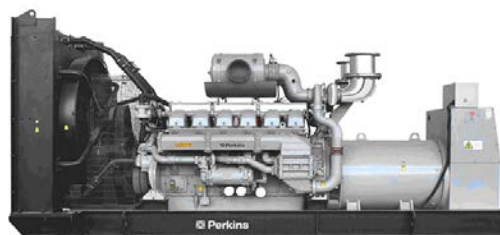


## DATA SHEET

DIESEL GENERATOR 1320KW  
 MODEL#FDK-P1320/H1  
 50HZ/1500RPM  
 PERKINS MODEL: 4012-46TAG2A



### General Features:

- ◆ All qualified generator sets are subjected to a comprehensive performance test which includes 50% load, 70% load, 100% load, 110% load and to check, verify that all control systems, alarm and shut-down protection.
- ◆ Equipped with battery charger and 24V high performance maintenance-free lead-acid starting batteries and connecting cables.
- ◆ Stainless galvanized zinc plates with strong corrosion-proof.
- ◆ Vibration isolators between the engine/alternator and base frame.
- ◆ Equipped with industrial silencer and flexible exhaust hose.
- ◆ Designed to comply with ISO8528/GB2820.
- ◆ Powered by Perkins engine and coupled with Stamford alternator.
- ◆ Water jacket preheater, oil heater and double air cleaner, etc. are available.

### FDK Diesel Generator Set Data

Genset Model	FDK-P1320/H1
Prime Power	1200KW/1500KVA
Standby Power	1320KW/1650KVA
Output Frequency / Rated speed	50Hz/1500rpm
Rated Voltage	230V/400V

Engine Make	Perkins UK
Engine Model	4012-46TAG2A
Alternator model	Stamford PI734C
Control System	DSE7320
Phase	Three

(1) **Prime power:** The rating is available for an unlimited of annual operating hours in variable load applications, in accordance with ISO8528-1.A 10% overload is available for a period of 1 hour within 12-hour period of operation, in accordance with ISO 3046-1.

(2) **Standby power:** The rating is applicable for supplying emergency power in variable load applications for up to 200 hours per year in accordance with ISO8528-1. Overload is not allowed.

(3) **Rated voltage:** available with customer requirement.

### Engine Specifications (DETAILED in APPENDIX)

Engine Model	4012-46TAG2A
Engine Manufacturer	Perkins UK
Cylinder quantity	12
Cylinder Arrangement	Vee 60°
Cycle	4
Aspiration	Turbo charged

Bore x Stroke (mm x mm)	160x190
Displacement	45.84 L
Compression Ratio	13:1
Prime power / Speed (KW/RPM)	1331kw/1500
Standby power/ Speed (KW/RPM)	1459kw/1500
Governor type	Electronic



Piston Speed	9.5m/s	Fuel Consumption at 100% load (L/HOUR)	317.9 at rated speed
Typical genset electrical output	1505kw	Starter motor	24V
Total Lubrication System Capacity (L)	177	Alternator	24V
Total Coolant Capacity (L)	210	Minimum cranking speed.	120 rpm

## Alternator Specifications

Alternator model	PI734C	Number of phase	3
Alternator manufacturer	STAMFORD	Rated voltage	400V (Available with custom requirements)
Exciter type	Single bearing, Brushless, Self-excited	Power factor	0.8
Rated output prime power	1550KVA	Voltage regulation NL-FL	±1%
Rated speed	1500 rpm	Insulation grade	H
Rated frequency	50Hz	Protection grade	IP23

## Alternator option: Leroy Somer, MECC, Marathon, Engga, Faraday

## Control System DSE7320 (DETAILED in INSTRUCTION)

DSE7320 is an advanced control module based on micro-processor, containing all necessary functions for protection of the genset and the breaker control. It can monitor the mains supply, breaker control and automatically start the engine when the mains are abnormal. Accurately measure various operational parameters and display all values and alarms information on the LCD. In addition, the control module can automatically shut down the engine and indicate the engine failure.

