

# YC4D155-D33

Prime power: 103kW @ 1800 r/min

Standby power: 113.3kW @ 1800 r/min



## Definitions

### Prime Power

It corresponds to the prime rated power (PRP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at the variable load for an unlimited running hours per year, with the maintenance intervals and procedures being carried out as prescribed by Yuchai, and the allowed average output power within 24 h shall not be higher than 70% of the prime power.

### Standby Power

It corresponds to the emergency standby power (ESP) of GB/T 2820 and ISO 8528, and refers to the maximum power accessible at a certain variable load series in the event of a utility power outage or under test conditions for an limited running hours up to 200 h per year, with the maintenance intervals and procedures being carried out as prescribed by Yuchai. The allowed average output power within 24 h shall not be higher than 70% of the standby power.

## Main technical parameters

Number of cylinders .....	4
Configuration .....	Vertical, in-line
Aspiration .....	Turbocharged, air-air intercooled
Combustion system .....	Direct injection
Compression ratio .....	16.7:1
Bore .....	108 mm
Stroke .....	115 mm
Displacement .....	4.21 L
Rotation .....	Counterclockwise (viewed from the flywheel end)
Firing order (viewed from the belt pulley end) .....	1-3-4-2
Dry weight (without radiator) .....	450 kg
Wet weight (without radiator) .....	480 kg

## Overall dimensions

Length (from front end of radiator to rear end of air filter) .....	1403 mm
Width .....	740 mm
Height (with radiator and mounting support) .....	1003 mm

## Centre of gravity (dry engine, with the center of the rear end face of the flywheel shell as the origin)

From the rear end face of the flywheel .....	387 mm
Height relative to the center of the crankshaft .....	140 mm

Centerline deviation relative to the crankshaft center gravity .....	-9 mm
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## Moments of rotation inertia

Engine .....	1.068 kg·m <sup>2</sup>
Flywheel .....	0.91 kg·m <sup>2</sup>

## Performance rating

Speed droop .....	≤0.5 %
Steady state speed band .....	≤0.5 %

## Test conditions

Ambient temperature .....	25 °C
Atmospheric pressure .....	100 kPa
Relative humidity .....	30 %
Max. operating intake resistance .....	≤5 kPa
Exhaust backpressure limit .....	≤10 kPa
Fuel temperature (fuel inlet pump) .....	38±2 °C

**Attention: Unless otherwise explicitly specified, all parameter data are measured under standard test condition as above. If the engine is operated under other test conditions rather than the test condition above, it shall be adjusted properly according to the actual environment. Contact the Yuchai Technical Service Department for details.**

## Matching parameters

Designation	Unit	Matching parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Gross engine power	kW	113.3	103
Net engine power	kW	108.8	98.5
Fan power consumption (belt pulley driven)	kW	2.2	2.2
Other power loss	kW	2.3	2.3
Mean effective pressure	MPa	1.78	1.62
Intake air flow	m <sup>3</sup> /min	9.5	9.3
Exhaust temperature limit (after turbocharger)	°C	580	510
Exhaust flow	m <sup>3</sup> /min	11	10.8
Boost pressure ratio		6.8	7.0
Thermal efficiency	%	38.1	36.4
Mean piston speed	m/s	6.9	6.9
Coolant flow	L/min	179	179
Cooling fan air flow	m <sup>3</sup> /min	312	312
Typical gen-set electrical output (power factor:0.8)	kW	100	90
	kVA	125	112.5
Assumed generator efficiency	%	92.2	90.6

## Energy balance parameters

**Note:** The calorific value of diesel is 42,770 kJ/kg

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	297.5	282.7
Output power (gross)	kW	113.3	103
Output power (net)	kW	108.8	98.5
Fan power consumption	kW	2.2	2.2
Other power loss	kW	2.3	2.3
Heat dissipation capacity(coolant circulation)	kW	81.7	81.4
Heat dissipation capacity(intake intercooled system)	kW	25.5	23.7
Heat dissipation of exhaust	kW	99.5	84
Heat dissipation of thermal radiation	kW	6.4	6.1

Heat dissipating capacity of Yuchai engine with D73M0-1316100 radiator at an ambient temperature of 50°C is as follows:

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	310.5	282.3
Output power (gross)	kW	111.6	101.6
Output power (net)	kW	107.1	97.1
Fan power consumption	kW	2.2	2.2
Other power loss	kW	2.3	2.3
Heat dissipation capacity(coolant circulation)	kW	78.7	74.9
Heat dissipation capacity(intake intercooled system)	kW	19.6	18.4
Heat dissipation of exhaust	kW	93.8	81.4
Heat dissipation of thermal radiation	kW	6.8	6.5

### Cooling system

Total coolant capacity.....	30L
Engine coolant capacity.....	15L
Radiator coolant capacity.....	12L
Pipeline coolant capacity.....	3L
Engine max. outlet coolant temperature.....	97°C
Thermostat operation temperature	
Initial open.....	(80±2)°C
full open.....	≤90°C
Max. coolant temperature rise:	
-Standby power.....	8°C
-Prime power.....	7°C

### Radiator

Cooling area.....	34.2m <sup>2</sup>
Radiator intercooler dry weight.....	70.5kg
Core material.....	Aluminum
Number of lines.....	/
Density of core.....	13 cooling fins/inch
Width of core.....	680 mm
Height of core.....	600 mm
Min. pressure of pressure cap.....	(50±5)kPa
Coolant resistance limit.....	15 kPa

