



## easYgen-3100/3200 Genset Control for Multiple Unit Operation

### DESCRIPTION

The easYgen-3000 Series are control units for genset applications. The numerous inputs and outputs, along with a modular software structure, permit you to use the easYgen-3000 Series for a wide range of applications. This includes stand-by, AMF, peak shaving, import-export, cogeneration or distributed generation, among others. Also the easYgen-3000 Series is compatible for isolated, island parallel, mains parallel and multiple unit mains parallel operations. The easYgen-3000 Series is able to control up to 32 gensets connected in a network with automatic sequencing.

The easYgen-3000 Series is available for simple paralleling as well as for complex paralleling applications. Choose easYgen-3200 should you want to take your fleet of gen-sets parallel to grid or choose easYgen-3500 with LS-5 for multi grid, multi segment applications. These controllers are also available without display, in a rugged metal housing suitable for back panel installation. A remote panel (RP-3000) can be used for visualization/control purpose in this case.

**FlexApp™** – This feature provides the tools to easily configure the number of operated breakers: None, GCB, GCB and MCB.

**LogicsManager™** – Woodward's LogicsManager enables to change the operation sequences and adapt them to specific needs. The LogicsManager accomplishes this by monitoring a range of measuring values and internal states, which are combined logically with Boolean operators and programmable timers. This enables to create and/or modify control and relay functions.

**FlexIn™** – The analog inputs are configurable to operate with VDO, resistive, and/or 0 to 20 mA senders.

**Flexible Outputs** – Speed and voltage bias outputs are configurable to function with all speed governors and voltage regulators. The outputs can also be used as freely scalable outputs (e.g. for driving external meters).

**FlexCAN™** – Advanced network interfaces ensure unsurpassed control performance – from engine control up to total plant operation. The easYgen-3000 Series is capable of working with common industrial interfaces, including CAN, RS-232, and RS-485. The multiple communication protocols permit the easYgen-3000 Series to communicate with a vast majority of engine control units (ECUs), external I/O boards, PLCs, and modems. CANopen, J1939, Modbus RTU, and Modem protocols are supported.

**DynamicsLCD™** – The adaptive and interactive 5.7", 320x240 pixel color graphical LC display with soft keys and a clear menu structure ensures intuitive user operation and navigation.

### FEATURES

- Operation modes: Auto, Stop, Manual, and Load/No Load test modes via discrete input possible
- Breaker control: Slip frequency / phase matching synchronization, open-close control, breaker monitoring
- Load transfer features: open / closed transition, interchange, soft loading / soft unloading, mains parallel
- Remote control via interface and discrete/analog inputs for adjusting speed, frequency, voltage, power, reactive power, and power factor set points
- Freely configurable PID controllers for various control purposes, such as heating circuit control (CHP applications), water level, fuel level, or pressure and/or other process values
- Supported ECU: Scania S6, MTU ADEC ECU7/8, Volvo EMS2 & EDC4, Deutz EMR2 & EMR3, MAN MFR/EDC7, SISU EEM, Cummins and Woodward EGS02 ECU
- Discrete and analog I/O expansion board connectivity (Woodward IKD 1 or Phoenix Contact IL series)
- Multi-lingual capability: English, German, Spanish, French, Italian, Portuguese, Japanese, Chinese, Russian, Turkish, Polish, Slovakian, Finnish, Swedish
- Configurable voltage/frequency control allows manual control of breakers
- Neutral interlocking determines and controls one common neutral in a network of generators
- Cylinder temperature monitoring for in-line and V engines
- Reactive power regulation at the grid interchange point (kvar or PF)

- Master or Slave control capability
- Peak shaving operation
- Stand-by operation
- AMF operation
- Cogeneration (CHP)
- Islanded & mains parallel operation
- Load sharing and load-dependent start/stop for up to 32 units
- Import/export control
- Open/closed transition
- CANopen / J1939 ECU Control
- Free configurable alarms and texts
- Fast configuration by partial setting files
- Dynamic mains stabilization (as per BDEW)
- Adjustable vector groups for synchronization

