

# List of Parameters of YC12VTD1860-D32 G-Drive Diesel Engine

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## YC12VTD1860-D32

Prime power: 1,240 kW @ 1,800 r/min

Standby power: 1,364 kW @ 1,800 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 unlimited running hours 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 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 limited running hours up to 200h, 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 prime power.

### Main technical parameters

Number of cylinders .....	12
Configuration .....	V, 90°
Aspiration .....	Turbocharged, water-air intercooled
Combustion system .....	Direct injection
Compression ratio .....	14:1
Bore .....	152 mm
Stroke .....	180 mm
Displacement .....	39.2 L
Rotation ....	Counterclockwise (viewed from the flywheel end)
Firing order: A(1)-B(2)-A(5)-B(4)-A(3)-B(1)-A(6)-B(5)-A(2)-B(3)-A(4)-B(6)	Viewed from the back end: numbered starting from 1, with A for left side, and B for right side.
Dry weight (excluding radiator) .....	4,200 kg
Wet weight (excluding radiator) .....	4,450 kg

### Overall dimensions

Length (from the fan to the flywheel housing) .....	2,200 mm
Width .....	1,700 mm
Height .....	1,950mm

### Gravity center coordinate (dry engine, with the center of the end face of the flywheel shell as the origin)

From the rear end face of the flywheel. ....	.867.1mm
Height relative to the center of the crankshaft .....	.224.5 mm
Centerline deviation relative to the crankshaft center gravity ..	-0.9mm

### Shafting rotation inertia

Engine .....	13.02 kg·m <sup>2</sup>
Flywheel .....	9.188 kg·m <sup>2</sup>

### Performance rating

Speed drop .....	≤0.3%
Speed fluctuation rate .....	≤0.5%
Speed governing type .....	Electronic control

### 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

Note: Unless otherwise specified, the data of this list of parameters are measured under these test conditions. If the engine is used under other test conditions other than those described above, proper adjustment shall be made according to the actual environment. For specific details, please contact Yuchai technical service department.

## Matching parameters

Designation	Unit	Matching parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Gross engine power	kW	1364	1240
Net engine power	kW	1289	1165
Fan power consumption (belt pulley driven)	kW	73	73
Other power loss	kW	2	2
Mean effective pressure	MPa	2.32	2.11
Intake air flow	m <sup>3</sup> /min	86.4	79.8
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m <sup>3</sup> /min	208.3	191.5
Boost pressure ratio		3.76	3.55
Thermal efficiency	%	40.3	40.7
Mean piston speed	m/s	10.8	10.8
Coolant flow (high temperature)	L/min	1500	1500
Coolant flow (low temperature)	L/min	1020	1020
Cooling fan air flow	m <sup>3</sup> /min	2430	2430
Typical gen-set electrical output (power factor:0.8)	kW	1200	1100
	kVA	1500	1375
Assumed generator efficiency	%	93.1	94.4

## Energy balance parameters

**Note:** The calorific value of diesel is 42,700 kJ/kg

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	3386	3048
Output power (gross)	kW	1364	1240
Output power (net)	kW	1289	1165
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	815	740
Heat dissipation capacity(intake intercooled system)	kW	310	280
Heat dissipation of exhaust	kW	805	730
Heat dissipation of thermal radiation	kW	92	58

When a TDV300-1301100-A81 radiator is used as a matching unit, the heat dissipations of Yuchai engine at an ambient temperature of 40°C are shown below: (-50°C Cooling fluid test data)

Designation	Unit	Energy balance parameters	
		Standby	Prime
		60 Hz @ 1800 r/min	
Total fuel chemical energy	kW	3437	3090
Output power (gross)	kW	1364	1240
Output power (net)	kW	1289	1165
Fan power consumption	kW	73	73
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	828	750
Heat dissipation capacity(intake intercooled system)	kW	320	288
Heat dissipation of exhaust	kW	821	744
Heat dissipation of thermal radiation	kW	104	68

## Cooling system

Total coolant capacity .....	467 L
Engine coolant capacity .....	121 L
Radiator coolant capacity .....	: 306 L
Pipeline coolant capacity .....	40 L
Max. water outlet temperature of engine (high temperature water passage).....	≤97°C
Max. outlet temperature of engine (low temperature water passage).....	≤70°C
Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....	150 kPa
Thermostat operation temperature .....	.
Initial opening temperature (75±2)°C, full opening temperature (85±2)°C	
Max. water temperature rise:	
- Standby power .....	9.5°C
- Prime power .....	8.5°C

### High temperature radiator

Cooling area .....	485 m <sup>2</sup>
Dry weight .....	860 kg
Material.....	Aluminum
Number of lines .....	/line
Density of core .....	cooling fins/inch
Width of core .....	2000 mm
Height of core .....	1800 mm
Min. pressure of pressure cover .....	(70±5) kPa
Resistance limit .....	25 kPa

### Low temperature radiator

Cooling area .....	530 m <sup>2</sup>
Material.....	Aluminum
Number of lines .....	Line
Density of core .....	cooling fins/inch
Width of core .....	2000mm
Height of core .....	1800 mm
Resistance limit .....	15 kPa

