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Technical Data Sheet  
EMERGENCY GENSET

PROJECT No. 5194812  
PROJECT NAME. HyNet Low Carbon Hydrogen Plant

DOCUMENT No. 5194812-000-45ED-4-0002  
REVISION 03  
ITEM NUMBER 10-CAB-R-001  
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1	Rev	Applicable To:	<input checked="" type="checkbox"/> Proposal	<input type="checkbox"/> Purchase	<input type="checkbox"/> As Built	<input type="checkbox"/> Manufacturers Std	<input type="checkbox"/> Other
2		Manufacturer	Model		Size & Type	Serial No.	
3		Driven equipment tag no	10-CAB-R-001		Location	Stanlow NW England	
4		Driven equipment type	Generator		Power reqd normal /max, kW	1000 (HOLD 1)	
5		Package mfr			Speed normal/max	STA	
6		Engine mfr			Direction of rotation facing	STA	
7		Max. Sound pressure level	85dB(A) @ 1m Envelope		Cooling Method	Roof mounted Air cooler	
8		Remarks:					
9							
10		<b>ENGINE DESIGN DATA</b>					
11		No of cylinders			Model no		
12		Direction of rotation facing flywheel	CW/CCW		Configuration	Inline/Vee	
13		Bore stroke	mm		No of cycles	4	
14		Turbocharged/supercharged	<input type="checkbox"/> Yes	<input type="checkbox"/> No	No of valves per cyl Inlet/exhaust		
15		Displacement	m <sup>3</sup>		Intercooled/aftercooled	<input type="checkbox"/> Yes	<input type="checkbox"/> No
16		Av piston speed @ max speed	m/s		Combustion air flow @ max power	m <sup>3</sup> /hr	
17		Engine speed max/ continuous	1500 rev/min		Compression ratio (mech/overall)		
18		Gross continuous engine output	kW		Max turbocharger speed	rev/min	
19		Deductions			BMEP*	bar a	
20		Jacket water pump	kW		Jacket/aftercooler water pump flows	m <sup>3</sup> /hr	
21		Aftercooler water pump	kW		Jacket water max outlet temp	°C	
22		Radiator fan (if direct)	kW		Exhaust temps aftercooler inlet/outlet	°C	
23		Other auxiliaries	kW		Exhaust manifold	Wet/Dry	
24		Net cont engine output	kW		Governing type	Single/Multiple/All speeds	
25		Max output 1 hr in 12	kW		Governing speed range	rev/min	
26		Specific fuel consumption at loads			Governing accuracy class		
27		100% load	kJ/kW hr	kJ/kW hr	Time to establish controllability	s	
28		75% load	kJ/kW hr	kJ/kW hr	Governor mfr/model		
29		50% load	kJ/kW hr	kJ/kW hr	Governor operation	<input type="checkbox"/> Hydraulic	<input type="checkbox"/> Electrical
30						<input type="checkbox"/> Mechanical	
31		* BMEP -brake mean effective pressure			Noise Enclosure Required	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
32		Remarks:					
33							
34		<b>HEAT REJECTION DATA</b>					
35		To exhaust @ 100% load	kW		To atmosphere @ 100% load	kW	
36		To cooling system @ 100% load	kW		To oil cooler @ 100% load	kW	
37		Remarks:					
38							
39		<b>LIQUID FUEL SYSTEM</b>					
40		Fuel	"Red" diesel		Filtration absolute particle size	µm	
41		Filter configuration	Simplex/duplex		Differential pressure	Normal	Max
42		Min inlet press	bar a		Fuel day tank by vendor	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
43		Fuel pump driver	<input checked="" type="checkbox"/> Engine	<input type="checkbox"/> Motor	Fuel tank volume	m <sup>3</sup>	
44		Fuel tank max/min elevation	m		Fuel tank retention	24 h	
45					Fuel tank data sheet no		
46		Remarks:	On skid double walled day tank required with fill connection at 1m above grade for filling via standard UK road tanker.				
47							
48		<b>GAS FUEL SYSTEM</b>					
49		Press regulator make/model			Press before/after regulator	bar a	
50		Gas valve make/model			Temp before/after regulator	°C	
51		Remarks:					
52							
53		<b>BASIC CONSTRUCTION</b>					
54		Cylinders			Pistons		
55		Removable	YES		No oil rings		
56		Wet or dry			No compression rings		
57		Integral jacket			Cooling method		
58		Crank shaft			Cam shaft		
59		Forged welded or cast			Type of drive		
60		Heat treated					
61		Remarks:	Skid baseplate shall incorporate drip pan with single, 2" minimum, flanged drain connection.				
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64							



