


**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  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	890 mm		kW	235	250	247
					hp	320	340	336
Torque at:	IFN Power				Nm	1771	1406	1266
					lbf ft	1306	1037	934
Max torque at engine speed	IFN Power	rpm	1260 rpm		Nm	1785		
					lbf ft	1316		
Power tolerance				%	±2			
Mean piston speed					m/s	6,6	9,1	10,1
					ft/sec	21,6	29,9	33,2
Effective mean pressure at:	IFN Power				MPa	2,05	1,63	1,47
					psi	298	236	213
Max combustion pressure at:	IFN Power				MPa	15	14,6	14,1
					psi	2175	2117	2045
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
					hp	32	58	71

**Derating see Technical Diagrams**

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

		rpm	1300	1800	2000	2100
Brake power:	without fan	kW hp	N/A	N/A	N/A	N/A
Brake torque:	without fan	Nm lbf ft	N/A	N/A	N/A	N/A
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)
Self circulating	Volvo	1,2	12
			Cooling water temp engine block -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 US gal	37 9,77
Oil pan capacity: (both variants)	Max	liter	32
		US gal	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 US gal/h	108 28,5
Fuel supply line max. restriction (measured at fuel inlet connection)		kPa psi	10 1,5
Fuel supply line max. pressure, during engine stand still (measured at fuel inlet connection)		kPa psi	16,5 2,4
Fuel supply line min. pressure, during engine stand still (measured at fuel inlet connection)		kPa psi	-12,5 -1,8
System return flow at max. Speed		liter/h US gal/h	30,0 7,9
Fuel return line max. restriction (measured at fuel return connection)		kPa psi	20 2,9
Max. allowable inlet fuel temp (Measured at fuel inlet connection)		°C °F	60 140
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 corresponding to EN590:1999 or ASTM D 975-No or JIS KK2204:2004		

**Intake and exhaust system**

		rpm	1300	1800	2000	2100
Charge air consumption at: (+25°C and 100kPa)	IFN Power	m³/min cfm	14,9 527	19,3 682	20,8 735	21,1 745
 <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	163 9253	197 11198	213,6 12147	230,4 13103
Exhaust gas temperature after turbine at:	IFN Power	°C °F	502 936	479 894	483 901	508 946
 <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	39,2 1384	46,5 1642	49,4 1745	51,6 1822

**Cooling system**

		rpm	1300	1800	2000	2100
Heat rejection radiation from engine at:	IFN Power	kW	9,7	9,0	9,2	10,2
		BTU/min	549	514	524	577
Heat rejection to coolant at:	IFN Power	kW	134	136	148	164
		BTU/min	7640	7757	8388	9338
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	5,7	15,2	18,3	19,2
		hp	8	21	25	26
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	5,2	7,2	8	8,4
		US gal/s	1,4	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	39,0	48,6	51,4	51,4
		BTU/min	2220	2762	2923	2921
Charge air mass flow	IFN Power	kg/s	0,29	0,38	0,4	0,41
Charge air inlet temp. (Charge air temp after turbo compressor)	IFN Power	°C	176	175	175	173
		°F	349	347	347	343
 <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	200	204	200	195
		psi	29,01	29,59	29,01	28,28
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	Engine power	Air on temp		Air flow		External restriction	
				kg/s	lb/s	Pa	psi
2100 (fix 0.9)	265	66,8	152	8,68	19,13	0	
	360	64,9	149	8,07	17,78	150	0,022
		62,1	144	7,33	16,16	300	0,044
		58,5	137	6,55	14,43	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	Engine power	Air on temp		Air flow		External restriction	
				kg/s	lb/s	Pa	psi
2100 (fix 0.9)	265	73,9	165,0	12,68	27,95	0	
	360	73,3	163,9	12,30	27,11	150	0,022
		72,6	162,7	11,91	26,25	300	0,044
		71,9	161,4	11,51	25,37	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	Engine power	Air on temp		Air flow		External restriction	
				kg/s	lb/s	Pa	psi
2100	265	65,8	150,4	8,43	18,59	0	
	360	63,4	146,1	7,76	17,10	150	0,022
		60,3	140,5	7,00	15,44	300	0,044
		56,1	132,9	6,18	13,63	450	0,065

**Cooling performance: 0,8 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	67,7	153,9	9,33	20,56	0	
	360	66,2	151,1	8,79	19,37	150	0,022
		64,4	147,9	8,22	18,12	300	0,044
		61,8	143,3	7,53	16,60	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	
Oil pressure	Low idle	kPa	N/A	50	25	Shut down, ON/OFF
	Rated speed	kPa	N/A	300	275	Shut down, ON/OFF
Oil level						
Piston cooling pressure >1000 rpm	kPa					
Coolant temp	°C	105-107	105	107	Soft derate	
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	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	

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>		
(4 mΩ main circuit resistance@ 20°C)		<b>Battery</b>		<b>Ah / CCA</b>		
				<b>25      0      -15</b>		
				<b>140 / 800    140 / 800    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		

