

PT410 – PT450S

Ratings @ 0.8 PF		Prime rating	Stand-by rating
Voltage ¹	Freq. ²	PT410 ³	PT450S ⁴
400 V	50 Hz	410.0 KVA	450.0 KVA
480 V	60 Hz	411.4 KVA	448.6 KVA

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.
3. PT410 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. PT450S is a 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 2206A-E13TAG3	
Cylinders	6; vertical in-line	
Aspiration	Turbocharged & A / A charge cooled	
Combustion	Direct injection	
Cooling System	Water cooled	
Displacement	12.5L	
Oil consumption	0.1 % of fuel consumption	
Lube oil capacity	40.0L	
Coolant capacity	51.4 L	
Governor	Electronic	
Emissions regulations	Non compliant	
Speed	1500 rpm	1800 rpm
Fuel Consumption PT410	81 L/H	81 L/H
Fuel Consumption PT450	89 L/H	88 L/H
Radiator Cooling Air Flow	563 m ³ /min	716 m ³ /min
Max exhaust gas flow	72.5 m ³ /min	73.5 m ³ /min

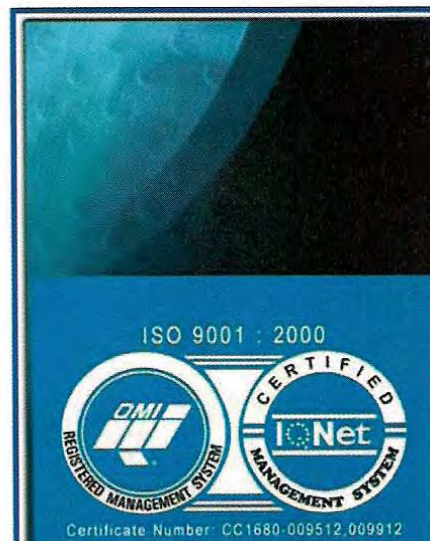
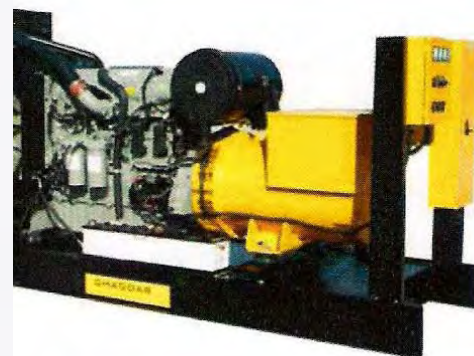
The above performance data are valid as per the following specs:

- Diesel Fuel is according to BS2869 Class A2 or equivalent.
- Lubricating oil is according to API CG4 (15W/40).
- The coolant should be 50% antifreeze and 50% fresh water.

Alternator Technical Data		
Model	Leroy Somer LSA 47.2 S4	
Regulation	± 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
3300 mm	1010 mm	1950 mm	3080 Kg

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





2200 Series

2206A-E13TAG3

Diesel Engine - Electropak

392 kWm at 1500 rpm
381 kWm at 1800 rpm



The 2200 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 2206A-E13TAG range are 6 cylinder, turbocharged air-to-air charge cooled diesel engines. It's 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 electronic control combined with carefully matched turbocharging, give excellent fuel atomisation and combustion with optimum economy.
- Low emissions result from electronically controlled fuel injection.

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 ratios ensure 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 give 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 to 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	Prime Power	400	320	368	493	349	468
		450	360	413	554	392	526
1800	Prime Power	400	320	373	500	349	468
		438	350	407	546	381	511

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, BS 5514/1, DIN 6271

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 BSEN590 or ASTM D975 Class 1D and 2D. Lubricating oil: 15W40 to API CI4.

Rating Definitions

Prime Power: Variable load. Unlimited hours usage with an average load factor of 70% of the published prime power rating over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours of operation.

Standby Power: Variable load. Limited to 500 hours annual usage up to 300 hours of which may be continuous running. No overload is permitted.

