



# GCR

## Digital power plant commander for generating sets paralleled to the commercial power

### GENERAL POINTS

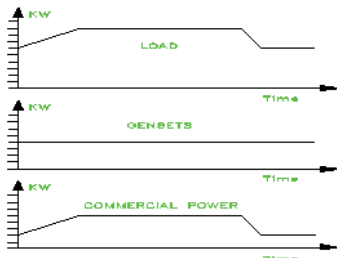
The GCR is the fourth version designed by CRE. It allows the synchronizing, the coupling, and the power control of one or several generating sets in parallel with one or several commercial powers. It can be used with the synchronizers and load-sharing modules from Barber Colman or Woodward and permits permanent or temporary paralleling.

The GCR is easily adjustable and configurable by its integrated screen and keyboard, or by a PC through its serial port.

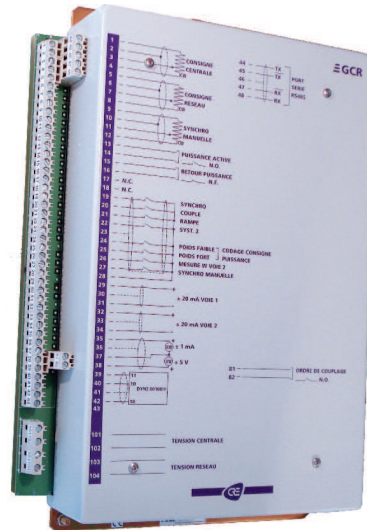
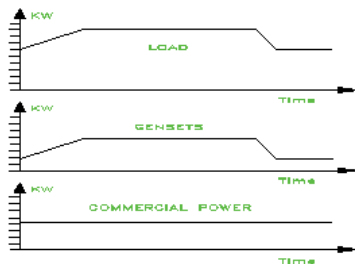
### OPERATING MODES

The GCR offers two different operating modes of the generating sets paralleled to the commercial power.

**Constant generating set power :** In this mode called system 1, the generating sets provide constant power. The commercial power varies according to the load.



**Constant commercial power:** In this mode, called System 2, the commercial power (imported or exported) remains constant. The generating sets power varies according to the load. The commercial power is measured by a current input, +/-20mA or 4-20mA.



A09T0 /1 /2

### FUNCTIONS

#### ■ Automatic or manual paralleling :

In automatic or manual (via a potentiometer) mode, the GCR controls the correction signals of all the generating sets by an analog bus driving each regulation independently. The PID synchronization performance is the same as synchronization between generators.

#### ■ Loading and unloading ramps :

These ramps are separately adjustable for the systems 1 or 2 from 0sec to 30mn. These digital ramps are perfectly linear and with a precision of 30ms. The transfer times are constant whatever the power to transfer (10s for 100KW = 10s for 1000KW).

#### ■ Minimum and maximum power protections :

The low and high adjustable limits protect the generating sets against underloads, reverse power and overloads.

#### ■ Paralleling and power transfer with several commercial power :

A memorization of the generating sets power allows to parallel a power plant to several commercial power (one by one). Transfers (power plant/commercial power or commercial power/power plant) is controlled without any power exchange between commercial powers and utilization. Two different +/- 20mA measurement inputs avoid to switch power measurements for transfers when coupling and uncoupling power plant

■ **Reverse commercial power limit:** Adjustable and at inverse time, it is available on an isolated NC contact.

■ **Forward commercial power limit with hysteresis:** Adjustable separately for closing and opening an isolated contact relay.

■ **Commercial power meter output:** Adjustable output for imported or exported commercial power by a +/-5VDC or +/-1mA signal.

■ **Separate command buses:** The GCR has one bus to control the generators synchronization and one bus to control the generators power, for better performance.

■ **Signaling by leds:**

- Automatic or manual synchronization.
- Generators paralleled with commercial power.
- Power up and down ramps.
- System 1 or system 2 operation.
- High limit reached.
- Low limit reached.

■ **RS 485 serial port:** All the inputs/outputs of the GCR are available through this port in MODBUS or JBUS RTU protocol. It is also used for programming from a PC (CRE software protocol).

■ **Power set points:** The GCR has 3 software power set points adjustable for each system 1 and 2. These set points are selected by the coding of 2 logic inputs. An external set point adjustable by potentiometer is also available.

■ **P.I.D. power regulation:** The GCR has a digital P.I.D. regulation (Proportional, Integral and Derivative) for the constant commercial power operation (system 2). The 3 parameters are adjustable separately

## CHARACTERISTICS

■ **CE Mark:** The GCR is in conformity with the European CE Mark requirements.

■ **Weight-Size:** 3,5Kg - 330 x 219 x 58 (fixing: 4 screws between-axes 314 x 150).

■ **AC power supply  $\pm 15\%$  :**

Reference	AC power supply
A09T0	100 VAC
A09T1	230 VAC
A09T2	400 VAC

Consumption 6VA per phase.

■ **Power measurement ( $\pm 20mA$  inputs) :** This input signal can be isolated or referenced to the 0VDC. Its response time must be better than 200ms for a good regulation. A CRE active power converter ( $\pm 20mA$ ) is available (ordering ref. A24Z0).

■ **Commercial power meter output:**

- $\pm 5VDC$  signal: Minimum internal resistance of the indicator 1Kohms.
- $\pm 1mA$  signal: Maximum internal resistance of the indicator 500 ohms.

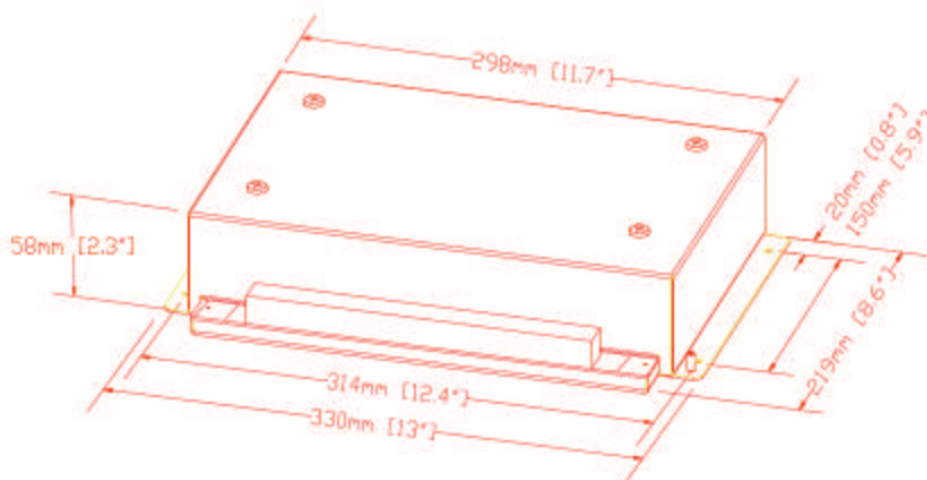
■ **Relay contacts:** Nominal current: 8A at 250VCA. Maximum break voltage: 440VCA. Nominal switched power: 2000VA (resistive load).

## ENVIRONMENT

■ **Operating temperature:** 0 to +70°C.

■ **Mounting:** Can be mounted in all positions.

■ **Humidity :** Will operate normally in humid conditions (tropic-proof circuits).



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