LP Water Pump Engines

LISTER PETTER

LP SERIES
BUILT ON A LEGACY, FOCUSED ON THE FUTURE

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

6.8 - 34.0 kW | 9.1 - 45.6 bhp [1]

LP Water Pump Engine

OVERVIEW

The **LP Series Water Pump Engines** are specifically designed as a pump spec engine, suitable for use in industrial, municipal, agricultural water supply and irrigation pumps.
Proven durability, reliability and easy to maintain with oil and filter changes up to 500 hours, dependant on operational conditions. It is designed for continuous operation in ambient temperatures up to 52°C (122°F) and a cold start capability down to -32°C (-25.6°F).

BASIC ENGINE CHARACTERISTICS

- diesel fuelled and approved for operation on biodiesel, that conforms with ASTM D6751 and EN14214, concentrations of up to 20%
- direct fuel injection
- 2, 3 or 4 cylinders
- liquid cooled
- naturally aspirated or turbocharged (LPWT4)

DESIGN FEATURES AND EQUIPMENT

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

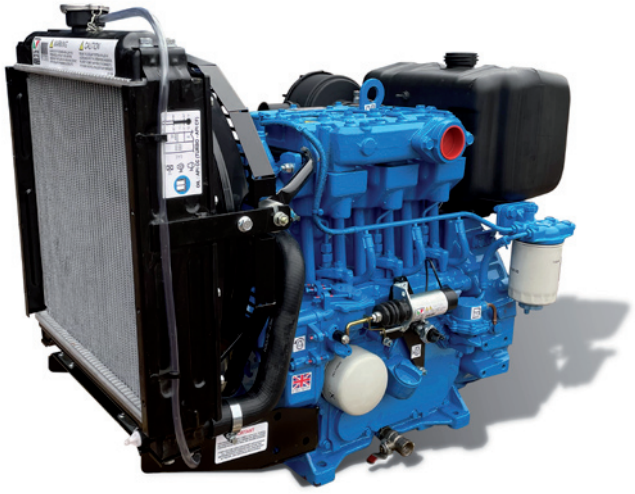
OPTIONAL ITEMS

- radiator options with choice of pusher or puller fan and full guarding
- oil cooler
- 24V electrics
- increased oil sump capacity (deep sump)

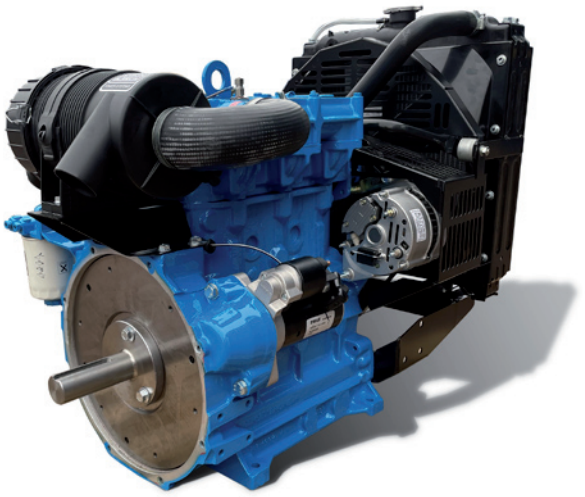
Note:
These engines do not comply with Harmonised International Regulated Emissions Limits.
* Optional items; ** Other paint finishes are available

