

**CH- E-24 – GTP CONTENT Phase-II R**

<b>GTP No</b>	<b>Name of Items</b>
1	33kV VCB (Indoor)
2	11kV VCB (Indoor)
3	33kV VCB (Outdoor)
4	11kV CT
5	33kV CT
6	33kV Insulator (B &S)
7	11kV Insulator (B &S)
8	LT Distribution Box
9	POWER TRF
10	STATION TRF 100 kVA
11	Transformer oil
12	33kv HG fuse
13	11kv HG fuse
14	33kv Isolator
15	11kV Isolator
16	33KV AB SWITCH
17	11KV AB SWITCH
18	PSC Pole
19	100sqmm AAAC
20	148sqmm AAAC
21	33kv Pin Insulator
22	11kv Pin Insulator
23	33 kV Surge arrester
24	11kv Surge arrester
25	Numerical relay
26	33kV IVT
27	11 kV IVT
28	33kV & 11kV V cross arm
29	RS joist
30	HT STAY SET
31	Stay Wire
32	Tension Clamp
33	Suspension Clamp
34	Back Clamp
35	F Clamp
36	Flexible Cu bond
37	Earthing Pipe
38	Earthing Coil

**CH- E-24 – GTP CONTENT Phase-II R**

39	33 kV Single core for line
40	33 kV Single core for sub station
41	33 kV Three core for station transformer
42	11 kV Three core for line
43	11 kV Three core for sub station
44	LT 3 half-core
45	LT 4-CORE
46	LT 2-CORE
47	ACSR Zebra

**GTP NO -1 Guaranteed Technical Particulars of 33 KV VCB (Indoor)**

<b>Sl. No</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50° C		
i)	For Bus-bar of Circuit Breaker	800A	
ii)	For Interrupter	630A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25 kA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kV	

ii)	Impulse withstand voltage to earth with 1.2/50psec, wave of +ve and —ve polarity (Peak)	170KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	48 V DC/230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Minimum creepage distance (mm)	900 mm	
19	Total break time in MS		
(a)	At 10% rated interrupting capacity	<80ms	
( b)	At rated interrupting current	<80ms	
20	Arcing Time	<15ms	
21	Make time	<100ms	
22	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
23	Minimum dead time for 3 phase closing	300ms	
24	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	

25	one time dry power frequency withstand test voltage between terminal with breaker contacts open	80kv	
26	Type of main contacts		
27	Type of Aux. Contacts		
28	Materials of auxilliary contacts	Copper Alloy	
29	Voltage distribution between breaker		
30	Type of device if any ,used to limit the rate of rise or restriking voltage	Nil	
31	Voltage grading device if any used	Nil	
32	Number of auxiliary contacts provided		
	i) those closed when breaker is closed	6	
	ii) those open when breaker is closed	6	
33	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii) Closing	Spring charged due to closing both manual and motorized Spring operated	
34	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
35	Nos of terminal connetor	6	
36	Short circuit type test certificate furnished		
37	Circuit breaker weight		

**GTP NO-2 Guaranteed Technical Particulars of 11kV Circuit Breaker(Indoor)**

<b>Sl. No</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	11 kV	
5	Highest system voltage	12kV	
6	Rated normal current at 50°C		
i)	For Bus-bar of Circuit Breaker	1250A	
ii)	For Interrupter	630A	
7	Rated short circuit breaking current (rms)	25kA	
8	Rated short circuit making current (peak)	62.5kA	
9	Rated short time current withstand capability for 3 sec.	25kA	

10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	28kV	
ii)	Impulse withstand voltage to earth with 1.2/50 $\mu$ sec, wave of +ve and —ve polarity (Peak)	75KV	
11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min- CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48 V D.C	

**GTP NO - 3 Guaranteed Technical Particulars of 33 KV VCB (Outdoor)**

<b>Sl. No</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Make		
2	Service type	Indoor	
3	No. of Poles	3	
4	Nominal system voltage	33KV	
5	Highest system voltage	36KV	
6	Rated normal current at 50°C		
i)	For Interrupter	1250A	
7	Rated short circuit breaking current (rms)	25KA	
8	Rated short circuit making current (peak)	62.5KA	
9	Rated short time current withstand capability for 3 sec.	25KA	
10	Rated insulation level:		
i)	One minute power frequency withstand voltage to earth (wet and dry) rms	70kv	
ii)	Impulse withstand voltage to earth with 1.2/50psec, wave of +ve and —ve polarity (Peak)	170KV	

11	First — pole — to clear factor	1.5	
12	Rated operating sequence (for auto reclosing)	0-0.3 Sec- CO-3 min-CO	
13	Maximum break time	3 cycles	
14	Rated out of phase breaking current	25% of the symmetrical short circuit breaking current	
15	Maximum pole scatter	10 mili seconds	
16	Rated Auxiliary supply for spring charge motor, lamp & heater circuit.	230V A.C	
17	Rated supply voltage for trip/close coil	48V D.C	
18	Minimum creepage distance (mm)	900 mm	
19	Minimum protected creepage distance (mm)	As Per IS	
20	Total break time in MS		
21	At 10% rated interrupting capacity	<80ms	
21 a	At rated interrupting current	<80ms	
21 b	Arcing Time	<15ms	
22	Make time	<100ms	

