



## Operating & Commissioning Instructions BLR-CC-..

As with all electrical equipment, the appropriate specifications governing electrical installation must be followed when Power Factor Correction Equipment is installed. When removing the front nameplate to adjust the function switch and DIP switches, always ensure that your body is not carrying any electrostatic charge. This can be accomplished by simply touching a grounded object, such as the switchboard metal casing to dissipate any electrical charge before removing the cover plate.

1. Check that the Measurement and Control Voltage, Supply Frequency and Current Transformer rating comply with the ratings given on the back of the relay (Transformer current =  $x/5A - 1 A$  available on request).
2. Mount the relay in the switch panel. The cut out size is 138x138 mm. The relay is secured either
  - a; with two fixing bolts
  - b; with mountig parts for wall fastening – side mounting (optional).
3. Connect up in accordance with the wiring diagram. **Pay special attention to the cross section size of the C.T. connections. We recommend for runs up to 10 metres 2,5 mm<sup>2</sup> cross section.**  
An integrated voltage observation in BLR-C.. guarantees a safety-disconnection of the capacitors in case of decreasing voltage below 280V AC. It is due to this device necessary to connect terminal "A" for control voltage to **L2** as shown in wiring diagram. This ensures a proper disconnection of the contactors.
4. Apply the measurement and control voltages. Connect the Current Transformer, and remove any short circuit link. Indication "I -0": no current flowing, resp. <1% of nominal secondary c.t. current. Active steps are cut off automatically after 10 minutes. There is no cutoff if the system is operated manually.  
Any p.f. controlling starts, if reactive vector exceeds >1% of nominal secondary c.t. current at least.
5. Function switch (3) in position 3 = automatic operation  
Required target p.f. = 1, switching time = 40s and step limitation are factory-preset. Wait for the 90 sec. lockout time to elapse. During this time the required parameters can be set as listed below, using the +/- buttons (2/1). Each set value is stored in the memory, once the function switch is moved on to the next position.
6. With function switch (3) in **position 1**, select the required target p.f. using +/- buttons.
7. With function switch (3) in **position 2**, select the required switching step time delay, using +/- buttons.
8. With function switch in **position 5**, select the number of switching steps, using the +/- buttons. The relay is delivered with this setting on its maximum number of steps. If the max. number of steps is selected, but capacitors are not connected to all the steps, the relay will recognize this, and will make three switchings to verify there is no connection. The disconnected step(s) will then be excluded from the switching sequence process. After 7 days or a system power failure, the disconnected steps will be automatically reactivated and a renewed switching attempt will be made.
9. **Set function switch (3) in position 3, so that the installation is in "Automatic" operation.**
10. The digital indicator will show the system power factor.  
f.e. **l** 0,87 for lagging or **c** 0.94 for leading load.

11. After the lock out time, with an inductive load on the system, if the relay is correctly connected, the + LED will start to flash.

12. If the installation is correctly connected, the relay will now switch successive steps, following the selected step time delay until the target power factor is obtained. Each energized step will be indicated on the LED display **4**. As each step switches in, so the digital display of power factor will change. If the installation p.f. is above or below the target p.f., the "+" LED (Below Target) or "-" LED (Above Target) will flash.

13. The BLR-CC does not require any adjustment of the responsiveness. Regulation does not follow a fixed switching program, different capacitor sizes can be used for the respective steps. The relay measures the output for each capacitor step in the form of "units of value". This measurement is made during the normal switching function according to reactive load requirement. These "units of value" are stored in the relay memory and the appropriate unit is called up in order to meet the changing reactive load demand. As the current transformer transmission is unknown, the measured units of value are only proportional to the capacitor output. If capacitors of the same size are used, an even distribution of the switchings is paid attention to.

14. A flashing display segment indicates that the relay is searching for a suitable capacitor size (ind. or cap.) in order to meet the required target power factor. If no suitable size is available, then no switching will take place, and the segment will continue to flash until the target p.f. is obtained.

15. It is often necessary to commission an installation when there is no other load on the system. In this case, put the function switch (3) to **position 4**. Capacitors can be switched with the aid of the +/- buttons. Please take into account that, during this time, there is not measured the output for each capacitor step in form of "units of value" (see item 13).

**When manual operation is no longer required, set the function switch back to position 3.**

16. The BLR-CC is fitted with the automatic alarm reset function as a standard feature. If the target power factor is not obtained, on account of insufficient capacitors, after a time delay of 75 times step switching time, the symbol "AL\_\_" will appear at 5 sec. intervals in the display.

