



# Power Factor Controller and Accessories

**Series/Type: BR7000-HD**

The following products presented in this data sheet are being withdrawn.

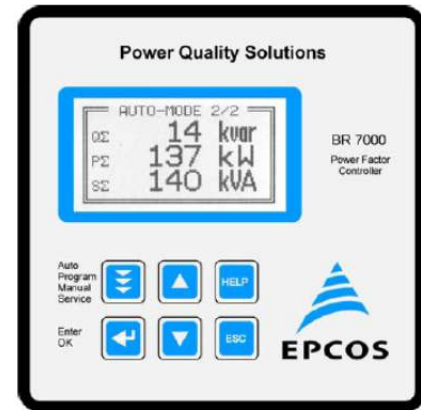
| Ordering Code   | Substitute Product | Date of Withdrawal | Deadline Last Orders | Last Shipments |
|-----------------|--------------------|--------------------|----------------------|----------------|
| B44066R7515E230 | B44066R7415E230    | 2021-05-21         | 2021-08-31           | 2021-11-30     |

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## General

### Characteristics

- Three phase measuring and controlling
- Switching relays customizable for three phase or single phase compensation
- Mixed three and single phase compensation
- Usage as power factor controller and/or as measuring device
- Intelligent control
- Menu driven handling (several plain languages)
- Optimized navigation in the menus by ESCAPE (ESC) button
- HELP-button for interactive help text (related to the particular menu)



### Measurement and display

- 3-phase measurement of all relevant grid parameters (voltage, current, reactive power, active power, apparent power, frequency, harmonics up to the 31<sup>st</sup> order, temperature)
- Display and storage of maximum values, switching operations and operation time
- Display of date, time, operation
- Display of harmonics as THD value or for every harmonic as bar graph
- Oscilloscope mode for graphical display of a complete oscillation incl. harmonics
- Display of measured values freely programmable (display-editor)
- Operation
- Graphic display 128 × 64 dots with max. 8 lines, BR7000-HD with OLED display
- User interface plain language; several languages
- Self explanatory and optimized menu navigation

### Modes of operation

- Display and automatic operation (normal control)
- Programming
- Manual operation
- Service operation
- Expert mode
- Osz-mode
- Display Editor
- Interface
- C-TEST

### Controlling

- Simple controlling 3-phase (3-phase capacitors), max. 15 switching outputs. For 3-phase-measurement: controlling is done either according to the worst  $\cos \varphi$  or average value. For single-phase-measurement: 2 current inputs are additionally available for measured capacitor bank currents
- Single phase controlling: max. 5 switching outputs for each phase (3 · 5 switching outputs); each phase is controlled separately. Single phase capacitors are switched to neutral.
- Mixed controlling: e.g. 3 · 3 single phase capacitors per phase (L-N) for balancing and additional 6 outputs for normal 3-phase-capacitors.
- Separate controlling of single phase capacitors L-L (without neutral)

### Error messages

- Over voltage/under voltage/no voltage
- Over current
- Over/under compensated
- Harmonics (THD exceeded)
- Over temperature
- C-defect
- Warning switching operations
- Internal alert message with time stamp
- 1 alarm relay
- 1 relay freely programmable
- 1 relay for fan control

### Inputs

- Operating voltage input: 110 ... 440 V AC  $\pm 10\%$
- 3 measuring voltage inputs: 30 ... 440 V AC (L-N) / 50...760 V AC (L-L)
- 3 current inputs: X:1A / X:5A
- 1 external input

### Outputs

- 3 · 5 relay outputs (contact NO) as switching outputs
- 3 relay outputs (contact NO) for message/alarm/fan
- 2 independent isolated interfaces RS485

### Interfaces

- 2 independent, isolated RS485 interfaces; as RJ45 jack

### Usage:

- As interface for PC for usage with Windows-Software BR7000-soft
- Firmware update possible
- As system interface for coupling with other controllers or enlargement with system accessories
- As interface for customer specific usage

### Specialities

- Time controlled functions possible by internal timer (e.g. time controlled target  $\cos \varphi$ )
- Internal second parameter set available
- Oscilloscope mode for graphical display of current and voltage – individual phases selectable
- Display of harmonics as bar graph (fourier transformation)

### Accessory: BR software for PC

- Connection to RS485-bus
- Administration of several PF-controller possible
- Convenient analysis of recorded values
- Direct connection to USB-port of PC via USB-adaptor
- Windows XP upwards



