

**NATURAL GAS AND PROPANE: COMPACT G.E. FROM 10.0KVA TO 19.0KVA**

**Main characteristics of gen. sets powered by Lister Petter engines:**

Water cooled three-phase or single phase 1500 or 1800 rpm. To run these generators less fuel is needed than running most of equivalent engines by competitors. Easy cold started, the engine is able to manage loads quickly and sturdy. First rank alternators driven from Lister Petter engines generates power going from 10.0 KVA to 19.0 KVA.

**Standard equipment for open gen. set:**

Zink plated sheet base with crossbars, easy to move with the fork-lift on four sides; fitted into the base; four vibration dampers, battery charge alternator, battery, starting engine 12 V; speed governor, residential silencer, lube oil first filling and cooling liquid first filling, manual control panel (see control panel instructions), control screen showing 15 parameters (see control panel instructions); safety devices: hot parts insulation, low oil pressure switch-off, engine high temperature switch-off, overload switch-off, short circuit switch -off .

**Canopy:**

The canopy has an exceptional little dimension (only mm 1693x743x1143) with a lifting hook on the top for easy moving in narrow spaces. The sound is deadened so efficiently that the generator can be placed in a residential area, and the canopy is designed for long lasting protection from weather. The iron sheet is 3 mm thickness and the base is made of zinc plated sheet.

**For rental:**

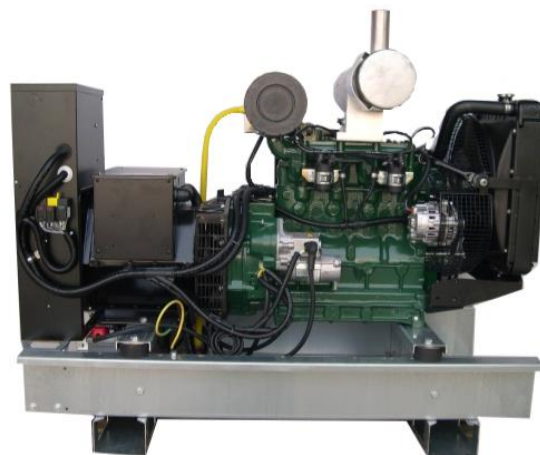
These machines are very easy to run, equipped with a last generation and complete control system that also a non-professional customer can use intuitively. They are fit for quick and agile rental to medium size power use. They can be lifted from four sides, and the hook on the top allows movement in narrow spaces. An outward socket board (optional) allows the customer to connect the load just inserting a plug.

**Optional devices:**

Some optional are available on request: water pre-heating, self blocking-sockets board, automatic changeover control board, mains gen. set changeover-device in a separate metal box, power leakage stop switch, terminal box for connecting the loads, remote emergency push button, remote start by external signal.

**Engine main feature:**

Three cylinders and four cylinders are available. Fit for heavy duty work, these are eight cycle type engines, water cooled, with counter-clockwise rotation (looking from flywheel side). Mechanical speed governor class A1, dry air filter with changeable elements.



### Engine standard equipment:

Rim gear flywheel, flywheel housing SAE 5, suction and exhaust pipes, centrifugal oil separator filter, air filter for prime usage, pre heater plug, engine oil low pressure protection switch, engine high temperature protection switch, starting engine, muffler with residential silencer.

### Operational conditions:

Generators can work no stop within 52 C° environment temperature. Engine water cooling is equipped with a radiator and a blowing fan thoroughly protected against accidental contact. Lube oil pump is gear driven by engine itself to guarantee lubrication under any work condition. Routine maintenance is recommended after any 250 work hours.

### Alternator's performance:

Single bearing alternator, 4 poles, 12 re-connectable terminals, 50Hz with electronic voltage regulator. It can stand 10% overload for about 1 hour in 12 hours working time.

### Control Panel:

Manual or automatic versions are available. Transformation from manual to automatic is made just adding an electronic card kit to the manual control panel. This means that a customer who bought a manual generator can decide to have it fully automatic whenever he needs with very little changes, keeping the same software and the same cabling. This is a major advantage of these generators, reflecting on the running and maintenance expenses, and also on the generator's versatility under different use conditions.

