



1100 Series

1104A-44TG1

Diesel Engine - ElectropaK

64.3 kWm at 1500 rpm

75.5 kWm at 1800 rpm



Compact, Efficient Power

- 1100 Series is the result of an intensive period of customer research that has guided the development of the range.
- The new 4.4 litre cylinder block ensures bore roundness is maintained under the pressures of operation. It also ensures combustion and mechanical noise is lowered.
- A new cylinder head has re-established Perkins mastery of air control.

Quality by Design

- Product design and Class A manufacturing improvements enhance product reliability while maintaining Perkins legendary reputation for durability.

Cost Effective Power

- Compact size and low noise.
- Lower fuel consumption and oil use.
- 500 hour service intervals.
- 2 year warranty.

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

Building upon Perkins proven reputation within the power generation industry, the 1100 Series range of ElectropaK engines now fit even closer to customers needs.

In the world of power generation success is only gained by providing more for less. With the 1104A-44TG1 Perkins has engineered even higher levels of reliability, yet lowered the cost of ownership.

1100A units are designed for territories that do not require compliance to EPA or EU emissions legislation. These units are able to meet TA luft legislation.

Engine speed rev/min	Operation Type	Typical Generator Output (Net)		Engine Power			
				Gross		Net	
		kVA	kWe	kWm	bhp	kWm	bhp
1500	Prime Power	65.0	52.0	59.6	79.9	58.4	78.3
	Standby Power	71.5	57.2	65.6	88.0	64.3	86.2
1800	Prime Power	76.0	60.8	70.7	94.8	68.6	92.0
	Standby Power	83.6	66.9	77.8	104.3	75.5	101.2

The above ratings represent the engine performance capabilities to conditions specified in ISO 8528/1, ISO 3046/1:1986, BS5514/1 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. ϕ) of 0.8

Fuel specification: BS 2869: Part 2 1998 Class A2 or DIN EN 590

Lubricating oil: 15W40 to API CG4

Rating Definitions

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 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.

1100 Series

1104A-44TG1

Standard ElectropaK Specification

Air inlet

- Mounted air filter

Fuel system

- Rotary type pump
- Ecoplus fuel filter

Lubrication system

- Wet sump with filler and dipstick
- Spin-on oil filter

Cooling system

- Thermostatically-controlled system with gear-driven circulation pump and belt-driven pusher fan
- Mounted radiator and piping

Electrical equipment

- 12 volt starter motor and 12 volt 65 amp alternator with DC output
- 12 volt shutdown solenoid energised to run
- Glow plug cold start aid

Flywheel housing

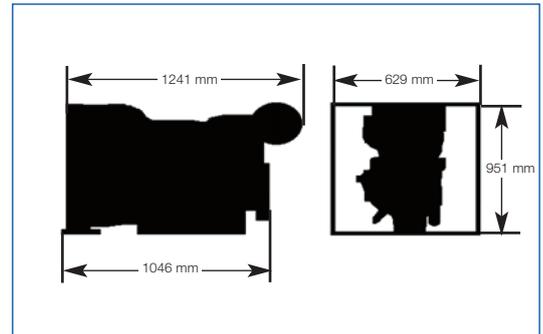
- High inertia flywheel to SAE J620 size 10/11½
- SAE 3 flywheel housing

Literature

- User's Handbook

Optional equipment

- Woodward electronic governor (LCG2)
- Workshop manual
- Parts book



Engine Speed	Fuel Consumption			
	1500 rev/min		1800 rev/min	
	g/kWh	l/hr	g/kWh	l/hr
At standby power	207	16.2	211	19.5
At prime power	208	14.8	211	17.7
At 75% of prime power	209	11.2	214	13.5
At 50% of prime power	224	8.0	229	9.6

General Data

Number of cylinders	4 vertical in-line
Bore and stroke	105 x 127 mm
Displacement	4.4 litres
Aspiration	Turbocharged
Cycle	4 stroke
Combustion system	Direct injection
Compression ratio	17.25:1
Rotation	Anti-clockwise viewed from flywheel
Cooling system	Water-cooled
Total lubrication system capacity	8.0 litres
Total coolant capacity	13.0 litres
Dimensions	Length 1241 mm Width 629 mm Height 951 mm
Dry Weight (approx.)	463 kg

Final weight and dimensions will depend on completed specification.



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TEKNİK ÖZELLİKLER

**ÇUKUROVA CJ110VM JENERATÖR
VOLVO PENTA TAD531GE DİZEL MOTOR
MARATHON 362 CSL 1606 ALTERNATÖR
108 kVA/86 kW STANDBY&OTOMATİK
98 kVA/78 kW PRİME**

1. DİZEL JENERATÖR SETİ:

Marka	: ÇUKUROVA
Model	: CJ110VM
Tipi	: Dizel jeneratör, otomatik
Çıkış gerilimi	: 380V/415V
Frekans	: 50Hz
Güç faktörü	: 0.8
Çıkış gücü, kVA	: 108 kVA STANDBY/ 98 kVA PRİME
Çıkış gücü, kW	: 86 kW STANDBY/ 78 kW PRİME
Şasi	: Ağır hizmet tipi, yekpare, kaldırma kulakları monteli.
Akuplaj	: SAE flanşlı akuplaj
Vibrasyon önlenmesi	: Jeneratör şasi altında zemine sarsıntıyı iletmeyen vibrasyon takozları ile birlikte.
Emniyet	: Fan, fan tahriki, şarj alternatörü tahriki vb. hareketli üniteler personele zarar vermemesi için çelik kafesle emniyete alınmış halde. Radyatör petekleri; darbe ve çarpmalara karşı, koruma kafesi monteli olarak.

Kontrol Sistemi : Otomatik kontrol modülü (Datakom DKG307)

Boya : Çukurova sarısı, endüstriyel tip.
Dökümantasyon : Kullanma, bakım ve yedek parça kitapları,
Fabrika YÜK TEST raporları ile birlikte.

1.1 MOTOR:

Marka	: VOLVO
Menşei	: İSVEÇ
Model	: TAD531GE
Tipi	: Su soğutmalı dizel, endüstriyel tip.
Radyatör	: Orjinal, TROPICAL TİP, 55 derece ortam sıcaklığına göre,
Hava emiş sistemi	: Turboşarj, Air-to-air intercooler
Devir	: 1500 RPM
Güç	: 102kWm
Silindir sayısı	: I-4, sıralı tip
Silindir çapı	: 108mm
Silindir boyu	: 130mm
Silindir hacmi	: 4.76 litre
Kompresyon oranı	: 18:1
Egzos sist.verilen ısı miktarı	: 88 kW
Soğutma sistemine ısı miktarı	: 52.5 kW
Radyasyon yoluyla ısı m.	: 10 kW
Egzos gaz sıcaklığı	: 557 °C
Egzos gazı debisi	: 18.4 m ³ /dakika
Governor	: Heinzman, Mekanik
Yakıt tüketimi	: <u>Güç</u> <u>Yakıt Tüketimi</u>
	% 100 yükte 219 g/kwh
	% 75 yükte 217 g/kwh
	% 50 yükte 221 g/kwh
Yakıt enjeksiyonu	: Direkt püskürtmeli
Yağlama sistemi	: Cebri basınçlı
Yol verme şekli	: Elektrikli, DC 12V
Elektrik sistemi	: 12V DC; Shutdown selonoidleri, shutdown switchleri, gösterge ikazları.
Minimum marş devri	: 200rpm
Filtre sistemi	: Tüm filtreler endüstriyel, değiştirilebilir tip.
Yıllık standby çalışma süresi	: 500 SAAT/YIL değişken yüklerde.
Standartlar	: ISO9001 tasarım, üretim ve servis ISO 3046 motor performansları ISO 3744-1981(E) gürültü emisyonu EU Stage - 2 egzos emisyonu

- Islak tip, değiştirilebilir silindir gömlekleri,
- Değiştirilebilir supab yatak ve guide-ları
- Tam akışlı yağ soğutucusu,
- Dişli tip yağ pompası, direkt motor volanından tahrikli
- Krank milinden kayışla tahrikli, bakım gerektirmeyen, yüksek verimli soğutma suyu pompası
- Min. Basınç düşümlü, uygun termostat
- Tam akışlı, değiştirilebilir tip, extra yüksek filtrasyon kapasiteli yağ filtresi
- Değiştirilebilir tip yakıt filtresi, su ayırıcı
- Yakıt su ayırıcı filtre, yıkanabilir tip
- Dönel tip düşük basınçlı yakıt pompası
- Bosch enjeksiyon pompası

- Değiştirilebilir tip hava filtresi
- İskra marka fabrika montajlı şarj alternatörü
- Bosch marka fabrika montajlı marş motoru
- Motor elektrik tesisatı fabrika montajlı

1.2 ALTERNATÖR:

Marka	: MARATHON
Menşei	: U.S.
Model	: 362 CSL 1606
Tipi	: Fırçasız, döner alanlı.
Konstrüksiyon	: TEK YATAKLI(Single Bearing), direkt akuple, amortisör sargılı, dip proof IP22, IC0A1 soğutma sistemi.
Frekans	: 50Hz
Gücü	: 114kVA
Devir sayısı	: 1500RPM
Güç faktörü	: 0.8
Gerilim	: 380/400V
İzolasyon sınıfı	: H, Sargılar vakum altında polyester reçine ile izole, nem veya yoğuşmaya karşı reçine üzeri kalın vernik kaplı.
İkaz şekli	: Kendinden
Regülasyon	: AVR; Otomatik solid state voltaj regülasyonu.
AVR modeli	: SE350
Verim	: %90
Voltaj sapması	: +/-% 1.0'den az ; GÜÇ FAKTÖRÜ DEĞİŞİMİNDE; 0.8-1.0 HIZ DEĞİŞİMİNDE; +/-%4
Dengesiz yüklenebilme	: %30
Koruma sınıfı	: IP22
Rotor	: Dinamik balanslı, nominal hızın % 130'una göre dizayn edilmiş.
Sinüs dalgası sapması	: Faz-faz arası veya faz-nötr arası; maksimum +/- %5
THF	: %2'den az
TIF	: 50'den az
Stator sarımı	: 2/3 pitch factor
Radio interference	: BS800 ve VDE Class G ve N standartlarını sağlayacak seviyede.
Çıkış gerilim ayar sınırı	: +/- %8
Aşırı yüklenebilme	: 12 saatlik çalışma periyodunda; % 110.....1 saat % 150.....2 dakika
Bağlantı şekli	: WYE
Dış etkilere karşı koruma	: NEMA I IP22standartları
Standartlar	: NEMA MG1-22, BS5000, CSA C22.2, IEC 34-1,ISO9001

1.3 JENERATÖR KONTROL PANOSU:

Sistem DATAKOM DKG307 dijital otomatik ana kontrol modülü ile kumanda edilmektedir.

1.3.1 PANO ÖN PANEL YERLEŞİMİ:

- 1 adet DATAKOM DKG-307 dijital otomatik kontrol modülü
- 1 adet Çalışma Saati sayacı
- 1 adet Acil Durdurma Butonu
- 1 adet Akü Şarj (Alternatör) Lambası

1.3.2 PANO İÇ YERLEŞİMİ:

- 1 adet Siren
- Muhtelif sigorta, Röle ve diğer aksam
- 1 adet Akü Şarj Redresörü (Transfer Panosu olan Jeneratör sistemlerinde mevcuttur)

1.3.3 DATAKOM DKG-307 OTOMATİK KONTROL MODÜLÜ:

1.3.3.1 ÖZELLİKLER:

- 155mm x 115x 48mm boyutlarında,
- 3 Segmentli 3 LCD ekran ve ikaz LED 'leri
- Geliştirilmiş microprocessor dizayn
- Ledli mimik diagramlı
- Dokunmatik tuş kontrollu basit kullanım
- Sistem parametreleri modül üzerinden ayarlanabilir
- Otomatik çalıştırma ve durdurma
- Otomatik Şebeke izleme
- Otomatik yük transferi
- Motor kumandası
- Jeneratör korumaları
- Dahili alarm ve uyarılar
- 3 faz Şebeke voltaj girişleri
- 3 faz jeneratör voltaj girişleri
- 3 faz jeneratör akım girişleri
- Motor yağ basınç ölçümü
- Motor soğutma suyu sıcaklık ölçümü
- Jeneratör aktif güç ölçümü
- Jeneratör cosfi ölçümü
- Servis zamanı göstergesi
- Motor çalışma saati
- Hata kayıtları tutma
- İstatistik kayıtları tutma
- Batarya destekli gerçek zaman saati
- Haftalık çalışma programı
- 155 adet programlı parametre
- Cihaz üzerinden değiştirilebilir parametreler
- RS-232 seri port çıkışı
- LED göstergeler
- Konfigüre edilebilen analog girişler: 2
- Konfigüre edilebilen dijital girişler: 7

- Konfigüre edilebilen role çıkışları: 2
- Toplam role çıkışı: 6
- Marş sırasındaki gerilim düşmesinden etkilenmez
- Tam kapalı ön panel
- Ayrılabilir bağlantı konnektörleri

1.3.3.2. DOKUNMATİK TUŞ KONTROLU:

Kullanıcı tarafından bilinen güvenlik kodu girildikten sonra, sistem aşağıdaki konumlara getirilebilir;

- Durdurma : OFF
- Otomatik : AUTO
- Test : TEST
- Yüklü Test : LOAD TEST
- Parametre Tuşları : MENU
- LCD sayfası : YUKARI-AŞAĞI OKLARI (ALARM MUTE-LAMP TEST)

1.3.3.3 LCD EKCRAN ÜZERİNDEN GÖRÜLEBİLEN ve GİRİLEBİLEN DEĞERLER:

Aşağıdaki parametreler için ALARM değerleri LCD ekran üzerinden DATAKOM DKG-205 üzerindeki tuşlar kullanılarak modüle doğrudan girilebilir.

- Jeneratör Faz-Nötr arası gerilimleri : Volts L1-N, L2-N, L3-N
- Jeneratör Faz-Faz arası gerilimleri : Volts L1-L2, L2-L3, L3-L1
- Jeneratör Akımları : Amp L1, L2, L3
- Jeneratör Toplam kW : kW
- Jeneratör güç katsayısı : Cos Phi
- Jeneratör frekansı : Hz
- Şebeke Faz-Nötr arası gerilimleri : Volts L1-N, L2-N, L3-N
- Şebeke Faz-Faz arası gerilimleri : Volts L1-L2, L2-L3, L3-L1
- Akü Volatajı : Volts DC
- Soğutma suyu sıcaklığı : C
- Yağ Basıncı : Bar

1.3.3.4 ALARM KANALLARI:

Aşağıdaki ALARMLAR LCD ekran üzerinde tanımlanır. Modül IŞIKLI(LED) ve SESLİ ALARM vererek, sistem çalışır vaziyette veya standby bekleme durumunda olsun/olmasın, sistemi kapatır.

- Düşük/aşırı jeneratör gerilimi
- Aşırı Yük
- Düşük/aşırı jeneratör frekansı
- Düşük/aşırı devir
- Akü şarj arızası
- Acil durdurma
- Düşük motor yağ basıncı
- Aşırı motor harareti
- Marş arızası, start anında
- Düşük/aşırı akü DC gerilimi

1.3.3.5 AYARLANABİLİR SÜRE VE VERİ GİRİŞLERİ:

- Sistem start zaman ayarı
- Sistem stop zaman ayarı
- Marş basma süresi/takip eden marşlar arası bekleme süresi
- Marş basma adedi/ manuel kullanımda marş adet sınırlaması
- Sistem emniyete geçme süresi
- Motor ısınma çalışması süresi
- Motor soğuma çalışması süresi
- Ön ısıtma süresi/ ön ısıtma by-pass süresi
- Aşırı hız aşım süresi ayarı
- Akü gerilim arızası
- Takip eden servis süresi ayarı

1.3.3.6 SİSTEM FOKSİYONLARI:

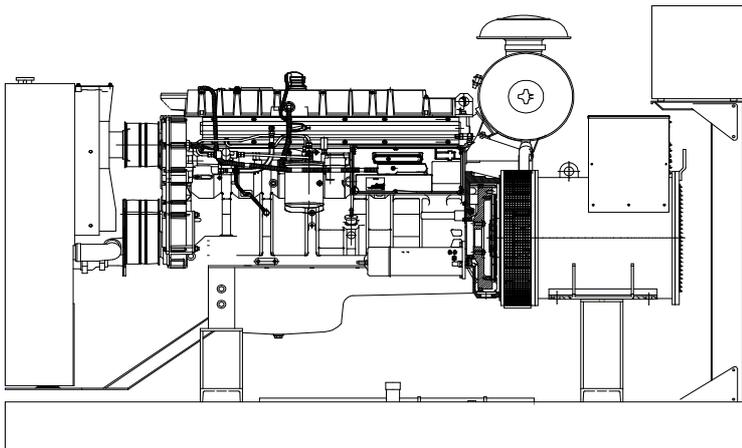
- Alternatör düşük/ aşırı gerilimi ikazı/ sistemin kapanması
- Alternatör düşük/ aşırı frekansı ikazı/ sistemin kapanması
- Düşük/ aşırı devir ikazı/ sistemin kapanması
- Düşük motor yağ basıncı ikazı/ sistemin kapanması
- Aşırı motor soğutma suyu harareti ikazı/ sistemin kapanması
- Düşük akü gerilimi ikazı
- Aşırı akü gerilimi ikazı
- Aşırı Yük ikazı/ sistemin kapanması
- Ayarlanabilir marş adedi/ marş süresi/ marş denemeleri arası gecikme süresi
- Alternatör çıkış değerlerinin izlenebilmesi
- 73/23/EEC
- 93/68/EEC
- EN 61010
- EN 50081-1
- EN 50082-1
- Tesiste kullanım şartlarına göre özel tanımlanabilen ek 3 Dijital veri girişi
- Şebeke aşırı/düşük gerilimi izlenmesi
- Kontaktör/şalter kontrolü

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Ford ECOTORQ 300PS diesel engine

Sincro SK250ML alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ250FS	250	200	227	182

APPLICATION DATA

Ford ECOTORQ 300PS Engine

Standard Features

Powerful, silent and long life industrial type engine

- ◊ Designed, developed and manufactured using the latest techniques
- ◊ Tested at the hardest conditions

Easy of maintenance

- ◊ Modular design to provide easy of maintenance

Ecotorq Diagnostic System (EDS)

- ◊ Easy system control and maintenance with the specific EDS, developed for the ecotorq engine

Electronic Control Unit (ECU)

- ◊ ECU is an engine management system.
- ◊ Provide engine to run efficient by using the datas sent from the sensors
- ◊ Register the failures appeared at the system. This failures can be written by the help of test equipment

Bosh Common Rail Injection System

- ◊ High pressure pump generates a pressure of up to 1400 bar (determined by the injection pressure setting in the engine control unit) independently of the engine speed and quantity of fuel injected. The fuel is fed through rigid pipes to the injectors, which inject the correct amount of fuel in a fine spray into the combustion chambers. The ECU controls extremely precisely all the injection parameters as well as performing other engine functions.

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
Ecotorq 300PS	224	215	205	196

Cooling System

- Type Tropical, heavy duty type
- Ambient temperature, °C 50
- Engine+Radiator coolant cap., Liters 40
- ◊ Gear-driven circulating pump
- ◊ Mounted belt-driven pusher fan
- ◊ Radiator supplied loose incorporating aftercooler
- ◊ System designed for ambients up to 50°C

Fuel System

- Type of injection system Common Rail
- Fuel injector Bosh Common Rail
- Pressure, bar 1400
- Governor type Electronic
- ◊ Replaceable fuel filter elements

Technical Specifications

Manufacturer	FORD
Model	Ecotorq 300PS
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	7.33
Bore X Stroke, mm	112 X 124
Compression Ratio	17.4:1
Combustion System	Common Rail
Aspiration	Turbocharged, aftercooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	224
Fan Power, kWm	9
Combustion air flow, m³ / min	11.6
Exhaust gas temp. (after turbo), °C	530
Exhaust gas flow (after turbo), m³ / min	28.5

Electrical System

- Alternator 24 Volt with integral regulator
- Starter motor (DC) 24 Volt
- Starter motor power 4 kW
- ◊ ECU (Electronic Control Unit) mounted on engine with wiring looms and sensors

Fuel Consumption

liters per hour	%110 Load	48 L
	%100 Load	43 L
	%75 Load	35 L
	%50 Load	24 L
grams per kWh	%110 Load	206 g/kWh
	%100 Load	203 g/kWh
	%75 Load	199 g/kWh
	%50 Load	203 g/kWh

Lubricating System

- Type Pressurized
- Capacity, Liters 28
- ◊ Full-flow replaceable filter

alternator

Sincro SK250ML Alternator

Standard Features

Electrical performance

Class H insulation
 Windings are vacuumed under pressurized polyester resin and varnished
 Standard 12-wire re-connectable winding, 2/3 pitch
 High efficiency and motor starting capacity

Protection degree

Sincro alternators are standard IP21
 All the rotating and electrically energized parts are fully guarded.
 Higher protection degree can be supplied on request

Costruction

Single bearing design
 Bearings are dimensioned for heavy duty
 Steel frame
 Cast iron flanges and shields

Automatic Voltage Regulator

BL3 automatic voltage regulator provides 1 % regulation and underspeed protection

Transient features

Transient voltage drop for rated step load at 0.8 power factor is less than 18%

Single phase operation

All brushless alternators can be connected for single phase use

Standards

Sincro alternators conforms to the main international standards and regulations:

IEC 34.1, IEC 34.5, IEC 34.22, EN55011, EN50081-1, EN50082-2

Model	Standby		Prime	
	kVA	kW	kVA	kW
SK250ML	251	201	230	184

Technical Specifications

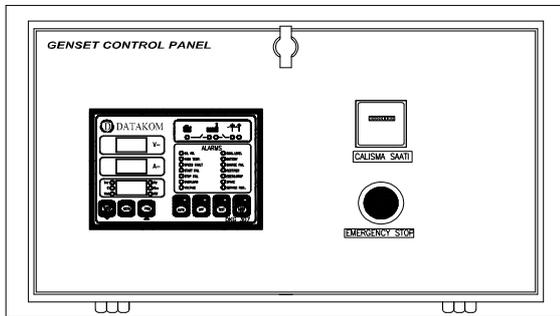
Manufacturer	SINCRO
Model	SK250ML
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	251
Efficiency, %	92.7
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	BL 3
Voltage Regulation, %	± 1
THC	< 2%
THF	< 3%
Short circuit current	>300 % In
Insultion class	H
Leads	12
Construction	Single bearing, direct coupled
Connection	WYE
Protection class	IP21

Optional Equipment

- ◊N° 3 Thermal contacts N.C. (N.O. On request)
- ◊Protection IP23
- ◊Protection IP44 (90 % of output power)
- ◊N° 1 PT100 on the bearing
- ◊Tropicalized winding
- ◊Device for parallel operation with other alternators
- ◊Space heaters 230V
- ◊N° 3 Thermistor PTC
- ◊N° 3 Thermoresistors PT100
- ◊N° 1 Potentiometer for voltage remote control
- ◊Special voltages

Control Panel

Standard Equipments



- ◊Datakom DKG307 digital automatic control module
- ◊Hourmeter
- ◊Emergency stop button

Datakom DKG307 Control Module

Description

◊The DKG-307 is a comprehensive AMF unit for a single generating set operating in standby mode.

◊In AUTOMATIC position, DKG-307 monitors mains phase voltages and controls the automatic starting, stopping and load transfer of the generating set in case of a mains failure and once the generator is running, it monitors internal protections and external fault inputs. If a fault condition occurs, the unit shuts down the engine automatically and indicates the failure source with the corresponding red led lamp.

◊The DKG-307 provides a comprehensive set of digitally adjustable timers, threshold levels, input and output configurations and operating sequences. The unauthorized access to program parameters is prevented by the program lock input. All programs may be modified via front panel pushbuttons, and do not require an external unit.

◊The fault conditions are considered in 2 categories as Warnings and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

◊The service request indicator lamp turns on at the expiration of either engine hours or time limits.

◊It is possible to monitor the operation of the system locally or remotely with the WINDOWS based PC utility program.

◊The unit is designed for front panel mounting. It is fitted into the cut-out with the steel spring removed. Connections are made with 2 part plug and socket connectors.

