TECHNICAL PARAMETERS FOR 22KV EQUIPMENTS

22KV SYSTEM PARAMETERS: -

1. Major Technical Parameters

The major technical parameters of the equipment are given below. For other parameters and features respective technical sections should be referred.

2. LT Transformer

Technical requirement of 800kVA, 22/0.433kV LT Transformer is as below:

S. N.	Description	Unit	Parameters
1	Rated Capacity	kVA	800
2	Rated Voltage		
a)	HV	kV	22
b)	LV	kV	0.433
3	Standard		IS 1180 & IS 2026
4	Type of Winding		Two Winding
5	Service		Outdoor
6	No of Phases	No.	Three
7	Frequency	Hz	50
8	Type of Cooling		ONAN
9	Impedance at 75 Deg C	%	5
10	Tolerance on Impedance	%	±10
11	Duty		Continuous
12	Overload		IS 6600
13	Max. Temp. Rise over an ambient of 50 Deg C		
a)	Oil (Temperature rise measurement by thermometer)	^{O}C	40
b)	Winding Temperature rise measurement by resistance method)	^{O}C	45
14	Windings		
a)	System Apparent Short circuit level (kA)		As per IS 2026-Part 1

TECHNICAL PARAMETERS FOR 22KV EQUIPMENTS

S. N.	Description	Unit	Parameters
b)	Winding Connection		
(i)	HV		Delta
(ii)	LV		Star
15	Vector Group		Dyn1
16	Insulation		Uniform
17	Insulation Level	kVrms	
a)	Power Frequency Test Level		
(i)	HV	kVrms	70
(ii)	LV	kVrms	2
18	Basic Impulse Level		
(i)	HV	kVp	170
(ii)	LV	kVp	-
19	Highest voltage (kV) for each winding	kV	24
20	Method of earthing		Solidly earthed
21	Tap changer		
a)	(i) Tap Change		+2.5% to -5% in step of 2.5% on HV side
b)	(ii) Tap control		Off Circuit Tap Change Switch
22	HV Bushing		
a)	Rated Voltage	kV	36
b)	Rated current	A	100
c)	Basic Impulse Level (kVp)	kVp	170
d)	Wet & Dry Power frequency Withstand Voltage	kVrms	70/77
e)	Min. Total Creepage Distance	mm	1116
f)	Mounting		Tank / Transformer Body
23	LV & Neutral Bushing		

TECHNICAL PARAMETERS FOR 22KV EQUIPMENTS

S. N.	Description	Unit	Parameters
a)	Rated Voltage	kV	1
b)	Rated current	A	2000
c)	Wet & Dry Power frequency Withstand Voltage	kVrms	5
d)	Mounting		Tank / Transformer Body
24	Terminal Details		
a)	HV		Suitable for 22kV Cable or Over Head Conductor
b)	LV & Neutral		Cable Box
25	Min. Clearance in Air and cable box		
a)	Ph-Ph (HV/LV)	mm	As per IS: 1180 & IS 2026-3
b)	Ph-Earth (HV/LV)	mm	As per IS: 1180 & IS 2026-3
26	Rated Short Circuit Current	kA	25kA for 3 Second
26	Guaranteed Losses	**kW**	The total losses (no-load + load losses at 75°C) at 50 percent of rated load and total losses at 100 percent of rated load shall not exceed the maximum total loss values given in IS 1180. Energy Efficiency Level 2

Note:

For other parameters and features respective technical sections should be referred.

3. Technical Parameters of 22kV Isolator, 50Hz, 3 Phase

(a)	Type	Outdoor (Double Break) mechanically ganged
(b)	Temperature rise over design ambient temperature	As per Table-14 of IEC-62271-1
(c)	Rated mechanical terminal load	As per Table 4 of IEC-62271-102
(d)	Number of terminals in control cabinet (Interpole cabling shall be Supplied by contractor)	All contacts and control circuits are to be wired upto control cabinet plus 24 terminals exclusively for Owner's use.

