

Design Safety Conformance (part 1)

Powercity generator sets are designed and certified to conform to **BS⁽¹⁾, EN⁽²⁾ and IEC⁽³⁾ Standards 60204-1:2006 – Safety of Machinery**. Product is assessed and certified by independent standards conformance agency Materials and Industrial Research & Technology Center (MIRTEC) based in Europe. Copy of certification can be viewed and downloaded from www.powercity.ph

Large generator sets are usually harnessed with heavy gauge cables. If not properly supported, or isolated from vibration source, these cables are subjected into mechanical or tensile stress. **IEC Standard 60204-1:2006, paragraph 12.6.2** requirement states that:



12.6.2 Mechanical rating

The cable handling system of the machine shall be so designed to keep the tensile stress of the conductors as low as is practicable during machine operations. Where copper conductors are used, the tensile stress applied to the conductors shall not exceed 15 N/mm² of the copper cross-sectional area. Where the demands of the application exceed the tensile stress limit of 15 N/mm², cables with special construction features should be used and the allowed maximal tensile stress should be agreed with the cable manufacturer.

The maximum stress applied to the conductors of flexible cables with material other than copper shall be within the cable manufacturer's specification.

NOTE The following conditions affect the tensile stress on the conductors:

- acceleration forces;
- speed of motion;
- dead (hanging) weight of the cables;
- method of guiding;
- design of cable drum system.

Hence to avoid mechanical or tensile stress caused by the weight of heavy gauge cables, **paragraph 13.1.2 of IEC Standard 60204-1** required that terminations of cables shall be adequately supported to prevent mechanical stress of these cables.

13.1.2 Conductor and cable runs

Conductors and cables shall be run from terminal to terminal without splices or joints. Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be joints for the purpose of this Subclause.

Exception: Where it is impracticable to provide terminals in a junction box (for example on mobile machines, on machines having long flexible cables; cable connections exceeding a length which is not practical to be supplied by the cable manufacturer on one cable drum; repair of cable due to mechanical stresses during installation and operation), splices or joints may be used.

Where it is necessary to connect and disconnect cables and cable assemblies, a sufficient extra length shall be provided for that purpose.

The terminations of cables shall be adequately supported to prevent mechanical stresses at the terminations of the conductors.

Wherever practicable, the protective conductor shall be placed close to the associated live conductors in order to decrease the impedance of the loop.

Other generator set would separate the breaker, cable runs and terminal busbar in an enclosure adjacent to the generator but only for extra cost to the end user. Powercity can built-in the system in the same generator set enclosure without the extra cost.

Cable support to prevent mechanical or tensile stress of cables.

Terminal busbar.



- (1) British Standards
- (2) European Norm
- (3) International Electrotechnical Commission