

Automatic voltage regulator

PMG excitation

> Specification sheet



**Power
Generation**

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Description

The PMG (permanent magnet generator) provides more power for motor starting. It sustains main field excitation for short circuit fault discrimination and coordination, and provides increased immunity from non-linear loads.

Under-frequency compensation provides a frequency measuring circuit that monitors generator output and under-speed protection by reducing the generator output voltage proportionally when generator set speed is below an adjustable frequency threshold.

Soft start circuitry provides a smooth, controlled generator voltage buildup from low residual voltage.

Remote voltage adjust enables connection of a remote voltage trimmer allowing fine control of generator voltage.

Paralleling provides droop adjustment for generators equipped with quadrature droop current transformers to allow up to 5% voltage droop at full load.

Voltage dip adjustment provides for an adjustment of the under-frequency compensation volts/hertz characteristic to compensate for different engine block load capabilities (torque matching).

Over-excitation protection continuously monitors the excitation level. If excitation level exceeds preset level for 10 seconds, the regulator is shutdown. The generator must be shutdown to reset.

Over-voltage protection continuously monitors generator output voltage and shuts down the regulator for sustained over-voltages caused by open circuited sensing or power control device failure. Breaker trip signal is provided if circuit isolation is required. The generator must be shutdown to reset.

Current limiting allows control over the level of three-phase and single-phase fault current when used with separate current transformers on the generator output.

Features

Power control devices - Solid state, three-phase, full wave bridge designed for permanent magnet generator (PMG) excitation and application on brushless generators, PMG excitation results in low radio frequency interference (RFI) and immunity to non-linear loads.

Three phase full wave bridge design - For operation on permanent magnet generator.

Fully encapsulated

Precise regulation

Torque matching under-frequency compensation

Protection - Over voltage and over excitation.

RMS sensing - Three-phase.

Operation - 60 Hz or 50 Hz.

Remote voltage adjustment - Standard on generator sets from 200 kW-1500 kW. Optional on generator sets from 50 kW-175 kW.

AVR control functions

Control	Function
Volts	To adjust generator output voltage
Stability 1	To prevent voltage hunting
Stability 2	To prevent voltage hunting
UFRO	To set under-frequency roll off knee point
Droop	To set generator droop to 5% at full load 0 PF
V/trim	To match AVR input to accessory output
EXC	To set the over-excitation cut off level
DIP	To set the initial-frequency related voltage dip
Over/V	To set the over-voltage protection cut off level
I/limit	To set the maximum short circuit current

Specifications

Sensing input

- Voltage: 170-250 VAC max
- Frequency: 50-60 Hz nominal
- Phase: 1 or 3
- Wire: 2 or 3

Power input (PMG)

- Voltage: 140-220 VAC
- Current: 3 A/phase
- Frequency: 100-120 Hz nominal
- Phase: 3
- Wire: 3

Output

- Voltage: Max 120 VDC
- Current: Continuous 2.7 A transient 6 A for 10 sec
- Field resistance: 150 Ω minimum

Regulation - With 4% engine governing: ±0.5% RMS

Thermal drift - (after 10 min) 0.5% to 40 °C. Change in AVR ambient

Soft start ramp time - 3 seconds

Typical system response

- Field current to 90%: 80 ms
- Machine volts to 97%: 300 ms

External voltage adjustment - ±6% with 4.7 Ω trimmer: ±0.5% RMS

Under-frequency compensation

- Set point: 95% Hz
- Slope: 100-300% down to 30 Hz

Unit power dissipation - 18 W maximum

Accessory input - ±1 volt input = ±5% change in output volts

Quadrature droop - Maximum sensitivity (27 Ω burden): 0.08 A for 5% droop @ 0 p.f.

Current limit - Sensitivity range (27 Ω burden): 0.166 A -0.370 A

Over-voltage protection

- Set point: 300 V
- Time delay (fixed): 1 second
- Circuit breaker: Trip coil voltage 40-60 VDC
- Circuit breaker: Trip coil resistance 50-100 ohms

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Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect generator sets to any building electrical system except through an approved device or after building main switch is open.

Warning: For professional use only. Must be installed by a qualified service technician. Improper installation presents hazards of electrical shock and improper operation, resulting in severe personal injury and/or property damage.

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Over-excitation protection

- Set point: 75 VDC
- Time delay (fixed): 10 seconds

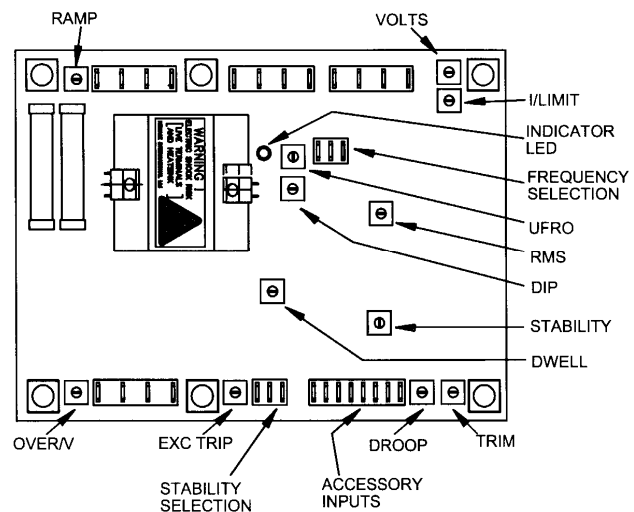
Environmental

- Vibration: 20-100 Hz, 3.1 in/s, 80 mm/s 100-2 k Hz, 5 g
- Relative humidity: 32 °F to 140 °F/0 °C to 60 °C
- Operating temperature: -40 °F to 140 °F/-40 °C to 60 °C
- Storage temperature: -130 °F to 175 °F/-55 °C to 80 °C

Field installation kits

Models	Description	Kit number
DG series (24 V)	-	0300-3618
DG series (14 V)	With Detector control	0300-5182
DG series (14 V)	With Sentinel control	0300-4908
MCG/MDG series	-	0300-4676

Fitting and operating



Certification:



ISO9001 - This product was designed and manufactured in facilities certified to ISO9001.

