

LIST OF DRAWINGS

145kV SF6 CIRCUIT BREAKER TYPE LTB145D1/B

COMPUTER ORIGINAL

CLIENT UPPTCL.

PO NO [REDACTED]

CONTROL VOLTAGE CLOSE/TRIP 110/220 VDC (As applicable)

SPRING DRIVE MOTOR VOLTAGE 230 VAC.

HEATER VOLTAGE 230 VAC.

SO NO 4201829213

QTY 79 NOS.

SR. NO.	REFERENCE DOCUMENT	DESCRIPTION
1	1HYB905395-1	GENERAL ARRANGEMENT
2	1HYB905395-3(Rev A)	SCHEMATIC DIAGRAM
3	1HYB904379-6	OPERATING MECHANISM
4	1HYB905395-13	LAYOUT ELECTRICAL COMPONENTS
5	1HYB906879-0009	RATING PLATE
6	1HYB990108-16	STRUCTURE ERECTION
7	1HYB904379-20	TERMINAL CONNECTOR(ACSR PANTHER)
8	1HYB906060-20	TERMINAL CONNECTOR(ACSR ZEBRA)
9	1HYB905395-204	SCHEMATIC DIAGRAM PLATE

Electrity Sub Station Design Circle
 U.P.P.T.C.L., Lucknow
APPROVED
  
 A.S. E.E. S.E.

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Revision	
A	20181011

COVER SHEET FOR
 145kV SF6 CIRCUIT BREAKER
 TYPE LTB145D1/B WITH FSA1

DRAWN: MB CHECKED: MB APPRD. UP

1HYB906879-010

TOTAL S
1
SH. NO
1

CONTROL VOLTAGE. : 110 OR 220 VDC (AS APPLICABLE)

MOTOR VOLTAGE. : 230 VAC

HEATER VOLTAGE. : 230 VAC

ITEM ABBREVIATIONS :-

DM:- DENSITY MONITOR
OM:- OPERATING MECHANISM.

DIAGRAM BASED ON IEC 617.
LOCAL REMOTE SWITCH IN REMOTE POSITION.
CIRCUIT BREAKER IN "OFF" POSITION.
AUXILIARY CIRCUIT "OFF".
DRAWN WITHOUT GAS PRESSURE.
SPRING DISCHARGED.

NOTE :-

WIRING TO BE DONE WITH CU.WIRE (GREY FOR DC CKT.
BLACK FOR AC CKT., GREEN + YELLOW FOR EARTHING.)
1:- 2.5 SQ. MM. FOR CONTROL CKT.
2:- 2.5 SQ. MM. FOR MOTOR CKT.
3:- 4.0 SQ. MM. FOR DOOR & PANEL EARTHING.
⊗ TERMINAL FOR CUSTOMER CONNECTION.
- S FOR :- SPARE TERMINAL.



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Revision Details

Revision		SHEMATIC DIAGRAM FOR 145KV SF6 CIRCUIT BREAKER TYPE LTB145D1/B WITH FSA1.	DRAWN UP	CHECKED KD	APPRO NS	REF. DRG.NO. 1HYB904379-3	TOTAL SH
							1HYB905395-3
A	20160528						

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Revision Details

Revision		
A	20160528	

CLOSING CKT.

ANTIPUMPING

TRIP CKT.-I

SF6 SUPERVISION FOR CLOSE & TRIP CKT-I

TRIP CKT-II

SCHEMATIC DIAGRAM FOR
145kV SF6 CIRCUIT BREAKER
TYPE LTB145D1/B WITH FSA1.

