

GOLDEN MAJD Co.



Rating @ 0.8 PF		Prime rating	Stand-by rating
Voltage ^{*1}	Freq. ^{*2}	PT 750 ^{*3}	PT 820S ^{*4}
400 V	50 Hz	747.3 KVA	819.2 KVA
480 V	60 Hz	756.8 KVA	843.7 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 fixed speed of 1500rpm or 1800rpm.
- 3 - PT750 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 - PT820S 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 4006-23TAG2A	
Cylinders	6; vertical in-line	
Aspiration	Turbocharged & A/A charge cooled	
Combustion	Direct injection	
Cooling System	Water cooled	
Displacement	22.921 L	
Oil consumption	0.25 % of fuel consumption	
Lube oil capacity	113.4 L	
Coolant capacity	105.0 L	
Governor	Electronic-Digital	
Emissions regulations	½ TA-Luft	
Speed	1500 rpm	1800 rpm
Fuel Consumption PT750	157 L/H	177 L/H
Fuel Consumption PT820S	173 L/H	199 L/H
Radiator Cooling Air Flow	1200 m³/min	1320 m³/min
Max Exhaust Gas Flow	180 m³/min	190 m³/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 CG 4 (15W/40).
- The coolant should be 50% antifreeze and 50% fresh water.

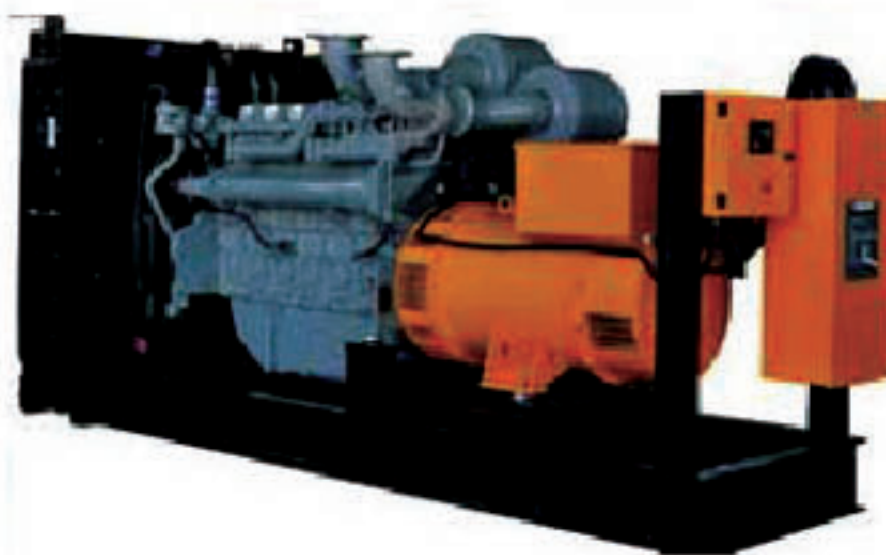
Alternator Technical Data

Model	Leroy Somer LSA 49.1 M75	
Regulation	$\pm 0.5\%$	
International protection	IP23	
Insulation class	H	
Terminals	6	
Frequency	50 Hz	60 Hz
Coolant Air Flow	1.0 m³/s	1.2 m³/s

Shipping Data

Length	Width	Height	Weight
4250 mm	1920 mm	2290 mm	6100 kg

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



750 - 820S

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4000 Series 4006-23TAG2A Diesel Engine – Electropak

695 kWm at 1500 rpm
715 kWm at 1800 rpm

The Perkins 4000 Series is a family of 6, 8, 12 and 16 cylinder diesel engines, designed to address today's uncompromising demands within the power generation industry with particular aim at the standby market sector. Developed from a proven engine range that offers superior performance and reliability.

The 4006-23TAG2A is a newly developed, turbocharged and air-to-air charge cooled, 6 cylinder diesel engine offered with either temperate or tropical cooling. Its premium features and design provide economic and durable operation as well as an exceptional power to weight ratio, excellent load acceptance and improved gaseous emissions, plus the overall performance and reliability characteristics essential to the power generation market.



