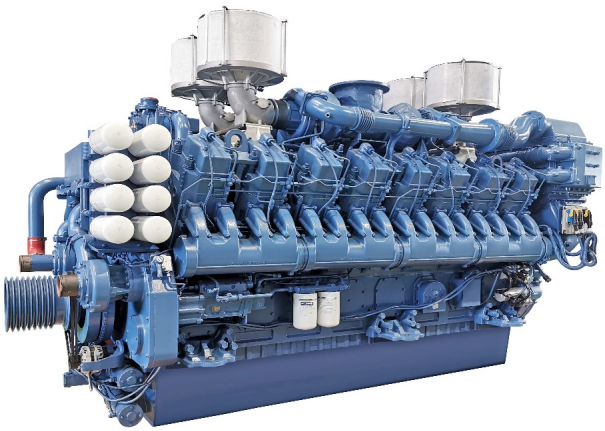
Leitner Engine Company GmbH

LTE Quality Diesel Engines

LTE16V4200

Emission Optmize Engine



Prime power: 2808KW @1500rpm

Standyby power: 3089KW@1500rpm

Nox+HC < 5,78 g/KWh

PM < 0,16 g/KWh

Formaldehyde < 60 mg/Nm^3 at 5%O_2

Main technical parameters

Number of cylinders 16

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..... . 105.56 L

Rotation.....Counterclockwise (viewed from the flywheel end)

Firing order (viewed from the belt pulley end)..... left 1—right 1-left 6—right 6-left 2—right 2-left 5—right 5-left 8—right 8-left 3-right 3-left 7-right 7-left 4-right 4

Dry weight (without radiator) ..... .12200 kg

Wet weight (without radiator) ..... . 13000 kg

Overall dimensions

Length (from front end of radiator to rear end of air filter)

.....3910 mm

Width .....1690 mm

Height (with radiator and mounting support)..... .....2450 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.....1652 mm

Height relative to the center of the crankshaft.....225 mm

Centerline deviation relative to the crankshaft center gravity

.....44 mm

Moments of rotation inertia

Engine .....44.42 kg·m^2

Flywheel .....29.36 kg·m^2

Performance rating

Speed droop .....≤1 %

Steady state speed band .....≤0.5 %

Test conditions

Ambient temperature .....25 ℃

Atmospheric pressure..... 100 kPa

Relative humidity .....35 %

Max. operating intake resistance .....≤3.7 kPa

Exhaust backpressure limit.....≤10 kPa

Fuel temperature (fuel inlet pump).....38±2 ℃

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.

Matching parameters

Designation	Unit	Matching parameters	
		Standby	Prime
		50 Hz @ 1,500 r/min	
Gross engine power	kW	3089	2808
Net engine power	kW	2931	2650
Fan power consumption (belt pulley driven)	kW	156	156
Other power loss	kW	2	2
Mean effective pressure	MPa	2.34	2.13
Intake air flow	m^3 /min	257	245
Exhaust temperature limit (after turbocharger)	℃	≤580	≤550
Exhaust flow	m^3 /min	635	608
Boost pressure ratio		4.08	3.88
Thermal efficiency	%	39.5	40.5
Mean piston speed	m/s	10.5	10.5
Coolant flow(high temperature)	L/min	1800	1800
Coolant flow(low temperature)	L/min	2000	2000
Cooling fan air flow	m^3 /min	4200	4200
Typical gen-set electrical output (power factor:0.8)	kW	2800	2500
	kVA	3500	3125
Assumed generator efficiency	%	95.5	94.3

Thermal balance parameters

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

Designation	Unit	Thermal balance parameters	
		Standby	Prime
		50 Hz @ 1,500 r/min	
Total fuel chemical energy	kW	7777	7002
Output power (gross)	kW	3089	2808
Output power (net)	kW	2931	2650
Fan power consumption	kW	156	156
Other power loss	kW	2	2
Heat dissipation capacity(coolant circulation)	kW	1000	926
Heat dissipation capacity(intake intercooled system)	kW	1050	950
Heat dissipation of exhaust	kW	2450	2150
Heat dissipation of thermal radiation	kW	180	160
Heat dissipation of fule	kW	8	8