### FEATURES

- ♦ Microprocessor control, with high stability and credibility.
- ♦ Monitoring and measuring operational parameters of the mains supply and genset.
- ♦ Indicating operation status, fault conditions, all parameters and alarms.
- ♦ Multiple protections; multiple parameters display, like pressure, temp. etc.
- ♦ Manual, automatic and remote work mode selectable.
- ♦ Real time clock for time and date display, overall runtime display, 250 log entries.
- ♦ Overall power output display.
- ♦ Integral speed/frequency detecting, telling status of start, rated operation, overspeed etc.
- ♦ Communication with PC via RS485 OR RS232 interface, using MODBUS protocol.

## Soundproof Enclosure Specification

FDK silent generator is designed by professional acoustic engineers based on years of experience. Now we can make the noise of the generator less than 80-85dB(A) at 1m, or 70-75dB(A) at 7m, 60-65dB(A) at 15m.

### FEATURES

- ♦ Multi-way air intake and exhaust guarantee the power performance of the generator.
- ♦ Large-scale impedance combined type silencer effectively reduce noise of the generator.
- ♦ Internal high performance rubber damper and flexible materials reduce vibration.
- ♦ Base mounted fuel tank supports the generator running for 8 hours.



ISO9001:2008

FDK reserves the right to change the specifications and designs without notice.

## Optional

Generator set	Alternator	Low environment Temp	ATS
<input type="checkbox"/> Open generator set <input type="checkbox"/> Silent generator set <input type="checkbox"/> Trailer generator set <input type="checkbox"/> ABB MCCB circuit breaker	<input type="checkbox"/> Stamford <input type="checkbox"/> Marathon <input type="checkbox"/> Mecc Alte <input type="checkbox"/> Leroy Somer <input type="checkbox"/> Farady <input type="checkbox"/> Engga	<input type="checkbox"/> Water heater <input type="checkbox"/> Oil heater <input type="checkbox"/> Battery heater	<input type="checkbox"/> CHINT <input type="checkbox"/> SCHNEIDER <input type="checkbox"/> ABB
Fuel system	Control system	Voltage	Synchronized system
<input type="checkbox"/> 12hrs base tank <input type="checkbox"/> 24hrs base tank <input type="checkbox"/> Dual wall base fuel tank <input type="checkbox"/> Outside fuel tank	<input type="checkbox"/> AMF function <input type="checkbox"/> ATS control cabinet <input type="checkbox"/> DSE7320 <input type="checkbox"/> DSE7510 <input type="checkbox"/> GU620A	<input type="checkbox"/> 415/240V <input type="checkbox"/> 400/230V <input type="checkbox"/> 380/220V <input type="checkbox"/> 220/127V <input type="checkbox"/> 200/115V	<input type="checkbox"/> CHINT Cabinet <input type="checkbox"/> SCHNEIDER Cabinet <input type="checkbox"/> DSE8610 Module <input type="checkbox"/> COMAQ Module <input type="checkbox"/> DEIF Module

## Dimension & Weight

### Open

Overall Size: LxWxH (mm)	7000x2300x2800
Weight (kg)	7200

### Soundproof Version

Overall Size: LxWxH (mm)	40FT Container
Weight (kg)	11500

## Sales Promises

- ◆ FDK provides a full line of brand new and high quality products. Each and every unit is strictly factory tested before shipment.
- ◆ Quality warranty is according to our standard conditions: 12 months from BL date or 1000 running hours, whichever comes first.
- ◆ Service and parts are available from FDK or distributors in your location.
- ◆ FDK guarantee use **BRAND NEW & GENUINE MACHINE.**



# Technical Data

## 4000 Series

# 4012-46TAG1A

# 4012-46TAG2A

Diesel Engine - Electropak

Emissions Compliant engines

### Basic technical data

Number of cylinders . . . . . 12  
 Cylinder arrangement . . . . . Vee, 60°  
 Cycle . . . . . 4 stroke  
 Induction system . . . . . Turbocharged  
 Combustion system . . . . . direct injection  
 Compression ratio . . . . . 13:1  
 Bore . . . . . 160 mm  
 Stroke . . . . . 190 mm  
 Cubic capacity . . . . . 45-842 litres  
 Direction of rotation . . . . . clockwise, viewed on flywheel  
 Firing order . . . . . 1<sup>A</sup>,6<sup>B</sup>,5<sup>A</sup>,2<sup>B</sup>,3<sup>A</sup>,4<sup>B</sup>,6<sup>A</sup>,1<sup>B</sup>,2<sup>A</sup>,5<sup>B</sup>,4<sup>A</sup>,3<sup>B</sup>  
 Cylinder 1 . . . . . furthest from flywheel  
**Note:** Cylinders designated 'A' are on the right hand side of the engine when viewed from the flywheel end

