

Technical Data

4000 Series

4016TAG1A

4016TAG2A

Diesel Engine - Electrounit

Emission compliant engines

Basic technical data

Number of cylinders ... 16
 Cylinder arrangement ... 60° Vee
 Cycle ... 4 stroke, compression ignition
 Induction system ... Turbocharged
 Compression ratio ... 13,6:1 nominal
 Bore ... 160 mm
 Stroke ... 190 mm
 Cubic capacity ... 61,123 litres
 Direction of rotation ... Anti-clockwise viewed on flywheel
 Firing order ... 1^A,1^B,3^A,3^B,7^A,7^B,5^A,5^B,8^A,8^B,6^A,6^B,2^A,2^B,4^A,4^B
 Cylinders 1 are furthest from flywheel.

Cylinders designated 'A' are on the left side of the engine when viewed from the front (opposite end to flywheel)

Total weight Electrounit (engine only) ... (dry) 5570 kg
 ... (wet) 5847 kg
 Overall dimensions ... Height 2128 mm
 ... Length 3302 mm
 ... Width 1723 mm
 Moment of inertia ... Engine 11,15 kgm²
 ... Flywheel 9,57 kgm²
 Cyclic irregularity for engine/flywheel (Prime power):
 4016TAG1A ... 1500 rev/min. ... 1,300
 4016TAG2A ... 1500 rev/min. ... 1,277

Ratings

Steady state speed stability at constant load ... ± 0,25%
 Electrical ratings are based on average alternator efficiency and are for guidance only (0,8 power factor being used).

Operating point

Engine speed ... 1500 rev/min
 Static injection timing... see below
 Cooling water exit temp... <93 °C

Fuel data

To conform to BS2869 class A1, A2.

Performance

Estimated sound pressure level 1500 rev/min ... 106/112 dBA
Note: All data based on operation to ISO 3046/1, BS 5514 and DIN 6271 standard reference conditions.

Test conditions

Air temperature... 25 °C
 Barometric pressure ... 100 kPa
 Relative humidity ... 30%
 Air inlet restriction at maximum power (nominal) ... 2,5 kPa
 Exhaust back pressure (nominal) ... 3,0 kPa

General installation 4016TAG1A

Designation	Units	Spill timing 12°					
		50Hz 1500 rev/min			60Hz 1800 rev/min		
		Continuous Baseload	Prime Power	Standby Maximum	Continuous Baseload	Prime Power	Standby Maximum
Gross engine power	kWb	1270	1588	1741	-	-	-
Fan power	kWm	51			-	-	-
Net engine power	kWm	1219	1537	1690	-	-	-
BMEP gross	bar	16,6	20,8	22,8	-	-	-
Combustion air flow	m ³ /min	107	132	140	-	-	-
Exhaust gas temperature max (after turbo)	°C	400	460		-	-	-
Exhaust gas flow max (after turbo)	m ³ /min	252	353		-	-	-
Boost pressure ratio max (after turbo)	-	3,0	3,30	3,50	-	-	-
Mechanical efficiency	%	88	91	92	-	-	-
Overall thermal efficiency	%	41	41	41	-	-	-
Friction power and pumping losses	kWm	160			-	-	-
Mean piston speed	m/s	9,5			-	-	-
Engine coolant flow (min)	l/s	19			-	-	-
Typical Genset electrical output 0,8 pf 25 °C (100 kPa)	kVA	1463	1844	2028	-	-	-
	kWe	1170	1476	1622	-	-	-
Assumed alternator efficiency	%	96			-	-	-

