



# NORTH BIHAR POWER DISTRIBUTION CO. LTD.

[Office of Chief Engineer, Project-II]  
(Regd. Office: Vidvut Bhawan, Bailey Road, Patna)

CIN No: U40109BR2012SGC018920

Letter No: 515  
[File No: NB/P-II/RDSS/Purnea/Cabcon/104/2023]

Contact No: +91-9264437179

Dated: 8/9/23

E-mail: [cerdssnbpdc12@gmail.com](mailto:cerdssnbpdc12@gmail.com)

From,

**Pranav Kumar,**  
Chief Engineer (Projects-II)

To,

**M/S CABCON India Limited**  
1st Floor, The Terminus Building, BG-12, Action Area -1B,  
New Town, Kolkata-700156 Telephone/Fax numbers: 033 4036 5000  
Email: [project@cabconindia.com](mailto:project@cabconindia.com)

**Sub: - Approval of GTP & Drawings of 315 KVA Distribution Transformers of M/s Ardisons Associate, Mohali against NIT No: 33/PR/NBPDCL/2022 for Purnea Circle.**

- Ref:**
1. NIT No: 33/PR/NBPDCL/2022.
  2. This Office NOA No: NB/P-II/RDSS/Tender/25/2022-19 & 20 dated 06.03.2023.
  3. Director (Project) Letter No: 192 dated 31.08.2023
  4. Your Letter No: CIL/NBPDCL/RDSS/Purnea/23-24/236 dated 28.07.2023.

Dear Sir,

With reference to subject noted above, please find attached herewith the GTP & Drawing of 315 KVA Distribution Transformers of M/s Ardisons Associate, Mohali for Development of Distribution Infrastructure against NIT No: 33/PR/NBPDCL/2022 for Purnea Circle under RDSS Scheme. The materials list is as follows:

Sl. No	Name of Items	Name of Vendor
1	315 KVA Distribution Transformers	M/s Ardisons Associate, Mohali

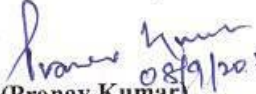
The Correction wherever required in GTP & Drawings submitted by the contractor has been done. However, these Drawings shall be subject to correctness as per technical specifications of the tender document and the entire responsibility of the correctness of the Drawing as per the specifications as well as supply of material according to the technical specifications of the contract agreement shall be that of the contractor .

In case of any conflict or contradiction between GTP/Drawing & Technical Specification, the decision of Chief Engineer (Project-II) shall be final and binding on both the parties. Contractor shall have to replace the material to the entire satisfaction of the owner in case the material is found unsuitable for use in the project at any stage.

Please carry out the works immediately under conditions stated above.

Encl: As above.

Yours faithfully,

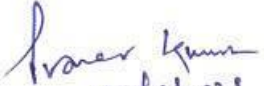
  
(Pranav Kumar) 08/9/23

Chief Engineer (Project-II)

Patna, dated 8/9/23

Memo No. 515

Copy forwarded to M/s NCC Limited, Hyderabad/M/s Vindhya Telelinks Limited, New Delhi/  
M/s Polycab limited, Mumbai/M/s Ashoka Buildcon Limited, Nashik/M/s Vaishno Associates Vidyut  
Projects LLP, Jaipur/M/s M/s JSP Projects Private Limited, Ghaziabad/M/s Techno Power Enterprises  
Private Limited, Kolkata for information.

  
(Pranav Kumar) 08/9/23

Chief Engineer (Project-II)

Patna, dated 8/9/23

Memo No. 515

Copy forwarded to Director (Projects)/OSD to MD, NBPDCCL for kind information.





(Pranav Kumar)

Chief Engineer (Project-II)



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		<b>CABCON INDIA LIMITED,</b> <span style="float: right;">1st</span> Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India	
Contract Title:-		Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022	
Name of Client		 NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-		M/s Ardisons Associates , A-21, Industrial Focal Point, Chanalon , Kurali, Punjab-140103	
N.O.A No :-		For Supply:-	NB/P-I/RDSS/Tender/25/2022 -19 dated 05.03.2023
		For Erection:-	NB/P-I/RDSS/Tender/25/2022 -20 dated 06.03.2023
DRG. TITLE :-		315 KVA , 11/0.433KV (LVLVE-1) ALU.WOUND DISTRIBUTION TRANSFORMER	
DRW NO :-		CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 01 to 14	
Drawn By		Checked By	Approved By
Bhaskar Behera		Er.D.P.Singh	
		REV :	✓
		DATE :	✓
		SHEET . NO.01	✓
Sl.No.	Particulars	Unit/Type	As Per Firm's Offer
1	Name of Manufacturer		Ardisons Associates, A-21, Industrial Focal Point, Chanalon, Kurali , Punjab-140103
2	Place of Manufacture		Ardisons Associates, A-21, Industrial Focal Point, Chanalon, Kurali , Punjab-140103
3	Transformer capacity	KVA	315
4	Voltage	11/0.433-.250KV	11/0.433-.250KV
5	No.of Phases	3 No./1 No.	3 No.
6	Vector group	Dyn-11	Dyn-11
7	Type of Cooling	ONAN	ONAN
8	Type of Transformer	Sealead/Unsealed	Unsealead
9	For 200KVA/500KVA transformers		
	a) No. of tap positions in HV winding		7 nos.
	b) Voltage Variation		+5% to-10% in step of 2.5%
10	Energy Efficiency Level	Level-1/Level-2	Level-1(As per amendment no.4)
11	Losses		
	i Core loss	Watts	
	a) at Normal Voltage	Watts	600 Watts
	b) at Maximum Voltage	Watts	1092 Watts
	ii Full Load losses at 75 deg.C	Watts	2500 Watts
	iii Total losse at 50% loading at 75 deg.C	Watts	1025 Watts
	iv Total losse at 100% loading at 75 deg.C	Watts	3100 Watts
12	Percentage Impedance at 75deg.C	%	4.5%(Tolerance as per IS)
13	Maximum temperature rise of		
	a) Windings by resistance method	40°C	45°C
	b) Oil by Thermometer	35°C	35°C
14	Clearances		
	(a.) Core and LV	mm	2.00
	(b.) LV and HV	mm	7.5
	(C.) HV Phase to Phase	mm	8
	(d.) End insulation clearance to earth	mm	20
	(e.) Any point of winding to tank	mm	25
	(f.) HV to earth creepage distance	mm	140
	(g.) L.V to earth creepage distance	mm	40
15	Efficiency at 75°C		
	(a.) Unity P.F		
	(1.) 125% Load	%	98.87
	(2.) 100% Load	%	99.02
	(3.) 75% Load	%	99.16
	(4.) 50% Load	%	99.23
	(5.) 25% Load	%	99.05
	(b.) 0.8 P.F		
	(1.) 125% Load	%	98.59
	(2.) 100% Load	%	98.78

