



easYgen Series Controls for Asynchronous Genset Applications

DESCRIPTION

Woodward's easYgen paralleling genset controls for asynchronous genset applications expand upon the versatility of the popular easYgen-2000 series and easYgen-3000 series genset controls and include a speed measurement device EPU-100.

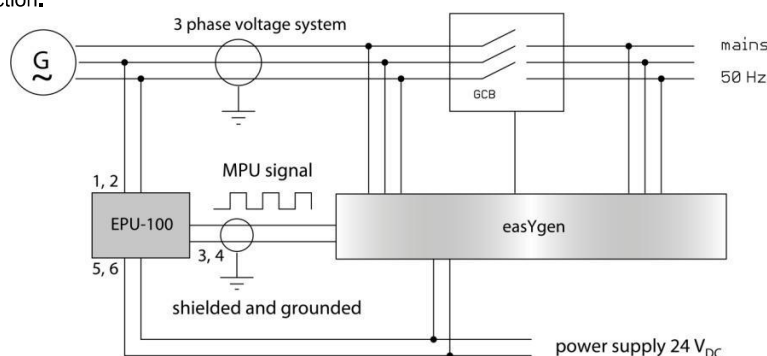
The easYgen controllers provide parameter selection for generator type. When asynchronous generator (induction generator) type is selected, the easYgen controls automatically re-configure to provide special functions for the asynchronous generators. The easYgen asynchronous genset controllers include all the highly-valued features and functions of the standard easYgen models, and an electronic speed measurement device. This device allows the user to easily convert the Remanence voltage into MPU square wave pulses which is then feed into the easYgen controller for speed reference.

The easYgen asynchronous genset application functionality is available in 2 kits:

- **Asynchron KIT-2000** – includes a standard easYgen-2500-P1, plus an EPU-100. Applications include parallel operation of a single genset with a utility.
- **Asynchron KIT-3000** – includes a standard easYgen-3500-P2, plus an EPU-100. Applications include load sharing of up to 32 gensets in utility parallel operation. This kit is also compatible with Woodward LS-5 series circuit breaker controls, for complex distribution systems with multiple utility feeds and tie breakers.

FEATURES

- As long as the GCB is open the relevant MPU input (speed signal) comes from the EPU-100.
- The closing of the GCB is executed, if the speed is within the corresponding frequency range of the generator operating window. The voltage and phase angle is ignored in this case.
- The generator monitoring (under/over frequency and under/overvoltage/asymmetry) is switched off, until the generator breaker is closed.
- After opening the GCB, under/over frequency and under/overvoltage and asymmetry monitoring is switched on again.
- The synchroscope is not displayed in the asynchronous mode.
- Operation modes: Auto, Stop, Manual, and Load/No Load test.
- Breaker control: Slip frequency synchronization, open-close control, and breaker monitoring.
- Load transfer features: Open / closed transition, interchange, soft loading / soft unloading.
- Active power and reactive power sharing.
- Discrete and analog I/O expansion board connectivity (Woodward IKD 1 or Phoenix Contact IL series).
- Event recorder (300 events, FIFO) with real time clock (battery backup for min. 5 years).
- Multi-level password protection.
- Multi-lingual capability.
- Perfectly working together. See application sample beside:



- For asynchronous or induction genset applications
- Allows packagers to standardize on a single control platform for multiple uses
- Speed input from simple and robust Electronic Pickup Unit
- Slip frequency synchronization
- Soft loading/unloading features
- Open/closed transition

Asynchron KIT-3000:

- Sophisticated control with load sharing and load-dependent start/stop of up to 32 units
- Provides full connectivity of up to 16 Woodward LS-5 circuit breaker controller
- Integrated Generator Group breaker control
- Run-up Synchronization

Asynchron KIT-2000:

- Economical option for a single genset paralleled with a utility
- Four configurable AI/AO
- Smaller footprint

