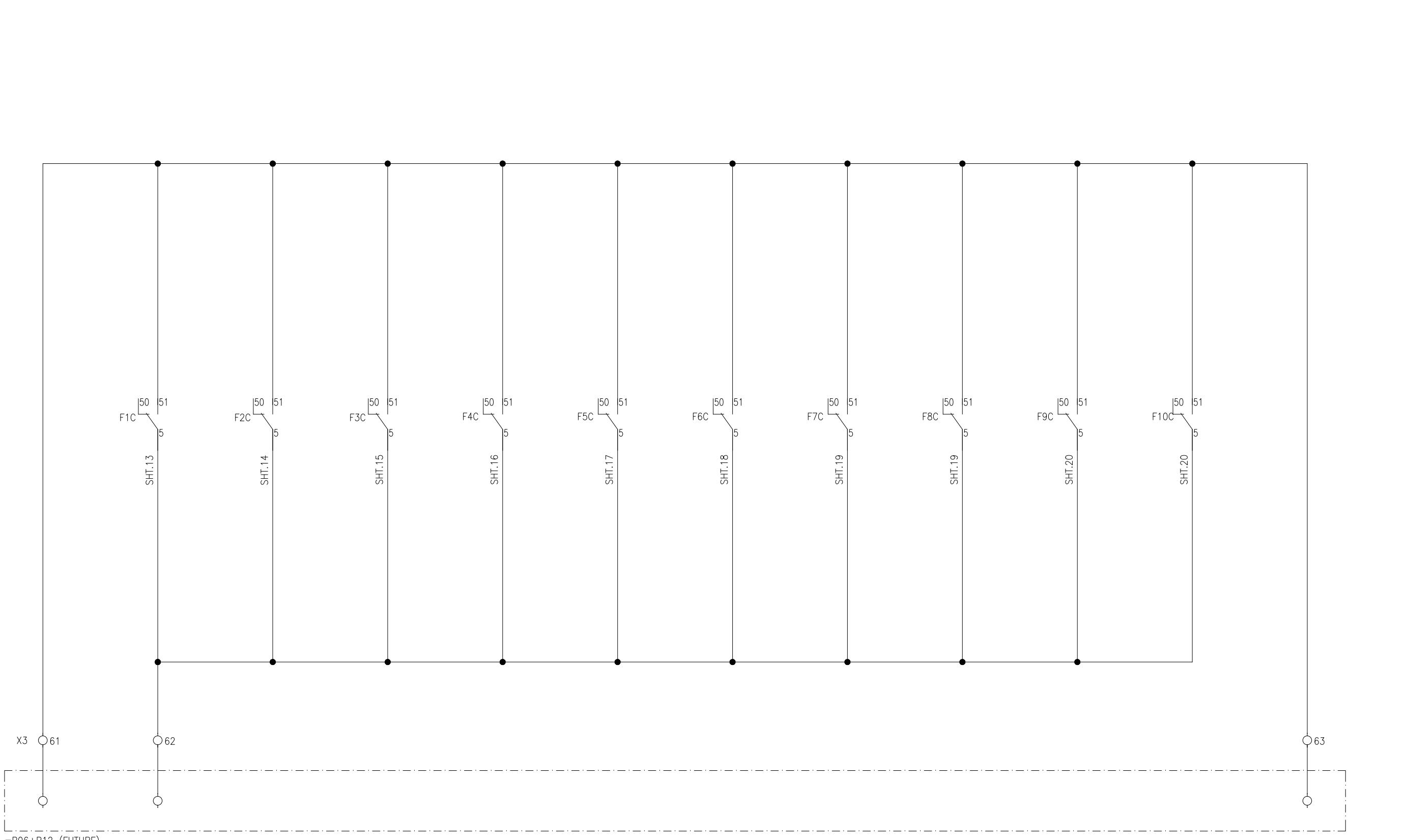
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE INITIATION FOR =D08+Q1 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 41 OF 66
NAH	MSS	MUR		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	LV O/C	HV O/C	REF	OVER FLUXING	TRAFO	ATR	OLTC OIL	TRAFO OIL
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	THERMAL OVER LOAD PROTECTION	BUCHLOZ	HV WINDING HIGH	TEMP. HIGH	TEMP.
				PROT. TRIP	TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP



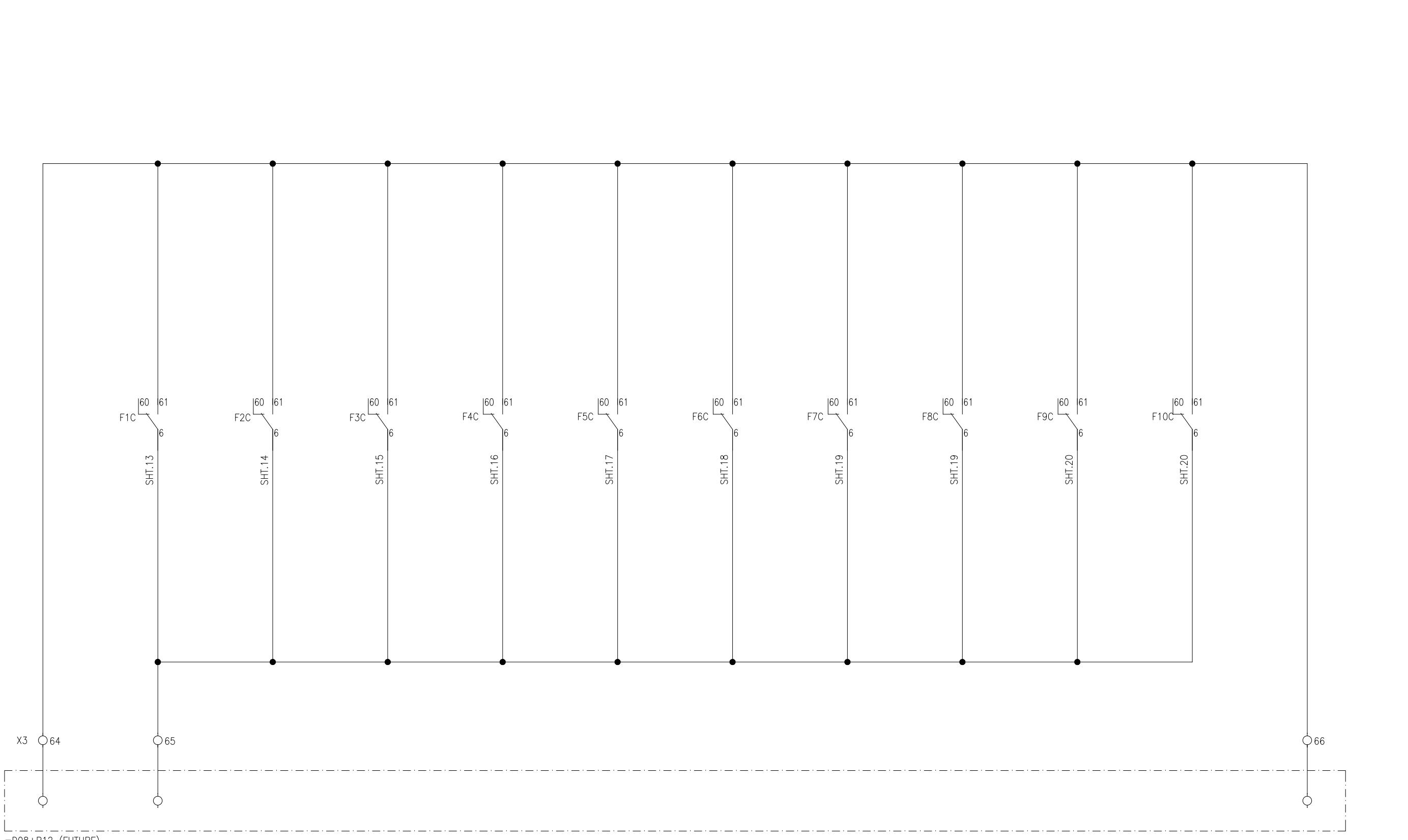
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: BREAKER FAILURE INITIATION FOR =D08+Q2 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 42 OF 66
NAH	MSS	MUR		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	ATR LV WINDING HIGH	ATR OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	TRIP	PROT. TRIP	PROT. TRIP	TRIP



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: AR BLOCK FOR B06+Q3 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 43 OF 66
NAH Q	MSS M	MUR		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	ATR LV WINDING HIGH	ATR OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	TRIP	PROT. TRIP	PROT. TRIP	TRIP



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: AR BLOCK FOR D08+Q3 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 44 OF 66
NAH Q	MSS M	MUR		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRAFO. DIFF. PROT.

