General / KC

Number of cylinders			6
Displacement, total		litre in^3	12,78 779,7
Firing order			1-5-3-6-2-4
Bore		mm in	131 5,16
Stroke		mm in	158 6,22
Compression ratio			18.5
Dry weight	Engine only, excluding cooling system	kg lb	1480 3263
	Genset, see dimension drawing	kg lb	

Performance		**rpm** **load**	**1500** **25%**	**50%**	**75%**	**100%**	**110%**
Power setting 300 kW		kW hp	75 102	150 204	225 306	300 408	330 449
Torque at:	Power setting 300 kW	Nm lbft	477 352	955 704	1432 1056	1910 1409	2101 1549
Mean piston speed		m/s ft/sec			7,9 26,0		
Effective mean pressure at:	Power setting 300 kW	MPa psi	0,5 68	0,9 136	1,4 204	1,9 272	2,1 300
Max combustion pressure at:	Power setting 300 kW	MPa psi	7 1015	9,7 1407	13,8 2002	15,4 2234	16,1 2335
Total mass moment of inertia, J (mR^2) Engine only		kgm^2 $lbft^2$			3,43 81,4		
Degree of irregularity at:	Power setting 300 kW						
Friction Power		kW hp	32 44	32 44	32 44	32 44	32 44
If applicable Derating are described in Technical Diagrams							

Performance		**rpm** **load**	**1800** **25%**	**50%**	**75%**	**100%**	**110%**
Power setting 360 kW		kW hp	90 122	180 245	270 367	360 490	396 539
Torque at:	Power setting 360 kW	Nm lbft	477 352	955 704	1432 1056	1910 1409	2101 1549
Mean piston speed		m/s ft/sec			9,5 31,2		
Effective mean pressure at:	Power setting 360 kW	MPa psi	0,5 68	0,9 136	1,4 204	1,9 272	2,1 300
Max combustion pressure at:	Power setting 360 kW	MPa psi	7,9 1146	11,4 1653	14,6 2118	17,2 2495	17,9 2596
Total mass moment of inertia, J (mR^2) Engine only		kgm^2 $lbft^2$			3,43 81,4		
Degree of irregularity at:	Power setting 360 kW						
Friction Power		kW hp	46 62,56	46 62,56	46 62,56	46 62,56	46 62,56
If applicable Derating are described in Technical Diagrams							

VOLVO PENTA 1500rpm/1800 rpm	Document No 21720674	Issue Index 09

Engine noise emission

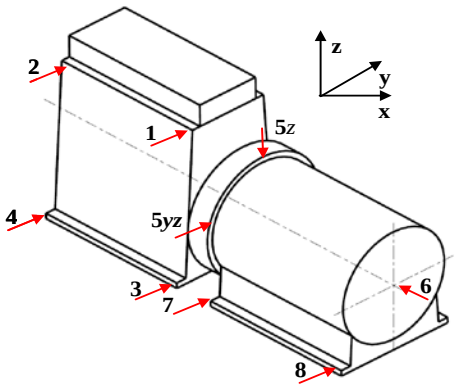
Test Standards: ISO 3744-1981 (E) sound power (without exhaust noise)

Tolerans ± 0.75 dB(A)

		rpm			1500		
		load	25%	50%	75%	100%	110%
Measured sound power Lw	No load	dB(A)	107,5	107,5	107,5	107,5	107,5
	Power setting 300 kW	dB(A)	110,4	111,7	111,2	111,7	112
		rpm			1800		
Measured sound power Lw	No load	dB(A)	109,1	109,1	109,1	109,1	109,1
	Power setting 360 kW	dB(A)	112,2	112,9	113,1	113,4	114,2

Vibrations (vibration velocity)

Declared vibration levels according to ISO 8528-9



rpm	1500		
	RMS Velocity (10 - 1000Hz) Measurement direction		
Measuring position	Axial [x] mm/s	Transverse [y] mm/s	Vertical [z] mm/s
1	11,4	13,7	16,9
2	10,9	15,2	14,4
3	9,9	12,6	10,5
4	10,4	18,5	16,2
5	10,1	6,2	14,2
6	13,6	14,8	21,4
7	10,2	12,4	18,3
8	10,2	15	18,5
rpm		**1800**	
1	10,8	16,0	18,0
2	11,5	32,7	20,5
3	10,8	21,4	28,0
4	10,3	20,7	28,3
5	9,7	9,8	17,5
6	15,4	20,0	16,5
7	9,7	18,4	24,9
8	9,9	21,3	24,2