### Total weight of Electropak

Temperate or Tropical (approximate)  
 -engine . . . . . 4400 kg  
 -electropak dry . . . . . 6000 kg  
 -electropak wet . . . . . 6400 kg

### Overall dimensions of Electropak

	unit	Tropical	Temperate
Height	mm	2260	2230
Length	mm	3971	3951
Width	mm	2192	1777

### Moment of inertia

Engine . . . . . 9,73 kgm<sup>2</sup>  
 Flywheel . . . . . 9,57 kgm<sup>2</sup>

### Cyclic irregularity for engine/flywheel maximum

4012-46TAG1A . . . . . 1:714  
 4012-46TAG2A . . . . . 1:669

### Ratings

Steady state speed stability at constant load . . . . . ± 0.25%  
 Electrical rating 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 engine number plate  
 Cooling water exit temperature . . . . . < 98 °C

Fuel data . . . . . to conform to BS2869 class A2 or BS EN590

### Performance

All data based on operation to ISO 3046/1, BS 5514 and DIN 6271 standard reference conditions.

### Noise

Estimated sound pressure level at 1 metre  
 -1500 rev/min . . . . . 111 dB(A)

For engines operating in ambient conditions other than the standard reference conditions stated below, a suitable de-rate must be applied. De-rate tables for increased ambient temperature and/or altitude are available, please contact Perkins Applications Department.

### 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 at maximum pressure (nominal) . . . . . 3,0 kPa  
 Fuel temperature (inlet pump) . . . . . 58 °C maximum  
 For test conditions relevant to data on load acceptance, refer to page 18 of this document.

## General installation

### 4012-46TAG1A - Temperate

Designation	Units	Type of operation and application		
		Spill Timing 12°		
		Baseload power	Prime power	Standby power
		50 Hz 1500 rev/min		
Gross engine power	kWm	951	1190	1305
Fan and battery charging alternator power	kW	42		
Nett engine power	kWm	909	1148	1263
Brake mean effective pressure (gross)	kPa	1656	2071	2271
Combustion air flow at ISO conditions	m <sup>3</sup> /min	85	100	110
Exhaust gas temperature (max) after turbo	°C	N/A	N/A	470
Exhaust gas flow (max) at atmospheric pressure	m <sup>3</sup> /min	N/A	N/A	277
Boost pressure ratio	-	2,8	3,2	3,3
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	39,5	39,0	38,9
Friction power and pumping losses	kWm	120		
Mean piston speed	m/s	9,5		
Engine coolant flow	l/s	1020		
Typical Genset electrical output (0.8pf)	kVA	1080	1364	1500
	kWe	864	1091	1200
Assumed alternator efficiency	%	95		

## General installation

### 4012-46TAG1A - Tropical

Designation	Units	Type of operation and application		
		Spill Timing 12°		
		Baseload power	Prime power	Standby power
		50 Hz 1500 rev/min		
Gross engine power	kWm	973	1212	1327
Fan and battery charging alternator power	kW	64		
Nett engine power	kWm	909	1148	1263
Brake mean effective pressure (gross)	kPa	1694	2110	2309
Combustion air flow at ISO conditions	m³/min	85	100	110
Exhaust gas temperature (max) after turbo	°C	N/A	N/A	425
Exhaust gas flow (max) at atmospheric pressure	m³/min	N/A	N/A	280
Boost pressure ratio	-	2,60	2,93	3,20
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	41,0	41,5	41,0
Friction power and pumping losses	kWm	120		
Mean piston speed	m/s	9,5		
Engine coolant flow	l/s	1020		
Typical Genset electrical output (0.8pf)	kVA	1080	1364	1500
	kWe	864	1091	1200
Assumed alternator efficiency	%	95		

