

# 1000KW Natural Gas Generator

Standby | 60 Hz | Cummins Engine | EPA Tier 2

## General

|                  |                               |
|------------------|-------------------------------|
| Model            | WDG-1000-CMS-NG-S             |
| Fuel Type        | Natural Gas                   |
| Rating           | 1000 kW / 1250 kVA            |
| Frequency        | 60 Hz                         |
| Voltage          | Any voltage can be customized |
| Phase            | Single Phase or Three Phase   |
| Enclosure Type   | Silent, Weatherproof          |
| Engine Brand     | Cummins                       |
| Alternator Brand | Stamford                      |
| Controller Model | Deep Sea DSE 7320/7310        |



## Engine Data

|                           |                 |
|---------------------------|-----------------|
| Engine Model              | Cummins QSK 60G |
| Configuration             | V16             |
| Aspiration                | Turbocharged    |
| Gross Engine Power Output | 1484 kWm (bhp)  |
| Bore x Stroke (in.)       | 6.25 x 7.48     |
| Rated Speed (RPM)         | 1800            |
| Displacement (L)          | 60              |
| Compression Ratio         | 11.4:1          |
| Cooling Method            | Radiator Cooled |
| Governor                  | Electronic      |

## Alternator Data

|                    |                           |
|--------------------|---------------------------|
| Alternator Model   | Stamford S6L1D-E4 Wdg 311 |
| Type               | Self-excited, Brushless   |
| Power Factor       | 0.8                       |
| Voltage Regulation | AVR                       |
| Insulation System  | Class H                   |
| Protection Level   | IP23                      |

## Size & Dimensions

|                        |                               |
|------------------------|-------------------------------|
| Dimensions (L x W x H) | approx. 258 x 141 x 154 (in.) |
| Net Weight (lbs.)      | approx. 80,000                |

## Fuel Consumption

|                    | Natural Gas Standby |     |      |        |
|--------------------|---------------------|-----|------|--------|
| Ratings            | 1000 kW   1250 kVA  |     |      |        |
| Load               | 1/4                 | 1/2 | 3/4  | Full   |
| cfh                | -                   | -   | 9005 | 11,551 |
| m <sup>3</sup> /hr | -                   | -   | 255  | 327    |



## Generator set data sheet

|                 |                                                                       |
|-----------------|-----------------------------------------------------------------------|
| Model           | C1000N6B                                                              |
| Frequency       | 60 Hz                                                                 |
| Fuel type       | Natural gas                                                           |
| kW (kVa) rating | 1000 (1250) standby and demand response                               |
| Emissions       | EPA-certified for stationary emergency and non-emergency applications |

|                                               |             |
|-----------------------------------------------|-------------|
| Exhaust emission data sheet                   | EDS-3078    |
| Sound performance data sheet                  | MSP-4070    |
| Cooling performance data sheet                | MCP-2120    |
| Prototype test summary data sheet             | PTS-701     |
| Standard set-mounted radiator cooling outline | C1000N6B-01 |

| Fuel consumption                                                                      | 50% load | 75% load | full load |
|---------------------------------------------------------------------------------------|----------|----------|-----------|
| Fuel consumption for cfh and m <sup>3</sup> /hr is based on 905 Btu/ft <sup>3</sup> . |          |          |           |
| cfh                                                                                   | -        | 9005     | 11,551    |
| m <sup>3</sup> /hr                                                                    | -        | 255      | 327       |
| MMBtu/hr                                                                              | -        | 8.15     | 10.45     |

### Fuel supply

Fuel supply pressure is measured at the factory-supplied fuel shut-off (FSO) valve.

|                                                        |           |
|--------------------------------------------------------|-----------|
| Minimum operating pressure, in. H <sub>2</sub> O (kPa) | 58 (14.4) |
| Maximum operating pressure, in. H <sub>2</sub> O (kPa) | 166 (41)  |

| Engine                               | Standby and demand response | Prime |
|--------------------------------------|-----------------------------|-------|
| Engine manufacturer                  | Cummins                     |       |
| Engine model                         | QSK 60G                     |       |
| Configuration                        | V16                         |       |
| Aspiration                           | Turbocharged                |       |
| Gross engine power output, bhp (kWm) | 1484 (1107)                 |       |
| BMEP at set rated load, psi (kPa)    | 178 (1230)                  |       |
| Bore, in. (mm)                       | 6.25 (159)                  |       |
| Stroke, in. (mm)                     | 7.48 (190)                  |       |
| Rated speed, rpm                     | 1800                        |       |
| Piston speed, ft./min (m/s)          | 1875 (9.5)                  |       |

