

## PLE410



### Main Features

|              |            |     |
|--------------|------------|-----|
| Frequency    | Hz         | 50  |
| Voltage      | V          | 400 |
| Power factor | cos $\phi$ | 0.8 |
| Phase        |            | 3   |

### Power Rating

|                             |     |        |
|-----------------------------|-----|--------|
| Emergency Standby Power ESP | kVA | 410.39 |
| Emergency Standby Power ESP | kW  | 328.31 |
| Prime power PRP             | kVA | 358.40 |
| Prime power PRP             | kW  | 286.72 |

### Ratings definition (ISO-8528)

#### ESP - Emergency Standby Power:

It is the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 h of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output over 24 h of operation shall not exceed 70 % of the ESP.

#### PRP - Prime Power:

It is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturer. The permissible average power output over 24 h of operation shall not exceed 70 % of the prime power.

## Engine specifications

|                                   |                        |       |
|-----------------------------------|------------------------|-------|
| Engine Brand                      | Perkins                |       |
| Model                             | 2206A-E13TAG2          |       |
| [50Hz] Exhaust emission level     | Non Emission Certified |       |
| Engine cooling system             | Water                  |       |
| Nr. of cylinder and disposition   | 6 in line              |       |
| Displacement                      | cm <sup>3</sup>        | 12500 |
| Aspiration                        | Turbocharged           |       |
| Speed governor                    | Electronic             |       |
| Prime gross power PRP             | kW                     | 324.2 |
| Maximum gross power LTP ESP       | kW                     | 368.4 |
| Oil capacity                      | l                      | 40    |
| Lube oil consumption PRP (max)    | %                      | 0.1   |
| Coolant capacity                  | l                      | 51.4  |
| Fuel                              | Diesel                 |       |
| Specific fuel consumption 75% PRP | g/kWh                  | 198   |
| Specific fuel consumption PRP     | g/kWh                  | 196   |
| Starting system                   | Electric               |       |
| Starting engine capability        | kW                     | 7.8   |
| Electric circuit                  | V                      | 24    |



### Cooling system

- Gear-driven circulating pump
- Mounted belt-driven pusher fan
- Radiator incorporating air-to-air charge cooler, (supplied loose)
- System designed for ambients up to 50°C (122°F)

### Electrical equipment

- 3 level engine protection system
- 24 volt starter motor and 24 volt 70 amp alternator with DC output

### Fuel system

- Fuel cooler
- Governing to ISO 8528-5 class G2 with isochronous capability
- Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control
- Replaceable 'Ecoplus' fuel filter elements with primary filter/water separator

### Oil system

- Full-flow replaceable 'Ecoplus' filter
- Oil cooler integral with filter header
- Wet sump with filler and dipstick

## Alternator Specifications

|                       |             |      |
|-----------------------|-------------|------|
| Alternator            | Leroy Somer |      |
| Model                 | LSA47.2 S4  |      |
| Voltage               | V           | 400  |
| Frequency             | Hz          | 50   |
| Power factor          | $\cos \phi$ | 0.8  |
| Poles                 | 4           |      |
| Voltage tolerance     | %           | 0.5  |
| Efficiency @ 75% load | %           | 94.5 |
| Class                 | H           |      |
| IP protection         | 23          |      |

### SPECIALLY ADAPTED TO APPLICATIONS

The LSA 47.2 alternator is designed to be suitable for typical generator applications, such as: backup, marine applications, rental, telecommunications, etc.

### TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 12 wire re-connectable winding, 2/3 pitch, type no. 6.
- High efficiency and motor starting capacity.
- R 791 interference suppression conforming to standard EN 55011 group 1 class B standard for European zone (CE marking).

### EXCITATION AND REGULATION SYSTEM

- Excitation system: AREP

### REINFORCED MECHANICAL STRUCTURE

- Compact rigid assembly to better withstand generator vibrations.
- Steel frame
- Cast iron flanges and shields.
- single-bearing designed to be suitable for heat engines.
- Half-key balancing bearing.
- Sealed for life ball bearing.

### PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA is IP 23.
- Winding Protection for clean environments with relative humidity  $\leq 95\%$ , including indoor marine environments.

### COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA alternator conforms to the main international standards and regulations:

- IEC 60034, NEMA MG 1.32-33, ISO 8528-3, CSA / UL 1146 (UL 1004 on request), marine regulations, etc.

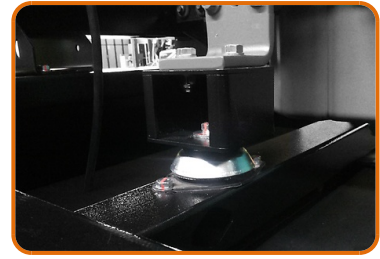
It can be integrated into a CE marked generator.

The LSA is designed, manufactured and marketed in an ISO 9001 environment and ISO 14001.

## Genset equipment

### BASE FRAME MADE OF WELDED STEEL PROFILE, COMPLETE WITH:

- Anti-vibration mountings properly sized
- Screwed support legs.