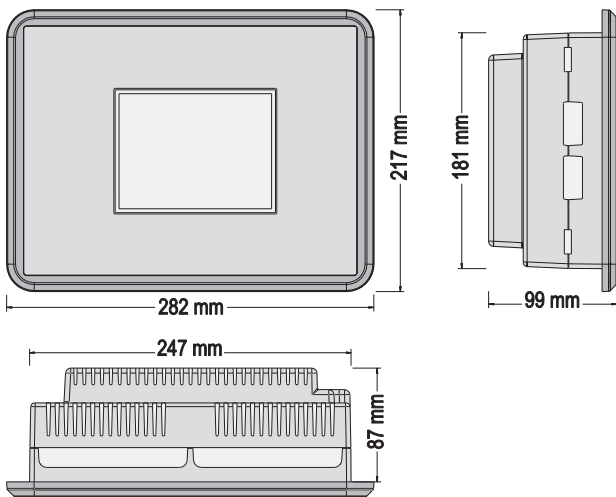
# SPECIFICATIONS

Power supply.....12/24 V<sub>DC</sub> (8 to 40 V<sub>DC</sub>)  
 Intrinsic consumption ..... max. 17 W  
 Ambient temperature (operation).....-20 to 70 °C / -4 to 158 °F  
 Ambient temperature (storage).....-30 to 80 °C / -22 to 176 °F  
 Ambient humidity.....95%, non-condensing  
**Voltage**..... (  $\lambda/\Delta$  )  
 100 Vac [1] Rated (V<sub>rated</sub>).....69/120 V<sub>AC</sub>  
 Max. value (V<sub>max</sub>).....86/150 V<sub>AC</sub>  
 Rated surge volt. (V<sub>surge</sub>).....2.5 kV  
**and 400 Vac [4]** Rated (V<sub>rated</sub>).....277/480 V<sub>AC</sub>  
 Max. value (V<sub>max</sub>).....346/600 V<sub>AC</sub>  
 Rated surge volt. (V<sub>surge</sub>).....4.0 kV  
 Accuracy .....Class 1  
 Measurable alternator windings...3p-3w, 3p-4w, 3p-4w OD, 1p-2w, 1p-3w  
 Setting range..... primary.....50 to 650,000 V<sub>AC</sub>  
 Linear measuring range.....1.25×V<sub>rated</sub>  
 Measuring frequency.....50/60 Hz (40 to 85 Hz)  
 High Impedance Input; Resistance per path.....[1] 0.498 MΩ, [4] 2.0 MΩ  
 Max. power consumption per path.....< 0.15 W  
**Current (Isolated)** Rated (I<sub>rated</sub>).....[1] ..1 A or [5] ..1/5 A  
 Linear measuring range ..... I<sub>gen</sub> = 3.0×I<sub>rated</sub>  
 I<sub>mains/ground</sub> = 1.5×I<sub>rated</sub>  
 Setting range.....1 to 32,000 A  
 Burden.....< 0.15 VA  
 Rated short-time current (1 s).....[1] 50×I<sub>rated</sub>, [5] 10×I<sub>rated</sub>  
**Power** .....  
 Setting range.....0.5 to 99,999.9 kW/kvar  
**Discrete inputs** .....isolated  
 Input range.....12/24 V<sub>DC</sub> (8 to 40 V<sub>DC</sub>)  
 Input resistance.....approx. 20 kOhms

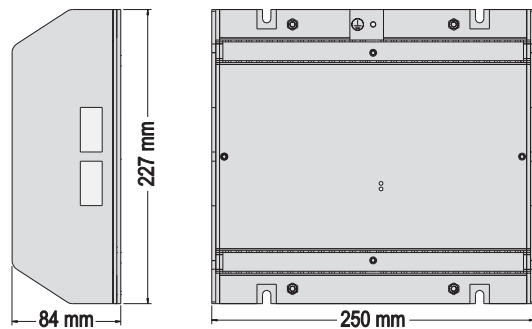
**Relay outputs** ..... isolated  
 Contact material.....AgCdO  
 Load (GP) .....2.00 A<sub>AC</sub>@250 V<sub>AC</sub>  
 2.00 A<sub>DC</sub>@24 V<sub>DC</sub> / 0.36 A<sub>DC</sub>@125 V<sub>DC</sub> / 0.18 A<sub>DC</sub>@250 V<sub>DC</sub>  
 Pilot duty (PD).....  
 1.00 A<sub>DC</sub>@24 V<sub>DC</sub> / 0.22 A<sub>DC</sub>@125 V<sub>DC</sub> / 0.10 A<sub>DC</sub>@250 V<sub>DC</sub>  
**Analog inputs (none isolated)** .....freely scalable  
 Type .....0 to 500 Ohms / 0 to 20 mA  
 Resolution .....11 Bit  
**Analog outputs (isolated)** .....freely scalable  
 Type .....± 10 V / ± 20 mA / PWM  
 Insulation voltage (continuously).....100 V<sub>AC</sub>  
 Insulation test voltage (1s).....500 V<sub>AC</sub>  
 Resolution .....11/12 Bit (depending on analog output)  
 ± 10 V (scalable) .....internal resistance ≤1 kOhms  
 ± 20 mA (scalable) .....maximum load 500 Ohms  
**Housing** Front panel flush mounting .....Plastic housing  
 Dimensions WxHxD .....282 × 217 × 99 mm  
 Front cutout WxH .....249 [+1.1] × 183 [+1.0] mm  
 Connection.....screw/plug terminals 2.5 mm<sup>2</sup>  
 Front.....insulating surface  
 Sealing Front.....IP66 (with screw fastening)  
 Front.....IP54 (with clamp fastening)  
 Back.....IP20  
 Weight.....approx. 1,850 g  
**Housing** Switch cabinet back mounting .....Sheet metal housing  
 Dimensions WxHxD .....250 × 217 × 84 mm  
 Connection.....screw/plug terminals 2.5 mm<sup>2</sup>  
 Protection system .....IP 20  
 Weight.....approx. 2,150 g  
**Disturbance test (CE)** .....tested according to applicable EN guidelines  
**Listings** .....UL, cUL, CSA  
**Marine** .....LR (Type Approval), ABS (Design Assessment)

