Annexure A

MADHYA PRADESH POWER TRANSMISSION CO.LTD.
(A wholly owned Govt. of Madhya Pradesh Undertaking)
CIN: U40109MP2001SGC014880
Block No.3 Shakti Bhawan, Rampur, Jabalpur (M.P.)482008
Phone : (0761)270-2162, 2238, 2134 Fax:(0761)2665593 e-mail: mptransco@nic.in

No. 04-01/ADB-III/TR-501/Lot-1/TK / 771 Dated : 29 JAN 2015

To,

M/s. Bharat Heavy Electricals Ltd,
Tower-A, 5th Floor, Advant Navis
IT Business Park, Plot No. 7,
Express Highway, NOIDA, UP

Fax 0120-6748494

Sub: Construction of new 400kV sub-stations, transmission lines and Augmentation work/feeder bay work on total turnkey basis TR-501(Lot no. 1) against contract dtd. 28.02.2014.

Ref:- i. Your letter No. TBEM/MPPTCL/TR-501/83012/LOT-1/CB/220/SK dtd. 08.01.15.
ii. This office order No. 04-01/ADB-III/MPPTCL/TR-501/Lot-1/TK-II/06602-3 dtd.28.02.2014.

Dear Sirs,

This has reference to your letter dtd. 08.01.2015 vide which you have submitted M/s. Siemens make drawings/details of 220 kV Circuit Breaker for our approval against contract dtd 28.02.2014, as per following details:-

Sl No.	Drawing/details of 220 kV CB	Drg. No.	Observation
1	Record of Drawing	(4) G71AHS-FA403-R608	OK
2	Design details (Three Sheet)	(4) G71AHS-FA403-D608	OK
3	Mandatory Spare List	(4) G71AHS-FA403-S608	OK
4	Standard GA Drawing (Sheet 1 & 2)	(4) G71AHS-FA403-Z608	OK
5	Standard Support Structure (Sheet 2 & 2)	(4) G71AHS-FA403-Z608	OK
6	Name Plate	(4) G71AHS-FA403-N608	Guarantee period should be 24 months from the date of commissioning of S/s (As mark in drawing by Red ink)
7	Marshalling Box (Sheet 1 of 3)	(4) G71AHS-FA403-L608	OK
8	Control Panel Layout (Sheet 2 of 3)	(4) G71AHS-FA403-L608	OK
9	Inter cabling arrangement (Sheet 3 of 3)	(4) G71AHS-FA403-L608	OK
10	Bill of materials equipment list	(4) G71AHS-FA403-E608	OK
11	Wiring drawing & Terminal plan (total 7 sheets)	(4) G71AHS-FA403-W608	OK

Subject to incorporation of modification indicated with red ink, the drawing submitted by you are generally found in order and hereby approved. Copy of the approved drawing duly stamped is enclosed herewith for your further needful.

Thanking you.

Encl : As above

Yours sincerely,

Chief Engineer (Procurement)

Copy to:

1. The Chief Engineer (EHT-C) MPPTCL, Jabalpur.
2. The Chief Engineer (EHT-M&I) MPPTCL, Jabalpur, with one set of drawing.
3. The S.E. (EHT) Circle, MPPTCL, Bhopal/Jabalpur/Indore.
4. The Executive Engineer (EHT:C.)Dn. MPPTCL, Bhopal/Barwaha-II/Ujjain with one set of drawing.
5. The Executive Engineer (EHT:C.) Dn.-I MPPTCL, Jabalpur with one set of drawing.

Index	Amendment/Revision	Date	Name
A			
B			
C			
D			

Index	Amendment/Revision	Date	Name
E			
F			
G			
H			

Sr. No.	Drawing No.	No. of Sh	Brief details of drawings	Amendment to RECORD OF DRAWINGS A	B	C	D	E	F	G	H	I	J	Qty of Prints
1	(4) G71AHS-FA4003-D6008- - -	3	Design Details											
2	(4) G71AHS-FA4003-Z6008- - -	2	GA Drawing /Support Structre											
3	(4) G71AHS-FA4003-N6008- - -	1	Rating Plate											
4	(4) G71AHS-FA4003-L6008- - -	3	Equipment Layout (Front/Rear)											
5	(4) G71AHS-FA4003-E6008- - -	1	Equipment List											
6	(4) G71AHS-FA4003-W6008- - -	7	Wiring Diagram											
7	(4) G71AHS-FA4003-S6008- - -	1	Mandatory Spare List											
8	( ) - - - - - - - - - - - - - - -													
9	( ) - - - - - - - - - - - - - - -													

DISTRIBUTION OF PRINTS

Customer : Bharat Heavy Electricals Limited.

PO.No : 144P143 Dt : 11.11.2014.

Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

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; S = Single Line Diagram; W = Wiring Drawing / Power & Control Circuit; Z = Any Drawing not covered by other code.

Date	05.01.15	Siemens Ltd.	Descr: 245kV,50kA(3s),3150A,SF6,CB	SAP No.: 3004137812	=
Prep.	AR	Aurangabad	Type: 3AP1FI	Item No: 100 Qty: 10 x	+
Ckd.	JR		Details: RECORD OF DRAWING	Drg No.: (4) G71AHS-FA4003-R6008--	Sh 1 Name
Norm					1 Sh
		Original/Replacement for/Replaced by:-			

DESIGN DETAILS

1.0		**General**		
	1.1	Type Designation		Siemens Make 3AP1 FI
	1.2	Governing Standard		IEC 62271-100 / IS 13118 (1991)
2.0		**Technical Data**		
	2.1	System Parameters		
	.1	Rated Voltage	kV	245 kV
	.2	Frequency	Hz.	50
	.3	No. of Poles		Three
	.4	Ambient Temperature Range	^{0}C	-30 to +50
3.0		**Operating Data**		
	3.1	Type of Operating Mechanism		Spring Energy Stored
	3.2	Mechanism is electrically gang operated		Yes
	3.3	Operating Data		
	.1	Closing	mSec.	Less than 100msec.
	.2	Breaking	mSec.	≤ 60
	.3	Opening Time	mSec.	28 ± 3
	.4	Arcing Time	mSec.	≤20
	3.4	Switching Data		
	.1	Rated normal current	A	3150
	.2	Rated short circuit breaking current	kA	50
	.3	Rated short time current	kA	50 (3sec.)
	.4	Rated short circuit making current	kAp	100
	.5	First pole to clear factor		1.3
	.6	Out-of-phase breaking current	kA	10
	.7	Rated line charging breaking current	A	125
	.8	Rated cable charging breaking current	A	250
	3.5	Rated operating sequence		O – 0.3sec – CO – 3min – CO

Customer: Bharat Heavy Electricals Limited.
PO. No : 144P143 Dtd : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Issue	Remarks	Date	Name	Date: 05.01.15 Prep : AR Ckd : JR Siemens Ltd. Office
Original/Replacement for/ Replaced by :-				

Sales Ref.: 3004137812	Qty : 10 Nos.
Description:- 245kV, 50kA, 3150A,SF6 CB	Sh. 1
Work :- 3AP1FI	3 Sh.
Details :- DESIGN DETAILS	
(4)GA71AHS-FA403-D608-	

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O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
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4.0		**Basic Insulation Level**			
	4.1	Rated power frequency withstand voltage (1min, 50 Hz)			
		.1	Phase to earth	kV	460
		.2	Across the open breaker	kV	460
		.3	Between phases	kV	460
	4.2	Rated lighting impulse withstand voltage (1.2 / 50 micro sec.)			
		.1	To earth	kVp	1050
		.2	Across the open breaker	kVp	1050
		.3	Between phases	kVp	1050
	4.3	Creepage distance			
		.1	To earth	mm	25 mm/kV Minimum
		.2	Across the open breaker	mm	25mm/kV Minimum
		.3	Insulator type		Hollow porcelain
5.0		**Construction**			
	5.1	Clearance			
		.1	To earth	mm	1900
		.2	Across the open breaker	mm	1900
		.3	Phase to phase	mm	4500
	5.2	Arc quenching Medium			
		.1	Nominal pressure SF6 (@20^{0}C)	bar	6.0 rel.
		.2	Signal loss of SF6 (@20^{0}C)	bar	5.2 rel.
		.3	General lockout (@20^{0}C)	bar	5.0 rel.
		.4	Quantity of SF6 gas required per pole of breaker	kg	6.0
		.5	Breaker Poles (3nos.) will be pre filled with transport pressure of 0.5 Bar gauge.	kg	3.6
		.6	Gas being supplied per breaker	kg	18
	5.3	Installation			Outdoor
	5.4	Approx. weight of breaker.		kg	3000 approx.
6.0		**Structures**			
	6.1	Material			Mild Steel
	6.2	Surface Treatment			Hot Dip Galavanised

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O/o Executive Director (T&P)
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Customer: Bharat Heavy Electricals Limited.
PO. No : 144P143 Dtd : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

				Date: 05.01.15	Sales Ref.: 3004137812	Qty : 10 Nos.
				Prep : AR	Description:- 245kV, 50kA, 3150A,SF6 CB	Sh. 2
				Ckd : JR	Work :- 3AP1FI	3 Sh.
				Siemens Ltd.		
Issue	Remarks	Date	Name	Office	Details :- DESIGN DETAILS	
Original/Replacement for/ Replaced by :-					(4)GA71AHS-FA403-D608-	

S

7.0		**Base Frame**		
	7.1	Material		Mild Steel
	7.2	Surface Treatment		Hot Dip Galvanized
8.0		**Control Cubicle**		
	8.1	Construction		
	.1	Material of enclosure		CR Sheet Steel
	.2	Thickness of sheet steel	mm	3.0
	.3	Painting for control cubicle		Powder coated polyurethane
	.4	Internal / External shade		697 as per IS5
	.5	Degree of protection of enclosure		IP 55
	.6	Padlocking facility for cubicle		Provided
	.7	Glass window to see spring status		Provided on control cubicle
	8.2	Wiring		
	.1	Control wiring		
		.1 Size		2.5 sq. mm, flexible copper conductor
		.2 Insulation		Grey 1100V Grade
	.2	Earth Wiring		
		.1 Size		2.5 sq. mm, flexible copper conductor
		.2 Insulation		Yellow Green 600V Grade
	8.3	Control Terminals		
	.1	Type		Stud type
	.2	Make		Connectwell / Elmex
	.3	Size	mm^2	2.5
	.4	Spare unwired terminal	%	20 Nos.

