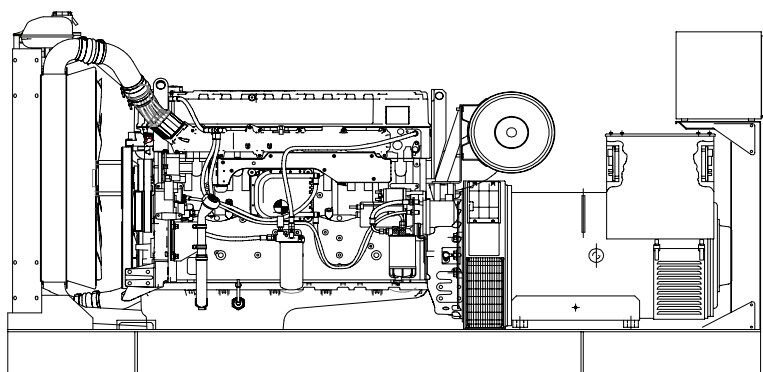




Volvo TAD1344GE diesel engine

Newage/Stamford HCI444F 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



	Standby		Prime	
	kVA	kW	kVA	kW
	<b>450</b>	<b>360</b>	<b>400</b>	<b>320</b>

# Volvo TAD1344GE Engine

## Standard Features

The TAD1344GE is a powerful, reliable and economical Generating Set Diesel Engine built on the dependable Volvo in-line six concept.

## Durability & low noise

Designed for easy, fast and economical installation. Field tested to ensure highest standard of durability and long life. 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.

## Low exhaust & noise emission

The state of the art, high-tech injection and highly efficient charge air system with low internal losses contributes to excellent combustion and low fuel consumption. The TAD1344GE is EU Stage 2 emission certified.

## Easy service & maintenance

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

## Engine and Block

- ◊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 increased piston lifetime
- ◊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	تولید کننده
Model	TAD1344GE	مدل
Type	4 cycle, water-cooled, diesel engine	تیپ
Number of cylinders	6	تعداد سیلندرها
Cylinder arrangement	Vertical in-line	آرایش سیلندرها
Displacement, Liters	12.78	جا به جایی
Bore X Stroke, mm	131 X 158	قطر سیلندر X کورس پیستون
Compression Ratio	18,1:1	نسبت تراکم
Combustion System	Direct injection	سیستم احتراق
Aspiration	Turbocharged, air-to-air charge cooled	سیستم تنفس
Rotation	Anti-clockwise viewed towards flywheel	چرخش
Gross engine power, kWb	399	قدرت ناخالص موتور
Fan Power, kWm	10	قدرت فن
BMEP gross, Mpa	2.5	جریان هوای احتراق
Exhaust gas temp.(after turbo), 465 °C		دمای گاز خروجی از اگزوز
Exhaust gas flow (after turbo), 67.5 m³ / min		جریان هوای خروجی از اگزوز
Mean piston speed, m / s	7.9	میانگین سرعت پیستون

Model	Standby kW		Prime kW	
	Gross	Net	Gross	Net
<b>TAD1344GE</b>	<b>399</b>	<b>389</b>	<b>364</b>	<b>354</b>

## Cooling System

- Type Tropical, heavy duty type
- Ambient temperature, °C 55
- Engine+Radiator coolant cap., Liters 44
- Jacket coolant flow, Liters / sec 5
- ◊Belt driven coolant pump with high degree of efficiency
  - ◊Coolant filter as standard
  - ◊Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop

## Fuel System

- Type of injection system Direct injection
- Fuel injector Electronic unit injector
- Delivery/hour at 1500rev/min, Liters 500
- Governor type Electronic/EDCIII
- ◊Electronic high pressure unit injectors
  - ◊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 Consumption

grams per kWh	%100 Load	215 g/kWh
	%75 Load	198 g/kWh
	%50 Load	199 g/kWh
	%25 Load	215 g/kWh

## Lubricating System

- Type Pressurized
- Capacity, Liters 36
- Lub oil pressure , kPa 370 - 520
- ◊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 Bosch, 80 A
- Starter motor (DC) Melco, 24 Volt
- Starter motor power 7 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.
  - ◊Possibility to perform a start battery test according to the NCPA requirements via CAN bus signals.
  - ◊Sensors for oil pressure, oil temp, boost pressure, boost temp, coolant temp, fuel temp, water in fuel, fuel pressure and two speed sensors.

