

YC6TD780-D32

Prime power: 520kW @ 1800 r/min

Standby power: 572 kW @ 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	6
Configuration	Vertical, in-line
Aspiration	Turbocharged, air-air intercooled
Combustion system	Direct injection
Compression ratio	14:1
Bore	152 mm
Stroke	180 mm
Displacement	19.6 L
Rotation	Counterclockwise (viewed from the flywheel end)
Firing order (viewed from the belt pulley end)	1-5-3-6-2-4
Dry weight (without radiator)	1900 kg
Wet weight (without radiator)	2000 kg

Overall dimensions

Length (from front end of radiator to rear end of air filter)	2245 mm
Width	1585 mm
Height (with radiator and mounting support)	1775mm

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	799 mm
Height relative to the center of the crankshaft	181 mm

Centerline deviation relative to the crankshaft center gravity	23 mm
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Moments of rotation inertia

Engine	6.25 kg·m ²
Flywheel	4.08 kg·m ²

Performance rating

Speed droop	≤ 1 %
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	572	520
Net engine power	kW	548	496
Fan power consumption (belt pulley driven)	kW	23	23
Other power loss	kW	1	1
Mean effective pressure	MPa	1.95	1.77
Intake air flow	m ³ /min	40.8	39.1
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	170	163
Boost pressure ratio		2.2	2.0
Thermal efficiency	%	38.5	39.6
Mean piston speed	m/s	10.8	10.8
Coolant flow	L/min	880	880
Cooling fan air flow	m ³ /min	1340	1340
Typical gen-set electrical output (power factor:0.8)	kW	500	450
	kVA	625	625
Assumed generator efficiency	%	91.2	90.7

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	1483	1348
Output power (gross)	kW	572	520
Output power (net)	kW	548	496
Fan power consumption	kW	23	23
Other power loss	kW	1	1
Heat dissipation capacity(coolant circulation)	kW	443	414
Heat dissipation capacity(intake intercooled system)	kW	146	140
Heat dissipation of exhaust	kW	226	204
Heat dissipation of thermal radiation	kW	96	70

Heat dissipating capacity of Yuchai engine with TD600-1316100radiator 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	1492	1356
Output power (gross)	kW	572	520
Output power (net)	kW	548	496
Fan power consumption	kW	23	23
Other power loss	kW	1	1
Heat dissipation capacity(coolant circulation)	kW	445	416
Heat dissipation capacity(intake intercooled system)	kW	147	142
Heat dissipation of exhaust	kW	228	206
Heat dissipation of thermal radiation	kW	100	72

Cooling system

Total coolant capacity.....	130.5 L
Engine coolant capacity.....	47 L
Radiator coolant capacity.....	76.5 L
Pipeline coolant capacity.....	7 L
Engine max. outlet coolant temperature.....	97°C
Thermostat operation temperature	
Initial open.....	(75±2)°C
full open.....	(85±2)°C
Max. coolant temperature rise:	
-Standby power.....	8.0°C
-Prime power.....	7.0°C

Radiator & Intercooler

Dry weight.....	380kg
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Radiator

Cooling area.....	230m ²
Core material.....	Aluminum
Width of core.....	1250mm
Height of core.....	1515 mm
Thickness of core.....	130 mm
Min. pressure of pressure cap.....	(50±5)kPa
Coolant resistance limit.....	25 kPa

Intercooler

Cooling area.....	110 m ²
Core material.....	Aluminum
Width of core.....	1230 mm
Height of core.....	1515 mm
Thickness of core.....	76 mm
Air resistance limit.....	12.5 kPa

Coolant pump

Rotation speed.....	3189 r/min
Drive mode.....	Pulley driven

Fan

Diameter.....	1142mm
Drive ratio.....	1:1.2
Material.....	Steel
Number of blades.....	8
Type.....	Blowing

Intake system

Air filter

Max. intake resistance:	
-Clean air filter	3.5 kPa
-Dirty air filter	5 kPa
-Warning of intake resistance	6.2 kPa
-Air filter type.....	Dry-type, filter cartridge of paper
Rated flow.....	3000m ³ /h

Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 52 L)	10°/ 10°
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Fuel system

Injection system.....	High pressure common rail
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Injector

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

Fuel pump

Drive mode	Gear driven
Fuel delivery pump flow @1,500 rpm	/
Max. fuel inlet temperature limit.....	70 °C
Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....	(15~70) kPa
Maximum fuel return pressure of fuel pump	20 kPa

Fuel filter

Pre- filter

Rated flow.....	7 L/min
Max. original resistance	12 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.....	15 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	1800 r/min	
	g/(kW·h)	L/h
Standby	218.6	149.7
Prime	218.5	136.1
75% prime	223.5	104.4
50% prime	225.4	70.2

Lubricating system

- Total oil capacity(dry engine)55 L
- Total oil capacity(oil change)50 L
- Oil sump capacity - low level/high level36.6/53 L
- Max. oil temperature (in oil sump)120 °C
- Operating oil temperature(in oil sump)..... (90~115) °C
- Oil pressure(idle speed) ≥120 kPa
- Oil pressure(rated speed)..... (250~500) kPa
- Oil-fuel consumption ratio..... <0.1 %

Oil filter

The filtering efficiency at the rated flow of 180 L/min and the assembly initial resistance ≤50 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 27A

Starter

- Type Electric start, 2
- Voltage 24V
- Power7.5kW
- Number of teeth of flywheel..... 124
- Number of teeth of starter..... 11

Cold start (test data, for reference only)

24 V					
Battery specification×quantity:12V/195Ah×4					
Starting temperature	°C	-15	-20	-25	-32
Starting speed	r/min	158	112	99	99
Starting current	A	500	655	639	850
Starting voltage	V	17.4	16.3	14.4	16.2
Starting time	s	5.7	4.3	4.4	6.1
Preheating time	s	0	40	50	60

Auxiliary intake heater

- Type..... Grating-type
- Specification3.9 kW

Water preheater

- Recommended specification.5 kW/220 V
- Engine preheater water outlet interface..... NPT 3/4
- Engine preheater water inlet interface..... **NPT 3/4**

Oil heater

- Recommended specification.300 W/220 V
- Interface (oil sump, 1)..... M22×1.5

Exhaust system

- Max. exhaust backpressure..... 10 kPa
- Inner diameter of exhaust port pipe.....Φ168 mm

Noise

Noise data (520kW @ 1800 r/min)

Position	Noise, Lp dB(A)
1	101.1
2	103.8
3	100.4
4	101.3
5	100.7
6	103.6
7	100.1
8	104.2
9	102.9

