ABB India Limited
ELDS-Nashik

FOR EPC CONTRACTS ONLY

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36 kV VACUUM CIRCUIT BREAKER

CUSTOMER: APTRANSCO

CUSTOMER PO. NO.:

ABB REF. NO.:

BREAKER QUANTITY :

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TECHNICAL DETAILS:

STANDARD	IEC62271-100
HIGHER SYSTEM VOLTAGE	36 kV
SERVICE VOLTAGE	33 kV
RATED CURRENT	2000 A
RATED FREQUENCY	50 Hz
BASIC INSULATION LEVEL	70 / 170 kVp
SHORT CIRCUIT BREAKING CURRENT	25 kA / 3 SEC
SHORT CIRCUIT MAKING CURRENT	62.5 kAp
MINIMUM CREEPAGE	900 mm
CONTROL VOLTAGE	220 VDC
SPRING CHARGE MOTOR SUPPLY VOLTAGE	230 VAC
AUXILIARY SUPPLY VOLTAGE	230 VAC
PAINT SHADE	631 OF IS 5
ENCLOSURE FABRICATION MATERIAL TYPE	MS
ENCLOSURE FABRICATION MATERIAL THICKNESS	3 mm
SUPPORT STRUCTURE TYPE	CB
TERMINAL CONNECTOR (REQD. IF ANY)	TWIN MOOSE ACSR
MECHANISM TYPE	SPRING CHARGE

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NOTE: PICTURE IS FOR REFERENCE ONLY. ACTUAL PRODUCT MAY VARY AS PER CONFIGURATION.

During the installation, commissioning period and the time of operation, client is obliged to follow all instructions and recommendation given by manufacturers of individual instruments installed inside supplied equipment

Based on			Prepared	Date	Title	Order No	= K00
		Customer:	Checked GN	Approved VR	COMMON DRAWINGS		+
		APTRANSCO	Project name		PROJECT TITLE PAGE	Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS		Page A00
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Make of Equipments list.

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Sr. No.	DESCRIPTION	MAKE
1	VACUUM CIRCUIT BREAKER & PANEL	ABB
2	CLOSING AND TRIPPING COIL	IMAX/POWERINST/EQ.
3	AUXILIARY PLUG IN RELAYS	ABB / PLA / JYOTI / EQ.
4	MCB	ABB / SCHNEIDER / HPL / EQ
5	SELECTOR SWITCHES	SWITRON/ SHIRKE/EQ.
6	CONTROL CIRCUIT FUSES	COOPER BUSSMANN/ ABB/ EQ.
7	INDICATING LAMP	ABB / ESSEN DEINKI / TEKNIC / EQ.
8	AUXILIARY SWITCH	SHIRKE /SHUBHADA
9	CABLE / WIRE	ROLLIFLEX / POLYCAB / FINOLEX / R.R KABLES / EQ.
10	TERMINAL BLOCKS	CONNECTWELL / PHOENIX / ELMEX / EQ.
11	CONNECTING LUGS	M.G.ELECTRICAL/ CHETANA/ ECC / DOWELLS / EQ.
12	THERMOSTATS	APT CONTROLS / VELICO/ EQ.
13	ILLUMINATION LAMPS-LED	HPL / ANCHOR / PHILLIPS / WIPRO / CROMPTON/ EQ
14	HEATERS	APT CONTROLS / VELICO / EQ.
15	TOGGLE SWITCH	SWITRON/KAYCEE/SHIRKE
16	DOOR OPERATE LIMIT SWITCH	SURAJ/KAYCEE/EQ.
17	3 PIN SOCKET FOR AUX. SUPPLY	ABB/LEGRAND / ANCHOR / SCHNEIDER
18	SPRING CHARGING MOTOR	WUXI
19		
20		
21		
22		
23		

SR. NO.	SPECIAL POINTS (IF ANY)
	STUD TYPE TB TO BE USED
	ALL WIRING IS TO BE DONE BY 2.5 SQ.MM. CONTROL WIRE
	AC : BLACK WIRE, DC : GRAY WIRE, EARTHING: GREEN WIRE TO BE USED

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NOTE: IF ANY SPECIFIC MAKE EQUIPMENT IS NOT AVAILABLE DURING MANUFACTURING OF BREAKER(S)THEN ALTERNATE MAKE EQUIPMENT WILL BE USED.

Based on			Prepared	Date	Title	Order No	= K00
		Customer:	Checked GN	Approved VR	COMMON DRAWINGS		+ SLD
		APTRANSCO	Project name		MAKE LIST	Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS	YN1V300013-	Page A01
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SHEET INDEX

PAGE	PAGE NAME	REVISION		
=H01+LV/1	SHEET INDEX			
=H01+LV/2	VBF INTERNAL WIRING			
=H01+LV/3	AC SUPPLY CIRCUITS			
=H01+LV/4	CLOSING CIRCUIT			
=H01+LV/5	TRIPPING CKT			
=H01+LV/6	INDICATION CKT			
=H01+LV/7	BREAKER SPARE CONTACTS			
=H01+LV/8	SWITCH DET. & SPARE CONTACTS			
=H01+LV/9	GENERAL ARRANGEMENT			
=H01+LV/10	Rating Plate			
=H01+BOM/1	Parts list			
=H01+BOM/2	Parts list			
=H01+BOM/3	Parts list			
=H01+BOM/4	Parts list			
=H01+BOM/5	Parts list			
=H01+BOM/6	Parts list			
=H01+TBPLAN/1	Terminal Strip Overview			

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		Customer:	Checked GN	Approved VR	OD BREAKER			+ LV
		APTRANSCO	Project name		SHEET INDEX		Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS			Page 1
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BREAKER WIRING DIAGRAM

2REA044865A0001, OUTDOOR VACUUM CIRCUIT BREAKER
TYPE : VBF NEW EL3

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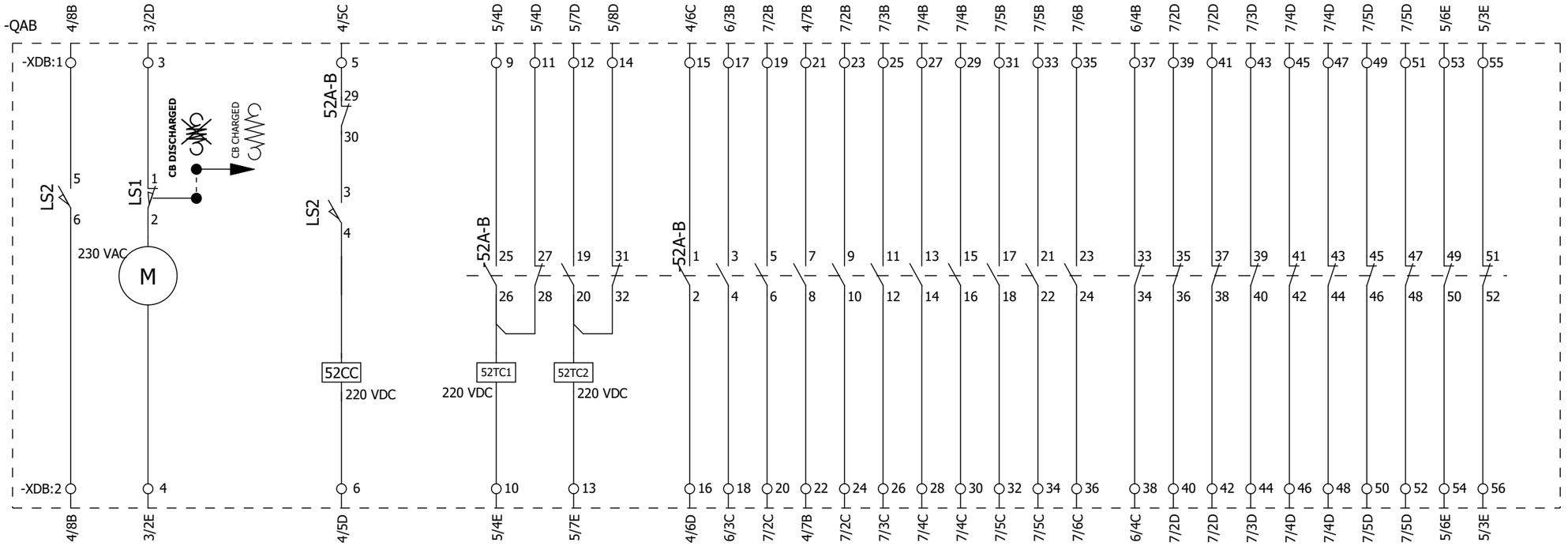
NOTE: CB OPEN & SPRING NOT CHARGED



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DESIGNAT.	DESCRIPTION
-M	MOTOR FOR THE CLOSING SPRING CHARGING
-LS1, LS2	LIMIT SWITCH OF THE SPRING CHARGING MOTOR
-52CC	CLOSE COIL
-52TC1	TRIP COIL-1
-52TC2	TRIP COIL-2
-52A-B	BREAKER AUXILIARY SWITCH