REF

HV O/C

THERMAL OVERLOAD

LV O/C

OVERFLUXING

AC SUPPLY

DC SUPPLY

DC SUPPLY

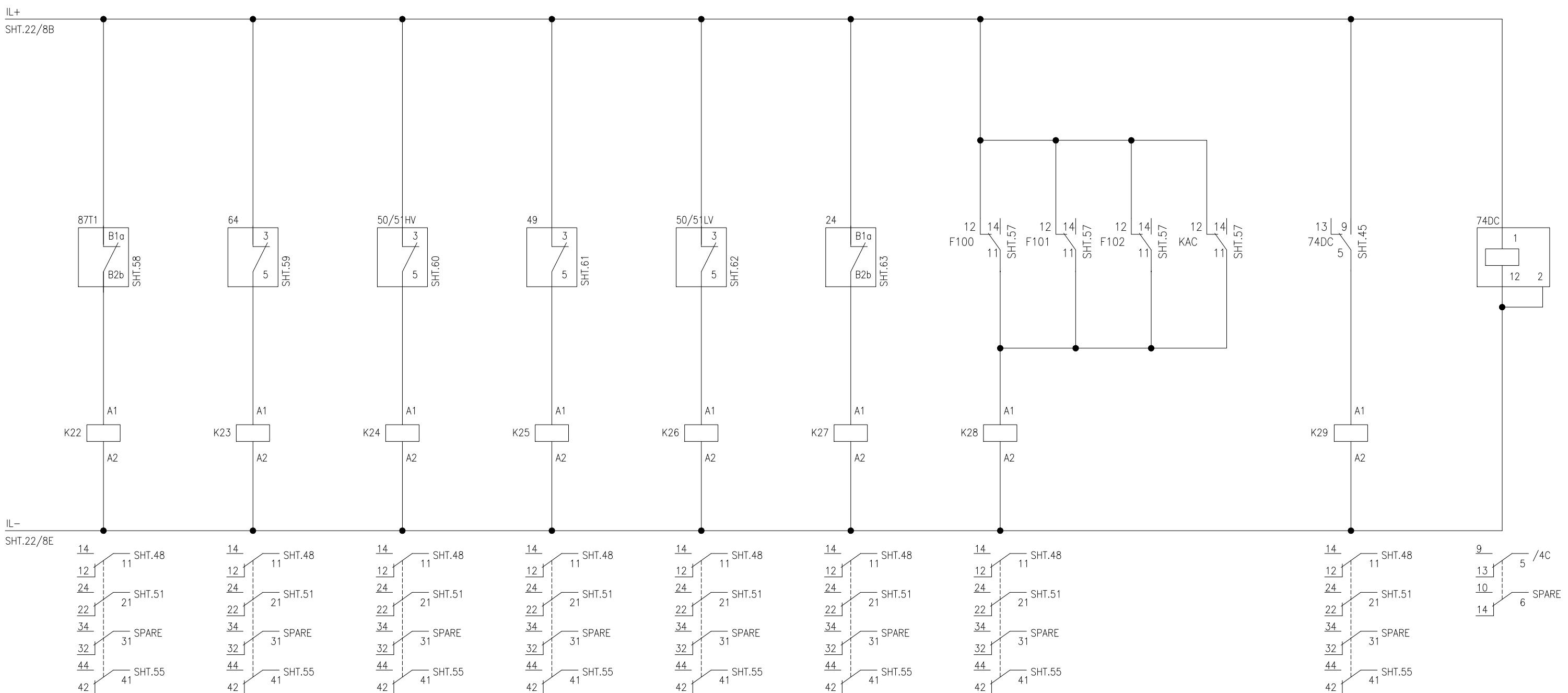
UNHEALTHY

PROT. UNHEALTHY

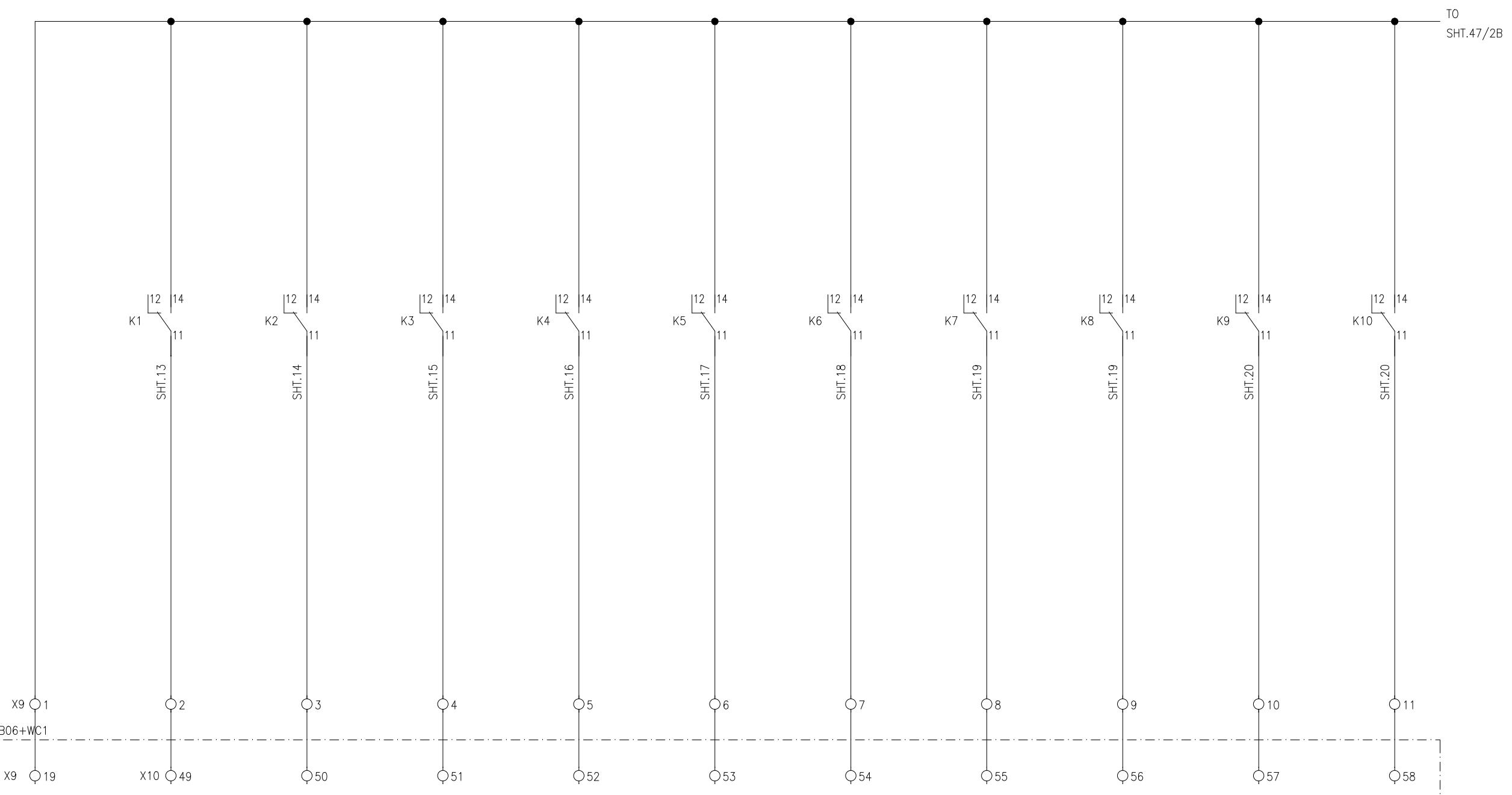
FAIL

HEALTHY

SUPERVISION

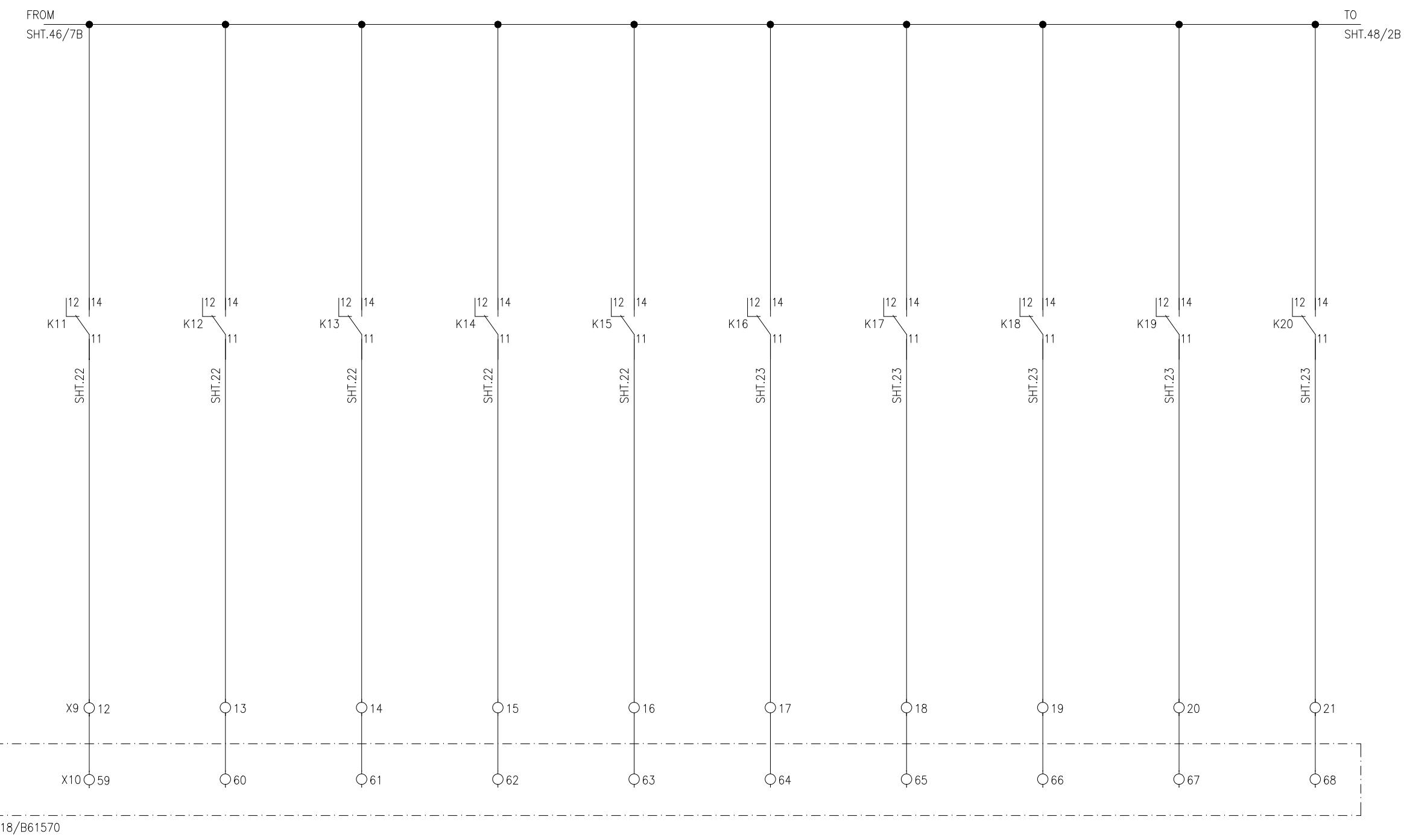


TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	ATR LV WINDING HIGH	ATR OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	TRIP	PROT. TRIP	PROT. TRIP	TRIP



DWG# EPE/ENU-18/B61570  
SHT.24

OVER EXCITATION RELAY STAGE-I ALARM	OVER LOAD RELAY STAGE-I ALARM	EXCESS OIL TEMPERATURE (R-PHASE)	EXCESS OIL TEMPERATURE (Y-PHASE)	EXCESS OIL TEMPERATURE (B-PHASE)	EXCESS WINDING TEMPERATURE ALARM (R-PHASE)	EXCESS WINDING TEMPERATURE ALARM (Y-PHASE)	EXCESS WINDING TEMPERATURE ALARM (B-PHASE)	TRANSFORMER BUCHHLOZ ALARM (R-PHASE)	TRANSFORMER BUCHHLOZ ALARM (Y-PHASE)
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PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

TITLE:  
ANNUNCIATION CIRCUIT  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



**E P E S O L P v t . L t d**  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61542 SHT: 47 OF 66  
DATE: 07.03.2019 **AS BUILT** REV: 0

