

Rating @ 0.8 PF		Prime rating	Stand-by rating
Voltage ^{*1}	Freq. ^{*2}	PT2000 ^{*3}	PT2200S ^{*4}
400 V	50 Hz	2000 KVA	2200 KVA
480 V	60 Hz	N/A	N/A

The above ratings represent the generating set capability guaranteed within $\pm 3\%$ at the references 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.
- 3 - **PT2000** 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 - **PT2200S** 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 4016TAG2	
Cylinders	16; 60° Vee Form	
Aspiration	Turbocharged & A/A charge-cooled	
Combustion	Direct injection	
Cooling System	Water cooled	
Displacement	61.123 L	
Oil consumption	0.52 g / KWhr	
Lube oil capacity	214.0 L	
Coolant capacity	316 L	
Governor	Electronic	
Emissions regulations	TA-Luft (1986)	
Speed	1500 rpm	1800 rpm
Fuel Consumption PT2000	436.0 L/H	N/A
Fuel Consumption PT2200S	490.0 L/H	N/A
Radiator Cooling Air Flow	2058 m ³ /min	N/A
Max Exhaust Gas Flow	395 m ³ /min	N/A

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

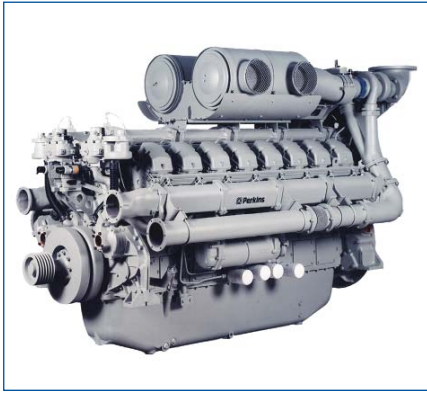
Model	Leroy Somer LSA 51.2 M60	
Regulation	$\pm 0.5\%$	
International protection	IP21	
Insulation class	H	
Terminals	6	
Frequency	50 Hz	60 Hz
Coolant Air Flow	2.5 m ³ /s	N/A

Shipping Data

Length	Width	Height	Weight
6000 mm	2320 mm	3200 mm	15100 kg

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





4000 Series

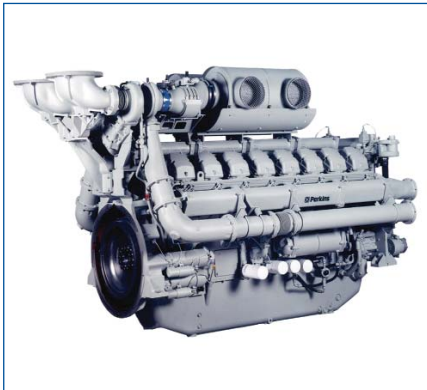
4016TAG2

4016TAG2A

Diesel Engine – Electro Unit

1540 kWm 1200 rev/min

1886 kWm 1500 rev/min



Economic power

Individual 4 valve cylinder heads give optimised gas flows, while unit fuel injectors ensure ultra fine fuel atomisation and hence controlled rapid combustion for efficiency and economy.

Commonality of components with other engines in 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.

Service is provided through the extensive Perkins network of over 4000 distributors and dealers worldwide.

Clean, efficient power

Exceptional power to weight ratio and compact size for easier transportation and installation.

Designed to provide excellent service access for ease of maintenance.

Engines designed to comply with major international standards.

Low gaseous emissions for cleaner operation.

The Perkins 4000 Series family of 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 4016TAG2/2A are turbocharged, air to air charge cooled, 16 cylinder vee form diesel engines. 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. The 4016TAG2A is specially tuned for improved load acceptance response in standby duty.

Engine Speed (rev/min)	Type of Operation	Typical Generator Output (Net)		Engine Power			
		kVA	kWe	Gross		Net	
				kWm	bhp	kWm	bhp
1200 4016 TAG2	Baseload Power	1329	1063	1166	1563	1108	1485
	Prime Power	1680	1344	1458	1954	1400	1877
	Standby (maximum)	1848	1478	1598	2148	1540	2065
1500 4016 TAG2A	Baseload Power	1634	1307	1413	1894	1362	1826
	Prime Power	2058	1646	1766	2367	1715	2300
	Standby (maximum)	2264	1811	1937	2596	1886	2529

Note: 4016TAG2A is offered for 50Hz operation only.

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, BS 5514/1.

