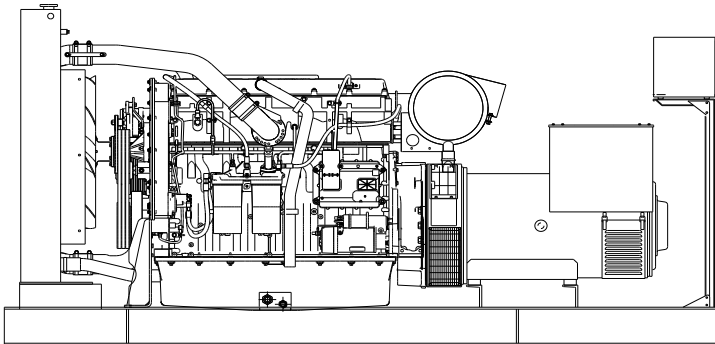


Perkins 2206A-E13TAG3 diesel engine

Newage/Stamford HCI444F 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 |
| CJ450PN | 450 | 360 | 400 | 320 |

APPLICATION DATA

Perkins 2206A-E13TAG3 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 electronically controlled fuel injection.

Reliable power

◊Developed and tested using the latest engineering techniques and finite element analysis for high reliability.

◊Low oil usage and low wear rates.

◊High compression ratio ensures clean rapid starting in all conditions.

Compact and efficient power

◊Exceptional power to weight ratio and compact size give optimum power density for ease of installation and more cost effective transportation.

◊Designed to provide excellent service access for ease of maintenance.

Standards

◊ UK MOD, ISO 8528/1, ISO 3046/1:1986, BS 5514/1, DIN 6271

BS 2869: Part 2 1998 Class A2 or BSEN590 or ASTM D975 Class 1D and 2D.

Technical Specifications

| | |
|---|---|
| Manufacturer | PERKINS |
| Model | 2206A-E13TAG3 |
| 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 cooling |
| Rotation | Anti-clockwise viewed from flywheel |
| Gross engine power, kWb | 412.5 |
| Fan Power, kWm | 14 |
| BMEP gross, kPa | 2637 |
| Combustion air flow, m ³ / min | 26.4 |
| Exhaust gas temp.(after turbo), °C | 630 |
| Exhaust gas flow (after turbo),m ³ / min | 72.5 |

Cooling System

| | |
|--|---------------------------|
| Type | Tropical, heavy duty type |
| Ambient temperature, °C | 50 |
| Engine+Radiator coolant cap., Liters | 51.4 |
| Jacket coolant flow, Liters / sec | 5.2 |
| Cooling min airflow, m ³ / min | 654 (at 50°C) |
| ◊Gear-driven circulating pump | |
| ◊Mounted belt-driven pusher fan | |
| ◊Radiator incorporating air-to-air charge cooler, (supplied loose) | |
| ◊System designed for ambients up to 50°C | |

| Model | Standby kW | | Prime kW | |
|----------------------|--------------|--------------|--------------|--------------|
| | Gross | Net | Gross | Net |
| 2206A-E13TAG3 | 412.5 | 392.3 | 368.4 | 348.9 |

Lubricating System

| | |
|---|-------------|
| Type | Pressurized |
| Capacity, Liters | 40 |
| Lub oil pressure (min), kPa | 270 |
| ◊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 |
| Delivery/hour at 1500rev/min, Liters | 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 | |

Electrical System

| | |
|--|---------|
| Alternator | 24 Volt |
| 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 | 89 L |
| | %100 Load | 81 L |
| | %75 Load | 62 L |
| | %50 Load | 42 L |
| grams per kWh | %110 Load | 196 g/kWh |
| | %100 Load | 197 g/kWh |
| | %75 Load | 199 g/kWh |
| | %50 Load | 202 g/kWh |

Optional Equipments

- ◊110 volt/240 volt immersion heater
- ◊Additional speed sensor
- ◊Temperature and pressure sensors for gauges
- ◊Air filter rain hood
- ◊Twin starters/facility for second starter
- ◊Tool kit

alternator

Newage/Stamford HCI444F 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.