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1	Re	<b>BASIC CONSTRUCTION (continued)</b>					
2	Conn rods						
3	Forged				Fly wheel		
4	Heat treated						
5	Rifle drilled						
6	Articulated						
7	Valves				Frame (cast) (fabricated)		
8	No per cylinder				Wrist pin (full float)		
9	Removable seats				Couplings & guards		
10	Lifters (hyd) (rollers)						
11	Compression release						
12	Remarks:						
13							
14							
15							
16		<b>MATERIALS</b>					
17	Cylinder heads				Cylinder liners		
18	Pistons				Connecting rings		
19	Crankshaft				Cam shaft		
20	Wrist pin				Valves		
21	Frame				Lube oil tank		
22	Base				Bearings		
23	Main - shell				Main - lining		
24	Crankpin						
25	Out board						
26	Remarks:						
27							
28							
29		<b>WEIGHTS &amp; DIMENSIONS</b>					
30	Bare engine with flywheel				Oil cooler		
31	Dry/operating weight			kg			
32	Length/width/height			kg			
33	Min distance between engines			m	Max maintenance weights		
34	Min height to remove pistons/rods			m		Weight	
35						Weight	
36						Weight	
37						Weight	
38	Remarks:						
39							
40		<b>SITE CONDITIONS</b>					
41	Altitude			Sea Level	Cooling medium	Air	
42	Ambient temp	Min	-15 °C	Max	35 °C	Equip duty	
43	Air humidity	Min	10 %	Max	100 %	Intermittent	
44	Back press (air cooler/radiator)			Bar	Area class	Unattended	
45	Electrical supply (For information only as Diesel Generator package is standalone unit with battery starter which self-charges whilst running)				Temp class	SAFE	
46	Motors	400 V	3 Ph	50 Hz	Location	Outdoors	
47	Heaters/chargers	220 V	1 Ph	50 Hz	Winterisation req'd	<input type="checkbox"/> Yes <input type="checkbox"/> No	
48	Fuel type	Diesel / Gas / Dual			Fuel gross calorific value		
49	Fuel specification						
50	Winter temp						
51	Remarks:						
52							
53		<b>AIR INTAKE SYSTEM</b>					
54	Filter mfr				Filtration		
55	Blow in doors	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No			5	
56	Inlet duct size			mm		Dry type	
57	Air intake shut off valve	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		Diff press indicator	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
58	Intake SOV actuated by				Weather louvres/shutters	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
59		with centrifugal/inertial first stage.					
60							
61	Remarks:						
62							
63							
64							
65							