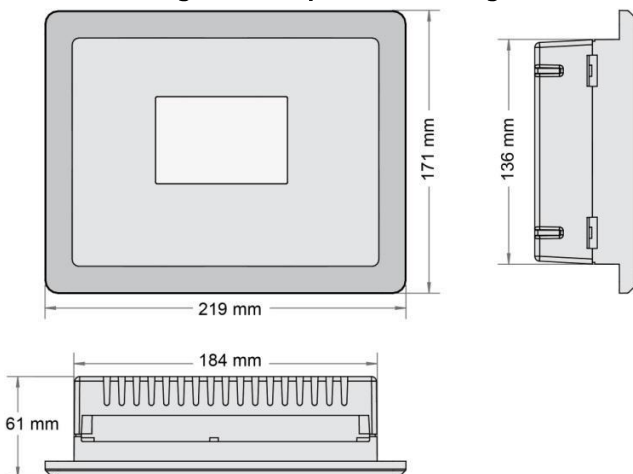
SPECIFICATIONS

Power supply..... 12/24 Vdc (8 to 40 Vdc)
 Intrinsic consumption max. 12 W (easYgen-2500P1)
 max. 19 W (easYgen-3500P2)
 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 / Δ)
 120 Vac [1] Rated (V_{rated}) 69/120 Vac
 Max. value (V_{max}) 86/150 Vac
 Rated voltage phase – ground 150 Vac (easYgen-2500P1)
 Rated surge volt. (V_{surge}) 2.5 kV
and 480 Vac [4] Rated (V_{rated}) 277/480 Vac
 Max. value (V_{max}) 346/600 Vac
 Rated voltage phase – ground 150 Vac (easYgen-2500P1)
 Rated surge volt. (V_{surge}) 4.0 kV
 Accuracy Class 1
 Measurable alternator windings (easYgen-3500P2)
 3p-3w, 3p-4w, 3p-4w OD, 1p-2w, 1p-3w
 Setting range..... primary (easYgen-3500P2)
 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 M Ω , [4] 2.0 M Ω
 Max. power consumption per path..... < 0.15 W
Current (Isolated) Rated (I_{rated}) 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 (easYgen-3500P2)
 Burden..... < 0.15 VA
 Rated short-time current (1 s) $10 \times I_{rated}$
Power (easYgen-3500P2)
 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

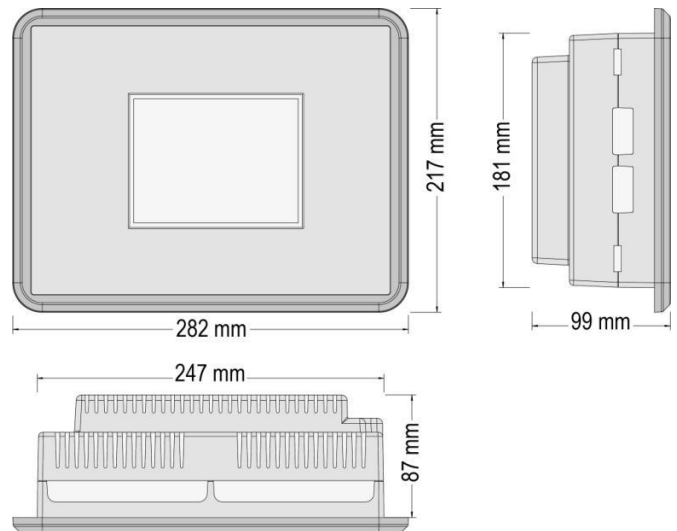
Relay outputs isolated/potential free
 Contact material..... AgCdO
 Load (GP) 2.00 Adc@24 Vdc / 0.36 Adc@125 Vdc / 0.18 Adc@250 Vdc
 Pilot duty (PD).....
 1.00 Adc@24 Vdc / 0.22 Adc@125 Vdc / 0.10 Adc@250 Vdc
Analog inputs (none isolated) freely scalable
 Type 0 to 500 Ohms / 0 to 20 mA
 Resolution 11 Bit
Analog outputs (isolated) freely scalable
 Type ± 10 V / ± 20 mA / PWM
 Insulation voltage (continuously) 100 Vac
 Insulation test voltage (≤ 5 s) 1000 Vac (easYgen-2500P1)
 (1s) 500 Vac (easYgen-3500P2)
 Resolution 11/12 Bit (depending on analog output)
 ± 10 V (scalable) internal resistance ~ 500 Ohms (easYgen-2500P1)
 ≤ 1 kOhms (easYgen-3500P2)
 ± 20 mA (scalable) maximum load 500 Ohms
Housing Front panel flush mounting Plastic housing
 Dimensions WxHxD 219 x 171 x 98 mm (easYgen-2500P1)
 282 x 217 x 99 mm (easYgen-3500P2)
 Front cutout WxH 186 [+1.1] x 138 [+1.0] mm (easYgen-2500P1)
 249 [+1.1] x 183 [+1.0] mm (easYgen-3500P2)
 Connection screw/plug terminals 2.5 mm²
 Front..... insulating surface
 Sealing Front..... IP65 (with screw fastening) (easYgen-2500P1)
 Front..... IP66 (with screw fastening) (easYgen-3500P2)
 Front..... IP54 (with clamp fastening)
 Back IP20
 Weight..... approx. 1,100 g (easYgen-2500P1)
 approx. 1,850 g (easYgen-3500P2)
Disturbance test (CE) tested according to applicable EN guidelines
Listings UL, cUL, GOST-R, CSA
Marine LR (Type Approval),
 ABS Design Assessment (easYgen-2500P1)
 ABS Type Approval (easYgen-3500P2)