Device settings and visualization

Display and recording of grid parameters

**Technical data**

|  |  |
|--|--|
| Operating voltage                            | 110 ... 440 V AC $\pm$ 10%, 50/60 Hz   |
| Measuring voltage (3-phase)                  | 3 · 30 ... 440 V AC (L-N), 50...760Vac (L-L); 50/60 Hz   |
| Measuring current (3-phase)                  | 3 · X: 5A / X:1A selectable  |
| Power consumption                            | < 5 W (with 15 relays activated)   |
| Sensibility                                  | 50 mA / 10 mA  |
| Switching outputs                            |  |
| Relay outputs for capacitor branches         | 15 relays, freely programmable for switching of 1- or 3-phase capacitors   |
| Alarm relay                                  | 1  |
| Message relay programmable                   | 1  |
| Relay for panel fan                          | 1  |
| Switching power of relays                    | 250 V AC, 1000 W   |
| Number of active outputs                     | programmable   |
| Operation and display<br>BR7000<br>BR7000-HD | illuminated full graphic display 128 × 64 dots<br>OLED character display, yellow   |
| Menu languages                               | D / E / ES / F / RU / TR   |
| Number of control series                     | 20   |
| Freely editable control series               | 1 via Editor   |
| Controlling                                  | reach controlling of each phase (L-N ) and ( L-L)  |
| Modes of operation                           | 1- phase: up to 3 · 5 single phase capacitors<br>3- phase: up to 15 three-phase capacitors<br>mixed Mode: for balancing and compensation |
| Control principle                            | series switching, circular switching,<br>self-optimized intelligent switching mode   |
|  | 4-quadrant operation   |
| Measuring of current inside the capacitor    | possible   |
| target cos $\varphi$                         | 0.1 ind ... 0.1 cap adjustable   |
| 2nd target cos $\varphi$ (result driven)     | 0.1 ind ... 0.1 cap 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   |
| Internal clock/several timers                | yes  |
| Manual operation                             | yes  |
| Fixed steps /skip steps                      | programmable   |
| Zero voltage release                         | standard   |

| <b>Display/Display functions</b>                              |   |
|---|---|
| Display of grid parameters<br>As real value/in %/as bar graph | 3- phase<br>cos $\varphi$ , V, I, f, Q, P, S, Q, THD-V, THD-I                     |
| Large display of 3 grid parameters                            | selection in display editor   |
| Oscilloscope mode   | available   |
| Precision   | current/voltage: 1%<br>active, reactive, apparent power: 2%                       |
| Integrated auxiliary function                                 | context depending, plain text   |
| <b>Storage function</b>                                       |   |
| Storage of maximum values                                     | voltage, current, active, reactive and apparent power, temperature, THD-V, THD-I, |
| Storage of minimum values                                     | voltage   |
| Storage of switching operations                               | each output, separately re-settable   |
| Storage of operation time                                     | each capacitor, separately re-settable  |
| Error storage   | error register in plain text with time stamp                                      |
| Error message   | red backlight   |
| Temperature monitoring  | automatic switching off of steps  |
| Temperature measuring range                                   | -30 ... +100 °C   |
| Interface   | 2 independent isolated interfaces<br>RS485 (MODBUS RTU, system interface)         |
| Grid measuring-, analysis- and parameterization software      | for PC, included in the extend of delivery  |
| External input  | 230 V AC, isolated  |
| 2. Parameter set (target cos $\varphi$ )                      | via external input or event driven  |
| Casing  | panel-mounted instrument<br>DIN 43 700, 144 × 144 × 50 mm                         |
| Weight  | 1 kg  |
| Operating ambient temperature<br>BR7000<br>BR7000-HD          | -20 ... +60 °C<br>-40 ... + 60 °C   |
| Protection class accord. DIN 40 050                           | front: IP54, rear: IP20   |
| Safety standards  | IEC 61010-1: 2011-07  |
| Interference resistance                                       | EN50082-1 :1995   |
| EMV resistance  | IEC61000-4-2: 2009-12<br>IEC61000-4-4: 2013-04                                    |
| Ordering codes<br>BR7000<br>BR7000-HD                         | B44066R7415E230<br>B44066R7515E230  |

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### 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 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.

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Release 2018-10