General installation 4016TAG2A

Designation	Units	Spill timing 14°					
		50Hz 1500 rev/min			60Hz 1800 rev/min		
		Continuous Baseload	Prime Power	Standby Maximum	Continuous Baseload	Prime Power	Standby Maximum
Gross engine power	kWb	1413	1766	1890	-	-	-
Fan power	kWm	51			-	-	-
Net engine power	kWm	1362	1715	1839	-	-	-
BMEP gross	bar	18,5	23,1	25,4	-	-	-
Combustion air flow	m ³ /min	117	137	145	-	-	-
Exhaust gas temperature max (after turbo)	°C	450	493		-	-	-
Exhaust gas flow (max)	m ³ /min	275	393		-	-	-
Boost pressure ratio	-	3,0	3,49	3,80	-	-	-
Mechanical efficiency	%	88	92	92	-	-	-
Overall electrical efficiency	%	41	40	40	-	-	-
Friction power and pumping losses	kWm	160			-	-	-
Mean piston speed	m/s	9,5			-	-	-
Engine coolant flow (min)	l/s	19			-	-	-
Typical Genset electrical output 0,8 pf 25 °C (100 kPa)	kVA	1634	2058	2206	-	-	-
	kWe	1307	1646	1765	-	-	-
Assumed alternator efficiency	%	96			-	-	-

Note: Not to be used for CHP design purposes. (Indicative figures only). Consult Perkins Engines Co. Ltd. Assumes complete combustion.

Continuous Baseload rating Power available for continuous full load operation. **Prime Power rating** is available for unlimited hours per year with a variable load of which the average engine load factor is 80% of the published prime power rating. **Standby Power rating** is for the supply of emergency power at variable load for the duration of the non-availability of the mains power supply. NO OVERLOAD capacity is available at this rating. Engines must not be allowed to have facilities for parallel operation with the mains supply. This rating should be applied only when reliable mains power is available. Should this not be the case then refer to Prime Power rating. A standby rated engine should be sized for an average load factor of 80% based on published standby rating for 500 operating hours per year. Standby ratings should never be applied except in true emergency power failure conditions.

On 16 cylinder engines used for baseload operation, the following items must be incorporated:

1. Auto lubricating oil pump (extra price, see options).
2. Centrifugal by-pass filter to be baseframe mounted (extra price, see options).
3. Electrically driven radiators on separate baseframe (customer supply).
4. Start/stop sequence as follows:

START - 4 minutes priming.

- 2 minutes start and no load 1500 rev/min.
- Synchronise and ramp to full load over 3 minutes.

STOP - Ramp down to no load 1500 rev/min.

- 5 minutes no load and running.
- Stop engine and run oil priming pump for 4 minutes.

Energy balance

Note: Not to be used for CHP design purposes. (Indicative figures only). Consult Perkins Engines Co. Ltd. Assumes complete combustion.

4016TAG1A

	Units	Spill timing 12°			1800 rev/min		
		1500 rev/min			1800 rev/min		
		Continuous Baseload	Prime Power	Standby Maximum	Continuous Baseload	Prime Power	Standby Maximum
Energy in fuel	kWt	3200	3903	4347	-	-	-
Energy in power output (gross)	kWb	1270	1588	1741	-	-	-
Energy to cooling fan	kWm	51	51	51	-	-	-
Energy in power output (net)	kWm	1219	1537	1690	-	-	-
Energy to exhaust	kWt	947	1138	1289	-	-	-
Energy to coolant and oil	kWt	520	580	629	-	-	-
Energy to radiation	kWt	58	97	117	-	-	-
Energy to charge coolers	kWt	405	500	571	-	-	-

4016TAG2A

	Units	Spill timing 14°			1800 rev/min		
		1500 rev/min			1800 rev/min		
		Continuous Baseload	Prime Power	Standby Maximum	Continuous Baseload	Prime Power	Standby Maximum
Energy in fuel	kWt	3535	4514	4853	-	-	-
Energy in power output (gross)	kWb	1413	1766	1890	-	-	-
Energy to cooling fan	kWm	51	51	51	-	-	-
Energy in power output (net)	kWm	1362	1715	1839	-	-	-
Energy to exhaust	kWt	1048	1346	1513	-	-	-
Energy to coolant and oil	kWt	550	677	690	-	-	-
Energy to radiation	kWt	68	130	150	-	-	-
Energy to charge coolers	kWt	456	595	610	-	-	-

Cooling system

Recommended coolant: 50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. For combined heat and power systems and where there is no likelihood of ambient temperatures below 10 °C then clean 'soft' water may be used, treated with 1% by volume of Perkins inhibitor in the cooling system. The inhibitor is available in bottles under Perkins Part No. 21825 735.
Maximum jacket water pressure in crankcase .. 1,7 bar

The following is a guide based on ambient air conditions of 52 °C on a Perkins supplied radiator.