8.4 Auxiliary Supply

Circuit	Rated Voltage	Source	Range
Spring Charging Motor	240V AC	External	85 – 110%
Closing Coil (300W)	220V DC	External	85 – 110%
Trip Coil – 1 & 2 (1300W)	220V DC	External	70 – 110%
Space Heater / Socket / Illumination	240V AC	External	--

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M.P. Power Transmission Co. Ltd.
JABALPUR

Customer: Bharat Heavy Electricals Limited.
PO. No : 144P143 Dtd : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Issue	Remarks	Date	Name	
				Date: 05.01.15
				Prep : AR
				Ckd : JR
				Siemens Ltd.
				Office

Original/Replacement for/
Replaced by :-

Sales Ref.: 3004137812	**Qty : 10 Nos.**
Description:- 245kV, 50kA, 3150A,SF6 CB	**Sh. 3**
Work :- 3AP1FI	**3 Sh.**
Details :- DESIGN DETAILS	
(4)GA71AHS-FA403-D608-	

S

List of Mandatory Spares:

1. Complete Pole without Mechanism – 2 Nos.
2. Trip Coil – 20 Nos
3. Closing Coil – 10 Nos
4. SF6 gas Density Monitor – 6 Nos
5. Spring Charging Motor – 3 Nos.
6. Spring Charging Motor – 3 Nos.
7. Limit Switch – 3 Nos.
8. 20% additional SF6 gas in separate Cylinder – Total 36 kgs for 10 breakers i.e. 2 Cylinders (18 kgs each.)

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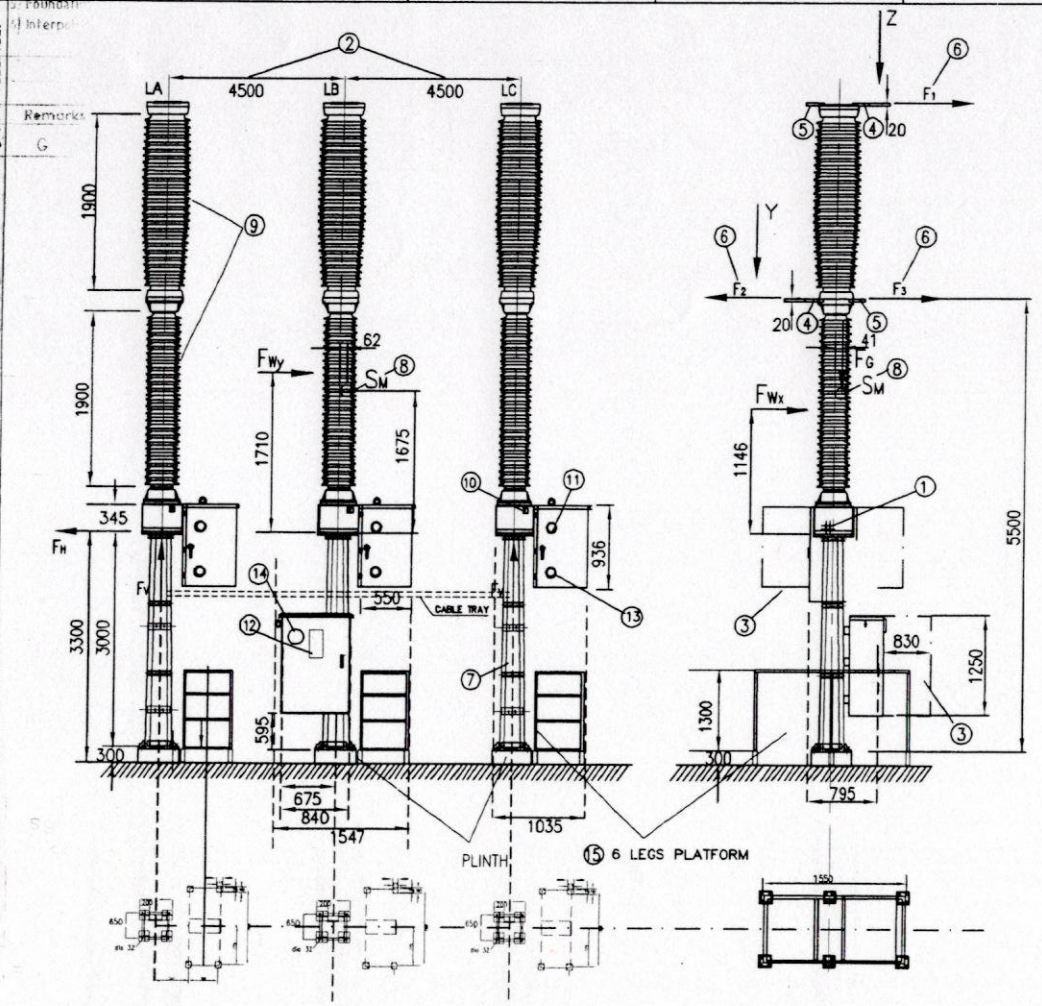
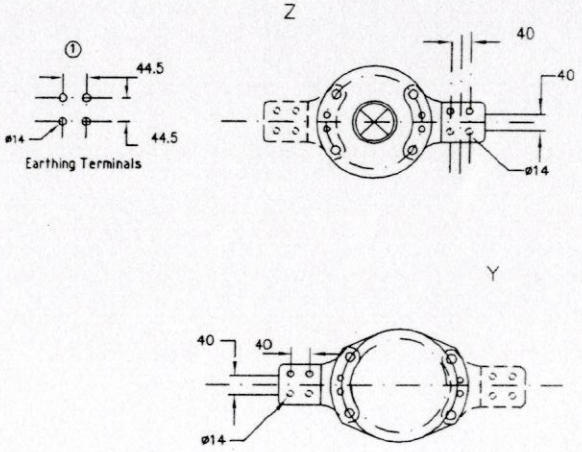
Customer: Bharat Heavy Electricals Limited.
PO. No : 144P143 Dtd: 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

					Sales Ref.: 3004137812	Qty : 10 Nos.
				Date: 05.01.15	Description:- 245kV, 50kA, 3150A,SF6 CB	Sh. 1
				Prep : AR		
				Ckd : JR	Work :- 3AP1FI	1 Sh.
				Siemens Ltd.		
Issue	Remarks	Date	Name	Office	Details :- Mandatory Spare List	
Original/Replacement for/ Replaced by :-					(4)GA71AHS-FA403-S608-	





COMPLETEWEIGHT OF THE CB WITHOUT STRUCTURE = 3000 KG APPROX.
WEIGHT OF INDIVIDUAL POLE WITH CONTROL PANEL = 920 KG APPROX.
TOTAL WEIGHT OF THE STRUCTURE = 750 KG APPROX.

WEIGHT OF THE INDIVIDUAL STRUCTURE = 300 KG APPROX.

1. HOLES FOR EARTHING TERMINALS
2. POLE TO POLE DISTANCE -4500MM
3. CLEARANCE REQUIRED FOR CHECKING AND DISMANTLING
4. ALUMINIUM ALLOY TERMINAL PLATES WITH HOLES,
5. TERMINAL PLATES TO THE OPPOSITE: MOUNTING AS REQUIRED (THICKNESS 26MM)
6. PERMISSIBLE TENSILE LOAD AT TERMINALS USING THE FOLLOWING FORMULEE, THE DATA MUST BE OBSERVED:

   $F_1 < F$; $F_2 < F_1 \times 1.94$; $F + F_H \times 0.53 < F$

   F1 - Terminal Load at TOP
   F2 - Terminal Load at - Bottom - Opposite F1
   F3 - Terminal Load at Bottom - Same Direction of F1
   F - GCB Limiting Load values for Static & Dynamic Condition
7. SUPPORT STRUCTURE
8. CENTRE OF GRAVITY
9. PORCELAIN INSULATOR 25mm/kV ABIL/MIL/IEC/PRATHAMESH MAKE
10. MECHANICAL "ON/OFF" INDICATION
11. PRESSURE GAUGE
12. RATING PLATE
13. VIEWING WINDOW FOR SPRING CHARGING STATUS.
14. WINDOW FOR VIEWING INDICATING LAMP
15. 6 LEGS PLATFORM

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O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

BILL OF MATERIAL

1) Poles - 3nos.
2) Spring operating mechanism with control panel - 3nos.
3) Marshelling Box fixed with Y pole - 1no.
4) Support Structure - 3nos.
5) Foundation Bolts - 12nos. (4nos./Pole)
6) Interpole cable - unarmoured, 2.5 sqmm

operating loads per pillar
vertical FV : +23 000 N (up) / -28 000 N (down)
Horizontal FH : + 6 500 N (in Y direction)

Loads per pole (LB)				
FG	F Wx	F Wy	F stat.	F stat+dyn
Weight loads	wind loads, at a wind speed of 55 m/s		tensile load at terminal	
9.2 kN	5.2 kN	3.87 kN	2.0 kN	4.0 kN

Issue	Remarks	Date	Name

Date 05.01.15
Prep. A R
Ckd. J M
Norm

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Original/Replacement for/Replaced by :-

Siemens Ltd.
AURANGABAD

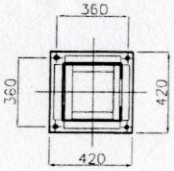
Descr : 245kV,50kA(3S),3150A,SF6 CB
Work : 3AP1FI
Details : STANDARD GA DRAWING

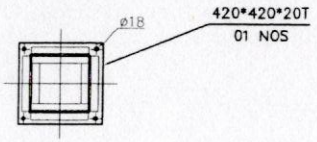
Sales Order.:3004137812
Line item: 100 Qty. : 10x

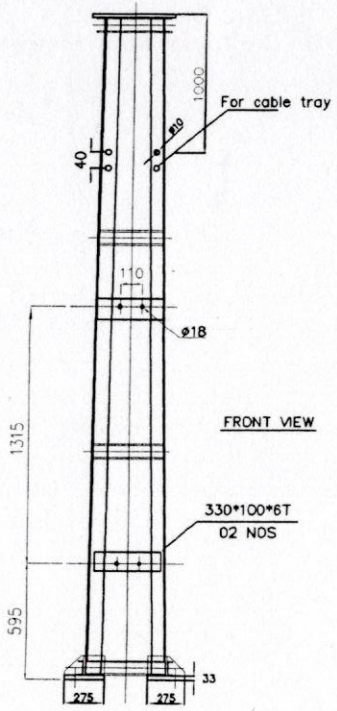
NOT TO SCALE
All dimensions are in MM

Drg. No:- (4) G71AHS-FA403-Z608-

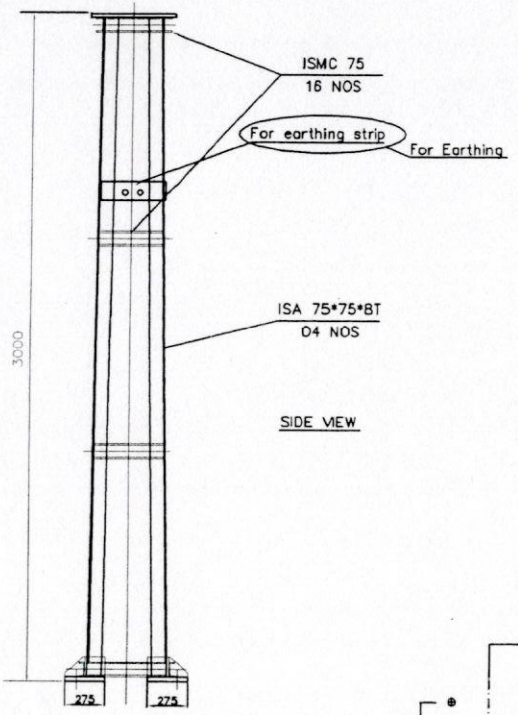
Sh. 1
2 Sh.



