
HV POWER CABLES & 8 KV SHIELDED CABLE TERMINATIONS

1. GENERAL

1.1 Description

- .1 Complete supply, installation and termination of 4160 V power cables with minimum 8 kV insulation rating (15kV is acceptable).

1.2 Codes and Standards

- .1 Insulated cables to CSA C22.2 No. 38, CSA C68.3, ICEA T-29-520, and ICEA T-30-520

2. PRODUCTS

- .1 Armoured Cables.

- .1 The Armoured Cables shall have the following characteristics:

- .1 Approved by CSA or other recognized Certification Organization in Canada.
- .2 Three soft drawn, bare, Class B compact or compressed stranded copper conductors sized as indicated per ASTM.
- .3 Conductor Shield: Extruded thermosetting semiconducting shield which is free stripping from the conductor and bonded to the insulation.
- .4 Insulation Rating: 90°C rating, 133% insulation level, 100% insulation level for 15kV cables
- .5 Insulation Shield: Extruded thermosetting semiconducting shield with controlled adhesion to the insulation providing the required balance between electrical integrity and ease of stripping.
- .6 Metallic Shield: Helically applied non-magnetic uncoated copper tape over the insulation shield with a maximum 15% gap.
- .7 Assembly: Three conductors shall be twisted together with fillers and soft drawn, bare copper bonding conductors and covered with a binder tape
- .8 Sunlight resistant PVC jacket tightly applied over the binder tape
- .9 Flexible AIA applied over the inner jacket for mechanical protection.
- .10 Low-temperature, sunlight-resistant PVC jacket applied over the armour.
- .11 Short circuit rating 60 kA, 1 cycle; 14 kA, 30 cycles.
- .12 90°C normal, 130°C emergency rating, 250°C short circuit rating.

HV POWER CABLES & 8 KV SHIELDED CABLE TERMINATIONS

- .2 The Armoured Cables shall be Prysmian 8kV or 15kV 3/C Armortek or approved equal.
- .2 Non-Armoured Cables
 - .1 Site Distribution Conductors are defined as medium voltage conductors between 5 kV switchgears in the main electrical room, generator conductors, and conductors to other buildings as indicated on Drawings.
 - .2 The Site Distribution Conductors shall have the following characteristics:
 - .1 Approved by CSA or other recognized Certification Organization in Canada.
 - .2 Three soft drawn, bare, Class B compact or compressed stranded copper conductors sized as indicated per ASTM.
 - .3 Conductor Shield: Extruded thermosetting semiconducting shield which is free stripping from the conductor and bonded to the insulation.
 - .4 Insulation Rating: 90°C rating, 133% insulation level, 100% insulation level for 15kV cables.
 - .5 Insulation Shield: Extruded thermosetting semiconducting shield with controlled adhesion to the insulation providing the required balance between electrical integrity and ease of stripping.
 - .6 Metallic Shield: Helically applied non-magnetic uncoated copper tape over the insulation shield with a maximum 15% gap.
 - .7 Assembly: Phase identified shielded conductors cabled with fillers forming a firm and cylindrical cable core. A binder tape is applied to maintain core symmetry and mechanical stability.
 - .8 Black sunlight resistant PVC jacket tightly applied over the binder tape.
 - .9 Short circuit rating 60 kA, 1 cycle; 14 kA, 30 cycles.
 - .10 90°C normal, 130°C emergency rating, 250°C short circuit rating.
 - .3 The Non-Armoured cables shall be Prysmian 8 kV or 15kV 3/C Power CSA cables suitable for cable tray and UG duct installation or approved equal.

2.2 Termination

- .1 Coldapplied, silicone rubber termination qualified to IEEE 48-1996, designed for indoor and outdoor applications
- .2 Use silicone molded skirts on outdoor applications
- .3 Prysmian Elasticfit, or approved equal

HV POWER CABLES & 8 KV SHIELDED CABLE TERMINATIONS

3. EXECUTION

3.1 Cables General

- .1 Do not splice cables. A continuous length is required for all feeds.
- .2 Submit certified Manufacturer's data sheets.

