

YC12VC2270-D31

Prime power: 1520 kW @ 1500 r/min

Standby power: 1670 kW @ 1500 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 (viewed from the belt pulley end)	left 1—right 6—left 5—right 2—left 3—right 4—left 6—right 1—left 2—right 5—left 4—right 3
Dry weight (without radiator)	8380 kg
Wet weight (without radiator)	8810 kg

Overall dimensions

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

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
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Moments of rotation inertia

Engine	44.119 kg·m ²
Flywheel	25.045 kg·m ²

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
		50 Hz @ 1500 r/min	
Gross engine power	kW	1670	1520
Net engine power	kW	1613	1463
Fan power consumption (belt pulley driven)	kW	56	56
Other power loss	kW	1	1
Mean effective pressure	MPa	1.69	1.54
Intake air flow	m ³ /min	173.87	165.17
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	372.25	352.00
Boost pressure ratio		3.26	3.04
Thermal efficiency	%	41.1	41.3
Mean piston speed	m/s	10.5	10.5
Coolant flow (High-temperature)	L/min	1050	1050
Coolant flow (Low-temperature)	L/min	900	900
Cooling fan air flow	m ³ /min	2520	2520
Typical gen-set electrical output (power factor:0.8)	kW	1500	1350
	kVA	1875	1688
Assumed generator efficiency	%	95	95

Thermal balance parameters

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

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		50 Hz @ 1500 r/min	
Total fuel chemical energy	kW	4061	3677
Output power (gross)	kW	1670	1520
Output power (net)	kW	1613	1463
Fan power consumption	kW	56	56
Other power loss	kW	1	1
Heat dissipation capacity(High-temp coolant circulation)	kW	405	385
Heat dissipation capacity(Low-temp coolant circulation)	kW	745	669
Heat dissipation of exhaust	kW	1069	942
Heat dissipation of thermal radiation	kW	172	161

Cooling system

Total coolant capacity.....	676 L
Engine coolant capacity (High-temp).....	160 L
Engine coolant capacity(Low-temp).....	70 L
Radiator coolant capacity (High-temp).....	156 L
Radiator coolant capacity (Low-temp).....	180 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.....	8℃
-Prime power.....	7℃
Max. coolant temperature rise (Low-temp):	
-Standby power.....	10.7℃
-Prime power.....	9.6℃

Radiator

Cooling area (High-temp).....	413m ²
Cooling area (Low-temp).....	693m ²
Dry weight.....	1620kg
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.....	(50±5)kPa
Coolant resistance limit.....	30 kPa

Intercooler

Cooling area.....	99.8m ²
Core material.....	aluminium
Number of lines.....	16
Density of core.....	1 of 1.2mm
Width of core.....	1200 mm
Height of core.....	360 mm
Air resistance limit.....	20 kPa

Coolant pump

Rotation speed.....	2864 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 @1500 rpm	38 L/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	1500 r/min	
	g/(kW·h)	L/h
Standby	204.7	409.5
Prime	203.6	370.6
75% prime	213.8	291.9
50% prime	223.2	203.2

Lubricating system

- Total oil capacity(dry engine)370 L
- Total oil capacity(oil change)310 L
- Oil sump capacity - low level/high level220/315 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

- TypeElectric 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×kW/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, 1)..... M22×1.5

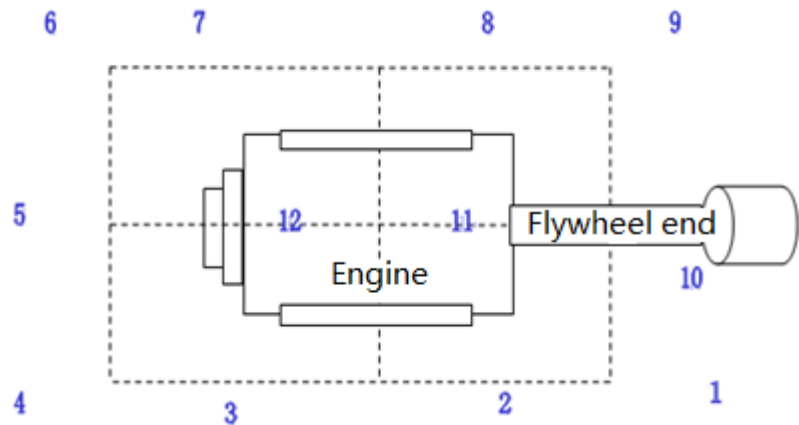
Exhaust system

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

Noise

Noise data (1520 kW @ 1500 r/min)

Position	Noise, dB(A)
1	106.8
2	101.9
3	103.4
4	103.0
5	104.3
6	104.5
7	104.8
8	105.4
9	105.8
10	112.8
11	110.2
12	108.2



Noise spectrum (1520 kW @ 1500 r/min)

Frequency, Hz	Noise, dB(A)
63	56.5
125	82.5
250	85.2
500	91.3
1K	91.5
2K	91.8
4K	90.3
8K	92.1
16K	78.2

