JCB ENERGY ELECTRIC POWER INDUSTRY

JCBENERGY

MADRID / SPAIN





231 / 400 V – 50 Hz & 277 / 480 V – 60 Hz





GENERATOR GENERAL INFORMATION

GENERATOR	FREQUENCY	VOLTAGE	POWER FACTOR	SPEED	DIESEL E	NGINE		ALTERN	IATOR		TYPE OF	GENER	RATOR O	UTPUT			
Model	Hz	V	Cos Q	Rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	А			
							Ĺ	L		Standby	200,0	160,0	289,0				
JCD 200	50	231/400	0.8	1500	<u> </u>				јсв	270M	Prime	182,0	145,6	263,0			
						BF6M1013EC	DE	BF RR			Continuous	164,2	131,4	237,3			
					DEUTZ	G2	БГ			JCB		Standby	220,0	176,0	317,9		
JCD 220	60	277/480	0.8	1800							ធ្វើ	ធ្វើ	270M	Prime	200,0	200,0 160,0 2	289,0
								·*,	`		Continuous	181,5	145,2	262,2			

 Diesel Engines with Advanced Technology and Quality Alternators with Advanced Technology and Quality Low Exhaust Emission Control Panel Suitable for Flexible Application Patented Compact Designed and Sound proof Canopy Low Operating Cost, Suitable for Heavy-Duty Durability Low Naice Lowel 	 Tropical 50 °C Radiator, First Class Product Support Fuel Filter with Water and Particle Separator Low Fuel Consumption, Low Oil Consumption Global Technical Service and Maintenance Support Wide Range of Affordable Spare Parts High Quality and Reliable Technology Half Contumy Experience in Constant Manufacturing
 Durability, Low Noise Level 	 Half Century Experience in Generator Manufacturing

STAND BY POWER RATING – (ESP):

ESP is applicable for supplying emergency power for the duration of the utility power outage. No overload capability is available for this rating. Under no condition is an engine allowed to operate in parallel with the public utility at the Stand by Power rating. This rating should be applied where reliable utility power is available. A Stand By rated engine should be sized for a maximum of an 70% average load factor and 200 hours of operation per year. This includes less than 25 hours per year at the Stand by Power rating. Stand By ratings should never be applied except in true emergency power outages. Negotiated power outages contracted with a utility company are not considered an emergency. **PRIME POWER RATING – (PRP):**

Applicable for supplying electric power in lieu of commercially purchased power. Prime Power applications must be in the form of one of the following two categories:

UNLIMITED TIME RUNNING PRIME POWER (ULTP):

PRP (Prime Power) is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. A 10% overload capability is available for a period of 1 hour within a 12-hour period of operation. Total operating time at the 10% overload power shall not exceed 25 hours per year.

LIMITED TIME RUNNING PRIME POWER (LTP):

LTP (Limited Time Prime Power) is available for a limited number of hours in a no variable load application. It is intended for use in situations where power outages are contracted, such as in utility power curtailment. Engines may be operated in parallel to the public utility up to 750 hours per year at power levels never to exceed the Prime Power rating. The customer should be aware, however, that the life of any engine will be reduced by this constant high load operation. Any operation

CONTINUOUS POWER RATING (COP):

COP is the power that the engine can continue to use under the prescribed speed and the specified environment condition in the normal maintenance period stipulated in the manufacturing plant. And Continuous Power is applicable for supplying utility power at a constant 100% load for an unlimited number of hours per year. No overload capability is available for this rating.





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PAY ATTENTION TO THE POINTS BELOW IN PICKING AND USING THE GENERATOR

* Generators can work on Continuous Power at 70% of Prime power value if only all maintenances are done on time with original spare parts and high-quality oils that manufacturer advice.

* Generators should not operate below 50% of Prime Power value. In such a case, the engine will burn excessive oil and eventually have irreparable damage.

* If your need is 1000 kVA or above, you should prefer Synchronic Systems with 2-3 generators with failure back up and simultaneous aging.

* These points will provide advantage for you with purchasing and operating the generator.

