

**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:	°	5
Max. intermittent forward inclination while running:	°	10
Max. intermittent backward inclination while running:	°	20
Max. intermittent side inclination while running:	°	20
Idling speed	rpm	700 - 750
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	12	24	39	87	115	132	152	159	162	162
		hp	16	33	53	119	156	179	206	217	220	220
Propeller shaft power 1) (At full load) With drive	5	kW	11	23	37	83	109	125	144	151	154	154
		hp	15	31	51	113	148	170	196	206	209	209
With reverse gear	5	kW	11	23	38	84	110	126	146	153	156	156
		hp	15	32	51	114	149	172	198	208	212	212
Propellershaft power at prop. load x <sup>2,5</sup>	5	kW	2	8	16	27	43	63	88	118	154	
		hp	3	10	21	37	58	86	120	161	209	
Torque at crankshaft 2)	5	Nm	158	193	234	417	456	449	453	423	387	374,6
		lbf ft	117	142	173	308	336	331	334	312	285	276
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	0,83	1,01	1,22	2,18	2,38	2,35	2,37	2,21	2,02	1,96
		psi	120,1	146,2	177,6	316,7	345,8	340,9	343,8	320,9	293,5	284,3
Max combustion pressure 2)	5	MPa	10,1	10,5	11,9	15,4	16,6	16,6	16,9	16,8	16,5	16,9
		psi	1465	1523	1726	2234	2408	2408	2451	2437	2393	2451

**Lubricating system**

Specific lubricating oil consumption.	g/kWh	0,3
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	2400	2800	3200	3600	4000	4130
Specific fuel consumption 2)	5	g/kWh lb/hph	342 0,55	248 0,4	250 0,4	224 0,36	208 0,34	210 0,34	219 0,35	234 0,38	241 0,39	245 0,398
Fuel consumption, Test cycle E5	5	g/kWh lb/hph	231 0,37									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h US gal/h	0,9 0,2	2,4 0,6	4,5 1,2	7,8 2,1	12,1 3,2	18,5 4,9	24,3 6,4	33,3 8,8	46,8 12,4	
Fuel consumption at full load	5	l/h US gal/h	4,8 1,3	7,2 1,9	11,7 3,1	23,5 6,2	28,6 7,6	33,2 8,8	39,8 10,5	44,8 11,8	46,9 12,4	47,7 12,6

Intake and exhaust system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Specific exhaust heating effect in percent of crankshaft power	5	%									90	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C °F									556 1033	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa psi								Max	30 4,4	
		kPa psi								Min	5 0,7	
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPa and relative humidity 30%.	5	m³/min cu.ft./min									11,7 413	
Charge air pressure Inlet manifold	5	kPa psi									293 42,5	
Exhaust gas flow	5	m³/min cu.ft./min									27,5 971	

Cooling system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Radiated heat in percent of crankshaft power.	5	%									7	
Heat rejection to charge air cooler in percent of crankshaft power.	5	%									23	
Coolant heat rejection to HE in percent of crankshaft power.	5	%									52	
Coolant flow with fully open thermostat and std cooling system		l/min cu.ft./min									270 9,5	
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				

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>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 cu.ft/min										131 4,6	
Nominal raw water pump pressure head at design flow. (measured before and after pump)	kPa psi										125 18,1	
Maximum raw water pump suction head	kPa psi	30 4,4										
Maximum additional pressure drop excl. reverse gear oil cooler and riser	kPa psi										28 4,1	
Pressure drop over reverse gear oil cooler (optional equipment)	kPa psi										9 1,3	
Maximum raw water temperature entering charge air cooler	°C °F	30 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	0,1	0,4	0,2	0,3	1,3	
Smoke at prop. load x <sup>3</sup>	5	*BSU		0,0	0,0	0,0	0,0	0,0	0,2	0,1	0,3	1,3	
Noise at prop. load x <sup>2,5</sup> . 4)	5	dBA		92	95	100	106	111	110	111	111	112	

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

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