Genset Control for Single Unit Operation

APPLICATIONS

The 2nd Generation of genset controls is designed to provide a maximum of flexibility in a user friendly and intuitive design with a large graphical display for various applications. This controller is one of a series of new and powerful genset controls (**easYgen**). This trend-setting technology offers a maximum of flexibility for each user. New technologies included are:

FlexApp™ - This intelligent and flexible feature provides the tools to easily configure for multiple applications. The user can configure the easYgen-1000 Series for use as

- Measuring transducer/engine control [0-CB-Mode {0}] for start/stop and measuring conversion
- 1-breaker-control [GCB open, {1o}] above plus engine/generator protection
- 1-breaker-control [GCB open/close, {1oc}] above plus stand-by power applications
- 2-breaker-control [GCB/MCB open/close, {2oc}] above plus AMF, and open transition applications

DynamicsLCD™ - The graphical LCD provides softkeys that vary depending on application and operation.

FlexIn™ - The two analog inputs can be freely configured (adaptable for each type of sensor) by the user as:

- VDO (0 to 180Ohm [0 to 5bar/0 to 10bar]; 0 to 380Ohm [40 to 120°C/50 to 150°C]; 0 to 180 Ohm [0 to 100% level]; isolated (2-pole) and non-isolated (1-pole) ground senders only)
- Resistive input (Pt100 / linear 2point / user-defined 9point)
- 0/4 to 20 mA (linear 2point / user-defined 9point)

FlexCAN™ - Flexible isolated CAN bus for multiple use. Selectable during configuration: CANopen, or CAN (CAL); coupling of easYlite remote annunciator; coupling of 3rd party expansion cards supported (request detailed information from our sales department). J1939 protocol for ECU coupling and alarm management, remote start/stop with ECU possible (Scania, Volvo, Deutz, mtu).

LogicsManager™ - A large number of measuring values, inputs, internal states or constant values can be combined logically to operate a relay contact or an internal function.

DESCRIPTION

I/Os

- *FlexRange™* - true RMS 3phase generator and mains voltage, measuring inputs:
  - Rated 120 Vac (max. 150 Vac) *and*
  - Rated 480 Vac (max. 600 Vac) *in 1 unit*
- True rms 3phase generator current/power
- True rms 1phase current input alternatively and freely configurable for
  - Mains current
  - Ground current (ground fault protection)
- 1 speed input (magnetic/switching)
- up to 8 configurable discrete alarm inputs
- *LogicsManager™* - up to 9 program. relays
- *FlexIn™* - 2 configurable analog inputs
- *FlexCAN™* - CAN bus communication (32 participants, isolated)

Protection   (ANSI #)

Generator / Engine: Battery voltage, overspeed (12), over-/undervoltage (59/27), over-/underfrequency (81O/U), overload (32), reverse/reduced power (32R/F), unbalanced load (46), definite time-overcur. (50/51), inverse time-overcurrent (IEC255), calculated + measured ground fault

Features

- *FlexApp™* Technology (4 application modes)
- *DynamicsLCD™* - 128×64 pixel graphical interactive LC display with softkeys
- Start/stop logic for Diesel/Gas engines
- Engine pre-glow or purge control
- kWh meter, kvarh meter
- Operating hours/start/maintenance counters
- Configurable trip levels/delays/alarm classes
- Push-buttons (softkeys) for direct control
- PC and/or front panel configurable
- Multi-level password protection
- Multi-lingual capability (10 languages in 1 unit configurable: English, German, French, Italian, Spanish, Portuguese, Russian, Turkish, Chinese, Japanese)
- Event recorder (300 events, FIFO) with real time clock (battery backed; min. 6 years)
- Modem connectivity with DPC
- easYlite annunciator support via CAN bus
- Remote control via interface / digital signals