Economic power

- Individual 4 valve cylinder heads giving optimised gas flows
- Unit fuel injectors ensure ultra fine fuel atomisation and hence controlled rapid combustion
- Commonality of components with other engines in the 4000 Series family for reduced stocking levels
- Designed to provide excellent service access for ease of maintenance
- Engines to comply with major international standards
- Low gaseous emissions that will satisfy the requirements of ½ TA Luft (1986)

Reliable power

- Developed and tested using the latest engineering techniques
- Piston temperatures controlled by an advanced gallery jet cooling system
- Tolerant of a wide range of temperature without derate
- 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
- 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

Compact, clean and efficient power

- Exceptional power to weight ratio and compact size give optimum power density for easier transportation and installation

Engine Speed (rev/min)	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	bhp	kWm	bhp
1500	Continuous Baseload	600	480	531	712	505	677
	Prime Power	750	600	658	882	632	847
	Standby (maximum)	825	660	721	967	695	932
1800	Continuous Baseload	600	480	554	743	511	685
	Prime Power	750	600	684	917	638	855
	Standby (maximum)	825	660	759	1018	702	941

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, 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 CG4.

Rating Definitions

Baseload Power: Power available for continuous full load operation. No overload is permitted on baseload power. 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.

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Perkins®

THE HEART OF EVERY GREAT MACHINE

4000 Series 4006-23TAG2A Diesel Engine – Electropak

695 kWm at 1500 rpm

715 kWm at 1800 rpm



Standard Electropak specification

Air inlet

- Mounted air filter

Fuel system

- Direct fuel injection system, fuel lift pump
- Fuel cooler

Governing

- Heinzmann digital governor – governing to ISO 8528-5 Class G2

Lubrication system

- Wet sump with filler and dipstick
- Lubrication oil filters
- Oil cooler with separate filter header

Cooling system

- Twin thermostats, water pump
- System designed for ambients up to 35°C or 50°C
- Radiator supplied loose incorporating air-to-air charge cooler

Electrical equipment

- 24 volt starter motor, 24 volt 70 amp battery charging alternator with integral voltage regulator and activating switch
- High coolant temperature switch
- Low oil pressure switch

Flywheel and housing

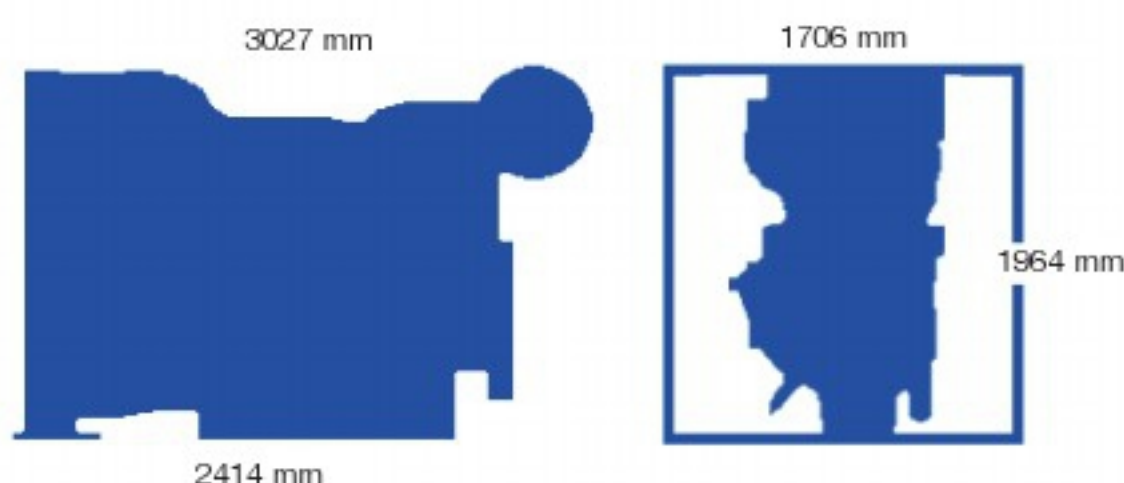
- SAE J620 size 18 flywheel
- SAE 'O' flywheel housing

Literature

- User's Handbook and Parts Manual

Optional equipment

- Heavy-duty air cleaners – paper element with pre-cleaner
- Changeover lubrication oil filter
- Changeover fuel filter
- Immersion heater with thermostat
- Additional manuals
- 4 metre wiring harness
- Tropical or temperate radiator kit
- Temperate fan



Fuel Consumption				
Engine Speed	1500 rev/min		1800 rev/min	
	g/kWh	l/hr	g/kWh	l/hr
Standby	202	169	226	199
Prime Power	202	155	222	177
Baseload Power	203	126	210	136
75% of Prime Power	204	117	212	129
50% of Prime Power	208	80	212	90