| <b>Engine (cont'd.)</b>    | <b>Standby and demand response</b> | <b>Prime</b> |
|----------------------------|------------------------------------|--------------|
| Compression ratio          | 11.4:1                             |              |
| Lube oil capacity, qt. (L) | 188 (178)                          |              |
| Overspeed limit, rpm       | 2150                               |              |
| Regenerative power, kW     | 250                                |              |

#### **Air**

|                                                                        |           |  |
|------------------------------------------------------------------------|-----------|--|
| Combustion air, scfm (m <sup>3</sup> /min)                             | 2960 (84) |  |
| Max air cleaner restriction (dirty filter), in. H <sub>2</sub> O (kPa) | 6 (1.5)   |  |

#### **Exhaust**

|                                                                |            |  |
|----------------------------------------------------------------|------------|--|
| Exhaust flow at set rated load, cfm (m <sup>3</sup> /min)      | 8428 (239) |  |
| Exhaust temp, °F (°C)                                          | 934 (501)  |  |
| Max allowable system back pressure, in. H <sub>2</sub> O (kPa) | 11 (2.7)   |  |

#### **Cooling**

|                                                                     |                |  |
|---------------------------------------------------------------------|----------------|--|
| Ambient design, °F (°C)                                             | 104 (40)       |  |
| Fan load, HP (kWm)                                                  | 99 (73.8)      |  |
| Coolant capacity (with radiator), gal (L)                           | 135 (511)      |  |
| Cooling system air flow, acfm (m <sup>3</sup> /min)                 | 95,430 (2702)  |  |
| Heat rejected, jacket water circuit, Btu/min (MJ/min)               | 40,347 (42.57) |  |
| Heat rejected, after-cooler circuit, Btu/min (MJ/min)               | 4793 (5.06)    |  |
| Total heat radiated to room, Btu/min (MJ/min)                       | 45,140 (47.63) |  |
| Max cooling air flow static restriction, in. H <sub>2</sub> O (kPa) | 0.5 (0.12)     |  |

#### **Weight**

Weight represents a set with standard features. See outline drawing for weights of other configurations.

|                            |                  |
|----------------------------|------------------|
| Unit wet weight lbs. (kgs) | 35,400 (16, 057) |
|----------------------------|------------------|

#### **Full-load amperage (FLA) at rated voltage**

Three-phase FLA is based on 0.8 power factor (PF).

| 120/240 (1 Ph) | 120/208 | 127/220 | 139/240 | 220/380 | 240/416 | 254/440 | 277/480 | 347/600 |
|----------------|---------|---------|---------|---------|---------|---------|---------|---------|
| N/A            | N/A     | N/A     | N/A     | N/A     | N/A     | N/A     | 1504    | 1203    |

### Engine derates

For non-standard remote installations, contact your local Cummins representative.

| Barometer<br>in. Hg (mbar) | SAE<br>standard<br>altitude<br>ft. (m) | Derate factor based on 1000 kWe<br>at ambient temperature °F (°C) |         |         |         |          |          |          |         |
|----------------------------|----------------------------------------|-------------------------------------------------------------------|---------|---------|---------|----------|----------|----------|---------|
|                            |                                        | 68 (20)                                                           | 77 (25) | 86 (30) | 95 (35) | 104 (40) | 113 (45) | 122 (50) | 131(55) |
| 20.7 (701)                 | 9843 (3000)                            | 0.85                                                              | 0.83    | 0.81    | 0.80    | 0.78     | 0.73     | 0.69     | 0.64    |
| 21.4 (723)                 | 9022 (2750)                            | 0.89                                                              | 0.88    | 0.86    | 0.84    | 0.82     | 0.78     | 0.73     | 0.69    |
| 22.1 (747)                 | 8202 (2500)                            | 0.94                                                              | 0.92    | 0.90    | 0.88    | 0.86     | 0.82     | 0.78     | 0.73    |
| 22.8 (771)                 | 7382 (2250)                            | 0.98                                                              | 0.96    | 0.94    | 0.93    | 0.91     | 0.86     | 0.82     | 0.77    |
| 23.5 (795)                 | 6562 (2000)                            | 1.00                                                              | 1.00    | 0.99    | 0.97    | 0.95     | 0.91     | 0.86     | 0.82    |
| 24.3 (820)                 | 5741(1750)                             | 1.00                                                              | 1.00    | 1.00    | 1.00    | 0.99     | 0.95     | 0.91     | 0.86    |
| 25.0 (846)                 | 4921(1500)                             | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 0.99     | 0.95     | 0.90    |
| 25.8 (872)                 | 4101 (1250)                            | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 0.99     | 0.95    |
| 26.6 (899)                 | 3281 (1000)                            | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 0.99    |
| 27.4 (926)                 | 2461 (750)                             | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 1.00    |
| 28.3 (954)                 | 1640 (500)                             | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 1.00    |
| 29.1 (983)                 | 820(250)                               | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 1.00    |
| 29.5 (995)                 | 492 (150)                              | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 1.00    |
| 30.0 (1012)                | 0                                      | 1.00                                                              | 1.00    | 1.00    | 1.00    | 1.00     | 1.00     | 1.00     | 1.00    |

