



# The Power Factor Controller BR 6000

User-friendly and Intelligent Controller with Multi-functional Display

Product Profile 2002



<http://www.epcos.com>

# EPCOS BR 6000 PFC Controller

- Innovative and intelligent concept
- Mega user-friendly handling procedures
- Easy to install and maintain
- Reasonable price level (cost/performance)

## Display

- Large and multifunctional LCD (2x16 characters)
- Graphic and alphanumeric
- LCD illumination

## Control

- Menu-driven handling (plain language)
- Multilingual display (menu)
- Self-optimizing control capability
- Recall-function of recorded values
- 4 Quadrant operation (e.g. stand-by generator)
- Large measuring voltage range (50 ... 525 V, phase to phase)
- Powerful alarm output

## Optional

- RS 232 Interface
- Harmonics display
- Real-time power factor correction (RTPFC)

## Power Factor Correction Controller BR 6000



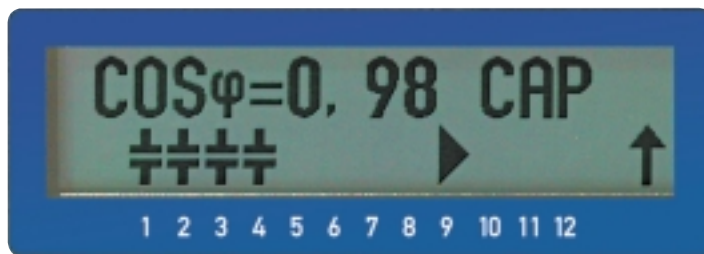
# BR 6000 in Operation

## ■ Display of large numbers of system parameters

- System voltage (VAC)
- Reactive power (kvar)
- Active power (kW)
- Apparent power (kVA)
- Apparent current (A)
- Temperature (°C)
- Real time  $\cos \phi$
- Target  $\cos \phi$
- kvar value to target  $\cos \phi$

## ■ Alarm output

- Insufficient compensation
- Over-compensation
- Under-current
- Over-current
- Over-temperature
- Harmonics exceeded



## ■ Recall recorded values

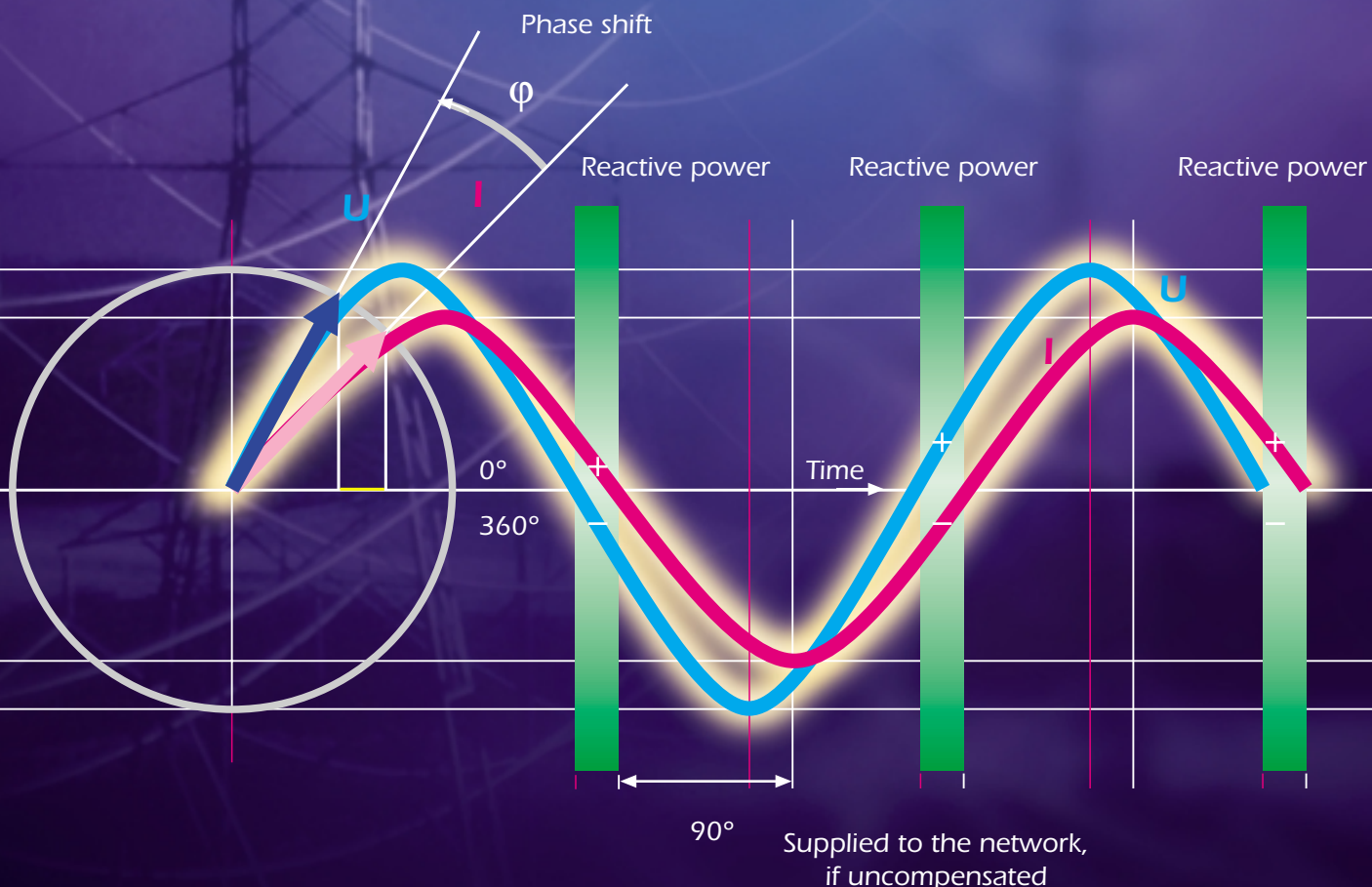
- Number of contactor switching operations
- Maximum voltage,  $U$  ( $V_{max}$ )
- Maximum reactive power,  $Q$  (kvar)
- Maximum active power,  $P$  (kW)
- Maximum apparent power,  $S$  (kVA)
- Maximum temperature (°C)