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

Fuel specification: BS 2869 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 1 hour in every 12 hours operation.

Standby (maximum): Power available at variable load in the event of a main power network failure for a maximum of 500 hours per year. No overload is permitted.

4000 Series

4016TAG2

4016TAG2A

Standard Electro Unit Specification

Air inlet

- Mounted air filters and turbochargers

Fuel system

- Unit fuel injectors with lift pump and hand stop control
- 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

- Twin gear driven circulating pumps
- Two twin thermostats
- Crankshaft pulley for fan drive

Electrical equipment

- 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 00 flywheel housing

Optional Equipment

The following optional equipment is available to make up the specifications to Perkins ElectropaK specification:

Tropical radiator including: Water pipes, clips and hoses
Fan, fan guards and belts

Other optional extra equipment available

Twin heavy duty air cleaner – paper element with pre-cleaner

Changeover lubricating oil filters

Changeover fuel oil filters

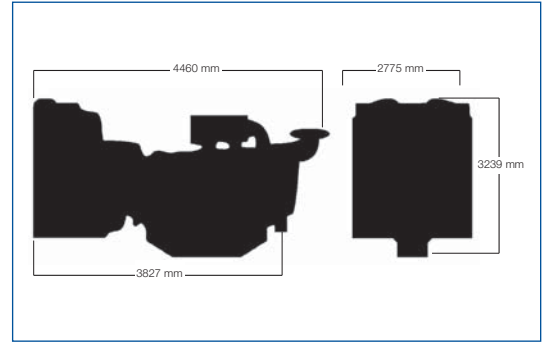
Immersion heater with thermostat

Water pipes, clips and hoses for radiator

Air starters

Instrument panel

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



General Data

Number of cylinders	16
Cylinder arrangement	60° Vee form
Cycle	4 stroke
Induction system	Turbocharged
	Air to air charge cooled
Combustion system	Direct injection
Cooling system	Water-cooled
Displacement	61.123 litres
Bore and stroke	160 x 190 mm
Compression ratio	13.6:1
Direction of rotation	Anti-clockwise, viewed from flywheel end
Firing order	1A, 1B, 3A, 3B, 7A, 7B, 5A, 5B, 8A, 8B, 6A, 6B, 2A, 2B, 4A, 4B
Total lubrication system capacity	237.2 litres
	Electro Unit ElectropaK
Total coolant capacity	95 litres 316 litres
Length	3302 mm 4460 mm
Width	1723 mm 2775 mm
Height	2128 mm 3239 mm
Total weight (dry)	5570 kg 8010 kg

Final weight and dimensions will depend on completed specification

Fuel Consumption (g/kWh)		
Engine Speed	1200 rev/min 4016TAG2	1500 rev/min 4016TAG2A
At Standby Maximum Rating	212	212
At Prime Power Rating	208	209
At Continuous Baseload Rating	207	205
At 75% of Prime Power Rating	207	203
At 50% of Prime Power Rating	215	202
At 25% of Prime Power Rating	251	212