### 4012-46TAG2A - Temperate

Designation	Units	Type of operation and application		
		Spill Timing 12°		
		Baseload power	Prime power	Standby power
		50 Hz 1500 rev/min		
Gross engine power	kWm	1047	1309	1437
Fan and battery charging alternator power	kW	42		
Nett engine power	kWm	1005	1267	1395
Brake mean effective pressure (gross)	kPa	1822	2278	2500
Combustion air flow at ISO conditions	m³/min	90	105	120
Exhaust gas temperature (max) after turbo	°C	N/A	N/A	500
Exhaust gas flow (max) at atmospheric pressure	m³/min	N/A	N/A	309
Boost pressure ratio	-	2,8	3,4	3,6
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	39,5	38,8	38,6
Friction power and pumping losses	kWm	120		
Mean piston speed	m/s	9,5		
Engine coolant flow	l/s	1020		
Typical Genset electrical output (0.8pf)	kVA	1194	1505	1656
	kWe	955	1204	1325
Assumed alternator efficiency	%	95		

## General installation

### 4012-46TAG2A - Tropical

Designation	Units	Type of operation and application		
		Spill Timing 12°		
		Baseload power	Prime power	Standby power
		50 Hz 1500 rev/min		
Gross engine power	kWm	1069	1331	1459
Fan and battery charging alternator power	kW	64		
Nett engine power	kWm	1005	1267	1395
Brake mean effective pressure (gross)	kPa	1861	2317	2538
Combustion air flow at ISO conditions	m <sup>3</sup> /min	90	105	120
Exhaust gas temperature (max) after turbo	°C	N/A	N/A	500
Exhaust gas flow (max) at atmospheric pressure	m <sup>3</sup> /min	N/A	N/A	309
Boost pressure ratio	-	2,8	3,4	3,6
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	39,5	38,8	38,6
Friction power and pumping losses	kWm	120		
Mean piston speed	m/s	9,5		
Engine coolant flow	l/s	1020		
Typical Genset electrical output (0.8pf)	kVA	1194	1505	1656
	kWe	955	1204	1325
Assumed alternator efficiency	%	95		

**Note:** All quoted gross engine powers include an allowance of 1.5% for installation variances. Not to be used for combined heat and power (CHP) design purposes (indicative figures only). Consult Perkins Engines Stafford Limited. Assumes complete combustion.

## Rating definitions

### Baseload power

Unlimited hours usage with an average load factor of 100% of the published baseload power rating.

### Prime power

Variable load. Unlimited hours usage with an average load factor of 80% of the published Prime Power over each 24 hour period. A 10% overload is available for 1 hour in every 12 hours.

### Standby power

Limited to 500 hours annual usage with an average load factor of 80% of the published Standby Power rating over each 24 hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on Standby Power.

## Energy balance

### 4012-46TAG1A - Temperate

Designation	Units	50 Hz 1500 rev/min		
		Baseload power	Prime power	Standby power
Energy in fuel	kW	2310	2940	3276
Energy in power output (gross)	kW	951	1190	1305
Energy to cooling fan	kW		42	
Energy in power output (nett)	kW	909	1148	1263
Energy to exhaust	kW	750	1020	1150
Energy to coolant and oil	kW	339	365	383
Energy to radiation	kW	69,3	75,0	98,0
Energy to charge coolers	kW	200	290	340

### 4012-46TAG1A - Tropical

Designation	Units	50 Hz 1500 rev/min		
		Baseload power	Prime power	Standby power
Energy in fuel	kW	2328	2962	3330
Energy in power output (gross)	kW	973	1212	1327
Energy to cooling fan	kW		64	
Energy in power output (nett)	kW	909	1148	1263
Energy to exhaust	kW	750	1020	1150
Energy to coolant and oil	kW	335	365	413
Energy to radiation	kW	70	75	100
Energy to charge coolers	kW	200	290	340

