

List of Parameters of YC12VTD1680-D32 G-Drive Diesel Engine

Version: 2021V01 Implementation Jul. 1, 2021

YC12VTD1680-D32

Prime power: 1,120 kW @ 1,800 r/min

Standby power: 1,230 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 ²
Flywheel	9.188 kg·m ²

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	1230	1120
Net engine power	kW	1170	1060
Fan power consumption (belt pulley driven)	kW	58	58
Other power loss	kW	2	2
Mean effective pressure	MPa	2.09	1.90
Intake air flow	m ³ /min	79.1	72.1
Exhaust temperature limit (after turbocharger)	°C	550	550
Exhaust flow	m ³ /min	189.8	173.5
Boost pressure ratio		3.61	3.32
Thermal efficiency	%	40.4	40.0
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 ³ /min	2050	2050
Typical gen-set electrical output (power factor:0.8)	kW	1100	1000
	kVA	1375	1250
Assumed generator efficiency	%	94.1	94.3

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	3042	2800
Output power (gross)	kW	1230	1120
Output power (net)	kW	1170	1060
Fan power consumption	kW	58	58
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	738	685
Heat dissipation capacity(intake intercooled system)	kW	275	256
Heat dissipation of exhaust	kW	718	671
Heat dissipation of thermal radiation	kW	81	68

When a TDV320-1301100-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	3098	2842
Output power (gross)	kW	1230	1120
Output power (net)	kW	1170	1060
Fan power consumption	kW	58	58
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	755	695
Heat dissipation capacity(intake intercooled system)	kW	283	262
Heat dissipation of exhaust	kW	735	690
Heat dissipation of thermal radiation	kW	95	75

Cooling system

Total coolant capacity	456 L
Engine coolant capacity	121 L
Radiator coolant capacity	: 295 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	420 m ²
Dry weight	690 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	420 m ²
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	8
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°
--	-------

Fuel system

Injection system.....	High pressure common rail
-----------------------	---------------------------

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

Max. fuel return pressure of fuel pump.....	30 kPa
---	--------

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	208.5	307.1
Prime power	210.8	282.7
75% of prime power	218.3	219.6
50% of prime power	233.4	156.5

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

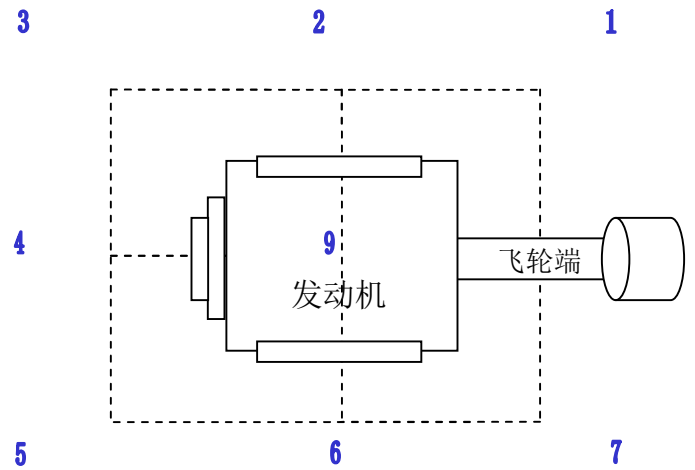
Exhaust system

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

Noise

Noise data (1,120 kW @ 1,800 r/min)

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



Noise spectrum (1,120 kW @ 1,800 r/min)

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