

Automatic Power Factor Controllers DCRG series

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The Solution for All Applications!

• **Backlight**

Graphic Display

128 x 80 Pixels with excellent legibility, with adjustable brightness and contrast



• **Optical Communication Port**

The Optical port on the front using a standard USB, Wi-Fi point or dongle allows to communicate with a PC, smartphone and tablet, to carry out programming diagnostics and data download without removing power to the electric pane.

General characteristics

The DCRG8 controller has been designed to satisfy technical characteristics of modern electrical installations in industry and new users' needs.

The main power factor controller characteristics include: reliability, capability of working in all conditions and the ability to detect critical operating conditions and all this to protect the power factor correction system.

DCRG8 is created to satisfy these requirements and with the option to extend its own functionality by using specific expansion modules. A standard-supplied USB frontal optic is also available for controller programming , diagnostics and data downloads.

User interface is easy to view thanks to the backlit graphical LCD that contributes to excellent data reading even with bad lighting condition and to view information clearly and comprehensively.

Main features are:

- Backlight graphic 128 x 80 pixel LCD with 10 language options.
- Automatic sensing of CT current flow
- Connection to single and three-phase lines, three-phase lines with neutral and co-generation systems with 4-quadrant operation
- Use with medium-voltage lines
- Capability to operate correctly in systems having high harmonic content
- Reduction of the number of switching operations
- Balanced use of steps with same power rating
- Reactive power measurement per installed step
- Recording of the number of connections per step
- Capacitor over-current protection on all three phases
- Over-temperature protection by internal sensor
- Accurate no-voltage release protection function
- Current and voltage harmonic analysis
- Harmonic analysis of current and voltage waveforms recorded for overload events
- USB and Wi-Fi communications interface for personal computer, smartphone and tablet connection.
- Modbus-RTU, TCP and ASCII communication protocols
- Set-up and remote control software
- SMS sending for Alarm conditions with EXP10 15 expansion module.

Order Code	Steps No.	Rush-mount Housing Size (mm)	Qty Per Pkg No.	Wt kg
DCRG 8	8	144 x 144	1	0.98

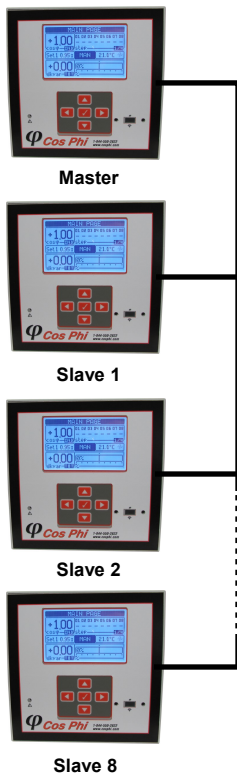
DCRG 8 Controller	EXP10 06 2 relay-output module	EXP10 01 4 static-output module	Total Steps	
			Relay	Static
No. of steps	No. of modules	No. of modules		
8	1 (2 step)	-	10	-
8	1 (2 step)	1 (4 steps)	10	4
8	2 (4 step)	-	12	-
8	2 (4 step)	1 (4 steps)	12	-
8	3 (6 step)	-	14	-
8	4 (8 step)	-	16	-
8	-	-	16	-
8	-	1 (4 steps)	8	4
8	-	1 (8 steps)	8	-

Operational characteristics

- Voltage Circuit
- Auxiliary power supply: 100-415VAC
- Rated frequency: 50/60Hz ± 10%
- Current circuit
- Single and three-phase input
- Rated current Ie: 5A (1A programmable)
- Measurement and control
- Power factor adjustment: 0.5 ind to 0.5 cap
- Voltage measurement range: 85-720VAC
- Current measurement range: 0.025-6A
- TRMS voltage and current measurements
- Reconnection delay time of the same step: 1-3000s
- Tripping sensitivity: 1-1000s/step

Master-Slave Function

The DCRG controller can control the outputs of other analog controllers in addition to its own steps. In this way it offers a master-slave architecture. Up to 8 slaves can be controlled to obtain a system with a maximum 32 steps.



Web Services Function

By installing the Ethernet expansion module EXP0 13, the main measured values of the controller can be viewed by most common Web-client compatibles on the market, using Java platform and with no need to install any additional PC software.