## Ratings definitions

### Emergency standby power (ESP):

Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power is in accordance with ISO 3046, AS 2789, DIN 6271, and BS 5514.

### Prime power (PRP):

Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271, and BS 5514.

### Base load (continuous) power (COP):

Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528, ISO 3046, AS 2789, DIN 6271, and BS 5514.

### Demand Response Power Rating - Spark Ignited Gas (DRP):

Applicable for supplying electrical power in parallel with commercially available power in variable and non-variable load applications. This fuel rating is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engine operation is limited to a total of 500 hours per year. Engines may be operated in parallel to the public utility for up to 500 hours per year, with an average load factor no greater than 80% of rated Demand Response Power. Engines with Standby Power ratings available can be run in Emergency Standby applications up to the Standby Power rating for up to 50 hours per year. The customer should be aware, however, that the life of any engine will be reduced by constant high load operation.

## ISO 9001:2015

This product has been manufactured under the controls established by an approved management system that conforms with ISO 9001:2015.

**Warning:** Backfeed to a utility system can cause electrocution and/or property damage. Do not connect GenSets to any building electrical system except through an approved device or after the building main disconnect is open. Neutral connection must be bonded in accordance with National Electrical Code.

Specifications are subject to change without notice.

## Power You Can Rely On

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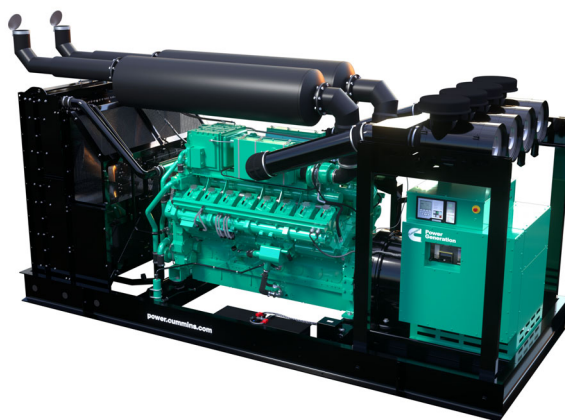
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## Specification sheet

# Gaseous fuel generator set

1000 kW - 1300 kW  
60 Hz



## Description

You can count on the 1000-1300 kW natural gas generator set (GenSet) for the reliability, quality, and dependability that is genuine Cummins performance. EPA-certified, this fully-integrated power generation system provides optimum performance and versatility for demand response and stationary standby power applications.

## Features

- Over 100 years of Cummins power generation technology and innovation
- Listed to UL 2200 and CSA standards for all low voltage models
- Stamford rugged and reliable alternator with state-of-the-art technology
- One-year (demand response) and two-year (standby) base warranty supported by a worldwide Cummins twenty-four hour, seven days-a-week, distributor network
- Accepts 100% rated load in a single step
- Capable of meeting NFPA 110 Type 10 for Level 1 emergency or standby power supply systems (EPSSs) when installed and operated per Cummins and NFPA guidelines
- Standard Power Command Control (PCC) 3300 technology provides digital (precise) frequency and voltage regulation
- Efficient and convenient operation monitoring and control options:
  - Modbus over the Internet (monitor and control)
  - Remote HMI (monitor and control)

| Model            | Power rating<br>60 Hz kW (kVa)<br>Standby and<br>demand response | Emissions                                                                      | Data<br>sheet |
|------------------|------------------------------------------------------------------|--------------------------------------------------------------------------------|---------------|
| <b>C1000</b> N6B | 1000 (1250)                                                      | EPA-certified for<br>stationary emergency<br>and non-emergency<br>applications | NAD-C1000N6B  |
| <b>C1300</b> N6  | 1300 (1625)                                                      |                                                                                | NAD-C1300N6   |



