



# Film Capacitors – Power Factor Correction

## Power Factor Controller

**Series/Type:** BR7000-I  
**Ordering code:** B44066R7012E230/B44066R7112E230  
**Date:** March 2013  
**Version:** 4

### Characteristics

- 12 – 13 switching outputs
- 20 pre-programmed control series
- Control series editor
- Full graphic display 128 x 64 dots
- Plain language menu
- 4-quadrant-operation
- Automatic initialization
- Display of multiple grid parameters
- Display of harmonics
- Display of distortion factor THD-V/THD-I
- Display and control of temperature
- Monitoring of capacitor current
- Storage of maximum values
- Storage of switching operations and times
- Manual and automatic operation
- Zero voltage cut-off
- Various error messages/alarm relay
- Error storage
- Test run of system with error analysis
- Interface RS485 optional
- Panel mounting 144 x 144 x 55 mm



### Inputs

- Operation voltage: 110 ... 230 V ~ +/- 15%
- Measuring voltage: 30 ... 440 V ~ (L-N) / 50 ... 760 V ~ (L-L)
- Current: X:1A / X:5A
- Additional external input (110...230V) - optional

### Outputs

- 12 relay outputs for capacitor
- 1 relay output (message/alarm/fan)
- 1 message relay (free programmable) - optional

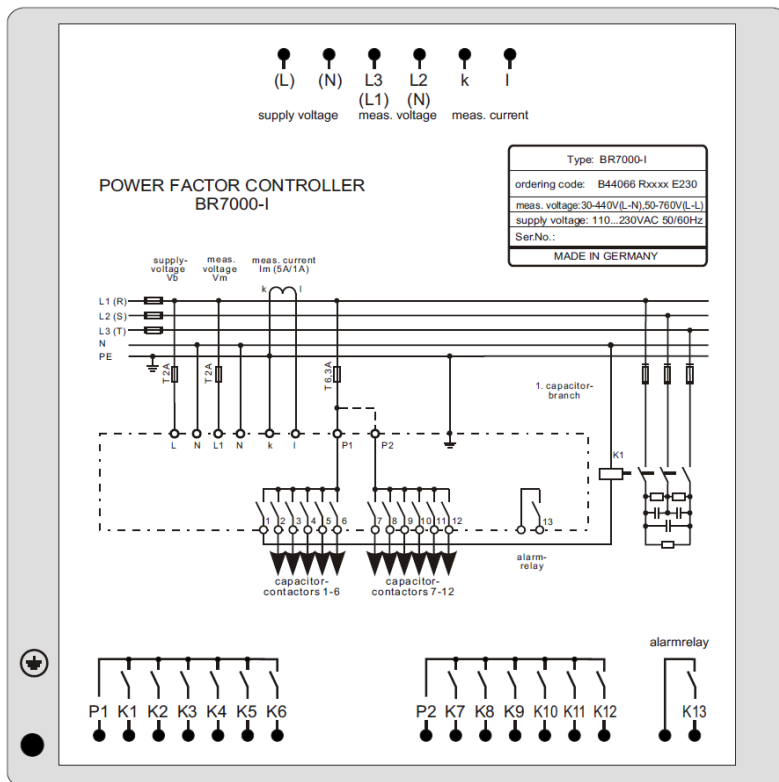
### Measuring and display of following grid parameters

- Voltage, current, frequency
- Active, reactive and apparent power
- Power factor, missing reactive power
- Energy
- Harmonics of voltage (up to 19<sup>th</sup>)
- Harmonic of current (up to 19<sup>th</sup>)
- TDH-V, THD-I
- Temperature
- Well-arranged display of power factor and actual status of switching outputs
- Display and storage of maximum values, switching operations and operation time
- Display of harmonics as bar chart

### Operation

- Graphic display 164 x 64 dots with 8 lines maximum
- Plain language menu in ten languages
- Optimum navigation in the menus via return (ESCAPE) button
- HELP-button for interactive help text

### Connection



**Technical data and specifications**

Operating voltage	110 ... 230 V ~ +/- 15 %, 50 and 60 Hz
Measuring voltage	30 ... 440 V ~ (L-N); 50 ... 760 V ~ (L-L); 50/60 Hz
Measuring current	X: 5 A / X: 1 A, selectable
Power consumption	< 5 VA
Sensitivity	50 mA/10 mA

