



### Generator Specification

| Service                         | PRP(1)    | ESP(2) |
|---------------------------------|-----------|--------|
| Power (KVA)                     | 80        | 88     |
| Power (KW)                      | 64        | 70     |
| Rated speed (r.p.m)             | 1500      |        |
| Standard voltage (V)            | 400/230 V |        |
| Rated at power factor (cos Phi) | 0,8       |        |

#### (1) PRP (Prime Power):

According to ISO8528-1, prime power is the maximum power available during a variable power sequence, which may be run for an unlimited number of hours per year, between stated maintenance intervals. The permissible average power output during at 24 hours period shall not exceed 80% of the prime power. 10% overload available for governing purposes only.

#### (2) ESP (Standby Power):

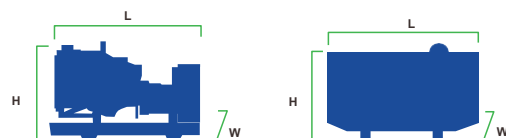
According to ISO 8528-1, It is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 hours of operation per year (of which no more than 300 hours for continuative use) with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. No overload capability is available.

| Power Voltage | ESP |    | PRP |    | Standby Amps |
|---------------|-----|----|-----|----|--------------|
|               | KVA | KW | KVA | KW |              |
| 415/240       | 88  | 70 | 80  | 64 | 122.4        |
| 400/230       | 88  | 70 | 80  | 64 | 127.0        |
| 380/220       | 88  | 70 | 80  | 64 | 133.7        |

| Performance Data       |                    |      |
|------------------------|--------------------|------|
| Model                  | DY88P              |      |
| Engine                 | Perkins            |      |
| Engine model           | 1104A-44TG2        |      |
| Speed control type     | Mechanical         |      |
| Phase                  | 3                  |      |
| Control sytem          | Digital            |      |
| Starter motor voltage  | 12V                |      |
| Frequency              | 50Hz               |      |
| Engine speed (RPM)     | 1500               |      |
| Fuel Consumption (L/H) | 100% standby power | 20.5 |
|                        | 100% prime power   | 18.7 |
|                        | 75% prime power    | 14   |
|                        | 50% prime power    | 9.7  |

#### Standard reference Conditions

Note: Standard reference condition 25 °C[77 °F] air inlet temp, 1000m(328ft) A.S.L 30% relative humidity. Fuel consumption dat with diesel fuel with specific gravity of 0.85 and conforming to BS 2869: 1998 Class A2



| Dimension and Weight |                       |        |
|----------------------|-----------------------|--------|
| Dimension            | 79dB(A)@1m-65dB(A)@7m | Silent |
| Length (L)           | 2668 mm               |        |
| Width (W)            | 1110mm                |        |
| Height (H)           | 1616mm                |        |
| Net Weight           | 1400 KG               |        |
| Fuel Tank (L)        | 140L                  |        |

## Engine Specification : 1104A-44TG2

| Basic technical data            |                  |
|---------------------------------|------------------|
| No. of cylinders                | 4                |
| Cylinder arrangement            | Vertical In-line |
| Cycle                           | 4 stroke         |
| Induction system                | Turbocharged     |
| Compression ratio               | 17.25:1          |
| Bore                            | 105mm            |
| Stroke                          | 127mm            |
| Displacement                    | 4.4L             |
| All ratings certified to within | ± 3%             |
| Estimated total weight          | 463kg            |

| Cooling system                        |                     |
|---------------------------------------|---------------------|
| Total coolant capacity -with radiator | 13.0L               |
| -without radiator                     | 7.0L                |
| Maximum top tank temp                 | 110°C               |
| Thermostat operation range            | 82-93°C             |
| Radiator face area                    | 0.276m <sup>2</sup> |
| Rows and material                     | 2 rows aluminium    |
| Pressure cap setting                  | 107kPa              |
| Fan diameter                          | 457.0mm             |
| Drive ratio                           | 1.25 : 1            |
| Number of blades                      | 7                   |

| Fuel system                            |             |
|----------------------------------------|-------------|
| Injection system                       | Direct      |
| Fuel injection pump                    | Rotary      |
| Fuel atomiser                          | Multi-hole  |
| Nozzel opening pressure                | 29.0 MPa    |
| Fuel lift pump type                    | Mechanical  |
| -flow/hour                             | 120-150 l/h |
| -pressure                              | 30-75 kPa   |
| Maximum suction head:<br>-1500 rev/min | 20kPa       |

| Induction system |      |
|------------------|------|
| Clean filter     | 5kpa |
| Dirty filter     | 8kpa |
| Air filter type  | Dry  |