SX440 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 |
| HCI444F | 450 | 360 | 400 | 320 |

Technical Specifications

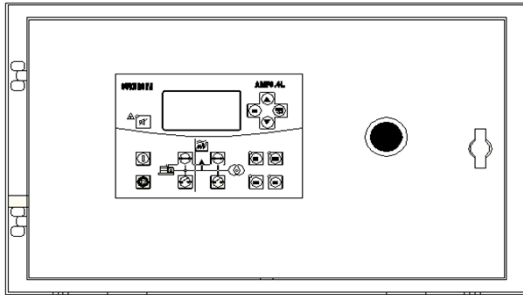
| | |
|--|---|
| Manufacturer | NEWAGE / STAMFORD |
| Model | HCI444F |
| Type | 4-Poles, Rotating Field, Brushless |
| Standby power at rated voltage, kVA | 450 |
| Efficiency, % | %92.8 |
| Power factor | 0.8 |
| Phase | 3 |
| Frequency, Hz | 50 |
| Speed, Rpm | 1500 |
| Voltage, V | 380/415 |
| Excitation | Self excited |
| Stator windings | 2/3 Pitch factor |
| Regulation | AVR, Automatic Voltage Regulator |
| Voltage Regulator | SX440 |
| 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



- ◊ AMF 3.4L graphical LCD display with white back light
- ◊ Emergency stop button
- ◊
- ◊
- ◊
- ◊
- ◊

AMF 3.4L Control Module

Description

- ◊ The model AMF 3.4L 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.
- ◊ Phase sequence detection and reverse power detection.
- ◊ Real time clock and time stamped alarm logging

Specifications

- ◊ 17,85mm x 125,6mm dimensions
- ◊ 128x64 screen LED display.
- ◊ IP52
- ◊ Easy comprehended display .
- ◊ LED mimic diagram
- ◊ Easy pushbutton controls
- ◊ System parameters can be adjusted manually from the front panel
- ◊ kVA, kW ve cosφ measurements
- ◊ Recording of the last 15 failure alarm.
- ◊ Battery saving sleep mode function.
- ◊ Pre-glow heater control
- ◊ True RMS voltage and current measurements for mains and generator.
- ◊ 8 digital inputs , 6 digital outputs (Dry Contact)

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 Kva,Kw,Kvar,Kvarh | L1-N, L2-N, L3-N |
| Generator Kva,Kw,Kvar,Kvarh | L1-N, L2-N, L3-N |
| Power Factor | cosφ |
| Mains Frequency | Hz |
| Engine Speed | RPM |
| Plant Battery Volts | Volts |
| Engine Hours Run | Hour |

Optional Functions

| | |
|---|-----|
| Engine Oil pressure | kPa |
| Engine Temperature | °C |
| Service Hours Timing Function | |
| SCADA Interface For Monitoring And Remote System Programing | |
| GSM Modem Interface (SMS options) | |
| Remote Start-Stop Interface | |
| Modbus Rtu Communication Interface Port | |

Alarm Channels

- Engine Start/Stop Failure
- Over-Current
- Under/Over Generator Frequency
- Under/Over Speed
- Charge Fail
- Emergency Stop
- Low Oil Pressure
- High Engine Temperature
- Under/Over Generator Voltage
- Loss Of Speed Sensing Signal
- Mains Out Of Limits

