

**General**

In-line four stroke diesel engine with direct injection. Rotation direction, anti-clockwise viewed towards flywheel. Turbocharged

Number of cylinders			6
Displacement, total		litre in <sup>3</sup>	7,15 436,0
Firing order			1-5-3-6-2-4
Bore		mm in	108 4,25
Stroke		mm in	130 5,12
Compression ratio			17
Dry weight	Engine only, excluding cooling system	kg lb	764 1684
	Including cooling system	kg lb	954 2103
Wet weight	Engine only, excluding cooling system	kg lb	788 1737
	GenPac	kg lb	1021 2251

**Performance**

		r/min	1500	1800
Standby Power	without fan	kW	250	263
		hp	340	357
	with fan	kW	241	247
		hp	328	336
Prime Power	without fan	kW	227	239
		hp	309	324
	with fan	kW	219	223
		hp	297	304
Torque at:	Standby Power	Nm	1592	1393
		lbft	1174	1027
	Prime Power	Nm	1447	1266
		lbft	1067	934
Mean piston speed		m/s	6,5	7,8
		ft/sec	21,4	25,7
Effective mean pressure at:	Standby Power	MPa	2,8	2,4
		psi	406	355
Effective mean pressure at:	Prime Power	MPa	2,5	2,2
		psi	369	323
Max combustion pressure at:	Standby Power	MPa	19,6	19,7
		psi	2843	2857
Max combustion pressure at:	Prime Power	MPa		
		psi		
Total mass moment of inertia, J (mR <sup>2</sup> )		kgm <sup>2</sup>	2,60	
		lbft <sup>2</sup>	61,7	
Degree of irregularity at:	Standby Power			
		Prime Power		
Friction Power		kW	17	23
		hp	22,576	31,552

**Derating**

NB! Describe derating according to engine control system's functionality.

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### Engine noise emission

Test Standards: ISO 3744-1981 (E) sound power (without fan, intake and exhaust noise)

Tolerance  $\pm 0.75$  dB(A)

		r/min	1500	1800
Measured sound power Lw	No load	dB(A)	99	104,5
	Standby Power	dB(A)	108,5	109,5
		dB(A)		
Calculated sound pressure Lp at 1 m	No load	dB(A)	87	89,5
	Standby Power	dB(A)	93,5	94,5
		dB(A)		

### Unsilenced exhaust noise

Data calculated as sound pressure Lp.

Assumed microphone distance 1 m

	r/min	1500	1800
Standby Power	dB(A)	116,7	118,2
	dB(A)		

### Test conditions for load acceptance data

Warm engine.	<b>Generator</b>	<b>Model</b>	<b>Type of AVR</b>
	mecc alte spa	ECO 38-2L/4	

Load acceptance performance can vary due to actual alternator inertia, voltage regulator, type of load and local ambient conditions.

### Single step load performance at 1500 rpm

Load (%)	Speed diff (%)		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby
0-20	2,3	2,6	1,5	1,4	30-100	8,3	-	2,0	-
0-40	4,2	4,7	1,5	1,5	40-100	6,3	6,2	1,5	3,3
0-50	5,1	6,9	1,5	1,7	50-100	4,7	5,3	1,5	3,0
0-60	7,8	10,0	2,0	2,1	60-100	4,0	4,5	1,0	2,5
0-70	11,9	16,9	2,5	3,1	70-100	3,3	3,5	0,5	2,0
0-80	17,7	21,7	3,5	3,6					
0-90	20,7	-	4,0	-					
100-0	7,7	8,3	2,0	2,0					

### Single step load performance at 1800 rpm

Load (%)	Speed diff %		Recovery time (s)		Remaining load (%)	Speed diff (%)		Recovery time (s)	
	Prime	Standby	Prime	Standby		Prime	Standby	Prime	Standby
0-20	1,7	1,8	1,0	1,0	20-100	8,0	8,7	3,1	3,5
0-40	2,8	2,9	1,5	1,3	40-100	4,1	5,2	2,3	3,0
0-50	3,9	4,1	1,4	1,6	60-100	2,9	2,9	1,3	2,0
0-60	4,5	5,3	1,4	1,6	80-100	2,3	2,3	1,0	1,8
0-70	6,3	7,7	1,7	2,0	90-100	0,9	1,0	1,0	1,0
0-80	7,7	9,2	2,0	2,0					
0-90	9,9	13,3	2,3	2,4					
100-0	5,8	6,5	2,0	2,0	0-100	12,1	16,0	2,3	3,9

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<b>Cold start performance</b>		r/min	1500	1800	
Time from start to no load speed at ambient temperature:	°C	20	s	6,6	7,6
		5	s	7,0	8,4
		-15*	s	10,5	12,0
Time from start to stay within 0.5% of no load speed at ambient temperature:	°C	20	s	6,0	7,0
		5	s	6,2	7,7
		-15*	s	9,6	11,5

\* With manifold heater kW engaged, lubrication oil 15W/40 and block heater.

