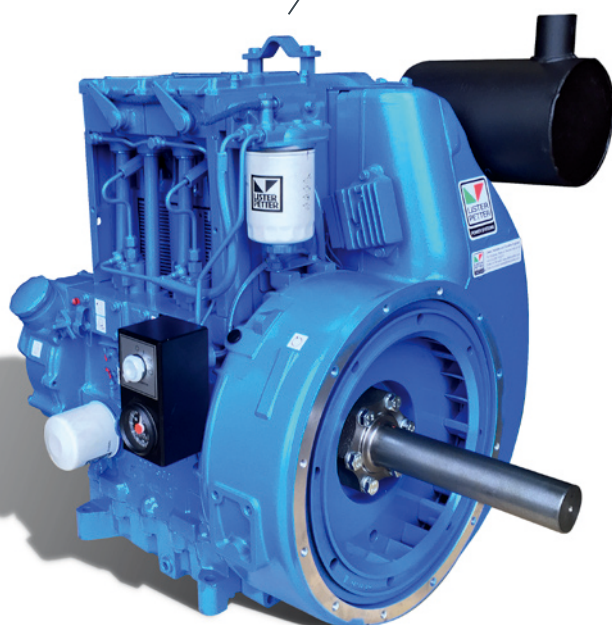


TR Water Pump Engines



TR Water Pump Engine



variable speed
1500 - 2500 r/min

4.1 - 25.9 kW | 5.5 - 34.7 bhp

OVERVIEW

Lister Petter has been closely associated with the pump industry for decades. The TR series legendary performance and reliability powers industrial, municipal, agricultural water supply and irrigation pumps produced from some of the world's leading pump manufactures.

Available with both hand and electric start options, making the TR series the perfect platform for OEMs, packagers and end users water conveying needs.

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
- 1, 2 or 3 cylinders
- air cooled
- naturally aspirated
- designed for continuous operation in ambient temperatures up to 40°C (104°F)

DESIGN FEATURES AND EQUIPMENT

- medium duty air cleaner *
- inlet and exhaust manifolds *
- self-vent fuel system with individual fuel injection pumps
- fuel filter and mechanical fuel lift pump *
- self-regulating plunger type lubricating oil pump
- spin-on lubricating oil filter
- decompressor levers *
- flywheel
- flywheel housing with SAE4 flange *
- 250 hour service intervals
- mechanical governing:
 - variable speed 900-2500 r/min
- 40mm flywheel mounted driveshaft
- engine mounted exhaust silencer
- engine starting handle *
- Cobalt Blue paint finish **
- operators' handbook (English) *

OPTIONAL ITEMS

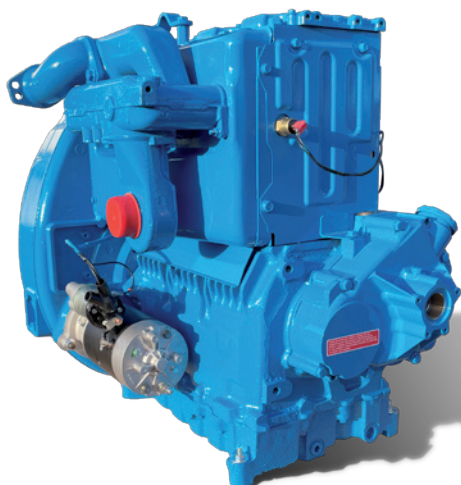
- 12V/24V electric start and battery charge windings ¹
- starting panels and instrumentation gauges
- engine temperature and pressure protection switches and solenoids
- heavy duty cyclonic air cleaner
- 13.5 litre engine mounted fuel tank

A range of options allows you to select a specification that matches your requirements, please consult your Lister Petter distributor.

¹ 12V charge windings only

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

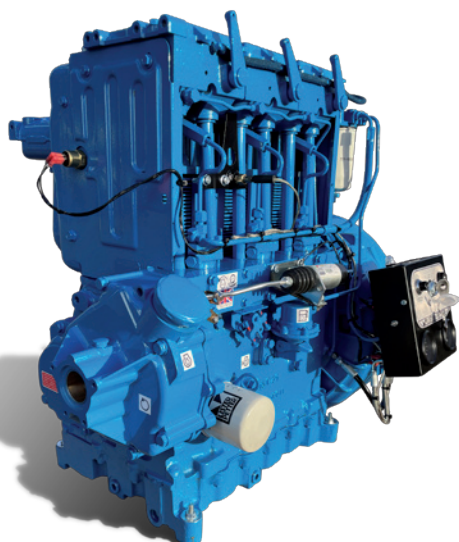
* Optional items; ** Other paint finishes are available



