


**Important**

This Technical Data Sheet and the corresponding Installation Instructions provide important information to ensure the installed engine will operate according to the design specification in the Volvo Penta application for certification.

Requirements marked with  are considered as critical for exhaust emissions compliance according to the design specification in the Volvo Penta application for certification.

Failing to follow and meet these instructions and requirements when installing a certified engine in a piece of nonroad equipment for use in the United States violates U.S. federal law (40 CFR 1068.105(b)), subject to fines or other penalties as described in the Clean Air Act.

**General**

In-line four stroke diesel engine with direct injection. Rotation direction, counterclockwise viewed towards flywheel

Number of cylinders			6
Displacement, total	liters		10,84
	in <sup>3</sup>		661
Firing order			1-5-3-6-2-4
Bore	mm		123
	in		4,84
Stroke	mm		152
	in		5,98
Compression ratio			17,0:1
Wet weight	Engine only (Estimated) (excl after treatment comp.)	kg	1072
		lb	2363
	Power pac	kg	1351
		lb	2978

**Performance**

				rpm	1300	1800	2000	2100
IFN Power	265 kW	without fan		kW	241	265	265	265
				hp	328	360	360	360
		with fan		kW	235	250	247	243
		890 mm		hp	320	340	336	330
Torque at:	IFN Power	rpm	1260 rpm	Nm	1771	1406	1266	1205
				lbf ft	1306	1037	934	889
Max torque at engine speed	IFN Power			Nm	1785			
				lbf ft	1316			
Power tolerance				%	±2			
Mean piston speed				m/s	6,6	9,1	10,1	10,6
				ft/sec	21,6	29,9	33,2	34,9
Effective mean pressure at:	IFN Power			MPa	2,05	1,63	1,47	1,40
				psi	298	236	213	203
Max combustion pressure at:	IFN Power			MPa	15,0	13,7	12,5	12,1
				psi	2178	1981	1815	1750
Total mass moment of inertia, J (mR <sup>2</sup> ) (not including flywheel)				kgm <sup>2</sup>	1,034			
				lbft <sup>2</sup>	24,5			
Friction Power				kW	24	43	53	58
				hp	32	58	71	79

**Derating see Technical Diagrams**

**Engine brake performance (only engines with VCB)**

		rpm	1300	1800	2000	2100
Brake power:	without fan	kW	83	169	184	189
		hp	113	230	250	256
Brake torque:	without fan	Nm	610	897	879	857
		lbf ft	450	661	649	632
Engine speed range for VCB activation:		rpm	1000-2200			
Min engine speed with VCB still active:		rpm	900			
Min oil temperature for VCB activation:		°C	55			

**Cold start performance**

*Cold start limit temperature	without starting aid	°C	-15	
		°F	5	
	with manifold heater 3.5 kW	°C	-25	
		°F	-13	
	with manifold heater 3.5 kW and block heater	°C	-30	
		°F	-22	
*Specify oil and fuel quality	T>-15°C Oil VDS3 or VDS4 15W/40 T<-15°C Oil VDS3 or VDS4 5W/40			
Heater type	Make	Power kW	Engaged hours (-30°C)	Cooling water temp engine block
Self circulating	Volvo	1,2	12	-1°C 30°F

\* See also general section in the sales guide

**Lubrication system**

Lubricating oil consumption (average)		l/hr	0,02
Oil system capacity including filters		liter	37
		US gal	9,77
Oil pan capacity: (both variants)	Max	US gal	32
		liter	8,45
	Min	liter	27
		US gal	7,13
Oil change intervals/specifications	VDS3	h	500*
	VDS4	h	500*
Engine angularity limits:	front up	°	30
	front down	°	30
	side tilt	°	30
Oil pressure at rated speed	kPa	350 - 600	
	psi	51 - 87	

\* Oil change intervals vary, depending on oil grade, sulfur content of the fuel and running conditions. Oil sample analysis is recommended to determine application specific oil change interval.




**Lubrication system**

Lubrication oil temperature in sump:	max	°C	127
		°F	261
Oil filter filtration efficiency (in accordance with ISO 4548-12)	99%	μ	38
	50%	μ	14

**Fuel system**



System supply flow at max. Speed		liter/h	108
		US gal/h	28,5
Fuel supply line max. restriction (measured at fuel inlet connection)		kPa	10
		psi	1,5
Fuel supply line max. pressure, during engine stand still (measured at fuel inlet connection)		kPa	16,5
		psi	2,4
Fuel supply line min. pressure, during engine stand still (measured at fuel inlet connection)		kPa	-12,5
		psi	-1,8
System return flow at max. Speed		liter/h	30,0
		US gal/h	7,9
Fuel return line max. restriction (measured at fuel return connection)		kPa	20
		psi	2,9
Max. allowable inlet fuel temp (Measured at fuel inlet connection)		°C	60
		°F	140
Prefilter / Water separator micron size		μ	10
Fuel filter filtration efficiency	96%	μ	6
	75%	μ	4
Governor type/make, standard	Volvo/EMS2.3		
Specific UREA consumption in Nonroad Transient Cycle (NRTC)	Vol%	N/A	
Fuel to conform to	Fuel equal to or better than EN590 or ASTM D 975 (No 1-D, No 2-D) or JIS KK2204		

**Intake and exhaust system**

		rpm	1300	1800	2000	2100
Charge air consumption at: (+25°C and 100kPa)	IFN Power	m³/min cfm	17,7 625	21,0 742	22,0 778	22,7 800
 <b>See front page for important information</b>						
Max allowable air intake restriction including piping		kPa psi		5 0,7		
Heat rejection to exhaust at:	IFN Power	kW BTU/min	160 9098	207 11769	231 13141	241 13713
Exhaust gas temperature after turbine at:	IFN Power	°C °F	435 814	467 873	497 926	503 937
 <b>See front page for important information</b>						
Max allowable back pressure in exhaust line (after turbine) Pipe dimension Ø: 125 mm		kPa psi	-	-	-	15 2,2
 <b>See front page for important information</b>						
Max allowable temperature drop between turbine and SCR muffler inlet.		Δ°C Δ°F	N/A	N/A	N/A	N/A
SCR muffler pressure drop (at exhaust gas flow and exhaust temp given)		kPa psi	N/A	N/A	N/A	N/A
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	IFN Power	m³/min cfm	41,3 1460	49,6 1750	53,1 1875	54,6 1929

<b>Cooling system</b>		<b>rpm</b>	<b>1300</b>	<b>1800</b>	<b>2000</b>	<b>2100</b>
Heat rejection radiation from engine at:	IFN Power	kW	7,3	8,4	9,3	9,7
		BTU/min	413	475	531	549
Heat rejection to coolant at:	IFN Power	kW	108	155	136	156
		BTU/min	6165	8809	7723	8873
Coolant		Volvo Penta coolant "ready mix" or Volvo Penta coolant mixed with clean fresh water 40 / 60				
Radiator cooling system type		Closed circuit				
Standard radiator core area		m <sup>2</sup>	0,8			
		foot <sup>2</sup>	8,61			
Fan diameter	890 mm	mm	890			
		in	35,04			
Fan power consumption	890 mm	kW	5,9	15,0	17,6	22,3
		hp	8	20	24	30
Fan drive ratio	fan Ø890	0,9:1 ccw				
Coolant capacity:	engine	liter	17			
		US gal	4,5			
	std. 0,8m <sup>2</sup> radiator with hoses	liter	21			
		US gal	5,5			
Coolant pump		drive/ratio	belt/1,41:1 cw			
Coolant flow with standard system		l/s	5,1	7,2	8	8,4
		US gal/s	1,3	1,9	2,1	2,2
Minimum coolant flow		l/s	2,0	2,5	2,5	2,7
		US gal/s	0,5	0,7	0,7	0,7
Maximum outer circuit restriction incl. piping		kPa	55,0			
		psi	8,0			
Thermostat:	start to open	°C	82			
		°F	180			
	fully open	°C	92			
		°F	198			
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa	100			
		psi	14,5			
Minimum static pressure head (expansion tank height + pressure cap setting)		kPa	70			
		psi	10,2			
Standard pressure cap setting		kPa	75			
		psi	10,9			
Maximum top tank temperature		°C	107			
		°F	225			
Recommended Draw down capacity. The difference between min coolant level in the expansion tank and the lowest level where the engine's coolant system still are functioning		liter	2			
		US gal	0,5			