| Lubrication system                                                              |             |
|---------------------------------------------------------------------------------|-------------|
| Maximum sump capacity                                                           | 7.0L        |
| Minimum sump capacity                                                           | 5.5L        |
| Total system                                                                    | 8.0L        |
| Maximum engine operating angles - front up, front down, right side or left side | 25°C        |
| Lubricating oil pressure<br>-Relief valve opens                                 | 415-470 kPa |
| -at maximum no load speed                                                       | 276-414 KPA |
| Oil consumption at full load as a % of fuel consumption                         | 0.15%       |

| Electrical system Type |                 |
|------------------------|-----------------|
| Type                   | Negative ground |
| Alternator voltage     | 12 volts        |
| Alternator output      | 65 amps         |
| Starter motor voltage  | 12 volts        |
| Starter motor power    | 3KW             |

| General installation           | Prime power            |
|--------------------------------|------------------------|
| Gross engine power             | 73.4kW                 |
| Brake mean effective pressure  | 1335kPa                |
| Combustion air flow            | 4.8m <sup>3</sup> /min |
| Exhaust gas temperature outlet | 555 °C                 |
| Energy to coolant              | 46kW                   |
| Energy to exhaust              | 53kW                   |

## ALTERNATOR SPECIFICATION : LEROY SOMER TAL-A44C

### The best of performance

The Leroy-Somer™ TAL 044 alternator has been designed to offer you the best power generation performances. With its meticulous design and optimized architecture, the TAL 044 strikes the perfect balance between compactness, reliability, performance and longevity. Whatever your application, the Leroy-Somer™ TAL 044 alternator will meet your needs and will adapt to all situations.

### Standards

The Leroy-Somer™ TAL 044 alternator meets all key international standards and regulations, including IEC 60034, NEMA MG 1.32-33, ISO 8528-3, CSA C22.2 n°100-14 and UL 1446 (UL 1004 on request). Also compliant with IEC 61000-6-2, IEC 61000-6-3, IEC 61000-6-4, VDE 0875G, VDE 0875N and EN 55011, group 1 class A for European zone. The Leroy-Somer™ TAL 044 alternator can be integrated in EC marked generator set, and bears EC, UKCA and CMIM markings. It is designed, manufactured and marketed in an ISO 9001 and ISO 14001 quality assurance environment.

### Electrical characteristics and performances

- Class H insulation
- Shunt excitation
- Low voltage winding:
  - Three-phase 50 Hz: 220V - 240V and 380V - 415V (440V) 60 Hz: 208V - 240V and 380V - 480V
  - Single-phase 50 Hz: 230V 60 Hz: 240V
- 4-terminal plates in 6-wire version
- Optimized performance

### Excitation and regulation system

|                     | Excitation system |          |                |              | Regulation options |                              |                                          |
|---------------------|-------------------|----------|----------------|--------------|--------------------|------------------------------|------------------------------------------|
|                     | AVR               | SHUNT    | AREP+ (option) | PMG (option) | ULC/us             | Remote voltage potentiometer | C.T. Current transformer for paralleling |
| Three-phase 6-wire  | R120              | Standard |                |              |                    |                              |                                          |
|                     | R150              | Option   |                |              |                    | √                            |                                          |
|                     | R180              |          | Standard       | Standard     |                    | √                            | √                                        |
|                     | D350              | Option   | Option         | Option       | √                  | √                            | √*                                       |
| Three-phase 12-wire | R120              | Standard |                |              |                    |                              |                                          |
|                     | R250              | Option   |                |              | √                  | √                            |                                          |
|                     | R180              |          | Standard       | Standard     |                    | √                            | √                                        |
|                     | D350              | Option   | Option         | Option       | √                  | √                            | √*                                       |
| Single-phase        | R121              | Standard |                |              |                    | √                            |                                          |
|                     | R251              | Option   |                |              | √                  | √                            |                                          |

\*: only with AREP+ or PMG

### Protection system and options

- Degree of protection: IP 23
- Complete winding protection for non-harsh environment with relative humidity ≤ 95%
- Options:
  - Three-phase 12-wire with 8-terminal plates
  - AREP+ or PMG excitation
  - ULC/us
  - Customized painting (unpainted machine as standard)
  - Space heater
  - Flying leads
  - Droop kit for alternator paralleling
  - Dedicated single-phase
  - Stator sensors
  - Winding 8 optimized for three-phase 380V / 416V - 60Hz
  - Reinforced winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4): for TAL 044 K apply a derating coefficient of 0.97

