

**BILL OF QUANTITY(BOQ) FOR ELECTRICAL WORKS FOR 11 KV SUB STATION AT LOCAL HEAD OFFICE LUCKNOW
TRANSFORMER, VCB PANEL AND CABLING WORKS**

S. No.	Item Description	Unit	Qty	Rate	Amount
	VACUUM CIRCUIT BREAKER AND TRANSFORMERS				
	(A)- VACCUM CIRCUIT BREAKER				
1	800A, 11KV26.3kA HT Vacuum Circuit Breaker(VCB) Panel				
	HT SECTION:				
	Supply, Design, Testing, Transportation, Installation and Commissioning of 11kV 800Amps 26.3kA HT VCB Panel (1Incomer + 2Outgoing) with Al Bus Bar consisting of following components :				
A	HT SWITCHGEAR Rating:				
	11KV 800A, 26.3KA Truck mounted Horizontal Isolation & Horizontal Drawout type Vacuum Circuit Breaker Incomer : 800A- 01 Nos. Outgoing : 800A: 02 nos. consisting of (D) One number direct module for incoming cable and Vacuum Circuit Breakers in SF6 insulated robotically welded non ferrite non magnetic stainless steel enclosure of thickness 2.5mm having IP67 with series trip, Self powered microprocessor based numerical over current and Earth Fault (IDMT+Inst.) relay protection. Interconnection between HT switchgear and transformer shall be using 1C x 3 x 240 sq.mm Al armorured XLPE HT Cable.(Make: Schneider/ABB/Crompton/CG Power/Seimens/LK/GE)				
B	Fabricated Housing :				
B1	Housing with Al 800A Interconnections Incomer : 800A- 01 Nos. Outgoing : 800A: 02 nos.				
B2	800A Al Bus Bar with 11KV Grade Slewing (Extension for future 4th VCB) Incomer : 800A- 01 Nos. Outgoing : 800A: 02 nos.				
B	CT & PT DETAILS :				
B1	DUAL CORE CT CTR : 150/5/5A Core 1 : Class 1, BURDEN 15 VA Core 2 : Class 5P10, BURDEN 15 VA (CT need to be >50 A) CT Position shall be in Cable Chamber of Panel Incomer : 03 Sets Outgoing : 06 Sets				
B5	3 No. Single Phase Potential Transformer (To be mounted at the rear end of the Panel and position will be above breaker position) Ratio : 11KV/rt3/110V/rt3 Class 1, BURDEN - VA Material - Cast Resin type Incomer : 01 Sets Outgoing : 00 Set				
C	BREAKER PANEL INDICATION LAMPS :				
C1	Breaker On / Off / Trip / Spring Charge (As required) Incomer : 05 Sets Outgoing : 10 Sets				
C2	R-Ph. / Y-Ph. / B-Ph Incomer : 03 Sets Outgoing : 00 Sets				
D	SWITCHES AND OTHER ACCESSORIES :				
D1	DC ON/OFF Switch Incomer : 01 Sets Outgoing : 02 Sets				
D2	AC ON/OFF Switch Incomer : 01 Sets Outgoing : 02 Sets				
D3	Local Remote Switch Incomer : 01 Sets Outgoing : 02 Sets				
D4	T-N-C Switch Incomer : 01 Sets Outgoing : 02 Sets				
D5	15A, 230V, 3 pin plug plug & socket Incomer : 01 Sets Outgoing : 02 Sets				
D6	Mech. ON-OFF push button Incomer : 01 Sets Outgoing : 02 Sets				
D7	Heater with heater switch & thermostat Incomer : 01 Sets Outgoing : 02 Sets				
D8	Cubicle illumination lamp Incomer : 01 Sets Outgoing : 02 Sets				
E	METERS :				
E1	MFM EM6400 Incomer : 01 Sets Outgoing : 02 Sets				
E3	Ammeter with Selector Switch Incomer : 01 Sets Outgoing : 02 Sets				
E4	Voltmeter with Selector Switch Incomer : 01 Sets Outgoing : Sets				
F	RELAYS :				
F1	Numerical Non -Directional 3 Over Current/ 1 Earth Fault Protection- P1F1 Incomer : 01 Sets Outgoing : 02 Sets				
F1	Trip Ckt Supervision Part of Main Numerical Relay				
F2	Antipumping Incomer : 01 Sets Outgoing : 02 Sets				
F3	Master Trip Part of Main Numerical Relay				
F4	Auxillary Relay for Trafo Fault (VAA33 or Equiv.) Incomer : Sets Outgoing : 02 Sets				
F5	Power Pack Incomer : 01 Sets Outgoing : 00 Sets				
F6	8 Window Annunciator with Hooter Incomer : 01 Sets Outgoing : 00 Sets				
	Relay shall be with communication port				
	Protection CT shall be 40/1A 2.5VA 5P10.				
	Mechanical ON-OFF-TRIP mimic diagram				

