VarplusBox Compact
LV Capacitor
Instruction Sheet

Applicable standards:
IEC 60831-1/2 and current local adaptations

Reception of goods

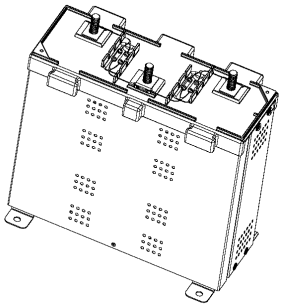
- Check that no package is missing and goods have not suffered from any impact that would have damaged their insulation or good operation.
- Check that all the characteristics meet the specifications of the order form. If characteristics are not right please note the delivery document number on your claim form and send it to us. We decline all responsibility in the case of missing goods or damages during transport.

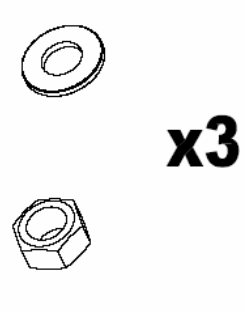
Storage

Capacitors should be stored in a dry, well ventilated room away from rain, water, chemicals and dust.

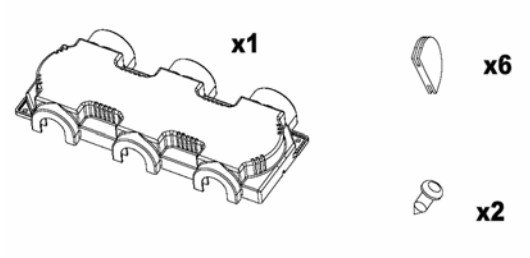
Presentation

VarplusBox Compact capacitors can be used alone or assembled together. Maximum power ratings given in the page3 should be strictly followed. Capacitors are delivered with their accessories and protective covers. Interconnection copper bars are delivered separately on an optional basis. (see Ref.No.)

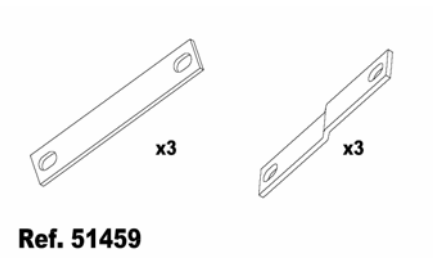




Accessories



Protective Cover



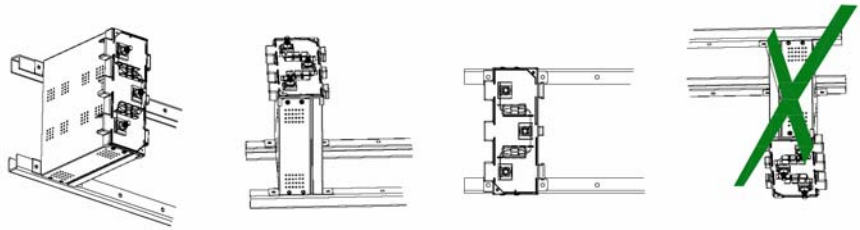
Interconnection Copper bars

Handling

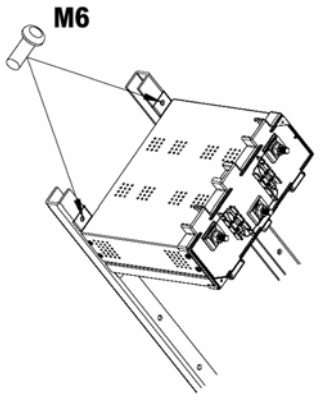
- Unpack on the installation site
- Keep this user manual at disposal of personnel in charge of installation, mounting, operation and maintenance.
- Avoid shocks and distortion on capacitor element.