NOTE: GROUP MARKER TERMINAL BLOCK TO BE ARRANGED FOR EACH GROUP OF TERMINAL BLOCKS

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		Customer:	Checked GN	Approved VR	OD BREAKER VBF INTERNAL WIRING		+ LV
		APTRANSCO	Project name			Doc. No. YN1V300013	Lang.
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SPRING CHARGING CIRCUIT

SPRING CHARGE MOTOR SUPPLY
230 VAC

ILLUMINATION CIRCUIT

SPACE HEATER

POWER SUPPLY
(3 PIN SOCKET)

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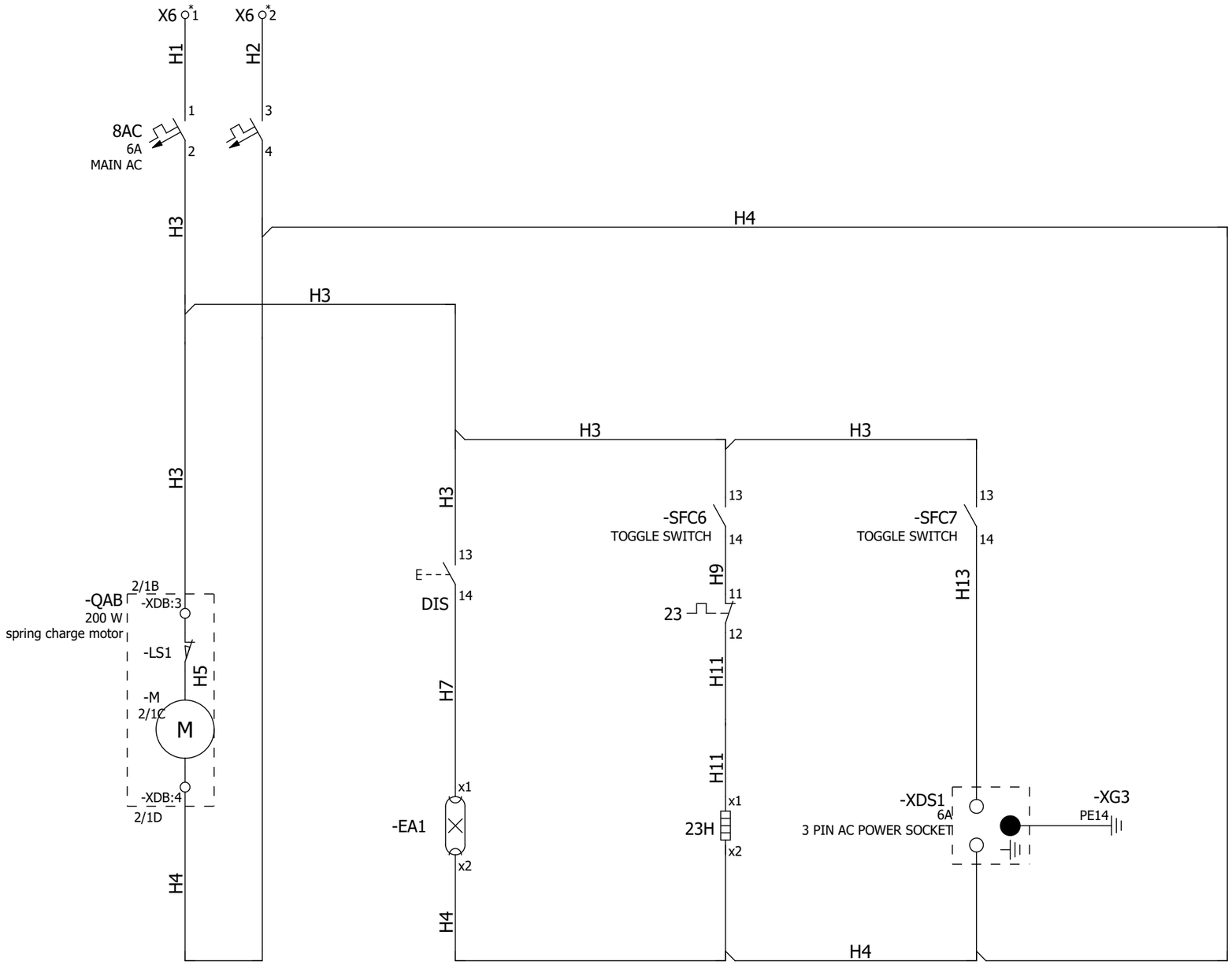

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Based on			Prepared	Date	Title	Order No	= H01
			Checked GN	Approved VR	OD BREAKER		+ LV
		Customer: APTRANSCO	Project name		AC SUPPLY CIRCUITS	Doc. No.	Lang.
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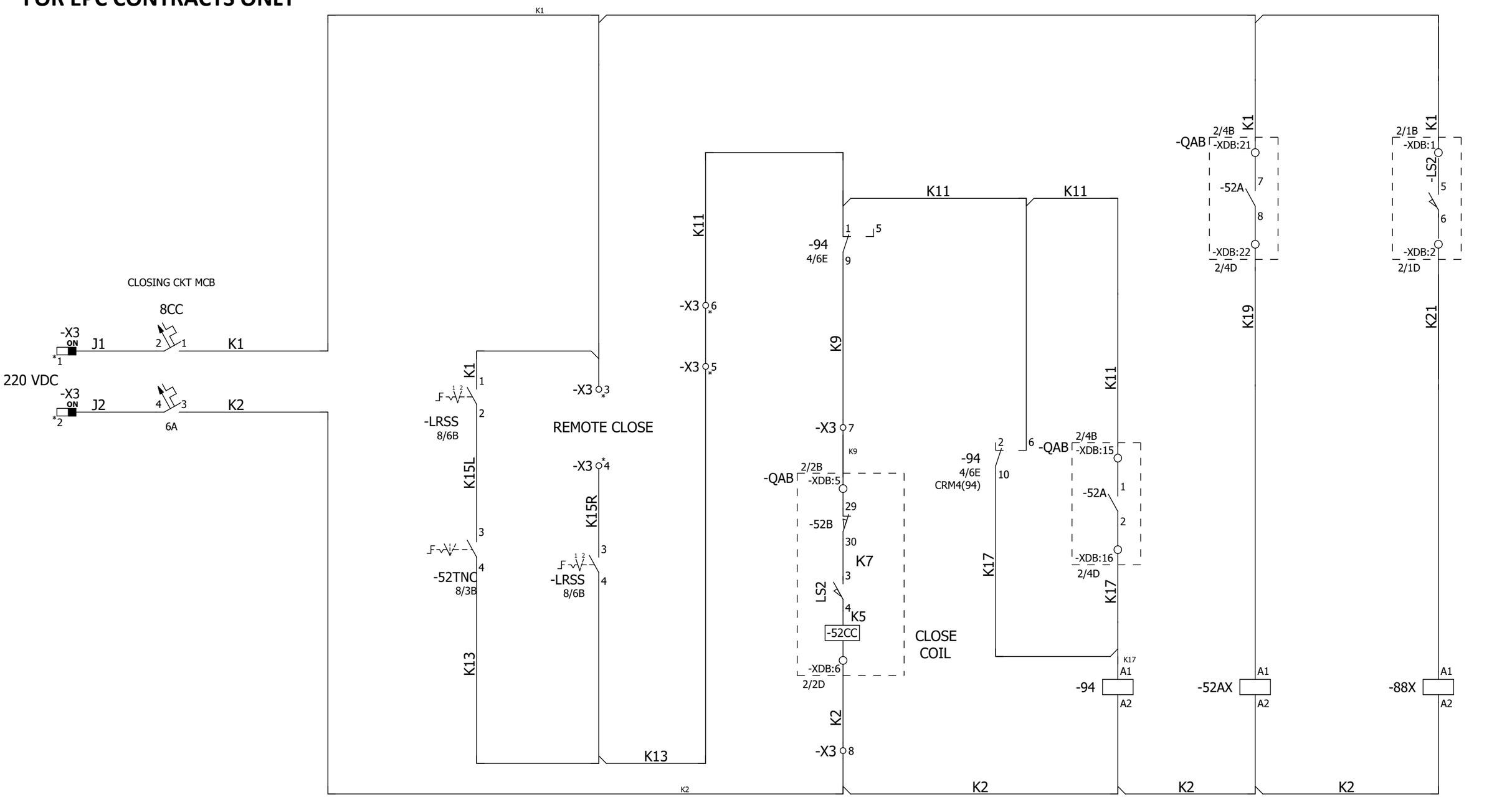
CB LOCAL CLOSE