2200 Series

2206A-E13TAG3

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 G2 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 pusher fan
- Radiator incorporating air-to-air charge cooler, (supplied loose)
- 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 1 flywheel housing

Mountings

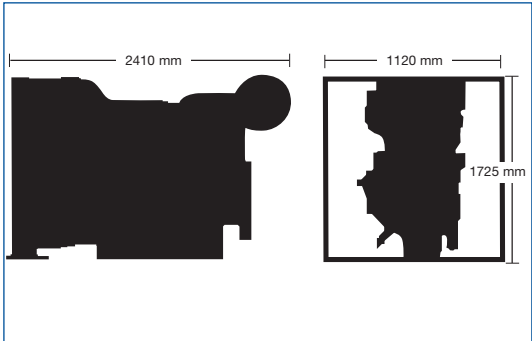
- Front engine mounting bracket

Literature

- User's Handbook and Parts Manual

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



Fuel Consumption (based on net power)				
Engine Speed	1500 rev/min		1800 rev/min	
	g/kWh	l/hr	g/kWh	l/hr
Standby power	194	90	193	87
110% prime power	196	89	195	88
100% prime power	197	81	196	81
75% prime power	199	62	199	62
50% prime power	202	42	205	43

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	130 x 157 mm
Displacement	12.5 litres
Compression ratio	16.3:1
Direction of rotation	Anti-clockwise, viewed on flywheel
Total lubrication system capacity	40 litres
Total coolant capacity	51.4 litres
Total dry weight	
Dimensions	Length 2410 mm Width 1120 mm Height 1725 mm

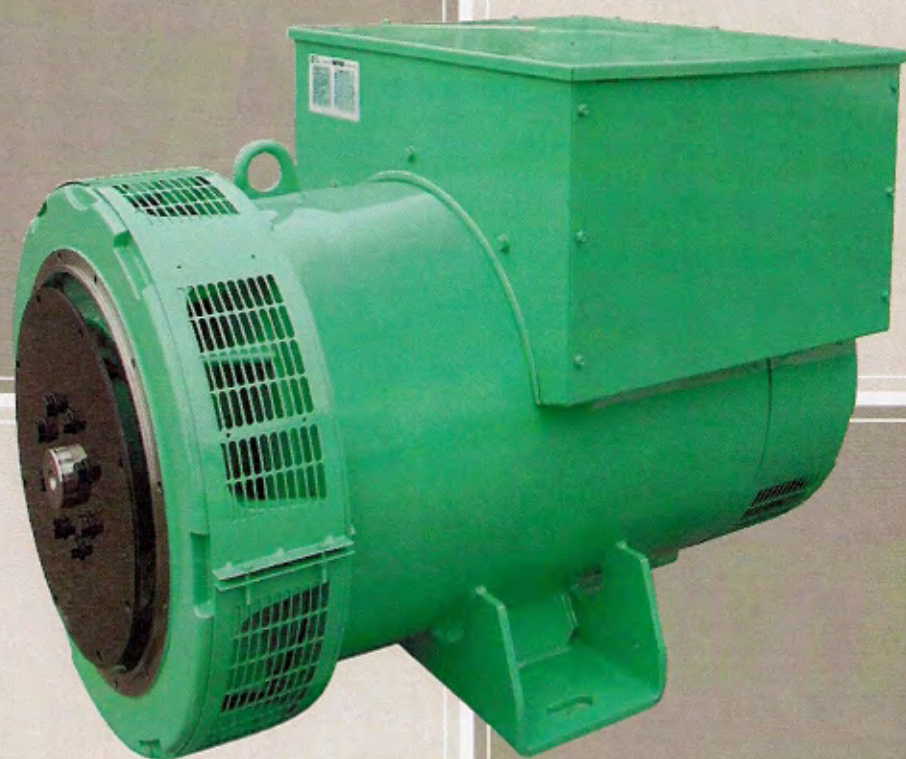
Final weight and dimensions will depend on completed specification



Perkins Engines Company Limited
Peterborough PE1 5NA
United Kingdom
Telephone +44 (0)1733 583000
Fax +44 (0)1733 582240
www.perkins.com

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Distributed by



Alternators

LSA 47.2 - 4 Pole

Electrical and mechanical data

Common data

Insulation class	H	Excitation system	SHUNT (12 wire)	A R E P or PMG
Winding pitch	2/3 (N° 6 or N° 6S)	A.V.R. model	R 250	R 448
Terminals	12 (N° 6) / 6 (N° 6S)	Voltage regulation (*)	± 0,5 %	± 0,5 %
Drip proof	IP 23	Sustained short-circuit current	-	300% (3 IN) : 10s
Altitude	≤ 1000 m	Total harmonic TGH / THC (**)	at 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)	Wave form : I.E.C. = THF(**)	< 2 %	

(*) Steady state duty. (**) Total harmonic content line to line, at no load or full rated linear and balanced load.