**Charge air cooler system**

		rpm	1300	1800	2000	2100
Heat rejection to charge air cooler	IFN Power	kW	44,7	47,5	48,6	50,5
		BTU/min	2541	2702	2763	2872
Charge air mass flow	IFN Power	kg/s	0,34	0,41	0,43	0,44
Charge air inlet temp. (Charge air temp after turbo compressor)	IFN Power	°C	176	165	163	165
		°F	349	328	325	328
 <b>See front page for important information</b> Max allowable Charge air outlet temp. (Charge air temp after charge air cooler)		°C	45	50	50	50
		°F	113	122	122	122
 <b>See front page for important information</b> Maximum pressure drop over charge air cooler incl. piping		kPa		12		
		psi		1,74		
Charge air pressure (Relative, after charge air cooler)		kPa	205	178	168	166
		psi	29,73	25,82	24,34	24,08
Standard charge air cooler core area		m <sup>2</sup>	0,8			
		foot <sup>2</sup>	8,61			

**Cooling performance: 0.8 m<sup>2</sup> radiator and pull 890 fixed fan standard drive ratio 0.9**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	kg/s	lb/s	Pa	psi
2100 (fix 0.9)	265	68,2	154,8	8,68	19,1	0	
	360	66,4	151,5	8,07	17,8	150	0,022
		63,7	146,7	7,33	16,2	300	0,044
		60,3	140,6	6,55	14,4	450	0,065

**Cooling performance: 0.8 m<sup>2</sup> radiator and push 890 fixed fan standard drive ratio 0.9**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	kg/s	lb/s	Pa	psi
2100 (fix 0.9)	265	69,9	157,7	9,58	21,1	0	
	360	68,5	155,3	9,06	20,0	150	0,022
		66,9	152,5	8,51	18,8	300	0,044
		64,9	148,8	7,89	17,4	450	0,065

**Cooling performance: 0,8 m<sup>2</sup> radiator and pull 890 Visco fan standard drive ratio 0.9**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power hp	Air on temp		Air flow		External restriction	
		°C	°F	kg/s	lb/s	Pa	psi
2100	265	68,3	155,0	8,43	18,6	0	
	360	66,2	151,1	7,76	17,1	150	0,022
		63,3	146,0	7,00	15,4	300	0,044
		59,5	139,1	6,18	13,6	450	0,065

**Cooling performance: m<sup>2</sup> radiator and push 890 Visco fan standard drive ratio 0.9**

Cooling air flow and maximum additional external restriction at different radiator air temperatures based on 107°C TTT and 40% coolant. Valid at 1 atm.

Engine speed rpm	Engine power kW hp	Air on temp		Air flow		External restriction	
		°C	°F	kg/s	lb/s	Pa	psi
2100	265	69,6	157,2	8,91	19,6	0	
	360	67,9	154,3	8,79	19,4	150	0,022
		65,8	150,4	8,22	18,1	300	0,044
		63,0	145,4	7,53	16,6	450	0,065

**Engine management system**

Functionality	Alternatives		Default setting
Governor mode		Isochronous	
Governor droop		0	
Governor response	Adjustable PI-constants		1
Idle speed		600-900	700
Stop function	Ignition off stop engine		
Preheating function		On/Off	
Lamp test		On/Off	

Engine sensors and switch settings		Warning Level (Yellow Lamp)		Engine protection (Red Lamp)	
Parameter	Unit	Setting range	Default setting	Level	Action. Default/Alternative
Oil temp	°C	125-130	125	130	Soft derate VE/Shutdown Powerpack
Oil pressure	Low idle	kPa	N/A	50	Shut down, ON/OFF
	Rated speed	kPa	N/A	300	Shut down, ON/OFF
Oil level					
Piston cooling pressure >1000 rpm	kPa				
Coolant temp	°C	105-107	105	107	Soft derate VE/Shutdown Powerpack
Coolant level		See cooling system	On		
Fuel feed pressure	1200rpm	kPa	100		
Water in fuel		Alarm When Closed			
Crank case pressure	kPa	N/A	Rapid Pres incr	Rapid pres incr	Shut down, ON/OFF
Air filter pressure drop			5		
Altitude, above sea	m				Automatic derating, see section derating
Charge air temp	°C	N/A	80	85	Soft derate
Charge air pressure	kPa	N/A	Demand value + 35kPa	Demand value + 40kPa	Soft derate VE/Shutdown Powerpack
Engine speed	rpm	x % of rated speed	110% of rated speed	Alarm level	Alarm only

\* Off means no shut down, alarm only

Parameter	Warning Yellow Lamp	Alarm Red Lamp	Derated 0% to engine protection map	Derated 100% to engine protection map	Forced idle after sec	Forced shut down after 2 sec
Coolant temp	105°C	107°C	107°C	108°C	N/A	N/A
Oil temp	125°C	130°C	130°C	132°C	N/A	N/A
Low oil pressure	Warning map value	Alarm map value	N/A	N/A	N/A	Alarm map value
High charge air temp	80°C	85°C	85°C	86°C	N/A	N/A
High charge air pressure	Warning map value	Alarm map value	Alarm map value	Alarm map value	N/A	N/A

**Electrical system**

Voltage and type				24V		
Alternator:	output	A		110/150		
	tacho output	Hz/alternator rev.		6		
	drive ratio			5,25		
Starter motor:	type			90P55 / (105P70 ISS för start/stop)		
	output	kW	hp	5.5 / (7.0)		
Number of teeth on:	flywheel			153		
	starter motor			11		
Inlet manifold heater (at 20 V)		kW	3.5			
Power relay for the manifold heater		A	1			
<b>Conditions:</b>		<b>Temperature</b>	<b>°C</b>	<b>25</b>	<b>0</b>	<b>-15</b>
(4 mΩ main circuit resistance@		<b>Battery</b>	<b>Ah / CCA</b>	<b>140 / 800</b>	<b>140 / 800</b>	<b>145 / 1050</b>
Crank speed		rpm	165 150 100			
Crank current		A	240 310 370			
Starter input power during crank		kW	5 6,1 6,3			
Battery power during crank		kW	5,3 6,5 6,8			
Min battery @ 0°C		Ah / CCA	140/800			