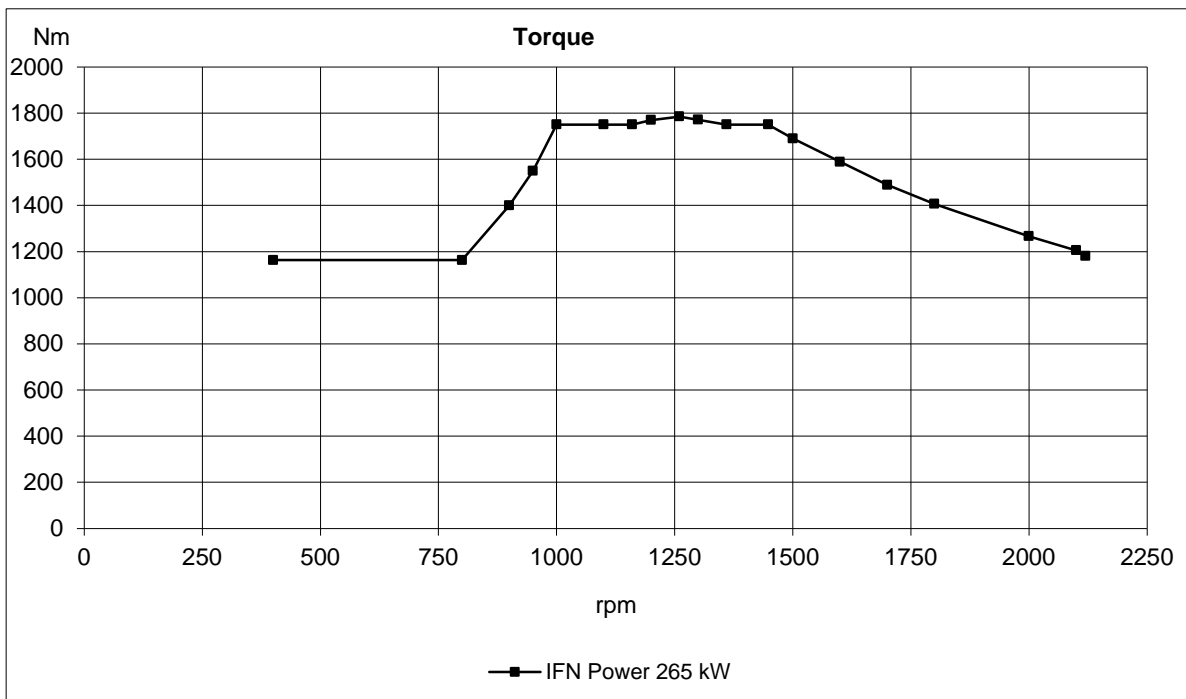
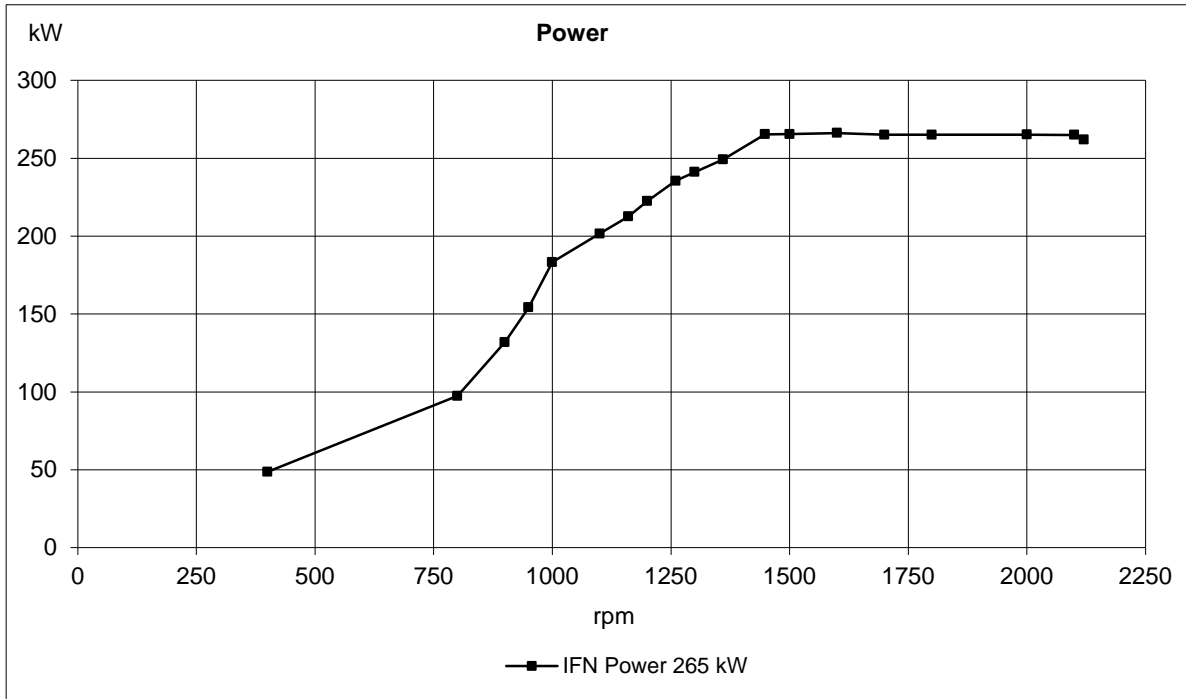
**Power take off**

