
	GENERAL & TECHNICAL SPECIFICATION FOR CONTROL CABLE	Doc. No.: REG -20220076	
Rudrapur	GROUP : RENEWABLE ENGERGY GROUP	Rev no	02

**PROJECT: 6.5 MWp (DC)/ 5 MW (AC) GRID INTERACTIVE SOLAR  
POWER PLANT AT NALANDA UNIVERSITY, RAJGIR - BIHAR.**

**GENERAL & TECHNICAL SPECIFICATIONS  
FOR  
1.1 KV CONTROL CABLE**

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**1. SCOPE OF SUPPLY :-**

**Scope:** Supply of 1.1 KV voltage grade, heavy duty, stranded copper conductor, PVC type, galvanized steel wire/strip armoured, flame retardant (FR) extruded PVC type ST- 1 outer sheath cables of sizes as below:-

S.No.	Item Description	Unit	Quantity
(i)	10C x 2.5 SQMM CABLE	Mtrs.	4000.00
(ii)	5C x 2.5 SQMM CABLE	Mtrs.	2000.00


**2. DELIVERY SCHEDULE:-** within 30 days from the date of issue of order.

The cables shall be supplied at BHEL-STORE, NALANDA UNIVERSITY – RAJGIR, BIHAR - 803116. Bidders to note that prices quoted shall be on F.O.R site basis & shall be firmed till completion of delivery.

**3. EXTENSION OF DELIVERY TIME :-** Extension in delivery schedule is permitted only in such cases wherein causes for the delay are not attributable to the supplier. In such case, supplier make a request to BHEL for the extension of delivery time with the all supporting documents. Extension of time will be given only if the facts given by supplier are found to be true/justified and on sole discretion of BHEL.

**4.** Bidders shall sign & stamp each page of tender document and submit with the technical offer as an acknowledgement that each and every page of tender document has read and understand by the bidders.

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## 5. GENERAL SPECIFICATION & TECHNICAL SPECIFICATION:-

### (i) Standard:-

IS:7098	for XLPE Cables.
IS:8130	for Conductor.
IS: 5831	for Sheath.
IS: 3975	for armour.
IS: 10810	for Testing.
IS: 10418	for packaging.
IS/IEC 69947	for UV resistant for outdoor installation

### (ii) Characteristics:- Cables shall have the following characteristics:

- Temp. Range: -10 Degree C to +90 Degree C.
- Voltage rating 0.6/1.1 kV.
- Excellent resistance to heat, cold, water, oil, abrasion, UV radiation.
- Flexibility as per relevant standard.
- Insulation:- Polyvinyl Chloride (PVC).
- Inner Sheath: PVC inner sheath
- Outer Sheath: Extruded PVC Sheath ST-1 Flame Retardant (FR),
- Conductor: Electrolytic Copper Conductor
- Armour: Wire/Strip armour as per IS:3975

**Note:-** Annex-I has to be filled & submitted by bidders alongwith Technical bid. Bidders shall also submit technical datasheet for cables of offered Make.


(iii) Cable shall have marked " Manufacturer's Name, insulation material, conductor size, volatage class & standard on its surface at every 600 meter (center).

(iv) The core insulation shall be with PVC compound applied over the conductor by extrusion and shall confirm to the requirement of IS-5831.

(v) Core identification shall provided and inadelible Arabic numerals on the outer surface of insulation colour as under:-

- |               |   |
|---------------|---|
| • Single Core | : Red, Black, Yellow or Blue                  |
| • Two Core    | : Red and Black                               |
| • Three Core  | : Red, Yellow and Blue                        |
| • Four Core   | : Red, Yellow, Blue and Black                 |
| • 3.5 Core    | : Red, Yellow, Blue and Black (reduced neutra |
| • Five Core   | : Red, Yellow, Blue, Black and Light Grey.    |

(vi) In case of cables having more than 5 cores two adjacent (counting and directional) in each layer shall be coloured Blue and Yellow respectively and the remaining core shall be light grey.

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(vii) Armouring shall be applied over the inner sheath. Armour shall be of galvanized round steel wires up to the cable diameter of 13mm and above 13 mm galvanized flat steel wires shall be provided.

(viii) Following documents are required during technical evaluation:-

- Technical Data sheet
- MQP/QAP (Bidders shall submit quality assurance plan (QAP) for approval. Inspection shall be done as approved QAP).

(6) **INSPECTION** :- Cables shall be inspected at vendor's work. The BHEL/ Customer shall be entitled to attend the inspection.

