Boddingtons Pφwer Controls

CM Power Factor control

power factor control relay

BLR-CM

- **Reactive power compensation with recognition and memory storage of each capacitor step**
- **Faulty capacitor step (s) displayed and disconnected**
- **Most suitable kvar compensation selected for each switching step. Unequal kvar values possible for each step.**
- **MODBUS RTU available as optional extra with MINISCADA web link**
- **Self commissioning – no C/K control**
- **Multi meter LCD display with indication of current and voltage harmonics 2nd … 31st**

BPC

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Reactive power compensation units are used in companies to save costs and also to reduce the load of the network. This is the cause that there are special requirements for the control units of these compensation panels, the power factor control relays. The most important duty for the power factor control relay is the reliable regulation of reactive power. On the one hand this is reducing costs and on the other hand the current through cables and circuit breakers is also reduced. Another task is to supervise the function of the panel and to signal problems. These tasks are perfectly done by Boddingtons Power Controls power factor control relays with their patented regulation principle. By continuous measuring of the capacitor power the relay is always able to use the step with the optimal size. The programme for regulation is only defined by the choice of the used capacitor sizes. If capacitors, contactors or fuses are damaged, power factor regulators of the BLR- CM series are detecting this and they give an alarm. If necessary this alarm message can also be forwarded by the internal alarm relay.

REGULATION

The intelligent regulation algorithm from Boddingtons switches the steps optimised and by this it guarantees short compensation times combined with smallest amount of operations. The operating cycles are shared equally to all steps.

All relevant parameters for the regulation are set ex works in the way that in nearly all cases no further adjustments are necessary to start the regulation. But this does not mean that the power factor control relay cannot be adapted to the compensation system by the means of further adjustments.

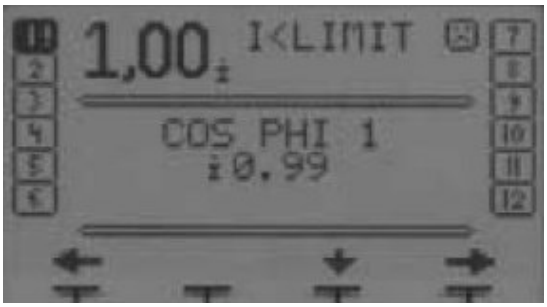
In the standard menu the following adjustments can be made:

Measurement: current and voltage transformer ratio, rated voltage

CT and PT ratio are only necessary display the correct measurement values. The setting for rated voltage is needed for over and under-voltage protection.

Regulation: target cosphi 1, target cosphi 2, switching time delay

Switchover from target cosphi 1 to target cosphi 2 is done by programmable events. This can either be the digitalinput or exceeding of threshold levels.
Adjustments for every step: rated value, discharging time, regulated on fix, off fix. The expert mode allows many further extensive settings.

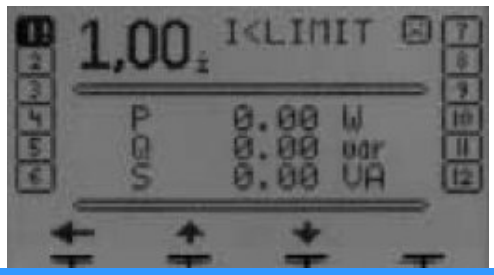


MEASURING

By means of the measurement values of voltage and current BLR-CM calculates the conditions in the network. As standard, the voltage L1-N and current in L1 is used. The separation of the auxiliary voltage and voltage measuring allows a voltage measuring range between 50 – 350V. Additionally, there is the possibility to change the phase shift between voltage and current in steps of 15 degrees. The result is the maximum possible flexibility of the relay for applications with voltage measuring phase/neutral, phase/phase and for mixed measuring with different transformer types.

The CM measures the temperature in the panel by using the integrated temperature sensor. This measurement value can be handled flexible eg it can be used for an alarm message. By the means of the digital output an additional fan can be activated.The CM power factor relay display the following measurement values:

- Voltage (phase/phase and phase/neutral
- Current
- Active power
- Reactive power
- Apparent power
- THD voltage
- THD current
- Harmonics for voltage (order 2 – 31)
- Harmonics for current (order 2 – 31)
- Counter active work import / export
- Counter reactive work inductive / capacitive
- Missing reactive power for target cosphi
- Frequency
- temperature



FEATURES

All relays are fitted with these features as standard:
Auxiliary voltage separate from voltage measuring

Auxiliary voltage:	115/230V, 45-65Hz
Voltage measuring:	1 x 50 – 530V
Current measuring:	1 x 15mA – 5A
Relay output alarm:	1 x C/O contact
Digital input:	1 x 50 – 250V AC
Digital output:	1 x N/O contact