Based on measurements with A2 diesel specification fuel

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.....	160 x 190 mm (6.3 x 7.5 in)
Displacement	22.9 litres (1397 cu in)
Compression ratio	13.6:1
Direction of rotation	Anti-clockwise, viewed on flywheel
Firing order	1, 5, 3, 6, 2, 4
Total lubrication system capacity.....	113.4 litres (30 US gal)
Total coolant capacity	105 litres (27.7 US gal)
Dimensions – Length	3027 mm (119 in)
Width	1706 mm (67 in)
Height	1964 mm (77 in)
Dry weight (engine).....	2524 kg (5564 lb)

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 49.1

660 to 1000 kVA - 50 Hz / 792 to 1250 kVA - 60 Hz

Electrical and mechanical data

3867 en - 2011.03 / g

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

LSA 49.1

660 to 1000 kVA - 50 Hz / 792 to 1250 kVA - 60 Hz

SPECIALLY ADAPTED TO APPLICATIONS

The LSA 49.1 alternator is designed to be suitable for typical generator applications, such as: backup, marine applications, rental, telecommunications, etc.

COMPLIANT WITH INTERNATIONAL STANDARDS

The LSA 49.1 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 49.1 is designed, manufactured and marketed in an ISO 9001 environment and ISO 14001.

TOP OF THE RANGE ELECTRICAL PERFORMANCE

- Class H insulation.
- Standard 6-wire re-connectable winding, 2/3 pitch, type no. 6.
- Voltage range 50 Hz: 380V - 400V - 415V 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. 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).
- 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	AREP	PMG	Current transformer for paralleling	Mains paralleling	3-phase sensing	3-phase sensing for mains paralleling unbalanced	Remote voltage potentiometer
R450	Std	Option	C.T.	R726	R731	R734	√
D510C	Option	Option	C.T.	included	included	contact factory	√

Voltage regulator accuracy $\pm 0.5\%$ - √: possible mounting

PROTECTION SYSTEM SUITED TO THE ENVIRONMENT

- The LSA 49.1 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 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.
- Regreasable bearings.
- 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 bar for reconnecting voltage.

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

LSA 49.1

660 to 1000 kVA - 50 Hz / 792 to 1250 kVA - 60 Hz

General characteristics

Insulation class	H	Air flow L11	1.2 m³/s (50 Hz) - 1.4 m³/s (60 Hz)
Winding pitch	2/3 (n° 6S)	Excitation system	AREP or PMG
Number of wires	6	AVR type	R 450
Protection	IP 23	Voltage regulation (*)	± 0.5 %
Altitude	≤ 1000 m	Short-circuit current	300% (3 IN) : 10s
Overspeed	2250 min ⁻¹	Totale Harmonic distortion THD (**)	at no load < 4 % - on load < 4 %
Air flow except L11	1 m³/s (50 Hz) - 1.2 m³/s (60 Hz)	Waveform: NEMA= TIF (**)	< 50

(*) 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
LSA 49.1 S4	kVA	660	660	660	594	594	594	693	693	693	725	725	725
	kW	528	528	528	475	475	475	554	554	554	580	580	580
LSA 49.1 M6	kVA	725	725	725	653	653	653	760	760	760	800	800	800
	kW	580	580	580	522	522	522	608	608	608	640	640	640
LSA 49.1 M75	kVA	775	800	775	698	720	698	810	840	810	850	880	850
	kW	620	640	620	558	576	558	648	672	648	680	704	680
LSA 49.1 L9	kVA	880	880	880	792	792	792	920	920	920	960	960	960
	kW	704	704	704	634	634	634	736	736	736	768	768	768
LSA 49.1 L10	kVA	890	910	890	800	820	800	934	955	934	979	1000	979
	kW	712	728	712	640	656	640	747	764	747	783	800	783
LSA 49.1 L11	kVA	1000	1000	1000	910	910	910	1050	1050	1050	1100	1100	1100
	kW	800	800	800	728	728	728	840	840	840	880	880	880