CB CLOSING CIRCUIT

ANTI PUMPING RELAY

BREAKER CONTACT MULTIPLIER RELAY

SPRING CHARGE MULTIPLIER RELAY



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		Customer: APTRANSCO	Checked GN	Approved VR	OD BREAKER CLOSING CIRCUIT		+ LV
		Contractor / Contract No.	Project name		ABB India Ltd., Nashik, ELDS	Doc. No. YN1V300013-KA-OG	Lang.
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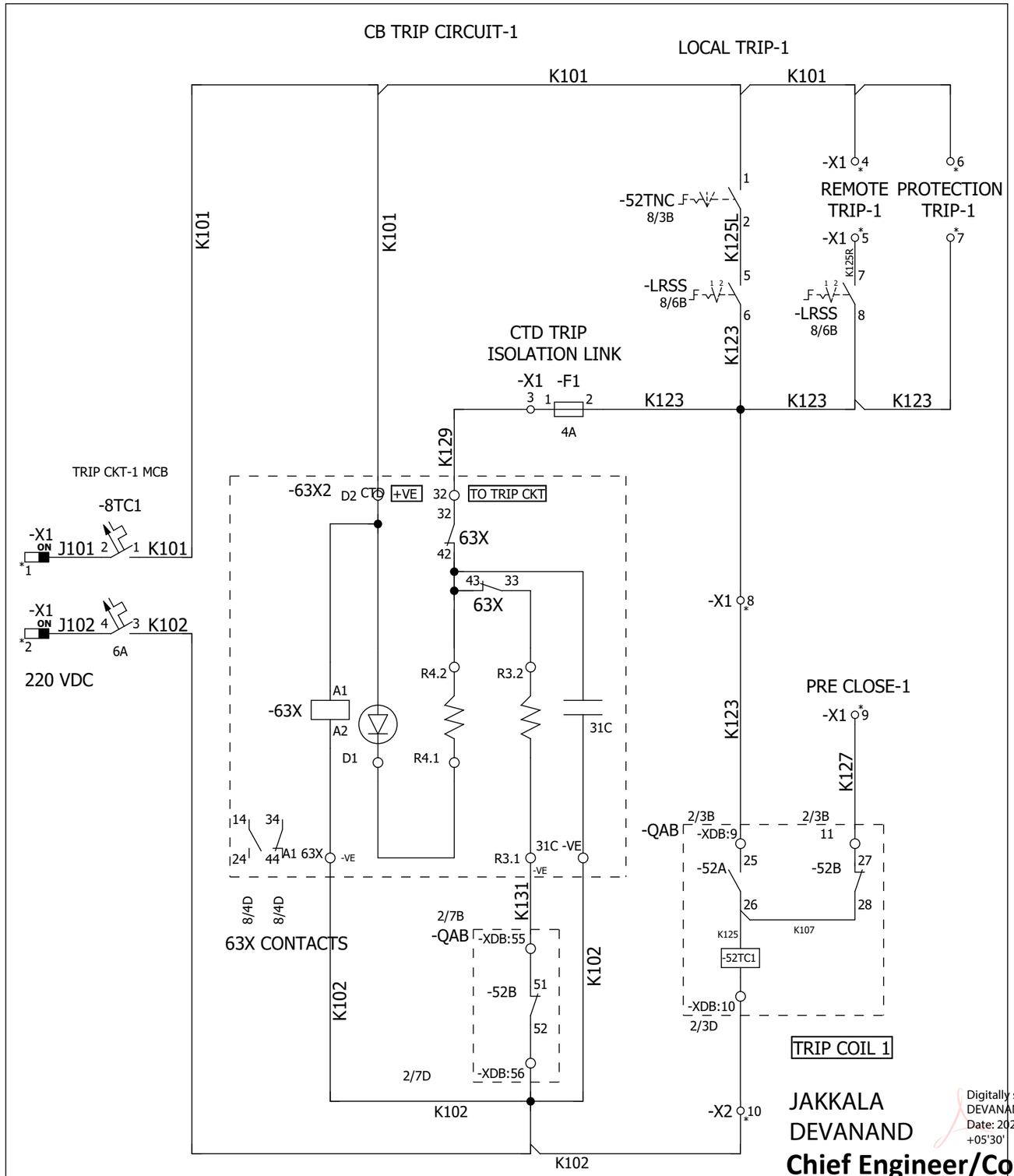

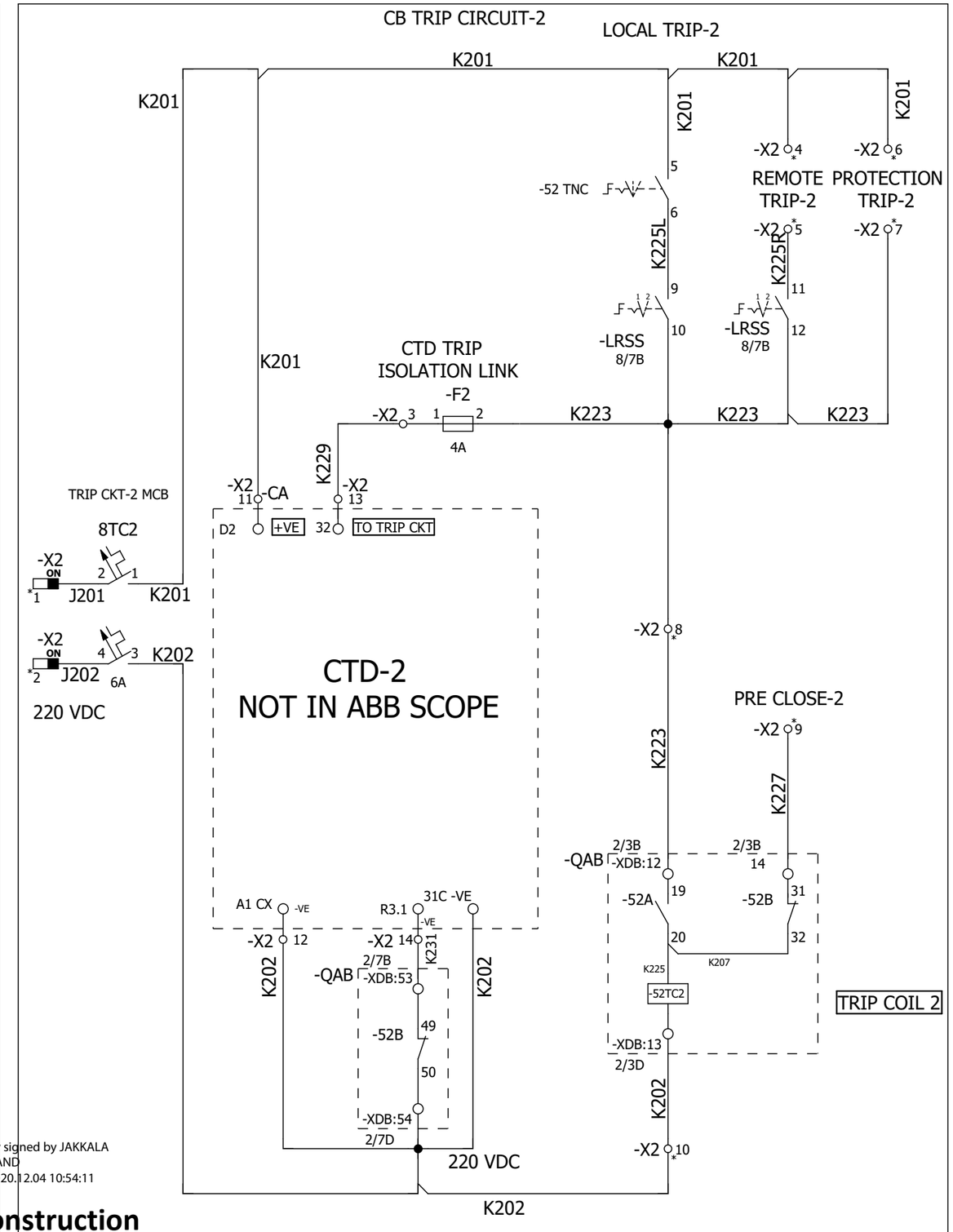

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Based on			Prepared	Date	Title	Order No	= H01
			Checked GN	Approved VR	OD BREAKER TRIPPING CKT		+ LV
		Customer: APTRANSCO	Project name			Doc. No. YN1V300013-KA-OG	Lang.
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CB CLOSED | CB OPEN | CB SPRING CHARGED

