Film Capacitors – Power Factor Correction

Power Factor Controller

Series/Type: **BR7000-I/BR7000-I/S485**
Ordering code: **B44066R7012E230/B44066R7112E230**

Date: October 2016
Version: 5

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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 possible
- Display of multiple grid parameters
- Display of harmonics (up to 33rd)
- 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 (version BR7000-I/S485)
- Internal clock with time stamp (version BR7000-I/S485)
- Panel mounting 144 x 144 x 55 mm

Inputs

Operation voltage: 110 …440 V ~ +/- 10%

- Measuring voltage: 30 … 440 V ~ (L-N) / 50 …760 V ~ (L-L)
- Current: X:1A / X:5A
- Standard service interface (e.g. for firmware update)
- Additional external input (110…230V) - optional

Outputs

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

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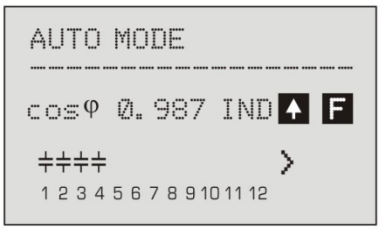
Measuring and display of following grid parameters

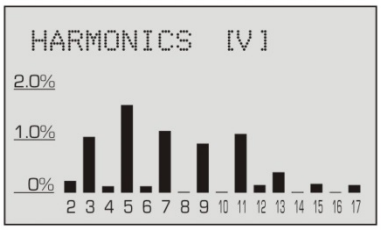
- Voltage, current, frequency
- Active, reactive and apparent power
- Power factor, missing reactive power
- Energy
- Harmonics of voltage (upto 33rd,linear up to 16th)
- Harmonic of current (33rd,linear up to 16th)
- TDH-V, THD-I
- Temperature
- Well-arranged display of power factor and actual status of switching outputs
- Display and storage of maximum values, switching operations and operation time
- Display of harmonics as bar chart

Operation

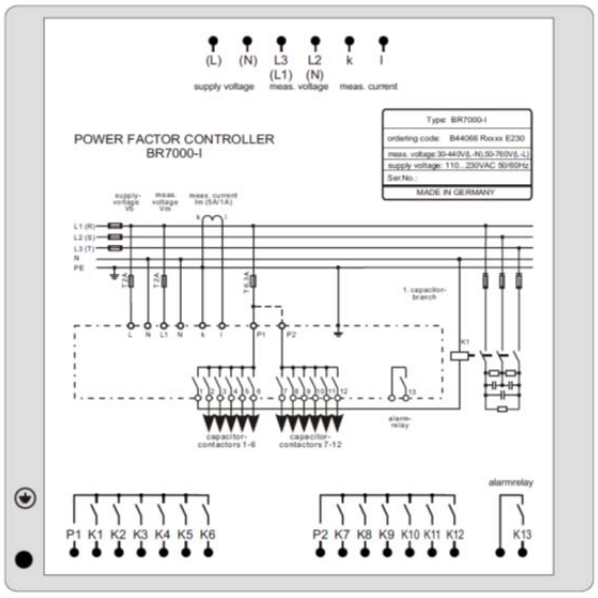
- Graphic display 164 x 64 dots with 8 lines maximum
- Plain language menu in ten languages
- Simple self-explanatory menu navigation
- Optimum navigation in the menus via return (ESCAPE) button
- HELP-button for interactive help text







Connection



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Only for BR7000-I/S485 (with interface)

- Additional potential free input (programmable) for
  - Coupling of different devices/systems
  - Switch over 2nd target cos-phi respectively 2nd parameter set
  - Switching of a fixed step
  - Triggering of a reactive power offset
- Additional potential free relay output (message relay) for
  - Switching of a fan
  - Output of error or status message (programmable)
- Interface RS485 (MODBUS RTU) for
  - Controller coupling as master-slave (serial; up to 4 devices = 48 physical outputs)
  - Embedding of the controller into a network (e.g. in connection with software MMI-energy) or networking with a SPC (control system)
  - Output of measuring values in ASCII-protocol
- Internal clock (battery buffered) for
  - Creation of time stamp for all recorded maximum values
  - Creation of time stamp for all error messages
  - Availability of time stamp when using an external data logger (DataLog-SD) for recording and evaluation of all measured values of the system
  - Output of measured value in ASCII-protocol

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Technical data and specifications

Operating voltage	110 … 440 V ~ +/- 10 %, 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 / message relay	1/1* (*only version –I/S485)
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 2nd parameter set Additional freely programmable message relay Internal clock
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	0.1 inductive up to 0.1 capacitive adjustable
Switch on time	Selectable from 1 sec. to 130 min.
Switch off time	Selectable from 1 sec. to 130 min.
Discharge time	Selectable from 1 sec. to 130 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
Large display of 3 grid parameters	Selection in display editor
Display of harmonics	3rd to 33th harmonics of V and I; linear harmonics up to 16th
Accuracy	Current/voltage: 1%; active, apparent and reactive power: 2%
Integrated help function	Context dependent (German/English)

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Storage function	
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
Temperature monitoring	
Monitoring	Automatic step switch off
Temperature measuring range	-30 … +100 °C
Casing	
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 61010-1
Interference resistance	IEC 61000-6-2; EN 61326
EMC-interference	IEC61000-6-2; EN 61326; IEC 61000-4-4
Ordering codes	
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.

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.

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