

**SANS 10142-1:2008**  
Edition 1.6  
(As amended 2008)

- c) when required (see SANS 10108), contains explosion-proof electrical equipment (see 7.14).

**7.11.5** Where the emergency supply is provided from a central power system, an emergency lighting supply circuit shall have a clearly identified manual control for use if the automatic control fails to operate. All controls of emergency lighting shall be inaccessible to the general public.

**7.11.6** Exit signs shall be illuminated by the safety and emergency lighting systems.

**7.11.7** An exit sign or an emergency luminaire that contains its own battery shall have continuous supply to the battery charging equipment.

**7.12 Alternative supplies (including low-voltage generating sets, photovoltaic (PV) installations, etc.)** **Amdt 6**

NOTE Alternative supplies include but are not limited to low-voltage generating sets and photovoltaic (PV) installations. **Amdt 6**

**7.12.1 General**

**7.12.1.1** Subclause 7.12 applies to an installation that incorporates alternative supplies intended to supply, either continuously or occasionally, all or part of the installation with the following supply arrangements: **Amdt 6**

- a) supply to an installation or part of an installation which is not connected to the main supply of a supplier; **Amdt 6**
- b) supply to an installation or part of an installation as an alternative to the main supply of a supplier; and **Amdt 6**
- c) appropriate combinations of the above.

NOTE 1 Requirements of the supplier should be ascertained before a generating set is installed in an installation connected to the main supply of a supplier.

NOTE 2 This part of SANS 10142 does not cover the supply to an installation that functions in parallel with the main supply (co-generation). **Amdt 6**

**7.12.1.2** Subclause 7.12 covers, but is not limited to, the following:

- a) generating sets that consist of a combination of an internal combustion engine or a turbine, and an alternator or a d.c. generator;

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- b) rotary UPS systems (uninterruptible power systems) that consist of a combination of an electric motor and an alternator, with batteries as a standby power source for the electric motor, or with an internal combustion engine or turbine as a standby power source for the alternator; and
- c) static UPS systems that consist of static inverters with batteries as the standby power source (with or without bypass facilities).

**7.12.2 Requirements for alternative sources of supply**

**7.12.2.1** Where any form of alternative supply (emergency supply, UPS, etc.), is connected to an electrical installation, a notice to this effect shall be displayed at the main switch of the installation, and where such supply

- a) supplies power only to certain circuits in a distribution board, a power-on indicator (visible or audible) shall be provided on each such distribution board as well as a notice indicating that the standby power main switch shall also be switched off in an emergency; **Amdt 6**

- b) only supplies a part of the electrical installation, the notice shall also be displayed on each distribution board in that part of the installation (see 6.6.1.1(d)). **Amdt 6**

**7.12.2.2** The means of excitation and commutation shall be appropriate for the intended use of the generating set and the safety and proper functioning of other sources of supply shall not be impaired by the generating plant.

**7.12.2.3** The prospective short-circuit current and prospective earth fault current shall be assessed for each source of supply or combination of sources, which can operate independently of other sources or combinations. The short-circuit rating of protective devices within the installation and, where appropriate, connected to the main supply, shall not be exceeded for any of the intended methods of operation of the sources.

**7.12.2.4** Where the alternative supply is intended to provide a supply to an installation that is not connected to the main supply, or to provide a supply as a switched alternative to the main supply, the capacity and operating characteristics of the alternative supply shall be such that danger or damage to equipment does not arise after the connection or disconnection of any intended load as a result of the deviation of the voltage or frequency from the standard range. Means shall be provided to automatically disconnect such parts of the installation, as may be necessary if the capacity of the alternative supply is exceeded. **Amdt 6**

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**188 Table 6.5(a) — Single-core PVC insulated cables, unarmoured, with or without sheath (SANS 1507 )**  
Current-carrying capacity aluminium conductors

1	Ambient temperature: 30 °C Conductor operating temperature: 70 °C										
	2	3	4	5	6	7	8	9	10	11	12
Conductor section area mm <sup>2</sup>	Insulation method 1 (enclosed in conduit in thermally insulating wall, etc.)	Insulation method 2 (enclosed in conduit on a wall or in trenching, etc.)	Insulation method 3 (clipped direct)	Insulation method 4 (on a perforated cable tray, horizontal or vertical)	Insulation method 5 (in free air)	Insulation method 6 (in free air)	Insulation method 7 (in free air)	Insulation method 8 (in free air)	Insulation method 9 (in free air)	Insulation method 10 (in free air)	Insulation method 11 (in free air)
	Two cables, three-phase a.c. or d.c.	Three or four cables, three-phase a.c. or d.c.	Two cables, three-phase a.c. or d.c.	Three or four cables, three-phase a.c. or d.c.	Two cables, three-phase a.c. or d.c.	Three or four cables, three-phase a.c. or d.c.	Two cables, three-phase a.c. or d.c.	Three or four cables, three-phase a.c. or d.c.	Two cables, three-phase a.c. or d.c.	Three or four cables, three-phase a.c. or d.c.	Two cables, three-phase a.c. or d.c.
	A	A	A	A	A	A	A	A	A	A	A
50	50	54	116	134	134	132	144	132	163	146	128
70	118	120	154	181	181	184	194	184	226	194	203
95	142	142	181	191	225	194	225	206	256	234	223
120	164	170	210	220	246	226	246	240	286	272	227
150	189	194	234	250	283	250	283	272	324	316	247
185	215	227	265	289	324	289	324	317	364	354	275
240	252	271	312	338	384	354	407	375	466	432	335
280	289	308	358	388	444	410	469	433	528	501	435
360	—	—	477	505	571	546	602	562	678	644	567
400	—	—	540	571	651	625	682	642	775	737	640
460	—	—	616	642	731	709	768	725	866	823	727
500	—	—	—	—	800	771	831	781	956	907	807
740	—	—	—	—	900	823	883	836	1 125	1 066	907
960	—	—	—	—	1 022	926	1 073	999	1 283	1 228	1 028

**7.10.1.5** Flexible cables shall be used to supply equipment that is permanently installed but movable, such as swivelling projection lamps and movable frames for lighting equipment (battens).

**7.10.1.6** Socket-outlet circuits supplied from a dimmer in any theatre, cinema or similar place of assembly do not need earth leakage protection, provided that

- a) the circuits are derived from a safety supply, and
- b) the socket-outlets are marked to indicate that they are on dimmer control.

## 7.10.2 Stage equipment

**7.10.2.1** Cables for stage equipment shall be insulated with material that is suitable for exposure to the high operating temperatures of such equipment.

**7.10.2.2** Suspended electrical equipment, including the cables themselves, shall be so supported that the conductors or cables are not strained.

**7.10.2.3** All stage luminaires that retract into recesses that close, shall automatically switch off as they retract (see also 6.14.3).

## 7.11 Safety and emergency lighting

**7.11.1** Normal, safety and emergency lighting systems shall be independent of outdoor lighting systems.

**7.11.2** The electrical equipment of an emergency lighting system shall be independent of the electrical equipment and circuit of the normal lighting system.

**7.11.3** Normal and safety lighting systems may share a source of supply, but an emergency lighting system shall have an independent source of supply.

**7.11.4** If the source of supply uses batteries that emit explosive fumes or gases (or both), it shall be installed in a room that

- a) is designed to accommodate the source of supply and the batteries,
- b) has adequate ventilation to the outside, and