Environmental Testing Standards

Electromagnetic Compatibility

K-Q TSE ISO 9000

Temperature

Cold : -25°C

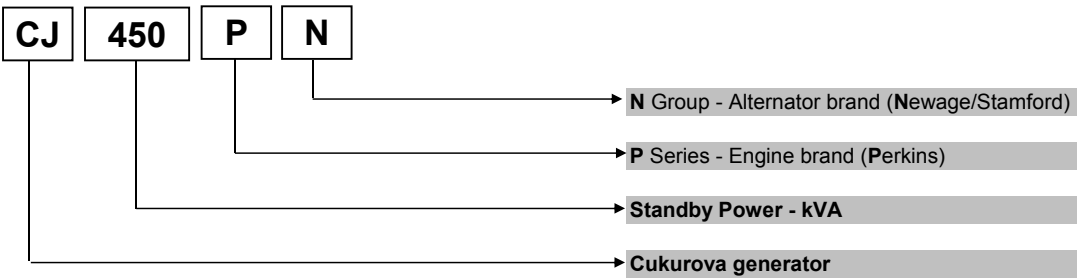
Hot : + 70°C

Humidity

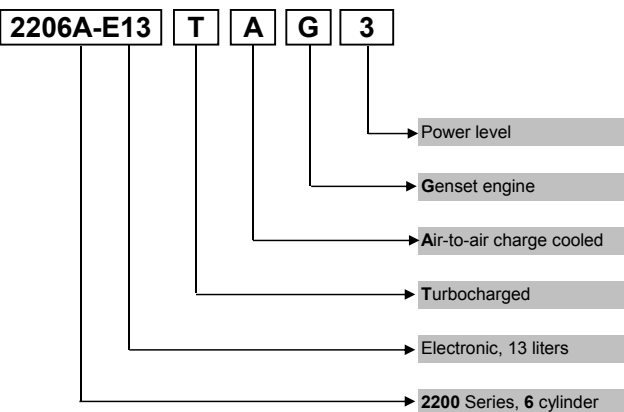
%10-95 non-condensing

Model Codes and General Information

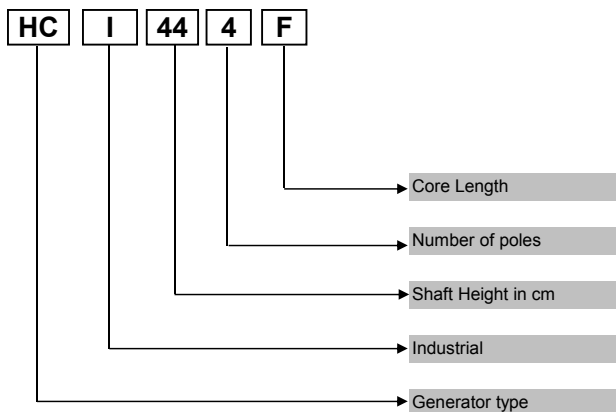
Cukurova Diesel Generator



Perkins 2200 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)

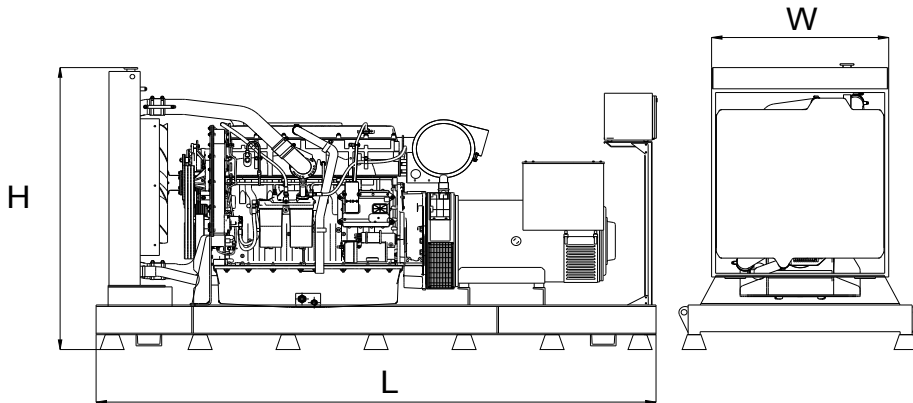
U : Voltage (V)