## S6L1D-E4 Wdg.311/312 - Technical Data Sheet

### Standards

STAMFORD industrial alternators meet the requirements of the relevant parts of the IEC 60034 and the relevant sections of other international standards such as BS5000-3, ISO 8528-3, VDE 0530, NEMA MG1-32, CSA C22.2-100 and AS 60034. Other standards and certifications can be considered on request.

### Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.



### Excitation and Voltage Regulators

| Excitation System  |       |             |         |         |                          |
|--------------------|-------|-------------|---------|---------|--------------------------|
| AVR Type           | MX341 | MX321/MX322 | DECS100 | DECS150 |                          |
| Voltage Regulation | ± 1%  | ± 0.5%      | ± 0.25% | ± 0.25% | with 4% Engine Governing |
| AVR Power          | PMG   | PMG         | PMG     | PMG     |                          |

|                                  |             |
|----------------------------------|-------------|
| No Load Excitation Voltage (V)   | 13.5 - 13.6 |
| No Load Excitation Current (A)   | 0.69 - 0.68 |
| Full Load Excitation Voltage (V) | 62          |
| Full Load Excitation Current (A) | 2.8         |
| Exciter Time Constant (seconds)  | 0.16        |

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## S6L1D-E4 Wdg.311/312

| Electrical Data                                             |                                                                                         |      |      |      |             |      |      |      |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------|------|------|------|-------------|------|------|------|
| Insulation System                                           | H                                                                                       |      |      |      |             |      |      |      |
| Stator Winding                                              | Double Layer Concentric                                                                 |      |      |      |             |      |      |      |
| Winding Pitch                                               | 2/3                                                                                     |      |      |      |             |      |      |      |
| Winding Leads                                               | 12/6                                                                                    |      |      |      |             |      |      |      |
| Winding Number                                              | 311/312                                                                                 |      |      |      |             |      |      |      |
| Number of Poles                                             | 4                                                                                       |      |      |      |             |      |      |      |
| IP Rating                                                   | IP23                                                                                    |      |      |      |             |      |      |      |
| RFI Suppression                                             | BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N.<br>Refer to factory for others |      |      |      |             |      |      |      |
| Waveform Distortion                                         | NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%                               |      |      |      |             |      |      |      |
| Short Circuit Ratio                                         | 1/Xd                                                                                    |      |      |      |             |      |      |      |
| Steady State X/R Ratio                                      | 18.89                                                                                   |      |      |      |             |      |      |      |
| 50 Hz                                                       |                                                                                         |      |      |      | 60 Hz       |      |      |      |
| Telephone Interference                                      | THF<2%                                                                                  |      |      |      | TIF<50      |      |      |      |
| Cooling Air Flow                                            | 1.41 m³/sec                                                                             |      |      |      | 1.69 m³/sec |      |      |      |