**Power take off - Front**

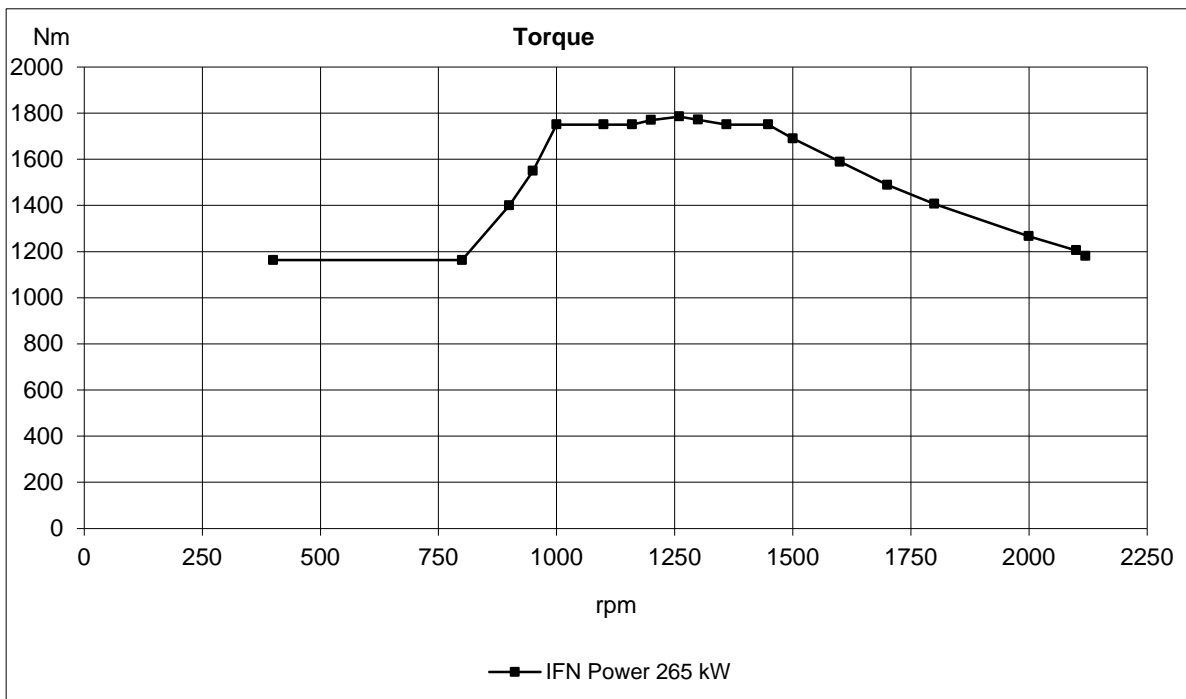
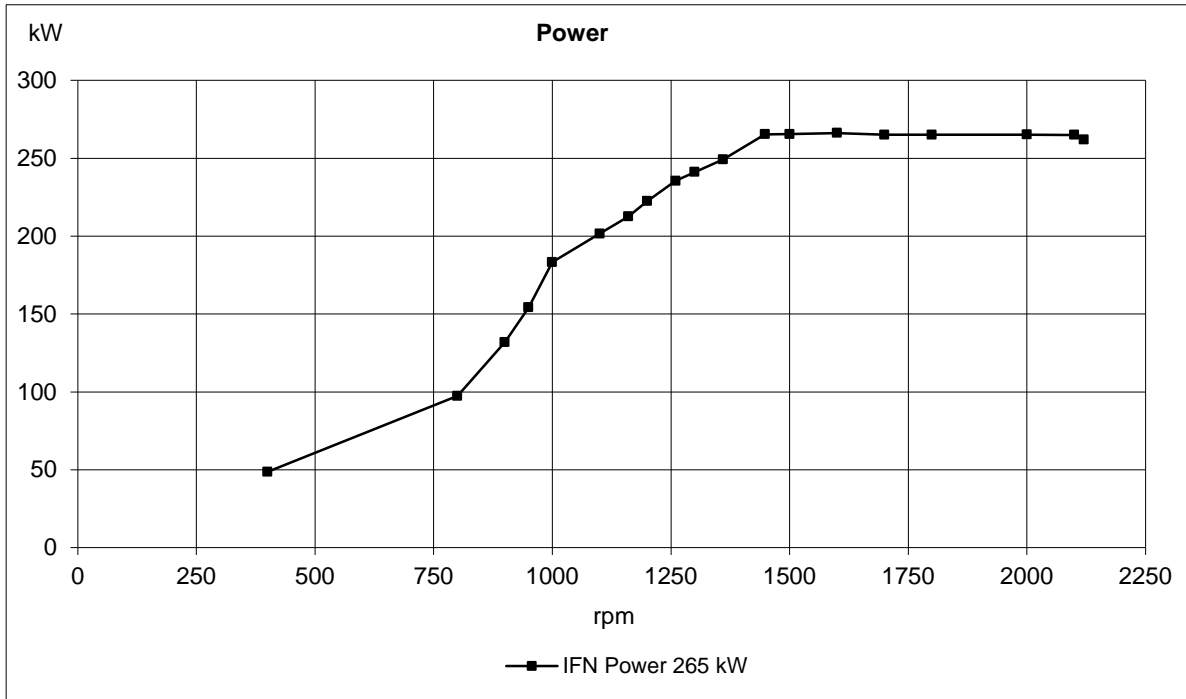
	rpm	1300	1800	2000	2100	
Front end in line with crank shaft max:*	Nm	1771	1371	1255	1205	
(with a total added mass moment of inertia, J (mR2) ≤ 0,05 kgm²)	lbf ft	1306	1011	926	889	
Front end belt pulley load. Direction of load viewed from flywheel side: (Pulley diameter 201 mm with distance 190 mm from main bearing nr 1)	max up	kW	16	22	24	25
		hp	22	30	33	34
	max side	kW	16	22	24	25
		hp	22	30	33	34
	max down	kW	33	46	51	53
		hp	45	63	69	72

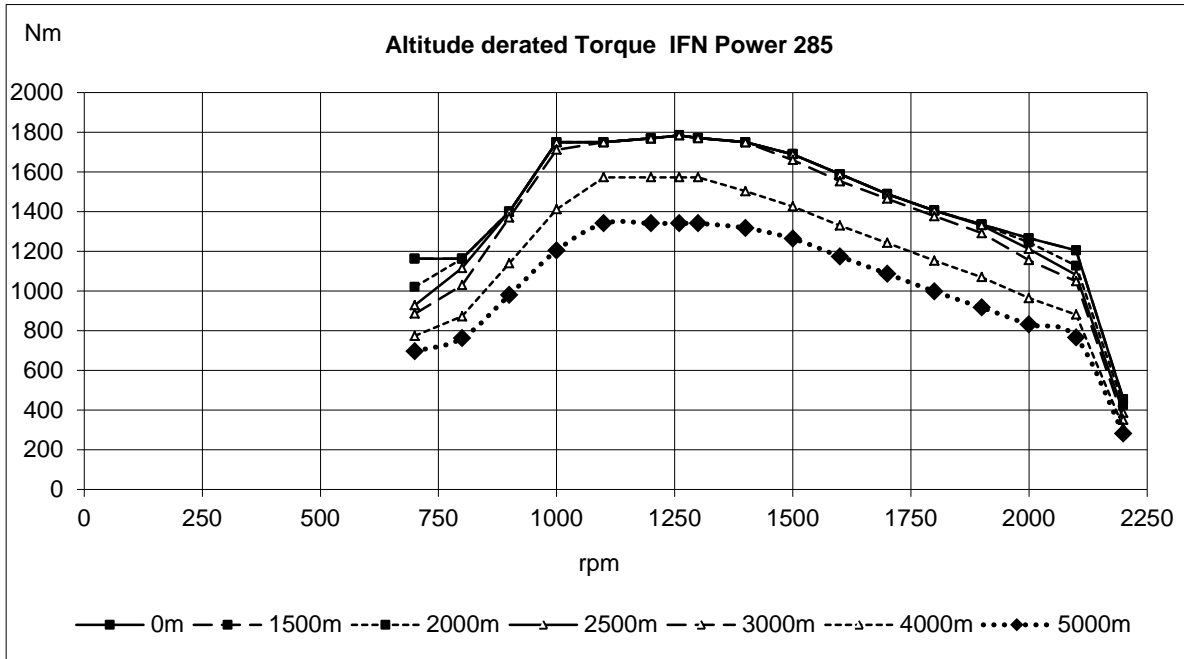
**Power take off - Rear with Flywheel housing Standard**

