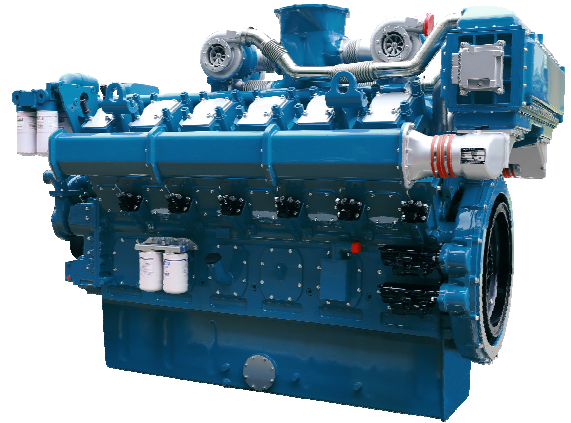


# YC12VC2170-D33

Prime power: 1450 kW @ 1200 r/min

Standby power: 1595 kW @ 1200 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 .....	12
Configuration .....	Vertical, V-type
Aspiration .....	Turbocharged, water-air intercooled
Combustion system .....	Direct injection
Compression ratio .....	13.5:1
Bore .....	200 mm
Stroke .....	210 mm
Displacement .....	79.17 L
Rotation .....	Counterclockwise (viewed from the flywheel end)
Firing order .....	B1-A6-B5-A2-B3-A4-B6-A1-B2-A5-B4-A3
Viewed from the back end: numbered starting from 1, with A for left side, and B for right side.	
Dry weight (without radiator) .....	8380 kg
Wet weight (without radiator) .....	8810 kg

## Overall dimensions

Length (from front end of radiator to rear end of intercooler) .....	3120 mm
Width .....	1735 mm
Height .....	2400 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.....1127 mm

Height relative to the center of the crankshaft.....	148 mm
Centerline deviation relative to the crankshaft center gravity .....	-31 mm

## Moments of rotation inertia

Engine .....	44.119 kg·m <sup>2</sup>
Flywheel .....	25.045 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 @ 1200 r/min	
Gross engine power	kW	1595	1450
Net engine power	kW	1538	1393
Fan power consumption (belt pulley driven)	kW	56	56
Other power loss	kW	1	1
Mean effective pressure	MPa	2.02	1.83
Intake air flow	m <sup>3</sup> /min	148.8	141.1
Exhaust temperature limit (after turbocharger)	°C	550	520
Exhaust flow	m <sup>3</sup> /min	325.1	308.4
Boost pressure ratio		2.37	2.15
Thermal efficiency	%	39.3	39.6
Mean piston speed	m/s	8.4	8.4
Coolant flow (High-temperature)	L/min	941.9	948.9
Coolant flow (Low-temperature)	L/min	753.7	752.6
Cooling fan air flow	m <sup>3</sup> /min	2520	2520
Typical gen-set electrical output (power factor:0.8)	kW	1350	1200
	kVA	1685	1500
Assumed generator efficiency	%	93%	93%

### Thermal balance parameters

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

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		60 Hz @ 1200 r/min	
Total fuel chemical energy	kW	4057	3662
Output power (gross)	kW	1595	1450
Output power (net)	kW	1538	1393
Fan power consumption	kW	56	56
Other power loss	kW	1	1
Heat dissipation capacity(High-temp coolant circulation)	kW	580	521
Heat dissipation capacity(Low-temp coolant circulation)	kW	724	640
Heat dissipation of exhaust	kW	991	895
Heat dissipation of thermal radiation	kW	167	156

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

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		60 Hz @ 1200 r/min	
Total fuel chemical energy	kW	4115	3709
Output power (gross)	kW	1595	1450
Output power (net)	kW	1538	1393
Fan power consumption	kW	56	56
Other power loss	kW	1	1
Heat dissipation capacity(High-temp coolant circulation)	kW	592	529
Heat dissipation capacity(Low-temp coolant circulation)	kW	739	657
Heat dissipation of exhaust	kW	1013	910
Heat dissipation of thermal radiation	kW	176	163

## Cooling system

Total coolant capacity.....	608 L
Engine coolant capacity (High-temp).....	160 L
Engine coolant capacity(Low-temp).....	70 L
Radiator coolant capacity (High-temp).....	133.5 L
Radiator coolant capacity (Low-temp).....	150.5 L
Pipeline coolant capacity.....	60 L
Engine max. outlet coolant temperature(High-temp).....	95℃
Engine max. inlet coolant temperature(Low-temp).....	65℃
Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....	280kPa
Thermostat operation temperature	
Initial open.....	(75±2)℃
full open.....	(85±2)℃
Max. coolant temperature rise (High-temp):	
-Standby power.....	6.9℃
-Prime power.....	6.2℃
Max. coolant temperature rise (Low-temp):	
-Standby power.....	9℃
-Prime power.....	7.6℃