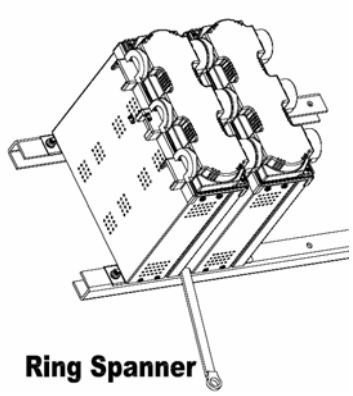
Mounting

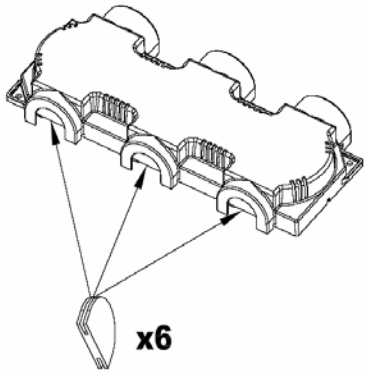
- VarplusBox capacitors can be mounted alone or in row.
- Position: *upright or horizontal*



- Capacitor body shall be earthed at bottom. Torque of 12NM to be used for tighten the bottom stud on the mounting plates
- Capacitor shall be installed in dry place away from heat generating source & avoid dusty atmosphere
- Refer Page no.4 for detailed dimension of the product.
- The use of punched mounting plates or support bars between two stages is compulsory in to facilitate the airflow.





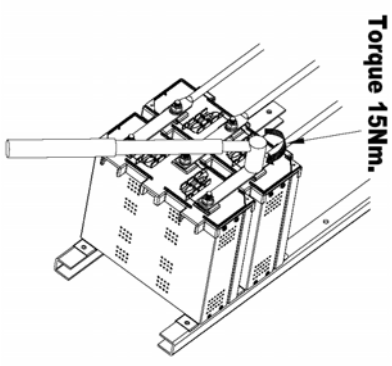


Installation

- Indoor installation on firm support in a correctly ventilated local or envelope.
- Ambient temperature around capacitors must not exceed 35°C over one year, 45°C over 24hours and 55°C max (according to IEC 60831 for -25/D temperature category)
- keep min. 25mm gap above the Top of the capacitor
- Capacitor duty contactors are recommended for switching the capacitors in order to limit the inrush current when capacitors are switched in parallel with other energized capacitor units.. When normal contactors are used use Inductor coil in series with two phases .

Electrical connection

- It is recommended to use a cable of minimum Temperature withstand capacity of 90°C
- Remove conductor insulation of the cable only 10mm for connection.
- Suitable sized connecting lugs have to be used with connecting cable to capacitor terminals in order to avoid heat generation due to improper contacts.
- Insert the connecting lugs inside the Stud Type Terminals and tighten the bolt with a torque of 15Nm with a torque wrench.
- Use the connectors (Ref no: 51459) to parallel the capacitor to make the capacitor bank assembly .(See pictures)



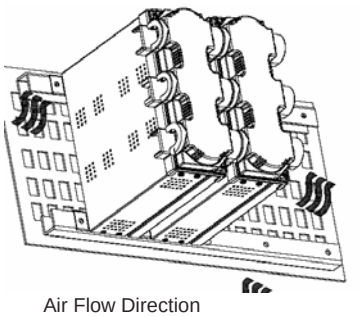
kvar Rating	Cable Size in mm^2					
	230V/240V		400 to 480 V		>600V	
	Al	Cu	Al	Cu	Al	Cu
2.5	1.5	1	1.5	1	1.5	1
5	4	2.5	1.5	1	1.5	1
7.5	10	6	4	2.5	1.5	1
10	16	10	6	4	2.5	1.5
12.5			10	6	4	2.5
15			10	6	6	4
20			16	10	10	6
25			25	16	16	10
30			35	25	16	10
40			50	35	25	16
50			50	35	35	25

Warning: Cable size recommendations are made as per the standard operating conditions. For conditions such as Harmonics, over voltage etc higher cable sizes may be necessary

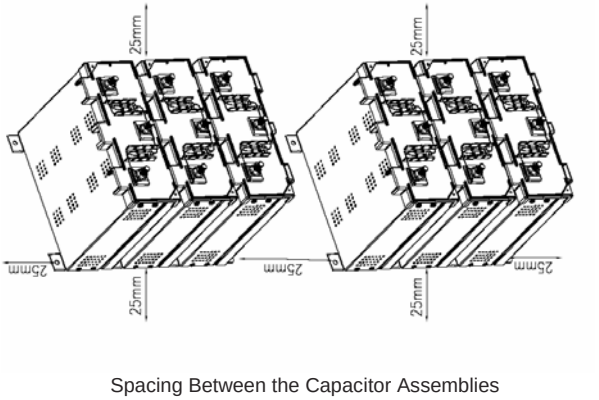
Ventilation

Capacitors, contactors, fuses and electrical connections generate heat dissipation (about 2,5W/kvar total or 8W/kvar with series reactors). Specific precautions must be taken in order not to exceed temperature values of -25°C/D category around the capacitors inside the cubicle. (refer to "Guide for the Design and Production of LV Power Factor Correction Cubicles" for more information).