Ratings 50 Hz - 1500 R.P.M.

kVA / kW - Power factor = 0,8														
Duty		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.			
12 wire	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		
	47.2 VS2	kVA	365		330		405		420					
		kW	292		264		324		336					
	47.2 S4	kVA	410		370		430		450					
		kW	328		296		344		360					
	47.2 S5	kVA	455		405		471		500					
		kW	364		324		377		400					
	47.2 M7	kVA	500		465		545		570					
	kW	400		372		436		456						
47.2 M8	kVA	550		500		575		600						
	kW	440		400		460		480						
47.2 L9	kVA	600		535		630		660						
	kW	480		428		504		528						
6 wire	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	
	47.2 L9*	kVA	600		535		630		660					
		kW	480		428		504		528					

Ratings 60 Hz - 1800 R.P.M.

kVA / kW - PF = 0,8																		
Duty		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.				
12 wire	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	
	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
	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
	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
	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	
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	
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 wire	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			
	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 —

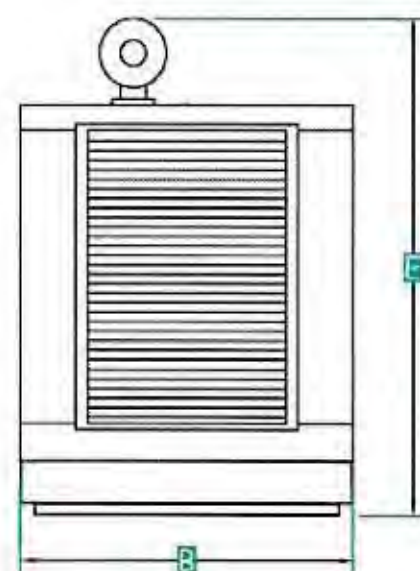
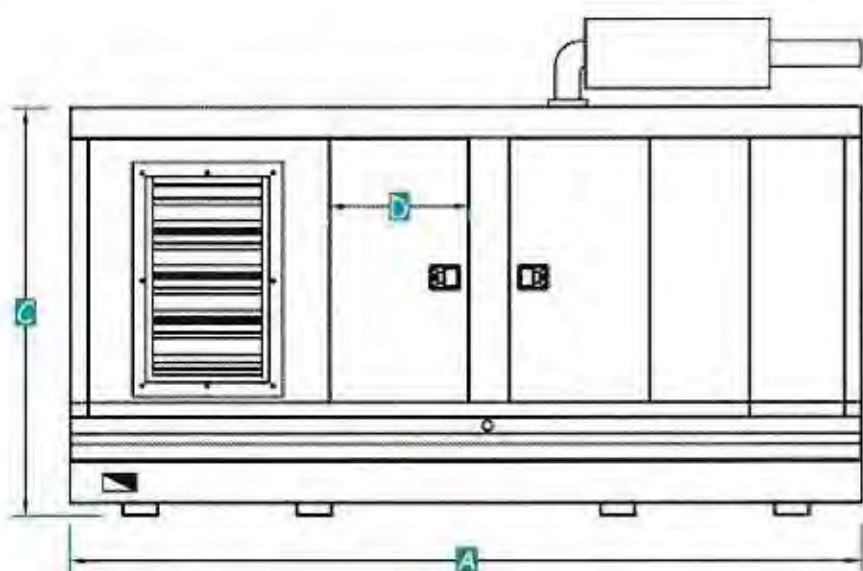
Range
200 - 800 KVA



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	86.1	77.8	80.4
2806C-E18TAG2	625	83.1	86	79.6	82.9	74.6	77.2	86.3	89.2	82.8	86.1	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