

**General**

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		5
No of valves		20
Displacement, total	litres in <sup>3</sup>	2,40 146,5
Firing order		1-2-4-5-3
Rotational direction, viewed from the front		Clockwise
Bore	mm in	81 3,19
Stroke	mm in	93,2 3,67
Compression ratio		16,5
Max. static forward inclination:	°	0
Max. static backward inclination:	°	10
Max. intermittent forward inclination while running:	°	20
Max. intermittent backward inclination while running:	°	10
Max. intermittent side inclination while running:	°	20
Idling speed	rpm	700 + 50
Rated speed R5	rpm	3000
Propeller selection range R5	rpm	2900-3130
Dry weight engine BT	kg lb	260 573

<b>Performance</b>	<b>Rating</b>	<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2200</b>	<b>2400</b>	<b>2600</b>	<b>2800</b>	<b>3000</b>	<b>3130</b>
Crankshaft power 1), 5)	5	kW	11	25	48	85	96	105	109	110	110	110
		hp	15	34	65	116	131	143	148	150	150	150
Propeller shaft power 1) (At full load) With reverse gear	5	kW	11	24	46	82	92	101	105	106	106	106
		hp	14	33	63	111	125	137	142	144	144	144
Propellershaft power at prop. load x <sup>2,5</sup>	5	kW	3	11	22	38	48	60	73	88	105	
		hp	4	14	30	52	65	81	99	120	142	
Torque at crankshaft 2)	5	Nm	150,1	198,9	286,5	405,8	416,7	417,8	400,3	375,2	350,1	335,6
		lbf ft	111	147	211	299	307	308	295	277	258	248
Mean piston speed		m/s	2,2	3,7	5,0	6,2	6,8	7,5	8,1	8,7	9,3	9,7
		ft/s	7,1	12,2	16,3	20,4	22,4	24,5	26,5	28,5	30,6	31,9
Effective mean pressure 2)	5	MPa	0,79	1,04	1,50	2,12	2,18	2,19	2,10	1,96	1,83	1,76
		psi	113,9	151,0	217,4	308,0	316,3	317,1	303,9	284,7	265,8	254,7
Max combustion pressure 2)	5	MPa	9,8	11	14,8	15,3	14,8	14,5	13,8	13,4	12,5	12,8
		psi	1421	1595	2147	2219	2147	2103	2002	1944	1813	1856

**Lubricating system**

Specific lubricating oil consumption.	g/kWh	0,29
Max. oil volume including filters for all allowed installation inclinations:	litres	6,3
	US gal	1,66
Max. oil volume excluding filters for all allowed installation inclinations:	litres	5,8
	US gal	1,53
Min. oil volume excluding filters for all allowed installation inclinations:	litres	4,3
	US gal	1,14

1) ISO 3046, fuel temp 40°C.

ISO 8665 (=SAE J 1228=ICOMIA 28-83)

2) At power according to 1).

3) If reverse gear is used, 4% in heat rejection will be added for its oil cooler.

4) Acc. to ISO 3744

5) At installed back pressure

Fuel system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Specific fuel consumption 2)	5	g/kWh lb/hph	357 0,578	261 0,423	245 0,397	217 0,352	213 0,345	215 0,348	218 0,353	218 0,353	223 0,361	221 0,358
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	226 0,37									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h US gal/h	1,1 0,3	3,2 0,8	6,4 1,7	10,7 2,8	13,2 3,5	16,6 4,4	19,8 5,2	23,9 6,3	29,0 7,6	
Fuel consumption at full load	5	l/h US gal/h	4,7 1,2	7,8 2,1	14,1 3,7	22,1 5,8	24,5 6,5	27,0 7,1	28,4 7,5	28,7 7,6	29,4 7,8	29,1 7,7

Intake and exhaust system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130	
Specific exhaust heating effect in percent of crankshaft power	5	%	64	68	67	63	65	69	71	71	75	75	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	385	455	491	501	507	531	531	508	505	470	
		°F	725	851	916	934	945	988	988	946	941	878	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi								Max	15 2,2		
		kPa psi								Min	5 0,7		
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min	0,8	1,6	2,9	4,7	5,4	5,9	6,3	6,8	7,2	8	
		cu.ft./min	28,25	56,5	102,4	166	190,7	208,4	222,5	240,1	254,3	282,5	
Charge air pressure Inlet manifold	5	kPa psi	105 15,2	127 18,4	172 24,9	230 33,4	235 34,1	235 34,1	233 33,8	235 34,1	230 33,4	244 35,4	
Exhaust gas flow	5	m³/min cu.ft./min	1,9 67,1	4,2 148,3	7,9 279	12,7 448,5	14,3 505	16 565	16,9 596,8	17,2 607,4	18 635,7	18,7 660,4	

Cooling system	Rating	rpm	700	1200	1600	2000	2200	2400	2600	2800	3000	3130
Radiated heat in percent of crankshaft power.	5	%				7	5	5	6	8	9	9
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2	5	10	14	14	14	14	14	15	18
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0	91	83	79	75	75	74	73	74	72
Coolant flow with fully open thermostat and std cooling system		l/min	45	70	94	116	130	140	153	165	176	185
		cu.ft./min	1,6	2,5	3,3	4,1	4,6	4,9	5,4	5,8	6,2	6,5
Max. permissible temperature on coolant in engine outlet		°C	98									
		°F	208									
Coolant volume engine, including heat exchanger		litres	8,7									
		US gal.	2,30									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres	8									
		US gal.	2,11									
Maximum coolant flow to cabin heater etc.		l/min	20									
		cu.ft./min	0,71									
Thermostat, start open at		°C	80									
		°F	176									
Thermostat, fully open at		°C	94									
		°F	201									

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5) At installed back pressure

<b>Raw water circuit</b>		<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2200</b>	<b>2400</b>	<b>2600</b>	<b>2800</b>	<b>3000</b>	<b>3130</b>
Nominal raw water design flow	l/min		27	46	61	76	83	90	96	103	109	113
	cu.ft/min		1,0	1,6	2,2	2,7	2,9	3,2	3,4	3,6	3,8	4,0
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa		19	26	36	48	55	62	69	77	85	90
	psi		2,8	3,8	5,2	7,0	8,0	9,0	10,0	11,2	12,3	13,1
Maximum raw water pump suction head	kPa		30									
	psi		4,4									
Maximum additional pressure drop excl. reverse gear oil cooler and riser	kPa		0	1	3	5	7	8	10	12	14	16
	psi			0,1	0,4	0,7	1,0	1,2	1,5	1,7	2,0	2,3
Pressure drop over reverse gear oil cooler (optional equipment)	kPa		2	3	4	5	5	6	6	7	7	7
	psi		0,2	0,4	0,6	0,7	0,8	0,8	0,9	1,0	1,0	1,0
Maximum raw water temperature entering charge air cooler	°C		30									
	°F		86									

<b>Emissions</b>		<b>Rating</b>	<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2200</b>	<b>2400</b>	<b>2600</b>	<b>2800</b>	<b>3000</b>	<b>3130</b>
Smoke at prop. load x <sup>2,5</sup>	5	*BSU		0,0	0,1	0,3	0,3	0,2	0,3	0,1	0,2	0,4	
Noise at prop. load x <sup>2,5</sup> . 4)	5	dBA		90	97	103	108	112	112	112	112	111	

\*NB.! BSU are calculated values. Measured values are acc. to ISO 10054 in FSN units

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