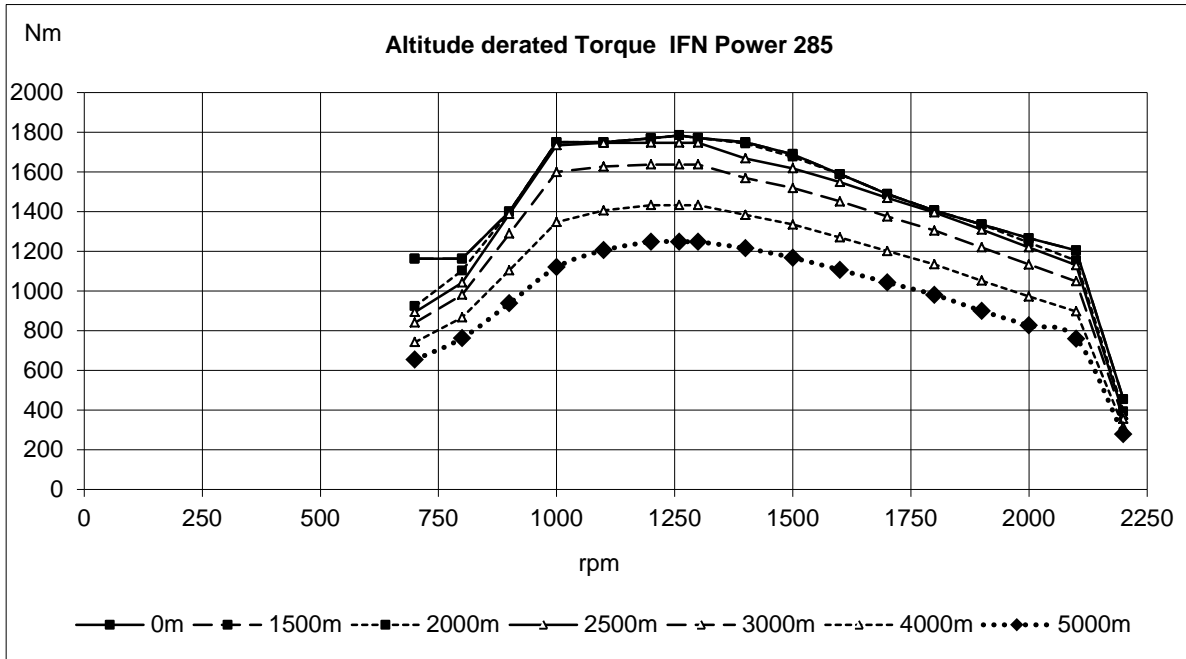
		rpm	1300	1800	2000	2100
Front end in line with crank shaft max:*		Nm	1771	1371	1255	1205
(with a total added mass moment of inertia, J (mR2)≤ 0,05 kgm²)		lbf ft	1306	1011	926	889
Front end belt pulley load. Direction of load viewed from flywheel side: (Pulley diameter 201 mm with distance 190 mm from 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
Timing gear at servo pump PTO max:*		Nm lbf ft	100 74			
Speed ratio direction of rotation viewed from flywheel side		1,08:1/ccw				
Maximum torque on timing gear at rear PTO : *		Nm lbf ft	650 479			
Speed ratio direction of rotation viewed from flywheel side		1,08:1/ccw				
Timing gear at compressor PTO max:*		Nm lbf ft	310 229			
Speed ratio direction of rotation viewed from flywheel side		1,29:1/ccw				
Max allowed bending moment in flywheel housing		Nm lbf ft	7000 5163			
Max. rear main bearing load		N lbf	3000 674,4			

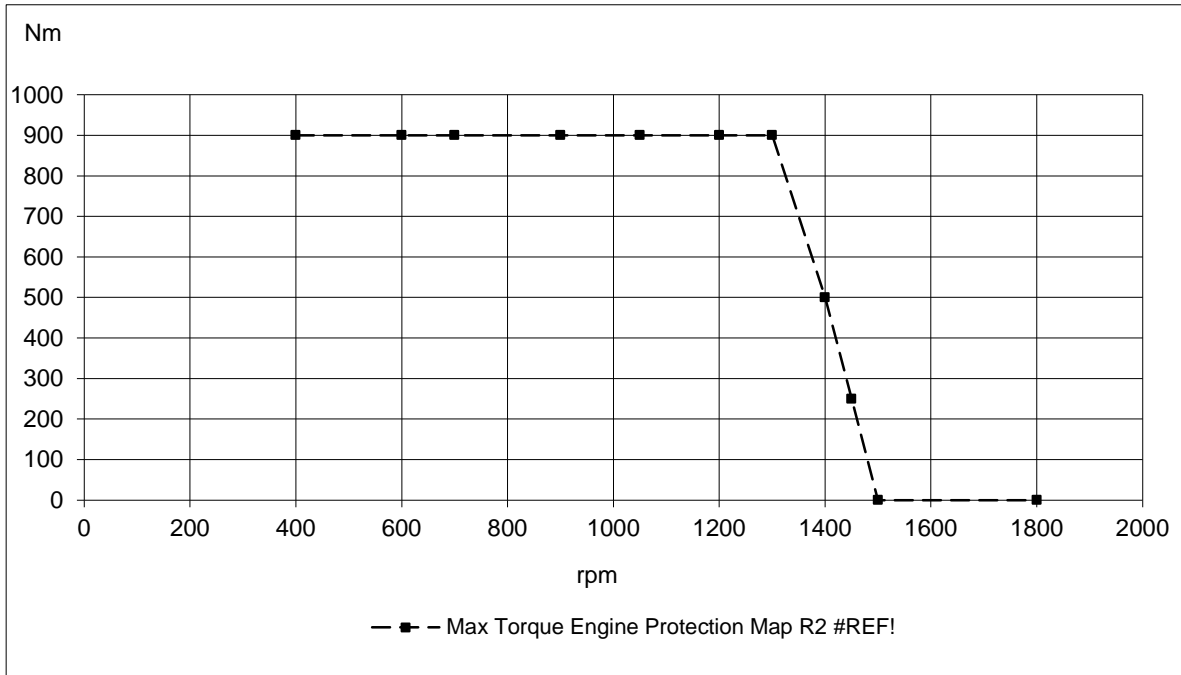
\* **Maximum allowed torque at individual PTO's.**