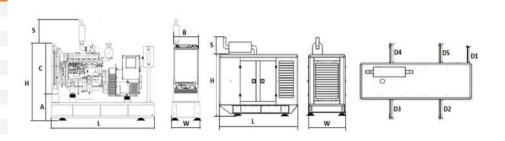
GENERATOR DIMENSIONS AND TECHNICAL DRAWINGS





VALUES		OPEN TYPE GENERATOR	CANOPY TYPE GENERATOR
WIDTH	mm	900	1153
LENGTH	mm	2400	2971
HEIGHT	mm	1549	2027
WEIGHT (NET)	Kg	1328	1690
FUEL TANK CAPACITY	L	256	376

SYMBOL	OPEN	CANOPY
L	2400	2971
W	900	1153
н	1002	1807
S	547	220
Α	696	
В	650	
С	680	
D1		520
D2		604
D3		604
D4		604
D5		604



FUEL CONSUMPTION

PERCENT OF PRIME POWER	1500 rpm	1800 rpm
	l/hr	l/hr
110 %	42,33	47,65
100 %	38,70	43,32
75 %	29,16	32,64
50 %	19,63	21,97





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DIESEL ENGINE MAIN TECHNICAL PARAMETERS

50 Hz – 1500 min ⁻¹			60 Hz – 1800 min ⁻¹		
		BF6M1013EC			BF6M1013EC
Speed	min ⁻¹	1500	Speed	min ⁻¹	1800
Net Frequency	Hz	50	Net Frequency	Hz	60
Power Standard		LTP	Power Standard		LTP
Power Level		G2	Power Level		G2
Exhaust Emission Standard		Fuel Optimized	Exhaust Emission Standard		Fuel Optimized
GENERAL			GENERAL		
Aspiration		Turbo,CAC	Aspiration		Turbo,CAC
Governing System		Electronic	Governing System		Electronic
Governor Brand		DDE	Governor Brand		DDE
No of Cylinders		6	No of Cylinders		6
Configuration		in-line	Configuration		in-line
Injection System		single injection pumps	Injection System		single injection pumps
Displacement	L	7,15	Displacement	L	7,15
Bore	mm	108	Bore	mm	108
Stroke	mm	130	Stroke	mm	130
Compression Ratio		19:1	Compression Ratio		19:1
Mean Effective Pressure	Bar	19,60	Mean Effective Pressure	Bar	18,40
Piston Speed	m/s	6,50	Piston Speed	m/s	7,80
•	111/5		•	111/5	
Rotation (looking at flywheel)		CCW	Rotation (looking at flywheel)		ccw
No of Teeth on Flywheel Ring Gear		129	No of Teeth on Flywheel Ring Gear		129
GOVERNOR PERFORMANCE Speed droop (static) mech. gov.	%	4-5	GOVERNOR PERFORMANCE Speed droop (static) mech. gov.	%	4-5
Speed droop (static) flech, gov.	%		Speed droop (static) meen, gov.		
	70	0-3		%	0-3
Governing standards		G3	Governing standards		G3
MOMENT OF INERTIA Engine without flywheel	kg m²	0,23	MOMENT OF INERTIA Engine without flywheel	kg m²	0,23
Flywheel (standard genset spec.)	kg m ²	2,60	Flywheel (standard genset spec.)	kg m ²	2,60
Max. step load acceptance, 1st step	%	-	Max. step load acceptance, 1st step	%	-
Sound power at full load, incl. cooling system	dB(A)	110,60	Sound power at full load, incl. cooling system	dB(A)	117,30
Sound press. (1m average, full load), incl. cool. syst.	dB(A)	96,70	Sound press. (1m average, full load), incl. cool. syst.	dB(A)	103,50
ENGINE WEIGHT			ENGINE WEIGHT		
Engine Dry, w/o Cooling System	kg	708	Engine Dry, w/o Cooling System	Kg	708
Engine with cooling system	kg	770	Engine with cooling system	kg	770
LUBRICATION SYSTEM			LUBRICATION SYSTEM		
Oil specification		15W40/CI-4/SL	Oil specification		15W40/CI-4/SL
Oil consumption (as % of fuel consumption)	%	0,30	Oil consumption (as % of fuel consumption)	%	0,30
Oil capacity (sump)	I	20	Oil capacity (sump)	I	20
Min. oil pressure (warning)	Bar	2,70	Min. oil pressure (warning)	Bar	2,70
Min. oil pressure (shut down)	Bar	2	Min. oil pressure (shut down)	Bar	2
Max. permissible oil temperature (oil pan) OUTPUT	°C	130	Max. permissible oil temperature (oil pan) OUTPUT	°C	130
Gross Output(LTP or StandBy Power)	Kw	175	Gross Output(LTP or StandBy Power)	Kw	197
Fan Reduction	Kw	7,20	Fan Reduction	Kw	8,70
Net flywheel	Kw	167,80	Net flywheel		188,30
Electrical Output (Stand By)	Kva	200	Electrical Output (Stand By)	Kva	220
Gross Output(PRP or Prime Power)	Kw	160	Gross Output(PRP or Prime Power)	Kw	181
Gross Output(Continous Power)	kw	150	Gross Output(Continous Power)	kw	165





