

GOLDEN MAJD Co.



Rating @ 0.8 PF		Prime rating	Stand-by rating
Voltage ^{*1}	Freq. ^{*2}	PT 1000 ^{*3}	PT 1100S ^{*4}
400 V	50 Hz	1000 KVA	1100 KVA
480 V	60 Hz	995.2 KVA	1095 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 480V for 50Hz applications and 380V to 480V for 60Hz applications.
- 2 - This generating set is of fixed speed of 1500rpm or 1800rpm.
- 3 - **PT1000** 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 - **PT1100S** 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 4008TAG2A/4008TAG2	
Cylinders	8; vertical in-line	
Aspiration	Turbocharged & A/A charge cooled	
Combustion	Direct injection	
Cooling System	Water cooled	
Displacement	30.561 L	
Oil consumption	0.25% of fuel consumption	
Lube oil capacity	153 L	
Coolant capacity	149 L	
Governor	Electronic - Digital	
Emissions regulations	TA-Luft(1986)	
Speed	1500 rpm	1800 rpm
Fuel Consumption PT1000	220 L/H	213 L/H
Fuel Consumption PT1100S	248 L/H	216 L/H
Radiator Cooling Air Flow	1350 m ³ /s	1290 m ³ /s
Max Exhaust Gas Flow	200 m ³ /min	202 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 CH 4 (15W/40).
- The coolant should be 50% antifreeze and 50% fresh water.

Alternator Technical Data

Model	Leroy Somer LSA 49.1L11	
Regulation	$\pm 0.5\%$	
International protection	IP23	
Insulation class	H	
Terminals	6	
Frequency	50 Hz	60 Hz
Coolant Air Flow	1.2 m ³ /s	1.4 m ³ /s

Shipping Data

Length	Width	Height	Weight
4900 mm	2050 mm	2470 mm	7510 kg

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



1000 - 1100S

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4000 Series 4008TAG1A/2A Diesel Engine – Electropak

844 kWm 1500 rev/min TAG1A

924 kWm 1500 rev/min TAG2A

Emission Compliant

The Perkins 4000 Series family of 6, 8, 12 and 16 cylinder diesel engines was designed in advance of today's uncompromising demands within the power generation industry and includes superior performance and reliability.

The 4008TAG1A/2A Electropaks are turbo-charged, air-to-air charge cooled, 8 cylinder in-line diesel engines. Offered with either Temperate or Tropical cooling packages (with or without fuel cooling). Their premium design and specification features provide economic and durable operation as well as exceptional power to weight ratio, improved serviceability, low gaseous emissions, overall performance and reliability essential to the power generation market.

Economic power

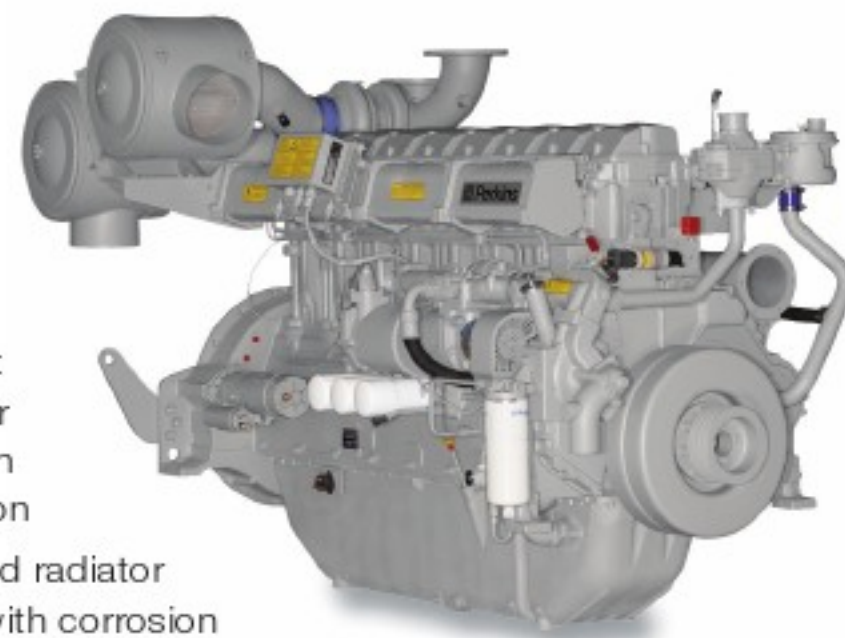
- Individual four valve per cylinder heads give optimised gas flows, whilst digitally governed unit fuel injectors ensure ultra fine fuel atomisation and hence controlled rapid combustion, for efficiency and economy
- Commonality of components with other engines in the 4000 Series family allows reduced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