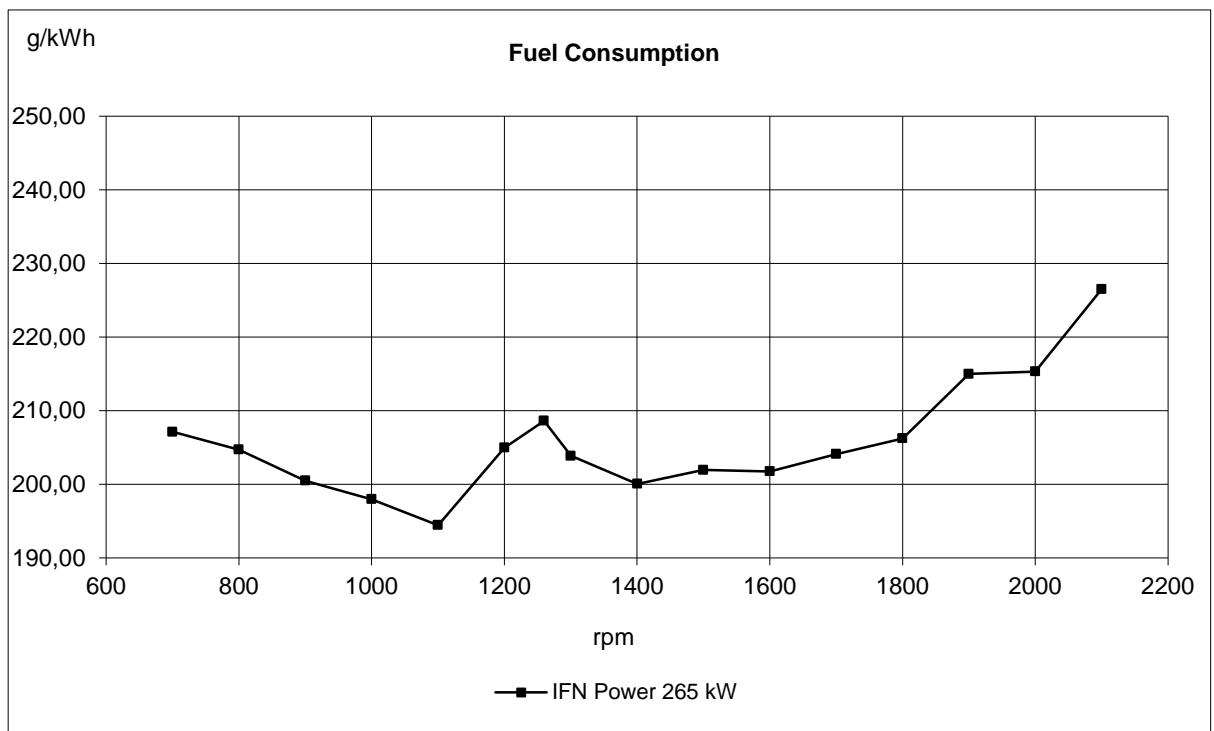
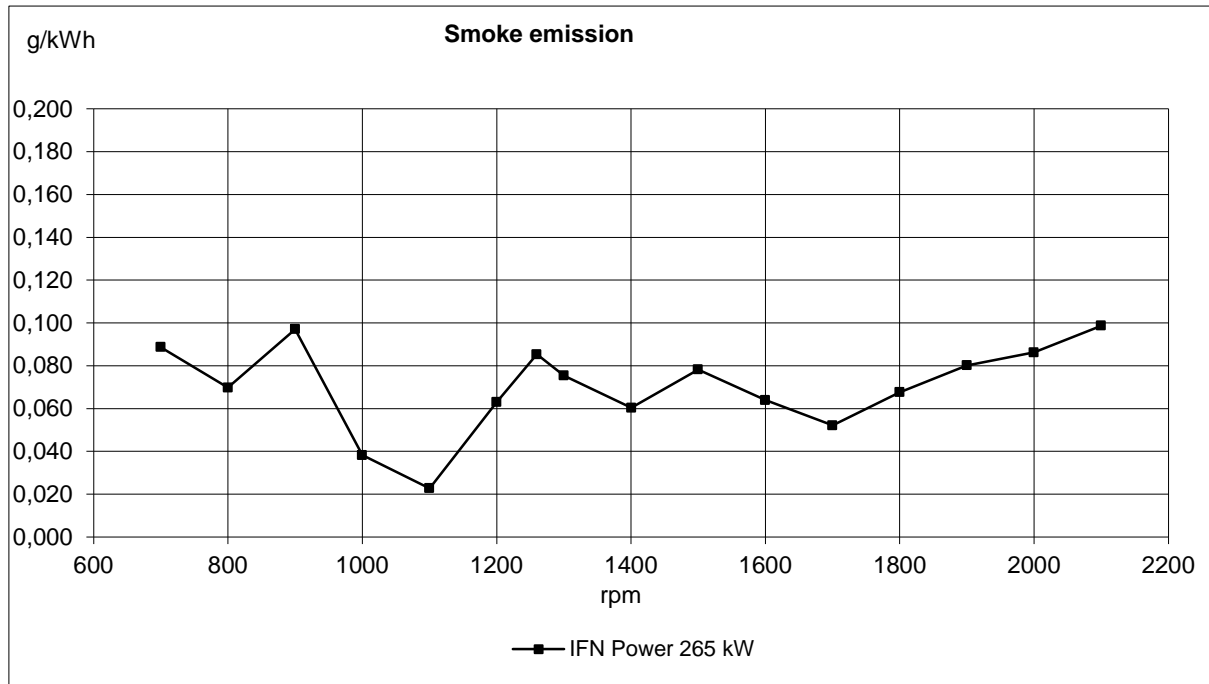
**If more than one PTO output is used simultaneously, calculations needs to be performed to determine available maximum. Available torque depends on application inertia.**

