



## easYgen-2200/2300/2500

# Genset Control for Multiple Unit Operation

## DESCRIPTION

The easYgen-2000 Series is a compact, affordable genset control and protection package for load sharing up to 16 gensets in island operation, or parallel operation of a single unit with a utility. Its integrated load dependent start/stop programming allows you to define how gensets are brought on- and off-line to support changing load demands. It equally works with a mix of different sized engines, so you can maintain the spinning reserve you need while optimizing fuel efficiency.

The easYgen-2000 Series works with many common industrial interfaces: CANopen for peer-to-peer load sharing; J1939 for engine ECU; Modbus RTU for PLC, HMI, and SCADA; and modem for remote control and programming using Woodward ToolKit software.

**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™** – Flexible and isolated CAN bus providing different protocols: CANopen protocols; coupling of IKD 1 expansion cards (up to 16DIs/16DOs) as well as of 3rd party expansion cards (request more detailed information from our sales department). ECU 1939 communication with start/stop and alarm management.

## 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
- Active power and reactive power load sharing with up to 16 units including load-dependent start/stop
- Neutral interlocking function to ensure only one of the running generators is bridged to earth
- Operating hours/start/maintenance counters - Operating hours also available from a connected ECU via J1939/CAN
- Supported ECU: Scania EMS/S6, Deutz EMR2, Volvo EMS2, MTU ADEC ECU7/8, Woodward EGS, MAN EDC 7, SISU EEM2/3, Cummins, Perkins and J1939 standard messages
- Event recorder (300 events, FIFO) with real time clock (battery backed; min. 5 years)
- 128x64 dot graphical interactive LC display with soft keys
- Start/stop logic for Diesel/Gas engines
- Engine pre-glow or purge control
- Warm-up control via timer or coolant temperature
- PC and/or front panel configurable (ToolKit software)
- Multi-level password protection
- Discrete I/O expansion board connectivity (Woodward IKD 1 or Phoenix Contact IL series)
- Multi-lingual capability (11 languages in 1 unit configurable: English, German, French, Spanish, Chinese, Japanese, Italian, Portuguese, Turkish, Russian, Polish)

- Island, mains parallel & AMF operation
- Load sharing and load-dependent start/stop for up to 16 units
- Synchronization with phase matching and slip frequency
- Load transfer programs
- Soft loading features
- Open/closed transition
- CANopen / J1939 ECU Control
- Freely configurable discrete & analog I/Os
- Multi-lingual display
- Fast configuration by partial setting files
- Modbus RTU Protocol
- Neutral interlocking function
- Generator kWh/kvarh meter
- Dynamic mains stabilization (as per BDEW)
- QV monitoring

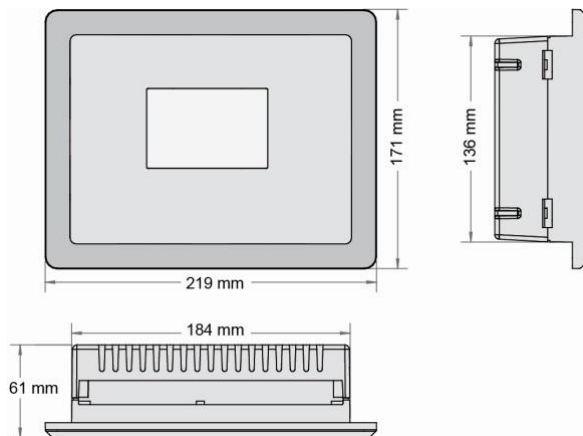
## SPECIFICATIONS

Power supply	12/24 Vdc (8 to 40 Vdc)
Intrinsic consumption	max. ~ 8 W (easYgen-2200)
	max. ~ 12 W (easYgen-2500)
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
<b>Voltage</b>	( $\Delta/\Delta$ )
120 Vac [1]	Rated ( $V_{rated}$ ) ..... 69/120 Vac
	Max. value ( $V_{max}$ ) ..... 86/150 Vac
	Rated voltage phase – ground ..... 150 Vac
	Surge volt. ( $V_{surge}$ ) ..... 2.5 kV
<b>and 480 Vac [4]</b>	Rated ( $V_{rated}$ ) ..... 277/480 Vac
	Max. value ( $V_{max}$ ) ..... 346/600 Vac
	Rated voltage phase – ground ..... 300 Vac
	Surge volt. ( $V_{surge}$ ) ..... 4.0 kV
Accuracy	Class 1
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 M $\Omega$ , [4] 2.0 M $\Omega$
Max. power consumption per path	< 0.15 W
<b>Current (Isolated)</b>	Rated ( $I_{rated}$ ) ..... [1] ..1 A or [5] ..1/5 A
Linear measuring range	$I_{gen} = 3.0 \times I_{rated}$
	$I_{mains/ground} = 1.5 \times I_{rated}$
Burden	< 0.15 VA
Rated short-time current (1 s)	[1] 50× $I_{rated}$ , [5] 10× $I_{rated}$
<b>Discrete inputs</b>	isolated
Input range	12/24 Vdc (8 to 40 Vdc)
Input resistance	approx. 20 kOhms