Test conditions for load acceptance data

Warm engine. UFRO according to stamford recommendation (Start at -3Hz) Minimum dip setting	**Generator**	**Modell**	**Type of AVR**
	Stamford	HCI534D1	MX341

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

Single step load performance at 1500 rpm

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Nominal	110% power	Nominal	110% power	(%)	Nomi-nal	110% power	Nomi-nal	110% power
0-20	1,8	1,8	1,1	1,0	20-100	12,1	14,5	2,5	12,7
0-40	2,4	3,1	1,3	3,1	40-100	5,6	6,1	2,3	10,2
0-60	5,3	8,5	1,4	2,0	60-100	2,6	3,9	1,2	7,6
0-80	11,3	17,7	2,5	3,2	80-100	1,4	1,3	0,8	1,9
0-100	20,5	28,4	3,5	11,6					
0-74.6	**10,2**		2,5		74.6-100	1,5		0,9	
0-67.8		**10,2**		2,3	67.8-100		2,7		5,4
0-65.3	**7,3**		1,8		65.3-100	4,6		7,9	
0-59.4		**7,3**		1,8	59.4-100		4,6		7,9
100-0	-3,8	-4,1	1,2	1,2					

Single step load performance at 1800 rpm

Load (%)	Speed diff %		Recovery time (s)		Remaining load	Speed diff (%)		Recovery time (s)	
	Nominal	110% power	Nominal	110% power	(%)	Nomi-nal	110% power	Nomi-nal	110% power
0-20	1,1	1,2	0,6	0,6	20-100	6,7	7,7	1,6	5,2
0-40	1,8	2,1	0,8	0,7	40-100	3,4	4,4	1,4	4,2
0-60	3,7	4,8	1,2	1,3	60-100	1,8	2,4	0,6	2,2
0-80	7,7	9,1	1,5	1,8	80-100	0,8	1,0	0,5	0,6
0-100	13,2	17,0	2,2	8,6					
0-92	**10,2**		1,9		92-100	0,4		0,1	
0-83.6		**10,1**		1,9	83.6-100		0,9		0,5
0-76.8	**6,9**		1,1		76.8-100				
0-69.8		**6,6**		1,2	69.8-100		1,6		1,6
100-0									

Cold start performance		**rpm**	**1500**	**1800**
Time from start to stay within 0.5% of no load speed at ambient temperature:	20°C	s	4,8	4,6
	5 °C	s	5,7	5,2

Lubrication system		**rpm load**	**1500 25%**	**50%**	**75%**	**100%**	**110%**
Lubricating oil consumption	Power setting 300 kW	liter/h	0,005	0,010	0,015	0,020	0,023
		US gal/h	0,001	0,003	0,004	0,005	0,006
		rpm			**1800**		
	Power setting 360 kW	liter/h	0,006	0,012	0,018	0,025	0,027
		US gal/h	0,002	0,003	0,005	0,006	0,007

Oil system capacity including filters		liter	49	
		US gal	12,9	
Oil sump capacity:	max	liter	44	
		US gal	11,6	
	min	liter	35	
		US gal	9,2	
Oil change intervals/ specifications: (Fuel quality dependant)	VDS-3	h	600	
	VDS-2	h	400	
		h		
		h		
Engine angularity limits, static (ref. classification rules, roll and pitch simultaneously)	front up	°	36	
	front down	°	36	
	side tilt	°	36	

Lubrication system		**rpm**	**1500**	**1800**
Oil pressure at rated speed		kPa	360	- 450
		psi	52,2	65,3
Lubrication oil temperature in oil sump:	max	°C	110	
		°F	230	
Oil filter micron size		µ	40	

