Diesel Generator

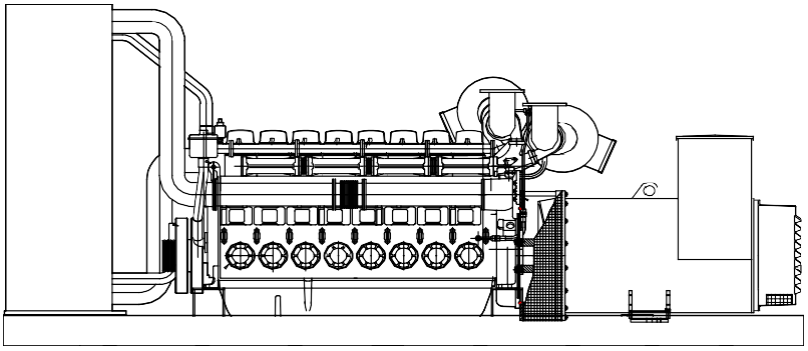
CJ2500PL

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Perkins 4016-61TRG3 diesel engine

Leroy Somer alternator



Standard Generator Features

- AMF, Automatic mains failure unit
- Heavy duty type, 8 cylinder, water cooled engine
- 52°C tropical type radiator
- Starter motor
- Lead acid battery
- Charging alternator
- Battery charge redressor
- Heavy duty, brushless type alternator
- Base frame with anti-vibration units
- Industrial type silencers
- Flexible exhaust compensator
- Block water heater unit
- Control panel with digital-automatic main control module
- Fan, fan drive, charging alternator drive and all rotating parts covered
- Radiator matrix covered by metal mesh against the mechanical damages
- Fabricated and welded steel base frame
- Anti-vibration mountings
- Engine and alternator manufacturer test reports
- Factory load, performance and function tests

Optional Features

- Automatic load transfer panel
- Automatic syncronization and power sharing systems
- Soundproof canopy
- Container type enclosers
- Road trailer
- Job-site trailer
- Protection circuit breaker
- Air start
- Remote type radiator
- Base fuel tank
- External type fuel tank
- Automatic fuel transfer system
- Residential silencer

Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ2500PL	**2500**	**2000**	**2250**	**1800**

APPLICATION DATA

Perkins 4016-61TRG3 Engine

Standard Features

Economic power

- Individual four valve per cylinder heads give optimised gas flows, whilst digitally governed unit fuel injectors ensure ultra fine fuel atomisation and hence controlled rapid combustion, for efficiency and economy
- Commonality of components with other engines in the 4000 Series family allows reduced parts stocking levels

Reliable power

- Developed and tested using latest engineering techniques
- Piston temperatures are controlled by an advanced gallery jet cooling sys.
- All engines are tolerant of a wide range of temperatures without derate
- Service is provided by the extensive Perkins network of over 4.000 distributers and dealers worldwide

Clean, efficient power

- Exceptional power to weight ratio and compact size for easier transportation and installation
- New designed radiator assembilies with corrosion inhibiting powder coated surfaces; fewer pipe joints and easier access to reduce maintenance times
- Designed to provide excellent service access for easy of maintenance
- Engines designed to comply with major international standards
- Low gaseous emissions for cleaner operation

Standards

- UK MOD, BS5750, ISO9001, BS5514/1-1982, ISO 3046/1, ISO 8528/1

Technical Specifications

Manufacturer	PERKINS
Model	4016
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	16
Cylinder arrangement	Vertical in-line
Displacement, Liters	30.561
Bore X Stroke, mm	160 X 190
Compression Ratio	13.6:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	2183
Fan Power, kWm	100
BMEP gross, bar	28,4
Combustion air flow, m³ / min	175
Exhaust gas temp.(after turbo), °C	560
Exhaust gas flow (after turbo),m³ / min	525
Mean piston speed, m / s	9,5

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	52
Engine coolant capacity, Liters	48
Engine+Radiator coolant cap., Liters	149
Jacket coolant flow, Liters / sec	10
Cooling min airflow, m³ / min	1350 (at 50°C)

- Gear driven circulating pump
- Twin thermostats
- Crankshaft pulley for fun drive
- Powder coated radiator assemblies comprising:water radiator; air charge cooled radiator; all pipes, hoses and clips; fan; pulley; fan belts and safety guards

Lubricating System

Type	Pressurized
Capacity, Liters	165.6
Lub oil temp. Max to bearings, °C	105
Lub oil pressure (at 80°C,min), MPa	0.34