APPROVED  
NAH  
1

CHECKED  
MSS  
2

DRAWN  
MUR  
3

TRANSFORMER TRANSFORM

BUCHHLOZ ALARM (B-PHASE) PF

TIAL  
ULTY PROT

-  
FAULTY

HV 0/0  
PROT. FAU

THERMAL  
PROT

OVER LOAD L  
FAULTY PRO

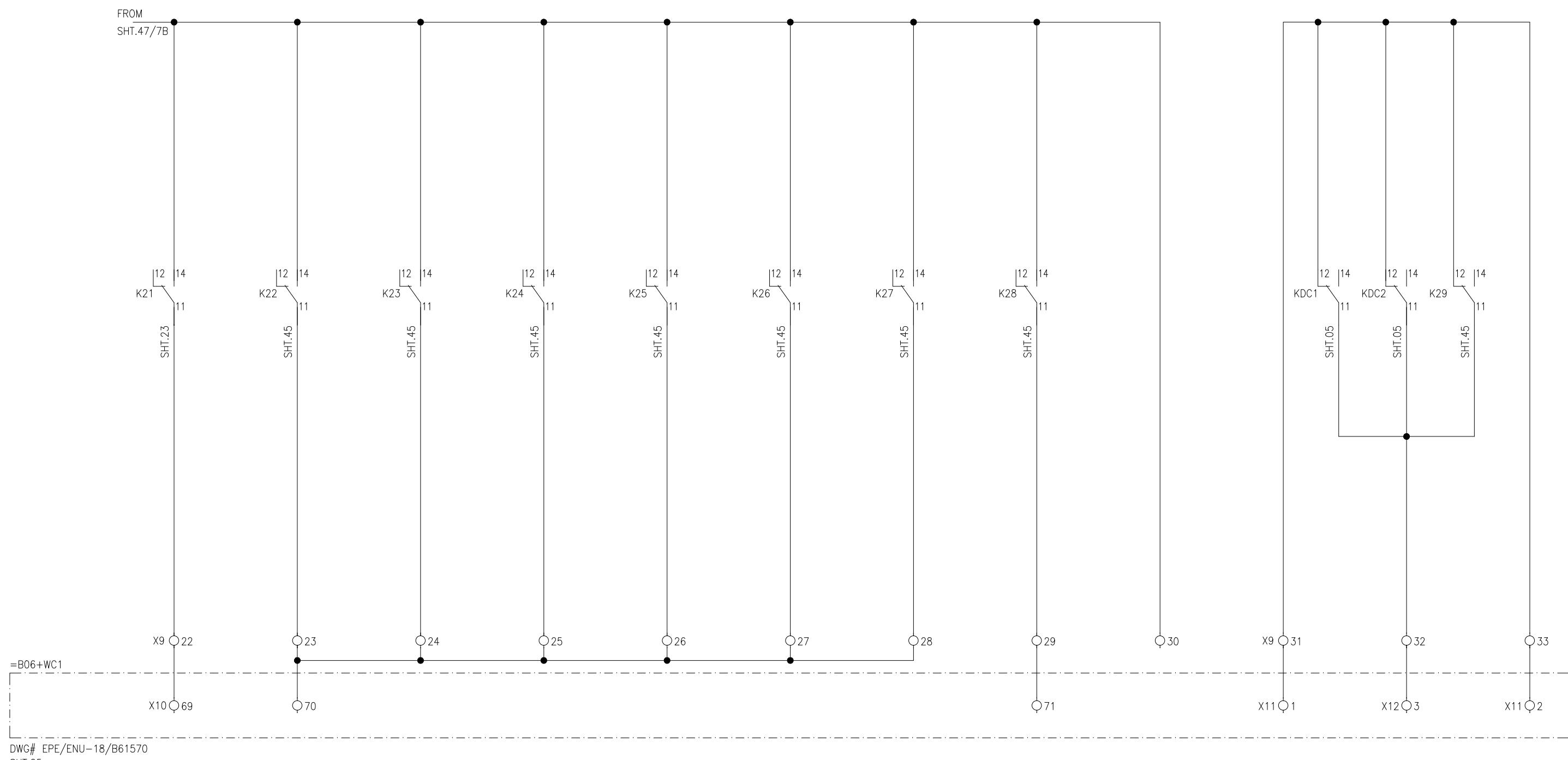
O/C  
FAULTY

## VER FLUXIM

PANEL AC  
SUPPLY FA

1

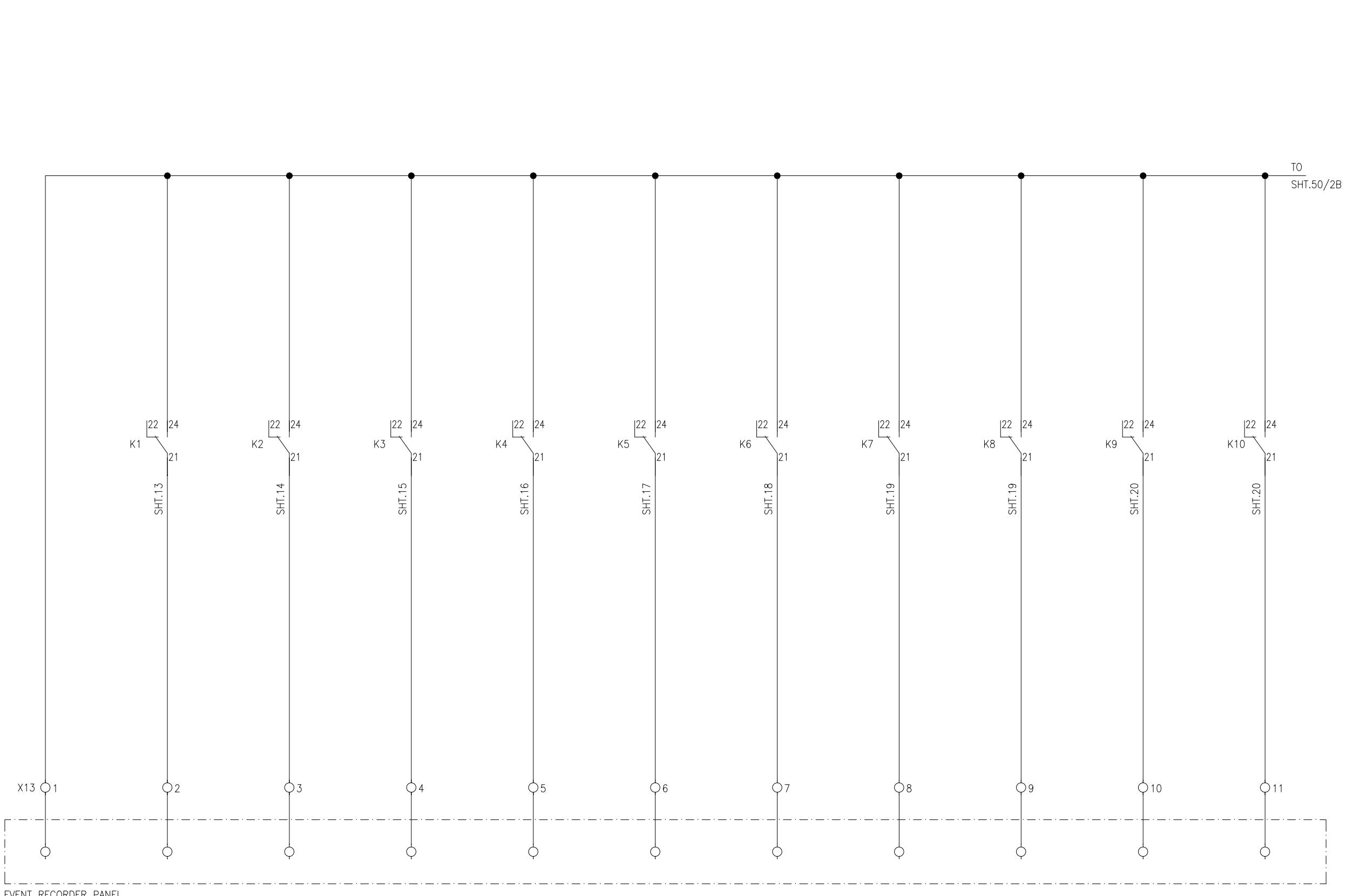
PANEL DC  
SUPPLY FAIL



DWG# EPE/ENU-18/B6157  
SHT.25

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: ANNUNCIATION CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 48 OF 66
NAH 	MSS 	MUR 				DATE: 07.03.2019	AS BUILT

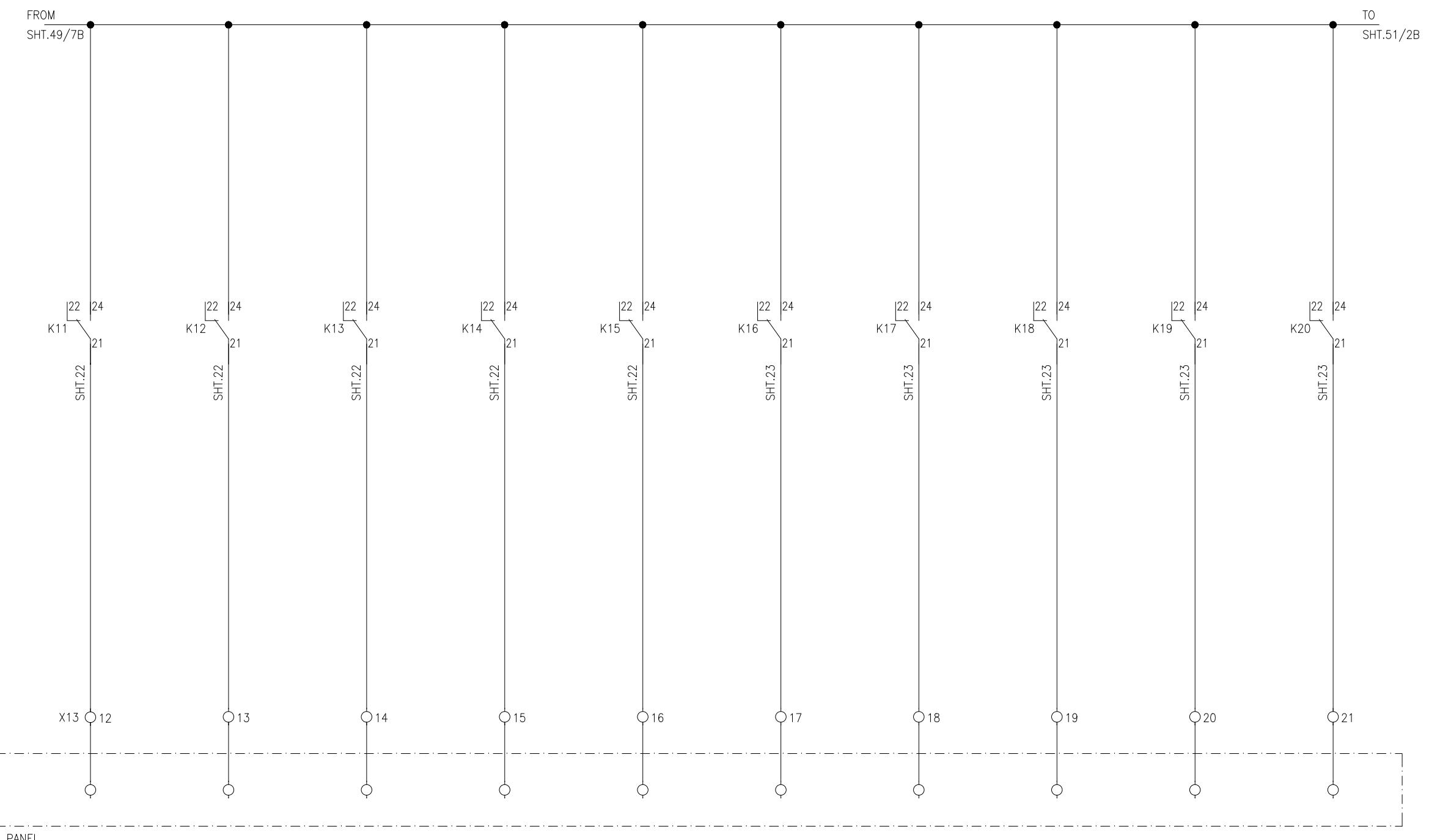
TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	ATR LV WINDING HIGH	ATR OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	TRIP	PROT. TRIP	PROT. TRIP	TRIP



EVENT RECORDER PANEL

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: ER SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 49 OF 66
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT

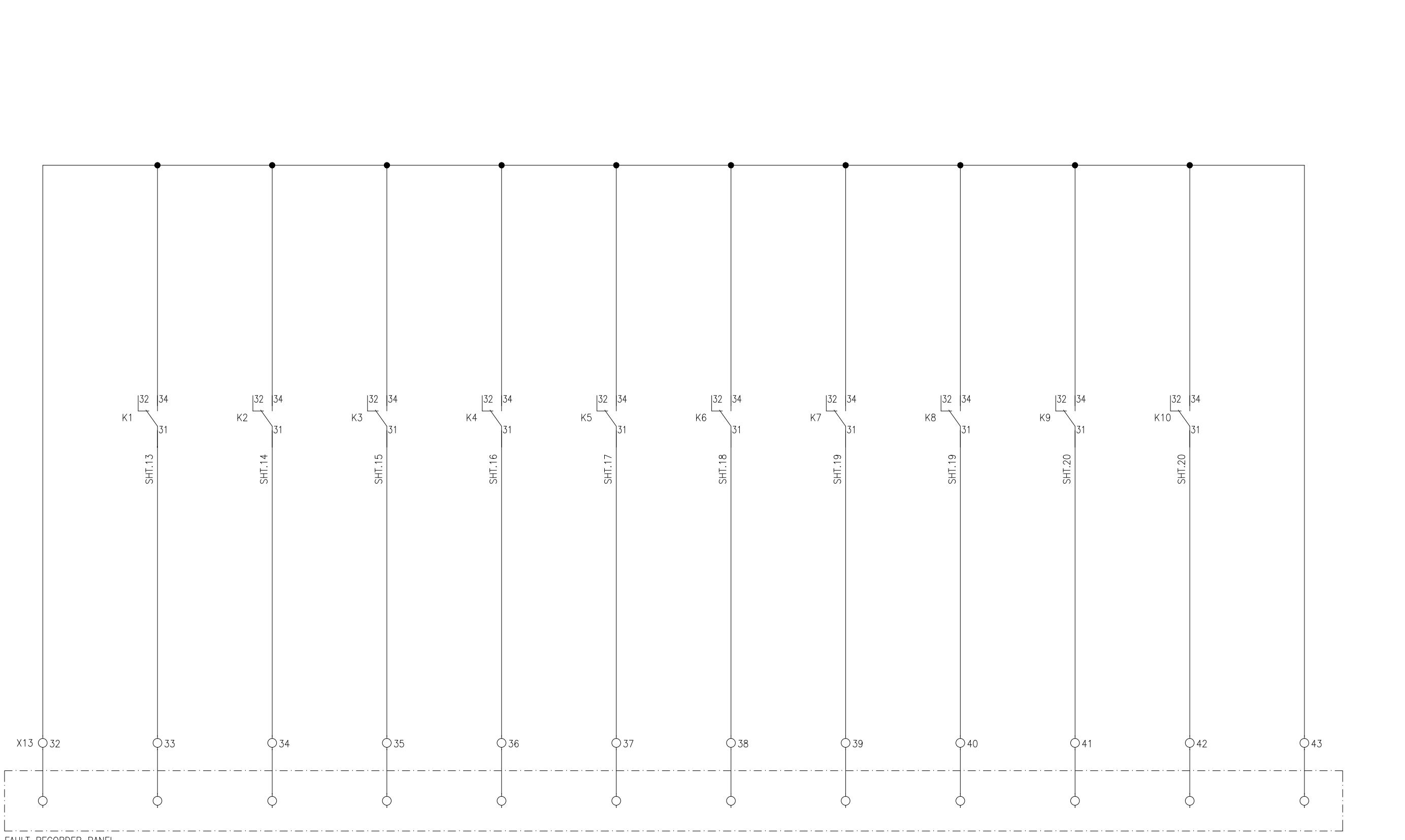
OVER EXCITATION RELAY STAGE-I ALARM	OVER LOAD RELAY STAGE-I ALARM	EXCESS OIL TEMPERATURE (R-PHASE)	EXCESS OIL TEMPERATURE (Y-PHASE)	EXCESS OIL TEMPERATURE (B-PHASE)	EXCESS WINDING TEMPERATURE ALARM (R-PHASE)	EXCESS WINDING TEMPERATURE ALARM (Y-PHASE)	EXCESS WINDING TEMPERATURE ALARM (R-PHASE)	TRANSFORMER BUCHHLOZ ALARM	TRANSFORMER BUCHHLOZ ALARM
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APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: ER SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 50 OF 66
NAH Q.	MSS M. Sohail	MUR Iy		<b>E P E S O L P v t . L t d</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TRANSFORMER BUCHHLOZ ALARM (B-PHASE)	TRANSFORMER DIFFERENTIAL PROT. FAULTY	REF PROT. FAULTY	HV O/C PROT. FAULTY	THERMAL OVER LOAD PROT. FAULTY	LV O/C PROT. FAULTY	OVER FLUXING PROTECTION FAULTY	PANEL AC SUPPLY FAIL	PANEL DC SUPPLY FAIL
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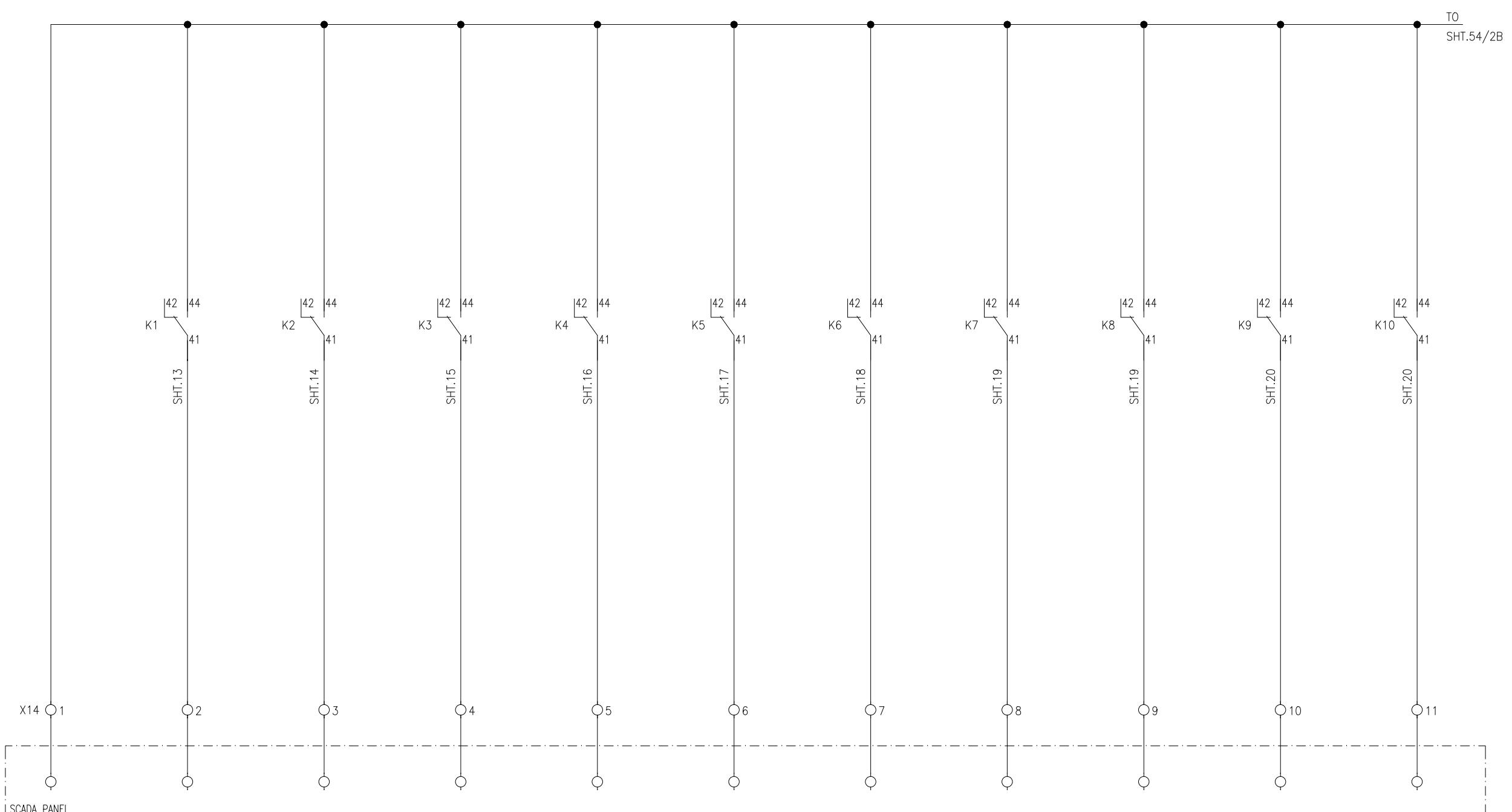
TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING PROTECTION	TRAFO BUCHLOZ	ATR HV WINDING HIGH	ATR LV WINDING HIGH	ATR OIL TEMP.
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	TRIP	TRIP	PROT. TRIP	PROT. TRIP	TRIP