S. No.	Item Description	Unit	Qty	Rate	Amount
	Fault Passage Indicator				
	Manometer				
	Terminal Protectors (BOOTS)				
	Operating Handle				
	Incoming and Outgoing modules of the RMU shall be suitable for 3C x 400 sq.mm HT 11 KV Cable termination Incoming Cable termination kits shall be in Purchaser Scope				
	Sub Total(A)- Supply, Design, in house Testing of 11kV 800Amps 26.3kA HT VCB Panel (1Incomer + 2Outgoing) as Described as Above.	SET	1		
2	(B)- TRANSFORMERS				
	Supply, Installation, Testing and Commissioning of 1000 KVA 11/0.433 KV Delta-Star DYn11 COPPER Wound (HV and LV), ONAN Oil immersed type transformer with On Load Tap change(OLTC) tap links of range +5% to - 15% @ 2.5% each. In steps of 2.5% each total 8 steps. Class of Insulation: A, Temperature Rise: 98 Deg. C, Losses (As per ECBC 2017) (Subjected to IS Tol.). Minimum 3 Star rated. (Make: Schneider/ABB/Crompton/CG Power/Seimens/LK/GE/BHEL)				
	1. Type of Cooling : ONAN				
	2. Class of insulation Class A				
	3. No of phase and rated frequency : 3, 50 Hz				
	4. Winding				
	a) HV Copper				
	b) LV Copper				
	5. Insulation level (Impulse withstand)(kVpeak)				
	a) HV 75				
	b) LV				
	6. Insulation level (power frequency withstand) (kVrms)				
	a) HV 28				
	b) LV 3				
	7. Tapping				
	a) Range +5% to -15% @ 2.5% Each				
	b) No of Steps 8				
	c) On HV yes				
	d) Tap changer type OLTC				
	8. Temperature rise of oil/winding over design ambient temperature of 50°C : 40/45(°C)				
	9. Hot spot temperature rise over a maximum yearly weighted : 98 °C				
	10. Short circuit Thermal withstand time (secs) : 2				
	11. % Impedance at 75°C , rated current & Frequency % (subject to IS tol) : 5				
	12. Total losses @ 50% Load at rated voltage & frequency kW (MAX) : 2.79				
	13. Total losses @ 100% Load at rated voltage & frequency kW (MAX) : 7.7				
	14. Bushings : HV				
	a) Reference standard : IS 2099 & IS 3349				
	b) Type of bushing : Porcelain				
	c) Voltage Rating (kV) : 17.5				
	d) Current Rating Amps : 250				
	15. Bushings : LV & LVN				
	a) Reference standard				
	b) Type of bushing : Epoxy				
	c) Voltage Rating (kV) : 1				
	d) Current Rating Amps : 2000				
	16. Weight in Kgs (Approximate)				
	a) Core and winding : 2350				
	b) Tank & Fittings : 1800				
	c) Oil : 1200				
	d) Total weight : 5350				
	17. Approximate Overall dimension (in mm)				
	a) Overall Length : 3300				
	b) Overall breadth : 3100				
	c) Overall Height : 2500				
	18. Approximate Weight of Heaviest package (KG) : 4100				
	19. Approximate transport dimensions LxBxH (mm) : 3300 X2000 X 1800				
	20. Fitting & Accessories as per specification Yes, IS : 2026 & CBIP				
	21. Reference standard : IS 1180 & IS:2028				
	22. Termination				
	a) HV Cable Box : (1 Run / Ph)				
	b) LV Cable Box : (4 Run / Phase) B2B				
	c) Orientation : 182 Degree				
	Sub Total (B) :11/0.433 KV, 1000 KVA ONAN Type Transformer Described as Above.	SET	2		

