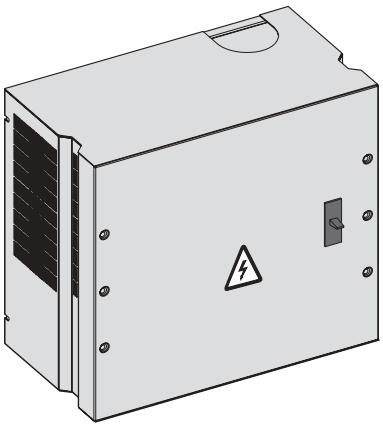
Varset Direct

Fixed low voltage capacitor banks Panels and cubicles

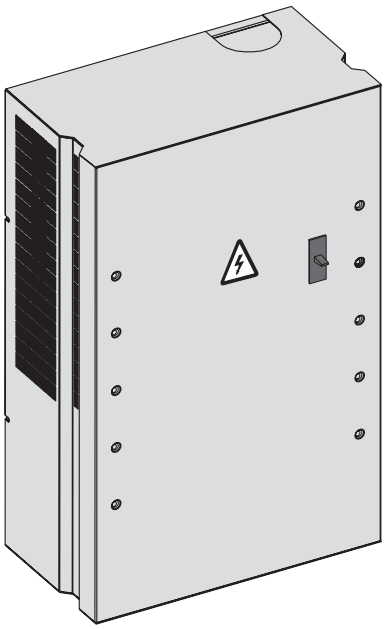
User guide

DB110515



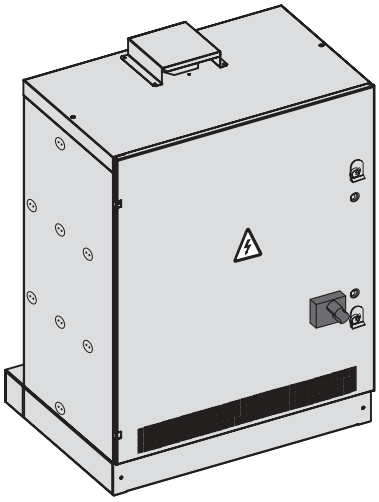
C1 panel

DB110528



C2 panel

DB110517

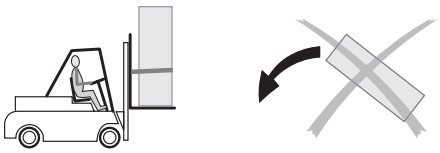


A2 cubicle

Schneider Electric

Reception

DB110591



For all panels and cubicles.

Presentation

Varset Direct is a fixed capacitor bank in the form of:
- panels
- cubicles.

The A2 cubicles can be fitted with harmonic filter reactors.

Reception of equipment

- the addressee is always responsible for the risks and perils of transporting our goods
- we decline all responsibility for missing items or damage attributable to the carrier. If need be, send your complaints by registered mail to the carrier
- make sure there are no missing items and that the equipment has not been subject to a shock likely to have affected its insulation or operation
- check the electrical characteristics indicated on the rating plate correspond to those on the order form
- in the event of a non-conformity, indicate the shipping note reference when submitting your complaint.

Handling

- unpack the equipment at the place where it is to be installed
- it is preferable to use a forklift truck
- avoid shocks and deformation to the equipment.

Storage

- store the devices in a dry and well ventilated place that is sheltered from rain, water projections, chemical agents and dust
- storage temperature: -20 °C to +45 °C.

Warranty

The equipment is factory cabled and inspected. Any modification to the equipment jeopardizes its warranty.

Description

Technical characteristics

- voltage, frequency, power, as per rating plate
- rating tolerances: -5, +10 %
- allowable voltage overload
- (8 h out of 24 h as defined in IEC 60831-1/2): 10 %
- insulation voltage: 690 V
  - 50 Hz, 1 min withstand: 2.5 kV
- ambient temperature in premises:
  - maximum temperature: 40 °C
  - average temperature over a 24 hour period: 35 °C
  - average temperature over a 1 year period: 25 °C
  - minimum temperature: -5 °C
- maximum dissipated power:
  - 1.5 W/kVAr for Classic cubicles
  - 1.9 W/kVAr for Comfort cubicles
  - 8 W/kVAr for Harmony cubicles
- protection degree: IP31 (apart for the ventilator outlet: IP21D)
- colour:
  - sheet steel: RAL 9001
  - front plate: RAL 7021
- compliant with IEC 60439-1 and IEC 61921.