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1	Rev	<b>LUBRICATION SYSTEM</b>			
2	Main oil pump drive	<input type="checkbox"/> Engine	<input type="checkbox"/> Motor	Cooling	<u>        </u> <b>Jacket water</b>
3	Auxiliary pre lube oil pump	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler mfr	<u>        </u>
4	Pump driver power			Cooler in / outlet temp	<u>        </u> °C
5	Engine sump capacity			Oil filter configuration	
6	Oil press to engine, normal / min			<input type="checkbox"/> Full flow	<input type="checkbox"/> Simplex
7	Sump heater			<input checked="" type="checkbox"/> Duplex	
8	Heater rating			<input type="checkbox"/> _____ % flow	
9	Pump mfr			Filter mfr	<u>        </u>
10	Pump type/model			Filtration	
11	Pump capacity			Absolute particle size	<u>        </u> µm
12	<b>Remarks:</b> _____				
13	_____				
14	_____				
15	<b>COOLING SYSTEM</b>				
16	Jacket water cooler	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Cooler mfr	<u>        </u>
17	Cooler configuration	<input type="checkbox"/> Simplex	<input type="checkbox"/> Duplex	Air cooler fan drive	<input type="checkbox"/> Direct
18	Turbocharger aftercooler	<input type="checkbox"/> Air	<input type="checkbox"/> Water	Fan drive by belts type/quantity	<input type="checkbox"/> Motor
19	Cooling system normal operating press			Cooler mfr	<u>        </u>
20				Cooler circuit	<input type="checkbox"/> Combined
21	Circulating pump mfr			Water temp @ inlet to jacket	<input type="checkbox"/> Separate
22	Pump model/type			Jacket water heater	<input type="checkbox"/> Yes
23	Pump rated power			Heater rating	<input type="checkbox"/> No
24	<b>Remarks:</b> <u>50/50 water &amp; ethylene glycol</u>				
25	_____				
26	_____				
27	<b>STARTING SYSTEM</b>				
28	Battery start	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	No of battery sets	<u>TWO</u>
29	Capacity per set			No of starts per set rated/actual	<u>        </u>
30	Battery charger			Time to recharge	<u>        </u> h
31	Hydraulic start	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Recharging pump drive	<input type="checkbox"/> Engine
32	Air start	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Air compressor drive	<input type="checkbox"/> Motor
33	Start system	<u>2 x electric motor starters</u>			<input type="checkbox"/> Aux Engine
34	Air receiver design press			<input type="checkbox"/> Motor	
35	Air compressor mfr			Air receiver capacity	<u>        </u> m <sup>3</sup>
36	Compressor installed power			Air receiver design code	<u>        </u>
37				No of starts	<u>        </u>
38				Receiver operating press normal / min	<u>        </u> bar a
39					<u>        </u>
40	<b>EXHAUST SYSTEM</b>				
41	Exhaust ducting supply	Vendor/Purchaser	Ducting layout refer sheet		<u>        </u>
42	Exhaust duct surface temperature, °C				
43	<b>BARRING SYSTEM</b>				
44	Type	<input type="checkbox"/> Manual	<input type="checkbox"/> Power assisted	Air operated	<input type="checkbox"/> Yes
45				Electrically operat	<input type="checkbox"/> Yes
46					<input checked="" type="checkbox"/> No
47	<b>TESTS</b>				
48	Inspection	<u>YES</u>	Witness performed test	<u>YES</u>	
49	Certified brake data	<u>YES</u>	Noise Test	<u>YES</u>	
50	_____				
51	_____				
52	_____				
53	<b>AUTO SHUT DOWN CONTROLS</b>				
54	Lube oil failure	<u>Yes</u>	Lube oil temp	<u>Yes</u>	
55	Water failure	<u>Yes</u>	Water temp	<u>Yes</u>	
56	Method of Shutdown			<u>        </u>	
57	_____				
58	<b>Remarks:</b> _____				
59	_____				
60	_____				



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PURCHASER'S DATA

Table with 21 rows and 4 columns. Columns include: Item No., Description, Value, and Remarks. Rows cover parameters like Rated Output (1000 kW), Service Voltage (V), Rated Frequency (50 Hz), No. of Phases (3), Duty Type (S1), Fault Level (25 kA), Excitation (BRUSHLESS), Parallel Operation (YES/NO), Unbalanced Load (YES/NO), Surge Overvoltage Protection (YES/NO), Mains Terminals, Neutral Terminals, Primary/Secondary Coolant (AIR), Cooling Classification, Cooling Temperature, IP Area Classification, Generator Enclosure Classification (TYPE 'N'), Generator Ingress Protection (IP23/IP42), Current Transformers, Insulation Class (F), Temperature Rise Class (B), Vibration Detection (YES), Winding Temp Detection (YES), Bearing Temp Detection (YES), Mounting (FOOT), Space Heater Voltage (BY SUPPLIER), and Environmental Conditions.

NOTES

- 1) Air cooling design temperature 35C
- 2) Neutral Earthing Transformer / Resistor is to be supplied by the Supplier
- 3) Generator power output shall be connected to a 6.6kV Switchboard by the Purchasers Step-Up Transformer (if required).