## ■ RTPFC support (transistor output)

- Contactor switching
- Thyristor switching

## Control panel

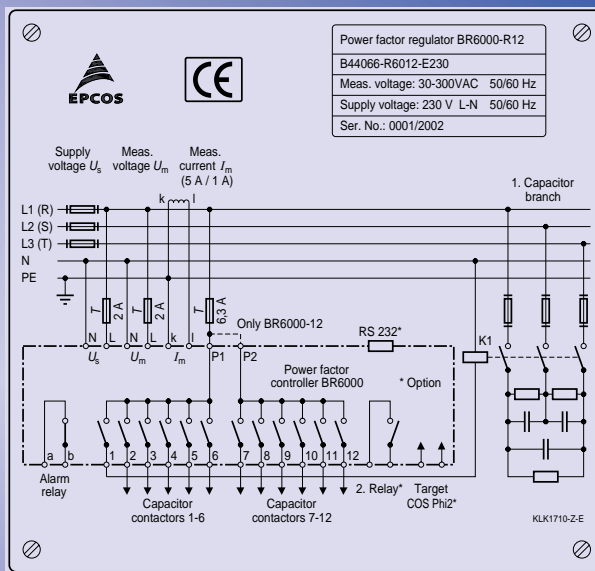
- Operation** (selection button)
- Input end** (enter, confirmation)
- Changing of parameter (up)
- Changing of parameter (down)



# Power Factor Controller BR 6000

## Putting the PFC Controller BR 6000 into operation

Easy and simple handling procedure indicated by the written instruction sequence shown on the display panel.