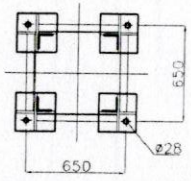


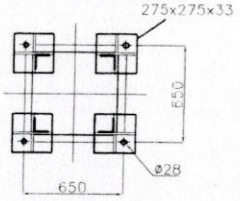


FRONT VIEW



SIDE VIEW





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O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
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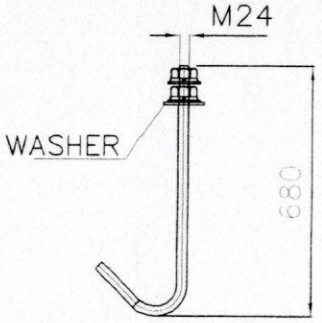
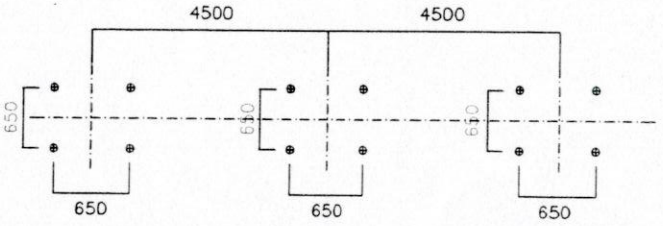


DETAILS OF FOUNDATION BOLT: 12nos/CB



FOUNDATION PLAN FOR 220KV CB

Issue	Remarks	Date	Name

Norm:
Date 05.01.15
Prep. GRB
Ckd. JR

Original/Replacement for/Replaced by :-

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

Descr : 245kV,50kA(3S),3150A,SF6 CB
Work : 3AP1FI
Details : STANDARD SUPPORT STRUCTURES

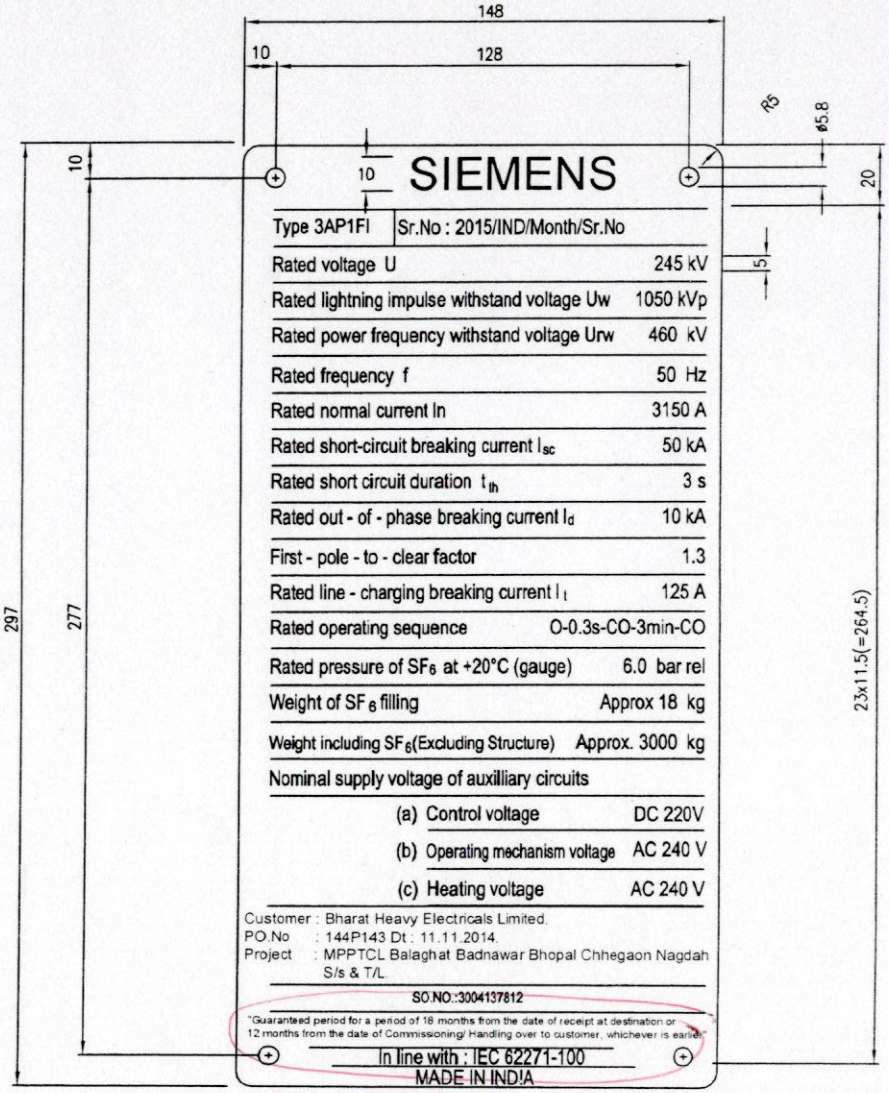
Sales Order:3804137812
Line Item: 100
Qty.: 10x

Drg. No:- (4) G71AHS-FA403-Z608-

NOT TO SCALE
All dimensions are in mm

Sh: 2
2 Sh

HQ/ESD-Coord/St 03-98



SIEMENS

Type 3AP1FI	Sr.No : 2015/IND/Month/Sr.No
Rated voltage U	245 kV
Rated lightning impulse withstand voltage Uw	1050 kVp
Rated power frequency withstand voltage Urw	460 kV
Rated frequency f	50 Hz
Rated normal current In	3150 A
Rated short-circuit breaking current I_{sc}	50 kA
Rated short circuit duration t_{th}	3 s
Rated out - of - phase breaking current I_d	10 kA
First - pole - to - clear factor	1.3
Rated line - charging breaking current I_l	125 A
Rated operating sequence	O-0.3s-CO-3min-CO
Rated pressure of SF_6 at +20°C (gauge)	6.0 bar rel
Weight of SF_6 filling	Approx 18 kg
Weight including SF_6(Excluding Structure)	Approx. 3000 kg
Nominal supply voltage of auxilliary circuits	
(a) Control voltage	DC 220V
(b) Operating mechanism voltage	AC 240 V
(c) Heating voltage	AC 240 V

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

SO.NO.:3004137812

"Guaranteed period for a period of 18 months from the date of receipt at destination or 12 months from the date of Commissioning/ Handing over to customer, whichever is earlier"

In line with : IEC 62271-100
MADE IN INDIA

Guarantee Period 24 months
months from Dt of commissioning

Pole A
Client - MPPTCL
Sr No -

Pole B
Client - MPPTCL
Sr No -

Pole C
Client - MPPTCL
Sr No -

Rating plate on respective operating mechanism

APPROVED
Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

NOTE :- NAME PLATE MADE UP OF ALUMINIUM ANODIZED

Issue	Remarks	Date	Name	Norm

Original/Replacement for/Replaced by :-

Date 05.01.14 | Prep AR | Ckd. JR

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

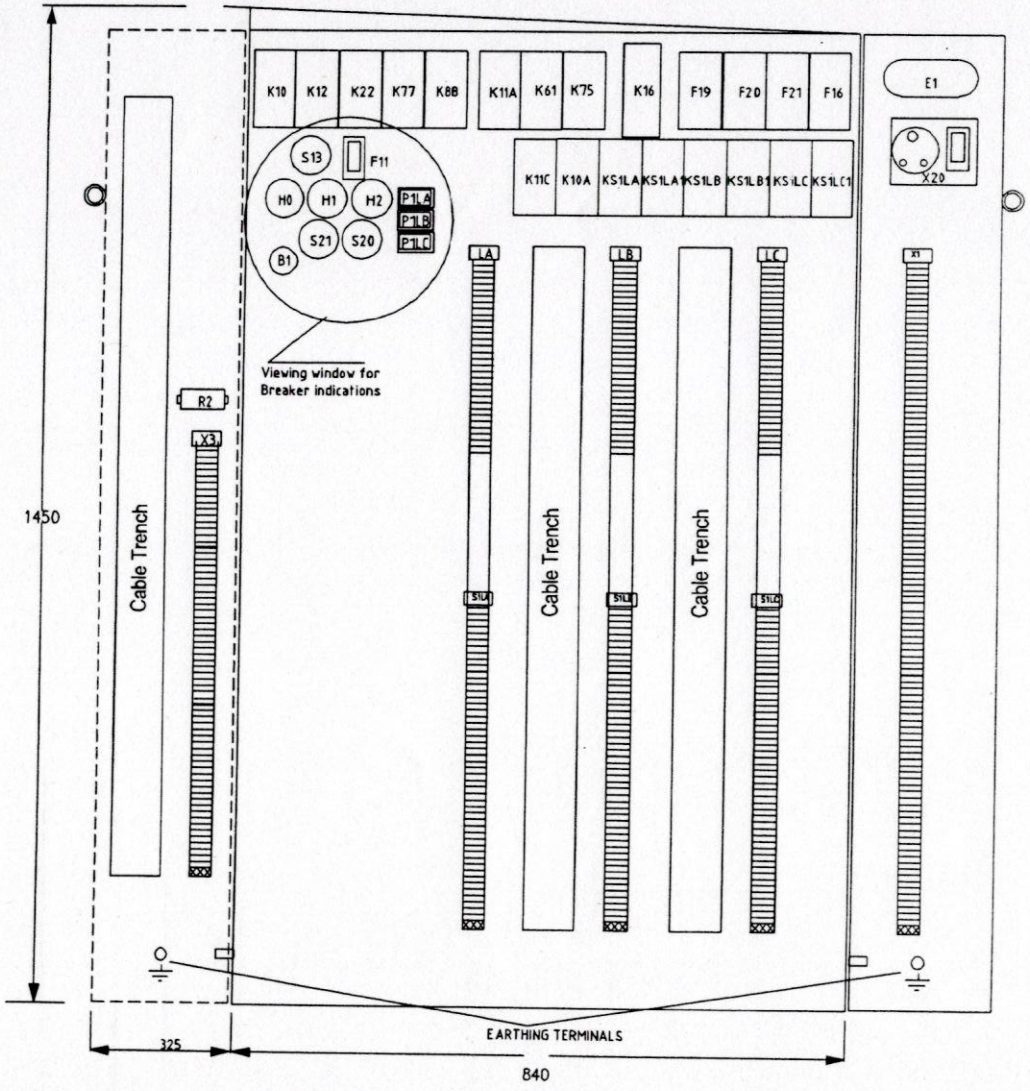
Descr : 245kV,50kA,3150A SF6 CB.
Work : 3AP1FI
Details : NAME PLATE

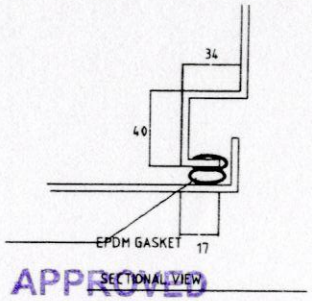
Sales Order.:3004137812
Line item: 100 Qty. : 10x

Drg. No:- (4)GA71AHS-FA403-N608- | Sh. 1 of 1 Sh.

