



## Product overview

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### Power Factor Control Relay BLR-CX



Microprocessor controlled power factor controller with 1-phase measurement system

- Fully-automatic c/k-value setting, self adapting, connection of different capacitor step sizes possible
- Automatic detection and usage of the optimum capacitor step
- Switching programs: automatic, LIFO, manual mode, combi filter (on request)
- Capable for 4-quadrant operation
- 1-phase measurement system also suitable for non sinusoidal currents and voltages
- Supply voltage 115/230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Current measuring 10mA – 5A, suitable for CT x/1A and x/5A
- Connection with cage clamps
- Commissioning without additional settings
- LED display for  $\cos\phi$  and parameters
- States of capacitor steps indicated via LED
- Alarm relay with voltfree c/o contact
- TTL-interface on back
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Factor Control Relay BLR-CX 4 relay outputs	CX 04		
Power Factor Control Relay BLR-CX 6 relay outputs	CX 06		
Power Factor Control Relay BLR-CX 8 relay outputs	CX 08		
Power Factor Control Relay BLR-CX 12 relay outputs	CX 12		
Power Factor Control Relay BLR-CX 6 transistor out.	CX 06T		
Power Factor Control Relay BLR-CX 12 transistor out.	CX 12T		
<b>Options</b>			
Fan control and tariff switchover	- L		
Measured value display ( $\cos\phi$ , U, I, P, S, Q, F)	- M		
Temperature dependent $\cos\phi$ switchover	- LT		
Pluggable terminals	- K2		
<b>Accessories</b>			
Software WINBSTO (WIN95/98/ME/NT/2000/XP)			
Data cable TTL/RS232 including software WINBSTO			
Data cable TTL/USB including software WINBSTO			
Measuring adapter 100 – 750V			
Connecting lead 1m with marked wires			
Additional price for each further meter			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			



## Power Factor Control Relay BLR-CM-R



Microprocessor controlled power factor controller with 1-phase measurement system and display of measurement values

- Full-automatic c/k-value setting, self adapting, connection of different capacitor step sizes possible
- Automatic detection and usage of the optimum capacitor step
- Manual mode possible
- Multiple connection types possible through adjustable phase compensation angle
- Capable for 4-quadrant operation
- Individually configurable discharging time allows quicker switching time
- 1-phase measurement system also suitable for non sinusoidal currents and voltages
- Graphical LCD for display of step status, measurement values and system data
- Measurement display for U, I, P, Q, S, THD U, THD I,  $\Delta Q$ , F, T
- Harmonics measurement for voltage and current up to the 31. order
- Counter for active and reactive work
- Flexible alarm system with up to 15 alarms
- Programmable digital input and digital output
- Programmable alarm relay with voltfree c/o contact
- Supply voltage 115/230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Current measuring 15mA – 5A, suitable for CT x/1A and x/5A
- Connection with pluggable screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Factor Control Relay BLR-CM with 6 relay outputs	CM 06R		
Power Factor Control Relay BLR-CM with 12 relay outputs	CM 12R		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
Version for HV and MV Capacitor banks	- HV		
<b>Accessories</b>			
Connecting lead 1m with marked wires and plug-in terminal			
Additional price for each further meter			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			



**Power Factor Control Relay BLR-CM-T/RT**  
for dynamic Power Factor Control



Microprocessor controlled power factor controller with 1-phase measurement system and display of measurement values

- Uses additional to the normal regulation algorithm an second "fast" algorithm
- For every static output the steptype can be chosen between "normal" or "fast"
- **Fast Steps**

Response time < 1ms after one period measuring

To get an optimal compensation result in systems with rapid load changes the controller switches all needed steps by one switch cycle

The nominal step size is free adjustable for every step (connection of different capacitor step sizes possible)

- **Normal Steps**

Automatic Stepsize detection and supervision of the connected capacitor steps

Automatic usage of the optimum capacitor step

Individually configurable discharging time allows quicker switching time

Normal steps adjust the operating point for the fast steps

- Full-automatic c/k-value setting
- Manual mode possible
- Multiple connection types possible through adjustable phase compensation angle
- Capable for 4-quadrant operation
- 1-phase measurement system also suitable for non sinusoidal currents and voltages
- Graphical LCD for display of step status, measurement values and system data
- Measurement display for U, I, P, Q, S, THD U, THD I, ΔQ, F, T
- Harmonics measurement for voltage and current up to the 31. order
- Counter for active and reactive work
- Flexible alarm system with up to 15 alarms
- Programmable digital input and digital output
- Programmable alarm relay with voltfree c/o contact
- Supply voltage 115/230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Current measuring 15mA – 5A, suitable for CT x/1A and x/5A
- Connection with pluggable screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Factor Control Relay BLR-CM with 6 transistor outputs	CM 06T		
Power Factor Control Relay BLR-CM with 12 transistor outputs	CM 12T		
Power Factor Control Relay BLR-CM with 6 relay and 6 transistor outputs	CM 12RT		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
<b>Accessories</b>			
Connecting lead 1m with marked wires and plug-in terminal			
Additional price for each further meter			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			