Pushbutton Controls

STOP / START
AUTO, TEST, MANUAL
LCD PAGE

Features

- Automatic mains failure with genset control and protection
- Remote Start operation capability
- Analogue temperature and oil pressure inputs
- Genset KW and Power Factor measurement
- Engine hours run counter
- Periodic maintenance request display
- 165 programmable parameters
- Battery backed-up real time clock
- Weekly operation schedule programs
- Daily, weekly, monthly exerciser
- Event logging with time stamp
- Statistical counters
- Serial RS-232 data output for telemetry on PC
- Free MS-Windows remote monitoring SW
- Configurable analogue inputs: 2
- Configurable digital inputs: 7
- Configurable relay outputs: 2
- Output expansion capability
- Small dimensions (155x115x48mm)

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	kW L1, L2, L3,total
Generator power factor	Cosf L1, L2, L3,total

Optional Input Functions

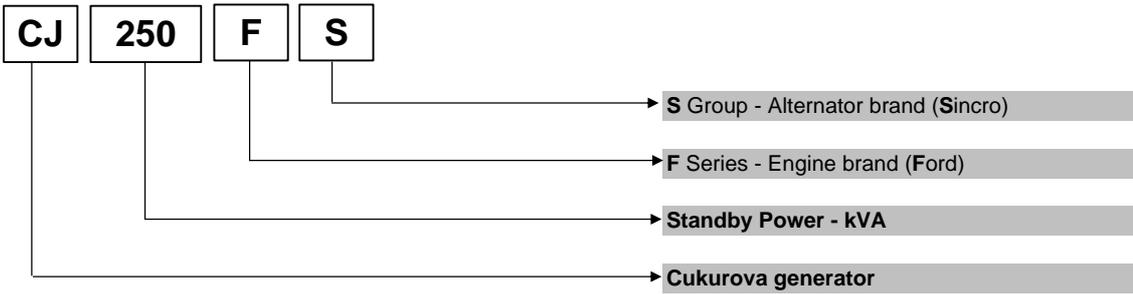
Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

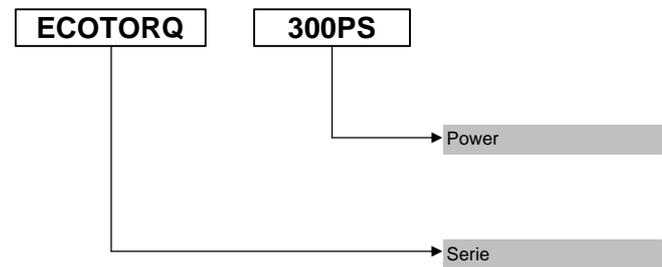
- Under/over generator voltage
- Over-current
- Under/over generator frequency
- Under/over speed
- Charge fail
- Emergency stop
- Low oil pressure
- High engine temperature
- Fail to start
- Low/high DC battery voltage
- Reverse power
- Generator phase rotation error
- Generator short-circuit protection
- Loss of speed sensing signal
- Mains out of limits

Model Codes and General Information

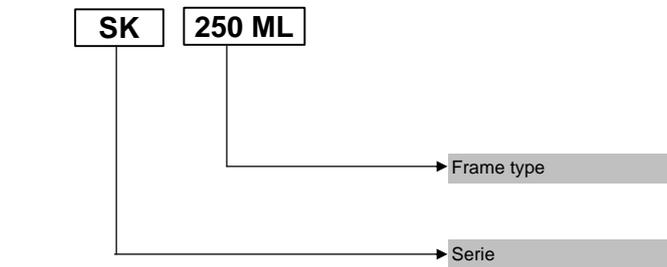
Cukurova Diesel Generator



Ford Ecotorq Diesel Engine



Sincro Alternator



Information

Power Ratings

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.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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation.No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

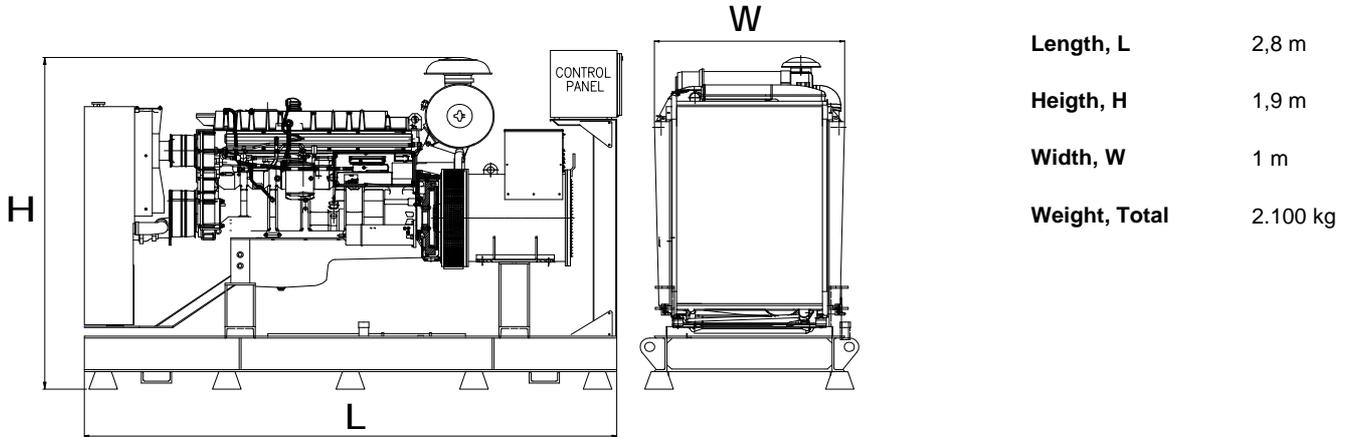
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

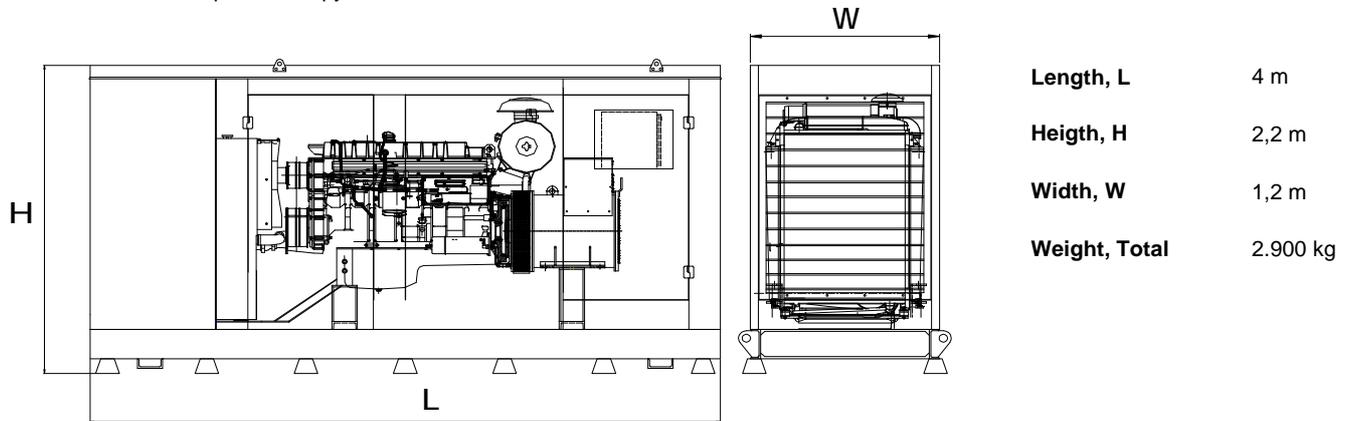
- kWm: Mechanical Power
- kWe : Electrical Power
- pf : Power factor
- E : Alternator efficiency
- I : Current (A)
- U : Voltage (V)
- kVA : Power
- Rpm: Revolutions per minute

General Dimensions

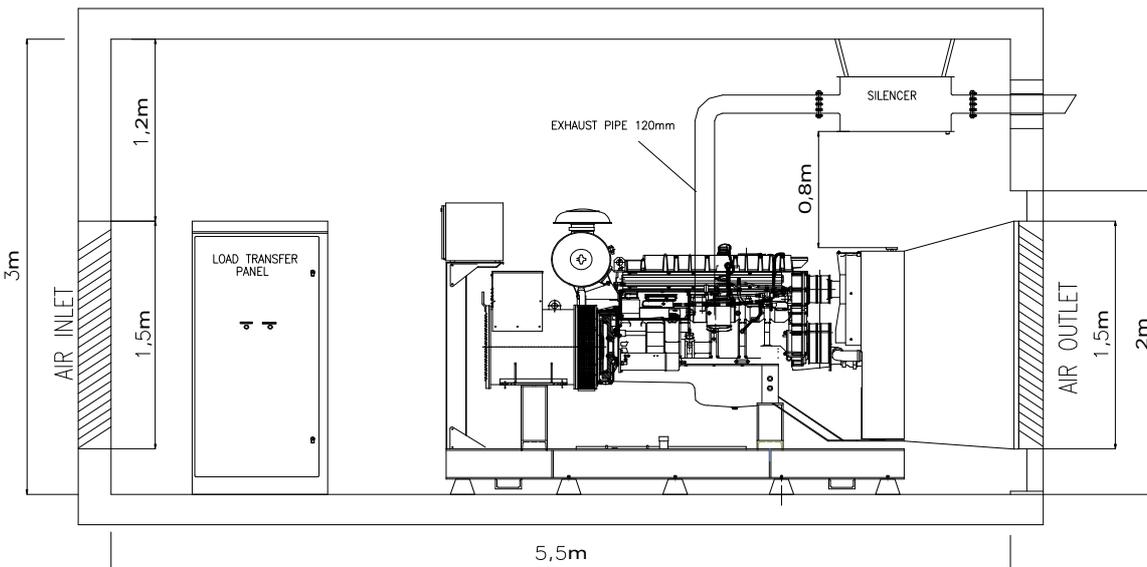
Standard Generator



Generator with Soundproof Canopy



Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice



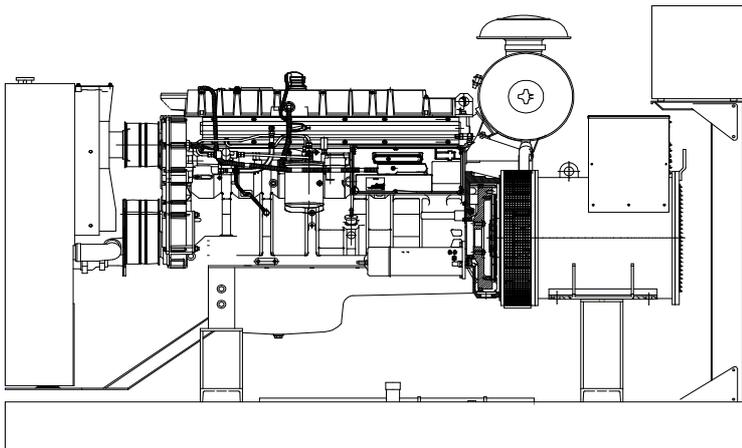
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İSTANBUL	Tel : (0216) 395 34 60 (5 hat)	Faks : (0216) 395 23 75
ADANA	Tel : (0322) 436 11 47 (5 hat)	Faks : (0322) 436 16 99
ANKARA	Tel : (0312) 490 87 77 (5 hat)	Faks : (0312) 490 89 88
İZMİR	Tel : (0232) 478 18 70	Faks : (0232) 478 18 30
ANTALYA	Tel : (0242) 221 49 21	Faks : (0242) 221 49 72
BURSA	Tel : (0224) 441 84 77	Faks : (0224) 441 84 78
DIYARBAKIR	Tel : (0412) 251 21 90 (10 hat)	Faks : (0412) 251 21 88
KAYSERİ	Tel : (0352) 331 74 74	Faks : (0352) 331 74 23
TRABZON	Tel : (0462) 325 70 10 (pbx)	Faks : (0462) 325 77 67

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Ford ECOTORQ 300PS diesel engine

Sincro SK250ML alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ250FS	250	200	227	182

APPLICATION DATA

Ford ECOTORQ 300PS Engine

Standard Features

Powerful, silent and long life industrial type engine

- ◊ Designed, developed and manufactured using the latest techniques
- ◊ Tested at the hardest conditions

Easy of maintenance

- ◊ Modular design to provide easy of maintenance

Ecotorq Diagnostic System (EDS)

- ◊ Easy system control and maintenance with the specific EDS, developed for the ecotorq engine

Electronic Control Unit (ECU)

- ◊ ECU is an engine management system.
- ◊ Provide engine to run efficient by using the datas sent from the sensors
- ◊ Register the failures appeared at the system. This failures can be written by the help of test equipment

Bosh Common Rail Injection System

- ◊ High pressure pump generates a pressure of up to 1400 bar (determined by the injection pressure setting in the engine control unit) independently of the engine speed and quantity of fuel injected. The fuel is fed through rigid pipes to the injectors, which inject the correct amount of fuel in a fine spray into the combustion chambers. The ECU controls extremely precisely all the injection parameters as well as performing other engine functions.

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
Ecotorq 300PS	224	215	205	196

Cooling System

- Type Tropical, heavy duty type
- Ambient temperature, °C 50
- Engine+Radiator coolant cap., Liters 40
- ◊ Gear-driven circulating pump
- ◊ Mounted belt-driven pusher fan
- ◊ Radiator supplied loose incorporating aftercooler
- ◊ System designed for ambients up to 50°C

Fuel System

- Type of injection system Common Rail
- Fuel injector Bosh Common Rail
- Pressure, bar 1400
- Governor type Electronic
- ◊ Replaceable fuel filter elements

Technical Specifications

Manufacturer	FORD
Model	Ecotorq 300PS
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	7.33
Bore X Stroke, mm	112 X 124
Compression Ratio	17.4:1
Combustion System	Common Rail
Aspiration	Turbocharged, aftercooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	224
Fan Power, kWm	9
Combustion air flow, m³ / min	11.6
Exhaust gas temp. (after turbo), °C	530
Exhaust gas flow (after turbo), m³ / min	28.5

Electrical System

- Alternator 24 Volt with integral regulator
- Starter motor (DC) 24 Volt
- Starter motor power 4 kW
- ◊ ECU (Electronic Control Unit) mounted on engine with wiring looms and sensors

Fuel Consumption

liters per hour	%110 Load	48 L
	%100 Load	43 L
	%75 Load	35 L
	%50 Load	24 L
grams per kWh	%110 Load	206 g/kWh
	%100 Load	203 g/kWh
	%75 Load	199 g/kWh
	%50 Load	203 g/kWh

Lubricating System

- Type Pressurized
- Capacity, Liters 28
- ◊ Full-flow replaceable filter

alternator

Sincro SK250ML Alternator

Standard Features

Electrical performance

Class H insulation
 Windings are vacuumed under pressurized polyester resin and varnished
 Standard 12-wire re-connectable winding, 2/3 pitch
 High efficiency and motor starting capacity

Protection degree

Sincro alternators are standard IP21
 All the rotating and electrically energized parts are fully guarded.
 Higher protection degree can be supplied on request

Costruction

Single bearing design
 Bearings are dimensioned for heavy duty
 Steel frame
 Cast iron flanges and shields

Automatic Voltage Regulator

BL3 automatic voltage regulator provides 1 % regulation and underspeed protection

Transient features

Transient voltage drop for rated step load at 0.8 power factor is less than 18%

Single phase operation

All brushless alternators can be connected for single phase use

Standards

Sincro alternators conforms to the main international standards and regulations:

IEC 34.1, IEC 34.5, IEC 34.22, EN55011, EN50081-1, EN50082-2

Model	Standby		Prime	
	kVA	kW	kVA	kW
SK250ML	251	201	230	184

Technical Specifications

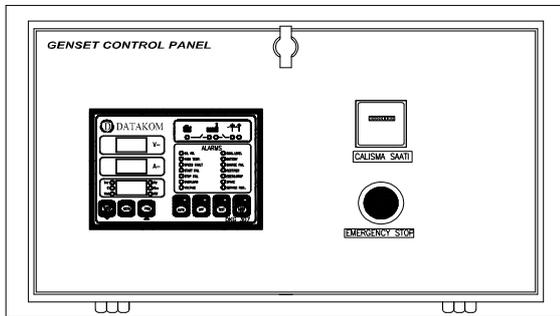
Manufacturer	SINCRO
Model	SK250ML
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	251
Efficiency, %	92.7
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	BL 3
Voltage Regulation, %	± 1
THC	< 2%
THF	< 3%
Short circuit current	>300 % In
Insultion class	H
Leads	12
Construction	Single bearing, direct coupled
Connection	WYE
Protection class	IP21

Optional Equipment

- ◊N° 3 Thermal contacts N.C. (N.O. On request)
- ◊Protection IP23
- ◊Protection IP44 (90 % of output power)
- ◊N° 1 PT100 on the bearing
- ◊Tropicalized winding
- ◊Device for parallel operation with other alternators
- ◊Space heaters 230V
- ◊N° 3 Thermistor PTC
- ◊N° 3 Thermoresistors PT100
- ◊N° 1 Potentiometer for voltage remote control
- ◊Special voltages

Control Panel

Standard Equipments



- ◊ Datakom DKG307 digital automatic control module
- ◊ Hourmeter
- ◊ Emergency stop button

Datakom DKG307 Control Module

Description

◊ The DKG-307 is a comprehensive AMF unit for a single generating set operating in standby mode.

◊ In AUTOMATIC position, DKG-307 monitors mains phase voltages and controls the automatic starting, stopping and load transfer of the generating set in case of a mains failure and once the generator is running, it monitors internal protections and external fault inputs. If a fault condition occurs, the unit shuts down the engine automatically and indicates the failure source with the corresponding red lamp.

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◊ The fault conditions are considered in 2 categories as Warnings and Alarms. Measured values have separate programmable limits for warning and alarm conditions.

◊ The service request indicator lamp turns on at the expiration of either engine hours or time limits.

◊ It is possible to monitor the operation of the system locally or remotely with the WINDOWS based PC utility program.

◊ The unit is designed for front panel mounting. It is fitted into the cut-out with the steel spring removed. Connections are made with 2 part plug and socket connectors.

Pushbutton Controls

STOP / START
AUTO, TEST, MANUAL
LCD PAGE

Features

- Automatic mains failure with genset control and protection
- Remote Start operation capability
- Analogue temperature and oil pressure inputs
- Genset KW and Power Factor measurement
- Engine hours run counter
- Periodic maintenance request display
- 165 programmable parameters
- Battery backed-up real time clock
- Weekly operation schedule programs
- Daily, weekly, monthly exerciser
- Event logging with time stamp
- Statistical counters
- Serial RS-232 data output for telemetry on PC
- Free MS-Windows remote monitoring SW
- Configurable analogue inputs: 2
- Configurable digital inputs: 7
- Configurable relay outputs: 2
- Output expansion capability
- Small dimensions (155x115x48mm)

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3, total
Generator total power	kW L1, L2, L3, total
Generator power factor	Cosφ L1, L2, L3, total

Optional Input Functions

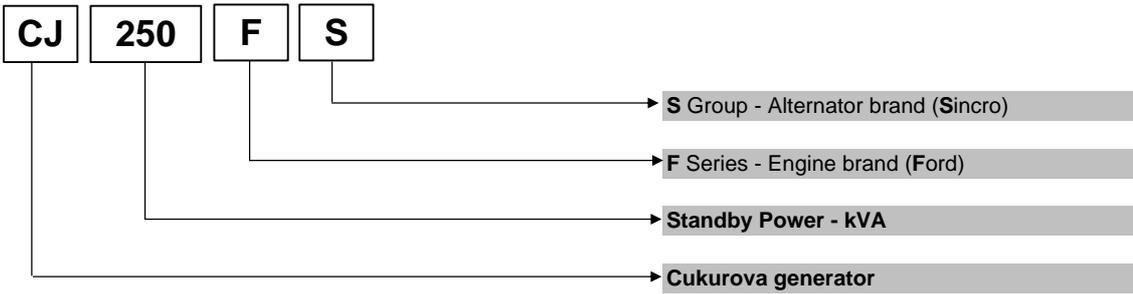
Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

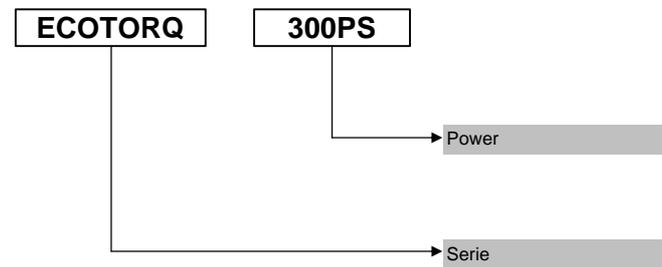
- Under/over generator voltage
- Over-current
- Under/over generator frequency
- Under/over speed
- Charge fail
- Emergency stop
- Low oil pressure
- High engine temperature
- Fail to start
- Low/high DC battery voltage
- Reverse power
- Generator phase rotation error
- Generator short-circuit protection
- Loss of speed sensing signal
- Mains out of limits

Model Codes and General Information

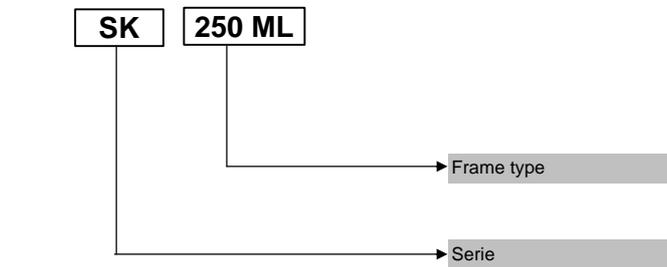
Cukurova Diesel Generator



Ford Ecotorq Diesel Engine



Sincro Alternator



Information

Power Ratings

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.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.

