

**General**

4-stroke direct injected, turbocharged and aftercooled diesel engine

Number of cylinders		5
No of valves		20
Displacement, total	litres	2,40
	in <sup>3</sup>	146,5
Firing order		1-2-4-5-3
Rotational direction, viewed from the front		Clockwise
Bore	mm	81
	in	3,19
Stroke	mm	93,2
	in	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 + 50
Rated speed R5	rpm	4000
Rated speed R5	rpm	4000
	rpm	
Propeller selection range R5	rpm	3900-4130
Propeller selection range R5	rpm	3900-4130
	rpm	
Dry weight engine BT	kg	260
	lb	573

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

Performance	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Crankshaft power 1), 5)	5	kW	11	25	43	61	73	85	99	103	103	103
		hp	15	34	58	83	99	116	135	140	140	140
	5	kW	11	25	43	61	73	85	99	103	103	103
		hp	15	34	58	83	99	116	135	140	140	140
Propeller shaft power 1) (At full load) With drive	5	kW	10	24	41	58	69	81	94	98	98	98
		hp	14	32	56	79	94	110	128	133	133	133
With reverse gear	5	kW	10	24	41	59	70	82	95	99	99	99
		hp	14	33	56	80	95	111	129	134	134	134
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	
	5	kW	1	5	10	17	28	41	57	76	99	
		hp	2	7	14	24	37	55	77	103	134	
Torque at crankshaft 2)	5	Nm	148,7	198,9	256,6	291,3	290,5	289,9	295,4	273,2	245,9	238,2
		lbf ft	110	147	189	215	214	214	214	218	202	181
	5	Nm	148,7	198,9	256,6	291,3	290,5	289,9	295,4	273,2	245,9	238,2
		lbf ft	110	147	189	215	214	214	218	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	1,34	1,52	1,52	1,52	1,55	1,43	1,29	1,25
		psi	112,9	151,0	194,8	221,1	220,5	220,0	224,2	207,4	186,6	180,8
	5	MPa	0,78	1,04	1,34	1,52	1,52	1,52	1,55	1,43	1,29	1,25
		psi	112,9	151,0	194,8	221,1	220,5	220,0	224,2	207,4	186,6	180,8
Max combustion pressure 2)	5	MPa	10	11,3	13,2	11,1	10,7	10,9	11,7	11,9	10,5	11,2
		psi	1450	1639	1914	1610	1552	1581	1697	1726	1523	1624
	5	MPa	10	11,3	13,2	11,1	10,7	10,9	11,7	11,9	10,5	11,2
		psi	1450	1639	1914	1610	1552	1581	1697	1726	1523	1624

### 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

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Fuel system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Specific fuel consumption 2)	5	g/kWh	367	264	251	213	213	216	217	223	237,2	237
		lb/hph	0,595	0,428	0,407	0,345	0,345	0,35	0,352	0,361	0,384	0,384
	5	g/kWh	367	264	251	213	213	216	217	223	237	237
		lb/hph	0,595	0,428	0,407	0,345	0,345	0,35	0,352	0,361	0,384	0,384
Fuel consumption, Test cycle E5	5	g/kWh	244									
		lb/hph	0,40									
	5	g/kWh	244									
		lb/hph	0,40									
Fuel consumption at prop. load x <sup>2,5</sup>	5	l/h	0,7	1,8	3,2	5,3	8,2	11,7	16,2	21,7	29,3	
		US gal/h	0,2	0,5	0,9	1,4	2,2	3,1	4,3	5,7	7,8	
	5	l/h	0,7	1,8	3,2	5,3	8,2	11,7	16,2	21,7	29,3	
		US gal/h	0,2	0,5	0,9	1,4	2,2	3,1	4,3	5,7	7,8	

Fuel system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Fuel consumption at full load	5	l/h	4,8	7,9	12,9	15,6	18,6	22,0	25,7	27,5	29,2	29,2
		US gal/h	1,3	2,1	3,4	4,1	4,9	5,8	6,8	7,3	7,7	7,7
	5	l/h	4,8	7,9	12,9	15,6	18,6	22,0	25,7	27,5	29,2	29,2
		US gal/h	1,3	2,1	3,4	4,1	4,9	5,8	6,8	7,3	7,7	7,7

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	%									88	
	5										88	
Exhaust temperature at the exhaust pipe connecting flange after the turbo charger.	5	°C									490	
		°F									914	
	5	°C									490	
		°F									914	
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	m <sup>3</sup> /min									8,5	
		cu.ft./min									300,2	
	5	m <sup>3</sup> /min									8,5	
		cu.ft./min									300,2	
Charge air pressure Inlet manifold	5	kPa									201	
		psi									29,2	
	5	kPa									201	
		psi									29,2	
Exhaust gas flow	5	m <sup>3</sup> /min									19,6	
		cu.ft./min									692,2	
	5	m <sup>3</sup> /min									19,6	
		cu.ft./min									692,2	

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Cooling system	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130	
Radiated heat in percent of crankshaft power.	5	%									7		
	5										7		
Heat rejection to charge air cooler in percent of crankshaft power.	5	%									15		
	5										15		
Coolant heat rejection to HE in percent of crankshaft power.	5	%									63		
	5										63		
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	

Raw water circuit	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130	
Nominal raw water design flow	l/min cu.ft./min									131		
										4,6		
Nominal raw water pump pressure head at design flow.	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	

Emissions	Rating	rpm	700	1200	1600	2000	2400	2800	3200	3600	4000	4130
Smoke at prop. load x <sup>2.5</sup>	5	*BSU	0,0	0,0	0,0	0,1	0,1	0,1	0,2	0,2	0,4	
	5	*BSU	0,0	0,0	0,0	0,1	0,1	0,1	0,2	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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