DRAWN: UP

CHECKED: KD

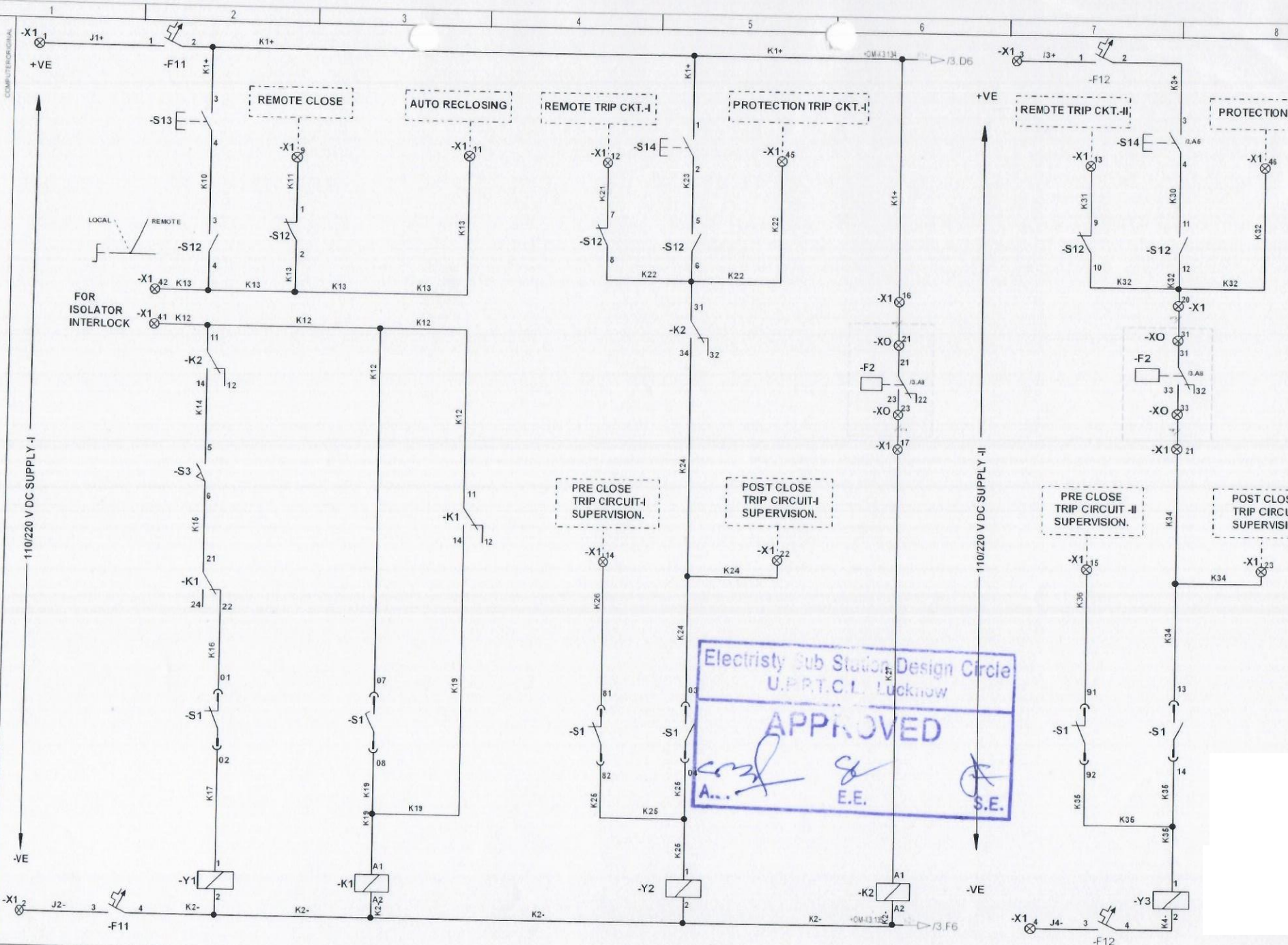
APPRD: NS

REF DRG NO. 1HYB904379-3

TOTAL SH

1HYB905395-3

SH. NO.
2



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Revision Details

Revision		
A	20160528	

SCHMATIC DIAGRAM FOR
145KV SF6 CIRCUIT BREAKER
TYPE LTB145D1/B WITH FSA1.

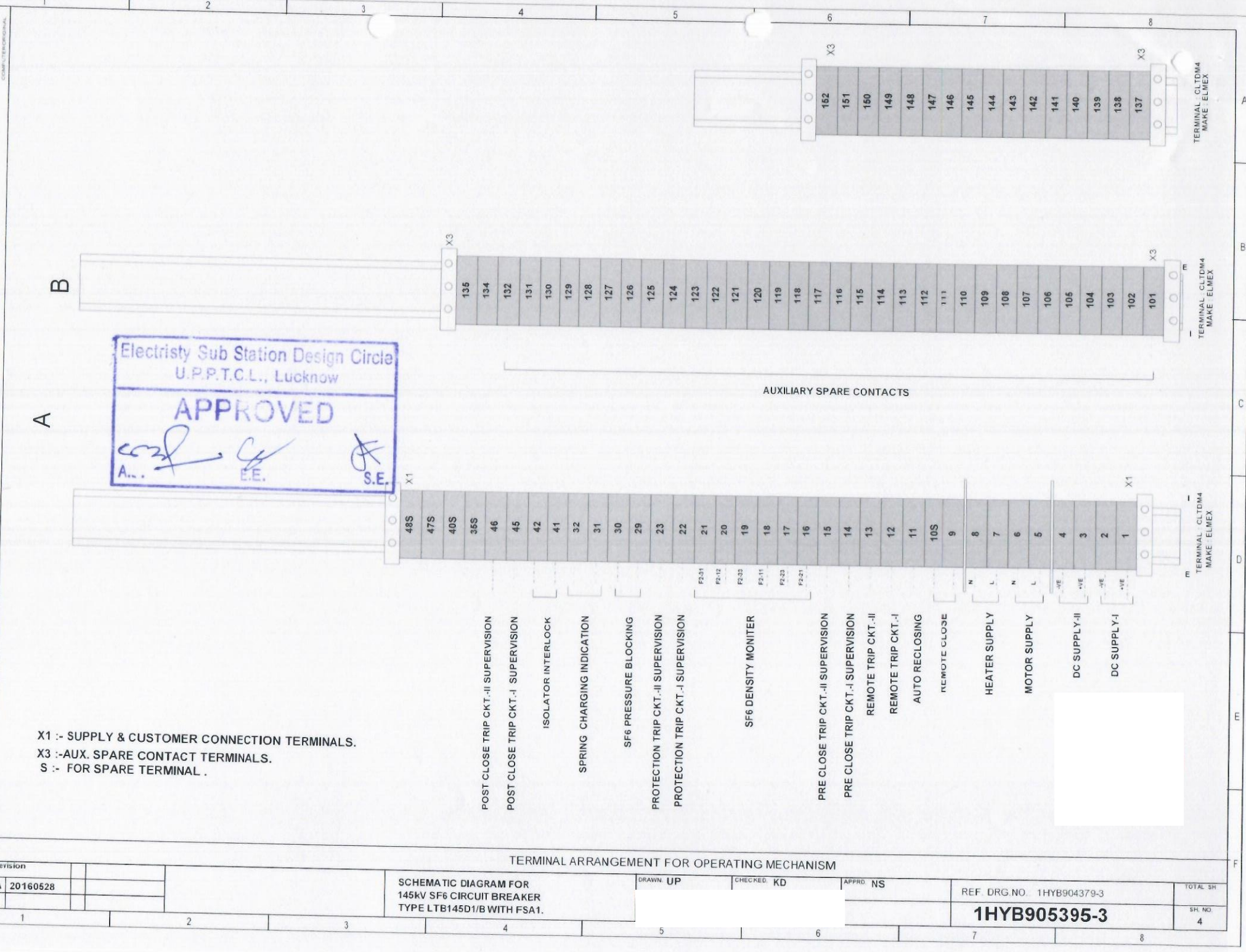
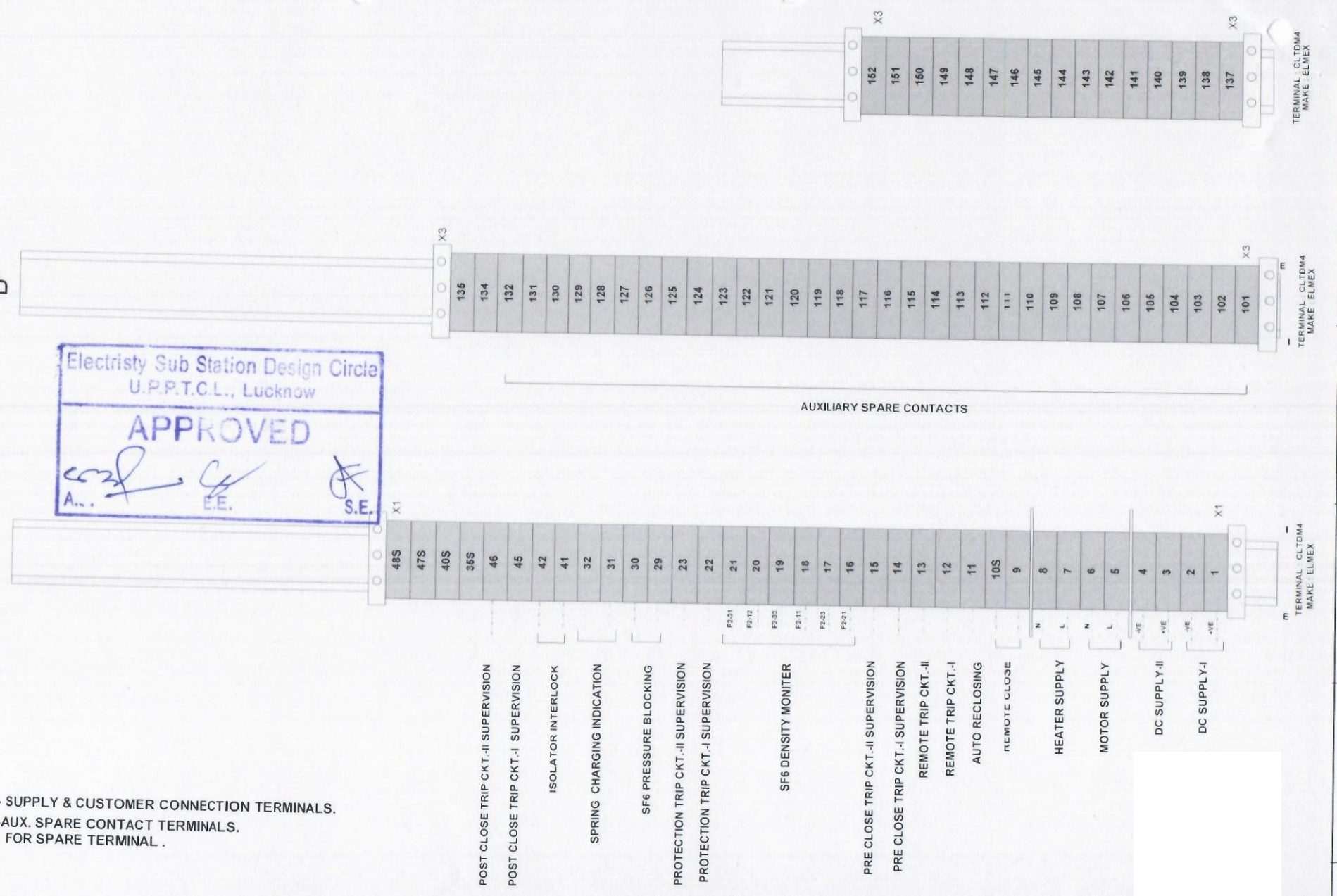
DRAWN: UP CHECKED: KD APPRD: NS

