TENDER NO. ZETDC/FA/05/2022

DISTRIBUTION DEPARTMENT

ZETDC SPECIFICATION NO. DS20052022PVC

SPECIFICATION FOR

PVCFR/PVCFR/SWA/PVCFR CABLES (600V/100V)

ZETDC H/O PROCUREMENT
08 JUN 2022
2nd Floor, Southwing, Electricity Centre
25 S. Machel Avenue, Harare
Tel: 0242 750262
procurement@zetdc.co.zw

SPECIFICATION FOR: - PVC POWER CABLES

1. Introduction

This Specification calls for supply and delivery of **PVCFR/PVCFR/SWA/PVCFR power cables with voltage rating 600/1000VA**

The supplier shall state name, place and country of manufacture. The supplier shall state whether or not the cables are produced under license, in which case license holder's name shall be stated.

Bidders/Tenderers shall include a complete list of suitable jointing and termination kits available on the market for the cables being tendered. They should also list the recommended types of terminating and jointing kits.

The manufacture shall have a proven track record of manufacture and delivery of such goods for at least 5 years, and must indicate production for the past 2 years.

The bidder/tenderer has to complete the Technical Guarantee Schedules at the end of the specification.

2. Standards, Units and Language

All cables supplied under this specification shall conform to relevant IEC/BS Standard.Any other standard provided the Bidder can provide documentary evidence that the standard is equal to or better than the above standards.

Cables not complying with the above standards will be rejected. All tenders, correspondence, and all description upon drawings, illustrations or instructions shall be in the **English language.**

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SI units of measurements shall be used throughout. The Cables shall be manufactured to high quality standards. The companies manufacturing the cables shall have ISO Certification. Documentary proof **of ISO certification** shall be provided with the bid.

3. Particulars of Electrical System

The cables shall be capable of operation in the following system: -

(a) 3 phase, underground, resistance earthed system.
(b) Operated at 50Hz variable between plus or minus 2.5%
(c) A highest system voltage not exceeding the normal by more than 10%.
(d) Earthed so that the earth fault factor will be less than 1.5 at any location.
(e) Maximum duration of earth fault not exceeding 20s.

4. Particulars of Environment

The cables will either be subjected to Atmospheric or Underground Environment or both

4.1 Particulars of Atmospheric Environment

The cables shall be capable of operation under the following atmospheric conditions.

(a) At an average altitude of 1 500m above sea level.
(b) Ambient air temperatures not exceeding +45 degrees centigrade or below - 10 degrees centigrade.
(c) Humidity 13mg/cubic metre absolute and 65% relative before storms with vapour pressure 17mm hg.
(d) Equipment will operate within the tropics and is subject to sudden ambient air temperature changes of the order of **10 degrees centigrade per hour** occurring at the onset of rain, but the barometric pressure at any given place does not vary by more than approximately 10mm mercury.
(e) Frequent and severe lightning storms occur during summer months, with **isoraunic** levels varying between 50 and 100 thunderstorm days per annum.

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(f) Particular attention should be paid in the design of all equipment to ensure that there is no damage to working parts or insulation through the ingress of dust, insects, vermin which are prevalent for long periods in the year.

4.2 Particulars of Underground Environment

In addition to being exposed to the conditions stated in 4.1 the cables shall be capable of operation in the following underground conditions: -

(a) At a depth of burial from the ground surface to centre of the cable, of 850mm for 11kV cables, and 1050mm for 33kV cables and 1300mm for cables greater than 33kV.

(b) Mean ground temperature at this depth being 25 degrees centigrade with a maximum value of 30 degrees.

(c) In soil with a maximum resistivity of 1.2 KΩ m

(d) With a foundation or bed of washed pit sand 150mm deep laid in the trench first, followed by a second 150mm pit sand above the cable. It is then backfilled by 450mm of earth before the yellow cable marker ribbon is laid and the trench completely closed.

5. Electrical Equipment Materials

All materials incorporated in the equipment supplied shall be new and of first class commercial quality, free from defects and imperfections.