- Wet sump with filler and dipstick
- Engine block lub oil temperature stabilizer
- Full-flow spin-on oil filters

Fuel System

Type of injection system	Direct injection
Fuel injection pump	Combined unit injector
Fuel injector opening pressure, bar	234
Delivery/hour at 1500rev/min, Liters	660
Fuel lift pump	Tuthill TCH 1-054
Governor type	Digital electronic governor to ISO 3046 Part 4 class A1

- Unit fuel injectors with lift pump and hand stop control
- Full flow spin-on fuel filters

Electrical System

Alternator	24 Volt with integral regulator
Starter motor (DC)	24 Volt
Starter motor power	8.2 kW

- Combined high coolant temperature / low oil pressure switch
- Overspeed switch and magnetic pick up
- Turbo inlet temperature shutdown switch

Fuel Consumption

liters per hour	%110 Load	529 L
	%100 Load	473 L
	%75 Load	346 L
	%50 Load	236 L
grams per kWh	%110 Load	214 g/kWh
	%100 Load	204 g/kWh
	%75 Load	202 g/kWh
	%50 Load	205 g/kWh

Optional Equipments

- Fuel oil cooling radiator available integral to radiator assemblies
- Twin heavy duty air cleaner - paper element with pre-cleaner
- Changeover lubricating oil filter
- Changeover fuel oil filter
- Immersion heater with thermostat
- Air starters

Leroy Somer Alternator

Standard Features

Top of the Range Electrical Performance
Class H insulation
Standard 6-wire re-connectable winding, 2/3 pitch
High efficiency and motor starting capacity
R 791 interference suppression conforming to standard EN 55011 group 1 class B standard for Europen zone (CE marking)

Protection System Suited to the Environment
The LSA 49.1 is IP23

Reinforced Mechanical Structure Using Finite Element Modelling
Standard direction of rotation: clockwise when looking at the drive end view
Compact and rigid assembly to better withstand generator-set 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 beraing

Accessible Terminal Box Proportioned for Optional Equipment
Easy access to the voltage regulator and to the connections
Possible clusion of accessories for paralelling, protection and measurement
Connection bar for reconnecting voltage

Compliant with International Standards
The LSA 49.1 alternator conforms to the main international standards and regulations:
IEC 60034, NEMA MG 1.22, ISO 8528, CSA, CSA/UL
It can be integrated into a **CE** marked generator set
The LSA 49.1 is designed, manufactured and marketed in an ISO 9001 environment

Marka	Standby		Prime	
	kVA	kW	kVA	kW
Leroy Somer	**2500**	**2000**	**2250**	**1800**

Technical Specifications

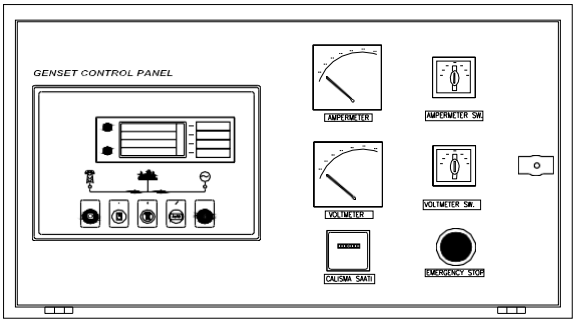
Manufacturer	LEROY SOMER
Model	LSA
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	1100
Efficiency, %	94.3
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	AREP+PMI or PMG
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	R 449
Voltage Regulation, %	± 0.5
Total HarmonicTGH / THC	< 4%
Waveform: NEMA = TIF	< 50
Waveform: I.E.C = THF,	< 2%
Insultion class	H
Overspeed, Rpm	2250
Sustained short-circuit current	300%(3IN) : 10s
Construction	Single bearing, direct coupled
Coupling	Flexible
Amortisseur Windings	Full
Connection	WYE
Rotor	Dynamic balanced
Protection class	IP23
Air flow, m³ / min	1.6

Optional Equipment

- Filters on air inlet and air outlet (IP44)
- Windign protection for clean environmetns with relative humidity greater than 95%
- Space heaters
- Thermal protection for winding
- Digital voltage regulator

Control Panel

Standard Equipments



- digital automatic control module
- Hourmeter
- Voltmeter
- Voltmeter commutator
- Ampermeter
- Ampermeter commutator
- Emergency stop button

