



YOUR PARTNER IN POWER

### OUTPUT RATINGS

Generator Set Model	P1350P1 P1500E1		P1500P3 P1650E3		P1700P1 P1875E1		P1750 P1925E		P1825 P2000E		P2000 P2200E	
	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW	kVA	kW
Ratings at 0.8PF												
380-415V, 50Hz / 1500 r.p.m	1350.0	1080.0	1500.0	1200.0	1700.0	1360.0	1750.0	1400.0	1825.1	1460.1	2000.0	1600.0
	1500.0	1200.0	1650.0	1320.0	1875.0	1500.0	1925.0	1540.0	2000.0	1600.0	2200.0	1760.0

### Ratings Definitions

**Prime Power(Continuous) – Model P & P with suffix (P1)or(P3)**

These ratings are applicable for supplying continuous electrical power (at variable load) in lieu of commercially purchased power. There is no limitation to the annual hours of operation and this model can supply 10% overload power for 1 hour in 12 hours.

**Standby Power – Model P with suffix (E), (E1)or(E3)**

These ratings are applicable for supplying continuous electrical power (at variable load) in event of a utility power failure.No overload is permitted on these ratings. The alternator on this model is peak continuous rated (as defined in ISO8528-3) at 27°C.

### TECHNICAL DATA

Perkins Engine Model:	4012-46TWG3A	4012-46TAG2A	4012-46TAG3A	4016TAG	4016TAG1A	4016TAG2A
Leroy-Somer Alternator Model:	LL8224N	LL8224N	LL9124H	LL9124H	LL9124H	LL9124H
Number of Cylinders:	12 / Vee	12 / Vee	12 / Vee	16 / Vee	16 / Vee	16 / Vee
Cubic Capacity:	Litres (cu.in)	45.8 (2797.5)	45.8 (2797.5)	45.8 (2794.9)	61.1 (3730.0)	61.1 (3730.0)
Bore/Stroke:	mm	160.0 / 190.0	160.0 / 190.0	160.0 / 190.0	160.0 / 190.0	160.0 / 190.0
	in	6.3 / 7.5	6.3 / 7.5	6.3 / 7.5	6.3 / 7.5	6.3 / 7.5
Compression ratio:		13.1:1	13.0:1	13.0:1	13.6:1	13.6:1
Aspiration:	Turbocharged Air To Air Charge Cooled					
Frequency:	50 Hz		50 Hz		50 Hz	
Engine Speed:	RPM	1500	1500	1500	1500	1500
Gross Engine Power:	kW (hp)	1314 (1762)	1437 (1927)	1643 (2203)	1649 (2211)	1741 (2335)
BMEP:	kPA (psi)	2293 (332.6)	2508 (363.7)	2868 (415.9)	2158 (313)	2279 (330.5)
Piston Speed:	m/sec (ft/sec)	9.5 (31.2)	9.5 (31.2)	9.5 (31.2)	9.5 (31.2)	9.5 (31.2)
Total Oil Capacity:	Litres (US Gal)	177 (46.8)	177 (46.8)	177 (46.8)	238 (62.9)	238 (62.9)
Fuel Consump, Prime:	1/hr (USg/hr)	278.3 (73.5)	296.6 (78.4)	350.4 (92.6)	356.7 (94.2)	378.3 (99.9)
Fuel Consump, Standby:	1/hr (USg/hr)	312.2 (82.5)	326.3 (86.2)	391.0 (103.3)	397.8 (105.1)	419.6 (110.8)
Heat Rejection to Exhaust System:	kW (Btu/min)	1128 (64148)	1050 (59712)	1219 (69323)	1159 (65911)	1276 (72565)
Heat Rejection to Cooling System:	kW (Btu/min)	441 (25079)	485 (27581)	625 (35543)	590 (33553)	629 (35771)
Total Radiated Heat:	kW (Btu/min)	96 (5459)	105 (5971)	123 (6995)	193 (10976)	177 (10066)
Exhaust Temperature:	°C (°F)	474 (885)	450 (842)	480 (896)	469 (876)	439 (822)
Radiator Cooling Air Flow:	m³/min (cfm)	1620 (57210)	1212 (42801)	1920 (67804)	2058 (72678)	2058 (72678)
Combustion Air Flow:	m³/min (cfm)	114 (4026)	128 (4520)	135 (4767)	138 (4873)	140 (4944)
Exhaust Gas Flow:	m³/min (cfm)	182 (6427)	315 (11124)	350 (12360)	353 (12466)	343 (12113)

Note: Standard reference conditions 27°C (80°F) Air Inlet Temp, 152.4m (500ft) A.S.L., 60% relative humidity. All engine performance data based on the above mentioned maximum continuous ratings. Fuel consumption data at full load with diesel fuel with specific gravity of 0.85 and conforming to BS2869: 1998, Class A2.