* See also general section in the sales guide

Fuel system		rpm / load	25%	50%	1500 75%	100%	110%
Specific fuel consumption: US EPA Tier 3	Power setting 300 kW	g/kWh	239	209	204	203	203
		lb/hph	0,387	0,339	0,330	0,329	0,330
Specific fuel consumption IMO Tier II	Power setting IMO Tier II	g/kWh	235	203	193	194	195
		lb/hph	0,381	0,329	0,313	0,314	0,316
		rpm			**1800**		
Specific fuel consumption: US EPA Tier 3	Power setting 360 kW	g/kWh	250	214	212	216	214
		lb/hph	0,405	0,347	0,344	0,349	0,346
Specific fuel consumption IMO Tier II	Power setting IMO Tier II	g/kWh	244	207	200	200	203
		lb/hph	0,396	0,336	0,324	0,325	0,329
Fuel to conform to		ASTM-D975-No. 1 and 2-D, JIS KK 2204, EN 590 MDO-DMX and MDO-DMA (ISO8217)					
		rpm			**1500**		
System return flow	Power setting 300 kW	liter/h	53	52	52	52	51
		US gal/h	13,9	13,8	13,6	13,6	13,5
		rpm			**1800**		
	Power setting 360 kW	liter/h	56	56	55	55	55
		US gal/h	14,9	14,7	14,6	14,5	14,4
		rpm			**1500**		
System supply flow	Power setting 300 kW	liter/h	74	90	106	125	131
		US gal/h	19,6	23,7	28,1	32,9	34,7
		rpm			**1800**		
	Power setting 360 kW	liter/h	83	102	124	148	156
		US gal/h	22,0	26,9	32,7	39,0	41,2
		rpm			**1500**		
Normal fuel pressure (after filter)	Power setting 300 kW	kPa	529	519	508	495	490
		psi	76,7	75,3	73,7	71,8	71,1
		rpm			**1800**		
	Power setting 360 kW	kPa	576	561	548	532	527
		psi	83,5	81,4	79,5	77,2	76,4

Fuel system

Fuel supply line max restriction	kPa	30
	psi	4,4
Fuel supply max pressure head (day tank, from CL)	m	2,0
	feet	6,6
Fuel supply line max suction head (from CL)	m	3,6
	feet	11,7
Fuel return line max restriction	kPa	20,0
	psi	2,9
Maximum allowable inlet fuel temp	°C	50
	°F	122

Fuel system

Prefilter / Water separator micron size	µ	
Fuel filter micron size	µ	2

Intake system		rpm / load	25%	50%	1500 / 75%	100%	110%
Air consumption at: (+25°C and 100kPa)	Power setting 300 kW	m^3/min	11	16	20	24	26
		cfm	401	551	709	865	929
		rpm			1800		
	Power setting 360 kW	m^3/min	15	22	27	30	30
		cfm	544	761	947	1051	1074
Max allowable air intake restriction including piping		kPa	3				
		psi	0,4				
Air filter type		Paper cartridge					
Air filter cleaning efficiency		%	98,5				

Exhaust system		rpm / load	25%	50%	1500 / 75%	100%	110%
Heat rejection to exhaust at:	Power setting 300 kW	kW	60	101	145	190	207
		BTU/min	3412	5744	8246	10805	11772
		rpm			1800		
	Power setting 360 kW	kW	73	122	171	238	268
		BTU/min	4151	6938	9725	13535	15241

Exhaust system		rpm / load	25%	50%	1500 / 75%	100%	110%
Exhaust gas temperature after turbine at:	Power setting 300 kW	°C	264	318	345	373	384
		°F	507	604	653	703	723
		rpm			1800		
	Power setting 360 kW	°C	247	287	321	386	423
		°F	477	549	610	727	793
Max allowable back pressure in exhaust line		kPa	10				
		psi	1,5				
		rpm			1500		
Exhaust gas flow at: (temp and pressure after turbine at the corresponding power setting)	Power setting 300 kW	m^3/min	21	32	42	51	54
		cfm	742	1130	1483	1801	1907
		rpm			1800		
	Power setting 360 kW	m^3/min	28	41	52	63	67
		cfm	989	1448	1836	2225	2366

Cooling system, HT circuit, heat rejection		rpm / load	25%	50%	1500 / 75%	100%	110%
Heat rejection radiation from engine to surrounding at:	Power setting 300 kW	kW	3,0	3,5	4,0	4,5	4,7
		BTU/min	171	199	227	256	267
		rpm			1800		
	Power setting 360 kW	kW	3,5	4,0	4,5	5,0	5,2
		BTU/min	199	227	256	284	296

Cooling system, HT circuit, heat rejection		rpm			1500		
Heat rejection to coolant at: (HT)	Power setting 300 kW	kW	67	76	89	155	162
		BTU/min	3810	4322	5061	8815	9213
		rpm			1800		
	Power setting 360 kW	kW	79	110	145	190	209
		BTU/min	4493	6256	8246	10805	11886