REF. DRG. NO. 1HYB904379-3 TOTAL SH

1HYB905395-3 SH. NO. 4

TERMINAL ARRANGEMENT FOR OPERATING MECHANISM

X1 :- SUPPLY & CUSTOMER CONNECTION TERMINALS.
X3 :-AUX. SPARE CONTACT TERMINALS.
S :- FOR SPARE TERMINAL .



Bill of Material

SL.	ITEM DESIGNATION	DESCRIPTION	MAKE
1	+DM-F2	SF6 GAS DENSITY MONITOR	SANGHAIROYE ELECTRIC/TRAFAG
2	+DM-XO(6)	TERMINAL BLOCK IN DENSIY MONITOR	---
3	+OM-F3	1 POLE MCB-MOTOR	ABB/SIEMENS OR EQUI
4	+OM-F4	1 POLE MCB-HEATER	ABB/SIEMENS OR EQUI
5	+OM-F5	1 POLE MCB-SUPPLY SOCKET	ABB/SIEMENS OR EQUI
6	+OM-F11	2 POLE MCB-DC SUPPLY-I	ABB/SIEMENS OR EQUI
7	+OM-F12	2 POLE MCB-DC SUPPLY-II	ABB/SIEMENS OR EQUI
8	+OM-K1	ANTI PUMPING RELAY	SCHRACK/ABB OR EQUI
9	+OM-K2	GAS SUPERVISION RELAY	SCHRACK/ABB OR EQUI
10	+OM-K3	MULTIPLYING RELAY	SCHRACK/ABB OR EQUI
11	+OM-K4	MULTIPLYING RELAY	SCHRACK/ABB OR EQUI
12	+OM-L	ILLUMINATION LAMP	BAJAJ/PHILIPS/CGL OR EQUI
13	+OM-M	DOOR LIMIT SWITCH	KAYCEE/BOHMEN OR EQUI
14	+OM-M1	SPRING CHARGING MOTOR	AGNI OR EQUI
15	+OM-PP	SOCKET(OUTLET)	CGI/SCHNIDER OR EQU
16	+OM-R3	HEATER	KIYOSH/RVM OR EQUI
17	+OM-S1	AUXILIARY CONATCT	ELMEX OR EQUI
18	+OM-S3	MOTOR LIMIT SWITCH	ELMEX OR EQUI
19	+OM-S12	LOCAL REMOTE SWITCH	SALZER/ KAYCEE OR EQUI
20	+OM-S13	PUSH BUTTON RED	SIEMENS/TEKNIC OR EQUI
21	+OM-S14	PUSH BUTTON GREEN	SIEMENS/TEKNIC OR EQUI
22	+OM-T1	THERMOSTAT	APT CONTROLS OR EQUI
23	+OM-X1(35)	TERMINAL BLOCK-CLTDM4	ELMEX/CONNECTWELL OR EQUI
24	+OM-X3(50)	TERMINAL BLOCK-CLTDM4	ELMEX/CONNECTWELL OR EQUI
25	+OM-Y1	CLOSE COIL	ABB
26	+OM-Y2	TRIP-I COIL	ABB
27	+OM-Y3	TRIP-II COIL	ABB