23	Minimum reclosing time at full rated interrupted MVA from the instant of Trip coil energisation	300ms	
24	Minimum dead time for 3 phase closing	300ms	
25	one time dry power frequency withstand test voltage between line terminal and ground objects	70kv	
26	onemin dry power frequency withstand test voltage between terminal with breaker contacts open	80kV	
27	Type of main contacts		
28	Type of Aux. Contacts		
29	Materials of auxilliary contacts	Copper Alloy	
30	Voltage distribution between breaker		
31	Type of device if any ,used to limit the rate of rise or restriking voltage	Nil	
32	Voltage grading device if any used	Nil	
33	Number of auxiliary contacts provided		

	i) those closed when breaker is closed	6	
	i) those open when breaker is closed	6	
34	Type of operating mechanism		
	i) Opening	Spring charged due to closing both manual and motorized Spring operated	
	ii) Closing	Spring charged due to closing both manual and motorized Spring operated	
35	Frequency at which contacts are to be replaced	After 100 full short circuit operations	
36	Nos of terminal connetor	6	
37	Short circuit type test certificate furnished		
38	Circuit breaker weight		
39	Minimum clearance in air		
	i) Between phases	>480mm	

	ii)Live parts to earth	>320mm	
	iii) Live parts to ground level	>3700mm	
	iv)Between Live parts & ground object	>320mm	
40	Bushing of insulators		
	i) Type of bushing	Porcelain	
	ii)Dry 1 min power frequency withstand test voltage	70kV	
	iii) Dry flash over value	>75kV	
	iv) Wet flashover value	>75kV	
	v) 1.2/50 impulse withstand	170KVp	
	vi) Creepage distance	900 mm	
	vii) Puncture value of bushing	>75kV	
	viii)Weight of bushing	<45kG	



**GTP NO - 4 GUARANTEED TECHNICAL PARTICULARS FOR 11KV CURRENT TRANSFORMERS**

Sl. No.	Name of the Particulars	Desired Value				Bidder's Offer			
1	Make								
2	Type of CT Installation	Single phase, dead tank, oil-filled Poly Crate hermetically sealed outdoor, self-cooled.							
3	Type of mounting	Pedestal type							
4	Suitable for system frequency	50 HZ (- 5% to +3%)							
5	Rated Voltage (KV rms)	11							
6	Nominal System Voltage (KV rms)	11							
7	Highest System Voltage (KV rms)	12							
8	Current Ratio (A/A)	400-200 -100/1-1-1 A							
9	Core details	Core 1		Core 2		Core 3			
		Desired value	Bidder's offer	Desired value	Bidder's offer	Desired value	Bidder's offer		
a	Accuracy class	0.2		PS		PS			
b	Rated burden	15VA		---		---			
c	Knee point voltage (Vk)	---		> 500 V		> 500 V			
d	Resistance of Secondary Winding, corrected to 75 deg C			<10Ω		<10Ω			
e	Maximum Exciting current at $V_k/2$			<30mA		<30mA			

f	Instrument security factor	5				
10	Rated Continuous Thermal Current (A)	120% of rated primary current				
11	Acceptable limit of temperature rise above 50°C ambient temperature for continuous operation at rated continuous thermal current					
	(a) Winding	40°C				
	(b)	35°C				
	(c) External surface of the core, metallic parts in contact with or adjacent to, insulation.	40°C				
12	1.2/50 micro second lightning impulse withstand voltage (kVP) (dry)	75				
13	1 Minute dry power frequency withstand voltage primary (kV rms)	28				
14	1 Minute dry power frequency withstand voltage secondary (KV rms)	3				
15	Minimum creepage distance of porcelain Housing (mm)	350				
16	Rated short time withstand current for 3 second duration at all ratios (KA rms)	25				
	Instrument security factor at all ratios for metering core	Not more than 5.0				
17	Maximum rated short time thermal current density of the primary winding copper conductor (A/mm <sup>2</sup> ) at all ratios	92				

18	Type of Core	Torroidal type	
19	Seismic acceleration	0.15g (Vertical)	
		0.3g (Horizontal)	
20	Accuracy class of standard C.T to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	
21	Method of earthing the system where the current transformers will be installed	Effectively earthed	

## GTP NO -5 GUARANTEED TECHNICAL PARTICULARS FOR 33 KV CURRENT TRANSFORMERS

Sl. No.	Name of the Particulars	Desired Value				Bidder's Offer	
1	Make						
2	Type of CT/Installation.	Single phase, dead tank, oil filled, hermetically sealed, outdoor, self-cooled					
3	Type of mounting.	Pedestal type					
4	Suitable for system frequency.	50 HZ (+ 5 % to -3%)					
5	Rated voltage (KV rms)	33					
6	Highest system voltage (KV rms)	36					
7	Current ratio (A/A)	a) 400-200/1-1-1A					
8	Method of earthing the system where the current transformer will be installed.	Solidly Effectively earthed.					
9	Core details	Core 1		Core 2		Core 2	
		Desired value	Bidder's offer	Desired value	Bidder's offer	Desired value	Bidder's offer
a	Accuracy class	0.2		PS		PS	

b	Rated burden	15VA		---		---	
c	Knee point voltage (Vk)	---		> 500 V		> 500 V	
d	Resistance of Secondary Winding, corrected to 75 deg C			<10Ω		<10Ω	
e	Maximum Exciting current at Vk/2			<30mA		<30mA	
f	Instrument security factor	5					
10	Rated continuous thermal current (A)	120 % of rated primary current					

11	Acceptable limit of temperature rise above 50°C ambient temperature for continuous operation at rated continuous thermal current.		
(a)	Winding	45°C	
(b)	Oil	40°C	
(c)	External surface of the core, metallic parts in contact with or adjacent to, insulation.	45°C	
12	Acceptable partial discharge level	Less than 10 pico coulombs	
13	Maximum radio interference voltage at 1.1 times the maximum rated voltage.	Less than 500 micro volts	
14	1.2/50 micro second lightning impulse withstand voltage (KVP) (dry)	170	
15	1 minute dry power frequency withstand voltage primary (KV rms)	70	
16	Switching Impulse with stand and voltage (KVP)		
17	1 Minute dry power frequency withstand voltage secondary (KV rms)	3	
18	Minimum creepage distance of porcelain Housing (mm)	900	
19	Rated short time withstand current for 3 second at all ratios (KA rms)	25KA	
20	Instrument security factor at all ratios for metering core.	Not more than 5.0	

21	Minimum rated short time thermal current density of the primary winding at all ratios (A/mm <sup>2</sup> )	As per clause No9.6.3- Note of IS: 2705 (Part-I)/1992	
22	Application, current ratio, output burden, accuracy class, minimum knee point voltage, secondary winding resistance, maximum excitation current at minimum knee point voltage etc.		
23	Type of core		
24	Seismic acceleration	0.15g (Vertical) 0.3g (Horizontal)	
25	Accuracy class of standard C.T. to be used during testing towards determination of ratio errors and phase angle errors for metering cores.	0.05 or better.	

