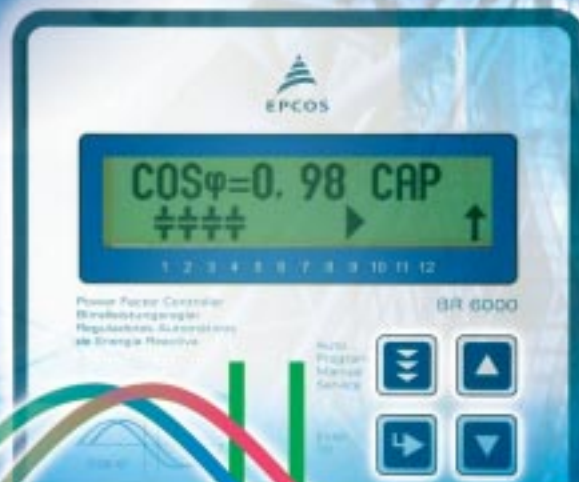




Power Factor Controller BR 6000

Intelligent Controller with Multi-Functional Display

Product Profile 2004



www.epcos.com

BR 6000 PFC Controller

General

This innovative PFC controller offers very intelligent control behavior and is extremely user-friendly due to menu-driven handling (plain language). The multifunctional display makes installation, handling and maintenance as easy as possible. Harmonics display is standard, interface RS232 or RS485 optional.

Power Factor Correction Controller BR 6000



BR 6000 PFC Controller

Features

- Innovative and intelligent concept
- User-friendly handling procedures
- Easy to install and maintain
- Large detachable connector plug
- 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: German/English/Spanish)
- Self-optimizing control capability
- Recall-function of recorded values
- 4 Quadrant operation (e.g. stand-by generator)
- Large measuring voltage range (50 ... 300 V, phase to neutral)
- Phase shifting programmable up to 300 V, phase to phase measurement
- Powerful alarm output
- Harmonics display (U, I)
- Display TDH-U, THD-I
- Monitoring of temperature

Optional

- RS232 or 485 interface (MODBUS or ASCII protocol)
- Dynamic power factor correction
- Adapter for grids without neutral conductor up to 3 x 690 V

Suitable for grids:

- Up to 3 x 525 V with neutral → directly
- Up to 3 x 300 V without neutral → directly, using phase shifting feature
- Up to 3 x 690 V without neutral → only with adapter