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Revision Details

Revision		APPARATURS LISTS FOR 145KV SF6 CIRCUIT BREAKER TYPE LTB145D1/B WITH FSA1.	DRAWN UP	CHECKED KD	APPRD NS	1HYB905395-3	TOTAL SH
A	20160528						5

1HYB905395-3
 SH. NO. **5**

1 2 3 4 5 6 7 8

A A

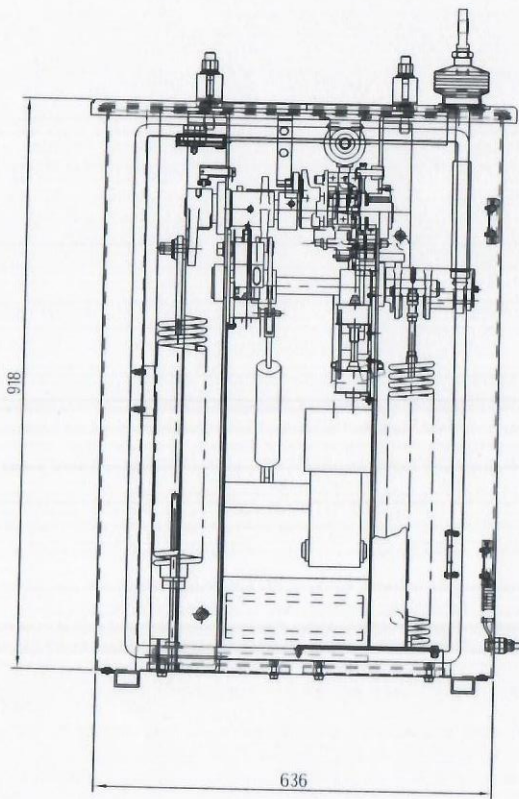
B B

C C

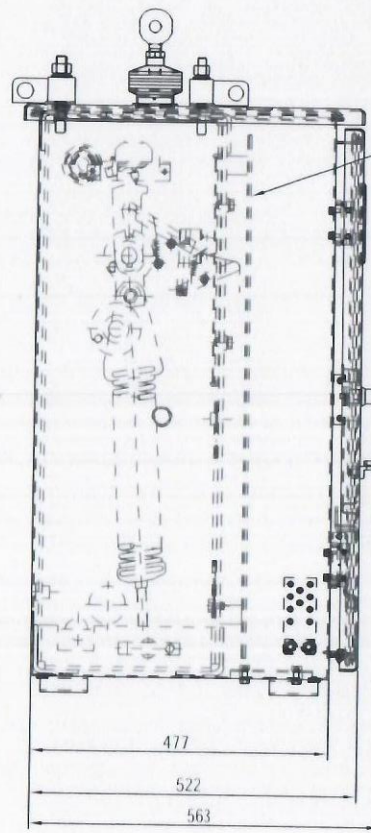
D D

E E

F F

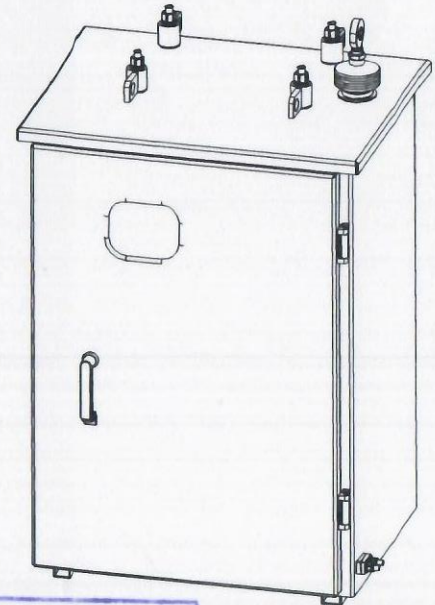


Elevation
(without door and apparatus mounting plate)



Side view

Electrical apparatus plate



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NOTE:-

- 1). DEGREE OF PROTECTION IP 55.
- 2). COLOUR SHADE 631 IS: 5.
- 3). CABINET THICKNESS:2 mm STEEL SHEET.

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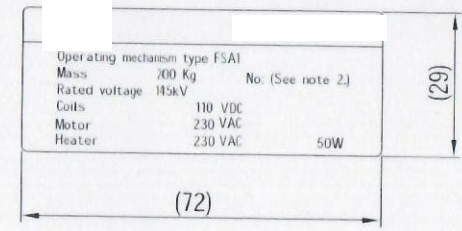
Revision Details:

Revision									
20140120									
OPERATING MECHANISM FOR 145kV SF6 CIRCUIT BREAKER TYPE LTB145D1/B WITH TSA1				DRAWN: NS	CHECKED: KD	APPRD: NS			TOTAL SH 1
							1HYB904379-6		Sh. NO. 1

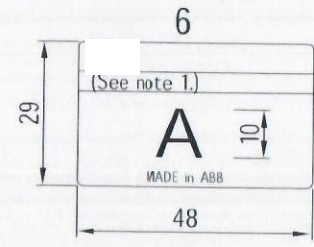
1 2 3 4 5 6 7 8

COMPUTER ORIGINAL

CE			
Circuit-breaker type	LTB145D1/B	Operating device type	FSA1
No. (See note 1.)		No. (See note 2.)	
Order	XPO-40	Order	XPO-40
Voltage	145 kV	Breaking current	40 31.5 kA
Insulation level		DC-component	36 %
lightning imp.with.voltage	650 kV	First-pole-to-clear-factor	1.5
switching imp.with.voltage	- kV	Making current	100 79 kA
power frequency with.voltage	275 kV	Short-time current	3 s 40 31.5 kA
Frequency	50 Hz		
Normal current	3150 1250 A	Line charging breaking current	50 A
Gas pressure SF6	abs (+20°C)	Mass total	1322 kg
Max. working pressure	0.9 MPa	Mass of gas	7 kg
Filling	0.7 MPa	Rules	IEC 62271-100
Signal	0.62 MPa	Operating sequence	0-0.3s-CO-3min-CO
Blocking	0.6 MPa	Temperature class	-30 °C
Volume per pole	50 l	Year of manufacture	
Tender Specification No : ESD-508			
Name of purchaser : UPPTCL			
Name of s/s/work/bay : ***			



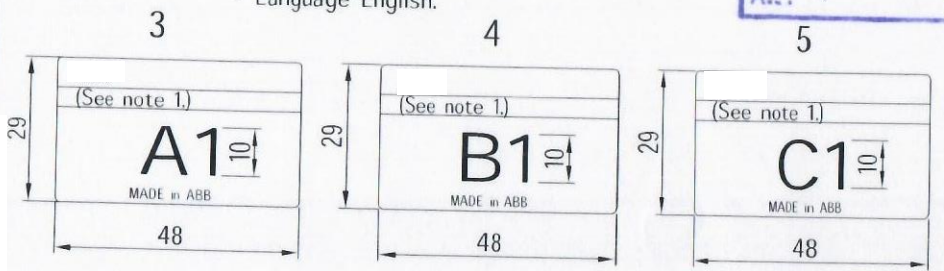
- Letter height 2 & line 0.3
- Blank text is to be engraved at ABB.
- Text to be filled with Sun-Proof black ink.
- Language English.