GTP No-48 Guaranteed Technical Particulars of 33 kv Insulator-70 KN (B & S Type)

Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer		
2	Type of Insulator	Polymeric Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I)E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	
6	Electrical Characterstics		
(a)	Nominal system voltage	33 KV	

(b)	Highest system voltage	36 KV	
(c)	Dry Power frequency withstand voltage	105 KV	
(d)	Wet Power frequency withstand voltage	75 KV	
(e)	Dry flashover voltage	125 KV	
(f)	Wet flash over voltage	85 KV	
(g)	Dry lighting impulse withstand voltage		
	(a) Positive	170 KV	
	(b) Negative	170 KV	
(h)	Dry lighting impulse flashover voltage		
	a) Positive	180 KV	
	b) Negative.	180 KV	
(i)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	40	
(j)	Creepage distance (Min.)	900 MM	
7	Mechanical characteristics Minimum failing load.	70KN	

8	Dimensions of insulator		
(i)	Weight	1.6	
(ii)	Dia of FRP rod	16 MM	
(iii)	Length of FRP rod	440 MM	
(iv)	Dia of weathersheds	100 MM	
(v)	Thickness of housing	3 MM	
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight) enclosed.	382 MM	
9	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression moulding)	Injection moulding	
10	No of weathersheds	8	
11	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		

12	Type of packing	Wooden Box	
----	-----------------	------------	--

13	Any other particulars which the bidder may like to give.		
14	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1 974).	YES	

GTP NO-49 Guaranteed Technical Particulars of 11 kv Insulator (B & S Type)

**BIDDER HAS TO CONFIRM FOLLOWING IMPORTANT REQUIREMENT:**

Sl. No.	Particulars	Desired Value	Bidder's Data
1	Name of the Manufacturer :		
2	Type of Insulator	Polymeric Composite	
3	Standard according to which the insulators manufactured and tested.	IEC 61109	
4	Name of material used in manufacture of the insulator with class/grade)	SILICON Wacker-Germany Dow Corning-USA	
(a)	Material of core(FRP rod)	ECR or BORRON FREE	
	(I)E-glass of ECR-glass.		
	(II)Boom content		
(b)	Material of housing Et weathersheds (silicon content by weight)	SILICON RUBBER 43 %	
(c)	Material of end fittings	SGI	
(d)	Sealing compound for end fittings	RTV SILICON	
5	Colour	GREY	

6	Electrical Characterstics		
(a)	Nominal system voltage	11 KV	
(b)	Highest system voltage	12 KV	
(c)	Dry Power frequency withstand voltage	70 KV	
(d)	Wet Power frequency withstand voltage	50 KV	
(e)	Dry flashover voltage	77 KV	
(f)	Wet flash over voltage	55 KV	
(g)	Dry lighting impulse withstand voltage		
	(a) Positive	129 KV	
	(b) Negative	135 KV	
(h)	Dry lighting impulse flashover voltage		
	a) Positive	135 KV	
	b) Negative.	141 KV	

(i)	RIV at 1 MHz when energized at 10 kV/30kV (rms) under dry condition.	20	
(j)	Creepage distance (Min.)	320 MM	
7	Mechanical characteristics Minimum failing load.	70 KN	
8	Dimensions of insulator		
(i)	Weight	1.25 KG(Approx.)	
(ii)	Dia of FRP rod	16 MM	
(iii)	Length of FRP rod	240 MM	
(iv)	Dia of weathersheds	90±1 MM	
(v)	Thickness of housing	3 MM	
(vi)	Dry arc distance Dimensioned drawings of insulator (including weight with tolerances in weight) enclosed.	160±5 MM	
9	Method of fixing of sheds to housing (specify). Single mould or Modular construction (injection moulding/compression moulding)	Injection moulding	

10	No of weathersheds	3	
11	Type of sheds		
i)	Aerodynamic	Aerodynamic	
ii)	With underribds		
12	Type of packing	Wooden Box	
13	Any other particulars which the bidder may like to give.		
14	The insulators shall have "W" type phosphors Bronze security clips for ball sockets portion of insulators confirming to IS-2486 (P-III/1974).	YES	

## GTP No-8 LT Distribution Box

SI No	Dimension / Description	63 KVA	Bidder's offer	100 KVA	Bidder's offer
1	A	700		1000	
2	B	600		800	
3	C	400		500	
4	D	80		170	
5	E	90		250	
6	Incomer MCCB 4Pole	100 A, with Over Current Setting 80% to 100%		200 A, with Over Current Setting 80% to 100%	
7	Cable Size for Incomer	50 mm <sup>2</sup> , 3 1/2 core cable		95 mm <sup>2</sup> , 3 1/2 core cable	
8	Three Pole MCCB for out- going feeder	50 Amp, with Over Current Setting 80% to 100% (2sets each)		100 Amp, with Over Current Setting 80% to 100% (2sets each)	

## GTP No-8 LT Distribution Box

9	Bus Bar for Incoming & Out going feeders	25 x 6 mm		40 x 6 mm	
10	Bus Bar material	Electrolytic Aluminium		Electrolytic Aluminium	
11	A neutral Bus bar similar to phase Bus bar is to be provided.				

