



APFC

FREQUENTLY ASKED QUESTIONS

Automatic Power Factor Correction Relays



UCX615



CMX815

- Q. When are the capacitor banks switched on ?
- A. Capacitor banks get switched on when 'LAG' LED is On and 'PF_OK' LED is Off. But if before the switching on of the capacitor banks the 'LEAD' LED or 'PF_OK' LED gets switched on even for once, then the relay will not switch on the capacitor banks and the timer will be reset.
- Q. When are the capacitor banks switched off ?
- A. Capacitor banks gets switched off when the 'LEAD' LED is On and 'PF_OK' is Off. But if before the switching on of the capacitor banks the 'LAG' LED or 'PF_OK' LED gets switched on even for once, then the relay will not Plug in the capacitor banks and the timer will be reset.
- (ii) The procedure of switching on and switching off the capacitor banks depends on the 'Set time' (as fed by the user) The relay will perform the action only after checking the 'LEAD/LAG/PF_OK' status for this set time period. If the status of the load gets changed, say 'LAG' to 'LEAD' or 'LEAD' to 'PF_OK' etc for even once, the relay will not take any action and the timer will be reset.
- (iii) Whenever 'PF_OK' LED is on the relay will not take any action as it means your desired Power factor has been achieved. Till the time your system is in this state, the relay will not take any further action.
- Q. The capacitor banks are not switching on, Why ?
- A. Following can be the reasons for not switching on of the capacitors.
- (i) 'LAG' LED is off and 'LEAD' LED is on, this can happen for the reasons mention below.
Your CT connection is wrong, please change it and check again.
- (ii) 'LAG' LED is on and 'LEAD' LED is off but 'PF_OK' LED is on.
This can be due to the following reasons-
(a) The Power factor you want is already where and relay is showing the already set Power factor. This happens where there are more heaters in the systems.
(b) Sometimes the CT connections are broken or damaged which leads to such problems. Even using bad quality CT hampers the working of the power factor relay. So it is very important to use only good quality CT.
- Note CT should always be used of very good quality as the working and performance of the Relay depends upon CT. If the CT is damaged or is of poor quality, the relay cannot correct the Power factor.
- Q. Even after checking/ changing the CT connections and CT, the capacitor banks are still not working, why?
- A. Sometimes capacitor banks do not work even when everything is right, this can be either because your Power factor is already correct or because there is some direct capacitor connected in the factory which is not known to us.
One more reason for this is connecting the 'CT' in wrong wire/Phase because of which the Power factor seems correct or always in 'LEAD' state.
- Q. Power factor relay is showing everything fine but the readings on government electricity meter is showing less Power factor than that is displayed by the Relay, Why?.
- This can happen in 2 cases.
- (i) When CT is connected in wrong wire/Phase.
- (ii) When load is less and the government meter is connected at 11KV and Power factor panel is connected at 'LT' (440V).

To correct the above, please follow the following procedure.

Connecting a direct capacitor according to the requirement of the Transformer but this solution is not very efficient as the capacitor power increases twice with the increase in voltage.

For eg if the voltage gets doubled the 'KVAR' becomes 4 times of itself. usually in our systems the voltage keeps fluctuating between 350-470V so the capacitor's 'KVAR' also keeps changing dramatically.

The best way to get rid of this problem is the use of SIGMA Relay UCX615 which has the special feature of working in 'KVAR' mode. In this you can set the desired 'KVAR' on transformer. In this way it will always keep the Capacitor bank switched on for the transformer in both on and off load condition.

- Q The Relay turns on all capacitor bank LED's where as actually no capacitor banks is switched on ?
- A Check the connection diagram of the 'Power Factor Relay' at the back of the Relay. For every four capacitor banks there is one point 'COM' written on it. If no supply phase is given to it then the capacitors will not get switched on and it will lead to this condition. If still the problem persists then please contact our Technical Expert.
- Q Power Factor relay works but when a certain Capacitor bank gets connected it removes all the banks one by one and this cycle keeps on repeating, Why?

A The most common reason for this is the connection of capacitor banks in wrong sequence. For eg the capacitor banks being connected in 2-3-20-10-20 sequence. If we require '7KVAR' then the relay will connect the first capacitor and then the second and so on. So in this manner after 2+3 (=5) the relay will connect 3rd capacitor which is 20, so 2+3+20=25 which is much more than the required '7KVAR' so the relay detects this '25KVAR' and disconnects all the capacitor one by one.

So it is very important to connect the capacitor banks in the right order, for eg 2-3-5-10-20.

- Q The Power factor correction relay is switching the capacitor banks on and off but the power factor remains within 90-95 range and is not stable, Why ?

A When the load is frequently changing or goes from on to off state repeatedly then the power factor keeps shifting from 'LAG' state to 'LEAD' and vice versa so the relay keeps on switching on and switching off the capacitors.

In this case the power factor can't be made '99-100' but can be made stable. To make it stable increase the 'DEAD_BAND' of the relay. You can also increase the 'UP_Time' and 'Dn_Time' to make it stable.

Note : For fast changing load we offer 'SOLID STATE PANEL' which is very efficient in solving this problem.

- Q. In Power factor relay 'CMX815', sometimes '___' flashes on the display window and decimal point also blinks, Why is it happening ?

A. In Power factor relay CMX815 '___' gets flashed whenever the system is working in no load condition. In this situation the relay removes (Switches Off) all the capacitors one by one. But if the system is running on load but still '___' is displayed on the display window so then the CT or CT connections are damaged.

The Power factor 'LED' blinks continuously when the Power factor is 'one' and KVAR reading is almost zero.

In Power Factor Relay UCX615 sometimes '___' gets displayed on display window when the running load is less than set load or CT/ CT connections are damaged.

Note The new Sigma Relay Models UCX615 and CMX815 automatically checks and corrects the Polarity of the CT when minimum 10% of the Load is running. Hence, the CT connection issue is taken care of by the Relays on its own.

For any other information on this please contact the following :-

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