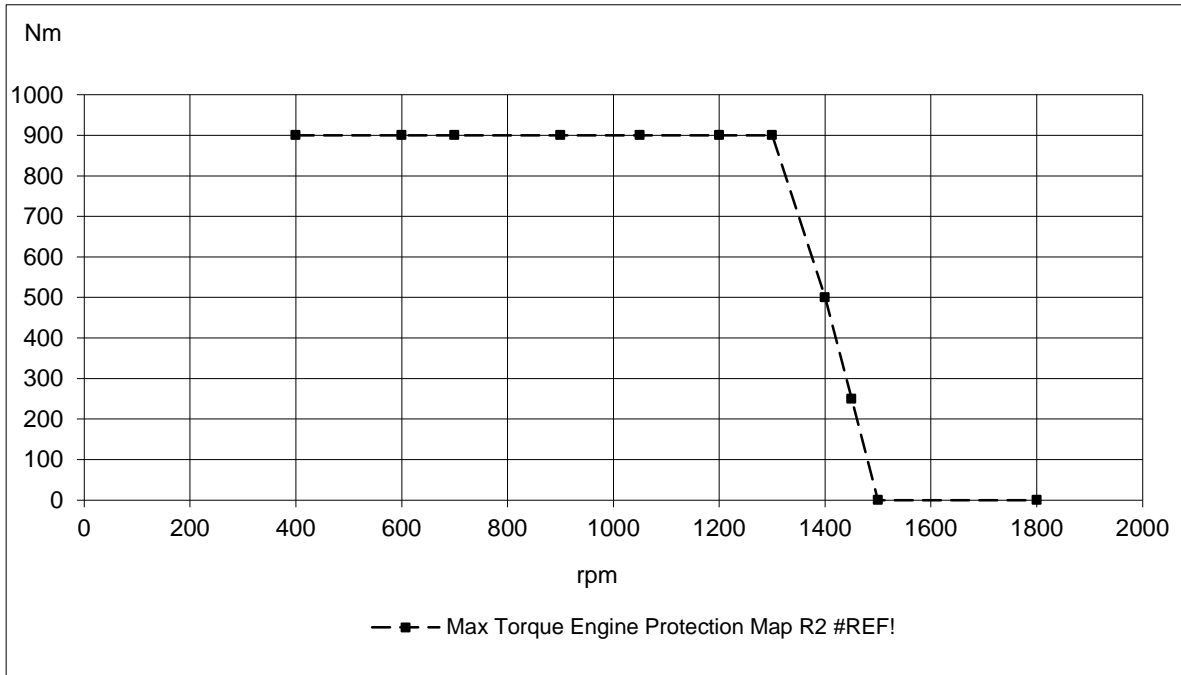
Timing gear at servo pump PTO max:*	Nm	100
	lbf ft	74
Speed ratio direction of rotation viewed from flywheel side		1,08:1/ccw
Continuous torque on timing gear at rear PTO*, SAE B spline	Nm	300
	lbf ft	221
Continuous torque on timing gear at rear PTO*, DIN 5462 spline	Nm	650
	lbf ft	479
Speed ratio direction of rotation viewed from flywheel side, all rear PTO		1,08:1/ccw
Continuous torque on timing gear at compressor PTO* SAE B spline	Nm	300
	lbf ft	221
Speed ratio direction of rotation viewed from flywheel side		1,29:1/ccw
Max allowed bending moment in flywheel housing	Nm	7000
	lbf ft	5163
Max. rear main bearing load	N	3000
	lbf	674,4

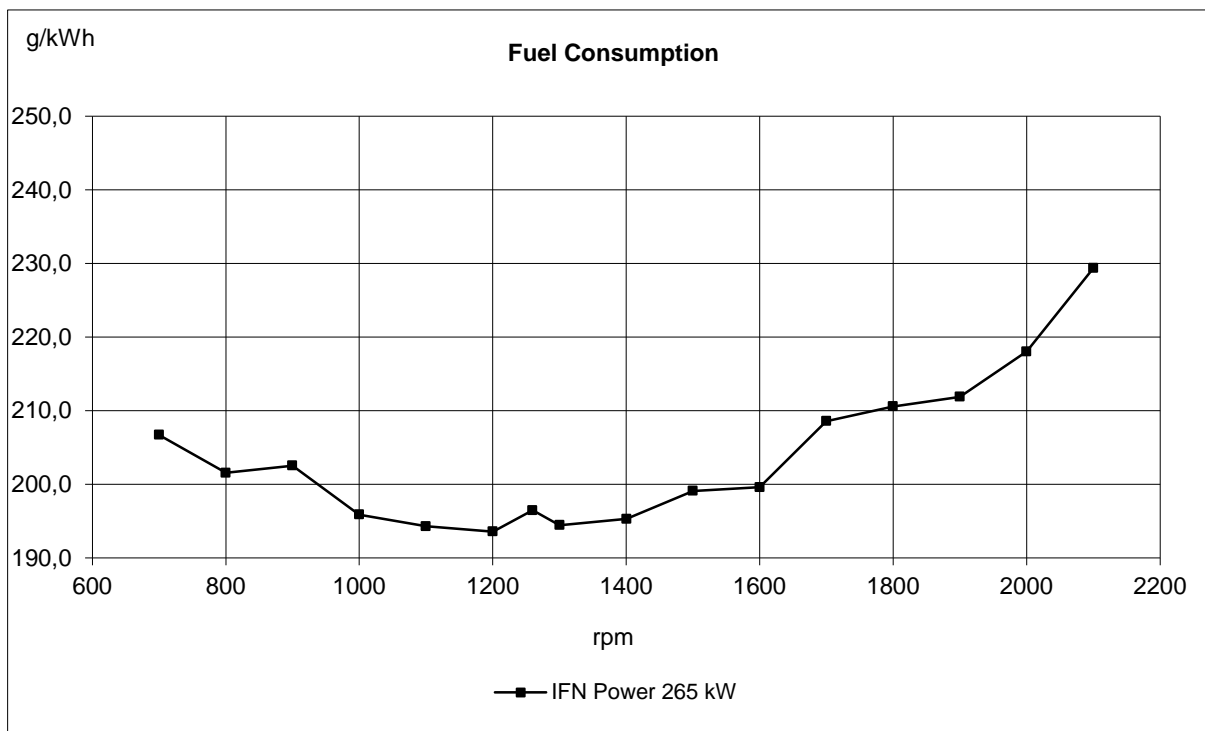
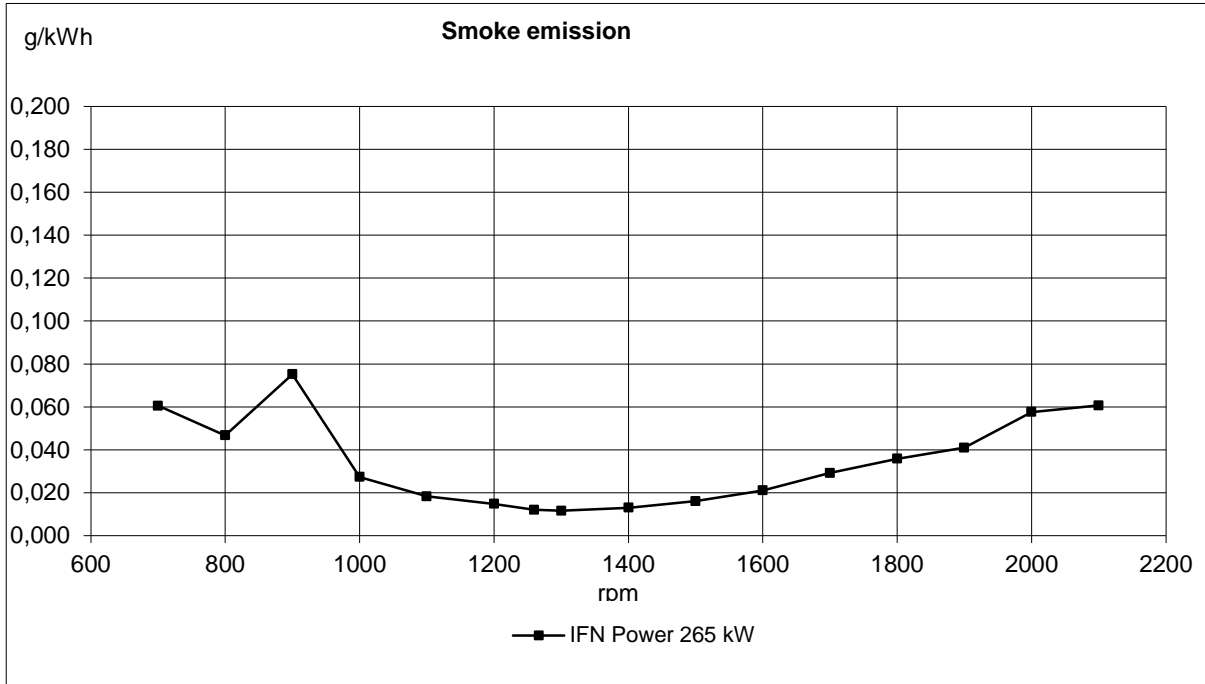
\* Maximum allowed torque at individual PTO's.