Usage of manifold heater:	Time preheating, minutes	Time post heating, minutes		
Block heater type	Make	Power kW	Engaged hours	Cooling water temp engine block

<b>Lubrication system</b>		r/min	1500	1800
Lubricating oil consumption	Standby Power	litre/h US gal/h	0,03 0,008	0,03 0,008
	Prime Power	litre/h US gal/h		
Oil system capacity including filters		litre US gal	29 7,7	
Oil sump capacity:	max	litre US gal	24 6,3	
	min	litre US gal	20 5,3	
Oil change intervals/specifications:		h	500	
		h		
		h		
Engine angularity limits:	front up	°	10	
	front down	°	10	
	side tilt	°	10	
Oil pressure at rated speed		kPa psi	420 - 450 61 - 65	
Oil pressure shut down switch setting		kPa psi	100 15	
Lubrication oil temperature in oil sump:	max	°C	130	
		°F	266	
Oil filter micron size		μ	17,000	

\* See also general section in the sales guide

<b>Fuel system</b>		<b>r/min</b>	<b>1500</b>	<b>1800</b>
Specific fuel consumption at:	25%	g/kWh lb/hph	247 0,400	259 0,420
	50%	g/kWh lb/hph	235 0,381	239 0,387
	75%	g/kWh lb/hph	217 0,352	225 0,365
	100%	g/kWh lb/hph	205 0,332	207 0,336
<b>Prime Power</b> Specific fuel consumption at:	25%	g/kWh lb/hph	244 0,396	257 0,417
	50%	g/kWh lb/hph	233 0,378	237 0,384
	75%	g/kWh lb/hph	217 0,352	222 0,360
	100%	g/kWh lb/hph	204 0,331	205 0,332

<b>Fuel system</b>	<b>r/min</b>	<b>1500</b>	<b>1800</b>
Fuel to conform to	EN 590 / 2-D (US)		
System supply flow at:	litre/h	164,0	197,0
	US gal/h	43,3	52,0
Fuel supply line max restriction (rel.)	kPa	35,0	35,0
	psi	5,1	5,1
Fuel supply line max pressure, engine stopped	kPa	35,0	35,0
	psi	5,1	5,1
System return flow	litre/h	102,6	132,0
	US gal/h	27,1	34,9
Fuel return line max restriction (rel.)	kPa	50,0	50,0
	psi	7,3	7,3
Maximum allowable inlet fuel temp	°C	70	70
	°F	158	158
Prefilter / Water separator micron size	μ	10,000	
Fuel filter micron size	μ	5,000	
Governor type/make, standard	EMS II		
Injection pump type/make	EMS II		
Injection timing std.	°B.T.D.C	5	9
Injection timing	°B.T.D.C		

**Intake and exhaust system**

		r/min	1500	1800
Air consumption at:	Standby Power	m <sup>3</sup> /min cfm	16,3 576	18,9 667
	Prime Power	m <sup>3</sup> /min cfm	16,1 569	18,3 646
Max allowable air intake restriction including piping		kPa psi	3 0,4	3 0,4
Air filter type		?		
Air filter cleaning efficiency		%	?	
Heat rejection to exhaust at:	Standby Power	kW BTU/min	177 10066	189 10748
	Prime Power	kW BTU/min	160 9099	174 9895
Exhaust gas temperature after turbine at:	Standby Power	°C °F	550 1022	510 950
	Prime Power	°C °F	495 923	475 887
Max allowable back pressure in exhaust line		kPa psi	10,0 1,5	10,0 1,5
Exhaust gas flow at:	Standby Power	m <sup>3</sup> /min cfm	33,4 1180	37,9 1338
		m <sup>3</sup> /min cfm	33,0 1165	36,7 1296

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<b>Cooling system</b>		<b>r/min</b>	<b>1500</b>	<b>1800</b>
Heat rejection radiation from engine at:	Standby Power	kW	26	28
		BTU/min	1479	1592
	Prime Power	kW	24	25
		BTU/min	1365	1422
Heat rejection to coolant at:	Standby Power	kW	128	137
		BTU/min	7279	7791
	Prime Power	kW	117	124
		BTU/min	6654	7052
Coolant				
Radiator cooling system type	Closed circuit			
Standard radiator core area	m <sup>2</sup>		0,65	
	foot <sup>2</sup>		7,00	
Fan diameter	mm		870	
	in		34,25	
Fan power consumption	kW		8,8	15,2
	hp		12	21
Fan drive ratio	1			
Coolant capacity,	engine	litre	10	
		US gal	2,64	
	engine with std radiator and hoses	litre	32	
		US gal	8,45	
Coolant pump	drive/ratio		2,56	
Coolant flow with standard system	l/s		4,08	4,91
	US gal/s		1,08	1,30
Minimum coolant flow	l/s		3,6	4,4
	US gal/s		0,95	1,16
Maximum outer circuit restriction, including piping	kPa		33	45
	psi		5	7
Thermostat	start to open	°C	86	
		°F	187	
	fully open	°C	98	
		°F	208	
Maximum static pressure head (expansion tank height + pressure cap setting)	kPa		110	
	psi		16	
Minimum static pressure head (expansion tank height + pressure cap setting)	kPa		90	
	psi		13	
Standard pressure cap setting	kPa		100	
	psi		15	
Maximum top tank temperature	°C		109	
	°F		228	
Draw down capacity				

