



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

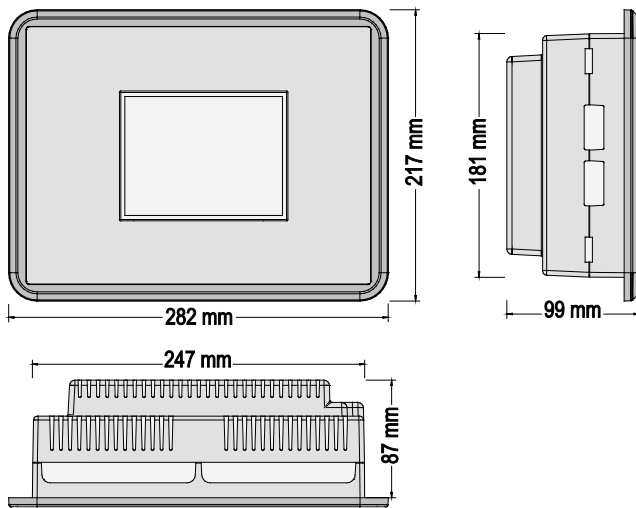
SPECIFICATIONS

Power supply	12/24 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	($\sqrt{\Delta}$)
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, 3p-4w OD, 1p-2w, 1p-3w
Setting range	primary 50 to 650,000 Vac
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 Ω , [4] 2.0 M Ω
Max. power consumption per path	< 0.15 W
Current (Isolated)	Rated (I_{rated}) [1] ..1 A or [5] ..15 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× I_{rated} , [5] 10× 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

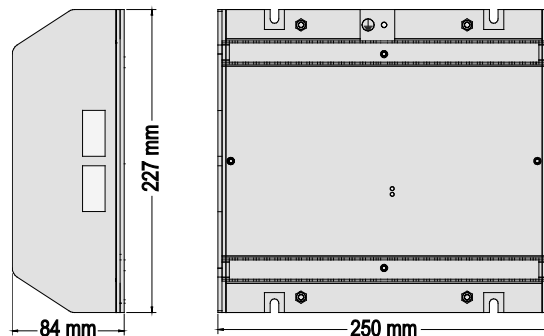
Relay outputs	isolated
Contact material	AgCdO
Load (GP)	2.00 Aac@250 Vac
	2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
Pilot duty (PD)	1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Analog inputs (none isolated)	freely scalable
Type	0 to 500 Ohms / 0 to 20 mA
Resolution	11 Bit
Analog outputs (isolated)	freely scalable
Type	± 10 V / ± 20 mA / PWM
Insulation voltage (continuously)	100 Vac
Insulation test voltage (1s)	500 Vac
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 ²
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 mm ²
Protection system	IP 20
Weight	approx. 2,150 g
Disturbance test (CE)	tested according to applicable EN guidelines
Listings	UL, cUL, GOST-R, CSA
Marine	LR (Type Approval), ABS (Design Assessment)

DIMENSIONS

Plastic housing for front panel mounting



Metal housing for cabinet mounting



TERMINAL DIAGRAM

		Serial #2 RS-485 isolated (Interface #2)				
40	480 Vac	Busbar voltage (system 1) L2 N	Relay [R 01] isolated ^{*1} Fixed to „Ready for operation“	41		
39	120 Vac			42		
38	480 Vac	Busbar voltage (system 1) L1	Relay [R 02] isolated ^{*1} Preconfigured to „Centralized alarm“	43		
37	120 Vac			44		
36	480 Vac	Generator voltage N	Relay [R 03] isolated ^{*1} Preconfigured to „Starter“	45		
35	120 Vac			46		
34	480 Vac	Generator voltage L3	Relay [R 04] isolated ^{*1} Preconfigured to „Fuel solenoid / gas valve“	47		
33	120 Vac			48		
32	480 Vac	Generator voltage L2	Relay [R 05] isolated ^{*1} Preconfigured to „Preglow“	49		
31	120 Vac			50		
30	480 Vac	Generator voltage L1	Relay [R 06] isolated ^{*1} Preconfigured to „Command: close GCB“	51		
29	120 Vac			52		
28	480 Vac	Mains voltage N	Relay [R 07] isolated ^{*1} Preconfigured to „Command: open GCB“	53		
27	120 Vac			54		
26	480 Vac	Mains voltage L3	Relay [R 08] isolated ^{*1} Preconfigured to „Command: close MCB“	55		
25	120 Vac			56		
24	480 Vac	Mains voltage L2	Relay [R 09] isolated ^{*1} Preconfigured to „Command: open MCB“	57		
23	120 Vac			58		
22	480 Vac	Mains voltage L1	Relay [R 10] isolated ^{*1} Preconfigured to „Auxiliary services“	59		
21	120 Vac			60		
PWM GND PWM GND V_{out} GND V_{out} GND N/C GND N/C GND I_A GND DC voltage GND DC current GND		-	[AO 02]	Analog outputs +/-10 Vdc +/-20 mA PWM isolated	61	
		19	+			62
		18	-			63
		17	-			64
		16	-	[AO 01]		65
		15	+			66
		14	+			67
		13	-	[AI 03]		68
		12	+			69
		11	-	[AI 02]		70
		10	+			71
		09	-	[AI 01]		72
08	s1	Generator current isolated		73		
07	s2			74		
06	s1			75		
05	s2			76		
04	s1			77		
03	s2			78		
02	s1	Mains or ground current isolated		79		
01	s2			80		
		CAN bus #2 Engine level isolated (Interface #4)				