Total coolant capacity:

Electronit (engine only) 95 litres
ElectropaK (engine/radiator) 316 litres
Pressure cap setting 0,69 bar
Fan Incorporated in radiator
Diameter 1905 mm (pusher)
Ambient cooling clearance (open ElectropaK Prime power) based on air temperature at fan 3 °C above ambient.

4016TAG1A

Maximum additional restriction (duct allowance) to cooling airflow (Prime power) and resultant minimum airflow					
Ambient clearance 50% glycol		Duct allowance mm H ₂ O		Min airflow m ³ /min	
rev/min		rev/min		rev/min	
1500	1800	1500	1800	1500	1800
52 °C	-	17	-	2394	-

4016TAG2A

Maximum additional restriction (duct allowance) to cooling airflow (Prime power) and resultant minimum airflow					
Ambient clearance 50% glycol		Duct allowance mm H ₂ O		Min airflow m ³ /min	
rev/min		rev/min		rev/min	
1500	1800	1500	1800	1500	1800
52 °C	-	15	-	2430	-

Coolant pump speed and

method of drive 1,4 x e rev/min, gear driven
Maximum static pressure head on pump
above engine crank centre line 7 m
Maximum external permissible restriction
to coolant pump flow 20 kPa
Thermostat operating range 71-85 °C
Shutdown switch setting 96 °C rising
Coolant immersion heater capacity 4 kW x 2

Jacket cooling water data	Units	1500 rev/min	1800 rev/min
Coolant flow	l/s	19	-
Coolant exit temperature (max)	°C	93	-
Coolant entry temperature (min)	°C	70	-
Coolant entry temperature (max)	°C	80	-

Lubrication system

Recommended lubricating oil to conform with the specification of API CG4.

Lubricating oil capacity:

Sump maximum 214 litres
Sump minimum 147 litres
Lubricating oil temperature maximum to bearings 105 °C
Lubricating oil pressure at 80 °C temperature
to bearing gallery (minimum) 0,34 MPa

Oil consumption	Units	1500 rev/min 4016TAG1A	1500 rev/min 4016TAG2A
After running-in*	g/kWhr	0,50	0,52
Oil flow rate from pump	l/s	6,70	6,70

*Typical after 250 hours

Sump drain plug tapping size G1
Oil pump speed and
method of drive 1,4 x e rev/min, gear driven
Oil pump flow 1500 rev/min 6,70 litres/sec
Shutdown switch setting 1,93 bar falling
Normal operating angles
Fore and aft 5°
Side tilt 10°

Fuel system

Recommended fuel To conform to BS2869 1998 Class A1, A2
Type of injection system Direct injection
Fuel injection pump Combined unit injector
Fuel injector Combined unit injector
Fuel injector opening pressure 234 bar
Fuel lift pump Tuthill TCH 5
Delivery/hour at 1500 rev/min 1380 litres
Delivery/hour at 1800 rev/min N/A
Heat retained in fuel to tank 12,0 kW
Temperature of fuel at lift pump to be less than 58 °C
Fuel lift pump pressure 3,0 bar
Fuel lift pump maximum suction head 2,5 m
Fuel lift pump maximum pressure head (see Installation Manual)
Fuel filter spacing 18 microns
Governor type Electronic
Torque at the governor output shaft 1,631 kgm
Static injection timing See engine number plate
Tolerance on fuel consumption +5%

