

## Features:

- Excitation system: self-excited
- ATS (automatic transfer switch) receptacle
- Lockable battery isolator switch
- Stainless galvanized zinc plates with strong corrosion resistance
- Vibration isolators between the engine/alternator and base frame
- Integrated wiring design
- Base fuel tank for at least 8 hours running
- Equipped with an industrial muffler
- Engine oil pump
- 50 C radiator
- Top lifting and steel base frame with forklift holes
- Drainage for fuel tank
- Complete protection functions and safety labels
- IP54 (soundproof sets), IP56 (control system)
- Water jacket preheater, oil heater and double air cleaner, etc. are available.



### Output Ratings

| Generating Set Model | Prime          | Standby        |
|----------------------|----------------|----------------|
| <b>EP1250</b>        | 1250kVA/1000kW | 1375kVA/1100kW |

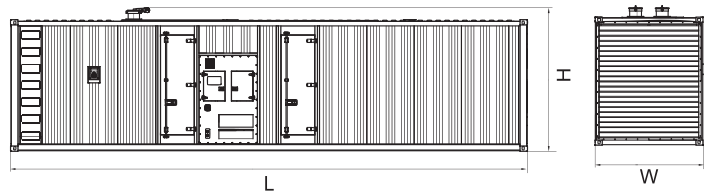
Ratings at 0.8 power factor.

### Ratings and Performance Data

|   |                |      |
|---|----------------|------|
| <b>Engine Make &amp; Model:</b>           | 4012-46TWG2A   |      |
| <b>Alternator Model:</b>                  | LSA50.2M6      |      |
| <b>Alternator Brand:</b>                  | Leroy Somer    |      |
| <b>Control System:</b>                    | PLC-7420       |      |
| <b>Noise Level@7m:</b>                    | /              |      |
| <b>Circuit Breaker Type:</b>              | /              |      |
| <b>Frequency &amp; Phase:</b>             | 50Hz & 3PH     |      |
| <b>Engine Speed: RPM</b>                  | 1500           |      |
| <b>Structure Type:</b>                    | <b>EP1250</b>  | C    |
| <b>Fuel Tank Capacity: L</b>              | <b>EP1250</b>  | 2000 |
| <b>Fuel Consumption: l/hr (100% Load)</b> | <b>Prime</b>   | /    |
|   | <b>Standby</b> | /    |

### Dimensions and Weights

| Generating Set Model | Length (L)<br>mm (in) | Width (W)<br>mm (in)            | Height (H)<br>mm (in) | Dry<br>kg (lb) | Wet<br>kg (lb) |
|----------------------|-----------------------|---------------------------------|-----------------------|----------------|----------------|
| <b>EP1250</b>        | 12192                 | 2438                            | 3150                  | 19469          | /              |
| Dry = With Lube Oil  |                       | Wet = With Lube Oil and Coolant |                       |                |                |



Also available in the following voltages: 415/240V-380/220V-220/127V-200/115V;

ESP: Standby Power Standby duty, operation under variable load, without over load;

PRP: Prime Power-Continuous duty operation, under variable load 24/24h-10% over load permissible 1 hour/12 hours;

The data is only for your reference but not for use of sales.

M: Mechanical speed governor, E/ECU: Electronic speed governor;

NA: Naturally aspirated, TC: Turbocharged, TCA: Turbocharged and air-air aftercooled. TCW: Water-cooled Turbocharged;

The weights are approximate and without fuel.

## Engine model: 4012-46TWG2A

### Cooling system

Recommended coolant: 50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. For CHP systems and where there is no likelihood of ambient temperature below 10 °C, then clean 'soft' water may be used, treated with 1% by volume of Perkins inhibitor in the cooling system. The inhibitor is available in 1 litre bottles from all Perkins Distributors.

Maximum pressure in crankcase water jacket . . . . . 170 kPa  
 Maximum top tank temperature (standby) . . . . . 98 °C  
 Maximum static pressure on pump . . . . . 70 kPa  
 Maximum pressure cap setting . . . . . 70 kPa

### Total coolant capacity

Electronit (engine only) . . . . . 73 litres  
 ElectropaK  
 -temperate (engine and radiator) . . . . . 196 litres  
 -tropical (engine and radiator) . . . . . 201 litres  
 Maximum permissible restriction to coolant pump flow . . . . . 20 kPa  
 Thermostat operating range . . . . . 71 - 85 °C  
 Temperature rise across the engine (standby power) with inhibited coolant . . . . . 8 °C  
 Shutdown switch setting . . . . . 101 °C (rising)  
 Coolant immersion heater capacity . . . . . 2 x 4 kW