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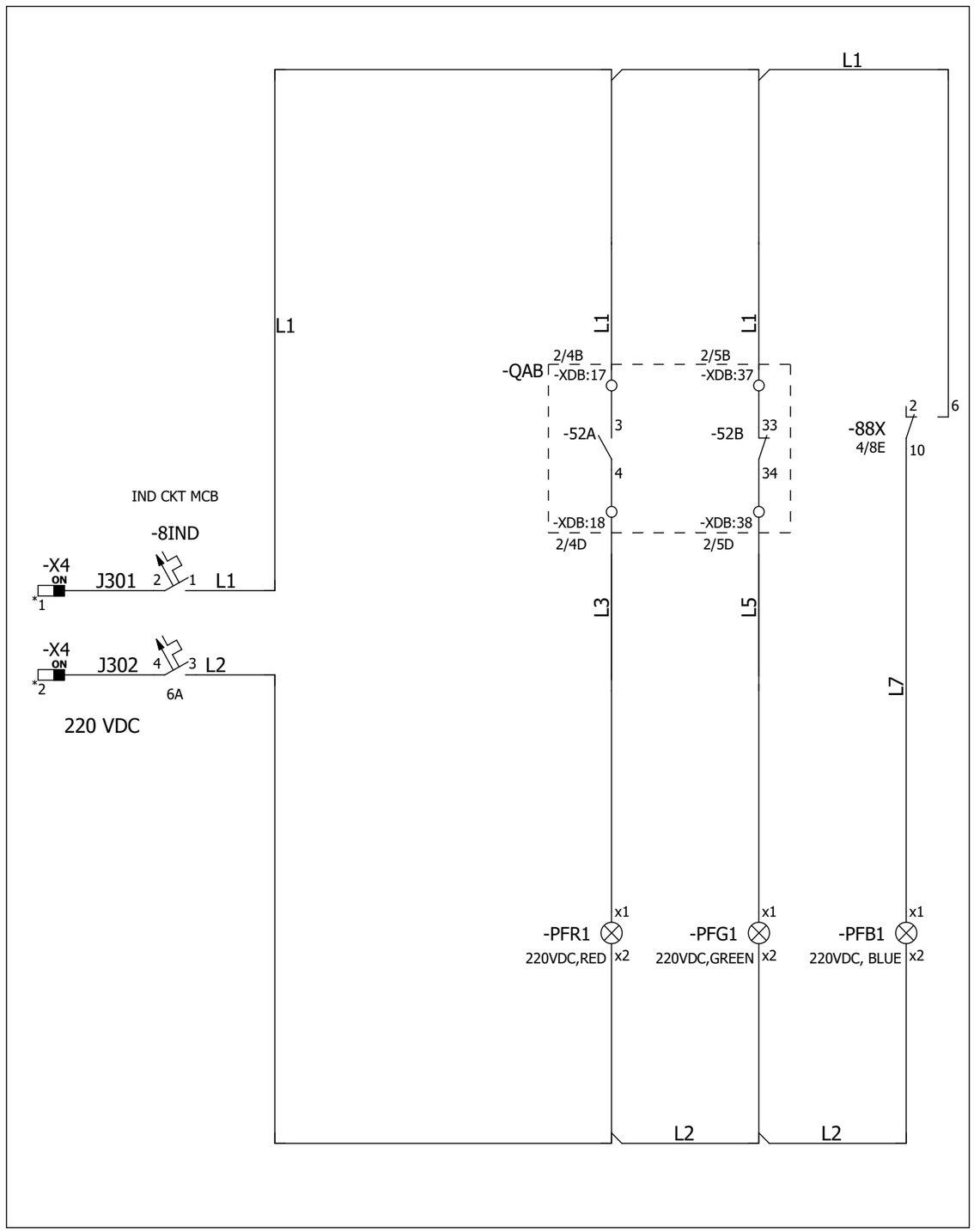

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		Customer:	Checked GN	Approved VR	OD BREAKER INDICATION CKT		+ LV
		APTRANSCO	Project name			Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS	YN1V300013-KA-OG	Page 6
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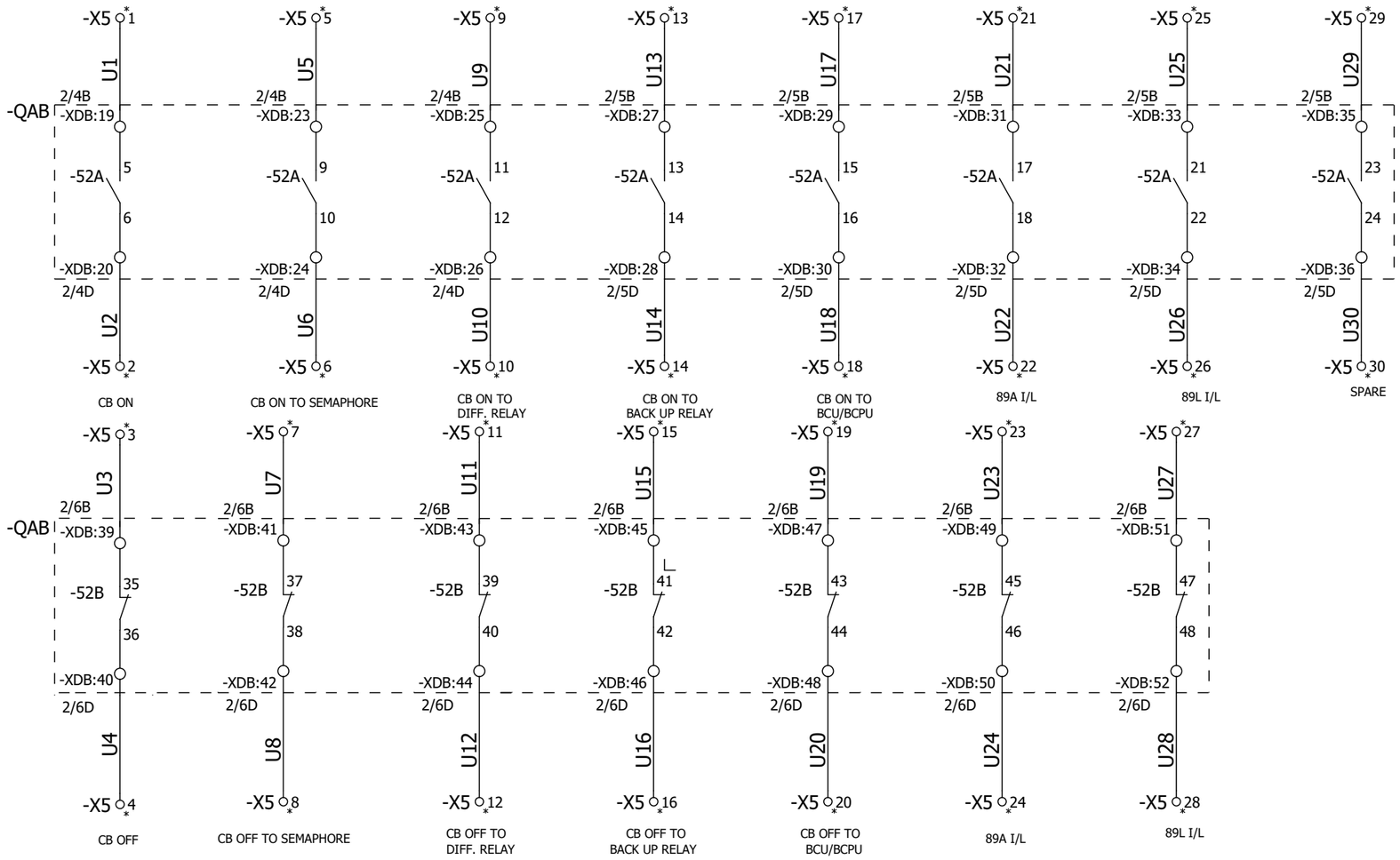
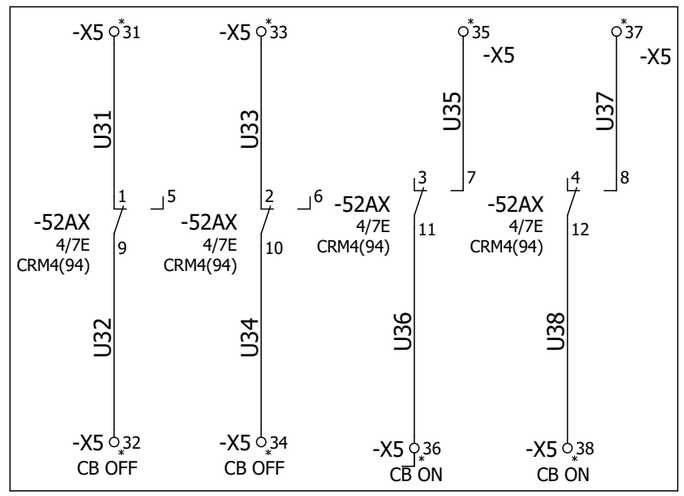
BREAKER SPARE CONTACTS





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			Customer:	Checked GN	Approved VR	OD BREAKER		+ LV
			APTRANSCO	Project name	BREAKER SPARE CONTACTS	Doc. No.	Lang.
			Contractor / Contract No.		ABB India Ltd., Nashik, ELDS	YN1V300013-KA-OG	Page 7
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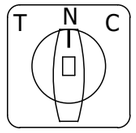
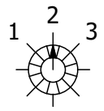
TRIP-NEUTRAL-CLOSE SELECTOR SWITCH



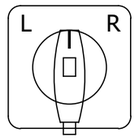
SPRING-RETURN HANDLE
PISTOL GRIP

-52TNC
TNC SELECTOR SWITCH



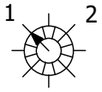
		5/4A 1-2	4/3D 3-4	5-6	7-8	9-10	11-12	
1	TRIP	X		X		X		
2	NEUTRAL							
3	CLOSE		X		X		X	