Reliable power

- Developed and tested using latest engineering techniques
- Piston temperatures are controlled by an advanced gallery jet cooling system
- All engines are tolerant of a wide range of temperatures 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

Clean, efficient power

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



Engine Model Rated Speed Radiator Type	Type of Operation	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	bhp	kWm	bhp
4008TAG1A 1500 rev/min Tropical	Baseload Power	720	576	644	864	602	807
	Prime Power	911	728	805	1080	767	1029
	Standby (maximum)	1002	802	882	1183	844	1132
4008TAG2A 1500 rev/min Tropical	Baseload Power	809	647	719	964	681	913
	Prime Power	1022	818	899	1206	861	1155
	Standby (maximum)	1093	874	962	1290	924	1239

The above ratings represent the engine performance capabilities guaranteed within plus or minus 3% at the reference conditions equivalent to those specified in ISO 8528/1, ISO 3046/1, BS5514/1.

Rating conditions: 25°C air inlet temperature, barometric pressure 100 kPa, relative humidity 30%. Please consult your distributor or the factory for ratings in other ambient conditions.

Note: For full ratings please refer to Perkins Engines Company Limited. All electrical ratings are based on an average alternator efficiency and a power factor of 0.8.

Full specification: BS2869: Class A1 + A2 or ASTM D975 No 2D.

Rating Definitions

Baseload Power: Power available for continuous full load operation. No overload is permitted. Prime Power: Power available for variable load with an average load factor not exceeding 80% of the prime power rating in any 24 hour period. Overload of 10% permitted for one hour in every twelve hours operation. Standby (maximum): Power available at variable load in the event of a main power network failure up to a maximum of 500 hours per year. 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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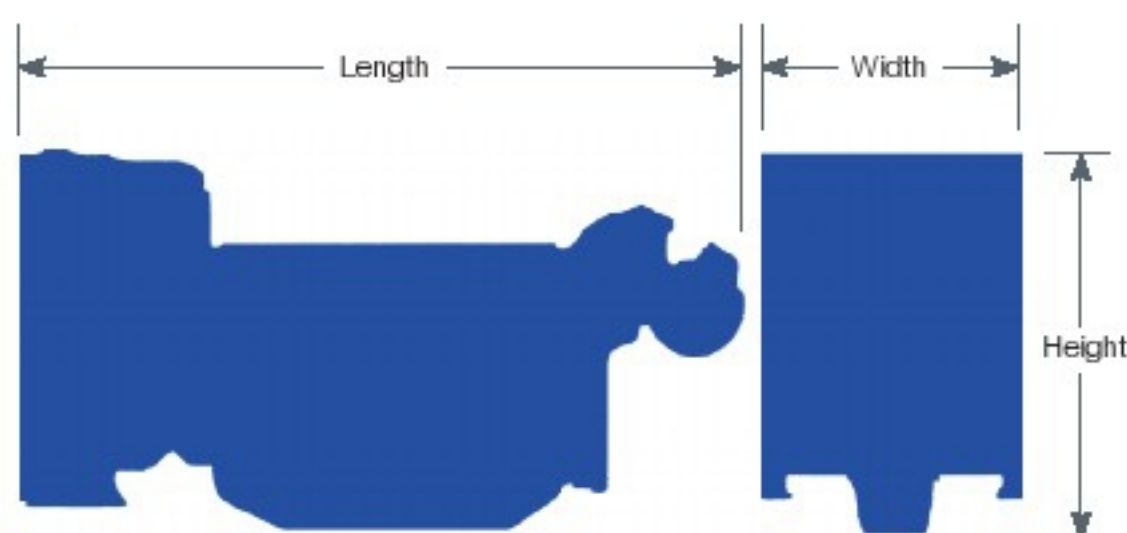
THE HEART OF EVERY GREAT MACHINE