### 4012-46TAG2A - Temperate

Designation	Units	50 Hz 1500 rev/min		
		Baseload power	Prime power	Standby power
Energy in fuel	kW	2520	3300	3720
Energy in power output (gross)	kW	1047	1309	1437
Energy to cooling fan	kW		42	
Energy in power output (nett)	kW	1005	1267	1395
Energy to exhaust	kW	800	1150	1250
Energy to coolant and oil	kW	387	441	499
Energy to radiation	kW	76	90	112
Energy to charge coolers	kW	210	310	423

### 4012-46TAG2A - Tropical

Designation	Units	50 Hz 1500 rev/min		
		Baseload power	Prime power	Standby power
Energy in fuel	kW	2548	3320	3740
Energy in power output (gross)	kW	1069	1331	1459
Energy to cooling fan	kW		64	
Energy in power output (nett)	kW	1005	1267	1395
Energy to exhaust	kW	805	1160	1250
Energy to coolant and oil	kW	387	428	499
Energy to radiation	kW	76	100	112
Energy to charge coolers	kW	210	301	420

**Note:** Not to be used for combined heat and power (CHP) purposes (indicative figures only). If necessary, please consult Perkins Engines Company Limited.

## Cooling system

Recommended coolant: 50% inhibited ethylene glycol or 50% inhibited propylene glycol and 50% clean fresh water. For combined heat and power systems (CHP) and where there is no likelihood of ambient temperature 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 1 litre bottles from Perkins under part number 21825 735.

Maximum pressure in crankcase water jacket ... 170 kPa  
 Maximum top tank temperature (standby) ... 98 °C  
 Maximum static pressure head on pump ... 7 m

### Total coolant capacity

Electronit (engine only) ... 73 litres  
 Electropak (engine and radiator):

-temperate.. 207 litres  
 -tropical .. 210 litres  
 Maximum permissible restriction to coolant pump flow... 20 kPa  
 Thermostat operating range... 71 - 85 °C  
 Temperature rise across the engine (standby power) with inhibited coolant @ 1500 rev/min . 8 °C  
 Coolant temperature shutdown switch setting ... 101 °C rising  
 Coolant immersion heater capacity (2 off) . 4 kWe each

### Radiator

#### Temperate

Radiator face area . 2,57 m<sup>2</sup>  
 Material and number of rows:  
 -charge air and water jacket... copper, 4 rows  
 Fins per inch and material:  
 -charge air and water jacket... brass, 12 rows  
 Width of matrix ... 1,608 m  
 Height of matrix.. 1,601 m  
 Weight of radiator... 1117 kg  
 Pressure cap setting (min) . 70 kPa

#### Tropical

Radiator face area . 3,46 m<sup>2</sup>  
 Material and number of rows:  
 -charge air and water jacket... copper, 4 rows  
 Fins per inch and material:  
 -charge air and water jacket... brass, 12 rows  
 Width of matrix ... 2,10 m  
 Height of matrix.. 1,65 m  
 Weight of radiator... 1620 kg  
 Pressure cap setting (min) . 70 kPa

### Water jacket cooling data

#### Temperate and Tropical @ 1500 rev/min

-coolant flow ... 1020 litres/min  
 -coolant exit temperature (max) . 98 °C  
 -coolant inlet temperature (min) . thermostatic control  
 -coolant inlet temperature (max) ... 90 °C

### Coolant pump

Speed. 2110 rev/min  
 Method of drive .. gear

### Fan

Type ... axial flow  
 Diameter  
 -Temperate ... 1530 mm  
 -Tropical . 1600 mm  
 Number of blades... 12  
 Material . Aluminium  
 Drive ratio... 0.93:1

#### 4012-46TAG1A - Temperate, Standby power

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow		
Ambient clearance: 50% Glycol	Duct allowance (Pa)	Min airflow (m <sup>3</sup> /sec)
1500 rev/min		
35 °C	250	20,2

#### 4012-46TAG1A - Tropical, Standby power

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow		
Ambient clearance: 50% Glycol	Duct allowance (Pa)	Min airflow (m <sup>3</sup> /sec)
1500 rev/min		
50 °C	200	32,4