If external fault signalling contacts for power factor (**m**) are fitted the alarm contact is given between terminals **M-MO**.

**Once the required settings or alterations have been made, set the function switch to position 3 "Automatic" and replace the front cover plate, so as to inhibit unauthorized interference with relay settings.**

### **Function Switch (3)**

**0** = Relay not in automatic function. All steps will be switched off after 20 secs. The digital display will show "OFF".

**1** = Adjustment of pre-set target power factor within the range 0,70 lag ... 1,0 ... 0,90 lead. by means of the +/- buttons. Target level is shown in the display.

**2** = Adjustment of the step switching time, 5 secs ... 1200 secs, by means of the +/- buttons. For rapid digit change, hold the button down continuously. The display will show for example "50".

**3 = Relay in automatic function**, with indication of system power factor in the digital display, i - ind., c = cap. If the +/- segments are flashing, this indicates that the target power factor has not been achieved. A suitable capacitor size will be selected.

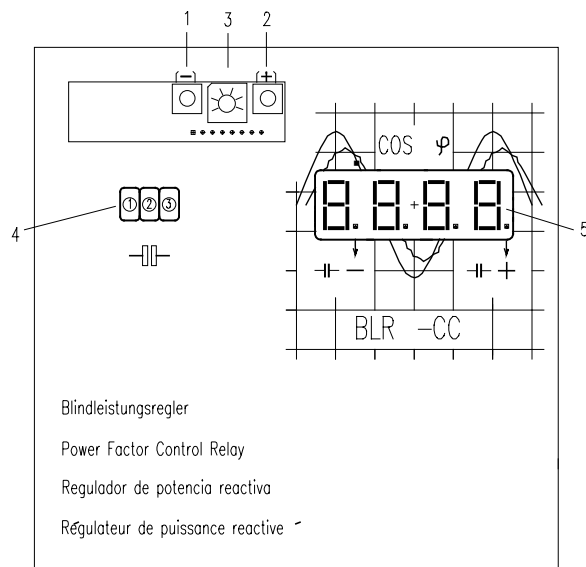
**4** = Manual operation. The display will show alternately "H" (1sec) and Power Factor (5 secs). Capacitor steps can be switched in rotation after the selected step switch time, using the +/- buttons.

5 = The number of switching steps can be limited, using +/- buttons. The display will indicate the number of steps - e.g. for 2 steps "CL2". **Do not exceed the number of steps on the relay!**

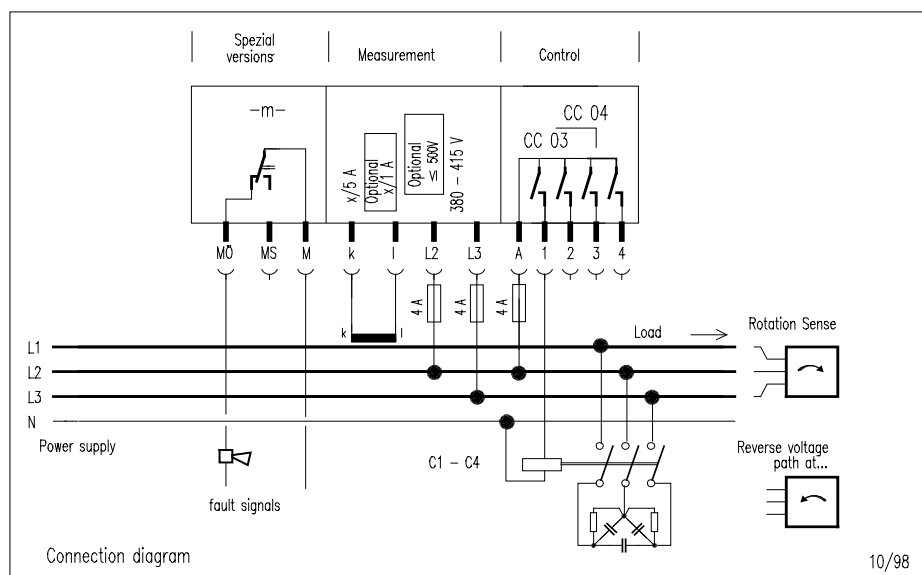
## Optional Setting Features

External Fault Signalling Contact (-m) to indicate target  $\cos \varphi$  not obtained.

### Operator and Indication Elements



### Connection Diagram



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