

## Features:

- Excitation system: self-excited (AREP and PMG are optional)
- 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
WPS150B/S	150kVA/120kW	165kVA/132kW

Ratings at 0.8 power factor.

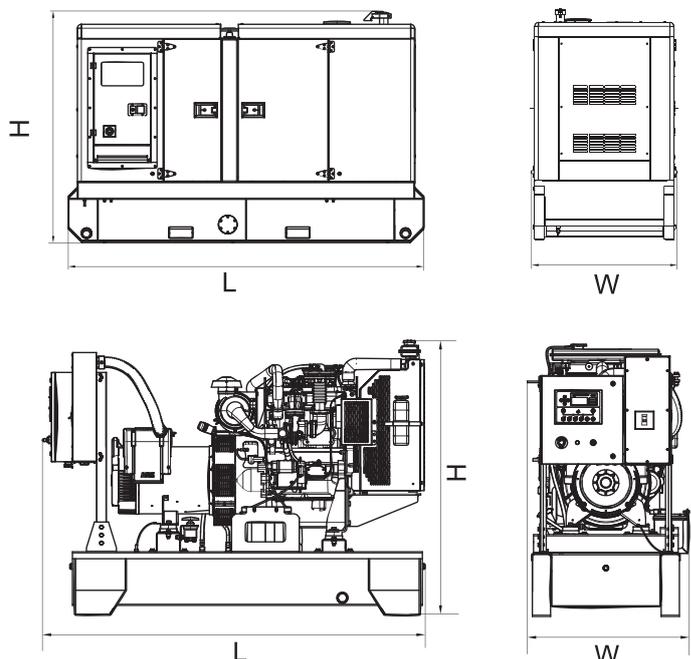
### Ratings and Performance Data

<b>Engine Make &amp; Model:</b>	1106A-70TAG2	
<b>Alternator Model:</b>	LSA44.2M95	
<b>Alternator Brand:</b>	Leroy Somer	
<b>Control System:</b>	PLC-920 / 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>	WPS150B	B
	WPS150BS	R
<b>Fuel Tank Capacity: L</b>	WPS150B	380
	WPS150BS	420
<b>Fuel Consumption: l/hr (100% Load)</b>	Prime	/
	Standby	/

### Dimensions and Weights

Generating Set Model	Length (L) mm (in)	Width (W) mm (in)	Height (H) mm (in)	Dry kg (lb)	Wet kg (lb)
WPS150B	2627	1036	1492	1569	/
WPS150BS	3468	1263	1843	2586	/

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: 1106A-70TAG2

### Cooling system

#### Radiator

-face area ... 0,401 m<sup>2</sup> (4.3 ft<sup>2</sup>)  
 -rows and materials ... 4 rows, brass  
 -gills / inch and material ... 14, copper  
 -width of matrix... 637 mm (25.1 in)  
 -height of matrix ... 630 mm (24.8 in)  
 -pressure cap settings ... 68,9 kPa (9.9 lbf / in<sup>2</sup>)  
 Maximum top tank temperature ... 103 °C (217 °F)  
 Estimated cooling air flow reserve  
 (see 'caution' on page 1) ... 0,15 kPa (0.59 in H<sub>2</sub>O)

#### Charge cooler

-type ... fin and tube  
 -rows and materials ... 1 row / 62 mm (2.4 in) - Aluminium  
 -number of blades... 10 - Aluminium

#### Fan

-diameter ... 635 mm (25 in)  
 -drive ratio ... 1.25 : 1  
 -number of blades... 10  
 -material ... Composite

#### Coolant

Maximum pressure head pump ... 6,8 m (22.3 ft)

#### Coolant capacity

-with radiator ... 37,22 litres (65.5 UK pints)  
 -without radiator ... 12,70 litres (22.4 UK pints)  
 -drain down capacity ... 35,30 litres (62.2 UK pints)  
 Minimum temperature to engine ... 76 °C (169 °F)  
 Temperature rise across engine ... 8 °C (14 °F)  
 Maximum permissible external system resistance 35 kPa (5 lbf/in<sup>2</sup>)  
 Thermostat operating range... 82 - 93 °C (180 - 199 °F)  
 Recommended coolant:

### Electrical system

Type ... Negative ground  
 Alternator output ... 55A 12 / 24v option  
 Starter motor power ... 12 / 24v option

#### Cold start recommendations

Minimum starting temperature °C	Grade of engine lubricating oil	Battery specification			
		BS3911 Cold start amps	SAEJ537 Cold cranking amps	Number of batteries needed	Perkins type
-10	10W	340	540	2	D (069)
-10	20W	340	540	2	D (069)
-15	10W	340	540	2	D (069)
-20	5W	340	540	2	D (069)

### Exhaust system

Maximum back pressure for total system ... TBA  
 Inside diameter of outlet flange ... 78 mm (3.1 in)  
**Note:** Changes to induction restriction, exhaust back pressure and fuel viscosity / temperature / specific gravity, can affect power output. For further details contact Perkins Technical Service Department.