If more than one PTO output is used simultaneously, calculations needs to be performed to determine available maximum. Available torque depends on application inertia.

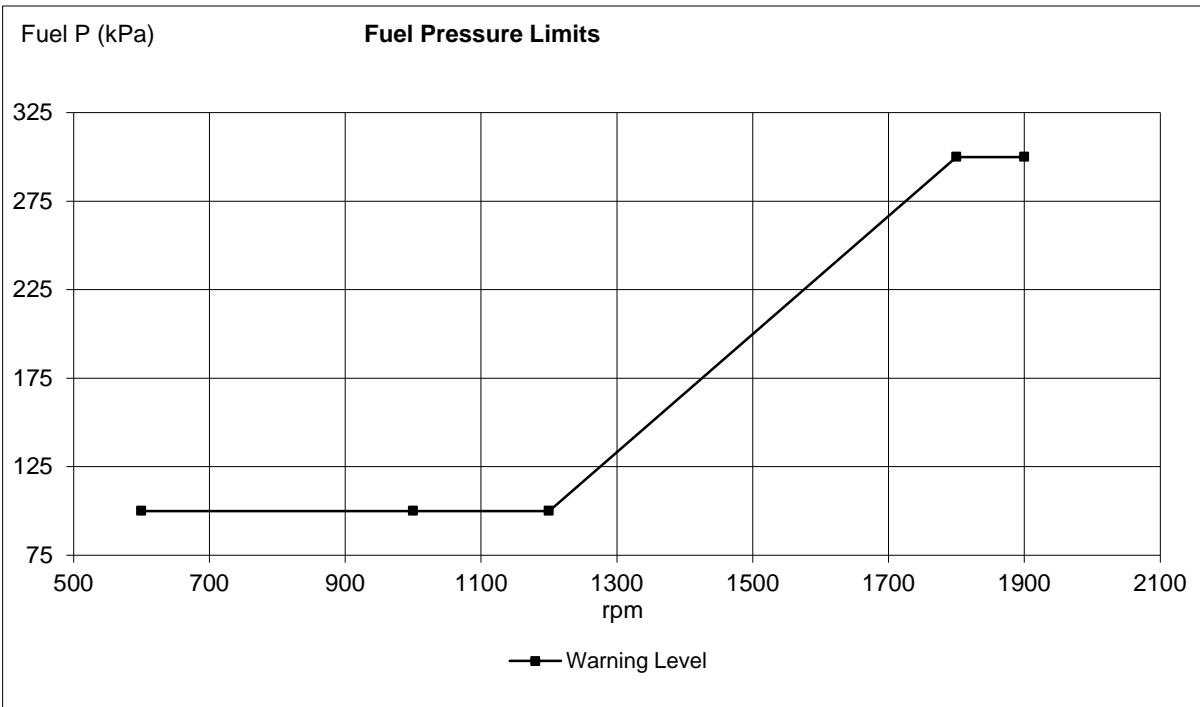
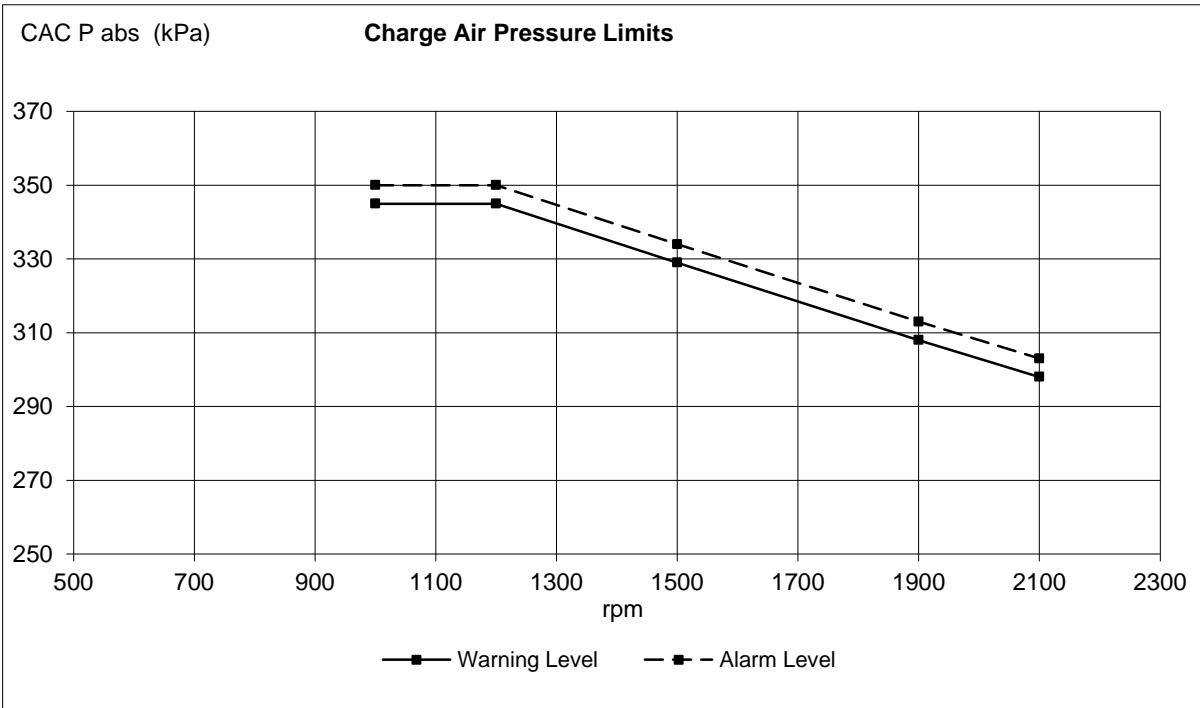