| Voltage Series Star (V)                                     | 380                                                                                     | 400  | 415  | 440  | 416         | 440  | 460  | 480  |
| Voltage Parallel Star (V)*                                  | 190                                                                                     | 200  | 208  | 220  | 208         | 220  | 230  | 240  |
| Voltage Delta (V)                                           | 220                                                                                     | 230  | 240  | 254  | 240         | 254  | 266  | 277  |
| kVA Base Rating (Class H) for Reactance Values (kVA)        | 1000                                                                                    | 1050 | 1050 | 1010 | 1150        | 1200 | 1250 | 1300 |
| Saturated Values in Per Unit at Base Ratings and Voltages   |                                                                                         |      |      |      |             |      |      |      |
| Xd Dir. Axis Synchronous                                    | 2.79                                                                                    | 2.64 | 2.45 | 2.10 | 3.21        | 2.99 | 2.85 | 2.72 |
| X'd Dir. Axis Transient                                     | 0.18                                                                                    | 0.17 | 0.16 | 0.13 | 0.20        | 0.19 | 0.18 | 0.17 |
| X''d Dir. Axis Subtransient                                 | 0.14                                                                                    | 0.14 | 0.13 | 0.11 | 0.16        | 0.15 | 0.15 | 0.14 |
| Xq Quad. Axis Reactance                                     | 2.17                                                                                    | 2.05 | 1.91 | 1.63 | 2.50        | 2.33 | 2.22 | 2.12 |
| X''q Quad. Axis Subtransient                                | 0.34                                                                                    | 0.32 | 0.30 | 0.25 | 0.39        | 0.36 | 0.34 | 0.33 |
| XL Stator Leakage Reactance                                 | 0.08                                                                                    | 0.07 | 0.07 | 0.06 | 0.09        | 0.08 | 0.08 | 0.08 |
| X2 Negative Sequence Reactance                              | 0.20                                                                                    | 0.19 | 0.18 | 0.15 | 0.23        | 0.21 | 0.20 | 0.20 |
| X0 Zero Sequence Reactance                                  | 0.08                                                                                    | 0.07 | 0.07 | 0.06 | 0.09        | 0.08 | 0.08 | 0.08 |
| Unsaturated Values in Per Unit at Base Ratings and Voltages |                                                                                         |      |      |      |             |      |      |      |
| Xd Dir. Axis Synchronous                                    | 3.34                                                                                    | 3.17 | 2.94 | 2.52 | 3.85        | 3.59 | 3.42 | 3.27 |
| X'd Dir. Axis Transient                                     | 0.20                                                                                    | 0.19 | 0.18 | 0.15 | 0.23        | 0.22 | 0.21 | 0.20 |
| X''d Dir. Axis Subtransient                                 | 0.17                                                                                    | 0.16 | 0.15 | 0.13 | 0.19        | 0.18 | 0.17 | 0.16 |
| Xq Quad. Axis Reactance                                     | 2.23                                                                                    | 2.12 | 1.97 | 1.68 | 2.57        | 2.40 | 2.29 | 2.18 |
| X''q Quad. Axis Subtransient                                | 0.40                                                                                    | 0.38 | 0.35 | 0.30 | 0.46        | 0.43 | 0.41 | 0.39 |
| XL Stator Leakage Reactance                                 | 0.09                                                                                    | 0.08 | 0.08 | 0.07 | 0.10        | 0.09 | 0.09 | 0.09 |
| Xlr Rotor Leakage Reactance                                 | 0.10                                                                                    | 0.09 | 0.09 | 0.07 | 0.11        | 0.11 | 0.10 | 0.10 |
| X2 Negative Sequence Reactance                              | 0.24                                                                                    | 0.23 | 0.21 | 0.18 | 0.28        | 0.26 | 0.24 | 0.23 |
| X0 Zero Sequence Reactance                                  | 0.09                                                                                    | 0.09 | 0.08 | 0.07 | 0.10        | 0.10 | 0.09 | 0.09 |