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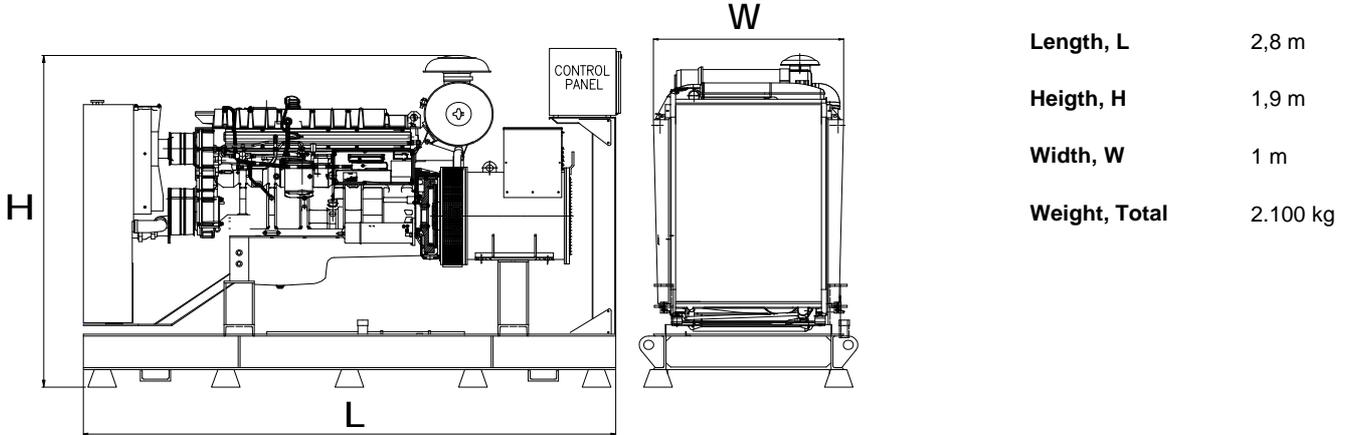
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

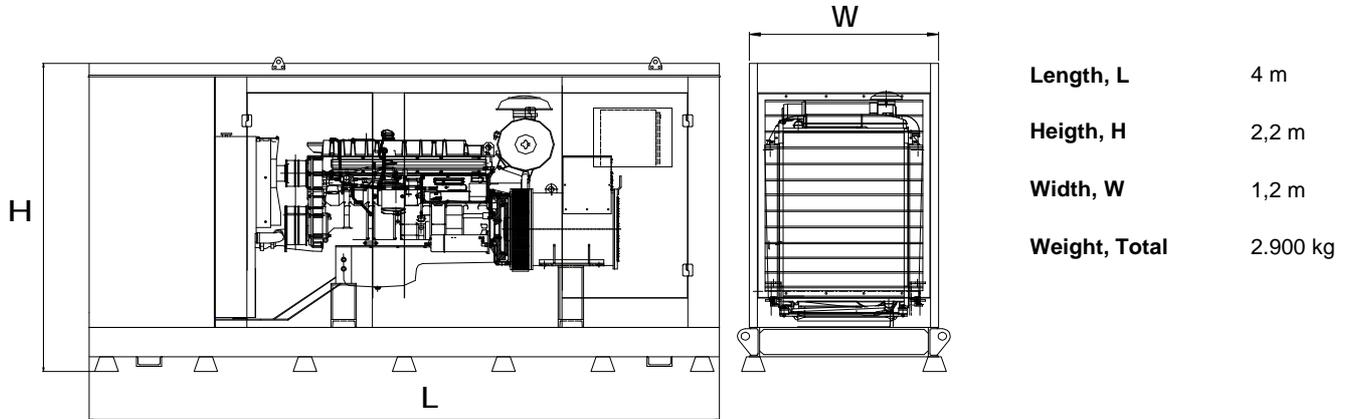
- kWm: Mechanical Power
- kWe : Electrical Power
- pf : Power factor
- E : Alternator efficiency
- I : Current (A)
- U : Voltage (V)
- kVA : Power
- Rpm: Revolutions per minute

General Dimensions

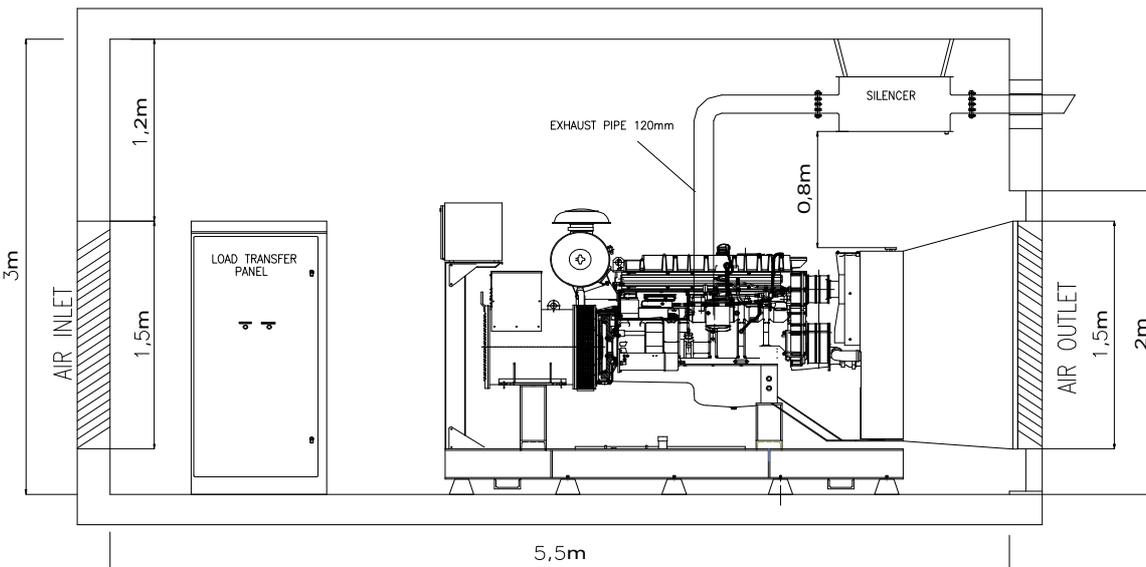
Standard Generator



Generator with Soundproof Canopy



Generator Room Layout



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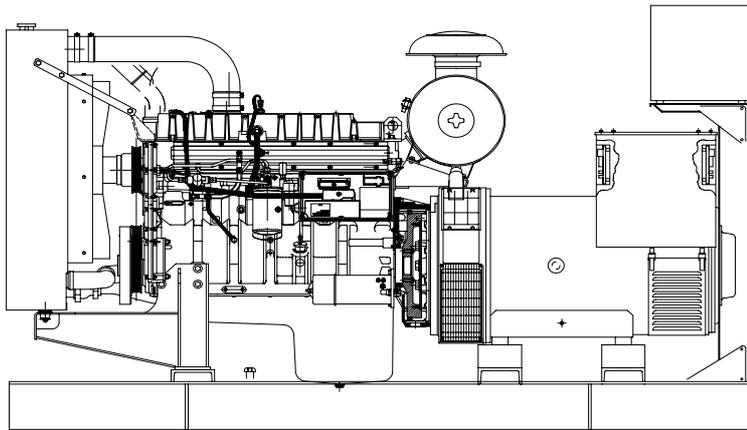
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CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Perkins 1306C-E87TAG4 diesel engine

Mecc Alte ECO38-3SN/4 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosers
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ250PC	250	200	225	180

APPLICATION DATA

Perkins 1306C-E87TAG4 Engine

Standard Features

High Performance Productive Power

◊Hydraulically actuated Electronically controlled Unit Injectors-high-pressure fuel injection gives consistent, reliable high performance.
 ◊Constant electronic engine management and monitoring enable precise fuel metering and injection timing to ensure reliable low temperature starting, superb economy with performance and very close governing.

Quiet, Clean Power

◊A rigid structure minimises noise transmission and helically cut gears provide quiet power transfer to auxiliaries.
 ◊Forced induction and electronic fuel injection control combine to reduce combustion noise while electronically optimised fuel/air mixing ensures complete combustion resulting in virtually smoke free operation with emissions capability matching current and future emissions legislation.

Durable Power

◊A fully balanced induction-hardened steel crankshaft gives smooth performance with minimised bearing loads.
 ◊Oil cooled pistons with keystone top and second rings give longer life while positive rotational valves and roller cam followers reduce wear on valve seats, tappets and cam lobes.

Reliable Power

◊Cylinder head coolant is directed to valve bridges and injectors and lub oil is cooled in a high efficiency oil cooler, both features enhancing engine reliability.
 ◊Electronic safety shutdown option protects the engine while event and fault warning codes protect operations.

Technical Specifications

Manufacturer	PERKINS
Model	1306C-E87TAG4
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical In-line
Displacement, Liters	8.7
Bore X Stroke, mm	116.6 X 135.9
Compression Ratio	16.9:1
Combustion System	Direct injection
Aspiration	Turbocharged, air to air charge cooled
Rotation	Anti-clockwise, viewed on flywheel
Gross engine power, kWb	224
Fan Power, kWm	7
BMEP gross, bar	20.55
Combustion air flow, m ³ / min	14.9
Exhaust gas temp.(after turbo), °C	526
Exhaust gas flow (after turbo),m ³ / min	40.3
Mean piston speed, m / s	6.8

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	50
Engine+Radiator coolant cap., Liters	37.2
Pressure cap setting, kPa	68.9
◊Thermostatically controlled cooling system with belt-driven circulating pump and 24 inch belt-driven fan	
◊Radiator mounted with all guards and pipes	
◊Air/air charge cooler incorporated in radiator	
◊Coolant filter/conditioner	

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
1306C-E87TAG4	224	217	205	164

Lubricating System

Type	Pressurized
Capacity, Liters	28.3
Lub oil pressure (min), kPa	552
◊Wet rear well steel sump with filler and dipstick	
◊Full-flow spin-on filter	
◊Tube-type oil cooler thermostatically controlled	

Fuel System

Type of injection system	Direct injection
Fuel atomiser	Heui
Fuel Feed Pump	Bosch
Hydraulic pump	Rexroth
Delivery/hour at 1500rev/min, Liters	180
Governor type	Electronic
◊Electronic governing to ISO3046-4 with stand alone isochronous or load sharing capabilities	
◊Hydraulically actuated electronically controlled unit fuel injectors with full authority electronic control	
◊Spin-on fuel filter with pre-filter and hand primer pump	

Electrical System

Alternator	24 Volt Lucas AC5R, 45 Amp
Starter motor (DC)	24 Volt Lucas S115
◊Electronic Control Module mounted on engine with wiring looms and sensors	
◊3 level engine protection system	

Fuel Consumption

liters per hour	%110 Load	53 L
	%100 Load	48.5 L
	%75 Load	37.5 L
	%50 Load	26.1 L
grams per kWh	%110 Load	198.7 g/kWh
	%100 Load	199.7 g/kWh
	%75 Load	205.9 g/kWh
	%50 Load	214.9 g/kWh

Mecc Alte ECO38-3SN/4

Standard Features

Range

The ECO generators are available with a 50/60 Hz frequency, either with 2 poles ranging from 8 to 114 KVA or with 4 poles ranging from 6.5 to 3,000 KVA, with a single or double support. In order to couple them with the prime mover it is possible to choose among a wide range of flanges and couplings.

Mechanical Structure

The robust mechanical structure permits easy access to the connections and components during routine and extraordinary maintenance check-ups. The materials used for the manufacture of the mechanical structure are the following: FeP12 steel for the frame, C45 steel for the shaft and cast iron for the end-brackets.

The standard degree of protection is IP21 or IP23; upon the customer's request, other higher degrees of protection, such as IP45, IP54, etc., are available.

Insulation And Impregnation

Insulation is of class H standard. Impregnation is made with tropicalized epoxy resins by dipping and dripping, whilst for the high voltage parts by vacuum, so that the insulation level is always very good. In the highpower models, the stator windings undergo a further insulation. Special treatments for particular environmental conditions are available on request.

Regulation

The self-regulation is obtained through an electronic regulator. The regulator is fed by an auxiliary winding which guarantees an almost constant supply under any possible operating condition of the generator. The ECO series can be equipped with the new interchangeable U.V.R.6-F or S.R.7/2-G regulator, ensuring the same performance.

Voltage Accuracy

The voltage accuracy is $\pm 1\%$ in static condition with any power factor and with speed variation between 5% and +30% with reference to the rated speed.

Voltage Regulation

The voltage can be regulated by the "VOLT" potentiometer of the electronic regulator. By connecting a 100K potentiometer in the proper terminals it is also possible to obtain a remote voltage regulation in a range of 5% of the rated voltage.

Standards

The entire series is manufactured according to and complies with the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 N°14-95 – N°100-95; special versions are available on request to meet specific specifications and regulations.

Model	Standby		Prime	
	kVA	kW	kVA	kW
ECO38-3SN/4	250	200	225	180

Technical Specifications

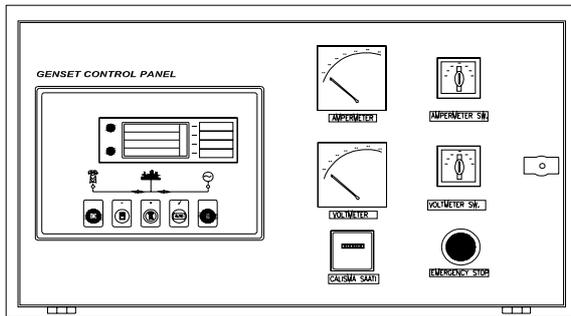
Manufacturer	Mecc Alte
Model	ECO38-3SN/4
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	250
Efficiency, %	92,7
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	380/415
Excitation	Self excited
Stator winding	12 ends
Regulation	Universal Voltage Regulator, sixth generation
Voltage Regulator	UVR6
Voltage Regulation, %	± 1
R.F.I Suppression	EN50081-1, EN50082-1, VDE0875K. For others standards apply to factory
Waveform Distors.at f. load LL/LN %	2,8 / 2,9
Waveform Distors.at no load LL/LN %	2,6 / 2,8
Rotor	with damping cage
Overspeed, Rpm	2250
Short circuit current	>300%
TIF Telephone Interference	THF < 2%
Insultion class	H
Stator Winding Resistance (20°C), Ω	0,0085
Rotor Winding Resistance (20°C), Ω	4,449
DE bearing	6318.2RS
NDE bearing	6314.2RS
Protection class	IP 21 (other protection on request)

Optional Equipment

- ◊Anti Condensation Heaters
- ◊Air Filters
- ◊Temperature Indication RTD's
- ◊Winding Protection Thermistors
- ◊UVR6 Universal Voltage Regulator, sixth generation

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ammeter
- ◊Ammeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The module is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment graphical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA, kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3, total
Generator total power	KW L1, L2, L3, total
Generator power factor	Cosφ L1, L2, L3, total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

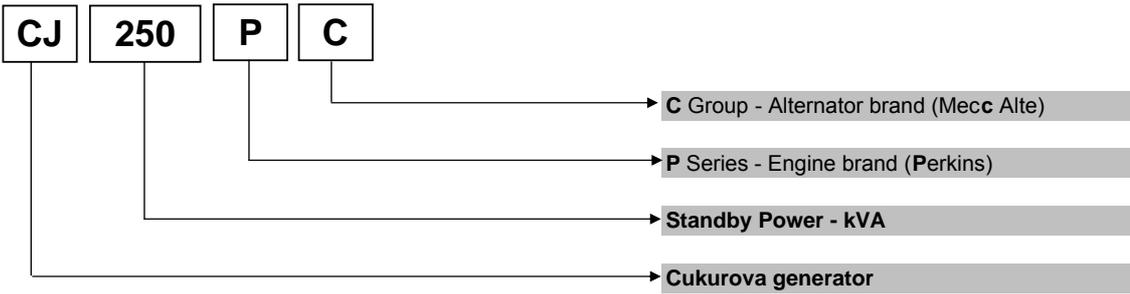
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude. 11ms duration.

Electrical Safety

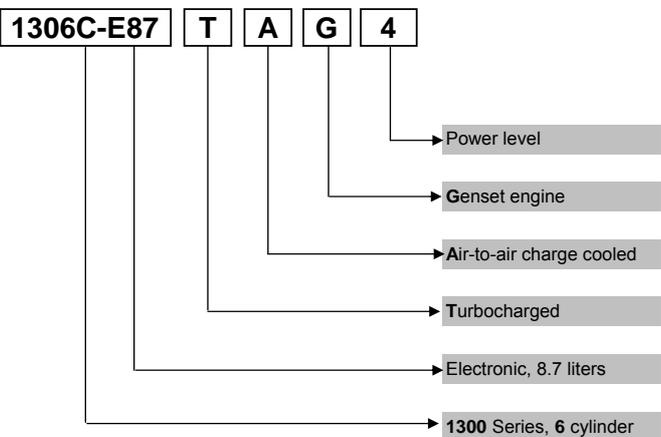
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

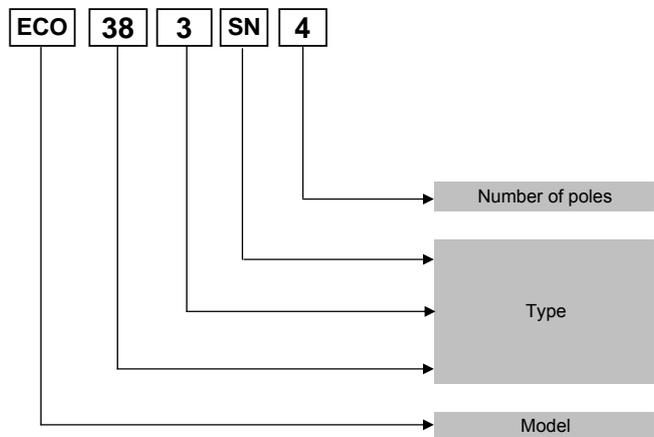
Cukurova Diesel Generator



Perkins 1300 Series Diesel Engine



Newage / Stamford Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

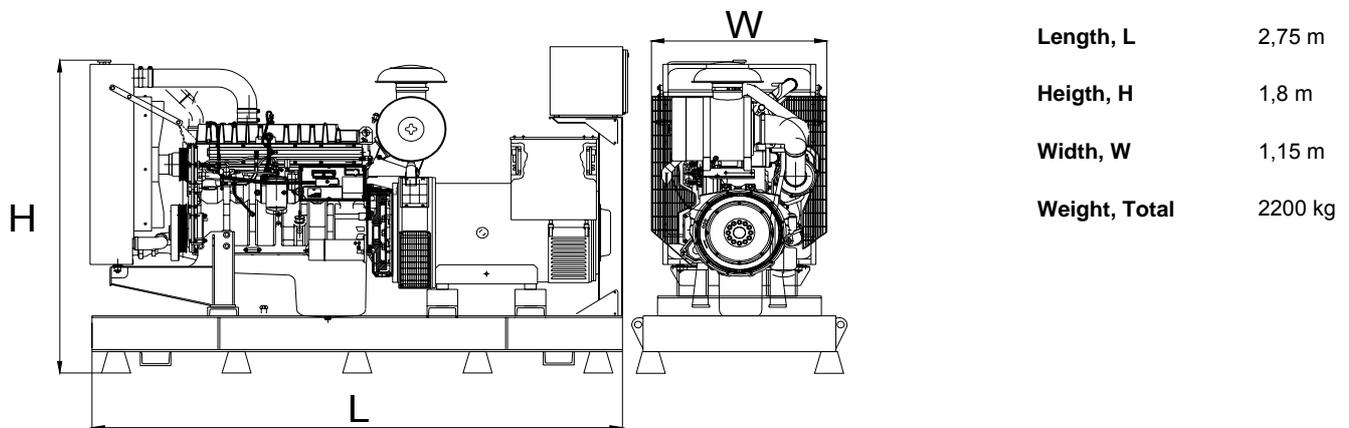
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

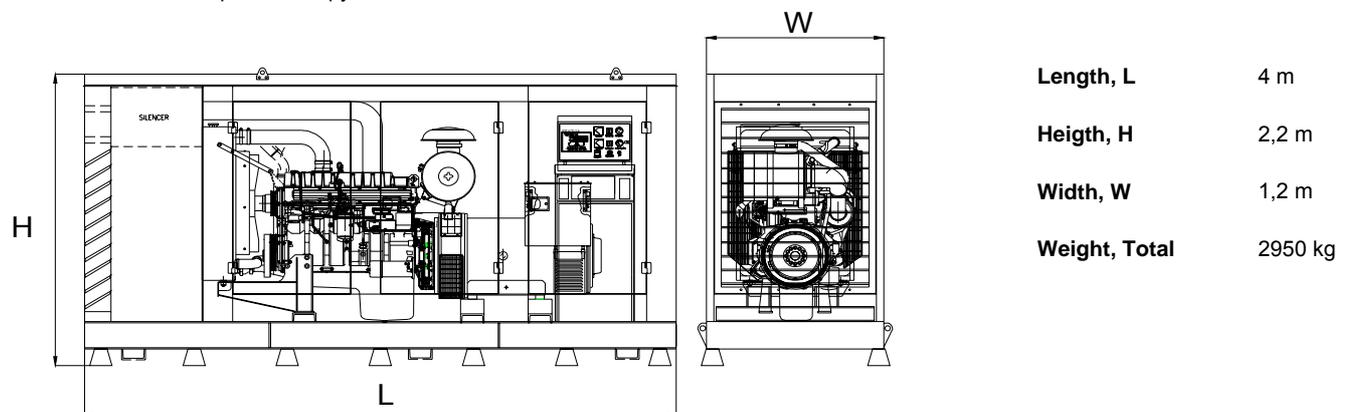
- kWm: Mechanical Power
- kWe : Electrical Power
- pf : Power factor
- E : Alternator efficiency
- I : Current (A)
- U : Voltage (V)
- kVA : Power
- Rpm: Revolutions per minute

General Dimensions

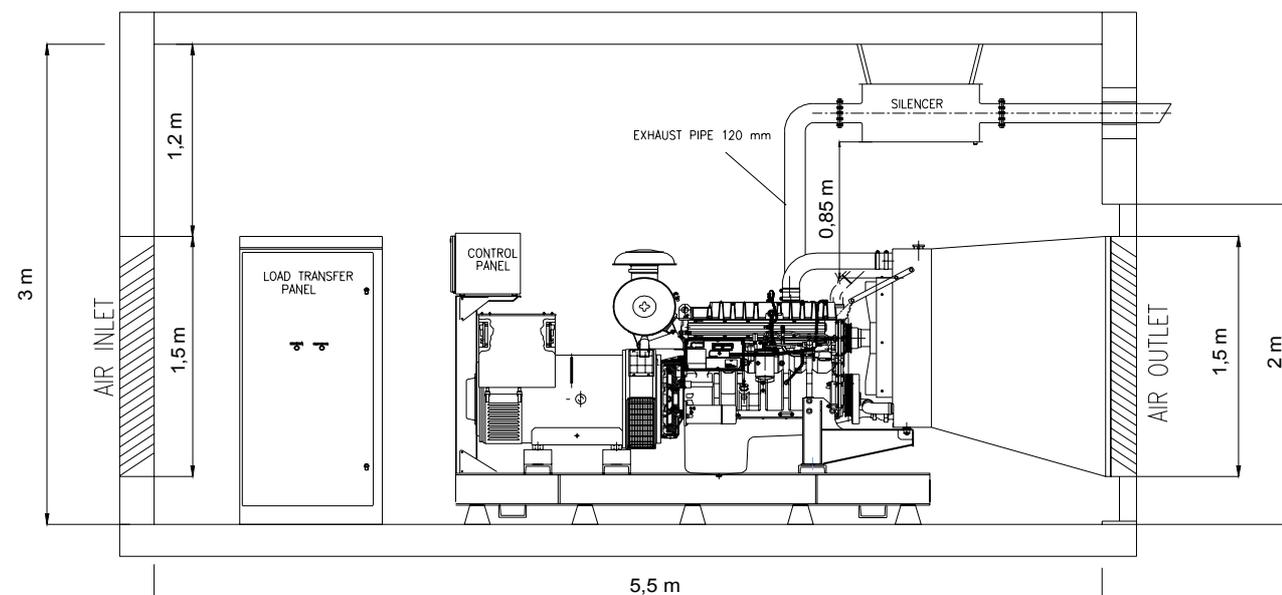
Standard Generator



Generator with Soundproof Canopy



Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

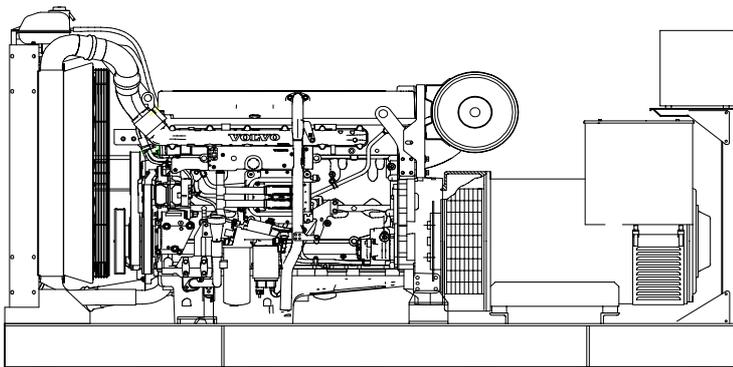
	CUKUROVA JENERATOR SANAYII TICARET A.S.	
	<p>Izmir Factory Aegean Free Zone Boss Sokak No:11, Gaziemir Izmir, Turkey Tel : +90 232 252 20 26 Fax : +90 232 252 20 27</p>	<p>Istanbul Export Sales Office Ebulula Mardin Caddesi Maya Meridyen İş Merkezi Kat:4 No: 14 Akatlar Istanbul, Turkey Tel : +90 212 352 70 90 Fax : +90 212 352 12 77 E-mail : info@cukurovapower.com</p>

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Volvo TAD941GE diesel engine

Leroy Somer LSA 47.2 VS2 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 55°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ350VL	360	288	328	262

APPLICATION DATA

Volvo TAD941GE Engine

Standard Features

The TAD941GE is a powerful, reliable and economical Generating Set Diesel built on the dependable in-line six design.

Durability & low noise

Designed for easiest, fastest and most economical installation. Well-balanced to produce smooth and vibration-free operation with low noise level. To maintain a controlled working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption. The TAD941GE complies with EU stage2 and TA-luft exhaust emission regulations.

Easy service & maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Engine and Block

- ◊Optimized cast iron cylinder block with optimum distribution of forces without the block being unnecessary heavy.
- ◊Wet, replaceable cylinder liners
- ◊Piston cooling for low thermal load on pistons and reduced ring temperature
- ◊Tapered connecting rods for reduce risk of piston cracking
- ◊Crankshaft induction hardened bearing surfaces and fillets with seven main bearings for moderate load on main and high-end bearings
- ◊Nitrocarburized transmission gears for heavy duty operation
- ◊Keystone top compression rings for long service life
- ◊Viscous type crankshaft vibration damper
- ◊Over head camshaft and four valves per cylinder equipped with camshaft damper to reduce noise and vibrations.

Technical Specifications

Manufacturer	VOLVO
Model	TAD941GE
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	9.36
Bore X Stroke, mm	120 X 138
Compression Ratio	17.4:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	323
Fan Power, kWm	13
Exhaust gas temp.(after turbo), °C	539
Exhaust gas flow (after turbo),m ³ / min	52.2
Mean piston speed, m / s	6.9

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
TAD941GE	323	310	294	281

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	55
Engine+Radiator coolant cap., Liters	41
Jacket coolant flow, Liters / sec	5.5

- ◊Air to air intercooler
- ◊Belt driven, maintenance-free coolant pump with high degree of efficiency
- ◊Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop
- ◊Coolant filter as standard

Fuel System

Type of injection system	Direct injection
Fuel injector	Electronic unit injector
Delivery/hour at 1500rev/min, Liters	108
Governor type	Electronic / EMS2
◊Non-return fuel valve	
◊Fuel prefilter with water separator and water-in-fuel indicator / alarm	
◊Gear driven low-pressure fuel pump	
◊Fuel pressure switch	
◊Self de-aerating system. When replacing filters all fuel stays in the engine.	