LOCAL/REMOTE SELECTOR SWITCH

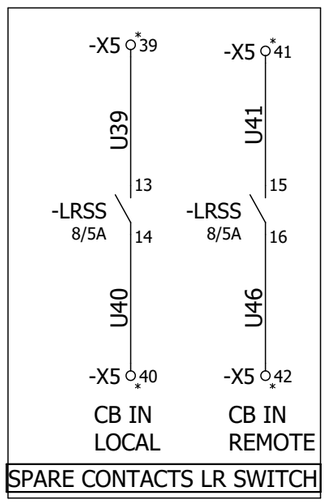


WING TYPE LOCKABLE

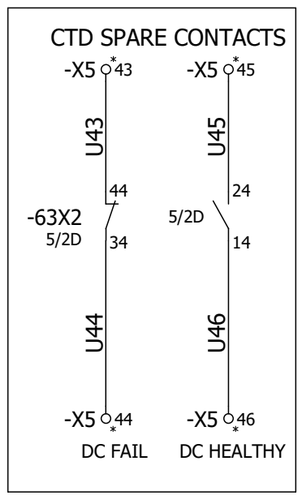
-LRSS
L/R SELECTOR SWITCH

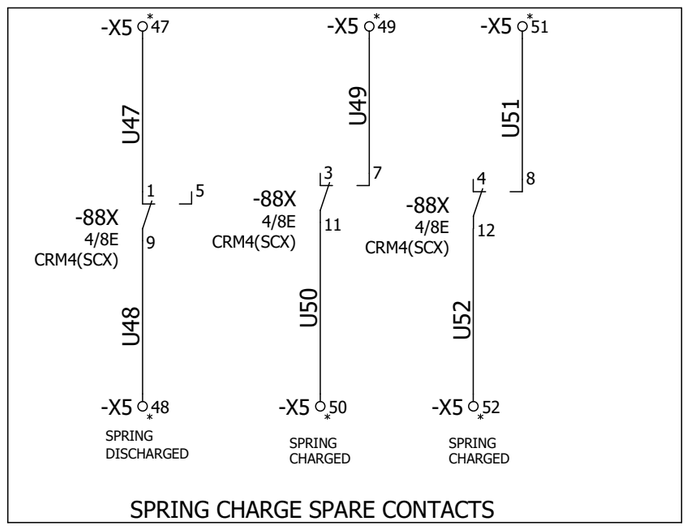


		4/3C 1-2	4/4D 3-4	5/4B 5-6	5/4B 7-8	5/7B 9-10	5/8B 11-12	13-14	15-16
1	LOCAL	X		X		X		X	
2	REMOTE		X		X		X		X



SPARE CONTACTS LR SWITCH





SPRING CHARGE SPARE CONTACTS

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		Customer: APTRANSCO	Checked GN	Approved VR	OD BREAKER SWITCH DET. & SPARE CONTACTS		+ LV
		Contractor / Contract No.	Project name		ABB India Ltd., Nashik, ELDS	Doc. No. YN1V300013-KA-OG	Lang.
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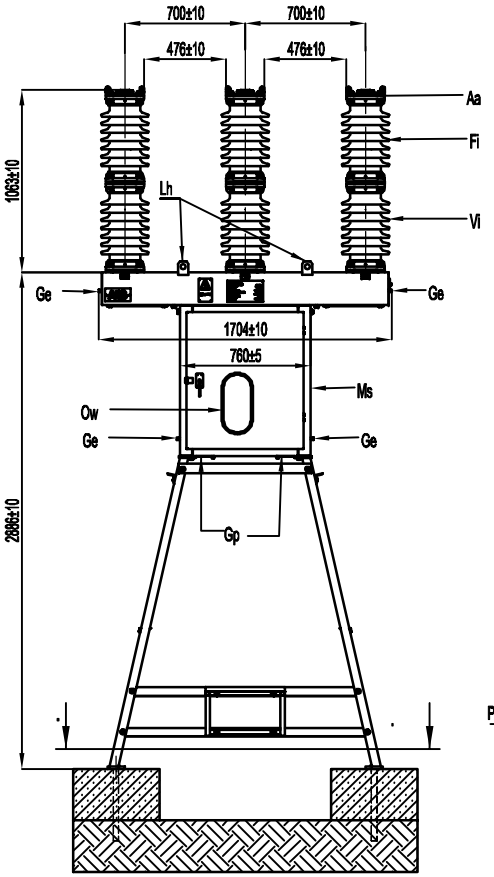

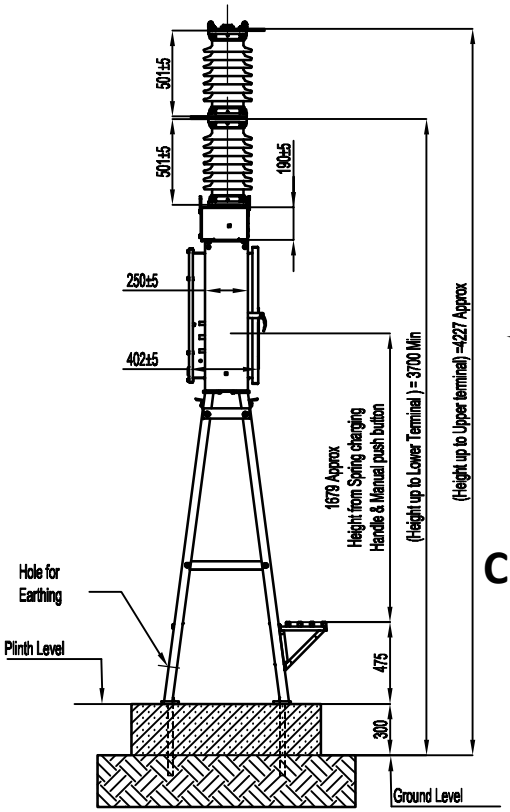

FRONT

Aa Terminals (Al alloy)
Fi Interrupting Chamber
Fb Foundation bolt (M20)
Ms Control cubical with spring drive
Vi Supporting insulator column
Vs Supporting structure (Galvanise steel)
Ow Observation window (Transparent polycorbonate)
Ge Earting point (Galvanise Bus)
Lh Hooks for lifting.
Gp Gland plate for Cable connection

Note :-

- Total mass including 3 poles, Drive and structure : 450 kg approx.
- Degree of protection : IP 55
- Thickness of cabinet - 3 mm,Thickness of Door- 2.0 mm
- Width x Height of control cabinet : 760 x 874
- With Pad lock facility.
- Color of porcelain insulator : Brown.
- Make of insulator : IEC,CJI or equivalent.
- Minimum Creepage Distance of porcelain insulator : 900 mm
- Paint shade of control cabinet : 631 of IS 5 (Light Gray)
- Plinth is not in ABB Scope.

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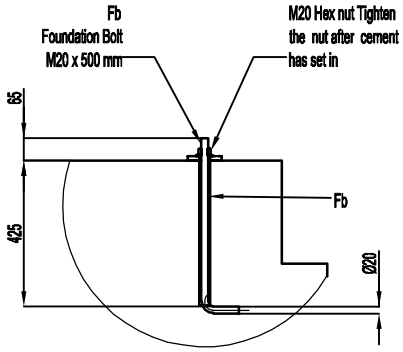
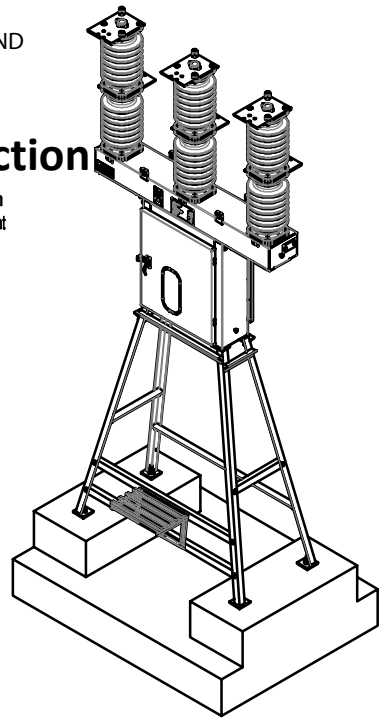
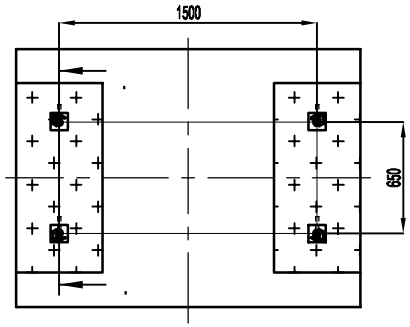
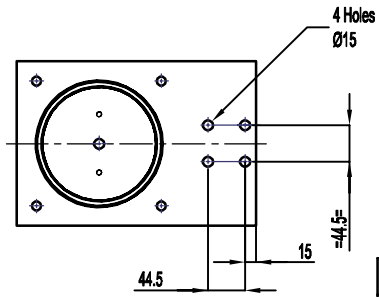


FOUNDATION BOLT DETAILS





Sectional View
Foundation Plinth details



Thickness= 12mm
Aa-Terminal plate details

Revision A.017	EC No.		Responsible INABB	Title GENERAL ARRANGEMENT DRAWING	Scale 1:30
	Location	Date	Name	Subtitle FOR OVB-VBF 36.20.32	Language EN
Drawn	IN-NAS	12/13/2017	Sagar.S		Format A3
Checked	IN-NAS	12/14/2017	B.Varade		
Approved	IN-NAS	12/14/2017	B.Varade		Sheet No. 1/1
ABB	ABB Switzerland Ltd Group Technology Management			Drawing No. 2REA044818A0001	