Remark

CONTROL UNIT FRONT VIEW





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Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

R2: SPACE HEATER

B1: THERMOSTAT

K10,K10A: AUXILIARY CONTACTOR FOR GENERAL LOCKOUT

K75: AUXILIARY CONTACTORS FOR ANTI-PUMPING

K12: AUXILIARY CONTACTOR FOR DC CHANGEOVER

K11A/B/C: AUXILIARY CONTACTOR FOR TRIP SYNCHRONIZING EACH PHASE

K16: ON DELAY TIMER ENFORCED TRIPPLE POLE OPERATION

K77: AUXILIARY CONTACTOR FOR MANUAL TRIP

K61: AUXILIARY CONTACTOR FOR TRIP CIRCUIT

S21/S20: OPEN(GREEN)/CLOSE(RED) PUSH BUTTONS

F19, F21: MCB FOR DC SUPPLY

F20: 3P+N MCB AC SUPPLY

F16: MCB FOR SPRING CHARGING MOTOR

F11: ON/OFF SWITCH FOR ILLUMINATION

H0/H1/H2: OFF(GREEN)/ON(RED)/SPRING(BLUE) CHARGING INDICATING LAMP

S13: LOCAL/REMOTE SWITCH

X20: PLUG SOCKET WITH SWITCH

E1: PANEL LAMP

P1LA/P1LB/P1LC: OPERATIONAL COUNTERS (ELECTRICAL)

LA, LB, LC: TERMINALS FOR INERPOLE WIRING

KS1LA,KS1LA1,KS1LB,KS1LB1,KS1LC,KS1LC1:- Spare Contacts

Note:
Degree of protection - IP55 as per IS 13947

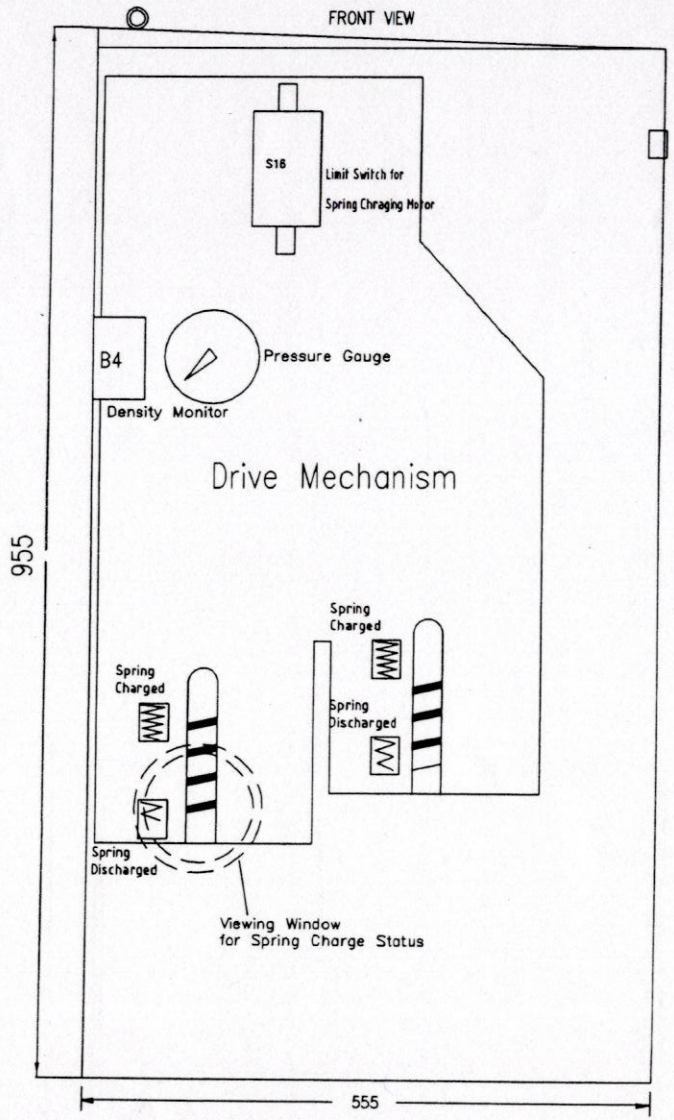
Color Shade Internal/External : 697 as per IS5

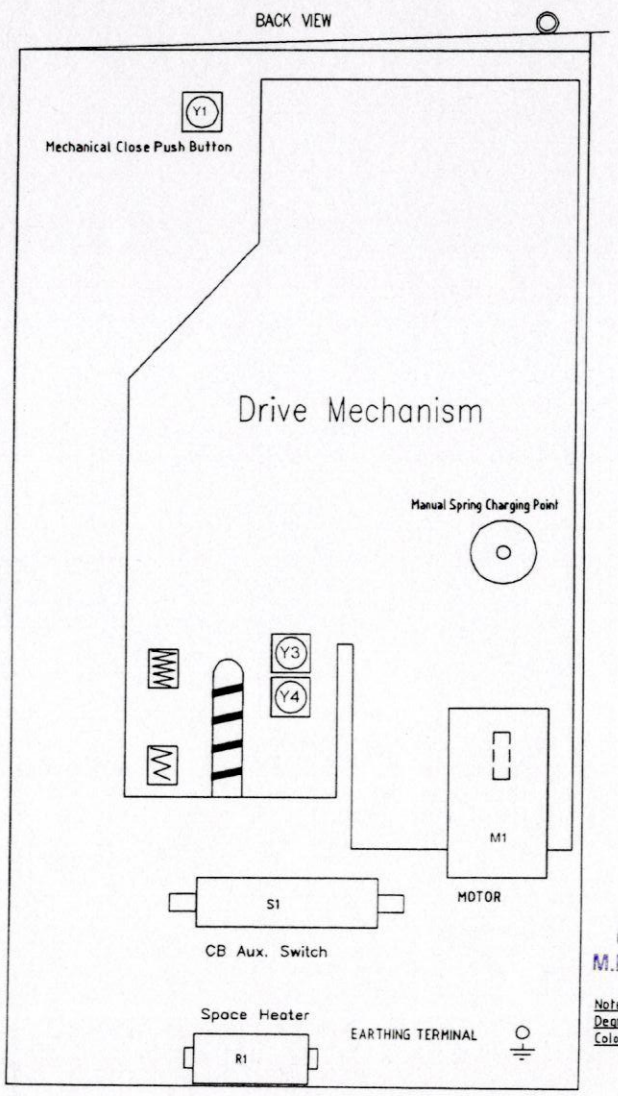
POSITIONING OF EQUIPMENTS MAY CHANGE DURING MANUFACTURING

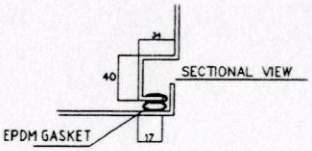
BASIC MODULE :-

				Date	05.01.15	Customer : Bharat Heavy Electricals Limited.	Siemens Ltd.	Descr : 245KV,50KA,3150A-SF6-CB	Sales Order.:3004137812	
				Prep	AR	P.O.No : 144P143 Dt : 11.11.2014.	AURANGABAD	Work : 3AP1FI	Line item: 100 Qty. : 10x	
				Ckd.	JR	Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.		Details : MARSHELLING_BOX	Drg. No:-(4) G71AHS-FA403-L608-	Sh. 1 3 Sh.
	Remarks	Date	Name	Norm.		Original/Replacement for/Replaced by :-				

OPERATING MECHANISM COMPARTMENT POLE LA, LB, LC







APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

Note:
Degree of protection - IP55 as per IS 13947
Color Shade Internal/External : 697 as per ISS

BASIC MODULE :-

Issue	Remarks	Date	Name
Norm			

Date 05.01.15
Prep AR
Ckd. JR

Original/Replacement for/Replaced by :-

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FI
Details : CONTROL_PANEL_LAYOUT

Sales Order.:3004137812
Line item: 100 Qty.: 10x

Drg. No:- (4) G71AHS-FA403-L608-

Sh. 2
3 Sh.

CONNETCTING CABLES: ARMOURED, 2.5 Sq.mm, 1100 V Grade, Copper Conductor

OPERATING MECHANISM COMPARTMENT POLE LA

OPERATING MECHANISM COMPARTMENT POLE LB

OPERATING MECHANISM COMPARTMENT POLE LC

Unarmoured cables

MARSHALLING BOX

LA LB LC

Unarmoured cables

Unarmoured cables

APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd,
JABALPUR

NOTE: INTERPOLE CONNECTION BETWEEN POLE PANEL TO MARSHELLING BOX TO BE DONE AT SITE

Note:
Degree of protection – IP55 as per IS 13947
Color Shade Internal/External : 697 as per IS5

BASIC MODULE : I

Issue	Remarks	Date	Name	Norm

Date 05.01.15
Prep AR
Ckd. JR

Original/Replacement for/Replaced by :-

Customer : Bharat Heavy Electricals Limited.
P.O.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FI
Details : INTERCABLING_ARRANGEMENT

Sales Order.:3004137812
Line item: 100 Qty. : 10x

Drg. No:- (4) G71AHS-FA403-L608-

Sh. 3
3 Sh.