### Fuel system

Type of injection ... Direct  
 Fuel injection pump ... Delphi rotary  
 Fuel atomiser... 0.35 mm diameter  
 Injection pressure ... 24,7 MPa (243.8 atm)

#### Fuel lift pump

-delivery / hour. ... 122,4 litres (215 UK pints)  
 -pressure ... 30 kPa (4.35 lbf / in<sup>2</sup>)  
 Maximum suction head ... 1,8 m (6.0 ft)  
 Maximum pressure head ... 3,0 (9.8 ft)  
**Diesel Fuel** to conform to BS 2869 1983 class A2 ASTM D97566T Number 2D.  
 Governor type... Electronic

#### Fuel consumption litres/hour (UK gallons/hour)

Power rating %			
110	100	75	50
45 (9.9)	41 (9.0)	31 (6.8)	20 (4.4)

### Induction system

#### Maximum permissible air intake restriction at engine

-clean filter ... 3,0 kPa (12 in H<sub>2</sub>O)  
 -dirty filter ... 5,0 kPa (20 in H<sub>2</sub>O)  
 -air filter type ... dry element  
 Minimum dirt capacity... 353 g / m<sup>3</sup> / min  
 Turbocharger type... Garrett T04E

### Lubrication system

#### Capacities

-total ... 19 litres (33.5 UK pints)  
 -sump only ... 16 litres (28.2 UK pints)  
 Maximum operating angles  
 -front up, front down, right side ... 25°

#### Lubricating oil pressure

-relief valve opens... 345 - 414 kPa (50 - 59 lbf / in<sup>2</sup>)  
 -at rated speed ... 300 - 340 kPa (43 - 49 lbf / in<sup>2</sup>)  
 -idle speed ... 62 - 60 kPa (9 - 13 lbf / in<sup>2</sup>)

#### Lubricating oil temperature

-at normal operation ... 105 °C (221 °F)  
 -maximum ... 125 °C (257 °F)  
 Lubricating oil consumption as a % of fuel consumption 0.2% max

#### Recommended SAE viscosity

A single of multigrade lubricating oil which conforms to API CD / SE or CCMC D4 must be used.

#### Mountings

Type ... 4 point rubber mounting  
 Maximum bending moment at rear face of block ... 1130 Nm (835 lbf ft)

## Alternator model: LSA44.2M95

### SPECIALLY ADAPTED FOR APPLICATIONS

The LSA 44.2 alternator is designed to be suitable for typical generator applications, such as: backup, standard production, cogeneration, marine applications, rental, telecommunications, etc.

### COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA 44.2 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 44.2 is designed, manufactured and marketed in an ISO 9001 environment.

### TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 12-wire re-connectable winding, 2/3 pitch, type no. 6 .
- Voltage range: 220 V - 240 V and 380 V - 415 V (440 V) - 50 Hz / 208 V - 240 V and 380 V - 480 V - 60 Hz.
- High efficiency and motor starting capacity.
- Other voltages are possible with optional adapted windings:
  - 50 Hz: 440 V (no. 7), 500 V (no. 9), 600 V (no. 22 or 23), 690 V (no. 10 or 52)
  - 60 Hz: 380 V and 416 V (no. 8), 600 V (no. 9).
- Total harmonic distortion HDT < 2%.
- 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

Excitation system				Regulation options				
Voltage regulator	SHUNT	AREP	PMG	T.I. Current transformer for paralleling	R 726 Mains paralleling	R 731 3-phase sensing	R 734 3-phase sensing on mains paralleling unbalanced	P Remote voltage potentiometer
R 250	Std	-	-	-	-	-	-	√
R 438	-	Std	Std	√	√	√	√	√
D 510	-	optional	optional	√	included	included	NA	√

Voltage regulator accuracy +/- 0.5% - ∅ : possible adaptation - NA : not possible.

### PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA 44. 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 windings and shields.

### 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.
- Greased for life bearings.
- Regreasable bearing option available on SHUNT and AREP versions, not available with PMG.

### ACCESSIBLE TERMINAL BOX PROPORTIONED FOR OPTIONAL EQUIPMENT

- Easy access to the voltage regulator and to the connections.
- Possible clusion of accessories for paralleling, protection and measurement.
- 8 way terminal block for reconnecting voltage reconnection.
- D 510 digital AVR adapted to the machine exterior

WPS150B / WPS150BS

# Control System PLC-920 (Optional)

Multiphase Power PLC-920 generator controllers integrating digital, intelligent and network techniques are used as the automatic control systems for diesel generators. It can carry out functions including pre-alarm, warning & electrical trip, fail monitoring and controls etc.

## FEATURES

- Parameter configuration via RS-232 serial communication;
- Log last 50 events & alarm information with measured values;
- Statistics records;
- Remote start/stop;
- Speed sensing from alternator voltage or magnetic pickup;
- Configurable 3 inputs and 6 outputs;
- ECU powers, ECU stop, STOP or fuel solenoid selection;
- Automatic transfer switching control and engine control;
- Adjustable start, load and stop timers.



## SPECIFICATION

- Dimensions: 111mm\*81mm\*61mm
- Protection: IP65 at front panel
- Operating temperature: -20 °C to 70 °C
- Max. Operating current is 360mA
- Sender measurement: 0 to 1300 ohm
- Panel cut-out: 81mm\*70mm
- Weight: approximately 0.3kg
- DC battery supply voltage: 8 to 32Vdc
- CT secondary: 5A
- Accuracy: 1%FS, resolution: 1 ohm

## FUNCTION

- Pre-Alarm
- Engine temperature
- Oil pressure
- Over/under voltage
- Over/under frequency
- Over/under speed
- Warning & Electrical trip
- Over current
- Short circuit
- Error
- Over/under speed
- Speed loss
- Battery low
- Battery high
- Maintenance
- Over current
- Short circuit
- Engine stop
- Can bus
- Charge alternator
- Fail monitoring
- Emergency stop
- Multiple engage fail
- Failed to start
- Low oil pressure
- High temperature
- Speed failure
- Voltage
- Charging fail
- Shutdown
- Warning
- Controls
- Fuel and stop solenoid
- ECU power and stop
- Starter motor
- Automatic generator start
- Preheat
- External alarm horn
- Engine cooling
- Idle mode

