

GOLDEN MAJD Co.



Rating @ 0.8 PF		Prime rating	Stand-by rating
Voltage ^{*1}	Freq. ^{*2}	PT 500 ^{*3}	PT 560S ^{*4}
400 V	50 Hz	500.0 KVA	563.0 KVA
480 V	60 Hz	513.8 KVA	578.2 KVA

The above ratings represent the generating set capability guaranteed within $\pm 3\%$ at the reference conditions equivalent to those specified in ISO 8528/1, ISO 3046/1 and BS 5514/1

NOTES

- 1 - The applicable voltage range is 380V to 415V for 50Hz applications and 380V to 480V for 60Hz applications.
- 2 - This generating set is of switchable speed of 1500rpm/1800rpm.
- 3 - **PT500** is the prime power rating of the generating set, where a variable load and unlimited hours usage are applied on the generating set with an average load factor of 80% of the prime rating over each 24 hour period. Noting that a 10% overload is available for 1 hour in every 12 hours operation.
- 4 - **PT560S** is the standby power rating of the generating set, where a variable load limited to an annual usage up to 500 hours is applied, with 300 hours of which may be continuous running. Noting that no overload is permitted.

Engine Technical Data		
Model	Perkins 2506A-E15TAG2	
Cylinders	6; vertical in-line	
Aspiration	Turbocharged & A/A charge cooled	
Combustion	Direct injection	
Cooling System	Water cooled	
Displacement	15.2 L	
Oil consumption	0.1 % of fuel consumption	
Lube oil capacity	62 L	
Coolant capacity	58 L	
Governor	Electronic	
Emissions regulations	TA Luft compliant	
Speed	1500 rpm	1800 rpm
Fuel Consumption PT500	106 L/H	109 L/H
Fuel Consumption PT560S	111 L/H	121 L/H
Radiator Cooling Air Flow	722 m ³ /min	866 m ³ /min
Max Exhaust Gas Flow	87 m ³ /min	105.3 m ³ /min

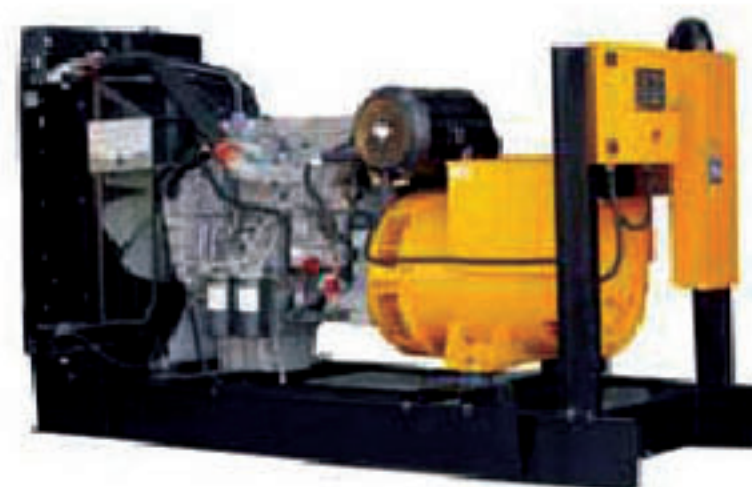
The above performance data are valid as per the following specs:

- Diesel Fuel is according to BS2869 Class A2 or equivalent.
- Lubricating oil is according to API CI 4 (15W/40).
- The coolant should be 50% antifreeze and 50% fresh water.

Alternator Technical Data		
Model	Leroy Somer LSA 47.2 M7	
Regulation	$\pm 0.5\%$	
International protection	IP23	
Insulation class	H	
Terminals	12	
Frequency	50 Hz	60 Hz
Coolant Air Flow	0.9 m ³ /s	1.1 m ³ /s

Shipping Data			
Length	Width	Height	Weight
3750 mm	1120 mm	2150 mm	3660 kg

All information given in this leaflet is correct at the time of printing but it may be changed subsequently by the company



500 - 560S

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2500 Series 2506A-E15TAG2 Diesel Engine – Electropak –

Non-Emissions compliant

478 kWm at 1500 rpm

490 kWm at 1800 rpm

The 2500 Series engine has been developed using the latest engineering techniques and builds on the strengths of the already very successful 2000 Series family and addresses today's uncompromising demands within the power generation industry. Developed from a proven heavy-duty industrial base these products offer superior performance and reliability.