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		
LSA 49.1 S4	kVA	710	710	725	792	639	639	652	712	745	745	760	830	781	781	798	871
	kW	568	568	580	634	511	511	522	570	596	596	608	664	625	625	638	697
LSA 49.1 M6	kVA	780	780	800	870	702	702	720	783	819	819	840	913	858	858	880	957
	kW	624	624	640	696	562	562	576	626	655	655	672	730	686	686	704	766
LSA 49.1 M75	kVA	866	936	960	960	780	842	865	865	910	983	1008	1008	953	1030	1056	1056
	kW	693	749	768	768	624	674	692	692	728	786	806	806	762	824	845	845
LSA 49.1 L9	kVA	910	980	1010	1056	819	882	909	950	955	1029	1060	1108	1000	1078	1111	1162
	kW	728	784	808	845	655	706	727	760	764	823	848	886	800	862	889	930
LSA 49.1 L10	kVA	958	1020	1050	1092	862	918	945	983	1006	1071	1102	1146	1054	1122	1155	1200
	kW	766	816	840	874	690	734	756	786	805	857	882	917	843	898	924	960
LSA 49.1 L11	kVA	1000	1080	1145	1250	900	980	1040	1140	1040	1135	1200	1310	1090	1190	1260	1375
	kW	800	864	916	1000	720	784	832	912	832	908	960	1048	872	952	1008	1100

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.

Charasteristics:

- > 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 —

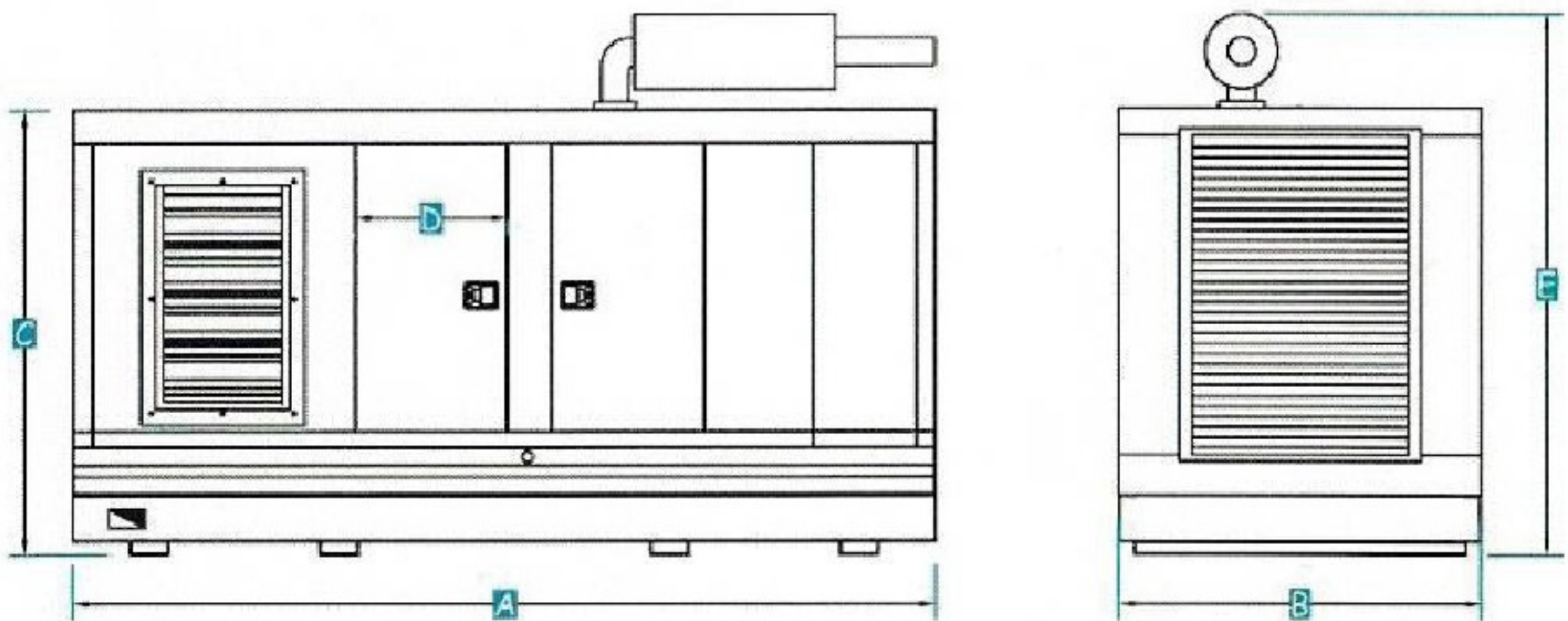
Range
200 - 800 KVA



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