

**Supply, Laying, Termination, Testing and Commissioning of HT & Control Cables for Heat Treatment Furnace in Block- II at BHEL, Haridwar.**

Sl.No.	Description and Details of Material	Make	Unit	Qty.
1.	<p><b><u>(A) HT XLPE 11 KV(E), Cable size 3x400 Sq.MM as per IS 7098 PART -2 1985 with upto date Ammendments. :</u></b></p> <p>1. 11 kV (E) voltage cable of size 3 X 400 sq. mm with compacted circular stranded Aluminum conductor.</p> <p>2. Aluminum conductor shall have both screening of extruded non-metallic semi conducting compound and semi conducting tape on all three phases over Conductor.</p> <p>3. The cable shall have cross linked polyethylene insulation (XLPE) applied by extrusion on all three phases over non-metallic semi conducting tape.</p> <p>4. Screening of extruded non-metallic semi conducting compound on all three phases over XLPE insulation.</p> <p>5. Metallic screening of copper tape on all three phases over insulation screening.</p> <p>6. Fillers of vulcanized or un-vulcanized rubber or thermoplastic materials.</p> <p>7. Extruded inner sheath of vulcanized or un-vulcanized rubber or thermoplastic materials.</p> <p>8. Galvanised round steel wire armouring over inner sheath.</p> <p>9. PVC extruded outer sheath over armouring.</p> <p><b>NOTE : 1. Cable must be supplied in equal two lengths (without any joint) of 625 Meters ± 5%</b>  <b>2. The termination of the cable shall be in the scope of Party including supply of Heat shrinkable jointing kits (06 Nos.).</b></p>	Torrent/ Universal / CCI	RM	1250
2.	<p><b><u>B. TECHNICAL SPECIFICATIONS FOR 6 X 2.5 Sq. mm PVC armoured Copper CABLE</u></b></p> <p>1.1 kV grade, 6 X 2.5 sq. mm LT PVC control cable with multi stranded (rm) copper conductor, PVC insulated, galvanized steel wire/strip armoured and overall PVC outer sheathed as per IS: 1554 Part-1/1988 with up to date amendments.</p> <p><b>NOTE : Cable must be supplied in single lengths (without any joint) of 1250 Meters ± 5%</b></p>	Torrent/ Universal / CCI	RM	1250

<b>Special Terms &amp; Conditins :-</b>	
1	Submission of Type test certificate on similar rating of equipments of any lot and routine test certificate of the Cables supplied ( In original and one photo copy) for individual equipment shall be in the scope of party.
2	PERT chart for the completion schedule of project (Supply & ETC) shall be provided by the Party after PO placement.
3	All the tools, tackles, T&P shall be arranged by the Party during Erection, Test & Commissioning.
4	Open space for material storage shall be provided by BHEL. However unloading, shifting, storage, custodian and safety of material related to above project shall be in scope of party. Any damages & shortages of the supplied material shall be responsibility of party.
5	No furnished/unfurnished accommodation shall be provided by BHEL for any labour/site personnel of the party.
6	BHEL will provide only power point for necessary lighting/ erection work etc.
7	BHEL shall not allow any space for labour camping inside the premises.
8	As this is a turnkey project, inspection, performance, erection, testing & commissioning of items supplied and safety & security of man & material shall be responsibility of the party. The party shall also provide the gaurantee for the total system as per gaurantee clause of the PO.
9	BHEL will allow the material handling equipments to enter inside as & when required for erection related work.
10	BHEL will arrange passes for the labour & other personals as per co. rules on the request of party.
11	The above cable shall be laid in under ground and ready made trench.
12	If required, party may visit the site for assesement of work.
<b><u>BHEL, Haridwar Scope of Work :</u></b>	
1	Preperation of pucca cable trenches only, if required as per instruction of Engineer Incharge.
2	Electrical power & water supply will be provided free of charge for laying work, if any.