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DIESEL ENGINE MAIN TECHNICAL PARAMETERS

piping)Bar0.25piping)Bar0.35Max. Temperature of Coolant (warning)°C108Max. Temperature of Coolant (shutdown)°C108Max. Temperature of Coolant (shutdown)°C110Max. Temperature of Coolant (shutdown)°C110Temperature at Which Thermostat Starts to open°C%8Temperature at Which Thermostat Starts to open°C%8Temperature at Which Thermostat is Fully Open°C%8Temperature at Which Thermostat Starts to Open°C%8Delivery of Coolant Pump%ar0.3Min. Pressure Before Coolant Pump%ar0.3Min. Pressure Before Coolant Pump%ar0.3Min. Pressure Before Coolant Pump%ar0.3Temperature at CAC outlet at standard conditions°C400Temperature at CAC outlet at standard conditions°C400ENGINE COOLING SYSTEMENGINE COOLING SYSTEMI9,8000colant Capacity (engine)19,800Coolant Capacity (engine)19,800Coolant Capacity (incl. cooling unit)19,800Coolant Capacity (engine)19,800Coolant Capacity (incl. cooling unit)19,800Coolant Capacity (engine)19,800Coolant Capacity (incl. cooling unit)19,800Coolant Capacity (incl. cooling unit)123,100Coolant Capacity (incl. cooling unit)19,800Coolang air Flowm³/h10800Cooling air Flowm³/h1150011500Air Pressure Loss, external	50 Hz – 1500 min ⁻¹			60 Hz – 1800 min ⁻¹		
Max. perm. Flow Resistance (cool. syst. and piping)Bar0.25Max. perm. Flow Resistance (cool. syst. and piping)Bar0,35Max. Temperature of Coolant (warning)°C108Max. Temperature of Coolant (warning)°C101Max. Temperature of Coolant (shutdown)°C110Max. Temperature of Coolant (shutdown)°C110Temperature at Which Thermostat Starts to open°C98Temperature at Which Thermostat Starts to open°C98Temperature at Which Thermostat is Fully Open°C98Temperature at Which Thermostat is Fully Open°C98Delivery of Coolant Pumpm³/h10,20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure at CAC outlet at standard conditions°C98Delivery of Coolant Quipt°C40Temperature at CAC outlet at standard conditions°C98Coolant Capacity (engine)19,80Coolant Capacity (engine)19,80Coolant Capacity (incl. cooling unit)123,10Air to Boil (max. permissible cool. air temp. at fan'°C55Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air to Boil (max. permissible cool. air temp. at fan°C168,70Cooling air Flowm³/h10800Cooling air Flowm³/h12,30Air Pressure Loss, externalmbar7,2	COOLING SYSTEM, GENERAL ENGINE COOLING DATA	A Contraction		COOLING SYSTEM, GENERAL ENGINE COOLING DAT/	A	
piping)Bar0.25piping)Bar0.35Max. Temperature of Coolant (warning)*C108Max. Temperature of Coolant (warning)*C108Max. Temperature of Coolant (shutdown)*C110Max. Temperature of Coolant (shutdown)*C101Temperature at Which Thermostat Starts to open*C83Temperature at Which Thermostat Starts to open*C98Delivery of Coolant Pumpm³/h10.20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant Pumpm³/h12,30Temperature at CAC outlet at standard conditions*C40Temperature at CAC outlet at standard conditions*C40ENCINE COOLING SYSTEMENCINE COOLING SYSTEMI9,809,809,809,80Coolant Capacity (incl. cooling unit)I2,310Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I2,310Air to Boil (max. permissible cool. air temp. at fan)*C\$55Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air Pressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHEAT BALANCE1,504,504,504,50Heat Dissipation (engine radiator)kW7,70Heat Dissipation (convection)kW4,1,80	Max. perm. Coolant Outlet Temperature	°C	105	Max. perm. Coolant Outlet Temperature	°C	105