TR3P2500VSC-EB | 25.9 kWm IFN
Including engine starting handle



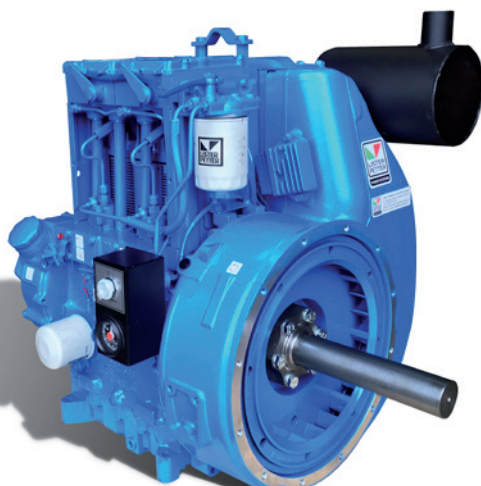
TR3P1800VSC-WC | 20.2 kWm IFN
Including engine start panel and gauges



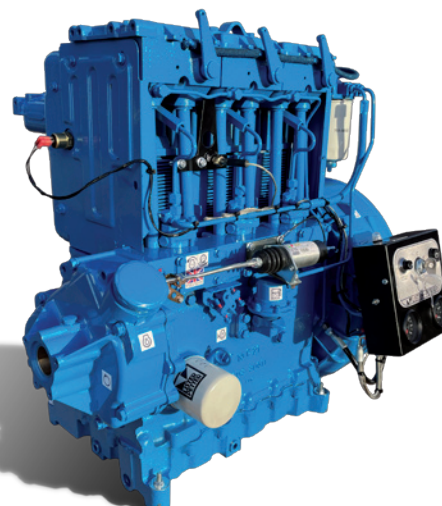
TR3P1500VSC-WC | 16.8 kWm IFN
Including engine start panel and gauges



TR3P2200VSC-WC | 23.7 kWm IFN
Including engine start panel and gauges



TR2P2500VSC-WI | 17.3 kWm IFN
Including running hour recorder



TR3P2500VSC-WC | 25.9 kWm IFN
Including engine start panel

POWER OUTPUTS TO ISO3046 CONTINUOUS NET POWER (IFN)

Model	r/min	1000	1200	1500	1800	2000	2200	2500
TR1	kW	4.1	4.7	5.5	6.7	7.3	7.9	8.6
	bhp	5.5	6.3	7.4	9.0	9.8	10.5	11.5
TR2	kW	6.4	8.7	11.0	13.1	14.5	15.7	17.3
	bhp	8.6	11.6	14.7	17.6	19.4	21.0	23.2
TR3	kW	10.0	13.1	16.8	20.2	22.2	23.7	25.9
	bhp	13.4	17.6	22.5	27.1	29.8	31.8	34.7

TORQUE TO ISO3046 CONTINUOUS NET POWER (IFN)

Model	r/min	1000	1200	1500	1800	2000	2200	2500
TR1	Nm	39.2	37.4	35.0	35.5	34.9	34.1	32.8
	lbf ft	28.9	27.6	25.8	26.2	25.7	25.1	24.2
TR2	Nm	61.1	69.0	70.0	69.5	69.2	68.1	66.1
	lbf ft	45.1	50.9	51.6	51.3	51.1	50.3	48.7
TR3	Nm	95.5	104.2	106.9	107.2	106.0	102.9	98.9
	lbf ft	70.4	76.9	78.9	79.0	78.2	75.9	73.0

TECHNICAL DATA

		TR1	TR2	TR3
Type of fuel injection		Direct	Direct	Direct
Number of cylinders		1	2	3
Aspiration		Natural	Natural	Natural
Direction of rotation looking on flywheel end		Anti clockwise	Anti clockwise	Anti clockwise
Nominal cylinder bore	mm	98.42	98.42	98.42
	in	3.875	3.875	3.875
Stroke	mm	101.6	101.6	101.6
	in	4.0	4.0	4.0
Total cylinder capacity	litre	0.773	1.55	2.32
	in ³	47.17	94.35	141.52
Compression ratio		15.5:1	15.5:1	15.5:1
Minimum idling speed	r/min	850	850	850
Number of flywheel ring gear teeth		110	110	110
Crankshaft end thrust (maximum continuous)	kgf	132	132	132
	lbf	290	290	290
Crankcase vacuum (minimum)	mbar	2.0	2.5	3.0
	in H ₂ O	0.8	1.0	1.2
Crankcase vacuum (average)	mbar	3.5	4.6	7.5
	in H ₂ O	1.4	1.8	2.9
Lubricating oil pressure (mean) with the oil at 110°C (230°F)	bar	2.0	2.0	2.0
	lbf ft ²	29	29	29
Lubricating oil pressure at idle	bar	1.0	1.0	1.0
	lbf ft ²	14.5	14.5	14.5

* For fixed speed engines the powers at these speeds are the same.

**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.

Note: Minimum full load speed 1500 r/min.

ENGINE EXHAUST SYSTEM DETAIL

Parameter	Engine Model		
	TR1	TR2	TR3
Maximum allowed back pressure (kPa)	10.3		
Maximum 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		
	TR1	TR2	TR3
Sound pressure level at 1m	≤ 94 dB(A)	≤ 93 dB(A)	≤ 93 dB(A)

ENGINE LUBRICATING OIL SYSTEM DETAIL

Parameter	Engine Model		
	TR1	TR2	TR3
Lubrication method	Pressure		
Sump capacity (L)	2.7	4.0	5.5
Total capacity (L)	3.2	4.5	6.0
Oil filter type	Full flow paper element		
Oil consumption (g/kW h)	≤ 0.25		
Lubrication oil temperature (°C)	120 (max. 135)		
Lubrication oil pressure at running conditions (kPa)	100-450		
Oil pump type	Plunger type		
Maximum operation angle (degrees)	Front/Rear/ Fuel Pump Up 15 / Manifold Down - 10		

ENGINE COOLING DETAIL

Parameter	Engine Model		
	TR1	TR2	TR3
Cooling method	Air		
Cooling fan	Flywheel		
Cooling package operating temperatures (°C)	40		
Maximum Cooling Airflow (litres/sec)	160	220	330
Maximum Cowling Pressure (mmWG)	97	120	
Ducting Sectional Area cm ²	140	330	530

Note:

The duct trunking must be the same cross sectional area throughout its length

For trunking lengths greater than 1.5m (5ft) then the above figures are multiplied by the following factors:

* 1.5m - 3.0m (5-10ft) x1.4

* 3.0m - 7.5m (10-25ft) x2.25

* 7.5m - 15.0m (25-50ft) x3.5

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).

**Derating**

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

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.

VARIABLE SPEED | APPROXIMATE FUEL CONSUMPTION | 100% LOAD

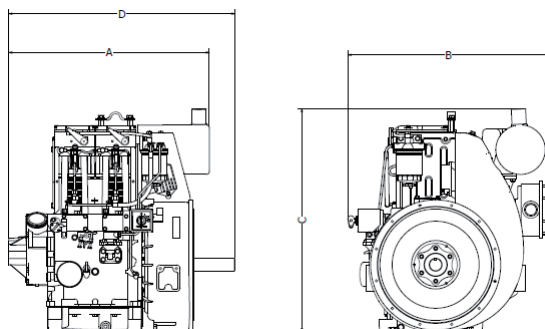
Model	r/min	1000	1200	1500	1800	2000	2200	2500
TR1	g/kWhr	253	243	239	240	242	243	245
	l/h	1.2	1.4	1.6	1.9	2.1	2.3	2.5
TR2	g/kWhr	249	240	236	237	238	239	241
	l/h	1.9	2.5	3.1	3.7	4.1	4.5	5.0
TR3	g/kWhr	246	238	230	229	231	234	237
	l/h	2.9	3.7	4.6	5.5	6.1	6.6	7.3

OPTIONAL ACCESSORIES

As part of your engine package from Lister Petter, we can offer you a full range of optional accessories to enhance your engine. Please consult Lister Petter for full details.

			
(CA) SAE 4 - SAE 5 Adapter (CB) SAE 4 Spacer Ring	(CL) SAE J620 7.5" Drive Member (CM) SAE J620 6.5" Drive Member *Use with SAE Adapter (CA, CB)	(FA) 8.25L Fuel Tank (FB) 13L Fuel Tank	(FE) Fuel Lift Pump
			
(WG) Keyswitch Start Panel	(WI) Start Panel with 12V hr Recorder	(EK) 12V Starter Motor (EL) 24V Starter Motor	(JE) 12V Fuel Control Solenoid (JQ) 24V Fuel Control Solenoid
			
(NA) Engine mounted exhaust silencer (NJ) Exhaust outlet bend * * Included in NA exhaust kit	(JA) Engine temperature switch (JD) Oil pressure switch * * Included oil distribution block - Not shown	(EA) Short Starting Handle (TR1) (EB) Long Starting Handle (TR2/3)	Service Kits 500, 1000, 2000, 4000 & 6000 hrs

APPROXIMATE DIMENSIONS AND WEIGHT



		TR1	TR2	TR3
Dry weight	kg	153	185	230
	lb	337	408	507
Length (A) without fuel tank	mm	476	623	749
	in	18.7	24.5	29.5
Width (B)	mm	624	624	646
	in	24.6	24.6	25.4
Height (C)	mm	692	692	692
	in	27.2	27.2	27.2
Total length (D)	mm	493	702	829
	in	19.4	27.6	32.6

TYPICAL PACKING CASE DIMENSIONS

Packing case dimensions					Container quantities	
Engine	Length (mm)	Width (mm)	Height (mm)	Gross weight (kg)	20ft	40ft
TR1	770	550	850	180	60	120
TR2				235		
TR3	880			285	52	104
Note: Optional accessories require the use of wider packing cases. TR1 engines fitted with fuel lift pumps TR1, TR2 and TR3 engines with starting panels and ducting.						
All	800	670	850	See above	30	66



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