**GTP NO-9 GUARANTEED TECHNICAL PARTICULARS FOR POWER TRANSFORMERS OF 3.15 MVA, 5 MVA & 8 MVA**

<b>Sl. No .</b>	<b>Name of the Particulars</b>	<b>Bidder's offer</b>
1	Name and address of the Manufacturer	
a)	Transformer	
b)	HV & LV Bushings	
c)	Bimetallic connectors	
d)	Transformer Oil	
e)	On load tap changer	
f)	Instruments	
g)	Neutral Bushing CTs	
2	Service ( Indoor / Outdoor )	
3	Normal continuous rating in KVA under site conditions at all taps :	
a)	HV winding (KVA)	
b)	LV winding (KVA)	
4	Rated Voltage	
a)	HV winding (KV )	
b)	LV winding (KV)	
5	Rated frequency (Hz)	
6	No. of phases	
7	Type of transformer	
8	Connections	
a)	HV winding	
b)	LV winding	
9	Connections symbols	
	HV – LV	
10	Tappings	

a)	Range	
b)	Number of steps	
c)	Position of tapping on HT winding for high voltage variation	
11	Reference ambient temperatures	
a)	Maximum ambient air temperature ( $^{\circ}\text{C}$ )	
b)	Maximum daily average ambient temperature ( $^{\circ}\text{C}$ )	
c)	Minimum ambient air temperature ( $^{\circ}\text{C}$ )	
d)	Maximum yearly weighted average ambient temperature ( $^{\circ}\text{C}$ )	
12	Maximum temperature rise over ambient temperature	
a)	Top oil by thermometer ( $^{\circ}\text{C}$ )	
b)	HV & LV windings by resistance measurement ( $^{\circ}\text{C}$ )	
c)	Hot Spot Temperature rise of windings ( $^{\circ}\text{C}$ )	
d)	Limit for hot spot temperature for which the transformer is designed ( $^{\circ}\text{C}$ )	
e)	Temperature gradient between windings and oil ( $^{\circ}\text{C}$ )	
f)	Type of maximum winding temperature indicator ( $^{\circ}\text{C}$ )	
13	Voltage to earth for which the star point will be insulated	
14	Cooling type	
15	Losses	
a)	No-Load loss at rated voltage & rated frequency (KW)	
b)	Load loss at rated current at Normal Tap at $75^{\circ}\text{C}$ (KW)	
16	Max. Current density in winding at rated current for normal tap position	
a)	HV winding (Amps/ sq.mm.)	
b)	LV winding (Amps / sq.mm.)	
17	Impedance voltage at rated current ,rated frequency and at $75^{\circ}\text{C}$ expressed as percentage of rated voltage at :-	
a)	Principal (normal) tap (%)	
b)	Highest tap (%)	

c)	Lowest tap (%)	
18	Reactance at rated current & frequency as percentage of rated voltage at:	
a)	Principal (normal) tap	
b)	Highest Tap	
c)	Lowest Tap	
19	Resistance at 75 <sup>o</sup> C	
a)	H.V. winding at normal tap position	
b)	L.V. winding	
c)	Resistance voltage drop at 75 <sup>o</sup> C winding temperature expressed as percent of rated voltage (%)	
	i) Principal/ normal tap	
	ii) Highest tap	
	iii) Lowest tap	
20	Insulation level	
a)	Separate source power frequency voltage withstand	
	i) HV winding (KV rms)	
	ii) LV winding (KV rms)	
b)	Induced over voltage withstand	
	i) HV winding (KV rms)	
	ii) LV winding (KV rms)	
c)	Full wave lightning impulse withstand voltage	
	i) HV winding (KV peak)	
d)	Power frequency high voltage tests	
	i) Test voltage for one minute withstand test on high voltage windings (induced)	
	ii) Test voltage for one minute withstand test on low voltage windings	
	iii) Test voltage for one minute withstand test on neutral end of low voltage windings	
e)	Lightning impulse withstand tests	

	i) Impulse test on high voltage winding 1.2/50 $\mu$ sec full wave withstand (KV peak)	
	ii) Impulse test on low voltage winding 1.2/50 $\mu$ sec full wave withstand (KV peak)	
	iii) Wave form for impulse test	
21	No load current, no load loss, no load power factor at normal ratio and frequency (Amp/ KW/ P.F.)	
	a) 10 percent of rated voltage	
	b) 25 percent of rated voltage	
	c) 50 percent of rated voltage	
	d) 85 percent of rated voltage	
	e) 100 percent of rated voltage	
	f) 105 percent of rated voltage	
	g) 110 percent of rated voltage	
	h) 112.5 percent of rated voltage	
	i) 115 percent of rated voltage	
	j) 120 percent of rated voltage	
	k) 121 percent of rated voltage	
22	Efficiency at 75° C at unity power factor	
	a) Full load	
	b) 75% load	
	c) 50% load	
	d) 25% load	
23 (a)	The minimum percentage of load at which the transformer will run at maximum efficiency (%)	
	b) Maximum efficiency of the transformer	
24	Regulation at full load at 75° C	
	a) At unity power factor (%)	
	b) At 0.8 power factor (lagging) (%)	
25	Core data	
a)	Grade of core material used	
b)	Thickness of core plate lamination (mm)	

c)	Whether core laminations are of HIB cold rolled grain oriented	
d)	Details of oil ducts in core, if any	
	i) Whether in the plane & at right angle to the plane of winding	
	ii) Across the plane of lamination	
e)	i) Insulation of core lamination	
	ii) Insulation of core plates	
	iii) Type of core joints (Mitred or Mitred Step-lap)	
26	Flux density	
a)	Designed maximum flux density at rated voltage and rated frequency (Tesla)	
b)	Designed maximum operating flux density which the transformer can withstand for one minute at normal tap (Tesla)	
c)	Designed maximum operating flux density which the transformer can withstand for five seconds at normal tap (Tesla)	
27	Inter-Tap insulation	
a)	Extent of extreme end turns reinforcement	
b)	Extent of end turns reinforcement	
c)	Extent of turn adjacent to tapping reinforced	
d)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (a)	
e)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (b)	
f)	Test voltage for 10 seconds 50Hz inter-turn insulation test on (c)	
28	Windings:	
a)	Material	
b)	Type of windings:	
	i) HV windings	
	ii) LV windings	

	c) Insulation of HV windings	
	d) Insulation of LV windings	
	e) Insulation between HV & LV windings	
29	Continuous rating under following conditions:	
a)	At 40°C ambient air temp. at site	
b)	At 30°C ambient air temp. at site	
c)	At 20°C ambient air temp. at site	
30	Transformer Tank	
a)	Material	
b)	Thickness	
	- Top	
	- Sides	
	- Bottom	
c)	Details of painting	
	- Inner surface	
	- Outer surface	
31	Dimensions of 3 phase transformers:	
a)	Max. Height to top of bushings (mm)	
b)	Over-all length (mm)	
c)	Over-all breadth (mm)	
32	Weight data of transformer components : (Tolerance + 5% ) (approximate values not allowed )	
a)	Core excluding clamping (Kg)	
b)	Core with clamping (Kg)	
c)	HV winding insulated conductor (Kg)	
d)	LV winding Insulated conductor (Kg)	
e)	Coils with insulation (Kg.)	
f)	Core and windings (Kg)	
g)	Weight of steel (Kg)	
h)	Fittings and accessories (Kg)	
i)	Oil required for first filling including 10% extra (ltrs / Kg )	
	1. Oil in main tank ( Ltrs)	

