Air Quality Assessment

Hailsham Roadway Construction Company Limited

February 2021

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1. Introduction

1.1 Phlorum Ltd has been commissioned by Hailsham Roadway Construction Company Limited to undertake an air quality assessment (AQA), as part of an environmental permit application (ref: EPR/ZP3992EW/V002), for a proposed diesel generator.

1.2 The application site is located to the south of Hailsham, just off the A22, in a rural setting. There are very few highly sensitive receptors in the local area, with the closest residential dwellings found at least 100m from the site. A Site Location Plan is included in Figure 1.

Environmental permit application

1.3 The environmental permit application is to convert the existing permit (for the transfer and treatment of non-hazardous waste) to a bespoke permit for the installation's activities and waste operations.

1.4 This AQA does not cover the permitted activity, but an associated diesel generator that is used to power their batching plant. The diesel generator is small (116kWe) and it is anticipated to run for fewer than 600 hours per year. The specification sheet for the generator can be found in Appendix A.

1.5 In pre-application from the Environment Agency (EA), they state that:

"You should describe the environmental risk posed by your proposals. This must take the form of an environmental risk assessment which should follow the methodology set out in 'Risk assessments for your environmental permit' at https://www.gov.uk/guidance/risk-assessments-for-your-environmentalpermit. You should consider using our assessment tool to assess your environmental risk. Our assessment tool will inform you when more detailed modelling is required.

If your site is located in a flood risk zone you should assess the risk of pollution in the event of a flood.

Depending on the outcome of your initial environmental assessment, you may be required to undertake detailed modelling of your environmental risk.

You need to assess the risk of emissions to air using the methodology in this guidance https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit.

You must carry out detailed modelling assessment on any emissions that you didn't screen out through your air emissions risk assessment. Your modelling report needs to

follow this guidance https://www.gov.uk/guidance/environmental-permitting-air-dispersion-modelling-reports *"*

1.6 EA guidance states that air quality consideration needs to be given to sensitive receptors including ecological sites with an international designation within 10km. The Pevensey Levels are a Ramsar and SAC located approx. 1.85km from the site. It is understood that the 10km screening threshold also applies to combustion sources of up to 50Mw, which is a source at least three hundred times more significant than the proposed diesel generator.

1.7 It is understood that Natural England's (NE) assessment of effects from air pollution follows the principles of the EA's screening assessment methodology. However, it is understood that NE commonly gives *discretionary advice* weighting the distance criterion by the size of the facility. It is understood that combustion facilities of up to 20MW often only require assessment within 500m of nationally and internationally designated sites. As such, without further assessment and based on the size of the diesel generator, it is considered highly unlikely to have the potential to impact air quality at the Pevensey Levels SAC.

1.8 Considering the location of the facility, the size of the generator and the pre-app advice above, Phlorum Ltd were commissioned to undertake a screening assessment (stage 1 and stage 2) of emissions using the Environment Agency guidance and tool (H1 tool) quoted above.

2. Air Emissions Risk Assessment

Guidance

2.1 An Air Emissions Risk Assessment has been undertaken in line with EA and Defra guidance[1]. The calculations were undertaken within the EA's H1 assessment tool[2].

2.2 The guidance states that to complete an air emissions risk assessment, the following steps must be followed:

1. *"Calculate the environmental concentration of each substance you release into the air – known as the process contribution (PC).*

2. *Identify PCs with insignificant environmental impact so that they can be 'screened out' – this means that you do not have to assess them any further.*

3. *For substances not screened out in step 2, calculate the predicted environmental concentration (PEC) for each substance you release to air – the PEC is the PC plus the concentration of the substance already present in the environment.*

4. *Identify emissions that have insignificant environmental impact – these can be screened out.*

5. *Get 'detailed modelling' (also known as detailed assessment or computer modelling) done for the emissions you cannot screen out.*

6. *For each substance you've released to air, compare the PC and PEC with the relevant environmental standard and summarise your results.*

7. *Check if you need to take further action.*

8. *Check if you need to do any other risk assessments."*

2.3 Steps 1 and 2 are referred to as stage 1, whilst stage 3 and 4 are referred to as stage 2 screening.

[1] Air emissions risk assessment for your environmental permit - GOV.UK (www.gov.uk)
[2] EA (2017) H1 Software

Risk assessment

2.4 The Broadcrown specification sheet states that the generator meets Stage IIIA emission standards for Non-Road Mobile Machinery (NRMM). The Stage IIIA emission standards are set out below in Table 1.