The 2506A-E15TAG2 is a turbocharged and air-to-air charge-cooled, 6 cylinder diesel engine. Its premium features provide exceptional power-to-weight ratio resulting in exceptional fuel consumption.

The overall performance and reliability characteristics make this the prime choice for today's power generation industry.

Economic power

- Mechanically operated unit fuel injectors with advanced electronic control, combined with carefully matched turbocharging, give excellent fuel atomisation which leads to exceptional low fuel consumption

Reliable power

- Developed and tested using the latest engineering techniques and finite element analysis for high reliability
- Low oil usage and low wear rates
- High compression ratio ensures clean rapid starting in all conditions
- Perkins global product support is designed to enhance the customer experience of owning a Perkins powered machine. We deliver this through the quality of our distribution network, extensive global coverage and a range of Perkins supported OEM partnership options. So whether you are an end-user or an equipment manufacturer our engine expertise is essential to your success

Compact, clean and efficient power

- Exceptional power to weight ratio and compact size gives optimum power density for ease of installation and more cost effective transportation
- Designed to provide excellent service access for ease of maintenance



Product support

- Perkins actively pursues product support excellence by ensuring our distribution network invest in their territory – strengthening relationships and providing more value to you, our customer
- Through an experienced global network of distributors and dealers, fully trained engine experts deliver total service support around the clock, 365 days a year. They have a comprehensive suite of web based tools at their fingertips covering technical information, parts identification and ordering systems, all dedicated to maximising the productivity of your engine
- Throughout the entire life of a Perkins engine, we provide access to genuine OE specification parts and service. We give 100% reassurance that you receive the very best in terms of quality for lowest possible cost .. wherever your Perkins powered machine is operating in the world

This engine does not comply with harmonized international regulated emissions limits

Engine Speed (rev/min)	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	bhp	kWm	bhp
1500	Baseload Power*	–	–	–	–	–	–
	Prime Power	500	400	451	605	435	583
	Standby Power	550	440	495	664	478	641
1800	Baseload Power*	–	–	–	–	–	–
	Prime Power	500	400	458	615	435	583
	Standby Power	563	450	514	689	490	657

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1988, BS 5514/1. Derating may be required for conditions outside these; consult Perkins Engines Company Limited.

Generator powers are typical and are based on an average alternator efficiency and a power factor (cos. θ) of 0.8. Fuel specification: BS 2869: Part 2 1998 Class A2 or ASTM D975 D2. Lubricating oil: 15W40 to API C4.

Rating Definitions

Prime Power: Power available at variable load with a load factor not exceeding 80% of the prime power rating. Overload of 10% is permitted for 1 hour in every 12 hours' operation.

Standby Power: Power available in the event of a main power network failure up to a maximum of 500 hours per year of which up to 300 hours may be run continuously. Load factor may be up to 100% of standby power. No overload is permitted.

Photographs are for illustrative purposes only and may not reflect final specification.

All information in this document is substantially correct at time of printing and may be altered subsequently.

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Perkins®

THE HEART OF EVERY GREAT MACHINE

2500 Series 2506A-E15TAG2 Diesel Engine – ElectropaK – Non-Emissions compliant

478 kWm at 1500 rpm

490 kWm at 1800 rpm



Standard ElectropaK specification

Air inlet

- Mounted air filter

Fuel system

- Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control
- Governing to ISO 8528-5 class G3 with isochronous capability
- Replaceable 'Ecoplus' fuel filter elements with primary filter/water separator
- Fuel cooler

Lubrication system

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

Cooling system

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

Electrical equipment

- 24 volt starter motor and 24 volt 70 amp alternator with DC output
- ECM mounted on engine with wiring looms and sensors
- 3 level engine protection system

