

**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	11	25	46	61	74	86	98	103	103	103
		hp	15	34	62	83	100	116	134	140	140	140
Propeller shaft power 1) (At full load) With drive	5	kW	10	24	43	58	70	81	93	98	98	98
		hp	14	32	59	79	95	111	127	133	133	133
Propellershaft power at prop. load x <sup>2,5</sup>	5	kW	1	5	10	17	27	40	56	75	98	
		hp	2	7	13	24	37	55	76	102	133	
Torque at crankshaft 2)	5	Nm	148,7	198,9	272,8	291,3	293,2	291,9	293	273,2	245,9	238,2
		lbf ft	110	147	201	215	216	215	216	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	0,78	1,04	1,43	1,52	1,53	1,53	1,53	1,43	1,29	1,25
		psi	112,9	151,0	207,0	221,1	222,6	221,6	222,4	207,4	186,6	180,8
Max combustion pressure 2)	5	MPa	9,7	11,2	14,2	11,5	10,6	10,8	11,7	11,9	10,4	10,3
		psi	1407	1624	2060	1668	1537	1566	1697	1726	1508	1494

**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	2400	2800	3200	3600	4000	4130
Specific fuel consumption 2)	5	g/kWh	353	270	242	213	214	216	219	224	238	242
		lb/hph	0,572	0,437	0,392	0,345	0,347	0,35	0,355	0,363	0,386	0,392
Fuel consumption, Test cycle E5	5	g/kWh	245									
		lb/hph	0,40									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h	0,8	1,8	3,3	5,3	8,2	11,9	16,4	21,9	29,5	
		US gal/h	0,2	0,5	0,9	1,4	2,2	3,2	4,3	5,8	7,8	
Fuel consumption at full load	5	l/h	4,6	8,1	13,2	15,5	18,9	22,1	25,7	27,6	29,3	29,8
		US gal/h	1,2	2,1	3,5	4,1	5,0	5,8	6,8	7,3	7,7	7,9

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	%	64	69	66	62	66	70	72	78	89	92	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C	385	458	464	414	442	442	423	431	492	499	
		°F	725	856	867	777	828	828	793	808	918	930	
Permitted back pressure in the exhaust line at rated speed. (Installed back pressure)		kPa								Max	20		
		psi									2,9		
		kPa								Min	5		
		psi									0,7		

Intake and exhaust system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Engine air consumption at 25°C / 77°F atmospheric pressure 100kPA and relative humidity 30%.	5	m³/min	0,8	1,6	2,8	4,2	5	6,1	7,6	8,6	8,5	8,6
		cu.ft./min	28,25	56,5	98,88	148,3	176,6	215,4	268,4	303,7	300,2	303,7
Charge air pressure Inlet manifold	5	kPa	106	127	167	199	199	206	227	224	203	200
		psi	15,4	18,4	24,2	28,9	28,9	29,9	32,9	32,5	29,4	29,0
Exhaust gas flow	5	m³/min	1,9	4,2	7,4	9,9	12,2	14,4	16,7	18,3	19,6	19,9
		cu.ft./min	67,1	148,3	261,3	349,6	430,8	508,5	589,8	646,3	692,2	702,8

Cooling system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
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	10	13	13	14	17	18	16	15
Coolant heat rejection to HE in percent of crankshaft power.	5	%	0	106	86	80	76	74	73	74	81	82
Coolant flow with fully open thermostat and std cooling system		l/min	45	70	94	116	140	165	190	211	237	246
		cu.ft./min	1,6	2,5	3,3	4,1	4,9	5,8	6,7	7,5	8,4	8,7
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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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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