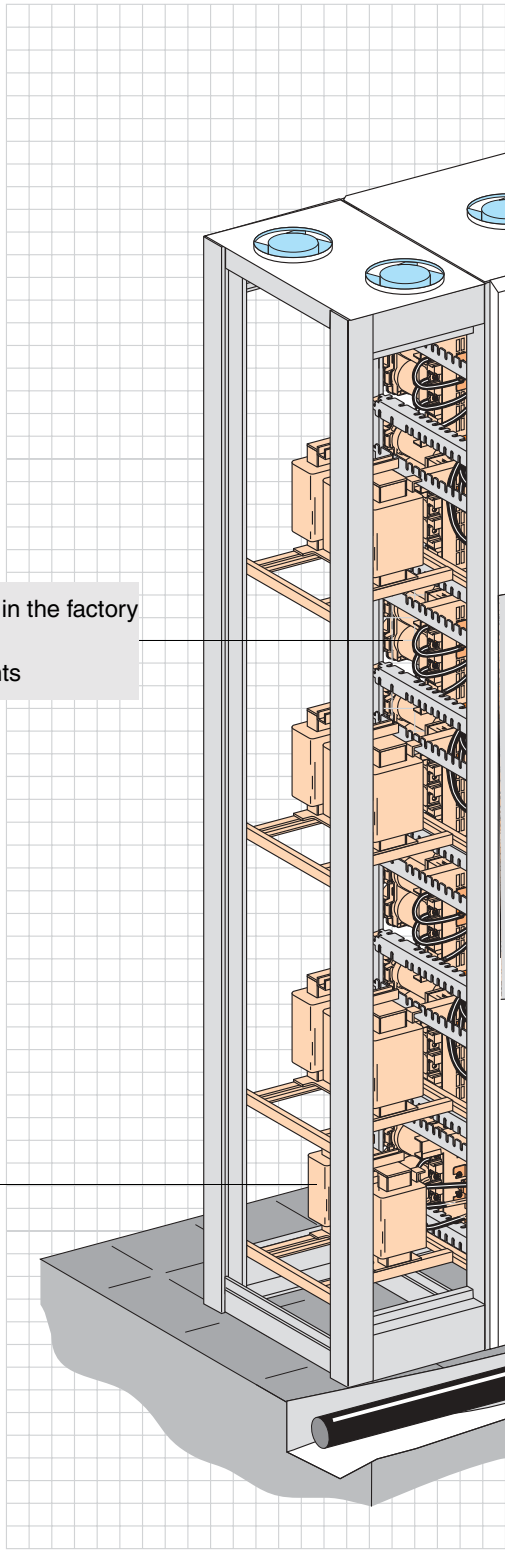
Design of a LV compensation cubicle

In addition to the rules and standards concerning production of electrical switchboards the LV correction switchboards require the consideration of specific constraints.



- mounted, pre-cabled and tested in the factory
- adaptation in all cubicle types
- perfect association of components

1- The Varpact compensation modules (see pages 40 to 42)

The Varplus² capacitors
(see pages 43 and 44)
Their positioning must ensure proper ventilation.
Their sizing must take into account ambient conditions (harmonics, temperature, etc…)

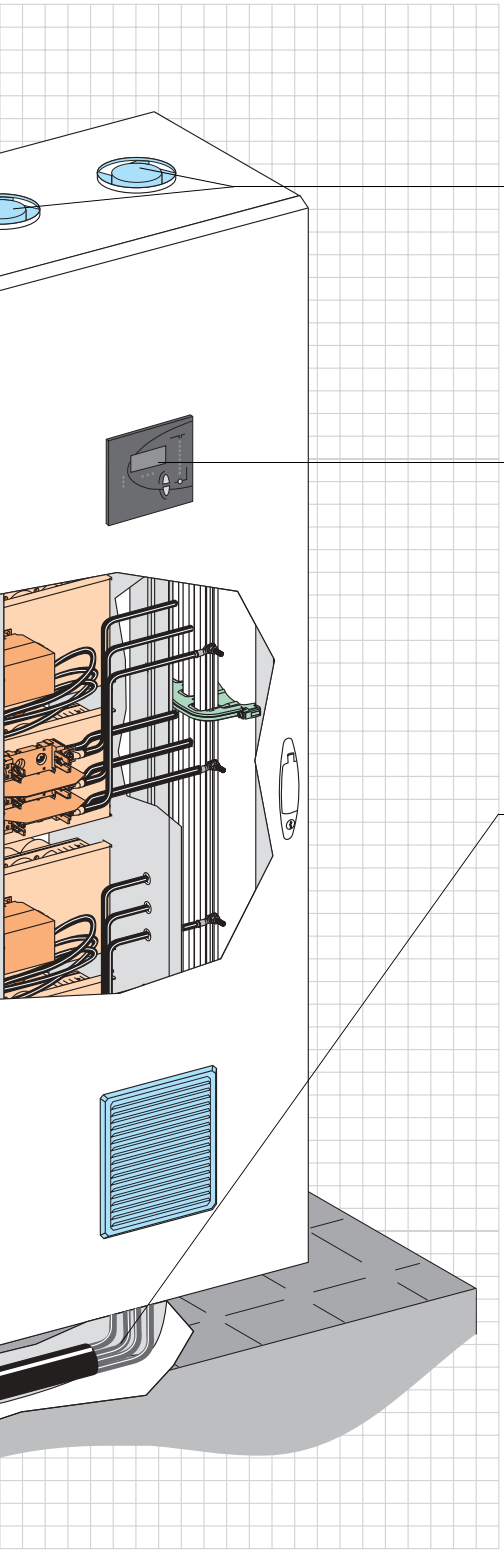
The contactors (see pages 38 and 39)
They must be suited to capacitor control.
Schneider Electric have designed and tested specific contactors (Telemecanique) for this application.
Their control voltage must be monitored in order to prevent rapid reclosing.

2- The detuned reactors (DR)

(see pages 33 to 35 and 45)
They must be chosen according to harmonic stresses and installed in order to avoid, as far as possible, capacitor temperature rise.
The DR temperature sensor must be connected so that the step can be disconnected if the temperature is too high.

To not respect one of these 7 rules can shorten the operating life of the capacitors (in a few months) as a result of an excessive temperature, harmonic stresses or an over voltage due to the wrong setting of the controller. It can lead to the rupture of the capacitors, contactors, wirings or detuned reactors.
In the worst case, this can lead to fire.

Key points and risks



3- Ventilation (see pages 46 to 49)

It must be efficient in order to keep operating temperature lower than maximum permissible temperature of components.

4- The power factor controller

(see pages 36 and 37)

Its functions must be adapted to the capacitor bank characteristics: number and power of steps, sequence, etc. The time delay must be adapted to capacitor discharge time.
Time delay must be set to a minimum of 50 secondes **(see page 11)**.

5- Low voltage network

(see pages 6 to 8)

Network characteristics, and in particular network harmonic pollution, must absolutely be taken into account when choosing capacitors and detuned reactors (if any).

6- Tests to be done after production of the bank (see p. 55 to 60)

At the end of the manufacturing process, a LV switchboard must undergo various routine inspections and tests in the factory, following an established programme.
The switchboard must comply with :

- the appropriate standards
- the design file (drawings, diagrams and specific requirements)
- manufacturer mounting instructions
- in-house instructions.

7- Maintenance must be done every year

One month after energising, check:

- contactor terminal tightening torques.

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 %.