



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The following products presented in this data sheet are being withdrawn.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

Please contact your nearest TDK sales office if you need support in selecting a suitable substitute. The addresses of our worldwide sales network are presented at [www.tdk-electronics.tdk.com/sales](http://www.tdk-electronics.tdk.com/sales).

## 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-adapter
- 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 BR7000 BR7000-HD	illuminated full graphic display 128 × 64 dots 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 3- phase: up to 15 three-phase capacitors mixed Mode: for balancing and compensation
Control principle	series switching, circular switching, 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 As real value/in %/as bar graph	3- phase cos $\varphi$ , V, I, f, Q, P, S, $\square$ Q, THD-V, THD-I
Large display of 3 grid parameters	selection in display editor
Oscilloscope mode	available
Precision	current/voltage: 1% 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 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 DIN 43 700, 144 × 144 × 50 mm
Weight	1 kg
Operating ambient temperature BR7000 BR7000-HD	-20 ... +60 °C -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 IEC61000-4-4: 2013-04
Ordering codes BR7000 BR7000-HD	B44066R7415E230 B44066R7515E230

### Display of ordering codes for EPCOS products

The ordering code for one and the same EPCOS product can be represented differently in data sheets, data books, other publications, on the EPCOS website, or in order-related documents such as shipping notes, order confirmations and product labels. **The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products.** Detailed information can be found on the Internet under [www.epcos.com/orderingcodes](http://www.epcos.com/orderingcodes)

### 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.

## 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 we are 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 a 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.tdk-electronics.tdk.com/material](http://www.tdk-electronics.tdk.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 our General Terms and Conditions of Supply**.
7. **Our manufacturing sites serving the automotive business apply the IATF 16949 standard**. The IATF certifications confirm our compliance with requirements regarding the quality management system in the automotive industry. Referring to customer requirements and customer specific requirements ("CSR") TDK always has and will continue to have the policy of respecting individual agreements. Even if IATF 16949 may appear to support the acceptance of unilateral requirements, we hereby like to emphasize that **only requirements mutually agreed upon can and will be implemented in our Quality Management System**. For clarification purposes we like to point out that obligations from IATF 16949 shall only become legally binding if individually agreed upon.
8. The trade names EPCOS, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, LeaXield, MiniBlue, MiniCell, MKD, MKK, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap are **trademarks registered or pending** in Europe and in other countries. Further information will be found on the Internet at [www.tdk-electronics.tdk.com/trademarks](http://www.tdk-electronics.tdk.com/trademarks).

Release 2018-10