Cooling system, HT circuit, other data

Coolant volume in engine with std. expansion tank		liter US gal	38 10,04		Note! Expansion tank size to be calculated. Recomended. 15% of total coolant volume
Max. additional coolant in HT system with std. expansion tank		liter US gal			
Coolant pump	drive/ratio		1/1.5		
		rpm	**1500**	**1800**	
Coolant flow with fully open thermostat		l/s US gal/s	1,53 0,40	3,6 0,95	
Nominal coolant pressure with standard system		kPa psi	180,0 26,1	227,0 32,9	
Maximum external coolant system restriction, including piping		kPa psi	85 12,3	85 12,3	
Thermostat	start to open	°C °F	82 180		
	fully open	°C °F	92 198		
Design point for box cooler, engine outlet temperature		°C °F	90 194	89 192	
Coolant flow at design point		l/s US gal/s	1,30 0,34	2,50 0,66	
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa psi	85 12,3		
Standard pressure cap setting		kPa psi	75 10,9		
Maximum temperature entering engine		°C °F	60 140	70 158	
Coolant (40% coolant / 60% water)	See Operators Manual				

Cooling system, LT circuit, heat rejection		**rpm** **load**	**25%**	**50%**	**1500** **75%**	**100%**	**110%**
Heat rejection to coolant at: (LT)	Power setting 300 kW	kW BTU/min	11 626	25 1422	46 2616	68 3867	76 4322
		rpm			**1800**		
	Power setting 360 kW	kW BTU/min	20 1137	44 2502	70 3981	96 5459	100 5687

Cooling system, LT, other data

Coolant volume in engine charge air cooler circuit		liter US gal	7 1,85	Note! Expansion tank size to be calculated. Recomended. 15% of total coolant volume
Max. additional coolant in LT system with std. expansion tank		liter US gal		
Maximum static pressure head (expansion tank height + pressure cap setting)		kPa psi	85 12,3	
Standard pressure cap setting		kPa psi	75 10,9	
LT circuit pump	drive/ratio		1/1.5	

		rpm	**1500**	**1800**
Nominal LT water design flow		l/s US gal/s	1,36 0,36	1,63 0,43
Nominal LT water pump pressure head at design flow		kPa psi	86 12,5	88 12,8
Maximum LT waterpump suction head		kPa psi	-14 -2,0	-19 -2,8
Maximum additional pressure drop LT water circuit		kPa psi	105 15,2	107 15,5
Maximum allowed LT water circuit pressure before Heat Exchanger (External pump system)		kPa psi	72 10,4	65 9,4
Maximum temperature entering charge air cooler		°C °F	38 100	

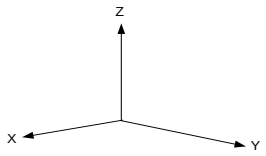
Coolant (40% coolant / 60%water)	Volvo Penta coolant together with clean fresh water

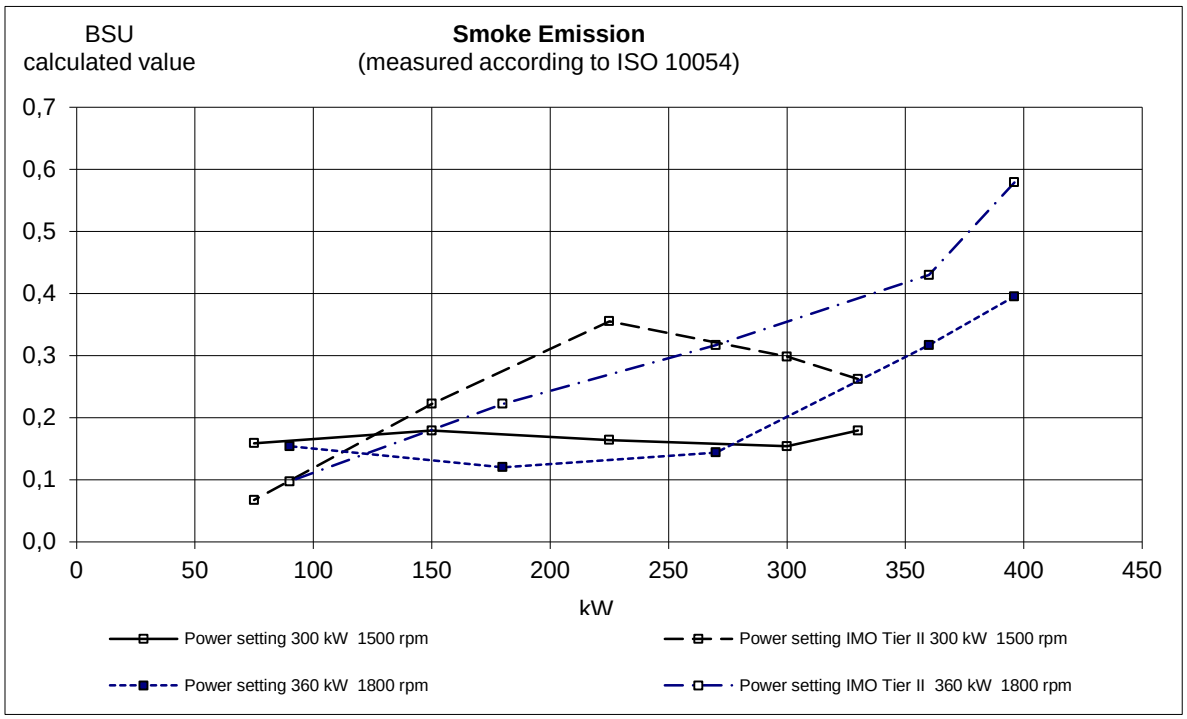
Charge air cooler system		**rpm** **load**	**1500** **25%**	**50%**	**75%**	**100%**	**110%**
Cooling power	Power setting 300 kW	kW	11	25	46	68	76
		BTU/min	626	1422	2616	3867	4322
		rpm			**1800**		
	Power setting 360 kW	kW	20	44	70	96	100
		BTU/min	1137	2502	3981	5459	5687
		rpm			**1500**		
Charge air mass flow	Power setting 300 kW	kg/s	0,231	0,312	0,408	0,488	0,512
		rpm			**1800**		
	Power setting 360 kW	kg/s	0,308	0,428	0,523	0,585	0,592
		rpm			**1500**		
Charge air inlet temp. Charge air temp after turbo compressor)	Power setting 300 kW	°C	70	105	144	177	188
		°F	158	221	291	351	370
		rpm			**1800**		
	Power setting 360 kW	°C	87	131	166	204	209
		°F	189	268	331	399	408