Fig. 1: electrical layout diagrams for Varset Direct and Varset Direct with circuit-breaker.

Fig. 2: electrical layout diagrams for Varset Direct Harmony and Varset Direct Harmony with circuit-breaker.

Description (cont.)

Sizes and weights (Fig. 3 et 4)

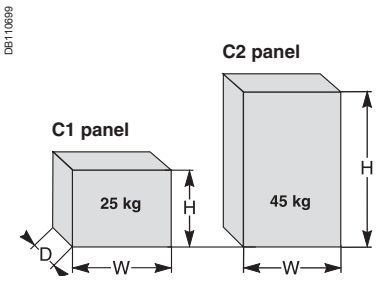


Fig. 3: C1 and C2 panels.

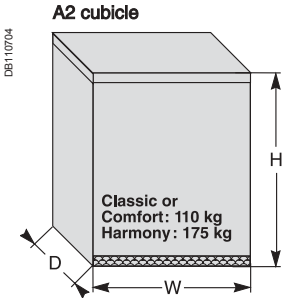


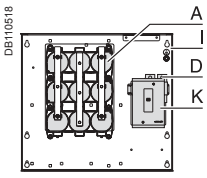
Fig. 4: A2 cubicle.

Panel sizes (mm)

	H	W	D
C1 panel	450	500	275
C2 panel	800	500	275

Cubicle sizes (mm)

	H	W	D
A2 cubicle	1100	800	600
Harmony A2 cubicle	1100	800	600



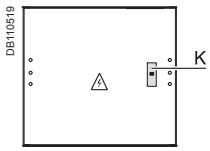
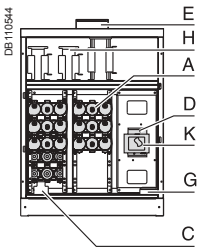


Fig. 5: C1 and C2 panels.



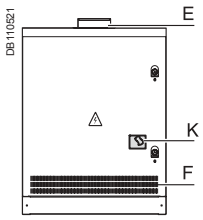


Fig. 6: A2 cubicle.

Components

A : capacitors
C : circuit protection fuses depending on range
D : power cable connection pads
E : ventilator depending on power rating
F : air vents
G : voltage transformer depending on range
H : harmonic filter reactors depending on range
I : earthing
K : protective circuit-breaker depending on range.

Installation

Ambient air temperature

The ambient air temperature surrounding the electrical cubicle must be within the following limits:

- maximum temperature: 40 °C
- average temperature over a 24 hour period: 35 °C
- average temperature over a 1 year period: 25 °C
- minimum temperature: -5 °C.

Ventilation rules

- place the equipment in well ventilated premises
- check maximum temperature limits are not exceeded when the equipment is in operation (see the "ambient air temperature" paragraph above)
- make sure the air vents are not covered (minimum space 100 mm)
- ensure the equipment is sheltered from dust and humidity.

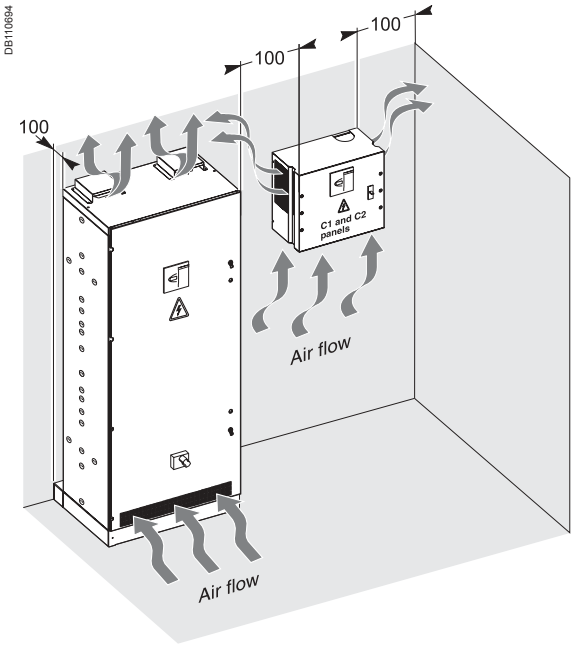


Fig. 7: air flow.