Fuel Consumption

grams per kWh	%100 Load	204 g/kWh
	%75 Load	200 g/kWh
	%50 Load	205 g/kWh
	%25 Load	226 g/kWh

Lubricating System

Type	Pressurized
Capacity, Liters	35
Lub oil pressure , kPa	350 - 600
◊Full flow oil cooler	
◊Full flow disposable spin-on oil filter, for extra high filtration	
◊The lubricating oil level can be measured during operation	
◊Gear type lubricating oil pump, gear driven by the transmission	

Electrical System

Alternator	Bosh, 24 Volt 80A
Starter motor (DC)	Melco, 24 Volt
Starter motor power	5.5 kW
◊Engine Management System 2 (EMS 2), an electronically controlled processing system which optimizes engine performance. It also includes advanced facilities for diagnostics and fault tracing	
◊The instruments and controls connects to the engine via the CAN SAE J1939 interface and the Control Interface Unit (CIU).The CIU converts the digital CAN bus signal to an analog signal, making it possible to connect a variety of instruments.	
◊Sensors for oil pressure, oil temp, boost pressure, boost temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.	

Leroy Somer LSA 47.2 VS2 Alternator

Standard Features

Top of the Range Electrical Performance

Class H insulation
 Standard 12-wire re-connectable winding, 2/3 pitch
 High efficiency and motor starting capacity
 R 791 interference suppression conforming to standard EN 55011 group 1
 class B standard for European zone (CE marking)

Protection System Suited to the Environment

The LSA 47.2 is IP23

Reinforced Mechanical Structure Using Finite Element Modelling

Compact and rigid assembly to better withstand generator-set vibrations
 Steel frame
 Cast iron flanges and shields
 Two-bearing and single bearing versions designed to be suitable for engines on the market
 Half-key balancing
 Greased for life bearings (regreasable bearings optional)

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
 8-way terminal block for voltage reconnection

Compliant with International Standards

The LSA 47.2 alternator conforms to the main international standards and regulations:

IEC 60034, NEMA MG 1.22, ISO 8528, CSA, CSA/UL

It can be integrated into a CE marked generator set

The LSA 47.2 is designed, manufactured and marketed in an ISO 9001 environment

Model	Standby		Prime	
	kVA	kW	kVA	kW
LSA 47.2 VS2	420	336	365	292

Technical Specifications

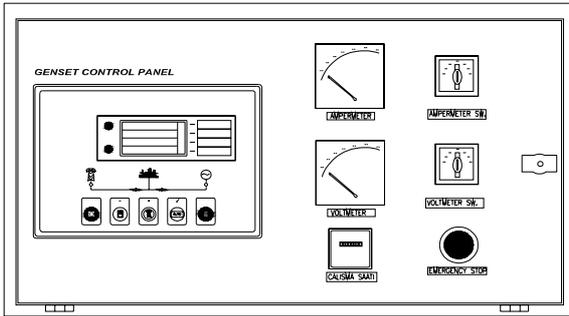
Manufacturer	LEROY SOMER
Model	LSA 47.2 VS2
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	420
Efficiency, %	93
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	SHUNT(12 wire)
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	R 230
Voltage Regulation, %	± 0.5
Total HarmonicTGH / THC	at no load<1.5% - on load<2%
Waveform: NEMA = TIF	< 50
Waveform: I.E.C = THF,	< 2%
Insulation class	H
Overspeed, Rpm	2250
Construction	Single bearing, direct coupled
Coupling	Flexible
Amortisseur Windings	Full
Connection	WYE
Rotor	Dynamic balanced
Protection class	IP23
Air flow, m ³ / min	0,9

Optional Equipment

- ◊Filters on air inlet and air outlet (IP44)
- ◊Windign protection for clean environmetns with relative humidity greater than 95%
- ◊Space heaters
- ◊Thermal protection for winding
- ◊Digital voltage regulator
- ◊PMG system

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ampermeter
- ◊Ampermeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment grafical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA,kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	KW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

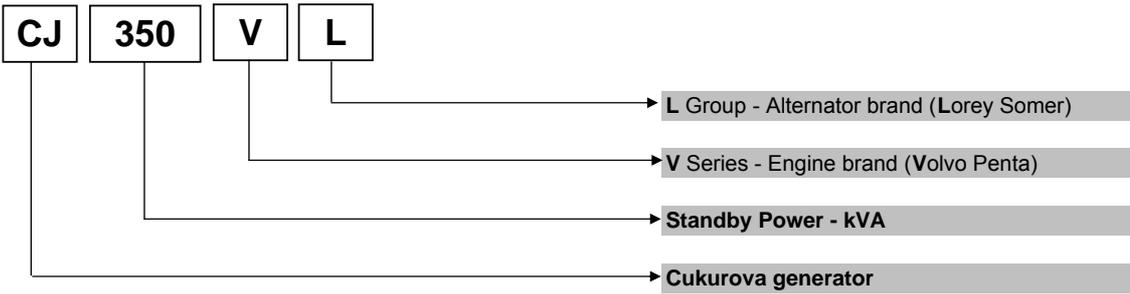
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11mS duration.

Electrical Safety

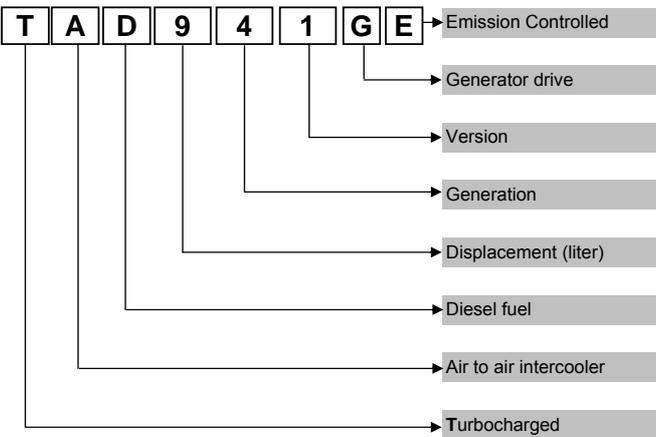
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

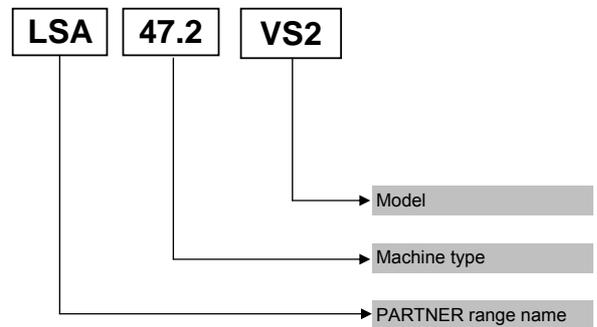
Cukurova Diesel Generator



Volvo Penta Diesel Engine



Leroy Somer Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

Electric Formulas

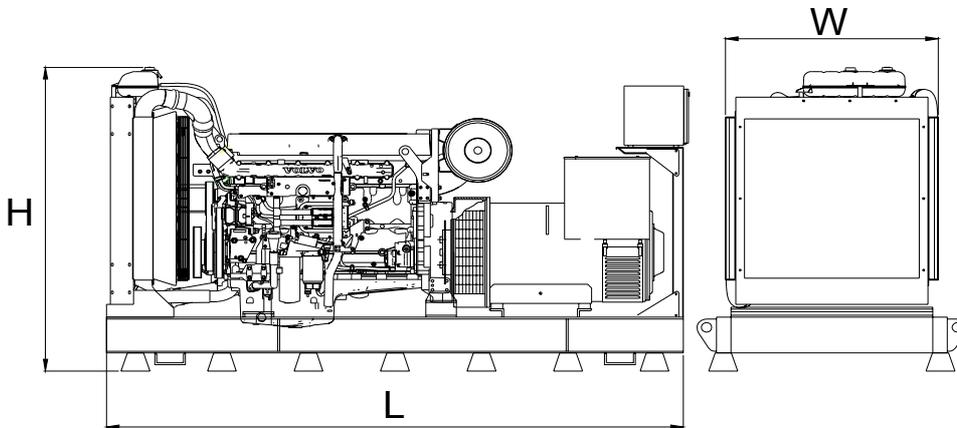
Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

kWm: Mechanical Power
kWe : Electrical Power
pf : Power factor
E : Alternator efficiency

I : Current (A)
U : Voltage (V)
kVA : Power
Rpm: Revolutions per minute

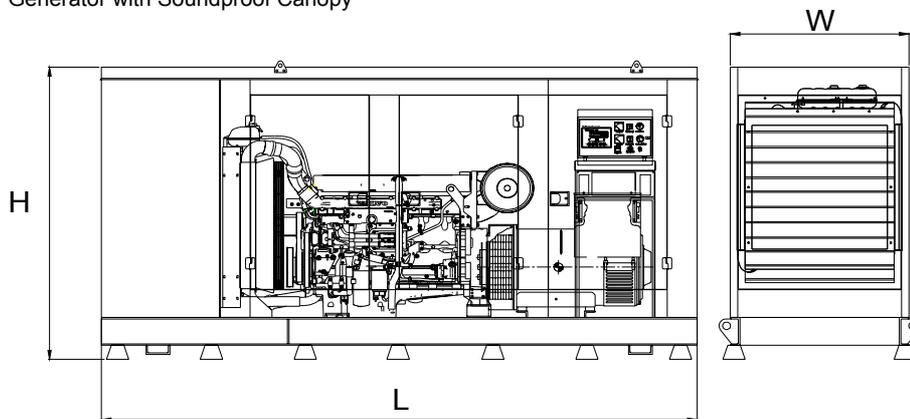
General Dimensions

Standard Generator



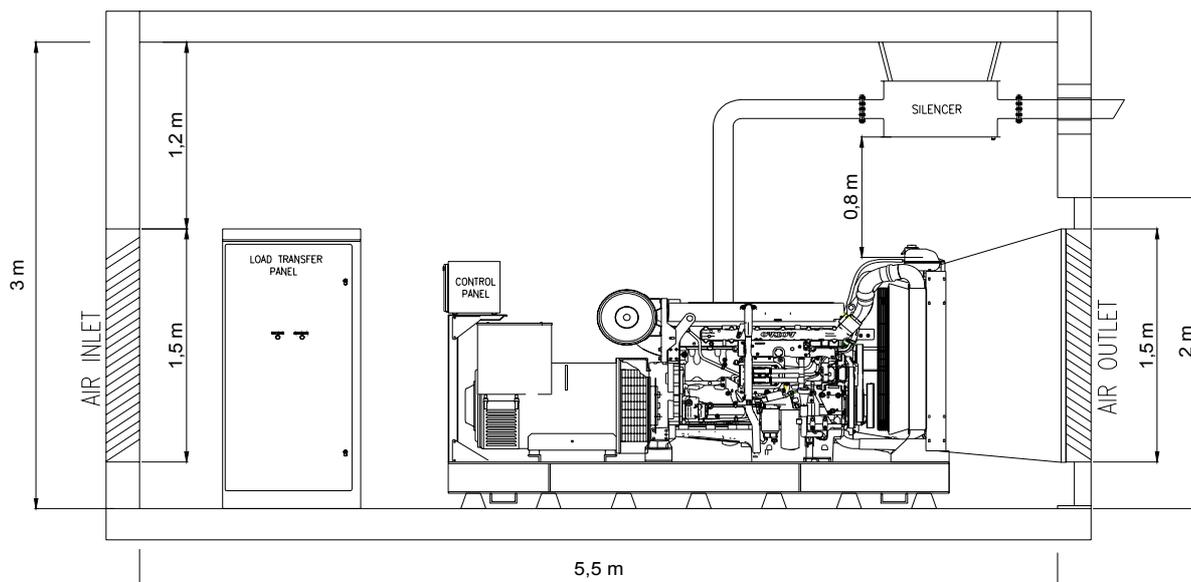
Length, L	3 m
Height, H	1,7 m
Width, W	1,1 m
Weight, Total	3150 kg

Generator with Soundproof Canopy



Length, L	4,5 m
Height, H	2,5 m
Width, W	1,4 m
Weight, Total	4350 kg

Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

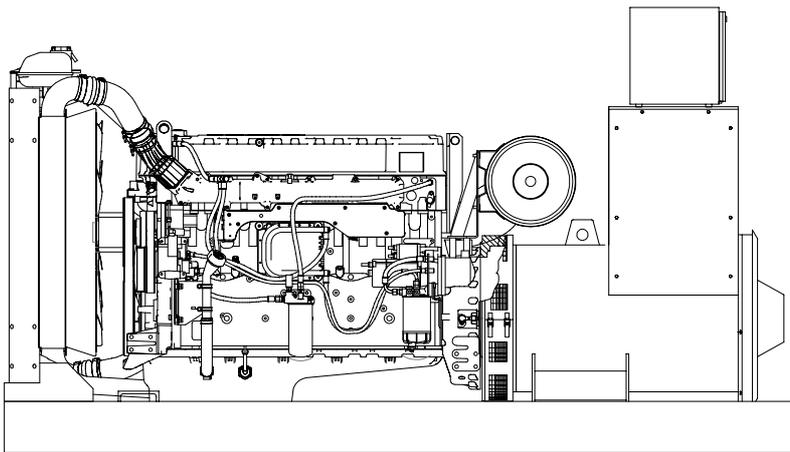
	CUKUROVA JENERATOR SANAYII TICARET A.S.	
	<p>Izmir Factory Aegean Free Zone Boss Sokak No:11, Gaziemir Izmir, Turkey Tel : +90 232 252 20 26 Fax : +90 232 252 20 27</p>	<p>Istanbul Export Sales Office Ebulula Mardin Caddesi Maya Meridyen İş Merkezi Kat:4 No: 14 Akatlar Istanbul, Turkey Tel : +90 212 352 70 90 Fax : +90 212 352 12 77 E-mail : info@cukurovapower.com</p>

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Volvo TAD941GE diesel engine

Marathon Magnaplus 433 CSL 6216 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 55°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ350VM	358	286	325	260

APPLICATION DATA

Volvo TAD941GE Engine

Standard Features

The TAD941GE is a powerful, reliable and economical Generating Set Diesel built on the dependable in-line six design.

Durability & low noise

Designed for easiest, fastest and most economical installation. Well-balanced to produce smooth and vibration-free operation with low noise level. To maintain a controlled working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption. The TAD941GE complies with **TA-Luft** exhaust emission regulations.

Easy service & maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Engine and Block

- ◊Optimized cast iron cylinder block with optimum distribution of forces without the block being unnecessarily heavy.
- ◊Wet, replaceable cylinder liners
- ◊Piston cooling for low thermal load on pistons and reduced ring temperature
- ◊Tapered connecting rods for reduce risk of piston cracking
- ◊Crankshaft induction hardened bearing surfaces and fillets with seven bearings for moderate load on main and high-end bearings
- ◊Nitrocarburized transmission gears for heavy duty operation
- ◊Keystone top compression rings for long service life
- ◊Viscous type crankshaft vibration damper
- ◊Over head camshaft and four valves per cylinder equipped with camshaft damper to reduce noise and vibrations.

Technical Specifications

Manufacturer	VOLVO
Model	TAD941GE
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	9.36
Bore X Stroke, mm	120 X 138
Compression Ratio	17.4:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	323
Fan Power, kWm	15
BMEP gross, bar	28
Exhaust gas temp.(after turbo), °C	539
Exhaust gas flow (after turbo),m ³ / min	52.2
Mean piston speed, m / s	6.9

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
TAD941GE	323	308	295	280

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	55
Engine+Radiator coolant cap., Liters	41
Jacket coolant flow, Liters / sec	5.5
Cooling airflow, kg / min	6.4 (at 55°C)
◊Air to air intercooler	
◊Belt driven, maintenance-free coolant pump with high degree of efficiency	
◊Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop	
◊Coolant filter as standard	

Fuel System

Type of injection system	Direct injection
Fuel injector	Electronic unit injector
Delivery/hour at 1500rev/min, Liters	108
Governor type	Electronic / EMS2
◊Non-return fuel valve	
◊Fuel prefilter with water separator and water-in-fuel indicator / alarm	
◊Gear driven low-pressure fuel pump	
◊Fuel pressure switch	
◊Self de-aerating system. When replacing filters all fuel stays in the engine.	

Fuel Consumption

liters per hour	%100 Load	71.6 L
	%75 Load	52.7 L
	%50 Load	35.8 L
grams per kWh	%100 Load	205 g/kWh
	%75 Load	200 g/kWh
	%50 Load	204 g/kWh

Lubricating System

Type	Pressurized
Capacity, Liters	35
Lub oil pressure , bar	3.5-6
◊Full flow oil cooler	
◊Full flow disposable spin-on oil filter, for extra high filtration	
◊The lubricating oil level can be measured during operation	
◊Gear type lubricating oil pump, gear driven by the transmission	

Electrical System

Alternator	Bosh, 24 Volt 80A
Starter motor (DC)	Melco, 24 Volt
Starter motor power	5.5 kW
◊Engine Management System 2 (EMS 2), an electronically controlled processing system which optimizes engine performance. It also includes advanced facilities for diagnostics and fault tracing	
◊The instruments and controls connects to the engine via the CAN SAE J1939 interface and the Control Interface Unit (CIU).The CIU converts the digital CAN bus signal to an analog signal, making it possible to connect a variety of instruments.	
◊Sensors for oil pressure, oil temp, boost pressure, boost temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.	

Marathon Magnaplus 433 CSL 6216 Alternator

Standard Features

Optimized Electrical Design with four-pole, brushless features, utilizes a 2/3 pitch winding to minimize harmonic distortion. The main rotor, utilizing Marathon Electric's unirotor construction, provides exceptional waveshape and voltage balance. The unirotor construction method incorporates full amortisseur windings facilitating parallel operation and distorting loads.

Enhanced Ventilation created by a high efficiency cast aluminum fan and optimized internal air flow patterns, maximizes heat transfer and minimizes hot spot differentials for extended winding life. Durable aluminum alloy fans avoid breakage problems associated with steel weldments or plastic fans.

Fully Guarded for operator safety and generator protection. No rotating or electrically energized parts are exposed. All openings are covered by louvers or screens.

Heavy Duty Bearings are double shielded and pre-lubricated for the life of the bearing. This helps resist contamination and ensures a minimum B-10 life of 100,000 hours.

Class H Insulation System utilizes an unsaturated polyester varnish for optimal insulation life and superior moisture protection. A tropical insulation is added for increased environmental protection. Field windings are wet wound with epoxy and designed to withstand overspeeds of 125%. All windings are 100% copper with class H insulation.

SE350 Voltage Regulator is encapsulated for reliable performance in all environments. The SE350 regulator provides 1% regulation, underspeed protection, stability adjustment to optimize transient performance, and EMI filtering to commercial standards.

Easy Mount SAE Adapters provided with every generator, are designed with easy drive disc access to simplify the mounting to all popular engines. Generator foot mounting location is unaffected by adapter changes. Special adaptations for automotive engines are available.

Linkboards are standard to simplify voltage reconnection and support lead termination.

Design Specs and Agency Approvals are important at Marathon. All MAGNAPLUS® units meet NEMA MG1-22, BS5000, CSA C22.2 and IEC34-1 requirements.

Model	Standby		Prime	
	kVA	kW	kVA	kW
Magnaplus 433 CSL 6216	406	325	385	308

Technical Specifications

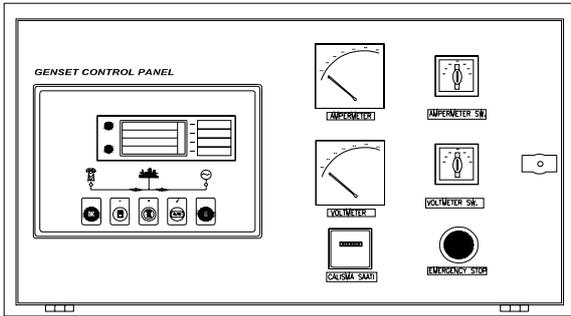
Manufacturer	MARATHON
Model	Magnaplus 433 CSL 6216
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	406
Efficiency, %	93
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	SE350
Voltage Regulation, %	± 1
Phase Sequence CCW-ODE	ABC
Deviation Factor, %	5.0
Voltage Balance, L-L or L-N, %	0.2
L-L Harmonic Max-Total, %	5.0
L-L Harmonic Max-Single, %	3.0
Overspeed, Rpm	1875
Short circuit current	< 300%
TIF	Less than 50
Insulation class	H
Construction	Single bearing, direct coupled
Coupling	Flexible
Amortisseur Windings	Full
Connection	WYE
Rotor	Dynamic balanced
Protection class	IP22
Shaft Current	< 0.1 ma
Main stator capacitance to ground, mfd	0.028
Cooling air volume, CFM	730

Optional Equipment

- ◊DVR 2000, Digital Voltage Regulator with PMG option
- ◊A VAR-PF controller
- ◊SAE adapters
- ◊Anti-condensation space heater
- ◊Two bearing construction
- ◊Droop CT

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ampmeter
- ◊Ampmeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment grafical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA,kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	KW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

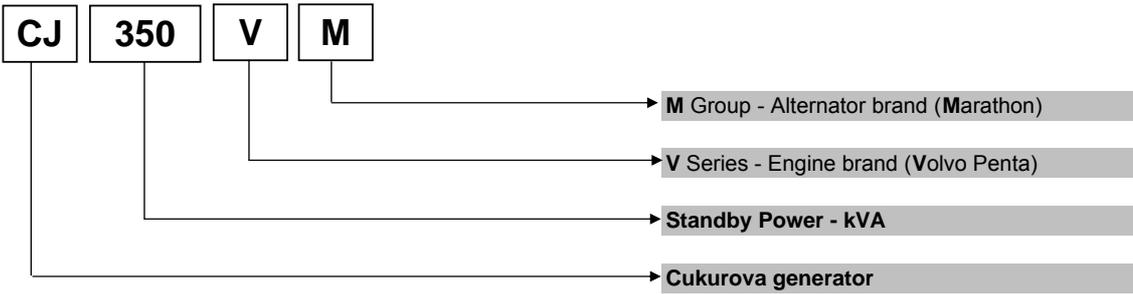
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11ms duration.