FAULT RECORDER PANEL

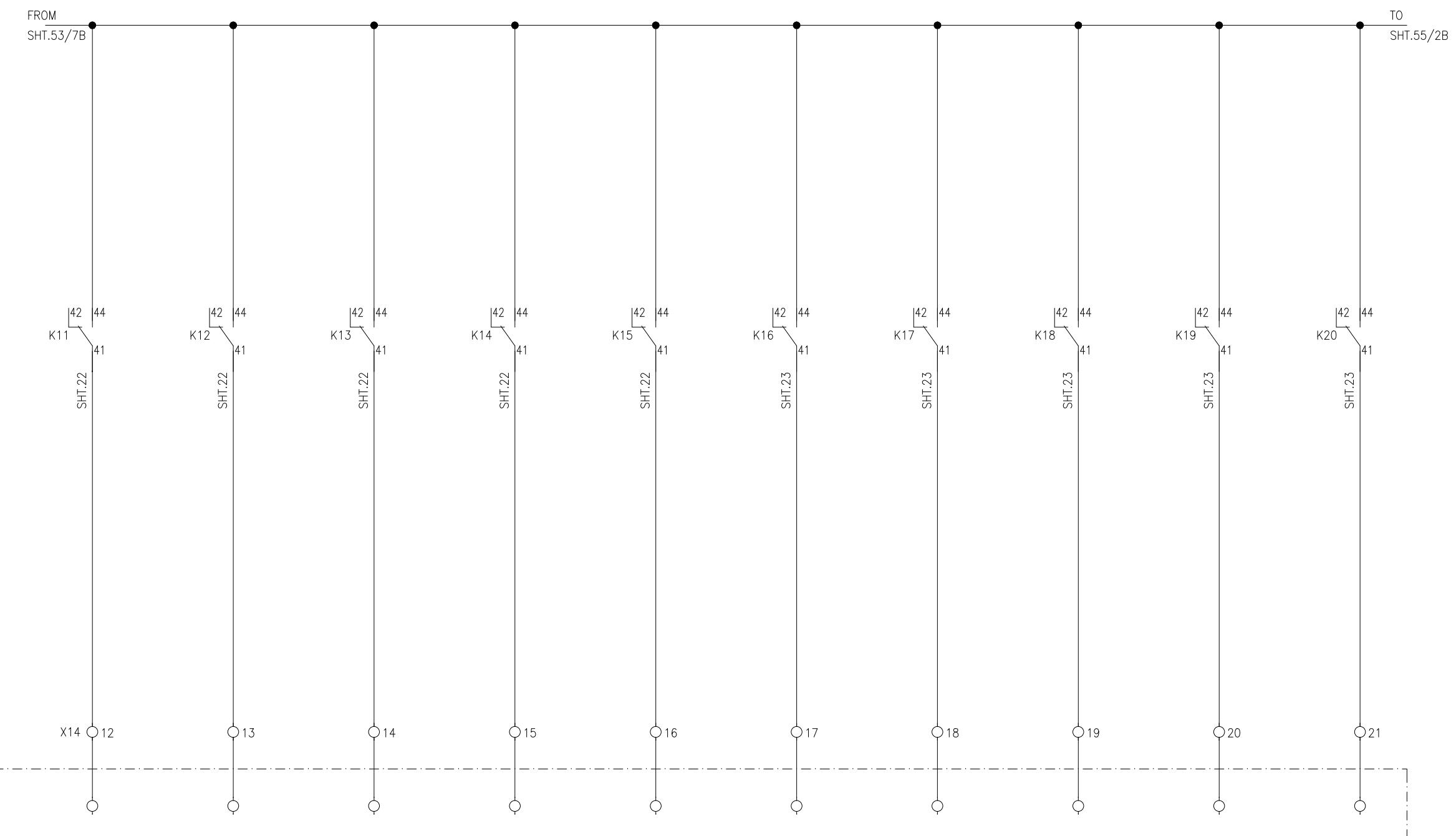
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: FR SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 52 OF 66
NAH Q	MSS M	MUR				DATE: 07.03.2019	AS BUILT

TRAFO DIFFERENTIAL	REF	HV O/C	THERMAL OVER LOAD	LV O/C	OVER FLUXING	TRAFO PROTECTION	ATR	ATR	ATR
PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROT. TRIP	PROTECTION	BUCHLOZ TRIP	HV WINDING HIGH PROT. TRIP	LV WINDING HIGH PROT. TRIP	OIL TEMP. TRIP



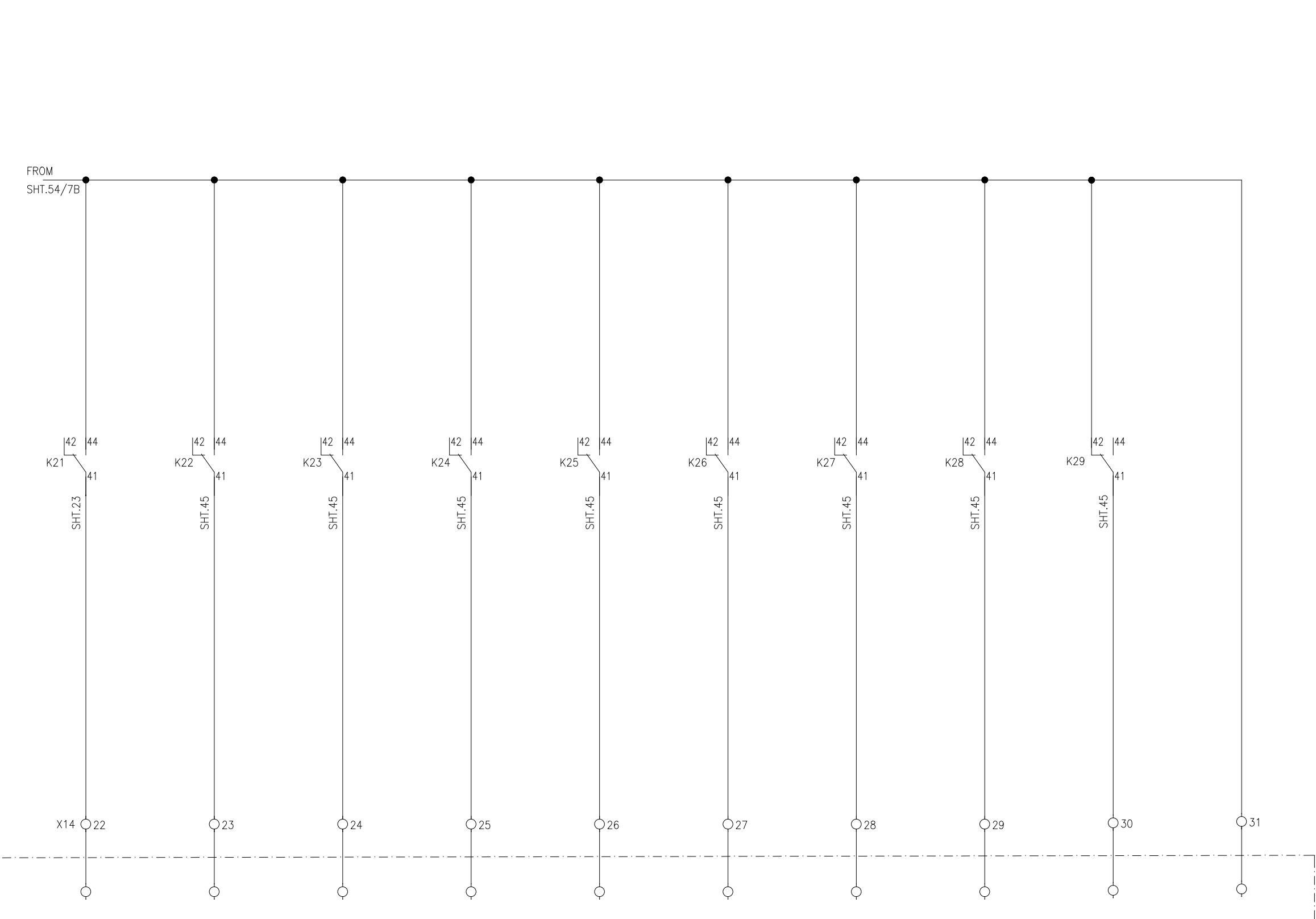
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SCADA SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 53 OF 66
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT

OVER EXCITATION RELAY STAGE-I ALARM	OVER LOAD RELAY STAGE-I ALARM	EXCESS OIL TEMPERATURE (R-PHASE)	EXCESS OIL TEMPERATURE (Y-PHASE)	EXCESS OIL TEMPERATURE (B-PHASE)	EXCESS WINDING TEMPERATURE ALARM (R-PHASE)	EXCESS WINDING TEMPERATURE ALARM (Y-PHASE)	EXCESS WINDING TEMPERATURE ALARM (Y-PHASE)	TRANSFORMER BUCHHLOZ ALARM (R-PHASE)	TRANSFORMER BUCHHLOZ ALARM (Y-PHASE)
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APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SCADA SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 54 OF 66
NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT REV: 0

TRANSFORMER BUCHHLOZ ALARM (B-PHASE)	TRANSFORMER DIFFERENTIAL REF PROT. FAULTY	HV O/C PROT. FAULTY	THERMAL OVER LOAD PROT. FAULTY	LV O/C PROT. FAULTY	OVER FLUXING PROTECTION FAULTY	PANEL AC SUPPLY FAIL	PANEL DC SUPPLY FAIL
--	--	------------------------	-----------------------------------	------------------------	--------------------------------------	-------------------------	-------------------------

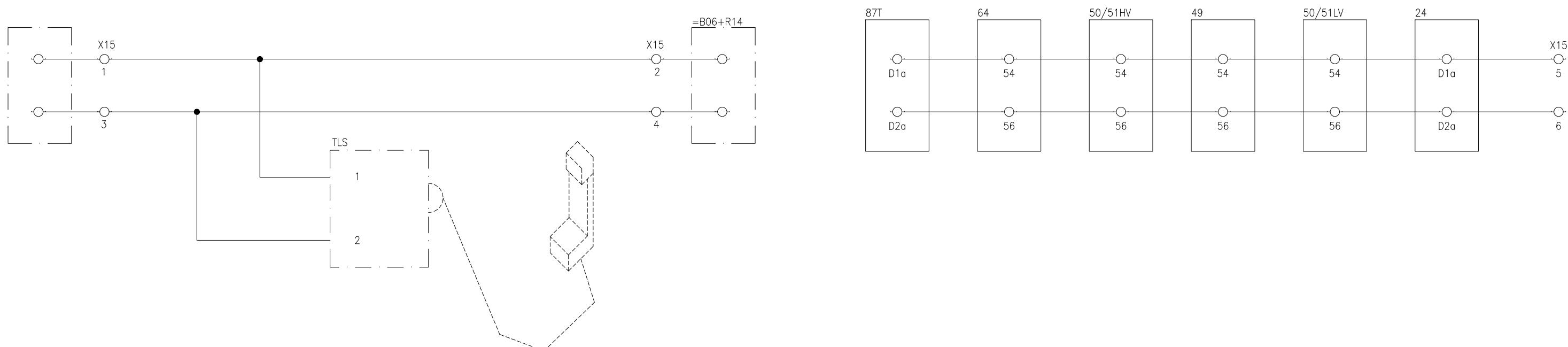


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: SCADA SIGNALING CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 55 OF 66
NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT

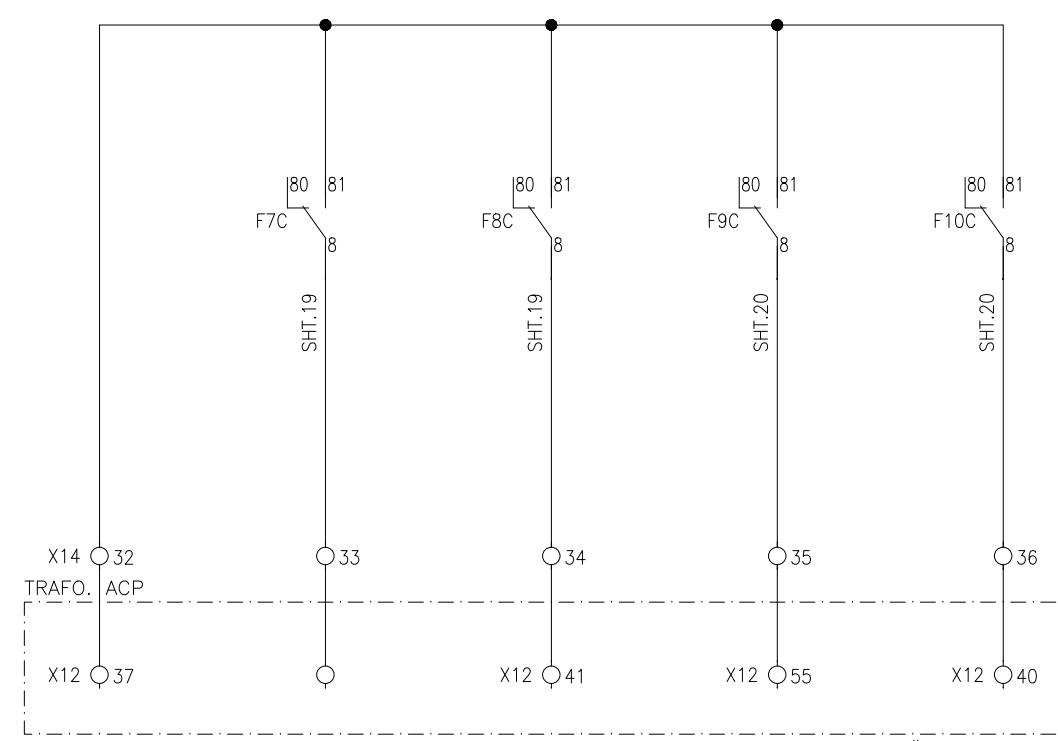
1 2 3 4 5 6 7 8

TELEPHONE  
SOCKET

RS-485 COMMUNICATION LOOP



TRAFO BUCHOLZ	ATR HV WINDING	ATR LV WINDING	TRAFO OIL TEMP.
PROT. TRIP	TEMP. PROT.	TRIP TEMP. PROT.	PROT. TRIP

DWG# OPK.352.6150  
SHT.6&7

APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: MECH. TRIP SIGNALING AND COMMUNICATION CIRCUIT 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt Ltd 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 56 OF 66
NAH [Signature]	MSS [Signature]	MUR [Signature]				DATE: 07.03.2019	AS BUILT

DOOR SWITCH & SPACE HEATER  
CUBICLE LIGHT THERMOSTAT

AC SUPPLY DISTRIBUTION

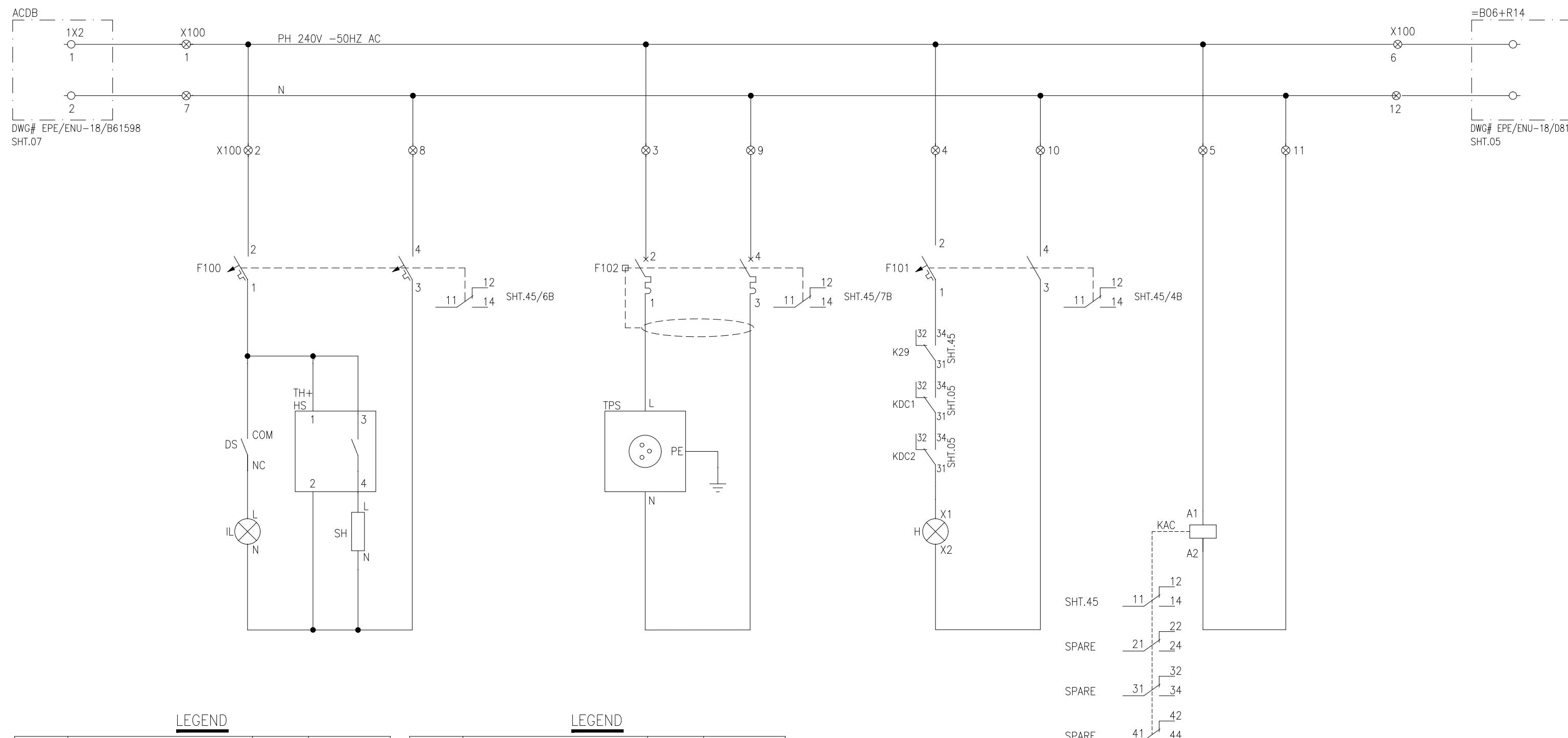
THREE PIN SOCKET

PANEL DC SUPPLY

HEALTHY

PANEL AC SUPPLY

SUPERVISION

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
F100, F101	TWO POLE AC MCB	G60	GE
F102	ELCB	DM100	GE
KAC,KDC	AUX. RELAY 240VAC	PRC	GE
H	INDICATION LAMP	YSPL	YONGSUNG

LEGEND

DES.	DESCRIPTION	TYPE	MAKE
TPS	THREE PIN SOCKET	220V SOCKET	GE
SH	SPACE HEATER	ELH220	GE
TH+HS	THERMOSTAT	ELH220	GE
IL	CUBICLE LIGHT	YST8	YONGSUNG

APPROVED: NAH [Signature] CHECKED: MSS [Signature] DRAWN: MUR [Signature]



PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&amp;M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV &amp; 500KV RELAY&amp; CONTROL PANELS

TITLE: AC SUPPLY DISTRIBUTION  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13E P E S O L P v t . L t d.  
71-B Garden Block, New Garden Town, Lahore, PakistanDWG# EPE/ENU-18/B61542 SHT: 57 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0

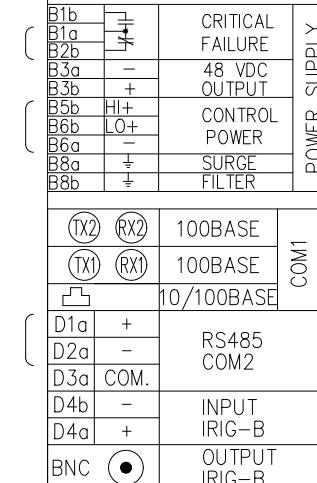
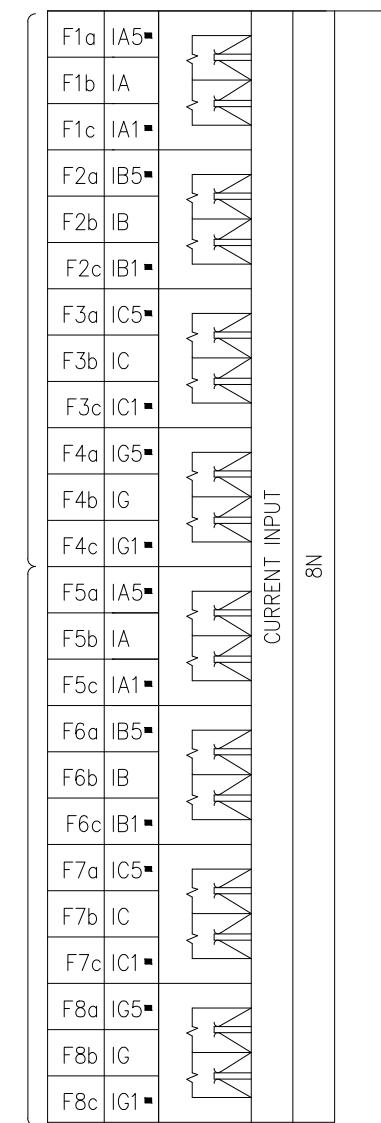
DIFFERENTIAL PROTECTION CT CIRCUIT  
FOR 500kV SIDE  
SHT.07

DIFFERENTIAL PROTECTION CT CIRCUIT  
FOR 220kV SIDE  
SHT.07

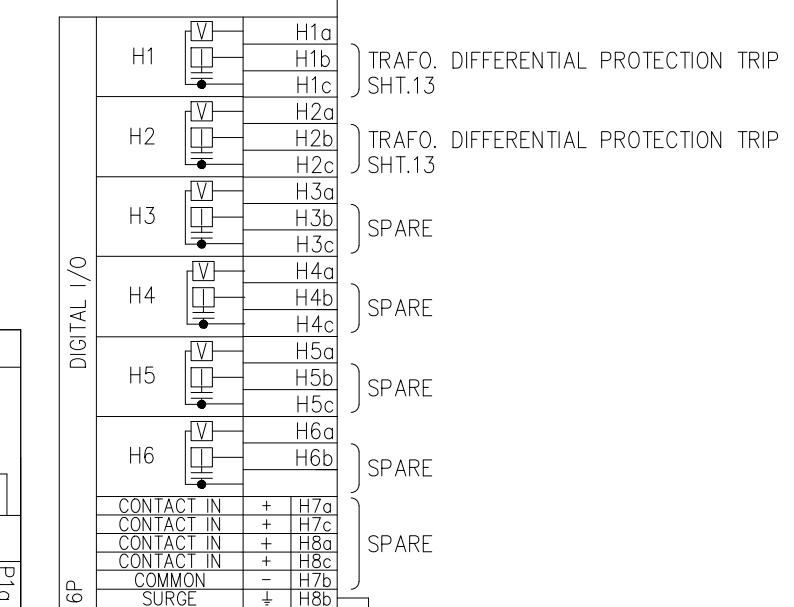
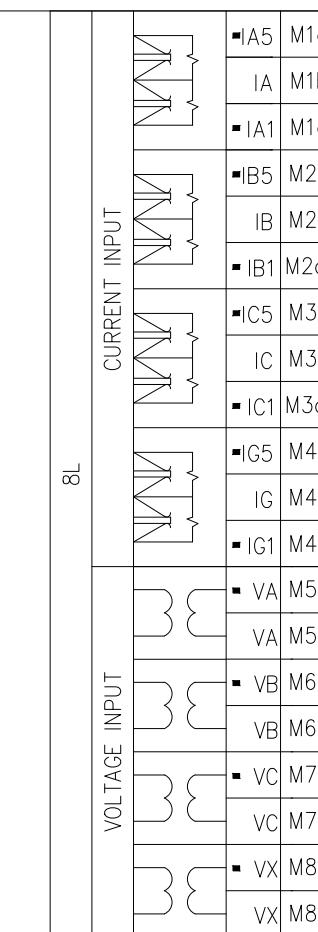
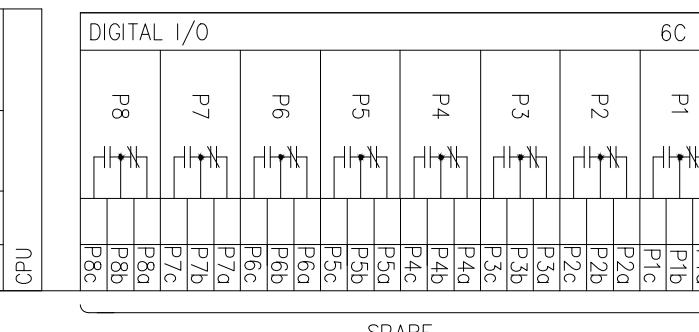
DIFFERENTIAL PROTECTION UNHEALTHY  
SHT.45