## Power Factor Control Relay BLR-CM 3-phase



Microprocessor controlled power factor controller with 3-phase measurement system and display of measurement values

- Full-automatic c/k-value setting, self adapting, connection of different capacitor step sizes possible
- Capacitor capacity is stored as a 3phase value. Thereby 1phase capacitors can be used.
- Automatic detection and usage of the optimum capacitor step for 3 phase power factor control.
- Manual mode possible
- Multiple connection types possible through adjustable phase compensation angle
- Capable for 4-quadrant operation
- Individually configurable discharging time allows quicker switching time
- 3-phase measurement system also suitable for non sinusoidal currents and voltages
- Graphical LCD for display of step status, measurement values and system data
- Measurement display for U, I, P, Q, S, THD U, THD I,  $\Delta Q$ , F, T
- Harmonics measurement for voltage and current up to the 31. order
- Counter for active and reactive work
- Flexible alarm system with up to 15 alarms
- Programmable digital input and digital output
- Programmable alarm relay with voltfree c/o contact
- Supply voltage 115/230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Current measuring 3 x 15mA – 5A, suitable for CT x/1A and x/5A
- Connection with pluggable screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Factor Control Relay BLR-CM 3-phase with 6 relay outputs	CM 06R –3A		
Power Factor Control Relay BLR-CM 3-phase with 12 relay outputs	CM 12R –3A		
Power Factor Control Relay BLR-CM 3-phase with 6 transistor outputs	CM 06T –3A		
Power Factor Control Relay BLR-CM 3-phase with 12 transistor outputs	CM 12T –3A		
Power Factor Control Relay BLR-CM 3-phase with 6 relay and 6 transistor outputs	CM 12RT –3A		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
<b>Accessories</b>			
Connecting lead 1m with marked wires and plug-in terminal			
Additional price for each further meter			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			



## Power Analyzer EMM-4



Multi-function power analyzer for acquisition and analysis of all parameters in 3-phase grids

- 3-phase measurement with 3- or 4 wire connection
- Operation and parameter input with 4 keys
- User guidance with text menu
- Measurement data displayed on LCD display with backlight
- Harmonics measurement up to the 19. harmonic for voltage and current
- Connected to voltage transformers also suitable for higher voltages
- Interface RS232 on front
- Integration in networks possible via interface RS485 Modbus RTU or RS485 Profibus DP (optional)
- Data logger for measurement data and events via MMC storage card (optional)
- Impulse outputs for active and reactive energy (optional)
- Programmable alarms (optional)
- Measurement and supply voltage 400V +/-10%, 50/60Hz, other voltages on request
- Current measuring suitable for CT x/1A or x/5A
- Connection with pluggable screw terminals
- Instrument casing for cutout 144 x 144mm, depth 62mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Analyzer EMM-4	EMM-4		
<b>Options</b>			
2 programmable signalling contacts (c/o)	- m		
2 Impulse outputs for active and reactive work	- I		
Analog output (0...20mA, 4...20mA, 0...24mA)	- P		
2. serial interface (RS485)	- B		
Interface RS485 protocol Modbus RTU	- MB		
Interface RS485 protocol Profibus DP	- PB		
Integrated data logger for MMC card	- D		
2. serial interface (RS485) + data logger	- BD		
Interface RS485 protocol Modbus RTU + data logger	- DMB		
Interface RS485 protocol Profibus DP + data logger	- DPB		
2. serial interface (RS485) + analog output	- BP		
<b>Accessories</b>			
Software WINVEMM4 (WIN95/98/ME/NT/2000/XP)			
Software EMM4_MMC (WIN95/98/ME/NT/2000/XP)			
Multimedia card (MMC) 128MB			
Card reader MMC for USB			
Data cable RS232			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			



## Power Analyzer EMM-5



Multi-function power analyzer for acquisition and analysis of all parameters in 3-phase grids

- 3-phase measurement with 3- or 4 wire connection
- Operation and parameter input with 4 keys
- User guidance with plain text menu
- Measurement data displayed on large LCD display with backlight
- Harmonics measurement up to the 63. harmonic for voltage and current
- Connected to voltage transformers also suitable for higher voltages
- Integration in networks possible via interface RS485 Modbus RTU (optional)
- Flexible alarm system enables supervision of up to 32 measurement values
- Output relays (optional) can be programmed for external alarms
- Supply voltage 230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Current measuring 50mA – 5A, suitable for CT x/1A and x/5A
- Connection with cage clamps
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Power Analyzer EMM-5	EMM-5		
Power Analyzer EMM-5 with 2 programmable signalling contacts (2 c/o, voltfree)	EMM-5 -m		
Power Analyzer EMM-5 with 6 programmable signalling contacts (2 c/o and 4 n/o, each voltfree)	EMM-5 -am		
Power Analyzer EMM-5 with 4 impulse outputs for active and reactive work and 2 programmable signalling contacts (2 c/o, voltfree)	EMM-5 -Im		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
<b>Accessories</b>			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			

## Web Gateway miniSCADA



Configurable web gateway with integrated web server for direct Ethernet connection of devices with Modbus RTU interface