### DIMENSIONS AND WEIGHTS

Generator Set Model	P1350P1 / P1500E1	P1500P3 / P1650E3	P1700P1 / P1875E1	P1750 / P1925E	P1825 / P2000E	P2000 / P2200E
Length:	mm (in)	4888 (192.4)	5095 (200.6)	5215 (205.3)	5725 (225.4)	5725 (225.4)
Width:	mm (in)	1895 (74.6)	1900 (74.8)	2205 (86.8)	2300 (90.6)	2300 (90.6)
Height:	mm (in)	2469 (97.2)	2435 (95.9)	2490 (98)	3020 (118.9)	3020 (118.9)
Net Weight*:	kg (lb)	9313 (20532)	9720 (21429)	10890 (24008)	15500 (34172)	15500 (34172)

\* Weight Including Lube Oil Only Without Coolant.

P1350P1-P2200E



# STANDARD SPECIFICATIONS: P1350P1 - P2200E

## 1. OUTPUT RATINGS

The generating set is normally supplied connected for 380 or 415 volt, 3 phase, 50 Hz and alternative voltages / frequencies are available.

## 2. ENGINE

Perkins four stroke heavy duty industrial type diesel engine.

### 2.2 Governing Type

Electronic Class A1 and compliant with ISO8528 Class G2.

### 2.3 Electrical System

24 Volt DC Energised to run shutdown solenoid. Oil pressure and coolant temperature shutdown switches and gauge senders.

## 3. COOLING SYSTEM

Radiator and cooling fan complete with protection guards, designed to cool the engine in ambient temperatures up to 50°C(122°F). A coolant drain valve is terminated at the base frame edge for convenience during maintenance.

## 4. ENGINE FILTERATION SYSTEM

Cartridge type dry air filters with restriction indicator. Cartridge type fuel filters and full flow lube oil filters. All filters have replaceable elements. A lube oil drain is terminated at the baseframe edge for convenience during maintenance.

## 5. EXHAUST SYSTEM

Heavy duty industrial capacity exhaust silencer (supplied loose).

## 6. ELECTRICAL SYSTEM

24 volt system with battery charging alternator, axial type starter motor. High capacity maintenance free lead acid starting battery (2x12Volt), battery rack mounted on the generating set baseframe and heavy duty inter-connecting cables with terminations.

## 7. ALTERNATOR

Screen protected and drip-proof IP23, self exciting, self regulating, single bearing brushless alternator with fully interconnected damper windings, IC0A1 cooling system and sealed-for life bearing.

### 7.1 Insulation System

The insulation system is class H. All windings are impregnated in either a triple dip thermosetting, polyester varnish or vacuum pressure impregnated polyester resin. Heavy coat of anti-tracking varnish for additional protection against moisture or condensation.

### 7.2 Automatic Voltage Regulator

The fully sealed automatic voltage regulator maintain the voltage (steady state) within the limits of +/-0.5% from no load to full load including cold to hot variations at any power factor between 0.8 lagging and unity and inclusive of a speed variation of 5%. Normal adjustment is by a trimmer incorporated in the AVR. The standard AVR is: **R449**

### 7.3 Waveform Distortion, THF & TIF Factors

The total distortion of the voltage waveform with open circuit between phases or phase and neutral is in the order of 2%. On a 3 phase balanced harmonic-free load the total distortion is in the order of 3.5%. Machines are designed to have a THF (waveform IEC) less than 2% and a TIF (waveform NEMA) less than 50. A 2/3 pitch factor is standard on all stator windings. (Total Harmonic Content LL/LN is less than 4%)

## 7.4 Radio Interference

Suppression is in line with standards: EN61000-6

## 7.5 Electrical Characteristics

Electrical design & features in accordance with: BS 5000, IEC60034.1, VDE0530, UTE 51100, NEMA MG 1-22.