4000 Series 4008TAG1A/2A Diesel Engine – ElectropaK

844 kWm 1500 rev/min TAG1A

924 kWm 1500 rev/min TAG2A

Emission Compliant



See General data

Standard ElectropaK specification

Air inlet

- Mounted oil filters and turbochargers

Fuel system

- Unit fuel injectors with lift pump and hand stop control
- Digital electronic governor to ISO 3046 Part 4 Class A1
- Full-flow spin-on fuel oil filters

Lubrication system

- Wet sump with filler and dipstick
- Full-flow spin-on oil filters
- Engine jacket water/lub oil temperature stabiliser

Cooling system

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

Electrical system

- 24 volt starter motor and 24 volt/40 amp alternator with integral regulator and DC output
- 24 volt combined high coolant temperature/low oil pressure switch
- Overspeed switch and magnetic pickup
- Turbine inlet temperature shutdown switch
- 24 volt stop solenoid (energised to run)

Flywheel and housing

- Flywheel to SAE J620 size 18
- SAE 0 flywheel housing

Optional equipment

Other optional extra equipment available:

Choice of Temperate or Tropical radiators available dependent on operational cooling requirements

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

Instrument panel

Note: This list is not exhaustive, further options may be available to meet particular applications on enquiry to Perkins Sales Department

4008TAG1A (1500 rev/min)		
Fuel Consumption for Temperate and Tropical		
Engine Speed	g/kWh	litres/hr
At Standby Maximum Power Rating	210	218
At Prime Power Rating	206	195
At Continuous Baseload Rating	203	154
At 75% of Prime Power Rating	201	143
At 50% of Prime Power Rating	207	98
At 25% of Prime Power Rating	217	52

4008TAG2A (1500 rev/min)		
Fuel Consumption for Temperate and Tropical		
Engine Speed	g/kWh	litres/hr
At Standby Maximum Power Rating	221	286
At Prime Power Rating	214	226
At Continuous Baseload Rating	205	175
At 75% of Prime Power Rating	203	163
At 50% of Prime Power Rating	206	109
At 25% of Prime Power Rating	218	59

General data

Number of cylinders	8 vertical in-line	
Bore and stroke	160 mm x 190 mm	
Displacement	30.561 litres	
Aspiration	Turbocharged and air-to-air charge cooled	
Cycle	4 stroke	
Combustion system	Direct injection	
Compression ratio	13.6:1	
Rotation	Anti-clockwise viewed from flywheel end	
Cooling system	Water-cooled	
Total lubrication system capacity	153 litres	
	Temperate cooling	Tropical cooling
Ambient coolant clearance TAG1A	41°C	50°C
Ambient coolant clearance TAG2A	35°C	50°C
Total coolant capacity	143 litres	149 litres
Dimensions – Length	3852 mm	3711 mm
Width	2046 mm	2046 mm
Height	2067 mm	2146 mm
Dry weight	4270 kg *	4320 kg *

* For fuel cooler, add 6 kg

Final weight and dimensions will depend on completed specification

Photographs are for illustrative purposes only and may not reflect final 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

Attenuator-Attenuator

This type of enclosures is distinguished from all of our other types with its excellent capability of noise reduction, this is mainly because of the presense of attenuators on each of the air inlet and outlet sides. It is fully weather proofed and the exhaust muffler is mounted on the top to ensure proper cooling and ventilation.

Charasteristics:

- > Body and components made of steel painted with highly corrosive synthetic gloss.
- > Large doors for maintenance (two or four depending on the size).
- > Stainless steel locks and hinges.
- > Easy access for the radiator and the control panel through the outlet and inlet attenuators.
- > Lube oil pipe can be reached externally to allow easy drainage.
- > Fuel fill and battery are secured through lockable doors.
- > Lifting points on the top of the enclosure.
- > Exhaust silencing system mounted externally.
- > Emergency stop push button installed on the exterior of the enclosure (optional).