### Mechanical construction

- Compact and rugged assembly to withstand engine vibrations
- Steel frame
- Aluminum flanges and shields
- Single-bearing design compatible with most diesel engines
- Greased for life bearings
- Direction of rotation: clockwise and counterclockwise without derating

### Terminal box design

- Easy access to AVR and terminals
- Possibility of current transformer for parallel operation





## ALTERNATOR SPECIFICATION : LEROY SOMER TAL-A44C

### General characteristics

|                                                          |                                           |                                                    |       |             |
|----------------------------------------------------------|-------------------------------------------|----------------------------------------------------|-------|-------------|
| Insulation class                                         | H                                         | Excitation system 6-wire                           | SHUNT | AREP+ / PMG |
| Winding pitch                                            | 2/3 (wind.6S - 6-wire / wind.6 - 12-wire) | AVR type                                           | R120  | R180        |
| Number of wires                                          | 6 (12 option)                             | Excitation system 12-wire (option)                 | SHUNT | AREP+ / PMG |
| Protection                                               | IP 23                                     | AVR type                                           | R120  | R180        |
| Altitude                                                 | ≤ 1000 m                                  | Voltage regulation (**)                            | ± 1 % | ± 0.5 %     |
| Overspeed                                                | 2250 R.P.M.                               | Total Harmonic Distortion THD (***) in no-load     | < 2 % |             |
| Air flow 50 Hz                                           | 0.29 m³/s                                 | Total Harmonic Distortion THD (***) in linear load | < 5 % |             |
| Air flow 60 Hz                                           | 0.34 m³/s                                 | Waveform: NEMA = TIF (***)                         | < 50  |             |
| AREP+/PMG Short-circuit current = 2.7 In : 5 seconds (*) |                                           | Waveform: I.E.C. = FHT (***)                       | < 2%  |             |

(\*) D350: 10 seconds (\*\*) Steady state (\*\*\*) Total harmonic distortion between phases, no-load or on-load (non-distorting)