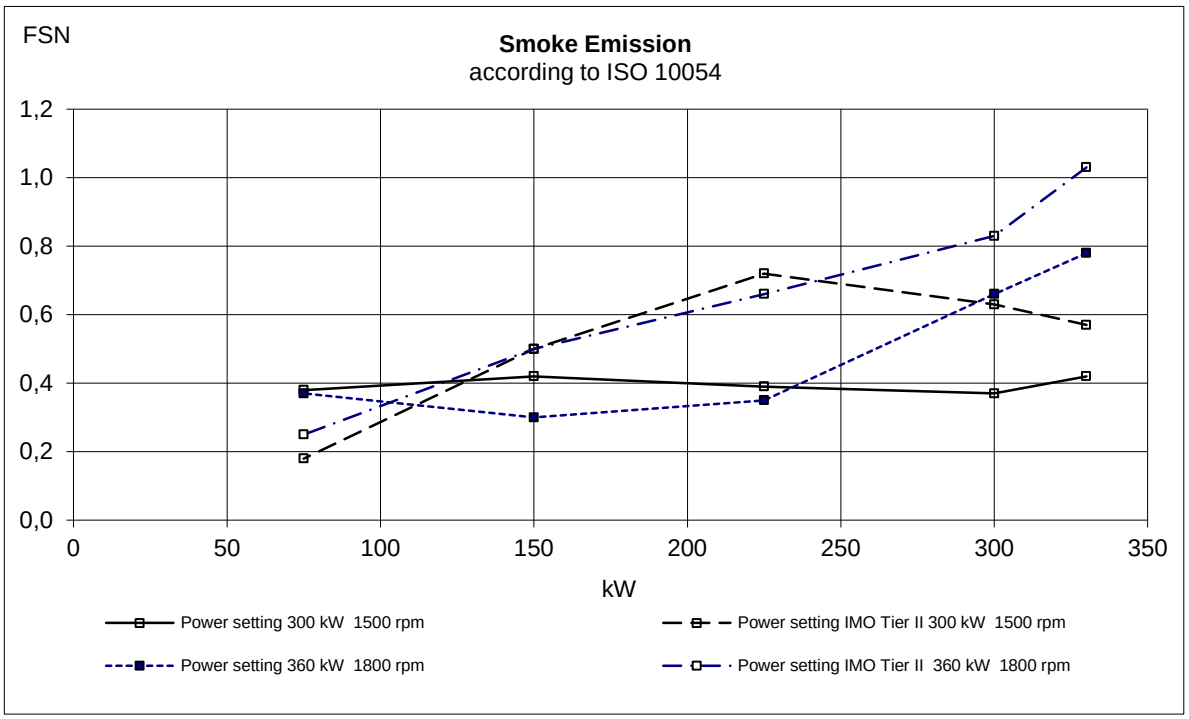
Charge air cooler system		**rpm** **load**	**1500** **25%**	**50%**	**75%**	**100%**	**110%**
Charge air outlet temp. (Charge air temp after charge air cooler)	Power setting 300 kW	°C	23	26	32	38	40
		°F	73	79	90	100	104
		rpm			**1800**		
	Power setting 360 kW	°C	23	29	34	42	40
		°F	73	84	93	108	104
		rpm	**1500**				
Charge air pressure	Power setting 300 kW	kPa	238				
		psi	34,52				
		rpm	**1800**				
	Power setting 360 kW	kPa	239,00				
		psi	34,66				