BR 6000 PFC Controller





BR 6000 in operation

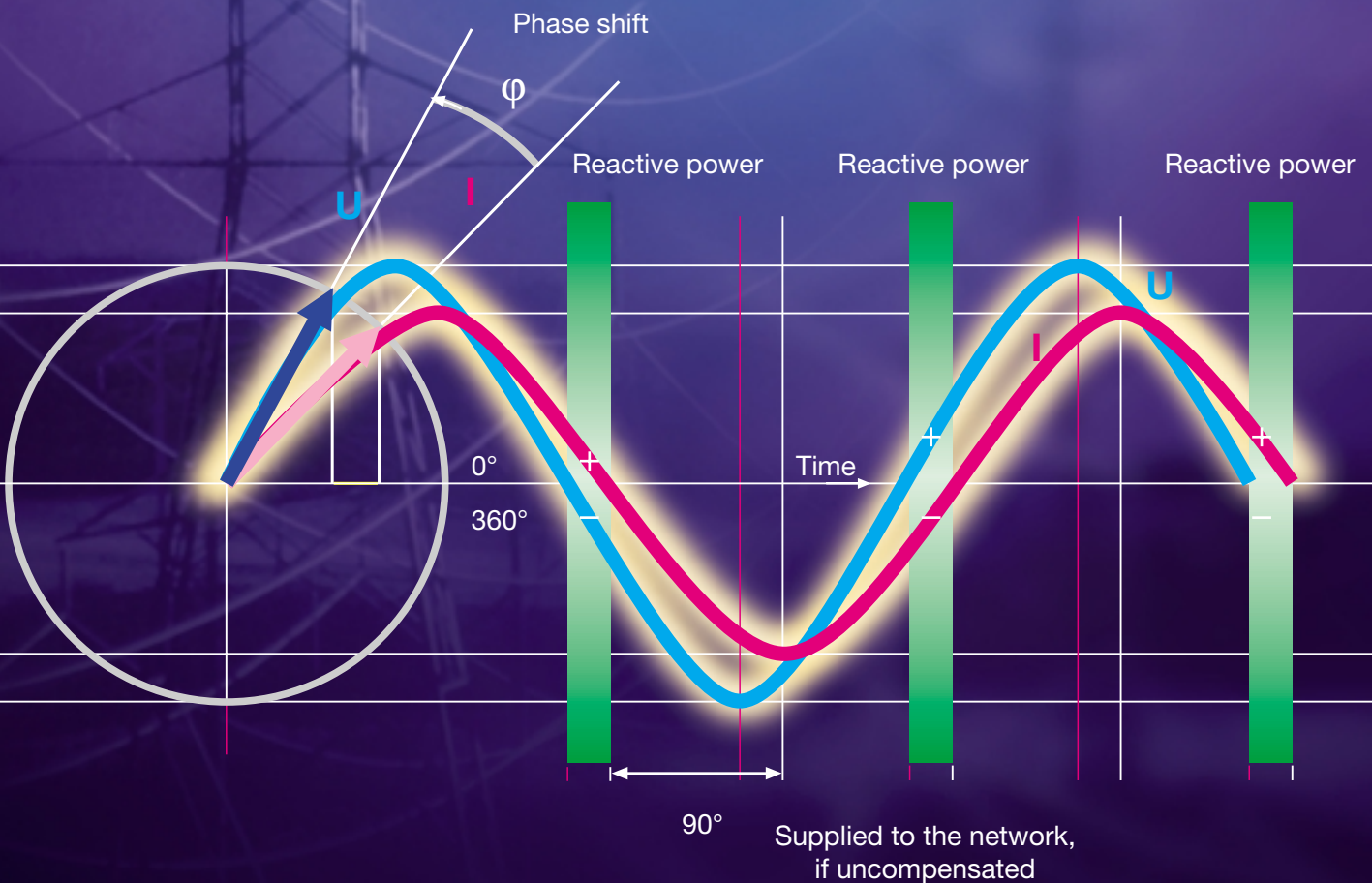
- Display numerous of system parameters
 - System voltage (VAC)
 - Reactive power (kvar)
 - Active power (kW)
 - Apparent power (kVA)
 - Apparent current (A)
 - Temperature (°C)
 - Real time $\cos \varphi$
 - Target $\cos \varphi$
 - kvar value to target $\cos \varphi$
 - Harmonics U (3. – 19.)
 - Harmonics I (3. – 19.)
 - THD-V, THD-I (%)
 - Fault memory

- Alarm output
 - Insufficient compensation
 - Over-compensation
 - Under-current
 - Over-current
 - Over-temperature
 - Harmonics exceeded
 - Over-/undervoltage
- 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)
 - Maximum THD-V (%)
 - Maximum THD-I (%)

- Dynamic PFC support (transistor output)
 - Contactor switching
 - Thyristor switching

Control panel

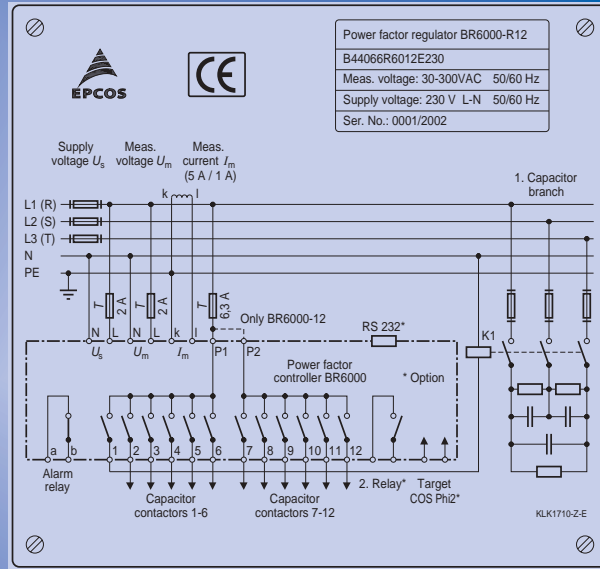
-  **Operation** (selection button)
-  **Input end** (enter, confirmation)
-  Changing of parameter (up)
-  Changing of parameter (down)