### Intercooler

Cooling area.....	18.5 m <sup>2</sup>
Core material.....	Aluminum
Number of lines.....	/
Width of core.....	570 mm
Height of core.....	530 mm
Air resistance limit.....	12.8 kPa

### Coolant pump

Rotation speed.....	2895 r/min
Drive mode.....	Pulley driven

### Fan

Diameter.....	500 mm
Drive ratio.....	1.93:1
Material.....	Steel
Number of blades.....	6
Type.....	Blowing

### Intake system

#### Air filter

Max. intake resistance:	
-Clean air filter .....	2.5 kPa
-Dirty air filter .....	5 kPa
-Air filter type.....	Dry-type, filter cartridge of paper

#### Inclination

Transverse inclination (volume of engine oil sump: 11 L) .....	±10°
Longitudinal inclination (volume of engine oil sump: 11 L) .....	±10°

### Fuel system

Injection system.....High pressure common rail

#### Injector

Type.....	Electronically controlled, with multiple jets
Injector opening pressure.....	Electronically controlled

#### Fuel pump

Drive mode .....	Gear driven
Fuel delivery pump flow @1500 rpm .....	1.2 L/min
Max. fuel inlet temperature limit.....	45 °C
Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....	(35~100) kPa
Maximum fuel return pressure of fuel pump .....	20 kPa

#### Fuel filter

##### Pre- filter

Rated flow.....	5 L/min
Max. original resistance.....	≤ 7 kPa
Water separation efficiency at the rated flow .....	≥95 %
Filter efficiency:	
For particles of 25 μm.....	≥99 %
For particles of 10 μm.....	≥85 %

##### Fine- filter

Rated flow.....	5 L/min
Max. original resistance.....	≤7 kPa
Filtering efficiency:	
For particles of 4 μm.....	≥98.5 %
For particles of 6 μm.....	≥99 %

### Fuel consumption

**Note:** The density of diesel is 0.835 kg/L.

Load condition	1800 r/min	
	g/(kW·h)	L/h
Standby	221	30.0
Prime	231	28.5
75% prime	244	22.5
50% prime	250	15.5

### Lubricating system

Total oil capacity(dry engine) ..... 13 L  
 Total oil capacity(oil change) ..... 11 L  
 Oil sump capacity - low level/high level ..... 9/11 L  
 Max. oil temperature (in oil sump) .....120 °C  
 Operating oil temperature(in oil sump)..... (90~115) °C  
 Oil pressure(idle speed) ..... ≥100 kPa  
 Oil pressure(rated speed)..... (250~500) kPa  
 Oil-fuel consumption ratio ..... <0.2 %

### Oil filter

The filtering efficiency at the rated flow of 30 L/min and the assembly initial resistance ≤25 kPa:

For 15µm≤particles<20µm.....>75%  
 For 20µm≤particles<30µm.....>95%  
 For 30µm≤particles<40µm.....>99%  
 For particles≥40µm.....>99.9999%

### Electric system

Type.....Negative ground

### Charger

Voltage ..... 28V  
 Output current ..... 55A

### Starter

Type .....Electric start, 1  
 Voltage ..... 24V  
 Power .....5 kW  
 Number of teeth of flywheel..... 130  
 Number of teeth of starter..... 11

### Cold start (test data, for reference only)

24 V				
Battery specification×quantity:12V/120Ah×2				
Starting temperature	°C	-15	-20	-25
Starting speed	r/min	220	180	155
Starting current	A	225	275	323
Starting voltage	V	19.8	18.3	17.7
Starting time	s	2.2	2.5	3.0
Preheating time	s	25	40	50

### Auxiliary intake heater

Type..... Grating-type  
 Specification ..... 1.7 kW

### Water preheater

Recommended specification. ....2 kW/220 V  
 Engine preheater water outlet interface (thermostat) ... NPT 1/4  
 Engine preheater water inlet interface (distributor)..... M14×1.5

### Oil heater

Recommended specification. .... .90 W/220 V  
 Interface (oil sump, 1)..... M22×1.5

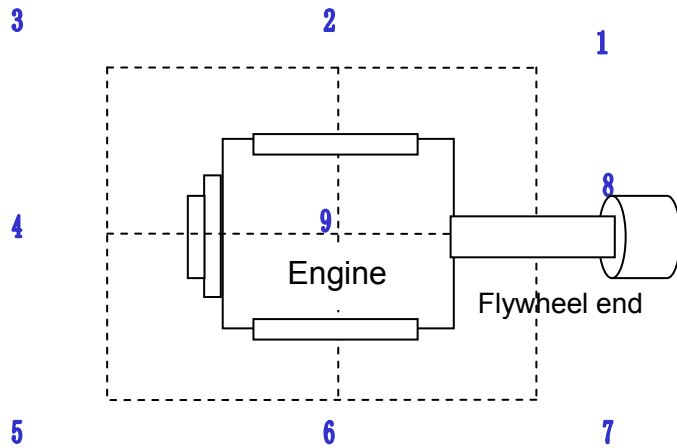
### Exhaust system

Max. exhaust backpressure..... 10 kPa  
 Inner diameter of exhaust port pipe.....Φ48 mm

### Noise

#### Noise data (103kW @ 1800 r/min)

Position	Noise, dB(A)
1	87.1
2	92.4
3	90.3
4	98
5	91.4
6	94.6
7	88.5
8	89.2
9	92.9



#### Noise spectrum (103kW @ 1800 r/min)

Frequency, Hz	Noise, dB(A)
63	48
125	57
250	73
500	77
1K	79
2K	81.5
4K	78
8K	74

