

SIEMENS

Standard Drawing : 145KV SF6 Breaker Drawing (2 Pole)

(with 25mm/kV creepage distance)

Customer Name : Transmission Corporation of Andhra Pradesh Ltd (APTRANSCO)



APPROVED

2/11/2017
**CHIEF ENGINEER
CONSTRUCTION
APTRANSCO**

1/30

Index	Amendment/Revision	Date	Name
A			
B			
C			
D			

Index	Amendment/Revision	Date	Name
E			
F			
G			
H			

The reproduction transmission of use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration of a utility model or design are reserved.

Sr. No.	Drawing No.	No. of Sh	Brief details of drawings	Amendment to RECORD OF DRAWINGS										Qty of Prints		
				A	B	C	D	E	F	G	H	I	J			
1	(4) G71AHS - KA401 - D2433 -	3	Design Details													
2	(4) G71AHS - KA401 - Z2433 -	3	GA Drawing/ Structure/ Terminal Connector													
3	(4) G71AHS - KA401 - N2433 -	1	Rating Plate													
4	(4) G71AHS - KA401 - L2433 -	1	Equipment Layout													
5	(4) G71AHS - KA401 - W2433 -	4	Wiring Diagram													
6	(4) G71AHS - KA401 - W2433 -	5	Terminal Plan													
7	(4) G71AHS - KA401 - E2433 -	6	Equipment List													
8	(4) G71AHS - KA401 - C2433 -	1	Chamber and Support Insulator													
9	()															
10	()															
11	()															
	()															

CUSTOMER: APTRANSCO

APPROVED

2 July 2020
CHIEF ENGINEER
CONSTRUCTION
APTRANSCO

2/30

Drg Codes	C = Construction Details; D = Design Details / Tech Details; E = Equipment List; L = Equipment Layout (Front, Rear); N = Name Plate / Rating Plate; R = Record of Drawings; W = Wiring Drawing / Power & Control Circuit; Z = Any Drawing not covered by other code.	
Date	30.06.2020	
Prep.	SN	
Ckd.	SB	
Norm		
Descr: 145KV Circuit Breaker		Sales Ref: _____
Type: 2AP1FG		QTY: No. _____
Details: RECORD OF DRAWING		
Original/Replacement for/Replaced by:-		
Siemens Ltd. Aurangabad		
Drng No.: (4) G 7 1 A H S - K A 4 0 1 - R 2 4 3 3 -		Sh 1
		1 Sh

DESIGN DETAILS

1.0 General

1.1 Type Designation Siemens Make 2AP1 FG
 1.2 Governing Standard IEC 62271-100

2.0 Technical Data

2.1 System Parameters
 .1 Rated Voltage kV 145 kV
 .2 Service Voltage kV 132 kV
 .3 Frequency Hz. 50
 .4 No. of Poles Three
 .5 Ambient Temperature Range °C -30 to +50

3.0 Operating Data at rated operating Voltage & rated pressure

3.1 Type of Operating Mechanism Spring Energy Stored
 3.2 Mechanism is mechanically gang operated Yes
 3.3 Operating Data
 .1 Closing mSec. 61 ± 8
 .2 Breaking mSec. 60 Max
 .3 Opening Time mSec. 28 ± 8
 .4 Arcing Time mSec. ≤21
 3.4 Switching Data
 .1 Rated normal current A 3150
 .2 Rated short circuit breaking current kA 40
 .3 Rated short time current kA 40, (3sec.)
 .4 Rated short circuit making current kAp 100
 .5 First pole to clear factor 1.3/1.5
 .6 Out-of-phase breaking current kA 10
 .7 Rated line charging breaking current A 50
 .8 Rated cable charging breaking current A 160
 3.5 Rated operating sequence O – 0.3sec – CO – 3min – CO

4.0 Basic Insulation Level

4.1 Rated power frequency withstand voltage (1min, 50 Hz)
 .1 Phase to earth kV 275
 .2 Across the open breaker kV 275
 .3 Between phases kV 275
 4.2 Rated lighting impulse withstand voltage (1.2 / 50 micro sec.)
 .1 To earth kVp 650
 .2 Across the open breaker kVp 650
 .3 Between phases kVp 650

APPROVED

[Signature]
 CHIEF ENGINEER
 CONSTRUCTION
 APTRANSCO

3/30

CUSTOMER: APTRANSCO				Sales Ref:		Qty.: Nos.	
			Date: 30.06.2020	Description :-145kV Circuit Breaker		Sh. 1 3 Sh.	
			Prep : SN				
			Ckd : SB				
			Siemens Ltd.	Work :- 2AP1FG			
Issue	Remarks	Date	Name				
Original/Replacement for/				(4) G71AHS-KA401-D2433-			
Replaced by :-							

4.3	Creepage distance			
.1	To earth	mm	25mm/kV (3625mm minimum)	
.2	Across the open breaker	mm	25mm/kV (3625mm minimum)	
5.0	Construction			
5.1	Clearance			
.1	To earth	mm	1250	
.2	Across the open breaker	mm	1200	
.3	Pole to pole center distance	mm	3400(Phase to Phase)	
5.2	Arc quenching Medium			
.1	Nominal pressure SF6 (@20°C) (Normal)	bar	6.0	
.2	Signal loss of SF6 (@20°C) (Alarm)	bar	5.2	
.3	General lockout (@20°C) (Lockout)	bar	5.0	
.4	Quantity of SF6 gas required per breaker	kg	4.4	
.5	Qty of gas being supplied per breaker, pre filled in the poles.	kg	0.63 (0.5 Bar pressure at 20°C)	
.6	In addition to pre filled gas, qty of gas being sent to site in cylinder	kg	5 per CB	
5.3	Installation		Outdoor	
5.4	Approx. weight of breaker without support structure	kg	1050 approx.	
6.0	Structures, Base Frame			
6.1	Material		Mild Steel	
6.2	Surface Treatment		Hot Dip Galvanized (86 Micron)	
7.0	Control Cubicle			
7.1	Construction			
.1	Material of enclosure		CR Sheet Steel	<p>APPROVED</p> <p><i>[Signature]</i></p> <p>CHIEF ENGINEER</p> <p>CONSTRUCTION</p> <p>APTRANSOCO</p>
.2	Thickness of sheet steel	mm	2.5 min	
.3	Painting for control cubicle		Epoxy / Polyester paint	
.4	External shade		631 AS IS:5	
.5	Internal shade		Glossy White	
.5	Degree of protection of enclosure		IP 55	
7.2	Wiring			
.1	Control wiring			4/30
.1	Size		2.5 sq. mm flexible copper conductor	
.2	Insulation		DC-Grey, AC-Black 1100V Grade	
.2	Earth Wiring			
.1	Size		2.5 sq. mm flexible copper conductor	
.2	Insulation		Yellow/Green 1100V Grade	
7.3	Control Terminals			
.1	Type		Stud Type	
.2	Make		Connectwell / Jainson/ Elmex	
.3	Size	mm ²	4	
.4	Spare unwired terminal	nos.	05	