S

S.No.	Description	Equipment Details	Quantity		Tag No.	Remarks
			Per CB	Total		
1.0	Space Heater	X'pose/Velico Make, 240V AC,100W	4x		R1LA,R1LB,R1LC R2	
2.0	Thermostat	X'pose/Velico Make, (0 - 75degC)	1x		B1	
3.0	Auxiliary Contactor	Siemens, Type 3TH 6NO+2NC,220 V DC	1x		K10,K10A	General Lockout SF6
4.0	Auxiliary Contactor	Siemens, Type 3TH 2NO+3NC, 220 VDC	1x		K75	Anti-Pumping
5.0	Auxiliary Contactor	Siemens, Type 3TH 2NO+2NC, 220 V DC	3x		K11A,B,C	Trip Synchronizing
6.0	Auxiliary Contactor	Siemens, Type 3TH 6NO+2NC, 220 VDC	2x		K77 K88	Manual Trip 1 Manual Trip 2
7.0	Auxiliary Contactor	Siemens, Type 3TH 6NO+2NC, 220 VDC	1x		K61	Trip Ckt
8.0	Auxiliary Contactor	Siemens, Type 3TH 2NO+2NC, 220 VDC	1x		K12	DC supply 1 monitor & changeover
9.0	Auxiliary Contactor	Siemens, Type 3TH 3NO+2NC, 220 VDC	1x		K22	DC supply 2 monitor
10.0	Push Button Assembly	Siemens / Teknic / ESBEE 2NO Aux Contacts	1x 1x		S20 S21	Red (ON) Green (OFF)
11.0	Indicating Lamp Assembly	Siemens / Teknic / Equivalent 220V DC	1x 1x 1x		H0 H1 H2	OFF Indication (Green) ON Indication (Red) Spring charged (Blue)
12.0	MCB	Siemens make / Equivalent 2Pole,220 V DC,16A	1x 1x		F19 F21	DC Supply - 1 DC Supply - 2
13.0	MCB	SIEMENS Make / Equivalent 415 V AC,3PN,10A	1x		F20	AC Supply
14.0	MCB	Anchor / KANNY/Equivalant Make 240 V AC,SPN,10A	1x		F 16	Spring Charging Motor
15.0	On/Off Switch	Anchor / KANNY/Equivalant Make 5A,240 V AC	1x		F11	Illumination
16.0	Local/Remote Selector Switch	Kaycee / Switron / Equivalent 2 Pole-2Way,Non Lockable	1x		S13	L/R Selector
17.0	Plug Socket with Switch	Anchor / KANNY/Equivalant Make 15A,240 V AC	1x		X 20	
18.0	Illumination Lamp	Philips/Orient Filament 14 W	1x		E1	Panel Lamp
19.0	Operational Counter	Gujaral/Equivalent Make, 220V DC	3x		P1LA, P1LB, P1LC	Electrical impulse
20.0	CB Aux. Switch	20 NO+19NC+4Wi	3x		S1LA, S1LB, S1LC	
20.1	Spare contractor	4NO+4NC, 220 VDC	3x		KS1LA, KS1LB, KS1LC	Spare
21.0	Limit Switch for spring charging	4NO+8NC	3x		S16LA, S16LB, S16LC	
22.0	Trip Coil	220V DC,max 1300W	3x 3x		Y3LA, Y3LB, Y3LC Y4LA, Y4LB, Y4LC	Trip Coil-1 Trip Coil-2
23.0	Closing Coil	220V DC,max 300W	3x		Y1LA, Y1LB, Y1LC	
24.0	Spring Charging Motor	240 V AC,Universal,500W max. KPT/Agni	3x		M1LA, M1LB, M1LC	
26.0	Density Monitor	COMDE/Trafag Setting @20 degC falling Pressure Contacts-11/12/13-5.2 bars Contacts-21/22/23 and 31/32/33 -5.0 bars	3x		B4LA, B4LB, B4LC	SF6 Monitoring
27.0	Timer	Siemens / Equivalent 220V DC, On dealy, 1 sec 1 No. Changeover Contact	1x		K16	Enforced Tripple Pole operation
28.0	Pressure Guage	WIKA/BRINDA	3x			
29.0	Cable glands	Siemens will provide cable glands for the interpole cable. Braco Make .				
30.0	Padlocks and duplicating keys	Three Nos Each CB				
31.0	Terminal Boards/ terminal block	Connectwell/ Elmex (As per approved control scheme)				
32.0	Spring charged discharged indicator	Mechanical – 3 Nos Electrical -1No				
33.0	Facility for manual charging of spring	Available for the offered CB				
34.0	The number of terminals provided shall be adequate enough to wire out all contacts and control circuits plus 20% spare terminals for	Confirmed				
35.0	Manual charging spring operating handle for maintenance	Confirmed				
36.0	Set of 6 nos. terminal connector clamps	Confirmed				
37.0	Name & Rating plate in accordance with IEC incorporating year of manufacture	Confirmed				
38.0	Portable/hand held SF6 gas leakage detector	Supply of 1 no. of SF6 gas leakage detector is in the scope of Siemens . CPS,Arth , USA Make				

Customer: Bharat Heavy Electricals Limited
PO No: 144P143 Dt: 11.11.2014
Project: MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L

Sales Ref: 300413/812
Item No: 100 Qty: 10x

		Date:	05.01.15	Description:	245 kV 50kA,3150A,SF6 CB
		Prep:	AR		
		chkd:	JR	Type Ref:	3AP1FI
			Siemens Ltd.		
Index	Remarks	Date	Name	Aurangabad	Details: Bill of Materials/ Equipment List
Original Replacement for Replaced by:					Drawing No: (4) G71AHS-FA403-E608-

Sh. 1

1 Sh

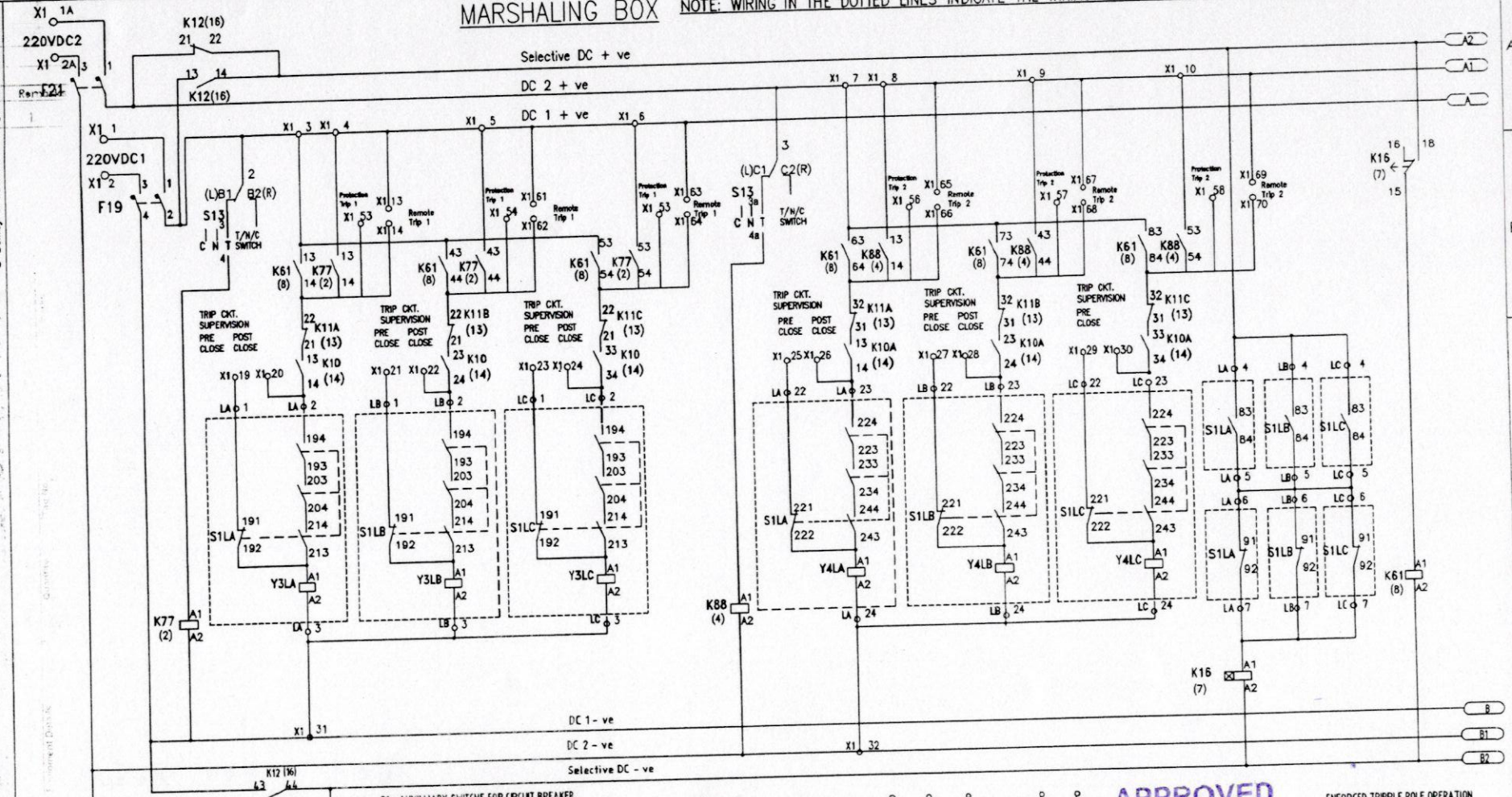
HVESD-DOORDSE 92-96

APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

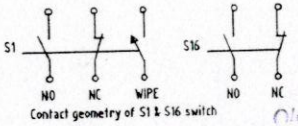
MARSHALING BOX

NOTE: WIRING IN THE DOTTED LINES INDICATE THE WIRING CIRCUIT INSIDE THE CONTROL CUBICLE (LA, LB, LC)



S1 - AUXILLIARY SWITCHE FOR CIRCUIT BREAKER
S16 - AUXILLIARY SWITCHE FOR SPRING CHARGING MOTOR
K75 - ANTI-PUMPING DEVICE
K11- AUXILIARY CONTACTOR FOR TRIP SYNCHRONIZING
K10,K10A - AUXILIARY CONTACTOR FOR GENERAL LOCKOUT
K61 AUXILIARY CONTACTOR FOR ENFORCED TRIPPLE POLE OPERATION
K77/K88 - AUXILIARY CONTACTORS FOR MANUAL TRIP
S3 - T/N/C SWITCH
F19/F21 - DC MCB FOR SUPPLY 1 & 2
S13 - LOCAL/REMOTE SWITCH
K16 - ON DELAY TIMER FOR ENFORCED TRIPPLE POLE OPERATION
B4 - DENSITY MONITOR

Y1 - CLOSING SOLENOID
Y3,Y4 - OPENING SOLENOID



Contact geometry of S1 & S16 switch

ENFORCED TRIPPLE POLE OPERATION

NOTES :-
1. ALL AUXILLIARY CONTACTS SHOWN WITH CIRCUIT DE-ENERGISED.
2. ALL CONTACTS OF PR. SWITCH SHOWN WITH THE SWITCH IN LOW PR. CONDITION.
3. CONTACTS OF LIMIT SWITCH OF SPRING CHARGING MOTOR SHOWN WITH SPRING DISCHARGED.