	2. Oil in the conservator (Ltrs)	
	3. Oil in the radiators ( Ltrs )	
	4. Oil in the OLTC (Ltrs.)	
	5. Overall total quantity of oil with 10% extra oil for first filling (ltrs / Kg)	
j)	1. Transportation weight excluding accessories (Kg)	
	2. Shipping details	
	i) Weight of heaviest package (Kg.)	
	ii) Dimension of largest package (Kg)	
k)	Untanking weight (Kg)	
l)	Total weight of transformer with oil and fittings (Kg)	
33	Bushing data :	
a)	Type of bushing insulator	
	i) HV	
	ii) LV	
	iii) Neutral	
b)	Material of bushing (inner part / outer part)	
c)	Weight of bushing insulator (Kg.)	
d)	Quantity of oil in one bushing (lt.)	
e)	Minimum dry withstand & flash over power frequency voltage of bushing (KV)	
f)	Minimum wet withstand & flash over power frequency voltage of bushing (KV)	
g)	Minimum withstand & flashover impulse level (KV)	
h)	Voltage rating (KV)	
i)	Current rating (Amps.)	
j)	Thermal Short Time current & Duration	
k)	Rated Dynamic current & its duration	
l)	Cantilever with stand loading	
m)	Clearance in oil	
	- phase to phase (mm)	

	- phase to earth (mm)	
n)	Creepage distance in oil & air (mm)	
o)	Minimum level of immersing / medium (oil ) (mm)	
p)	Maximum pressure of immersing medium (oil) Kg/ cm <sup>2</sup>	
q)	Free space required at top for removal of bushings (mm)	
r)	Angle of mounting	
34	Details of CT to be provided in the neutral for REF protection.	
a)	Outdoor bushing type	
b)	No. of cores and their function	
c)	Location (Line / Neutral)	
d)	Current rating for various cores (Primary / Secondary)	
e)	VA burden / Knee Point voltage (Core wise)	
f)	Magnetising current at half knee point voltage. (mA)	
g)	Classification (PS class) core wise	
h)	Test voltage	
i)	Construction details	
35	Conservator (Main Transformer and OLTC)	
a)	Total volume of the Conservator (Cub mtr / Ltr.)	
b)	Volume of the conservator between the highest and lowest level (Cubic mtr. / Ltrs )	
36	Calculated time constants for natural cooling	
37	Type of axial coil supports :	
a)	HV winding	
b)	LV winding	
38	Details of On Load tap changer	
a)	Make	
b)	Type	
c)	Rating	

	i) Rated Voltage	
	ii) Rated current	
	iii) Step voltage	
	iv) Number of steps	
	v) Rated Short Circuit Current	
d)	Whether Diverter switch provided with gas vent and buchholz relay (Yes / No )	
e)	Whether a separate oil surge relay with trip contacts provided (Yes / No)	
f)	Pressure relief valve	
g)	Details of motor device unit housed in kiosk / mounted on tap changer	
	<sup>n)</sup> running	
	Whether Remote control panel provided with Control scheme for simultaneous operation of Tap changer when transformers are in parallel and independent control when in independent	
i)	Details of equipment in the OLTC kiosk	
j)	Details of OLTC panels	
	i) automatic tap changer relay	
	ii) literature of all the relays	
	iii) dimensions of OLTC, Panel L x B x H	
	iv) thickness of sheet	
	v) degree of protection	
	vi) details of equipment supplied	
39	Dispatch details :	
a)	Approx. mass of heaviest Package (Kg)	
b)	Approx. dimensions of largest Package	
	i) Length ( m m )	
	i i) Breadth ( m m )	

	iii) Height (mm)	
40	Un-tanking height (mm)	
41	Bimetallic connectors HV / LV	
a)	Normal current rating (A)	
b)	Short time current rating (A)	
c)	Tensile strength (Kg)	
d)	Maximum temperature limit	
e)	Dimensional sketch enclosed indicating tolerances (Yes/No)	
f)	Minimum clearance (mm)	
	- Phase to phase	
	- Phase to Earth	
	42CORE ASSEMBLY .	
a)	Core diameter (mm)	
b)	Core window height (mm)	
c)	Core leg centre (mm)	
d)	Gross core cross – sectional area (m <sup>2</sup> )	
e)	Total height of core (mm)	
f)	Details of top end frame	
g)	Details of Bottom end frame	
h)	Details of clamp plate (material, thickness, insulation)	
i)	Total core weight (Kg)	
j)	Core loss, basing on core loss graph at operating flux density (rated voltage and rated frequency) ( KW )	
k)	Core stacking factor	
l)	Net core area (Sq.m)	
m)	Margin towards corner joints, cross-fluxing, dielectric loss (KW)	
n)	Total core loss at rated voltage and rated frequency (KW)	
o)	Describe location / method of core grounding	
p)	Details of core- belting	
	i)Material , grade and type	

	ii) Width	
	iii) Thickness	
	iv) Fixing method	
43	DETAILS OF WINDING	
a)	Type of winding	
b)	Material of the winding conductor	
c)	Maximum current density of windings at rated current and conductor area	
d)	Whether windings are pre-shrunk ?	
e)	Whether adjustable coil clamps are provided for HV and LV windings ?	
f)	Whether steel rings are used for the windings ? If so, whether these are split ?	
g)	Whether electrostatic shields are provided to obtain uniform voltage distribution in the windings ?	
h)	Winding Insulation ( Type & Class )	
i)	Insulating material , used for	
	i) H.V winding	
	ii) LV winding	
	iii) Tapping connection	
j)	Insulating material used between	
	i) L.V and H.V winding	
	ii) Core & L.V winding	
k)	H.V to H.V winding between phases	
l)	Type of axial supports	
	i) H.V winding	
	ii) L.V winding	
m)	Type of radial supports	
	i) H.V winding	
	ii) L.V winding	
n)	Maximum allowable torque on coil clamping bolts	
o)	Clamping ring details	
	i) Thickness of ring mm	