CHECKED

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 Subject to the condition that you are not absolved of the responsibility of the correctness of materials.  
 Chief Engineer (Project-II) NBPDCL





	(3.) 75% Load	%	08.06
	(4.) 50% Load	%	99.04
	(5.) 25% Load	%	98.81
16	Regulation at.		
	(a.) Unity P.F.		0.86
	(b.) 0.8 P.F. at 75°C		3.34
17	CORE	CRGO/AMORPHOUS	CRGO
i	Core Grade	<b>CHECKED</b>	Prime CRGO Thickness 0.27mm or better grade (tolerance as per IS)
ii	Core diameter	mm	167.5 mm
iii	Gross Core area	Mtr <sup>2</sup>	0.021371 m <sup>2</sup>
iv	Net Core area	Mtr <sup>2</sup>	0.02072987 m <sup>2</sup>
v	Flux density	Wb/Mtr <sup>2</sup>	1.6 Wb/Mtr <sup>2</sup>
vii	Wt. of Core	kg	560 kg.
viii	Loss per kg. of core at the specified Flux density	Watts	0.75 watts
ix	Core window height	mm	590 mm
x	Center to centre distance of the core	mm	388 mm
xi	The nominal flux density at		
	a) 100% rated voltage	≤ 1.69 Wb/Mtr <sup>2</sup>	1.60 Tesla(max)
	b) 110% of rated voltage	≤ 1.9 Wb/Mtr <sup>2</sup>	1.80 Tesla
xii	% No load current of full load current at rated voltage and frequency on the secondary and increase of voltage by 112.5%		
	i) CRGO core : at 100% and 112.5% of rated voltage		
	a) Up to 200KVA Transformer	≤ 3% and ≤ 6%	
	b) Above 200KVA Transformer	≤ 2% and ≤ 5%	≤ 2% and ≤ 5%
	ii) Amorphous Core at 100% and 112.5% of rated Voltage		NA
	a) All Ratings	≤ 2% and ≤ 5%	
18	WINDINGS	Aluminium	
i	No. of L.V. Turns	No.	34
ii	No. of H.V. Turns	No.	1496 At normal Tap & 1570.8 At Tap no.1
iii	Size of LV Conductor bare/ covered	mm	Bare Strip (9.5x4.0)mm /Covered strip (9.75X4.25)
iv	Size of HV Conductor bare/ covered	mm	Bare strip (5.0 x 3.0)mm/Covered Strip (5.25 x 3.25)with DPC
v	No. of parallels	No.	12 NO. in LV & One No. in HV
vii	Resistance of HV winding at 20 deg.C	Ohm	3.185 Ohms
viii	Resistance of LV winding at 20 deg.C	Ohm	0.00172 Ohms
ix	Current density of LV winding	Amps/sq.mm	0.942 Amps/sq.mm
x	Current density of HV winding	Amps/sq.mm	0.660 Amps/sq.mm
xi	Wt. of the LV winding for Transformer	kg.	86 Kg.
xii	Wt. of the HV winding for Transformer	kg.	194 Kg.
xiii	No. of LV Coils/phase	No.	1No.
xiv	No. of HV Coils/phase	No.	4Nos.
xv	Height of LV Windings	mm	575mm
xvi	Height of HV Windings	mm	131 mm each coil
xvii	ID/OD of LV winding	mm	(172/242) mm
xviii	ID/OD of HV winding	mm	(259/376) mm
xix	Size of the duct in LV winding	mm	No duct
xx	Size of the duct in HV winding	mm	No duct
xxi	Size of the duct between HV& LV	mm	5.50 mm
xxii	Inter layer insulation provided in design for		
	1.) Top & bottom layer		10 mil craft paper in bottom layer & 3 mil Epoxy dotted Craft paper in top layer
	2.) In between all layer		3 mil Epox dotted craft paper
	3.) Details of end insulation		Insulating Sleeves
	4.) Whether wedges are provided at 50% turns of the HV coil		NA
xxiii	Insulation materials provided		
	a) for Conductors		
	1) HV		DPC
	2) LV		DPC

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 Chief Engineer (Project-II)





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B) For core		Heat resistant insulation
xxiv	Material and size of the wire used	
	1) HV a) SWG	No.
	b) Dia	mm
	2) LV a) Strip size	mm X mm
	b) No. of Conductors in parallel	No.
	c) Total area of cross section	sq.mm
19	Weight content of	
	a) Core lamination (min)	KG
	b) Winding (min) Aluminium	KG
	c) Tank & Fittings	KG
	d) Oil	KG
	e) Oil qty (min)	Litre
	f) Total Weight	KG
20	Oil Data	
	1. Qty for first filling (min)	Litre
	2. Grade of oil used	
	3. Maker's name	
	4. BDV at the time of filling	KV
21	Transformer	
	1) Overall length x breadth x height	mm X mm X mm
	2) Shape of Tank	
	3) Tank length x breadth x height	mm X mm X mm
	4) Thickness of plates for	
	a) Side plate (min)	mm
	b) Top & Bottom plate (min)	mm
	4) Conservator Dimensions	mm X mm
	5) Tank base channel dimensions	mm X mm X mm
22	HV Bushings & Terminals	
	1) Make of HV bushing	
	2) Rating in KV	KV
	3) Turret Height	mm
	4) Material of HV terminal	Brass/Copper
	5) Current Density of HV terminal	Amps/sq.mm
23	LV Bushings & Terminals	
	1) Make of LV bushing	
	2) Rating in KV	KV
	3) Turret Height	mm
	4) Material of LV terminal	Brass/Copper
	5) Current Density of LV terminal	Amps/sq.mm
24	Details of MCCB ( for transformers having rating upto 25KVA	
	Make	NA
	Rated thermal current	Amp.
	Current setting	Amp.
	Current setting	KA
	Minimum short circuit breaking current	NA
25	Radiation	
	1) Heat dissipation by tank walls exclusive top & bottom	Watts
	2) Heat dissipation by cooling tube	Watts
	3) Dia & thickness of cooling tube	ETR Length 890 mm, Nos. 44
	4) Whether calculation sheet for selecting cooling area to ensure that the transformer is capable of giving continuous rated output without exceeding temperature rise is enclosed.	Yes/No
26	Whether the name plate gives all particulars as required in Tender	Yes/No
27	Whether the transformer offered is already type tested for the design and test reports enclosed	Yes/No