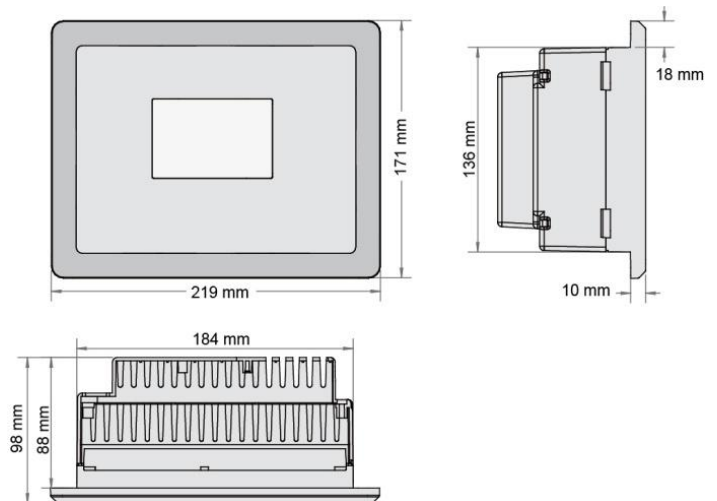
<b>Relay outputs</b>	potential free
Contact material	AgCdO
Load (GP)	2.00 Aac@250 Vac
	2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
Pilot duty (PD)	1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
<b>Analog inputs (none isolated)</b>	freely scalable
Type	0 to 500 Ohms / 0 to 20 mA
Resolution	11 Bit
<b>Analog outputs (isolated)</b>	freely scalable
Type	$\pm 10$ V / $\pm 20$ mA / PWM
Insulation voltage (continuously)	100 Vac
Insulation test voltage ( $\leq 5$ s)	1000 Vac
Resolution	11/12 Bit (depending on output)
$\pm 10$ V (scalable)	internal resistance ~ 500 Ohms
$\pm 20$ mA (scalable)	maximum load 500 Ohms
<b>Housing</b>	Front panel flush mounting ..... Plastic housing
Dimensions	WxHxD 219 × 171 × 61 mm (easYgen-2200/2300)
	WxHxD ..... 219 × 171 × 98 mm (easYgen-2500)
Front cutout	WxH ..... 186 [+1.1] × 138 [+1.0] mm
Connection	screw/plug terminals 2.5 mm <sup>2</sup>
Front	insulating surface
Sealing	Front ..... IP65 (with screw fastening)
	Front ..... IP54 (with clamp fastening)
	Back ..... IP20
Weight	approx. 800 g (easYgen-2200/2300)
	approx. 1,100 g (easYgen-2500)
<b>Listings</b>	UL, cUL, GOST-R (easYgen-2200/2500)
<b>Marine</b>	LR (Type Approval), ABS (Design Assessment)
	(easYgen-2200/2500)
<b>Disturbance test (CE)</b>	tested according to applicable EN guidelines

## DIMENSIONS

easYgen-2200/2300

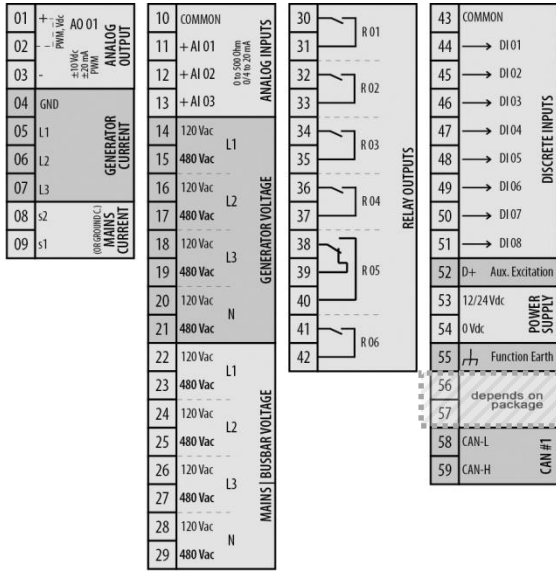


easYgen-2500



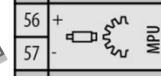
# TERMINAL DIAGRAM

## easYgen-2200

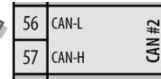


Differences between packages:

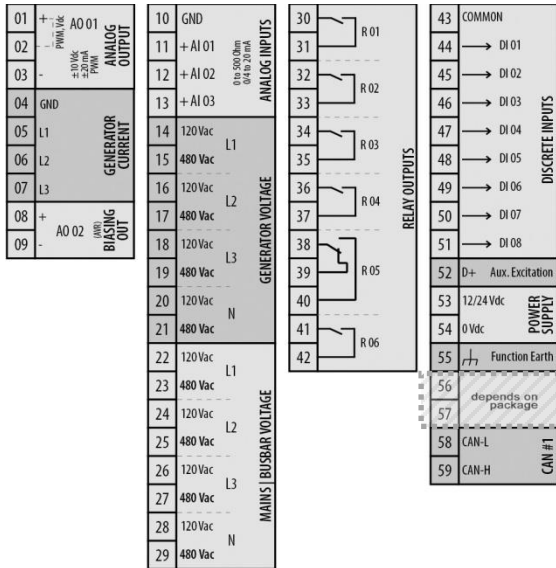
### easYgen-2200 P1



### easYgen-2200 P2

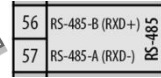


## easYgen-2300

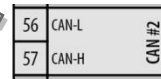


Differences between packages:

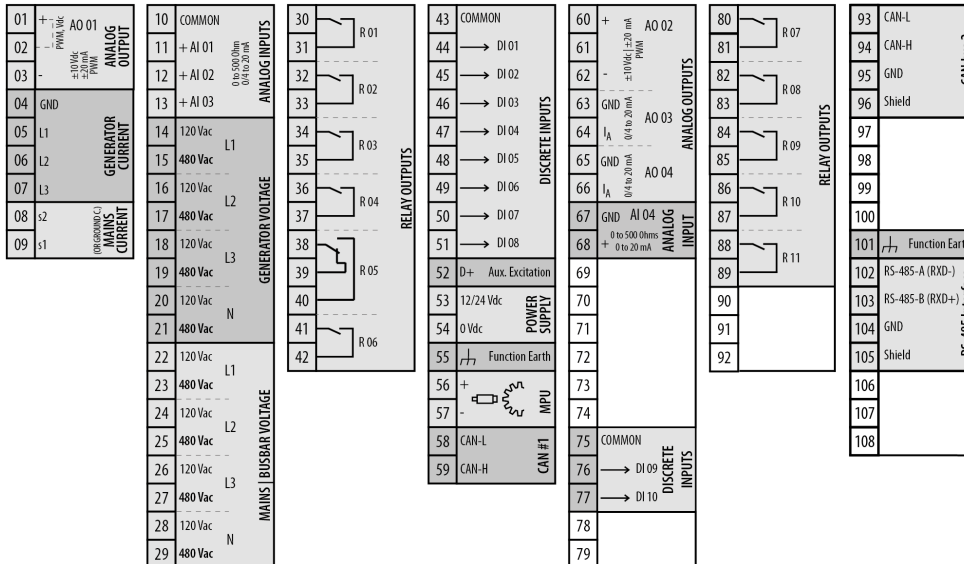
### easYgen-2300 P1



### easYgen-2300 P2



## easYgen-2500 (P1)



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## FEATURES OVERVIEW

	Model / Package	easYgen-2000 Series				
		2200 P1	2200 P2	2300 P1	2300 P2	2500 P1
<b>Measuring</b>						
Generator voltage (3-phase/4-wire)		✓	✓	✓	✓	✓
Generator current (3x true r.m.s.)		✓	✓	✓	✓	✓
Mains / Bus bar voltage (3-phase/4-wire)		✓	✓	✓	✓	✓
Mains or ground current (1x true r.m.s.) #1		✓	✓	-	-	✓
<b>Control</b>						
Different Breaker Operation modes	<i>FlexApp™</i>	✓	✓	✓	✓	✓
Automatic, Manual, and Stop operating modes		✓	✓	✓	✓	✓
Single unit mains parallel operation		✓	✓	✓	✓	✓
Multiple-unit island parallel operation (up to 16 units)		✓	✓	✓	✓	✓
AMF (auto mains failure operation)		✓	✓	✓	✓	✓
Stand-by operation		✓	✓	✓	✓	✓
Critical mode operation		✓	✓	✓	✓	✓
GCB and MCB synchronization (slip synchronization / phase matching)		✓	✓	✓	✓	✓
Open (break-before-make) and closed (make-before-break) transition		✓	✓	✓	✓	✓
Interchange		✓	✓	✓#7	✓#7	✓
Load-dependent start/stop		✓	✓	✓	✓	✓
n/f, V, P, Q, and PF remote control via analog input or interface		✓	✓	✓	✓	✓
Load/var sharing for up to 16 gensets		✓	✓	✓	✓	✓
Start/stop logic for Diesel/Gas engines		✓	✓	✓	✓	✓
<b>HMI</b>						
Soft keys (advanced LC display)		✓	✓	✓	✓	✓
Generator kWh/kvarh meter		✓	✓	✓	✓	✓
Operating hours/start/maintenance counter		✓	✓	✓	✓	✓
Configuration via PC #2		✓	✓	✓	✓	✓
Event recorder entries with real time clock (battery backup)		300	300	300	300	300
<b>Protection</b>						
	ANSI#					
Generator: voltage/frequency	59/27/810/81U	✓	✓	✓	✓	✓
Generator: overload, reverse/reduced power	32/32R/32F	✓	✓	✓	✓	✓
Generator: unbalanced load	46	✓	✓	✓	✓	✓
Generator: instantaneous overcurrent	50 / 51V	✓	✓	✓	✓	✓
Generator: time-overcurrent (IEC 255 compliant)	51 / 51V	✓	✓	✓	✓	✓