### Ratings 50 Hz - 1500 R.P.M.

| kVA / kW - P.F. = 0.8 |     |                    |      |      |       |       |                    |      |       |       |      |                  |       |       |      |      |                  |      |      |      |      |  |
|-----------------------|-----|--------------------|------|------|-------|-------|--------------------|------|-------|-------|------|------------------|-------|-------|------|------|------------------|------|------|------|------|--|
| Duty / T° C           |     | Continuous / 40 °C |      |      |       |       | Continuous / 40 °C |      |       |       |      | Stand-by / 40 °C |       |       |      |      | Stand-by / 27 °C |      |      |      |      |  |
| Class / T° K          |     | H / 125° K         |      |      |       |       | F / 105° K         |      |       |       |      | H / 150° K       |       |       |      |      | H / 163° K       |      |      |      |      |  |
| Phase                 |     | 3 ph.              |      |      | 1 ph. | 3 ph. |                    |      | 1 ph. | 3 ph. |      |                  | 1 ph. | 3 ph. |      |      | 1 ph.            |      |      |      |      |  |
| Y                     |     | 380V               | 400V | 415V | 440V  |       | 380V               | 400V | 415V  | 440V  |      | 380V             | 400V  | 415V  | 440V |      | 380V             | 400V | 415V | 440V |      |  |
| Δ                     |     | 220V               | 230V | 240V |       | 230V  | 220V               | 230V | 240V  |       | 230V | 220V             | 230V  | 240V  |      | 230V | 220V             | 230V | 240V |      | 230V |  |
| YY (*)                |     | 200V               |      |      | 220V  |       | 200V               |      |       | 220V  |      | 200V             |       |       | 220V |      | 200V             |      |      | 220V |      |  |
| ΔΔ (*)                |     |                    |      |      |       | 230V  |                    |      |       |       | 230V |                  |       |       |      | 230V |                  |      |      |      | 230V |  |
| TAL 044 A             | kVA | 70                 | 70   | 70   | 63    | 42    | 64                 | 64   | 64    | 57    | 38   | 74               | 74    | 74    | 67   | 45   | 77               | 77   | 77   | 69   | 46   |  |
|                       | kW  | 56                 | 56   | 56   | 50    | 33.5  | 51                 | 51   | 51    | 46    | 30.5 | 59               | 59    | 59    | 54   | 36   | 62               | 62   | 62   | 55   | 37   |  |
| TAL 044 B             | kVA | 80                 | 80   | 80   | 72    | 48    | 73                 | 73   | 73    | 66    | 44   | 85               | 85    | 85    | 76   | 51   | 88               | 88   | 88   | 79   | 53   |  |
|                       | kW  | 64                 | 64   | 64   | 58    | 38.5  | 58                 | 58   | 58    | 53    | 35   | 68               | 68    | 68    | 61   | 41   | 70               | 70   | 70   | 63   | 42   |  |
| TAL 044 C             | kVA | 90                 | 90   | 90   | 81    | 54    | 82                 | 82   | 82    | 74    | 49   | 95               | 95    | 95    | 86   | 57   | 100              | 100  | 100  | 89   | 59   |  |
|                       | kW  | 72                 | 72   | 72   | 65    | 43    | 66                 | 66   | 66    | 59    | 39   | 76               | 76    | 76    | 69   | 46   | 80               | 80   | 80   | 71   | 47   |  |
| TAL 044 D             | kVA | 100                | 100  | 100  | 90    | 60    | 91                 | 91   | 91    | 82    | 55   | 106              | 106   | 106   | 95   | 64   | 110              | 110  | 110  | 99   | 66   |  |
|                       | kW  | 80                 | 80   | 80   | 72    | 48    | 73                 | 73   | 73    | 66    | 44   | 85               | 85    | 85    | 76   | 51   | 88               | 88   | 88   | 79   | 53   |  |
| TAL 044 E             | kVA | 125                | 125  | 125  | 113   | 67    | 114                | 114  | 114   | 103   | 61   | 133              | 133   | 133   | 120  | 71   | 138              | 138  | 138  | 124  | 74   |  |
|                       | kW  | 100                | 100  | 100  | 90    | 54    | 91                 | 91   | 91    | 82    | 49   | 106              | 106   | 106   | 96   | 57   | 110              | 110  | 110  | 99   | 59   |  |
| TAL 044 H             | kVA | 135                | 135  | 135  | 122   | 73    | 123                | 123  | 123   | 111   | 66   | 143              | 143   | 143   | 129  | 77   | 150              | 150  | 150  | 134  | 80   |  |
|                       | kW  | 108                | 108  | 108  | 98    | 58    | 98                 | 98   | 98    | 89    | 53   | 114              | 114   | 114   | 103  | 62   | 120              | 120  | 120  | 107  | 64   |  |
| TAL 044 J             | kVA | 150                | 150  | 150  | 135   | 80    | 137                | 137  | 137   | 123   | 73   | 159              | 159   | 159   | 143  | 85   | 165              | 165  | 165  | 149  | 88   |  |
|                       | kW  | 120                | 120  | 120  | 108   | 64    | 110                | 110  | 110   | 98    | 58   | 127              | 127   | 127   | 114  | 68   | 132              | 132  | 132  | 119  | 70   |  |
| TAL 044 K             | kVA | 165                | 165  | 165  | 138   | 88    | 150                | 150  | 150   | 126   | 80   | 175              | 175   | 175   | 150  | 93   | 182              | 182  | 182  | 157  | 97   |  |
|                       | kW  | 132                | 132  | 132  | 110   | 70    | 120                | 120  | 120   | 101   | 64   | 140              | 140   | 140   | 120  | 74   | 146              | 146  | 146  | 126  | 78   |  |
| TAL 044 L             | kVA | 180                | 180  | 180  | 171   | 90    | 164                | 164  | 164   | 156   | 82   | 191              | 191   | 191   | 181  | 95   | 200              | 200  | 200  | 188  | 99   |  |
|                       | kW  | 144                | 144  | 144  | 137   | 72    | 131                | 131  | 131   | 125   | 66   | 153              | 153   | 153   | 145  | 76   | 160              | 160  | 160  | 150  | 79   |  |
| TAL 044 M             | kVA | 192                | 200  | 200  | 192   | 100   | 175                | 182  | 182   | 175   | 91   | 204              | 212   | 212   | 204  | 106  | 211              | 220  | 220  | 211  | 110  |  |
|                       | kW  | 154                | 160  | 160  | 154   | 80    | 140                | 146  | 146   | 140   | 73   | 163              | 170   | 170   | 163  | 85   | 169              | 176  | 176  | 169  | 88   |  |