CUSTOMER: APTRANSOCO				Sales Ref:	Qty.: Nos.
			Date: 30.06.2020	Description :-145kV Circuit Breaker	Sh. 2 3 Sh.
			Prep : SN		
			Ckd : SB		
			Siemens Ltd.		
Issue	Remarks	Date	Name	Office	Work :- 2AP1FG
Original/Replacement for/					Details :- DESIGN INSTRUCTIONS
Replaced by :-					(4) G71AHS-KA401-D2433-

SIEMENS

7.4

Auxiliary Supply

Drawing approval subject to valid vendor registration

Circuit	Rated Voltage	Source	Range
Spring Charging Motor(Approx 500 Watt)	240V AC	External	85 – 110%
Closing Coil(Max 330 Watt)	220V DC	External	85 – 110%
Trip Coil – 1 & 2(Max330 Watt)	220V DC	External	70 – 110%
Space Heater / Socket / Illumination	240V AC	External	-

APPROVED

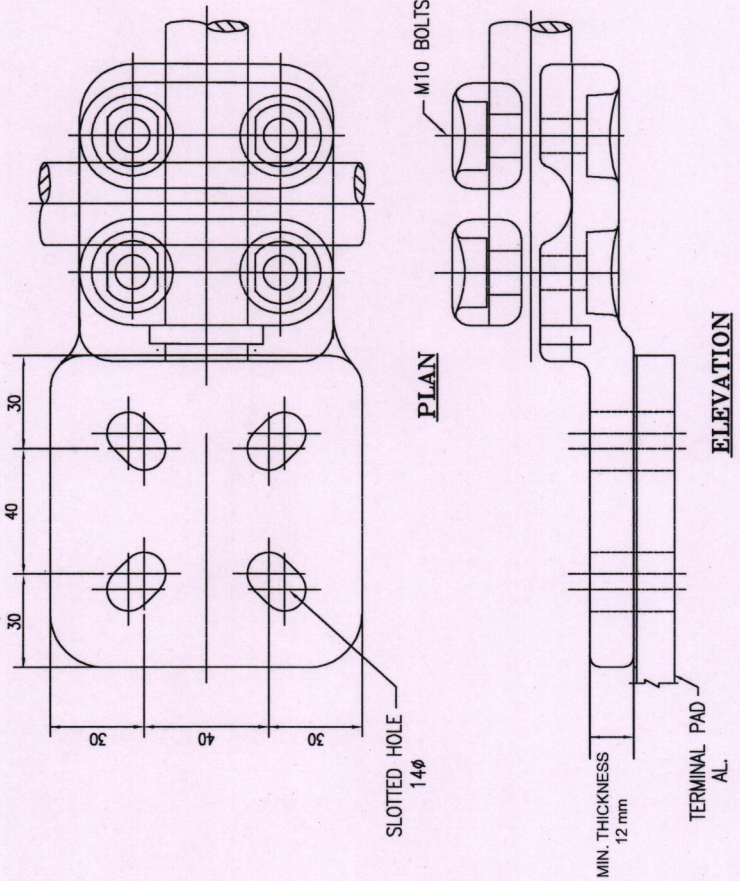
[Signature]
 CHIEF ENGINEER
 CONSTRUCTION
 APTRANSCO

5/20

CUSTOMER: APTRANSCO				Sales Ref:		Qty.: Nos.	
			Date: 30.06.2020	Description :-145kV Circuit Breaker		Sh. 3 3 Sh.	
			Prep : SN				
			Ckd : SB				
			Siemens Ltd.	Work :- 2AP1FG		Details :- DESIGN INSTRUCTIONS	
Issue	Remarks	Date	Name				
Original/Replacement for/				(4) G71AHS-KA401-D2433-			
Replaced by :-							

DWG_ADD G1 G2 G3 G4 G5 G6 G7 G8

TERMINAL CONNECTOR TYPE: BIMETALLIC TYPE SUITABLE FOR SINGLE ACSR DRAKE CONDUCTOR



APPROVED
[Signature]
CHIEF ENGINEER
CONSTRUCTION
APTRANSCO
 2/30

MATERIAL		BOLT TIGHTENING TORQUE	
CONNECTOR	AL ALLOY GRADE- 4600 (A6) IS-617 T0 LM6 B.S-1490	M10 : 30Nm	M16 : 75
FASTENER	MS HDG. GRADE - 5.6	M12 : 55Nm	M16 : 75
BI-METAL FLEXIBLE	AL. CU. AAC / 2S ALLOY	SIZE OF BOLTS	
RECOMMENDED TORQUE (Nm)		M10	M12
		30	55