DIMENSIONS

Plastic housing for front panel mounting



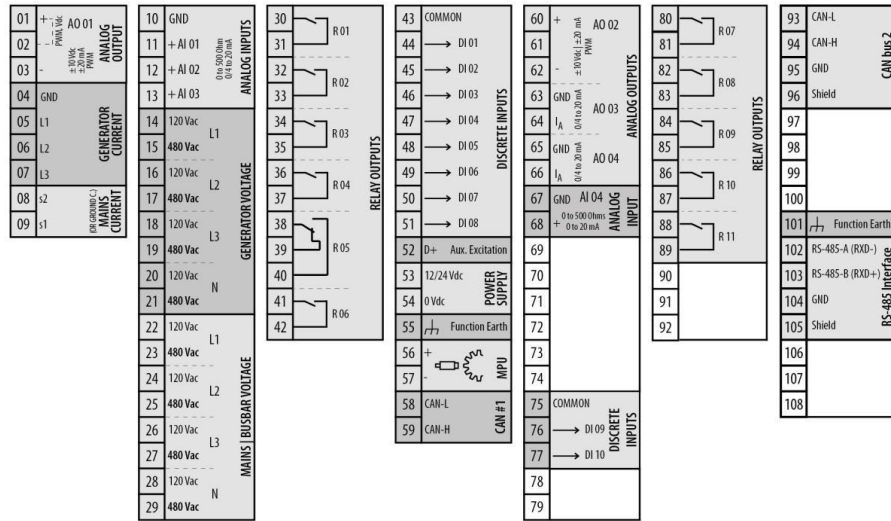
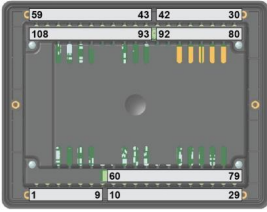
easYgen-2500P1



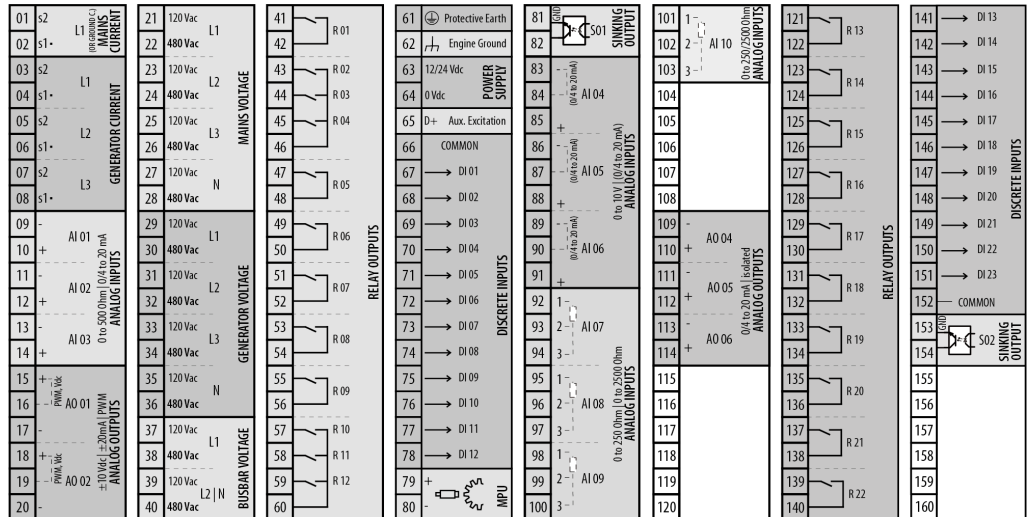
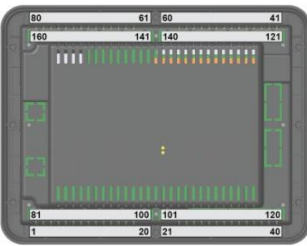
easYgen-3500P2