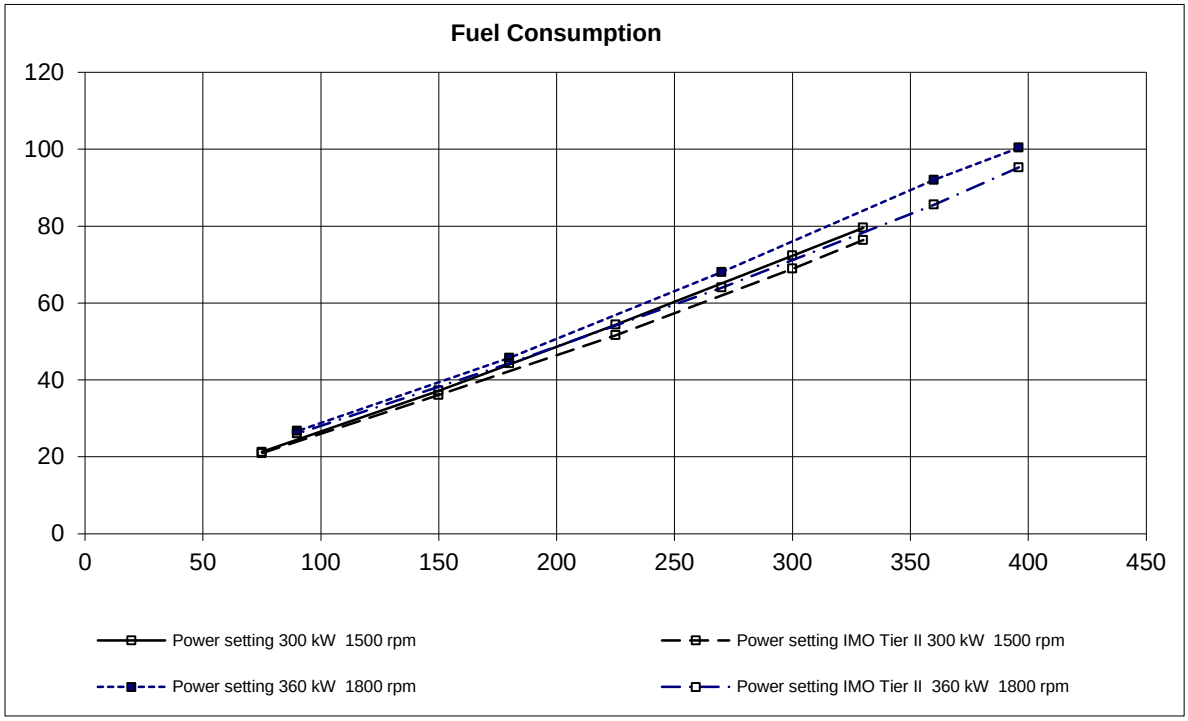
Engine management system

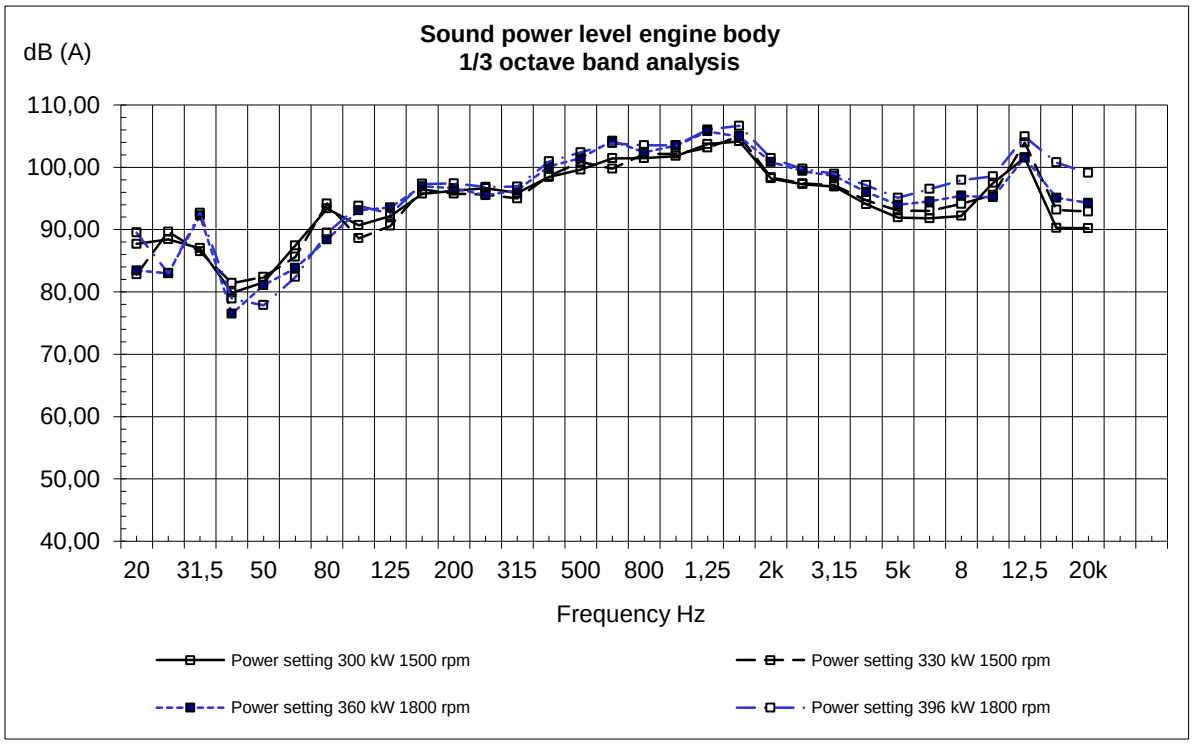
Functionality	Alternatives	Default setting
Governor mode	Isochronus / Droop	Droop
Governor droop	0 / 0.1-5%	4%
Governor response	Adjustable PID (service tool)	0/0/0
Dual speed	YES	1500 or 1800 rpm
Idle speed	600-1200	900
Fine speed adjustment	± 90	0
Stop function	Normaly Closed / Normaly Opend	Depends on order

Electrical system			**rpm**	**1500 and 1800**
Voltage and type			24V / insulated from earth	
Alternator:	make/output		Amp	Bosch /110A
	tacho output		Hz/alt. Rev	6
	drive ratio			3,7:1
Starter motor			make	Melco
			type	105P70
			kW	7,0
Starter motor solenoid,	pull current		Amp	280
	hold current		Amp	-
Number of teeth on:	flywheel			153
	starter motor			12
Inrush current at +20°C \ 5°C			Amp	1020 \ 1560
Cranking current at +20°C \ 5°C			Amp	400 \ 530
