

**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	4000
Propeller selection range R5	rpm	3900-4130
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>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>
Crankshaft power 1), 5)	5	kW	10	25	47	61	73	85	101	103	103	103
		hp	14	34	64	83	99	116	137	140	140	140
Propeller shaft power 1) (At full load) With drive	5	kW	10	24	45	58	69	81	96	98	98	98
		hp	13	32	61	79	94	110	130	133	133	133
Propellershaft power at prop. load x <sup>2,5</sup>	5	kW	1	1	5	10	17	27	40	56	75	98
		hp	1	2	7	13	24	37	55	76	102	133
Torque at crankshaft 2)	5	Nm	136,4	198,9	280,5	291,3	290,5	289,9	301,4	273,2	245,9	238,2
		lbf ft	101	147	207	215	214	214	222	202	181	176
Mean piston speed		m/s	2,2	3,7	5,0	6,2	7,5	8,7	9,9	11,2	12,4	12,8
		ft/s	7,1	12,2	16,3	20,4	24,5	28,5	32,6	36,7	40,8	42,1
Effective mean pressure 2)	5	MPa	0,71	1,04	1,47	1,52	1,52	1,52	1,58	1,43	1,29	1,25
		psi	103,5	151,0	212,9	221,1	220,5	220,0	228,8	207,4	186,6	180,8
Max combustion pressure 2)	5	MPa	9,3	11,7	14,8	11,9	11	11,5	12,9	13,2	11,3	11,1
		psi	1349	1697	2147	1726	1595	1668	1871	1914	1639	1610

**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

<b>Fuel system</b>	<b>Rating</b>	<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>
Specific fuel consumption 2)	5	g/kWh lb/hph	276 0,447	260 0,421	235 0,381	212 0,343	214 0,347	215 0,348	215 0,348	221 0,358	238 0,386	243 0,394
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	247 0,40									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h US gal/h		0,8 0,2	1,8 0,5	3,3 0,9	5,4 1,4	8,3 2,2	12,1 3,2	16,6 4,4	21,8 5,8	29,5 7,8
Fuel consumption at full load	5	l/h US gal/h	3,3 0,9	7,8 2,1	13,2 3,5	15,5 4,1	18,7 4,9	21,9 5,8	26,0 6,9	27,2 7,2	29,3 7,7	29,9 7,9

<b>Intake and exhaust system</b>	<b>Rating</b>	<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>	
Specific exhaust heating effect in percent of crankshaft power	5	%	52	65	65	62	68	72	72	77	91	95	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F	341 646	463 865	486 907	428 802	462 864	466 871	442 828	444 831	518 964	528 982	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi kPa psi								Max Min	20 2,9 5 0,7		
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min cu.ft./min	0,7 24,72	1,6 56,5	2,8 98,88	4,2 148,3	5,1 180,1	6,2 219	7,8 275,5	8,7 307,2	8,5 300,2	8,7 307,2	
Charge air pressure Inlet manifold	5	kPa psi	105 15,2	127 18,4	168 24,4	198 28,7	199 28,9	206 29,9	227 32,9	224 32,5	203 29,4	200 29,0	
Exhaust gas flow	5	m³/min cu.ft./min	1,7 60,03	4,4 155,4	7,8 275,5	10,4 367,3	12,9 455,6	15,3 540,3	17,8 628,6	19,3 681,6	20,9 738,1	21,4 755,7	

<b>Cooling system</b>	<b>Rating</b>	<b>rpm</b>	<b>700</b>	<b>1200</b>	<b>1600</b>	<b>2000</b>	<b>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>
Radiated heat in percent of crankshaft power.	5	%				7	7	6	6	5	5	7
Heat rejection to charge air cooler in percent of crankshaft power.	5	%	2	5	9	13	13	14	17	17	15	15
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0	106	86	70	66	65	62	64	72	73
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min	45 1,6	80 2,8	109 3,8	138 4,9	165,9 5,9	195 6,9	221 7,8	250 8,8	275 9,7	283 10,0
Max. permissible temperature on coolant in engine outlet		°C °F	98 208									
Coolant volume engine, including heat exchanger		litres US gal.	8,7 2,30									
Max. additional coolant for cabin heater etc. with std. Expansion tank		litres US gal.	8 2,11									
Maximum coolant flow to cabin heater etc.		l/min cu.ft./min	20 0,71									
Thermostat, start open at		°C °F	80 176									
Thermostat, fully open at		°C °F	94 201									

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2) At power according to 1).

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4) Acc. to ISO 3744

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>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>
Nominal raw water design flow	l/min		27	46	61	76	89	102	114	124	134	136
	cu.ft/min		1,0	1,6	2,2	2,7	3,1	3,6	4,0	4,4	4,7	4,8
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa		19	26	36	48	62	77	93	109	125	130
	psi		2,8	3,8	5,2	7,0	9,0	11,2	13,5	15,8	18,1	18,9
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	8	12	17	22	28	30
	psi			0,1	0,4	0,7	1,2	1,7	2,5	3,2	4,1	4,4
Pressure drop over reverse gear oil cooler (optional equipment)	kPa		2	3	4	5	6	7	7	8	9	9
	psi		0,2	0,4	0,6	0,7	0,9	1,0	1,0	1,2	1,3	1,3
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>2400</b>	<b>2800</b>	<b>3200</b>	<b>3600</b>	<b>4000</b>	<b>4130</b>
Smoke at prop. load x <sup>2,5</sup>	5	*BSU		0,0	0,0	0,0	0,1	0,3	0,4	0,3	0,2	0,4	
Noise at prop. load x <sup>2,5</sup> . 4)	5	dBA		92	92	96	100	109	108	108	109	111	

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

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