DIFFERENTIAL PROTECTION  
DC SUPPLY  
SHT.13

RS-485 NETWORK  
SHT.56



CONTACTS SHOWN  
WITH NO  
CONTROL POWER



87T1  
DIFFERENTIAL PROTECTION RELAY TYPE T60  
T60-U03-HKH-F8N-H6P-M8L-P6C-UXX-WXX

APPROVED	CHECKED	DRAWN
NAH	MSS	MUR

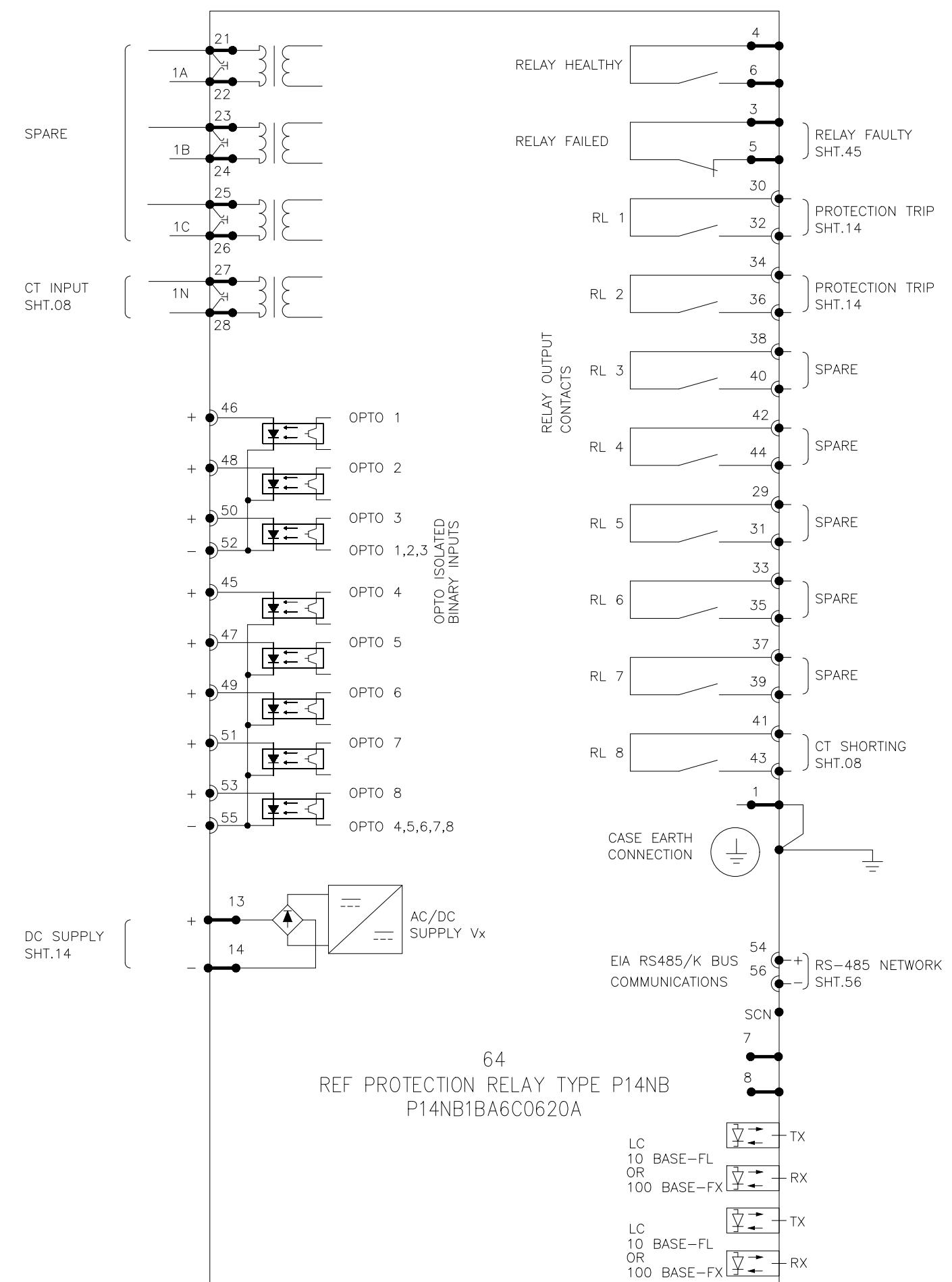


PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018  
FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS

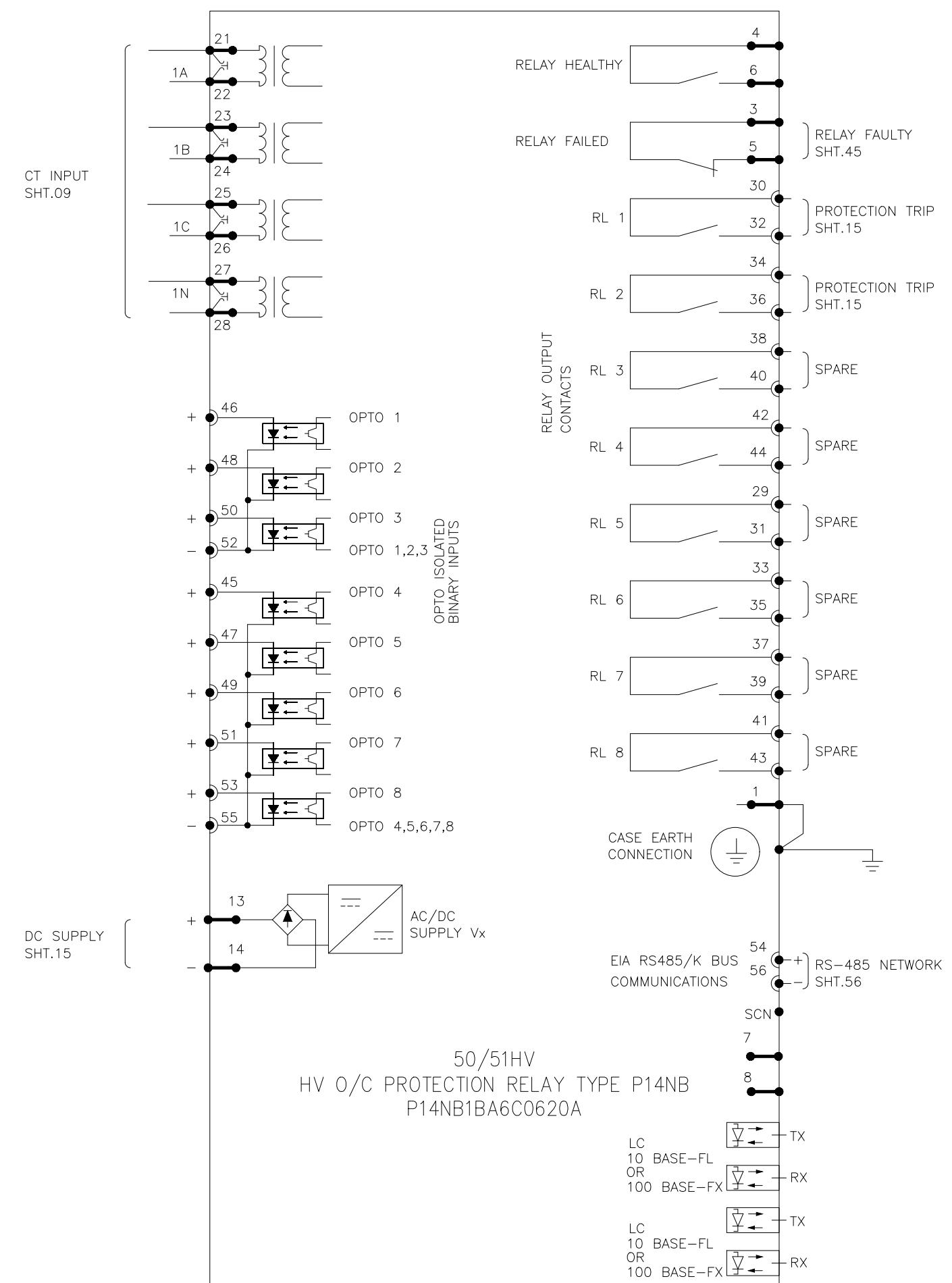
TITLE:  
DEVICE DETAIL FOR 87T1  
500KV TRAFO. PROTECTION PANEL TYPE =B06+R13



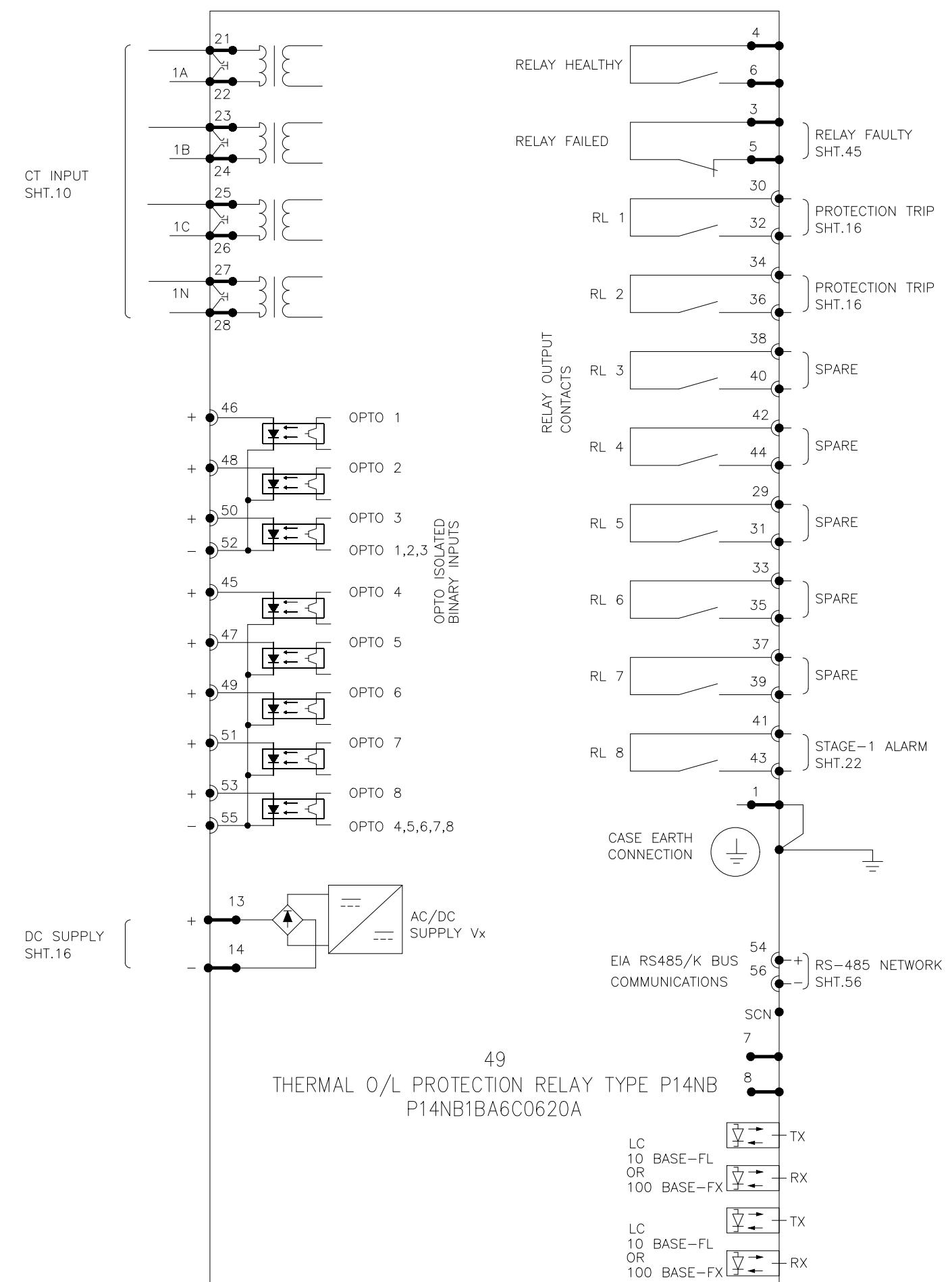
DWG# EPE/ENU-18/B61542 SHT: 58 OF 66  
DATE: 07.03.2019 AS BUILT REV: 0