## 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 parallelling.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 relevent 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 quaility assurance level to BS EN ISO 9001.

Model	Standby		Prime	
	kVA	kW	kVA	kW
<b>HCI444F</b>	<b>450</b>	<b>360</b>	<b>400</b>	<b>320</b>

### Technical Specifications

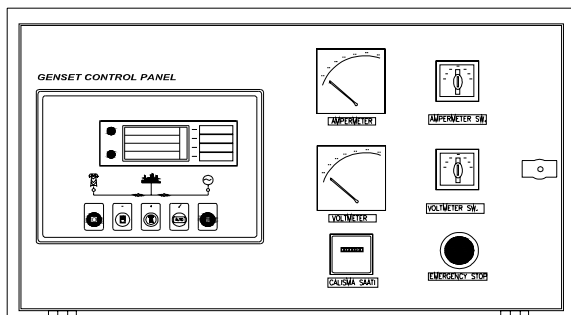
Manufacturer	NEWAGE / STAMFORD	تولید کننده
Model	HCI444F	مدل
Type	4-Poles, Rotating Field, Brushless	تیپ
Standby power at rated voltage, kVA	450	توان standby در ولتاژ نامی
Efficiency, %	%92.8	راندمان
Power factor	0.8	ضریب قدرت
Phase	3	فاز
Frequency, Hz	50	فرکانس
Speed, Rpm	1500	سرعت
Voltage, V	380/415	ولتاژ
Excitation	Self excited	سیستم تحریک
Stator windings	2/3 Pitch factor	
Regulation	AVR, Automatic Voltage Regulator	تنظیم ولتاژ
Voltage Regulator	SX440	رگولاتور ولتاژ
Voltage Regulation, %	± 1	درصد تنظیم ولتاژ
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	روتور
Overspeed, Rpm	2250	حداکثر سرعت مجاز
Short circuit current	< 300%	جریان اتصال کوتاه
TIF	Less than 50	
Insultion class	H	کلاس عایق
Construction	Single bearing, direct coupled	نحوه کوپلینگ
Coupling	Flexible	کوپلینگ
Stator winding	Double layer concentric	
Connection	WYE	اتصال
Protection class	IP23	کلاس حفاظت
Cooling air volume,m³ / sec	0.8	دبی هوای خنک کننده

