

## **CAPACITOR BANKS**

### **CONNECTING DIRECTIVES**







## **Protection Device**

Dimensioning of the protection device of a capacitor bank :

The nominal current of the capacitor bank will be calculated as follows:

$$I \text{ nom} = \frac{\text{kVar x } 1000}{\text{U nom x } \sqrt{3}}$$

This current must be multiplied with following coefficients:

I protection = I nom x  $1,1 \times 1,3$ 

- 1,1: to take account of the deviations in the network voltage.
- 1,3: to take account of the extra currents due to harmonics.

So:

I protection = I nom x 1,43

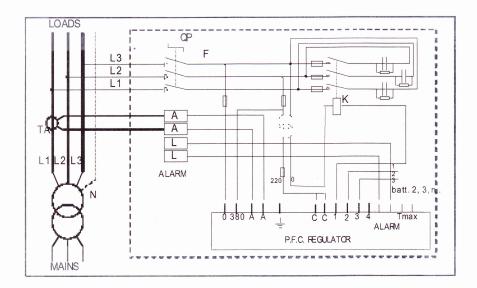
# Positioning of the current transformer

Most of the PF controllers measure according the following principle :

Measurement of the voltage between 2 phases (between L2 and L3) and measurement of the current in the other phase (L1).

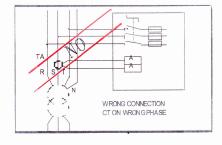
In the following diagrams we give good and bad examples.





- The CT measures the total load **upstream** from every load, inclusive the capacitor bank.
- Moreover, the CT is placed on L1, whereas the tension to the regulator is taken between L2 and L3 (TI in L3 and tension between L1 and L2 is also correct)
- The CT is placed correctly: the current flows from P1 to P2.
- The entrance K of the PF controller is linked with S1 of the CT and the entrance L of the PF controller is linked with S2 of the CT.

This is the correct principle.

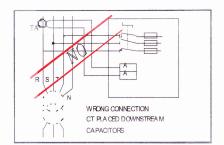


### 3 incorrect examples:

- The CT is placed on L3, while the tension to the PF controller is taken between L2 and L3.
- The CT is mounted incorrectly: the current flows from P2 to P1.
- The entrance K of the PF controller is connected with S2 and entrance L with S1.

The consequence is a wrong power factor regulation and reading out.

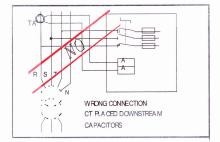




### 1 fault :

 The CT measures only the capacitor bank and not the total load.

The steps remain not switched on.
When a step is switched on, the PF
controller will measure a capacitive load and
switches off the steps.



### 1 fault:

• The CT measures the load but not the capacitor bank.

All steps will be switched on.
The PF controller measures no changes in the power factor when the steps of the capacitor bank are switched on.
You can switch on as many steps you will, the measurement values (via CT) will not change.