Max. Temperature of Coolant (shutdown)°C110Max. Temperature of Coolant (shutdown)°C110Temperature at Which Thermostat Starts to open°C83Temperature at Which Thermostat Starts to open°C98Temperature at Which Thermostat is Fully Open°C98Temperature at Which Thermostat is Fully Open°C98Delivery of Coolant Pumpm³/h10,20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant PumpBar0,3Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C40ENGINE COOLING SYSTEMCoolant Capacity (engine)I9,80Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I23,10Coolant Capacity (incl. cooling unit)I23,10Air to Boil (max. permissible cool. air temp. at fan°CSoFan Power Consumption%V8,70Air to Boil (max. permissible cool. air temp. at fan°CFan Power Consumptionm³/h11500Air Pressure Loss, externalmbar1,50Air Pressure Loss, externalm³/h2,80Heat Dissipation (engine radiator)KW7,80Heat Dissipation (engine radiator)kW8,70Heat Dissipation (convection)kW7,80Heat Dissipation (convection)kW4,180Heat Dissipation (convection)kW7,80Heat Dissipation (convection)kW4,180 <td>Max. perm. Flow Resistance (cool. syst. and piping)</td> <td>Bar</td> <td>0.25</td> <td></td> <td>Bar</td> <td>0,35</td>	Max. perm. Flow Resistance (cool. syst. and piping)	Bar	0.25		Bar	0,35
Temperature at Which Thermostat Starts to open°C83Temperature at Which Thermostat Starts to open°C83Temperature at Which Thermostat is Fully Open°C98Temperature at Which Thermostat is Fully Open°C98Delivery of Coolant Pumpm³/h10,20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant PumpBar0,3Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C40ENGINE COOLING SYSTEMENGINE COOLING SYSTEMI9,80Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I23,10Coolant Capacity (engine)I23,10Air to Boil (max. permissible cool. air temp. at fan)°CS5Air to Boil (max. permissible cool. air temp. at fan)°CS5Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air Pressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHEAT BALANCEHEAT BALANCEHEAT BALANCEHeat Dissipation (engine radiator)kW7,70Heat Dissipation (CAC)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAINLET / EXHAUST DATA19,40INLET / EXHAUST DATAINLET / EXHAUST DATAMax. intake Depression (Switc	Max. Temperature of Coolant (warning)	°C	108	Max. Temperature of Coolant (warning)	°C	108
Temperature at Which Thermostat is Fully Open°C98Temperature at Which Thermostat is Fully Open°C98Delivery of Coolant Pumpm³/h10,20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant PumpBar0.3Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C400ENGINE COOLING SYSTEMENGINE COOLING SYSTEM19,80Coolant Capacity (engine)19,80Coolant Capacity (incl. cooling unit)123,10Coolant Capacity (incl. cooling unit)123,10Air to Boil (max. permissible cool. air temp. at fan.°C55fan.fan.°C55Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air ressure Loss, externalmbar1,50Air ressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHEAT BALANCE40087,60Heat Dissipation (engine radiator)kW7,70Heat Dissipation (convection)kW9,80Heat Dissipation (convection)kW7,830Heat Dissipation (convection)kW9,80Heat Dissipation (convection)kW7,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATA </td <td>Max. Temperature of Coolant (shutdown)</td> <td>°C</td> <td>110</td> <td>Max. Temperature of Coolant (shutdown)</td> <td>°C</td> <td>110</td>	Max. Temperature of Coolant (shutdown)	°C	110	Max. Temperature of Coolant (shutdown)	°C	110