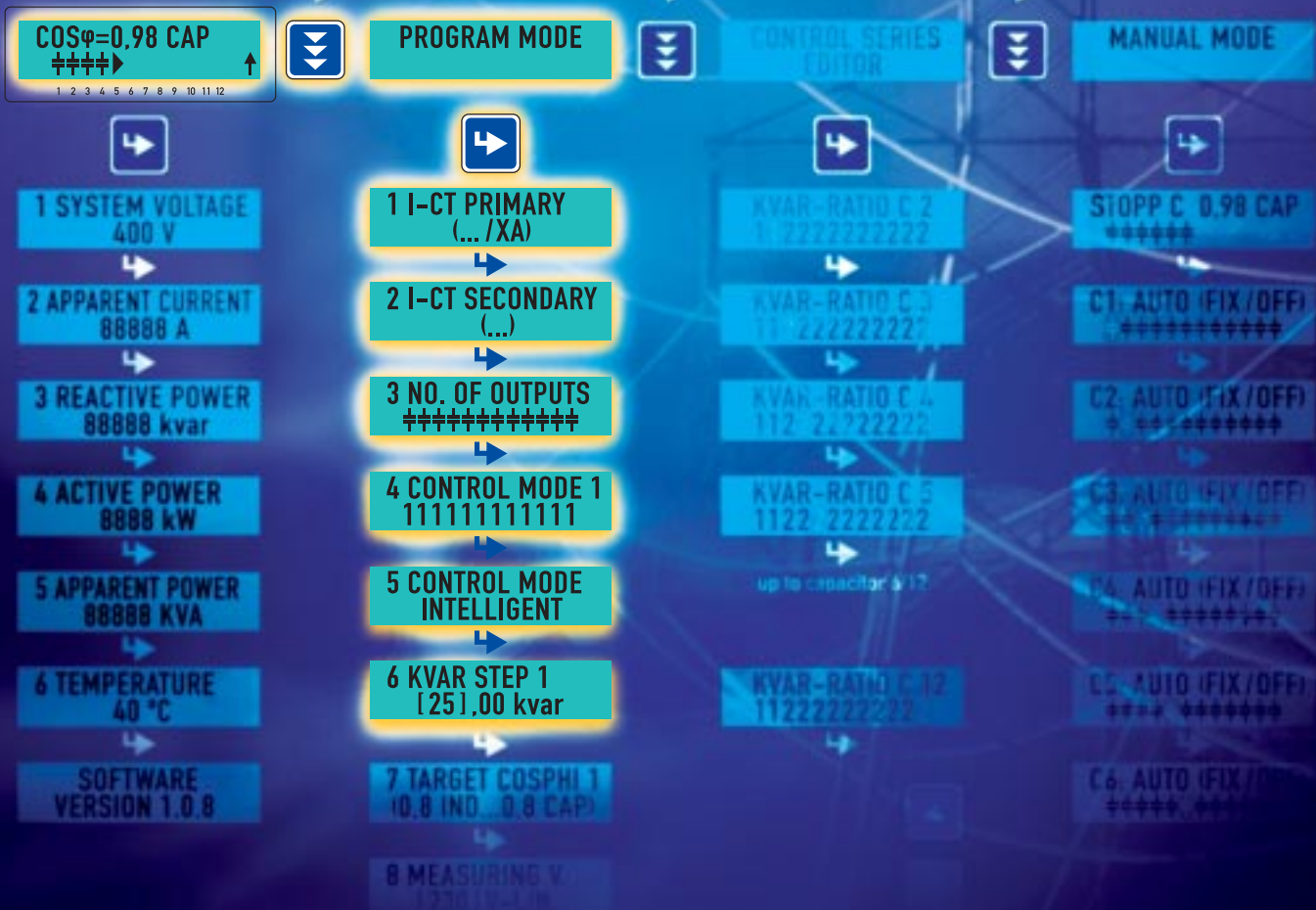
BR 6000 PFC Controller

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



BR 6000 PFC Controller

Technical data	
Weight:	1 kg
Casing:	Panel-mounted instrument, 144 x 144 x 60 mm
Ambient conditions	
Over-voltage class:	III
Pollution degree:	2
Operating temperature:	-10 °C ... + 60 °C
Storage temperature:	-20 °C ... + 65 °C
Sensitivity to disturbance (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
Operation	
Supply voltage:	230 VAC, other voltages available upon request
Mains frequency:	50 and 60 Hz power lines
Power consumption:	5 VA
Target cos ϕ :	0.8 ind. – 0.8 cap.
Switching-ON time range:	1 – 1200 seconds
Switching-OFF 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)
Fixed or skipped stages:	programmable
Fault memory:	last 8 faults are stored
Measurement	
Measurement voltage range:	30 ... 300 VAC phase to neutral (i.e. 50 ... 525 V phase to phase, phase shift programmable)
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
Switching outputs	
Relay outputs	
Number of relays:	6 and 12 steps available
Switching voltage:	max. 250 VAC
Switching power:	max. 1000 W
Max. switching frequency:	1 Hz
Expected mechanical life:	> 30 x 10 ⁶ switching operations
Expected electrical life:	> 5 x 10 ⁶ switching operations (load = 200 VA, cos ϕ = 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)