GHADDAR
MACHINERY Co. S.A.L.



Range

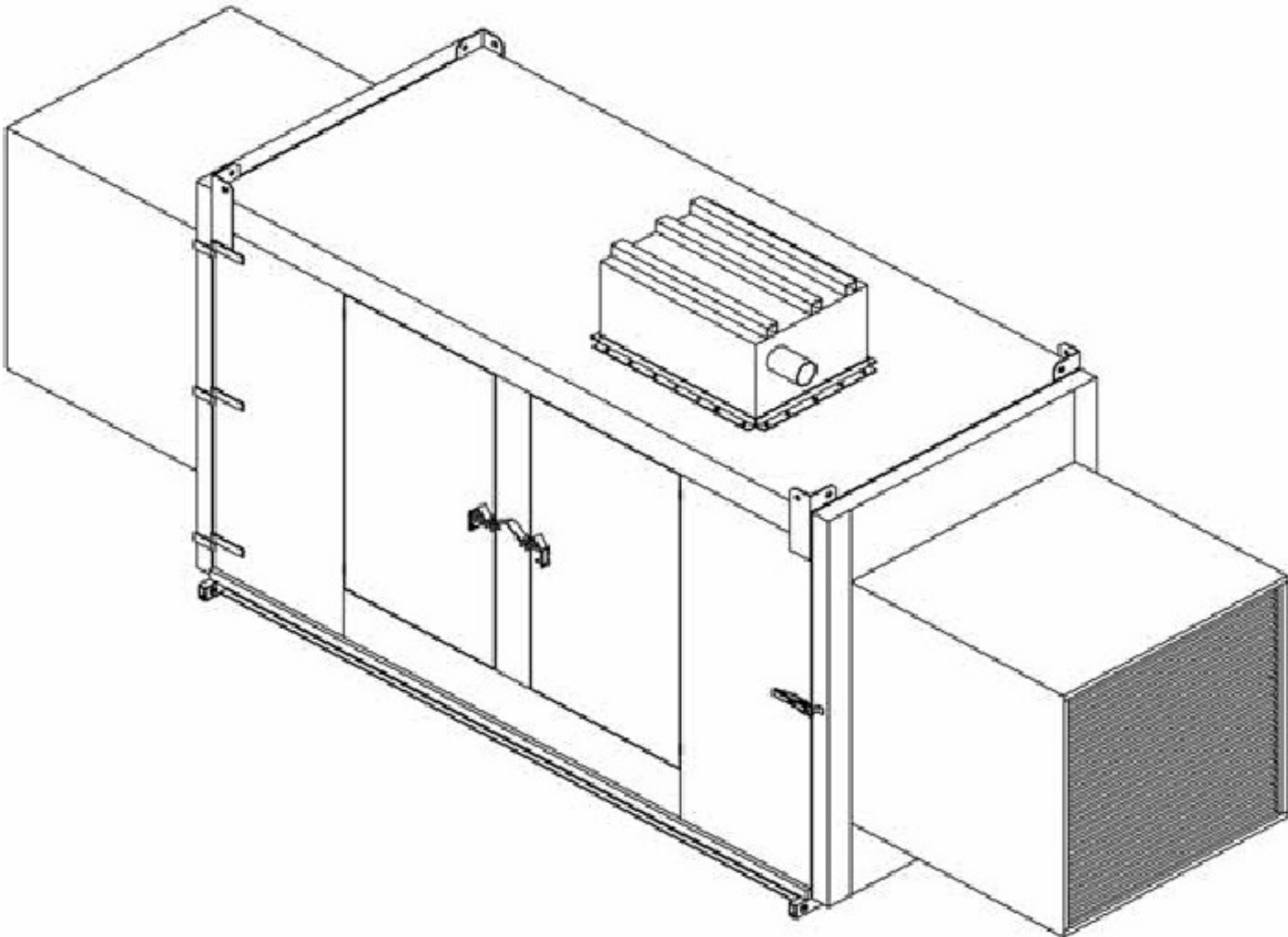
9 - 1500 KVA

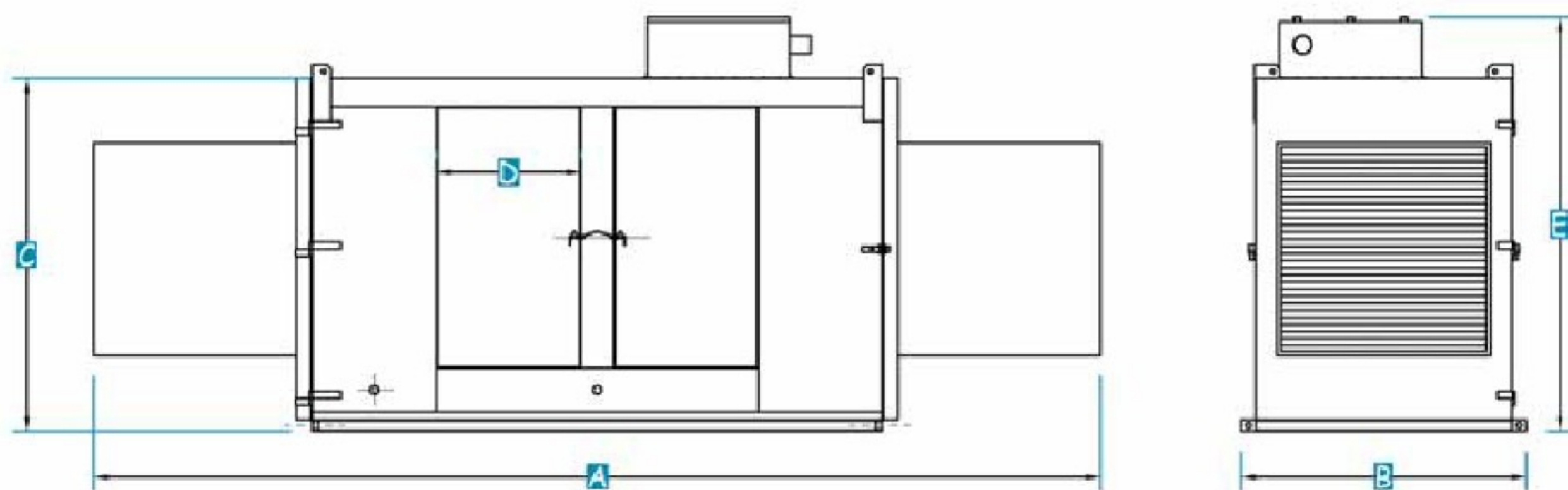


Certificate Numbers: CC1680-009512, 009912

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
403C-11G	9	66.5	67.8	63.5	64.8	58.5	59.8	68.2	69.5	65.2	66.5	60.2	61.5
403C-15G	13	66.5	67.8	63.5	64.8	58.5	59.8	68.2	69.5	65.2	66.5	60.2	61.5
404C-22G	20	66.5	67.8	63.5	64.8	58.5	59.8	68.2	69.5	65.2	66.5	60.2	61.5
1103A-33G	30	68.7	70.2	65.2	66.7	60.2	61.7	70.6	72.1	67.1	68.6	62.1	63.6
1103A-33TG1	45	67.3	68.8	63.8	65.3	58.8	60.3	69.2	70.7	65.7	67.2	60.7	62.2
1103A-33TG2	60	67.3	68.8	63.8	65.3	58.8	60.3	69.2	70.7	65.7	67.2	60.7	62.2
1104A-44TG1	65	67.3	68.8	63.8	65.3	58.8	60.3	69.2	70.7	65.7	67.2	60.7	62.2
1104A-44TG2	80	68.5	70	65	66.5	60	61.2	70.3	71.8	66.8	68.3	61.8	63
1006TG1A	95	70.3	71.8	66.8	68.3	61.8	63	72.8	74.3	69.3	70.8	64.3	65.5
1104C-44TAG2	100	70.3	71.8	66.8	68.3	61.8	63	72.8	74.3	69.3	70.8	64.3	65.5
1006TG2	105	70.3	71.8	66.8	68.3	61.8	63	72.8	74.3	69.3	70.8	64.3	65.5
1006TAG1	135	71.5	73	68	69.5	63	64.2	74	75.5	70.5	72	65.5	66.7