Flywheel and housing

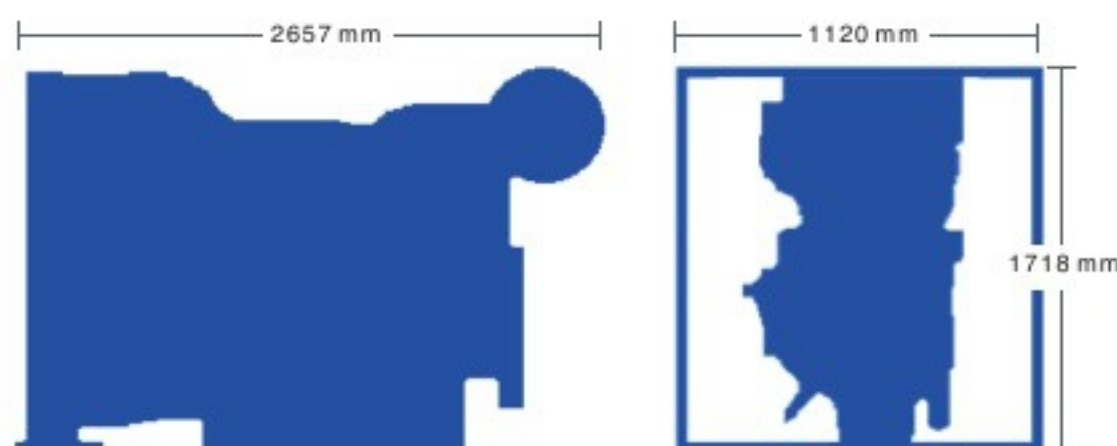
- High inertia flywheel to SAE J620 size 14
- SAE ½ flywheel housing

Mountings

- Front engine mounting bracket

Optional equipment

- 110 volt/240 volt immersion heater
- Additional speed sensor
- Temperature and pressure sensors for gauges
- Air filter rain hood
- Twin starters/facility for second starter
- Tool kit
- Additional manuals
- Closed circuit crankcase ventilation system



Fuel Consumption				
Engine Speed	1500 rev/min		1800 rev/min	
	g/kWh	l/hr	g/kWh	l/hr
Standby	200	111	204	116
Prime Power	199	100	203	102
75% of Prime Power	201	76	206	78
50% of Prime Power	211	53	212	53

General data

Number of cylinders	6
Cylinder arrangement	Vertical in-line
Cycle	4 stroke
Induction system	Turbocharged and air-to-air charge cooled
Combustion system	Direct injection
Cooling system	Water-cooled
Bore and stroke	137 mm x 171 mm
Displacement	15.2 litres
Compression ratio	16:1
Direction of rotation	Anti-clockwise, viewed on flywheel
Total lubrication system capacity	62 litres
Total coolant capacity	58 litres
Dimensions – Length	2657 mm
Width	1120 mm
Height	1718 mm
Dry weight (ElectropaK)	1,633 kg

Final weight and dimensions will depend on completed specification

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THE HEART OF EVERY GREAT MACHINE



Low Voltage alternators - 4 pole
LSA 47.2

365 to 600 kVA - 50 Hz / 456 to 750 kVA - 60 Hz

Electrical and mechanical data

Low Voltage alternators 4 pole 3-phase **PARTNER**

LSA 47.2

365 to 600 kVA - 50 Hz / 456 to 750 kVA - 60 Hz

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.

COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA 47.2 alternator conforms to the main international standards and regulations:

- IEC 60034, NEMA MG 1.32-33, ISO 8528-3, CSA / UL 1446 (UL 1004 on request), marine regulations, etc.

It can be integrated into a CE marked generator.

The LSA 47.2 is designed, manufactured and marketed in an ISO 9001 environment and ISO 14001.

TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 12-wire re-connectable winding, 2/3 pitch, type no. 6 (the LSA 47.2 L9 is available in two versions: 6-wire and 12-wire).
- Voltage range 50 Hz: 220 V - 240 V and 380 V - 415 V (440 V).
- Voltage range 60 Hz: 208 V - 240 V and 380 V - 480 V.
- 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. 23), 690 V (no. 52).
 - 60 Hz : 380 V and 416 V (no. 8), 600 V (no. 9).
- 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				
Volage regulator	SHUNT	AREP	PMG	Current transformer for paralleling	Mains paralleling	3-phase sensing	3-phase sensing for mains paralleling unbalanced	Remote voltage potentiometer
R250	Std	-	-	-	-	-	-	√
R450	Option	Std	Std	C.T.	R726	R731	R734	√
D510C	Option	Option	Option	C.T.	included	included	included	√

Voltage regulator accuracy $\pm 0.5\%$

√ : possible mounting

PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA 47.2 is IP 23.
 - Standard winding protection for clean environments with relative humidity $\leq 95\%$, 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.
- 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.
- 9-way terminal block for voltage reconnection.

Low Voltage alternators 4 pole 3-phase **PARTNER**

LSA 47.2

365 to 600 kVA - 50 Hz / 456 to 750 kVA - 60 Hz

General characteristics

Insulation class	H	Excitation system	SHUNT (12 wire)	AREP or PMG
Winding pitch	2/3 (N° 6 or N° 6S)	AVR type	R 250	R 450
Number of wires	12 (N° 6) / 6 (N° 6S)	Voltage regulation (*)	± 0.5 %	± 0.5 %
Protection	IP 23	Short-circuit current	-	300% (3 IN) : 10s
Altitude	≤ 1000 m	Totale Harmonic distortion THD (**)	no load < 1.5% - on load < 2%	
Overspeed	2250 min ⁻¹	Waveform: NEMA = TIF (**)	< 50	
Air flow	0.9 m³/s (50Hz) / 1.1 (60Hz)			

(*) Steady state. (**) Total harmonic distortion between phases, no-load or on-load (non-distorting)

Ratings 50 Hz - 1500 R.P.M.

kVA / kW - P.F. = 0.8													
Duty/T°C		Continuous duty/40°C			Continuous duty/40°C			Stand-by/40°C			Stand-by/27°C		
Class/T°K		H/125°K			F/105°K			H/150°K			H/163°K		
Phase		3 ph.			3 ph.			3 ph.			3 ph.		
Y		380V	400V	415V	380V	400V	415V	380V	400V	415V	380V	400V	415V
Δ		220V	230V	240V	220V	230V	240V	220V	230V	240V	220V	230V	240V
YY			200V			200V			200V			200V	
12 wires version													
LSA 47.2 VS2	kVA	365			330			405			420		
	kW	292			264			324			336		
LSA 47.2 S4	kVA	410			370			430			450		
	kW	328			296			344			360		
LSA 47.2 S5	kVA	455			405			471			500		
	kW	364			324			377			400		
LSA 47.2 M7	kVA	500			465			550			570		
	kW	400			372			440			456		
LSA 47.2 M8	kVA	550			500			575			600		
	kW	440			400			460			480		
LSA 47.2 L9	kVA	600			535			630			660		
	kW	480			428			504			528		
6 wires version													
Y		380V	400V	415V	380V	400V	415V	380V	400V	415V	380V	400V	415V
Δ		220V	230V	240V	220V	230V	240V	220V	230V	240V	220V	230V	240V
LSA 47.9 L9*	kVA	600			535			630			660		
	kW	480			428			504			528		

Ratings 60 Hz - 1800 R.P.M.