## Control System function list

MODEL	PLC-920	PLC-7420
<b>General Accessory</b>		
AVR	●	●
Electronic Governing	×	×
Glow plug control	●	●
Cycle Cranking	●	●
(MODBUS) Networking	×	●
Fault History	●	●
manual start/stop	●	●
Auto/remote start	●	●
Regular Test	●	●
Auto operation LED	●	●
Manual operation LED	●	●
Common Shutdown LED	●	●
Common warning LED	●	●
Fail to start LED	●	●
Emergency stop(local)	●	●
Alphanumeric screen	●	●
Remote start input active LED	×	●
Alarm reset	●	●
<b>Measurement and Instrumentation</b>		
<b>Engine</b>		
Oil pressure	●	●
Water Temperature	●	●
Engine Speed	●	●
Hours Run	●	●
Number of Starts	●	●
Battery Voltage	●	●
Coolant Temperature	●	●
3Phase-L Voltage&Frequency	●	●
3phase Current	●	●
Frequency	●	●
kWh	●	●
Apparent Power	●	●
Active Power and Reactive Power	●	●
Power Factor	●	●
Per PhasekW, MWr	●	●
Per Phase kVA	●	●
Phase Voltage	●	●
Output Power	×	●
<b>Mains Expression</b>		
Grid Line Voltage	×	●
Grid Phase Voltage	×	●
Grid Frequency		●
<b>Shutdown Protection and Indication</b>		
<b>Engine</b>		
Low Fuel Level	●	●
High Fuel Level	×	○
Low Oil Pressure	●	●
High Water Temperature	●	●
Failure to Stop	●	●
Failure to Start	●	●
Controllable start circles/times	×	●
Overspeed	●	●
<b>Alternator</b>		
Under/Over Voltage	●	●
Under/Over Frequency	●	●
Overcurrent	●	●
Earth Leakage	○	○
Reverse Power	×	×
Reverse kW	×	×
<b>Threshold Warning/Indication</b>		
Low Oil Pressure	●	●
Low Water Temperature	○	○
High Water Temperature	●	●
Low Water Level	●	●
Low/High Battery Voltage	●	●
Failure to Charge	●	●
Overcurrent	●	●
Overload	●	●
Genset Under/Over Voltage	●	●
Genset Under/Over Frequency	●	●
under/over Speed	●	●
High Engine Temperature	●	●
<b>Paralleling Capability</b>		
Earth Leakage	○	○
Synchoscope(Independent Bus)	×	×
Active and Reactive Power Control	×	×
Synchoscope(Shared Bus)	×	×
Synchronization Detector	×	×
Peak Lopping	×	×
<b>Power Transfer Function</b>		
Automatic Transfer	○	●
Hard Closed Transition	●	●
Soft Closed Transition	×	×
Gen/Mains Breaker	×	●
Gen/Mains Breaker Status Protection	×	●
Speed/Voltage Control	×	×
Power Indication	×	●
Fuel&Solenoid Valve Control	●	●
Starter Control	●	●
Preheating	○	○
Mains Transfer Switch (Standard)	×	●
Mains Transfer Switch (Emergency)	×	●
<b>Environment</b>		
Operating Temperature (-40 °C-70 °C)	●	●
Ambient Temperature (-25 °C-45 °C)	●	●
Humidity ≤80%	●	●
<b>Monitoring Function</b>		
Grid Over/Under Voltage Control	×	●
Grid Over/Under Frequency Control	×	●
Remote Start Output(Load/No-load)	●	●
Optional Relay Output	●	●
Remote Telecom Control with All Functions	×	●
Engine Instrument Monitoring	●	●
Alternator Output Instrument Monitoring	●	●
Connection Point with All-around Setting For 4 Users	●	●
3 Users Input Connection Point	●	●
LCD Light Control of Low Light Operation Environment	●	●
Safe PIN Code	●	●
RS232/485 Interface	×	●
Language Selection	●	●
Multi-Language Function	●	●

# Control System

**Digital, intelligent control system allows easier operation.**

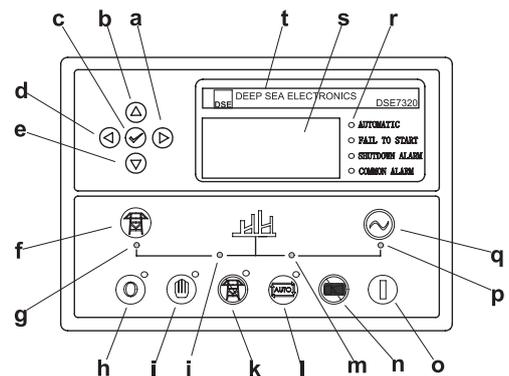
## PLC-7420

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



**Control Panel**

- 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)
- l 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

## Optional

Engine	Alternator	Generator Set	Fuel System	Canopy
<ul style="list-style-type: none"> <li>• Water Jacket Preheater</li> <li>• Oil Preheater</li> </ul>	<ul style="list-style-type: none"> <li>• Winding Temperature Measuring Instrument</li> <li>• Alternator Preheater</li> <li>• PMG</li> <li>• Anti-damp and anti-corrosion treatment</li> <li>• Anti-condensation heater</li> </ul>	<ul style="list-style-type: none"> <li>• Tools with the machine</li> </ul>	<ul style="list-style-type: none"> <li>• Low fuel level alarm</li> <li>• Automatic fuel feeding system</li> <li>• Fuel T-valves</li> </ul>	<ul style="list-style-type: none"> <li>• Trailer</li> </ul>
Lubricating System	Exhaust System	Cooling System	Control Panel	Voltages
<ul style="list-style-type: none"> <li>• Oil with the machine</li> </ul>	<ul style="list-style-type: none"> <li>• Protection board from hotness</li> </ul>	<ul style="list-style-type: none"> <li>• Front heat protection</li> <li>• Coolant (-30°C)</li> </ul>	<ul style="list-style-type: none"> <li>• Remote control panel</li> <li>• PLC-920</li> <li>• PLC-7420</li> <li>• ATS</li> </ul>	<ul style="list-style-type: none"> <li>• 415/240V</li> <li>• 400/230V</li> <li>• 380/220V</li> <li>• 220/127V</li> <li>• 200-115V</li> </ul>

