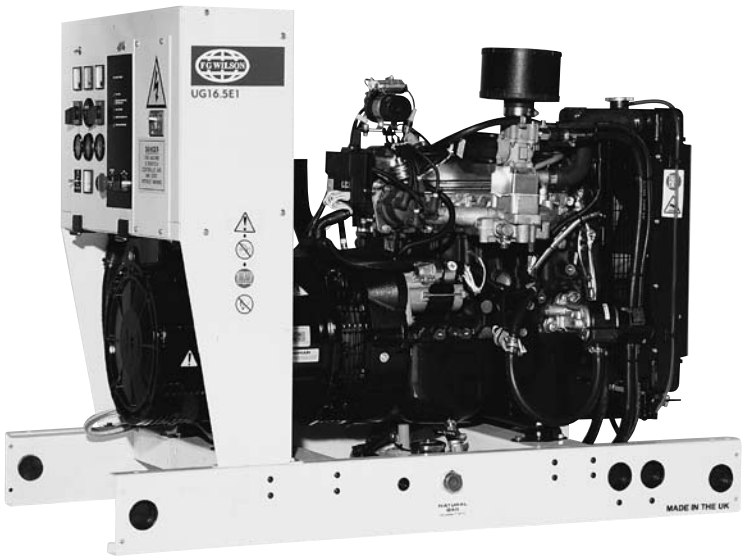
# UG14P1/UG16.5E1




| Output Ratings | | | | |
|---|---|---|---|---|
| Generating Set Model | UG14P1/UG16.5E1 | | | |
| | LPG | | Nat Gas | |
| | Prime* | Standby* | Prime* | Standby* |
| 380 – 415V. 50 Hz | 14.0 kVA | 16.5 kVA | 12.5 kVA | 15.0 kVA |
| | 11.2 kW | 13.2 kW | 10.0 kW | 12.0 kW |
| 220/127V. 60 Hz | 16.9 kVA | 20.0 kVA | 16.8 kVA | 18.8 kVA |
| | 13.5 kW | 16.0 kW | 13.4 kW | 15.0 kW |

* Refer to ratings definitions on page 4.
Ratings at 1.0 pf

| Technical Data | | |
|---|---|---|
| Engine Make & Model | HM 1.8L | |
| Alternator Model | LUA1014NX | |
| Base Frame Type | Heavy Duty Fabricated Steel | |
| Circuit Breaker Type/Rating | 3 Pole MCB | |
| Frequency | 50 Hz | 60 Hz |
| Engine Speed | 1500 | 1800 |

## Engine Technical Data

| Physical Data | |
|---|---|
| Manufacturer: | HM |
| Model: | 1.8L |
| No. of Cylinders/Alignment: | 4 in Line |
| Cycle: | 4 Stroke |
| Induction: | Naturally Aspirated |
| Cooling Method: | Water |
| Governing Type: | Electronic |
| Class: | ISO 8528 G2 |
| Compression Ratio: | 8.5:1 |
| Displacement: l (cu.in) | 1.8 (111) |
| Bore/Stroke: mm (in) | 84.0 (3.3) / 82.0 (3.2) |
| Engine Electrical System: | |
| -Voltage/Ground | 12/Negative |
| -Battery Charger Amps | 45 |
| Weight: kg (lb) - (includes lube oil) | 143 (315) |

| Performance | | 50 Hz | 60 Hz |
|---|---|---|---|
| Engine Speed: rpm | | 1500 | 1800 |
| Gross Engine Power: | | | |
| kW (hp) | -Standby: | 15.7 (21) | 19.5 (26) |
| | -Prime: | 13.4 (18) | 16.6 (22) |
| BMEP: kPa (psi) | | | |
| | -Standby: | 691 (100.2) | 715 (103.7) |
| | -Prime: | 590 (85.5) | 609 (88.3) |

| Air System | | 50 Hz | 60 Hz |
|---|---|---|---|
| Combustion Air Flow LPG: | | | |
| $m^3$/min (cfm) | -Standby: | 1.3 (46) | 1.6 (57) |
| | -Prime: | 1.1 (39) | 1.3 (46) |
| Combustion Air Flow Natural Gas: | | | |
| $m^3$/min (cfm) | -Standby: | 1.1 (39) | 1.5 (53) |
| | -Prime: | 1.0 (35) | 1.4 (49) |
| Max. Combustion Air Intake Restriction: kPa (in $H_2O$) | | 1.5 (6) | 1.5 (6) |
| Radiator Cooling Airflow: $m^3$/min (cfm) | | 63 (2225) | 75.6 (2670) |
| External Restriction to Cooling Airflow: kPa (in $H_2O$) | | 247 (1) | 247 (1) |

| Cooling System | 50 Hz | 60 Hz |
|---|---|---|
| Cooling System Capacity: l (US gal) | 6.1 (1.6) | 6.1 (1.6) |
| Water Pump Type: | Centrifugal | |
| Heat Rejected to Water & Lube Oil: kW (Btu/min) | | |
| -Standby: | 14.1 (804) | 17.1 (970) |
| -Prime: | 12.1 (685) | 14.6 (827) |
| Heat Radiation to Room: | | |
| kW (Btu/min) -Standby: | 7.5 (424) | 9.00 (512) |
| -Prime: | 6.4 (362) | 7.7 (436) |
| Radiator Fan Load: kW (hp) | 0.52 (0.7) | 0.9 (1.21) |