### Differentiation

- Current input as ../5 A (standard) or ../1 A

- *FlexApp™* Technology
- Flexible and multifunctional *DynamicsLCD™*
- AMF/loss of mains auto start/stop
- Complete engine, generator, and mains protection in one unit
- True rms voltage sensing with *FlexRange™*
- True rms current/power sensing
- kWh meter
- Counters for engine starts, operating hours, maintenance call
- Freely configurable discrete inputs
- Freely configurable analog *FlexIn™* inputs
- Freely programmable relay outputs with *LogicsManager™*
- PC and/or front panel configurable
- Multi-lingual capability 10 languages in 1 unit
- *FlexCAN™* communication (32 participants, isolated)
- Modbus RTU Slave
- 6.5 to 40.0 Vdc power supply
- Flush-mounting
- CE marked
- UL/cUL Listed
- GL, LR Marine Approval

SPECIFICATIONS

Power supply .... 12/24 Vdc (6.5 to 40.0 Vdc)
Intrinsic consumption .... max. 15 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 .... (both ranges within one unit on different terminals, λ/Δ)
   100 Vac [1]   Rated (V_{rated}) .... 69/120 Vac
           Max. value (V_{max}) .... 86/150 Vac
           Rated ($V_{phase-ground}$) .... 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 ($V_{phase-ground}$) .... 300 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 70 Hz)
Input resistance per path .... [1] 0.498 MΩ, [5] 2.0 MΩ
Max. power consumption per path .... < 0.15 W
Current   Rated (I_{rated}) .... [1] ../1 A or [5] ../5 A
Linear measuring range .... $I_{gen} = 3.0 \times I_{rated}$, $I_{mains} = 1.5 \times I_{rated}$
Burden .... < 0.15 VA
Rated short-time current (1 s) .... [1] $50 \times I_{rated}$, [5] $10 \times I_{rated}$

Discrete inputs .... isolated
Input range .... 12/24 Vdc (6.5 to 40.0 Vdc)
Input resistance .... approx. 6.7 kΩ
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 input .... freely scaleable
Type .... variable
Resolution .... 10 Bit
Housing   Flush .... Type easYpack
Dimensions   Flush .... 219×171×61 mm
Front cutout   Flush .... 186 [+1.1]×138 [+1.0] mm
Connection .... screw/plug terminals 2.5 mm²
Front .... insulating surface
Protection system .... with professional installation
         Front .... IP54 (with clamp fastening)
         Front .... IP65 (with screw fastening)
         Back IP20
Weight .... approx. 800 g
Disturbance test (CE) .... tested according to applicable EN guidelines
Listings .... UL/cUL listed
Marine Approvals .... GL, LR , others upon request