\* Parallel Star connection only available with 12 leads winding option

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## S6L1D-E4 Wdg.311/312

| Time Constants (Seconds)                                       |                                                                                                                                                                               |                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| T'd Transient Time Const.                                      | 0.101                                                                                                                                                                         |                |
| T''d Sub-Transient Time Const.                                 | 0.016                                                                                                                                                                         |                |
| T'do O.C. Field Time Const.                                    | 3.570                                                                                                                                                                         |                |
| Ta Armature Time Const.                                        | 0.024                                                                                                                                                                         |                |
| T''q Sub-Transient Time Const.                                 | 0.0104                                                                                                                                                                        |                |
| Resistances in Ohms (Ω) at 22°C                                |                                                                                                                                                                               |                |
| Stator Winding Resistance (Ra), per phase for series connected | 0.00220                                                                                                                                                                       |                |
| Rotor Winding Resistance (Rf)                                  | 1.91                                                                                                                                                                          |                |
| Exciter Stator Winding Resistance                              | 19.56                                                                                                                                                                         |                |
| Exciter Rotor Winding Resistance per phase                     | 0.1                                                                                                                                                                           |                |
| PMG Phase Resistance (Rpmg) per phase                          | 1.91                                                                                                                                                                          |                |
| Positive Sequence Resistance (R1)                              | 0.0028                                                                                                                                                                        |                |
| Negative Sequence Resistance (R2)                              | 0.0032                                                                                                                                                                        |                |
| Zero Sequence Resistance (R0)                                  | 0.0028                                                                                                                                                                        |                |
| Saturation Factors                                             | 400V                                                                                                                                                                          | 480V           |
| SG1.0                                                          | 0.29                                                                                                                                                                          | 0.289          |
| SG1.2                                                          | 1.181                                                                                                                                                                         | 1.063          |
| Mechanical Data                                                |                                                                                                                                                                               |                |
| Shaft and Keys                                                 | All alternator rotors are dynamically balanced to better than ISO 21940-11 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key. |                |
|                                                                | 1 Bearing                                                                                                                                                                     | 2 Bearing      |
| SAE Adaptor                                                    | SAE0,1                                                                                                                                                                        | SAE0,1         |
| Moment of Inertia                                              | 20.014 kgm²                                                                                                                                                                   | 19.49 kgm²     |
| Weight Wound Stator                                            | 999kg                                                                                                                                                                         | 999kg          |
| Weight Wound Rotor                                             | 853kg                                                                                                                                                                         | 811kg          |
| Weight Complete Alternator                                     | 2020kg                                                                                                                                                                        | 2102kg         |
| Shipping weight in a Crate                                     | 2063kg                                                                                                                                                                        | 2145kg         |
| Packing Crate Size                                             | 170x90x153(cm)                                                                                                                                                                | 170x90x153(cm) |
| Maximum Over Speed                                             | 2250 RPM for two minutes                                                                                                                                                      |                |
| Bearing Drive End                                              | -                                                                                                                                                                             | BALL 6224      |
| Bearing Non-Drive End                                          | BALL 6317                                                                                                                                                                     | BALL 6317      |

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## S6L1D-E4 Wdg.311/312

### RATINGS AT 0.8 POWER FACTOR

| Class - Temp Rise |                    | Standby - 163/27°C |      |      |      | Standby - 150/40°C |      |      |      | Cont. H - 125/40°C |      |      |      | Cont. F - 105/40°C |      |      |      |
|-------------------|--------------------|--------------------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|--------------------|------|------|------|
| <b>50</b><br>Hz   | Star (V)           | 380                | 400  | 415  | 440  | 380                | 400  | 415  | 440  | 380                | 400  | 415  | 440  | 380                | 400  | 415  | 440  |
|                   | Parallel Star (V)* | 190                | 200  | 208  | 220  | 190                | 200  | 208  | 220  | 190                | 200  | 208  | 220  | 190                | 200  | 208  | 220  |
|                   | Delta (V)          | 220                | 230  | 240  | 254  | 220                | 230  | 240  | 254  | 220                | 230  | 240  | 254  | 220                | 230  | 240  | 254  |
|                   | kVA                | 1100               | 1125 | 1125 | 1100 | 1060               | 1100 | 1100 | 1060 | 1000               | 1050 | 1050 | 1010 | 900                | 945  | 945  | 900  |
|                   | kW                 | 880                | 900  | 900  | 880  | 848                | 880  | 880  | 848  | 800                | 840  | 840  | 808  | 720                | 756  | 756  | 720  |
|                   | Efficiency (%)     | 94.8               | 94.9 | 95.0 | 95.2 | 94.9               | 95.0 | 95.1 | 95.3 | 95.1               | 95.1 | 95.2 | 95.4 | 95.3               | 95.3 | 95.4 | 95.5 |
|                   | kW Input           | 928                | 949  | 947  | 925  | 893                | 927  | 926  | 890  | 841                | 883  | 882  | 847  | 755                | 793  | 792  | 754  |