#### 4012-46TAG2A - Temperate, Standby power

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow		
Ambient clearance: 50% Glycol	Duct allowance (Pa)	Min airflow (m <sup>3</sup> /sec)
1500 rev/min		
35 °C	250	20,2

#### 4012-46TAG2A - Tropical, Standby power

Maximum additional restriction (duct allowance) to cooling airflow and resultant minimum airflow		
Ambient clearance: 50% Glycol	Duct allowance (Pa)	Min airflow (m <sup>3</sup> /sec)
1500 rev/min		
50 °C	200	32,4



## Lubrication system

Recommended SAE viscosity: A multigrade oil conforming to the following must be used: API CH4 15W/40.

**Note:** For additional notes on lubricating oil specifications, please refer to the Operation and Maintenance Manual (OMM)

### Lubricating oil capacity

-total system capacity ... 177 litres  
 -sump maximum ... 159 litres  
 -sump minimum ... 136 litres  
 -oil temperature at normal operating conditions to bearings 105 °C

### Lubrication oil pressure

-at rated speed ... 400 kPa  
 -minimum at 80 °C ... 340 kPa  
 -oil relief valves open ... 400 kPa  
 -oil filter spacing ... 20 microns  
 -sump drain plug tapping size ... G1  
 -oil pump speed ... 2100 rev/min  
 -method of drive ... gear  
 -shutdown switch pressure setting (where fitted) ... 193 kPa falling

### Oil pump flow

-1500 rev/min ... 6,0 litres/sec

### Normal operating angles

Front and rear ... 5°  
 Side tilt ... 10°

### Oil consumption

Prime power	Units	1500 rev/min
After running in (typically after 250 hours)	g/kWhr	0,52
Oil flow rate from pump	litres/sec	6

## Electrical system

Type ... insulated return  
 Alternator voltage ... 24 volts with integral regulator  
 Alternator output:  
 ... 40 amps at a stabilised output, 28 volts at 20 °C ambient  
 Starter type ... axial  
 Starter motor voltage ... 24 volts  
 Starter motor power ... 16,4 kW  
 Number of teeth on flywheel ... 156  
 Number of teeth on starter pinion ... 12  
 Minimum cranking speed ... 120 rev/min  
 Pull in current of starter motor solenoid @ -25 °C max <sup>(1)</sup> ... 30 amps at 24 volts  
 Hold in current of starter motor solenoid @ -25 °C max <sup>(1)</sup> ... 9 amps at 24 volts  
 Stop solenoid hold-in current ... 1,1 amps at 24 volts  
 Engine stop solenoid ... 24 volts  
 1. All leads to rated at 10 amps minimum

## Fuel system

Recommended fuel to conform to:  
 BS2869 1998 Class A2 or BS EN590

Injection system ... direct  
 Fuel injection pump and injector type ... combined unit injector  
 Injector pressure ... 140 MPa  
 Lift pump type ... Tuthill TCH 1-089

### Delivery

-4012-46TAG1A ... 1020 litres/hour  
 -4012-46TAG2A ... 1020 litres/hour  
 Heat retained in fuel to tank ... 8 kW  
 Fuel inlet temperature to be less than ... 58 °C  
 Delivery pressure ... 300 kPa  
 Maximum suction head at pump inlet ... 2,5 m  
 Maximum static pressure head ... 3 m  
 Fuel filter spacing ... 10 microns  
 Governor type ... electronic  
 Governing to ISO 8528-12 CLASS 3 and 4; ISO 8528-5 CLASS G2  
 Tolerance on fuel consumption ... 5%

### Fuel consumption

Ratings	g/kWhr	litres/hr
	1500 rev/min	
<b>4012-46TAG1A, Temperate</b>		
Standby	219	356,8
Prime	218	325,3
Baseload	216	260,2
75% Prime	218	246,4
50% Prime	232	178,5
<b>4012-46TAG1A, Tropical</b>		
Standby	205	323,6
Prime	204	295,1
Baseload	202	236,0
75% Prime	203	223,5
50% Prime	213	161,9
<b>4012-46TAG2A, Temperate</b>		
Standby	209	362,7
Prime	207	328,0
Baseload	207	261,5
75% Prime	208	249,6
50% Prime	212	172,8
<b>4012-46TAG2A, Tropical</b>		
Standby	210	353,0
Prime	207	317,9
Baseload	204	251,1
75% Prime	205	239,5
50% Prime	206	165,5