LPW3P3000VSC | 20.1 kWm IFN

LPW4P3000VSC | 26.8 kWm IFN

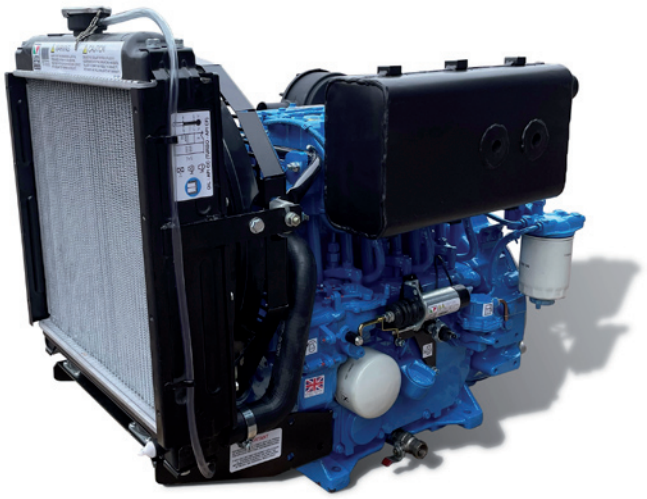


LPW3P3000VSC-FB | 20.1 kWm IFN
Including fuel tank



LPW3P3000VSC-BA | 20.1 kWm IFN
Including driveshaft

LPWX3P3000VSC-HXNA | 22.1 kWm IFN
Including exhaust silencer and hydraulic coupling



LPW3P3000VSC-NA | 20.1 kWm IFN
Including exhaust silencer

Note: Images shown are for reference only.
A fully detailed breakdown confirming the exact scope of supply is provided within our sales quotation, and acknowledgment.

VARIABLE SPEED POWER - ISO3046 CONTINUOUS RATING (IFN)

Model	Output	r/min	1500	1800	2000	2200	2500	2800	3000
LPW2	Gross	kWm	6.8	8.5	9.6	10.5	11.8	12.9	13.4
		bhp	9.1	11.4	12.9	14.1	15.8	17.3	18.0
	Net	kWm	6.2	7.7	8.7	9.5	10.6	11.4	11.8
		bhp	8.3	10.3	11.7	12.8	14.1	15.3	15.8
LPWX2	Gross	kWm	7.9	9.8	10.8	11.7	12.9	13.9	14.5
		bhp	10.6	13.1	14.5	15.8	17.3	18.7	19.5
	Net	kWm	7.3	9.0	9.9	10.7	11.7	12.5	12.9
		bhp	9.8	12.1	13.3	14.4	15.6	16.7	17.3
LPW3	Gross	kWm	10.3	12.8	14.5	15.8	17.7	19.3	20.1
		bhp	13.8	17.2	19.4	21.2	23.7	25.9	27.0
	Net	kWm	9.7	12.0	13.6	14.8	16.4	17.9	18.5
		bhp	13.0	16.1	18.2	19.9	22.1	24.0	24.8
LPWX3	Gross	kWm	11.9	14.7	16.3	17.7	19.5	21.1	22.1
		bhp	16.0	19.7	21.9	23.7	26.2	28.3	29.6
	Net	kWm	11.3	13.9	15.4	16.7	18.3	19.7	20.5
		bhp	15.2	18.6	20.6	22.4	24.5	26.4	27.5
LPW4	Gross	kWm	13.6	17.0	19.3	21.1	23.6	25.7	26.8
		bhp	18.2	22.8	25.9	28.3	31.6	34.5	35.9
	Net	kWm	13.0	16.2	18.4	20.1	22.3	24.3	25.2
		bhp	17.4	21.7	24.7	27.0	30.0	32.6	33.8
LPWX4	Gross	kWm	15.8	19.6	21.7	23.5	25.9	28.1	29.5
		bhp	21.2	26.3	29.1	31.5	34.8	37.7	39.6
	Net	kWm	15.2	18.8	20.8	22.5	24.7	26.6	27.9
		bhp	20.4	25.2	27.9	30.2	33.1	35.7	37.4
LPWT4	Gross	kWm	18.9	24.2	26.4	28.6	31.0	32.8	34.0
		bhp	25.3	32.4	35.4	38.3	41.6	44.0	45.6
	Net	kWm	18.3	23.4	25.5	27.6	29.7	31.4	32.4
		bhp	24.5	31.4	34.2	37.0	39.9	42.1	43.5

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.