Delivery of Coolant Pumpm³/h10,20Delivery of Coolant Pumpm³/h12,30Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant PumpBar0.3Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C40ENGINE COOLING SYSTEMENGINE COOLING SYSTEMI9,80Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I23,10Coolant Capacity (incl. cooling unit)I23,10Air to Boil (max. permissible cool. air temp. at fan)°C55Air to Boil (max. permissible cool. air temp. at fan)°C55Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Air ressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHEAT BALANCE19,80Heat Dissipation (engine radiator)kW7,70Heat Dissipation (convection)kW8,70Heat Dissipation (convection)kW7,70Heat Dissipation (convection)kW8,70Heat Dissipation (convection)kW7,70Heat Dissipation (convection)kW9,80INLET / EXHAUST DATANUCNUC19,801Max. intake Depression (Switch setting)mbar25Conbustion Air Volumem³/h852	Temperature at Which Thermostat Starts to open	°C	83	Temperature at Which Thermostat Starts to open	°C	83
Min. Pressure Before Coolant PumpBar0.3Min. Pressure Before Coolant PumpBar0.3Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C40ENGINE COOLING SYSTEMENGINE COOLING SYSTEMI9,8050	Temperature at Which Thermostat is Fully Open	°C	98	Temperature at Which Thermostat is Fully Open	°C	98
Temperature at CAC outlet at standard conditions°C40Temperature at CAC outlet at standard conditions°C40ENGINE COOLING SYSTEMENGINE COOLING SYSTEMENGINE COOLING SYSTEM19,80Coolant Capacity (engine)I9,80Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I23,10Coolant Capacity (incl. cooling unit)I23,10Air to Boil (max. permissible cool. air temp. at fan)°C55Air to Boil (max. permissible cool. air temp. at fan)°C55Fan Power ConsumptionKW7,20Fan Power ConsumptionKW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air pressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHEAT BALANCE41,8041,80Heat Dissipation (engine radiator)kW7,70Heat Dissipation (CAC)kW41,80Heat Dissipation (Convection)kW7,70Heat Dissipation (CAC)kW41,80Heat Dissipation (convection)kW7,70Heat Dissipation (CAC)kW41,80INLET / EXHAUST DATAINLET / EXHAUST DATA25Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h25	Delivery of Coolant Pump	m³/h	10,20	Delivery of Coolant Pump	m³/h	12,30
ENGINE COOLING SYSTEMENGINE COOLING SYSTEMCoolant Capacity (engine)19,80Coolant Capacity (incl. cooling unit)123,10Air to Boil (max. permissible cool. air temp. at fan)°C55Air to Boil (max. permissible cool. air temp. at fan)°C55Fan Power ConsumptionkW7,20Fan Power ConsumptionkWCooling air Flowm³/h10800Cooling air Flowm³/hAir pressure Loss, externalmbar1,50Air Pressure Loss, externalmbarHEAT BALANCEHEAT BALANCEHEAT BALANCE1Heat Dissipation (engine radiator)kW78,30Heat Dissipation (convection)kW9,30INLET / EXHAUST DATAkW77,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAmbar25Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25	Min. Pressure Before Coolant Pump	Bar	0.3	Min. Pressure Before Coolant Pump	Bar	0,3
Coolant Capacity (engine)I9,80Coolant Capacity (engine)I9,80Coolant Capacity (incl. cooling unit)I23,10Coolant Capacity (incl. cooling unit)I23,10Air to Boil (max. permissible cool. air temp. at fan)°C55Air to Boil (max. permissible cool. air temp. at fan)°C55Fan Power ConsumptionkW7,20Fan Power ConsumptionkW8,70Cooling air Flowm³/h10800Cooling air Flowm³/h11500Air Pressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT Dissipation (engine radiator)kW78,30Heat Dissipation (engine radiator)kW87,60Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAINLET / EXHAUST DATA20Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Temperature at CAC outlet at standard conditions	°C	40	•	°C	40