DIMENSIONS
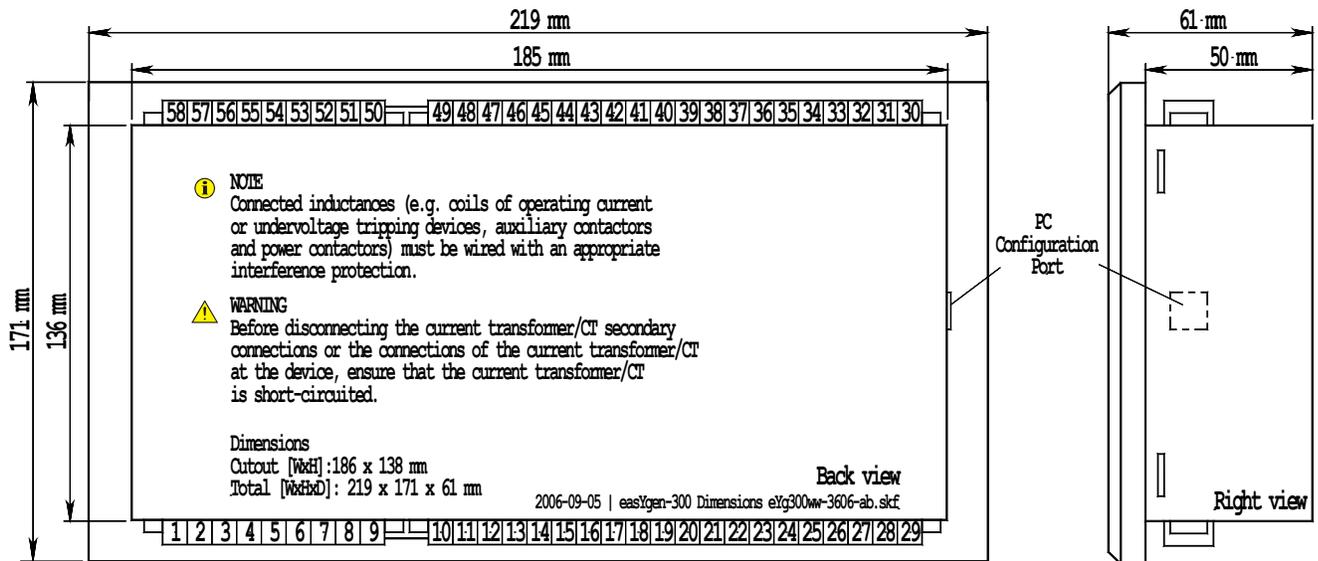
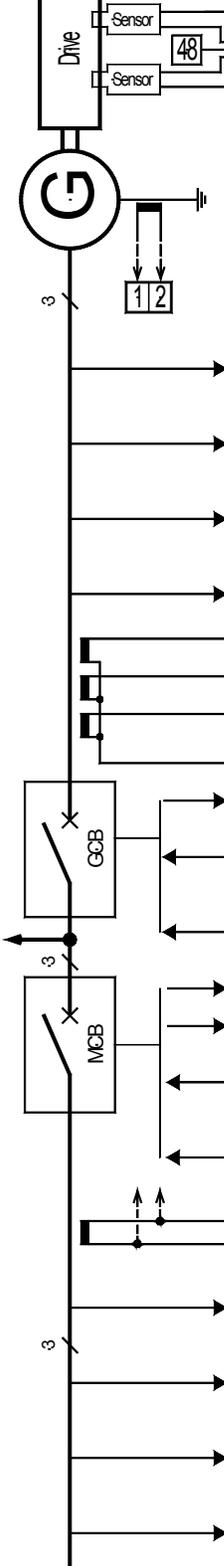# PART NUMBERS AND ORDER CODES

Model Mounting	Rated PT secondary *FlexRange™*	Rated CT secondary	Part Number (P/N)	Description
	69/120 Vac	../5 A	8440-1809	EASYGEN-1500-55B
1500	*and*			
	277/480 Vac	../1 A	8440-1810	EASYGEN-1500-51B

WIRING DIAGRAM

EASY GEN 1000

only connection for two-pole sensors is shown below.

Drive

-Sensor
48
-Sensor

Terminal		
4	-CAN-H	*FlexCAN*
3	-CAN-L	CAN bus
10		
9	switching/inductive	Pickup
13	Analog input 1 [T1] VDO & resistive & 0/4 to 20 mA	*FlexIn*
12	Battery ground/common or genset chassis ground	
11	Analog input 2 [T2] VDO & resistive & 0/4 to 20 mA	

G

1 2

29	480 Vac	Generator voltage L1
28	120 Vac	
27	480 Vac	Generator voltage L2
26	120 Vac	
25	480 Vac	Generator voltage L3
24	120 Vac	
23	480 Vac	Generator voltage N
22	120 Vac	

FlexRange

8	-../1 A or ../5 A	Generator current L1
7	-../1 A or ../5 A	Generator current L2
6	-../1 A or ../5 A	Generator current L3
5	-GND	Common

GCB

	Reply: GCB is open => use discrete input [D8]
	Command: close GCB => use relay [R10]
	Command: open GCB => use relay [R7]

FlexApp

MCB

	Reply: MCB is open => use discrete input [D7]
	Enable MCB => use discrete input [D6]
	Command: open MCB => use relay [R9]
	Command: close MCB => use relay [R8]

FlexApp

| 2 | -../1 A or ../5 A | Mains current L1 or |
| 1 | -GND | Ground current |

21	480 Vac	{2oc} Mains voltage L1
20	120 Vac	
19	480 Vac	{2oc} Mains voltage L2
18	120 Vac	
17	480 Vac	{2oc} Mains voltage L3
16	120 Vac	
15	480 Vac	{2oc} Mains voltage N
14	120 Vac	

FlexRange

WOODWARD

easYgen-1500 V2.1xxx (Genset Control)

Subject to technical modifications.