Table with 26 rows and 4 columns. Columns include: Item No., Description, Value, and Remarks. Rows cover Generator parameters (Type, Frame Designation, Degree of Protection (IP23), Synchronous Speed (1500 rpm), 1st Critical Speed, Direction of Rotation (CCW), Rated Voltage, Rated Frequency (50 Hz), Rated Output (MW), Power Factor (cos Phi), Duty Type (F), Rated Current (A), Thermal Rating, Max. Allowable Neg. Phase Seq. Current, Max. Allowable Content of Overharmonics, Efficiency (100% Base kVA, 75% Base kVA, 50% Base kVA), Field Current (No Load, Full Load), Insulation Class (Stator/Rotor), Temp Rise Class (Stator/Rotor), Overload Capability (% hrs, % secs), Substained Short-Circuit (% secs), Moment of Inertia of Rotor (kg m2), Cooling Method (Air), Cooling Water Flow Rate (m3/h), Cooling Water Design Pressure (barg), Leak Detection System, Generator Parameters (All) (Positive Sequence Resistance, Zero Sequence Resistance, Negative Sequence Resistance, Zero Sequence Reactance, Negative Sequence Reactance, Direct Axis Synchronous Reactance, Direct Axis Transient Reactance, Direct Axis Sub-Transient Reactance, Short Circuit Ratio), Generator Parameters (>1MVA only) (Quadrature Axis Synchronous Reactance, Quadrature Axis Transient Reactance, Quadrature Axis Sub-Transient Reactance, Direct Axis O.C. Transient Time Constant, Direct Axis S.C. Transient Time Constant, Direct Axis O.C. Sub-Trans. Time Constant, Direct Axis S.C. Sub-Trans. Time Constant, Quad. Axis O.C. Transient Time Constant, Quad. Axis S.C. Transient Time Constant, Quad. Axis O.C. Sub-Trans. Time Constant, Quad. Axis S.C. Sub-Trans. Time Constant, Potier Reactance, Damping Factor, Saturation Factor, Basic Impulse Level), and Dimensions & Weights (Overall Dimensions, Weight of Machine, Weight of Stator, Weight of Heat Exchanger, Weight of Coolant).





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NOTES

- The Emergency Diesel Generator shall be supplied as a package, complete with a weatherproof fully ventilated acoustic enclosure. The enclosure shall be fabricated from corrosion resistant materials and attenuate noise levels to 85dBA @ 1m.
- The Package shall be supplied complete with its own control panel, radiator cooling system, starting system, air intake filtration, exhaust silencer and all accessories. The diesel engine shall be close coupled to the generator on a common baseplate. Baseplate shall include drip tray sloped to one common drain flange for connection to OWNER drain system.
- The protection rating of the acoustic enclosure shall be IP 55 minimum. AC generator shall be IP44 minimum.. Instrumentation shall be IP66 minimum.
- Batteries and chargers shall be supplied for starting and control panel power. The charging and battery system shall contain adequate protection against complete depletion. Primary starting system shall be electric, secondary system shall be a separate starter/battery.
- An electronic speed governor shall be provided, and a separate overspeed device shall be installed on the engine.
- The engine shall be provided with an air intake shutoff, operated by a gas detection system supplied by Others.

7. ~~Project emission standards are as follows: (HOLD 2)~~ Change Note 7 to say: "Diesel engine shall conform to the emissions limits stated in 2G TA-Luft. NOx emissions to be maximum 2000mg/m3 at 5% Oxygen."

Fuel Type	Total Solid Particles (TSP)	Carbon Monoxide (CO)	Sulphur Dioxide (SO <sub>2</sub> )	NOx
<del>Diesel</del>	<del>100</del>	<del>250</del>	<del>400</del>	<del>500</del>

8. Engine protection shall be provided as follows: (SUPPLIER to confirm)

	ALARM	SHUTDOWN
Fuel oil leak rom high pressure jacketed pipe	X	
Lube oil low pressure	X	
Lube oil low low pressure		X
Lube oil high temperature	X	
Turbocharger speed	X	
Water cooling high temperature	X	X
Water cooling low pressure	X	
Exhaust gas cylinder high temperature	X	X
Exhaust gas turbocharger high temperature	X	
Hydraulic oil leak from jacketed pipes	X	
Engine speed	X	
Engine overspeed	X	X
Crankcase oil mist detection (if provided)	X	X
AC generator winding temperature	X	X
Failed Start	X	

- SUPPLIER shall provide the exhaust system comprising silencer, bellows and spark arrestor, fabricated in stainless steel.
- SUPPLIER shall complete all data in this datasheet with their proposal.

Add Note 11 to say: "SUPPLIER shall provide vertical, elevated exhaust stacks with unimpeded emission point (no cowls and caps). Stacks shall also be provided with sampling ports (sampling probes, CEMS or otherwise by OTHERS)."