(e)	Rated current at design ambient temperature	400 Amps(as applicable).
(f)	Rated short time withstand current of isolator and earthswitch	25 kA for 3 Sec
(g)	Rated dynamic short circuit withstand current of isolator and earth switch	62.5kAp
(h)	Operating mechanism for Isolator	Motorised
(i)	No. of auxiliary contacts on each isolator	Beside requirement of this spec, 5 NO + 5 NC contacts, wired to terminal block exclusively for Owner's use in future.
(j)	Interlock	Pad locking of operating handle for preventive unauthorized operation
(k)	Terminal connector	To suit site Terminal connector conditions and layout requirements
(l)	Construction details	All ferrous parts to be galvanized except nuts and bolts which shall be electroplated as per relevant IS

The porcelain of the 22 kV insulators shall have minimum cantilever strength of 450 kgs

4. <u>Technical parameters for 18 kV Surge Arresters (with Porcelain /Polymer Housing)</u>

Sl. No.	Description	Unit	18kV SA
1	Nominal System Operating voltage	kV, rms	22kV
2	Rated frequency	Hz	50
3	No. of Poles	No.	1

TECHNICAL PARAMETERS FOR 22KV EQUIPMENTS

4	Design ambient temperature	°C	50
5	Rated arrester voltage	kV	18
6	Continuous operating voltage at 50 deg.C	kVrms	15
7	Nominal discharge current	kA	10 kA of 8/20 microsecond wave
8	Discharge current at which insulation co- ordination will be done	kA	10 kA of 8/20 microsecond
9	Rated thermal energy rating Wth	kJ/kV of rated arrester voltage	4
10	Repetitive charge transfer rating Qrs in coulombs	C	1
11	Max. switching surge residual voltage	kVp	44.8 (at 0.5kA)
12	Max. residual voltage at		
i)	5kA	kVp	52
ii)	10 kA nominal discharge current	kVp	56
iii)	20 kA nominal discharge current	kVp	--
iv)	Steep fronted wave residual voltage at 10 kA	kVp	--
13	Arrester designation		Station Low duty (SL)
14	High current short duration test value(4/10 micro second wave)	kArms	100
15	Current for pressure relief test	kAp	25
16	Low current long duration test value		As per IEC
17	Insulation Level		
a)	Full wave impulse withstand voltage (1.2/50 microsec.)		
i)	Arrester Housing	kVpeak	As per latest IEC:60099-4/IS 15086 part 4
b)	One minute power frequency		
i)	Arrester Housing	kV rms	As per latest IEC:60099-4/IS 15086 part 4

18	Minimum Creepage distance	mm/kV	31
19	Cantilever Strength (for 1 minute withstand test)	kg	150
20	Maximum deflection at above cantilever load	mm	**20**

5. 22kV Bus Post Insulators.

a)	Type	Solid Core
b)	Voltage class (kV)	24
c)	Dry and wet one minute power frequency withstand voltage (kV rms)	50
d)	Dry lightning impulse withstand Voltage (kVp)	±125
e)	Total minimum cantilever strength (Kg)	450
f)	Minimum torsional moment	As per IEC-273
g)	Total height of insulator (mm)	As per requirement
h)	Pollution level as per IEC-815	Heavy (III)
i)	Minimum creepage distance for Heavy Pollution (mm)	744

6. <u>Technical parameters for 22kV Horn gap fuse</u>

Sl. No.	**Description**	**HG Fuse**
1	Rated Voltage	22kV
2	Maximum Continuous voltage	24kV
3	Rated Current	50 Amps (min)
4	Lighting Impulse voltage withstand	125 KV (Between Live and earth) 145 KV (Across open terminals)

TECHNICAL PARAMETERS FOR 22KV EQUIPMENTS

5	One minute Power frequency voltage withstand (Dry and Wet)	50 KV (Between Live and earth) 60 KV (Across open terminals)
6	Minimum Creepage distance	744mm