### Water jacket cooling data

Coolant flow . . . . . 948 l/min  
 Coolant exit temperature (max) . . . . . 98 °C  
 Coolant inlet temperature (min) . . . . . 70 °C  
 Coolant inlet temperature (max) . . . . . 85 °C

### Cooling clearance

| 4012-46TWG2A - Temperate  |    |     |        |
|---|----|-----|--------|
| Maximum additional restriction (duct allowance) to cooling airflow, and resultant min airflow |    |     |        |
| Description   | °C | Pa  | m³/sec |
| Ambient clearance:<br>Inhibited coolant   | 35 | N/A | N/A    |
| Duct allowance  | 35 | 250 | N/A    |
| Minimum airflow   | 35 | 250 | 22     |

### Fuel system

Injection system . . . . . direct injection  
 Fuel injection pump/Injector type . . . . . Combined unit injector  
 Injector pressure . . . . . 23,4 MPa  
 Fuel lift pump type . . . . . Gerotor  
 Delivery flow . . . . . 1020 litres/hr  
 Heat retained in fuel to tank  
 -4012-46TWG2A . . . . . 8,5 kW  
 -4012-46TWG3A . . . . . 9,0 kW  
 Fuel inlet temperature to be less than . . . . . 58 °C  
 Delivery pressure . . . . . 300 kPa  
 Maximum suction head at pump inlet . . . . . 24,5 kPa  
 Maximum static pressure head . . . . . see installation manual for details  
 Fuel filter spacing . . . . . 10 microns  
 Governing type . . . . . electronic  
 Governing . . . . . to ISO 8528-5 2005  
 Torque at the governor output shaft . . . . . 1-631  
 Tolerance on fuel consumption . . . . . to ISO 8528-1 1993

### Coolant pump

-speed . . . . . 1.4 x engine rev/min  
 -method of drive . . . . . engine (gear) driven

### Radiator

Face area  
 -temperate . . . . . 2630400 mm²  
 -tropical . . . . . 2967420 mm²  
 Number of rows and material . . . . . 226  
 Fins per inch and material . . . . . 7  
 Width of matrix  
 -temperate . . . . . 1600 mm  
 -tropical . . . . . 1805 mm  
 Height of matrix . . . . . 1644 mm  
 Weight (dry)  
 -temperate . . . . . 780 kg  
 -tropical . . . . . 843 kg  
 Total coolant capacity  
 -temperate . . . . . 123 litres  
 -tropical . . . . . 128 litres  
 Pressure cap setting (min) . . . . . 69 kPa

### Fan

Type . . . . . engine driven  
 Diameter  
 -temperate . . . . . 1400 mm  
 -tropical . . . . . 1530 mm  
 Number of blades . . . . . 12  
 Material . . . . . Aluminium  
 Drive ratio  
 -temperate . . . . . 1:1  
 -tropical . . . . . 1:0,9

| 4012-46TWG2A - Tropical   |    |     |        |
|---|----|-----|--------|
| Maximum additional restriction (duct allowance) to cooling airflow, and resultant min airflow |    |     |        |
| Description   | °C | Pa  | m³/sec |
| Ambient clearance:<br>Inhibited coolant   | 50 | N/A | N/A    |
| Duct allowance  | 50 | 125 | N/A    |
| Minimum airflow   | 50 | 125 | 28     |

## Engine model: 4012-46TWG2A

### Fuel specification

Recommended fuel to conform to: ..... -BS2869 1998 class A2 or BS EN590

### Fuel consumption

**Note:** All fuel consumption figures are based on assumed fuel density of 0.862.

#### 4012-46TWG2A - Temperate

| Designation           | Fuel consumption calculated on nett rated powers |           |
|-----------------------|--|-----------|
|                       | 1500 rev/min                                     |           |
|                       | g/kWh  | litres/hr |
| Standby               | 212  | 287       |
| Prime power           | 211  | 258       |
| Baseload power        | 213  | 206       |
| At 75% of Prime power | 214  | 196       |
| At 50% of Prime power | 230  | 141       |

