easYgen-3000

Genset Control for Multiple Unit Operation

easYgen-3200

easYgen-3100

DESCRIPTION

The easYgen-3000 is a control unit for genset management applications. The numerous inputs and outputs, along with a modular software structure, permit you to use the easYgen-3000 for a wide range of applications with only a single part number. This includes stand-by, AMF, peak shaving, import-export, cogeneration or distributed generation, among others. Also the easYgen-3000 is compatible for island, island parallel, mains parallel and multiple unit mains parallel operations.
The easYgen-3000 is able to control up to 32 gensets connected in a network with automatic sequencing.
The easYgen-3000 is available in two variants, the easYgen-3100 for cabinet back panel installation, and the easYgen-3200 with graphical display and soft keys for front panel mounting.

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

LogicsManager™ – Woodward's *LogicsManager* software 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 is capable of working with all common industrial interfaces, including CAN, RS-232, and RS-485. The multiple communication protocols permit the easYgen-3000 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 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
- Process and load-dependent start/stop logic for diesel and gas engines programmable for spinning or system reserve with fixed or dynamic priorities.
- Real and reactive power load sharing with up to 32 units
- Remote control via interface and discrete/analog inputs for adjusting speed, frequency, voltage, power, reactive power, and power factor set points
- Complete integrated engine and generator protection as well as mains monitoring features
- 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
- Special Scania S6, MTU ADEC, Volvo EMS2 & EDC4, Deutz EMR2, MAN MFR/EDC7, SISU EEM and Woodward EGS02 ECU support (depending on Package)
- Counters for operating hours / engine starts / maintenance / active energy / reactive energy
- Configurable trip levels / delay timers / alarm classes for monitoring and protective functions
- Clear text display and evaluation of up to 100 J1939 analog values
- Discrete and analog I/O expansion board connectivity (Woodward IKD 1 or Phoenix Contact IL series)
- Front panel and PC configurable (ToolKit software)
- Multi-level password protection for access via HMI or interface
- Multi-lingual capability (English, German, French, Spanish, Chinese, Japanese, Italian, Portuguese, Turkish, Russian)
- Event recorder (300 events, FIFO) with real time clock

- Peak shaving operation
- Stand-by operation
- AMF operation
- Cogeneration (CHP)
- Isolated & mains parallel operation
- Import/export control
- Soft loading features
- Open/closed transition
- Load sharing and load-dependent start/stop for up to 32 units
- Programmable operation sequences
- Multi-lingual capability
- CANopen / J1939 ECU Control
- Modbus RTU Protocol
- CE marked
- UL/cUL Listing
- LR & ABS Marine Approvals

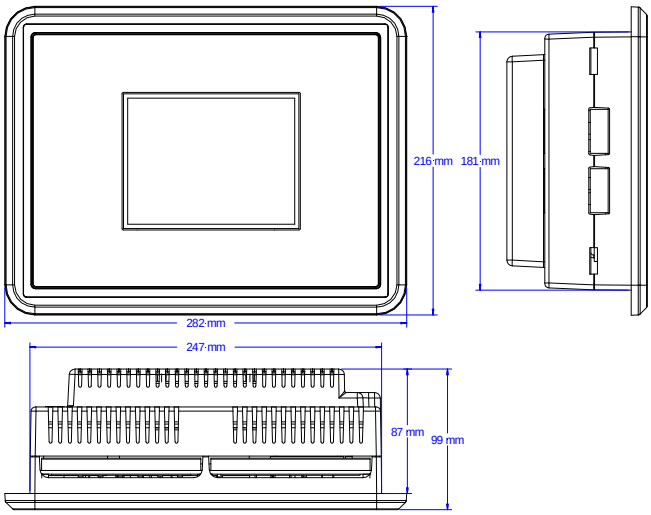
SPECIFICATIONS

Power supply ..... 12/24 Vdc (8 to 40 Vdc)
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 Vac
Max. value (V_{max}) ..... 86/150 Vac
Rated surge volt.(V_{surge}) ..... 2.5 kV
and 400 Vac [4] Rated (V_{rated}) ..... 277/480 Vac
Max. value (V_{max}) ..... 346/600 Vac
Rated surge volt.(V_{surge}) ..... 4.0 kV
Accuracy ..... Class 1
Measurable alternator windings 3p-3w, 3p-4w, 1p-2w, 1p-3w
Setting range ..... primary ..... 50 to 650,000 Vac
Linear measuring range ..... $1.25 \times V_{rated}$
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 ..... $I_{gen} = 3.0 \times I_{rated}$
$I_{mains/ground} = 1.5 \times I_{rated}$
Setting range ..... 1 to 32,000 A
Burden ..... < 0.15 VA
Rated short-time current (1 s) ..... [1] $50 \times I_{rated}$, [5] $10 \times I_{rated}$
Power .....
Setting range ..... 0.5 to 99,999.9 kW/kvar
Discrete inputs ..... isolated
Input range ..... 12/24 Vdc (8 to 40 Vdc)
Input resistance ..... approx. 20 kOhms