### PLASTIC FUEL TANK WITH THE FOLLOWING COMPONENT:

- Filler neck
- Air breather (ventilation pipe)
- Minimum fuel level sensor



### MANUAL OIL DRAINING PUMP:

- Oil draining facilities



### ENGINE COMPLETE WITH:

- Battery
- Liquids (no fuel)



### CANOPY:

- Soundproof canopy made up of modular panels, realized with zinc-coated steel as treatment against corrosion and aggressive conditions, properly fixed and sealed allowing a full weatherproof enclosure.
- Easy access to the genset for maintenance purposes thanks to: Wide lateral access doors fixed by stainless steel hinges and provided with plastic lockable handles and internal perforated galvanized steel-sheet; Detachable panels, with screws holes protected by rubber tap.
- Control panel protection door provided with suitable window and lockable handle.
- Lateral air inlet opening properly protected and soundproofed. Exhaust air outlet from the roof, through wet section protected by proper grid.
- Double lifting points frame structure.

### SOUNDPROOF:

- Noise attenuation thanks to soundproofing material
- Efficient residential silencer placed inside the canopy



### Dimensional data

|                    |        |         |
|--------------------|--------|---------|
| Length             | (L) mm | 4400    |
| Width              | (W) mm | 1560    |
| Height             | (H) mm | 2250    |
| Fuel tank capacity | l      | 636     |
| Fuel tank material |        | Plastic |

### Autonomy

|                             |     |       |
|-----------------------------|-----|-------|
| Fuel consumption @ 75% PRP  | l/h | 58.23 |
| Fuel consumption @ 100% PRP | l/h | 75.65 |
| Running time 75% PRP        | h   | 10.92 |
| Running time 100% PRP       | h   | 8.41  |

### Noise level

|                              |       |    |
|------------------------------|-------|----|
| Guaranteed noise level (LWA) | dB(A) | 97 |
| Noise pressure level @ 7 m   | dB(A) | 67 |

### Installation data

|                         |                     |        |
|-------------------------|---------------------|--------|
| Total air flow          | m <sup>3</sup> /min | 729.30 |
| Exhaust gas flow        | m <sup>3</sup> /min | 56.6   |
| Exhaust gas temperature | °C                  | 630    |

### Electrical Data

|                 |   |        |
|-----------------|---|--------|
| Max current     | A | 592.36 |
| Circuit breaker | A | 630    |

### Control panel availability

|                         |     |
|-------------------------|-----|
| AUTOMATIC CONTROL PANEL | ACP |
| MODULAR PARALLEL PANEL  | MPP |

## ACP - Automatic control panel

Mounted on the genset, complete with digital control unit AC03 for monitoring, control and protection of the generating set, protected through door with lockable handle

### DIGITAL INSTRUMENTATION

- Generating set voltage (3 phases)
- Mains voltage
- Generating set frequency
- Generating set current (3 phases)
- Battery voltage
- Power (kVA - kW - kVAr)
- Power factor Cos  $\phi$
- Hours-counter
- Engine speed r.p.m.
- Fuel level (%)
- Engine temperature (depending on model)

### COMMANDS AND OTHERS

- Four operation modes: OFF - Manual starting - Automatic starting - Automatic test
- Pushbutton for forcing Mains contactor or Genset contactor
- Push-buttons: start/stop, fault reset, up/down/page/enter selection
- Remote starting availability
- DC system disconnection switch
- Acoustic alarm
- Automatic battery charger
- RS232 Communication port
- Settable PASSWORD for protection level

### PROTECTIONS WITH ALARM

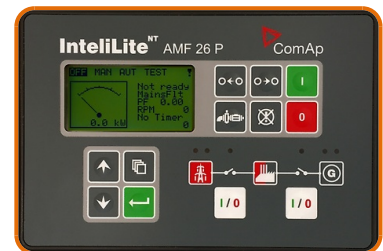
- Engine protections: low fuel level, low oil pressure, high engine temperature
- Genset protections: under/over voltage, overload, under/over frequency, starting failure, under/over battery voltage

### PROTECTIONS WITH SHUTDOWN

- Engine protections: low fuel level, low oil pressure, high engine temperature
- Genset protection: under/over voltage, overload, under/over battery voltage, battery charger failure
- Circuit breaker protection: III poles
- Earth Fault included in the control unit

### OTHERS PROTECTIONS

- Emergency stop button
- Panel protected through door with lockable handle



### OUT PUT PANEL ACP

|  |          |
|--|----------|
| Predisposed for remote control optional: | RCG      |
| External Terminal Board (ETB)            | Standard |
| Socket kit                               | Optional |

## MPP - Modular parallel panel

Mounted on the genset, complete with digital control unit IntelliVision5 for monitoring, control, protection and load sharing for both single and multiple gen-sets operating in standby or parallel modes (up to 32 gen-sets in island).