**SCOPE OF SUPPLY WITH TERMS & CONDITIONS**

**Supply, installation, Testing and commissioning of "7.5 MVA , 11 / 0.415 kV Dry type Power Transformer for Heat Treatment Furnace in Block-II" at BHEL, Haridwar.**

SL	Description and Details of Equipment	Make	Unit	Qty.
1	<b>POWER TRANSFORMER</b> :- 7.5 MVA, 11 / 0.415 KV, POWER TRANSFORMER (nitrogen filled) and first filling of Transformer Oil to be supplied seperately with 10% extra, Vector Group Dyn11, Type of cooling - ONAN, indoor, class of insulation- F, degree of protection for enclosure- IP23, having winding tempreture protection relay, % impedance, impulse with stand voltage on HV & LV, losses, type & routine tests as per Applicable Standadrs IS : 11171/ 1965 , IEC-725 with upto date ammendments.	ABB /Areva/ Siemens/Volt amp/ Telk	No.	1
<b>SPECIAL TERMS AND CONDITIONS :-</b>				
1.	Power supply of 415 Volt AC is available.			
2.	Type test certificate of any lot of same rating equipments to be provided and routine test certificate for all supplied equipments (original and one copy), O&M manual (3 sets) for individual equipments shall be provided by the party.			
3.	O.G.A. & other drawings for 7.5 MVA Oil Filled Power transformers is to be provided by the party after placement of Purchase Order.			
4.	Party has to submit the PERT chart for overall completion of the 7.5 MVA Power Ttransformer (Supply, erection, testing and commissioning and handing over) after placement of Purchase Order.			
5.	All the tools, tackles and T&P shall be arranged by the party for erection, testing and commissioning of the 7.5 MVA Power Ttransformer.			
6.	Custodian and security of material related to above work shall be in the scope of Party.			
7.	Open space for material storage shall be provided by BHEL. However unloading, shifting, storage, custodian and safety of material related to above project shall be in scope of party. Any damages & shortages of the supplied material shall be responsibility of party.			
8.	No furnished/unfurnished accomodation shall be provided by BHEL.			
9.	BHEL will provide only power point connection for ETC .			
10.	BHEL will not allow any space for labour camping inside the premises.			
11.	The earthing of the neutral & body of these transformers are to be done by party by making earth pits as per standard.			
<b>BHEL, Haridwar Scope of Work :</b>				
1	Preperation of transformer foundation,Trenches etc., however the drawings shall be prepared & submitted by the party.			
2	Electrical power & water supply will be provided free of charge for construction work.			

**Supply, installation, Testing and Commissioning of LT Distribution Board for Heat Treatment Furnace in Block-II at**

Sl.No.	Description and Details of Equipment	Make	Unit	Qty.
1	<b><u>L.T. DISTRIBUTION PANEL :</u></b>	ABB, SIEMENS, AREVA AND L&T	SET	1
	<b>(a) ONE INCOMER (10000 A)</b> Air Circuit Breaker, Draw Out type Electrically & Mechanically operated with Over Current & Earth Fault Protection (Micro Processor Based) with suitable CTs incorporating indicating lamps, control switch with Voltmeter and Ammeter (with selector switch), & Energy meter (3 phase 4 wire) ,Degree of protection shall be of IP-54. Panel shall be fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.			
	<b>(b) OUT GOING FEEDERS (TOTAL FIVE) :</b>			
	<b>(b-1) Two feeders (5000 A)</b> Air Circuit Breaker, Draw Out type Mechanically operated with Over Current & Earth Fault Protection (DN Release type) with suitable CTs incorporating indicating lamps, control switch with Ammeter & selector switch.Degree of protection shall be of IP-54. Panel shall be fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.			
	<b>(b-2) One feeder (1000 A)</b> Air Circuit Breaker, Draw Out type Mechanically operated with Over Current & Earth Fault Protection (DN Release type) with suitable CTs incorporating indicating lamps, control switch with Ammeter& selector switch.Degree of protection shall be of IP-54. Panel shall be fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.			
	<b>(b-3) One feeder (800 A)</b> Air Circuit Breaker, Draw Out type Mechanically operated with Over Current & Earth Fault Protection (DN Release type) with suitable CTs incorporating indicating lamps, control switch with Ammeter& selector switch.Degree of protection shall be of IP-54. Panel shall be fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.			
	<b>(b-4) One feeder (630 A)</b> MCCB with suitable CTs incorporating indicating lamps, control switch with Ammeter& selector switch.Degree of protection shall be of IP-54. Panel shall be fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.			