TERMINAL DIAGRAM

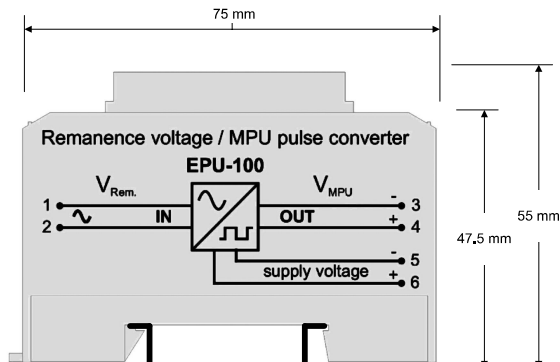
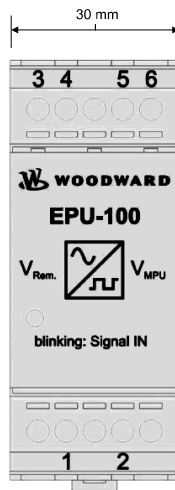
easYgen-2500P1



easYgen-3500P2



EPU-100



(Terminal diagram and dimensions)

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FEAUTURE OVERVIEW

	Model	easYgen ...	
		Asynchron KIT-2000	Asynchron KIT-3000
Measuring			
Generator voltage (3-phase/4-wire)		✓	✓
Generator current (3x true r.m.s.)		✓	✓
Mains voltage (3-phase/4-wire)		✓	✓
Mains or ground current (selectable, 1 x true r.m.s.)		✓	✓
Busbar voltage (1-phase/2-wire)		-	✓
Control			
Breaker control logic (open and closed transition)	<i>FlexApp™</i>	2	3
Number of supported Woodward LS-5 units		-	16
Automatic, Manual, Stop, and test operating modes		✓	✓
Mains parallel multiple-unit operation (up to ...)		1	32 ^{#1} units
GCB and MCB synchronization (slip synchronization)		✓	✓
Open (break-before-make) and closed (make-before-break) transition		✓	✓
Run-up synchronization		-	✓
Interchange (import / export control)		✓	✓
Load-dependent start/stop		✓	✓
n/f, V, P, Q, and PF remote control via analog input or interface		✓	✓
Freely configurable PID controllers		-	3
HMI			
Display with Softkey operation	<i>DynamicsLCD™</i>	Monochrome	Color
Counters for period of use / total operating hours / starts / maintenance		✓	✓
Configuration via PC (ToolKit software included)		✓ (needs DPC cable)	✓
Event recorder entries with real time clock (battery backup)		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	✓	✓
Generator: ground fault ^{#2}	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 / 810 / 81U	✓	✓
Mains: rotation field		✓	✓
Mains: phase shift / df/dt (ROCOF)	78	✓	✓
I/Os			
Speed input through EPU-100		✓	✓
Discrete alarm and control inputs (configurable)		10	10
Discrete outputs (configurable)	<i>LogicsManager™</i>	11	max. 12
External discrete inputs / outputs via CANopen (maximum)		16 / 16 ^{#3}	16 / 16
Analog inputs (configurable)	<i>FlexIn™</i>	4	10 ^{#4}
Analog outputs (+/- 10V, +/- 20mA, PWM; configurable)		4	5
CAN bus communication interfaces ^{#5}	<i>FlexCAN™</i>	2	3
RS-485 Modbus RTU Slave interface(s)		1	1
Service Port to connect via RS-232 DPC cable or DPC USB cable		✓	✓
Listings/Approvals for the easYgens (EPU-100 is CE marked. For details please see the respective product specifications.)			
UL / cUL listing and CE marked		✓	✓
GOST-R & CSA		✓	✓
LR & ABS Marine		✓	✓
BDEW / VDE-AR-N 4105		-	✓
Part Numbers for the complete KIT		CT inputs: 5A	CT inputs: 5A
easYgen with display for front panel mounting (incl. mounting kit) and EPU		8923-2074	8923-2073
Spare connector kit for easYgen		8928-7297	8923-1314
DPC Service Port cable for easYgen	RS-232 DPC cable	5417-557	-/-
	DPC USB cable	5417-1251	-/-

#1 Refer to the Manual for applications with more than 8 parallel gensets because of bus load limits

#2 Measured ground current

#3 Two digital IO expansion boards (P/N 8440-2028) are connectable via CAN bus to provide 8 additional DIs and DOs each

#4 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)

#5 Freely selectable during configuration between CANopen or J1939; request information