APPROVED
Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

BASIC MODULE :-

Issue	Remarks	Date	Name	Norm
		Date	05.01.15	
		Prep	AR	
		Ckd.	JR	

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Original/Replacement for/Replaced by :-

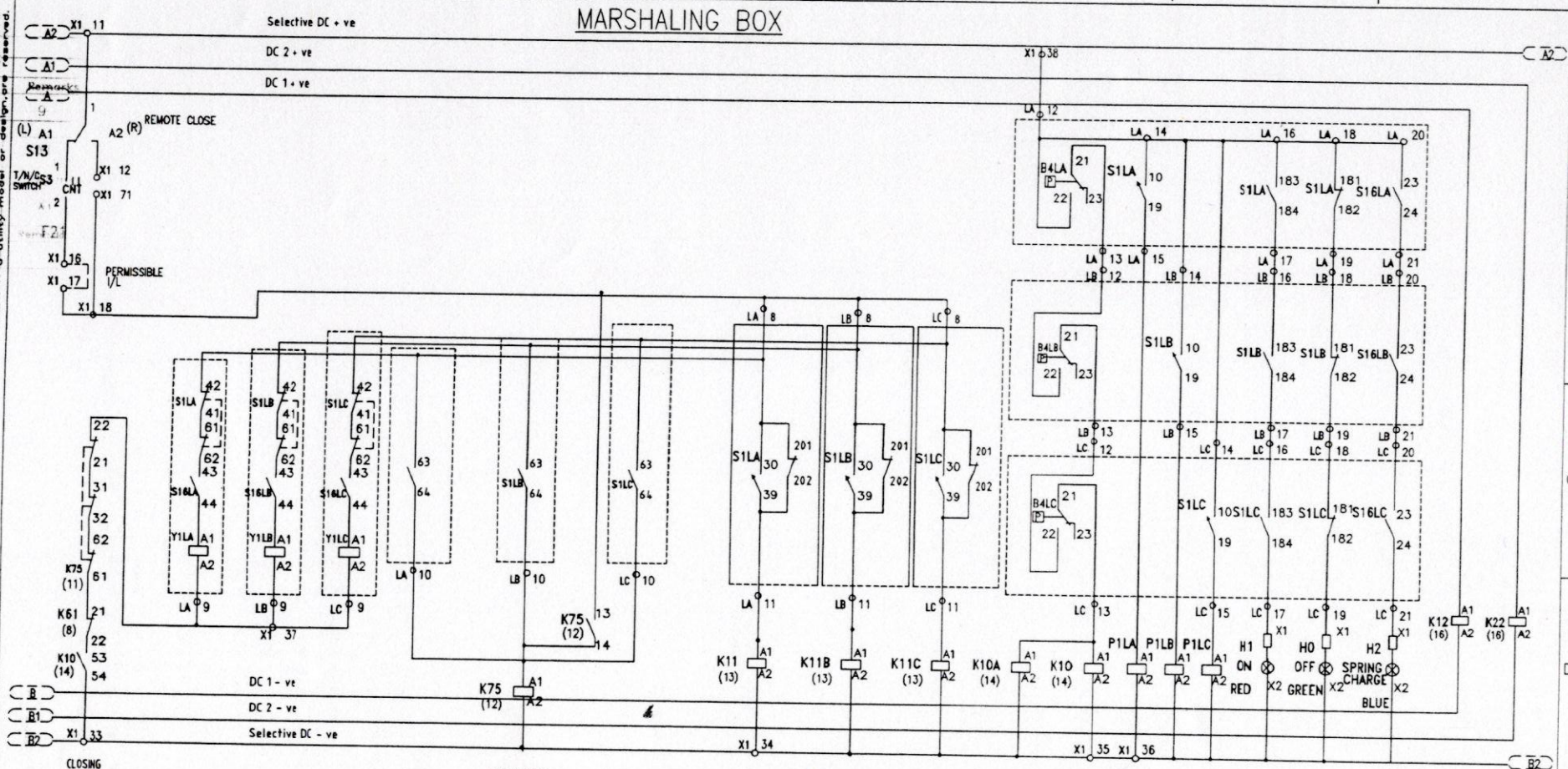
Siemens Ltd.
AURANGABAD

Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FG
Details : WIRING_DRAWING

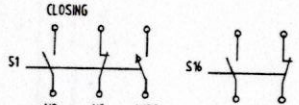
Sales Order:3004137812
Line item: 100
Qty. : 10x
W.O.
Drg. No:- (4)G71AHS-FA403-W608-

Sh. 1
7 Sh.

MARSHALING BOX

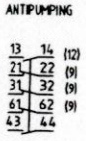


CLOSING

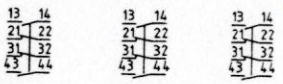


Contact geometry of S1 & S16 switch

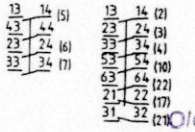
ANTIPUMPING



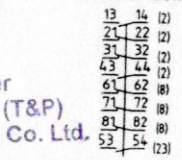
TRIP SYNCHRONISING EACH PHASE



LOCKOUT



DC SUPPLY 1& 2 MONITOR



P1 - IMPLUSE COUNTER
B4 - DENSITY MONITOR
S1 - AUXILLIARY SWITCHE FOR CIRCUIT BREAKER
S16 - AUXILLIARY SWITCHE FOR SPRING CHARGING MOTOR
K75 - ANTI-PUMPING DEVICE

Y1 - CLOSING SOLENOID
Y3,Y4 - OPENING SOLENOID

K12: AUXILIARY CONTACTOR FOR DEC CHANGEOVER

K77 - AUXILIARY CONTACTOR FOR MANUAL TRIP
H0/H1/H2: INDICATING LAMP ON/OFF/SPRING CHARGED
S3 - T/N/C SWITCH
F19 - DC MCB
S13 - LOCAL/REMOTE SWITCH
K16 - ON DELAY TIMER FOR ENFORCED TRIPPLE POLE OPERATION
B4 - DENSITY MONITOR

NOTE: WIRING IN THE DOTTED LINES INDICATE THE WIRING CIRCUIT INSIDE THE CONTROL CUBICLE (LA, LB, LC)

NOTES :-
1. ALL AUXILLIARY CONTACTS SHOWN WITH CIRCUIT DE-ENERGISED.
2. ALL CONTACTS OF PR. SWITCH SHOWN WITH THE SWITCH IN LOW PR. CONDITION.
3. CONTACTS OF LIMIT SWITCH OF SPRING CHARGING MOTOR SHOWN WITH SPRING DISCHARGED.

APPROVED
Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

BASIC MODULE : -

Issue	Remarks	Date	Name	Norm.
		Date	05.01.15	
		Prep	A R	
		Ckd.	J R	

Original/Replacement for/Replaced by :-

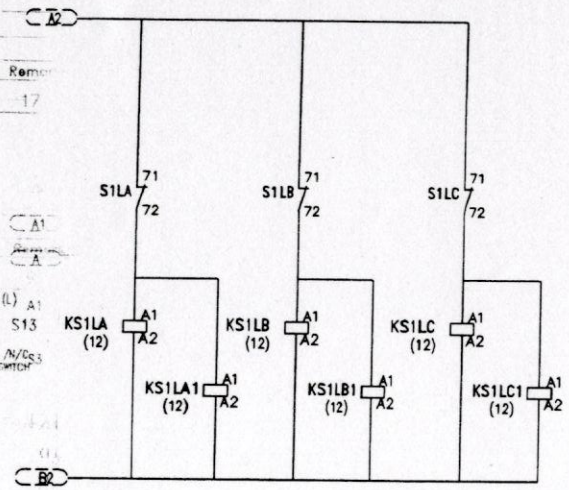
Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

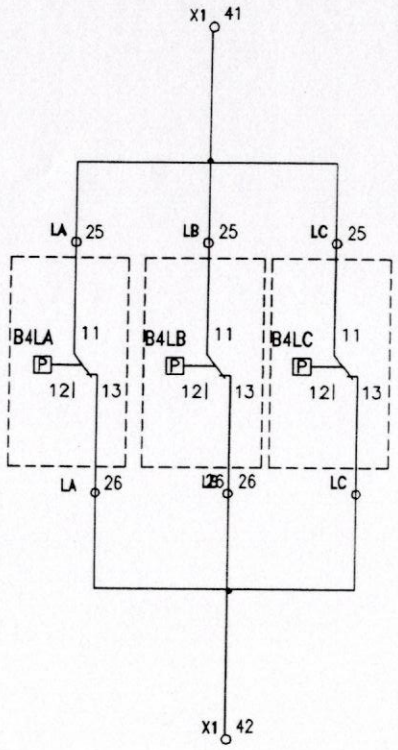
Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FG
Details : WIRING_DRAWING

Sales Order.:3004137812
Line item: 100 Qty. : 10x
W.O.
Drg. No:- (4)G71AHS-FA403-W608-A
Sh. 2
7 Sh.

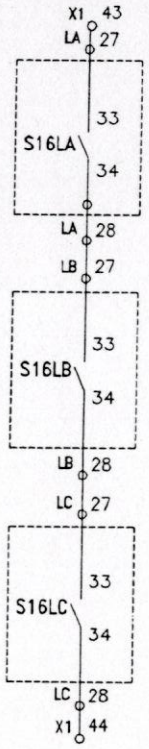
MARSHALING BOX



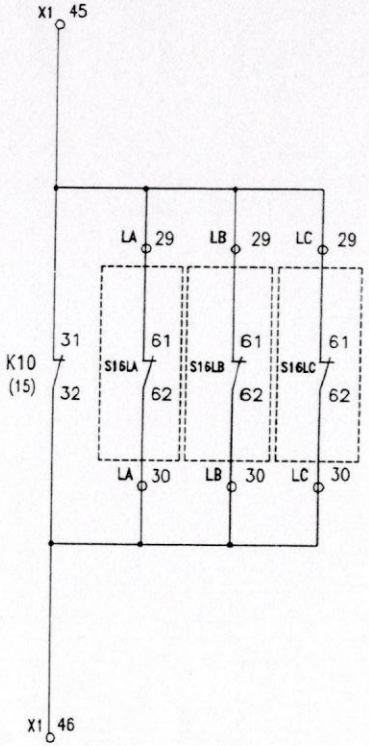
LOSS OF SF6



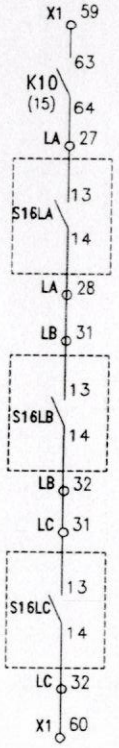
SPRING CHARGE STATUS



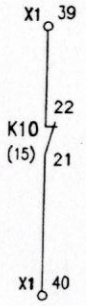
AUTO RECLOSER



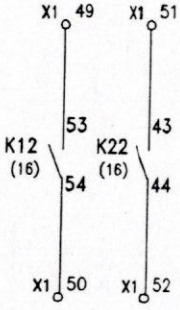
AUTO RECLOSER II



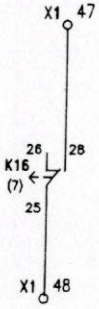
GENERAL LOCKET SF6



DC SUPPLY 1 & 2 MONITOR



POLE DISCREPANCY ALARM



APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

All the above contacts are exclusively for Customer use

NOTE: WIRING IN THE DOTTED LINES INDICATE THE WIRING CIRCUIT INSIDE THE CONTROL CUBICLE (LA, LB, LC)

BASIC MODULE :-

Issue	Remarks	Date	Name	Norm	Date	05.01.15	Customer : Bharat Heavy Electricals Limited.	Siemens Ltd.	Descr : 245KV,50KA,3150A-SF6-CB	Sales Order.:3004137812		
					Prep	AR	PO.No : 144P143 Dt : 11.11.2014.		Work : 3AP1FI	Line item: 100	Qty. : 10x	
					Ckd.	JR	Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.	AURANGABAD	Details : WIRING_DRAWING	W.O.	Drg. No:- (4) G71AHS-FA403-W608-	Sh. 3 7 Sh.