VARIABLE SPEED TORQUE - ISO3046 CONTINUOUS POWER (IFN)

Model		1500	1800	2000	2200	2500	2800	3000
LPW2	Nm	43.3	45.1	45.8	45.7	45.1	43.9	42.7
	lbf ft	31.9	33.3	33.8	33.7	33.2	32.4	31.5
LPWX2	Nm	50.3	52.0	51.6	51.0	49.3	47.5	46.2
	lbf ft	37.1	38.3	38.0	37.6	36.3	35.0	34.0
LPW3	Nm	65.6	67.9	69.2	69.0	67.6	65.6	64.0
	lbf ft	48.4	50.1	51.1	50.9	49.9	48.4	47.2
LPWX3	Nm	75.8	78.0	77.8	76.8	73.8	72.0	70.3
	lbf ft	55.9	57.5	57.4	56.6	54.4	53.1	51.9
LPW4	Nm	86.6	90.2	92.1	91.6	90.1	88.0	85.3
	lbf ft	63.9	66.5	68.0	67.6	66.5	64.9	62.9
LPWX4	Nm	100.6	104.0	103.6	102.0	98.2	95.8	93.9
	lbf ft	74.2	76.7	76.4	75.2	72.4	70.7	69.3
LPWT4	Nm	120.3	128.3	126.0	124.0	118.4	112.0	107.3
	lbf ft	88.7	94.6	92.9	91.5	87.3	82.6	79.1

VARIABLE SPEED I APPROXIMATE FUEL CONSUMPTION I 100% LOAD (IFN)

Model	r/min	1500	1800	2000	2200	2500	2800	3000
LPW2	g/kWh	234.6	227.3	223.3	223.4	227.8	234.9	244.5
	l/h	1.9	2.3	2.6	2.8	3.2	3.6	3.9
LPWX2	g/kWh	244.5	233.1	229.2	227.3	229.7	237.0	243.1
	l/h	2.3	2.7	3.0	3.2	3.5	3.9	4.2
LPW3	g/kWh	228.2	223.1	220.2	219.7	223.1	234.7	246.5
	l/h	2.8	3.4	3.8	4.1	4.7	5.4	5.9
LPWX3	g/kWh	261.0	239.9	230.9	226.0	223.9	232.8	243.4
	l/h	3.7	4.2	4.5	4.8	5.2	5.9	6.4
LPW4	g/kWh	234.6	227.3	223.0	221.3	224.3	234.9	244.5
	l/h	3.8	4.6	5.1	5.6	6.3	7.2	7.8
LPWX4	g/kWh	260.5	244.2	236.9	232.3	230.1	236.2	244.9
	l/h	4.9	5.7	6.1	6.5	7.1	7.9	8.6
LPWT4	g/kWh	217.8	208.4	210.1	217.6	230.3	248.1	261.7
	l/h	4.9	6.0	6.6	7.4	8.5	9.7	10.6

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

Power Standards

The engine performance corresponds to ISO 3046, BS 5514 and DIN 6271. The technical data applies to an engine without cooling fan and operating on a fuel with calorific value of 42.7 MJ/kg (18360 BTU/lb) and a density of 0.84 kg/litre (7.01 lb/US gal, 8.42 lb/Imp gal).

Notes:
1. Power ratings measured at the flywheel and fuel consumptions apply to a fully run-in, non derated engine without a radiator and fan fitted, and without 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.
3. Excluding radiator.

TECHNICAL DATA

Model		LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
Type of fuel injection		Direct	Direct	Direct	Direct	Direct	Direct	Direct
Number of cylinders		2	2	3	3	4	4	4
Aspiration		Natural	Natural	Natural	Natural	Natural	Natural	Turbocharged
Direction of rotation (flywheel end)		Anti clockwise	Anti clockwise	Anti clockwise	Anti clockwise	Anti clockwise	Anti clockwise	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	86.0	80.0	86.0	80.0	86.0	80.0
	in	3.15	3.39	3.15	3.39	3.15	3.39	3.15
Total cylinder capacity	litre	0.930	0.999	1.395	1.499	1.860	1.998	1.860
	in^3	56.75	60.96	85.13	91.47	113.5	121.93	113.5
Compression ratio		18.5:1	19.5:1	18.5:1	19.5:1	18.5:1	19.5:1	16.2:1
Firing order (number 1 cylinder is at the gear end)		1 - 2	1 - 2	1 - 2 - 3	1 - 2 - 3	1 - 3 - 4 - 2	1 - 3 - 4 - 2	1 - 3 - 4 - 2
Minimum idling speed		Dependent on build						
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
Gear end power take-off (subject to Lister Petter Power Systems approval) - maximum inline	kw	12	12	12	12	12	12	12
	bhp	16	16	16	16	16	16	16
- maximum side load using a drive belt	kw	8.0	8.0	8.0	8.0	8.0	8.0	8.0
	bhp	10.7	10.7	10.7	10.7	10.7	10.7	10.7
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_2O	10	10	10	10	10	10	10
Maximum permissible exhaust back pressure	mbar	75	75	75	75	75	75	50
	in H_2O	30	30	30	30	30	30	20
Lubricating oil pressure at 3000r/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