**CHECKED**

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NBPDC



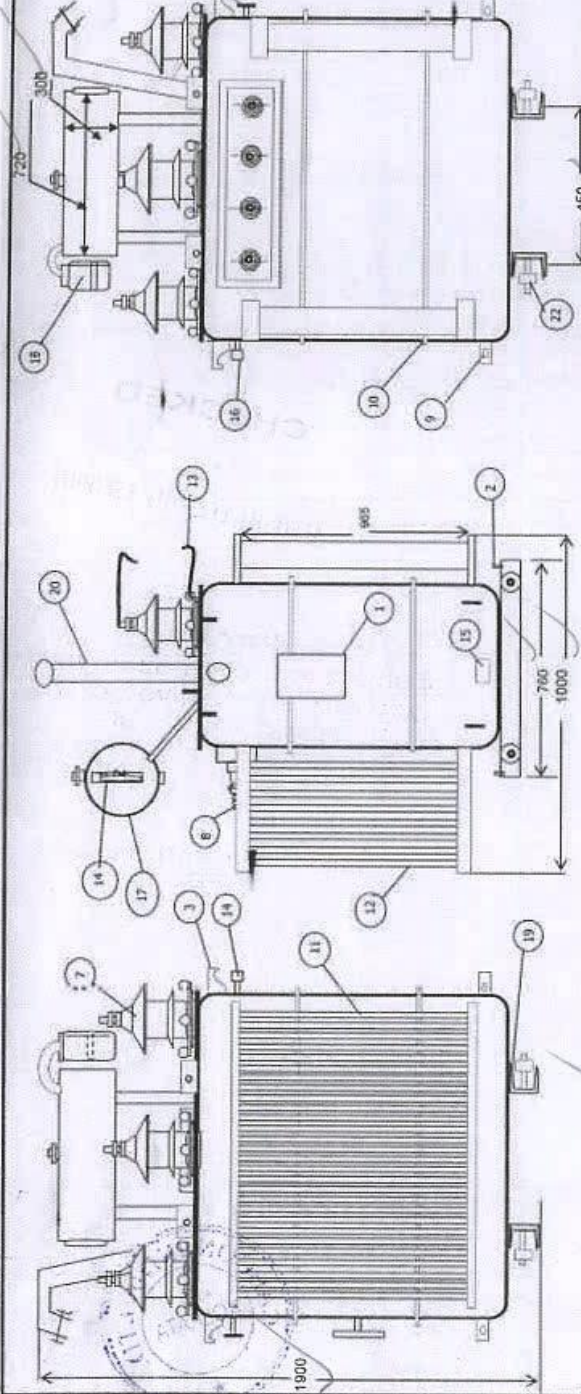


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*Praveer Kumar*  
 Chief Engineer (Project-II)  
 NBPDCL



NOTES:  
 1 ALL DIMENSIONS ARE IN MM  
 2 ± 1.0% tolerance in weight and dimensions

MIN ELECTRICAL CLEARANCE IN AIR

PHASE TO PHASE	HV	LV
235	140	40
75	140	40

TANK DIMENSIONS INSIDE

LENGTH OF STRAIGHT PORTION	1220
WIDTH OF STRAIGHT PORTION	490
Height of tank (Avg.) Slightly Slopping	1125
TOP & BOTTOM SIDES	6.0 mm
	4.0 mm

WEIGHT CHART

Core & Winding Assy. in kg	910
Tank & Fittings in kg	330
Weight of oil in kg	408
Total Weight in kg	1648
Volume of oil in Ltrs	500

ITEM NO.	DESCRIPTION	QTY.
23	Inspection Window	1
22	Uni-directional Rollers	4
21	2.5mm Dia Changer 1.5% to 10% of HV in steps of 2.5%	1
20	Explosion VENT	1
19	Raise Channels (100X50 mm)	2
18	Sarcogal Breather	1
17	Conservator with drain plug & oil filling hole	1
16	Top filter valve	1
15	Drain cum sampling valve	1
14	Oil level gauge	1
13	Arching horns on HT side	3
12	ETR (Length 800 mm x 8 Nos. in one row) on LV Side	2
11	ETR (Length 800 mm x 28 Nos. in one row) on HV Side	2
10	STEPPER	2
9	Pulling Luggs	4
8	LV OUTDOOR BUSHINGS	4
7	HV OUTDOOR BUSHINGS	3
6	AIR RELEASE DEVICE	1
5	THERMOMETER POCKET WITH CAP	1
4	LIFTING LUGGS FOR TOP COVER	2
3	LIFTING LUGGS FOR MAIN TANK	4
2	EARTHING TERMINAL WITH LUGGS	2
1	RATING & TERMINAL MARKING PLATE	1

CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India

NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21

GENERAL ASSEMBLY OF 315 KV, 11-433 KV EEL-1 (New)/Star-1(New), ISI Marked, Alu. Wound, Outdoor Type Distribution Transformer

NAME OF MANUFACTURER - M/s Ardisons Associates, A-21, Industrial Estate, Point, Chananon, Kurali, Punjab-140103

DRW NO :- CABINBPDCU/Purnea - Kathihar/ RDSS/ 2023-24/ 01

N.O.A No :- NBIP-II/RDSS/Tender/25/2022 -19 dated 06.03.2023

DATE: NBIP-II/RDSS/Tender/25/2022 -20 dated 06.03.2023

SHEET NO 01

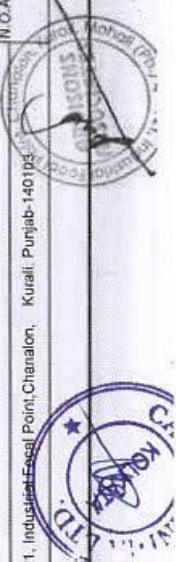
Contract Title: NBPDCL

DRG TITLE: Distribution Transformer

NAME OF MANUFACTURER: M/s Ardisons Associates, A-21, Industrial Estate, Point, Chananon, Kurali, Punjab-140103

Drawn By: Bhaskar Behara

Checked By: Er. D.P. Singh

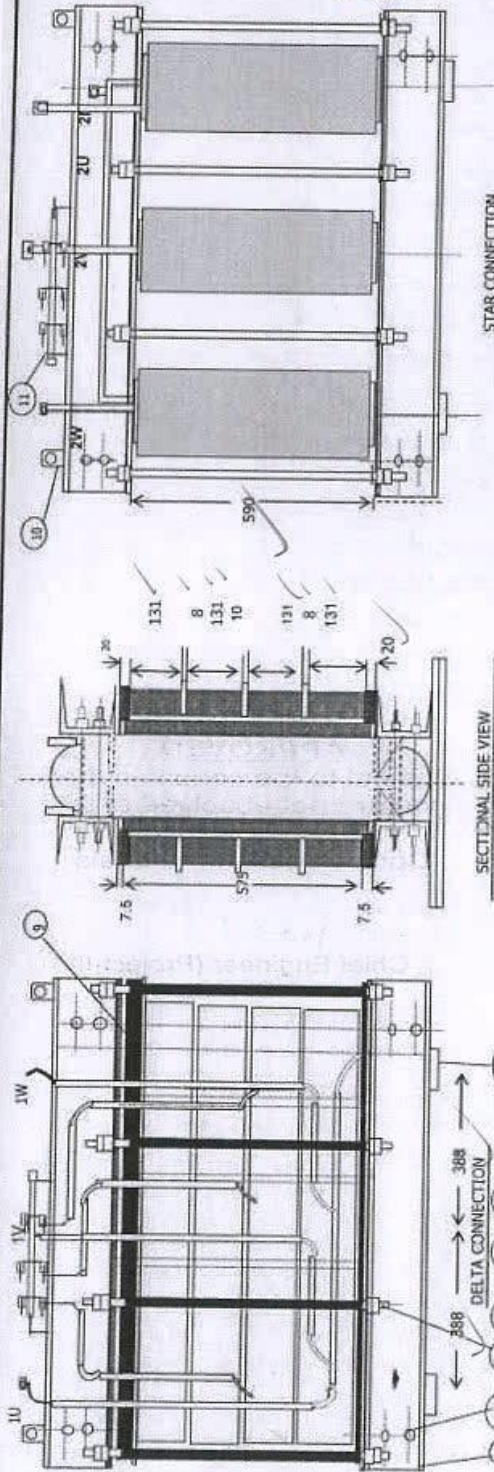




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Chief Engineer (Project-II)  
NBPDC



NOTES:  
1 ALL DIMENSION ARE IN MM.  
2 ±10 % tolerancien weight & Dimensions  
3 Conductor tolerance as per IS

SIZE OF CONDUCTOR (Aluminium)  
LV (9.50x4.0)mmx12 nos  
HV (5.0X3.0)mmx01 no.  
CORELING DPC  
DPC

ITEM NO.	DESCRIPTION	QTY.
11	TAP CHANGER	1
10	LIFTING LUGS	2
9	DELTA SUPPORT	1
8	M.S. FOOT plate	2
7	P.B.SPACERS BETWEEN/SECTION	10
6	P.B.SEPARATORS	2
5	LV/COIL/LIMB 1 NO.	3
4	HV COIL/LIMB 4 NOS	12
3	M.S.TIE ROD	8
2	M.S.CORE BOLT	8
1	M.S.CORE CHANNEL	4

<b>CABCON</b> CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-22, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Kathar Districts) of Bihar under Revamped Retoms-Based and Rasati-Linked, Distribution Sector Scheme against MIT No.: 33/PRINBPDC/2022	CAB/BNPDC/Purnea - Kathar/ RDSSI/ 2023-24/ C2	
	Drawn By Bhaskar Behere	Checked By Er.D.P. Singh
Contract Title: NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	DRW NO :-	REV : DATE : SHEET - NO.#2
Name of Client: NBIP-IJRDSSI/Tender/25/2022-19 dated 06.33.2023 NBIP-IJRDSSI/Tender/26/2022-20 dated 06.33.2023 CORE & COIL Assembly of 315 KVA, 11/433 Kv EEL-1 (New) /Sub-1 (New), ISI Marked, Alu. Wound, Outdoor Type Distribution Transformer	For Supply:- NBIP-IJRDSSI/Tender/25/2022-19 dated 06.33.2023	For Erection:- NBIP-IJRDSSI/Tender/26/2022-20 dated 06.33.2023
NAME OF MANUFACTURER :- M/s Ardison Associates, 3-21, Industrial Focal Point, Chanalon, Kurali, Punjab-140103	For Supply:- NBIP-IJRDSSI/Tender/25/2022-19 dated 06.33.2023	For Erection:- NBIP-IJRDSSI/Tender/26/2022-20 dated 06.33.2023
DRG. TITLE :- Type Distribution Transformer	For Supply:- NBIP-IJRDSSI/Tender/25/2022-19 dated 06.33.2023	For Erection:- NBIP-IJRDSSI/Tender/26/2022-20 dated 06.33.2023

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### DISTRIBUTION TRANSFORMER

ARDISONS ASSOCIATES

A-21, Industrial Area, Focal Point, Chanalon, Kurali

Email: admin@ardisons.com

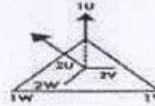
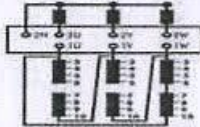
PH.8725063080

3		PHASE TRANSFORMER	ENERGY EFFICIENCY LEVEL (Amend. 4)	1
STANDARD	IS 1180(PART-1)2014		MAX.TOTAL LOSSES AT 50% RATED LOAD	W 1025
kVA	315		MAX.TOTAL LOSSES AT 100% RATED LOAD	W 3100
VOLTS AT NO LOAD	HV	11000	TYPE OF COOLING	ONAN
	LV	433		TEMP RISE
BIL	HV	75 kVp	WDG°C	45
	LV	3KV rms	MASS OF OIL	kg 408
AMPERES	HV	16.53	TOTAL MASS	kg 1648
	LV	420.00	VOL OF OIL	l 500
FREQUENCY	Hz	50.00	MONTH & YEAR OF MFG.	
VECTOR GROUP	Dyn 11		SERIAL NO	ARD/315/EEL-1/
IMPEDANCE VOLT %	4.5		Tapping 7-Position +5% to-10% in step of 2.5%	
DATE OF INSP.				
CUSTOMER				
ORDER NUMBER				
LOA NO.				
CONTRACTOR				
WARRANTY PERIOD				

MADE IN INDIA

**CHECKED**  
 ✓  
 ✓  
 ✓  
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OFF-CIRCUIT TAP CHANGER		HS LVMS VOLTAGE	
Switch Position	Connections	HV	LV
1	6 - 7	11550	433.0
2	7 - 8	11275	433.0
3	8 - 9	11000	433.0
4	9 - 10	10725	433.0
5	10 - 11	10450	433.0
6	11 - 12	10175	433.0
7	12 - 13	9900	433.0



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 Subject to the condition that you are not absolved of the responsibility of Correctness of materials



*Praveer Kumar*  
 Chief Engineer (Project-II)  
 NBPDC

<b>CABCON</b> Powering Generators	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDC/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED, Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates, A-21, Industrial Focal Point, Chanalon, Kurali, Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	RATING & TERMINAL MARKING PLATE of 315KVA, 11/0.433KV EEL-1(New)/Star-1(New), ALU.WOUND DISTRIBUTION TRANSFORMER		
DRW NO :-	CAB/NBPDC/Purnea - Katihar/RDSS/2023-24/ 03		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh	DATE :	
		SHEET . NO.03	





1322

	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chanaon, Kurali. Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	FLUX DENSITY & OVER FLUXING CALCULATION		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 04		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.04

Dia =167.5 mm ,W.H=590 mm ,Center to center =388 mm

	Lamination	Stack Thickness (mm)		Stack Area (mm <sup>2</sup> )
1	165	33.70	=	5560.50
2	155	32.00	=	4960.00
3	145	19.80	=	2871.00
4	135	15.00	=	2025.00
5	125	12.10	=	1512.50
6	115	10.10	=	1161.50
7	105	8.60	=	903.00
8	95	7.40	=	703.00
9	85	6.30	=	535.50
10	70	7.80	=	546.00
11	60	4.20	=	252.00
12	50	3.40	=	170.00
13	40	2.70	=	108.00
12	30	2.10	=	63.00
		<b>GROSS AREA</b>	=	<b>21371.00</b>

GROSS AREA = 21371.00 mm<sup>2</sup>  
NET AREA = GROSS AREA x S.F  
= 21371.00 \* 0.97  
= 20729.87 mm<sup>2</sup>  
NO.OF L.V.TURNS = 34  
FLUX DENSITY =  $250 \times 10^6 / 4.44 \times 50 \times 20729.87 \times 34$   
FLUX DENSITY AT 100% = 1.60 Tesla  
RATED VOLTAGE =  
FLUX DENSITY AT 112.50% = 1.80 Tesla  
OVER VOLTAGE =





**CHECKED**  
AEE(P-II) EEE(P-II) ESE(P-II)

**APPROVED**  
Subject to the condition that you are not absolved of the responsibility of Correctness of materials  
  
Chief Engineer (Project-II)  
NBPDCL





	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	Office of
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chanaion, Kurall. Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	315 KVA , Heat dissipation		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 05		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.05

KVA 315

Tank inside Dimensions

L = 1220 MM

B = 490 MM

H = 1125 MM

Length of Elliptical tube = 890 MM

= 0.890 MM ✓

No of tubes = 44 nos.

Total length of 44 tubes(0.890x44) = 39.16 Mtrs ✓

Heat dissipated by Tubes@55W/Mtr(39.16x55) = 2153.8 watts ✓

AREA OF TANK WALLS (1.220+0.490)X2X1.125 = 3.8475 M<sup>2</sup> ✓

Heat dissipation per m<sup>2</sup> of tank surface = 500 watts ✓

Heat dissipated by the tank wall 3.8475x500 = 1923.75 watts ✓

Heat dissipated by Tank and radiators (2153.8+1923.75) Watts = 4077.55 watts ✓

Total losses to be dissipated at 100% load & 75°C = 3100 watts ✓

Total Heat dissipated by Tank and radiators (4077.55 watts) >

3.8475 M<sup>2</sup> ✓

500 watts ✓

1923.75 watts ✓

4077.55 watts ✓

3100 watts ✓

Total losses to be dissipated at 100% load & 75°C

(3100 watts) ✓

**CHECKED**

AEE(P-II) EEE(P-II) ESE(P-II)

**APPROVED**  
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Correctness of materials

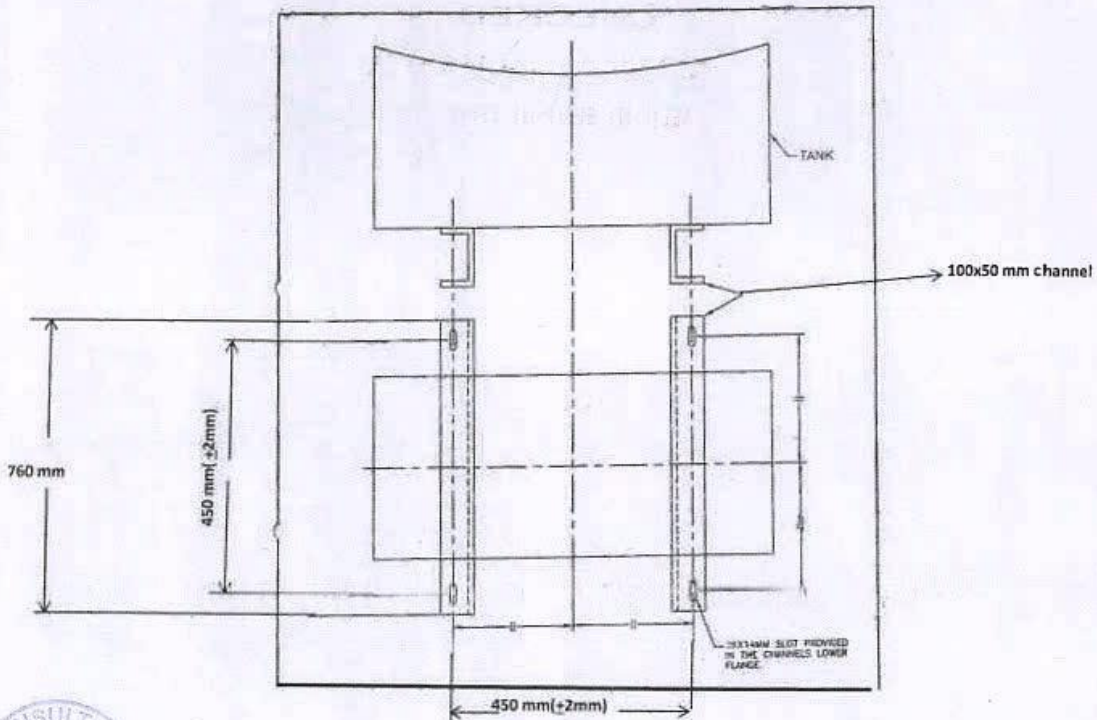
*Kumar Kumar*  
Chief Engineer (Project-II)





321

	Bajaj Electricals Limited		
Contract Title:-	Development of Distribution Infrastructure of Loss Reduction works at Sasaram Circle and Munger		
Name of Client	SOUTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Vidyut Bhawan, Bailey Road, Patna -21		
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chandalon, Kurali, Punjab-140103		
L.O.A No :-	: SB/P-II/RDSS/Sasaram/312/2022/145&146 dated 03.03.2023 : SB/P-II/RDSS/Munger/311/2022/147&148 dated 03.03.2023		
DRG. TITLE :-	Mounting Dimensions of Transformers for 315 KVA		
DRW NO :-	BEL/SBPDC/Sasaram -Munger/RDSS/2023-24/ 06		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.06





**CHECKED**  
✓  
✓  
✓  
AEE(P-I) ESE(P-II)

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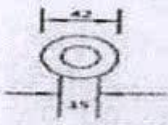
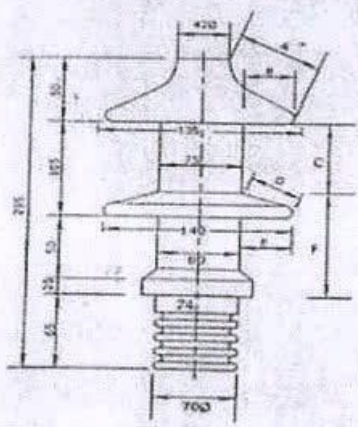
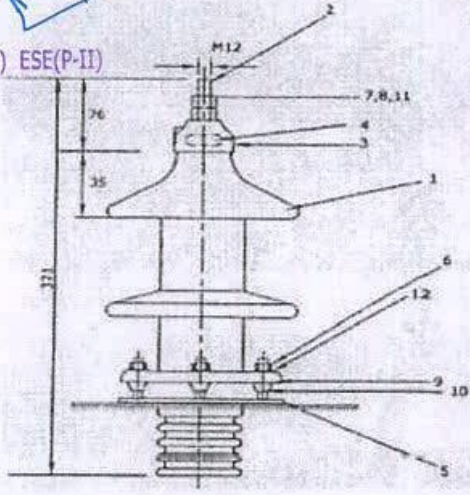
*[Signature]*  
Chief Engineer (Project-II)  
NBPDC





	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Balley Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point,Chanalon, Kurali, Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	17.50 kV /250 Amp BUSHING REF.IS :3347 PART-III (SEC.2), IS :2099		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 07		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.07

Note :- PERFORMANCE REQUIREMENT OF THE BUSHING SHALL CONFORM TO IS :2099  
MAKE :- ANY REPUTED FIRM

CHECKED

AEE(P-II) EEE(P-II) ESE(P-II)

ITEM NO.	DESCRIPTION	QTY.
1	INSULATOR 17.50KV/250AMP	1
2	STEM 12 MM DIA	1
3	CAP 50 MM DIA	1
4	SEALING WASHER FOR STEM	1
5	SEALING WASHER FOR GENERAL PURPOSE	1
6	HEXAGONAL NUT M10	4
7	HEXAGONAL NUT M17	3
8	PLAIN WASHER AM12	2
9	CLAMPING RING	3
10	CLAMPING MEMBER	4
11	SPRING WASHER R17	1
12	PLAIN WASHER AM10.	1

RATED RATING	17.50KV/250Amp.
STANDARD APPLICABLE IS	IS-3347(Part III)
ONE MINUTE DRY P.F. VOLTAGE WITH STAND	35KV(RMS)
ONE MINUTE WET P.F. VOLTAGE WITH STAND	35KV(RMS)
1.2/50 MICRO SEC. IMPULSE VOLTAGE WITH STAND	75KVP
TOTAL CREPAGE DISTANCE (AIR) 25MM/KV	300MM

HT Connector should suitable for RABBIT Conductor



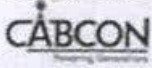

APPROVED

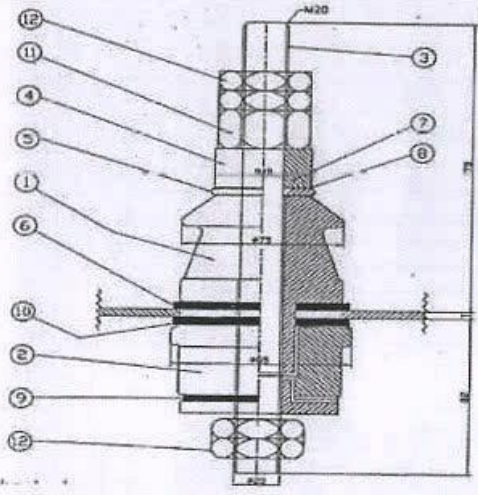
Subject to the condition that  
you are not absolved of the  
responsibility of the  
Correctness of materials

  
 Chief Engineer (Project-II)  
 NBPDCL



1320

	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chanalon, Kurali, Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	1.1KV /250 Amp BUSHING REF.IS :3347 PART-I(SEC.1&2), IS :7421		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 08		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SIICCT . NO.00



Sl.No	DESCRIPTION
12	HEX LOCK NUT
11	HEX NUT
10	GASKET-X
9	GASKET-R
8	SEALING WASHER ( TYPE-H)
7	SEALING WASHER (STEEL)
6	GENERAL PURPOSE WASHER
5	WASHER STEM
4	WASHER (TOP END)
3	STEM (M20) BRASS
2	INSULATOR BOTTOM
1	INSULATOR TOP

Sl.No	DESCRIPTION	VALUE
3	DRY AND WET POWER FREQUENCY WITHSTAND VOLTAGE	10 KV (rms)
2	RATED CURRENT	630 AMPS
1	RATED VOLTAGE	1 KV

ELECTRICAL CHARACTERISTICS

\*LT Bushing shall be suitable for 630 Amp as per IS 3347-1-2(1979) (Type Tested only)



**APPROVED**  
Subject to the condition that you are not absolved of the responsibility of the correctness of materials



*Pranav Kumar*  
Chief Engineer (Project-II)  
NBPDCL

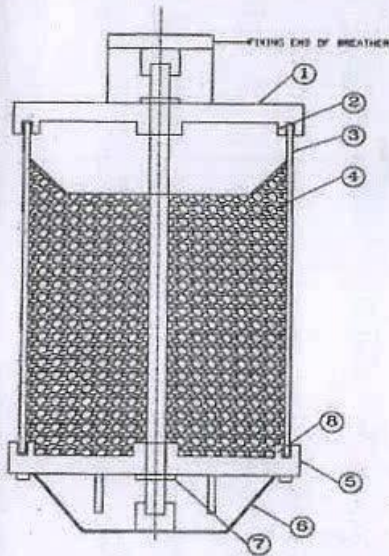


**CHECKED**  
AEE(P-II) EEE(P-II) ESE(P-II)





	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chanalon, Kurali. Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	Silicagel Breather - 1000 grm		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/09		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.09



LIST OF FITTINGS			
SL	DESCRIPTION	MATERIAL	QTY
1	TOP COVER	ALUMINIUM	1
2	GASKIT	NITRILE RUBBER	1
3	BREATHER BODY	ALUMINIUM	1
4	SILICAGEL	SILICAGEL	1
5	BOTTOM COVER	ALUMINIUM	1
6	OIL CAP	ALUMINIUM	1
7	LOCK NUT	MILD STEEL	1
8	BOTTOM GASKIT	NITRILE RUBBER	1

MAKE- BHARAT HETEL/ANUSHREE ELECTRICAL

- NOTE :
- 1- ALL DIMENSIONS, WEIGHTS & VOLUME ARE SUBJECT TO  $\pm 10\%$  TOLERANCE.
  - 2- ARRANGEMENT OF ACCESSORIES IS TENTATIVE
  - 3- ALL DIMENSIONS ARE IN MM

CHECKED

AEE(P-II) EEE(P-II) ESE(P-II)

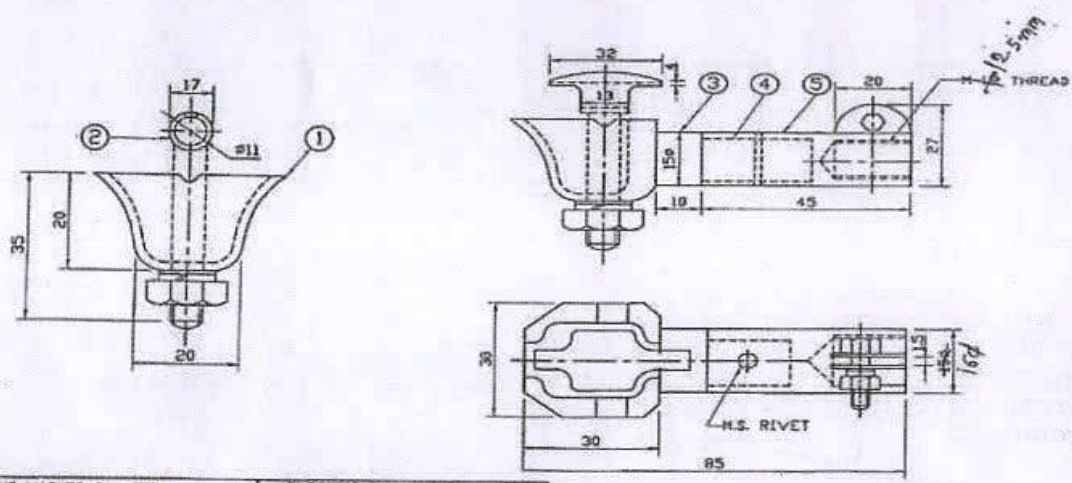


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responsibility of the  
Correctness of materials

*[Signature]*  
Chief Engineer (Project-II)  
NBPDCL



	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Chief Engineer, Project-II, Vidhyut Bhawan, Bailey Road, Patna-21	Office of
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point, Chanalon, Kurall. Punjab-140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	BMC FOR 11KV , 250AMP Bushing		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2022-23/ 10		
Drawn By	Checked By	Approved By	REV :
Bhaskar Behera	Er.D.P.Singh		DATE :
			SHEET . NO.10



SL	DESCRIPTION	MATERIAL	QTY.
10	SPRING WASHER 6 # STD.	ELECTRIC GALVANISED	1
9	PLAIN WASHER 6 # STD.	ELECTRIC GALVANISED	1
8	NUT M-6	ELECTRIC GALVANISED	1
7	BOLT M-6	ELECTRIC GALVANISED	1
6	SPRING WASHER # 10 STD.	ELECTRIC GALVANISED	1
5	PLAIN WASHER #10 STD.	ELECTRIC GALVANISED	1
4	NUT M-10	ELECTRIC GALVANISED	1
3	CONDUCTOR GRIP WITH ELECTRIC GALVANISED BOLT M-10	AL. ALLOY (A - II) (IS -617)	1
2	CONNECTOR BODY	AL. ALLOY (A - II) (IS -617)	1
1	MAIN BODY	BRONZE SEE NOTE - 4	1

NOTE :-  
 1- ALL SHARP EDGES TO BE ROUNDED OFF.  
 2- ITEM No.-3 IS USED TO GRIP THE CONDUCTOR IN HORIZONTAL & VERTICAL DIRECTION.  
 3- MATERIAL IS TO BE HIGH STRENGTH CORROSION RESISTANT BRONZE.  
 4- HIGH PRESSURE FIT JOINT BETWEEN AL.ALLOY AND BRONZE COMPONENTS OF THE CONNECTOR.



**APPROVED**  
 Subject to the condition that you are not absolved of the responsibility of Correctness of materials

*Praveer Kumar*  
 Chief Engineer (Project-II)  
 NBPDCL

**CHECKED**

AEE(P-II) EEE(P-II) ESE(P-II)







CABCON INDIA LIMITED,  
1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156,  
West Bengal, India

Contract Title:-

Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022

Name of Client



NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED  
Office of Chief Engineer, Project-II, Vidyt Bhawan, Bailey Road, Patna-21

NAME OF MANUFACTURER :-

M/s Ardisons Associates , A-21, Industrial Focal Point, Chalanon, Kurali. Punjab-140103

N.O.A No :-

For Supply:-

NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023

For Erection:-

NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023

DRG. TITLE :-

BMC LV FOR 1.1KV , 630 AMP Bushing

DRW NO :-

CAB/NBPDCL/Purnea - Katihar/RDSS/2022-23/ 11

Drawn By

Checked By

Approved By

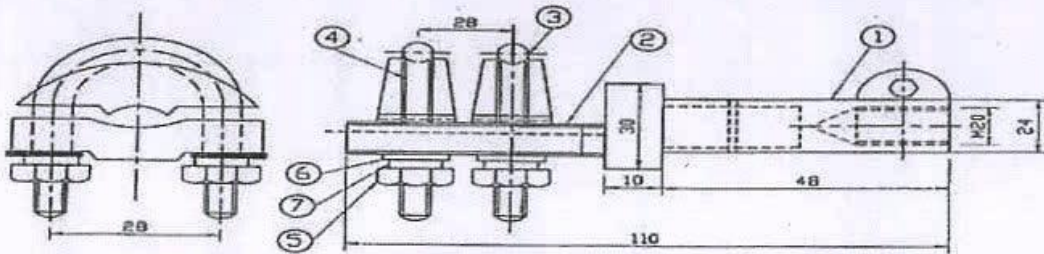
REV :

Bhaskar Behera

Er.D.P.Singh

DATE :

SHEET . NO.11



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responsibility of  
Correctness of materials

Chief Engineer (Project-II)  
NBPDCL

NOTE :-

- 1- ALL SHARP EDGES & CONERS TO BE REMOVED.
- 2- HIGH PRESSURE FIT JOINT BETWEEN AL. ALLOY AND BRONZE COMPONENT OF THE CONNECTOR.
- 3- MATERIAL IS TO BE HIGH STRENGTH CORROSION RESISTANT BRONZE.
- 4- FOR FASTNERS REFER IS 10367.
- 5- BIRMETALIC CONNECTOR must be available to supply conductor

SL	DESCRIPTION	MATERIAL	QTY.
10	SPRING WASHER 6 Ø STD.	ELECTRIC GALVANISED	1
9	PLAIN WASHER 6 Ø STD.	ELECTRIC GALVANISED	1
8	BOLT M-6 (F THD.)	ELECTRIC GALVANISED	1
7	SPRING WASHER 8 Ø STD.	ELECTRIC GALVANISED	4
6	PLAIN WASHER 8 Ø STD.	ELECTRIC GALVANISED	4
5	NUT M-8	ELECTRIC GALVANISED	4
4	'U' BOLT M-8	ELECTRIC GALVANISED	2
3	CONDUCTOR CLAMP	AL. ALLOY (A - 11)	2
2	CONNECTOR BODY	AL. ALLOY (A - 11)	1
1	MAIN BODY	BRASS	1
SL	DESCRIPTION	MATERIAL	QTY.