FlexApp / DynamicsLCD

The Mode of the control can be configured alternatively as an:
- {0} - Measuring transducer/engine control [0CB]
- {1o} - 1-CB-control [GCB open]
- {1oc} - 1-CB-control [GCB open/close]
- {2oc} - 2-CB-control [GCB/MCB open/close]

Depending on the setting you have different I/O's available, respectively the control can operate the breakers for protection/closing or not.

Model easYgen-1500
- P/N 8440-1750 = ../5 A
- P/N 8440-1751 = ../1 A

{0} {1o} {1oc} {2oc}
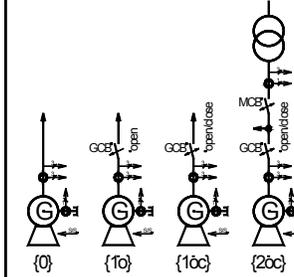
47	Relay [R11] ~ *LogicsManager* or - Ready for operation
46	
45	Relay [R10] ~ *LogicsManager* or - "Command: close GCB"
44	
43	Relay [R9] ~ *LogicsManager* or - "Command: open MCB"
42	
41	Relay [R8] ~ *LogicsManager* or - "Command: close MCB"
40	
39	Relay [R7] ~ *LogicsManager* or - "Command: open GCB"
38	
37	Relay [R6] (*LogicsManager*) - Auxiliary services
36	

LogicsManager

35	Common (terminals 30-34)
34	Relay [R5] (*LogicsManager*) - Diesel: Preglow; Gas: Ignition ON
33	Relay [R4] - Diesel: Fuel relay; Gas: Gas valve
32	Relay [R3] - Crank
31	Relay [R2] (*LogicsManager*) - Alarm class C/D/E/F active
30	Relay [R1] (*LogicsManager*) - Centralized alarm

LogicsManager

58	8	Discrete input [D8] - Alarm input (*LogMan*) or "Reply: GCB is open"
57	7	Discrete input [D7] - Alarm input (*LogMan*) or "Reply: MCB is open"
56	6	Discrete input [D6] - Alarm input (*LogMan*) or "Enable MCB"
55	5	Discrete input [D5] - Alarm input (*LogicsManager*)
54	4	Discrete input [D4] - Alarm input (*LogicsManager*)
53	3	Discrete input [D3] - Alarm input (*LogicsManager*)
52	2	Discrete input [D2] - Start in Auto (*LogicsManager*)
51	1	Discrete input [D1] - Emergency stop (*LogicsManager*)
50		Common (terminals 51 to 58)
49		-12/24 Vdc
48		-0 Vdc

Battery
Battery

The socket for the PC configuration is situated on the back of the item. This is where the DPC has to be plugged in.
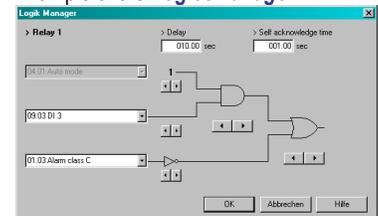
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FEATURES OVERVIEW