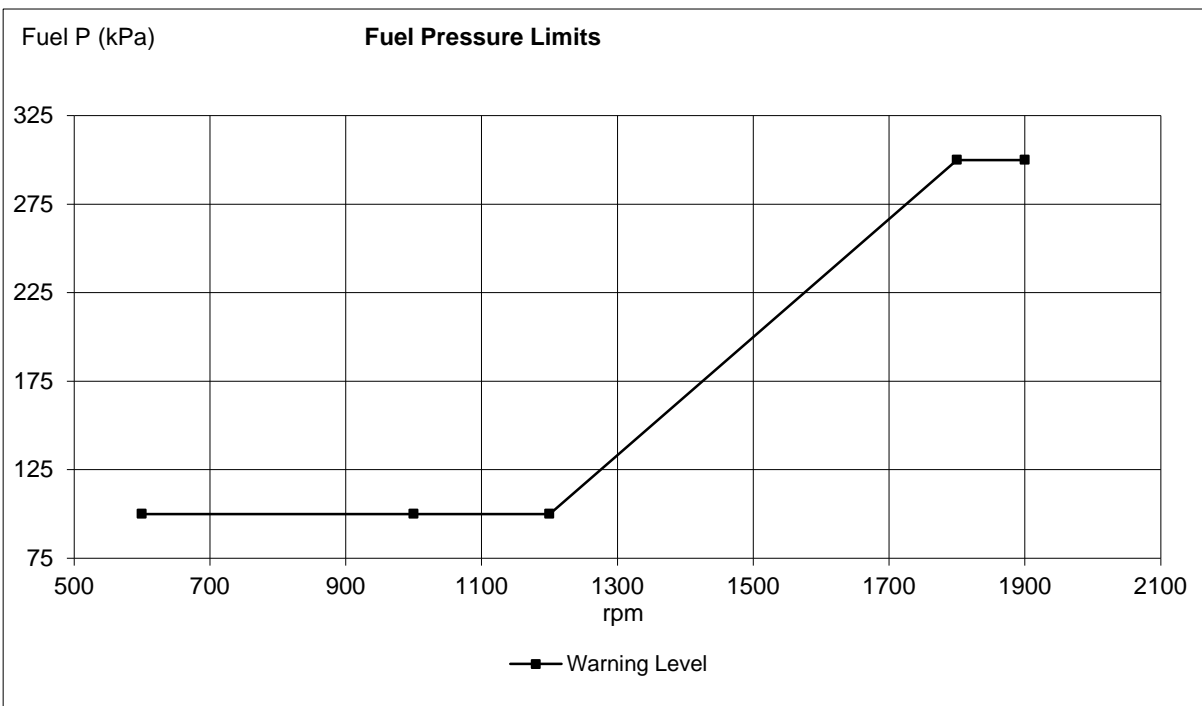
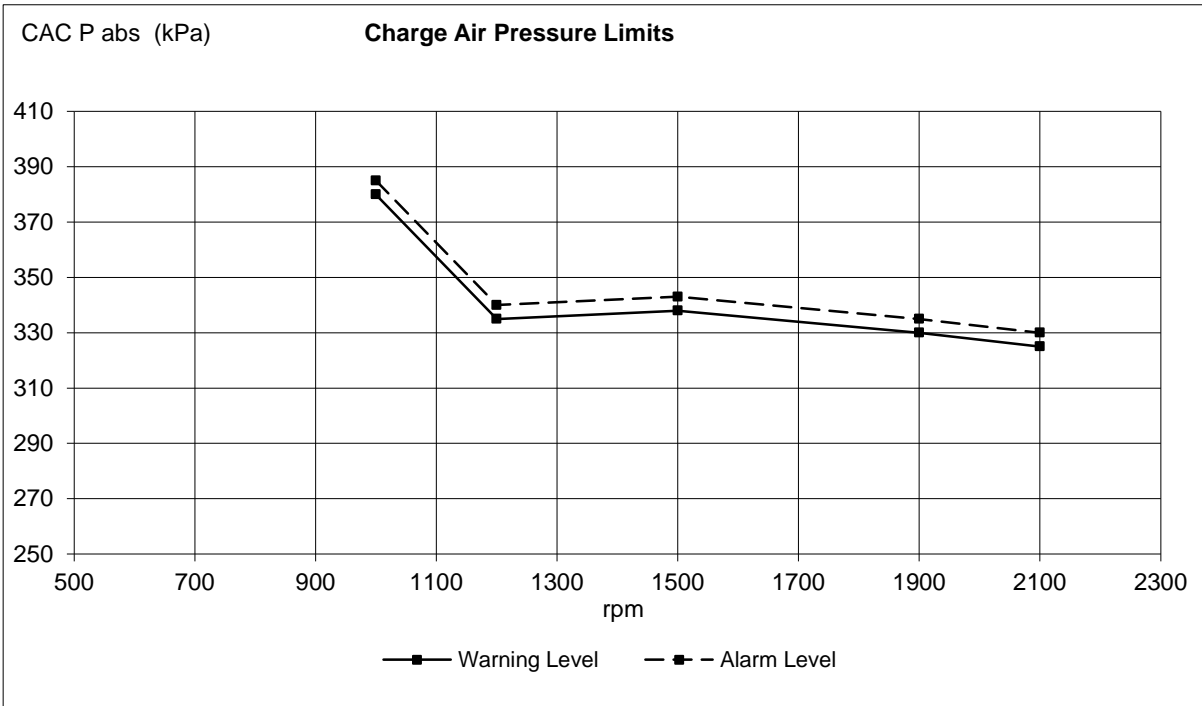