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Air Pressure Loss, externalmbar1,50Air Pressure Loss, externalmbar2,00HEAT BALANCEHEAT BALANCEHeat Dissipation (engine radiator)kW78,30Heat Dissipation (engine radiator)kW87,60Heat Dissipation (CAC)kW28,80Heat Dissipation (CAC)kW41,80Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAINLET / EXHAUST DATA25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Fan Power Consumption	kW	7,20	Fan Power Consumption	kW	8,70
HEAT BALANCEHEAT BALANCEHeat Dissipation (engine radiator)kW78,30Heat Dissipation (engine radiator)kW87,60Heat Dissipation (CAC)kW28,80Heat Dissipation (CAC)kW41,80Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAINLET / EXHAUST DATA25Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Cooling air Flow	m³/h	10800	Cooling air Flow	m³/h	11500
Heat Dissipation (engine radiator)kW78,30Heat Dissipation (engine radiator)kW87,60Heat Dissipation (CAC)kW28,80Heat Dissipation (CAC)kW41,80Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAMax. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Air Pressure Loss, external	mbar	1,50	Air Pressure Loss, external	mbar	2,00
Heat Dissipation (CAC)kW28,80Heat Dissipation (CAC)kW41,80Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAMax. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	HEAT BALANCE			HEAT BALANCE		
Heat Dissipation (convection)kW17,70Heat Dissipation (convection)kW19,30INLET / EXHAUST DATAINLET / EXHAUST DATAINLET / EXHAUST DATAMax. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Heat Dissipation (engine radiator)	kW	78,30	Heat Dissipation (engine radiator)	kW	87,60
INLET / EXHAUST DATA INLET / EXHAUST DATA Max. intake Depression (Switch setting) mbar 25 Combustion Air Volume m³/h 682 Combustion Air Volume m³/h 852	Heat Dissipation (CAC)	kW	28,80	Heat Dissipation (CAC)	kW	41,80
Max. intake Depression (Switch setting)mbar25Max. intake Depression (Switch setting)mbar25Combustion Air Volumem³/h682Combustion Air Volumem³/h852	Heat Dissipation (convection)	kW	17,70	Heat Dissipation (convection)	kW	19,30
Combustion Air Volumem³/h682Combustion Air Volumem³/h852	INLET / EXHAUST DATA			INLET / EXHAUST DATA		
	Max. intake Depression (Switch setting)	mbar	25	Max. intake Depression (Switch setting)	mbar	25
Max. Exhaust Back Pressurembar30Max. Exhaust Back Pressurembar30	Combustion Air Volume	m³/h	682	Combustion Air Volume	m³/h	852
	Max. Exhaust Back Pressure	mbar	30	Max. Exhaust Back Pressure	mbar	30
Max. Exhaust Gas Temperature°C560Max. Exhaust Gas Temperature°C560	Max. Exhaust Gas Temperature	°C	560	Max. Exhaust Gas Temperature	°C	560
Exhaust Gas Flow (at above temp)m³/h1905Exhaust Gas Flow (at above temp)m³/h2440	Exhaust Gas Flow (at above temp)	m³/h	1905	Exhaust Gas Flow (at above temp)	m³/h	2440
Exhaust Flange / pipe diameter mm - Exhaust Flange / pipe diameter mm -	Exhaust Flange / pipe diameter	mm	-	Exhaust Flange / pipe diameter	mm	-
ELECTRICAL SYSTEM ELECTRICAL SYSTEM	ELECTRICAL SYSTEM			ELECTRICAL SYSTEM		
Voltage V 24 Voltage V 24	Voltage	V	24	Voltage	V	24
Starter KW 6 Starter KW 6	Starter	КW	6	Starter	KW	6
Alternator Output A 35 Alternator Output A 35	Alternator Output	А	35	Alternator Output	А	35
Batteries (minimum capacity, cold start limit -5°C)Ah2*85Batteries (minimum capacity, cold start limit -5°C)Ah2*85	Batteries (minimum capacity, cold start limit -5°C)	Ah	2*85	Batteries (minimum capacity, cold start limit -5°C)	Ah	2*85