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<b>Charge air cooler system</b>		<b>r/min</b>	<b>1500</b>	<b>1800</b>
Heat rejection to charge air cooler	Standby Power	kW	48	55,3
		BTU/min	2730	3145
	Prime Power	kW	46,9	55,1
		BTU/min	2667	3133
	Continuous Standby Power	kW	44,8	53,4
		BTU/min	2548	3037
Charge air mass flow	Standby Power	kg/s	0,3	0,35
	Prime Power	kg/s	0,29	0,34
	Continuous Standby Power	kg/s	0,29	0,34
Charge air inlet temp. (Charge air temp after turbo compressor)	Standby Power	°C	207	205
		°F	405	401
	Prime Power	°C	198	199
		°F	388	390
Charge air outlet temp. (Charge air temp after intercooler)	Standby Power	°C	43	42
		°F	109	107
	Prime Power	°C	40	40
		°F	103	104
Maximum pressure droop over charge air cooler incl. piping		kPa	15	
		psi	2,18	
Charge air pressure 1500rpm (After charge air cooler)		kPa	250	
		psi	36,26	
Charge air pressure 1800rpm (After charge air cooler)		kPa	240	
		psi	34,81	
Standard charge air cooler core area		m <sup>2</sup>	0,41	
		foot <sup>2</sup>	4,41	

### Cooling performance

Cooling air flow and external restriction at different radiator air temperatures based on 109°C TTT and 50% antifreeze (radiator and cooling fan, see optional equipment) and sea level.

Engine speed rpm	Air on temp °C	PRIME POWER		STANDBY POWER	
		Air flow kg/s	External restriction Pa	Air flow kg/s	External restriction Pa
1500	58	3,8	410	3,9	350
	63	4,0	310	4,6	170
	67			5,2	0
	68	4,8	90		
	70	5,2	0		
1800	63	4,4	500	5,0	500
	68	5,1	460	5,6	230
	71	5,7	230	6,5	0
	74	6,5	0		

Note! Calculated values >0 Pa

**Engine management system**

Functionality	Alternatives	Default setting
Governor mode	Isochronous/droop switchable	Isochronous
Governor droop	1rpm/10Nm - 1rpm/127Nm	1rpm/25Nm
Governor response	NA	NA
Idle speed	550-800 rpm	600 rpm
Stop function	Energized to run / stop	Energized to stop
Preheating on ignition	ON/OFF*	OFF*
Lamp test	ON/OFF	ON

\* Option

**Engine protections**

Parameter	"Yellow lamp"	"Red lamp"	Derate 0 % to engine protection map	Derate 100% to engine protection map	Forced idle after 5sec	Forced shut down after 15sec]
Coolant temperature	110°C	114°C	114°C	114°C	>114°C	>114°C
Oil temperature	128°C	130°C	130°C	135°C		
High boost temp	75°C	80°C	80°C	85°C	>85°C	>85°C
Parameter	"Yellow lamp"	"Red lamp"	Derate 50 % to engine protection map		Forced idle after 5sec	Forced shut down after 15sec]
High boost pressure	380kpa	390kpa	390kpa		>395kpa	>395kpa
Parameter	"Yellow	"Red lamp"	Derate 70		Forced idle after	Forced shut
Low oil pressure	Limit	80kpa < limit	80kpa < limit		85kpa < limit	85kpa < limit

\* Off means no shut down, alarm only



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### Electrical system

r/min      1500      1800

Voltage and type		24V / insulated from earth	
Alternator:	make/output	Amp	100
	tacho output	Hz/alt. Rev	
	drive ratio		3
Starter motor	make	Melco	
	type	M008T62471	
	kW	5,0	
Number of teeth on:	flywheel	129	
	starter motor	10	
Inrush current at +20°C		Amp	1750
Cranking current at +20°C		Amp	400
Crank engine speed at 20°C		rpm	200
Starter motor battery capacity:	max	Ah	135
	min at +5°C	Ah	
Inlet manifold heater (at 20 V)		kW	
Power relay for the manifold heater		Amp	2

### Power take off

r/min      1500      1800

Front end in line with crank shaft max:		Nm	1200
		lbft	885
Front end belt pulley load. Direction of load viewed from flywheel side:	max left	kW	
		hp	
	max down	kW	
		hp	
	max right	kW	
		hp	
Timing gear at compressor PTO max:		Nm	187
		lbft	138
Speed ratio direction of rotation viewed from flywheel side		1,116 ccw	
Timing gear at servo pump PTO max:		Nm	
		lbft	
Speed ratio direction of rotation viewed from flywheel side			
Timing gear at hydraulic pump PTO max:		Nm	
		lbft	
Speed ratio direction of rotation viewed from flywheel side			
Max allowed bending moment in flywheel housing		Nm	1100
		lbft	811
Max. rear main bearing load		N	5000
		lbf	1124,0