4016TAG1A

Fuel consumption (gross)				
Designation	g/kWh		Litres/hr	
	1500	1800	1500	1800
At Standby Max power rating	210	-	430	-
At Prime Power rating	208	-	389	-
At Continuous Baseload rating	206	-	308	-
At 75% of Prime Power rating	205	-	287	-
At 50% of Prime Power rating	205	-	191	-
At 25% of Prime Power rating	222	-	104	-

4016TAG2A

Fuel consumption (gross)				
Designation	g/kWh		Litres/hr	
	1500	1800	1500	1800
At Standby Max power rating	216	-	488	-
At Prime Power rating	213	-	447	-
At Continuous Baseload rating	210	-	349	-
At 75% of Prime Power rating	209	-	326	-
At 50% of Prime Power rating	204	-	212	-
At 25% of Prime Power rating	216	-	112	-

Induction system

Maximum air intake restriction of engine:

Clean filter 127 mm H₂O
 Dirty filter 380 mm H₂O
 Air filter type MF&T 5000-00-00

Exhaust system

Maximum back pressure for total system at standby max power

Designation	Units	1500 rev/min	1800 rev/min
4016TAG1A	mm H ₂ O	949	-
4016TAG2A	mm H ₂ O	673	-

Exhaust outlet flange size 2 x 254 mm (table 'D')
 For recommended pipe sizes refer to Installation Manual.

Electrical system

Type Insulated return
 Alternator 24 volts with integral regulator
 Alternator output 40 amps at a stabilised output 28 volts at
 20 °C ambient
 Starter motor 24 volts
 Starter motor power 16,4 kW
 Number of teeth on flywheel 156
 Number of teeth on starter motor 12
 Minimum cranking speed at 0 °C 120 rev/min
 Pull-in current of each starter
 motor solenoid 30 amps at 24 volts
 Hold-in current of each starter
 motor solenoid 9 amps at 24 volts
 Engine stop solenoid 24 volts
 Pull-in current of stop solenoid 60 amps at 24 volts
 Hold-in current of stop solenoid 1,1 amps at 24 volts

Engine mounting

Position of centre of gravity (wet engine)
 forward from rear face of crankcase 1117 mm
 Engine vertical centre line above crankshaft centre line ... 50 mm
 Maximum additional load applied to flywheel
 due to all rotating components 850 kg