Generator: ground fault	50G	✓	✓	✓#3	✓#3	✓
Generator: power factor	55	✓	✓	✓	✓	✓
Generator: rotation field		✓	✓	✓	✓	✓
Engine: overspeed/underspeed	12/14	via Speed input	via ECU [CAN/J1939]	-	via ECU [CAN/J1939]	via Speed input or ECU [CAN/J1939]
Genset: speed/frequency mismatch		✓	✓	-	✓	✓
Engine: D+ auxiliary excitation failure		✓	✓	✓	✓	✓
Mains: voltage/frequency/phase shift/ROCOF	59/27/810/81U /78	✓	✓	✓	✓	✓
Mains: rotation field		✓	✓	✓	✓	✓
<b>I/Os</b>						
Speed input (magnetic/switching; Pickup)		✓	-	-	-	✓
Discrete alarm and control inputs (configurable)		8	8	8	8	10
Discrete outputs (configurable)	<i>LogicsManager™</i>	6	6	6	6	11
External discrete inputs / outputs via CANopen (maximum) #4		16 / 16	16 / 16	16 / 16	16 / 16	16 / 16
Analog inputs (configurable)	<i>FlexIn™</i>	3	3	3	3	4
Analog outputs (+/- 10V, +/- 20mA, PWM; configurable)		1	1	2#6	2#6	4
CAN bus communication interfaces	<i>FlexCAN™</i>	1	2	1	2	2
RS-485Modbus RTU Slave interface		-	-	1	-	1
Service Port (USB or RS-232) - Woodward DPC cable required #2		✓	✓	✓	✓	✓
<b>Listings/Approvals</b>						
UL / cUL listing		✓	✓	-	-	✓
GOST-R		✓	✓	-	-	✓
LR & ABS Marine		✓	✓	-	-	✓
CE Marked		✓	✓	✓	✓	✓
<b>P/Ns</b>						
easYgen 1A CT inputs / front panel mounting with display #5	P/N	8440-1856	8440-1858	-	-	8440-1860
easYgen 5A CT inputs / front panel mounting with display #5	P/N	8440-1855	8440-1857	8440-2080	8440-2058	8440-1884
easYgen (5A CT inputs) and EPU-100 as <b>Asynchron KIT</b> (see ProductSpec 37568)		--	--	8923-2074	--	--

#1 mains or ground current selectable

#2 via serial (external Woodward DPC cable required – USB connector: P/N 5417-1251 / RS-232 connector: P/N 5417-557) or CAN connection by ToolKit software

#3 calculated ground current

#4 it is possible to connect up to two digital IO expansion boards (P/N 8440-2116), which provide 8 additional DIs and DOs each

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

#6 external resistor (500 Ohms) for voltage mode is part of delivery

#7 Soft interchange from generator to mains but hard interchange from mains to generator