Table 1: Stage IIIA Non-Road Mobile Machinery Emission Standards

Cat.	Net Power	Date†	CO	HC	HC+NOx	NOx	PM
	kW		g/kWh				
H	130 ≤ P ≤ 560	2006.01	3.5	-	4.0	-	0.2
I	**75 ≤ P < 130**	**2007.01**	**5.0**	**-**	**4.0**	**-**	**0.3**
J	37 ≤ P < 75	2008.01	5.0	-	4.7	-	0.4
K	19 ≤ P < 37	2007.01	5.5	-	7.5	-	0.6

2.5 The diesel generator has an output of 116kWe and, therefore, has an average emission rate of 0.128 g/s ((116kWe * 4.0g/kWh)/60/60), using the regulatory maximum Stage IIIA emission limit value for combined NO_X and HC.

2.6 Using the regulatory maximum for Stage IIIA NRMM, the average PM emission rate from the diesel generator would be 0.0096 g/s. For the purposes of this assessment, it has been assumed that 100% of PM emits in *both* the $PM_{2.5}$ and PM_{10} fractions.

2.7 The generator would run for approximately 576 hours per year and would therefore release, at most, 0.26 tonnes of NO_X and 0.002 tonnes of PM.

2.8 The guidance states that the process contribution (PC) for any substance can be screened out (i.e., be deemed to be insignificant) if:

- *"the short-term PC is less than 10% of the short-term environmental standard*
- *the long-term PC is less than 1% of the long-term environmental standard"*

2.9 Table 2 below sets out the relevant environmental standards/ air quality standards for NO_2, PM_{10} and $PM_{2.5}$.

Table 2: UK Air Quality Standards

Pollutant	Averaging Period	Air quality standard (µg.m^{-3})	Air quality objective	Objective: to achieved by
Nitrogen dioxide (NO_2)	1 hour	200	200 µg.m^{-3} not to be exceeded more than 18 times a year	31 December 2005
	Annual	40	40 µg.m^{-3}	31 December 2005
Particulate Matter (PM_{10})	24 hour	50	50 µg.m^{-3} not to be exceeded more than 35 times a year	31 December 2004
	Annual	40	40 µg.m^{-3}	31 December 2004
Particulate Matter ($PM_{2.5}$)	Annual	25	25 µg.m^{-3}	2020

Note: The AQSs equate to environmental standard or Environmental Assessment Limits (EALs) used in the risk assessment.

Step 1: Calculation of Process Contribution to Air

2.10 The EA's H1 tool[3] has been used to calculate the PCs of PM_{10}, $PM_{2.5}$ and PM_{10} at ground level. It should be noted that the H1 tool calculates the maximum ground level PC and does not calculate impacts at specific locations. It is, therefore, highly conservative.

2.11 The diesel generator's exhaust is at the top of the unit at circa 2m. The total flow rate (1558.8 m^3/hr) was taken from the generator's specification sheet and the efflux velocity (55.1 m/s) calculated from the flow rate and diameter of stack (0.1m).

2.12 In line with EA/Defra guidance, it was assumed that 50% of NO_X would convert to NO_2 in the short-term and that 100% of the NO_X would convert to NO_2 in the long-term (i.e., over an annual averaging period). The short-term emission rate of NO_X was, therefore, halved to account for this.

2.13 The outputs of the H1 tool screening stage 1 are presented in Figure 1 below.

[3] EA (2017) H1 Software

Figure 1: H1 Screening Tool Stage 1

Number	Substance	Long Term EAL	Short Term EAL	Long Term			Short Term		
				PC	% PC of EAL	> 1% of EAL?	PC	% PC of EAL	> 10% of EAL?
		µg/m3	µg/m3	µg/m3	%		µg/m3	%	
1	Nitrogen Dioxide	40.0	200	1.06	2.65	Yes	209	104	Yes
2	Particulates (PM2.5)	25.0	-	0.0803	0.321	No	31.6	-	
3	Particulates (PM10) (/	40.0	-	0.0803	0.201	No	31.6	-	
4	Particulates (PM10) (:	-	50.0	0.0803	-		31.6	63.0	Yes

Step 2: Identify PCs with insignificant environmental impact.

2.14 The results show that emissions of $PM_{2.5}$ could be screened out, as increases in long-term $PM_{2.5}$ were below 1% of the long term AQS.