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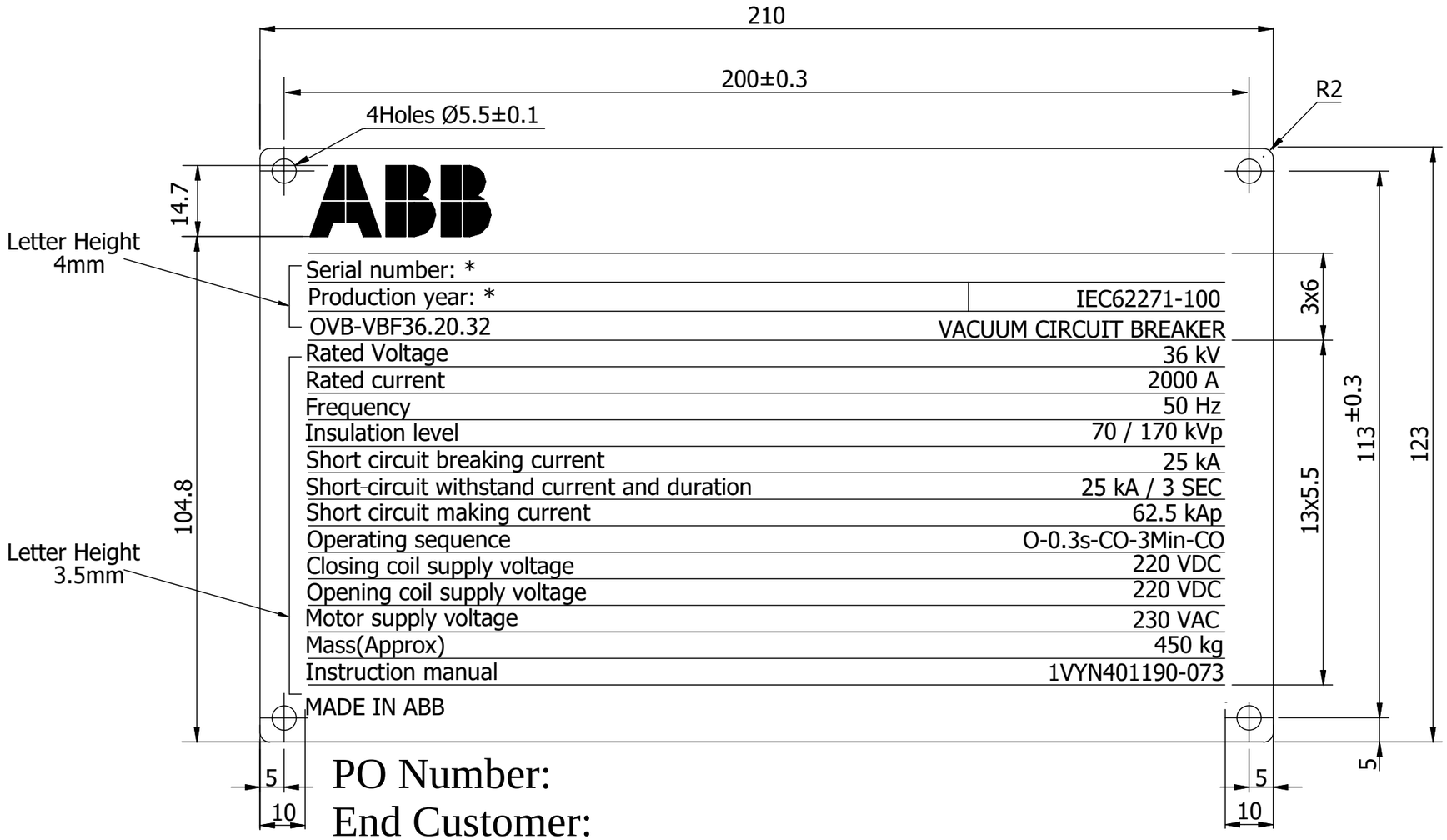

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Based on			Prepared	Date	Title	Order No	= H01
		Customer: APTRANSCO	Checked GN	Approved VR	OD BREAKER Rating Plate		+ LV
		Contractor / Contract No.	Project name		ABB India Ltd., Nashik, ELDS	Doc. No.	Lang.
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Parts list:

H01
OD BREAKER

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DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
23H SPACE HEATER	+LV3/4E	APT CONTROL	GCE0990162P0102	CABINET	APT CONTROLS & APPLIANCES PVT. LTD., Cubicle Space Heater, 100W, 230VAC +/-10%	1
DIS DOOR INTERLOCK SWITCH	+LV3/3D	SURAJ	1VYN452305-003	CABINET	Door Interlock Switch, Ratings:250 VAC,0.25A Range :Push to OFF,Screw Type Terminal	1
-EA1 ILUMINATION LAMP	+LV3/3E	REPUTED	1VYN434059-099	CABINET	MAKE: REPUTED 7 Watt LED Lamp with Clamp. HOLDER	1
52CC	+LV2/2C	Imax	1VYN401001-TG	EL MECHANISM	220 VDC/VAC CLOSING/TRIPPING COIL DOMESTIC -52CC	1
52TC1	+LV2/3C	POWERINST	1VCR007335G0003	EL MECHANISM	Instantaneous coil MB01 220V DC FOR DOMESTIC BREAKERS -52TC1	1
52TC2	+LV2/3C	POWERINST	1VCR005962G0003	EL MECHANISM	Instantaneous coil MB02 220V DC FOR DOMESTIC BREAKERS -52TC2	1

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Based on			Prepared	Date	Title: OD BREAKER Parts list
		Customer: APTRANSCO	Checked GN	Approved VR	Order No: = H01 + BOM
		Contractor / Contract No.	Project name		Doc. No.
Rev. Code	Date	Name			ABB India Ltd., Nashik, ELDS

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Parts list: H01
OD BREAKER

FOR EPC CONTRACTS ONLY

DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
M	+LV2/1C	WUXI	1VCR012079G0004	EL MECHANISM	230 VAC SPRING CHARGE MOTOR 200 WATT. -M	1
-QAB	+LV2/1B	ABB	2REA044865A0001	PLG	2REA044865A0001, OUTDOOR VACUUM CIRCUIT BREAKER TYPE : VBF NEW EL3	1
8AC MAIN AC	+LV3/2B	ABB	1SYS271112R0064	WIRING PLATE	MAKE:ABB ABB AC MCB SB201 M-C6 NA Aux Voltage : Suitable upto 400V AC 6A	1
8CC CLOSING CKT MCB	+LV4/2C	ABB	1SYS252067R0064	WIRING PLATE	MAKE:ABB ABB DC MCB SB202-C6DC ABB, S282UC K2, 6A, MCB 2 Pole,6A. Aux Voltage : Suitable upto 440V DC	1
-8IND IND CKT MCB	+LV6/2C	ABB	1SYS252067R0064	WIRING PLATE	MAKE:ABB ABB DC MCB SB202-C6DC ABB, S282UC K2, 6A, MCB 2 Pole,6A. Aux Voltage : Suitable upto 440V DC	1
-8TC1 TRIP CKT-1 MCB	+LV5/1C	ABB	1SYS252067R0064	WIRING PLATE	MAKE:ABB ABB DC MCB SB202-C6DC ABB, S282UC K2, 6A, MCB 2 Pole,6A. Aux Voltage : Suitable upto 440V DC	1

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Chief Engineer/Construction

Based on			Prepared	Date	Title	Order No	= H01
		Customer:	Checked GN	Approved VR	OD BREAKER Parts list		+ BOM
		APTRANSCO	Project name			Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS		Page 2
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Parts list: H01
OD BREAKER

FOR EPC CONTRACTS ONLY

DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
8TC2 TRIP CKT-2 MCB	+LV5/5C	ABB	1SYS252067R0064	WIRING PLATE	MAKE:ABB ABB DC MCB SB202-C6DC ABB, S282UC K2, 6A, MCB 2 Pole,6A. Aux Voltage : Suitable upto 440V DC	1
23 THERMOSTAT	+LV3/4D	APT CONTROL	IN76350001-2	WIRING PLATE	Thermostat,Setting:0-60 deg.centigrade.,15A,220 V 50 Hz	1
-52AX CB AUXILIARY CONTACT MULTIPLIER	+LV4/7E	ABB-PEENYA	1SVR405613R9000	WIRING PLATE	CR-M4SS With Base For Contacts:4C/O SR Plug-in Relay, Aux.Voltage:220V DC,	1
-52AX =	+LV4/7E	ABB-PEENYA	1VYN401056-009	WIRING PLATE	SOCKET,CR-M4SS,FOR-2/4-C/O,STD/SCREW 1SVR405651R3000 BASE FOR CR-M4SS RELAY ABB	1
-52AX =	+LV4/7E	ABB-PEENYA	1VYN401056-021	WIRING PLATE	Holding clamp for CRM relays CR-MH1 Metal holder for CR-M sockets 1SVR405659R1100 ABB	1
-52TNC TNC SELECTOR SWITCH	+LV8/2A	SHIRKE	SC32C0206UBS3P	WIRING PLATE	TNC Switch Configuration : 3 Pole 3 Position; 32A (3 Contacts to Close in each position) Mechanism - Spring Return to Neutral (45°+45°) Legent Plate Size - 75mm x 75mm. Position Lable - TRIP-NEUTRAL-CLOSE Handle - Pistol Grip Non-Lockable Catagory - AC21A : 690 VAC; AC23A : 440 VAC"	1