ENGINE EXHAUST SYSTEM DETAIL

Parameter	Engine Model						
	LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
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						
	LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
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						
	LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
Lubrication method	Pressure						
Sump capacity (L)	3.0	3.0	3.8	3.8	5.5		
Total capacity (L)	3.5	3.5	4.8	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

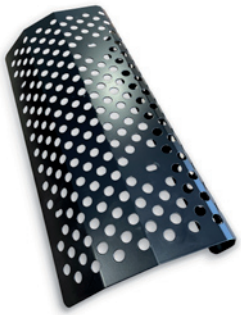
Parameter	Engine Model						
	LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
Cooling method	Liquid cooled circulation by belt driven water pump						
Cooling package operating temperatures (°C)	88						
Total system coolant capacity (L)	5.6		7.0		7.5		
Thermostat type	Wax capsule						
Thermostat opens at... (°C)	86						
Thermostat fully open at…(°C)	99						
Minimum temperature to engine (°C)	74						
Maximum static pressure head at pump (metres at 1500rpm)	4						

OPTIONAL ACCESSORIES

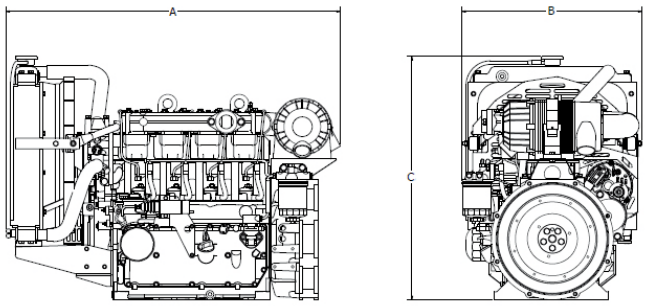
The installation is critical to ensure your engines performance and reliability being maintained throughout its lifetime operation.
As part of your engine package from Lister Petter, we can offer you a full range of optional accessories to enhance your engines installation.
Please consult Lister Petter for full details.

Basic installation accessories comprise, but not limited to:

- Control lever and cables
- Fuel pre-filter and ISO hoses
- Engine mountings
- Battery leads
- Exhaust systems
- Lubricating oil drain pumps
- Service kits

			
(NA) Industrial exhaust silencer	**(NL)** Exhaust silencer guard	**(NH)** Tail pipe - 90 degrees	**(KC)** Engine speed control - friction lever
			
(INSTRUMENT GAUGES) Please consult Lister Petter	**(WCE)** Electric start panel	**(EM)** 24V starter motor	**(EN)** 24V alternator
			
Service Kits 500, 1000, 2000, 4000 & 6000 hrs	**(BA)** Drive shaft - 40 mm	**(FLYWHEEL COUPLINGS)** Please consult Lister Petter	**(GV)** Radiator screen guard

APPROXIMATE DIMENSIONS AND WEIGHT



		LPW2	LPWX2	LPW3	LPWX3	LPW4	LPWX4	LPWT4
Dry weight	kg	112	112	150	150	180	180	186
	lb	247	247	330	330	396	396	409
Length (A)	mm	699	699	809	809	909	909	999
	in	27.5	27.5	31.9	31.9	35.8	35.8	39.3
Width (B)	mm	512	512	512	512	512	512	512
	in	20.2	20.2	20.2	20.2	20.2	20.2	20.2
Height (C)	mm	647	647	685	685	685	685	685
	in	25.5	25.5	27.0	27.0	27.0	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
LPW2	770	550	850	175	56	120
LPWX2	770			175	56	120
LPW3	880			205	48	104
LPWX3	880			205	48	104
LPW4	1020			240	40	88
LPWX4	1020			240	40	88
LPWT4	1020	670		255	30	66

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