		easYgen-1500			
EASYGEN 1000	Configured as ...	{0} No CB control	{1o} 1 CB control (GCB open)	{1oc} 1 CB control (GCB open / close)	{2oc} 2 CB control (GCB / MCB open / close)
Measuring					
Generator voltage (3phase/4-wire)	rated 69/120 Vac	✓	✓	✓	✓
- true rms	max. 86/150 Vac	✓	✓	✓	✓
- *FlexRange*™	rated 277/480 Vac	✓	✓	✓	✓
	max. 346/600 Vac	✓	✓	✓	✓
Generator current #1 (3phase/4-wire, true RMS)	../1 A or ../5 A	✓	✓	✓	✓
Mains voltage (3phase/4-wire)	rated 69/120 Vac	(✓)#2	(✓)#2	(✓)#2	✓
- true rms	max. 86/150 Vac	(✓)#2	(✓)#2	(✓)#2	✓
- *FlexRange*™	rated 277/480 Vac	(✓)#2	(✓)#2	(✓)#2	✓
	max. 346/600 Vac	(✓)#2	(✓)#2	(✓)#2	✓
Mains current #1 (1phase/2-wire, true RMS)	../1 A or ../5 A	(✓)#2	(✓)#2	(✓)#2	✓
Control					
Breaker control logic	*FlexApp*™	0	0	1	2
Number of controlled power circuit breakers can be user configured depending on application needs out of 4 Modes	GCB open#3		✓	✓	✓
	GCB open/close#3			✓	✓
	GCB/ MCB open/close#3				✓
Isolated single-unit operation				✓	✓
AMF (auto mains failure operation)					✓
Stand-by operation					✓
Open transition (break-before-make)					✓
ATS (automatic transfer switching)					✓
Accessories					
Softkeys (advanced LC display)	*DynamicsLCD*™	✓	✓	✓	✓
Start/stop logic for Diesel/Gas engines		✓	✓	✓	✓
kWh meter, kvarh meter		✓	✓	✓	✓
Operating hours/start/maintenance counter		✓	✓	✓	✓
Configuration via PC #4		✓	✓	✓	✓
Event recorder with real time clock (battery backup)		300	300	300	300
Flush-mounting		✓	✓	✓	✓
Protection	ANSI#				
Generator: voltage/frequency	59/27/81O/81U	(✓)#6	✓	✓	✓
Generator: overload, reverse/reduced power	32/32R/32F	(✓)#6	✓	✓	✓
Generator: unbalanced load	46	(✓)#6	✓	✓	✓
Generator: definite time-overcurrent	50/51	(✓)#6	✓	✓	✓
Generator: inverse time-overcurrent	IEC255	(✓)#6	✓	✓	✓
Generator: ground fault #5		(✓)#6	✓	✓	✓
I/Os					
Speed input (magnetic/switching; Pickup)		✓	✓	✓	✓
Discrete alarm inputs (configurable)		8	8	7	5
Relay outputs (configurable)	*LogicsManager*™	8	7	6	4
Analog inputs #7 (configurable)	*FlexIn*™	2	2	2	2
CAN bus communication #8	*FlexCAN*™	✓	✓	✓	✓
RS-232 Modbus RTU Slave #9		✓	✓	✓	✓
Listings/Approvals #10					
UL/cUL Listed		✓	✓	✓	✓
LR, GL Marine Approval		✓	✓	✓	✓
CE Marked		✓	✓	✓	✓

#1 Selection during order; both ../5 A (standard) or both ../1 A (alternatively);

#2 the mains are measured and may be displayed, but they will not be evaluated

#3 dedicated to a fixed relay

#4 external Woodward DPC cable required.
USB connector: P/N 5417-1251 / RS-232 connector: P/N 5417-557 or CAN connection by LeoPC1 software

#5 calculated + measured ground current

#6 possible (not dedicated to a fixed relay)

#7 selectable during configuration
VDO (0 to 180 Ohm, 0 to 5 bar, 2-pole)
VDO (0 to 180 Ohm, 0 to 10 bar, 2-pole)
VDO (0 to 380 Ohm, 40 to 120°C, 2-pole)
VDO (0 to 380 Ohm, 50 to 150°C, 2-pole)
Pt100
Resistive input (linear 2pt. or free chart 9pt.)
20 mA (0/4 to 20 mA, freely configurable)

#8 freely selectable during configuration
CANopen, CAN (CAL), or J1939; request info

#9 external electrical isolation required (e.g. DPC cable P/N 5417-557)

#10 contact your sales rep to find out whether your desired unit has the required approval

Example of the *LogicsManager*