Description

- The model is an Automatic Mains Failure Control module.
- The modul is used to monitor a mains supply and automaticlly start a standby generator set.
- The module also provides indication of operational status and fault conditions automaticly shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- Selected timers and alarms can be altered by the user from the front panel.
- Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- 240mm x 172mm dimensions
- 70mm x 40mm dimensions, 4 segment grafical LCD monitor
- Developed 16-bit Microprocessor design
- Easy comprehended display (Hid-Til-Lit SMD LED technology)
- LED mimic diagram
- SMS messaging capability with suitable GSM Modem
- PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- Easy pushbutton controls
- System parameters can be adjusted manually from the front panel
- kVA,kW ve Cosφ measurements
- Communication with MODEM

Pushbutton Controls

STOP / START
AUTO, TEST, MANUAL
LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	kW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
Over-current
Under/over generator frequency
Under/over speed
Charge fail
Emergency stop
Low oil pressure
High engine temperature
Fail to start
Low/high DC battery voltage
Reverse power
Generator phase rotation error
Generator short-circuit protection
Loss of speed sensing signal
Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment
EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.
5Hz to @ +/-7.5mm constant displacement.
8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C
Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

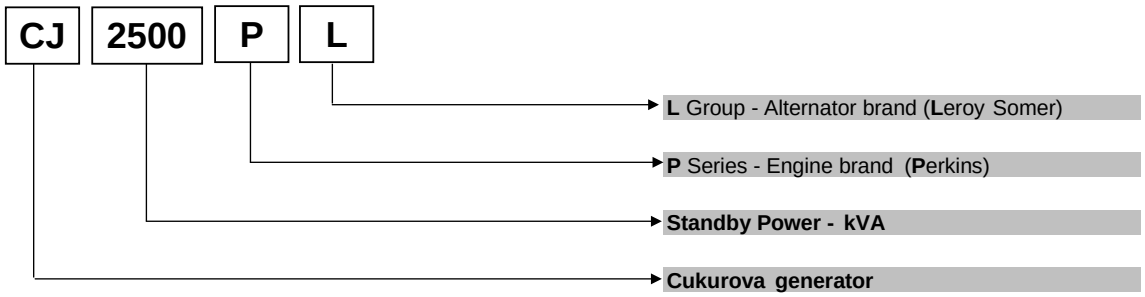
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11mS duration.

Electrical Safety

BS EN 60950 Low Voltage Dirctive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

Cukurova Diesel Generator



Information

Power Ratings

Standby power rating is for the supply of emergency power at variable load for the duration of the non-avalaibality of the mains power supply.No overload capacity is available at this rating.A standby rated engine should be sized for an avarage load factor of 80% based on published standby rating for 500 operating hours per year.Standby ratings should never be applied except in true emergency power failure conditions.

Prime power rating is available for unlimited hours per year with a variable load of which the average engine load factor is 80% of the published power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation.No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

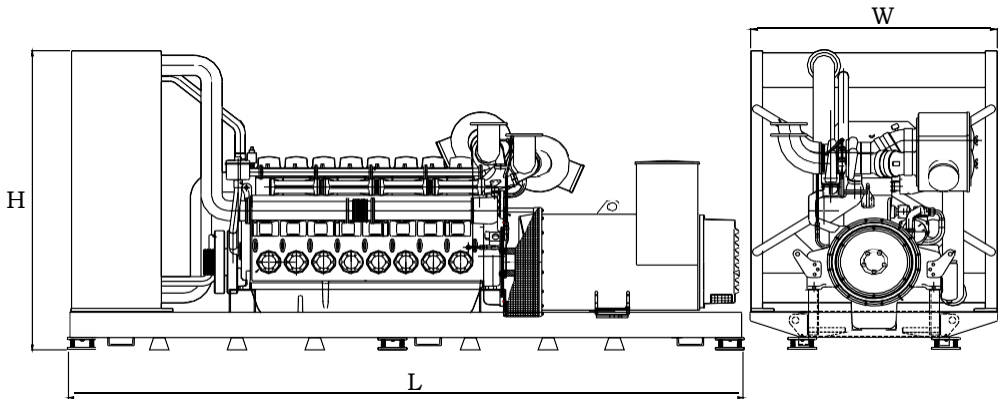
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	(U x I x 1.73 x pf) / 1000	kVA x pf
kVA	(U x I x 1.73) / 1000	kWe / pf
I (Amp)	(kWe x 1000) / (U x 1.73 x pf)	(kVA x 1000) / (U x 1.73)
Frequency	(Rpm x N°Pole) / (2 x 60)	
Rpm	(2 x 60 x Frequency) / N°Pole	

kWm: Mechanical Power
kWe : Electrical Power
pf : Power factor
E : Alternator efficiency
I : Current (A)
U : Voltage (V)
kVA : Power
Rpm: Revolutions per minute