1006TAG2	150	71.5	73	68	69.5	63	64.2	74	75.5	70.5	72	65.5	66.7
1306C-E87TAG3	200	73.7	76.4	70.2	72.3	65.2	67.6	76.6	79.3	73.1	75.2	68.1	70.5
1306C-E87TAG6	250	73.7	76.4	70.2	72.3	65.2	67.6	76.6	79.3	73.1	75.2	68.1	70.5
2306C-E14TAG2	350	75.2	77.9	71.7	73.8	66.7	69.1	78.1	80.8	74.6	76.7	69.6	72
2306C-E14TAG3	400	75.2	77.9	71.7	73.8	66.7	69.1	78.1	80.8	74.6	76.7	69.6	72
2806C-E16TAG1	450	75.9	78.6	72.4	74.5	67.4	69.8	79	81.7	75.5	77.6	70.5	72.9
2806C-E16TAG2	500	75.9	78.6	72.4	74.5	67.4	69.8	79	81.7	75.5	77.6	70.5	72.9
2806C-E18TAG1	550	77.1	80	73.6	76.9	68.6	71.2	80.3	83.2	76.8	80.1	71.8	74.4
2806C-E18TAG2	625	77.1	80	73.6	76.9	68.6	71.2	80.3	83.2	76.8	80.1	71.8	74.4
4006C-23TAG2A	725	77.8	80.7	74.3	77.6	69.3	71.9	81.3	84.2	77.8	81.1	72.8	75.4
4006C-23TAG3A	800	78.1	81.6	74.6	78.5	69.6	72.8	81.5	85	78	81.9	73	76.2
4008TAG2	1000	78.1	81.6	74.6	78.5	69.6	72.8	81.5	85	78	81.9	73	76.2
4012TWG2	1250	78.9	82.4	75.4	79.3	70.4	73.6	82.9	86.4	79.4	83.3	74.4	77.6
4012TAG2	1500	80.5	84	77	80.9	72	75.2	85	88.5	81.5	85.3	76.5	79.7





Dimensions