kVA : Power

Rpm: Revolutions per minute

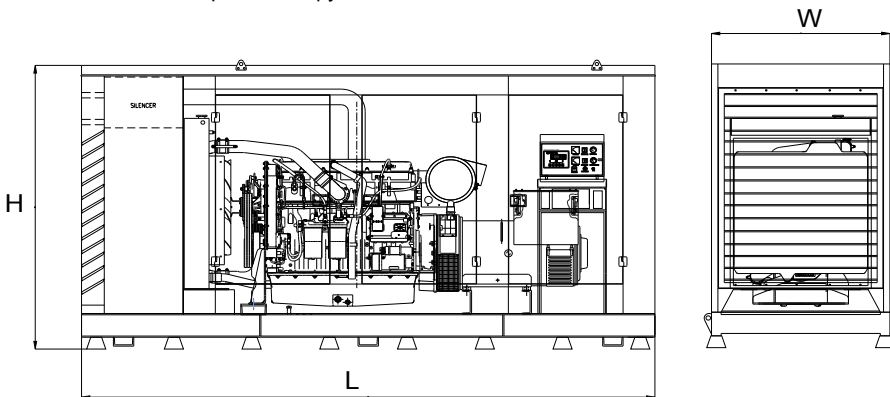
General Dimensions

Standard Generator



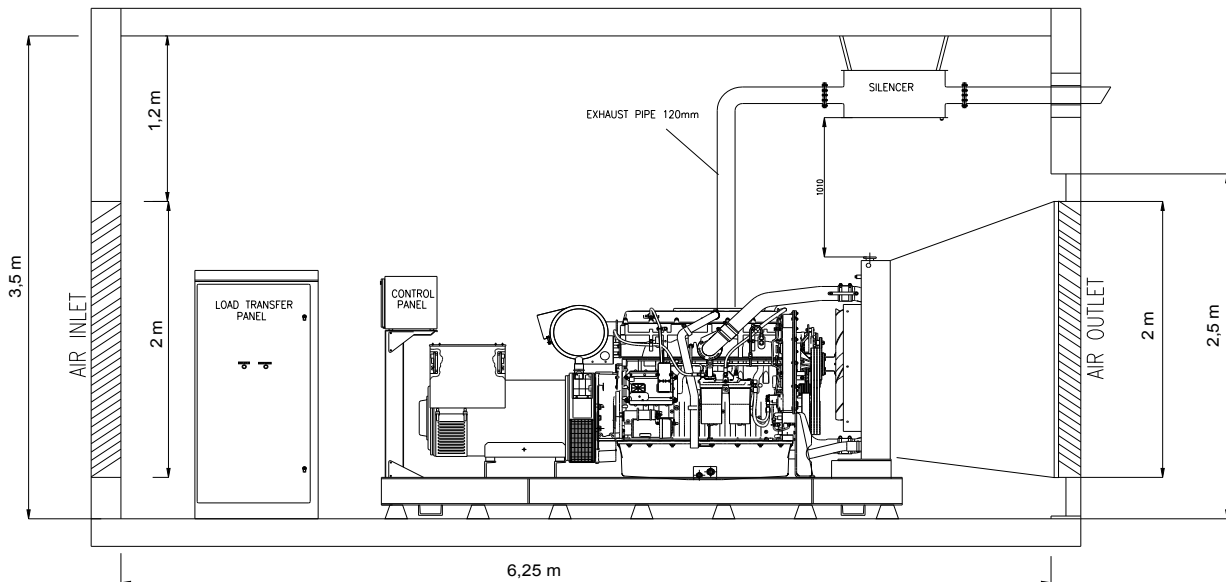
| | |
|----------------------|---------|
| Length, L | 3,2 m |
| Height, H | 1,97 m |
| Width, W | 1,15 m |
| Weight, Total | 3550 kg |

Generator with Soundproof Canopy



| | |
|----------------------|---------|
| Length, L | 4,1 m |
| Height, H | 2,45 m |
| Width, W | 1,4 m |
| Weight, Total | 5000 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

| | |
|--|--|
| <p>CUKUROVA PowerGeneration</p> | <p>CUKUROVA JENERATOR SANAYII TICARET A.S.</p> |
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