Product Specification
37258P

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**

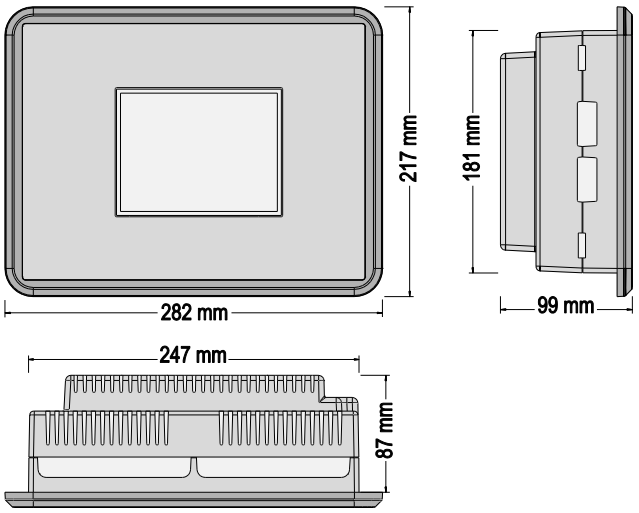
SPECIFICATIONS

Power supply ..... 12/24 V_{DC} (8 to 40 V_{DC})
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 ..... (⅄/Δ)
100 Vac [1] Rated (V_{rated}) ..... 69/120 V_{AC}
Max. value (V_{max}) ..... 86/150 V_{AC}
Rated surge volt.(V_{surge}) ..... 2.5 kV
***and** 400 Vac [4]* Rated (V_{rated}) ..... 277/480 V_{AC}
Max. value (V_{max}) ..... 346/600 V_{AC}
Rated surge volt.(V_{surge}) ..... 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_{AC}
Linear measuring range ..... 1.25×V_{rated}
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_{rated}) ..... [1] ../1 A or [5] ../5 A
Linear measuring range ..... I_{gen} = 3.0×I_{rated}
$I_{mains/ground}$ = 1.5×I_{rated}
Setting range ..... 1 to 32,000 A
Burden ..... < 0.15 VA
Rated short-time current (1 s) ..... [1] 50×I_{rated}, [5] 10×I_{rated}
Power .....
Setting range ..... 0.5 to 99,999.9 kW/kvar
Discrete inputs ..... isolated
Input range ..... 12/24 V_{DC} (8 to 40 V_{DC})
Input resistance ..... approx. 20 kOhms

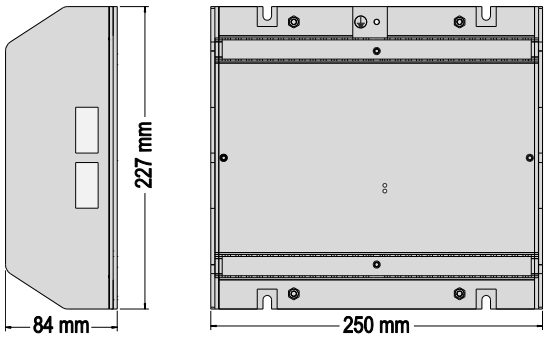
Relay outputs ..... isolated
Contact material ..... AgCdO
Load (GP) ..... 2.00 A_{AC}@250 V_{AC}
2.00 A_{DC}@24 V_{DC} / 0.36 A_{DC}@125 V_{DC} / 0.18 A_{DC}@250 V_{DC}
Pilot duty (PD) .....
1.00 A_{DC}@24 V_{DC} / 0.22 A_{DC}@125 V_{DC} / 0.10 A_{DC} @250 V_{DC}
Analog inputs (none isolated) ..... freely 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_{AC}
Insulation test voltage (1s) ..... 500 V_{AC}
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 mm²
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 × 227 × 84 mm
Connection ..... screw/plug terminals 2.5 mm²
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

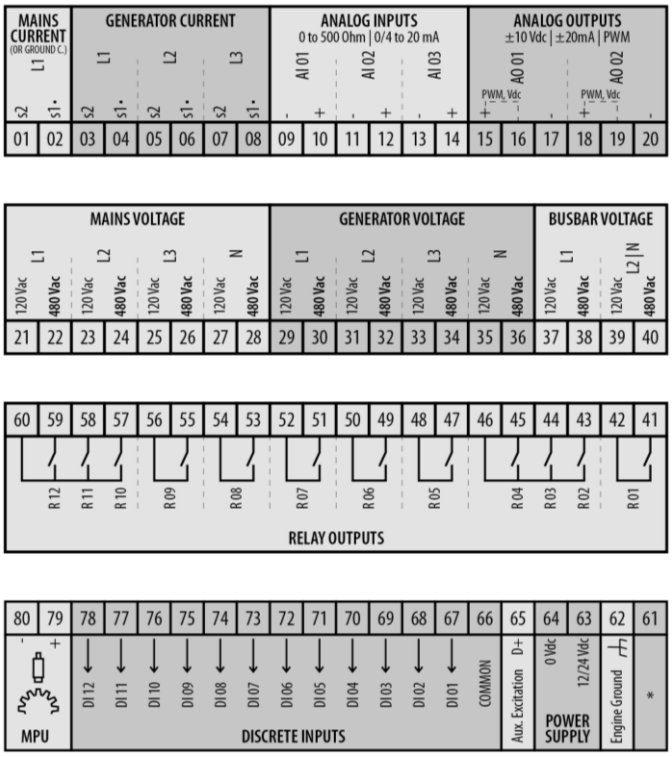
Plastic housing for front panel mounting

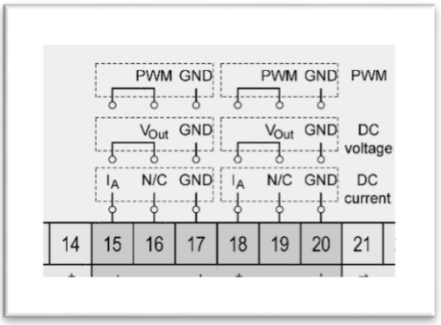


Metal housing for cabinet mounting



TERMINAL DIAGRAM





<u>* pin 61</u>
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 Gen**eration **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**)

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FEATURES OVERVIEW

EASYGEN 3000	easYgen-3000 Series			
Model	3100		3200	
Package	P1	P2	P1	P2
Measuring				
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)	✓	✓	✓	✓
Control				
Breaker control logic (open and closed transition) *FlexApp™*	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
HMI				
Color Display with Softkey operation *DynamicsLCD™*	-	-	✓	✓
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
Protection ANSI#				
Generator: voltage / frequency 59 / 27 / 81O / 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 / 81O / 81U	✓	✓	✓	✓
Mains: phase shift / rotation field / ROCOF (df/dt) 78	✓	✓	✓	✓
I/Os				
Speed input: magnetic / switching; Pickup	✓	✓	✓	✓
Discrete alarm inputs (configurable)	12 (10)	12 (10)	12 (10)	12 (10)
Discrete outputs, configurable *LogicsManager™*	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 *FlexIn™*	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 *FlexCAN™*	2	2	2	2
RS-232/485 Modbus RTU Slave interface(s)	1 / 1	1 / 1	1 / 1	1 / 1
Listings/Approvals				
UL / cUL Listing	✓	✓	✓	✓
CSA	✓	✓	✓	✓
LR & ABS Marine	✓	✓	✓	✓
BDEW / VDE-AR-N 4105	✓	✓	✓	✓
CE Marked	✓	✓	✓	✓
Part Numbers				
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