Crank engine speed at 20°C \ 5°C			rpm	150 \ 130
Starter motor battery capacity:		max	Ah	2x220
		min at +5°C	Ah	2x180
Max. g-force 		x	m/s²	2
		y	m/s²	2
		z	m/s²	6


BSU
calculated value
Smoke Emission
(measured according to ISO 10054)
0,7
0,6
0,5
0,4
0,3
0,2
0,1
0,0
0
50
100
150
200
250
300
350
400
450
kW
Power setting 300 kW 1500 rpm
Power setting IMO Tier II 300 kW 1500 rpm
Power setting 360 kW 1800 rpm
Power setting IMO Tier II 360 kW 1800 rpm


FSN
Smoke Emission
according to ISO 10054
1,2
1,0
0,8
0,6
0,4
0,2
0,0
0
50
100
150
200
250
300
350
kW
Power setting 300 kW 1500 rpm
Power setting IMO Tier II 300 kW 1500 rpm
Power setting 360 kW 1800 rpm
Power setting IMO Tier II 360 kW 1800 rpm


Fuel Consumption
120
100
80
60
40
20
0
0
50
100
150
200
250
300
350
400
450
Power setting 300 kW 1500 rpm
Power setting IMO Tier II 300 kW 1500 rpm
Power setting 360 kW 1800 rpm
Power setting IMO Tier II 360 kW 1800 rpm