Capacitor Protection

By adding the EXP10 16 expansion module, the DCRG controller can be equipped with additional capacitor protection functions. The module can measure the harmonic current values and the capacitor temperature on-site, in addition to detecting a failure on any phase.

Three Current Inputs

- Independent power factor correction of each step can be done.
- Analysis of all electrical parameters of the system by a multimeter

Wide Range of Rated Voltage Measurements

The wide measurement range between 100 to 600VAC allows to use the controller in most types of applications.

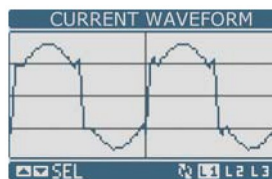
GSM/GPRS Modem

By fitting the EXP10 15 expansion module the controller is automatically equipped and configures a GSM/GPRS modem, This simplifies installation and wiring. Once a data-enabled SIM card is inserted, alarm or even SMS and email can be transmitted by the controller to FTP servers.

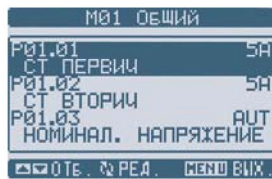
5A and 1A Both on the Same Controller

By configuring an apposite parameter, the controller can be enabled for use with either a 5A or 1A secondary current transformer

Graphs and Text in Multi Languages



Viewing of waveforms, text, trend and bar graphs in 10 languages: Italian, English, Spanish, French, German, Czech, Polish, Russian, Portuguese and customisable.



Energy Monitoring Functionality

By installing EXP10 13 and EXP10 30 the DCRG controller can also offer energy monitoring functionality viewable on most common web-client compatibles on the market.

Suitable for Medium-Voltage Systems

The controllers can be installed in medium-voltage systems thanks to its configuration for voltage transformer ratio, thereby obtaining measurements with regards to the transformer primary value both for the correction adjustment and the display readouts.

Suitable for Dynamic (FAST) Power Factor Correction

With the EXP10 01 static output expansion module installed, the controller can be used in dynamic power factor correction systems where the reactive load quickly varies over time. Also taking advantage of the built in controller relay outputs, a mixed system of traditional relay and dynamic type of correction steps can be obtained.

Technical Characteristics

Auxiliary Supply Circuit

Rated Auxiliary voltage	100-415VAC
Operation Range	-10 to +10%
Rated Frequency	50Hz or 60Hz ± 10%
Maximum power consumption	12VA
Maximum power dissipation (output contacts excluded)	4.5W

Voltage Slave

Control Voltage	100-600VAC
Operating Range	50-720VAC
Rated frequency	50Hz or 60Hz ± 10% - 360-440Hz
Immunity time for micro-breakings	35ms (110VAC) - 80ms (220-415VAC)

Current Circuit

Rated current Ie	Programmable 5A/1A
Operating range	0.025-6A / 0.025-1.2A
Constant overload	1.2 Ie
Short time withstand current	50 Ie for 1s
Current consumption	0.6VA

Measurement Data

Type of voltage-current measurement	TRMS
Power factor adjustment	0.5 inductive to 0.5 capacitive
Type of Temperature sensor	internal + PT100 with EXP10 04 + NTC with EXP10 16

Relay Outputs

Number of outputs	8 (10,12, 14, 16 with EXP...)
Contact arrangement	7 NO (SPST + 1 changeover (SPSD) contacts
IEC rated capacity	5A 250V (AC1)
Maximum capacity of common terminal of contacts	10A
Maximum switching voltage	415 VAC
UL/CSA and IED/EN 60947-5-1 designation	B300
Electrical life (at rated load)	10 ⁵
Mechanical life	30 x 10 ⁶ cycles

Static Outputs

Number of outputs	4 or 8 w/EXP10 01
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Connections

Type fo terminal	Removable/plug-in
Conductor section min-max	0.2-2.5mm ² (24- 12AWG)

Ambient Conditions

Operating temperature	-30...+70°C
Storage temperature	-30...+80°C

Housing

Version	Flush mount 144 x 144mm
Material	Polycarbonate
IEC degree of protection	IP54