Cooling system

Total coolant capacity.....1030 L

Engine coolant capacity.....450 L

Radiator coolant capacity.....540 L

Pipeline coolant capacity.....40 L

Engine max. outlet coolant temperature(high temperature). ≤98℃

Engine max. inlet coolant temperature(low temperature).... ≤67℃

Pressure difference between inlet and outlet of water pump (max. hydrostatic head).....135.5/332 kPa

Thermostat operation temperature

Initial open..... (75±2)℃

full open..... ＜85℃

Max. coolant temperature rise(high temperature):

-Standby power.....9.5℃

-Prime power.....8.8℃

Max. coolant temperature rise(low temperature):

-Standby power.....9.0℃

-Prime power.....8.0℃

Radiator

Cooling area(high temperature).....858m^2

Cooling area(low temperature).....929m^2

Dry weight.....2200kg

Core material.....Aluminum

Width of core.....2800 mm

Height of core.....2646 mm

Min. pressure of pressure cap..... (70±5)kPa

Coolant resistance limit.....90 kPa

Intercooler

Cooling area.....227.5 m^2

Core material.....T2,B10

Air resistance limit.....20 kPa

Coolant pump

Rotation speed.....2700 r/min

Drive mode.....gear driven

Intake system

Air filter

Max. intake resistance:

-Clean air filter ..... 2.45 kPa

-Dirty air filter ..... 6 kPa

-Air filter type.....dry-type, filter cartridge of hardware cloth

Inclination

Transverse inclination/longitudinal inclination (volume of engine oil sump: 400 L) ..... 20°/15°

Fuel system

Injection system.....High pressure common rail

Injector

Type.....Electronically controlled, with multi

Injector opening pressure.....Electronically cont

Fuel pump

Drive mode ..... Gear driven

Fuel delivery pump flow @1,500 rpm ..... 10 L/min

Max. fuel inlet temperature limit.....75 ℃

Allowed fuel inlet pressure of front end of fuel delivery pump (absolute pressure).....(35～100) kPa

Maximum fuel return pressure of fuel pump .....20 kPa

Fuel filter

Pre- filter

Rated flow.....40 L/min

Max. original resistance 15kPa

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	1,500 r/min	
	g/(kW·h)	L/h
Standby	212.1	784.6
Prime	206.3	693.8
75% prime	201.4	508.0
50% prime	205.9	346.2

Lubricating system

Total oil capacity(dry engine) .....520 L

Total oil capacity(oil change) .....460 L

Oil sump capacity .....460 L

Max. oil temperature (in oil sump) .....110 ℃

Operating oil temperature(in oil sump)..... (70~110) ℃

Oil pressure(idle speed) ..... （200-500）kPa

Oil pressure(rated speed)..... (400~700) kPa

Oil-fuel consumption ratio..... .＜0.25 %

Oil filter

The filtering efficiency at the rated flow of 200 L/min and the assembly initial resistance ≤25 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

Starter

Type ..... .Electric start, 2

Voltage 24V

Power ..... 2×11 kW

Number of teeth of flywheel.....199

Number of teeth of starter..... 11

Charger

Voltage 27V

Electric current .....55 A

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	℃	-15	-20	-25	-30
Starting speed	r/min	/	/	/	/
Starting current	A	/	/	/	/
Starting voltage	V	/	/	/	/
Starting time	s	/	/	/	/
Preheating time	s	/	/	/	/