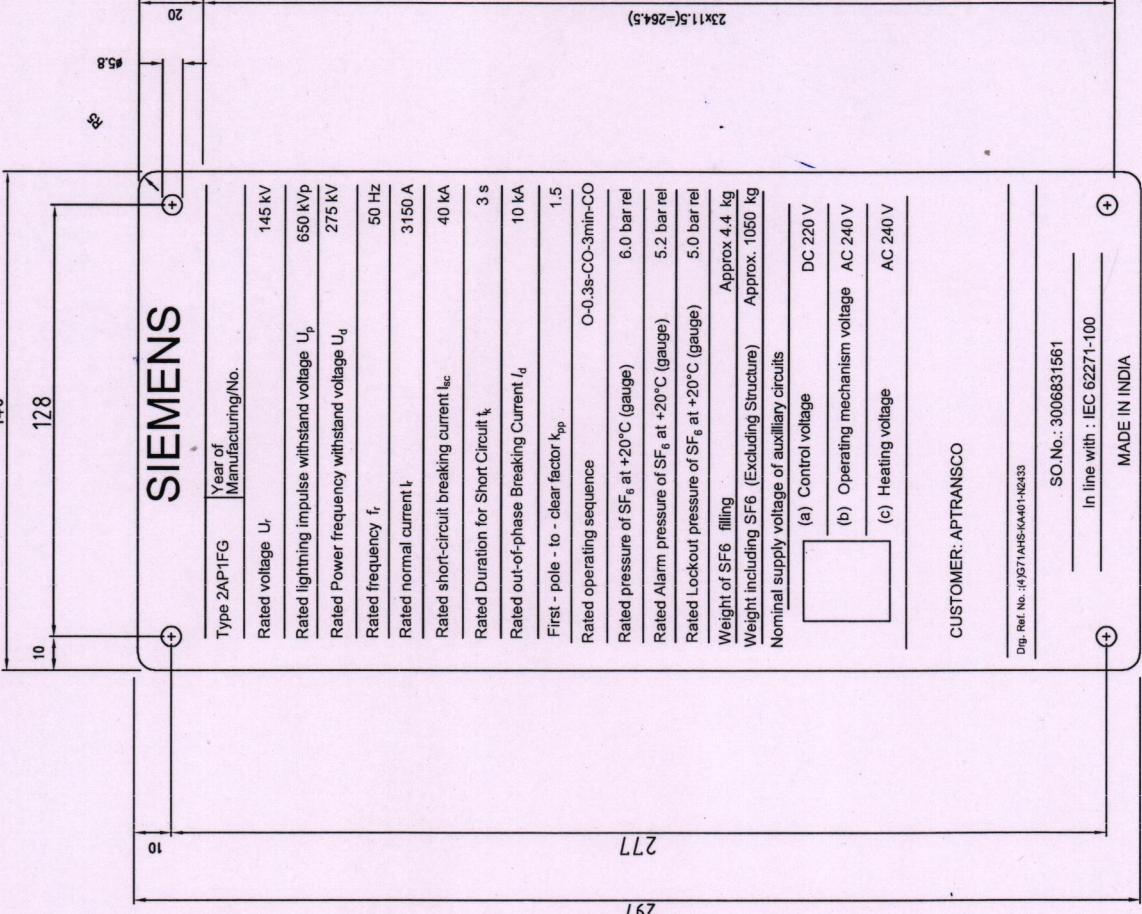
Table 1

31	MOOSE	31.77	
30	ELK	31.50	
29	DEER	29.89	
28	ZEBRA	28.62	
27	DRAKE	28.14	
26	SHEEP	27.93	
25	KUNDHA	27.00	
24	GOAT	25.97	
23	BEAR	23.45	
22	LION	22.26	
21	PANTHER	21.00	
20	LARK	20.44	
19	LYNX	19.53	
18	WOLF	18.13	
17	TIGER	16.52	
16	COYOTE	15.89	
15	LEOPARD	15.84	
14	GUINEA	14.60	
13	DOG	14.15	
12	CAT	13.50	
11	OTTER	12.66	
10	RACCOON	12.27	
09	BEAVER	11.97	
08	MINK	10.98	
07	RABBIT	10.05	
06	FERROT	09.00	
05	FOX	08.37	
04	SPARROW	08.01	
03	WEASEL	07.77	
02	GOPHER	07.08	
01	SQUIRREL	06.33	
REF	CONDUCTOR	ØD	SIZE
NOM-A	NAME		

Issue	Remarks	Date	Name	Original/Replacement for/Replaced by :-
Prep	SN	Date	30.06.2024	CUSTOMER: APTRANSCO
Ckd.	SB			
Siemens Ltd. AURANGABAD Descr : 145KV Circuit Breaker Type : 2AP1FG Details : TERMINAL CONNECTOR				
Sales Ref :		QTY: No.		ALL DIMENSION ARE IN mm NOT TO SCALE
Drig. No. : (3)G71AHS-K4401-Z2433-		Sh. 3		Sh. 3

The reproduction, transmission or use of this document or its contents is not permitted without express written authority from the originator. All rights, including rights created by patent grant or registration of a utility model or design, are reserved.

The reproduction, transmission or use of this document or its contents is not permitted without express written authority of the utility model or design, are reserved. Its contents will be liable for damages. All rights including rights created by patent grant or registration of a utility model or design, are reserved.



SIEMENS

Type 2AP1FG	Year of Manufacturing/No.
Rated voltage U _i	145 kV
Rated lightning impulse withstand voltage U _p	650 kVp
Rated Power frequency withstand voltage U _d	275 kV
Rated frequency f _r	50 Hz
Rated normal current I _n	3150 A
Rated short-circuit breaking current I _{sc}	40 kA
Rated Duration for Short Circuit t _k	3 s
Rated out-of-phase Breaking Current I _d	10 kA
First - pole - to - clear factor k _{pp}	1.5
Rated operating sequence	O-0.3s-CO-3min-CO
Rated pressure of SF ₆ at +20°C (gauge)	6.0 bar rel
Rated Alarm pressure of SF ₆ at +20°C (gauge)	5.2 bar rel
Rated Lockout pressure of SF ₆ at +20°C (gauge)	5.0 bar rel
Weight of SF ₆ filling	Approx 4.4 kg
Weight including SF ₆ (Excluding Structure)	Approx. 1050 kg
Nominal supply voltage of auxiliary circuits	
(a) Control voltage	DC 220 V
(b) Operating mechanism voltage	AC 240 V
(c) Heating voltage	AC 240 V

CUSTOMER: APTRANSCO

SO.No.: 3006831561
 In line with : IEC 62271-100
 MADE IN INDIA

APPROVED
[Signature]
CHIEF ENGINEER
CONSTRUCTION
APTRANSCO
 9/90

NOTE :- NAME PLATE MADE UP OF ALUMINIUM COMPOSITE LETTERS ARE ENGRAVED IN WHITE.

1	ISSUE	Remarks	Date	Name	2	Original/Replacement/Or/Replaced by :-	3	4	5	6	7	8
	Prep	SN	30.06.2020	CLIENT APTRANSCO								
1	Sh.	1	Sh.	1	2	3	4	5	6	7	8	9
	Qty: No.	Sales Ref:		Descr : 145kV Circuit Breaker Type : 2AP1FG Details : Name Plate								

ALL DIMENSION ARE IN mm
 NOT TO SCALE

QTY: No.