kVA / kW - P.F. = 0.8																	
Duty/T°C		Continuous duty/40°C				Continuous duty/40°C				Stand-by/40°C				Stand-by/27°C			
Class/T°K		H/125°K				F/105°K				H/150°K				H/163°K			
Phase		3 ph.				3 ph.				3 ph.				3 ph.			
Y		380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
Δ		220V	240V			220V	240V			220V	240V			220V	240V		
YY			208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V
12 wires version																	
LSA 47.2 VS2	kVA	424	454	456	456	394	410	410	410	451	483	500	511	469	500	518	530
	kW	339	363	365	365	315	328	328	328	361	386	400	409	375	400	414	424
LSA 47.2 S4	kVA	450	480	500	512	396	442	442	465	475	513	533	550	500	530	550	581
	kW	360	384	400	410	317	354	354	372	380	410	426	440	400	424	440	465
LSA 47.2 S5	kVA	475	510	531	570	441	473	493	518	503	543	566	592	527	562	585	625
	kW	380	408	425	456	353	378	394	414	402	434	453	474	422	450	468	500
LSA 47.2 M7	kVA	562	610	625	625	523	566	581	590	600	651	669	680	625	668	690	700
	kW	450	488	500	500	418	453	465	472	480	521	535	554	500	534	552	560
LSA 47.2 M8	kVA	562	610	630	690	523	566	587	632	600	651	672	729	625	671	705	750
	kW	450	488	504	552	418	453	470	506	480	521	538	583	500	537	564	600
LSA 47.2 L9	kVA	602	661	685	750	556	609	634	675	643	707	734	780	667	728	763	825
	kW	482	529	548	600	445	487	507	540	514	566	587	624	534	582	610	660
6 wires version																	
Y		380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
Δ		220V	240V			220V	240V			220V	240V			220V	240V		
LSA 47.2 L9*	kVA	602	661	685	750	556	609	634	675	643	707	734	780	667	728	763	825
	kW	482	529	548	600	445	487	507	540	514	566	587	624	534	582	610	660

* AREP excitation only

COMPACT (Big Range)

A larger type of the compact enclosure that is used in tight spaces and almost having the same look. The difference between the two is mainly the number of the doors and the silenced exhaust system which is mounted externally.

Characteristics:

- > Body and components made of steel painted with highly corrosive synthetic gloss.
- > Stainless steel locks and hinges.
- > Two large doors on each side for easy maintenance access.
- > Lube oil pipe can be reached externally to allow easy drainage.
- > Special viewing window for the control panel in a lockable door.
- > Lifting points on the base frame.
- > Fuel fill and battery are secured through lockable doors.
- > Exhaust silencing system mounted externally.
- > Emergency stop push button installed on the exterior of the enclosure (optional).