Electrical Safety

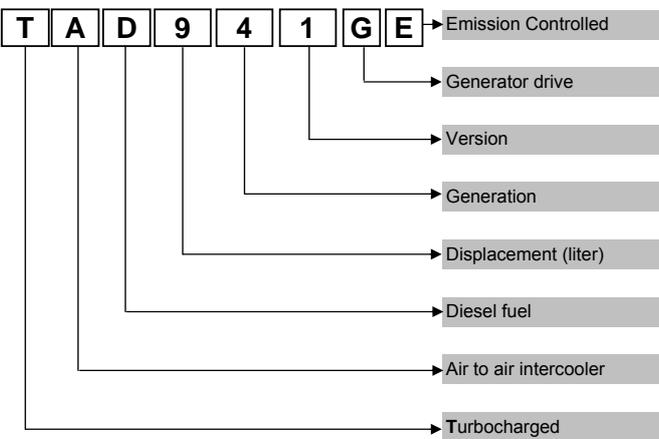
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

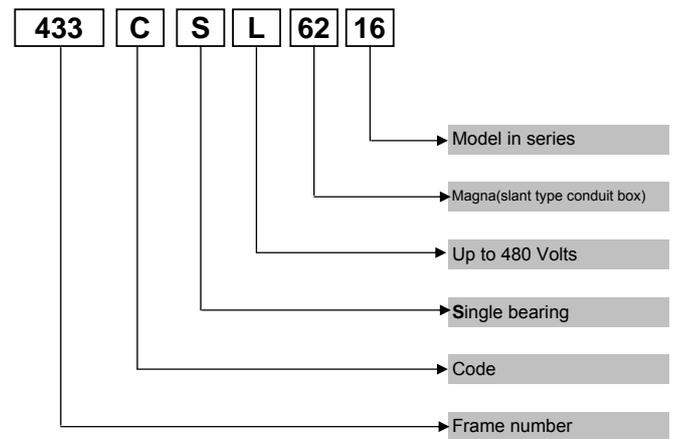
Cukurova Diesel Generator



Volvo Penta Diesel Engine



Marathon Magnaplus Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

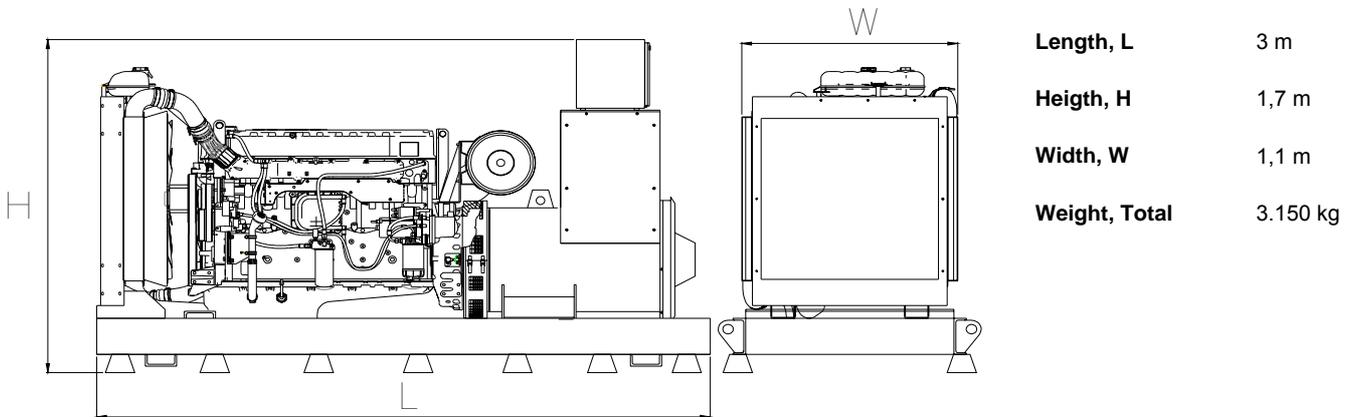
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

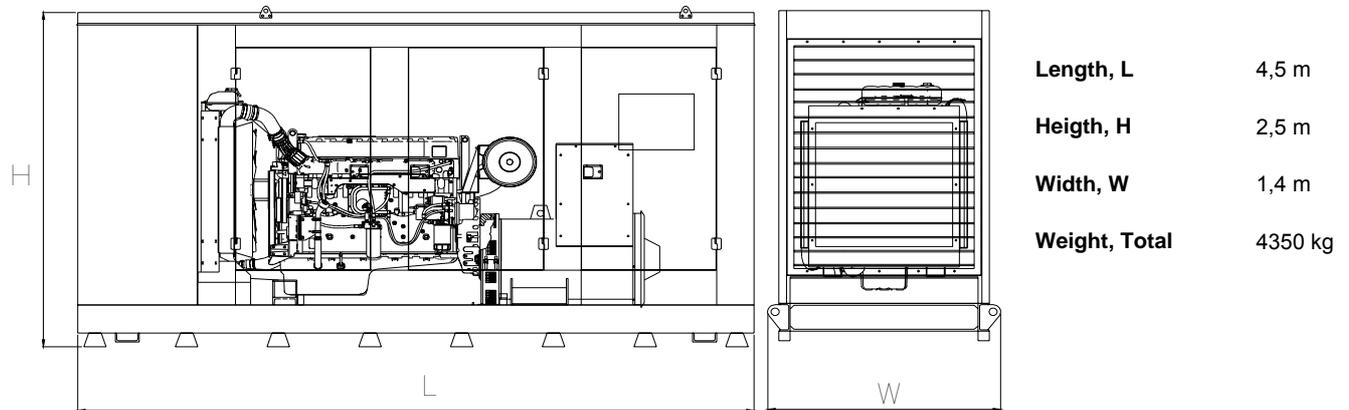
- kWm: Mechanical Power
- kWe : Electrical Power
- pf : Power factor
- E : Alternator efficiency
- I : Current (A)
- U : Voltage (V)
- kVA : Power
- Rpm: Revolutions per minute

General Dimensions

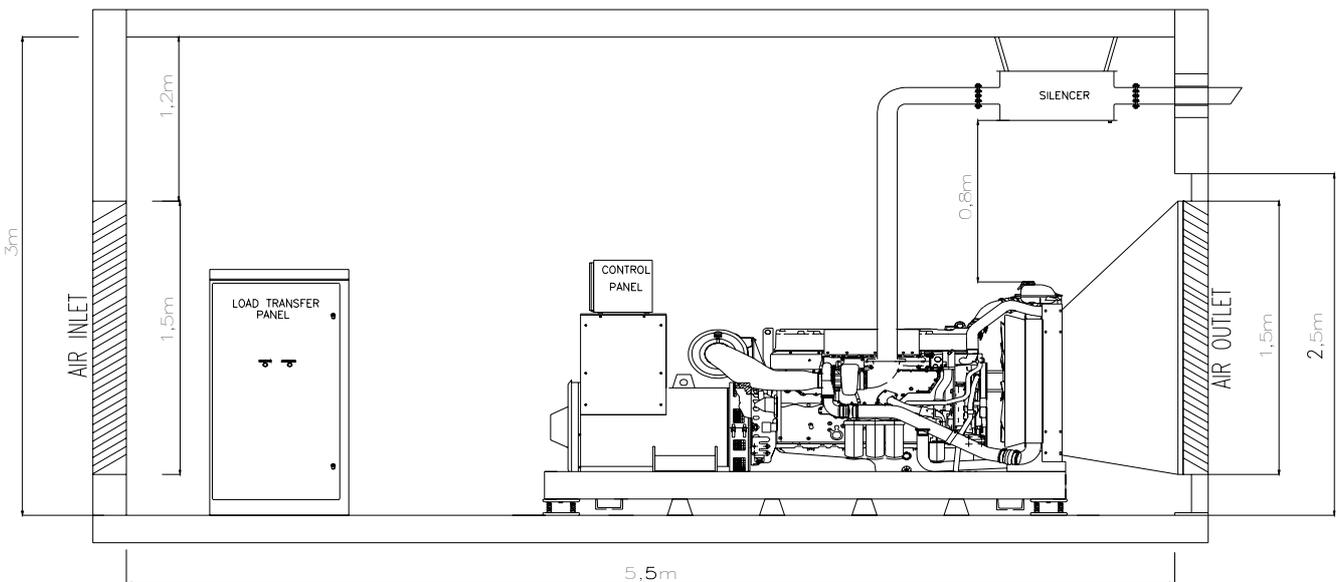
Standard Generator



Generator with Soundproof Canopy



Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

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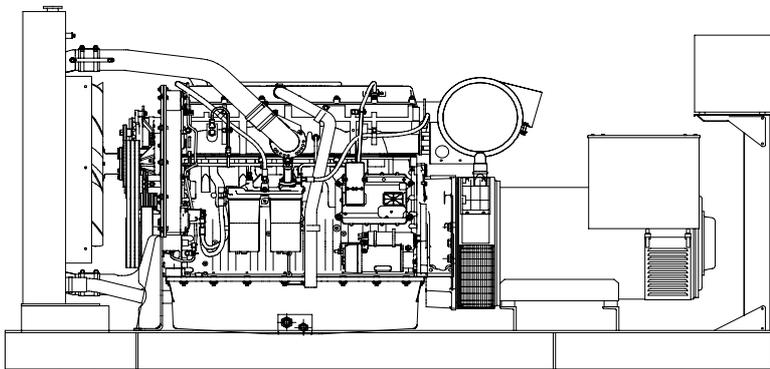
İSTANBUL	: Tel : (0212) 482 16 00 (30 hat)	Faks : (0212) 482 16 60
İSTANBUL	: Tel : (0216) 395 34 60 (5 hat)	Faks : (0216) 395 23 75
ADANA	: Tel : (0322) 435 11 47 (5 hat)	Faks : (0322) 435 16 59
ANKARA	: Tel : (0312) 490 87 77 (6 hat)	Faks : (0312) 490 89 88
İZMİR	: Tel : (0232) 478 18 70	Faks : (0232) 478 18 30
ANTALYA	: Tel : (0242) 221 49 21	Faks : (0242) 221 49 72
BURSA	: Tel : (0224) 441 84 77	Faks : (0224) 441 84 78
DIYARBAKIR	: Tel : (0412) 251 21 90 (10 hat)	Faks : (0412) 251 21 88
KAYSERİ	: Tel : (0352) 331 74 74	Faks : (0352) 331 74 23
TRABZON	: Tel : (0462) 325 70 10 (pbx)	Faks : (0462) 325 77 67

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Perkins 2206A-E13TAG2 diesel engine

Newage/Stamford HCI444E alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ400PN	400	320	350	280

APPLICATION DATA

Perkins 2206A-E13TAG2 Engine

Standard Features

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 electronic control of fuel injected.

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.

Compact and efficient power

◊Exceptional power to weight ratio and compact size gives optimum power for ease of installation and more cost effective transportation.
 ◊Designed to provide excellent service access for ease of maintenance.

Standards

◊ UK MOD, BS5750, ISO9001, BS5514/1-1982, ISO 3046/1, ISO 8528/1

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
2206A-E13TAG2	368,4	348,9	324,2	305,3

Lubricating System

Type Pressurized
 Cubic capacity, Liters 12,5
 Lub oil pressure (min), bar 2
 ◊Wet sump with filler and dipstick
 ◊Full-flow replaceable 'Ecoplus' filter
 ◊Oil cooler integral with filter header

Fuel System

Type of injection system MEUI
 Fuel injector MEUI
 lift pump delivery, litres/hour 480
 Governor type Electronic, governing to ISO 8528-5 class G2
 ◊Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control
 ◊Replaceable 'Ecoplus' fuel filter elements with primary filter/water separator
 ◊Fuel cooler

Technical Specifications

Manufacturer	PERKINS
Model	2206A-E13TAG2
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	12.5
Bore X Stroke, mm	130 X 157
Compression Ratio	16.3:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	368,4
Exhaust gas flow (after turbo),m³ / min	64,8
BMEP gross, bar	19
Combustion air flow, m³ / min	23.6
Exhaust gas temp.(after turbo), °C	630

Electrical System

Type 24 Volt negative earth
 Starter motor (DC) 24 Volt
 Starter motor power 7.8 kW
 ◊ECM mounted on engine with wiring looms and sensors
 ◊3 level engine protection system

Fuel Consumption

liters per hour	%110 Load	80 L
	%100 Load	71 L
	%75 Load	54 L
	%50 Load	37 L
grams per kWh	%110 Load	195 g/kWh
	%100 Load	196 g/kWh
	%75 Load	198 g/kWh
	%50 Load	203 g/kWh

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	50
Cooling fan air flow, m³/min	654
Jacket coolant flow, Liters / sec	5.3

◊Gear-driven circulating pump
 ◊Mounted belt-driven pusher fan
 ◊Radiator supplied loose incorporating air-to-air charge cooler
 ◊System designed for ambients up to 50°C

Optional Equipments

◊Additional speed sensor
 ◊Temperature and pressure sensors for gauges
 ◊Air filter rain hood
 ◊Twin starters/facility for second starter
 ◊Electric hours counter

Newage/Stamford HCI444E Alternator

Standard Features

Winding&Electrical Performance

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

AS440 AVR

With this self-excited system the main stator provides power via the Automatic Voltage Regulator (AVR) to the exciter stator. The high efficiency semi-conductors of the AVR ensure positive build-up from initial low levels of residual voltage.

The exciter rotor output is fed to the main rotor through a three-phase full-wave bridge rectifier. The rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out-of-phase paralleling.

The SX440 will support a range of electronic accessories, including a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators. If 3-phase sensing is required with the self-excited system, the SX421 AVR must be used.

Terminals&Terminal Box

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers wiring and gland arrangements. It has removable panels for easy access.

Shaft&Keys

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

Insulation / Impregnation

The insulation system is class 'H'

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

Standards

Newage Stamford industrial generators meet the requirements of **BS EN 60034** and the relevant section of other international standards such as **BS5000, VDE0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359**. Other standards and certifications can be considered on request.

Quality Assurance

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Model	Standby		Prime	
	kVA	kW	kVA	kW
HCI444E	400	320	350	280

Technical Specifications

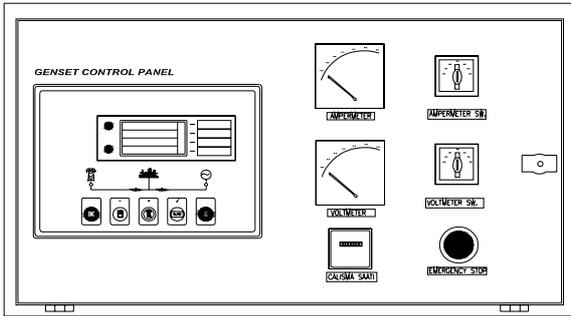
Manufacturer	NEWAGE / STAMFORD
Model	HCI444E
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	400
Efficiency, %	%92.7
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	380/415
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	AS440
Voltage Regulation, %	± 1
R.F.I Suppression	BS EN 61000-6-2 & BS EN 61000-6-4 VDE0875G, VDE 0875N
Waveform distortion	No Load <1.5% Non distorting balanced linear load <5.0%
Rotor	Dynamic balanced
Overspeed, Rpm	2250
Short circuit current	< 300%
TIF	Less than 50
Insulation class	H
Construction	Single bearing, direct coupled
Coupling	Flexible
Stator winding	Double layer concentric
Connection	WYE
Protection class	IP23
Cooling air volume, m ³ / sec	0.8

Optional Equipment

- ◊Optional Permanent Magnet Generator (PMG) provides an isolated power supply to the excitation control system
- ◊Anti Condensation Heaters
- ◊Air Filters
- ◊Temperature Indication RTD's
- ◊Winding Protection Thermistors
- ◊Quadrature Droop kit for Parallel Operation
- ◊SX421 AVR with 3 Phase Sensing and improved Regulation 0.5%
- ◊MX341 (PMG) 1% Regulation with 2 Phase Sensing
- ◊MX321 (PMG) with 3 Phase Sensing and improved Regulation 0.5%

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ammeter
- ◊Ammeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment grafical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA,kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	KW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

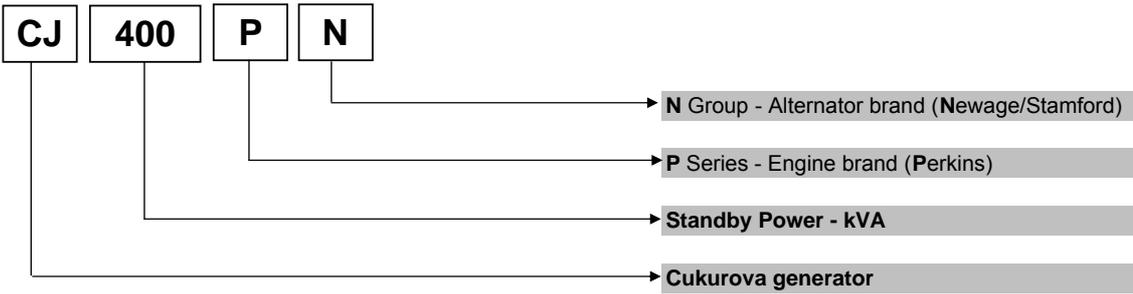
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11mS duration.

Electrical Safety

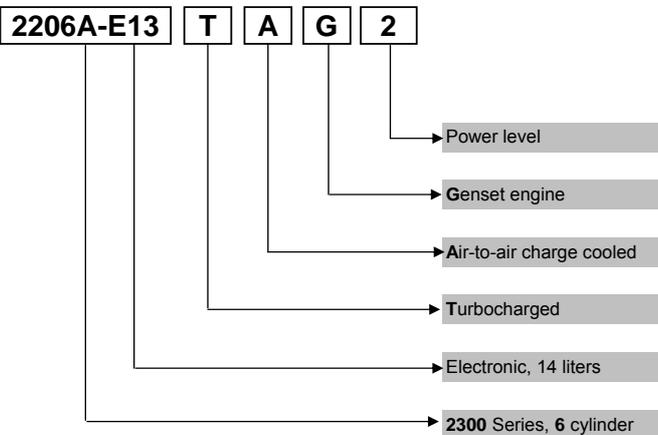
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

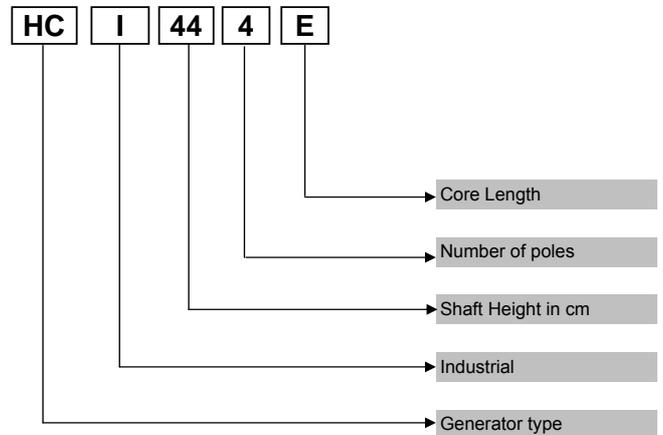
Cukurova Diesel Generator



Perkins 2300 Series Diesel Engine



Newage/Stamford Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which is permitted.

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

Electric Formulas

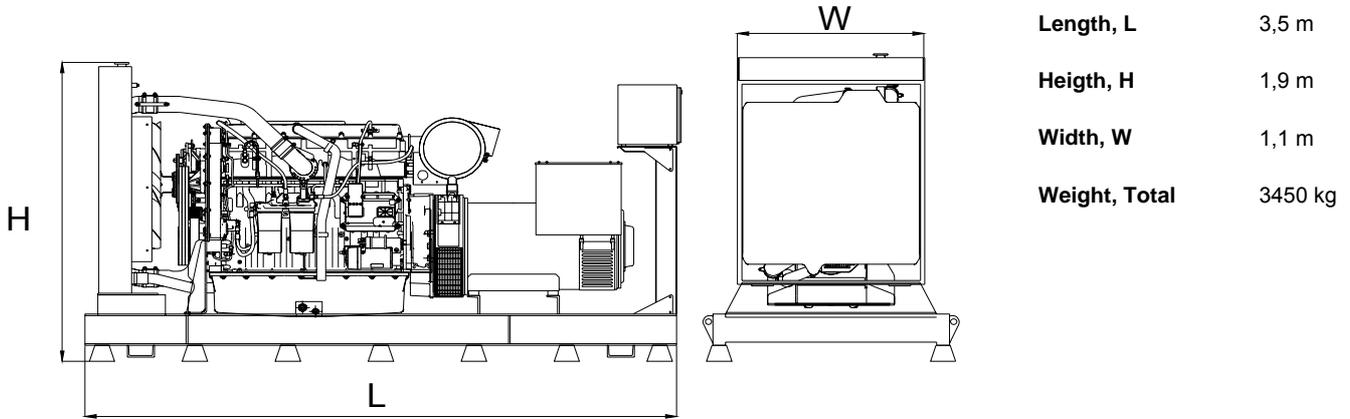
Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

kWm: Mechanical Power
kWe : Electrical Power
pf : Power factor
E : Alternator efficiency

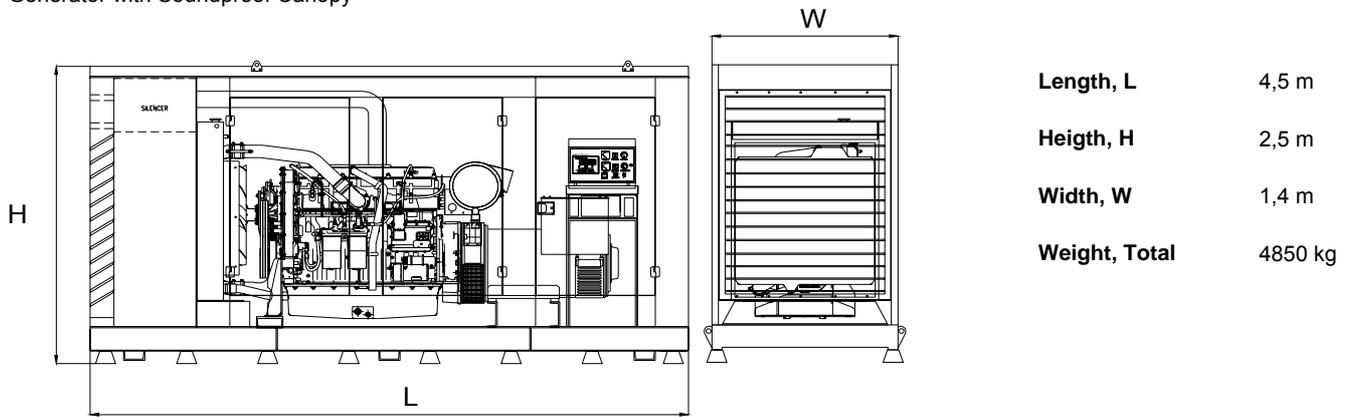
I : Current (A)
U : Voltage (V)
kVA : Power
Rpm: Revolutions per minute

General Dimensions

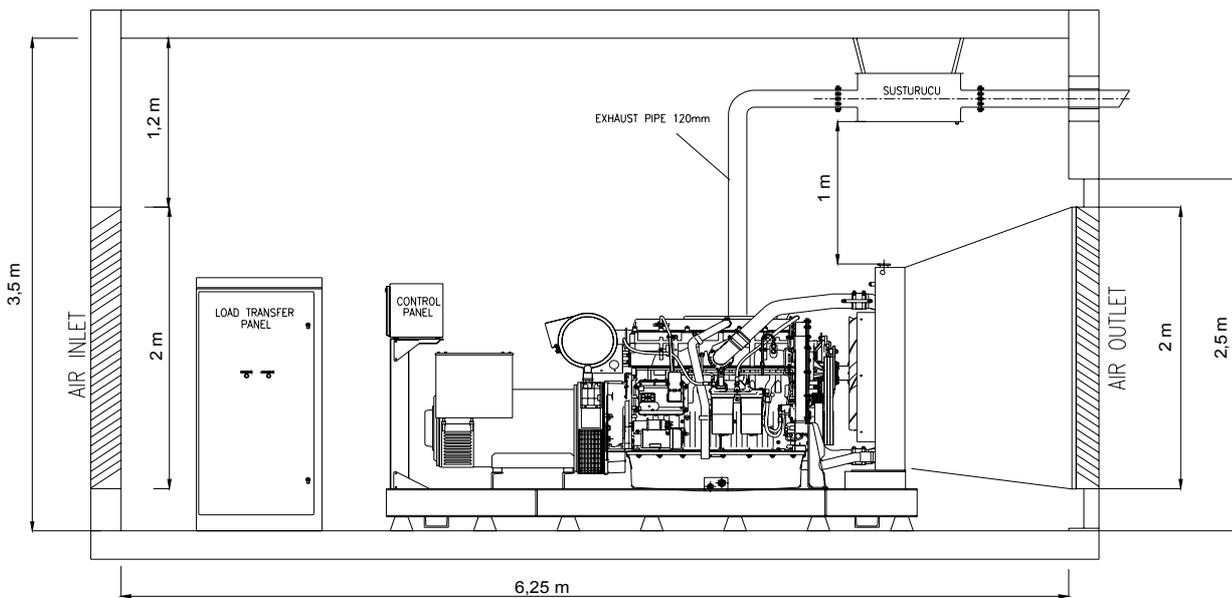
Standard Generator



Generator with Soundproof Canopy



Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

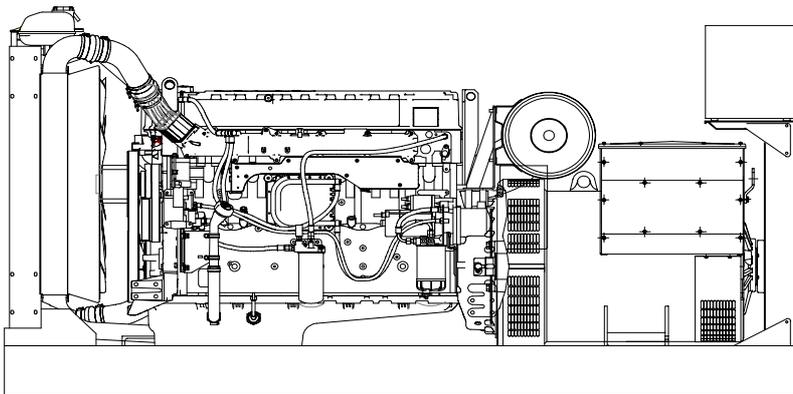
	CUKUROVA JENERATOR SANAYII TICARET A.Ş.	
	<p>Izmir Factory Aegean Free Zone Boss Sokak No:11, Gaziemir Izmir, Turkey Tel : +90 232 252 20 26 Fax : +90 232 252 20 27</p>	<p>Istanbul Export Sales Office Ebulula Mardin Caddesi Maya Meridyen İş Merkezi Kat:4 No: 14 Akatlar Istanbul, Turkey Tel : +90 212 352 70 90 Fax : +90 212 352 12 77 E-mail : info@cukurovapower.com</p>

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Volvo TAD1343GE diesel engine

Leroy Somer LSA 47.2 VS2 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 6 cylinder, water cooled engine
- ◊ 55°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ400VL	414	331	379	303

APPLICATION DATA

Volvo TAD1343GE Engine

Standard Features

The TAD1343GE is a powerful, reliable and economical Generating Set Diesel built on the dependable in-line six design.

Durability & low noise

Designed for easiest, fastest and most economical installation. Well-balanced to produce smooth and vibration-free operation with low noise level.