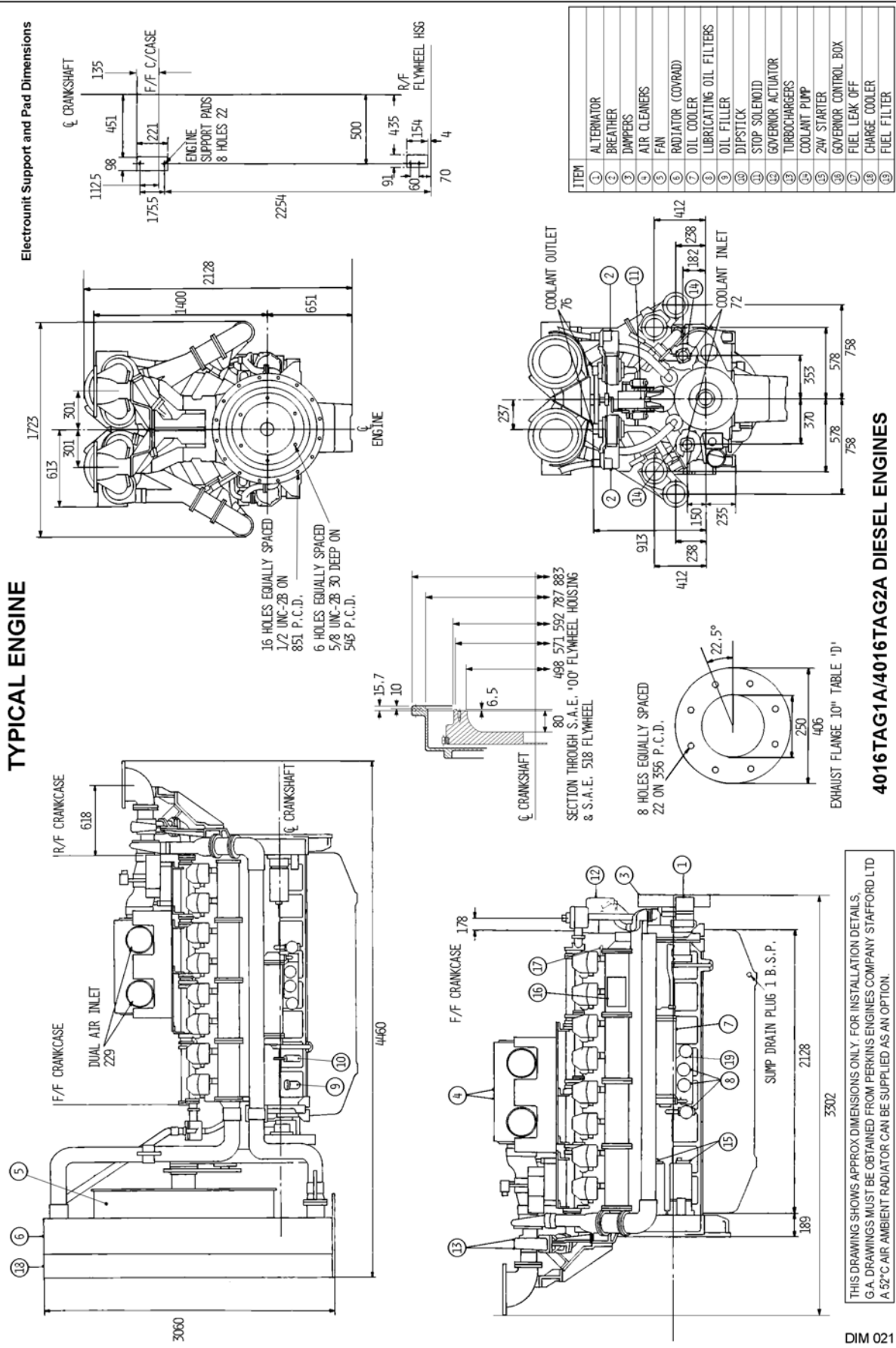
Starting requirements

Temperature range	
Range Down to 0 °C (32 °F)	Oil: SAE 30
	Starter: 2 x 24V
	Battery: 4 x 12 volts x 286 Ah
	Max breakaway current: 2000 amps
	Cranking current: 957 amps
	Aids: Not necessary
	Starter cable size: 120 mm Maximum length: 6 m

Notes:

- Battery capacity is defined by the 20 hour rate at 0 °C.
- The oil specification should be for the minimum ambient temperature as the oil will not be warmed by the immersion heater.
- Breakaway current is dependent on battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

TYPICAL ENGINE



ITEM	
1	ALTERNATOR
2	BREATHER
3	DAMPERS
4	AIR CLEANERS
5	FAN
6	RADIATOR (COVERAD)
7	OIL COOLER
8	LUBRICATING OIL FILTERS
9	OIL FILLER
10	DIPSTICK
11	STOP SOLENOID
12	GOVERNOR ACTUATOR
13	TURBOCHARGERS
14	COOLANT PUMP
15	24V STARTER
16	GOVERNOR CONTROL BOX
17	FUEL LEAK OFF
18	CHARGE COOLER
19	FUEL FILTER

4016 TAG1A/4016TAG2A DIESEL ENGINES

THIS DRAWING SHOWS APPROX DIMENSIONS ONLY. FOR INSTALLATION DETAILS, G.A. DRAWINGS MUST BE OBTAINED FROM PERKINS ENGINES COMPANY STAFFORD LTD A 52°C AIR AMBIENT RADIATOR CAN BE SUPPLIED AS AN OPTION.