The airflow inside the cubicle must go from bottom to top.



Air Flow Direction

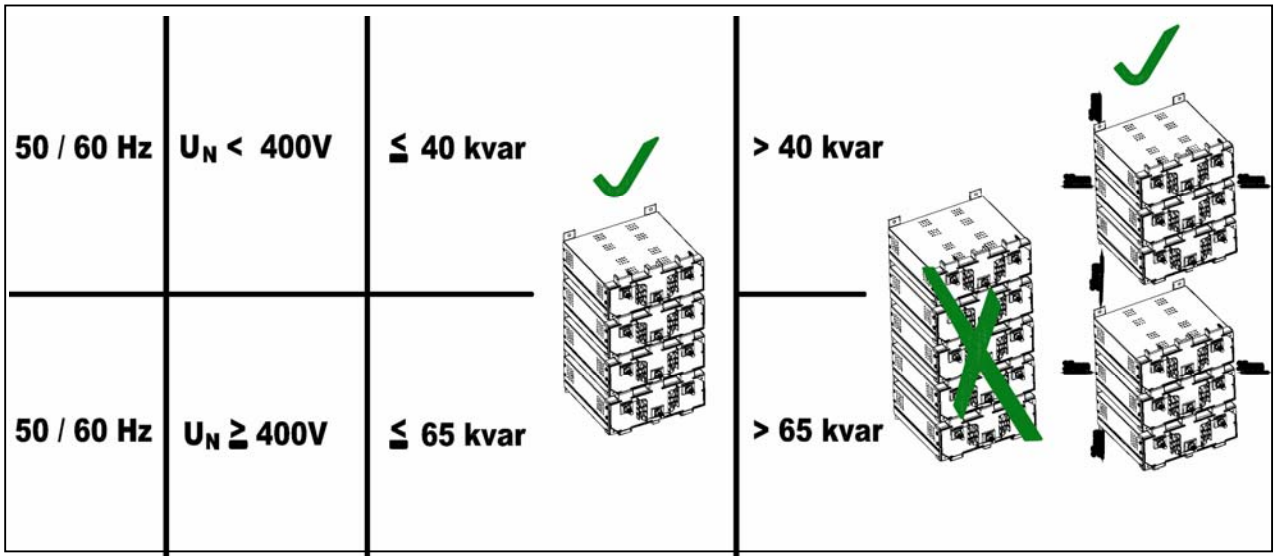


Spacing Between the Capacitor Assemblies

Maximum Power of VarplusBox Compact Capacitor Assembly

Rated voltage	Maximum quantity of units mechanically assembled	Maximum acceptable power of the assembly
380/400/415V	4	65 kvar (20kvar is the Maximum with single Unit)
440V	4	65 kvar (20kvar is the Maximum with single Unit)
480V /525 V	4	50 kvar (12.5kvar is the Maximum with single Unit)
690V	4	50 kvar (12.5kvar is the Maximum with single Unit)

Applicable Maximum Power can be estimated from the figure below.



Harmonics

User is advised to check the harmonic content in the system before installation of capacitor. In case of high harmonics content in the network, it is necessary to use specifically adapted capacitors with additional series reactors to avoid resonance phenomena (detuned reactors). The use of inappropriate capacitor will reduce its life time.

Switching and protection devices

Use switching and protection devices designed for capacitive switching duty.
After switching off a capacitor, a delay of at least 1 minute must be allowed before switching on again to ensure the discharge of individual capacitor step/unit before reconnection.

Safety

All operations described in this user manual must be carried out in compliance with safety standards under the responsibility of a competent authority.
To access installed capacitors:

- Switch off main power supply.
- Switch off power supply of control circuit.
- Allow capacitor discharge time (1 minute).
- Short circuit and earth the terminals to ensure that capacitors are fully discharged.

Caution! Do not touch the Capacitor Terminals before Discharging

Attention

Wrong selection of capacitor with respect to duty to be performed will cause Over Heating,
Over Stress, and it will shorten the life of capacitor and hence user should take proper care for selection of capacitor and maintaining operating conditions

Limits of Warranty:

This equipment should only be mounted following these instructions. The manufacturer shall not be held responsible for any failure to comply with the instructions given in this manual.