To maintain a controlled working temperature in cylinders and combustion chambers, the engine is equipped with piston cooling. The engine is also fitted with replaceable cylinder liners and valve seats/guides to ensure maximum durability and service life of the engine.

Low exhaust emission

The state of the art, high-tech injection and charging system with low internal losses contributes to excellent combustion and low fuel consumption.

The TAD1343GE complies with **EPA/CARB Tier 2** and **TA-Luft-50%** exhaust emission regulations.

Easy service & maintenance

Easily accessible service and maintenance points contribute to the ease of service of the engine.

Engine and Block

- ◊Optimized cast iron cylinder block with optimum distribution of forces without the block being unnecessarily heavy.
- ◊Wet, replaceable cylinder liners
- ◊Piston cooling for low piston temperature and reduced ring temperature
- ◊Tapered connecting rods for reduce risk of piston cracking
- ◊Crankshaft induction hardened bearing surfaces and fillets with seven bearings for moderate load on main and high-end bearings
- ◊Case hardened and nitrocarburized transmission gears for heavy duty operation
- ◊Keystone top compression rings for long service life
- ◊Viscous type crankshaft vibration dampers to withstand single bearing alternator torsional vibrations
- ◊Replaceable valve guides and valve seats
- ◊Over head camshaft and four valves per cylinder

Technical Specifications

Manufacturer	VOLVO
Model	TAD1343GE
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	6
Cylinder arrangement	Vertical in-line
Displacement, Liters	13
Bore X Stroke, mm	131 X 158
Compression Ratio	18.1:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	366
Fan Power, kWm	10
BMEP gross, bar	23
Exhaust gas temp.(after turbo), °C	420
Exhaust gas flow (after turbo),m³ / min	60
Mean piston speed, m / s	7.9

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
TAD1343GE	366	356	335	325

Cooling System

- | | |
|--------------------------------------|---------------------------|
| Type | Tropical, heavy duty type |
| Ambient temperature, °C | 55 |
| Engine+Radiator coolant cap., Liters | 44 |
| Jacket coolant flow, Liters / sec | 4.6 |
| Cooling min airflow, m³ / min | 342 (at 55°C) |
- ◊Air to air intercooler
 - ◊Gear driven, maintenance-free coolant pump with high degree of efficiency
 - ◊Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop
 - ◊Coolant filter as standard

Fuel System

- | | |
|--------------------------------------|--------------------------|
| Type of injection system | Direct injection |
| Fuel injector | Electronic unit injector |
| Delivery/hour at 1500rev/min, Liters | 120 |
| Governor type | Electronic/EMS2 |
- ◊Non-return fuel valve
 - ◊Fuel prefilter with water separator and water-in-fuel indicator / alarm
 - ◊Gear driven low-pressure fuel pump
 - ◊Fine fuel filter with manual feed pump and fuel pressure switch
 - ◊Fuel shut-off valve, electrically operated

Fuel Consumption

liters per hour	%110 Load	84 L
	%100 Load	76 L
	%75 Load	57 L
	%50 Load	39.5 L
grams per kWh	%110 Load	194 g/kWh
	%100 Load	192 g/kWh
	%75 Load	193 g/kWh
	%50 Load	200 g/kWh

Lubricating System

- | | |
|------------------------|-------------|
| Type | Pressurized |
| Capacity, Liters | 36 |
| Lub oil pressure , bar | 3,7-5.2 |
- ◊Full flow oil cooler
 - ◊Full flow disposable spin-on oil filter, for extra high filtration
 - ◊The lubricating oil level can be measured during operation
 - ◊Gear type lubricating oil pump, gear driven by the transmission

Electrical System

- | | |
|---------------------|--|
| Alternator | Valeo, 24 Volt with integral regulator |
| Starter motor (DC) | Bosh, 24 Volt |
| Starter motor power | 7 kW |
- ◊EngineManagementSystem(EMS2), an electronically controlled processing system which optimizes engine performance.It also includes advanced facilities for diagnostics and fault tracing
 - ◊Three different ways for the customer to connect his controls and instrument to the engine. CAN SAE J1939 interface, CIU (Control interface unit) and connections.
 - ◊Sensors for oil pressure, oil temp, boost pressure, boost temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.

Leroy Somer LSA 47.2 VS2 Alternator

Standard Features

Top of the Range Electrical Performance

Class H insulation
 Standard 12-wire re-connectable winding, 2/3 pitch
 High efficiency and motor starting capacity
 R 791 interference suppression conforming to standard EN 55011 group 1
 class B standard for European zone (CE marking)

Protection System Suited to the Environment

The LSA 47.2 is IP23

Reinforced Mechanical Structure Using Finite Element Modelling

Compact and rigid assembly to better withstand generator-set vibrations
 Steel frame
 Cast iron flanges and shields
 Two-bearing and single bearing versions designed to be suitable for engines on the market
 Half-key balancing
 Greased for life bearings (regreasable bearings optional)

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
 8-way terminal block for voltage reconnection

Compliant with International Standards

The LSA 47.2 alternator conforms to the main international standards and regulations:

IEC 60034, NEMA MG 1.22, ISO 8528, CSA, CSA/UL

It can be integrated into a CE marked generator set

The LSA 47.2 is designed, manufactured and marketed in an ISO 9001 environment

Model	Standby		Prime	
	kVA	kW	kVA	kW
LSA 47.2 VS2	420	336	365	292

Technical Specifications

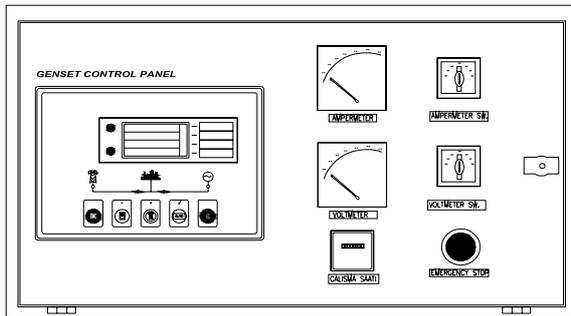
Manufacturer	LEROY SOMER
Model	LSA 47.2 VS2
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	420
Efficiency, %	93
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	SHUNT(12 wire)
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	R 230
Voltage Regulation, %	± 0.5
Total Harmonic TGH / THC	at no load < 1.5% - on load < 2%
Waveform: NEMA = TIF	< 50
Waveform: I.E.C = THF,	< 2%
Insulation class	H
Overspeed, Rpm	2250
Construction	Single bearing, direct coupled
Coupling	Flexible
Amortisseur Windings	Full
Connection	WYE
Rotor	Dynamic balanced
Protection class	IP23
Air flow, m ³ / min	0,9

Optional Equipment

- ◊ Filters on air inlet and air outlet (IP44)
- ◊ Windign protection for clean environments with relative humidity greater than 95%
- ◊ Space heaters
- ◊ Thermal protection for winding
- ◊ Digital voltage regulator
- ◊ PMG system

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ammeter
- ◊Ammeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The module is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment graphical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA, kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	KW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

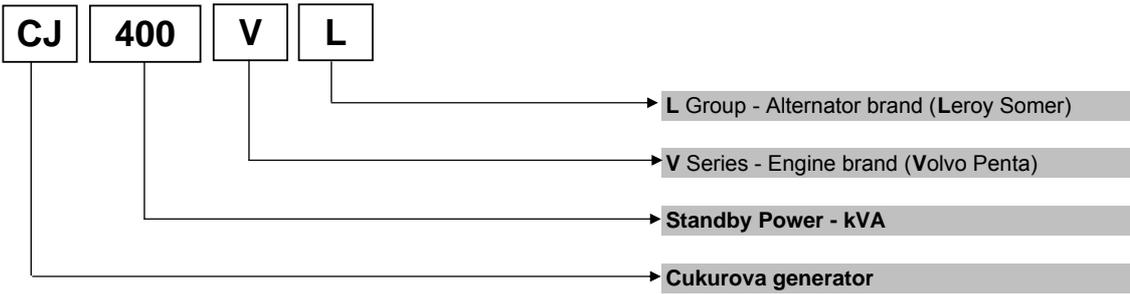
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11ms duration.

Electrical Safety

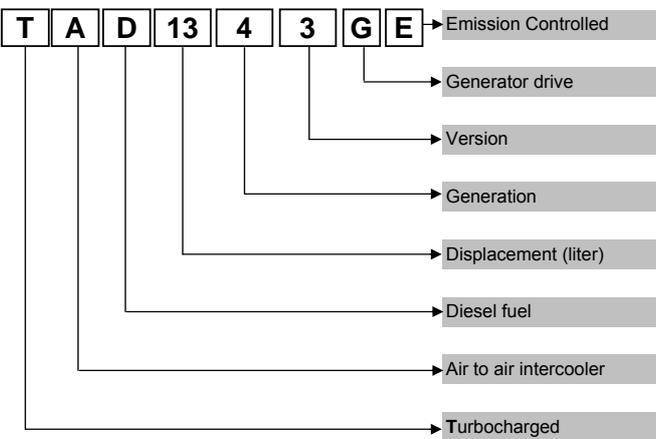
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

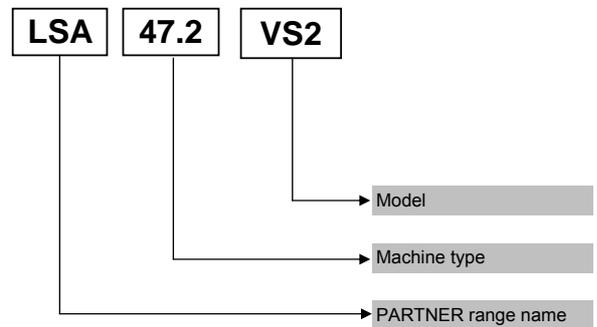
Cukurova Diesel Generator



Volvo Penta Diesel Engine



Leroy Somer Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

Electric Formulas

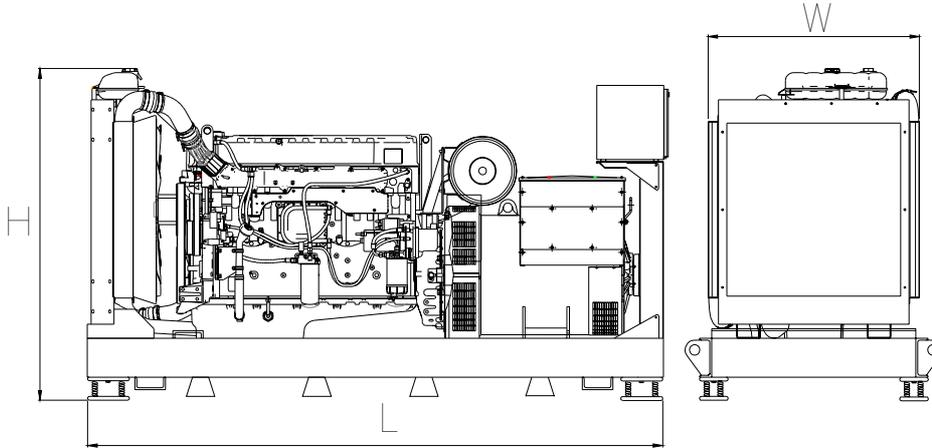
Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

kWm: Mechanical Power
kWe : Electrical Power
pf : Power factor
E : Alternator efficiency

I : Current (A)
U : Voltage (V)
kVA : Power
Rpm: Revolutions per minute

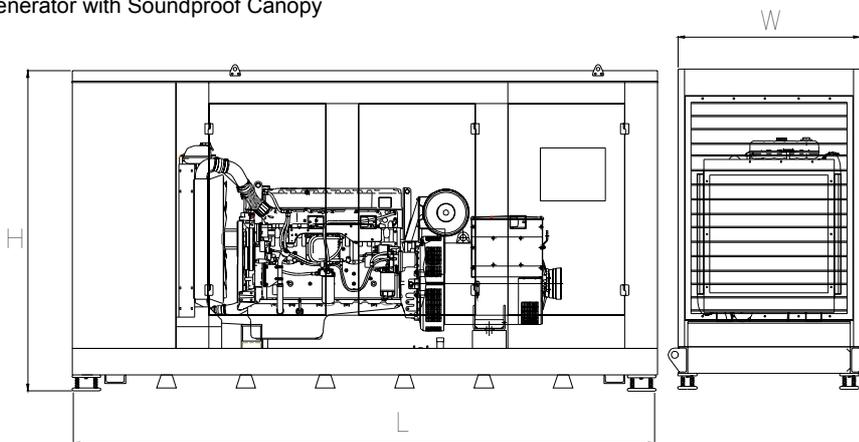
General Dimensions

Standard Generator



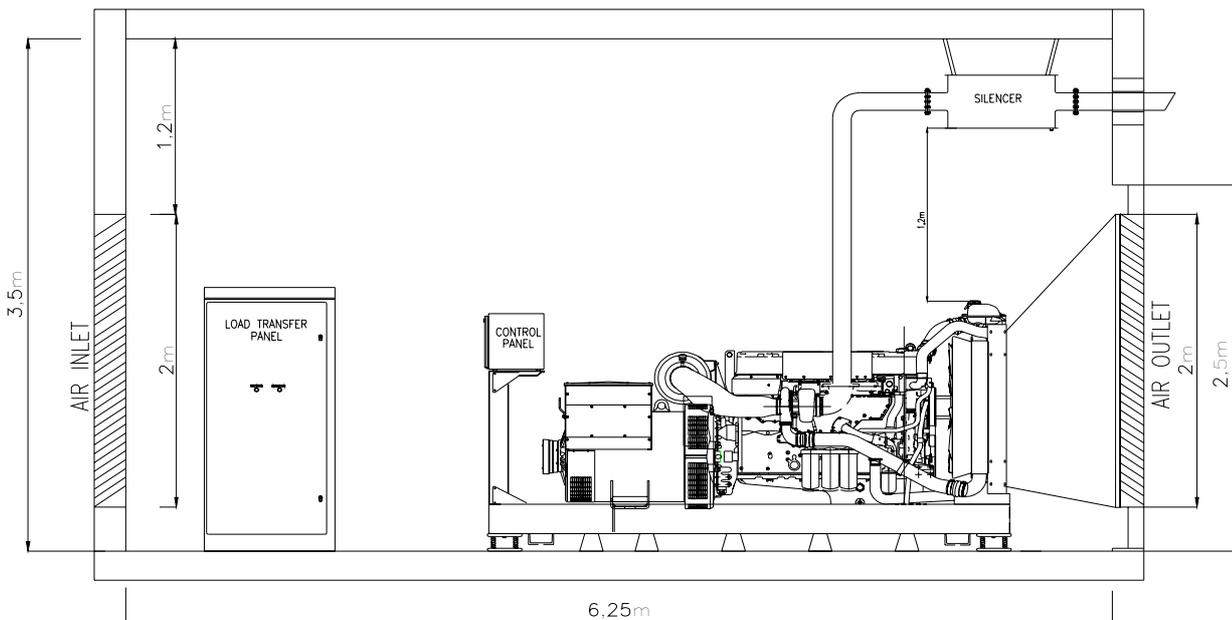
Length, L	3 m
Height, H	1,7 m
Width, W	1,1 m
Weight, Total	3.600 kg

Generator with Soundproof Canopy



Length, L	4,5 m
Height, H	2,5 m
Width, W	1,4 m
Weight, Total	5.000 kg

Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

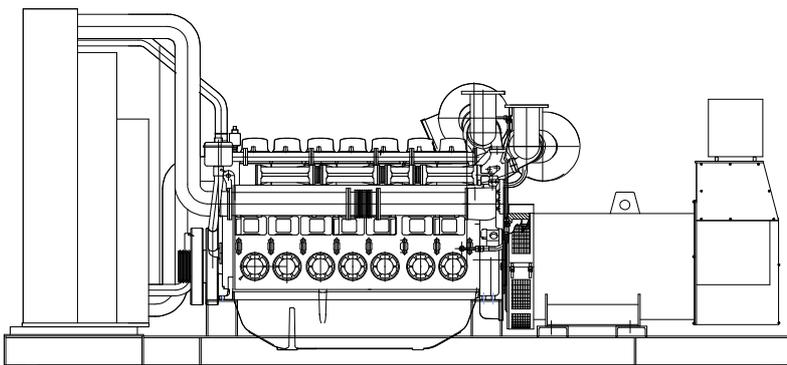
	CUKUROVA JENERATOR SANAYII TICARET A.S.	
	<p>Izmir Factory Aegean Free Zone Boss Sokak No:11, Gaziemir Izmir, Turkey Tel : +90 232 252 20 26 Fax : +90 232 252 20 27</p>	<p>Istanbul Export Sales Office Ebulula Mardin Caddesi Maya Meridyen İş Merkezi Kat:4 No: 14 Akatlar Istanbul, Turkey Tel : +90 212 352 70 90 Fax : +90 212 352 12 77 E-mail : info@cukurovapower.com</p>

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Perkins 4008TAG2A diesel engine

Marathon Magnamax 575 RSL 4044 alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 8 cylinder, water cooled engine
- ◊ 52°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ1100PM	1125	900	1022	818

APPLICATION DATA

Perkins 4008TAG2A Engine

Standard Features

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 sys.
- ◊ All engines are tolerant of a wide range of temperatures without derate
- ◊ Service is provided by the extensive Perkins network of over 4.000 distributors and dealers worldwide

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 easy of maintenance
- ◊ Engines designed to comply with major international standards
- ◊ Low gaseous emissions for cleaner operation

Standards

- ◊ UK MOD, BS5750, ISO9001, BS5514/1-1982, ISO 3046/1, ISO 8528/1

Technical Specifications

Manufacturer	PERKINS
Model	4008TAG2A
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	8
Cylinder arrangement	Vertical in-line
Displacement, Liters	30.561
Bore X Stroke, mm	160 X 190
Compression Ratio	13.6:1
Combustion System	Direct injection
Aspiration	Turbocharged, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	985
Fan Power, kWm	38
BMEP gross, bar	25,4
Combustion air flow, m ³ / min	80,5
Exhaust gas temp.(after turbo), °C	465
Exhaust gas flow (after turbo),m ³ / min	200
Mean piston speed, m / s	9,5

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	52
Engine coolant capacity, Liters	48
Engine+Radiator coolant cap., Liters	149
Jacket coolant flow, Liters / sec	10
Cooling min airflow, m ³ / min	1350 (at 50°C)
◊ Gear driven circulating pump	
◊ Twin thermostats	
◊ Crankshaft pulley for fan drive	
◊ Powder coated radiator assemblies comprising: water radiator; air charge cooled radiator; all pipes, hoses and clips; fan; pulley; fan belts and safety guards	

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
4008TAG2A	985	947	899	861

Lubricating System

Type	Pressurized
Capacity, Liters	165.6
Lub oil temp. Max to bearings, °C	105
Lub oil pressure (at 80°C,min), MPa	0.34
◊ Wet sump with filler and dipstick	
◊ Engine block lub oil temperature stabilizer	
◊ Full-flow spin-on oil filters	

Fuel System

Type of injection system	Direct injection
Fuel injection pump	Combined unit injector
Fuel injector opening pressure, bar	234
Delivery/hour at 1500rev/min, Liters	660
Fuel lift pump	Tuthill TCH 1-054
Governor type	Digital electronic governor to ISO 3046 Part 4 class A1
◊ Unit fuel injectors with lift pump and hand stop control	
◊ Full flow spin-on fuel filters	

Electrical System

Alternator	24 Volt with integral regulator
Starter motor (DC)	24 Volt
Starter motor power	8.2 kW
◊ Combined high coolant temperature / low oil pressure switch	
◊ Overspeed switch and magnetic pick up	
◊ Turbo inlet temperature shutdown switch	

Fuel Consumption

liters per hour	%110 Load	248 L
	%100 Load	220 L
	%75 Load	160 L
	%50 Load	108 L
grams per kWh	%110 Load	214 g/kWh
	%100 Load	204 g/kWh
	%75 Load	202 g/kWh
	%50 Load	205 g/kWh

Optional Equipments

- ◊ 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

alternator

Marathon Magmax 575 RSL 4044 Alternator

Standard Features

Permanent Magnet Generator ensures 300% short circuit current during fault conditions and provides the regulator with input power isolated from load distortions.

Digital Voltage Regulator is encapsulated for reliable performance in all environments. The DVR@2000 includes voltage regulation to .25%, three phase RMS sensing, adjustable volts/hertz underspeed protection, advanced engine unloading algorithms, integrated paralleling capabilities, and over-excitation/over-voltage protection.

Unirotor Construction incorporates single piece rotor laminations, a die cast rotor core and ammortisseur windings into an integrated rotor assembly. The field winding is wet layer wound to the rotor assembly with thermo setting epoxy for high mechanical and electrical integrity.

Class H Insulation System utilizes an unsaturated polyester varnish for optimal insulation life and superior moisture protection. A tropical insulation is added for increased environmental protection. A vacuum pressure impregnated insulation system is an available option.

Shielded Heavy-Duty Bearings resist contamination and give a minimum B-10 life of 40,000 hours. Regreasing provisions are available on all generators.

Enhanced Ventilation created by a high efficiency fan and optimized internal air flow patterns, maximizes heat transfer and minimizes hot spot differentials for extended winding life.

Fully Guarded for operator safety and generator protection, no rotating or electrically energized parts are exposed. All openings are covered by louvers or screens.

Optimized Windings provide low reactances and exceptional motor starting capability. The stator windings utilize a 2/3 pitch to minimize harmonic distortion and facilitate parallel operation.

Large Conduit Box provides ample space for easy connections and allows load line access from all sides, top, or bottom.

Exciter and PMG Mounting provides easy access and serviceability. The PMG is mounted external to the generator bearing. The exciter is externally mounted on 570 and 740 frame generators.

Design Specs and Agency Approvals are important at Marathon. All MAGMAX units meet **NEMA MG1-22, BS5000, CSA C22.2, IEC 34-1** and **VDE 0530** requirements.

Model	Standby		Prime	
	kVA	kW	kVA	kW
Magmax 575 RSL 4044	1190	952	1080	864

Technical Specifications

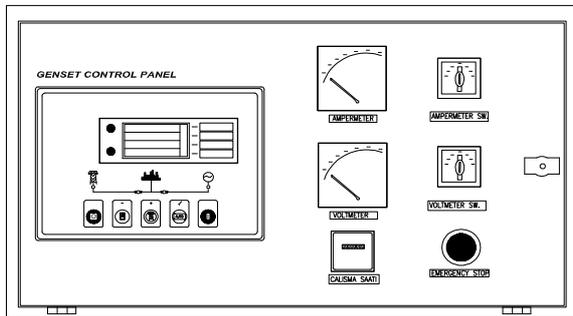
Manufacturer	MARATHON
Model	Magmax 575 RSL 4044
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	1190
Efficiency, %	95
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	400
Excitation	Self excited, PMG system
Stator windings	2/3 Pitch factor
Regulation	DVR, Digital Voltage Regulator
Voltage Regulator	DVR 2000
Voltage Regulation, %	± 0.25
Phase Sequence CCW-ODE	ABC
Deviation Factor, %	5.0
Voltage Balance, L-L or L-N, %	0.2
L-L Harmonic Max-Total, %	5.0
L-L Harmonic Max-Single, %	3.0
Overspeed, Rpm	1875
Full load current, amps	1461
TIF	Less than 50
THF	< 2%
Insulation class	H
Construction	Single bearing, direct coupled
Coupling	Flexible
Amortisseur Windings	Full
Connection	WYE
Rotor	Dynamic balanced
Protection class	IP22
Shaft Current	< 0.1 ma
Main stator capacitance to ground, mfd	0.047
Cooling air volume, CFM	890
Heat rejection rate, Btu's/min	2733
Full load torque, Lb-ft	4166

Optional Equipment

- ◊A VAR-PF controller
- ◊SAE adapters
- ◊Anti-condensation space heater
- ◊Two bearing construction
- ◊Droop CT

Control Panel

Standard Equipments



- ◊ Deeapse 5220 digital automatic control module
- ◊ Hourmeter
- ◊ Voltmeter
- ◊ Voltmeter commutator
- ◊ Amperimeter
- ◊ Amperimeter commutator
- ◊ Emergency stop button

Deepsea 5220 Control Module

Description

- ◊ The model 5220 is an Automatic Mains Failure Control module.
- ◊ The module is used to monitor a mains supply and automatically start a standby generator set.
- ◊ The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊ Selected timers and alarms can be altered by the user from the front panel.
- ◊ Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊ 240mm x 172mm dimensions
- ◊ 70mm x 40mm dimensions, 4 segment graphical LCD monitor
- ◊ Developed 16-bit Microprocessor design
- ◊ Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊ LED mimic diagram
- ◊ SMS messaging capability with suitable GSM Modem
- ◊ PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊ Easy pushbutton controls
- ◊ System parameters can be adjusted manually from the front panel
- ◊ kVA, kW ve Cosφ measurements
- ◊ Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3, total
Generator total power	kW L1, L2, L3, total
Generator power factor	Cosφ L1, L2, L3, total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

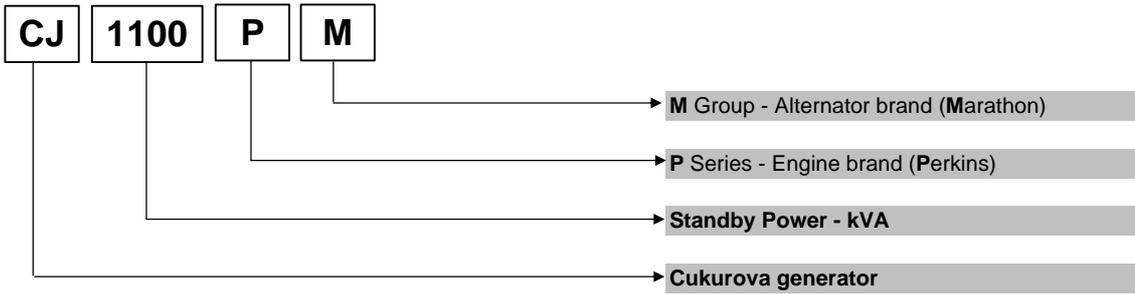
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude. 11ms duration.

