# HEAT EXCHANGER COOLED GENERATING SETS

## LLDM 95 *, LLDM 135, LLDM 140, LLDM 190, LLDM 200, LLDM 250, LLDM 275, LLDM 400

*50 Hz; 1500/3000 r/min; power outputs: 5.9—43.5 kVA*
*60 Hz; 1800 r/min; power outputs: 7.3—25.3 kVA*

### HEAT EXCHANGER COOLED GENSETS WITH ELECTRONIC CONTROL MODULE

### BASIC CHARACTERISTICS

- Lister Petter Alpha series Marine engine
- 2, 3 or 4 cylinders
- heat exchanger cooled
- direct or indirect injection
- naturally aspirated or turbocharged
- open set (LLDM)

### STANDARD FEATURES

- heat exchanger cooling
- water cooled exhaust manifold
- water injected exhaust bend
- raw water connectors
- control system with electronic digital control module
- single bearing, 2 or 4-pole brushless alternator
- 66-litre polypropylene fuel tank with contents gauge
- galvanised steel base plate with forklift pockets and bunding for the fuel tank
- anti vibration mountings
- 12V starter battery and leads
- mechanical governing
- emergency stop button (lock-down type)
- operators' handbook
- electrical diagrams

**LLDM GENSET**

### ENGINE ACCESSORIES

- medium or heavy duty air cleaner
- oil and fuel filters
- fuel lift pump
- 12V electric starting system

** LLDM 95 - Please refer to Applications Department for cyclic irregularity implications*

## ALTERNATOR SPECIFICATION

- single bearing, 2 or 4-pole brushless alternator
- solid state AVR with ±1.5% as standard
- class H insulation on the rotor and stator
- IP23 protection class

## CONTROL CUBICLE

All LLDM sets have a control cubicle mounted on a vibration-isolated support, which has the following features:

- electronic digital control module with monitoring/control facility and warning indicators
- automatic shutdown protection
- emergency stop button (lock-down type)
- AC output circuit breaker with over-current protection
- DC circuit control switch and overload circuit breaker

**The control module gives digital readouts of:**

- generator voltage (phase-to-phase and phase-to-neutral)
- generator current (each phase displayed separately)
- output frequency
- engine speed
- engine coolant temperature
- battery voltage
- engine hours run

**The control module has indicators for:**

- overspeed / underspeed
- emergency stop
- engine oil pressure
- engine temperature
- failure to start
- battery charger failure

**Automatic shutdown occurs under:**

- low engine oil pressure
- high engine temperature
- overspeed / underspeed
- failure to start after three attempts

## MANUAL/REMOTE START SETS

These sets have the flexibility of either manual or remote automatic operation:

- manual operation is by **START** and **STOP** push-buttons on the control module
- remote operation is achieved by connecting a 2-wire circuit to the relevant terminals on the control module and is activated by setting the control module to **AUTO**

## AUTOMATIC MAINS FAILURE SETS (AMF)

In the event of a mains failure, the generating set will automatically operate to supply the electrical load. In addition to the standard features, automatic mains failure sets have:

- wall-mounted cubicle governing automatic mains failure operation
- control module timer circuits set to delay start, delay transfer back to mains and delay stop to allow for engine cooldown
- solid-state automatic battery charger that maintains charge when set is not running

**The wall mounted cubicle features:**

- mains monitoring unit to control set operation
- load transfer contactors, mechanically and electrically interlocked (rated for set output)
- indicator for mains-on-load or plant-on-load