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 outputs, 1 alarm contact	B44066R6112E230
BR 6000-R12/F	– Input for 2. cos ϕ – additional user programmable message relay – controller coupling possible	B44066R6212E230
BR 6000-R12/S	RS232 or RS485 interface, others identically to option /F	B44066R6312E230

Accessories

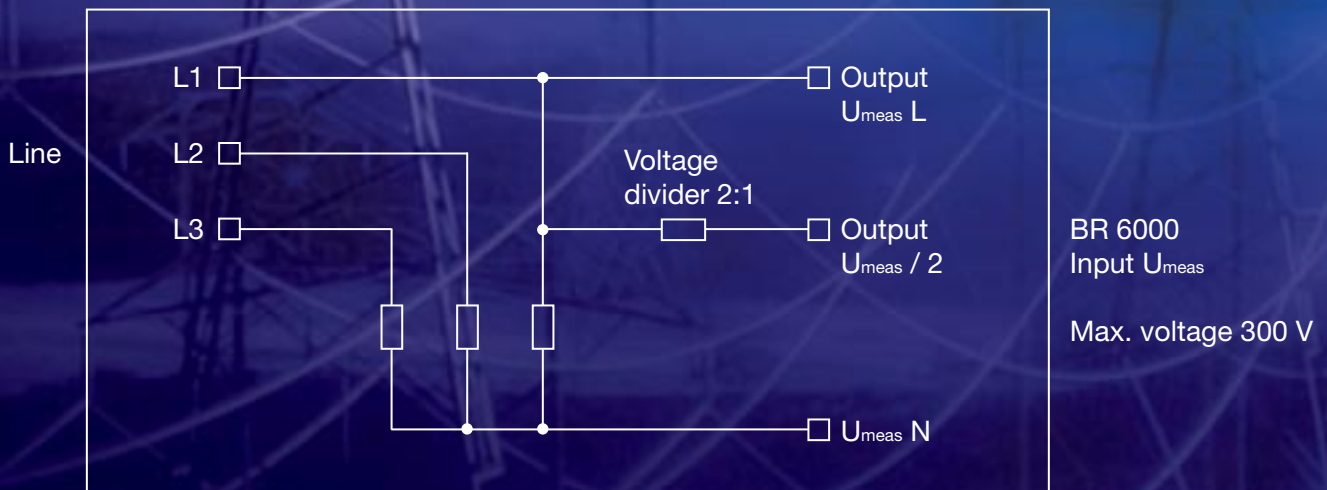
Adapter for Power Factor Controller BR 6000 (Connection to grids without neutral conductor)

- Designed to use the power factor controller BR 6000 in grids without neutral conductor
- Forms a virtual neutral for measuring purpose
- Three input terminals for phases L1, L2 and L3
- Three output terminals L1, N and $\frac{1}{2}L1$
- Additional output in the adapter allows usage of BR 6000 controller in voltage nets above 300 V

Technical data:

Design:	Compact form, all connections as screw-type clamp
Mounting:	Snap on top hat rail
Input voltage:	Grid without neutral max. 3 x 690 V
Output voltage 1:	L1-N
Output voltage 2:	$\frac{1}{2}L1-N$ (when using this output, a U-transformer ratio of 2 has to be programmed at the BR 6000)
Protection:	Necessary external according cable cross section
Max. ambient temperature:	-20/+55 °C
Dimensions:	Height 76 mm, width 45 mm, depth 110 mm
Ordering code:	B44066R9999E230

Circuit Diagram



Herausgegeben von EPCOS AG

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