Electrical Safety

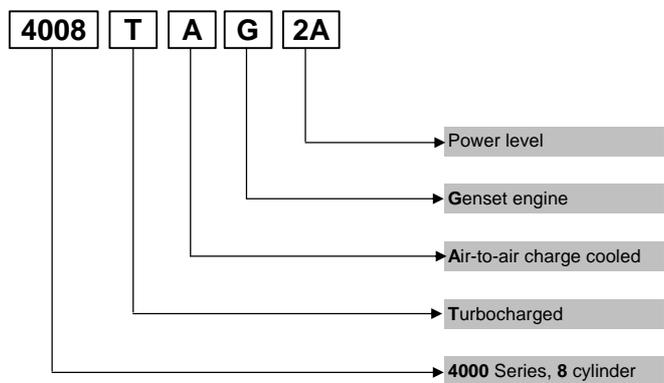
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

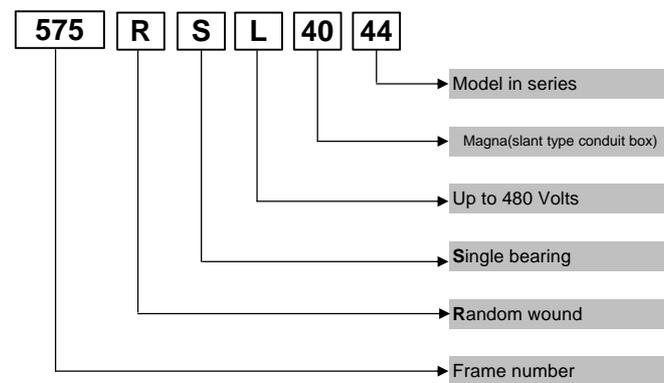
Cukurova Diesel Generator



Perkins 4000 Series Diesel Engine



Marathon Magnamax Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to ISO 3046/1, BS 5514, DIN6271

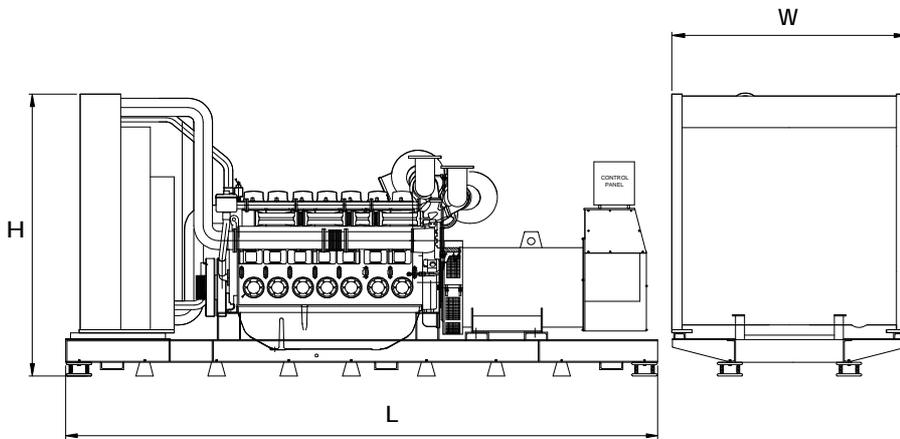
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

- kWm**: Mechanical Power
- kWe**: Electrical Power
- pf**: Power factor
- E**: Alternator efficiency
- I**: Current (A)
- U**: Voltage (V)
- kVA**: Power
- Rpm**: Revolutions per minute

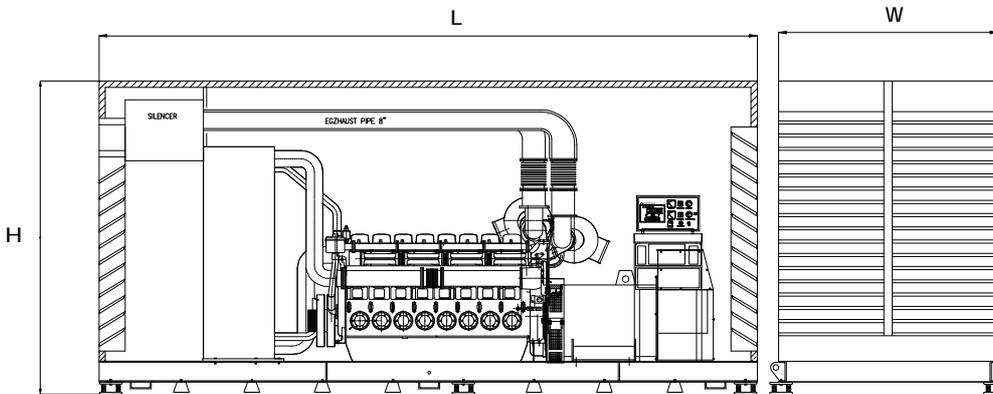
General Dimensions

Standard Generator



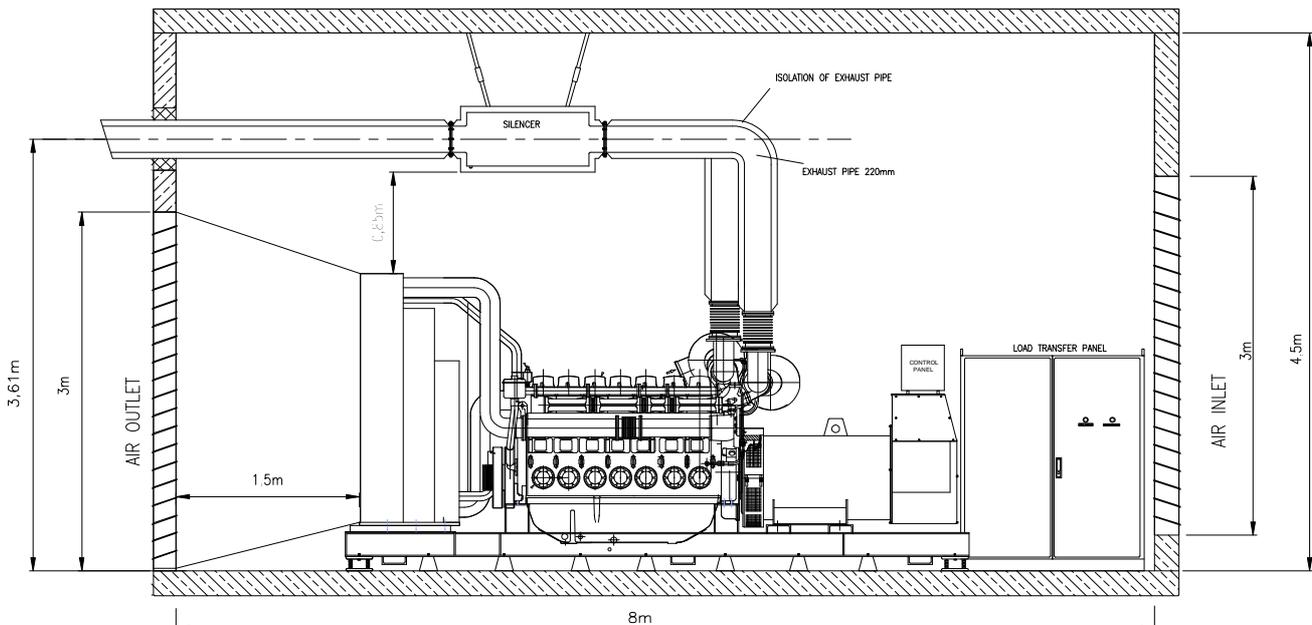
Length, L	5,1 m
Height, H	2,5 m
Width, W	2,1 m
Weight, Total	8000 kg

Generator with Soundproof Canopy



Length, L	6,3 m
Height, H	3,15 m
Width, W	2,1 m
Weight, Total	10.640 kg

Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice



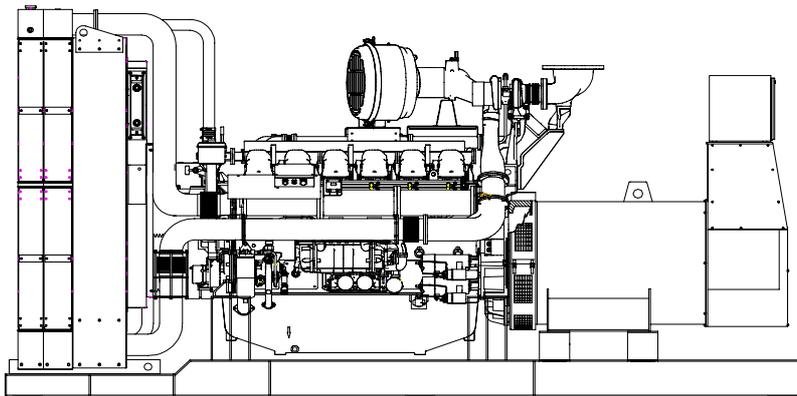
İSTANBUL	Tel : (0212) 482 16 00 (30 hat)	Faks : (0212) 482 16 80
İSTANBUL	Tel : (0216) 395 34 60 (5 hat)	Faks : (0216) 395 23 75
ADANA	Tel : (0322) 436 11 47 (5 hat)	Faks : (0322) 436 16 59
ANKARA	Tel : (0312) 490 87 77 (5 hat)	Faks : (0312) 490 89 88
İZMİR	Tel : (0232) 478 18 70	Faks : (0232) 478 18 30
ANTALYA	Tel : (0242) 221 48 21	Faks : (0242) 221 48 72
BURSA	Tel : (0224) 441 84 77	Faks : (0224) 441 84 78
DIYARBAKIR	Tel : (0412) 251 21 90 (10 hat)	Faks : (0412) 251 21 88
KAYSERİ	Tel : (0352) 331 74 74	Faks : (0352) 331 74 23
TRABZON	Tel : (0462) 325 70 10 (pbx)	Faks : (0462) 325 77 67

CUKUROVA GENERATOR SYSTEMS

1500 Rpm, 50Hz, 400V

Perkins 4012-46TAG2A diesel engine

Newage/Stamford PI734C alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 12 cylinder, water cooled engine
- ◊ 50°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosures
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ1650PN	1658	1326	1511	1208

APPLICATION DATA

Perkins 4012-46TAG2A Engine

Standard Features

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 sys.
 ◊ All engines are tolerant of a wide range of temperatures without derate
 ◊ Service is provided by the extensive Perkins network of over 4.000 distributors and dealers worldwide

Clean, efficient power

◊ New designed radiator assemblies with corrosion inhibiting powder coated finish; fewer pipe joints and easier access to reduce maintenance times
 ◊ Exceptional power to weight ratio and compact size for easier transportation and installation
 ◊ Designed to provide excellent service access for easy of maintenance
 ◊ Engines designed to comply with major international standards
 ◊ Low gaseous emissions that will satisfy the requirements of **1/2 TA Luft**

Standards

◊ UK MOD, BS5750, ISO9001, BS5514/1-1982, ISO 3046/1, ISO 8528/1

Technical Specifications

Manufacturer	PERKINS
Model	4012-46TAG2A
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	12
Cylinder arrangement	60° Vee
Displacement, Liters	45.842
Bore X Stroke, mm	160 X 190
Compression Ratio	13.6:1
Combustion System	Direct injection
Aspiration	Turbocharge, air-to-air charge cooled
Rotation	Anti-clockwise viewed on flywheel
Gross engine power, kWb	1459
Fan Power, kWm	64
BMEP gross, bar	25.38
Combustion air flow, m³ / min	128
Exhaust gas temp.(after turbo), °C	455
Exhaust gas flow (after turbo), m³ / min	320
Mean piston speed, m / s	9,5

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	50
Engine coolant capacity, Liters	73
Engine+Radiator coolant cap., Liters	210
Jacket coolant flow, Liters / sec	17
Cooling min airflow, m³ / min	1944
◊ System designed for ambients up to 50°C	
◊ Two twin thermostats	
◊ Powder coated radiator comprising: water radiator; air charge cooled radiator; fuel oil cooling (optional); all pipes, hoses and clips; fan; pulleys; fan belts and safety guards	

Model	Standby kWm		Prime kWm	
	Gross	Net	Gross	Net
4012-46TAG2A	1459	1395	1331	1267

Lubricating System

Type	Pressurized
Capacity, Liters	177
Lub oil temp. Max to bearings, °C	105
Lub oil pressure, kPa	400
◊ Wet sump with filler and dipstick	
◊ Full flow spin on oil filters	
◊ Engine jacket lub oil temperature stabilizer	

Fuel System

Type of injection system	Direct injection
Fuel injection pump	Combined unit injector
Injector pressure, MPa	140
Delivery/hour at 1500rev/min, Liters	1020
Fuel lift pump	Tuthill TCH 1-089
Governor type	Electronic governor, ISO 8528-12 CLASS 3-4; ISO 8528-5 CLASS G2
◊ Direct fuel injection system with fuel lift pump	
◊ Full flow spin-on fuel filters	

Electrical System

Alternator	24 Volt with integral regulator
Starter motor (DC)	24 Volt
Starter motor power	16,4 kW
◊ Twin high coolant temperate shutdown switches	
◊ Twin low oil pressure shutdown switches	
◊ Overspeed switch and magnetic pick up	
◊ Turbine inlet temperature shutdown switch	

Fuel Consumption

liters per hour	%110 Load	329 L
	%100 Load	297,5 L
	%75 Load	226,4 L
	%50 Load	156,8 L
grams per kWh	%110 Load	196 g/kWh
	%100 Load	194 g/kWh
	%75 Load	194 g/kWh
	%50 Load	195 g/kWh

Optional Equipments

- ◊ Fuel oil cooler integral to the radiator assembly
- ◊ Immersion heater with thermostat

Newage/Stamford PI734C Alternator

Standard Features

Winding&Electrical Performance

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

MX341-AVR

The PI range generators, complete with a PMG, are available with one of two AVRs. Each AVR has soft start voltage build up and built in protection against sustained over-excitation, which will de-excite the generator after a minimum of 8 seconds.

Underspeed protection (UFRO) is also provided on both AVRs. The UFRO will reduce the generator output voltage proportional to the speed of the generator below a pre-settable level.

The MX341 AVR is two phase sensed with a voltage regulation of $\pm 1\%$. Both the MX341 and MX321 need a generator mounted current transformer transformer to provide quadrature droop characteristics for load sharing during parallel operation.

Terminals&Terminal Box

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers wiring and gland arrangements. It has removable panels for easy access.

Shaft&Keys

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

Insulation / Impregnation

The insulation system is class 'H'

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

Standards

Newage Stamford industrial generators meet the requirements of **BS EN 60034** and the relevant section of other international standards such as **BS5000, VDE0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359**. Other standards and certifications can be considered on request.

Quality Assurance

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Model	Standby		Prime	
	kVA	kW	kVA	kW
PI734C	1660	1328	1550	1240

Technical Specifications

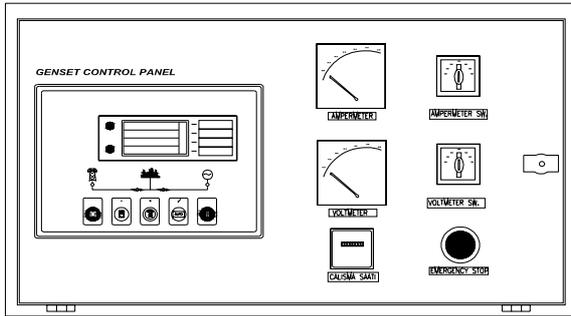
Manufacturer	NEWAGE / STAMFORD
Model	PI734C
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	1660
Efficiency, %	95.1%
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	380/415
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	MX341
Voltage Regulation, %	± 1
R.F.I Suppression	BS EN 61000-6-2 & BS EN 61000-6-4 VDE0875G, VDE 0875N
Waveform distortion	No Load <1.5% Non distorting balanced linear load <5.0%
Rotor	Dynamic balanced
Overspeed, Rpm	2250
Short circuit current	< 300%
TIF	Less than 50
Insulation class	H
Construction	Single bearing, direct coupled
Coupling	Flexible
Stator winding	Double layer concentric
Connection	WYE
Protection class	IP23
Cooling air volume, m ³ / sec	2.69

Optional Equipment

- ◊ Winding and bearings RTD's
- ◊ Winding Protection Thermistors
- ◊ Anti Condensation Heaters
- ◊ Air Filters
- ◊ Quadrature Droop kit for Parallel Operation
- ◊ Power Factor Controller
- ◊ Diode Failure Unit
- ◊ Excitation Loss Module
- ◊ Manual Voltage Regulator
- ◊ Re-greased bearings
- ◊ MX321 AVR with 0.5% Regulation and 3 phase sensing

Control Panel

Standard Equipments



- ◊Deeapse 5220 digital automatic control module
- ◊Hourmeter
- ◊Voltmeter
- ◊Voltmeter commutator
- ◊Ammeter
- ◊Ammeter commutator
- ◊Emergency stop button

Deepsea 5220 Control Module

Description

- ◊The model 5220 is an Automatic Mains Failure Control module.
- ◊The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊The module also provides indication of operational status and fault conditions automatically shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊Selected timers and alarms can be altered by the user from the front panel.
- ◊Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊240mm x 172mm dimensions
- ◊70mm x 40mm dimensions, 4 segment grafical LCD monitor
- ◊Developed 16-bit Microprocessor design
- ◊Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊LED mimic diagram
- ◊SMS messaging capability with suitable GSM Modem
- ◊PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊Easy pushbutton controls
- ◊System parameters can be adjusted manually from the front panel
- ◊kVA,kW ve Cosφ measurements
- ◊Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	kW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
 Mains out of limits

Environmental Testing Standards

Electromagnetic Compatibility

BS EN 50081-2:1992 and EN 61000-6-4:2000 EMC, Emission Standards for the Industrial Environment

EN 61000-6-2:1999 EMC, Immunity Standards for the Industrial Environment

Vibration

BS EN 60068-2-6 Ten sweeps (up and back down) at 1 octave/minute in each of the three major axes.

5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

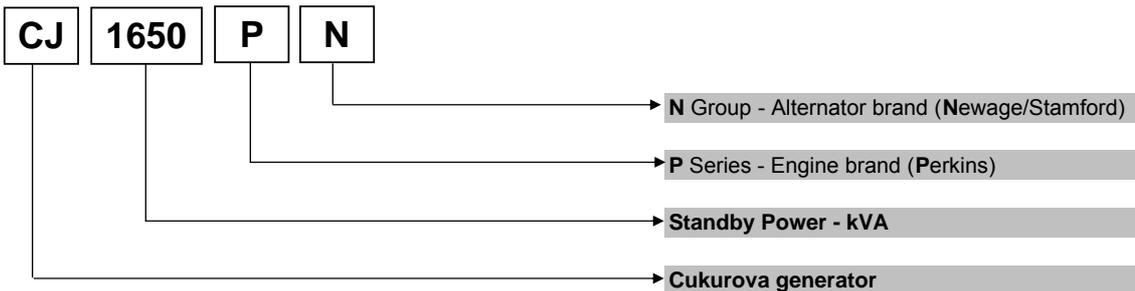
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude.11mS duration.

Electrical Safety

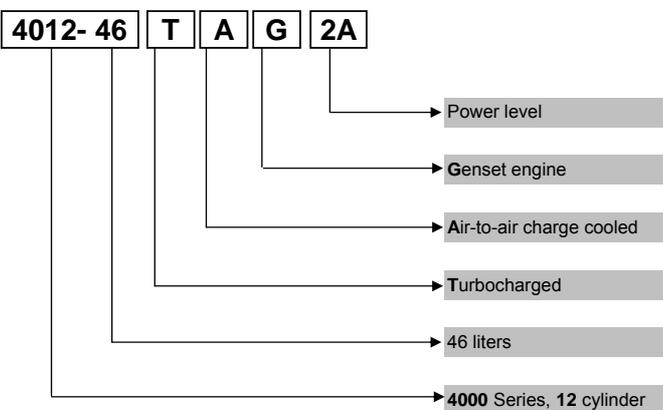
BS EN 60950 Low Voltage Directive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

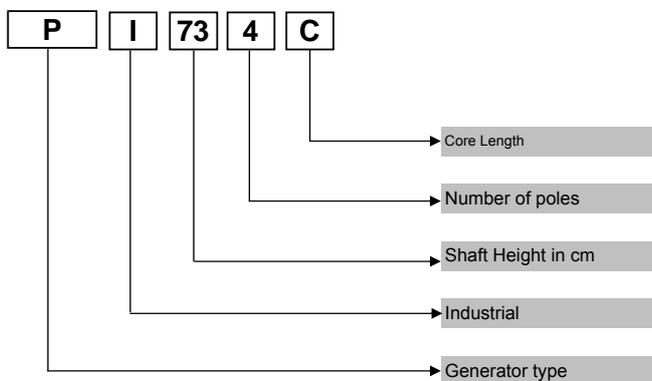
Cukurova Diesel Generator



Perkins 4000 Series Diesel Engine



Newage/Stamford Alternator



Information

Power Ratings

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. 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.

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 power rating, incorporation of a 10% overload for 1 hour in every 12 hours of operation which permitted

Continuous power rating is available for continuous full load operation. No overload is permitted.