Sales Ref:

Descr : 145kV Circuit Breaker
 Type : 2AP1FG
 Details : Name Plate

Siemens Ltd.
 AURANGABAD

Original/Replacement/Or/Replaced by :-

CLIENT APTRANSCO

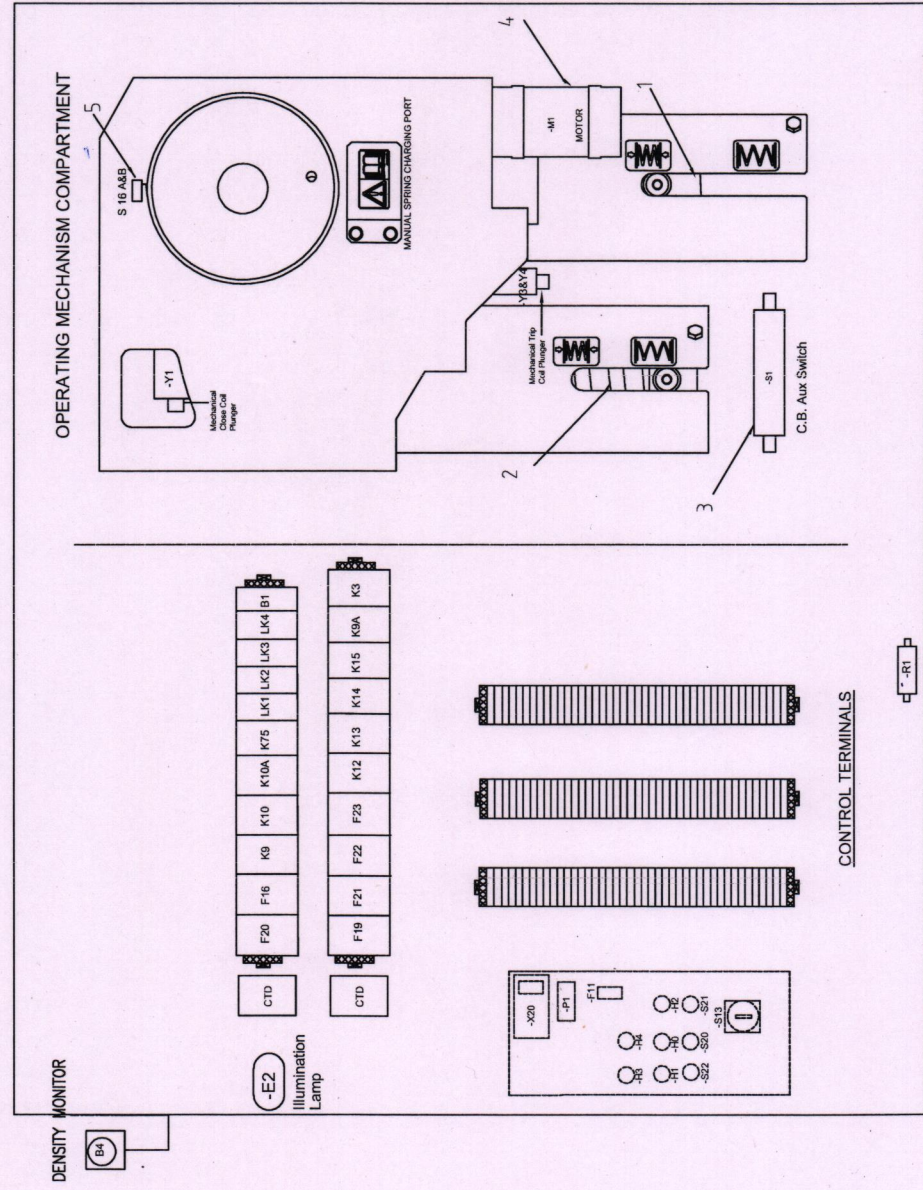
30.06.2020

1 Sh. 1

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Offenders will be liable for damages. All rights, including rights created by patent grant or registration, are reserved.

CONTROL UNIT

PAGES 2,3&4 OF 4 WITH LAMINATED SHALL BE KEPT INSIDE THE MAR.BOX.

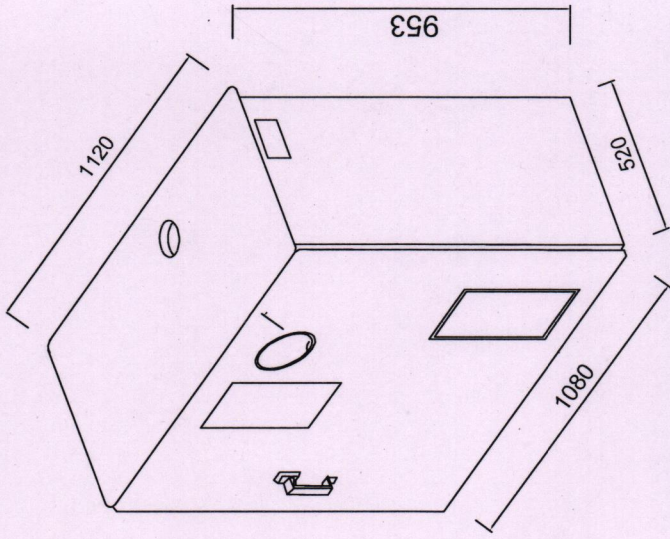


EQUIPMENT LAYOUT-FRONT

Details of operating mechanism box

1.	Closing Spring
2.	Opening Spring
3.	Circuit breaker auxiliary switch
4.	Spring Charging Motor
5.	Limit Switch for motor