Installation (cont.)

Earth connection (Fig. 8)

The capacitor bank must be earthed using the terminal intended for this purpose.

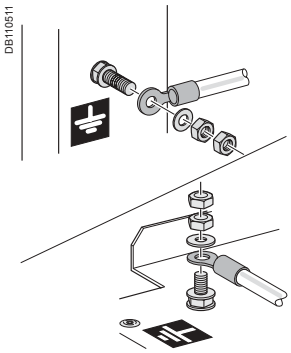


Fig. 8: earth connection: horizontal or vertical.

Choice of cables

For an ambient temperature of 40 °C, the temperature inside the cubicle can reach 55 °C.

Sizing current

The connection cables to the power factor correction cubicle must be sized for the following maximum continuous currents Imp:

Model	Imp
Classic	1.36 In
Comfort	1.50 In
Harmony 135 Hz	1.10 In
Harmony 190 Hz	1.19 In
Harmony 215 Hz	1.31 In

Minimum sizing rules not taking into consideration any correction factors: temperature, installation method.

Power factor correction cubicle nominal current:

$$In = \frac{Q}{U\sqrt{3}}$$

where U = mains supply voltage
Q = reactive power of the cubicle

Cross-section

It must be compatible with:

- the ambient temperature around the conductor
- the installation method (trunking, duct, etc.)
- the cable manufacturer's recommendations.

Connection methods

- to circuit-breakers (Fig. 10)
- to terminal blocks (Fig. 9)
- to Polybloc (Fig. 11).

Tightening torques

- cables connected to terminal blocks must be tightened to 42 Nm max.

For cables connected to circuit-breakers, refer to the user guide.

Power circuit connection

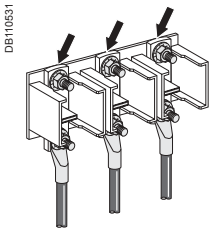


Fig. 9: power connection to terminal blocks.

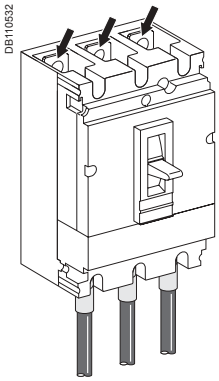


Fig. 10: power connection to circuit breakers.

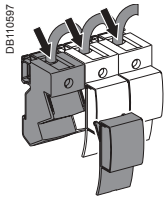


Fig. 11: power connection to Polybloc.

Maintenance

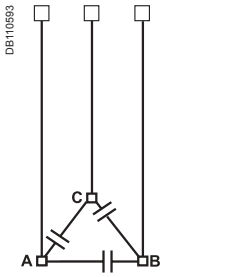


Fig. 12: capacitor cabling.

Personnel protection

Each capacitor is fitted with discharge resistors which reduce terminal voltages to 50 V one minute after de-energising.

Before carrying out work on the equipment:

- remove its power supply
- wait until the compulsory discharge time has elapsed
- ensure each capacitor has been fully discharged by short-circuiting and earthing its terminals.

Discharging the capacitors

Warning:
To ensure capacitor discharge, successively short-circuit terminals: AB, AC and BC (Fig. 12).

Checks

Each year check:

- general cleanliness of the equipment
- filters and ventilation system
- terminal tightening torques.
- proper working order of switching and protective devices
- temperature in the premises: -5 °C to +40 °C max
- capacitor capacitance, consult us if the capacitance value has changed by more than 10 %.

Safety

All the operations described in this guide must be carried out whilst respecting current safety standards, and under the responsibility of a competent authority.

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