



## Diesel engine D 2840 LE20x Technical Data

page 1  
01.03.11

Engine type:	four-stroke, direct-injection			
Cylinders :	10 cylinder in V-form, wet replaceable cylinder liners			
Aspiration :	turbocharger, intercooler			
Cooling :	water circulation by centrifugal pump on engine			
Lubrication:	force-feed lubrication by gear pump, lubricating oil cooler in cooling water circuit of engine			
Injection:	Bosch in-line pump with integrated, electromagnetic actuator			
Generator:	Bosch three-phase generator with rectifier and transistorized governor, 28V, 80A			
Starter motor:	Bosch solenoid-operated starter, typ KB, 24 V, 6.6 kW			
Bore :	128 mm	Starter battery capacity	180 Ah (24V)	
Stroke :	142 mm	Engine lube oil for		
Volume :	18,27 l	- oil sump standard (min./max.)	24 / 32 l	
Compression ratio:	15,5:1	- oil sump shallow (min./max.)	22 / 30 l	
		- oil sump for automatic refilling (min./max.)		
Cooling water temp.	LE 211	LE 213	Inertia moments (SI-Unit):	
- under normal conditions	90 °C	100 °C	- engine and vibration damper	1,316 kgm <sup>2</sup>
- short period under extreme conditions	95 °C	105 °C	- flywheel for	
- before start of full load (min.)	40 °C	40 °C	generator drive 1500 rpm (1-bearing)	2,412 kgm <sup>2</sup>
			generator drive 1500 rpm (2-bearing)	4,120 kgm <sup>2</sup>
			generator drive 1800 rpm	2,412 kgm <sup>2</sup>
Filling capacities:			Steady-state speed accuracy (speed droop)	
- engine cooling water abt.	21 l		- electronical governor	0 - 8 %
- cooling water for radiator with pipe system abt.	80 l			
Negative pressure at air filter outlet, max. permissible (in a new condition/after usage)	30 / 60 hPa		Exhaust gas back pressure max. permissible	60 hPa



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 (be-optimised version)

		<b>LE211 (COP)</b>	<b>LE211 (PRP)</b>	<b>LE213 (LTP)</b>
speed	1/min	<b>1500</b>	<b>1500</b>	<b>1500</b>
ISO-Standard ICXN <sup>1</sup>	kW	350	495	
ISO net brake fuel stop rating IFN <sup>2</sup>	kW			610
Electrical output	kW <sub>e</sub>	317	452	560
<b>Genset rating net</b>	<b>kVA</b>	<b>400</b>	<b>550</b>	<b>700</b>
Mean effective pressure (ICXN)	bar	15,33	20,1	
Mean effective pressure (IFN)	bar			22,5
Torque (ICXN)	Nm	2228	3151	
Torque (IFN)	Nm			3820
Mean piston velocity	m/s	7,1	7,1	7,1
Specific fuel consumption				
100% load	g/kWh	200	205	211
75% load	g/kWh	198	200	202
50% load	g/kWh	198	201	200
Lube oil consumpt. max.	g/h	450	506	625
Air for combustion	m <sup>3</sup> /h	1530	2010	2445
Exhaust gas heat	kW	290	395	510
Exhaust gas temp. after turbocharger	°C	510	557	590
Exhaust gas mass flow	kg/h	1840	2431	2965
Exhaust gas vol. flow	m <sup>3</sup> /h		5790	7345
Jacket water heat <sup>2)</sup>	kW	140	185	235
Minimum cooling water circulation	l/min	550	650	650
Intercooler heat rate	kW	37	82	132
Intercooler heat temp. before cooler	°C	125	176	212
Residual energy (radiation, etc.)	kW	50	58	60
Cooling air requirements for	m <sup>3</sup> /h	37000	37000	37000
Power input for fan	kW	17	17	17
Noise pressure level at 1 m distance	dB(A)	104	104	104
Weight including cooling system (dry)	kg	1480	1480	1480

<sup>1)</sup> ISO standard rating ICXN: variable continuous power output, average 70% use of capacity, with 10% overload capability for technical purposes for one hour in twelve; fan output not taken into account.

<sup>2)</sup> ISO fuel stop power IFN: 100% continuous power output for limited period without overload capability; must be available for 500 h/year or (300 h/year of this without interruption).

These ratings apply at an air temperature of 298 K (25 °C), an air pressure of 100 kPa (1000 mbar) 100 m above sea level and a relative humidity of 30%.

Other site conditions may result in reduced output.

Rating definition to ISO 3046/1

application definition LTP, PRP, COP to ISO 8528-1



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		<b>LE211 (COP) 1800</b>	<b>LE211 (PRP) 1800</b>	<b>LE213 (LTP) 1800</b>
speed	1/min			
ISO-Standard ICXN <sup>1</sup>	kW	435	565	
ISO net brake fuel stop rating IFN <sup>2</sup>	kW			660
Electrical output	kW <sub>e</sub>	387	498	600
<b>Genset rating net</b>	<b>kVA</b>	<b>480</b>	<b>620</b>	<b>750</b>
Mean effective pressure (ICXN)	bar	15,87	22,7	
Mean effective pressure (IFN)	bar			24,1
Torque (ICXN)	Nm	2308	3295	
Torque (IFN)	Nm			3480
Mean piston velocity	m/s	8,52	8,52	8,52
Specific fuel consumption				
100% load	g/kWh	205	209	217
75% load	g/kWh	202	204	208
50% load	g/kWh	204	206	205
Lube oil consumpt. max.	g/h	450	580	710
Air for combustion	m <sup>3</sup> /h	2430	2620	3050
Exhaust gas heat	kW	380	495	615
Exhaust gas temp. after turbocharger	°C	490	540	570
Exhaust gas mass flow	kg/h	2590	3160	3680
Exhaust gas vol. flow	m <sup>3</sup> /h		7375	8900
Jacket water heat <sup>2)</sup>	kW	165	205	245
Minimum cooling water circulation	l/min	650	780	780
Intercooler heat rate	kW	70	118	170
Intercooler heat temp. before cooler	°C	150	185	218
Residual energy (radiation, etc.)	kW	55	60	61
Cooling air requirements for	m <sup>3</sup> /h	46500	46500	46500
Power input for fan	kW	28	28	28
Noise pressure level at 1 m distance (incl. fan)	dB(A)	106	106	106
Weight including cooling system (dry)	kg	1480	1480	1480

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