Sensor for temperature measuring

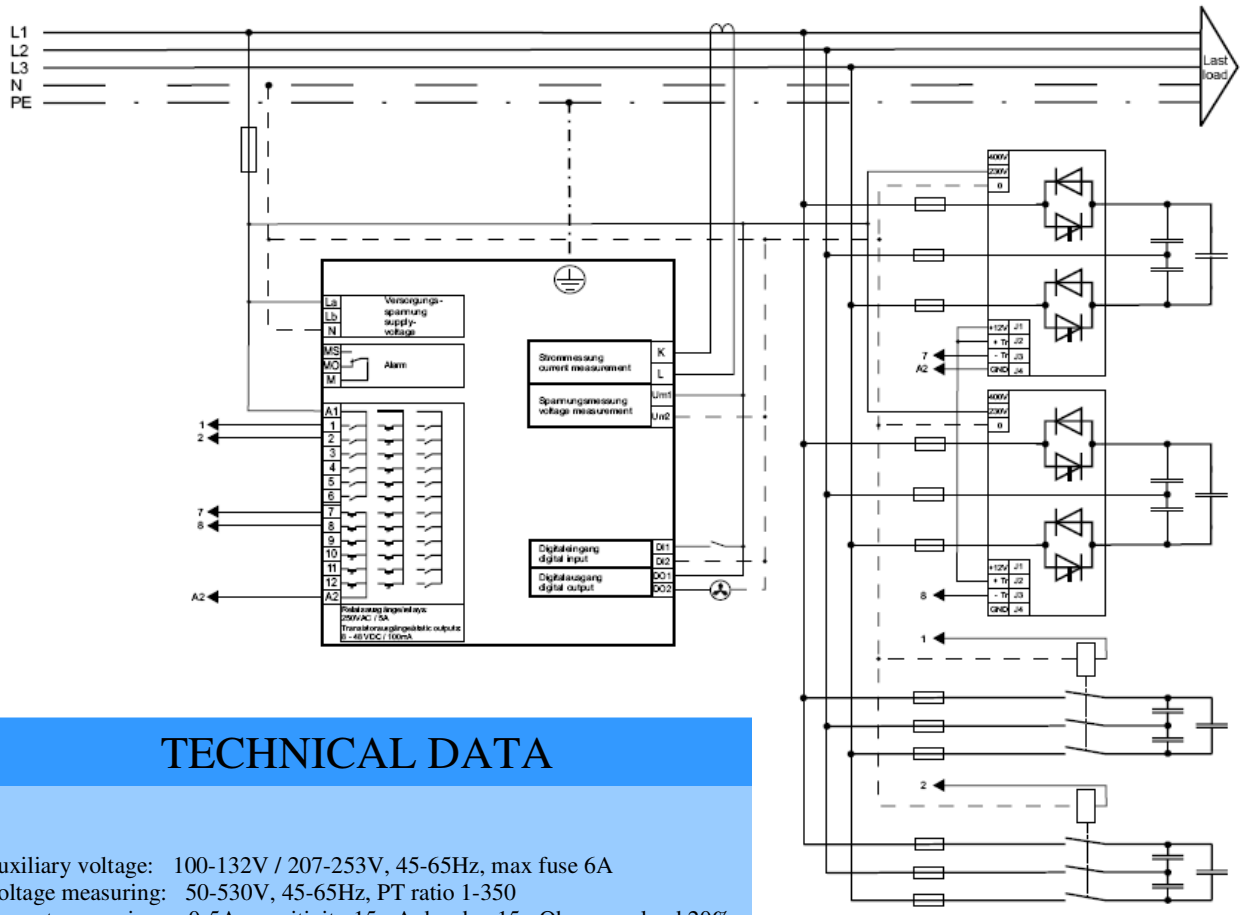
Types of different switching outputs:
CM06R – 6 stages (one common point) // CM12R – 12 stages (one common point) // CM06T – 6 static outputs (one common point) // CM12T – 12 static outputs (one common point) // CM12RT – 6 static outputs, 6 relays (two separate common points). Optional features : MB: RS485 with MODBUST RTU protocol

Different auxiliary voltage on request

SUPERVISION

The CM relay includes a lot of different supervision functions to guarantee a durable safe operation of the compensation system and to ensure a long life cycle of the used components. Some of these supervising functions are: under and over voltage; harmonics; defective steps; maintenance (loss of power and amount of operations); alarm by not reaching the target cosphi; temperature measuring with fan control and switching off steps; digital input.

CONNECTION DIAGRAM



TECHNICAL DATA

Auxiliary voltage: 100-132V / 207-253V, 45-65Hz, max fuse 6A
Voltage measuring: 50-530V, 45-65Hz, PT ratio 1-350
Current measuring: 0-5A, sensitivity 15mA, burden 15mOhm, overload 20% continuous, CT ratio 1-4000
Regulation outputs: 6R, 12R, 6T, 12T, 12RT
Relays: N/O, one common point, max, fuse 6A, breaking Capacity 250V AC / 5A
Static outputs: open collector, braking capacity: 8 – 48V DC /
100mA
Alarm contact: C/O volt free programmable
Max fuse 6A, breaking capacity 250V AC / 3A
Digital output: N/O, volt free programmable
Max fuse 6A, breaking capacity 250V AC / 5A
Interface: RS485 (optional) MODBUS RTU protocol (Slave)
Ambient temperature: operation: 0°C … + 70°C, storage: -20°C…+85°C
Humidity: 0% - 95% without moisture condensation
Over voltage class: ll, pollution degree 3(DIN VDE 0110, Teil 1/IEC 60664-1)

Standards: DIN VDE 0110 Teil1(IEC 60664-1:1992)
VDE 0411 Teil1 (DIN EN 61010-1/IEC 61010-1:2001)
VDE 0843 Teil 20 (DIN EN 61326/IEC 61326: 1997 + A1: 1998 + A2:2000)
Conformity and listing: CE, UL, cUL
Terminals: screw-type, pluggable, max 2.5qmm
Casing: Front: instrument casing plastic (UL94-VO), rear: metal
Protection class: front: IP54, rear: IP20
Weight: Each 0.8kg
Dimensions: 144 x 144 x 58mm h x w x d, cutout 138mm x 138mm

DIMENSIONS