Circuit diagram on the rear side of the controller

**COS $\phi$ =0,98 CAP**  
 ++++++  
 1 2 3 4 5 6 7 8 9 10 11 12

**PROGRAM MODE**

**CONTROL SERIES EDITOR**

**MANUAL MODE**

**1 SYSTEM VOLTAGE**  
400 V

**2 APPARENT CURRENT**  
88888 A

**3 REACTIVE POWER**  
88888 kvar

**4 ACTIVE POWER**  
8888 kW

**5 APPARENT POWER**  
88888 kVA

**6 TEMPERATURE**  
40 °C

**SOFTWARE VERSION 1.0.8**

**1 I-CT PRIMARY (.../XA)**

**2 I-CT SECONDARY (...)**

**3 NO. OF OUTPUTS**  
+++++

**4 CONTROL MODE 1**  
1111111111

**5 CONTROL MODE INTELLIGENT**

**6 KVAR STEP 1**  
[25],00 kvar

**7 TARGET COSPHI 1**  
(0.8 IND...0.8 CAP)

**8 MEASURING V**  
(230) V-L-N

**KVAR-RATIO C 2**  
1.2222222222

**KVAR-RATIO C 3**  
1.2222222222

**KVAR-RATIO C 4**  
1.1222222222

**KVAR-RATIO C 5**  
1.1222222222

up to capacitor 6/12

**KVAR-RATIO C 12**  
1.1222222222

**STOPP C 0,98 CAP**  
+++++

**C1: AUTO (FIX/OFF)**  
+++++

**C2: AUTO (FIX/OFF)**  
+++++

**C3: AUTO (FIX/OFF)**  
+++++

**C4: AUTO (FIX/OFF)**  
+++++

**C5: AUTO (FIX/OFF)**  
+++++

**C6: AUTO (FIX/OFF)**  
+++++

# BR 6000 PFC Controller

Technical data		
Weight:	1 kg	
Casing:	Panel-mounted instrument, 144 x 144 x 60 mm	
<b>Ambient conditions</b>		
Over-voltage class:	III	
Pollution degree:	2	
Operating temperature:	-10 °C ... + 60 °C	
Storage temperature:	-20 °C ... + 65 °C	
Sensitivity to disturb. (industrial areas):	EN55082-2:1995	
Spurious radiation (residential areas):	EN55011 10.1997	
Safety guidelines:	EN61010-1 03.1994 + A2 05.1996 / IEC1010-1 1990 + A1 1992	
Mounting position:	any	
Operating height:	0 ... 3000 m over NN	
Humidity class:	15 % to 95 % without dew	
Protection class:		
Front plate:	IP54 according to IEC529 / DIN 40050	
Rear side:	IP20 according to IEC529 / DIN 40050	
<b>Operation</b>		
Supply voltage:	230 VAC, other voltages available upon request	
Mains frequency:	50 and 60 Hz power lines	
Power consumption:	5 VA	
Target cosφ:	0.8 ind. – 0.8 cap.	
Switching time range:	1 – 1200 seconds	
Discharge time range:	1 – 1200 seconds	
Number of control series:	20 series preset + control series editor for free programming	
Control modes:	Series switching (LIFO), circular switching (FIFO), self-optimized intelligent control mode	
4 Quadrant operation:	yes (e.g. for stand-by generator)	
<b>Measurement</b>		
Measurement voltage range:	30 ... 300 VAC phase to neutral (i.e. 50 ... 525 V phase to phase)	
Fundamental frequency:	50 and 60 Hz	
Measurement current (CT):	x/1 and x/5 Ampere possible	
Minimum operating current:	40 mA	
Maximum current:	5.3 A (sinusoidal)	
Zero voltage release:	< 15 ms	
<b>Switching outputs</b>		
Relay outputs		
Number of relays:	6 and 12 steps available	
Switching voltage:	max. 250 VAC	
Switching power:	max. 1000 W	
Max. switching frequency:	0.25 Hz	
Expected mechanical life:	> 30 x 10 <sup>6</sup> switching operations	
Expected electrical life:	> 5 x 10 <sup>6</sup> switching operations (load = 200 VA, cosφ = 0.4)	
Transistor outputs		
Switching voltage :	15 ... 30 Vdc	
Switching current :	max. 50 mA	
Max. switching frequency :	10 Hz	
Alarm relay	potential-free contact (6 parameters)	
BR 6000 ordering codes		
Type (230 V)	Features	Ordering code
BR 6000-R6	6 relay outputs, 1 alarm contact	B44066R6006E230
BR 6000-T6	6 transistor outputs, 1 alarm contact	B44066R6106E230
BR 6000-R12	12 relay outputs, 1 alarm contact	B44066R6012E230
BR 6000-T12	12 transistor output, 1 alarm contact	B44066R6112E230
BR 6000-R12/O	2 relay (alarm or temperature control) – Harmonics display, temperature control – Input target cosφ 1, change over to target cosφ 2	B44066R6212E230
BR 6000-R12/OS	RS232 interface, others identical to option O	B44066R6312E230

**Herausgegeben von EPCOS AG**

**Unternehmenskommunikation, Postfach 80 17 09, 81617 München, DEUTSCHLAND**

**☎ ++49 89 636 09, FAX (0 89) 636-2 26 89**

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**Corporate Communications, P.O. Box 80 17 09, 81617 Munich, GERMANY**

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