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<b><u>Special Terms &amp; Conditins :-</u></b>			
1	Submission of Type test certificate on similar rating of equipments of any lot and routine test certificate of the equipments supplied ( In original and one photo copy) and O&M manual (3 sets) for individual equipment shall be in the scope of party.		
2	PERT chart for the completion schedule of project (Supply & ETC) shall be provided by the Party after PO placement.		
3	All the tools, tackles, T&P shall be arranged by the Party during Erection, Test & Commissioning.		
4	Open space for material storage shall be provided by BHEL. However unloading, shifting, storage, custodian and safety of material related to above project shall be in scope of party. Any damages & shortages of the supplied material shall be responsibility of party.		
5	Supply of consumables like nuts, bolts etc. if required shall be in scope of party.		
6	No furnished/unfurnished accommodation shall be provided by BHEL for any labour/site personnel of the party.		
7	BHEL will provide only power point for necessary lighting/ erection work etc.		
8	BHEL shall not allow any space for labour camping inside the premises.		
9	As this is a turnkey project, inspection, performance, erection, testing & commissioning of items supplied and safety & security of man & material shall be responsibility of the party. The party shall also provide the gauranttee for the total system as per gauranttee clause of the PO.		
10	BHEL will allow the material handling equipments to enter inside as & when required for erection related work.		
11	BHEL will arrange passes for the labour & other personal as per co. rules on the request of party.		
12	Party has to arrange angle iron frame/ support stucture for any equipment, if required.		
13	Bus bars of LT panels shall be of Copper.		
14	If required, party may visit the site for assesement of work.		
15	The panels are to earthed at 02 points with suitable GI strip as per instruction of the Engineer Incharge		
<b><u>BHEL, Haridwar Scope of Work :</u></b>			
1	Preperation of cable trenches.		
2	Electrical power & water supply will be provided free of charge for construction work.		

**SCOPE OF SUPPLY WITH TERMS & CONDITIONS**

**Supply, installation, Testing and commissioning of VCB switchgear panel in DS-2 at BHEL, Haridwar.**

SL	Description and Details of Equipment	Make	Unit	Qty.
1	<b>OUTGOING PANEL</b> :- Out going VCB panels 11kV, 1000 A, 31.5 kA for 1 Sec. with copper bus bar to accomodate 02 nos. cable end termination (Heat Shrinkable Type) of 3X400 Sq.mm size with Current Transformer (Qty.-3 Nos.) of 11KV, 1000-800 / 5A (2 Cores for Over Current & Earth fault Protection and Metering purpose) fitted with Bus-Bars on each phase, with support structure. Incorporating indicating lamps, control switch, protection relay for over current & earth fault (static) and other auxiliary relays for annunciation & alarm purpose, Power meter with accuracy Class 0.5, featuring KW, KVA, KVAR, KWH, KVAH, KVARh, Frequency, Voltage, Current, Power Factor (for supply voltage 110 VAC and control voltage 30 VDC), metering instrument should be of Accuracy Class 1.0. Degree of protection not less than IP-54 fabricated of CRCA Sheet Steel. Applicable Standadrs for Panel IS:3427, IEC 298, BS 5277, VDE 0670 with upto date ammendments.	ABB / Siemens /Areva/L&T	Nos.	1
<b>SPECIAL TERMS AND CONDITIONS :-</b>				
1	Type test certificate of any lot of same rating equipments to be provided and routine test certificate for all supplied equipments (original and one copy), O&M manual (3 sets) for individual equipments shall be provided by the party.			
2	O.G.A. & other drawings for VCB switchgear panel, wiring scheme are to be provided by the party after placement of Purchase Order.			
3	The above VCB panel is to be installed at DS-2 sub-station .			
4	All the Control wiring shall be carriedout with 650 Volt grade standard copper wire with PVC insulation. For CT circuit the wire size should be 2.5 Sq.mm. and other circuit shall be with 1.5 Sq.mm copper wire.			
5	Supply of consumables like nuts & bolts required for installation of VCB switchgear panel are in the scope of party.			
6	Party has to submit the PERT chart for overall completion of the project (Supply, erection, testing and commissioning and handing over) after placement of Purchase Order.			
7	All the tools, tackles and T&P shall be arranged by the party for erection, testing and commissioning of the project.			
8	Being a turnkey project the principle vendor of the project shall be responsible for inspection, performance, quality, erection, testing and commissioning of the items/equipments supplied by the them.			
9	Bus Bars of HT Panels shall be of Copper.			