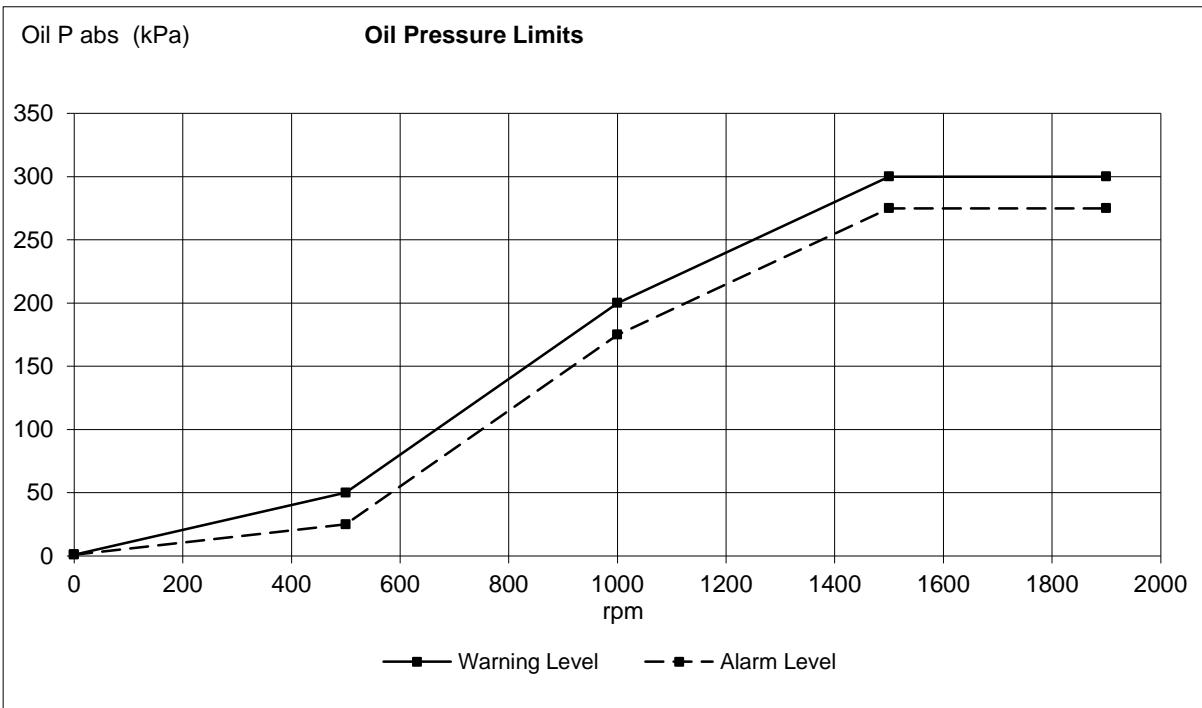


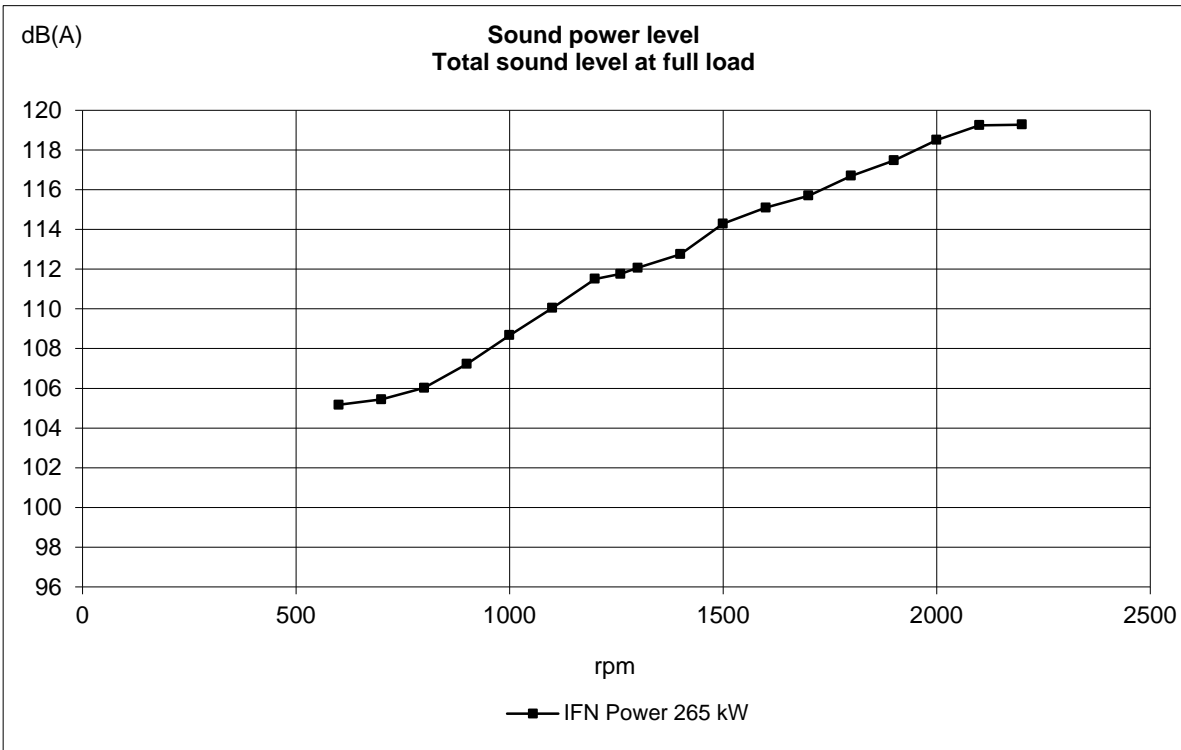
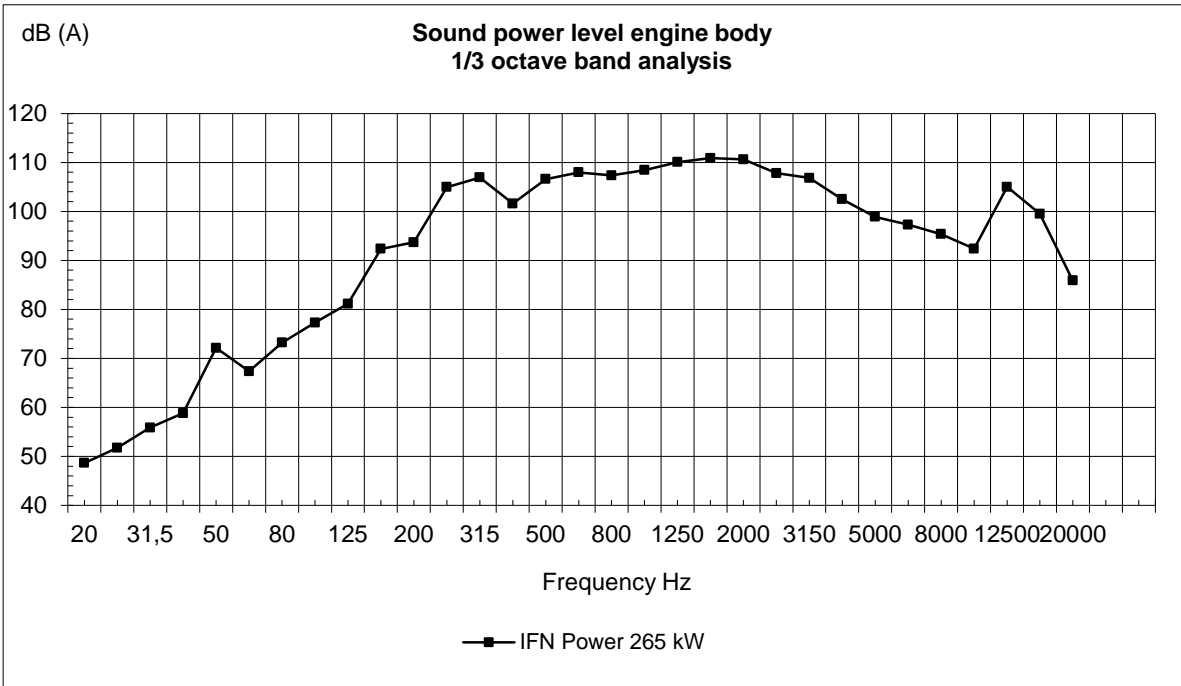