**Switching outputs**

Relay outputs for capacitor branches	12
Alarm relay	1
Switching power of relays	250 V AC, 1000 W
Number of active outputs	Programmable
Version BR7000-I/S485	Interface RS485, for usage with evaluation software BR7000-SOFT, included in the delivery One freely programmable external input, e.g. for 2 <sup>nd</sup> parameter set Additional freely programmable message relay

**Operation and display**

Display	Illuminated full graphic display 128 x 64 dots
Menu languages	CZ/EN/ES/FR/GER/NL/PL/PT/RU/TR
Freely editable control series	1 via Editor

**Control**

Control principle	Sequential switching, circle switching, intelligent switching behavior, 4-quadrant operation
Automatic initialization/test run	Possible
Target cos-φ	0.3 inductive up to 0.3 capacitive adjustable
Switch on time	Selectable from 1 sec. to 20 min.
Switch off time	Selectable from 1 sec. to 20 min.
Discharge time	Selectable from 1 sec. to 20 min.
Manual operation	Yes
Fixed steps/skip steps	Programmable
Zero voltage release	Standard

**Display/display functions**

Display of grid parameters	Cos-φ, V, I, F, W, Q, P, S, ΔQ, THD-V, THD-I
Display of harmonics	3 <sup>rd</sup> to 19 <sup>th</sup> harmonics of V and I
Accuracy	Current/voltage: 1% Active, apparent and reactive power: 2%
Integrated help function	Context dependent

<b>Storage function</b>	
Storage of maximum values	Voltage, current, active/reactive/apparent power, temperature, THD-V, THD-I
Storage of switching operations	Each output can be reset separately
Storage of operation time	Each capacitor can be reset separately
Error storage	Error register in plain language
<b>Temperature monitoring</b>	
Monitoring	Automatic step switch off
Temperature measuring range	-30 ... +100 °C
<b>Casing</b>	
Panel mounted instrument	DIN 43700, 144 x 144 x 55 mm
Weight	1 kg
Ambient operating temperature	-20 °C ... +60 °C
Protection class accord. DIN 40050	Front: IP54, rear: IP 20
Safety regulations	IEC 601010-1:2001, EN61010-1:2001
Interference resistance	EN50082-1:1995
EMC-interference	IEC61000-4-2: 8 kV IEC61000-4-4: 4 kV
<b>Ordering codes</b>	
BR7000-I (without interface)	B44066R7012E230
BR7000-I/S485 (with interface RS485)	B44066R7112E230

### Cautions and Warnings

Controller hunting: When putting the capacitor bank into operation, it is required to avoid needless switching cycles (means permanent switching on and off of steps without significant change of consumer load). This so called “controller hunting“ would increase the number of switching operations of the connected contactors and capacitors and decrease the expected life cycle (wear out) and, in worst case, capacitor bursting and fire, etc . This can be avoided by a proper programming of the BR7000-I with the actual system parameters (current transformer prim. and sec., first kvar step, control series, switching time).

**⚠ Please read cautions information about PFC capacitors and cautions as well as installation and maintenance instructions in the actual version of the Product Profile *Power Factor Correction* to ensure optimum performance and prevent products from failing, and in worst case, bursting and fire, etc. The actual Product Profile is available at [www.epcos.com/publications](http://www.epcos.com/publications).**

**Information given in the PFC-product profile and values given in the data sheet reflect typical specifications. You are kindly requested to approve our product specifications or request our approval for your specification before ordering.**

### Note

For detailed information about PFC capacitors and cautions, refer to the latest version of EPCOS PFC Product Profile.

## Important notes

The following applies to all products named in this publication:

1. Some parts of this publication contain **statements about the suitability of our products for certain areas of application**. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out **that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application**. As a rule, EPCOS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**
4. In order to satisfy certain technical requirements, **some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous)**. Useful information on this will be found in our Material Data Sheets on the Internet ([www.epcos.com/material](http://www.epcos.com/material)). Should you have any more detailed questions, please contact our sales offices.
5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order. We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.
6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
7. The trade names EPCOS, BAOKE, Alu-X, CeraDiode, CeraLink, CSMP, CSSP, CTVS, DeltaCap, DigiSiMic, DSSP, FilterCap, FormFit, MiniBlue, MiniCell, MKD, MKK, MLSC, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, SIP5D, SIP5K, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.epcos.com/trademarks](http://www.epcos.com/trademarks).