#### 4012-46TWG2A - Tropical

| Designation           | Fuel consumption calculated on nett rated powers |           |
|-----------------------|--|-----------|
|                       | 1500 rev/min                                     |           |
|                       | g/kWh  | litres/hr |
| Standby               | 213  | 288       |
| Prime power           | 212  | 259       |
| Baseload power        | 214  | 207       |
| At 75% of Prime power | 216  | 196       |
| At 50% of Prime power | 233  | 143       |

### Electrical system

Alternator

-type ..... insulated return  
 -voltage ..... 24 volts  
 -output ..... 40 amps

Starter

-type ..... (axial) electric  
 -motor voltage ..... 24 volts  
 -motor power ..... 16,4 kW  
 Number of teeth on  
 -flywheel ..... 156  
 -starter motor ..... 12  
 Minimum cranking speed ..... 120 rev/min  
 Starter solenoid (24V)  
 -pull in current @ -25 °C max. .... 30 amps  
 -hold in current @ -25 °C max ..... 9 amps  
 Engine stop solenoid current ..... 1,1 amps

### Engine mounting

Maximum static bending moment at rear face of block ... 1356 Nm  
 Maximum additional load applied to flywheel due to rotating components ..... 850 kg

### Centre of gravity

Bare engine (wet) 4012-46TWG2A / 4012-46TWG3A

-forward of rear face of cylinder block ..... 658 mm  
 -above crankshaft centre line ..... 32 mm  
 ElectropaK (wet) - Temperate

-forward of rear face of cylinder block ..... 960 mm  
 -above crankshaft centre line ..... 32 mm  
 ElectropaK (wet) - Tropical  
 -forward of rear face of cylinder block ..... 1286 mm  
 -above crankshaft centre line ..... 32 mm

### Cold start recommendations

| Temperature range    |   |
|----------------------|---|
| Down to 0 °C (32 °F) | Oil: .....API CH4 15W40<br>Starter: ..... 2 x 24 volts<br>Battery: ..... 4 x 12V 286 Ah<br>Max breakaway current: ..... 1600 amps<br>Cranking current: ..... 810 amps<br>Aids: ..... block heaters<br>Min mean cranking speed:..... 120 rev/min |

#### Notes:

- The battery capacity is defined by the 20 hour rate
- The oil specification should be for the minimum ambient temperature as the oil will not be warmed by the immersion heater
- Breakaway current is dependant on battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

### Lubrication system

Recommended multigrade oil viscosity (15W40) which adequately meets the specifications of API CH4. For further details refer to the engine OMM.

#### Lubricating oil capacity

Total system ..... 177 litres  
 Sump maximum ..... 157,5 litres  
 Sump minimum ..... 115 litres  
 Oil temperature at normal operating conditions ..... 95 °C  
 Oil temperature (in rail) - maximum continuous operation .. 105 °C

#### Lubricating oil pressure

minimum ..... 340 kPa  
 At rated speed ..... 400 kPa  
 Oil relief opens ..... 400 kPa  
 Oil filter screen spacing ..... 20 microns  
 Sump drain plug tapping size ..... G1  
 Lubricating oil pump speed ..... 1.4 x engine rev/min  
 Lubricating oil pump drive method ..... engine driven  
 Shutdown switch - pressure setting (where fitted) 193 kPa (falling)

#### Normal operating angles

-front and rear ..... 5°  
 -side tilt ..... 10°

| Oil consumption (prime power)                |        | 4012-46TWG2A | 4012-46TWG3A |
|--|--------|--------------|--------------|
| After running-in (typically after 250 hours) | g/kWhr | 0,52         | 0,52         |
| Oil flow rate from oil pump                  | l/s    | 6,0          | 6,0          |

## Alternator model: LSA50.2M6

### SPECIALLY ADAPTED FOR APPLICATIONS

The LSA 50.2 alternator is designed to be suitable for typical generator set applications, such as: backup, base production, cogeneration, marine applications, rental, telecommunications, etc.

### COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA 50.2 alternator conforms to the main international standards and regulations:  
IEC 60034, NEMA MG 1.22, ISO 8528, CSA/UL on request, marine regulations, etc.  
It can be integrated into a CE marked generator.  
The LSA 50.2 is designed, manufactured and marketed in an ISO 9001 environment.

### TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 6-wire re-connectable winding, 2/3 pitch, type no. 6S.
- Voltage range 50 Hz : 380V - 400V - 415V - 440 V and 220V - 230V - 240V ,
- Voltage range 60 Hz : 380V - 416V - 440V - 480V and 220 V - 240 V.
- High efficiency and motor starting capacity.
- Other voltages are possible with optional adapted windings :
  - 50 Hz : 440 V (no. 7S), 500 V (no. 9S), 600 V (no. 22S or 23S), 690 V (no. 10S or 52S)
  - 60 Hz : 380 V and 416 V (no. 8S), 600 V (no. 9S).
- THD Total harmonic distortion < 3.5% (full load)..
- R 791 interference suppression conforming to standard EN 55011 group 1 class B standard for European zone (CE marking).

### EXCITATION AND REGULATION SYSTEM SUITED TO THE APPLICATION

The LSA 50.2 can be supplied with AREP or PMG excitation system, according to the alternator specification.

| Excitation system |        |        | Regulation options                          |                            |                          |   |                                   |
|-------------------|--------|--------|---|----------------------------|--------------------------|---|-----------------------------------|
| Volage regulator  | AREP   | PMG    | T.I.<br>Current transformer for paralleling | R 726<br>Mains paralleling | R 731<br>3 Phase sensing | R 734<br>3 Phase sensing for mains paralleling unbalanced | P<br>Remote voltage potentiometer |
| R 450             | Std    | Option | √   | √                          | √                        | √   | √                                 |
| D 510             | Option | Option | √   | included                   | included                 | contact factory   | √                                 |

Voltage regulator accuracy +/- 0.5%. √ : possible mounting

### PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA 50.2 is IP 23.
- Standard winding protection for clean environments with relative humidity ≤ 95 %, including indoor marine environments.
- Options: - Filters on air inlet : derating 5%.
  - Filters on air inlet and air outlet (IP 44) : derating 10%.
  - Winding protections for harsh environments and relative humidity greater than 95%.
  - Space heaters.
  - Thermal protection for winding.

### REINFORCED MECHANICAL STRUCTURE USING FINITE ELEMENT MODELLING

- Compact and rigid assembly to better withstand generator vibrations.
- Steel frame.
- Cast iron flanges and shields.
- Twin-bearing and single-bearing versions designed to be suitable for engines on the market.
- Half-key balancing.
- Sealed for life ball bearings, regreasable bearings (optional).
- Standard direction of rotation : clockwise when looking at the drive end view (for anti-clockwise, derate the machine by 5%).

### ACCESSIBLE TERMINAL BOX PROPORTIONED FOR OPTIONAL EQUIPMENT

- Easy access to the voltage regulator and to the connections.
- Possible inclusion of accessories for paralleling, protection and measurement.
- Connection bars for winding reconnection.

## Control System

### PLC-7420

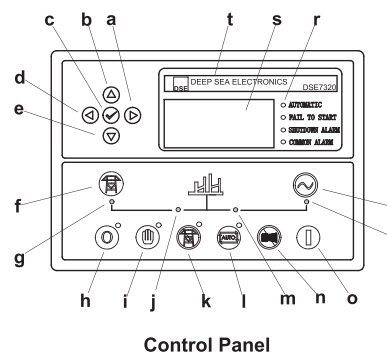
PLC-7420 is an advanced control module based on micro-processor, containing all necessary functions for protection of the genset and the breaker control. It can monitor the mains supply, breaker control and automatically start the engine when the mains is abnormal. Accurately measure various operational parameters and display all values and alarms information on the LCD. In addition, the control module can automatically shut down the engine and indicate the engine failure.

#### FEATURES

- Microprocessor control, with high stability and credibility
- Monitoring and measuring operational parameters of the mains supply and genset
- Indicating operation status, fault conditions, all parameters and alarms
- Multiple protections; multiple parameters display, like pressure, temp. etc.
- Manual, automatic and remote work mode selectable
- Real time clock for time and date display, overall runtime display, 250 log entries
- Overall power output display
- Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
- Communication with PC via RS485 OR RS232 interface, using MODBUS protocol



- a Button (next page)
- b Button (increase value / previous item)
- c Button (accept)
- d Button (previous page)
- e Button (decrease value / next item)
- f Button (transfer the load to the mains supply, when in Manual mode only)
- g Mains supply available LED
- h Stop / Reset button
- i Manual button (Manual control mode)
- j Mains supply on load LED
- k Test button (Test mode) | Auto button (Auto mode)
- m Genset on load LED | n Mute/Lamp test button
- o Start button (Manual) | p Genset available LED
- q Button (transfer the load to the genset, when in Manual mode only)
- r Alarm LED (4 alarm items)
- s LCD display
- t Control module name



Control Panel