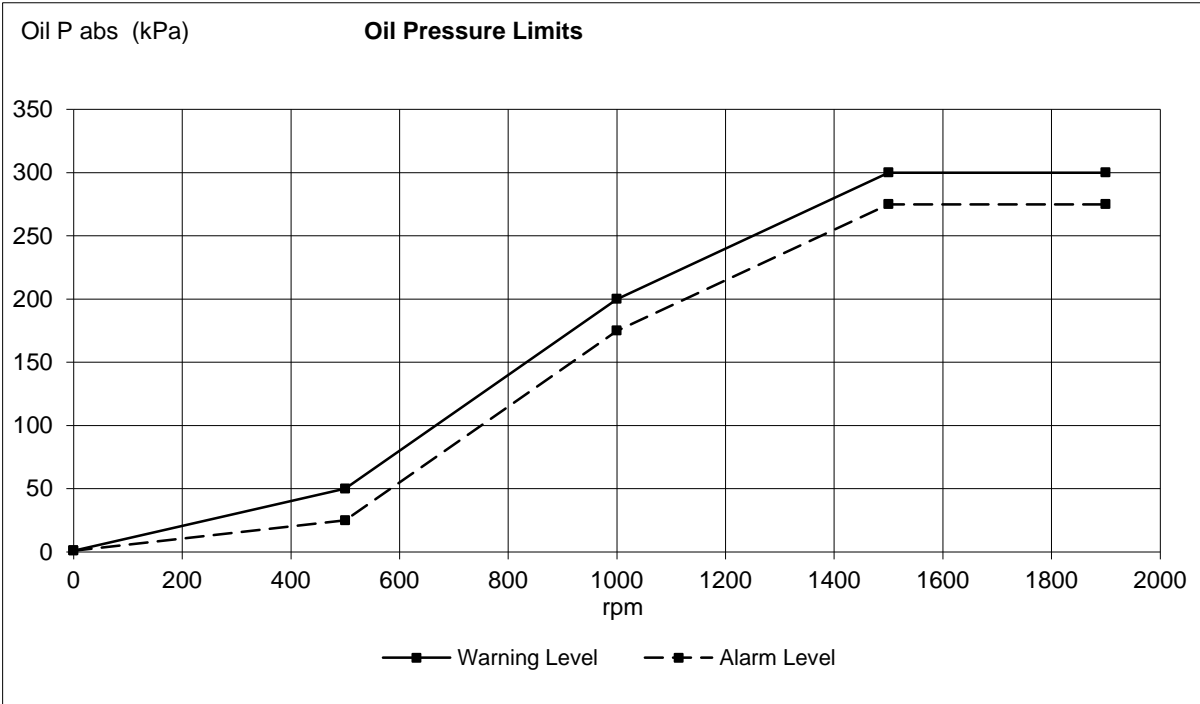


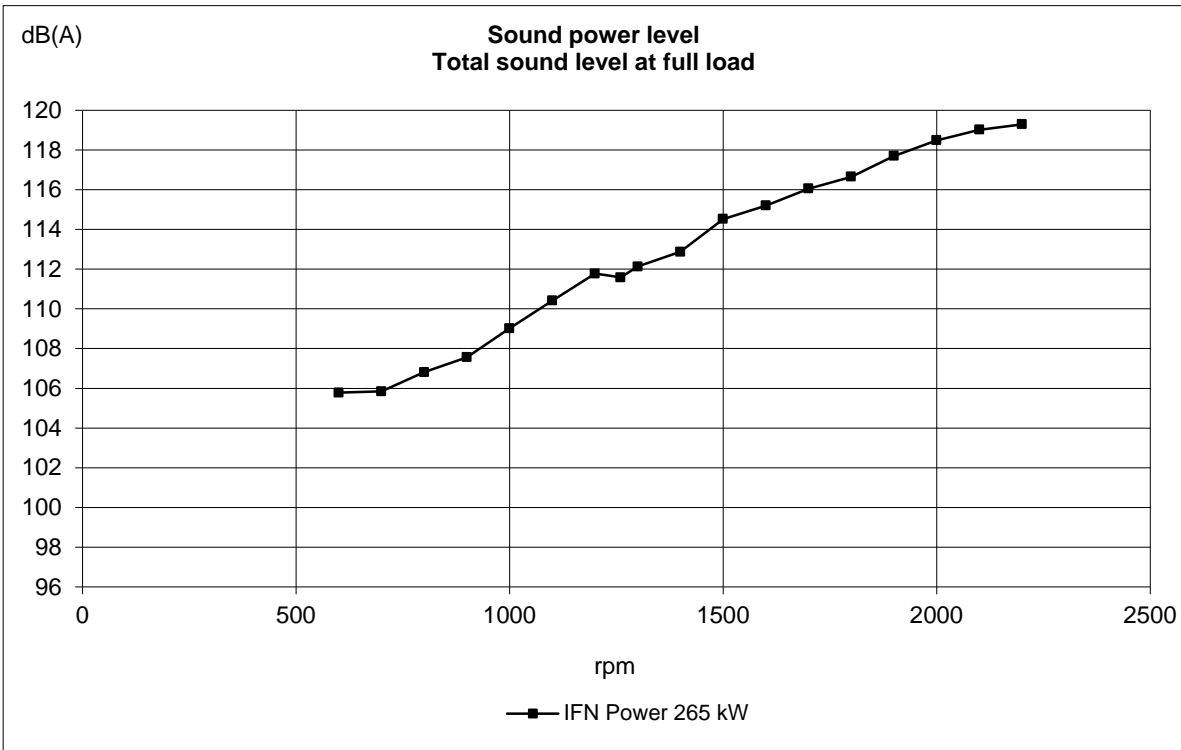
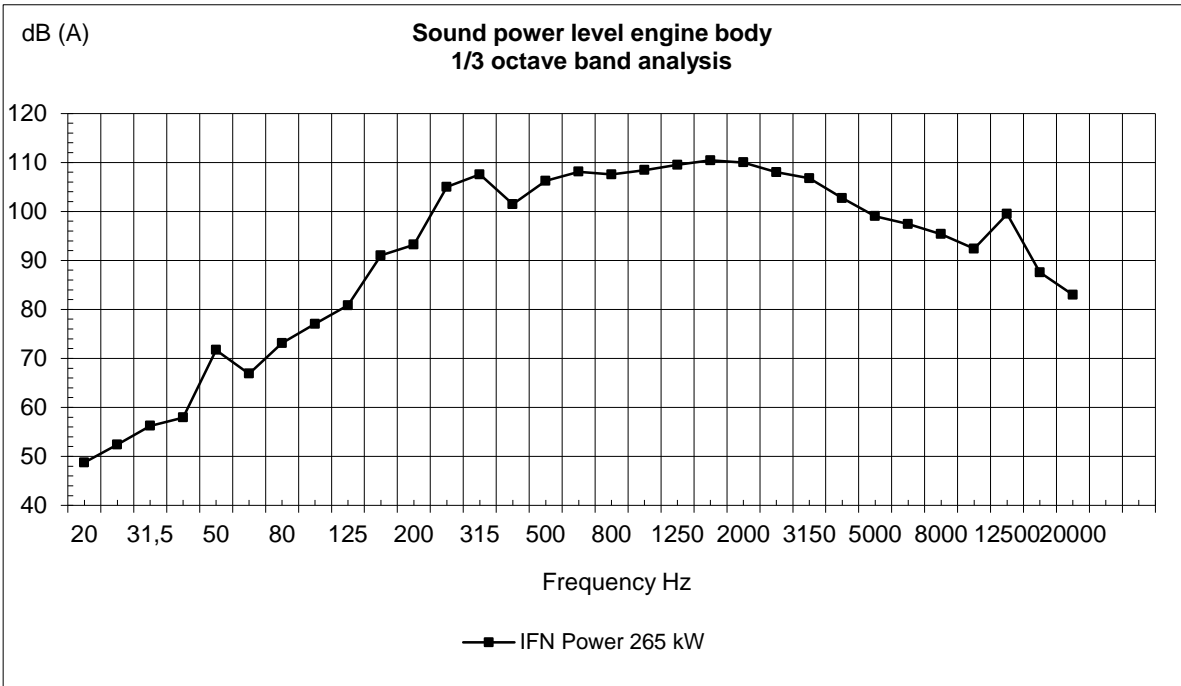


