ALPHA MAX SERIES

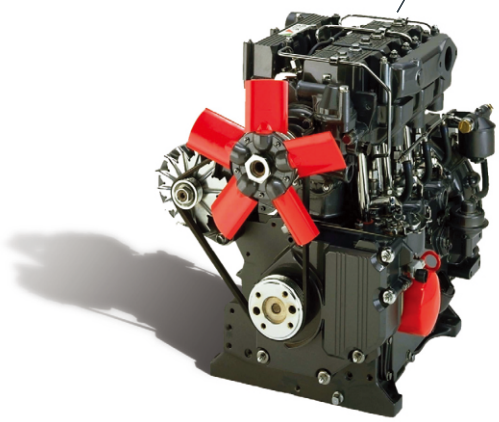
LPWX Liquid Cooled Engines

LPWX2 | LPWX3 | LPWX4

fixed speed | full-load speed range
1500 |1800 | 3000 | 3600 r/min
variable speed | full-load speed range
1500 - 3000 r/min

7.9 - 32.4 kW | 10.6 - 43.4 bhp [1]

LPWX4 Engine



OVERVIEW

The LPWX Series has been developed to deliver a compact, high power density engine with improved fuel consumption. Through development and use of the Lister Petter HRCS advanced combustion system additional attributes have also been achieved. These combine to give a smoother, quieter and more powerful engine coupled with our world famous reliability.

SPECIAL ATTRIBUTES

- LP-HRCS (High Re-Entrant Combustion System)
- multi-hole fuel injection system
- hydro-honed injector hole conditioning
- increased power density
- reduced fuel consumption and noise
- 500-hour service intervals
- designed for continuous operation in ambient temperatures up to 52°C (122°F)
- cold start capability down to -32°C (-25.6°F)

Note:
This engine does not comply with Harmonised International Regulated Emissions Limits.

BASIC ENGINE CHARACTERISTICS

- diesel fuelled and approved for operation on biodiesel, that conforms with ASTM D6751 and EN14214, concentrations of up to 20%
- direct injection
- 2, 3 or 4 cylinders
- liquid cooled
- naturally aspirated

DESIGN FEATURES AND EQUIPMENT

- heavy duty air cleaner *
- Polyvee fan/alternator drive belt *
- inlet and exhaust manifolds *
- inlet manifold heater plugs
- fuel lift pump
- self-vent fuel system with individual fuel injection pumps
- fuel filter/agglomerator
- gear-driven positive displacement type lubricating oil pump
- spin-on lubricating oil fi lter
- 12V starter motor *
- 12V battery charge alternator *
- safety switches *
- fuel control solenoid (energised to run) *
- mechanical governing
- radiator with fan and belt guard *
- flywheel with ring gear
- SAE 5 flywheel housing (SAE 4 optional)
- standard skid base packing
- operators' handbook

OPTIONAL ITEMS

- oil cooler
- 24V electrics
- deep sump

See also items with asterisk under Design Features and Equipment. A range of options allows you to select a specification that matches your requirements; please consult your Lister Petter distributor.

* Optional items standard on most builds

VARIABLE SPEED | POWER OUTPUTS TO ISO3046

Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX2	1500	Continuous	7.9	10.6	7.8	10.4
		Fuel stop	8.8	11.8	8.7	11.6
	1800	Continuous	9.8	13.1	9.6	12.8
		Fuel stop	10.9	14.6	10.7	14.3
	2000	Continuous	10.8	14.5	10.5	14.1
		Fuel stop	12.1	16.2	11.8	15.8
	2200	Continuous	11.7	15.7	11.3	15.2
		Fuel stop	13.0	17.5	12.6	16.9
	2500	Continuous	12.9	17.2	12.3	16.5
		Fuel stop	14.3	19.1	13.7	18.4
	2800	Continuous	13.5	18.1	12.6	16.9
		Fuel stop	14.9	20.0	14.0	18.8
	3000	Continuous	14.5	19.4	13.3	17.8
		Fuel stop	16.0	21.5	14.8	19.8
Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX3	1500	Continuous	11.9	15.9	11.8	15.8
		Fuel stop	13.2	17.7	13.1	17.5
	1800	Continuous	14.7	19.7	14.5	19.4
		Fuel stop	16.4	22.0	16.2	21.7
	2000	Continuous	16.3	21.8	16.0	21.5
		Fuel stop	18.1	24.2	17.8	23.9
	2200	Continuous	17.6	23.6	17.2	23.1
		Fuel stop	19.5	26.2	19.1	25.6
	2500	Continuous	19.3	25.8	18.7	25.1
		Fuel stop	21.4	28.7	20.8	27.9
	2800	Continuous	20.3	27.1	19.4	26.0
		Fuel stop	22.4	30.0	21.5	28.8
	3000	Continuous	22.1	29.6	20.9	28.0
		Fuel stop	24.3	32.6	23.1	31.0
Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX4	1500	Continuous	15.8	21.2	15.7	21.0
		Fuel stop	17.6	23.6	17.5	23.4
	1800	Continuous	19.6	26.3	19.4	26.0
		Fuel stop	21.8	29.3	21.6	28.9
	2000	Continuous	21.7	29.1	21.4	28.7
		Fuel stop	24.1	32.3	23.8	31.9
	2200	Continuous	23.4	31.4	23.0	30.8
		Fuel stop	26.0	34.9	25.6	34.3
	2500	Continuous	25.7	34.4	25.1	33.7
		Fuel stop	28.5	38.2	27.9	37.4
	2800	Continuous	27.0	36.1	26.1	35.0
		Fuel stop	29.9	40.0	29.0	38.9
	3000	Continuous	29.5	39.5	28.3	38.0
		Fuel stop	32.4	43.4	31.2	41.8

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 specifi ed 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.

FIXED SPEED | POWER OUTPUTS TO ISO3046

Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX2	1500	Continuous	8.6	11.5	8.2	11.0
		Fuel stop	9.4	12.6	9.0	12.1
	1800	Continuous	10.6	14.2	10.0	13.4
		Fuel stop	11.6	15.5	10.9	14.6
	3000	Continuous	14.7	19.7	13.5	18.1
		Fuel stop	16.1	21.6	14.9	20.0
	3600	Continuous	14.5	19.4	12.4	16.6
		Fuel stop	16.0	21.5	13.9	18.6
Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX3	1500	Continuous	12.9	17.3	12.5	16.7
		Fuel stop	14.1	18.9	13.7	18.4
	1800	Continuous	15.8	21.2	15.2	20.4
		Fuel stop	17.0	22.8	16.7	22.4
	3000	Continuous	22.1	29.6	20.9	28.0
		Fuel stop	24.3	32.6	23.1	30.9
	3600	Continuous	21.5	28.8	19.4	26.0
		Fuel stop	23.7	31.8	21.6	28.9
Model	Speed, r/min	Power	Gross		Net	
			kWm	bhp	kWm	bhp
LPWX4	1500	Continuous	16.9	22.6	16.5	22.1
		Fuel stop	18.5	24.8	18.1	24.3
	1800	Continuous	20.9	28.0	20.3	27.2
		Fuel stop	23.0	30.8	22.4	30.0
	3000	Continuous	29.5	39.5	28.3	37.9
		Fuel stop	32.4	43.4	31.2	41.8
	3600	Continuous	28.0	37.5	25.9	34.7
		Fuel stop	30.8	41.3	28.7	38.5

VARIABLE SPEED | TORQUE

Model		1500	1800	2000	2200	2500	2800	3000
LPWX2	Nm	56	58	57	57	55	51	51
	lbf ft	41	43	42	42	40	37	38
LPWX3	Nm	84	87	86	85	82	77	77
	lbf ft	62	65	64	62	60	56	57
LPWX4	Nm	112	116	115	113	109	102	103
	lbf ft	83	86	85	83	80	75	76

Note:
Engines operating at 3600r/min are offered for standby duty only.
For further information and approval please contact Applications Department

1. Power ratings measured at the flywheel and fuel consumptions, apply to a fully run-in, non derated engine without a radiator and fan fi tted and other power absorbing accessories or transmission equipment.
2. The overload (intermittent) capability applies to a fully run-in engine.
This is normally attained after a running period of about 50 hours.