6. Drumming Cables

Cables are to be supplied on suitably reinforced cable drums which shall be weatherproofed for extended external outdoor unprotected storage. Each drum shall be firmly, clearly and indelibly labelled to include information on actual cable length in meters, size, type, and voltage rating of the cable, as well as rolling arrow and direction of lay of the cores where appropriate.

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The drum capacities shall be utilised fully, and the drum sizes selected for minimum drum transport cost. The drum weight shall not exceed 1000kg.

7. Ratings

7.1 Voltage rating

The maximum continuous voltage rating shall be 10% more than the continuous voltage rating. Cables that do not meet this requirement will be rejected.

7.2 Current Rating

Unless otherwise approved by the Authority, the current ratings depending on the method and environment in which the cable is laid according to the attached schedule of requirements shall conform to IEC 502 for cable rated below 30kV and IEC 840 for cables rated above 30kV. These shall correspond to conductor temperature of 90 degrees during normal operation and 250 degrees during faults. The short circuit ratings shall be according to IEC 949.

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8. TECHNICAL GUARRANTEE SCHEDULE

Please complete this schedule by stating the actual tendered HDA conductor specification in the column labeled Guaranteed Value.

TECHNICAL GUARANTEE SCHEDULE

Item	Description	Unit	Requirement	Actual
1	Conductor material	-	copper	
2	Conductor Construction	Min no of wires	6	
3	Conductor size	mm^2	As per schedule of requirements	
5	Insulation material		PVC/FR	
6	Number of Cores/Colour		4/Red, Yellow, Blue, Black.	
7	Bedding material		PVC/FR	
8	Single layer Steel Armour		✓	✓
9	Armouring material		GSW	
10	Armouring construction	Min no of wires	-	
11	Sheathing material		PVC/FR	
12	Method of installation		Air, direct burial, ducts	
13	Depth of laying	mm (min)	500	
14	Ground Temperature	^0C	25	
15	Ground thermal resistivity	Km/W	1.2	
16	Rated voltage ac (U_o/U)	V	600/1000	
17	Highest system voltage	V	1100	
18	Operating ambient temperature	°C	-1 to 40	
19	Conductor maximum operating temperature	°C	70	
20	Current ratings ground/air	A	42/36	
21	Cable length per despatch drum	m	500	
22	Type of despatch drum		Treated wooden	
23	Altitude	m	1400	
24	Relative Humidity	%	85	

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IMPORTANT INFORMATION

1. Deliver period shall be 8 weeks or better to ZETDC Central Stores Harare
2. The manufacture shall have a proven track record of manufacture and delivery of such goods for at least 5 years, and must indicate production for the past 2 years.
3. Factory Acceptance Tests shall be carried according to the IEC 502 standard. Tests to be carried out are as specified in this specification. Two ZETDC engineers shall witness the tests at the expense of the manufacturer.
4. Valid copy of ISO 9001/2 or proof of SABS/SAZ mark/certification to be provided with the bid.
5. Results of Type tests carried out by an independent Technical Institute on previously manufactured items to be included in the bid. The tests should have been carried out by a recognised institute (e.g KEEMA). The institute should be recognised by IEC. Documentary proof that the Test Institute is recognised by IEC shall be provided with the bid.
6. The drum weight shall not exceed 1000kgs.
7. A marking bearing voltage designation, maker's name, year of manufacture shall be marked on the PVC outer sheath at suitable intervals throughout the cable. The cable shall be marked at 1.0 m intervals to indicate the length of cable remaining on the cable drum as the cable is used.
8. Each drum shall be firmly, clearly and indelibly labelled to include information on actual cable length in meters, size, type, and voltage rating of the cable, as well as rolling arrow and direction of lay of the cores where appropriate.
9. The bidder/tenderer has to complete the Technical Guarantee Schedules at the end of the specification. The bidder should also fill; in the Technical Guarantee Schedules the actual standard being complied to.
10. Technical brochures with detailed literature covering the tendered items to be included in the bid.
11. Compliance statement to the specification on a clause by clause basis to be provided.

    Failure to meet any of the technical requirements in rejection of the bid.