Perkins Engines Company Limited

Peterborough PE1 5NA

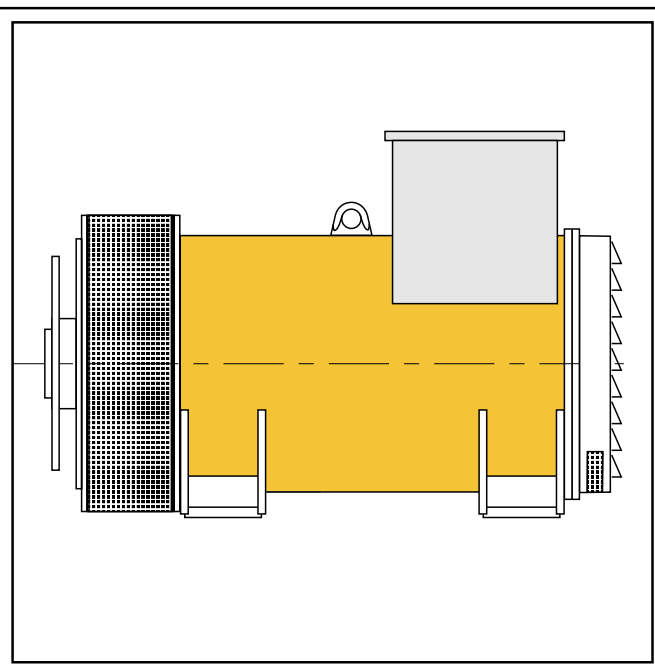
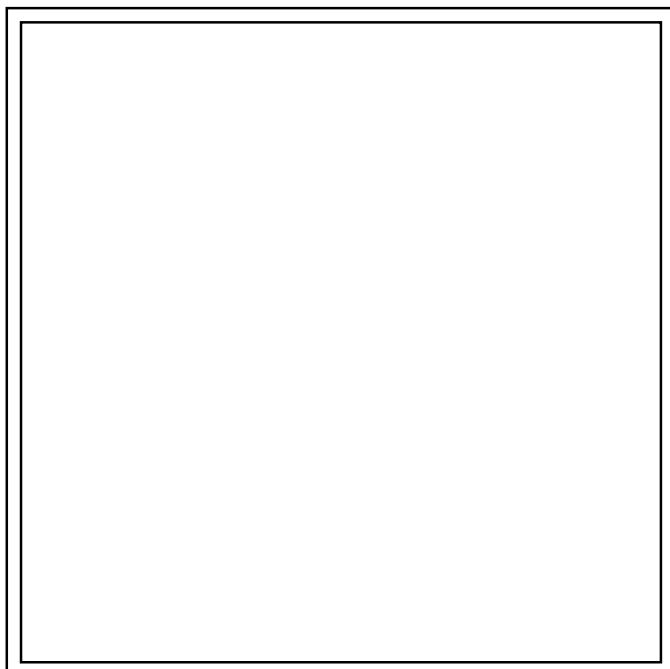
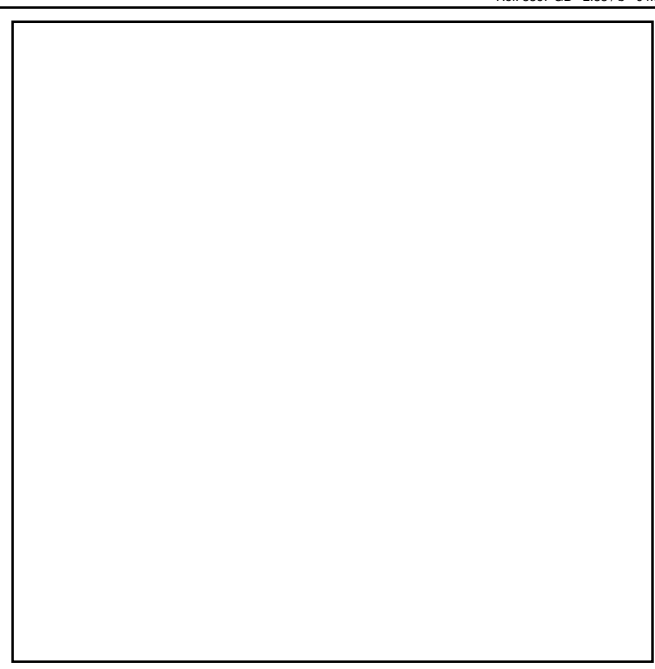
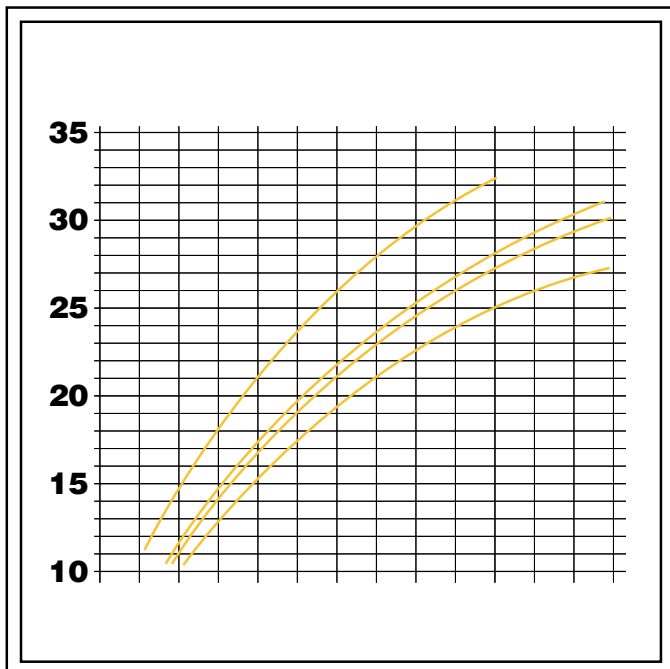
United Kingdom