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		Contractor / Contract No.	Project name		ABB India Ltd., Nashik, ELDS	Doc. No.	Lang.
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Parts list: H01
OD BREAKER

FOR EPC CONTRACTS ONLY

DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
-88X CRM4(SCX) CB SPRING CHARGED MULTIPLIER	+LV4/8E	ABB-PEENYA	1SVR405613R9000	WIRING PLATE	CR-M4SS With Base For Contacts:4C/O SR Plug-in Relay, Aux.Voltage:220V DC,	1
-88X =	+LV4/8E	ABB-PEENYA	1VYN401056-009	WIRING PLATE	SOCKET,CR-M4SS,FOR-2/4-C/O,STD/SCREW 1SVR405651R3000 BASE FOR CR-M4SS RELAY ABB	1
-88X =	+LV4/8E	ABB-PEENYA	1VYN401056-021	WIRING PLATE	Holding clamp for CRM relays CR-MH1 Metal holder for CR-M sockets 1SVR405659R1100 ABB	1
-94 CRM4(94) ANTIPUMPING RELAY	+LV4/6E	ABB-PEENYA	1SVR405613R9000	WIRING PLATE	CR-M4SS With Base For Contacts:4C/O SR Plug-in Relay, Aux.Voltage:220V DC,	1
-94 =	+LV4/6E	ABB-PEENYA	1VYN401056-009	WIRING PLATE	SOCKET,CR-M4SS,FOR-2/4-C/O,STD/SCREW 1SVR405651R3000 BASE FOR CR-M4SS RELAY ABB	1
-94 =	+LV4/6E	ABB-PEENYA	1VYN401056-021	WIRING PLATE	Holding clamp for CRM relays CR-MH1 Metal holder for CR-M sockets 1SVR405659R1100 ABB	1

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Parts list: H01
OD BREAKER

FOR EPC CONTRACTS ONLY

DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
-LRSS L/R SELECTOR SWITCH	+LV8/5A	SHIRKE	SC32D0258UBA9L	WIRING PLATE	Type : Local Remote Switch Configuration : 4 Pole 2 Position; 32A (4 Contacts to Close in each position) Mechanism -Staput Type (90°) Legent Plate Size - 75mm x 75mm Position Lable - LOCAL-REMOTE Handle - Wing Type Lockable.	1
-PFB1 CB SPRING CHARGED	+LV6/4E	ABB	1SFA619402R5234	WIRING PLATE	CL-523B,LED indicating Lamp,Label:Blue color lens,Suitable for 230V AC	1
-PFG1 CB OPEN	+LV6/4E	ABB	1SFA619402R5202	WIRING PLATE	CL-520G,LED indicating Lamp,Label:Green color lens,Suitable for 220V DC	1
-PFR1 CB CLOSED	+LV6/3E	ABB	1SFA619402R5201	WIRING PLATE	CL-520R,LED indicating Lamp,Label:Red color lens,Suitable for 220V DC	1
-SFC6 TOGGLE SWITCH	+LV3/4C	SWITRON	1VYN452150-362	WIRING PLATE	MAKE:SWITRON, Toggle Switch,10A,240V AC.	1
-SFC7 =	+LV3/5C	SWITRON	1VYN452150-362	WIRING PLATE	MAKE:SWITRON, Toggle Switch,10A,240V AC.	1

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		Customer: APTRANSCO	Checked GN	Approved VR	OD BREAKER Parts list		+ BOM
		Contractor / Contract No.	Project name		ABB India Ltd., Nashik, ELDS	Doc. No.	Lang.
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Parts list: H01
OD BREAKER

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DEVICE TAG / FUNCTION	PAGE / POSITION	MANUFACTURER	MATERIAL ORDERING CODE	MOUNTING LOCATION	MATERIAL DESCRIPTION	Quantity
-XDS1 3 PIN AC POWER SOCKET	+LV3/5E	ABB	1SYN880422R0001	WIRING PLATE	SNWP3302 2 M Plate 3"X3" for 03 pin socket	1
-XDS1 =	+LV3/5E	ABB	1SYN880690R0001	WIRING PLATE	06A, 240VAC, 3-PIN SOCKET	1

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			Customer:	Checked GN	Approved VR	OD BREAKER		+ BOM
			APTRANSCO	Project name		Parts list	Doc. No.	Lang.
			Contractor / Contract No.			ABB India Ltd., Nashik, ELDS		Page 6
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TERMINALS

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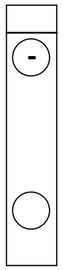
=H01
OD BREAKER

STRIP TAG	FIRST TERMINAL OF TERMINAL DIAGRAM	LAST TERMINAL OF TERMINAL DIAGRAM	TOTAL QTY.	TERMINAL FUNCTION
-X1	1	10	10	TRIP CKT-1
-X2	1	14	14	TRIP CKT 2
-X3	1	8	8	CLOSING CKT
-X4	1	2	2	IND. CKT
-X5	1	52	52	SPARE CONTACTS OF BREAKER, LR SWITCH, CTD & SPRING CHARGE
-X6	1	2	2	MAIN AC SUPPLY

NOTE:

DISCONNECTING TERMINAL BLOCK

TOP SIDE



BOTTOM SIDE

NON-DISCONNECTING TERMINAL BLOCK

TOP SIDE

BOTTOM SIDE

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Based on			Prepared	Date	Title		Order No	= H01
		Customer:	Checked GN	Approved VR	OD BREAKER			+ TBPLAN
		APTRANSCO	Project name		Terminal Strip Overview		Doc. No.	Lang.
		Contractor / Contract No.			ABB India Ltd., Nashik, ELDS			Page 1
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GUARANTEED TECHNICAL PARTICULARS FOR 33 kV VACUUM CIRCUIT BREAKERS

S. No	Description	33kV VCBs
1.	a) Maker's name country of manufacture. b) Manufacturer's type designation.	a) ABB India Ltd b) OVB-VBF
2.	Applicable Technical Standards	IEC 62271-100
3.	a) Rated voltage (kV) b) Rated Frequency (Hz)	a) 36 b) 50
4.	Number of Poles	03
5.	Class (Outdoor/Indoor)	Outdoor
6.	Rated normal current: a) Under site conditions (Amps) b) Rated (Amps)	a) 2000 b) 2000
7.	Rated short circuit breaking current: a) R.M.S. value of A.C. component of rated short circuit current (kA) b)Percentage DC component c) Asymmetrical breaking current (including DC component) d) Certificate or report no. e) Oscillogram no.	a) 25kA b), c), d) & e) Please refer type test report no. 2050-17
8.	Rated short circuit making current (kA)	62.5kA
9.	First Pole to clear factor	1.5
10.	Rated transient recovery voltage for terminal faults (kV peak)	As per relevant IEC
11.	Rated characteristics for short line faults.	As per IEC 62271-100
12.	Rated operating sequence .	O - 0.3 sec. - CO -3min. – CO
13.	Rated duration of short circuit (sec.)	3 sec
14.	Rated out of phase breaking current (kA)	As per relevant IES
15.	Opening time (ms)	< 65ms
16.	Arcing time (ms) a) At 10% rated breaking current b) At 25% rated breaking current c) At 50% rated breaking current d) At 100% rated breaking current e) Maximum Arcing time at lowest fault currents	 < 15ms < 15ms < 15ms < 15ms < 15ms
17.	Break time (ms) a) At 10% rated breaking current b) At 25% rated breaking current	 < 65ms < 65ms

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	c) At 50% rated breaking current d) At 100% rated breaking current e) Maximum break time at lowest fault current	< 65ms < 65ms < 65ms
18.	Closing time (ms)	< 85ms
19.	Maximum Pole discrepancy time: a) Opening (ms) b) Closing (ms)	 <5 <5
20.	Rated line charging breaking current (kA)	As per relevant IEC
21.	Maximum cable charging current a) On supply side b) On line side	 a) As per relevant IEC b) As per relevant IEC
22.	Rated small inductive breaking current (kA)	As per relevant IEC
23.	Max. rise of temperature over ambient temperature for current rating under clause 6.	As per relevant IEC
24.	Interrupting capacity based on duty cycle as per clause 11. a) AC Component (kA) b) Percentage D.C. Component	 a) As per relevant IEC b) As per relevant IEC
25.	Latching current (kA)	As per IEC 62271-100
26.	No of breaks in series per pole	One
27.	Length of contact travel (mm)	16-20.5 mm Approx.
28.	Total length of break per pole (mm)	24mm (max)
29.	Rate of contact travel : a) At tripping (meters/sec.) b) At closing (meters/sec.)	 a) 1.2-1.7 m/sec b) 0.8-1.6 m/sec
30.	Type of devices, if any, usd to obtain uniform voltage distribution between breaks	NA
31.	Recovery voltage distribution between breaks in percent of rated voltage: a) Single line to ground fault b) Interruption of short lines c) Switching off an unloaded Transformers	NA
32.	Type of main contact	Spiral Electrode butt. Type
33.	Type of arcing-contacts and/or arc control device	NA for VCB
34.	Material of contacts a) Main b) Arcing c) Auxiliary	Copper Chromium alloy
35.	Whether contacts are silver plated	NO
36.	Thickness of silver coating (mm)	NA
37.	Contact pressure (kg/sq. mm.)	3200 N (approx.)