### DIGITAL INSTRUMENTATION

- Mains: voltage, Intensity, Frequency.
- Mains kW - kVAr -Power factor Cos f.
- Generating set voltage (3 phases).
- Generating set frequency.
- Generating set current (3 phases).
- Generating set Power (kVA - kW - kVAr).
- Generating set Power factor Cos f.
- Generating set kWh and kVAh.
- Battery voltage.
- Hours-counter.
- Engine speed r.p.m.
- Fuel level (%).
- Engine temperature (depending on model).
- Oil pressure (depending on model).

### COMMAND AND OTHERS

- Graphical display 320x240 pixels.
- Operation modes: OFF - AMF function - Single Parallel to mains Island application - Single Parallel to Mains AMF application - Multiple parallel genset Island application.
- Pushbutton for forcing Mains Breaker/contactor or Genset Breaker/contactor.
- Push-buttons: start/stop, fault reset, up/down/page/enter selection.
- Multiple parallel and Power Management operation with digital load AVR sharing.
- Automatic synchronizing and power control (via speed goveroner or ECU)
- Baseload Import/Export and Peak shaving
- Voltage and PF control (AVR).
- Configurable digital I/O (12/12) and analogue inputs (3).
- Integrate PLC programmable functions.
- Event-based history (up to 500records).
- Selectable measurement range 120/277V and 0-1/0-5A.
- Remote starting and Blocking signal availability.
- DC system disconnection switch.
- Acoustic alarm.
- Automatic battery charger.
- 2xRS232/RS485/USB Communication ports.
- Settable PASSWORD for protection level.

### PROTECTION WITH ALARM AND SHUTDOWN

- Engine protections: low fuel level, low oil pressure, high engine temperature.
- Genset protections: under/over voltage, overload, under/over frequency, starting failure, under/over battery voltage
- Others: overcurrent, shortcircuit, reverse power, Earth fault

### OTHERS PROTECTION:

- Circuit breaker protection: IV poles Motorized.
- Emergency stop button.
- Panel protected through door with lochetable handle

### OUT PUT PANEL MPP

|   |   |     |
|---|---|-----|
| Multi-pin connectors (in and out ) for parallel with other generators | n | 2   |
| Connecting cable with 2 connectors multipin (length 10m)              | n | 1   |
| External terminal board   |   | ETB |



## Supplements:

To be ordered with equipment (when necessary) :

### CONTROL PANEL SUPPLEMENT

|   |         |
|---|---------|
| RCG - Various supplements for remote controls - available for models: | ACP MPP |
| TLP - Various supplements for remote signals - available for models:  | ACP MPP |
| ADI - Adjustable Differential Intensity - available only for models:  | ACP     |
| TIF - IV Poles Circuit Breaker instead of III - available for models: | ACP     |



### Socket kit

|   |     |
|---|-----|
| Kit SKB or Kit SKC (for total n. 4 socket) - available for model: | ACP |
| Individual CB and Earth Fault protection                          |     |
| 3P+N+T 400V 63A   | n 1 |
| 3P+N+T CEE 400V 32A   | n 1 |
| 230V/16A SCHUKO   | n 1 |
| With version SKB:   |     |
| 3P+N+T CEE 400V 16A   | n 1 |
| With version SKC:   |     |
| 400V/125A 3P+N+T CEE  | n 1 |

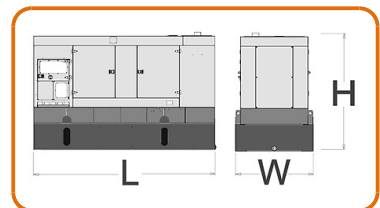


### GENSET EQUIPMENT

|  |   |
|--|---|
| LPT - Leak Proof Tray  | ● |
| AFP - Automatic Fuel Pump  | ● |
| KRT- Kit Rental for HEI gensets which includes: 3-way fuel valve, battery switch | ● |

### Extended Fuel Tank

|                    |        |      |
|--------------------|--------|------|
| Fuel tank capacity | l      | 3330 |
| Length (Genset)    | (L) mm | 3977 |
| Width (Genset)     | (W) mm | 1618 |
| Height (Genset)    | (H) mm | 2571 |



### ENGINE SUPPLEMENTS

|                                  |         |
|----------------------------------|---------|
| PHS - Coolant Pre-Heating System | ACP MPP |
|----------------------------------|---------|

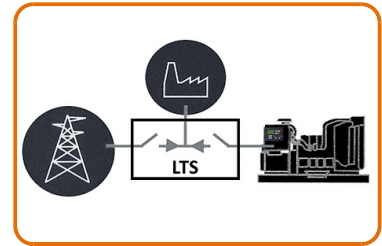


## Accessories

Items available as accessory equipment

### LTS - Load Transfer Switch [Accessories for ACP Automatic Control Panel]

The Load Transfer Switch (LTS) panel operates the power supply changeover between the generator and the Mains in backup applications, guarantying the feeding to the load within a short period of time. It consists of a standalone cabinet which can be installed separate from the generating set. The logic control of the power supply changeover is operated by means of the Automatic Control Panel (ACP) mounted on the generating set, so therefore none logic device is required on the LTS panel.



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