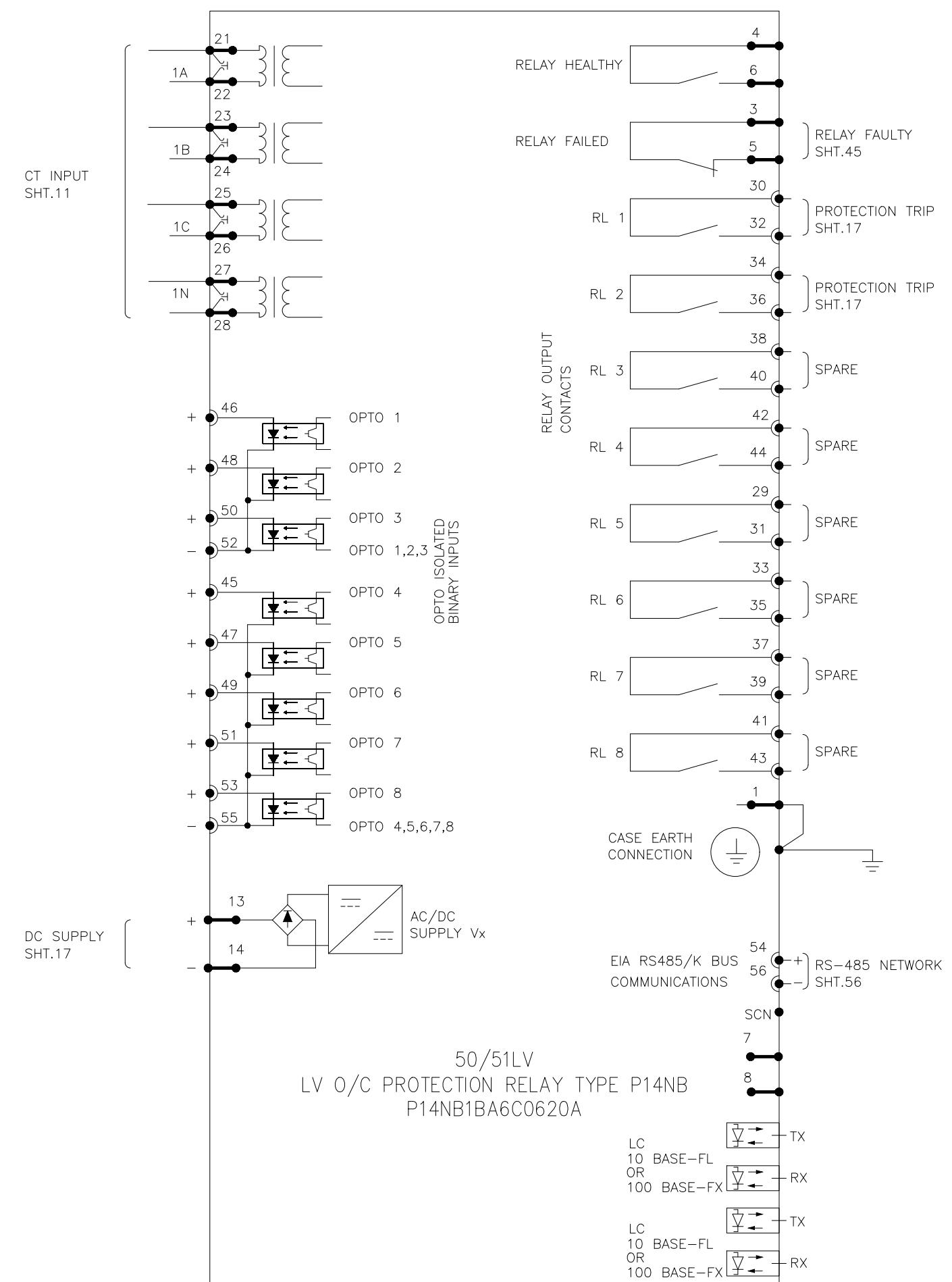
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR 64 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 59 OF 66
NAH	MSS	MUR		EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT



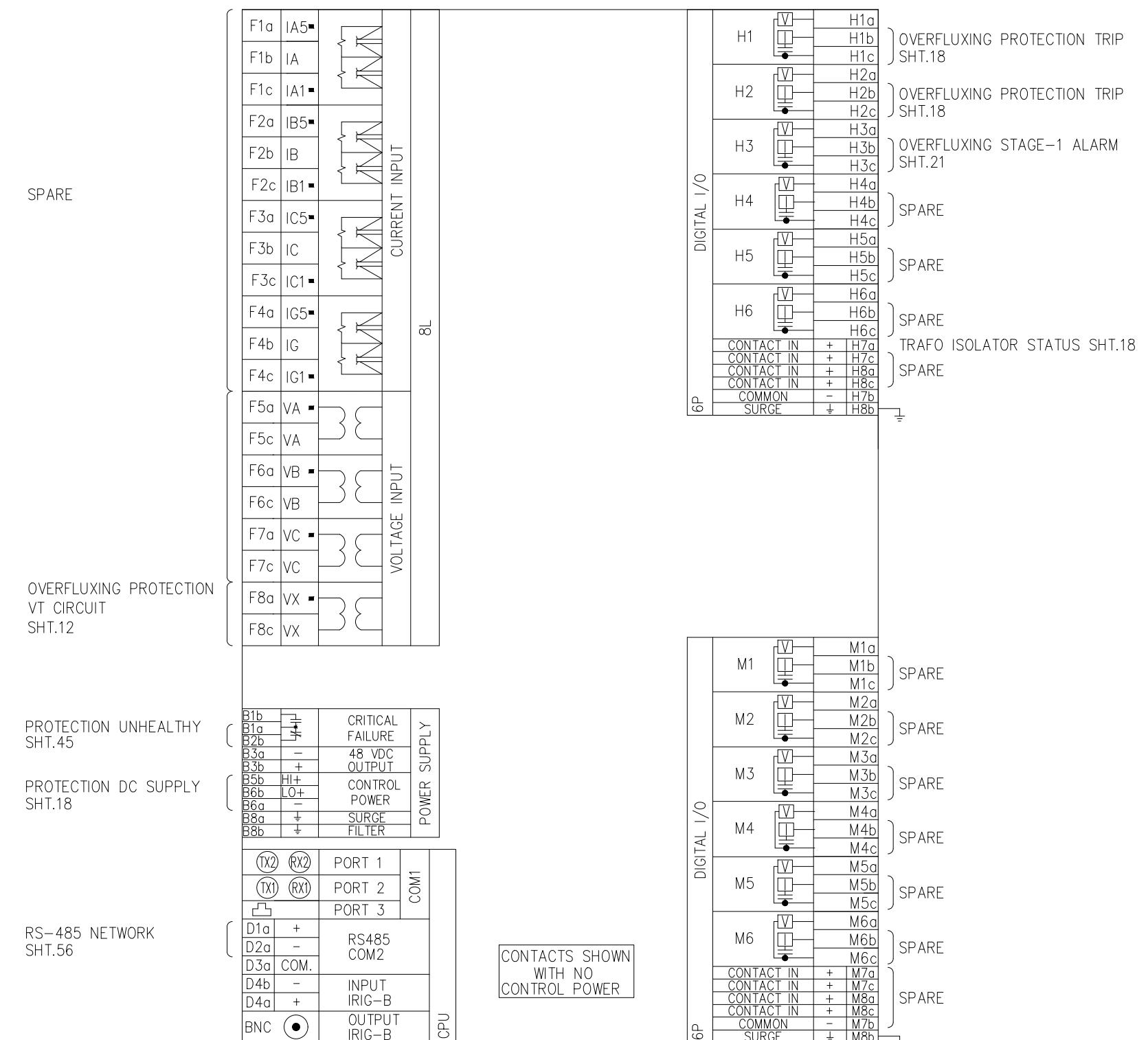
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR 50/51HV 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 60 OF 66
NAH	MSS	MUR		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR 49 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 61 OF 66
NAH	MSS	MUR	 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan		DATE: 07.03.2019	AS BUILT



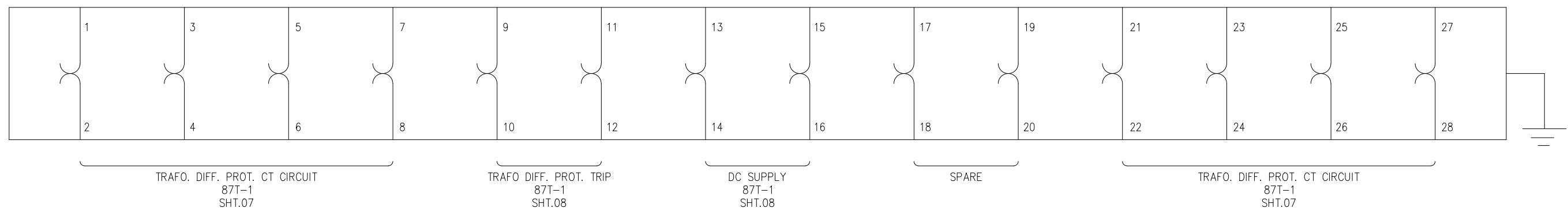
APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR 50/51LV 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 62 OF 66
NAH	MSS	MUR		<b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT



TS-1

## TEST BLOCK TYPE TSB-14

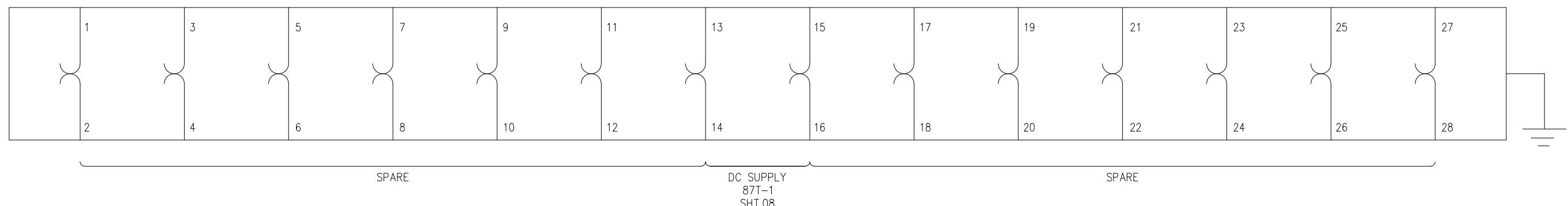
ORDERING CODE: TSB-14-AAAB11111AAAB



TS-2

## TEST BLOCK TYPE TSB-14

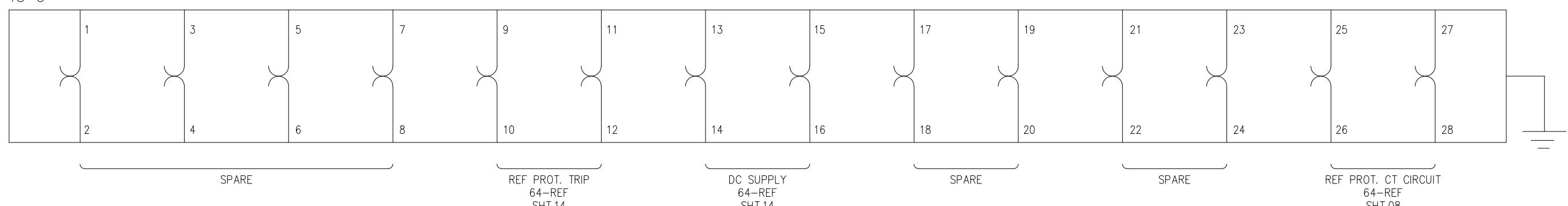
ORDERING CODE: TSB-14-11111111111111



TS-3

## TEST BLOCK TYPE TSB-14

ORDERING CODE: TSB-14-111111111AAAB

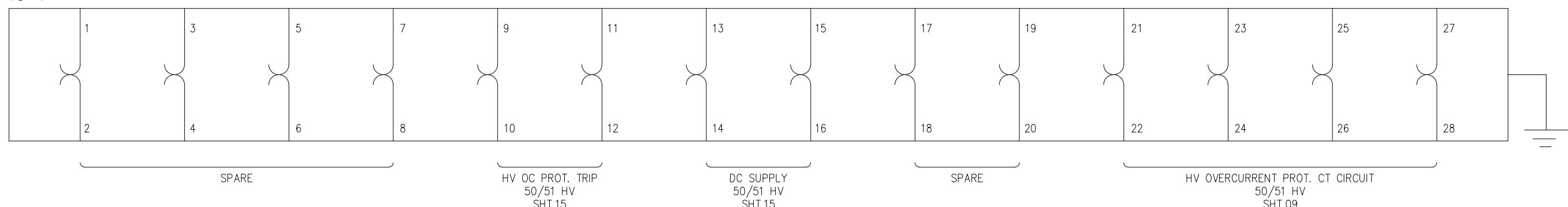


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR TEST BLOCKS 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	DWG# EPE/ENU-18/B61542	SHT: 64 OF 66
NAH Q.	MSS M. Sohail	MUR Iy		<b>EPE SOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DATE: 07.03.2019	AS BUILT

TS-4

## TEST BLOCK TYPE TSB-14

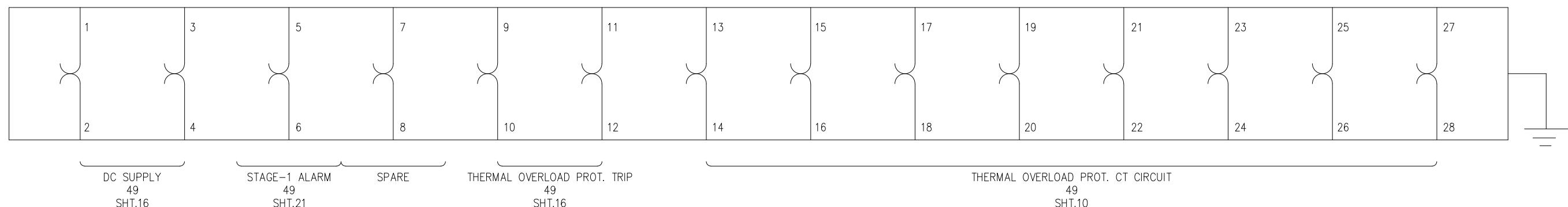
ORDERING CODE: TSB-14-111111111AAAB



TS-5

## TEST BLOCK TYPE TSB-14

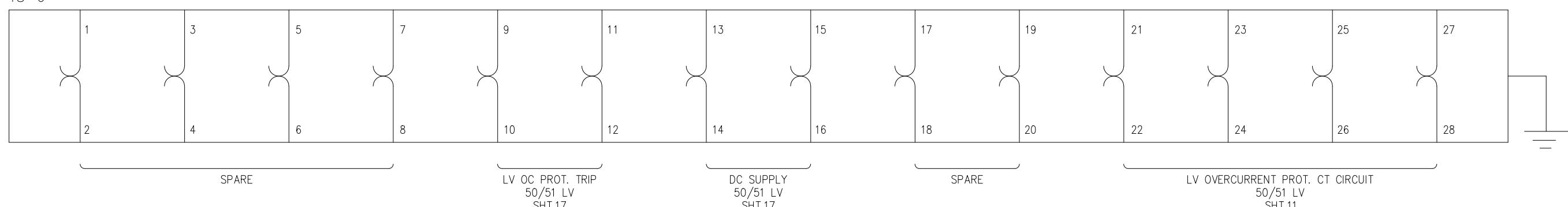
ORDERING CODE: TSB-14-11111ABABABAB



TS-6

## TEST BLOCK TYPE TSB-14

ORDERING CODE: TSB-14-111111111AAAB

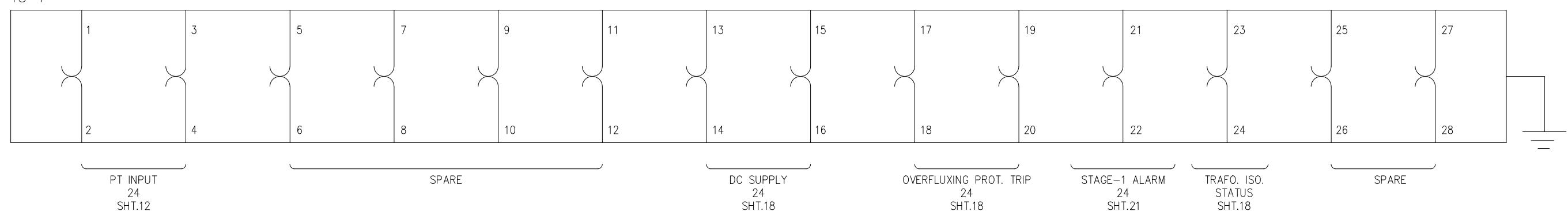


APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR TEST BLOCKS 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 65 OF 66
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT

TS-7

## TEST BLOCK TYPE TSB-14

ORDERING CODE: TSB-14-222221111111



APPROVED	CHECKED	DRAWN	PROJECT: EDUCATIONAL ORDER NTDC PO# CE/MP&M /M(P)/AM-VI/E0/9417-29 DATED 14.11.2018 FOR THE PROCUREMENT OF 220KV & 500KV RELAY& CONTROL PANELS	TITLE: DEVICE DETAIL FOR TEST BLOCKS 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	EPE SOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61542	SHT: 66 OF 66
NAH Q.	MSS M. Sohail	MUR Iy				DATE: 07.03.2019	AS BUILT

## LEGEND



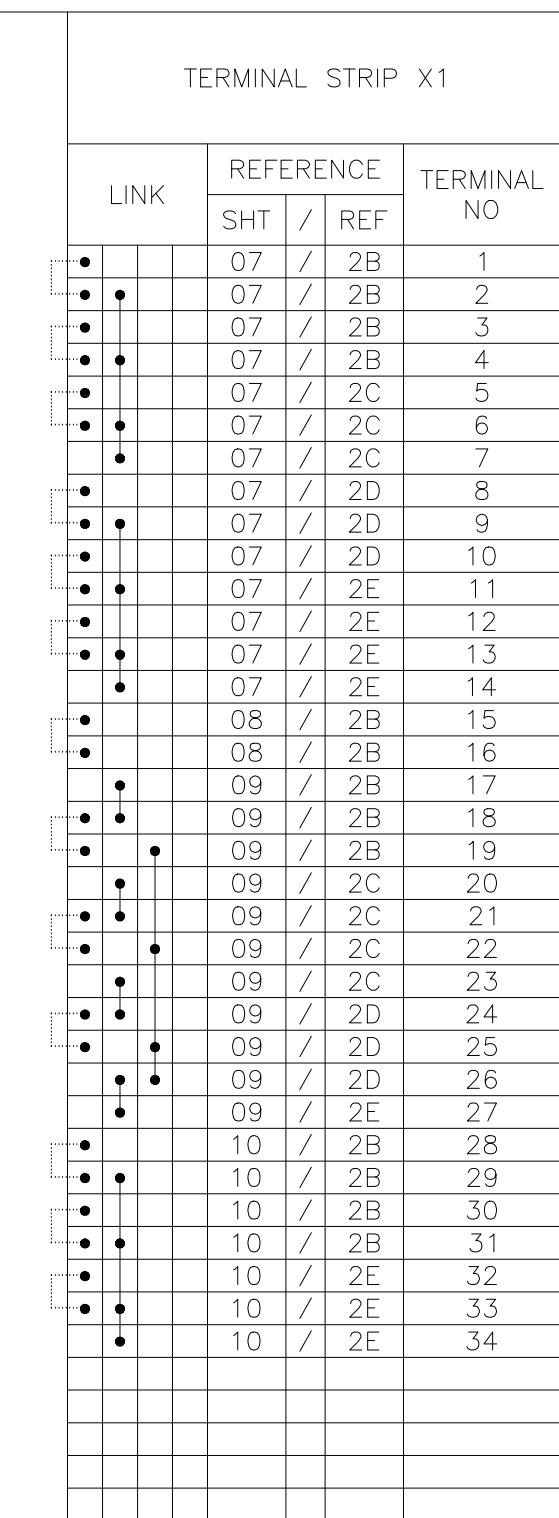
## TEMPORARY SHORTENING LINK



PERMANENT LINK



END COVER



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

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**TERMINAL DETAIL**  
ECCM, TRACO PROTECTION PANEL TYPE POC-P13

DWO // EDE /ENH 18 /DC1543

GUT 01 OF 14

DWG# EPE/ENU-18/B61543

SHI: 01

DATE: 07.03.2019

7 8

APPROVED	CHECKED	DRAWN	PR
NAH	MSS	MUR	



PROIEC

T:  
NTDC PO# CE/MP&M/M(P)/AM-VI/EO/  
9417-29 DATED 14.11.2018 FOR PROCUREMENT  
OF 220KV & 500KV PROTECTION & CONTROL PANELS



PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/  
9417-29 DATED 14.11.2018 FOR PROCUREMENT  
OF 2021KV A. EOCYLV PROTECTION & CONTROL PANEL

三

TITLE: TERMINAL DETAIL  
C ECOLV TRACQ PROTECTION PANEL TYPE: PSC-P17



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

BROWNSVILLE, TEXAS / BROWNSVILLE, TEXAS

DWG# EPE/ENU-1

Page 15 of 17

/B61543 SHI



Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION										SCHEME DWG. REF: EPE/ENU-18/B61542		
A	1																
A	2																
A	3																
A	4																
A	5																
A	6																
B	7																
B	8																
B	9																
B	10																
B	11																
B	12																
C	1	2	3	4	5	6	7	8	9	10	11	12					
D																	
D																	
D																	
E																	
F																	
LEGEND:																	

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61542		
A	1																				
A	2																				
A	3																				
A	4																				
A	5																				
A	6																				
B	7																				
B	8																				
B	9																				
B	10																				
B	11																				
B	12																				
C	1	2	3	4	5	6	7	8	9	10	11	12									
D																					
E																					
F																					
APPROVED		CHECKED		DRAWN		PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS				TITLE: TERMINAL DETAIL		500KV TRAFO. PROTECTION PANEL TYPE =B06+R13		 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan		DWG# EPE/ENU-18/B61543		SHT: 05 OF 14			
NAH [Signature]		MSS [Signature]		MUR [Signature]												DATE: 07.03.2019		AS BUILT	REV: 0		

Sr.	CABLE DESIGNATION		CORE CROSS SECTION		DESTINATION		LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61542		
A	1																				
A	2																				
A	3																				
A	4																				
A	5																				
A	6																				
B	7																				
B	8																				
B	9																				
B	10																				
B	11																				
B	12																				
C	1	2	3	4	5	6	7	8	9	10	11	12									
D																					
E																					
F																					
APPROVED		CHECKED		DRAWN		PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS				TITLE: TERMINAL DETAIL		500KV TRAFO. PROTECTION PANEL TYPE =B06+R13		 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan		DWG# EPE/ENU-18/B61543		SHT: 06 OF 14			
NAH [Signature]		MSS [Signature]		MUR [Signature]												DATE: 07.03.2019		AS BUILT	REV: 0		

Sr.	CABLE DESIGNATION			CORE CROSS SECTION			DESTINATION			LEGEND:												SCHEME DWG. REF: EPE/ENU-18/B61542					
A	1	2	3	4	5	6	7	8	9	10	11	12															
B	9												REMOTE DESTINATION	TERMINAL BLOCK	TERMINAL NO	TERMINAL STRIP X13											
	10															LINK		REFERENCE		TERMINAL NO							
	11															SHT	/	REF									
	12															49	/	1E	1								
	1	2	3	4	5	6	7	8	9	10	11	12				49	/	2E	2								
																49	/	2E	3								
																49	/	3E	4								
																49	/	4E	5								
C																49	/	4E	6								
																49	/	5E	7								
																49	/	5E	8								
																49	/	6E	9								
																49	/	6E	10								
																49	/	7E	11								
																50	/	2E	12								
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D																50	/	3E	14								
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																51	/	4E	26								
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F																51	/	6E	30								
																51	/	7E	31								
																52	/	1E	32								
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																52	/	4E	37								
G																52	/	5E	38								
																52	/	5E	39								
																52	/	6E	40								
				</																							

SCHEME DWG. REF: EPE/ENU-18/B61542

APPROVED	CHECKED	DRAWN	P
NAH <i>O</i>	MSS <i>n. Schat</i>	MUR <i>W</i>	



PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/E0/  
9417-29 DATED 14.11.2018 FOR PROCUREMENT  
OF 220KV & 500KV PROTECTION & CONTROL PANEL

TITLE:		TERMINAL DETAIL				
C	EOLW	TRAFO	PROTECTION	PANEL	TYPE	R06; P13



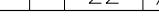
# **E P E S O L** Pvt. Ltd.

DWG# EPE/ENU-18/B61543 SHT: 08 OF 14  
 DATE: 07.03.2019 AS BUILT REV: 0

Sr.	CABLE DESIGNATION	CORE CROSS SECTION		DESTINATION		LEGEND:	SCHEMEL DWG. REF. LF/LNU-18/D01542													
A	1						TEMPORARY SHORTENING LINK													
2							PERMANENT LINK													
3						D-	END COVER													
4							TERMINAL STRIP X14													
5							LINK	REFERENCE		TERMINAL NO							TERMINATION B			
6								SHT	/	REF										
7								53	/	1E	1							ITEM DESIGNATION		
8								53	/	2E	2							TERMINAL NO		
9								53	/	2E	3							K1		
B								53	/	3E	4							44		
10								53	/	4E	5							K1		
11								53	/	4E	6							41		
12								53	/	5E	7							K2		
	1	2	3	4	5	6	7	8	9	10	11	12							41	
																			K3	
																			41	
																			K4	
																			41	
																			K5	
																			41	
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																			41	
																			K10	
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																			K18	
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																			K19	
																			41	
																			K20	

APPROVED	CHECKED	DRAWN	PROJECT:  NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS	TITLE: TERMINAL DETAIL 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	 E P E S O L P v t . L t d. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61543	SHT: 09 OF 14
NAH	MSS	MUR				DATE: 07.03.2019	AS BUILT REV: 0

Sr.	CABLE DESIGNATION	CORE CROSS SECTION	DESTINATION	LEGEND:															SCHEME DWG. REF: EPE/ENU-18/B61542								
A	1																										
A	2																										
A	3																										
A	4																										
A	5																										
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APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS	TITLE: TERMINAL DETAIL 500kV TRAFO. PROTECTION PANEL TYPE =B06+R13	 <b>EPESOL Pvt. Ltd.</b> 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61543	SHT: 11 OF 14
NAH	MSS M. Sohail	MUR				DATE: 07.03.2019	AS BUILT

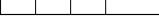


**E P E S O L** Pvt. Ltd.

DWG# EPE/ENU-18/B61543	SHT: 12 OF 14
DATE: 07.03.2019	<b>AS BUILT</b> REV: 0

APPROVED	CHECKED	DRAWN	PROJECT:
NAH <i>[Signature]</i>	MSS <i>M. Sohal</i>	MUR <i>[Signature]</i>	NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PA

	TITLE:		
ENT	TERMINAL DETAIL		
ELS	500KV TRAFO. PROTECTION PANEL	TYPE	=B06+R13

APPROVED	CHECKED	DRAWN	PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/ 9417-29 DATED 14.11.2018 FOR PROCUREMENT OF 220KV & 500KV PROTECTION & CONTROL PANELS	TITLE: TERMINAL DETAIL 500KV TRAFO. PROTECTION PANEL TYPE =B06+R13	 EPESOL Pvt. Ltd. 71-B Garden Block, New Garden Town, Lahore, Pakistan	DWG# EPE/ENU-18/B61543	SHT: 13 OF 14
NAH Q.	MSS M. Sohail	MUR <i>LG</i>				DATE: 07.03.2019	AS BUILT



PROJECT: NTDC PO# CE/MP&M/M(P)/AM-VI/EO/  
9417-29 DATED 14.11.2018 FOR PROCUREMENT  
OF COMPUTER & EQUIPMENT PROTECTION & CONTROL PANEL

TITLE: TERMINAL DETAIL  
S. ECOLV TRAFO PROTECTION PANEL TYPE: P261P13



**E P E S O L** Pvt. Ltd.  
71-B Garden Block, New Garden Town, Lahore, Pakistan

DWG# EPE/ENU-18/B61543	SHT: 14 OF 14
DATE: 07.03.2019	AS BUILT REV: 0