- NOTE
- MOUNTED ON DRIVE
 - 1. CIRCUIT BREAKER SERIAL NO. NOTED IN THIS SPACE.
 - 2. OPERATING MECHANISM SERIAL NO. NOTED IN THIS SPACE.



- Engraved on natural background.
- Letter height 3.5 & line 0.3 thk.
- Blank text is to be engraved at
- Text to be filled with Sun-Proof black ink.
- General tolerance as per ISO 2768-c, 89.
- Language English.

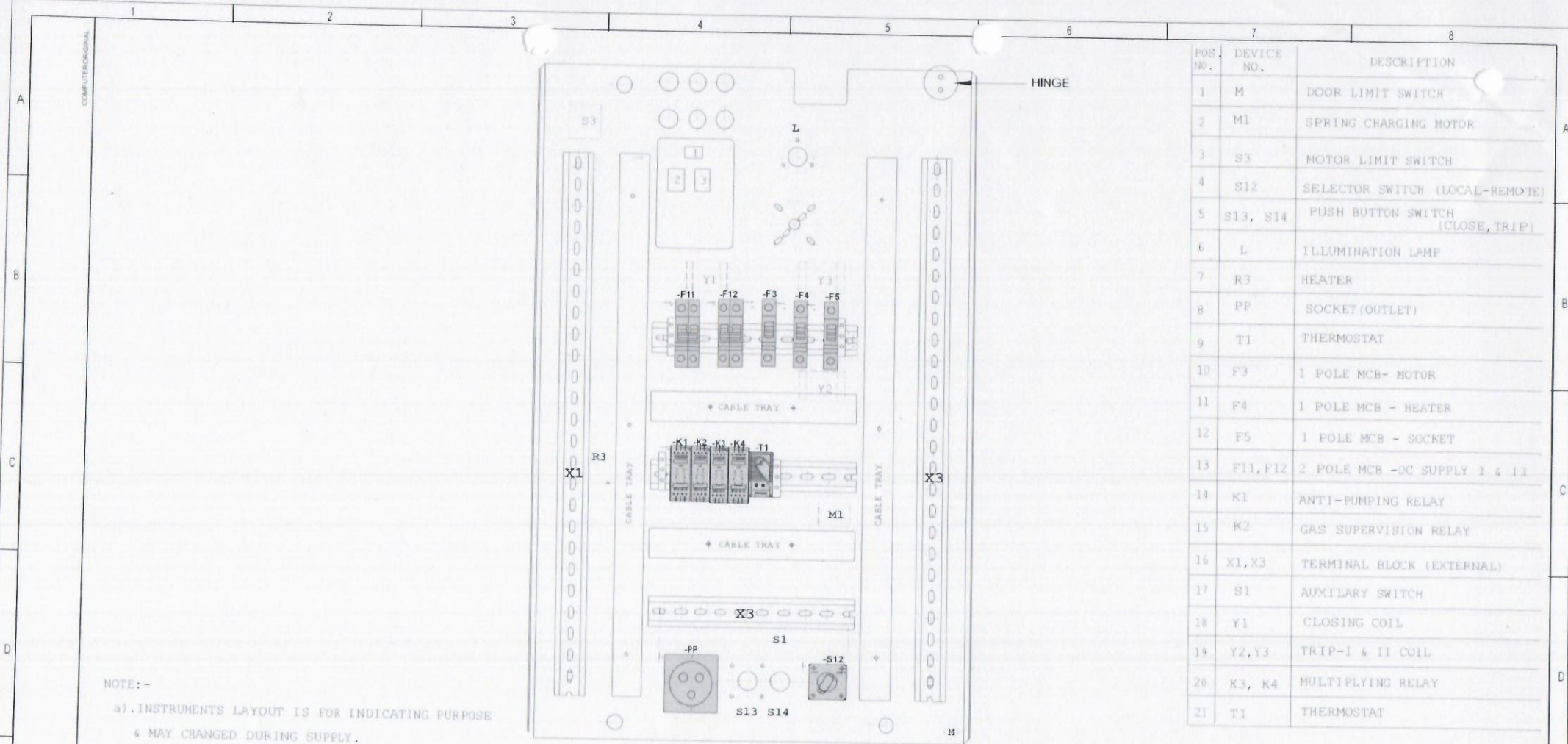


- MOUNTED ON RESPECTIVE POLES.

Prepared: HJ	Checked: MB	Approved: UP	Title	 Scale - Lang E Total Sh. 1 Sheet 1
Without Sep.PL <input checked="" type="checkbox"/>	Sep.PL Same No. <input type="checkbox"/>	Sep.PL Other No. <input type="checkbox"/>	RATING PLATES FOR	
Derived from:	Supersedes:	Superseded by:	145kV SF6 CIRCUIT BREAKER	
Revision:			TYPE LTB145D1/B WITH FSA1	
			1HYB906879-0009	