Serial #1
RS-232
isolated
(Interface #1)

Relay [R 01] isolated ^{*1}
Fixed to „Ready for operation“

Relay [R 02] isolated ^{*1}
Preconfigured to „Centralized alarm“

Relay [R 03] isolated ^{*1}
Preconfigured to „Starter“

Relay [R 04] isolated ^{*1}
Preconfigured to „Fuel solenoid / gas valve“

Relay [R 05] isolated ^{*1}
Preconfigured to „Preglow“

Relay [R 06] isolated ^{*1}
Preconfigured to „Command: close GCB“

Relay [R 07] isolated ^{*1}
Preconfigured to „Command: open GCB“

Relay [R 08] isolated ^{*1}
Preconfigured to „Command: close MCB“

Relay [R 09] isolated ^{*1}
Preconfigured to „Command: open MCB“

Relay [R 10] isolated ^{*1}
Preconfigured to „Auxiliary services“

Relay [R 11] isolated ^{*1}
Preconfigured to „Alarm class A or B“

Relay [R 12] isolated ^{*1}
Preconfigured to „Alarm class C, D, E or F“

Protective earth PE ^{*2}

Engine ground

Power supply
8 to 40 Vdc

Auxiliary excitation
isolated

Common (terminals 67 to 78)

Discrete input [DI 01] isolated ^{*1}
Emergency stop

Discrete input [DI 02] isolated ^{*1}
Start in Auto

Discrete input [DI 03] isolated ^{*1}
Low oil pressure

Discrete input [DI 04] isolated ^{*1}
Coolant temp.

Discrete input [DI 05] isolated ^{*1}
Alarm acknowledge

Discrete input [DI 06] isolated ^{*1}
Enable MCB

Discrete input [DI 07] isolated
Reply: MCB open

Discrete input [DI 08] isolated
Reply: GCB open

Discrete input [DI 09] isolated ^{*1}

Discrete input [DI 10] isolated ^{*1}

Discrete input [DI 11] isolated ^{*1}

Discrete input [DI 12] isolated ^{*1}

MPU input

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easYgen-3100/3200

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For more information contact:

FEATURES OVERVIEW

		easYgen-3000 Series			
		Model Package	3100	3200	
Measuring			P1	P2	
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)		<i>FlexApp™</i>	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		<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
Protection		ANSI#			
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 /	✓	✓	✓
I/Os					
Speed input: magnetic / switching; Pickup			✓	✓	✓
Discrete alarm inputs (configurable)			12 (10)	12 (10)	12 (10)
Discrete outputs, configurable		<i>LogicsManager™</i>	max. 12	max. 12	max. 12
External discrete inputs / outputs via CANopen			16 / 16	32 / 32	16 / 16
Analog inputs #1, configurable		<i>FlexIn™</i>	3	3	3
Analog outputs: +/- 10V, +/- 20mA, PWM; configurable			2	2	2
External analog inputs / outputs via CANopen			-	16 / 4	-
Display and evaluation of J1939 analog values, "supported SPNs"			100	100	100
CAN bus communication interfaces #2		<i>FlexCAN™</i>	2	2	2
RS-232/485 Modbus RTU Slave interface(s)			1 / 1	1 / 1	1 / 1
Listings/Approvals					
UL / cUL Listing			✓	✓	✓
GOST-R & CSA			✓	✓	✓
LR & ABS Marine			✓	✓	✓
BDEW / VDE-AR-N 4105			✓	✓	✓
CE Marked			✓	✓	✓
Part Numbers					
1A CT inputs / front panel mounting with display #3			-	-	8440-2049
5A CT inputs / front panel mounting with display #3			-	-	8440-2050
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

#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; request information

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

Related devices (# Product Specification number):

- esepro ()
- esenet ()
- easYlite 100 (# 37279)
- Remote Panel RP-3000 (# 37446)