### Display of the control system:

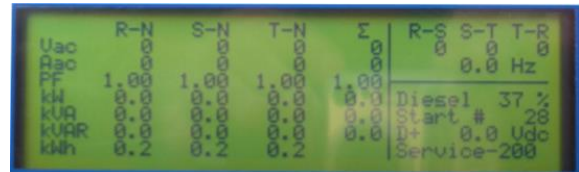
The control screen can show twelve functional parameters simultaneously, which helps to check the machine also in difficult situations. All alarms are shown on the screen while a sound warning is on. If necessary, an instruction is displayed about the most suitable operation to following the situation. Very useful are the battery low level alarm, the lube oil low level alarm, the engine high temperature alarm. Customer can select six different languages on the control screen.

### Warranty:

Warranty is two years from selling date, only for questions related to manufacturing problems, or materials defects. Warranty is not valid for improper use, for damages because of partial or forgotten maintenance and for running more than 12 work hours a day.

### Main features on single bearing alternator:

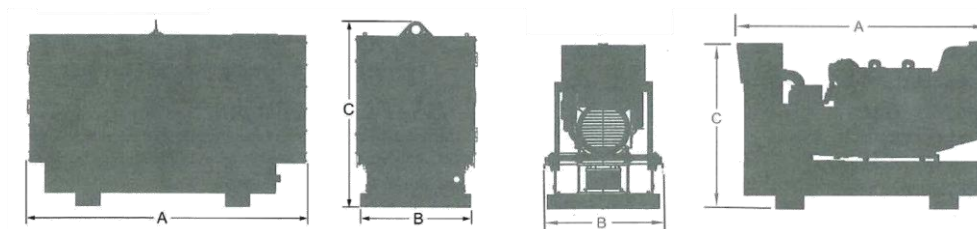
Insulation, winding and construction mechanic are the three key elements making a good alternator. In these alternators all wound components are impregnated with materials specifically designed for work in harsh environments, and resins are selected to provide the high build required for static winding and the high mechanical strength required for rotating components. Stators are wound to eliminate third grade harmonics on the waveform and other disturbances in parallel mode with the main. A fully connected damper winding reduces oscillation during parallel work. The rotor is dynamically balanced to better than BS6861. Using high quality AVR (and the absence of brush-gear) ensure low level of interference with radio transmission. Telephone interference (as defined by BS4999) is better than 2%, and is better than 50 (as defined by Nema MG1-32). Generator is three-phase, 12 ends re-connectable, with all electronic components placed into an easy access iron box.



Prime and Standby Power Ratings										
			NATURAL GAS		PROPANE		NATURAL GAS		PROPANE	
			1500 RPM 50Hz		1500 RPM 50Hz		1800 RPM 60Hz		1800 RPM 60Hz	
			3 Phase	1 Phase	3 Phase	1 Phase	3 Phase	1 Phase	3 Phase	1 Phase
LPWG3	Prime	kVA	10.0	10.0	12.5	12.5	12.0	12.0	15.0	15.0
		kW	8.0	8.0	10.0	10.0	9.6	9.6	12.0	12.0
	Standby	kVA	11.0	11.0	13.7	13.7	13.2	13.2	18.0	18.0
		kW	8.8	8.8	11.0	11.0	10.5	10.5	14.4	14.4
LPWG4	Prime	kVA	13.5	13.5	16.0	16.0	16.2	16.2	19.2	19.2
		kW	10.8	10.8	12.8	12.8	12.9	12.9	15.3	15.3
	Standby	kVA	14.8	14.8	17.6	17.6	17.7	17.7	21.1	21.1
		kW	11.8	11.8	14.0	14.0	14.2	14.2	16.8	16.8

Sound Pressure Levels	Approximate Weight	
	LPW3 62 dB a 7mt.	LPW3
LPW3S		Kg. 540
LPW4 62 dB a 7mt.	LPW4	Kg. 456
	LPW4S	Kg. 580

Approximate Dimensions							
		Length (A)		Width (B)		Height (C)	
		Open Set	Acoustic Set	Open Set	Acoustic Set	Open Set	Acoustic Set
LPW4	mm	1442	1693	715	743	984	1143
LPW3	Inc.	56.8	66.6	28.1	29.2	38.7	45.0



