

ALPHA SERIES

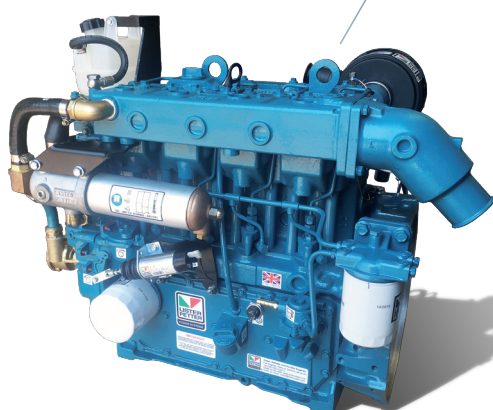
Alpha Marine Propulsion Engines

variable speed
full-load speed range 1500-3000r/min

6.8 - 37.5 kW | 9.7 - 50.3 bhp¹

20 | 22 | 30 | 33 | 40 | 43 | 50 Turbo

Alpha Marine Engine



OVERVIEW

The Alpha marine propulsion engine is specifically designed to suit for small offshore boats, work boats, pleasure craft and hire fleets. It is durable, reliable and easy to maintain with oil and filter changes up to 500 hours, dependent on operational conditions. It is designed for continuous operation in ambient temperature up to 52°C (122°F) and cold start capability down to -32°C (-25.6°F).

Note:

This engine does not comply with RCD-2 Recreational Craft Directive 2013/53/EU. Lister Petter Alpha Marine engines do not comply with Harmonised International Regulated emissions limits.

BASIC ENGINE CHARACTERISTICS

- 2, 3 or 4 cylinders
- raw water heat-exchanger cooling
- direct fuel injection
- naturally aspirated and turbocharged
- 4 cylinder
- low fuel consumption
- long service periods

STANDARD EQUIPMENT

- heat exchanger
- water cooled exhaust manifold
- fuel filter / agglomerator
- self-vent fuel system with fuel lift pump
- individual fuel injection pump for each cylinder
- high level oil filler and dipstick
- raw water cooling system pump
- operators' handbook (English)
- thermostatically controlled cooling system with belt driven raw water pump
- gear driven positive displacement type lubricating oil pump
- spin on full flow lubricating oil filter
- mechanical governing
- gearbox adaptor and drive plate to suit PRM150 or PRM280 (LPWT4) gearboxes
- cooling water header tank at gear end
- 12V 70 Amp insulated earth return alternator and 12V 2.0 kW starter motor with earthing solenoid as standard
- SAE5 flywheel housing
- oil pressure and coolant temperature switches and VDO gauge senders
- fuel control solenoid (energised to stop)
- skid base packing

OPTIONAL ITEMS

A range of options enables are available that allows you to select a specification that matches your requirements. Please consult you Lister Petter Power Systems distributor.

- keel cooling fittings
 - earth return electrics
 - 24V electrics
 - range of gearboxes (PRM, ZF or Techno Drive)
 - choice of air cleaners
 - high level bearers (wide or narrow options)
 - choice of engine control panels
 - range of gearbox mounting adaptors, and drive couplings
 - high output alternator
 - cooling water header tank mounted at flywheel end (not 50 Turbo)
 - anti-vibration mountings
 - sump lubricating oil drain pump (gear end or flywheel end mounting)
 - paint colour (standard is Peacock Blue)
- See end of TDS for some of the available options.