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11	Custodian and security of material related to above work shall be in the scope of Party.
12	Open space for material storage shall be provided by BHEL. However unloading, shifting, storage, custodian and safety of material related to above project shall be in scope of party. Any damages & shortages of the supplied material shall be responsibility of party.
13	No furnished/unfurnished accomodation shall be provided by BHEL.
14	BHEL will provide only power point connection for ETC .
15	BHEL will not allow any space for labour camping inside the premises.
	<b>BHEL, Haridwar Scope of Work :</b>
1.	The civil work required for erection of the VCB switchgear panel under the supervision of party.
2.	Electrical power & water supply will be provided free of charge for this work.

**Supply, installation, testing and commissioning of Bus-Duct for Heat Treatment Furnace in Block- II at BHEL, Haridwar.**

SL	Description and Details of Equipment	Make	Unit	Qty.
1	<p><b>Copper Bus-Duct</b> :- 3 PHASE &amp; NEUTRAL COPPER CONDUCTOR BUS-DUCT OF 10000 AMP. CAPACITY PER PHASE &amp; 5000 AMP. FOR NEUTRAL HAVING SHORT CIRCUIT RATING-50KA FOR 1 SEC. &amp; TEMPERATURE RISE OF 55 DEGREE ABOVE AMBIENT AND EARTH STRIPS AS PER IEC-439/2, ALONGWITH FOLLOWING SCOPE OF SUPPLY PER SET :-</p> <p>1. STRAIGHT RUN OF COPPER BUS DUCT - 5 METER (APPROX.) FOR 3 PHASE &amp; NEUTRAL. (Rates shall be quoted for per Meter, and actual length of the bus duct shall be as per site condition)</p> <p>2. COPPER FLEXIBLE END CONNECTIONS - 2 NOS. (FOR EACH PHASE &amp; NEUTRAL). (Rates shall be quoted for per End Connections)</p> <p>3. BUS BAR BENDS - 2 NOS. (Rates shall be quoted for per Bend)</p> <p><b>NOTE</b> : INSTALLATION &amp; COMMISSIONING OF COPPER BUS DUCT SHALL INCLUDE CONNECTION OF BUS DUCT WITH TRANSFORMER AT ONE END AND CONNECTION WITH LT SWITCHGEAR ON THE OTHER END SUITABLE TO THE CUTOUT OF TRANSFORMER &amp; LT SWITCHGEAR. IT ALSO INCLUDES LIKE ADAPTOR BOX, NECESSARY HARDWARES, SUPPORT INSULATORS, EARTHING &amp; PAINTING ETC.</p>	ANY REPUTED MAKE	Nos.	1
<b>SPECIAL TERMS AND CONDITIONS :-</b>				
1	Submission of Type test certificate on similar rating of equipments of any lot and routine test certificate of the equipments supplied (In original and one photo copy) shall be in the scope of party.			
2	PERT chart for the completion schedule of project (Supply & ETC) shall be provided by the Party after PO placement.			
3	All the tools, tackles, T&P shall be arranged by the Party during Erection, Test & Commissioning.			
4	Open space for material storage shall be provided by BHEL. However unloading, shifting, storage, custodian and safety of material related to above project shall be in scope of party. Any damages & shortages of the supplied material shall be responsibility of party.			
5	Supply of consumables like nuts, bolts etc. if required shall be in scope of party.			
6	No furnished/unfurnished accommodation shall be provided by BHEL for any labour/site personnel of the party.			
7	BHEL will provide only power point for necessary lighting/ erection work etc.			
8	BHEL shall not allow any space for labour camping inside the premises.			
9	As this is a turnkey project, inspection, performance, erection, testing & commissioning of items supplied and safety & security of man & material shall be responsibility of the party. The party shall also provide the guarantee for the total system as per guarantee clause of the PO.			
10	BHEL will arrange passes for the labour & other personals as per co. rules on the request of party.			
11	Party has to arrange angle iron frame/ support structure, if required.			
12	If required, party may visit the site for assessment of work.			
13	The Bus- Duct to be earthed at 02 points with suitable GI strip & shall be in the scope of party.			
<b>BHEL, Haridwar Scope of Work :</b>				
1	Preparation of transformer foundation, Trenches etc., however the drawings shall be prepared & submitted by the party.			
2	Electrical power & water supply will be provided free of charge for construction work.			