### Fuel System

| | |
|---|---|
| Fuel Filter Type: | Replaceable Element |
| Recommended Fuel: | LPG/Natural Gas |

Fuel Consumption LPG: $m^3$/hr (cfh)

| Prime | 110% Load | 100% Load | 75% Load | 50% Load |
|---|---|---|---|---|
| 50 Hz | 2.2 (77.7) | 1.9 (67.1) | 1.4 (49.4) | 1.0 (35.3) |
| 60 Hz | 2.6 (91.8) | 2.2 (77.7) | 1.7 (60.0) | 1.2 (42.4) |
| **Standby** | | | | |
| 50 Hz | n/a | 2.2 (77.7) | 1.6 (56.5) | 1.1 (38.8) |
| 60 Hz | n/a | 2.6 (91.8) | 1.9 (67.1) | 1.4 (49.4) |

Fuel Consumption Natural Gas: $m^3$/hr (cfh)

| Prime | 110% Load | 100% Load | 75% Load | 50% Load |
|---|---|---|---|---|
| 50 Hz | 5.1 (180.1) | 4.3 (151.9) | 3.3 (116.5) | 2.3 (81.2) |
| 60 Hz | 6.3 (222.5) | 5.6 (197.8) | 4.3 (151.9) | 3.0 (105.9) |
| **Standby** | | | | |
| 50 Hz | n/a | 5.1 (180.1) | 3.9 (137.7) | 2.7 (95.4) |
| 60 Hz | n/a | 6.3 (222.5) | 4.7 (166.0) | 3.3 (116.5) |

### Lubrication System

| | |
|---|---|
| Oil Filter Type: | Spin-On. Full Flow |
| Total Oil Capacity L (US Gal) | 4.5 (1.2) |
| Oil Pan L (US Gal): | 4.0 (1.1) |
| Oil Type: | AP1CF4 15W-40 |

| Exhaust System | | 50 Hz | 60 Hz |
|---|---|---|---|
| Max. Allowable Back Pressure: kPa (in Hg) | | 17.3 (5.1) | 17.3 (5.1) |
| Exhaust Gas Flow: | | | |
| LPG: $m^3$min (cfm) | | | |
| | - Standby: | 3.87 (137) | 4.83 (171) |
| | - Prime: | 3.23 (114) | 4.00 (141) |
| Natural Gas: $m^3$/min (cfm) | | | |
| | - Standby: | 3.57 (126) | 4.89 (173) |
| | - Prime: | 2.9 (102) | 4.36 (154) |
| Exhaust Gas Temperature: °C (°F) | | | |
| LPG: | - Standby: | 568 (1054) | 600 (1112) |
| | - Prime: | 552 (1026) | 584 (1083) |
| Natural Gas: | | | |
| | - Standby: | 580 (1076) | 612 (1134) |
| | - Prime: | 557 (1035) | 605 (1121) |

## Alternator Performance Data

| Data Item | 50 Hz | | | | 60 Hz | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 380/220 | 400/230 | 415/240 | 220/127 | 380/220 220/110 | 230/115 | 240/120 208/120 | 440/254 220/127 | 480/277 240/139 |
| **Motor Starting Capability* kVA** | 39 | 43 | 46 | 50 | 34 | 37 | 39 | 43 | 50 |
| **Reactances: Per Unit** | | | | | | | | | |
| **Xd** | 1.45 | 1.31 | 1.22 | 1.08 | 2.11 | 1.90 | 1.76 | 1.57 | 1.32 |
| **X'd** | 0.09 | 0.08 | 0.07 | 0.07 | 0.13 | 0.12 | 0.11 | 0.11 | 0.08 |
| **X"d** | 0.045 | 0.040 | 0.037 | 0.033 | 0.065 | 0.058 | 0.054 | 0.048 | 0.040 |

Reactances shown are applicable to prime ratings using LPG fuel

* Based on 30% voltage dip at 0.9 power factor and shunt excitation system

## Alternator Technical Data

| Physical Data | | Operating Data | |
|---|---|---|---|
| **Manufacturer:** | FG Wilson | **Overspeed:** RPM | 2250 |
| **Model:** | LUA1014NX | **Voltage Regulation: (steady state)** | +/- 0.5% |
| **No. of Bearings:** | 1 | **Wave Form NEMA =TIF:** | <50 |
| **Insulation Class:** | H | **Wave Form IEC=THF:** | <2% |
| **Winding Pitch Code:** | 2/3 (6) | **Total Harmonic Content LL/LN:** | <4% |
| **Wires:** | 12 | **Radio Interference:** | Suppression is in line with European Standard EN61000-6. |
| **Ingress Protection Rating:** | IP23 | **Radiant Heat:** kW (Btu/min) | |
| **Excitation System:** | SHUNT | -50 Hz: | 1.8 (102) |
| **AVR Model:** | R250 | -60 Hz: | 2.2 (125) |