	ii) Diameter of ring mm	
	iii) No. & size of pressure screw	
p)	Bare conductor size (mm)	
	i) HV	
	ii) LV	
q)	Insulated conductor size (mm)	
	i) HV	
	ii) LV	
r)	No. of conductor in parallel ( Nos.)	
	i) HV	
	ii) LV	
s)	No. of turns / phase	
	i) HV	
	ii) LV	
t)	No. of discs / phase	
	i) HV	
	ii) LV	
u)	No. of turns / Disc	
	i) HV	
	ii) LV	
v)	Gap between discs (mm )	
	i) HV	
	ii) LV	
w)	Inside diameter (mm )	
	i) HV	
	ii) LV	
x)	Outside diameter (mm )	
	i) HV	
	ii) LV	
y)	Axial height after shrinkage (mm )	
	i) HV	
	ii) LV	
z)	D.C Resistance	
i)	L.V winding at 75 <sup>0</sup> C (Ohms )	

ii)	H.V winding at normal tap at 75 <sup>0</sup> C (Ohms )	
iii)	H.V winding at highest tap at 75 <sup>0</sup> C (Ohms )	
iv)	H.V winding at lowest tap at 75 <sup>0</sup> C (Ohms )	
v)	Total I <sup>2</sup> R losses at 75 <sup>0</sup> C for normal tap (KW )	
vi)	Total I <sup>2</sup> R losses at 75 <sup>0</sup> C for highest tap (KW )	
vii)	Total I <sup>2</sup> R losses at 75 <sup>0</sup> C for lowest tap (KW )	
vii i)	Stray losses including eddy current losses in winding at 75 <sup>0</sup> C (KW)	
	a) Normal tap position	
	b) Highest tap position	
	c) Lowest tap position	
	d) Any special measures, taken to reduce eddy current losses and stray losses. Mention in details	
ix)	Load losses at 75 <sup>0</sup> C (I <sup>2</sup> R + Stray )	
	a) Normal tap position (KW )	
	b) Highest tap position (KW)	
	c) Lowest tap position (KW )	
x)	Details of special arrangement, provided to improve surge voltage distribution in the windings.	
44	<b>DETAILS OF TANK :</b>	
a)	Material of Transformer tank	
b)	Type of tank	
c)	Thickness of sheet (No approximate value to be mentioned)	
	i) Sides (mm)	
	ii) Bottom (mm )	
	iii) Cover (mm )	
	iv ) Radiators (mm)	

d)	Inside dimensions of main tank (No approximation in dimensions to be used )	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm )	
e)	Outside dimensions of main tank (No approximation in dimensions to be used )	
	i) Length (mm)	
	ii) Breadth (mm)	
	iii) Height (mm)	
f)	Vacuum recommended for hot oil circulation (torr / mm of Hg)	
g)	Vacuum to be maintained during oil filling in transformer tank (torr / mm of Hg)	
h)	Vacuum to which the tank can be subjected without distortion (torr / mm of Hg)	
i)	No. of bi-directional wheels provided	
j)	Track gauge required for the wheels	
	i) Transverse axis	
	ii) Longitudinal axis	
k)	Type and make of pressure relief device and minimum pressure at which it operates (Kpa )	
45	CONSERVATOR :-	
a)	Thickness of sheet (mm)	
b)	Size (Dia x length ) (mm)	
c)	Total volume (Litres)	
d)	Volume between the highest and lowest visible oil levels (Litres)	

<b>GTP NO- 10 GUARANTEED AND OTHER PARTICULARS FOR 100kVA STATION TRANSFORMERS</b>			
<b>Sl. No.</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Make		
2	Name of Manufacturer		
3	Place of Manufacture		
4	Voltage Ratio	33/0.4kV	
5	Rating in kVA	100kVA	
6	Core Material used and Grade:		
	a)	Flux density	
	b)	Over fluxing without saturation	
		(Curve to be furnished by the	
		Manufacturer in support of his	
		claim)	
7	Maximum temperature rise of:		
	a)	windings by resistance method	
	b)	Oil by thermometer	
8	Magnetizing (no-load) current at:		
	a)	90% Voltage	
	b)	100% Voltage	
	c)	110% Voltage	
9	Core loss in watts:		
	a)	Normal voltage	
	b)	Maximum voltage	
10	Resistance of windings at 20°C,75°C		
	(with 5% tolerance)		
a)	HV Winding (ohms)		
b)	LV Winding (ohms)		
11	Load losses (watts) at 75°C at normal tap(100% Load Condition)		

12	TOTAL Losses (Load loss +No Load Loss)at 100% load at 75°C at rated Voltage, frequency & at normal tap.		
13	Total Losses at 50% load at 75°C		
14	Current density used for: (Ampere/sq mm)		
	a)	HV Winding.	
	b)	LV Winding.	
15	Clearances: (mm)		
	a)	Core and LV	
	b)	LV and HV	
	c)	HV Phase to phase	
	d)	End insulation clearance to	
	e)	Any point of winding to tank.	
16	Efficiency at 75°C		
	a)	Unity P.F and	
	b)	0.8 P.F.	
	1)	125°C load	
	2)	100°C load	
	3)	75°C load	
	4)	50°C load	
	5)	25°C load	
17	Regulation at:		
	a)	Unit P.F.	
	b)	0.8 P.F. at 75°C	
18	% Impedance at 75°C		
19	Flash test:-		
	(i)	HV 70 kV/ 50HZ for 1 minute	
	(ii)	LV 3 kV /50 Hz for 1 minutes.	
20	Over potential test (Double voltage and Double frequency for 1 minute)		