More information on:
www.schneider-electric.com

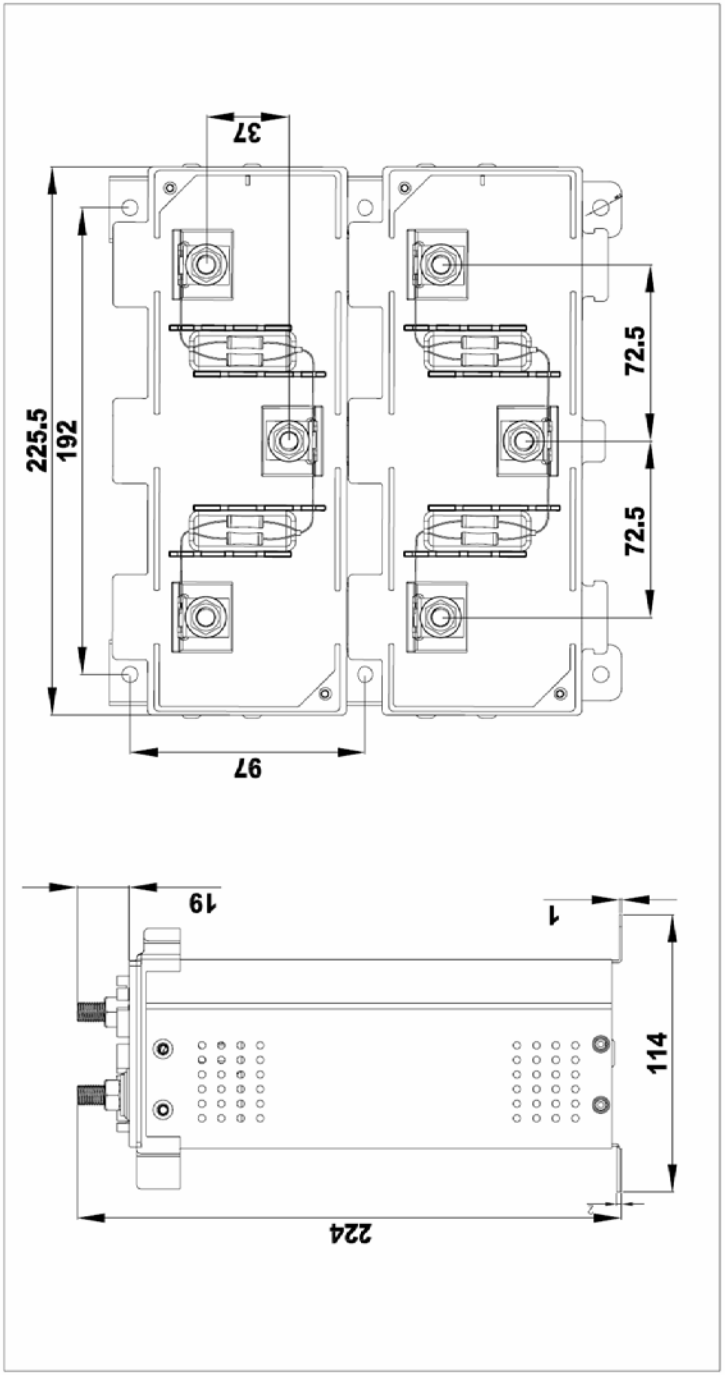
Schneider Electric India Pvt Ltd, Power Factor Correction,
16K- Attibele Industrial Area
Neralur Post, Bangalore 562 107
INDIA.

TEST CERTIFICATE

IEC 60831-1 - 2002

Sl No.	TEST	CLAUSE	RESULTS
1	Capacitance Measurement & Output calculation	7	Within the Specified Tolerance
2	measurement of the tangent of Loss angle (tan δ) of the capacitor (After energization)	8	< 0.0005
3	Voltage Test Between Terminals	9	Withstood
4	Voltage Test Between Terminal & Container	10	Withstood
5	Test of the internal discharge Device	11	Residual Voltage < 50V within 60 seconds
6	Sealing Test	12	No Leakage

Tested By: QA Engineer



VarplusBox Compact Dimensions