|                 |                    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------------|--------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>60</b><br>Hz | Star (V)           | 416  | 440  | 460  | 480  | 416  | 440  | 460  | 480  | 416  | 440  | 460  | 480  | 416  | 440  | 460  | 480  |
|                 | Parallel Star (V)* | 208  | 220  | 230  | 240  | 208  | 220  | 230  | 240  | 208  | 220  | 230  | 240  | 208  | 220  | 230  | 240  |
|                 | Delta (V)          | 240  | 254  | 266  | 277  | 240  | 254  | 266  | 277  | 240  | 254  | 266  | 277  | 240  | 254  | 266  | 277  |
|                 | kVA                | 1250 | 1300 | 1350 | 1400 | 1206 | 1250 | 1300 | 1350 | 1150 | 1200 | 1250 | 1300 | 1063 | 1100 | 1150 | 1188 |
|                 | kW                 | 1000 | 1040 | 1080 | 1120 | 965  | 1000 | 1040 | 1080 | 920  | 960  | 1000 | 1040 | 850  | 880  | 920  | 950  |
|                 | Efficiency (%)     | 95.0 | 95.1 | 95.1 | 95.1 | 95.1 | 95.2 | 95.2 | 95.2 | 95.2 | 95.2 | 95.3 | 95.3 | 95.3 | 95.4 | 95.4 | 95.4 |
|                 | kW Input           | 1053 | 1094 | 1136 | 1178 | 1015 | 1051 | 1093 | 1134 | 967  | 1008 | 1050 | 1091 | 892  | 922  | 964  | 996  |

**\* Parallel Star connection only available with 12 leads winding option**

#### De-rates

All values tabulated above are subject to the following reductions:

- 5% when air inlet filters are fitted
- 3% for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- 3% for every 5°C by which the operational ambient temperature exceeds 40°C @ Class H temperature rise (please refer to applications for ambient temperature de-rates at other temperature rise classes)
- For any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60°C and altitude exceeding 4000 meters (for <690V) or 1500 meters (for >690V) must be referred to applications.

#### Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (<http://stamford-avk.com/>)

**Note:** Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

# 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 35 V Continuous  
5 V for up to 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

330 mA at 12 V, 160 mA at 24 V

#### CHARGE FAIL/EXCITATION RANGE

0 V to 35 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

3.5 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  
-40 °F to +158 °F

### RELATED MATERIALS

#### TITLE

DSE7310 MKII & DSE7320 MKII Installation Instructions  
DSE7310 MKII & DSE7320 MKII Operator Manual  
DSE7310 MKII & DSE7320 MKII Configuration Suite PC Manual

#### PART NO.

053-181  
057-253  
057-243

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# DSE7310/20 MKII

## AUTO START & AUTO MAINS FAILURE CONTROL MODULES

The DSE7310 MKII is an Auto Start Control Module and the DSE7320 MKII is an Auto Mains (Utility) Failure Control Module suitable for a wide variety of single, diesel or gas, gen-set applications.

Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs, remote PC and via SMS text alerts (with external modem).

The DSE7320 MKII will also monitor the mains (utility) supply. The modules include USB, RS232 and RS485 ports as well as dedicated DSENet® terminals for system expansion.

Both modules are compatible with electronic (CAN) and non-electronic (magnetic pick-up/alternator sensing) engines and offer an extensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry requirements.

The extensive list of features includes enhanced event and performance monitoring, remote communications & PLC functionality. Dual mutual standby is now available on both the DSE7310 MKII & DSE7320 MKII using RS232 or RS485 communications. This provides for a simpler and more convenient installation with more advanced features such as true engine hours balancing.

The modules can be easily configured using the DSE Configuration Suite PC software. Selected front panel editing is also available.

### ENVIRONMENTAL TESTING STANDARDS

#### ELECTRO-MAGNETIC COMPATIBILITY

BS EN 61000-6-2  
EMC Generic Immunity Standard for the Industrial Environment  
BS EN 61000-6-4  
EMC Generic Emission Standard for the Industrial Environment

#### ELECTRICAL SAFETY

BS EN 60950  
Safety of Information Technology Equipment, including Electrical Business Equipment

#### TEMPERATURE

BS EN 60068-2-1  
Ab/Ae Cold Test -30 °C  
BS EN 60068-2-2  
Bb/Be Dry Heat +70 °C

#### VIBRATION

BS EN 60068-2-6  
Ten sweeps in each of three major axes  
5 Hz to 8 Hz at +/-7.5 mm,  
8 Hz to 500 Hz at 2 gn

#### HUMIDITY

BS EN 60068-2-30  
Db Damp Heat Cyclic 20/55 °C  
at 95% RH 48 Hours  
BS EN 60068-2-78  
Cab Damp Heat Static 40 °C  
at 93% RH 48 Hours

#### SHOCK

BS EN 60068-2-27  
Three shocks in each of three major axes  
15 gn in 11 ms

#### DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529  
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

## COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS

