

CONTENTS		Page
1	Scope	2
2	Standards	2
3	Site conditions	2
4	Main materials	3
4.1	Step down transformer	3
4.2	Surge arrestor	6
4.3	Cut out fuse	7
4.4	ABC cables	7
4.5	ACSR	7
4.6	Disc insulator	8
4.7	Pin insulator	8
4.8	Stay set	8
4.9	Earthing set	8
4.10	Others	9
5	Quantities	9

1. Scope :

This specification covers design, manufacture, factory testing and inspection, packing and shipping of three phase distribution pole mounted step down transformers complete 50KVA, Poles 11m, Poles 9m, Cut out fuses 11KV, Surge arrestors 12KV, ACSR wire 35mm², Disc insulator 11KV, Pin insulator 11KV And ABC cables with different cross sectional area and their accessories.

2. Standards:

Unless otherwise specified herein, construction, performance and testing of all equipments shall comply in all respects to requirements contained in IEC, BS standards specification or issue of this standards.

3. Site conditions:

All equipments shall be suitable to ensure satisfactory operation for the following altitude, climatic and atmospheric site conditions:

- Altitude: - From sea level up to 2300m will be subjected to
 - Lightning strokes.
- Ambient temperature: -5 up to 50C⁰.
- Wind pressure (Kg/m²): 80 -130.
- Relative humidity: 5 – 100%.
- Solar radiation: 1200W/m².
- Atmosphere: heavy salt and dust laden pollution in coastal areas, moderate sandstorm exposure and dust pollution in low to mid altitude and light to heavy dust pollution at high altitude.

4. Main Materials:

4.1 Step down transformer:

4.1.1 Type:

Step down distribution transformers, outdoor, double wound core type, ONAN cooling, oil immersed, Quantity (12).

4.1.2 Name plate:

Rating: 50KVA.

Voltage ratio at no load: 11/0.415KV.

No. of phases: 3 phase

Frequency: 50Hz.

Vector group: Dyn11

Taping: On H.V winding in step of $3x\pm 2.5\%$

Winding type: copper.

4.1.3 H.V termination:

Outdoor weatherproof bushings shall be provided within duplex earring horn and mounted on the tank side.

4.1.4 L.V termination:

Outdoor weatherproof bushings shall be fixed on the transformer tank side opposite to the H.V bushing.

4.1.5 Temperature rise:

The temperature rise shall not exceed the value stated in IEC76-2, BS.171 or the latest issue of this standard for $50C^0$ maximum ambient temperature.

4.1.6 Fittings:

The following fittings shall be supplied:

- Plain horizontal base.
- Earthing terminals.
- Silica gel breather.
- Rating and connecting plate.
- Oil level gauge.
- Pressure relief valve.

4.1.7 Information to be furnished:

The following minimum technical information shall be supplied with the tender:

- No. load losses.
- Full Load losses.
- Rating (KVA).
- No load voltage ratio.
- Temperature rises.
- Basic impulse level.
- Total weight including oil.
- Oil quantity.
- Dimensions (length, width and height.).
- General arrangement drawings.
- H.V and L.V bushing assembly drawings.

4.1.8 Factory Test certificates:

The factory test certificate of transformers shall be provided.

Technical Specifications for Mains Electrical Network Materials

4.1.9 Schedule technical data of transformer

no	Description	Unit	data
1	Manufacture/COUNTRY of Origin		
2	Applicable Standards		
3	Country of manufacture		
4	Manufactures Type Number		
5	Rated power output	KVA	
6	Number of phases		
7	Rated frequency	HZ	
8	Rated Primary voltage	KV	
9	Rated Secondary voltage	KV	
10	Rated primary current	A	
11	Rated secondary current	A	
12	Vector group		
13	Tapping type (off load) of primary winding	%	
14	Ambient temperature /altitude	C	
15	Temperature rise in : Winding Top oil Core	°C C C	
16	Type of cooling		
17	Sound level	dB	
18	Applied test voltage, 1min.50Hz Primary winding Secondary winding	KV KV	
19	Impulse test voltage full wave primary winding	KV	
20	No-load losses	KW	
21	Full Load losses	KW	
22	Impedance	%	
23	No-load current at primary	%	
24	Terminal bolt : - Material - Diameter, primary side - Diameter, secondary side	mm mm	
25	Material of winding : - High voltage - low voltage		
26	Mass : - Total mass - Mass of oil - Untanked mass	Kg Kg Kg	
27	Oil Capacity	liter	

4.2 Surge Arrestor:

4.2.1 Type:

Arrestor shall be outdoor, valve type, metal oxide or non linear resistor of polymer material suitable for operation in altitude up to 2500m on 50Hz.