Original/Replacement for/Replaced by :-

Remark

25

MARSHALING BOX

S1LA 1 S1LA 3 S1LA 5 S1LA 7 S1LA 9 S1LA 11 S1LA 13 S1LA 15 S1LA 17 S1LA 19 S1LA 21 S1LA 23 S1LA 25 S1LA 27 S1LA 29 S1LA 31 S1LA 33 S1LA 35 S1LA 37 S1LA 39 S1LA 41 S1LA 43 S1LA 45 S1LA 47

29 103 111 113 121 123 131 133 141 143 151 153 161 93 71 163 81 173 101 253 171 191 73 163

S1LA

20 104 112 114 122 124 132 134 142 144 152 154 162 94 72 164 82 174 102 254 172 192 74 164

S1LA 2 S1LA 4 S1LA 6 S1LA 8 S1LA 10 S1LA 12 S1LA 14 S1LA 16 S1LA 18 S1LA 20 S1LA 22 S1LA 24 S1LA 26 S1LA 28 S1LA 30 S1LA 32 S1LA 34 S1LA 36 S1LA 38 S1LA 40 S1LA 42 S1LA 44 S1LA 46 S1LA 48

S1LB 1 S1LB 3 S1LB 5 S1LB 7 S1LB 9 S1LB 11 S1LB 13 S1LB 15 S1LB 17 S1LB 19 S1LB 21 S1LB 23 S1LB 25 S1LB 27 S1LB 29 S1LB 31 S1LB 33 S1LB 35 S1LB 37 S1LB 39 S1LB 41 S1LB 43 S1LB 45 S1LB 47

29 103 111 113 121 123 131 133 141 143 151 153 161 93 71 163 81 173 101 253 171 191 73 163

S1LB

20 104 112 114 122 124 132 134 142 144 152 154 162 94 72 164 82 174 102 254 172 192 74 164

S1LB 2 S1LB 4 S1LB 6 S1LB 8 S1LB 10 S1LB 12 S1LB 14 S1LB 16 S1LB 18 S1LB 20 S1LB 22 S1LB 24 S1LB 26 S1LB 28 S1LB 30 S1LB 32 S1LB 34 S1LB 36 S1LB 38 S1LB 40 S1LB 42 S1LB 44 S1LB 46 S1LB 48

S1LC 1 S1LC 3 S1LC 5 S1LC 7 S1LC 9 S1LC 11 S1LC 13 S1LC 15 S1LC 17 S1LC 19 S1LC 21 S1LC 23 S1LC 25 S1LC 27 S1LC 29 S1LC 31 S1LC 33 S1LC 35 S1LC 37 S1LC 39 S1LC 41 S1LC 43 S1LC 45 S1LC 47

29 103 111 113 121 123 131 133 141 143 151 153 161 93 71 163 81 173 101 253 171 191 73 163

S1LC

20 104 112 114 122 124 132 134 142 144 152 154 162 94 72 164 82 174 102 254 172 192 74 164

S1LC 2 S1LC 4 S1LC 6 S1LC 8 S1LC 10 S1LC 12 S1LC 14 S1LC 16 S1LC 18 S1LC 20 S1LC 22 S1LC 24 S1LC 26 S1LC 28 S1LC 30 S1LC 32 S1LC 34 S1LC 36 S1LC 38 S1LC 40 S1LC 42 S1LC 44 S1LC 46 S1LC 48

MAXIMUM SPARE CONTACTS 12NO/11NC OF CB AUXILIARY SWITCH

APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

BASIC MODULE :-

NOTE: WIRING IN THE DOTTED LINES INDICATE THE WIRING CIRCUIT INSIDE THE CONTROL CUBICLE (LA, LB, LC)

NOTES :-

1. ALL AUXILLIARY CONTACTS SHOWN WITH CIRCUIT DE-ENERGISED.
2. ALL CONTACTS OF PR. SWITCH SHOWN WITH THE SWITCH IN LOW PR. CONDITION.
3. CONTACTS OF LIMIT SWITCH OF SPRING CHARGING MOTOR SHOWN WITH SPRING DISCHARGED.

Issue	Remarks	Date	Name

Date 05.01.15
Prep AR
Ckd. JR
Norm

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L

Original/Replacement for/Replaced by :-

Siemens Ltd.
AURANGABAD

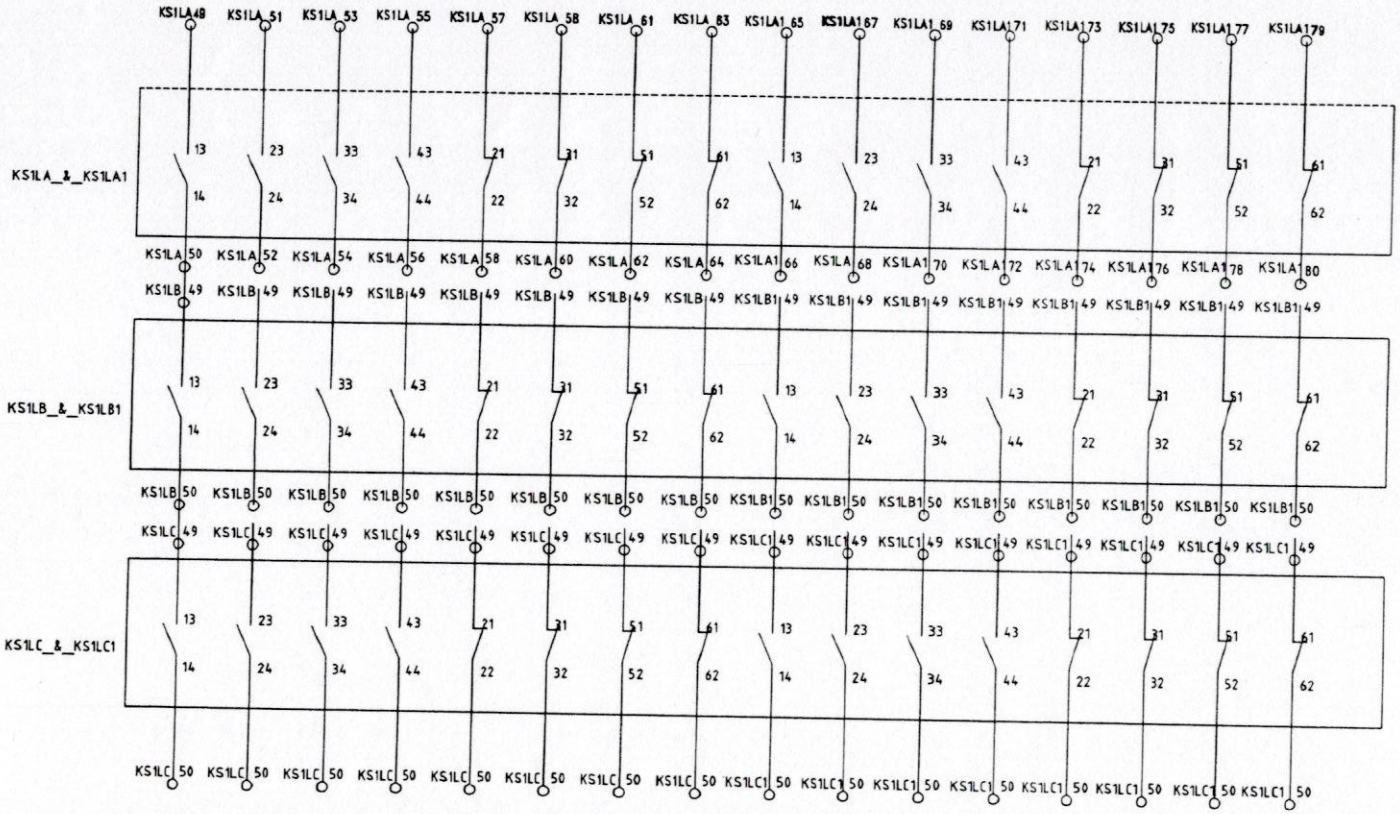
Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FG
Details : WIRING_DRAWING

Sales Order.:3004137812
Line item: 100 Qty. : 10x

W.O.

Drg. No:- (4)G71AHS-FA403-W608-

Sh. 4
7 Sh.



MAXIMUM SPARE CONTACTS 8NO/8NC OF CB AUXILIARY CONTRACTOR

APPROVED
Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

BASIC MODULE :-

Issue	Remarks	Date	Name
			Norm
			Prep AR
			Ckd. JR
		05.01.15	Date

Original/Replacement for/Replaced by :-

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Siemens Ltd.
AURANGABAD

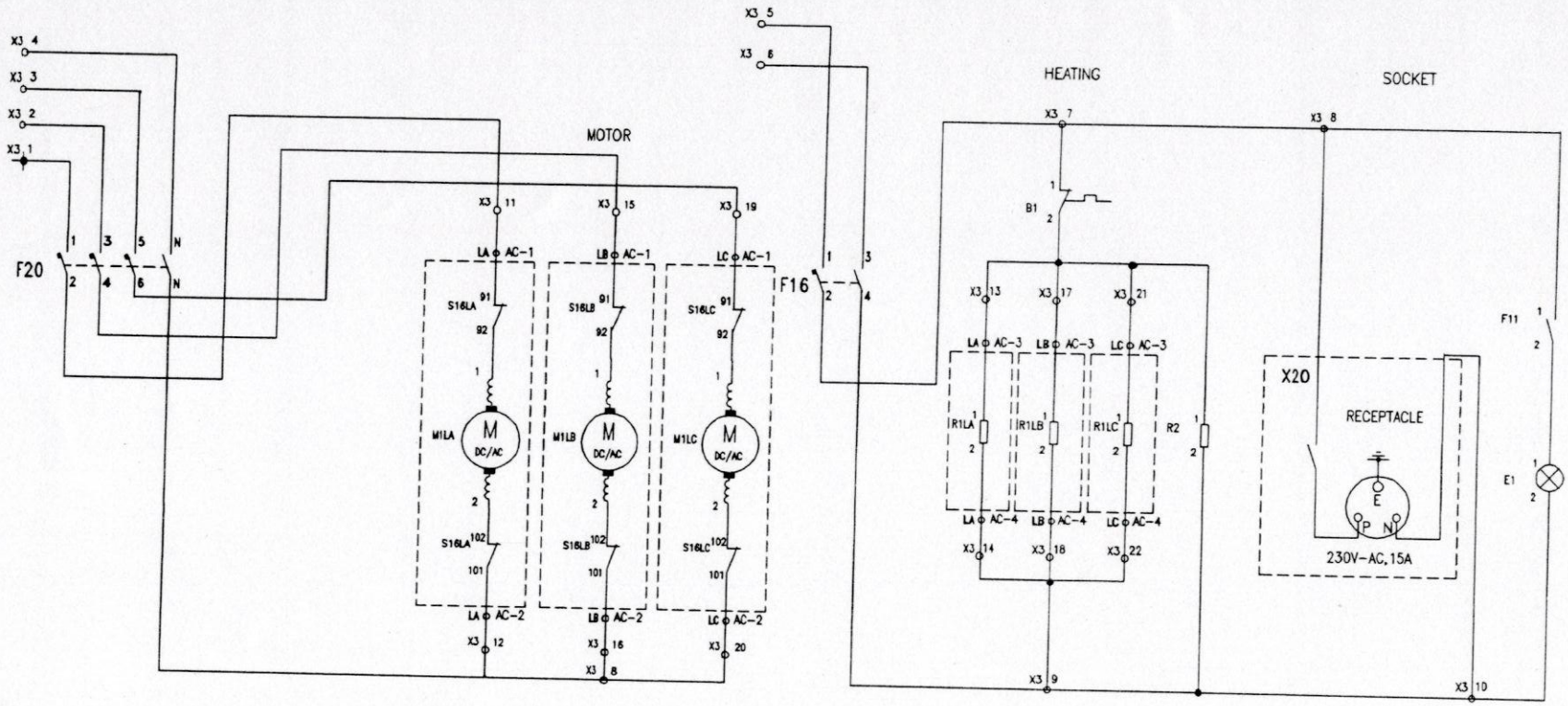
Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FG
Details : WIRING_DRAWING

Sales Order:3004137812
Line item: 100 Qty. : 10x

Drg. No:- (4)G71AHS-FA403-W608-

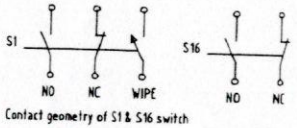
Sh. 5
7 Sh.