CHECKED

AEE(P-II) EEE(P-II) ESE(P-II)



1318

		CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India	
Contract Title:-		Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022	
Name of Client 		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-		M/s Ardisons Associates , A-21, Industrial Focal Point,Chanelon, Kurali, Punjab-140103	
N.O.A No :-		For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023
		For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023
DRG. TITLE :-		CALCULATION OF CURRENT DENSITY of 315 kVA, 11/433 kV , EEL-1(New)/Star-1(New) Alu.wound outdoor type distribution transformer.	
DRW NO :-		CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 12	
Drawn By	Checked By	Approved By	REV :
Bhaskar Behara	Er.D.P.Singh		DATE :
			SHEET . NO.12

**L.V. WINDING**

Size of L.T. Conductor	=	(9.5	x	4.0)	x	12
Area of L.T. Conductor	=	445.680		mm <sup>2</sup>		
L.T. Full load current per phase	=	420		Amp.		
Current density	=	Full load current				
	=	Area of conductor				
	=	420				
	=	445.680000				
	=	0.942		Amp./mm <sup>2</sup>		

**H.V. WINDING**

Size of H.T. Conductor	=	(5.0 x 3.0)	mm	x	1
Area of H.T. Conductor	=	14.450000	mm <sup>2</sup>		
H.T. Full load current per phase	=	16.53			
	=	$\sqrt{3}$			
	=	9.544	Amp.		
	=	Full load current			
	=	Area of conductor			
	=	9.5436			
	=	14.45000000			
	=	0.660	Amp./mm <sup>2</sup>		

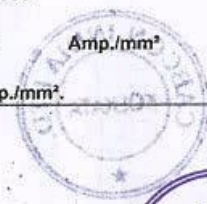
Which is less than maximum guaranteed value of 1.5 Amp./mm<sup>2</sup>.

**APPROVED**  
Subject to the condition that  
you are not absolved of the  
responsibility of  
Correctness of material



*[Signature]*  
Chief Engineer (Project-II)  
NBPDCL



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	CABCON INDIA LIMITED, 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022		
Name of Client		NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardsons Associates , A-21, Industrial Focal Point,Chanelon, Kurall, Punjab 140103		
N.O.A No :-	For Supply:-	NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:-	NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :	Oil Absorption Calculation		
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 13		
Drawn By	Checked By	Approved By	REV :
Bhasker Behera	Er.D.P.Singh		DATE :
			SHEET . NO.13

100 KVA		VOLTAGE RATIO=11000/433
Sr.no	Description	QTY.in Ltrs.
1	First filling of transformers oil quanti	500 Ltrs.
2	Total Insulation used in Transformer in kgs	15.0kg
3	Oil Absorption (in% of insulation in kgs average)	10%
4	Total Oil Absorption by insulation in kg	1.5kg
5	Oil soaked by winding (LT &HT) & core	25kg
6	Total Oil Absorption by insulation,winding& Core	26.50kg/32.0L trs
7	Total oil in Transformer after oil absorption by insulation,winding&Core	532 Ltrs



**CHECKED**



AEE(P-II) EEE(P-II) ESE(P-II)

**APPROVED**  
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you are not absolved of the  
responsibility of  
Correctness of materials

Chief Engineer (Project-II)  
NBPDCL

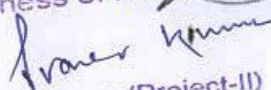


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 <b>CABCON INDIA LIMITED,</b> 1st Floor, The Terminus Building, BG-12, Action Area - 1b, New Town, Kolkata - 700156, West Bengal, India		
Contract Title:-	Development of Distribution Infrastructure at Purnea Electric Supply Circle (Purnea and Katihar Districts) of Bihar under Revamped Reforms-Based and Result-Linked, Distribution Sector Scheme against NIT No : 33/PR/NBPDCL/2022	
Name of Client	 <b>NORTH BIHAR POWER DISTRIBUTION COMPANY LIMITED</b> Office of Chief Engineer, Project-II, Vidyut Bhawan, Bailey Road, Patna-21	
NAME OF MANUFACTURER :-	M/s Ardisons Associates , A-21, Industrial Focal Point,Chanaon, Kurail. Punjab-140103	
N.O.A No :-	For Supply:- NB/P-II/RDSS/Tender/25/2022 -19 dated 06.03.2023	
	For Erection:- NB/P-II/RDSS/Tender/25/2022 -20 dated 06.03.2023	
DRG. TITLE :-	315 KVA Calculation for no load loss & no load current at 100 % voltage	
DRW NO :-	CAB/NBPDCL/Purnea - Katihar/RDSS/2023-24/ 14	
Drawn By	Checked By	
Bhaskar Behera	Er.D.P.Singh	
Approved By	REV :	
	DATE :	
	SHEET . NO.14	
Particulars		Design Figure
1	Weight of core	560.0 Kg
	Watt / Kg at 1.60 tesla (included building factor)	0.87 Watts / kg
	No load loss	487.2 watts
	Magnetising component of no load current (Im)	
	Phase Voltage	250.0 Volt
	Excting Power at 1.60 tesla (maxm.)	0.92 VA / kg
	Per phase Magnetising current	
	VA x core weight / 3 x phase voltage	$I_m$ 0.687 Amp
	Add 150 % Handling & building factor	$I_m + I_m \times 1.50$ 1.72 Amp
	2	Hystersis & Eddy current component of no load current (Lr)
No load loss / (3 x no load voltage)		$I_r$ 0.65 Amp
3	No load current at 100 % Voltage (Io)	$\sqrt{I_m^2 + I_r^2}$ 1.84 Amp
		< 2%
Calculation for no load & no current at 112.5% voltage		
Particulars		Design Figure
1	Weight of core	560.0 kgs
	Watt / Kg at 1.80 tesla (included building factor)	1.95 watt / kg
	No load loss	1092 watts
	Magnetising component of no load current (Im)	
	Phase Voltage	281.25 Volt
	Excting Power at 1.80 tesla (maxm.)	2.6 VA / kg
	Per phase Magnetising current	
	VA x core weight / 3 x phase voltage	$I_m$ 1.73 Amp
	Add 150 % Handling & building factor	$I_m + I_m \times 1.50$ 4.325 Amp
	2	Hystersis & Eddy current component of no load current (Lr)
No load loss / (3 x no load voltage)		$I_r$ 1.29 Amp
3	No load current at 112.5 % Voltage (Io)	$\sqrt{I_m^2 + I_r^2}$ 4.52 Amp
		< 5%




**APPROVED**

Subject to the condition that you are not absolved of the responsibility of Correctness of materials

  
 Chief Engineer (Project-II)  
 NBPDCL

**CHECKED**

  
 AEE(P-II), EEE(P-II) ESE(P-II)



All Painting to be carried out as per IS/TS

Notes :-

- 1) Transformers shall be suitable for loading as per IS: 6600
- 2) All fittings and accessories to be provided as per Technical specification
- 3) Bushing shall be as per relevant Indian standard
- 4) Arching horn to be provided within Bushings
- 5) CRGO shall be procured from PGCIL approved vendors only
- 6) Tapping shall be ~~provided~~ as per provision of IS: 1180 (Part-I) 2014

Audible sound level at rated voltage and frequency shall be  $< 56$  decibels.

Inside of tank shall be painted with varnish/hot oil resistant paint

LV and HV bushing shall be provided with suitable terminal connectors with eye bolts as per IS: 5082



**APPROVED**

Subject to the condition that you are not absolved of the responsibility of correctness of materials

*Praveer Kumar*

Chief Engineer (Projec.-II)  
NBPDCCL

**CHECKED**

*AE*  
AEE(P-II) EEE(P-II) ESE(P-II)