APPROVED
[Signature]
CHIEF ENGINEER
CONSTRUCTION
 16/30 APTRANSCO



CONTROL TERMINALS ARE STUD TYPE
 DEGREE OF PROTECTION - IP55

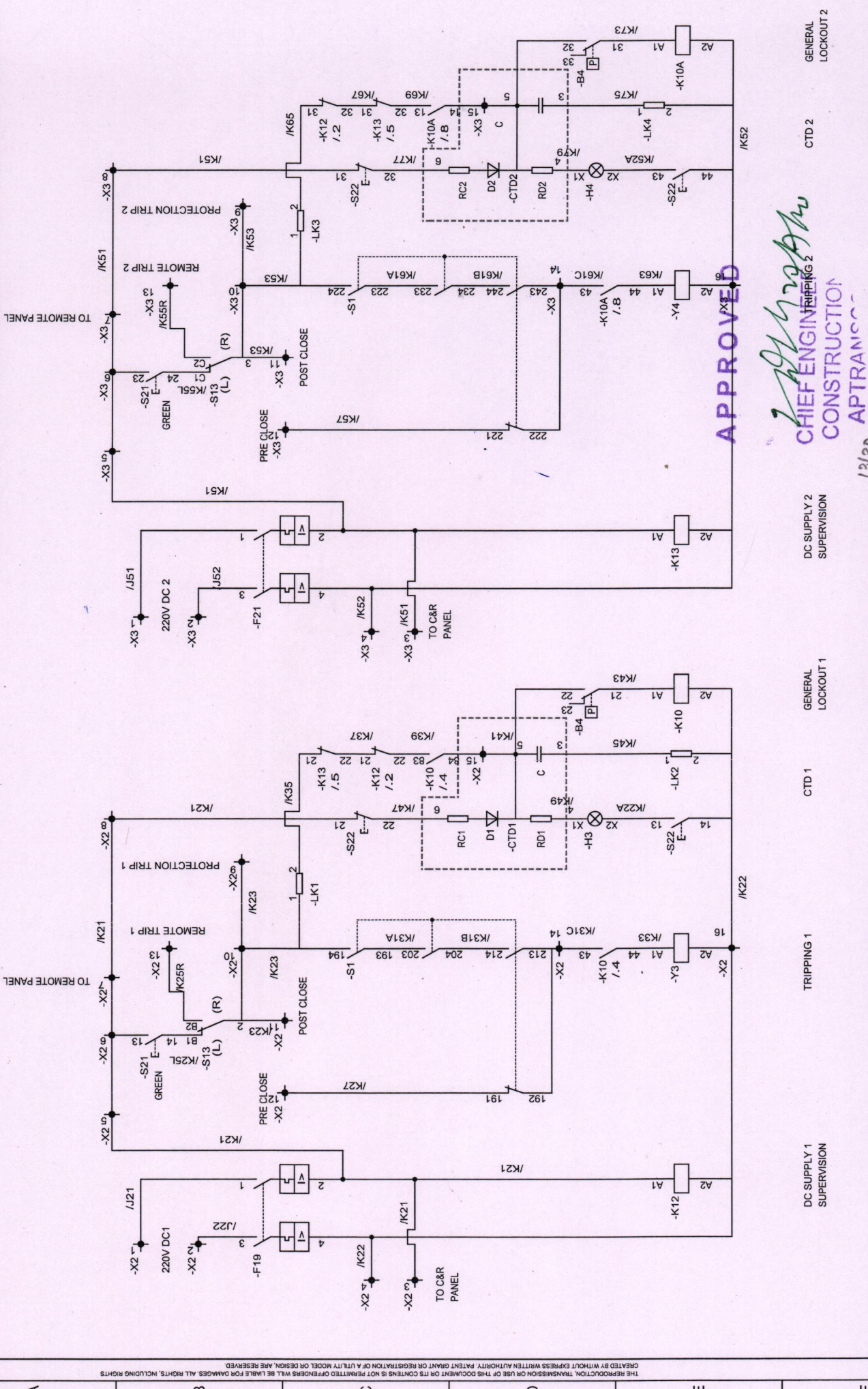
LEGEND :-

- S20, S21, S22 - PUSH BUTTON
- X20 - INDUSTRIAL TYPE PLUG SOCKET WITH SWITCH
- B1 - THERMOSTAT
- H0/H1/H2/H3/H4 - OFF (GREEN)/ON (RED)/SPRING (YELLOW)/CTD CHARGED (AMBER) INDICATING LAMP
- P1 - OPERATIONAL COUNTER
- S13 - LOCAL/REMOTE SWITCH
- F11 - ON/OFF SWITCH FOR ILLUMINATION
- B4 - DENSITY MONITOR
- E2 - ILLUMINATION LAMP
- CTD - CAPACITOR TRIP DEVICE
- R1 - SPACE HEATER

*NOTE: POSITION OF EQUIPMENTS MAY CHANGE DURING DETAILED ENGINEERING.

Ref. Dwg. no. : 584 - 02700	ALL DIMENSION ARE IN mm		NOT TO SCALE		Sh. 1	
Sales Ref. :	QTY. No.	Drg. No. : (4)G71AHS-KA401-L2433		Sh. 1		
Descr. : 145KV Circuit Breaker		Type : 2AP1FG		Details : Equipment Layout		
16/30 APTRANSCO		Siemens Ltd.		AURANGABAD		
Date	30.06.2020	CUSTOMER: APTRANSCO		Original/Replacement for/Replaced by :-		
Prep	SN					
Ckd.	SB					
Remarks						

PAGES 2,3&4 OF 4 WITH LAMINATED SHALL BE KEPT INSIDE THE MAR.BOX.



APPROVED

S. Vijaya Bhaskar
CHIEF ENGINEER
CONSTRUCTION
APTRANSCO

13/30

Issue	Remarks	Date	Name	2	3	4	5	6	7	8
		28.06.2020	SN							
		Prep.	SB							
		Chkd.								
ORIGINAL/REPLACEMENT FOR/REPLACED BY:										
SIEMENS LTD. Aurangabad										
CLIENT : APTRANSCO CONTRACTOR: M/S. Sri S Vijaya Bhaskar PROJECT: 220/132/33KV SS at Duwa PO No: SVB/01/RTSS TANUKU / 2020 Dated 15.06.2020										
Descp:145KV Circuit Breaker Type:2AP1FG										
Dwg. Name: Schematic Drawing										
SO NO : 3006831561										
Qty :- 2 Nos.										
=ZZA										
Drg No: (4)G71AHS-KA401-W2433										
Sh.										
Sh.										

THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED WITHOUT THE WRITTEN PERMISSION OF APTRANSCO. ALL RIGHTS, INCLUDING PATENT RIGHTS RESERVED.

1	2	3	4	5	6	7	8	
CABLE DESTINATION	TYPE, CORE NO., CROSS SECTION	DEST./ITEM NO.	LEVEL	CABLE CONNECTION TO TERMINATION				TYPE OF WIRING
				A	B	C	D	
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								