21	Impulse test.		
22	Mass of : (kg)		
	a)	Core lamination (minimum)	
	b)	Windings (minimum)	
	c)	Tank and fittings	
	d)	Oil	
	e)	Oil quantity (minimum) (litre)	
	f)	Total weight	
23	Oil Data:		
	1)	Quantity for first filling (minimum) (litre)	
	2)	Grade of oil used.	
	3)	Maker's name	
	4)	BDV at the time of filling (kV)	
24	Transformer:		
	1)	Overall length x breadth x height (mm x mm x mm)	
	2)	Tank length x breadth x height	
	3)	Thickness of plates for	
	a)	Side plate (min)	
	b)	Top and bottom plate (min)	
	4)	Conservator Dimensions.	
25	Radiation:		
	1) excluding	Heat dissipation by tank walls top and bottom	
	2)	Heat dissipation by cooling tube	
	3)	Diameter and thickness of cooling tube.	
	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.	
26	Inter layer insulation provided in design for:		
	1)	Top and bottom layer	
	2)	In between all layer	
	3)	Details of end insulation.	
	4)	Whether wedges are provided at 50°C turns of the HV coil.	
27	Insulation materials provided.		
	a)	For Conductors	
		1 HV	
		2 LV	
	b)	For Core.	
28	Material and Size of the wire used.		
		HV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
		LV	
		Dia (mm)	
		Number of conductors in	
		Total cross sectional area	
29	Whether the name plate gives all particulars as required in		
30	Particulars of bushings HV/LV		
	1)	Maker's name	
	2)	Type IS-3347/IS-2099/IS-7421	

	3)	Rating as per IS	
	4)	Dry power frequency voltage withstand test	
	5)	Wet power frequency voltage withstand test.	
<b>Note:</b>			
The following shall be specifically confirmed:			
1)	Whether the offer conforms to the limits of impedance mentioned in the specification.		
2)	Whether the offer conforms to the limits of temperature rise mentioned in the specification.		
3)	Whether the losses of the transformers offered are within the limits specified.		
4)	Whether the transformer offered is already type tested for the design and test reports enclosed.		

Sl. No.	Description	To be specified by Bidders
1	Core Grade	
2	Core diameter(mm)	
3	Gross core area(Sq cm)	
4	Net core area(Sq cm)	
5	Flux density(Tesla)	
6	Mass of core(Kg)	
7	Loss per kg of core at the specified flux density(watt)	

8	Core window height(mm)	
9	Center to enter distance of the	
10	No.of LV Turns	
11	No.of HV turns	
12	Size of LV conductor bare/covered (mm)	
13	Size o HV conductor bare/covered (mm)	
14	No. of parallels	
15	Current density of LV winding.(A/sq mm)	
16	Current density of HV winding.(A/sq mm)	
17	Wt. of the LV winding for Transformer (kg)	
18	Wt. of the HV winding for Transformer (Kg)	
19	No. of LV Coils/phase	
20	No. of HV Coils/phase	
21	Height of LV Winding.(mm)	
22	Height of HV Winding.(mm)	
23	ID/OD of HV winding(mm)	
24	ID/OD of LV winding(mm)	
25	Size of the duct in LV winding(mm)	

26	Size of the duct in HV winding(mm)	
27	Size of the duct between HV and LV(mm)	
28	HV winding to LV winding	
29	HV winding to tank clearance(mm)	
30	Calculated impedance(%)	
31	HV to earth creepage distance(mm)	
32	LV to earth creepage distance(mm)	

**GTP NO - 11 GUARANTEED TECHNICAL PARTICULARS of Transformer OIL**

<b>SL. NO.</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Appearance	Clear and transparent free from suspended matter or sediments.	
2	Density at 29.5° C (Max) gm/cc	0.89	
3	Viscosity, Kinematic at 27° C (Max)	27	
4	Interfacial Tension at 27° C (Min) Newton / M	0.04	
5	Flash point, Pensky Marten (closed) in °C (min).	140	
6	Pour point in ° C (Max)	-6	
7	Neutralisation value		
	a) Total acidity, mg KOH/gm (Max)	0.03	
	b) Inorganic acidity / alkalinity	Nil	
8	Corrosive sulphur (Copper strip) 19 hours at 140°C	Non corrosive	
9	Electric strength (Breakdown Voltage ) KV (rms).		
	a) New unfiltered oil (min).	60	
	b) After filtration (min).	60	
10	Dielectric dissipation factor (Tan Delta) at 90°C (Max).	0.002	

11	Specific resistance (resistivity)		
	a) at 90° C , ohm-cms (Min)	$35 \times 10^{12}$	
	b) at 27° C , ohm-cms (Min)	$1500 \times 10^{12}$	
12	Oxidation stability.		
	a) Neutralisation value, after Oxidation for 164 hours at 100°C mg KOH/gm (Max).	0.4	
	b) Total sludge, after 164 hours at 100°C wt. % (max).	0.1	
13	Ageing characteristics after accelerated Ageing (open beaker method with copper Catalyst) for 96 hours at 115°C		
	a) Specific resistance(resistivity)		
	i) at 27°C, ohm-cms (Min)	$2.5 \times 10^{12}$	
	i) at 90°C, ohm-cms (Min)	$0.2 \times 10^{12}$	
	b) Dielectric dissipation factor (Tan Delta ) at 90°C, , ohm-cms (Min)	0.2	
	c)Total acidity, mg KOH/gm (max)	0.05	
	d) Total sludge value, Wt. % (max)	0.05	

14	Presence of oxidation <sup>inhibitor</sup>	The oil shall not contain anti oxidant additives.	
15	Water content, ppm (max)	20	
16	i) Proportion of classes of hydrocarbons in the crude oil including content of aromatic hydrocarbons.		
	ii) Details of barrel (Size, gauge inside/outside coating/weight of empty drum not less than 18 Kg.)		
	iii) List of equipments for testing of oil as per revised ISS		
	iv) Electric strength (breakdown voltage ) KV (Min)		
	a) Value of the fresh sample in the supplied sealed drums KV (Min).		
	b) Value after filling in transformer upto & within 3 months (Min)		