Expansion Modules

Order Code	Description	Qty No.	Wt kg
Inputs and outputs			
EXP10 06	2 relay outputs to increase number of steps	1	0.064
EXP10 01	4 static outputs, opto-isolated to increase number of steps	1	0.054
EXP10 16	Capacitor banks protection	1	0.080
EXP10 00	4 digital inputs, opto-isolated	1	0.060
EXP10 02	2 digital inputs and 2 static outputs, opto-isolated	1	0.058
EXP10 03	2 relay outputs, rated 5A250VAC	1	0.050
EXP10 04	2 analog inputs, opto-isolated, 0/4-20mA, PT100, 0-10V or 0 to ± 5V	1	0.056
EXP10 05	2 analog inputs, opto-isolated, 0/4-20mA, 0-10V or 0 to ± 5V	1	0.064
Communication Ports			
EXP10 11	Opto-isolated RS232 interface	1	0.050
EXP10 12	Opto-isolated RS485 interface	1	0.040
EXP10 13	Opto-isolated Ethernet interface with Web server function	1	0.060
EXP10 14	Opto-isolated Profibus-DP interface	1	0.080
Various Functionality			
EXP10 15	GPRS/GSM modem	1	0.080
EXP10 30	Data storage, clock-calendar with backup energy for data logging	1	0.050



General characteristics

EXP series expansion modules can add extra functions to the DCRG series power factor controllers. Each controller can mount a maximum of four expansion modules. These models snap on to the rear of the controller and allow to:

- Increase the number of steps to connect
- Use in application with static real-time (fast) power factor correction
- Add analog type of inputs and outputs to have 0/4-20mA, 0-10V, -5 to +5 or PT100 function
- Add RS232 and RS485 communication ports
- Predispose the controller for connection to Ethernet TCP/IP, Profibus-DP, GPRS/GSM.

Certifications and compliance

Certifications obtained: UL Listed, for USA and Canada (cULus—File E93601), as listed Accessory under Auxiliary Devices, for EXP... modules only except for EXP10 15 and EXP10 16 pending. Compliant with standards: IEC/EN 61010-1, IEC/EN 61000-6-2, IEC/EN 61000-4 for EXP10 13, IEC/EN 61000-6-3 for all the rest, UL508, CSA C22.2 no. 14.

Communication Devices

Order Code	Description	Qty No.	Wt kg
CX 01	PC ↔ DCRG8 connecting cable, with USB connector for programming, data download, diagnostics and firmware upgrade	1	0.090
CX 02	PC ↔ DCRG8 Wi-Fi connecting device for programming, data download, diagnostics and firmware upgrade	1	0.090
CX 03	GSM quad-band antenna (800/900/1800/1900MHz) for EXP10 15 expansion module	1	0.090



General characteristics

Communication and connection devices allow the DCRG8 controller to be linked to:

- Personal computers (PC)
- Smartphones
- Tablets

CX 01

This USB option connector complete with cable, provides for connection on DCRG8 controller, with a PC without even disconnecting the power supply of the electric panel board and to be able to:

- Program parameters
- Download data and event logs
- Complete diagnostics.

The PC identifies the connection as a standard USB.

CX 02

Using Wi-Fi connection, the DCRG8 power factor controllers can be viewed by a PC, smartphone and tablet without having to connect cables and allows to:

- Program parameters
- Download data and event logs
- Complete diagnostics.

CX 03

Compatible with major worldwide mobile phone networks, thanks to the 800/900/1800/1900MHz frequencies.

Software and accessories

Order Code	Description	Qty No.	Wt kg
Software			
DCRJ SW	Setup, automatic panel test and remote control software with 51 C2 connecting cable	1	0.246
Accessories			
51 C2	PC ↔ DCRG8 c/w EXP10 11 connecting cable, 1.8m long	1	0.090
51 C4	PC ↔ PX1 converter drive connecting cable 1.8m long	1	0.147
51 C6	4 PX1 converter drive ↔ DCRG8 c/w EXP10 11 connecting cable 1.8m long	1	0.102
51 C9	PC ↔ Analog modem connecting cable 1.8m long	1	0.137
4 PX1	RS232/RS485 converter drive, galvanically isolated, 220-240VAC (110-120VAC on request) ¹	1	0.090



¹RS232/R485 opto-isolated analog modem, 38,400 Baud rate maximum, automatic or manual TRANSMIT line supervision, 220-240VAC ± 10% power supply (110-120VAC on request)