4.2.2 Name plate:

Nominal system voltage: 11KV.

Maximum system voltage: 12KV.

Frequency: 50Hz.

Impulse withstand voltage of line insulation: 150KV

4.2.3 Accessories:

The following Accessories shall be supplied:

- Fixing bolts
- Earthing terminals.

4.2.4 Schedule technical data of surge arrestor:

no	Description	Unit	data
1	Manufacture/COUNTRY		
2	Applicable Standards		
3	Country of manufacture		
4	Manufactures Type Number (Model)		
5	Rated frequency	HZ	
6	Rated voltage	KV	
7	Maximum system voltage	KV	
8	Maximum discharge current capacity	KA	
9	Impulse voltage	KV	

4.3 Cut out fuse:

4.3.1 Type:

Is a combination of a fuse and a switch, used in primary overhead feeder lines and taps to protect distribution transformers from current surges and overloads. An over current caused by a fault in the transformer or customer circuit will cause the fuse to melt, disconnecting the transformer from the line. It can also be opened manually by utility linemen standing on the ground and using a long insulating stick called a hot stick.

4.3.2 Components:

- Cutout body.
- Fuse holder.
- Fuse link.

4.3.3 Rating:

Nominal voltage: 11KV.

Fuse link current: 5A.

Frequency: 50HZ.

4.4 ABC cables (Aerial bundle cable):

4.4.1 Type:

Aerial bundle cable shall be outdoor, 3 covering cables + 1 bare wire and all aluminum alloy conductors and must be numbered every meter length.

4.4.2 ratings:

Nominal system voltage: 1KV.

Cross sectional area: $3 \times 16 + 16 \text{mm}^2$, $3 \times 25 + 25 \text{mm}^2$, $3 \times 35 + 35 \text{mm}^2$.

Frequency: 50Hz.

4.5 ACSR wire:

Is a specific type of high-capacity, high-strength stranded cable typically used in overhead power lines, the outer strands are aluminum.

Cross sectional area: 35mm^2 .

4.6 Disc insulator:

Disc insulator shall be 11KV system voltage and contains:

- Disc insulator (2).
- Shackle anchor.
- Socket eye.
- End eye link.
- Tension clamp dead end for (35-50mm²).

4.7 Pin insulator:

Pin insulator shall be 11KV system voltage and contains:

- Pin insulator.
- Spindle.

4.8 Stay set:

Stay set shall be 11KV system voltage and contains:

- Stay rod (2200x20) mm.
- Stay wire steel high strength 35mm² (12m for each set).
- Preformed gauge grip dead end for 35mm².
- Stay plat (500x500x10) mm.
- Stay insulator 11KV.

4.9 Earthing set:

Earthing set shall be pure copper and contains:

- Earthing rod (120) cm.
- Earthing plate (500x500x3) mm.
- Wire copper 35mm² (30m for each one).
- Rod Copper gripper (hold the copper wire with rod).

Technical Specifications for Mains Electrical Network Materials

4.10 Others:

- Wooden pole medium 11m long.
- Wooden pole medium 9m long.
- Steel cross arm galvanized (2200x100x75x10) mm.
- Steel tie strap galvanized.
- Disconnector 200A with fuses (200A).
- Machine bolt with nut & washer steel galvanized (24x45) mm.
- Machine bolt with nut & washer steel galvanized (24x300/250) mm.

5. Quantities:

NO	SPECIFICATIONS	UNIT	QNT
1	(STEP – DOWN) TRANSFORMER 3PH 50KVA, 11/0.4 kV, 50Hz	NOS	12
2	CROSS ARM STEEL GLVANIZED (2200X100X75X10 mm)	NOS	80
3	TIE STRAP GALVANIZED	NOS	150
4	CUT OUT FUSE WITH FUSE LINK	NOS	36
5	SURGE ARRESTOR 11KV WITH FIXING TOOLS	NOS	36
6	EARTHING SET(PURE COPPER)	SET	24
7	ABC CABLE (3x16+16)mm ²	M	2000
8	ABC CABLE (3x25+25)mm ²	M	2000
9	ABC CABLE (3x35+35)mm ²	M	2000
10	DISCONNECTOR 200A WITH FUSES	NOS	12
11	WOODEN POLE MEDUIM 11M	NOS	50
12	WOODEN POLE MEDUIM 9M	NOS	20
13	COMPLETE STAY SET 11KV WITH WIRE 35mm	SET	30
14	ALUMINUM WIRE ACSR (35)mm ²	M	10000
15	PIN INSULATOR 11KV	NOS	100
16	DISC INSULATOR 11KV	SET	60
17	MACHINE BOLT 24x45 mm	NOS	200
18	MACHINE BOLT 24x300 mm	NOS	150