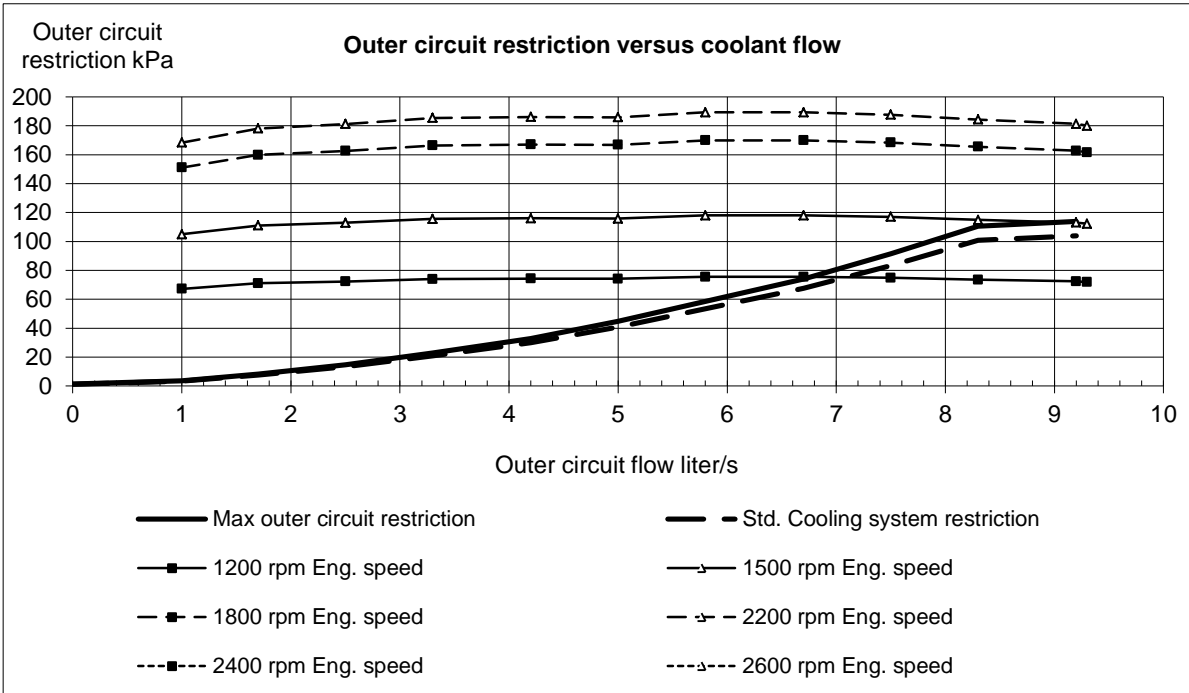




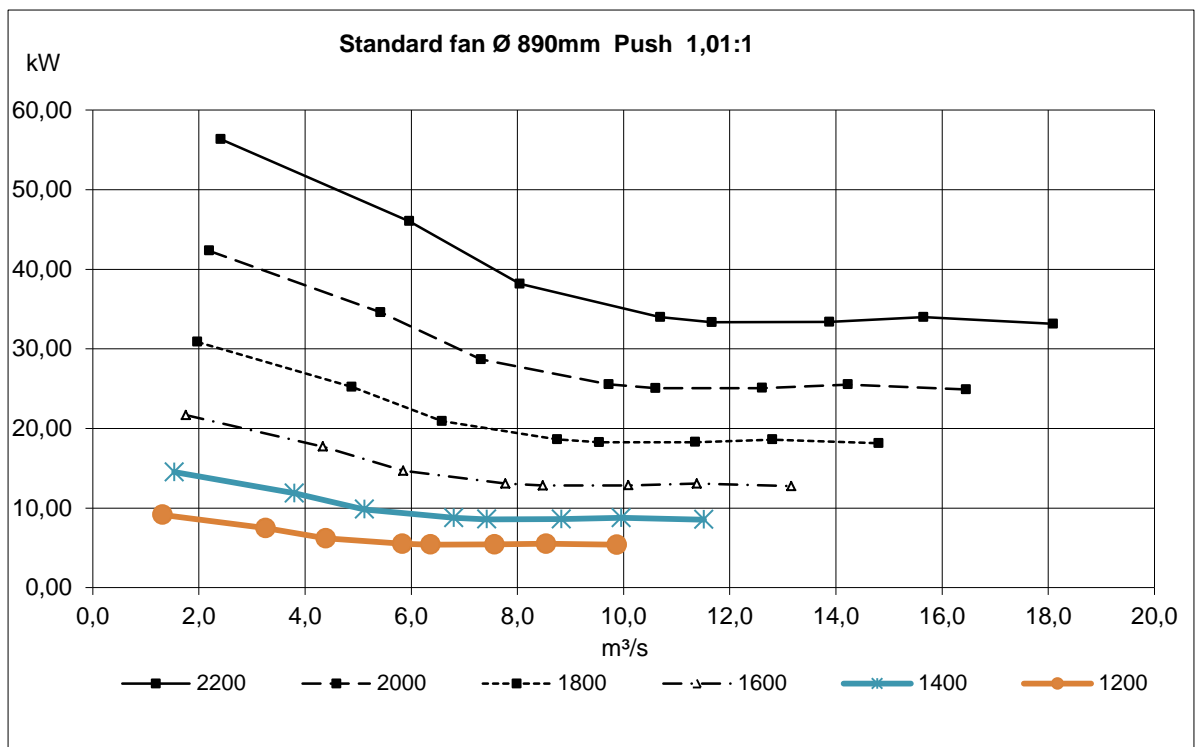
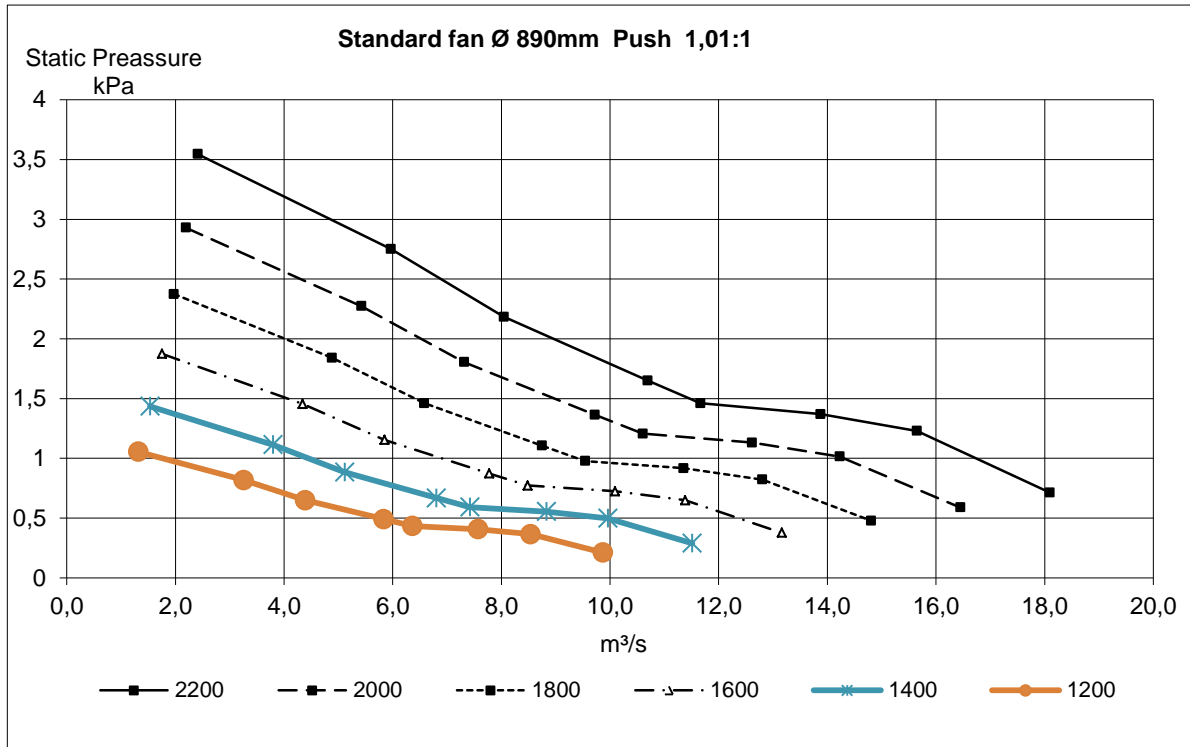