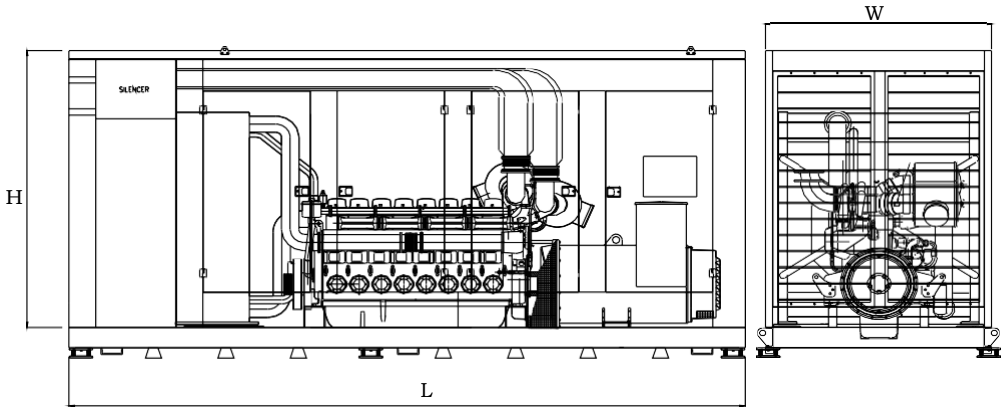
General Dimensions

Standard Generator



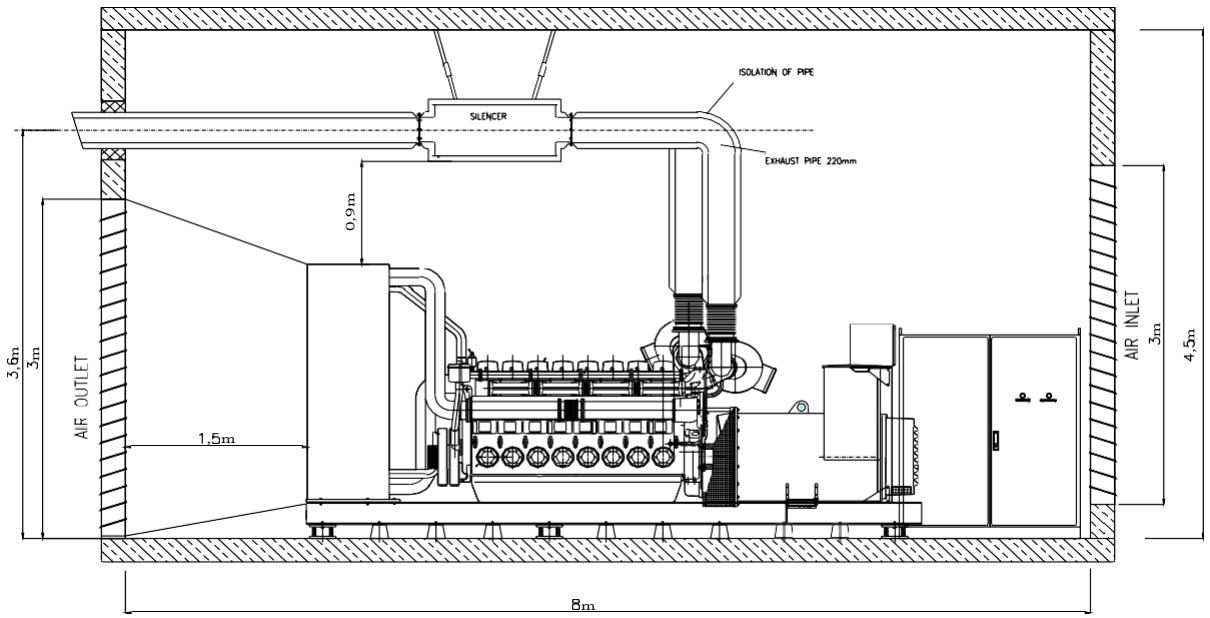
Length, L	6050mm
Heigth, H	2780mm
Width, W	2250mm
Weight, Total	12.915 kg

Generator with Soundproof Canopy



Length, L	**12,200**mm
Heigth, H	3100mm
Width, W	2470mm
Weight, Total	18.710 kg

Generator Room Layout



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