

# CE12 SERIES DIESEL ENGINE



## RATINGS DEFINITION

The power ratings of Emergency Standby and Prime are in accordance with the standard of ISO8528. Fuel Stop power in accordance with the standard of ISO3046.

Electric power (kW) should be estimated by considering generator efficiency, cooling fan power loss and power derating due to altitude and temperature.

**STANDBY POWER RATING** is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. A standby rated engine should be sized for a maximum of a 70% average load factor and 200 hours of operation per year, this includes less than 25 hours per year at the Standby Power rating.

**PRIME POWER RATING** is available for an unlimited of hours per year in variable load application. Variable load should not exceed a 70% average the Prime Power rating during any operating period hours., The Total operating time at 100% Prime Power shall not exceed 500 hours per year. 10% overload capability is available for a period of 1 hour within a 12 hours period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year,

**CONTINUOUS POWER RATING** is the power that the engine can continue to use under the prescribed speed and the specific environment condition in the normal maintenance period stipulated in the manufacturing plant. And continuous power applicable for supplying utility power at a constant 100% for an unlimited number of hours per year. No overload capability is available for this rating.

## GENERAL ENGINE DATA

Engine Model	CE12A	CE12B
Engine Type	Line type 6 -Cylinder, Turbo charged & intercooled (air to air)	
Prime Power ( kW/Ps )	350/476	350/476
Standby Power ( kW/Ps )	385/524	385/524
Continuous Power ( kW/Ps )	280/381	280/381
Speed	1500 rpm	1800 rpm
Bore x stroke	128 X 153 mm	
Displacement	11.81 L	
Compression ratio	17:1	
Rotation {Looking at flywheel}	Counter clockwise {CCW}	
Firing order	1-5-3-6-2-4	
Injection timing	4.5°±2.5° BTDC @ 1500 rpm	7.5°±3° BTDC@ 1800 rpm
Dry weight {W/O cooling system}	1065 kg	
Dimension {L x W x H}	1373 * 812 *1138 mm	
Flywheel housing	SAE 1 #	
Flywheel	14	
Number of teeth on flywheel	143	
Piston speed	7.6 m/s	9.2 m/s

## ENGINE MOUNTING

## INTAKE & EXHAUST SYSTEM

Engine Model	CE12A	CE12B
Max.Intake Restriction (kPa)	3.5	3.5
Max.Exhaust Back Pressure (kPa)	15	15
Combustion Air Consumption (m <sup>3</sup> /h)	1804	1710
Max.Exhaust Temp.(After Turbo°C)	590	590
Exhaust Gas Flow (m <sup>3</sup> /h)	1873	1787

## COOLING SYSTEM

### Water circulation by centrifugal pump on engine

Coolant capacity	45.7 L
Max.Permissible Temperature	105 °C
Max.Coolant warning Temperature	102 °C
Max.Coolant Shutdown Temperature	104 °C
Thermostat Open Temperature	85°C start open; 95°C full open
Max.external coolant system restriction	Cooling water pump inlet pressure > 30kpa

Two radiator options are provided, based on allowable maximum Air temperature On radiator inlet ( Air On 40 °C) Air On 50 °C

- ATB (Ambient Temperature before Boiling ) of generator set varies depending on the engine room ventilation design, even if the same radiator applied. Adequate selection of radiator options by means of the cooling test is highly recommended, and generator set makers are responsible for the selection.

**FUEL SYSTEM****High pressure common rail**

Engine Model	CE12A	CE12B
Governor	Common rail (Bosch's ECM)	
Speed drop	G2 Class (ISO 8528)	
Feed pump	Common rail	
Injection nozzle	Multi hole type	
Opening pressure	25 MPa	
Fuel filter	Full flow, Cartridge type with water drain valve	
Maximum fuel inlet restriction	65 kPa	
Maximum fuel return restriction	20 kPa	
Fuel feed pump Capacity	260 liters / hr	
Fuel	Diesel fuel	
Fuel Consumption of generator set		
Standby power- 100% load (l/h)	78	80
Prime Power - 100% load (l/h)	70	75
- 75% load (l/h)	53	56
- 50% load (l/h)	36	33
- 25% load (l/h)	19	20
Continuous power - 100% load (l/h)	53	56
Lowest Fuel Consumption Ratio(g/kW.h)	202	192

**LUBRICATION SYSTEM****Force-feed lubrication by gear pump, lubricating oil cooling water circuit of engine**

	Force-feed lubrication by gear pump, lubricating oil cooling water circuit of engine	
Lub.Method	Fully forced pressure feed type	
Oil filter	Full flow, cartridge type	
Lube oil specification	CH-4	
Lube oil pressure	Min 150 kPa	
Maximum oil temperature	120 °C	
Max.Permissible Oil Temperature	116 °C	
Oil Consumption (as % of fuel consumption)	≤0.1	
Oil capacity	38L	

**ELECTRICAL SYSTEM**

Charging Alternator Voltage	28V
Charging Alternator Capacity	70A
Voltage regulator	Built-in type IC regulator
Starting motor	7.5kW
Battery Voltage	24V
Battery Capacity	2 * 150 Ah ( recommended )
Starting aid (Option)	Block heater ( Min. Temperature for Unaided Cold Start -10°C )

**VALVE SYSTEM**

Type	Overhead valve type	
Number of valve	Intake 2, exhaust 2 per cylinder	
Valve lashes at cold	Intake 0.4 mm, Exhaust 0.65 mm	
Valve timing		
	Opening	Close
- Intake valve	10.8 deg.BTDC	29.2 deg.ABDC
- Exhaust valve	49.7 deg.BBDC	11.3 deg.ATDC

**CE12 Series diesel engine drawing**