## POWER OUTPUTS TO ISO 8528-1 [1] AND EMISSIONS COMPLIANCE

### 50 Hz, 1500 r/min [3]

| Model | Engine | Rating | Single Phase 220V 230 V 240 V | | Three Phase 380/220 V 400/230 V 415/240 V | |
|---|---|---|---|---|---|---|
| | | | kVA | kW | kVA | kW |
| LLD 95 | LPW2 | Prime | 5.6 | 5.6 | 7.0 | 5.6 |
| | | Standby | 6.1 | 6.1 | 7.6 | 6.1 |
| | LPWS2 | Prime | 5.6 | 5.6 | 7.0 | 5.6 |
| | | Standby | 6.1 | 6.1 | 7.6 | 6.1 |
| LLD 140 | LPW3 | Prime | 8.7 | 8.7 | 10.9 | 8.7 |
| | | Standby | 9.5 | 9.5 | 12.0 | 9.6 |
| | LPWS3 | Prime | 8.7 | 8.7 | 10.9 | 8.7 |
| | | Standby | 9.5 | 9.5 | 12.0 | 9.6 |
| LLD 190 | LPW4 | Prime | 12.2 | 12.2 | 15.0 | 12.0 |
| | | Standby | 13.5 | 13.5 | 16.5 | 13.2 |
| | LPWS4 | Prime | 12.2 | 12.2 | 15.0 | 12.0 |
| | | Standby | 13.5 | 13.5 | 16.5 | 13.2 |
| LLD 250 | LPWT4 | Prime | 16.1 | 16.1 | 20.0 | 16.0 |
| | | Standby | 17.7 | 17.7 | 21.9 | 17.6 |
| | LPWST4 | Prime | 16.1 | 16.1 | 20.0 | 16.0 |
| | | Standby | 17.7 | 17.7 | 21.9 | 17.6 |

### 60 Hz, 1800 r/min [3]

| Model | Engine | Rating | Single Phase 220 or 110 V 230 or 115 V 240 or 120 V | | Three Phase 220/127 230/133 | |
|---|---|---|---|---|---|---|
| | | | kVA | kW | kVA | kW |
| LLD 95 | LPW2 | Prime | 6.9 | 6.9 | 8.6 | 6.9 |
| | | Standby | 7.5 | 7.5 | 9.5 | 7.6 |
| | LPWS2 | Prime | 6.9 | 6.9 | 8.6 | 6.9 |
| | | Standby | 7.5 | 7.5 | 9.5 | 7.6 |
| LLD 140 | LPW3 | Prime | 10.5 | 10.5 | 13.3 | 10.6 |
| | | Standby | 11.5 | 11.5 | 14.6 | 11.7 |
| | LPWS3 | Prime | 10.5 | 10.5 | 13.3 | 10.6 |
| | | Standby | 11.5 | 11.5 | 14.6 | 11.7 |
| LLD 190 | LPW4 | Prime | 14.8 | 14.8 | 18.5 | 14.8 |
| | | Standby | 16.3 | 16.3 | 20.3 | 16.2 |
| | LPWS4 | Prime | 14.8 | 14.8 | 18.5 | 14.8 |
| | | Standby | 16.3 | 16.3 | 20.3 | 16.2 |
| LLD 250 | LPWT4 | Prime | 19.3 | 19.3 | 24.4 | 19.5 |
| | | Standby | 21.2 | 21.2 | 26.9 | 21.5 |
| | LPWST4 | Prime | 19.3 | 19.3 | 24.4 | 19.5 |
| | | Standby | 21.2 | 21.2 | 26.9 | 21.5 |

### 50 Hz, 3000 r/min [2]

| Model | Engine | Rating | Single Phase 220V 230 V 240 V | | Three Phase 380/220 V 400/230 V 415/240 V | |
|---|---|---|---|---|---|---|
| | | | kVA | kW | kVA | kW |
| LLD 135 | LPW2 | Prime | 10.2 | 10.2 | 13.7 | 11.0 |
| | | Standby | 11.2 | 11.2 | 15.1 | 12.1 |
| | LPWS2 | Prime | 10.2 | 10.2 | 13.7 | 11.0 |
| | | Standby | 11.2 | 11.2 | 15.1 | 12.1 |
| LLD 200 | LPW3 | Prime | 15.4 | 15.4 | 20.3 | 16.3 |
| | | Standby | 16.9 | 16.9 | 22.4 | 17.9 |
| | LPWS3 | Prime | 15.4 | 15.4 | 20.3 | 16.3 |
| | | Standby | 16.9 | 16.9 | 22.4 | 17.9 |
| LLD 275 | LPW4 | Prime | 20.9 | 20.9 | 28.1 | 22.5 |
| | | Standby | 23.0 | 23.0 | 30.9 | 24.8 |
| | LPWS4 | Prime | 20.9 | 20.9 | 28.1 | 22.5 |
| | | Standby | 23.0 | 23.0 | 30.9 | 24.8 |
| LLD 400 | LPWT4 | Prime | | | 39.5 | 31.6 |
| | | Standby | | | 43.5 | 34.8 |

1. For rating definitions see page 4. Power Factor: single phase, 1.0 pf; three phase, 0.8 pf. Other voltages are available on request. Power outputs are based on standard Lister Petter alternators (but see 2).
2. 50 Hz, 3000 r/min outputs are based on Mecc Alte Alternators.
3. Mecc Alte Alternators are available as an option, ratings are different.