1	2	3	4	5	6	7	8
TERMINATION A/C DESTINATION/ITEM DESIGNATION	TERMINATION B/D DESTINATION/ITEM DESIGNATION	TERMINAL STRIP -X1		TYPE	TERMINATION B/D DESTINATION/ITEM DESIGNATION	TYPE OF WIRING	TERMINATION B/D DESTINATION/ITEM DESIGNATION
		LINK	NO.				
J11	-F22	1		CSB3	-S20	13	
J12	-F22	3		CSB3	-X1	7	A
K11	-F22	2		CSB3	-S16A	1	
K12	-F22	4		CSB3			
K13	-F22	2		CSB3			
K14	-X1	6	B	CSB3			
K15	-K15	A1		CSB3			
K16	-S13	1		CSB3	-X1	9	B
K17	-X1	9	B	CSB3	-X1	8	B
K18	-X1	11	B	CSB3	-X1	10	B
K19	-X1	11	B	CSB3	-X1	12	A
K20	-X1	11	B	CSB3	-K75	13	
K21	-K9A	14		CSB3	-K75	61	
K22	-K75	14		CSB3	-ST3	A2	
K23	-X1	A2		CSB3	-Y1	A1	
K24	-X1	17		CSB3	-K75	A1	
K25	-K75	A2		CSB3	-F22	4	
K26	-K75	A2		CSB3			
K27				CSB3			
K28				CSB3			
K29				CSB3			
K30				CSB3			
K31				CSB3			
K32				CSB3			
K33				CSB3			
K34				CSB3			
K35				CSB3			
K36				CSB3			
K37				CSB3			
K38				CSB3			
K39				CSB3			
K40				CSB3			
K41				CSB3			
K42				CSB3			
K43				CSB3			
K44				CSB3			
K45				CSB3			
K46				CSB3			
K47				CSB3			
K48				CSB3			
K49				CSB3			
K50				CSB3			
K51				CSB3			
K52				CSB3			
K53				CSB3			
K54				CSB3			
K55				CSB3			
K56				CSB3			
K57				CSB3			
K58				CSB3			
K59				CSB3			
K60				CSB3			
K61				CSB3			
K62				CSB3			
K63				CSB3			
K64				CSB3			
K65				CSB3			
K66				CSB3			
K67				CSB3			
K68				CSB3			
K69				CSB3			
K70				CSB3			
K71				CSB3			
K72				CSB3			
K73				CSB3			
K74				CSB3			
K75				CSB3			
K76				CSB3			
K77				CSB3			
K78				CSB3			
K79				CSB3			
K80				CSB3			
K81				CSB3			
K82				CSB3			
K83				CSB3			
K84				CSB3			
K85				CSB3			
K86				CSB3			
K87				CSB3			
K88				CSB3			
K89				CSB3			
K90				CSB3			
K91				CSB3			
K92				CSB3			
K93				CSB3			
K94				CSB3			
K95				CSB3			
K96				CSB3			
K97				CSB3			
K98				CSB3			
K99				CSB3			
K100				CSB3			

APPROVE
 28/06/2020
 CHIEF ENGINEER
 CONSTRUCT
 APTRANSO

SCREEN BUS
 N-BUS
 PE-BUS
 USED COPIES TOTAL
 CONTINUED ON SHEET

FIXED LINK
 INSERTABLE JUMPER
 SHORT CIRCUIT LINK

INSULATING WASHER
 SECTION INSULATING WASHER
 COVER

SO NO : 3006831561
 Qty :- 2 Nos.
 =ZZA
 ++

SIEMENS LTD.
 Aurangabad

CLIENT : APTRANSO
 CONTRACTOR: M/S. Sri S Vijaya Bhaskar
 PROJECT: 220/132/33KV SS at Duwa
 PO No: SVB / 01 / RTSS TANUKU / 2020 Dated 15.06.2020





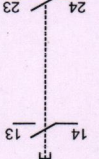
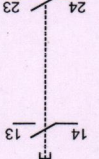

ORIGINAL/REPLACEMENT FOR/REPLACED BY:

Date: 28.06.2020
 Prep. SN
 Ckd. SB

Remarks
 Date
 Name

Dwg No: (4)G71AHS-KA401-W2433
 Sh. 1
 7
 8

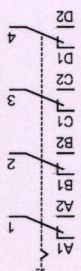
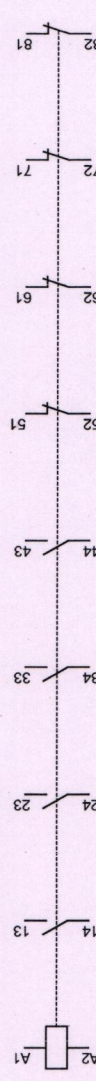


THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED OFFENDERS WILL BE LIABLE FOR DAMAGES. ALL RIGHTS, INCLUDING RIGHTS CREATED BY WITHOUT EXPRESS WRITTEN AUTHORITY, PATENT GRANT OR REGISTRATION OF A UTILITY MODEL OR DESIGN, ARE RESERVED.

1	2	3	4	5	6	7	8
DESIGNATION / TECHNICAL DATA	QTY.	ITEM DESIGNATION	FUNCTIONS	TOTAL ITEM REPRESENTATION AND OTHER TECHNICAL DATA			
COIL 220VDC 330W Inpress/Subhmi/Eq.	3.00		CLOSE COIL	=ZZA++Y1			
				=WD&EFS/2.2			
				=ZZA++Y3			
=ZZA++Y4	TRIP COIL - 1						
INDICATING LAMP 220 VDC AMBER Siemens/ Teknik/ Laptron/ Eq.	2.00		CTD HEALTHY INDICATION	=ZZA++H3			
				=WD&EFS/4.4			
				=ZZA++H4			
INDICATING LAMP 220 VDC GREEN Siemens/ Teknik/ Laptron/ Eq.	1.00		CTD HEALTHY INDICATION	=ZZA++H0			
				=WD&EFS/2.7			
INDICATING LAMP 220 VDC RED Siemens/ Teknik/ Laptron/ Eq.	1.00		BREAKER ON INDICATION	=ZZA++H1			
				=WD&EFS/2.7			
ON/OFF SWITCH 5A, 240VAC Anchor/Kany/Customis/Eq	1.00		ON/OFF SWITCH	=ZZA++F11			
				=WD&EFS/4.3			
PUSH BUTTON GREEN 2NO Siemens/Teknic/Laptron/Eq.	1.00		CLOSING	=ZZA++S20			
				=WD&EFS/2.3			
APPROVAL  CHIEF ENGINEER CONSTRUCTION APTRANS CC							
Date: 28.06.2020 Prep. SN Ckd. SB		CLIENT : APTRANS CO CONTRACTOR: M/S. Sri S Vijaya Bhaskar PROJECT: 220/132/33KV SS at Duwa PO No: SVB / 01 / RTSS TANUKU / 2020 Dated 15.06.2020		SIEMENS LTD. Aurangabad		SO NO : 3006831561 Qty :- 2 Nos.	
Remarks		ORIGINAL REPLACEMENT FOR/REPLACED BY:		Dwg. Name: Equipment List		Drg No: (4)G71AHS-KA401-E2433 Sh. 7 Sh. 1	

THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED OFFENDERS WILL BE LIABLE FOR DAMAGES. ALL RIGHTS, INCLUDING RIGHTS CREATED BY WITHOUT EXPRESS WRITTEN AUTHORITY, PATENT GRANT OR REGISTRATION OF A UTILITY MODEL OR DESIGN, ARE RESERVED.