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38.	Insulation level of the breaker : a) 1 minute power frequency withstand voltage (kV rms) b) Switching surge withstand test voltage (kV peak) c) Impulse withstand test voltage (kV peak) d) Max. dynamic p.f. over voltage withstand (kV peak)	a) 70KV rms b) Within IEC c) 170kV Peak d) Within IEC
39.	Minimum clearance in Air (mm) a) Between Phases (live parts) b) Between live parts and earth c) Centre to centre distance between phases d) The safety boundaries during a breaking operation for circuit breakers with an external exhaust for ionized gases or flames	As per enclosed GA
40	Whether the circuit breaker is suitable for fixed trip operation or trip free operation and whether it is provided with a lock-out device preventing closing of the breaker	Trip free
41.	Method of closing a) Normal b) Emergency	Spring charging motorised
42.	Type of closing mechanism	Spring Charged stored energy mechanism
43.	a) Normal voltage of closing b) Pick up range, (volts)	a) 220V DC b) 85-110%
44.	a) Normal voltage of closing b) Pick up range, (volts) a) Power at normal voltage of closing mechanism, (watts) b) Power at 85% of normal voltage, (watts)	a) As per req. b) 85-110% c) 300 Watt d) 300 Watt
45.	Type of tripping mechanism	Spring Charged stored energy mechanism
46.	Normal voltage of tripping coils, (volts)	220V DC
47.	a) Power at normal voltage for tripping coils, (watts) b) Power at 70% normal voltage for tripping coils, (watts)	a) 300 Watt b) 300 Watt
48.	Arc duration at 100% (ms) Interruption capacity: a) Opening Arcing time No. of loops and time including resistor current duration (cycle)	<15 ms NA

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	Resistor current duration, (cycle) Total length of the arc, (mm) Max. length of the arc, (mm) Total interrupting time measured from instant of trip coil energisation to arc extinction of resistor current (cycles). b) Closing time measured from instant of application of power to closing device upto arcing contacts touching, (cycles).	As per IEC 62271-100 <100 ms approx <120 ms approx
49.	Critical current (current giving the longest arc when a break takes place) (kA)	Not Applicable
50.	a) Recovery voltage when circuit breaker tested at 100% rated breaking capacity, (kV inst.) b) Rate of rise of re-striking voltage at breaking i) for 30% breaking capacity, (kV/Micro. sec.) ii) for 100% breaking capacity, (kV/Micro. sec.) c) Maximum over voltage factor of the circuit breaker when switching off. i) Unloaded transformers. ii) Loaded transformer iii) Open circuited lines	As per IEC 62271-100
51.	When switching of synchronous systems: a) Max. current (kA) b) Max. contacts of 1 pole (kV)	As per IEC 62271-100
52.	No. of openings the circuit breaker is capable of performing without inspection, replacement of contacts or other main parts. a) at 50% rated current b) at 100% rated current c) at current corresponding to 50% rated breaking capacity d) at current corresponding to 100% rated breaking capacity	 a) 10000 b) 10000 c) 100 d) 30
53.	a) Weight of complete circuit breaker (kg.) b) Impact loading for foundation design, to include deed load plus impact value on opening at maximum interrupting ratings, in terms of equivalent static load, (kg.) c) Overall dimensions: Height (mm) Width (mm)	a) 450kg (approx..) b) 14 KN c) As per enclosed GA drawing

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	Length (mm)	
54.	Porcelain: a) Make b) Type c) Descriptive pamphlet No. d) Weight (kg.) e) Transport dimensions, (mm) f) Height above floor, required to remove porcelain, (mm) g) Insulation class h) One minute dry power frequency withstand, kV (r.m.s.) i) 10 seconds wet power frequency withstand, kV (peak) j) Flash over voltage, (kV) k) Full wave impulse withstand voltage kV (peak) l) Switching surge withstand voltage kV (peak) m) Corona discharge voltage, (kV r.m.s.) n) Nature of the dielectric o) Creepage distance, total protected (mm) p) Volume of insulating medium per porcelain, (liters) q) Permissible safe cantilever loading on installed porcelain (kg.m.)	a) CJI/RCPL/PCPL/VM/IEC/WSI/EQ b) Porcelain/Hollow c) 1VYN301101-CH d) 32 Approx. e) As per enclosed GA f) 4500 Max. g) Class C h) 70 i) As per IEC j) 70 kVrms k) 170 kV peak l) Not Applicable m) Not Applicable n) Ceramic o) 900 mm Protected Creepage is as per relevant IEC p) 8.3 Ltr q) 7500 NM

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55.	Operating mechanism : a)Mechanically operated or pneumatically or hydraulically operated. b) For stored energy mechanism : 1. Spring charging motor i) Rating kW ii) Voltage V iii) Power frequency withstand voltage kV. iv) Time required for the motor to charge the spring fully (secs.) v) Power required at the normal control voltage to charge the spring - Watts. vi) Specification reference. 2.Spring closing/opening i) Number of springs ii) Type iii) Number of turns iv) Guage v) External diameter mm. vi) Stiffness vii) Material viii) Force developed in full charged position. ix) Specification reference.	a) Mechanically Operated b) Spring Stored Energy Mechanism i) 600 Watt (Approx.) ii) 230VAC iii) 2.5kV / 1 min iv) 15 Sec (max) v) 600 Watt (Approx.) vi) As per relevant IEC i) 1 No each ii) Spiral iii) As per manufacturer design iv) As per manufacturer design v) As per manufacturer design vi) As per manufacturer design vii) As per manufacturer design viii) As per manufacturer design ix) As per manufacturer design
56.	Pneumatic equipment for pneumatically operated breakers. a) Type b) Manufacturers type designation c) Air Compressor i) Type ii) Make iii) Capacity in	Not Applicable

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	liters/min. d) **Compressor motor:** i) HP rating ii) Rated voltage and frequency iii) Limits of voltage and frequency variation for satisfactory operation of compressor motor iv) No. of phases v) Speed (r.p.m.) vi) Temp. of insulation. vii) Class of insulation. **e)** Safety, valve opens on receiver kg/sq.cm. f) Compressor start at kg/sq.cm. g) Compressor stops at kg/sq.cm. h) Alarm switch on receiver closes at kg/sq.cm. i) Lockout switch on receiver operates at i) kg/sq.cm. for closing ii) kg/sq.cm. for opening iii) kg/sq.cm. for auto re-closure duty j) Time of air compressor to charge the reservoirs: i) From atmospheric to pressure indicated in (g) above, (minutes) ii) From pressure indicated in (g) above to that in (h) above (minutes)	
57.	Rated pressure of SF6 gas in the circuit breaker (kg/sq.cm)	Not Applicable
58.	Rated pressure of SF6 gas in the gas cylinders (kg./sq.cm.)	Not Applicable
59.	Quantity of SF6 gas required per single pole unit (kg.) (3 pole unit for 145 kV)	Not Applicable
60.	Quantity of SF6 gas per cylinder (kg.)	Not Applicable
61.	Weight of empty cylinder (kg.)	Not Applicable
62.	Quantity of absorbent required per pole (kg.)	Not Applicable
63.	Recommended interval for renewal of absorbent in case of outdoor circuit breakers operating in tropical conditions.	Not Applicable

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64.	Chemical composition of absorbent	Not Applicable
65.	Quantity of absorbent covered in the scope of supply (including spare quantity) (kg.)	Not Applicable
66.	Limits of gas pressure for pressure operation of circuit breaker (kg./sq.cm.)	Not Applicable
67.	Pressure and temperature at which the temperature compensated gas pressure switch a) alarm (kg./sq.cm., deg.C) b) Cut off (kg/sq.cm. deg.C)	Not Applicable
68.	Name of SF6 supplier and country of origin	Not Applicable
69.	Quantity of SF6 gas supplied for a) Actual use in breakers (kg.) b) As spare (kg.)	Not Applicable
70.	Chemical composition of gas: a) Qty. of air by weight (ppm) b)Qty. of H20 by weight (ppm) c)Qty. of CF4 by weight (ppm) d) Qty of free acid by weight (ppm)	Not Applicable
72.	No. of auxiliary contacts provided a) Those close when breaker is closed. b) Those open when breaker is closed. c) Those adjustable with respect to the position of main contacts. d) Continuous rating of contacts. e) Breaking capacity of contacts.	 a) 08 b) 08 c) NO d) 2A e) 10A
73.	Whether the equipment covered by this Bid have been fully type tested and if so, whether the copies of the type test cert. enclosed to the bid offer.	Yes

Name of the firm : M/s ABB India Ltd

Signature of Bidder :

Designation & Seal :

Date :

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