Sound power level engine body
1/3 octave band analysis
dB (A)
110,00
100,00
90,00
80,00
70,00
60,00
50,00
40,00
20
31,5
50
80
125
200
315
500
800
1,25
2k
3,15
5k
8
12,5
20k
Frequency Hz
Power setting 300 kW 1500 rpm
Power setting 330 kW 1500 rpm
Power setting 360 kW 1800 rpm
Power setting 396 kW 1800 rpm

Performance	Power (kW)	Rpm
Power setting HE	300	1500
Power setting HE	300	1500
Power setting HE	360	1800
Power setting HE	360	1800
Power setting KC	300	1500
Power setting KC	300	1500
Power setting KC	360	1800
Power setting KC	360	1800

Sensors Control and Monitoring System							Switches Engine Shutdown System	
Sensors	**Signal**	**Unit**	**Range**	**Initial Delay / Warning Delay**	**Warning Level**	**Derating Level**	**Shutdown Initial Delay / Shutdown Delay**	**Shutdown Level (Tolerance)**
Coolant level switch	Digital		ON/OFF	7,5 sec from start / 7,5 sec	Low(OFF / Open contact)	NA	NA	NA
Coolant temperature	50-0 kΩ	°C	- 40 - 140 ±1.5°C	30 sec from start / 2 sec	98° C	NA	NA	NA
Coolant temperature (SDU)	Digital	°C	ON/OFF	NA	NA	NA	1 sec. from start / 1 sec	105 (±2°C) SDU Ch. S1 (NA for EME. Valid for AUX and HBR modes)*
Engine speed cam	Frequency	rpm		Instant	Lost signal	NA	NA	NA
Engine speed crank	Frequency	rpm		Instant	Lost signal	NA	NA	NA
Eng. overspeed SDU 1500 rpm+15%	Frequency	rpm / Hz	153 puls./rev.	Instant	Lost signal	NA	Instant	1725 rpm / 4399 Hz (-1 to 0%)
Eng. overspeed SDU 1800 rpm+15%	Frequency	rpm / Hz	153 puls./rev.	Instant	Lost signal	NA	Instant	2070 rpm / 5278 Hz (-1 to 0%)
Exhaust gas temperature	PT200	°C	- 40 - 750 ± 2.5%	30 sec from start / 22 sec	575° C	NA	NA	NA
Crankcase pressure	0,5-4,5 V	kPa	0-15 kPa	20 sec from start / Instant	Rapid Pressure Increase	NA	NA	NA
Oil temperature	50-0 kΩ	°C	-40 - 140°C	30 sec from start / 22 sec	130° C	NA	NA	NA

NA = Not applicable *
Emergency genset modes= EME
Auxiliary genset modes= AUX
Combined genset modes= EME, HBR

Sensors Alarm	Signal	Unit	Range	Initial Delay / Delay	Warning Level / Derating Level / Shutdown Level rpm Map (relative pressure)				Notes
Charge air pressure	0,5-4,5 V	kPa	50 - 600 ± 4 kPa				**1500 rpm**	**1800 rpm**	
Warning Level		kPa		30 sec from start / 2 sec			319	269	
Charge air Temperature	50 - 0 kΩ	°C	-40 - 130°C ±4%				**1500 rpm**	**1800 rpm**	
Warning Level		°C		90 sec from start / 22 sec			80° C	75° C	
Coolant pressure	0,5-4,5 V	kPa	0-300 kPa ±3%				**1500 rpm**	**1800 rpm**	
Warning Level		kPa		30 sec from start / 4 sec			55	81	
Seawater pressure	0,5-4,5 V	kPa	0-300 kPa ±3%				**1500 rpm**	**1800 rpm**	
Warning Level		kPa		30 sec from start / 7.5 sec			40	40	
Fuel pressure	0,5-4,5 V	kPa	0-700 kPa ±1,5%				**1500 rpm**	**1800 rpm**	
Warning Level		kPa		30 sec from start / 30 sec			270	270	
Oil pressure	0,5-4,5 V	kPa	0-700 kPa ±1,5%				**1500 rpm**	**1800 rpm**	
Warning Level		kPa		30 sec from start / 3 sec			265	265	
Shutdown Level (SDU)	Digital	kPa	ON/OFF	11 s ±20% from start / 1 s			120 ±20	120 ±20	Shutdown Unit Activated S2,S3: 510 rpm ±2% 1300 Hz ±2% 153 pulses / revolution (NA for EME. Valid for AUX and HBR modes)*