(7) **DISPATCH CLERANCE**:- MDCC (material despatch clearance certificate) for each lot shall be issued after inspection by BHEL/Customer inspection.

(8) **PACKING & DISPATCH**:- Cable shall be supplied in wooden drums of suitable barrel diameter, securely battened with take off end fully protected against mechanical damage. The wood used for construction of drum shall be properly seasoned. Sound and free from defect. No loose cables are allowed to supply.


On flange of the drum, necessary information such as manufactures name type, size, voltage grade of cable, length of cable in meters, drum no, cable code, ISI certification mark gross weight etc.

(9) **TESTS** :- All cables to be supplied of type tested quality. Cables shall conform to type tests including routine & acceptance tests in accordance with requirements. Any other test as per manufacturers standard quality plan ( MQP) deemed to be included. The prices for conducting all tests are deemed to be included in respective cable prices

The Bidder to submit the valid type test, Routine test reports to BHEL.

(10) **DEVIATIONS** :The bidder shall list all the deviation from the specification separately. Offers without specific deviation will be deemed to be totally in compliance with the specification and NO DEVIATION on any account will be entertained at a later date.

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**ANNEXURE-I**


**CHECKLIST**

**CHECK LIST FOR INFORMATION TO BE FURNISHED WITH OFFER RETURN THIS CHECKLIST AS PART OF THE OFFER DULY SIGNED**

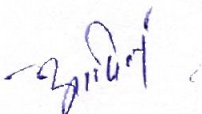
The offer may not be considered if the following information and this Checklist are not enclosed with the Offer.


S.N.	Parameter	Data	Confirmation	Remarks
1.	Applicable standrads	Latest IS-1554 part1,5831,8130,3975,IEC-60754,IEC60332	Yes/No	
2.	Rated Voltage	1100V Grade		
3.	<b>Construction</b>			
3.a	Conductor material	Heavy duty, stranded copper conducto		
3.b	Conductor Insulation	Extruded PVC		
3.c	Armouring for contr cable	Galvanized steel wire/Strip (as per 1554 part I)		
3.d	Inner sheath	Extruded PVC, type ST-1		
3.e	Outer sheath	PVC extruded, FR, Type ST-1( as p IS:5831)		
4.	<b>FR properties of Out Sheath</b>			
4.a	Minimum Oxygen index	29 as per IS 10810 part-58		
4.b	Minimum Temperatu index	250 °C		
4.c	Acid gas emission	Max 20% as per IEC-754-I		
4.d	Allowable Tolerance o overall diameter	±2mm		
4.e	Chemicals added to outer sheath to prote from rodent, vermin and termite attack	Yes		
4.f	Standard lengths of each Control Cable	500m/1000m		
4.g	Tolerance on Cable Length per Drum.	±5% of the standard drum length		

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4.h	Layer of water proof paper shall be applied to surface of the drum and over the outermost cable layer	Yes		
4.i	Minimum bending radius for multicore cables	12XD		
5.	Core Identification / markings	As per spec and standards		
6.	Technical Data Sheet of the offered cables	The technical data sheet of the offered cables conforms to Technical spec		




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**ANNEXURE-II**

**LIST OF MAKE**

S.No.	Item Description	Make
1.	10 C X 2.5 SQMM, 1.1 KV voltage Grade, heavy duty, stranded copper conductor, PVC insulated, extruded PVC ST-1 sheath (outer sheath FR), armoured	<ul style="list-style-type: none"> <li>• POLYCAB</li> <li>• KEI</li> <li>• RAVIN</li> <li>• LAPP</li> <li>• HAVELLS</li> <li>• RR KABEL.</li> </ul>
2.	5 C X 2.5 SQMM, heavy duty, stranded copper conductor, PVC insulated, extruded PVC ST-1 sheath (outer sheath FR), armoured	

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**ANNEXURE-III**

**BILL OF QUANTITY**

S.No.	Item Description	Unit	Quantity
1.	10 C X 2.5 SQMM, 1.1 KV voltage Grade, heavy duty, stranded copper conductor, PVC insulated, extruded PVC ST-1 sheath (outer sheath FR), armoured	Mtr.	4000.00
2.	5 C X 2.5 SQMM, heavy duty, stranded copper conductor, PVC insulated, extruded PVC ST-1 sheath (outer sheath FR), armoured	Mtr.	2000.00
	<b>Total</b>		

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