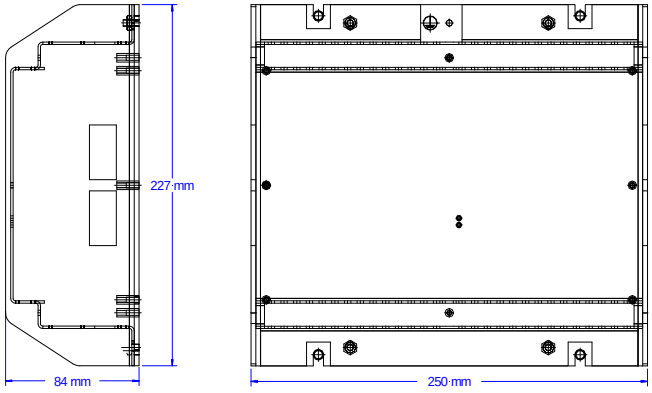
Relay outputs ..... isolated
Contact material ..... AgCdO
Load (GP) ..... 2.00 Aac@250 Vac
2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
Pilot duty (PD) .....
1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Analog inputs (none isolated) ..... freely scaleable
Type ..... 0 to 500 Ohms / 0 to 20 mA
Resolution ..... 11 Bit
Analog outputs (isolated) ..... freely scaleable
Type ..... ± 10 V / ± 20 mA / PWM
Insulation voltage ..... 1,000 Vdc
Resolution ..... 11/12 Bit (depending on analog output)
± 10 V (scaleable) ..... internal resistance ≤1 kOhms
± 20 mA (scaleable) ..... maximum load 500 Ohms
Housing (3200) 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 (3100) Switch cabinet back mounting ..... Sheet metal housing
Dimensions WxHxD ..... 250 × 228 × 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 (cUL only for easYgen-3100)
Marine Approvals ..... LR, ABS, others upon request

DIMENSIONS

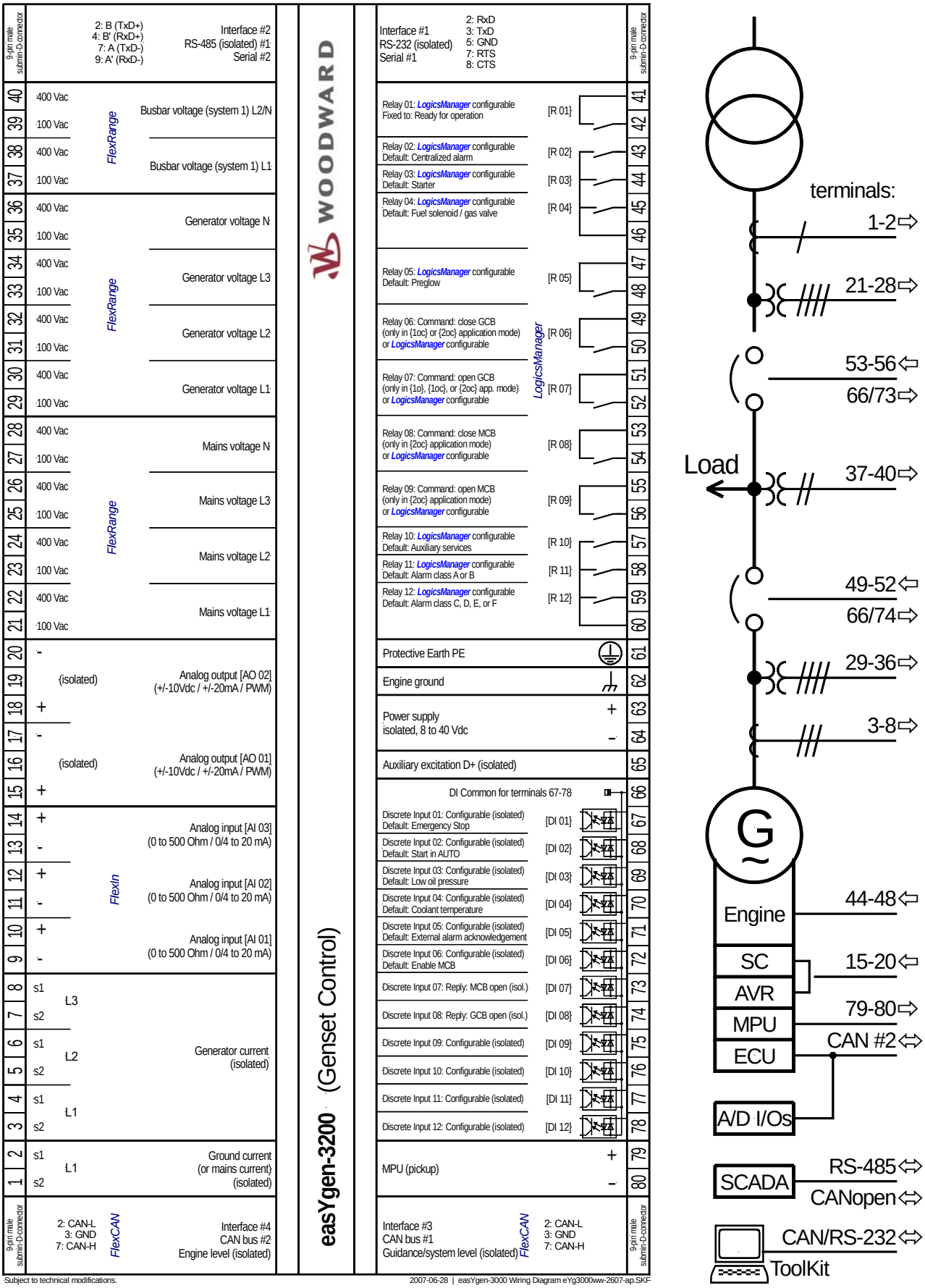
Plastic housing for front panel mounting (3200)