VARIABLE SPEED | APPROXIMATE FUEL CONSUMPTION | 100% LOAD

Speed, r/min	LPWX2		LPWX3		LPWX4	
	g/kWh	l/h	g/kWh	l/h	g/kWh	l/h
1500	245	2.3	261	3.7	271	5.1
1800	231	2.7	246	4.3	257	6.0
2000	223	2.9	232	4.5	240	6.2
2500	234	3.6	226	5.2	229	7.0
3000	243	4.2	243	6.4	245	8.6

TECHNICAL DATA

Model		LPWX2	LPWX3	LPWX4
Type of fuel injection		Direct	Direct	Direct
Number of cylinders		2	3	4
Aspiration		Natural	Natural	Natural
Direction of rotation (flywheel end)		Anti clockwise	Anti clockwise	Anti clockwise
Nominal cylinder bore	mm	86.0	86.0	86.0
	in	3.39	3.39	3.39
Stroke	mm	86.0	86.0	86.0
	in	3.39	3.39	3.39
Total cylinder capacity	litre	0.999	1.499	1.998
	in^3	60.96	91.47	121.93
Compression ratio		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
Number of flywheel ring gear teeth		96	96	96
Maximum continuous crankshaft end thrust	kgf	180	180	180
	lbf	400	400	400
Maximum permissible intake restriction at full rated speed and load	mbar	25	25	25
	in H_2O	10	10	10
Maximum permissible exhaust back pressure	mbar	75	75	75
	in H_2O	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
	lbf/in^2	29	29	29

ENGINE EXHAUST SYSTEM DETAIL

Parameter	Engine Model		
	LPWX2	LPWX3	LPWX4
Maximum allowed back pressure (kPa)	7.5		
Bosch smoke level at rated output	5.5		
Exhaust gas temperature, continuous (°C)	520	520	520
Exhaust gas temperature, overload (°C)	550	550	550
Exhaust pipe diameter - recommended O/D	48		

ENGINE NOISE LEVELS

Parameter	Engine Model		
	LPWX2	LPWX3	LPWX4
Sound pressure level at 1m	≤ 92.8	≤ 92.3	≤ 94.9

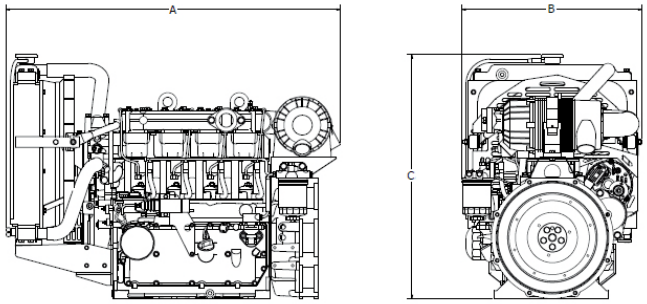
ENGINE LUBRICATING OIL SYSTEM DETAIL

Parameter	Engine Model		
	LPWX2	LPWX3	LPWX4
Lubrication method	Pressure		
Sump capacity (L)	3.0	3.8	5.5
Total capacity (L)	3.5	4.8	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		
	LPWX2	LPWX3	LPWX4
Cooling method	Liquid cooled circulation by belt driven water pump		
Cooling package operating temperatures (°C)	88		
Total system coolant capacity (L)	5.6	7.0	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		

APPROXIMATE DIMENSIONS AND WEIGHT



		LPWX2	LPWX3	LPWX4
Dry weight	kg	112	150	180
	lb	247	330	396
Length (A)	mm	699	809	909
	in	27.5	31.9	35.8
Width (B)	mm	512	512	512
	in	20.2	20.2	20.2
Height (C)	mm	647	685	685
	in	25.5	27.0	27.0

TYPICAL PACKING CASE DIMENSIONS

Packing case dimensions					Container quantities	
Engine	Length (mm)	Width (mm)	Height (mm)	Gross weight (kg)	20ft	40ft
LPWX2	770	550	850	175	56	120
LPWX3	880			205	48	104
LPWX4	1020			240	40	88

Head Office
Lister Petter Engine Company Limited
Rutland House, Minerva Business Park,
Lynch Wood, Peterborough, PE26PZ.
T:+44(0)1778 394091

enquiry@listerpetter.com
www.listerpetter.com

MADE IN BRITAIN