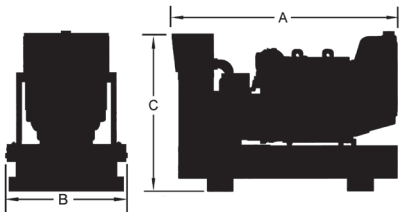
### Key to Emissions Compliance

| |
|---|
| EU Stage 3A only |
| USA EPA Interim Tier 4 only |
| EU Stage 3A, USA EPA Interim Tier 4 |
| EU Stage 3A, India GSR 448 (E) |
| EU Stage 3A, USA EPA Interim Tier 4 and India GSR 448 (E) |

## APPROXIMATE FUEL CONSUMPTION

| Values refer to litres/hour | | | 50 Hz | | 60 Hz |
|---|---|---|---|---|---|
| Genset | Engine | Load | 1500 r/min | 3000 r/min | 1800 r/min |
| LLD 95 | LPW2 | 100% | 1.9 | | 2.3 |
| | | 75% | 1.5 | | 1.8 |
| | LPWS2 | 100% | 2.1 | | 2.5 |
| | | 75% | 1.6 | | 2.0 |
| LLD 135 | LPW2 | 100% | | 3.9 | |
| | | 75% | | 3.1 | |
| | LPWS2 | 100% | | 4.4 | |
| | | 75% | | 3.4 | |
| LLD 140 | LPW3 | 100% | 2.8 | | 3.4 |
| | | 75% | 2.2 | | 2.7 |
| | LPWS3 | 100% | 3.1 | | 3.7 |
| | | 75% | 2.4 | | 2.9 |
| LLD 200 | LPW3 | 100% | | 5.9 | |
| | | 75% | | 4.6 | |
| | LPWS3 | 100% | | 6.6 | |
| | | 75% | | 5.1 | |
| LLD 190 | LPW4 | 100% | 3.8 | | 4.6 |
| | | 75% | 2.9 | | 3.6 |
| | LPWS4 | 100% | 4.1 | | 5.0 |
| | | 75% | 3.2 | | 3.9 |
| LLD 275 | LPW4 | 100% | | 7.8 | |
| | | 75% | | 4.6 | |
| | LPWS4 | 100% | | 8.8 | |
| | | 75% | | 6.9 | |
| LLD 250 | LPWT4 | 100% | 4.9 | | 6.0 |
| | | 75% | 3.7 | | 4.6 |
| | LPWST4 | 100% | 5.4 | | 6.6 |
| | | 75% | 4.1 | | 5.1 |
| LLD 400 | LPWT4 | 100% | | 10.6 | |
| | | 75% | | 8.3 | |

## APPROXIMATE DIMENSIONS




| | | |
|---|---|---|
| Length (A) | mm | 1442 |
| | in | 56.8 |
| Width (B) | mm | 715 |
| | in | 28.1 |
| Height (C) | mm | 997 |
| | in | 39.25 |

## RATING DEFINITIONS TO ISO 8528-1

*Ratings are in accordance with ISO 8528-1. Power Factor: Single phase, 1.0 pf; three-phase, 0.8 pf. Other voltages are available on request.*

***Rating Conditions***

*A standard generating set is designed to operate in environmental reference conditions of 25°C, 100 kPa and 30% humidity.*

***Prime Power***

*This rating is for the supply of continuous electrical power (at variable load). There is no limit on the annual hours of operation and 10% overload power can be supplied for 1 hour in 12.*

***Standby Power***

*This rating is for the supply of continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted.*

## WEIGHT

| | | LLDM 95 | LLDM 135 | LLDM 140 | LLDM 190 | LLDM 200 | LLDM 250 | LLDM 275 | LLDM 400 |
|---|---|---|---|---|---|---|---|---|---|
| Dry weight | kg | 396 | 396 | 417 | 456 | 417 | 466 | 456 | 466 |
| | lb | 873 | 873 | 919 | 1005 | 919 | 1027 | 1005 | 1027 |

A comprehensive range of options allows you to select a specification that matches your requirements. Please ask your Lister Petter distributor (see panel below right).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