Water preheater

Recommended specification. .....25 kW/380 V

Engine preheater water outlet interface..... . NPT1/2×2

Engine preheater water inlet interface..... . NPT1×2

Oil heater

Recommended specification. .....2.22kW/220 V

Interface (oil sump, 4)..... . M22×1.5

Exhaust system

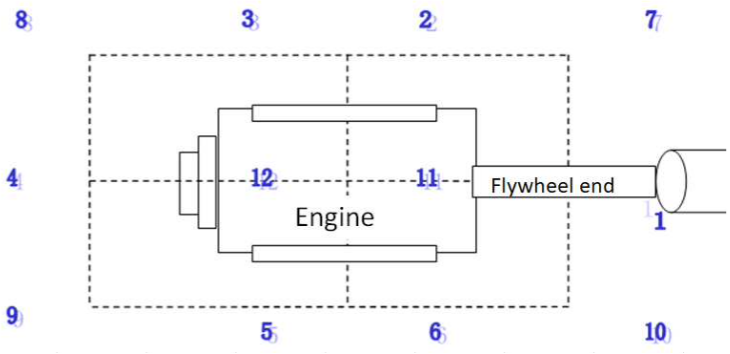
Max. exhaust backpressure.....10 kPa

Inner diameter of single exhaust port pipe.....≥Φ300 mm

Noise

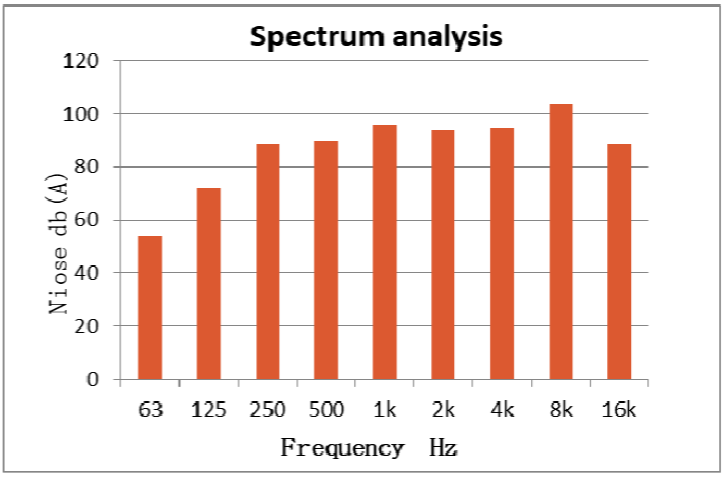
Noise data (2808 kW @ 1500 r/min)

Position	Noise, dB(A)
1	110.2
2	113.2
3	111.6
4	107.9
5	108.2
6	110.4
7	110.7
8	108.2
9	107.2
10	109.6
11	109.9
12	108.1



Noise spectrum (2808 kW @ 1500 r/min)

Frequency, Hz	Noise, dB(A)
63	53.9
125	71.9
250	88.3
500	89.2
1K	95.7
2K	94.1
4K	94.3
8K	103.7
16K	88.3



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Speed	Torque	Power	Fuel Consumption	
r/min	Nm	kW	kg/h	g/kWh
1500	19706	3095	656,60	212,10
1500	17880	2808	579,30	206,30
1500	13430	2109	424,80	201,40
1500	8948	1405	289,40	205,90
1500	4465	701	173,80	247,80
1500	1799	282	90,70	321,10

Load %	test	Before		Highest rpm	After speed stabilize		Calculation results		
		Power KW	Speed (r/min)		Power KW	Speed (r/min)	(%) Speed regulation rate	(%) Steady-state tune speed	(s) Stable time
100%-0	1	2500	1500	1592	0	1500	6,10	0,00	1,64
	2	2500	1500	1591	0	1500	6,10	0,00	1,66
	3	2500	1500	1590	0	1500	6,00	0,00	1,72
	Average	2500	1500	1591	0	1500	6,10	0,00	1,67
0-50%	1	0	1500	1408	1250	1501	-6,20	0,10	2,42
	2	0	1500	1409	1250	1501	-6,10	0,10	2,41
	3	0	1500	1408	1250	1500	-6,10	0,00	2,46
	Average	0	1500	1408	1250	1501	-6,20	0,00	2,43
50-100%	1	1250	1500	1428	2500	1500	-4,80	0,00	2,59
	2	1250	1500	1426	2500	1500	-4,90	0,00	2,66
	3	1250	1500	1429	2500	1500	-4,70	0,00	2,63
	Average	1250	1500	1428	2500	1500	-4,80	0,00	2,63