IAL : S.S. 07/Gr18M9 IS.6911-'92

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POS. NO.	DEVICE NO.	DESCRIPTION
1	M	DOOR LIMIT SWITCH
2	M1	SPRING CHARGING MOTOR
3	S3	MOTOR LIMIT SWITCH
4	S12	SELECTOR SWITCH (LOCAL-REMOTE)
5	S13, S14	PUSH BUTTON SWITCH (CLOSE, TRIP)
6	L	ILLUMINATION LAMP
7	R3	HEATER
8	PP	SOCKET (OUTLET)
9	T1	THERMOSTAT
10	F3	1 POLE MCB - MOTOR
11	F4	1 POLE MCB - HEATER
12	F5	1 POLE MCB - SOCKET
13	F11, F12	2 POLE MCB -DC SUPPLY 1 & II
14	K1	ANTI-PUMPING RELAY
15	K2	GAS SUPERVISION RELAY
16	X1, X3	TERMINAL BLOCK (EXTERNAL)
17	S1	AUXILIARY SWITCH
18	Y1	CLOSING COIL
19	Y2, Y3	TRIP-I & II COIL
20	K3, K4	MULTIPLYING RELAY
21	T1	THERMOSTAT

NOTE:-

- a). INSTRUMENTS LAYOUT IS FOR INDICATING PURPOSE & MAY CHANGED DURING SUPPLY.
- b). ALL EMPTY MOUNTING HOLES TO BE BLOCKED WITH RUBBER GROMMAT.
- c). COMPONENT MOUNTING ON DRIVE:-
Y1, Y2, Y3, S3, S1, M, M1
- d). 1 - COUNTER
2 - SPRING CHARGED INDICATION
3 - CB ON - OFF INDICATION
- e). LOOSE BUNCH TO BE KEPT FOR 150mm.

LAYOUT ELECTRICAL COMPONENT AS PER SCHEMATIC DIAGRAM 1HYB905395-3.

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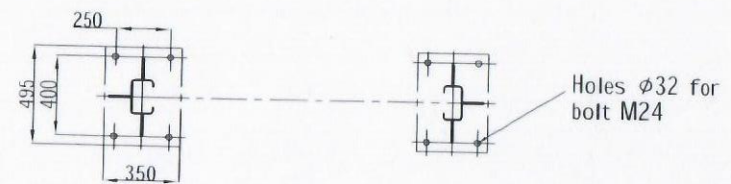
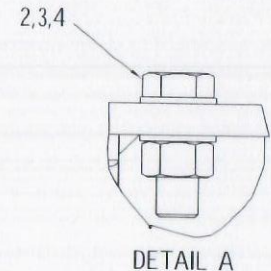
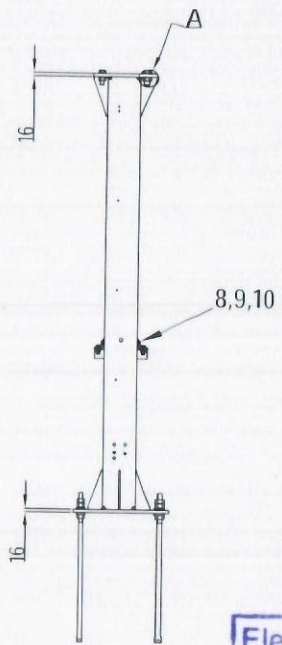
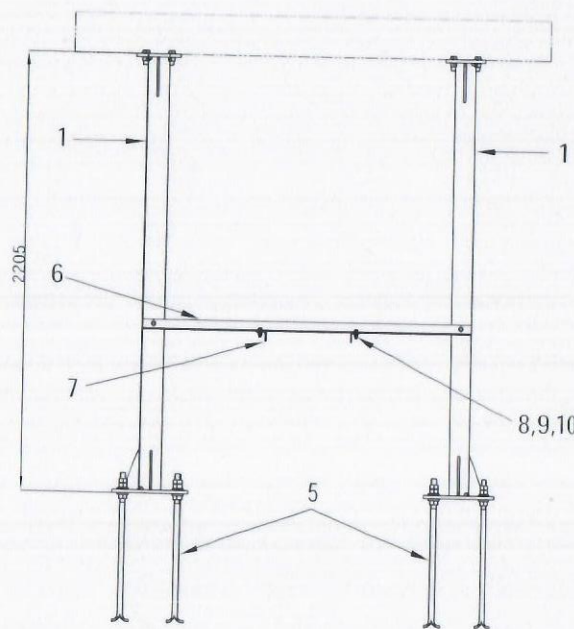
A... E.E. S.E.

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Revision		LAYOUT ELECTRICAL COMPONENT FOR 145kV SF6 CIRCUIT BREAKER TYPE LTB145D1/B WITH FSA1.	DRAWN NS	CHECKED KD	APPRD. UP	REF DRG.NO. 1HYB905395-3	TOTAL SH 1
A	20160528						
						1HYB905395-13	SH. NO. 1

COMPUTER ORIGINAL

LIST OF ITEMS PER STRUCTURE		
ITEM NO.	DESCRIPTION	QTY.
1	BREAKER FRAME	2
2	HEX HEAD SCREW FULL THREAD	8
3	PLAIN WASHER	16
4	HEXAGON NUT	8
5	FOUNDATION BOL	8
6	ANGLE	2
7	ANGLE	2
8	HEX HEAD SCREW FULL THREAD	8
9	PLAIN WASHER	16
10	HEXAGON NUT	8