## Radiator

Cooling area(high temperature).....	530m <sup>2</sup>
Cooling area(low temperature).....	900m <sup>2</sup>
Dry weight.....	1482kg
Core material.....	Cuprum
Number of lines.....	244
Density of core.....	12 cooling fins/inch
Width of core.....	2559 mm
Height of core.....	2086 mm
Min. pressure of pressure cap.....	50kPa
Coolant resistance limit.....	30 kPa

## Intercooler

Cooling area.....	73.4m <sup>2</sup>
Core material.....	aluminium
Number of lines.....	16
Density of core.....	1 of 1.2mm
Width of core.....	1200 mm
Height of core.....	260 mm
Air resistance limit.....	20 kPa

## Coolant pump

Rotation speed.....	2291 r/min
Drive mode.....	gear driven

## Fan (For reference. The engine has no fan)

Diameter.....	1700 mm
Drive ratio.....	1.26:1
Material.....	PAG
Number of blades.....	8
Type.....	Blowing

## Intake system

### Air filter

Max. intake resistance:	
-Clean air filter .....	3 kPa
-Dirty air filter .....	6 kPa
-Air filter type.....	filter cartridge of steel wire & nonwovens

## Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 310 L) .....	15°/ 15°
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## Fuel system

Injection system.....	Electronic unit pump
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### Injector

Type.....	Mechanical, with multiple jets
Injector opening pressure .....	26~27 MPa

### Fuel pump

Drive mode .....	Gear driven
Fuel delivery pump flow @1200 rpm .....	16.6L/min
Max. fuel inlet temperature limit.....	50 ℃
Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....	50 kPa
Maximum fuel return pressure of fuel pump .....	25 kPa

### Fuel filter

#### Pre- filter

Rated flow.....	40 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.....	60 L/min
Max. original resistance .....	10 kPa
Filtering efficiency:	
For particles of 10 μm.....	99.6 %
For particles of 3 μm.....	98.5 %

### Fuel consumption

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

Load condition	1200 r/min	
	g/(kW·h)	L/h
Standby	214.1	409.3
Prime	212.6	369.2
75% prime	215.9	281.2
50% prime	221.7	192.5

### Lubricating system

- Total oil capacity(dry engine) .....370 L
- Total oil capacity(oil change) .....310 L
- Oil sump capacity - low level/high level .....220/315 L
- Max. oil temperature (in oil sump) .....110 °C
- Operating oil temperature(in oil sump)..... (85~105) °C
- Oil pressure(idle speed) .....≥250 kPa
- Oil pressure(rated speed)..... (350~800) kPa
- Oil-fuel consumption ratio..... <0.3 %

### Oil filter

- The filtering efficiency at the rated flow of 833 L/min and the assembly initial resistance ≤20 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, 2
- Voltage ..... 24V
- Power ..... 11 kW
- Number of teeth of flywheel.....199
- Number of teeth of starter..... 11

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

24 V					
Battery specification × quantity: 12V/210Ah×4 Attention: the minimum CCA of battery should not be less than 1200A when applied to the cold area or plateau.					
Starting temperature	°C	-15	-20	-25	-30
Starting speed	r/min	/	/	/	/
Starting current	A	/	/	/	/
Starting voltage	V	/	/	/	/
Starting time	s	/	/	/	/
Preheating time	s	/	/	/	/

### Auxiliary intake heater

- Type...../
- Specification ...../

### Water preheater

- Recommended specification. .... 2×5kW/220 V
- Engine preheater water outlet interface..... 2×Φ20
- Engine preheater water inlet interface ..... 2×Φ20

### Oil heater

- Recommended specification. .... 800W/220 V
- Interface (oil sump, 4)..... M22×1.5

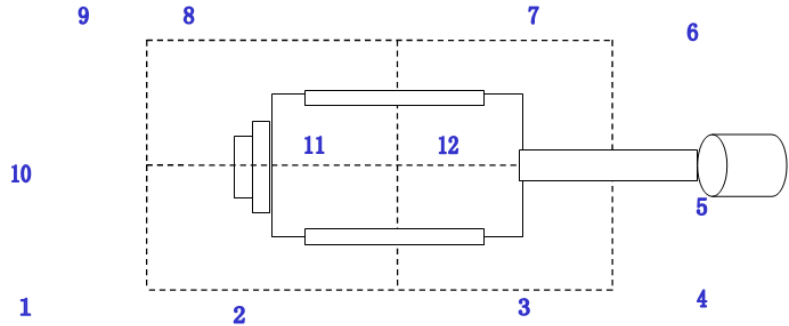
### Exhaust system

- Max. exhaust backpressure..... 10 kPa
- Inner diameter of exhaust port pipe..... Φ370 mm

### Noise

Noise data (1450 kW @ 1200 r/min)

Position	Noise, dB(A)
1	102.4
2	105.4
3	106.8
4	101.6
5	103.9
6	103.0
7	105.2
8	104.6
9	101.3
10	103.8
11	104.6
12	106.5



Noise spectrum (1450 kW @ 1200 r/min)

Frequency, Hz	Noise, dB(A)
63	58.1
125	72.5
250	83.9
500	87.7
1K	91.0
2K	89.5
4K	89.7
8K	92.2
16K	84.9