2.15 However, the long-term PC of NO_2 (at 1.06µg/m^{-3}) was predicted to exceed 1% of the AQS and daily PM_{10} (at 31.6µg/m^{-3}) was predicted to exceed 10% of the daily-mean AQSs. As such, the assessment progressed to Step 3.

Steps 3: Calculate the PECs for substances not screened out in step 2.

2.16 The predicted environmental concentration (PEC) was calculated by combining the process contribution from Stage 1 with the UK-AIR background concentration for the application site[4].

2.17 The annual mean background concentrations of NO_2 and PM_{10} in 2019 were 8.55µg m^{-3} and 13.04µg m^{-3}, respectively. Hourly mean concentrations of NO_2 were calculated by multiplying the annual mean background concentration by two, in line with EA/Defra guidance. Daily mean concentrations of PM_{10} were assumed to be equal to annual mean concentrations.

2.18 The resulting PECs for NO_2 and PM_{10} were calculated at 9.61µg $m^{-3}$for long-term NO_2, 114µg m^{-3} for hourly mean (short term) NO_2 and 131µg m^{-3} for daily mean PM_{10}[5].

Step 4: Identify PECs with insignificant environmental impact.

2.19 As stage 1 could not screen out emissions from all pollutants , the second stage of screening was undertaken. At this stage, both the PC and the PEC of the pollutant were considered. The guidance states that significant impacts can be screened out at the second stage if:

- *"the short-term PC is less than 20% of the short-term environmental standards minus twice the long-term background concentration;*

[4] UK Ambient Air Quality Interactive Map (defra.gov.uk)
[5] The output of the H1 tool appears erroneous as higher background concentrations results in *less* significant impacts and at some concentrations, negative concentrations. Whether calculated by hand, or in the tool, an exceedance of the screening criterion is anticipated.

- *the long-term PEC is less than 70% of the long-term environmental standards."*

2.20 The EA's H1 tool[6] was used to assess whether impacts could be screened out using the PEC. The outputs of the H1 tool screening stage 2 are presented in Figure 2 below.

Figure 2: H1 Screening Tool Stage 2

			Long Term					Short Term		
Number	Substance	Air Bkgrnd Conc.	PC	% PC of headroom (EAL - Bkgrnd)	PEC	% PEC of EAL	% PEC of EAL >=70?	PC	% PC of headroom (EAL - Bkgrnd)	% PC of headroom >=20?
		µg/m3	µg/m3		mg/m3	%		µg/m3		
	e.g.	12								
1	Nitrogen Dioxide	8.55	1.06	3.37	9.61	24.0	No	209	114	Yes
4	Particulates (PM10) (24 hr Mean)	13	0.0803	-	0	-		31.6	131	Yes

2.21 The results showed that changes in long-term NO_2 concentrations could also be screened out as insignificant, as the PEC was predicted to be less than 70% of the long-term AQS.

2.22 However, short-term changes in NO_2 concentrations and daily emissions of PM_{10} (at 131%) could not be screened out using H1 tool, as the results were greater than *20% of the short-term environmental standards minus twice the long-term background concentration* .

[6] EA (2017) H1 Software

3. Discussion and Conclusions

3.1 The screening assessment undertaken above suggested that long-term changes in $PM_{2.5}$, NO_2 and PM_{10} could be screened out at all locations. The H1 tool is a worst-case screening tool and as such, it can be concluded that there would be no long-term changes in pollutant concentrations at local sensitive receptors (which are all located at least 100m away).

3.2 Short-term changes in NO_2 and PM_{10} concentrations could not be screened out using this methodology. It should be stressed that the H1 tool outputs the maximum predicted concentrations based on worst-case meteorological conditions.

3.3 In reality, short-term increases in NO_2 and PM_{10} concentrations at sensitive receptors would likely to be far less than predicted in the assessment as:

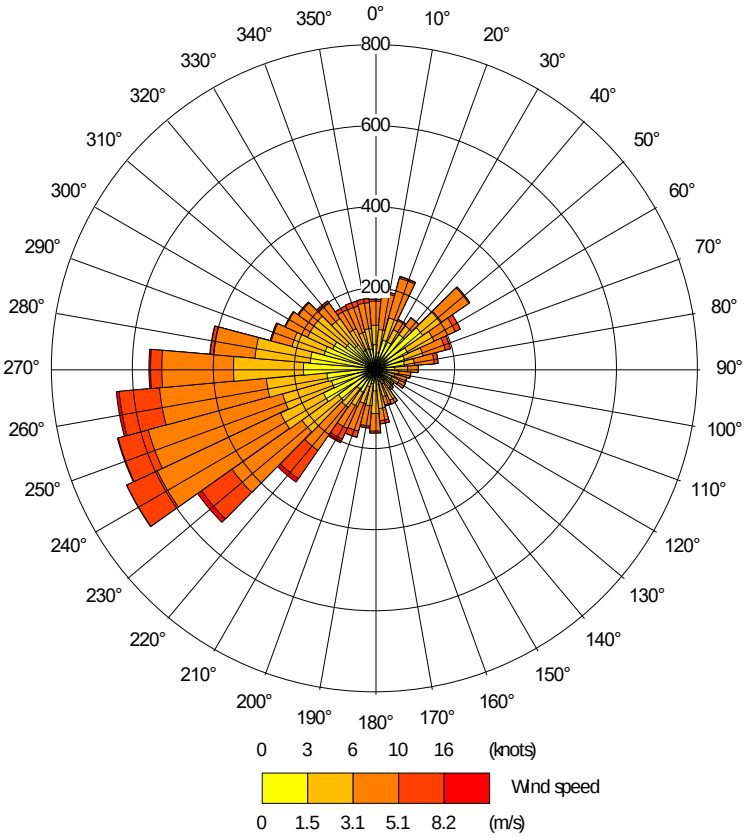
- The NO_X emission rate for the diesel generators was calculated using regulatory maximum emissions (Stage IIIA NRMM) for *both* HC and NO_X.
- sensitive receptors are located at least 100m from the proposed diesel generator;
- Receptors down-wind (of the prevailing south westerly wind – see Figure 2) of the proposed diesel generator are at least 280m from the site).
- The proposed development would only operate for 576 hours per year and, therefore, operation would be less likely to occur during worst-case meteorological conditions;
- The assessment of short-term NO_2 should be assessed against the 99.79th highest hourly concentration and not the 100th highest hourly concentration (as occurs in the H1 tool), as the UK AQS allows for 18 exceedances of 200 µg m^{-3} at any one location.

3.4 Although significant increases in short-term hourly NO_2 and daily mean PM_{10} concentrations could not be screened out using the H1 tool. For the reasons discussed above, the fact there are few local sensitive receptors and that existing air quality in the local area is good, it is considered highly unlikely that the proposed generator would cause significant impacts on local air quality.

Figure 1: Site Location Plan

Note 1: Map of Hailsham Roadways, Google Earth, 2021.

Figure 2: Wind Rose for Herstmonceaux (2017)



Appendix A: Broadcrown Diesel Generator

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Technical Data

May 2014

John Deere 6068 HFU82	CGT Stamford UCI 274 F	Generator Model:	BCRJD 150-50/60 E3A

50/60 Hz	3-Phase	Power Factor Cos Φ = 0.8	Emissions EU Stage IIIA Certified

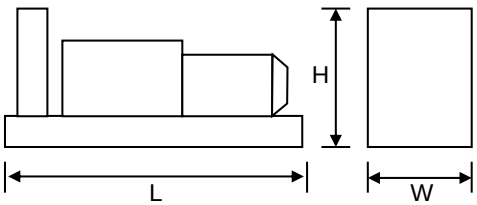
50Hz RATINGS	PRIME POWER (PRP)		STANDBY POWER (LTP)		
Voltage	**kVA**	kWe	kVA	kWe	Amps
400/230	**150**	120	165	132	238
60Hz RATINGS	PRIME POWER (PRP)		STANDBY POWER (LTP)		
Voltage	**kVA**	kWe	kVA	kWe	Amps
480/277	**145**	116	156	125	188

Definition of Ratings & Reference Conditions

Prime Power (PRP) is the nominal output continuously available, where the average load (variable) does not exceed 70% of the prime power rating. 10% overload is available for a maximum of 1 hour in 12 hours of operation.
Standby Power (LTP) is the maximum output available, for up to 500 hours per year, where the average load does not exceed 70% of the standby power rating. No overload is available.
Standard Reference Conditions: air inlet temperature 25°C (77°F), barometric pressure 100kPa, [110m (361ft) altitude], 30% relative humidity.
Note: The above ratings may be subject to derate at different operating conditions. Please see the Derate Guidelines on the Broadcrown website.
All power ratings and reference conditions in accordance with ISO 8528-1 and ISO 3046-1.