1	2	3	4	5	6	7	8
DESIGNATION / TECHNICAL DATA	QTY.	ITEM DESIGNATION	FUNCTIONS	TOTAL ITEM REPRESENTATION AND OTHER TECHNICAL DATA			
PUSH BUTTON RED 4NO Siemens/Teknic/Laptron/Eq.	1.00						
PUSH BUTTON YELLOW 2NO+2NC Siemens/Teknic/Laptron/Eq.	1.00	=ZZA++S21	OPENING				
THERMOSTAT 0-60 deg C APT/Xexagon/Stego/ Alpha	1.00	=ZZA++S22	CTD HEALTHY CHECK				
10 A SIEMENS	4.00	=ZZA++B1	THERMOSTATE				
	1.00	=ZZA++LK1	FOR CTD CIRCUIT	=WD&EFS/3.3			
		=ZZA++LK2	FOR CTD CIRCUIT	=WD&EFS/3.4			
		=ZZA++LK3	FOR CTD CIRCUIT	=WD&EFS/3.7			
		=ZZA++LK4	FOR CTD CIRCUIT	=WD&EFS/3.8			
RESISTOR 100WATT 230VAC Velico/Girish EGO/Eq	1.00	=ZZA++R1	SPACE HEATER	=WD&EFS/4.3			
<p>APPROVED</p> <p><i>[Signature]</i> CHIEF ENGINEER CONSTRUCTION APTRANSCO</p> <p>23/30</p>							
Date: 28.06.2020 Prep: SN Ckd: SB		CLIENT: APTRANSCO CONTRACTOR: M/S. Sri S Vijaya Bhaskar PROJECT: 220/132/33KV SS at Duwva PO No: SVB / 01 / RTSS TANUKU / 2020 Dated 15.06.2020		SIEMENS LTD. Aurangabad		SO NO : 3006831561 Qty :- 2 Nos. Dwg. Name: Equipment List	
Issue	Remarks	Date	Name	Issue No: 7 Sh. 2 Dwg No: (4)G71AHS-KA401-E2433			

THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED WITHOUT THE WRITTEN PERMISSION OF APTRANSCO. ALL RIGHTS, INCLUDING RIGHTS CREATED BY WITHOUT EXPRESS WRITTEN AUTHORITY, PATENT GRANT OR REGISTRATION OF A UTILITY MODEL OR DESIGN, ARE RESERVED.

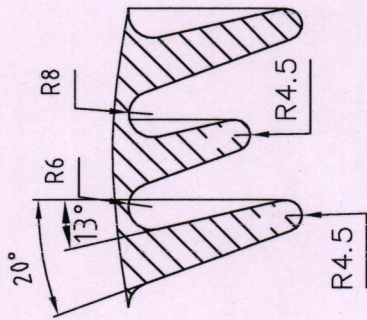
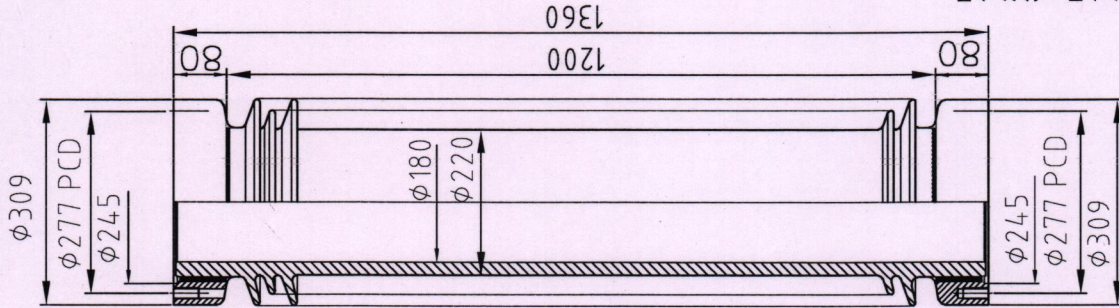
1	2	3	4	5	6	7	8
DESIGNATION / TECHNICAL DATA	QTY.	ITEM DESIGNATION	FUNCTIONS	TOTAL ITEM REPRESENTATION AND OTHER TECHNICAL DATA			
SWITCH (LOCAL REMOTE CONTROL) 4 POLE 2 WAY NON-LOCKABLE 16A 440VAC/DC Switron/Eq.	1.00						
AUXILIARY CONTACTOR 4NO & ADD ON 4NC 250V DC Siemens/ C&S / Eq.	1.00	=ZZA+++S13	LOCAL REMOTE SELECTOR SWITCH				
CAPACITOR TRIPPING DEVICE CTD 25W	2.00	=ZZA+++K9A	FOR SPRING CHARGED STATUS	 <p>CAPACITOR - 1X Rc : CHARGING RESISTOR - 1X Rd : DISCHARG RESISTOR - 1X DIODE - 1X</p>			
ILLUMINATION LAMP LED 240VAC 9W Bajaj/ Seska /Eq.	1.00	=ZZA+++E2	ILLUMINATION LAMP				
				<p style="text-align: center;">APPROVED</p> <p style="text-align: center;"><i>[Signature]</i> CHIEF ENGINEER CONSTRUCTION APTRANSOC</p> <p style="text-align: right;">26/30</p>			
Issue	Remarks	Date	Name	SO NO : 3006831561			
		28.06.2020		Descp: 145KV Circuit Breaker			
		Prep. SN		Type: 2AP1FG			
		Clkd. SB		Dwg. Name: Equipment List			
				Drg No: (4)G71AHS-KA401-E2433			
				Qty :- 2 Nos.			
				Sh. 7			
				Sh. 5			

THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED OFFENDERS WILL BE LIABLE FOR DAMAGES. ALL RIGHTS INCLUDING RIGHTS CREATED BY WITHOUT EXPRESS WRITTEN AUTHORITY. PATENT GRANT OR REGISTRATION OF A UTILITY MODEL OR DESIGN, ARE RESERVED.