Load acceptance (cold)

4016TAG1A 1500 rev/min

Initial load application when engine reaches rated speed (15 seconds max after engine starts to crank)				Second load application immediately after engine has recovered to rated speed (5 seconds after initial load application)			
Prime power %	Load kWm/kWe	Transient frequency deviation %	Frequency recovery time seconds	Prime power %	Load kWm/kWe	Transient frequency deviation %	Frequency recovery time seconds
67	1030/989	≤ -10	5	33	307/487	≤ -10	5

4016TAG2A 1500 rev/min

Initial load application when engine reaches rated speed (15 seconds max after engine starts to crank)				Second load application immediately after engine has recovered to rated speed (5 seconds after initial load application)			
Prime power %	Load kWm/kWe	Transient frequency deviation %	Frequency recovery time seconds	Prime power %	Load kWm/kWe	Transient frequency deviation %	Frequency recovery time seconds
57	978/938	≤ -10	5	43	737/708	≤ -10	5

Above complies with requirements of Classifications 3 & 4 of ISO 8528-12 and G2 operating limits stated in ISO 8528-5.

The above figures were obtained under test conditions as follows:

Engine block temperature 45 °C

Alternator efficiency 96%

Minimum ambient temperature 10 °C

Isochronous governing.

Under Frequency Roll Off (UFRO) set to 1 Hz below rated frequency.

Typical alternator inertia. 50 kgm²

All tests were conducted using an engine which was installed and serviced to Perkins Engines Company Limited recommendations.

Emissions chart

4016TAG1A

Spill timing 12° @ 50 Hz conform to					
Rating	German TA-Luft 1 to 3 MW	German ½ TA-Luft Limit @ >3 MW	German TA-Luft Limit @ >3 MW	French Limits 2000 @ <500 hours/year	French Limits 1500 @ >500 hours/year
Baseload	N/A	No	Yes	Yes	No
Prime power	N/A	N/A	Yes	Yes	No
Standby	N/A	N/A	Yes	Yes	No

4016TAG2A

Spill timing 14° @ 50 Hz conform to					
Rating	German TA-Luft 1 to 3 MW	German ½ TA-Luft Limit @ >3 MW	German TA-Luft Limit @ >3 MW	French Limits 2000 @ <500 hours/year	French Limits 1500 @ >500 hours/year
Baseload	N/A	No	Yes	Yes	No
Prime power	N/A	N/A	Yes	Yes	No
Standby (107%)	N/A	N/A	Yes	Yes	No

Noise level

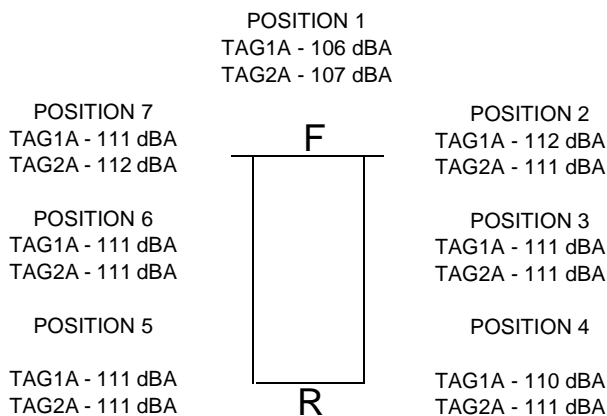
The figures for total noise levels are typical for an engine running at Prime Power rating in a semi-reverberant environment and measured at a distance of one metre from the periphery of the engine.

Octave analysis

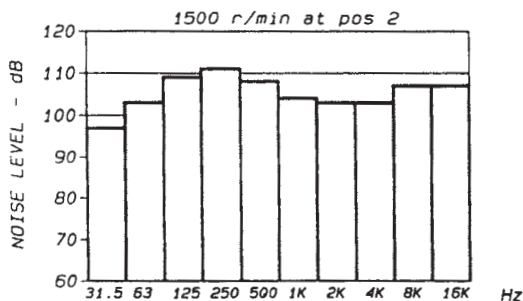
The following histograms show an octave band analysis at the position of the maximum noise level.