Key Features:

- Water cooled dual speed John Deere diesel engine
- EC NRMM Directive - Stage IIIA emissions certified engine
- Heavy duty rubber captive anti-vibration mountings
- Single bearing CGT Stamford alternator
- Electronic speed governer
- Fuel water seperating filters - Racor
- Three way fuel valve - single lever operation
- Integral 515 litre bunded fuel tank with filler cap and gauge
- Heavy duty zinc-treated central lift canopy c/w fork pockets
- Large door access for ease of maintenance
- Integral Industrial silencer
- Deep sea Auto-start / Load-Share controller
- 4 pole Main line circuit breaker
- Heavy duty optima red batteries 12v
- Battery isolator



Overall Dimensions & Weights

Length (L) = 3800mm
Width (W) = 1270mm
Height (H) = 2033mm

Dry Weight (inc oil) = 3000kg
Operating Weight = 3400kg

	Typical Sound Pressure Level at 75% of Prime Power dBA			
Overall LwA dBA	1m	5m	7m	10m
96	77	69	67	63

All specifications and design are subject to change without notice

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BCRJD 150-50/60 E3A

May 2014

ENGINE & COOLING SYSTEM — JOHN DEERE 6068 HFU82 - 50Hz

		SI Units	PRIME	STANDBY
Performance	Engine Speed	r/min	1500	
	Gross Power	kWm	139	153
	Fan Power	kWm	16.0	16.0
	Net Power	kWm	123	137
	Emissions Certification		EU Stage IIIA	
	Altitude Capability	m	3000	0
General	Cylinders / Type		6 cyl / inline / 4-stroke	
	Aspiration / Charge Cooling		Turbocharged / Air to Air	
	Governing / Engine Management		Electronic Governor	
	Bore / Stroke	mm	106 / 127	
	Cubic Capacity	litres	6.8	
	BMEP	kPa	1654	1820
Fuel	Fuel Consumption at 100% Power	litres/h	34.8	34.2
	Fuel Consumption at 75% Power	litres/h	24.4	26.8
	Fuel Consumption at 50% Power	litres/h	17.8	19.7
	Total fuel flow	litres/h	0	
	Standard Fuel Tank Capacity	litres	515	
Air	Engine Air Flow	m³/s	0.167	0.167
	Maximum Air Intake Restriction (used filter)	kPa	6.25	
Exhaust	Exhaust Gas Flow	m³/s	0.433	0.433
	Exhaust Gas Temperature	°C	545	545
	Maximum Exhaust Back Pressure	kPa	7.5	
	Typical Exhaust Pipe Diameter	mm	100	
Cooling	Radiator Cooling Air Flow	m³/s	TBA	
	Max Restriction to Cooling Air Flow	Pa	TBA	
	Max Radiator Air-On Temperature	°C	TBA	
	Maximum Coolant Temperature	°C	105	
	Coolant Capacity - Engine Only	litres	11.3	
	Total Coolant Capacity	litres	0	
Oil	Total Oil Capacity incl Filters	litres	24.6	
	Typical Oil Pressure at Rated Speed	kPa	271	
	Typical Oil Consumption (>250hrs Operation)	litres/h	0.09	
Thermal	Heat Rejection to Engine Cooling Water	kW	73.9	73.9
	Heat Rejection to Charge Cooler	kW	0	0
	Heat Radiated From Engine (Typical)	kW	15	15
Elec	Electrical System Voltage	V	12	
	Battery Type		1 x Optima (Red Top) 50Ah	
	Battery Capacity SAE CCA	A	815A	

ALTERNATOR — CGT STAMFORD UCI 274 F

		SI Units	PRIME	STANDBY
General Data	Manufacturer		Cummins Generator Technologies - STAMFORD	
	Model (may vary with voltage)		UCI 274 F	UCI 274 F
	Operating Temperature	°C	40	27
	Coupling / No. of Bearings		Direct / Single Bearing	
	Phase / Poles / Winding Type		3-Phase / 4-Pole / Winding 311	
	Power Factor		Cos Φ = 0.8	
	Excitation		Self Excited	
	Insulation System		Class H	
	AVR Type		SX 460	
	Voltage Regulation		± 1.0%	

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ENGINE & COOLING SYSTEM — JOHN DEERE 6068 HFU82 - 60Hz