**GTP NO-12 GUARANTEED TECHNICAL PARTICULARS FOR 33kV , 200 AMP, 3 POLE, H.G. FUSE**

<b>Sl. No.</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Maker's name and country or origin	To be specified by the tenderder.	
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	4 nos. 22KV/24KV Post Insulator per phase as per ISS - 2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or orgin	To be specified by the tenderder.	
(b)	Type of cemeting	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	80 KV RMS	
(d)	One minute power frequency withstand voltage wet.	70 KV RMS.	
(e)	Visible discharge voltage	27 KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderder.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	170KV (peak)	
(l )	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder )	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	195 KV (peak)	
(b)	To earth & between poles	170 KV (peak)	

6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	80 KV (RMS)	
(b)	To earth & between poles	70 KV (RMS)	
7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	33 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	508 mm (minimum)	
10	Height of the riser for carrying the horns.	250mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 8.32 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 995mm). All the bolts, nuts and washers should be made out of brass.	
12	Riser Unit (250mm total height).	(a) The shape of connectors may be made of straight copper Flat of	
		(b) 170mm height G.I. Riser made of 25mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 35 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	100 x 50 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1 972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderder.	

**GTP NO-13 GUARANTEED TECHNICAL PARTICULARS FOR 11kV 200 AMP, 3 POLE, H.G. FUSE .**

<b>Sl. No.</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Maker's name and country or origin		
2	Suitable for mounting	Horizontal only.	
3	Number of supporting post insulator per phase	2 nos. 12KV Post Insulator per phase as per ISS -2544/ 1973	
4	Post Insulator		
(a)	Maker's name and country or origin	To be specified by the tenderer.	
(b)	Type of cementing	To be quoted original cemented only.	
(c)	One minute power frequency withstand voltage dry	28 KV RMS	
(d)	One minute power frequency withstand voltage wet.	28 KV RMS	

(e)	Visible discharge voltage	9KV RMS	
(f)	Dry Flashover Voltage	To be specified by the tenderer.	
(g)	Power frequency puncture withstand voltage	1.3 times of actual dry flash over voltage.	
(h)	Impulse withstand voltage(Switching Position)	75KV (peak)	
(l )	Creepage distance	380mm minimum. (actual creepage distance for which type test have been conducted is to be specified by the bidder )	
5	Impulse withstand voltage for positive and negative polarity (1.2/50 micro second wave)		
(a)	Across the isolating distance	85KV (peak)	
(b)	To earth & between poles	75 KV (peak)	
6	One minute power frequency withstand voltage		
(a)	Across the isolating distance	32 KV (RMS)	
(b)	To earth & between poles	28 KV (RMS)	

7	Rated normal current and rated frequency.	200 amps, 50 Hz , 3 Pole	
8	Operating Voltage	11 KV	
9	Vertical clearance from top of insulator cap to mounting Channel	254 mm (minimum)	
10	Height of the riser for carrying the horns.	150mm from the cap (top) of insulator.	
11	Details of Arcing Horns	Copper rod having 7.62 mm dia Silver-plated provided with screwing arrangement for fixing use wire made of copper casting. (Total length 635mm). All the bolts, nuts and washers should be made out of brass.	

12	Riser Unit	(a) The shape of connectors may be made of straight copper Flat of size adequate enough to carry a current density not less than 1.5 Amp/ mm <sup>2</sup> . 2 Nos of 3/8" G.I. Bolts, double nuts, plain and spring washers and 2 nos. solder less bimetallic shockets per each connector suitable up to 100 mm <sup>2</sup> AAA conductor.	
	(250mm total height).		
		(b) 100mm height G.I. Riser made of 19mm nominal bore medium gauge G.I. Pipe welded with 2 nos. G.I. Flat of 30 x 5 mm at both ends fixed with 10mm dia stainless steel, bolts and nuts with flat stainless steel spring washers.	
13	Supporting Channels	75 x 40 x 6 mm M.S. Channel (galvanized)	
14	Galvanisation	All ferrous parts should be galvanized as per IS-2633/1972 & all non-ferrous part should be duly electroplated with silver.	
15	Weight of each pole (complete)	To be specified by the tenderer.	

**GTP NO- 14 GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(33kV)**

<b>SI.No</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operator	
5	Rated voltage nominal/ Maximum	33/36 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		
	a) Across Isolating distance	195 kVpeak	

	b) To earth & between poles	170 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	80 kVpeak	
	b) To earth & between poles	70 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Motorised	
14	Auxiliary voltage	33kV	
	a) Control & Inter lock	48 DC 80% to 110%	
15	Safe duration of overload		

	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	900mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp	
	iii) Control	Local	

**GTP NO- 15****GURANTEED TECHNICAL PARTICULARS OF ISOLATOR(11kV)**

<b>Sl.No</b>	<b>Name of the Particulars</b>	<b>Desired Value</b>	<b>Bidder's Offer</b>
1	Main switch	Double end break Centre post rotating, gang operated	
2	Service	Outdoor	
3	Applicable standard	IS : 9921 / IEC-129/IEC-62271-102	
4	Pole	3 pole gang operated	
5	Rated voltage nominal/ Maximum	11/12 kV	
6	Rated Frequency	50 Hz (+5% to -3%)	
7	System earthing	Effectively earthed	
8	Temperature rise	As per relevant IS/IEC publication	
9	Insulation level impulse with stand voltage		

	a) Across Isolating distance	85 kV peak	
	b) To earth & between poles	75 kVpeak	
10	1 minute power frequency withstand voltage		
	a) Across Isolating distance	32 kVpeak	
	b) To earth & between poles	28 kVpeak	
11	Rated current in Amp	1250	
12	Short time current for 3 sec	25kA	
13	Operating mechanism	Manual	
14	Auxiliary voltage	11kV	
	a) Control & Inter lock	48 DC 80% to 110%	

15	Safe duration of overload		
	a)150% of rated current	5 minute	
	b)120% of rated current	30 minute	
16	Minimum creepage distance of support and Rotating insulator	380 mm	
	i) Mounting structure	Upright on G.I structure	
	ii) Terminal connector type	Bimetallic clamp size	
	iii) Control	Local	