MARSHALING BOX



APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR



Contact geometry of S1 & S16 switch

M1LA,M1LB,M1LC: Spring Charging Motors
F20: 3Ph MCB
F16: 1Ph, MCB
R2,R3,R4,R1LA,R1LB,R1LC: Space Heaters
X20: Receptacle
F11: ON/OFF Switch
E1: Illumination Lamp
B1: Thermostat

NOTE: WIRING IN THE DOTTED LINES INDICATE THE WIRING CIRCUIT INSIDE THE CONTROL CUBICLE (LA, LB, LC)

NOTES :-
1. ALL AUXILLIARY CONTACTS SHOWN WITH CIRCUIT DE-ENERGISED.
2. ALL CONTACTS OF PR. SWITCH SHOWN WITH THE SWITCH IN LOW PR. CONDITION.
3. CONTACTS OF LIMIT SWITCH OF SPRING CHARGING MOTOR SHOWN WITH SPRING DISCHARGED.

BASIC MODULE :-

Issue	Remarks	Date	Name

Norm | Date 05.01.15 | Prod AR | Ckd. JR

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon Nagdah S/s & T/L.

Original/Replacement for/Replaced by :-

Siemens Ltd.
AURANGABAD

Descr : 245KV,50KA,3150A-SF6-CB
Work : 3AP1FG
Details : WIRING_DRAWING

Sales Order.:3004137812
Line item: 100 Qty. : 10x

Drg. No:- (4)G71AHS-FA403-W608-

Sh. 6
7 Sh.

Main Sign	Terminal No.	Strip Joint	Terminal No.	Equipement Main Sign	EqipementTerminal No.
		X1			
220V DC (+)		O	1	F19	1
220V DC (-)		O	2	F19	3
220V DC (+)		O	1A	F21	1
220V DC (-)		O	2A	F21	3
		O	3	K61	13
		O	4	K77	13
		O	5	K77	43
		O	6	K77	53
		O	7	K61	63
REMOTE TRIP		O	8	K88	13
REMOTE TRIP		O	9	K88	43
REMOTE TRIP		O	10	K88	53
REMOTE TRIP		O	11	S13	A1
REMOTE TRIP		O	12	S13	A2
REMOTE TRIP		O	13	S13	B2
REMOTE TRIP		O	14	S13	C2
REMOTE CLOSE		O	15	S20	4
PERMISSIBLE I/L		O	16		
		O	17		
		O	18		
TRIP CKT SUP.		O	19	S1LA	191
TRIP CKT SUP.		O	20	S1LA	194
TRIP CKT SUP.		O	21	S1LB	191
TRIP CKT SUP.		O	22	S1LB	194
TRIP CKT SUP.		O	23	S1LC	191
TRIP CKT SUP.		O	24	S1LC	194
TRIP CKT SUP.		O	25	S1LA	221
TRIP CKT SUP.		O	26	S1LA	224
TRIP CKT SUP.		O	27	S1LB	221
TRIP CKT SUP.		O	28	S1LB	224
TRIP CKT SUP.		O	29	S1LC	221
TRIP CKT SUP.		O	30	S1LC	224
		O	31	K11	21
		O	32	K11	31
		O	33	K10	54
		O	34		
		O	35	K10	A2
		O	36		
		O	37	K75	22
		O	38	B4LA	22
GENERAL LOCKOUT		O	39	K10	22
		O	40	K10	21
LOSS OF SF6		O	41	B4LA	11
		O	42	B4LA	13
SPRING CHARGE STATUS		O	43	S16LA	33
		O	44	S16LC	34
AUTO RECLOSER I		O	45		
		O	46		
POLE DISCREPANCY ALARM		O	47	K16	28
		O	48	K16	25
		O	49		
DC SUPPLY 1 & 2 MONITORING		O	50		
		O	51		
		O	52		
		O	53		
Protection Trip		O	54		
		O	55		
		O	56		
		O	57		
		O	58		
SPARES		O	59		
SPARES		O	60		
SPARES		O	61		
SPARES		O	62		
SPARES		O	63		
SPARES		O	64		
SPARES		O	65		
SPARES		O	66		
SPARES		O	67		
SPARES		O	68		

Main Sign	Terminal No.	Strip Joint	Terminal No.	EquipementMain Sign	EqipementTerminal No.
		S1LA			
		O	1	S1LA	29
		O	2	S1LA	20
		O	3	S1LA	103
		O	4	S1LA	104
		O	5	S1LA	111
		O	6	S1LA	112
		O	7	S1LA	113
		O	8	S1LA	114
		O	9	S1LA	121
		O	10	S1LA	122
		O	11	S1LA	123
		O	12	S1LA	124
		O	13	S1LA	131
		O	14	S1LA	132
		O	15	S1LA	133
		O	16	S1LA	134
		O	17	S1LA	141
		O	18	S1LA	142
		O	19	S1LA	143
		O	20	S1LA	144
		O	21	S1LA	151
		O	22	S1LA	152
		O	23	S1LA	153
		O	24	S1LA	154
		O	25	S1LA	161
		O	26	S1LA	162
		O	27	S1LA	93
		O	28	S1LA	94
		O	29	S1LA	71
		O	30	S1LA	72
		O	31	S1LA	163
		O	32	S1LA	164
		O	33	S1LA	81
		O	34	S1LA	82
		O	35	S1LA	173
		O	36	S1LA	174
		O	37	S1LA	101
		O	38	S1LA	102
		O	39	S1LA	223
		O	40	S1LA	224
		O	41	S1LA	171
		O	42	S1LA	172
		S1LB			
		O	1	S1LB	29
		O	2	S1LB	20
		O	3	S1LB	103
		O	4	S1LB	104
		O	5	S1LB	111
		O	6	S1LB	112
		O	7	S1LB	113
		O	8	S1LB	114
		O	9	S1LB	121
		O	10	S1LB	122
		O	11	S1LB	123
		O	12	S1LB	124
		O	13	S1LB	131
		O	14	S1LB	132
		O	15	S1LB	133
		O	16	S1LB	134
		O	17	S1LB	141
		O	18	S1LB	142
		O	19	S1LB	143
		O	20	S1LB	144
		O	21	S1LB	151
		O	22	S1LB	152
		O	23	S1LB	153
		O	24	S1LB	154
		O	25	S1LB	161
		O	26	S1LB	162
		O	27	S1LB	93
		O	28	S1LB	94
		O	29	S1LB	71
		O	30	S1LB	72
		O	31	S1LB	163
		O	32	S1LB	164
		O	33	S1LB	81
		O	34	S1LB	82
		O	35	S1LB	173
		O	36	S1LB	174
		O	37	S1LB	101
		O	38	S1LB	102
		O	39	S1LB	223
		O	39	S1LB	223
		O	40	S1LB	224
		O	41	S1LB	171
		O	42	S1LB	172

Main Sign	Terminal No.	Strip Joint	Terminal No.	Equipement Main Sign	EqipementTerminal No.
		S1LC			
		O	1	S1LC	29
		O	2	S1LC	20
		O	3	S1LC	103
		O	4	S1LC	104
		O	5	S1LC	111
		O	6	S1LC	112
		O	7	S1LC	113
		O	8	S1LC	114
		O	9	S1LC	121
		O	10	S1LC	122
		O	11	S1LC	123
		O	12	S1LC	124
		O	13	S1LC	131
		O	14	S1LC	132
		O	15	S1LC	133
		O	16	S1LC	134
		O	17	S1LC	141
		O	18	S1LC	142
		O	19	S1LC	143
		O	20	S1LC	144
		O	21	S1LC	151
		O	22	S1LC	152
		O	23	S1LC	153
		O	24	S1LC	154
		O	25	S1LC	161
		O	26	S1LC	162
		O	27	S1LC	93
		O	28	S1LC	94
		O	29	S1LC	71
		O	30	S1LC	72
		O	31	S1LC	163
		O	32	S1LC	164
		O	33	S1LC	81
		O	34	S1LC	82
		O	35	S1LC	173
		O	36	S1LC	174
		O	37	S1LC	101
		O	38	S1LC	102
		O	39	S1LC	223
		O	40	S1LC	224
		O	41	S1LC	171
		O	42	S1LC	172
		X3			
AC SUPPLY 3 PH		O	1	F20	1
		O	2	F20	3
		O	3	F20	5
		O	4	F20	N
		O	5	F16	1
		O	6	F16	3
		O	7	B1	1
		O	8	X20	P
AC SUPPLY MOTOR		O	9	R2	2
		O	10	X20	N
		O	11	LA	AC-1
		O	12	LA	AC-2
		O	13	LA	AC-3
		O	14	LA	AC-4
		O	15	LB	AC-1
		O	16	LB	AC-2
		O	17	LB	AC-3
		O	18	LB	AC-4
		O	19	LC	AC-1
		O	20	LC	AC-2
		O	21	LC	AC-3
		O	22	LC	AC-4
SPARES		O	23		
SPARES		O	24		
SPARES		O	25		
SPARES		O	26		
SPARES		O	27		
SPARES		O	28		

APPROVED

Executive Engineer
O/o Executive Director (T&P)
M.P. Power Transmission Co. Ltd.
JABALPUR

Customer : Bharat Heavy Electricals Limited.
PO.No : 144P143 Dt : 11.11.2014.
Project : MPPTCL Balaghat Badnawar Bhopal Chhegaon
Nagdah S/s & T/L.

Index	Remarks	Date	Name	
			Date:	05.01.15
			Prep:	AR
			chkd:	JR
				Siemens Ltd.
Original Replacement for Replaced by:-				Aurangabad

H9ESD-CDORDBE 03-90

Sales Ref:	3004137812
Line Item: 100	Qty: 10x
Description:	245kV,50kA,3150A,SF6 CB
Type Ref:	3AP1FI
Details:	Terminal Plan
Drawing No:	(4) G71AHS-FA403-W508-

Sh.7

7 Sh.