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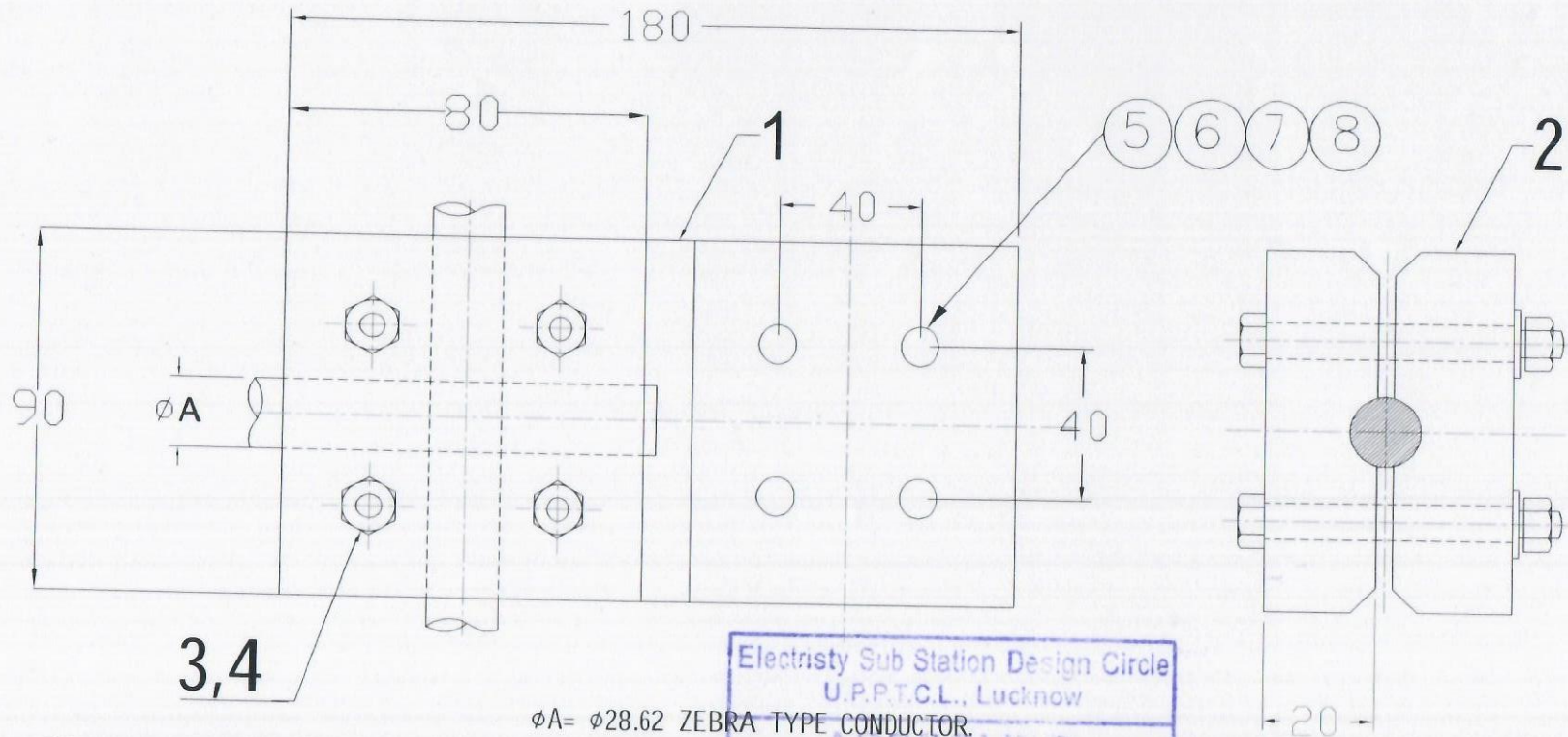
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[Signature] E.E. *[Signature]* S.E.

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Revision								
20160531								
STRUCTURE ERECTION FOR 145KV, SF6 CIRCUIT BREAKER TYPE LTB145D1/B WITH FSA1				DRAWN: UP	CHECKED: KD	APPRD: NS	TOTAL SH. 1	
							1HYB990108-16	SH. NO. 1

COMPUTER ORIGINAL



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TECHNICAL PARTICULARS

1. REFERENCE STANDARDS IS - 5561 - 1970.
2. RATED VOLTAGE : 145KV.
3. CURRENT RATING: 1000A
4. MAX. TEMP. RISE : 45° OVER 50° AMBIENT.
5. SHORT TIME RATING : 31.5KA 3 SEC.
6. FOR EQUIPMENT : CIRCUIT BREAKER
7. MIN. THICKNESS OF ANY CURRENT CARRYING PARTS WILL NOT BE LESS THEN 12 MM.
8. ALL SHARP CORNERS WOULD BE ROUNDED OFF.
9. MANUFACTURING TOLERANCES
 UP TO 50MM ± 5%
 UP TO 100 MM ± 4%
 ABOVE TO 100 MM ± 3%
10. ALL FASTENERS WILL BE M.S. HOT DIP GALVANIZED AS PER IS 1367, PART 13.
11. ** MATERIAL FOR PLAIN WASHER : STEEL PROPERTY CLASS-200HV
 MATERIAL FOR SPRING WASHER : SPRING STEEL

Sr. No.	ITEM & MATERIAL	QTY.	SIZE	REMARKS
8	HEX SCREW-8.8 GRADE	4	M12x65	HDC
7	HEX NUT-8 GRADE	4	M12	HDC
6	PLAIN WASHER FOR M12	8	---	HDC
5	SPRING WASHER FOR M12	4	---	HDC
4	WASHERS	4	M12	HDC
3	MS BOLT & NUT	4	M12	HDC
2	GRIPPER	1	---	AL. ALLOY 4600 (A6) IS-617
1	BODY	1	---	AL. ALLOY 4600 (A6) IS-617