**Note:** Fuel consumption calculated on gross rated powers.

## Induction system

Maximum air intake restriction of engine:

- clean filter . . . . . 2 kPa
- dirty filter . . . . . 4 kPa
- air filter type . . . . . paper element

## Exhaust system

Exhaust outlet size (internal).. . . . . 2 x 254 mm Table D flanges  
 Exhaust outlet flange size .. . . . . 2 x 254 mm Table D flanges  
 Back pressure for total system at standby power .. . . . . 5 kPa  
 For recommended pipe sizes, please refer to the Installation Manual.

## Cold start recommendations

Temperature range	
5 °C down to -10 °C (41 °F to 14 °F)	Oil: 15W40 CH4 Starter: 2 x 24 volts Battery: 4 x 12V 286 Ah Max breakaway current: 1600 amps Cranking current: 810 amps Aids: block heaters Min mean cranking speed: 120 rev/min

### Notes:

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

## Engine mounting

Maximum static bending moment at rear face of block... 1356 Nm  
 Maximum additional load applied to flywheel due to all rotating components... 850 kg

## Centre of gravity

Bare engine, dry  
 -forward of the rear face of the cylinder block ... 771 mm  
 -above the crankshaft centre line... 32 mm  
 ElectropaK, dry  
 -forward of the rear face of the cylinder block ... 1176 mm  
 -above the crankshaft centre line... 32 mm

**Typical load acceptance (cold)**

**At 1500 rev/min**

Engine type	Initial Load Acceptance When engine reaches rated speed (15 seconds maximum after engine starts to crank)				2nd Load Application Immediately after engine has recovered to rated speed (5 seconds after initial load application)			
	Prime Power%	Load kW <sub>e</sub> Nett	Transient Frequency Deviation %	Frequency recovery time seconds	Prime Power%	Load kW <sub>m</sub> Nett	Transient Frequency Deviation %	Frequency recovery time seconds
4012-46TAG1A	73	800	≤ 10	5	27	291	≤ 10	5
4012-46TAG2A	71	860	≤ 10	5	29	344	≤ 10	5

The above figures were obtained under test conditions as follows:

Engine block temperature ..... 40 °C  
 Ambient temperature ..... 25 °C  
 Governing mode ..... Isochronous  
 Alternator inertia ..... 50 kgm<sup>2</sup>  
 Under frequency roll off (UFRO) point set to ..... 49,5  
 UFRO rate set to ..... 16 v/hz  
 LAM on / off ..... on

**Emissions chart**

Spill timing 12° @ 50 Hz conform to				
Rating	German TA-Luft @ <3 MW	German TA-Luft Limit @ >3 MW	French Limits 2000 @ <500 hours/year	French Limits 1500 @ >500 hours/year
<b>4012-46TAG1A</b>				
Baseload	Yes	Yes	Yes	No
Prime power	Yes	Yes	Yes	No
Standby	N/A	Yes	Yes	No
<b>4012-46TAG2A</b>				
Baseload	Yes	Yes	Yes	No
Prime power	N/A	Yes	Yes	No
Standby	N/A	Yes	Yes	No

German TA Luft legislation (1986) limits:

- NO<sub>x</sub> ≤ 2000 mg/Nm<sup>3</sup>
- CO ≤ 650 mg/Nm<sup>3</sup>
- HC ≤ 150 mg/Nm<sup>3</sup>
- PM ≤ 50 mg/Nm<sup>3</sup>

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

Applied load is a percentage of generator electrical output efficiency as published in the general installation section of this data sheet. The above data complies with the requirements of classifications 3 and 4 of ISO 8528-2 and G2 Operating Limits stated in ISO 8528-5.

**The information given on this Technical Data Sheet is for standard engines, and for guidance only. For ratings other than those shown contact Perkins Engines Company Limited, Stafford.**



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