		SI Units	[US Units]	PRIME	STANDBY
Performance	Engine Speed	r/min	[rpm]	1800	
	Gross Power	kWm	[bhp]	143 [192]	157 [211]
	Fan Power	kWm	[bhp]	28 [36.9]	28 [36.9]
	Net Power	kWm	[bhp]	116 [155]	130 [174]
	Emissions Certification			EU Stage IIIA	
	Altitude Capability	m	[ft.]	3048 [10000]	3048 [10000]
General	Cylinders / Type			6 cyl / inline / 4-stroke	
	Aspiration / Charge Cooling			Turbocharged / Air to Air	
	Governing / Engine Management			Electronic Governor	
	Bore / Stroke	mm	[in.]	106 / 127 [4.19 / 5.00]	
	Cubic Capacity	litres	[cu.in.]	6.8 [414]	
	BMEP	kPa	[psi]	1418 [206]	1557 [226]
Fuel	Fuel Consumption at 100% Power	litres/h	[gal/h]	36.0 [10]	35.5 [9.4]
	Fuel Consumption at 75% Power	litres/h	[gal/h]	25.4 [6.7]	28.0 [7.4]
	Fuel Consumption at 50% Power	litres/h	[gal/h]	18.6 [4.9]	20.5 [5.4]
	Total fuel flow	litres/h	[gal/h]	0 [0]	
	Standard Fuel Tank Capacity	litres	[gal]	515 [113]	
Air	Engine Air Flow	m³/s	[cfm]	0.210 [445]	0.210 [445]
	Maximum Air Intake Restriction (used filter)	kPa	[inWG]	6.25 [25]	
Exhaust	Exhaust Gas Flow	m³/s	[cfm]	0.502 [1063]	0.502 [1063]
	Exhaust Gas Temperature	°C	[°F]	478 [892]	478 [892]
	Maximum Exhaust Back Pressure	kPa	[inWG]	7.5 [30]	
	Typical Exhaust Pipe Diameter	mm	[in.]	[]	
Cooling	Radiator Cooling Air Flow	m³/s	[cfm]	TBA [ ]	
	Max Restriction to Cooling Air Flow	Pa	[inWG]	TBA [ ]	
	Max Radiator Air-On Temperature	°C	[°F]	TBA [ ]	
	Maximum Coolant Temperature	°C	[°F]	105 [221]	
	Coolant Capacity - Engine Only	litres	[gal]	11.9 [3]	
	Total Coolant Capacity	litres	[gal]	TBA [ ]	
Oil	Total Oil Capacity incl Filters	litres	[gal]	0 [0]	
	Typical Oil Pressure at Rated Speed	kPa	[psi]	291 [42]	
	Typical Oil Consumption (>250hrs Operation)	litres/h	[pt/h]	0.09 [0.19]	
Thermal	Heat Rejection to Engine Cooling Water	kW	[btu/min]	69.9 [3979]	69.9 [3979]
	Heat Rejection to Charge Cooler	kW	[btu/min]	0 [0]	0 [0]
	Heat Radiated From Engine (Typical)	kW	[btu/min]	16 [911]	16.0 [911]
Elec	Electrical System Voltage		V	12	
	Battery Type			1 X 643	
	Battery Capacity SAE CCA		A	660	

ALTERNATOR — CGT STAMFORD UCI 274 F

		SI Units	[US Units]	PRIME	STANDBY
General Data	Manufacturer			Cummins Generator Technologies - STAMFORD	
	Model (may vary with voltage)			UCI 274 F	UCI 274 F
	Operating Temperature	°C	[°F]	40 [104]	27 [81]
	Coupling / No. of Bearings			Direct / Single Bearing	
	Phase / Poles / Winding Type			3-Phase / 4-Pole / Winding 311	
	Power Factor			Cos Φ = 0.8	
	Excitation			Self Excited	
	Insulation System			Class H	
	AVR Type			SX 460	
	Voltage Regulation			± 1.0%	

All designs and specifications subject to change without notice

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STANDARD CONTROL SYSTEM — BC 7310 Digital Auto Start

The standard control system for this model is **BC 7310** (photo), based on the Deep Sea Electronics DSE7310 Digital Auto Start controller.