VARIABLE SPEED | POWER OUTPUTS TO ISO 3046¹

Speed, r/min	Power	20 - LPW2		22 - LPWX2	
		Gross		Gross	
		kWm	bhp	kWm	bhp
1500	Continuous	6.8	9.1	7.9	10.6
	Fuel stop	7.5	10.0	8.8	11.8
1800	Continuous	8.5	11.4	9.8	13.1
	Fuel stop	9.4	12.6	10.9	14.6
2000	Continuous	9.6	12.9	10.8	14.5
	Fuel stop	10.6	14.2	12.1	16.2
2500	Continuous	11.8	15.8	12.9	17.2
	Fuel stop	13.0	17.4	14.3	19.1
3000	Continuous	13.4	18.0	14.5	19.4
	Fuel stop	14.7	19.7	16.0	21.5
Speed, r/min	Power	30 - LPW3		33 - LPWX3	
		Gross		Gross	
		kWm	bhp	kWm	bhp
1500	Continuous	10.3	13.8	11.9	15.9
	Fuel stop	11.8	15.8	13.2	17.7
1800	Continuous	12.8	17.2	14.7	19.7
	Fuel stop	14.1	18.9	16.4	22.0
2000	Continuous	14.5	19.4	16.3	21.8
	Fuel stop	15.9	21.3	18.1	24.2
2500	Continuous	17.7	23.7	19.3	25.8
	Fuel stop	19.5	26.1	21.4	28.7
3000	Continuous	20.1	27.0	22.1	29.6
	Fuel stop	22.1	29.6	24.3	32.6
Speed, r/min	Power	40 - LPW4		43 - LPWX4	
		Gross		Gross	
		kWm	bhp	kWm	bhp
1500	Continuous	13.6	18.2	15.8	21.2
	Fuel stop	15.0	20.1	17.6	23.6
1800	Continuous	17.0	22.7	19.6	26.3
	Fuel stop	18.7	25.1	21.8	29.3
2000	Continuous	19.3	25.9	21.7	29.1
	Fuel stop	21.2	28.4	24.1	32.3
2500	Continuous	23.6	31.6	25.7	34.4
	Fuel stop	26.0	34.8	28.5	38.2
3000	Continuous	26.8	35.9	29.5	39.5
	Fuel stop	29.5	39.5	32.4	43.4
Speed, r/min	Power	50 - LPWT4			
		Gross			
		kWm	bhp		
1500	Continuous	18.9	25.3		
	Fuel stop	20.9	28.1		
1800	Continuous	24.2	32.4		
	Fuel stop	26.9	36.0		
2000	Continuous	26.3	35.2		
	Fuel stop	29.2	39.1		
2500	Continuous	31.0	41.5		
	Fuel stop	34.4	46.4		
3000	Continuous	33.7	45.2		
	Fuel stop	37.5	50.3		

Note:

1. Powers, measured at flywheel, are for variable speed builds. Fixed speed builds also available.

**RATING DEFINITIONS
TO ISO 3046****ISO Standard Conditions**

Barometric pressure 100 kPa

Relative humidity 30%

Ambient air temperature at the inlet manifold 25°C

Fixed Speed: Continuous Power (ICN)

The power in kW which the engine is capable of delivering continuously at the stated crankshaft speed, under ISO 3046 standard conditions, measured at the flywheel without power-absorbing accessories, provided that the engine is overhauled and maintained in good operating condition and that fuel to BS EN 590 Class A1 or A2, and lubricating oils to the correct performance specification and viscosity classification as recommended by Lister Petter Limited are used.

**Fixed Speed (Fuel Stop):
Overload Power (ICXN)**

The maximum power in kW which the engine is capable of delivering intermittently at the stated crankshaft speed for a period not exceeding one hour in any period of twelve hours of continuous running, immediately after working at the continuous power, under ISO 3046 standard conditions and with the provisions specified for continuous power in item (1) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

**Variable Speed (Fuel Stop):
Continuous Power (IFN)**

The maximum power in kW which the engine is capable of delivering continuously at the stated crankshaft speed, under ISO 3046 standard conditions, and with the provisions specified in item (1) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

**Variable Speed (Fuel Stop):
Overload Power (IOFN)**

The maximum power in kW which the engine is capable of delivering intermittently at the stated crankshaft speed for a period not exceeding one hour in any period of twelve hours of continuous running, immediately after working at the continuous power, under ISO 3046 standard conditions and with the provisions specified for continuous power in item (3) above, but with the fuel limited so that the fuel stop power cannot be exceeded.

Derating

For non-standard site conditions, reference should be made to relevant BS, ISO & DIN standards.

TORQUE							
Model	20	22	30	33	40	43	50
r/min	2000	1800	2000	1800	2000	1800	1800
Nm	51	58	76	87	102	86	151

TECHNICAL DATA								
Model		20	30	40	50 Turbo	22	33	43
Type of fuel injection		Direct						
Number of cylinders		2	3	4	4	2	3	4
Aspiration		Natural			Turbo-charged	Natural		
Direction of rotation (flywheel end)		Anti clockwise						
Nominal cylinder bore	mm	86.0	86.0	86.0	86.0	86.0	86.0	86.0
	in	3.39	3.39	3.39	3.39	3.39	3.39	3.39
Stroke	mm	80.0	80.0	80.0	80.0	86.0	86.0	86.0
	in	3.15	3.15	3.15	3.15	3.39	3.39	3.39
Total cylinder capacity	litre	0.930	1.395	1.860	1.860	0.999	1.499	1.998
	in ³	56.75	85.1	113.5	113.5	60.96	91.47	121.93
Compression ratio		18.5:1	18.5:1	18.5:1	16.2:1	19.5:1	19.5:1	19.5:1
Firing order (number 1 cylinder is at the gear end)		1-2	1-2-3	1-3-4-2	1-3-4-2	1-2	1-2-3	1-3-4-2
Off load idling speed		900	900	900	900	900	900	900
Minimum full load speed	r/min	1500	1500	1500	1500	1500	1500	1500
Number of flywheel ring gear teeth		96	96	96	96	96	96	96
Maximum continuous crankshaft end thrust	kgf	180	180	180	180	180	180	180
	lbf	400	400	400	400	400	400	400
Maximum permissible intake restriction at full rated speed and load	mbar	25	25	25	25	25	25	25
	in H ₂ O	10	10	10	10	10	10	10
Maximum permissible exhaust back pressure	mbar	75	75	75	50	75	75	75
	in H ₂ O	30	30	30	20	30	30	30
Lubricating oil pressure at 3000 r/min and with the oil at 110°C (230°F)	bar	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	lbf/in ²	29	29	29	29	29	29	29
Lubricating oil pressure at idle	bar	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	lbf/in ²	14.5	14.5	14.5	14.5	14.5	14.5	14.5
Maximum installation angle (gearbox down)		20°	20°	20°	20°	20°	20°	20°
Propeller rotation (viewed from the stern in forward gear)		Clockwise						

ENGINE EXHAUST SYSTEM DETAIL

Parameter	Engine Model						
	20	22	30	33	40	43	50 Turbo
Maximum allowed back pressure (kPa)	7.5						
Bosch smoke level at rated output	5.5						
Exhaust gas temperature, continuous (°C)	520	520	520	520	520	520	480
Exhaust gas temperature, overload (°C)	550	550	550	550	550	550	520
Exhaust pipe diameter - recommended O/D	48						

ENGINE NOISE LEVELS

Parameter	Engine Model						
	20	22	30	33	40	43	50 Turbo
Sound pressure level at 1m	≤ 92.9	≤ 92.8	≤ 92.3	≤ 92.3	≤ 95.2	≤ 94.9	≤ 88.0

ENGINE LUBRICATING OIL SYSTEM DETAIL

Parameter	Engine Model						
	20	22	30	33	40	43	50 Turbo
Lubrication method	Pressure						
Sump capacity (L)	3.0	3.0	3.8	3.8	5.5	5.5	5.5
Total capacity (L)	3.5	3.5	4.8	4.8	6.5	6.5	6.5
Oil filter type	Full flow paper element						
Oil consumption (g/kW h)	≤ 0.25						
Lubrication oil temperature (°C)	110 (max. 125)						
Lubrication oil pressure at running conditions (kPa)	100-450						
Oil pump type	Gear type						
Oil cooler type (where fitted)	Oil to water						
Maximum operation angle (degrees)	Front/rear - 30; Fuel pump up/down - 30						

ENGINE COOLANT DETAIL

Parameter	Engine Model						
	20	22	30	33	40	43	50 Turbo
Cooling method	Liquid cooled circulation by belt driven water pump						
Cooling package operating temperatures (°C)	88						
Total system coolant capacity (L)	5.6	5.6	7.0	7.0	7.5	7.5	7.5
Thermostat type	Wax capsule						
Thermostat opens at... (°C)	86						
Thermostat fully open at...(°C)	99						
Minimum temperature to engine (°C)	74						
Maximum static pressure head at pump (metres at 1500rpm)	4						

VARIABLE SPEED | APPROXIMATE FUEL CONSUMPTION | 100% LOAD

Speed, r/min	20		22		30		33	
	g/kWh	l/h	g/kWh	l/h	g/kWh	l/h	g/kWh	l/h
1500	224	2.0	245	2.3	261	3.2	261	3.7
1800	247	2.5	231	2.7	243	3.7	246	4.3
2000	219	2.5	223	2.9	220	3.8	232	4.5
2500	228	3.2	234	3.6	223	4.7	226	5.2
3000	245	3.9	243	4.2	247	5.9	243	6.4
Speed, r/min	40		43		50 Turbo			
	g/kWh	l/h	g/kWh	l/h	g/kWh	l/h		
1500	253	4.1	271	5.1	209	3.7		
1800	237	4.8	257	6.0	212	6.1		
2000	218	5.0	240	6.2	227	7.1		
2500	224	6.3	229	7.0	239	8.8		
3000	245	7.8	245	8.6	364	10.6		

OPTIONAL ACCESSORIES

As part of your marine engine package from Lister Petter, we can offer you a full range of optional accessories to enhance your engine. Upgrade options include control panels, alternators, gearboxes engine installation mounting arrangements, engine sump pumps and exhaust systems.

Please consult Lister Petter for full details.

Selectable flywheel end, low level mounted coolant expansion tank for ease of retro fit engine installations.

Note:

Standard engine variant supplied at gear end.

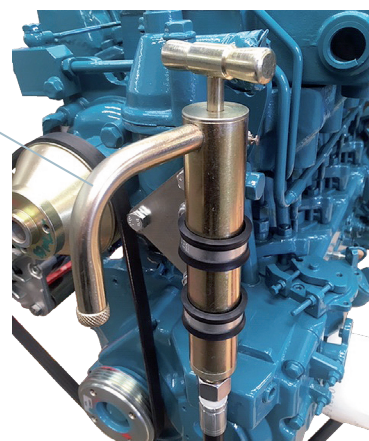
Dry exhaust manifold outlet fitting - CODE MNK

Note:

Standard engine variant supplied with water cooled outlet injection bend

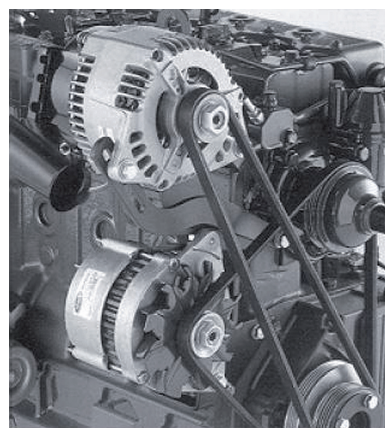
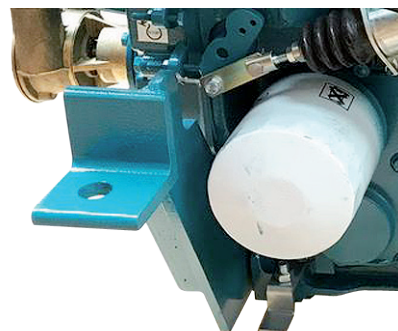
Engine lubricating oil service pump kit (optional)

- gear end shown – CODE MLF
- flywheel end – CODE MLD



Auxilliary Alternator

- 100A Insulated earth return auxiliary alternator

**Gear end option****Flywheel end option****Engine Mounting Bearers**

- gear end and flywheel end options
- narrow and wide fittings to aid installation

APPROXIMATE ENGINE MOUNTING BEARER DIMENSIONS

Model	Narrow Bearer Hole Centres (mm)		Wide Bearer Hole Centres (mm)	
	Length	Width	Length	Width
LPW/X2	377	410	378	572
LPW/X3	477		539	
LPW/X4	577		578	
LPWT4			644	

Lister Petter offers a comprehensive range of optional fitted gearboxes from PRM, ZF and Techno Drive. Please consult Lister Petter engineering for technical support with engine power train matching.

OPTIONAL GEARBOX DATA

(Pleasure / Light Commercial)

	Length	Dry weight	Oil capacity	Ratios
	mm	kg	litres	
PRM150	216	21	1.4	2.09:1 / 2.82:1
PRM280	293	48	1.85	1.96:1 / 2.94:1
ZF15M	193	13	0.6	1.56:1 / 1.87:1
TMC60P	225	14	0.65	2.00:1 / 2.45:1

Service Classification Definitions – Pleasure

Limited to craft used exclusively for pleasure boating; operation at full engine throttle should not exceed 5% of total time, with balance of usage at 90% of full throttle engine speed, or less. Maximum operation 500hrs per year.

Service Classification Definitions – Light Commercial

Lister Petter recommends that when considering gearbox selection for use in watercraft of whatever hull form for commercial use, that the duty cycle and gearbox are selected accordingly.

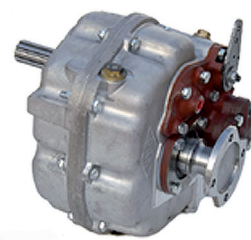
Important Notes:

It is essential for the engine, transmission model, reduction ratio and propeller size be correctly matched so that the engine can attain its rated speed appropriate to the relevant service classification without labouring.

It is also necessary to ensure the torsional compatibility of the complete propulsion system from the engine through to the propeller, since disregarding this may result in gear noise, particularly at low speed operation, and may result in engine and transmission damage

The responsibility for ensuring torsional compatibility rests with the assembler.

Lister Petter can accept no liability for gearbox noise or for damage to the engine, gearbox, the flexible coupling or to other parts of the transmission caused by this kind of vibrations.



PRM150



PRM280D



ZF15M



TMC60P

CONTROL PANELS

Intermediate engine control panel including:

- key starting
- switch engine stopping function
- tachometer with engine running hour recorder
- indicator and buzzer for low oil pressure, high engine temperature, engine alternator loss of charge
- pre-heat position for cold starting

Intermediate temperature and pressure gauge panel – for use with above

- engine temperature and oil pressure gauge panel
- simple plug wiring connection allows oil temperature and water temperature gauges to be retro fitted to the intermediate engine control panel

Delux engine control panel including:

- key starting
- switch engine stopping function
- tachometer with engine running hour recorder
- coolant temperature gauge
- oil pressure gauge
- voltmeter
- indicator and buzzer for low oil pressure, high engine temperature, engine alternator loss of charge
- pre-heat position for cold starting

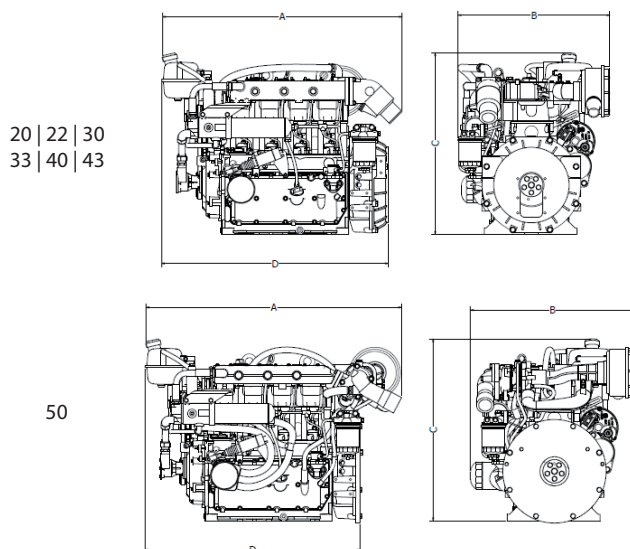


OPTIONAL ACCESSORIES

The installation is critical to ensure your engines performance and reliability are maintained throughout its lifetime operation. Lister Petter installation accessories comprise.

- control lever and cables
- fuel pre-filter and ISO hoses
- wet and dry exhaust systems
- engine mountings
- hot water engine calorifier connections
- battery leads

APPROXIMATE DIMENSIONS AND WEIGHT¹



		20/22	30/33	40/43	50 Turbo
Length A	mm	625	725	825	880
Length B	mm	522	522	522	565
Length C	mm	625	625	625	625
Width D	mm	580	680	780	740
Dry weight of engine	kg	150	180	210	230

Note: 1. The dimensions (mm) given are for guidance only and must not be used for installation purposes.

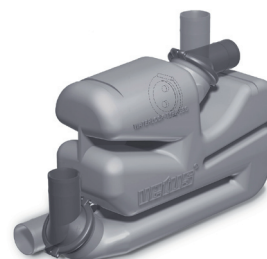
Exhaust bellows



Residential exhaust



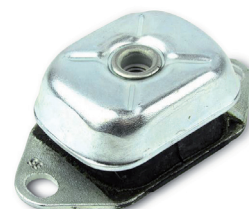
Vetus exhaust



Fuel pre-filter



Engine mounts



Images may vary from article supplied.



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MADE IN BRITAIN