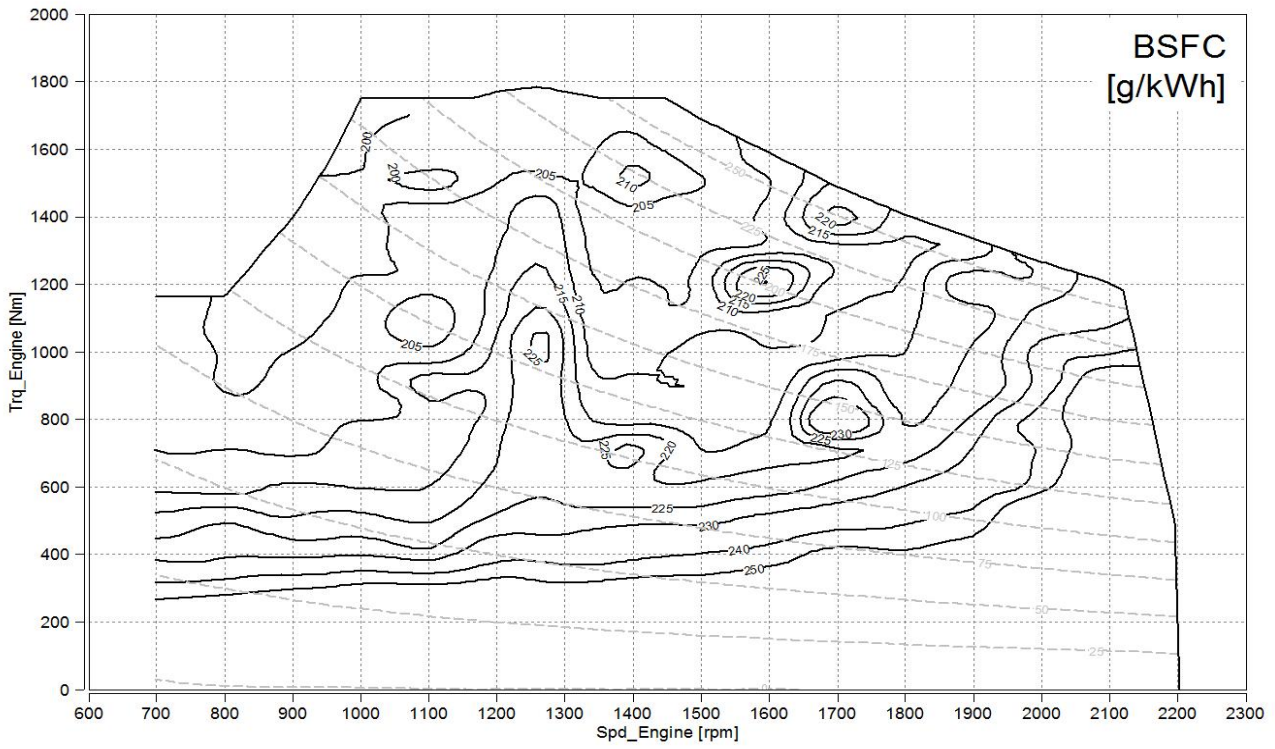








BSFC [g/kWh]



Fuel consumption [l/h]