Telephone +44 (0)1733 583000

Fax +44 (0)1733 582240

www.perkins.com

Distributed by



ALTERNATORS

LSA 51.2 - 4 Pole

Electrical and mechanical data

ELECTRICAL DATA

Insulation class	H	Excitation system	A R E P + PMI
Winding pitch - Code	2/3 - (N° 6S)	A.V.R. model	R 449
Leads	6	Voltage regulation (steady state)	± 0,5 %
Drip proof	IP 23	Sustained short-circuit current	300% (3 IN) : 10s
Altitude	≤ 1000 m	Total harmonic (*) TGH / THC	< 2,5 %
Overspeed	2250 min⁻¹	Waveform : NEMA = TIF - (*)	< 50
Air flow	2,5 m³/s	Waveform : I.E.C. = THF - (*)	< 2 %

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

RATINGS : kVA / kW - Power factor = 0,8

Duty/Ambiant T°	Continuous / 40°C						Stand-by / 40°C			Stand-by / 27°C			
	H / 125° K			F / 105° K			H / 150° K			H / 163° K			
Class/T° rise	3 ph.						3 ph.			3 ph.			
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	
51.2 S55	kVA	1800			1620			1890			1980		
	kW	1440			1296			1512			1584		
51.2 M60	kVA	2000			1800			2100			2200		
	kW	1600			1440			1680			1760		
51.2 L70	kVA	2150			1935			2255			2365		
	kW	1720			1548			1804			1892		
51.2 VL 85	kVA	2250			2025			2360			2475		
	kW	1800			1620			1888			1980		

EFFICIENCIES (%) - Class H / 40° C

	Three phase : 400 V									
	P.F. = 0,8					P.F. = 1				
	1/4	2/4	3/4	4/4	St.by	1/4	2/4	3/4	4/4	St.by
51.2 S55	94,9	96,2	96,1	95,7	95,4	95,4	97	97,2	97,1	97
51.2 M60	95	96,2	96,2	95,8	95,6	95,5	97	97,3	97,2	97,1
51.2 L70	95	96,4	96,4	96,1	96	95,4	97,1	97,4	97,3	97,3
51.2 VL 85	94,8	96,5	96,7	96,5	96,4	95,2	97,1	97,5	97,6	97,5

REACTANCES (%) - TIME CONSTANTS (ms) - CLASS H / 400 V

		51.2 S55	51.2 M60	51.2 L70	51.2 VL 85
Kcc	Short-circuit ratio	0,34	0,36	0,39	0,45
Xd	Direct axis synchronous reactance unsaturated	362	348	320	278
Xq	Quadrature axis synchronous reactance unsaturated	217	209	192	167
T'do	Open circuit time constant	2660	2770	2910	3050
X'd	Direct axis transient reactance saturated	27,4	26,2	23,8	20,4
T'd	Short circuit transient time constant	237	245	254	263
X''d	Direct axis subtransient reactance saturated	14,2	13,6	12,4	10,6
T''d	Subtransient time constant	22	23	24	26
X''q	Quadrature axis subtransient reactance saturated	17,8	17	15,5	13,2
Xo	Zero sequence reactance unsaturated	3,4	3,2	2,9	2,5
X2	Negative sequence reactance saturated	16	15,3	13,9	12
Ta	Armature time constant	38	41	44	48

OTHER DATA - CLASS H / 400 V

io (A)	No load excitation current	1,5	1,5	1,6	1,6
ic (A)	Full load excitation current	6	5,9	5,5	5
uc (V)	Full load excitation voltage	63	62	60	56
ms	Recovery time (ΔU = 20 % transient)	< 700	< 700	< 700	< 700
kVA	Motor start. (ΔU = 20% sust.) or (ΔU = 50% Transient)	3600	4000	4300	4500
%	Transient dip (rated step load) - PF : 0,8 LAG	12	12	11	10
kW	No load losses	16	17,5	19,2	21,7
kW	Heat rejection	64,7	70,1	69,8	65,2

According to : I.E.C. 34.1/34.2 - U.T.E. : NF C 51.111 - V.D.E. 0530 - B.S. 4999 & 5000 - NEMA : MG 1.22 - ISO 8528 . 3 - CSA (C22.2 + UL 2200).
 Products and materials shown in this catalogue may, at any time, be modified in order to follow the latest technological developments, improve the design or change the conditions of utilisation.
 Their description cannot in any case engage Leroy-Somer's liability. The values indicated are typical values.