### 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

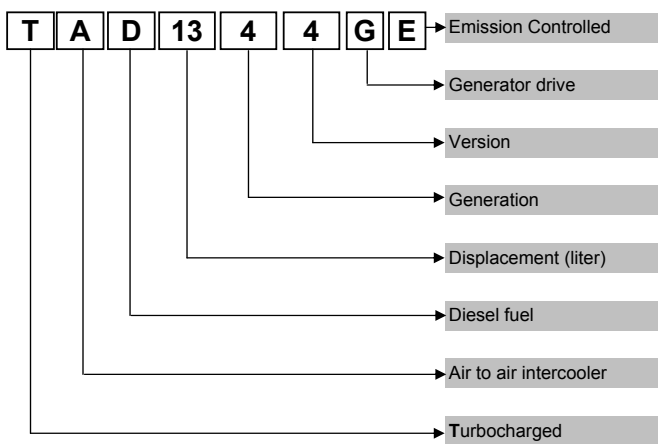
#### Shock

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

## Volvo Penta Diesel Engine



## Information

### Power Ratings

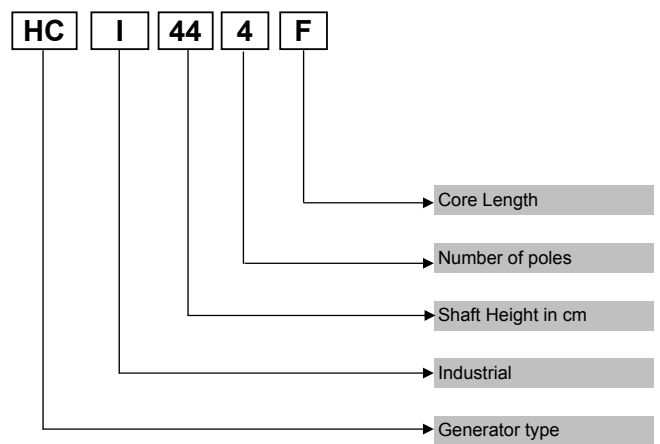
**Standby power rating** is for the supply of emergency power at variable load for the duration of the non-availability of the mains power supply. No overload capacity is available at this rating. A standby rated engine should be sized for an average load factor of 80% based on published standby rating 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

## Newage/Stamford Alternator



## Electric Formulas

Values	Formula	
kWe	$kW_m \times E$	
kWe	$(U \times I \times 1.73 \times pf) / 1000$	$kVA \times pf$
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)

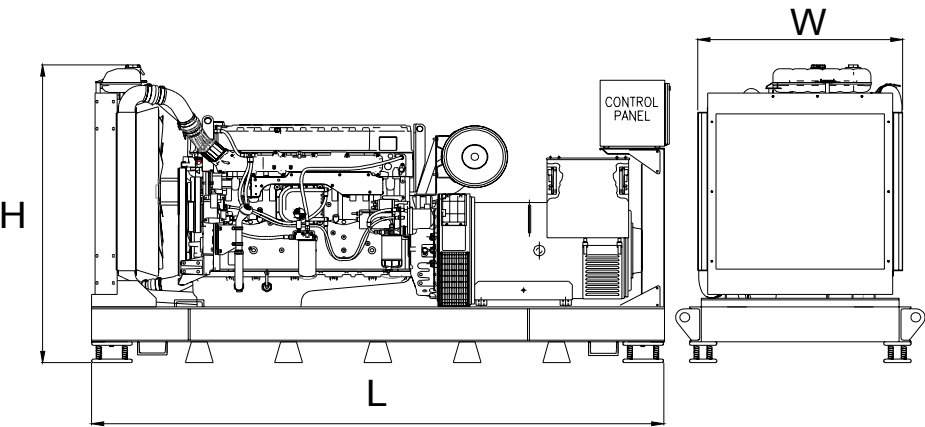
**U** : Voltage (V)

**kVA** : Power

**Rpm**: Revolutions per minute

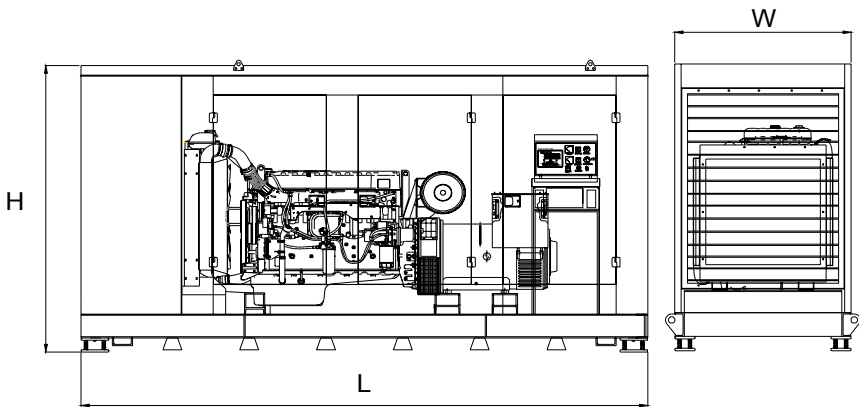
General Dimensions

Standard Generator



Length, L	3,1 m
Heigth, H	1,7 m
Width, W	1,1 m
Weight, Total	3400 kg

Generator with Soundproof Canopy



Length, L	4,5 m
Heigth, H	2,5 m
Width, W	1,4 m
Weight, Total	4600 kg

Generator Room Layout

