

# Combination Generator Control Module



Flexible and Robust Generator Control,  
Protection and System Supervision

## Benefits

- Generator Protection
- Excitation Control
- Synchronization Control
- Full Featured Metering
- Integration with Allen-Bradley ControlLogix Family

## Communication Ports

- Redundant ControlNet connector
- EtherNet/DLR communication
- RS-232 port for dedicated communication with a redundant CGCM

## Synchronization Parameters

- Frequency
- Phase Rotation Match
- Phase Angle
- Voltage Magnitude



The Rockwell Automation Allen-Bradley® Combination Generator Control Module (CGCM) sets a new standard for generator control. The CGCM combines excitation control, generator protection, synchronization control, and full-featured metering in a single compact product. The CGCM, when used in conjunction with a ControlLogix® Automation Controller, provides a highly robust and flexible platform for generator control and system supervision.

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## Generator Regulation and Control Functions

- Four excitation control modes
- Automatic voltage regulation (AVR)
- Manual or field current regulation (FCR)
- Power factor (PF)
- Reactive power (VAR)
- Soft start voltage buildup with an adjustable ramp in AVR and FCR control modes
- Overexcitation (OEL) and underexcitation (UEL) limiting in AVR, VAR, and PF control modes
- Underfrequency compensation (Volts/Hertz)
- Line Drop Compensation
- Auto-tracking between operating modes and between redundant CGCM units
- Automatic transfer to a backup CGCM unit in redundant systems
- Generator paralleling with reactive droop compensation or crosscurrent (reactive differential) compensation
- Generator paralleling with real power load sharing
- Synchronizing for 1 or 2 circuit breakers

## Generator Current Sensing

Type	Three-Phase plus cross current compensation input
Frequency	50/60 Hz
Range	1A or 5 A maximum continuous
Burden	<0.1 VA per phase for metering CT's <2.5 VA per phase for cross current inputs
3 Phase	Open delta, grounded "B" phase

## Field Output

Continuous Voltage	32, 63, 125 Vdc
Continuous Current	15 Adc
10 Second Forcing Voltage	50, 100, or 200 Vdc
10 Second Forcing Current	30 Adc

Catalog Number	Description
1407-CGCM	Combination Generator Control Module with ControlNet
1407-CGCM-DLR	Combination Generator Control Module with EtherNet/DLR

## Generator Protection Functions

- Loss of excitation current (ANSI 40)
- Overexcitation voltage (ANSI 59F)
- Generator overvoltage (ANSI 59)
- Generator undervoltage (ANSI 27)
- Loss of sensing (ANSI 60FL)
- Loss of permanent magnet generator (PMG/Excitation power) (ANSI 27)
- Reverse VAR (ANSI 40Q)
- Overfrequency (ANSI 81O)
- Underfrequency (ANSI 81U)
- Reverse power (ANSI 32R)
- Rotating diode monitor (ANSI 58)
- Phase rotation error (ANSI 47)
- Generator overcurrent (ANSI 51/27F)
- Voltage Magnitude

## Metering Functions

- Voltage
- Current
- Frequency
- Real Power
- Apparent Power
- Reactive Power
- Power Factor
- Real Energy (kWh)
- Apparent Energy (kVAh)
- Reactive Energy (kVARh)
- Controller Excitation

## Current and Voltage

- Diode Monitor Ripple Level
- Load Share Error Synchronization Parameters:
- Frequency
- Phase Rotation Match
- Phase Angle
- Voltage Magnitude

## Operating Power Requirements

Source	Phases	Wiring Configuration	Voltage	Frequency	VA (max)
Permanent Magnet Generator	1 Phase	PMG-A & PMG-C	Min: 56 Vrms Max: 300Vrms	Min: 50 Hz Max: 342 Hz	3070
Permanent Magnet Generator	3 Phase	Floating wye	Min: 56 Vrms L-L Max: 300Vrms L-L	Min: 50 Hz Max: 342 Hz	3070
Separately Excited	1 Phase	PMG-A & PMG-C	Min: 56 Vrms Max: 300Vrms	Min: 50 Hz Max: 342 Hz	3070
Separately Excited	3 Phase	Floating wye	Min: 56 Vrms L-L Max: 300Vrms L-L	Min: 50 Hz Max: 342 Hz	3070
Separately Excited	3 Phase	Grounded wye (grounded neutral)	Min: 56 Vrms L-L Max: 300Vrms L-L	Min: 50 Hz Max: 342 Hz	3070
Separately Excited	3 Phase	Floating delta	Min: 56 Vrms L-L Max: 300Vrms L-L	Min: 50 Hz Max: 342 Hz	3070
Separately Excited	3 Phase	Open delta, floating	Min: 56 Vrms L-L Max: 300Vrms L-L	Min: 50 Hz Max: 342 Hz	3070

## Generator and Bus Voltage Sensing Values

Phases	Wiring Configuration	Grounded Connection Available	Voltage	Frequency
1 Phase	V A & V C	No	Min: 57 Vrms Max: 150 Vrms	Min: 20 Hz Max: 90 Hz
3 Phase	Floating wye	No	Min: 99 Vrms L-L Max: 208 Vrms L-L	Min: 20 Hz Max: 90 Hz
3 Phase	Grounded wye	Yes	Min: 99 Vrms L-L Max: 208 Vrms L-L	Min: 20 Hz Max: 90 Hz
3 Phase	Open delta, grounded "B" phase	Yes	Min: 99 Vrms L-L Max: 208 Vrms L-L	Min: 20 Hz Max: 90 Hz

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