S. No.	Item Description	Unit	Qty	Rate	Amount
	(C) - HT Cabling				
3	11 KV END TERMINATION:				
	Supplying and making indoor cable end termination with heat shrinkable jointing kit complete with all accessories including lugs suitable for following size of 3 core, XLPE aluminium conductor cable of 11 KV grade as required :				
3.1	3C x 240 Sqmm, 11KV XLPE	SET	6		
4	11 KV H.T. CABLE:				
	Supply of 11 KV grade aluminium conductor, cross linked polyethylene (XLPE) insulated individual core screened, flat steel/strip armoured PVC sheathed cable complete as required.				
4.1	3C x 240 Sqmm, 11 KV XLPE	M	80		
5	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 11 KV grade of following size in existing trench including excavation and dismantling of existing cable, protective covering and refilling with repair the trench etc as required.				
5.1	Above 120 sq. mm and upto 400 sq. mm	Mtr	80		
	Sub Total (C) HT Cabling				
	(D) -LT Cabling				
6	DISTRIBUTION CABLE:				
	SUPPLY AND LAYING OF LT CABLE:				
	Supply of following sizes of 1.1KV grade aluminium conductor XLPE insulated and FRLS PVC sheathed armoured cable conforming to relevant IS. (Cable shall be purchased only after approval of cable schedule by Engineer In charge/ architect / consultant).				
6.1	3.5 core, 400 sq.mm.	Mtr	320		
7	Laying of one number PVC insulated and PVC sheathed / XLPE power cable of 1.1 KV grade of following size direct in ground including excavation and refilling the trench etc as required, sand cushioning, dismantling and safe keeping of existing cable, protective covering and refilling with repair the trench etc as required				
7.1	Above 185 sq. mm and upto 400 sq. mm	Mtr	320		
8	Supplying and making end termination with brass compression gland and aluminium lugs for following size of PVC insulated and PVC sheathed / XLPE aluminium conductor cable of 1.1 KV grade as required.				
8.1	3½ X 400 sq. mm	Set	16		
	Sub Total (D) LT Cabling				
	(E)- Earthing and other works				
9	Earthing with G.I. plate 600mmx600mmx6mm thick, top of the plate placed at least 3 mt. below ground level with 20 mm Class-B, G.I. pipe for watering, as per IS 3043, with 32x6 mm GI earthing strip in 50mm B class GI pipe from plate to masonry inspection pit, with salt and charcoal and providing 12 mm diax 80mm long GI bolt, nut and double washers for connecting earth lead including restoring the surface duly rammed as per specification with 300 mmX300mmX300mm(inside) finished masonry chamber with 8 mm thick MS sheet hinged,lockable cover and MS frame on top of chamber.	Nos.	4		
10	Earthing with copper plate 600mmx600mmx3mm thick, top of the plate placed at least 3M below ground level with 20 mm Class-B, G.I. pipe for watering as per IS 3043-1987 with 32x6 mm Cu earthing strip in 40 mm B class GI pipe from plate to masonry inspection pit, with salt and charcoal including passivated 2 mm diax80 mm long brass bolt, nut and double washers for connecting earth lead including restoring the surface duly rammed as per specification with 300 mmX300mmX300mm(inside) finished masonry chamber with 8 mm thick MS sheet hinged,lockable cover and MS frame on top of chamber.	Nos.	4		

S. No.	Item Description	Unit	Qty	Rate	Amount
11	Providing and fixing earth bus of 40 mm X 6 mm copper strip on surface or underground as required for connections etc. as required.	Mtr	70		
12	Providing and fixing 40 mm X 6 mm G.I. strip on surface or in recess or underground as required for connections etc. as required.	Mtr	120		
13	Dismanteling, shifting at suitable place in same premises and safekeeping of existing 02 nos. 1000KVA 11/0.433 KV old transformer and Oil Circuit Breaker(OCB) (1 Incoming and 02 Outgoing)	L.S.	1		
14	Charges for liaisoning with power supply and other statutory authorities like Directorate of electrical Safety for obtaining necessary clearances/ approvals including preparation of drawings, filling up norms, follow-up on behalf of Employer etc. in connection with the subject installation and getting power supply shut down and restoration from UPPCL.	L.S.	1		
	Sub Total (E)- Earthing and other works				
	GRAND TOTAL (A+B+C+D+E)				
	GST.....@.....%				
	Total amount including GST				
					Including GST

Note: Rates are considered inclusive of all including GST. However, break up to be submitted and bill is to be raised showing GST at prevalent rates/ rules.