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Revision		
1	20160629	

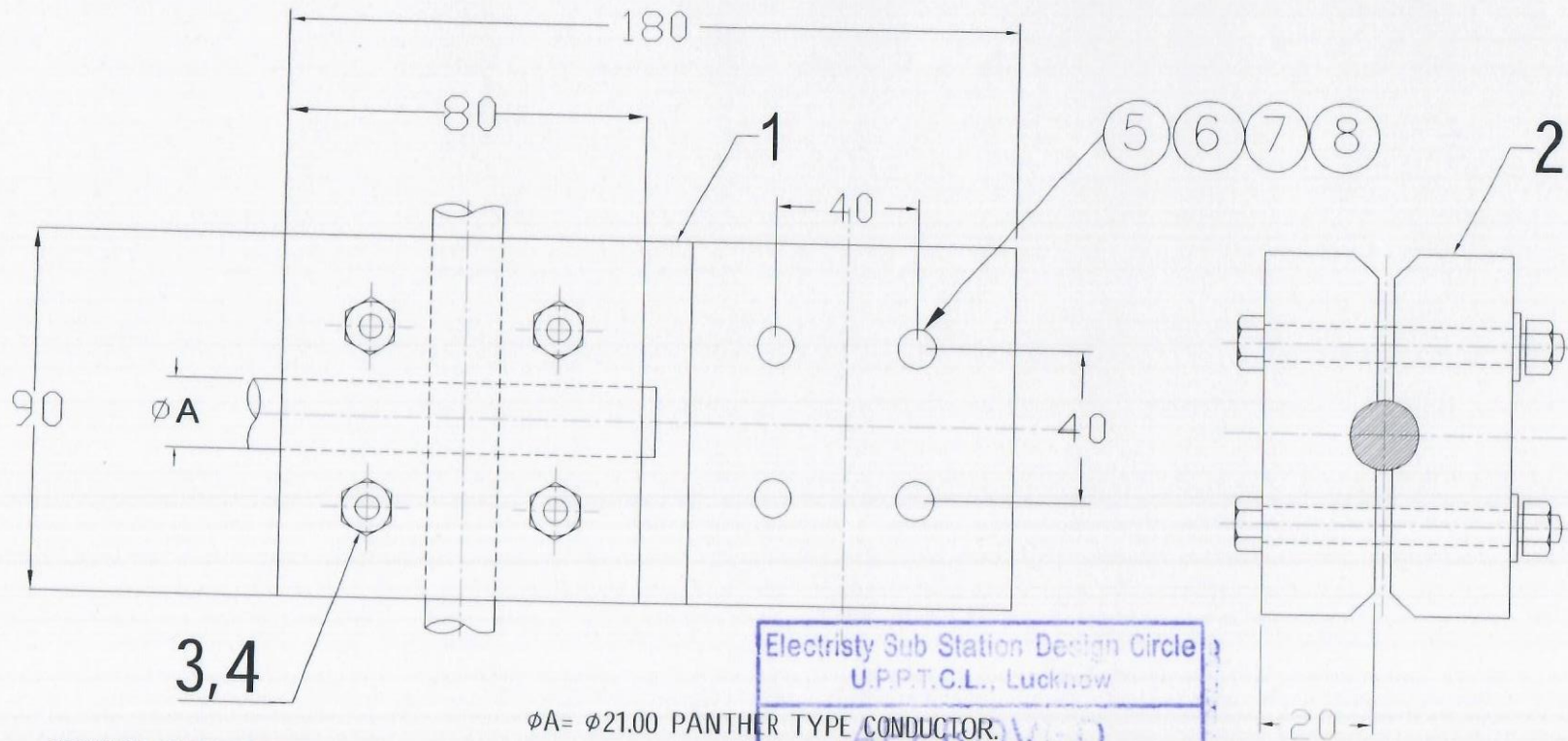
TERMINAL CONNECTOR SINGLE ACSR CONDUCTOR(ZEBRA) - BOLTED TYPE FOR 145kv SF6 CIRCUIT BRKAKER TYPE LTB 145D1/B WITH FSA1.

DRAWN: UP CHECKED: NS APPRD: NS

1HYB906060-20

TOTAL SH.	1
Sh. NO.	1

COMPUTER ORIGINAL



$\phi A = \phi 21.00$ PANTHER TYPE CONDUCTOR.

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TECHNICAL PARTICULARS

1. REFERENCE STANDARDS IS - 5561 - 1970.
2. RATED VOLTAGE : 145KV.
3. CURRENT RATING: 1000A
4. MAX. TEMP. RISE : 45° OVER 50° AMBIENT.
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8. ALL SHARP CORNERS WOULD BE ROUNDED OFF.
9. MANUFACTURING TOLERANCES
 UP TO 50MM \pm 5%
 UP TO 100 MM \pm 4%
 ABOVE TO 100 MM \pm 3%
10. ALL FASTENERS WILL BE M.S. HOT DIP GALVANIZED AS PER IS 1367, PART 13.
11. ** MATERIAL FOR PLAIN WASHER : STEEL PROPERTY CLASS-200HV
 MATERIAL FOR SPRING WASHER : SPRING STEEL

8	HEX SCREW-8.8 GRADE	4	M12x65	HDG
7	HEX NUT-8 GRADE	4	M12	HDG
6	PLAIN WASHER FOR M12	8	---	HDG
5	SPRING WASHER FOR M12	4	---	HDG
4	WASHERS	4	M12	HDG
3	MS BOLT & NUT	4	M12	HDG
2	GRIPPER	1	---	AL ALLOY 4600 (A6) IS-617
1	BODY	1	---	AL ALLOY 4600 (A6) IS-617
Sr. No.	ITEM & MATERIAL	QTY.	SIZE	REMARKS

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Revision	DATE	DESCRIPTION	DRAWN UP	CHECKED: KD	APPRO. KD	TOTAL SH.
B	20160617	TERMINAL CONNECTOR SINGLE ACSR CONDUCTOR(PANTHER) - BOLTED TYPE FOR 145KV SF6 CIRCUIT BREAKER TYPE LTB 145D1/B WITH FSAI.				1
						1

1HYB904379-20

Sh. NO.
1

A

B

C

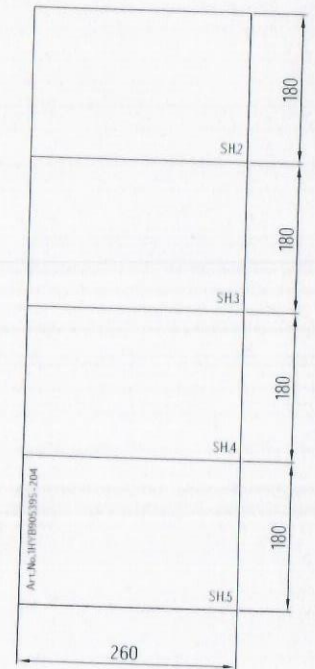
D

E

F

COMPUTER ORIGINAL

1



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Note:-

- 1) SCHEMATIC DIAGRAM DRG.NO. 1HYB905395-3. SH 2,3,4,5.
- 2) BACK GROUND SILVER .
PRINTING BLACK.
- 3) ARRANGEMENT OF SHEETS IS SHOWN FOR INDICATIVE PURPOSE HOWEVER SHEET LAYOUT CAN BE ADJUSTED TO SUIT PRIDUCTION.

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Revision		
A	20160528	

LAYOUT OF SCHEMATIC DIAGRAM PLATE FOR
 145kV SF6 CIRCUIT BREAKER
 TYPE LTB 145D1/B WITH FSAT

4	Sheet 260x180	1	ALU. FOIL PAPER	Sh.0.275mm,thk.	
QTY.	DESCRIPTION	P	MATERIAL / CODE NO.	LOWER DRG.NO./ CODE NO.	WT.
DRAWN: UP	CHECKED: KD	APPRD. NS			TOTAL SH.
					1
					Sh. NO
					1

1HYB905395-204

2

3

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