## Technical Data

**1 Phase Ratings and Performance at 50 Hz. 1500 RPM**

| Voltage | Model: UG11P1S Prime | | Model: UG13E1S Standby | |
|---|---|---|---|---|
| | kVA | kW | kVA | kW |
| 380/220 | 14.0 | 11.2 | 16.5 | 13.2 |
| 400/230 | 14.0 | 11.2 | 16.5 | 13.2 |
| 415/240 | 14.0 | 11.2 | 16.5 | 13.2 |
| 220/127 | 14.0 | 11.2 | 16.5 | 13.2 |

**1 Phase Ratings and Performance at 60 Hz. 1800 RPM**

| Voltage | Model: UG11P1S Prime | | Model: UG13E1S Standby | |
|---|---|---|---|---|
| | kVA | kW | kVA | kW |
| 380/220 | 16.9 | 13.5 | 20.0 | 16.0 |
| 220/110 | 16.9 | 13.5 | 20.0 | 16.0 |
| 230/115 | 16.9 | 13.5 | 20.0 | 16.0 |
| 240/120 | 16.9 | 13.5 | 20.0 | 16.0 |
| 208/120 | 16.9 | 13.5 | 20.0 | 16.0 |
| 440/254 | 16.9 | 13.5 | 20.0 | 16.0 |
| 220/127 | 16.9 | 13.5 | 20.0 | 16.0 |
| 480/277 | 16.9 | 13.5 | 20.0 | 16.0 |
| 240/139 | 16.9 | 13.5 | 20.0 | 16.0 |

These ratings are based on generating set performance using LPG fuel.

| Voltage | Model: UG11P1S Prime | | Model: UG13E1S Standby | |
|---|---|---|---|---|
| | kVA | kW | kVA | kW |
| 380/220 | 12.5 | 10.0 | 15.0 | 12.0 |
| 400/230 | 12.5 | 10.0 | 15.0 | 12.0 |
| 415/240 | 12.5 | 10.0 | 15.0 | 12.0 |
| 220/127 | 12.5 | 10.0 | 15.0 | 12.0 |

| Voltage | Model: UG11P1S Prime | | Model: UG13E1S Standby | |
|---|---|---|---|---|
| | kVA | kW | kVA | kW |
| 380/220 | 16.7 | 13.4 | 18.8 | 15.0 |
| 220/110 | 16.7 | 13.4 | 18.8 | 15.0 |
| 230/115 | 16.8 | 13.4 | 18.8 | 15.0 |
| 240/120 | 16.8 | 13.4 | 18.8 | 15.0 |
| 208/120 | 16.8 | 13.4 | 18.8 | 15.0 |
| 440/254 | 16.8 | 13.4 | 18.8 | 15.0 |
| 220/127 | 16.8 | 13.4 | 18.8 | 15.0 |
| 480/277 | 16.9 | 13.5 | 18.8 | 15.0 |
| 240/139 | 16.9 | 13.5 | 18.8 | 15.0 |

These ratings are based on generating set performance using Natural Gas fuel.

## Definitions

### Standby Rating

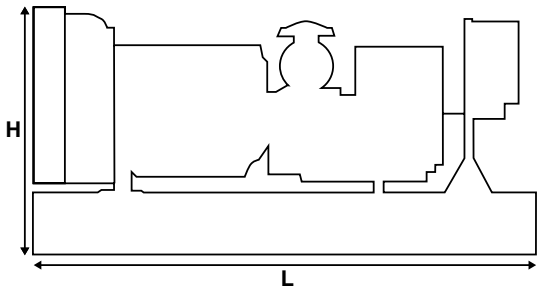
These ratings are applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings. The alternator on this model is peak continuous rated (as defined in ISO 8528-3).

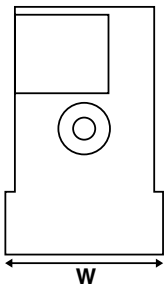
### Prime Rating

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.

### Standard Reference Conditions

Ratings in accordance with ISO 8528. All engine performance data based on the above mentioned maximum continuous ratings. Fuel Consumption data assumes complete combustion of LPG fuel with a calorific value of 95MJ/$m^3$ and of Natural gas with a calorific value of 34.4MJ/$m^3$.




## Weights & Dimensions

| Dimensions: mm (in) | | Weight: kg (lbs) | |
|---|---|---|---|
| Length | 1350 (53.1) | Net (+ lube oil) | 393 (866) |
| Width | 715 (28.1) | Wet (+ lube oil & coolant) | 405 (893) |
| Height | 1004 (39.5) | | |

## General Data

### Documents

A full set of operation and maintenance manuals and circuit wiring diagrams.

### Control Panel Standards

The equipment meets the following standards: BS5000. ISO 8528. ISO 3046. IEC 60034. NEMA MG-1.22.

FG Wilson is a fully accredited ISO 9001 company.

### Warranty

All equipment carries full manufacturer's warranty. Extended warranty terms available. For details on warranty cover please contact your local dealer. or visit our website. www.FGWilson.com