Metal housing for cabinet mounting (3100)



TERMINAL DIAGRAM



Subject to technical modifications.

2007-06-28 | easYgen-3000 Wiring Diagram eYg3000ww-2607-ap.SKF

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Distributors & Service
Woodward has an international network of distributors and service facilities. For your nearest representative, call the Fort Collins plant or see the Worldwide Directory on our website.

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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.) #1		✓	✓	✓	✓
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)		✓	✓	✓	✓
Interchange (import / export control)		✓	✓	✓	✓
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					
Soft keys (advanced LC display)	*DynamicsLCD™*	-	-	✓	✓
Start/stop logic for diesel / gas engines		✓	✓	✓	✓
Counters for operating hours / starts / maintenance / active/reactive energy		✓	✓	✓	✓
Configuration via PC #3		✓	✓	✓	✓
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	✓	✓	✓	✓
Generator: ground fault #4	50G	✓	✓	✓	✓
Generator: power factor	55	✓	✓	✓	✓
Generator: rotation field		✓	✓	✓	✓
Engine: overspeed / underspeed	12 / 14	✓	✓	✓	✓
Engine: speed / frequency mismatch		✓	✓	✓	✓
Engine: D+ auxiliary excitation failure		✓	✓	✓	✓
Mains: voltage / frequency	59 / 27 / 81O / 81U	✓	✓	✓	✓
Mains: phase shift / rotation field	78 /	✓	✓	✓	✓
I/Os					
Speed input (magnetic / switching; Pickup)		✓	✓	✓	✓
Discrete alarm inputs (configurable)		10	10	10	10
Discrete outputs (configurable)	*LogicsManager™*	max. 12	max. 12	max. 12	max. 12
External discrete inputs / outputs via CANopen (maximum)		16 / 16	32 / 32	16 / 16	32 / 32
Analog inputs #5 (configurable)	*FlexIn™*	3	3	3	3
Analog outputs (+/- 10V, +/- 20mA, PWM; configurable)		2	2	2	2
External analog inputs / outputs via CANopen (maximum)		-	16 / 4	-	16 / 4
Display of J1939 analog values (number of SPNs)		16	-	16	-
Display and evaluation of J1939 analog values (supported SPNs)		-	100	-	100
CAN bus communication interfaces #6	*FlexCAN™*	2	2	2	2
RS-232/485 Modbus RTU Slave interface(s)		1 / 1	1 / 1	1 / 1	1 / 1
Listings/Approvals					
UL Listing		✓	✓	✓	✓
cUL Listing		✓	✓	-	-
LR & ABS Marine Approval		✓	✓	✓	✓
CE Marked		✓	✓	✓	✓
Part Numbers					
1A CT inputs / front panel mounting with display #7	P/N 8440-	-	-	1816	1842
5A CT inputs / front panel mounting with display #7	P/N 8440-	-	-	1831	1843
1A CT inputs / cabinet back mounting w/o display	P/N 8440-	1818	1844	-	-
5A CT inputs / cabinet back mounting w/o display	P/N 8440-	1817	1845	-	-
Spare connector kit	P/N 8923-	1314	1314	1314	1314

#1 mains or ground current selectable
#2 refer to the Application Manual 37417 for applications with more than 8 parallel gensets because of bus load limits
#3 via serial connection and ToolKit software (included)
#4 measured ground current
#5 selectable during configuration between 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, Resistive input (one- or two-pole, 2pt. linear or 9pt. user defined), or 20 mA (0/4 to 20 mA, freely configurable)
#6 freely selectable during configuration between CANopen or J1939; request information
#7 a screw and a clamp kit are delivered with the unit for fastening