Total noise level

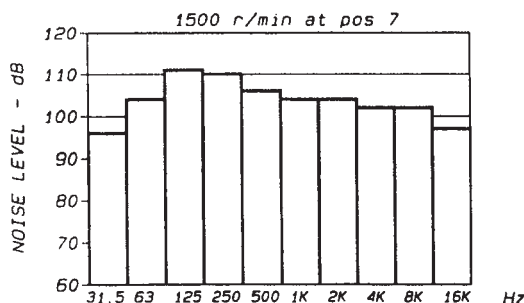
Sound pressure level re: -20×10^{-6} pa.
 Speed 1500 r/min.....Ambient noise level 75 dBA.
 Octave analysis performed at the position of maximum noise.



4016TAG1A



4016TAG2A



The information given on technical data sheets is for standard ratings only. For ratings other than shown contact Perkins Engines Company Limited, Stafford.

Notes



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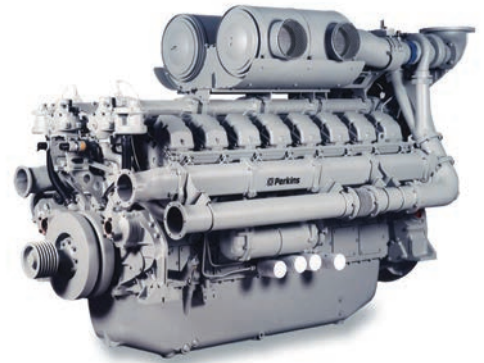
4000 Series 4016TAG1A Diesel Engine – Electro Unit

1690 kWm @ 1500 rpm

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 4016TAG1A is a turbocharged, air to air charge cooled, 16 cylinder vee form diesel engine.

Its 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 4016TAG1A is specially tuned for improved load acceptance response in standby duty.



Specification				
Number of cylinders	16 60° Vee form			
Bore and stroke	160 x 190 mm	6.3 x 7.5 in		
Displacement	61.123 litres	3722 in ³		
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			
Total lubricating capacity	237.2 litres	63 US gal		
Cooling system	Water-cooled			
	Electro unit		ElectropaK	
Total coolant capacity	95 litres	25 US gal	316 litres	85 US gal

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 **Perkins**®

THE HEART OF EVERY GREAT MACHINE

4000 Series 4016TAG1A Diesel Engine – Electro Unit

1690 kWm @ 1500 rpm

Features and benefits

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
- 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
- Designed to provide excellent service access for ease of maintenance
- Engines designed to comply with major international standards
- Low gaseous emissions for cleaner operation

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

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THE HEART OF EVERY GREAT MACHINE

4000 Series 4016TAG1A Diesel Engine – Electro Unit

1690 kWm @ 1500 rpm

Technical information

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 filter

Changeover fuel oil filter

Immersion heater with thermostat

Water pipes, clips and hoses for radiator

Air starters

Instrument panel

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

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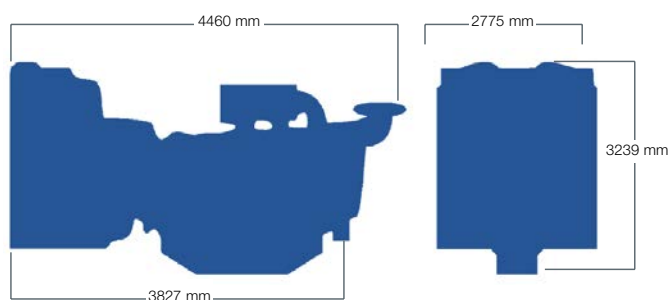
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THE HEART OF EVERY GREAT MACHINE