This provides for the manual and automatic remote start of the generator, together with full CANBus implementation for the control and protection of the engine via the ECU. LCD digital display of :

- Coolant temperature with high temperature alarm and shutdown
- Oil pressure with low pressure alarm and shutdown
- Oil temperature, engine operating hours, battery charge volts and amps
- Volts, with Under/Over Volts protection
- Amps, with Over Current protection
- Frequency, kW, kVA, Power Factor

Also featuring :

- Full RS485 Telemetry implementation
- Automatic cool-down timer function
- Ample auxiliary inputs/outputs for optional features

OPTIONAL CONTROL SYSTEM — BC 8610 Digital Synchronisation

BC 8610 control systems provide the same features as BC 7310, plus :

- BC 8610 - Set-to-Set Synchronisation
- BC 8620 - Single Set-to-Mains Supply Synchronisation with integrated mains monitoring

For Multi Set-to-Mains synchronisation, each set requires BC 7510 with the addition of one mains monitoring panel BC 8660 (not illustrated).
See the Synchronisation Guidelines for further details.

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Key Features - Standard

Engine :

- Water Cooled turbocharged- direct Injection
- Engine driven radiator complete with fan guard and coolant drain valve designed to cool the engine at specified output, in air-on radiator temperatures up to 45^{0}C
- Suitable protection to exposed exhaust and turbo hot surfaces
- Vertical discharge exhaust with rain cap
- Electronic governor

Chassis :

- Heavy duty fabricated steel chassis, incorporating bunding for all liquids within the set to 110% containment.
- Centre point lifting frame.
- Suitably sized, fork lift pockets
- Suitable anchorage points on baseframe
- Captive type, anti-vibration mountings.

Canopy :

- The complete set is housed in a corrosion treated steel canopy, acoustically lined to achieve noise reduction to comply with EC directive 2000/14/EC of 03/01/2006, meeting levels, depending on the model, between 70 and 80dBA @1m
- Enclosure has lockable, (common key), side access doors with stays.
- Control panel viewing window
- Cable passage with gland plate fitting

Circuit Breaker Box :

- With door giving access to a set rated, terminal box, housing a 4 pole moulded case circuit breaker, cabled to the alternator and supplied with outgoing bus bar terminals for load connection.
- Earthing terminal stud / bus bar
- Neutral to earth connection point
- Input socket for supply to battery charger and optional jacket water heater, (when fitted).
- Terminals for auto start signal cabling.

Alternator :

- IP23
- Class H Insulation
- Voltage regulation to ±1%, at any power factor, 0.8 lagging - unity

Electrical :

- External emergency Stop button
- Interlock on cable entry panel
- 50/60Hz panel mounted switch
- Analogue Hour meter
- Battery Isolator

Fuel Systems :

- Fully bunded
- Built in, single skin, baffled fuel tank of adequate capacity, complete with internal low level fuel filler and cap
- Cleaning access, high level vent and fuel contents gauge.
- Flexible fuel feed and return lines, passing through three way monobloc valves for diversion to an external bulk tank.
- Dual stage racor fuel filter with water separation

General :

- Works test in general compliance with ISO standards
- Set of operation & maintenance manuals
- Engine, alternator & radiator supplied in manufacturer colours
- Broadcrown Standard colour - Canopy (RAL9001), Cream
- Broadcrown Standard colour - Baseframe (RAL9005), Black
- First fills of lube oil and coolant

Key Mechanical & Electrical Options

Fuel System :

- Extended long range fuel tank in baseframe (24hr)
- Low fuel level options
- Bund Alarm / Shutdown

Alternator :

- Anti-condensation heater
- Quadrature droop kit
- Alternative AVR
- PMG Alternator

Engine & Cooling :

- Lub oil drain valve with evacuation pump
- Air Intake heater
- Coolant heater
- Heavy duty air cleaner
- Air Shut off valve (refinery specification)

Control panel :

- Deep Sea 8610 Controller - loadshare
- Distribution panel (cee-form / powerlock options)
- Adjustable / Key Switchable earth leakage
- Static 5 Amp Battery charger

Electrical Options :

- Intergrated Distribution panel
  - 125 Amp 3ph IP67 outlet
  - 63 Amp 3ph IP44 outlet
  - 2x32 Amp 3ph IP44 outlet
  - 3x32 Amp 1ph IP44 outlet

Canopy :

- Customer colour Change
- Galvanised Base frame
- Earth spike

Exhaust :

- DNV Certified Spark Arrestor (refinery specification)

Please refer to Broadcrown rental division for full details of these and other options.

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