**GHADDAR
MACHINERY Co. S.A.L.**

— YOUR POWER PARTNER —

Range

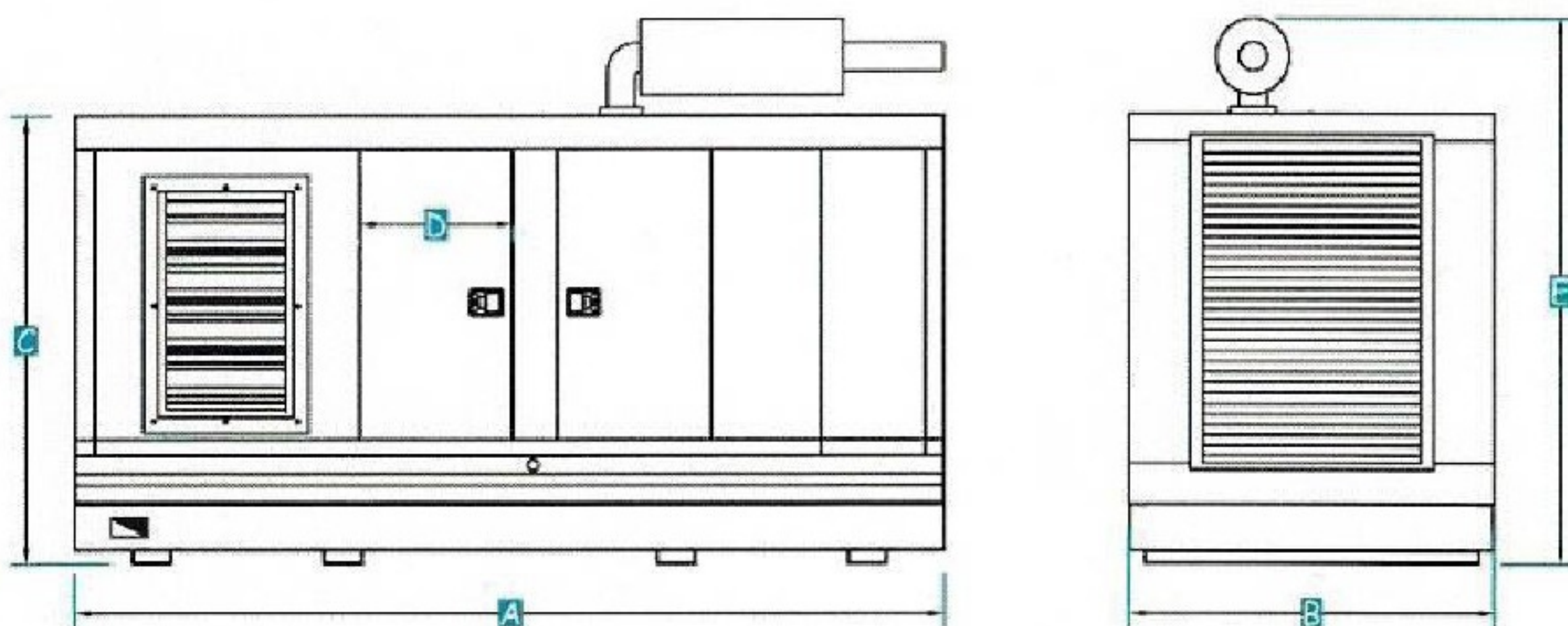
200 - 800 KVA



Certificate Numbers. CC1680-009512. 009912

Sound Pressure Levels (dBA)

		50 Hz						60 Hz					
		1 m		3 m		7 m		1 m		3 m		7 m	
Generating Set	Powertech	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%	0%	100%
Engine model	KVA	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load	Load
1306C-E87TAG3	200	79.7	82.4	76.2	78.3	71.2	73.6	82.6	85.3	79.1	81.2	74.1	76.5
1306C-E87TAG6	250	79.7	82.4	76.2	78.3	71.2	73.6	82.6	85.3	79.1	81.2	74.1	76.5
2206A-E13TAG2	355	81.2	83.9	77.7	79.8	72.7	75.1	84.1	86.8	80.6	82.7	75.6	78
2206A-E13TAG3	410	81.2	83.9	77.7	79.8	72.7	75.1	84.1	86.8	80.6	82.7	75.6	78
2806C-E16TAG1	450	81.9	84.6	78.4	80.5	73.4	75.8	85	87.7	81.5	83.6	76.5	78.9
2806C-E16TAG2	500	81.9	84.6	78.4	80.5	73.4	75.8	85	87.7	81.5	83.6	76.5	78.9
2806C-E18TAG1	550	83.1	86	79.6	82.9	74.6	77.2	86.3	89.2	82.8	85.1	77.8	80.4
2806C-E18TAG2	625	83.1	86	79.6	82.9	74.6	77.2	86.3	89.2	82.8	85.1	77.8	80.4
4006C-23TAG2A	725	83.8	86.7	80.3	83.6	75.3	77.9	87.3	90.2	83.8	87.1	78.8	81.4
4006C-23TAG3A	800	84.1	87.6	80.6	84.5	75.6	78.8	87.5	91	84	87.9	79	82.2



Dimensions

Generating Set	Powertech	A: mm	B: mm	C: mm	D: mm	E: mm
Engine model	KVA					
1306C-E87TAG3	200	4150	1800	2250	735	2570
1306C-E87TAG6	250	4150	1800	2250	735	2570
2206A-E13TAG2	355	4750	2000	2350	729	2850
2206A-E13TAG3	410	4750	2000	2350	729	2850
2806C-E16TAG1	450	5250	2000	2350	822	2850
2806C-E16TAG2	500	5250	2000	2350	822	2850
2806C-E18TAG1	550	5500	2200	2470	822	2920
2806C-E18TAG2	625	5500	2200	2470	822	2920
4006C-23TAG2A	725	5750	2200	2470	822	2920
4006C-23TAG3A	800	5750	2200	2470	822	2920