## 7.6 Motor Starting

An overload capacity equivalent to between 160% and 300% (depending on alternator frame size) of full load impedance at zero power factor can be sustained for 10 seconds

## 8. MOUNTING ARRANGEMENT

### 8.1 Baseframe:

The complete generating set is mounted, as a whole, on a heavy duty fabricated, welded steel baseframe. The baseframe incorporates specially designed lifting points.

### 8.2 Coupling:

The engine and alternator are directly coupled by means of an SAE flange so that there is no possibility of misalignment after prolonged use. The high inertia engine flywheel (SAE J620 size 14) is flexibly coupled to the alternator rotor and a full torsional analysis has been carried out to guarantee no harmful vibration will occur in the assembly.

### 8.3 Anti-Vibration Mounting Pads:

Anti-vibration pads are affixed between engine/alternator feet and the baseframe thus ensuring complete vibration isolation of the rotating assemblies and enabling the machine to be placed on an uneven surface without any detrimental effects.

### 8.4 Safety Guards:

The fan, fan drive and battery charging alternator drive are fully guarded for personnel protection. A stone guard protects the radiator core from accidental damage.

## 9. FUEL SYSTEM

Fuel Feed and return lines to the engine are terminated at the baseframe using threaded connectors. A separate fuel tank must be provided.

## 10. CONTROL SYSTEM

10.1 PowerWizard 1.0 Control Panel: Set mounted auto start panel in a vibration isolated sheet steel enclosure with a hinged lockable door. The control panel is equipped as follows: (PW2.0 is optional)

### a. INSTRUMENTATION: LCD Display with adjustable contrast and backlight with auto power off

Volts 3-phase (L-L & L-N)
Amps (per phase & average)
Frequency
Battery Volts
Hours Run
Engine Jacket Water Temperature (in °C or °F)
Lube Oil Pressure (in psi, kPa or bar)
Engine Speed (rpm)

## b. CONTROLS

2 LED Status Indicators	Menu Navigation Keys
Lamp Test Key	Alarm Acknowledge Key
Run, Auto & Stop keys	2 Spare Fault Channels
Engine and AC Metering Shortcut Keys	
Control Module Keys have tactile feedback	
Lock Down Emergency Stop Push Button	

## c. PROTECTION

Fail to start	Loss of engine speed detection
High coolant temperature	High/Low Battery Voltage
Low lube oil pressure	Battery Charger Failure
Under/Over speed	(if fitted)

## d. Other Features

20 Event Fault Log
CAN1 data link - J1939 for communication with ECM

## e. Languages: LED displays with many languages

### e. DC and AC Wiring Looms

DC and AC wiring looms utilizing industrial type multipin connectors, thus permitting fast fault finding and simple retrofitting of alternative or remote control systems.

### 10.3 Circuit Breaker

3 Pole with solid neutral (4 wire) circuit breaker (ACB) with integral trip unit for thermal and magnetic overload protection. It is in a separate free standing cabinet & supplied loose without cables.

## 11. DOCUMENTATION

A full set of installation, operation and maintenance manuals, circuit wiring diagrams, and commissioning / fault finding instruction leaflets.

## 12. GENERAL ARRANGEMENT

The generating set is designed and constructed for installation in a weather protected building. Various types of weatherproof and sound attenuated enclosures are available upon request.

## 13. FACTORY TESTS

The generating set is load tested before despatch. All protective devices, control functions and site load conditions are simulated and the generator and it's systems checked, proved and then passed for despatch. A test certificate can be provided upon request.

## 14. EQUIPMENT FINISH

All sheet metal components are first treated with a phosphate chemical conversion coating which provides an excellent corrosion resistant surface. These metal components are then "painted" by applying a polyester powder which is subjected to very high temperatures causing the powder to melt and form a continuous high gloss and extremely durable coating. The engine and alternator are thoroughly cleaned and finished in temperature controlled ovens with industrial high gloss paint. All fasteners are electroplated.

Note: Generating set is supplied with unpainted turbo-charger.

## 15. QUALITY STANDARDS

The equipment meets the followings standards: BS4999, BS5000, BS5514, ISO8528, ISO3406, IEC60034, VDE0530, NEMA MG-1.22

## 16. WARRANTY

One year against manufacturing defects.

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Website: [www.marapco.com](http://www.marapco.com)

N. Ireland - U.K.



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Made in UK