



FAQ's

Selection of cables for
Electrical Switchboards

Q: What is the standard to be referred to in selecting cable sizes for LV switchboards in Australia?

- AS/NZS 3008.1.1:2009 covers the cable selection criteria for electrical installations of alternating voltages up to and including 0.6/1kV

Q: What are the main factors to be considered in selecting a particular cable size?

1. Current-carrying capacity: Depends on the method of installation (eg. Installed directly exposed to sun, underground, covered by thermal insulation etc) that restricts the operating temperature of the cables.
1. Voltage drop: Depends on the impedance of the cable, load current and power factor
1. Short circuit temperature limit: Depends on the energy produced during the short circuit condition

Q: What condition is used in selecting cables for switchboards as per the standard?

- We consider the cables are installed in air and unenclosed when selecting cables that are installed inside a switchboard (section 3.4.2.b.i.g of AS/NZS 3008.1.1:2009)

Q: What is the minimum operating temperature limit of insulation used for cables in Australia?

- Polymeric cables with normal use temperatures below 75 deg C are not suitable for Australian conditions. Therefore, V-75 is considered the lowest insulation type that can be used. All insulation types are listed in table 3.2 of AS/NZS 3000: 2007.

Q: What are the typical cable sizes considering V-95 insulation type?

CONDUCTOR SIZE (mm ²)		MAXIMUM RATED CURRENT (A)
SINGLE CONDUCTOR	IN PARALLEL	
1.5		20
2.5		30
4		40
6		50
10		70
16		90
25		110
35		150
50		200
70		250
95		300
120		350
150	2 X 90	400
185	2 X 120	500
240	2 X 150	630
	2 X 240	800

- The above table has not taken into consideration the terminal temperature effect of circuit breakers and therefore is to be used only after careful consideration of maximum demand of the particular circuits, loading cycles, derating factors etc.

Q: What is terminal temperature?

- Table 8 of AS/NZS 3439.1:2002 includes cable sizes used by the equipment (circuit breaker) manufacturers in performing the temperature rise tests.

Q: What are the cable sizes to be used inside a switchboard when connecting circuit breakers?

- The best place to find these cable sizes that are typically being used by the equipment (circuit breaker) manufacturers in performing the temperature rise test is listed in table 8 of AS/NZS 3439.1:2002
- The table below shows some typical values of cable sizes that can be used, taking to account the effect of terminal temperature.

CONDUCTOR SIZE (mm ²)		MAXIMUM RATED CURRENT (A)
SINGLE CONDUCTOR	IN PARALLEL	
MINIMUM 2.5		
2.5		20
4		25
6		32
10		50
16		65
25		85
35		115
50		150
70		175
95		225
120		250
150	2 X 70	275
185	2 X 95	350
240	2 X 120	400

Reference: AS/NZS 3008.1.1:2009 and AS/NZS 3439.1:2002

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