### Water pump

Rotation speed. ....	3,374 r/in
Drive mode .....	Gear drive

### Fan

Diameter.....	1,700 mm
Gear ratio .....	1:0.61
Material.....	Nylon

Number of blades .....	10
Blowing/suction .....	Blowing type

## Intake system

### Air cleaner

Max. intake resistance:	
- Clean air cleaner .....	3.5 kPa
- Dirty air cleaner .....	5 kPa
- Air cleaner type .....	Dry paper element

### Inclination

Transverse inclination/longitudinal inclination (oil sump capacity: 160 L).....	5°/5°
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## Fuel system

Injection system.....	High pressure common rail
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### Fuel injector

Type .....	Mechanical control injector, multi-hole injection
Fuel injector opening pressure .....	Electronically-controlled

### Fuel pump

Drive mode .....	Gear drive
Fuel delivery pump flow @ 1,800 rpm .....	2×4.8 L/min
Max. fuel inlet temperature limit.....	70°C

Allowed fuel inlet pressure (absolute pressure) at the front end of fuel delivery pump .....

(50~100) kPa
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Max. fuel return pressure of fuel pump.....	30 kPa
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### Fuel filter

#### Primary filter

Rated flow .....	2×15 L/min
Max. original resistance.....	15 kPa
Water separation efficiency under rated flow .....	≥95%
Filtration efficiency:	
For particles of 25 µm.....	99%
For particles of 10 µm.....	85 %

#### Secondary filter

Rated flow .....	2×15 L/min
Max. original resistance.....	10 kPa
Filtration efficiency:	
For particles of 10 µm.....	99.6%
For particles of 3 µm.....	98.5%

## Fuel consumption

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

Conditions	1800 r/min	
	g/ (kW·h)	L/h
Standby power	209.3	341.9
Prime power	207.2	307.7
75% of prime power	215.8	240.4
50% of prime power	229.1	170.1

## Lubricating system

Total oil capacity (dry engine) ..... 215 L  
 Total oil capacity (oil change) ..... 210 L  
 Oil sump capacity - low level/high level ..... 160/210 L  
 Max. oil temperature (oil sump) ..... 120°C  
 Operating oil temperature (oil sump) ..... (90~115)°C  
 Oil pressure at idle speed ..... ≥120 kPa  
 Oil pressure at rated speed ..... (250~500) kPa  
 Engine oil-fuel consumption ratio ..... <0.3 %

## Oil filter

The filtering efficiency at the rated flow of 44 L/min and the assembly initial resistance ≤25 kPa:

15 μm ≤ Particle size < 20 μm ..... >75%;  
 20 μm ≤ Particle size < 30 μm ..... >95 %;  
 30 μm ≤ Particle size < 40 μm ..... >99 %;  
 Particle size ≥ 40 μm ..... >99.9999%;

## Electric system

Type ..... Negative grounding

### Charging alternator 24 V

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

### Starter (24 V/12 V)

Type ..... Electric start, 2

Voltage ..... 24 V  
 Power ..... 8.5 kW  
 Number of flywheel teeth ..... 141  
 Number of starter teeth ..... 10

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

24V					
Battery specification × quantity 12 V/195 Ah×4					
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 ..... N/A  
 Specification ..... N/A

### Water preheater

Recommended specification ..... 6 kW/220 V  
 Engine preheater water outlet interface ..... 2×NPT 1  
 Engine preheater water inlet interface ..... 2×Φ28

### Oil heater

Recommended specification ..... 300 W/220 V  
 Interface (oil sump, 2) ..... M22×1.5

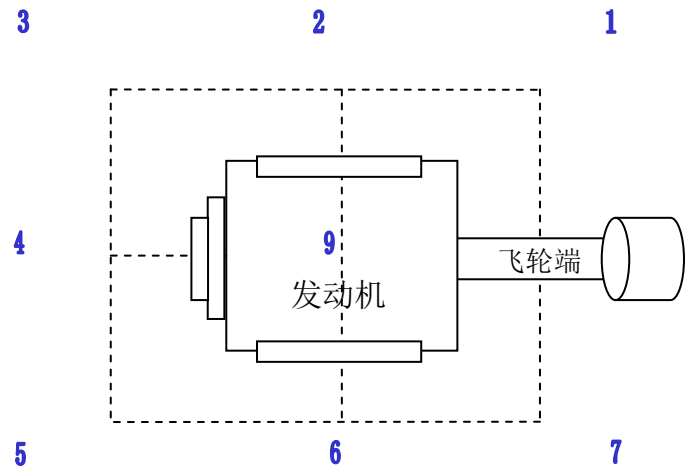
## Exhaust system

Max. exhaust backpressure ..... 10 kPa  
 Inner diameter of exhaust port ..... 250 mm

## Noise

### Noise data (1,240 kW @ 1,800 r/min)

Position	Sound pressure level Lp, dB(A)
1	/
2	/
3	/
4	/
5	/
6	/
7	/
8	/
9	/



### Noise spectrum (1,240 kW @ 1,800 r/min)

Frequency, Hz	Noise, dB(A)
63	/
125	/
250	/
500	/
1K	/
2K	/
4K	/
8K	/