# DIMENSIONS

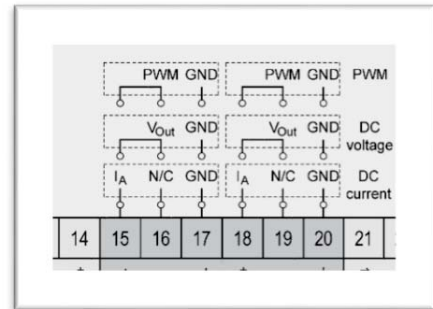
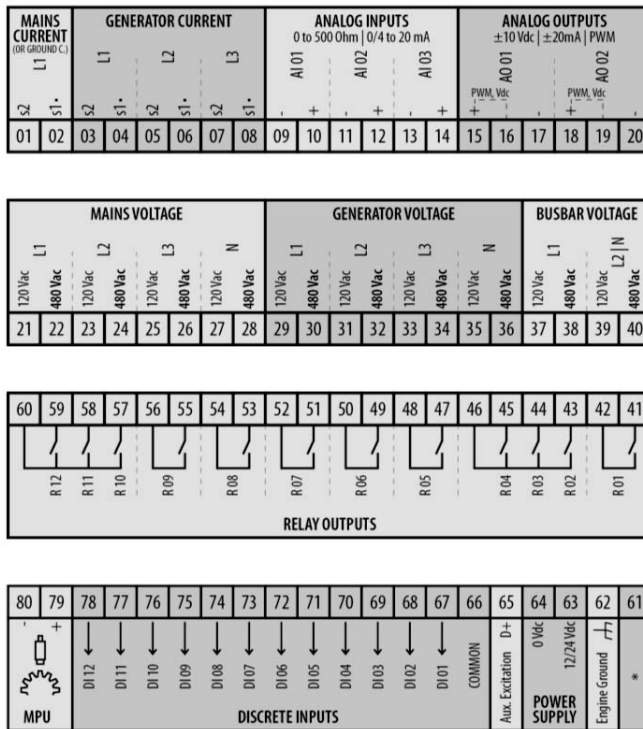
Plastic housing for front panel mounting



Metal housing for cabinet mounting



## TERMINAL DIAGRAM



\* pin 61  
 easYgen-3100: No connection  
 easYgen-3200: Protective earth

## RELATED PRODUCTS

- Engine Speed Control **actiVgen** (Product Specification # 03419): P/N 8440-2108
- Remote Panel **RP-3000** (Product Specification # 37446)
- **ToolKit** (Product Specification # 03366)
- I/O Expansion Board **IKD1** (Product Specification # 37171)
- Load Share Gateway **LSG** (Product Specification # 37451)
- Electronic Pickup Unit **EPU-100** (Product Specification # 37562)
- CANbus based Remote Annunciator (Product Specification # 37279): **easYlite 100** P/N 8446-1023
- **Power Generation Learning Module** (Product Specification # 03412): P/N 8447-1012
- Profibus Gateway (Application Note # 37577): **ESEPRO** P/N 8445-1046
- Ethernet (Modbus/TCP) Gateway (Application Note # 37576): **ESENET** P/N 8445-1044
- CANbus to Fiber Optic Converters (Application Note # 37598):  
**DL-CAN** P/N 8445-1049 and **DL-CAN-R** P/N 8445-1048
- Remote Access Gateway (with HMS **Netbiter** EasyConnect **EC250**)
- Analog Expansion Card (**PHOENIX CONTACT** Inline terminal **IB IL**)
- Thermocouple Scanner (**AXIOMATIC AXTC20**)

# FEATURES OVERVIEW

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For more information contact:

Model Package	easYgen-3000 Series			
	3100		3200	
	P1	P2	P1	P2
<b>Measuring</b>				
Generator voltage (3-phase/4-wire)	✓	✓	✓	✓
Generator current (3x true r.m.s.)	✓	✓	✓	✓
Mains voltage (3-phase/4-wire)	✓	✓	✓	✓
Mains or ground current (1x true r.m.s.; mains or ground current selectable)	✓	✓	✓	✓
Busbar voltage (1-phase/2-wire)	✓	✓	✓	✓
<b>Control</b>				
Breaker control logic (open and closed transition) <i>FlexApp™</i>	2	2	2	2
Automatic, Manual, Stop, and test operating modes	✓	✓	✓	✓
Single and multiple-unit operation	✓	✓	✓	✓
Mains parallel multiple-unit operation (up to 32 units)	✓	✓ #2	✓	✓ #2
AMF (auto mains failure) and stand-by operation	✓	✓	✓	✓
Critical mode operation	✓	✓	✓	✓
GCB and MCB synchronization (slipping / phase matching)	✓	✓	✓	✓
Import / export control (kW and kvar)	✓	✓	✓	✓
Load-dependent start/stop	✓	✓	✓	✓
n/f, V, P, Q, and PF remote control via analog input or interface	✓	✓	✓	✓
Load/var sharing for up to 32 gensets	✓	✓	✓	✓
Freely configurable PID controllers	-	3	-	3
<b>HMI</b>				
Color Display with Softkey operation <i>DynamicsLCD™</i>	-	-	✓	✓
Start/stop logic for diesel / gas engines	✓	✓	✓	✓
Counters for operating hours / starts / maintenance / active/reactive energy	✓	✓	✓	✓
Configuration via PC (serial connection and ToolKit software (included))	✓	✓	✓	✓
Event recorder entries with real time clock (battery backup)	300	300	300	300
<b>Protection</b>				
Generator: voltage / frequency	59 / 27 / 810 / 81U	✓	✓	✓
Generator: overload, reverse/reduced power	32 / 32R / 32F	✓	✓	✓
Generator: unbalanced load	46	✓	✓	✓
Generator: instantaneous overcurrent	50	✓	✓	✓
Generator: time-overcurrent (IEC 255 compliant)	51 / 51 V	✓	✓	✓
Generator: ground fault (measured ground current)	50G	✓	✓	✓
Generator: power factor	55	✓	✓	✓
Generator: rotation field		✓	✓	✓
Engine: overspeed / underspeed	12 / 14	✓	✓	✓
Engine: speed / frequency mismatch		✓	✓	✓
Engine: D+ auxiliary excitation failure		✓	✓	✓
Engine: Cylinder temperature		-	✓	✓
Mains: voltage / frequency	59 / 27 / 810 / 81U	✓	✓	✓
Mains: phase shift / rotation field / ROCOF (df/dt)	78	✓	✓	✓
<b>I/Os</b>				
Speed input: magnetic / switching; Pickup		✓	✓	✓
Discrete alarm inputs (configurable)	12 (10)	12 (10)	12 (10)	12 (10)
Discrete outputs, configurable <i>LogicsManager™</i>	max. 12	max. 12	max. 12	max. 12
External discrete inputs / outputs via CANopen	16 / 16	32 / 32	16 / 16	32 / 32
Analog inputs #1: configurable <i>FlexIn™</i>	3	3	3	3
Analog outputs: +/- 10V, +/- 20mA, PWM; configurable	2	2	2	2
External analog inputs / outputs via CANopen	-	16 / 4	-	16 / 4
Display and evaluation of J1939 analog values, "supported SPNs"	100	100	100	100
CAN bus communication interfaces #2 <i>FlexCAN™</i>	2	2	2	2
RS-232/485 Modbus RTU Slave interface(s)	1 / 1	1 / 1	1 / 1	1 / 1
<b>Listings/Approvals</b>				
UL / cUL Listing	✓	✓	✓	✓
CSA	✓	✓	✓	✓
LR & ABS Marine	✓	✓	✓	✓
BDEW / VDE-AR-N 4105	✓	✓	✓	✓
CE Marked	✓	✓	✓	✓
<b>Part Numbers</b>				
1A CT inputs / front panel mounting with display #3	-	-	8440-2049	8440-2051
5A CT inputs / front panel mounting with display #3	-	-	8440-2050	8440-2052
1A CT inputs / cabinet back mounting w/o display	8440-2055	8440-2057	-	-
5A CT inputs / cabinet back mounting w/o display	8440-2054	8440-2056	-	-
Spare connector kit	8923-1314	8923-1314	8923-1314	8923-1314

#1 selectable senders: VDO (0 to 180 Ohm, 0 to 5 bar), VDO (0 to 180 Ohm, 0 to 10 bar), VDO (0 to 380 Ohm, 40 to 120°C), VDO (0 to 380 Ohm, 50 to 150°C), Pt100, Pt1000, resistive input (one- or two-pole, 2pt. linear or 9pt. user defined)

#2 freely selectable during configuration between CANopen or J1939; please feel free to request more information

#3 a screw and a clamp kit are delivered with the unit for fastening