4000 Series 4016TAG1A Diesel Engine – Electro Unit

1690 kWm @ 1500 rpm



Engine package weights and dimensions

	Electro unit		ElectropaK	
	Length	3302 mm	130 in	4460 mm
Width	1723 mm	68 in	2775 mm	109 in
Height	2128 mm	84 in	3239 mm	126 in
Weight (dry)	5570 kg	12279 lb	8010 kg	17659 lb

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THE HEART OF EVERY GREAT MACHINE

4000 Series 4016TAG1A Diesel Engine – Electro Unit

1690 kWm @ 1500 rpm

Speed rpm	Type of operation	Typical generator output (Net)		Engine power			
				Gross		Net	
		kVA	kWe	kWm	hp	kWm	hp
1500	Baseload power	1463	1170	1270	1703	1219	1635
	Prime power	1844	1476	1588	2130	1537	2061
	Standby (maximum)	2028	1622	1741	2334	1690	2266

The above ratings represent the engine performance capabilities 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

Continuous baseload: 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.

Percent of prime power	Fuel consumption at 1500 rpm g/kWh
Standby (maximum)	207
Prime power	205
Baseload power	199
75%	198
50%	198
25%	218

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THE HEART OF EVERY GREAT MACHINE

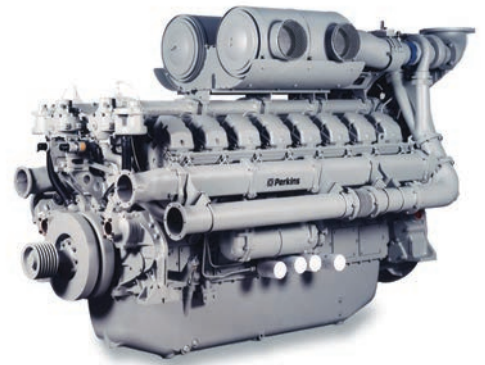
4000 Series 4016TAG2A Diesel Engine – Electro Unit

1886 kWm @ 1500 rpm

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 4016TAG2A 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.



Specification				
Number of cylinders	16 60° Vee form			
Bore and stroke	160 x 190 mm	6.3 x 7.5 in		
Displacement	61.123 litres	3722 in ³		
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			
Total lubricating capacity	237.2 litres	63 US gal		
Cooling system	Water-cooled			
	Electro unit		ElectropaK	
Total coolant capacity	95 litres	25 US gal	316 litres	85 US gal

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Features and benefits

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

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

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

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Technical information

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

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

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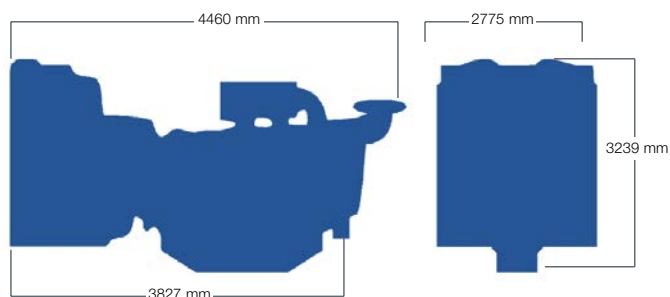
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Engine package weights and dimensions

	Electro unit		ElectropaK	
	mm	in	mm	in
Length	3302 mm	130 in	4460 mm	176 in
Width	1723 mm	68 in	2775 mm	109 in
Height	2128 mm	84 in	3239 mm	126 in
Weight (dry)	5570 kg	12279 lb	8010 kg	17659 lb

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Speed rpm	Type of operation	Typical generator output (Net)		Engine power			
				Gross		Net	
		kVA	kWe	kWm	hp	kWm	hp
1500	Baseload power	1634	1307	1413	1894	1362	1826
	Prime power	2058	1646	1766	2367	1715	2300
	Standby (maximum)	2263	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.

Percent of prime power	Fuel consumption at 1500 rpm g/kWh
Standby (maximum)	212
Prime power	209
Baseload power	205
75%	203
50%	202
25%	212

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