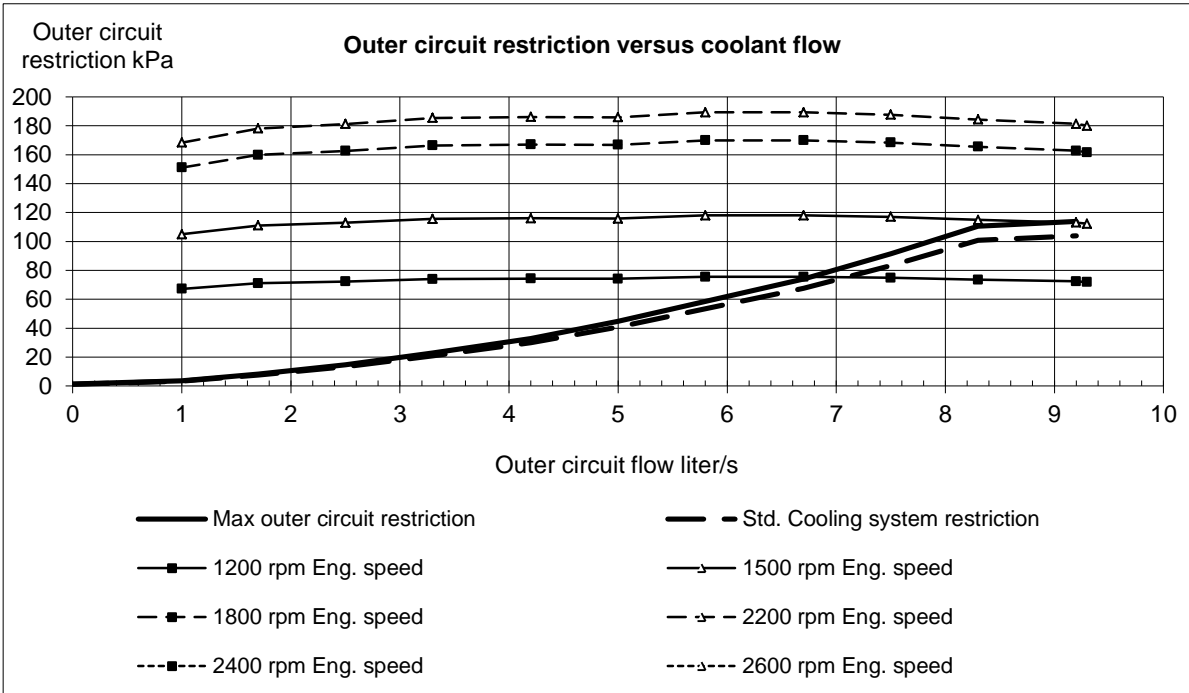
Smoke emission

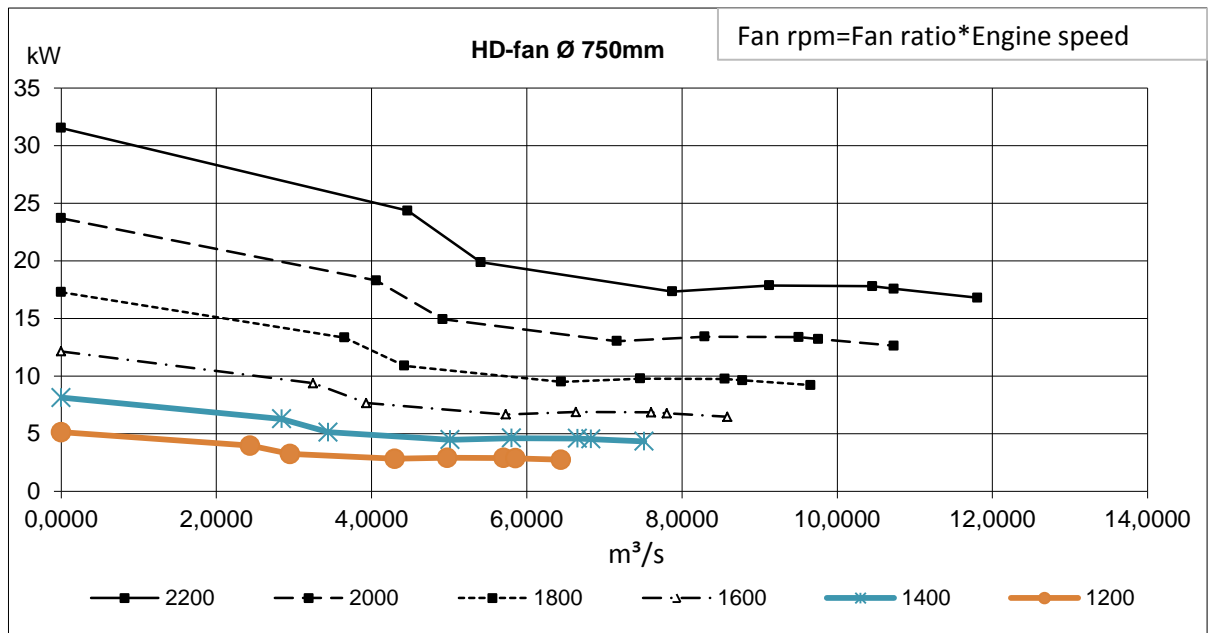
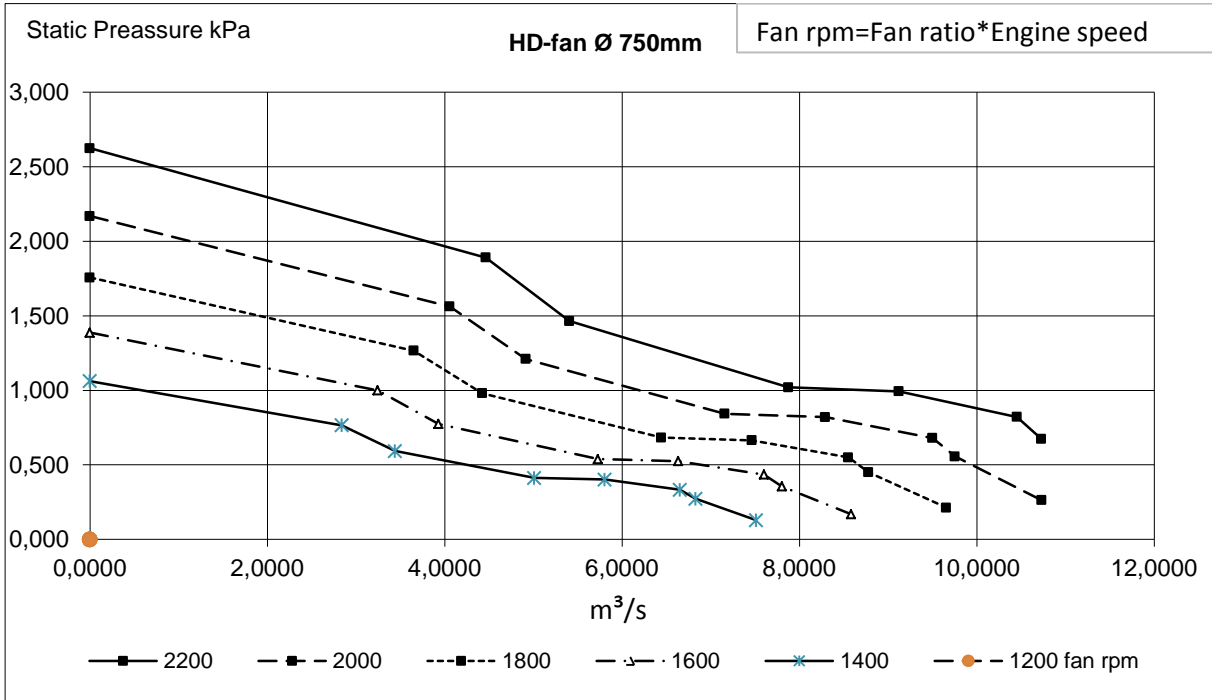