- Monitor and control Modbus devices with standard web browser
- Configuration and design of web interface without special tools or HTML editors
- Send alarm messages via e-mail or SMS (external modem necessary)
- Data logging of selectable data points
- Can also be used as gateway for protocol Modbus RTU/TCP
- Supply voltage 9 – 32V AC/DC
- Casing plastic grey 90 x 70 x 58mm, DIN rail mounting, IP20

Description	Type		
miniScada			



## Capacitor Protecting Relay KSR



Multi-function capacitor protecting relay for unbalance supervision of 3-phase capacitor banks in doublestar connection (current unbalance supervision)

- User guidance with plain text menu
- Measurement data displayed on large LCD display with backlight
- Harmonics measurement up to the 63. harmonic for voltage and current
- Connected to voltage transformers also suitable for higher voltages
- Integration in networks possible via interface RS485 Modbus RTU (optional)
- Flexible alarm system enables supervision of up to 32 measurement values
- Output relays can be programmed for external alarms
- Voltage measuring mains: 50 – 530V, 45 – 65Hz
- Current measuring unbalance supervision: 4 x 50mA – 5A, suitable for CT x/1A and x/5A
- Connection with screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Capacitor Protecting Relay KSR, supply voltage 230V AC	KSR -am		
Capacitor Protecting Relay KSR, supply voltage 115V DC	KSR -am		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
<b>Accessories</b>			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			

## Capacitor Protecting Relay KSR-V



Multi-function capacitor protecting relay for unbalance supervision of 3-phase capacitor banks via 3 x 2-pole voltage transformers secondary connections open delta (voltage unbalance supervision)

- User guidance with plain text menu
- Measurement data displayed on large LCD display with backlight
- Harmonics measurement up to the 63. harmonic for voltage and current
- Connected to voltage transformers also suitable for higher voltages
- Integration in networks possible via interface RS485 Modbus RTU (optional)
- Flexible alarm system enables supervision of up to 32 measurement values
- Output relays can be programmed for external alarms
- Voltage measuring mains: 50 – 530V, 45 – 65Hz
- Voltage measuring unbalance supervision: 4 x 200mV – 20V
- Connection with screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Capacitor Protecting Relay KSR-V, supply voltage 230V AC	KSR -amv		
Capacitor Protecting Relay KSR-V, supply voltage 115V DC	KSR -amv		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		



## Voltage Control Relay VxR



Multi-function device for voltage supervision of 3-phase systems

- User guidance with plain text menu
- Measurement data displayed on large LCD display with backlight
- Harmonics measurement up to the 63. harmonic for voltage
- Connected to voltage transformers also suitable for higher voltages
- Integration in networks possible via interface RS485 Modbus RTU (optional)
- Flexible alarm system enables supervision of up to 32 measurement values
- Supply voltage 230V, 45-65Hz, other voltages on request
- Voltage measuring 50 – 530V, 45 – 65Hz
- Connection with screw terminals
- Instrument casing for cutout 144 x 144mm, depth 49mm
- Protection class IP20 (casing), IP50 (front)

Description	Type		
Voltage Control Relay VCR, 1-phase	VCR		
Voltage Control Relay VSR, 3-phase	VSR		
<b>Options</b>			
Interface RS485 protocol Modbus RTU	- MB		
<b>Accessories</b>			
Transparent cover with lock IP54	- VT		
Wall mounting bracket			

## Static Contactor BEL-TS



Thyristor switch for rapid switching of capacitors in LV-grid

- Switching without inrush current, smooth disconnecting
- Rapid switching
- Can be used in chocked capacitor banks and unchocked as well
- Depending on the type for max. voltage 525V or 690V
- Recovery time 20ms
- Voltage level trigger signal 8 – 30V DC
- Protection class IP00

Description	Type		
Static contactor without fan, $I_N = 22A$ , $U_{nominal} = 400V$	BEL-TS 15H2		
Static contactor without fan, $I_N = 36A$ , $U_{nominal} = 400V$	BEL-TS 25H2		
Static contactor without fan, $I_N = 72A$ , $U_{nominal} = 400V$	BEL-TS 50H2		
Static contactor without fan, $I_N = 42A$ , $U_{nominal} = 690V$	BEL-TS 50		
Static contactor with fan, $I_N = 110A$ , $U_{nominal} = 400V$	BEL-TS 75H2		
Static contactor with fan, $I_N = 145A$ , $U_{nominal} = 400V$	BEL-TS100H2		
Static contactor with fan, $I_N = 84A$ , $U_{nominal} = 690V$	BEL-TS100		
Static contactor with fan, $I_N = 250A$ , $U_{nominal} = 690V$	BEL-TS300H2		
Static contactor with fan, $I_N = 250A$ , $U_{nominal} = 690V$	BEL-TS300		

Our deliveries and services are based on "Allgemeinen Lieferbedingungen für Erzeugnisse und Leistungen der Elektroindustrie" (January 2002) and "Ergänzungsklausel Erweiterter Eigentumsvorbehalt" (January 2003).  
Warranty period for all our products is 2 years!

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