Approximate Fuel Consumption								
	LPW3 NATURAL GAS		LPW3 PROPANE		LPW4 NATURAL GAS		LPW4 PROPANE	
	1500	1800	1500	1800	1500	1800	1500	1800
R/min	1500	1800	1500	1800	1500	1800	1500	1800
100%	3,1	4,1	1,4	2,0	4,4	5,8	1,9	2,5
75%	2,7	3,4	1,2	1,6	3,8	4,8	1,6	2,1
50%	2,1	2,7	1,0	1,3	3,0	3,8	1,3	1,6

Thermal power LPWG3	Thermal power LPWG4
	KW 15 (engine cooling water)
	KW20 (engine cooling water+ exhausting pipe)
	Temperature of output water: 85°C

## CONTROL BOARD

The control board in stainless steel has an upper box and a lower box. In the upper box there are the control panel, the display of the control system, the key, the emergency stop button; overall protection class IP44. In the lower box there are the Amp. transformers, the earth leakage-switch off, the clamps to connect the power cables, the clamps for ground connecting, the clamps for auxiliary connections; overall protection class IP20.

### Software main features.

Microprocessor technology gives: parameters, alarms and stops automatic diagnostic; easy to read display on the control screen; thoroughness in electrical figures and measures; possibility to add other functions; manual running or automatic running; automatic running under mains failure; from remote input, and special applications. All information are displayed on the control screen about electrical parameters, engine parameters, about start/stop, work steps, with written message and sound warnings. It's also possible to analyze and compare all data and also to connect the control board to a P.C. through a SR485 door for remote checking and using of the generator.

### Fittings of the manual version.

#### Technical characteristics:

- Microprocessor: Microchip 16 MHz
- Working temperature: -20 +70 C °
- Display: Liquid crystals 240x64 pixel, 320 types
- Stand-by consumption: 70 mA medium

#### Parameters available:

- Generator tension on the three phases (phase-phase, phase-neutral)
- Generator current on the three phases
- Speed counter
- Generator frequency
- Work hour count
- Count down for maintenance service ( selection )
- Active power (KW) on each phase, and  $\Sigma$
- Engine temperature
- Apparent power (KVA) on each phase, and  $\Sigma$
- Engine lubricant oil pressure
- Reactive power (KVA) on each phase, and  $\Sigma$
- Energy production (KWh) on each phase, and  $\Sigma$
- Lubricant oil temperature \*
- Battery tension
- Power factor on each phase, and medium
- Alternator's excitation tension c.b
- Starting counter
- Date and hour \*
- Records box (last 400 events memory)\*

#### Protections and alarms:

In case of malfunctioning or breakdown the generator stops and all parameters necessary for problem solving are shown on the display:

- Starting failure
- Engine stop failure
- Mechanic stop / engine breakdown
- Engine over-speed / over-tension
- Engine lower speed / lower-tension
- Engine coolant low level
- Engine high temperature
- Lubricant oil low level \*
- Lubricant oil low pressure
- Lubricant oil high temperature\*
- Breakdown of Lubricant oil sensor
- Average of D+ cable
- Generator over-voltage
- Generator low voltage
- Asymmetry of generator voltage
- Generator exceeding load \*
- Alternator not excited
- Alternator high temperature\*
- Microprocessor memory damaged
- Battery low tension
- Battery high tension
- System block-down, engine stop
- System overall failure
- Emergency stop
- Maintenance required

\* These functions need special sensors or software implementation available as optional. Other data can be shown, as for example the exhaust gas temperature, lubricant oil temperature, fuel level.

#### Other standard function of the control, system

Language selection, active feeding when engine stops, password selection to enter the user's menu, maintenance time countdown, alarm lights selections, display of mode in use, acoustic alarm, remote cumulative alarm, P.C. connection, storage of last 16 alarms.

#### Automatic version

Besides all the functions of the manual control panel, the automatic one also allows to connect the generators with the mains. In this case it's possible to select time and thresholds about line parameters and related functions among which the most commonly used are:

- Time of absence or presence of tension on the mains
- Tension threshold for the automatic start
- Time intervals for automatic tests
- Engine cooling down time
- Duration of automatic tests
- Maintenance intervals
- Test mode selection: idle or under load
- LCD display contrast regulation

Moreover, it's possible to select the modes of generator functioning: Blocked, Manual, Automatic, Test.

For details and further explanations see instruction of control board user's manual attached to the generator's handbook

#### Distributors Address