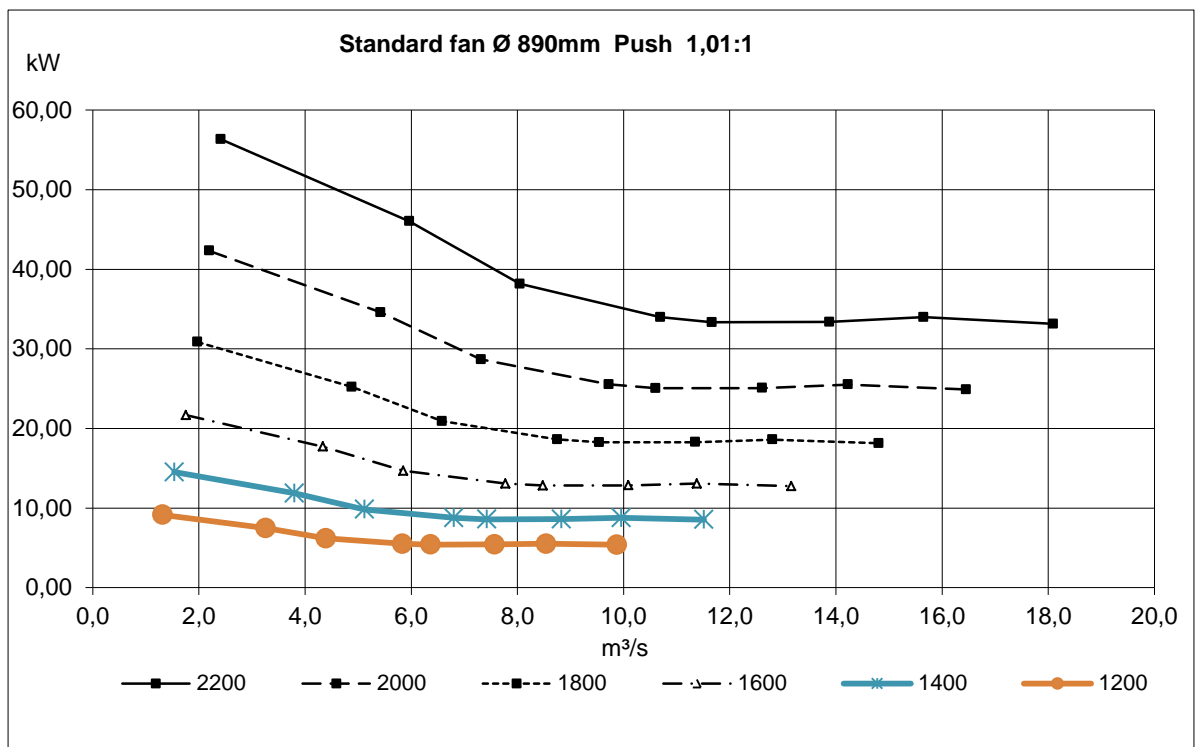
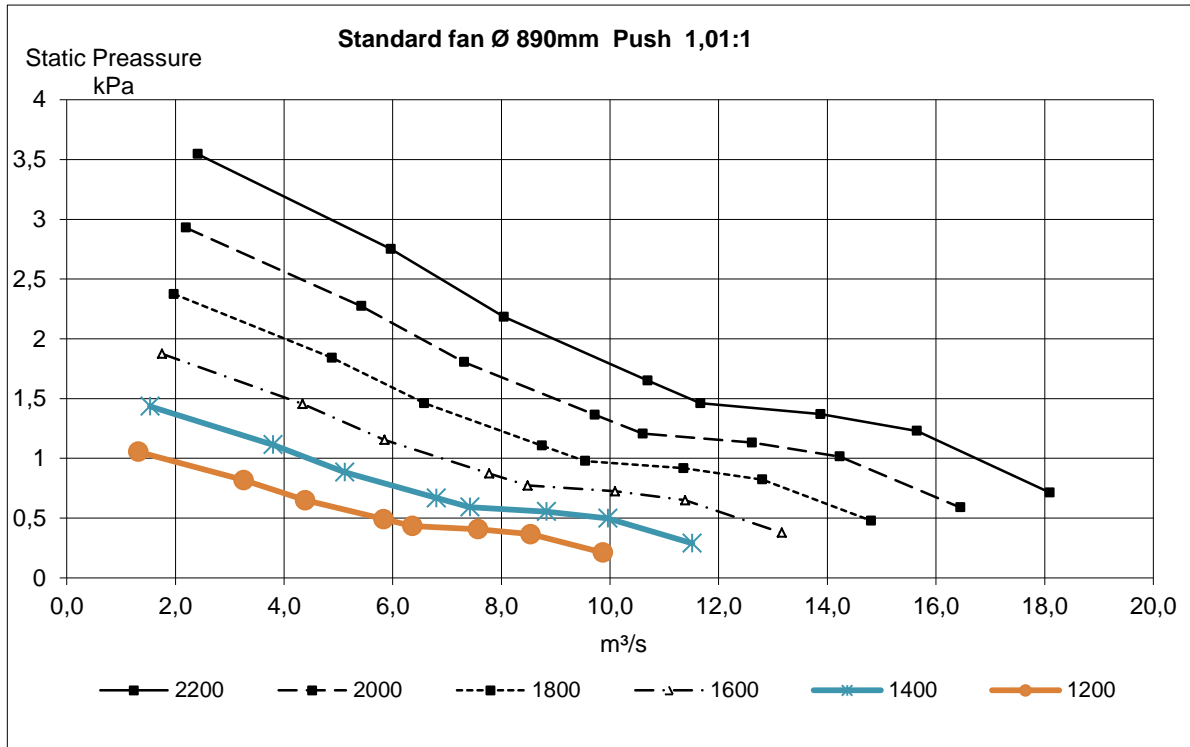
### Smoke emission



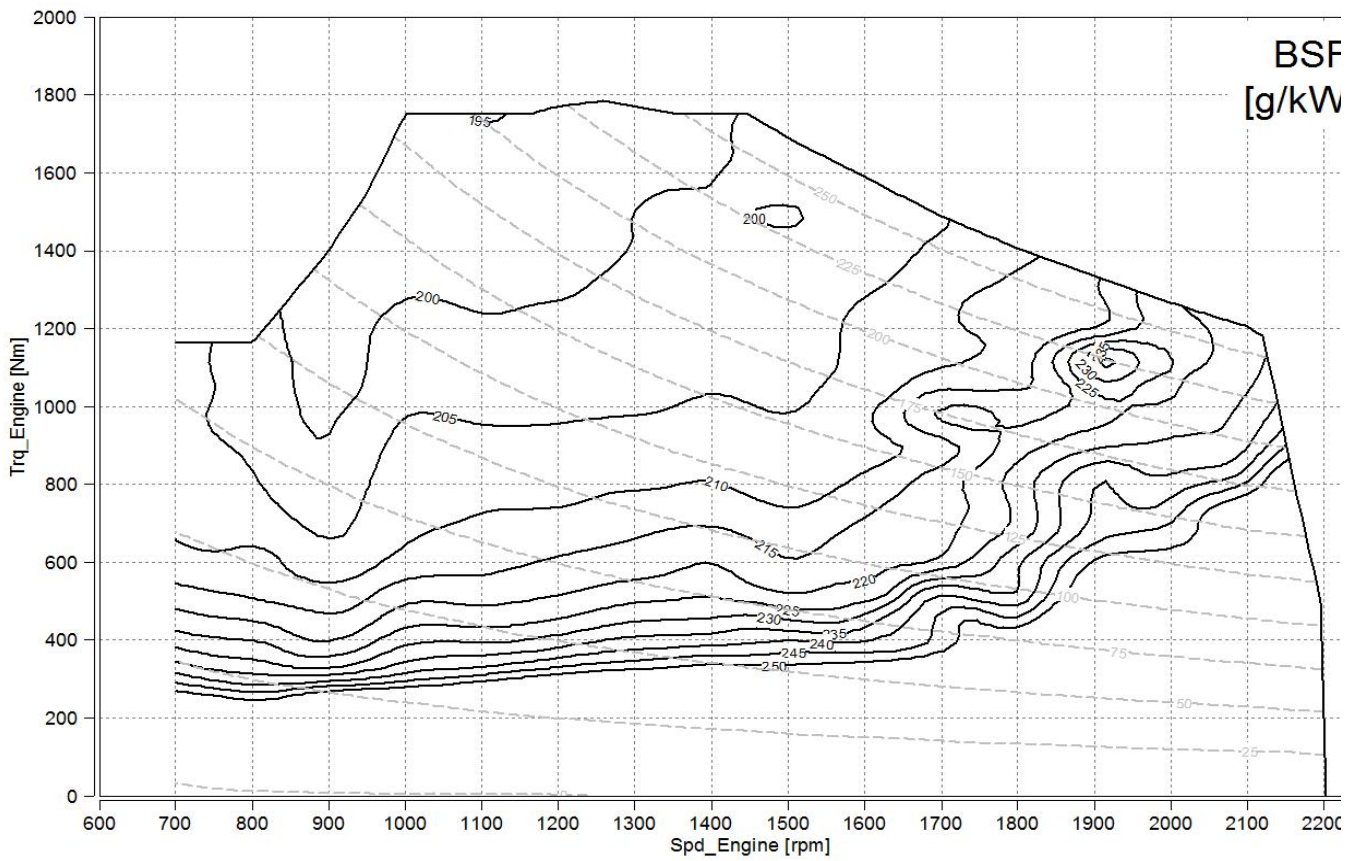








BSFC [g/kWh]



Fuel consumption [l/h]