A	B	C	D	E	F	7	8										
1	2	3	4	5	6	7	8										
DESIGNATION / TECHNICAL DATA	QTY.	ITEM DESIGNATION	FUNCTIONS	TOTAL ITEM REPRESENTATION AND OTHER TECHNICAL DATA	<table border="1"> <tr> <td colspan="2">SETTING AT +20°C AT FALLING PRESSURE</td> </tr> <tr> <td>CONTACT</td> <td>BAR</td> </tr> <tr> <td>11/12/13</td> <td>5,2</td> </tr> <tr> <td>21/22/23</td> <td>5,0</td> </tr> <tr> <td>31/32/33</td> <td>5,0</td> </tr> </table>			SETTING AT +20°C AT FALLING PRESSURE		CONTACT	BAR	11/12/13	5,2	21/22/23	5,0	31/32/33	5,0
SETTING AT +20°C AT FALLING PRESSURE																	
CONTACT	BAR																
11/12/13	5,2																
21/22/23	5,0																
31/32/33	5,0																
DENSITY MONITOR SF6; 6BAR, 3 POLE Trafag/EMD/Comdel/Eq.	1.00	=ZZA+++B4	SF6 MONITORING		<p>Drawing approval subject to valid vendor registration</p> <p>=WD&EFS/4.6 =WD&EFS/3.4 =WD&EFS/3.8</p>												
MOTOR UNIVERSAL 1PH 220V/DC/AC 500W AGNI/Eq.	1.00	=ZZA+++M	SPRING CHARGING		<p>APPROVED</p> <p><i>[Signature]</i> CHIEF ENGINEER CONSTRUCTION APTRANSCO</p> <p>29/30</p>												
Issue	Date	Name	Date	Name	SO NO : 3006831561	Qty :- 2 Nos.	Sh. 7										
Remarks	Prep. SN	Ckd. SB	Date	Name	Descp: 145KV Circuit Breaker Type: 2AP1FG	Dwg. Name: Equipment List	Sh. 7										
	Date	28.06.2020	28.06.2020	28.06.2020	SIEMENS LTD. Aurangabad	SIEMENS LTD. Aurangabad	8										
	Prep. SN	SB	SB	SB	CLIENT: APTRANSCO CONTRACTOR: M/S. Sri S Vijaya Bhaskar PROJECT: 220/132/33KV SS at Duwa PO No: SVB / 01 / RTSS TANUKU / 2020 Dated 15.06.2020	ORIGINAL/REPLACEMENT FOR/REPLACED BY:	8										

THE REPRODUCTION, TRANSMISSION OR USE OF THIS DOCUMENT OR ITS CONTENTS IS NOT PERMITTED OFFENDERS WILL BE LIABLE FOR DAMAGES. ALL RIGHTS, INCLUDING RIGHTS CREATED BY INTELLECTUAL PROPERTY, ARE RESERVED.

Chamber Insulator



MECHANICAL CHARACTERISTICS:
 1. Mechanical routine test: Pressure test 30 bar / 1 min
 2. Mechanical routine test: Bending test F = 5147 N / 10 sec / 4 x 90°
 3. Design pressure 10 bar

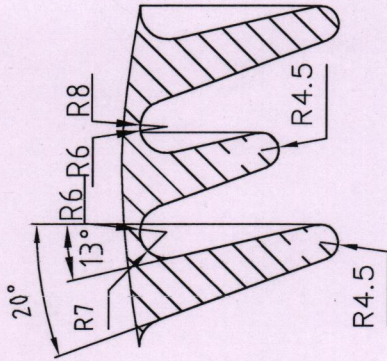
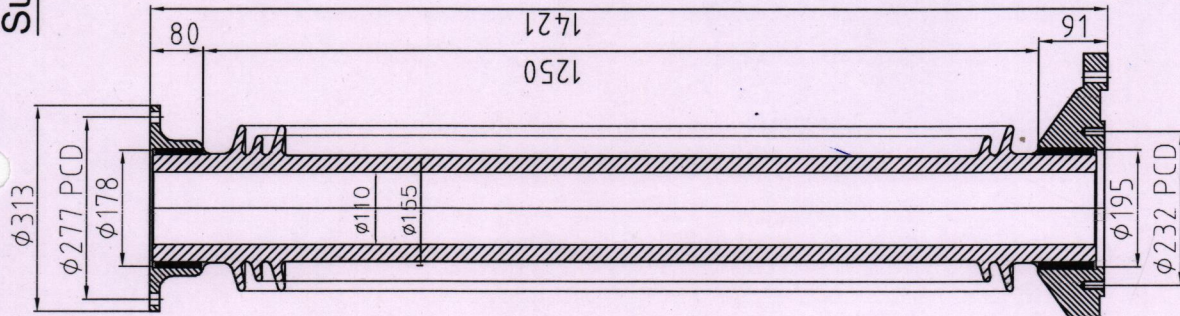
ELECTRICAL PARAMETERS FOR COMPLETE CB:
 1. 1 MIN. P.F. withstand voltage = 275 kV
 2. Lightning Impulse withstand voltage = 650 kV

Min. creepage distance : 3625 mm

All unspecified dimensional tolerances are as per IEC 60815

NOTES:
 Material :
 Color : Brown
 Mark : ABL/MODERNIEC.
 Qty Per pole : 1 No.
 Qty Per CB : 3 No.
 Shed Profile as per IEC 60815

Support Insulator



MECHANICAL CHARACTERISTICS:
 1. Mechanical routine test: Pressure test 30 bar / 1 min
 2. Mechanical routine test: Bending test F = 2338 N / 10 sec / 4 x 90°
 3. Design pressure 10 bar

ELECTRICAL PARAMETERS FOR COMPLETE CB:
 1. 1 MIN. P.F. withstand voltage = 275 kV
 2. Lightning Impulse withstand voltage = 650 kV

Min. creepage distance : 4495 mm

All unspecified dimensional tolerances are as per IEC 62155

APPROVED

29/30
CHIEF ENGINEER
CONSTRUCTIVE
APTRANSCO

The reproduction, transmission or use of this document or its contents is not permitted without express written authority from the originator. All rights reserved. A utility model or design, or a registered trademark or other right created by patent grant or registration of a utility model or design, are reserved.

Issue	Remarks	Date	Name	2	3	4	5	6	7	R
		30.05.2020								
		Prep	SN							
		Ckd.	SB							
CUSTOMER: APTRANSCO				Descr : 145kV Circuit Breaker		Sales Ref :		QTY: No.		ALL DIMENSION ARE IN mm
Original/Replacement (or) Replaced by :				Type : 2AP1FG		Details : Chamber & Support insulator		Drng. No. : (4)G71AHS-KA401-C2433		NOT TO SCALE
				AURANGABAD		Siemens Ltd.		Sh. 1		1 Sh.