Acc. to 3046/1, BS 5514, DIN6271

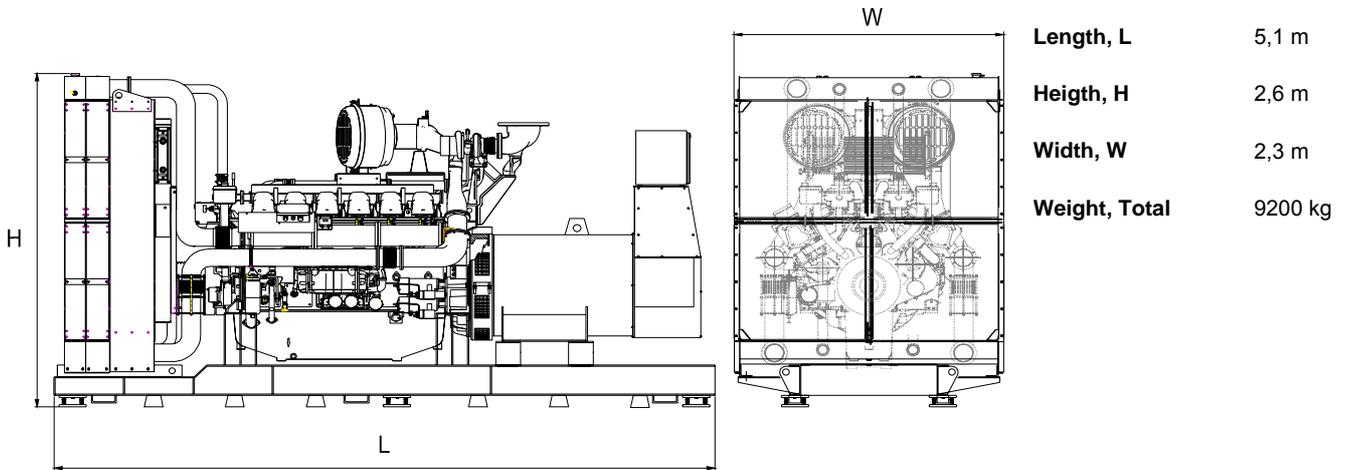
Electric Formulas

Values	Formula	
kWe	kWm X E	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	kVA x pf
kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
I (Amp)	$(kWe \times 1000) / (U \times 1.73 \times pf)$	$(kVA \times 1000) / (U \times 1.73)$
Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

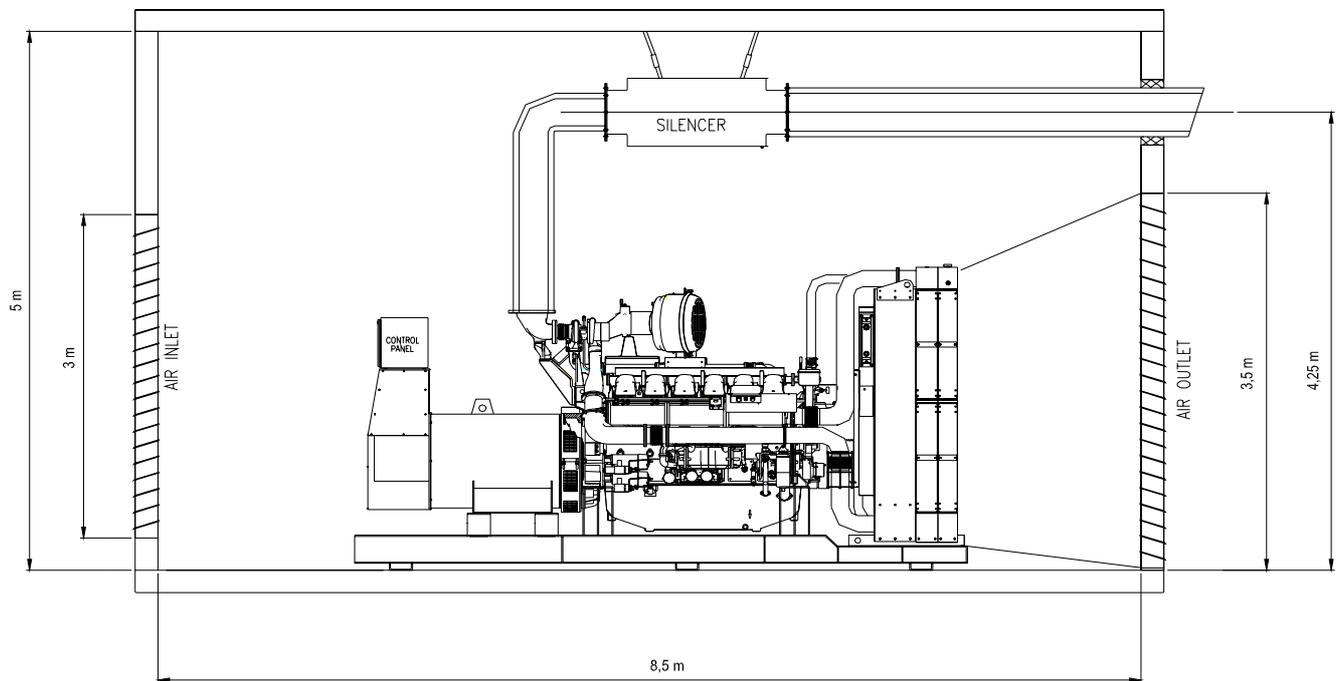
- kWm: Mechanical Power
- kWe : Electrical Power
- pf : Power factor
- E : Alternator efficiency
- I : Current (A)
- U : Voltage (V)
- kVA : Power
- Rpm: Revolutions per minute

General Dimensions

Standard Generator



Generator Room Layout



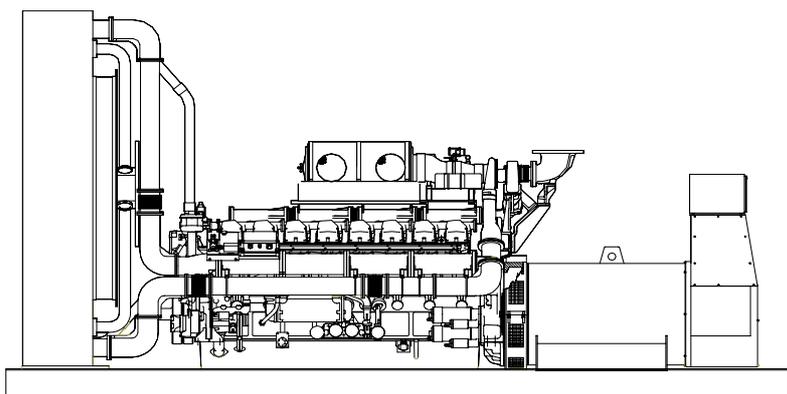
Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

Specifications may change without notice

	CUKUROVA JENERATOR SANAYII TICARET A.S.	
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Perkins 4012-46TAG3A diesel engine

Newage/Stamford PI734E alternator



Standard Generator Features

- ◊ AMF, Automatic mains failure unit
- ◊ Heavy duty type, 12 cylinder, water cooled engine
- ◊ 52°C tropical type radiator
- ◊ Starter motor
- ◊ Lead acid battery
- ◊ Charging alternator
- ◊ Battery charge redressor
- ◊ Heavy duty, brushless type alternator
- ◊ Base frame with anti-vibration units
- ◊ Industrial type silencers
- ◊ Flexible exhaust compensator
- ◊ Block water heater unit
- ◊ Control panel with digital-automatic main control module
- ◊ Fan, fan drive, charging alternator drive and all rotating parts covered
- ◊ Radiator matrix covered by metal mesh against the mechanical damages
- ◊ Fabricated and welded steel base frame
- ◊ Anti-vibration mountings
- ◊ Engine and alternator manufacturer test reports
- ◊ Factory load, performance and function tests

Optional Features

- ◊ Automatic load transfer panel
- ◊ Automatic synchronization and power sharing systems
- ◊ Soundproof canopy
- ◊ Container type enclosers
- ◊ Road trailer
- ◊ Job-site trailer
- ◊ Protection circuit breaker
- ◊ Air start
- ◊ Remote type radiator
- ◊ Base fuel tank
- ◊ External type fuel tank
- ◊ Automatic fuel transfer system
- ◊ Residential silencer



Model	Standby		Prime	
	kVA	kW	kVA	kW
CJ1900PN	1893	1514	1725	1380

APPLICATION DATA

Perkins 4012-46TAG3A Engine

Standard Features

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 sys.
- ◊ 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.

Clean, efficient power

- ◊ Exceptional power to weight ratio and compact size for easier transportation and installation
- ◊ Designed to provide excellent service access for easy of maintenance
- ◊ New designed radiator assemblies with corrosion inhibiting powder coated finish; fewer pipe joints and easier access to reduce maintenance times
- ◊ Engines designed to comply with major international standards
- ◊ Low gaseous emissions that will satisfy the requirements of **1/2 TA Luft**

Standards

- ◊ UK MOD, BS5750, ISO9001, BS5514/1-1982, ISO 3046/1, ISO 8528/1

Technical Specifications

Manufacturer	PERKINS
Model	4012-46TAG3A
Type	4 cycle, water-cooled, diesel engine
Number of cylinders	12
Cylinder arrangement	60° Vee
Displacement, Liters	45.842
Bore X Stroke, mm	160 X 190
Compression Ratio	13:1
Combustion System	Direct injection
Aspiration	Turbocharge, air-to-air charge cooled
Rotation	Anti-clockwise, viewed from flywheel end
Gross engine power, kWb	1639
Fan Power, kWm	60
BMEP gross, bar	28.52
Combustion air flow, m³ / min	135
Exhaust gas temp. (after turbo), °C	480
Exhaust gas flow (after turbo), m³ / min	350
Mean piston speed, m / s	9,5

Cooling System

Type	Tropical, heavy duty type
Ambient temperature, °C	52
Engine coolant capacity, Liters	73
Engine+Radiator coolant cap., Liters	210
Jacket coolant flow, Litres/min	1020
Cooling min airflow, m³ / min	2220
◊ Two twin thermostats	
◊ System designed for ambients up to 52°C	
◊ Powder coated radiator comprising: water radiator; air charge cooled radiator; fuel oil cooling (optional); all pipes, hoses and clips; fan; pulleys; fan belts and safety guards	

Model	Standby kWm		Prime kWm	
	Gross	Net	Gross	Net
4012-46TAG3A	1639	1579	1496	1436

Lubricating System

Type	Pressurized
Capacity, Liters	177
Lub oil temp. Max to bearings, °C	105
Lub oil pressure (at 80°C, min), MPa	0.34
◊ Wet sump with filler and dipstick	
◊ Full flow spin on oil filters	
◊ Engine jacket water/lub oil temperature stabiliser	

Fuel System

Type of injection system	Direct injection
Fuel injection pump	Combined unit injector
Injector pressure, MPa	140
Delivery/hour at 1500rev/min, Liters	1020
Fuel lift pump	Tuthill TCH 1-089
◊ Governing to ISO 8528-5 class G2 with isochronous capability	
◊ Direct fuel injection system with fuel lift pump	
◊ Full flow spin-on fuel filters	

Electrical System

Alternator	24 Volt with integral regulator
Starter motor (DC)	24 Volt
Starter motor power	16.4 kW
◊ Overspeed switch and magnetic pick up	
◊ Turbine inlet temperature shutdown switch	
◊ Twin high coolant temperate shutdown switches	
◊ Twin low oil pressure shutdown switches	

Fuel Consumption

liters per hour	%110 Load	396 L
	%100 Load	353 L
	%75 Load	262 L
	%50 Load	178 L
grams per kWh	%110 Load	202 g/kWh
	%100 Load	197 g/kWh
	%75 Load	192 g/kWh
	%50 Load	191 g/kWh

Optional Equipments

- ◊ Fuel oil cooler integral to the radiator assembly
- ◊ Immersion heater with thermostat

alternator

Newage/Stamford PI734E alternator

Standard Features

Winding&Electrical Performance

All generator stators are wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches, when in parallel with the mains. A fully connected damper winding reduces oscillations during paralleling. This winding, with the 2/3 pitch and carefully selected pole and tooth designs, ensures very low waveform distortion.

MX341 AVR

The PI range generators, complete with a PMG, are available with one of two AVRs. Each AVR has soft start voltage build up and built in protection against sustained over-excitation, which will de-excite the generator after a minimum of 8 seconds.

Underspeed protection (UFRO) is also provided on both AVRs. The UFRO will reduce the generator output voltage proportional to the speed of the generator below a pre-settable level.

The MX341 AVR is two phase sensed with a voltage regulation of $\pm 1\%$.

Both the MX341 and MX321 need a generator mounted current transformer transformer to provide quadrature droop characteristics for load sharing during parallel operation.

Terminals&Terminal Box

Standard generators feature a main stator with 6 ends brought out to the terminals, which are mounted on the frame at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers' wiring and gland arrangements. It has removable panels for easy access.

Shaft&Keys

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

Insulation / Impregnation

The insulation system is class 'H' and meets the requirements of UL1446. All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

Standards

Newage Stamford industrial generators meet the requirements of **BS EN 60034** and the relevant section of other international standards such as **BS5000, VDE0530, NEMA MG1-32, IEC34, CSA C22.2-100, AS1359**. Other standards and certifications can be considered on request.

Quality Assurance

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

Model	Standby		Prime	
	kVA	kW	kVA	kW
PI734E	2035	1628	1900	1520

Technical Specifications

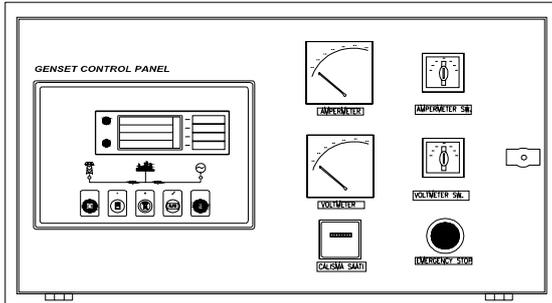
Manufacturer	NEWAGE / STAMFORD
Model	PI734E
Type	4-Poles, Rotating Field, Brushless
Standby power at rated voltage, kVA	2035
Efficiency, %	95.6%
Power factor	0.8
Phase	3
Frequency, Hz	50
Speed, Rpm	1500
Voltage, V	380/415
Excitation	Self excited
Stator windings	2/3 Pitch factor
Regulation	AVR, Automatic Voltage Regulator
Voltage Regulator	MX341
Voltage Regulation, %	± 1
R.F.I Suppression	BS EN 61000-6-2 & BS EN 61000-6-4 VDE0875G, VDE 0875N
Waveform distortion	No Load <1.5% Non distorting balanced linear load <5.0%
Rotor	Dynamic balanced
Overspeed, Rpm	2250
Short circuit current	< 300%
TIF	Less than 50
Insulation class	H
Construction	Single bearing, direct coupled
Coupling	Flexible
Stator winding	Double layer concentric
Connection	WYE
Protection class	IP23
Cooling air volume, m ³ / sec	2.69m ³ /sec

Optional Equipment

- ◊Winding and bearings RTDs
- ◊Winding Protection Thermistors
- ◊Anti Condensation Heaters
- ◊Air Filters
- ◊Quadrature Droop kit for Parallel Operation
- ◊Power Factor Controller
- ◊Diode Failure Unit
- ◊Excitation Loss Module
- ◊Manual Voltage Regulator
- ◊Re-greasable bearings

Control Panel

Standard Equipments



- ◊ Deepsea 5220 digital automatic control module
- ◊ Hourmeter
- ◊ Voltmeter
- ◊ Voltmeter commutator
- ◊ Ampermeter
- ◊ Ampermeter commutator
- ◊ Emergency stop button

Deepsea 5220 Control Module

Description

- ◊ The model 5220 is an Automatic Mains Failure Control module.
- ◊ The modul is used to monitor a mains supply and automatically start a standby generator set.
- ◊ The module also provides indication of operational status and fault conditions automaticly shutting down the genset and indicating failures by means of an LCD display, and appropriate flashing LED on the front panel.
- ◊ Selected timers and alarms can be altered by the user from the front panel.
- ◊ Alterations to the system are made using the 810 interface and a PC. This interface also provides real time diagnostic facilities

Specifications

- ◊ 240mm x 172mm dimensions
- ◊ 70mm x 40mm dimensions, 4 segment grafical LCD monitor
- ◊ Developed 16-bit Microprocessor design
- ◊ Easy comprehended display (Hid-Til-Lit SMD LED technology)
- ◊ LED mimic diagram
- ◊ SMS messaging capability with suitable GSM Modem
- ◊ PC software is MS Windows based and allows the operator to control the module from a remote location (P810 Software Kit necessary)
- ◊ Easy pushbutton controls
- ◊ System parameters can be adjusted manually from the front panel
- ◊ kVA, kW ve Cosφ measurements
- ◊ Communication with MODEM

Pushbutton Controls

STOP / START
 AUTO, TEST, MANUAL
 LCD PAGE

Input Functions display on LCD

Generator Volts	Volts L1-N, L2-N, L3-N
Generator Volts	Volts L1-L2, L2-L3, L3-L1
Generator Amps	Amps L1, L2, L3
Generator Frequency	Hz
Mains Volts	Volts L1-N, L2-N, L3-N
Mains Volts	Volts L1-L2, L2-L3, L3-L1
Mains Frequency	Hz
Engine Speed	RPM
Plant Battery Volts	Volts
Engine Hours Run	Hour
Generator total power	kVA L1, L2, L3,total
Generator total power	kW L1, L2, L3,total
Generator power factor	Cosφ L1, L2, L3,total

Optional Input Functions

Engine Oil pressure	kPa
Fuel level	%
Engine Temperature	°C

Alarm Channels

Under/over generator voltage
 Over-current
 Under/over generator frequency
 Under/over speed
 Charge fail
 Emergency stop
 Low oil pressure
 High engine temperature
 Fail to start
 Low/high DC battery voltage
 Reverse power
 Generator phase rotation error
 Generator short-circuit protection
 Loss of speed sensing signal
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5Hz to @ +/-7.5mm constant displacement.

8Hz to 500Hz 2gn constant acceleration.

Temperature

Cold : BS EN 60068-2-1 to -30°C

Hot : BS EN 60068-2-2 to 70°C

Humidity

BS EN 2011 part 2.1 93% RH @ 40° for 48 hours

Shock

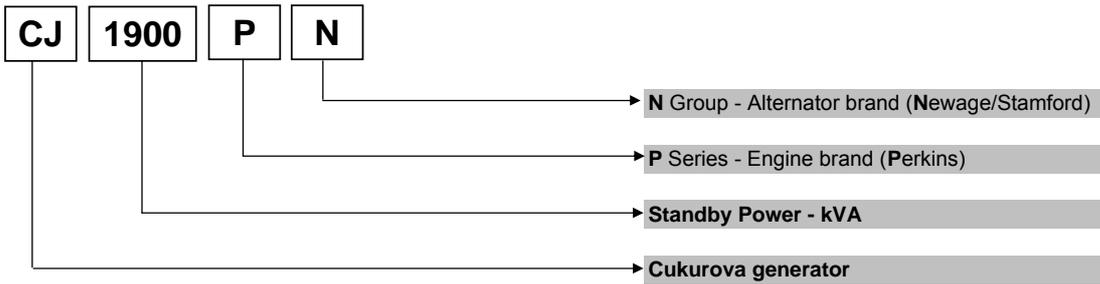
BS EN 6068-2-27 Three half sine shocks in each of the three major axes 15gn amplitude. 11ms duration.

Electrical Safety

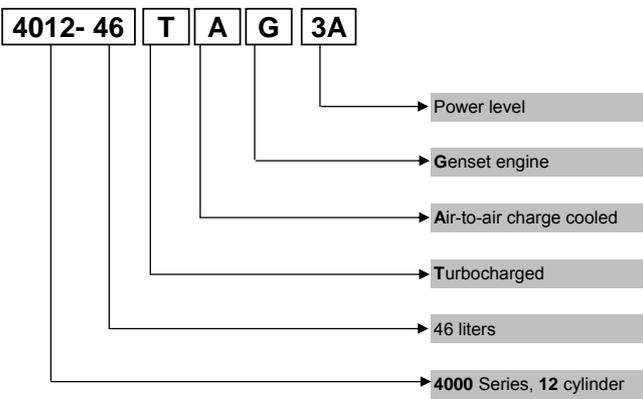
BS EN 60950 Low Voltage Dirctive/Safety of information technology equipments, including electrical business equipment

Model Codes and General Information

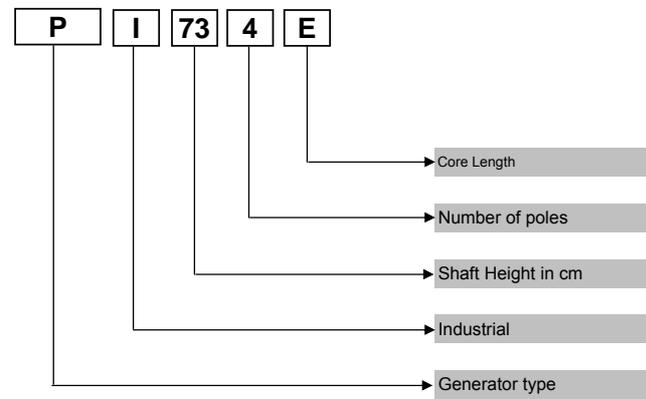
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Electric Formulas

Values	Formula	
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kVA	$(U \times I \times 1.73) / 1000$	kWe / pf
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Frequency	$(Rpm \times N^{\circ}Pole) / (2 \times 60)$	
Rpm	$(2 \times 60 \times Frequency) / N^{\circ}Pole$	

kWm: Mechanical Power

kWe : Electrical Power

pf : Power factor

E : Alternator efficiency

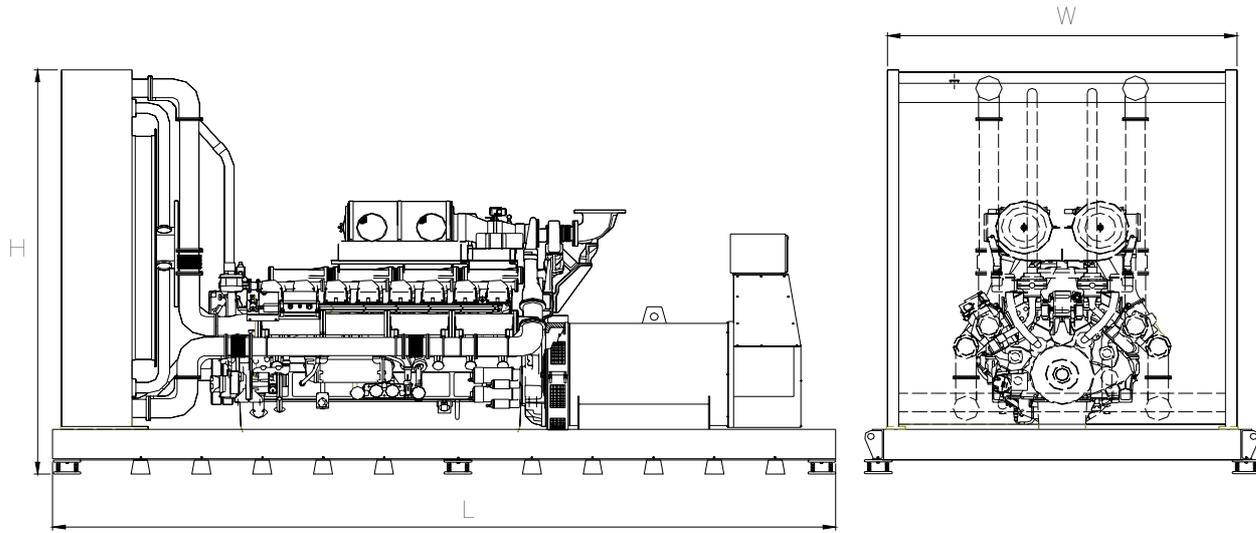
I : Current (A)

U : Voltage (V)

kVA : Power

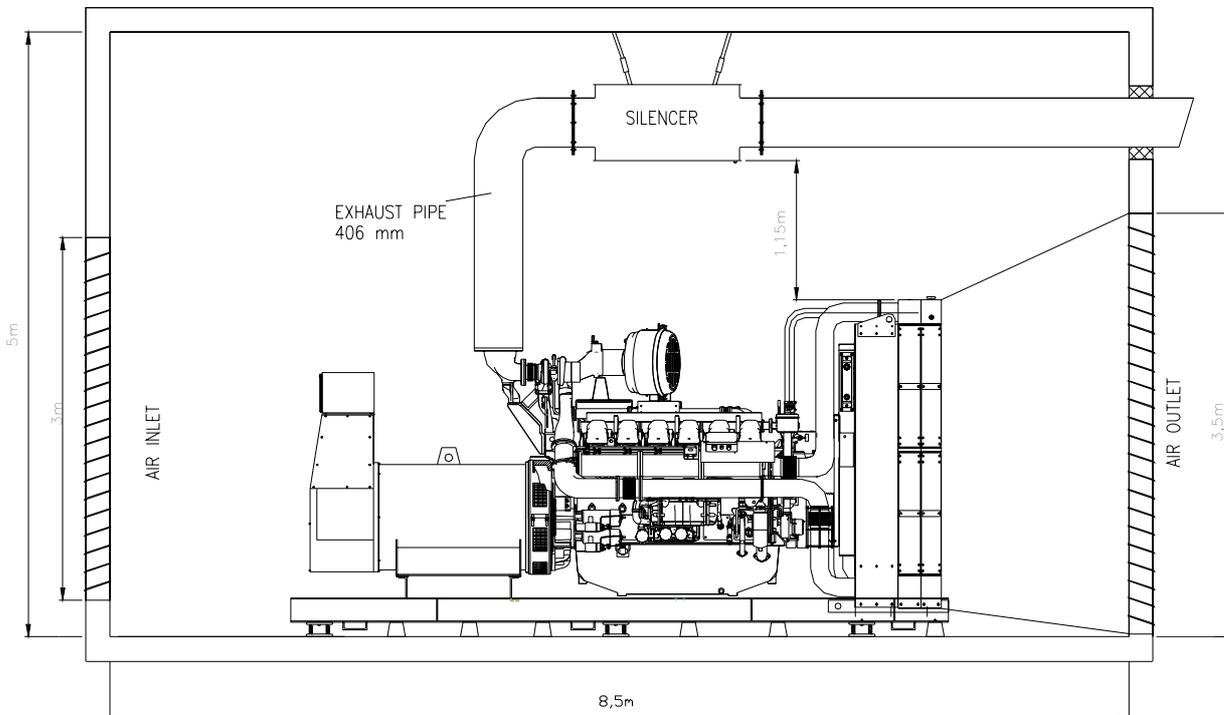
Rpm: Revolutions per minute

General Dimensions



Length, L	5,5 m
Height, H	2,87 m
Width, W	2,1 m
Weight, Total	11.300 kg

Generator Room Layout



Above drawings dimensions and weights are only for guidance. For installation design of your specific application, necessary certified drawings, at site consultancy service as well as maintenance and installations manuals will be provided by Cukurova without any charge.

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