## Control Panel: DEEPSEA 7320MKII

# DSE7310/20 MKII

## AUTO START & AUTO MAINS FAILURE CONTROL MODULES



### KEY FEATURES

- Configurable power-up mode
- MPU fail delay
- Enhanced graphical user interface
- Drag & drop advanced PLC editor
- MSC ID within PLC GenComm override
- 4-Line back-lit LCD text display
- Multiple Display Languages
- Five key menu navigation
- LCD alarm indication
- Heated display option available
- Customisable power-up text and images
- DSENet expansion compatibility
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB, RS232 & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3 phase generator sensing and protection
- 3 phase mains (utility) sensing and protection (DSE7320 MKII only)
- Automatic load transfer control (DSE7320 MKII only)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- Mains current and power monitoring (kW, kvar, kVA, pf) (DSE7320 MKII only)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Independent earth fault protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 6 configurable DC outputs
- 2 configurable volt-free relay outputs
- 6 configurable analogue/digital inputs
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs
- Configurable 5 stage dummy load and load shedding outputs
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Manual and automatic fuel pump control
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of RS232 and RS485 communication ports
- True dual mutual standby using RS232 or RS485 for accurate engine hours balancing.
- MODBUS RTU support with configurable MODBUS pages.
- Advanced SMS messaging (additional external modem required)

- Start & stop capability via SMS messaging
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Modules can be integrated into building management systems (BMS) using MODBUS RTU

### KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE7320 MKII only) for convenience.
- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.

### SPECIFICATIONS

#### DC SUPPLY

**CONTINUOUS VOLTAGE RATING**  
8 V to 95 V Continuous  
5 V for upto 1 minute

#### CRANKING DROPOUTS

Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

#### MAXIMUM OPERATING CURRENT

510 mA at 12 V, 240 mA at 24 V

#### MAXIMUM STANDBY CURRENT

930 mA at 12 V, 160 mA at 24 V

#### CHARGE FAIL/EXCITATION RANGE

0 V to 95 V

#### GENERATOR & MAINS (UTILITY)

##### VOLTAGE RANGE

15 V to 415 V AC (Ph to N)  
26 V to 719 V AC (Ph to Ph)

##### FREQUENCY RANGE

5.5 Hz to 75 Hz

#### MAGNETIC PICKUP

**VOLTAGE RANGE**  
+/- 0.5 V to 70 V

##### FREQUENCY RANGE

10,000 Hz (max)

#### INPUTS

##### DIGITAL INPUTS A TO H

Negative switching

##### ANALOGUE INPUTS A & F

Configurable as:  
Negative switching digital input  
0 V to 10 V sensor  
4 mA to 20 mA sensor  
Resistive sensor

##### ANALOGUE INPUTS B, C, D & E

Configurable as:  
Negative switching digital input  
Resistive sensor

#### OUTPUTS

##### OUTPUT A & B (FUEL & START)

15 A DC at supply voltage

##### OUTPUTS C & D

8 A AC at 250 V AC (Volt-free)

##### AUXILIARY OUTPUTS E, F, G, H, I & J

2 A DC at supply voltage

#### DIMENSIONS

##### OVERALL

245 mm x 184 mm x 51 mm  
9.6" x 7.2" x 2.0"

##### PANEL CUT-OUT

220 mm x 160 mm  
8.7" x 6.3"

##### MAXIMUM PANEL THICKNESS

8 mm  
0.3"

#### STORAGE TEMPERATURE RANGE

-40°C to +85°C  
-40 °F to +185 °F

#### OPERATING TEMPERATURE RANGE

-30°C to +70°C  
-22 °F to +158 °F

#### HEATED DISPLAY VARIANT

-40 °C to +70 °C

## Monitoring 3G/4G: DEEPSEA 890MKII (OPTIONAL)



### MONITORING

## Discover Dynamis Webnet

**A remote generator management and control solution.**

**DYNAMIS WEBNET** allows you to receive detailed reports including recommendations for corrective and preventive maintenance.

It also enables you to connect and access real-time data across a range of generator operating parameters.

The solution offers you real-time control of your generator.

- DSE890 MKII 4G gateway used with DSE controllers for remote monitoring and communication via DSEWebNet® or third-party MQTT brokers.
- Communicates with up to five connected DSE controllers to monitor instruments and operating states.

- Internally records data changes and transmits them to DSEWebNet® or to an MQTT broker (Amazon Web Services, Google, IBM, etc.).

- DSEWebNet® software is accessible via a web browser or a dedicated app.

- Supports multiple operations: equipment monitoring, alarm clearing, equipment start/stop, and fuel level monitoring.
- The IoT functionality of the DSE890 MKII supports MQTT V 3.1.1 (ISO/IEC 20922:2016).

- Connection to a third-party server running an MQTT broker is possible, while maintaining a connection to DSEWebNet®.

- For more information on DSEWebNet® software, refer to datasheet 055-192.

- The DSE890 MKII also supports 2G and 3G connectivity.





## Extended tanks– 200-500-600-1000l



**22kVA 1000l**



**33kVA 1000l antitheft**



**55kVA 600l**