Generating Set	Powertech	A: mm	B: mm	C: mm	D: mm	E: mm
Engine model	KVA					
403C-11G	9	2920	1100	1300	834	1650
403C-15G	13	2920	1100	1300	834	1650
404C-22G	20	2920	1100	1300	834	1650
1103A-33G	30	4580	1200	1700	980	2050
1103A-33TG1	45	4580	1200	1700	980	2050
1103A-33TG2	60	4580	1200	1700	980	2050
1104A-44TG1	65	4580	1200	1700	980	2050
1104A-44TG2	80	4580	1200	1700	980	2050
1006TG1A	95	5120	1360	1970	634	2320
1104C-44TAG2	100	5120	1360	1970	634	2320
1006TG2	105	5120	1360	1970	634	2320
1006TAG1	135	5120	1360	1970	634	2320
1006TAG2	150	5120	1360	1970	634	2320
1306C-E87TAG3	200	5570	1800	2410	784	2760
1306C-E87TAG6	250	5570	1800	2410	784	2760
2306C-E14TAG2	350	6370	2000	2410	1000	2760
2306C-E14TAG3	400	6370	2000	2410	1000	2760
2806C-E16TAG1	450	7070	2000	2580	1000	2930
2806C-E16TAG2	500	7070	2000	2580	1000	2930
2806C-E18TAG1	550	7070	2000	2580	1000	2930
2806C-E18TAG2	625	7070	2000	2580	1000	2930
4006C-23TAG2A	725	8620	2552	2850	986	3200
4006C-23TAG3A	800	8620	2552	2850	986	3200
4008TAG2	1000	8620	2552	2850	986	3200
4012TWG2	1250	9120	2552	3200	985	3550
4012TAG2	1500	10700	2750	3450	982	3800