3.2 Receiving/Handling Cable

- .1 Visually inspect cable reels for any damage that may have occurred in transit.
- .2 Visually check each reel to insure that it has the proper tags and labels as described in the Specifications.
- .3 Handling of Cable Reels. When moving cable reels, care should be taken to insure that material handling equipment does not come in contact with cable surfaces or with protective covering on the reel. Under no circumstances should cable reels be dropped from any height, or be allowed to roll uncontrolled.
- .4 Storage of Cable Reels. Where possible, cable reels are to be stored indoors on a hard, dry surface to prevent deterioration of the reels and possible ingress of moisture into the cables. Cable reels stored outdoors must be supported off the ground and covered with a suitable weatherproof material.

3.3 Installation

- .1 Install in accordance with Manufacturer's recommendations, observing requirements for minimum bending radius and pulling tensions.
- .2 Clearing Duct. Using a plug approximately the same diameter as the inside of the duct, clear all burrs and obstructions in the duct or conduit by pulling the plug through the structure. Follow with a wire brush and swab to clean and remove foreign matter from the duct.
- .3 Rack/Trays. Check the entire path that the cable will follow during pulling to make sure that the cable will ride free and clear of all obstructions, sharp edges or projections which might cause it to jam or be damaged in passage.
- .4 Cable Pulling and Cable Guides. To avoid abrasion and damage of the cable jacket when guiding the cable from the reel to the duct mouth or trench, all guides shall be in the form of large diameter, smooth-surfaced, free-turning sheaves or rollers.
- .5 Maximum Pulling Tensions. Pulling tensions for installing electrical cables should be maintained as low as possible to prevent damage to the cable. Follow Manufacturer recommendation.
- .6 Consideration for Metallic Armoured Cables. Cable armours and concentrically applied grounding conductors shall be bonded and grounded at the supply end only and thereafter isolated from ground and each other. Installing cables in individual ducts of insulating

HV POWER CABLES & 8 KV SHIELDED CABLE TERMINATIONS

material, by using cables jacketed with PVC or other insulating material, or mounting cables on insulated supports, may attain isolation.

3.4 Terminations

- .1 Follow manufacture's recommended installation procedures.
- .2 Remove the insulation to fit the connector. Avoid nicking the conductor strands. Remove enough insulation to allow crimp connectors to "grow" without pushing into insulation. Follow connector Manufacturer's instructions for use of oxide inhibiting compounds, crimp tools, dies, etc.
- .3 Thoroughly read Manufacturer's instructions before beginning installation, taking note of any special requirements. Make sure that the dimensions for cable prep are for the appropriate voltage class. Make sure that the connectors used are appropriate for the application (suitable for use on copper, sealed lugs if outdoor, length, tapered, if required, etc.) and that the proper crimp tool (and dies, if needed) is available.
- .4 Clean the cable jackets to the specified distance. To eliminate the risk of damaging the underlying metallic shield, do not cut completely through the jacket. Instead, ring cut through at least 50% of the material and tear off the remainder.
- .5 Metallic Shields. Remove the metallic shield to the specified distance. Consult instructions prior to bundling.
- .6 Semiconductive Layer. Remove the extruded semiconductive layer. Any nick through this layer into the insulation shall be sanded out or discharge will occur and could lead to failure.
- .7 Cleaning Solvents. Solvents should be used with lint-free cloths. Do not pour solvents directly onto cable insulation. Read solvent manufacturer's instructions thoroughly.
- .8 Install compression connectors using tools provided by the connector Manufacturer in accordance with the Manufacturer's recommendations.

3.5 Tests

- .1 The electrical contractor is to test cables prior to energization, as follows:
 - .1 Megger
 - .2 Highpot
 - .3 25 kV DC ICEA
 - .4 Radar scan shield test

END OF SECTION