231 / 400 V – 50 Hz & 277 / 480 V – 60 Hz



ALTERNATOR TECHNICAL PARAMETERS



ALTERNATOR TECHNICAL PARAMETERS				
Insulation Class	Н	Field Control System		Self-Excited
Winding Pitch	2/3 - (N° 6)	A.V.R. Model	Standard	SX460
Wires	12	Voltage Regulation	%	± 1
Protection	IP 23	Sustained Short-Circuit Current	10 sec	300% (3 IN)
Altitude m	1000	Total Harmonic (*) TGH / THC	%	< 4
Overspeed rpm	2250	Wave Form: NEMA = TIF - (*)		< 50
Air Flow m³/sec.	0.514	Wave Form: I.E.C. = THF - (*)	%	< 2
Bearing Drive N/A	-	Bearing Non-Drive	Bearing	6310-2RZ
Rotor Winding 100%	Copper	Stator Winding	100%	Copper

50 HZ / 231-400V COSQ 0,8 / 1500 RPM

STANDARD USING ALTERNATOR				OPTIONAL USING ALTERNATOR					
BRAND/MODEL	JEBENERGY	JCB 270M		LEROY-SO	OMER	TAL044L	STAMFORD	UC274G	
DUTY				Continuous			-	Stand By	
AMBIENT	C°			40°C				27°C	
CLASS / TEMP. RISE	C°			H/ 125° K				H/ 163° K	
SERIES STAR	V	380/220	400/231	415/240	1 Phase	380/220	400/231	415/240	1 Phase
PARALLEL STAR	V	190/110	200/115	208/120	220	190/110	200/115	208/120	220
SERIES DELTA	V	220	230	240	230	220	230	240	230
OUTPUT POWER	kVA	182,0	182,0	189,0	-	200,0	200,0	208,0	-
OUTPUT POWER	kW	145,6	145,6	151,2	-	160,0	160,0	166,4	-

60 HZ / 277-480V COSQ 0,8 / 1800 RPM

STANDARD USING ALTERNATOR				OPTIONAL USING ALTERNATOR						
BRAND/MODEL	JCBENERGY	JCB 270S2		LEROY-SOM	ER T	AL044K	STAMF	ORD UC27	4F	
DUTY				Continuous				Stand By		
AMBIENT	C°			40°C				27°C		
CLASS / TEMP. RISE	C°			H / 125° K				H / 163° K		
SERIES STAR	V	416/240	440/254	480/277	1 Phase	416/240	440/254	480/277	1 Phase	
PARALLEL STAR	V	208/120	220/127	240/138	-	208/120	220/127	240/138	-	
SERIES DELTA	V	240	254	277	240	240	254	277	240	
OUTPUT POWER	kVA	184,0	194,0	204,0	-	202,0	213,0	224,0	-	
OUTPUT POWER	kW	147,2	155,2	163,2	-	161,6	170,4	179,2	-	





231 / 400 V – 50 Hz & 277 / 480 V – 60 Hz



CONTROL MODULE ALERTS

Emergency Stop Malfunction High Generator Frequency Low Generator frequency, Low Load Over Current, Unbalanced Current Low Generator Voltage High generator Frequency Phase sequence error Overload, Heat Sensor Broken Low Water Level (Optional) Low Oil Pressure, Reverse Power Low Water Temperature

Start Error, Stop Error Magnetic Pickup Error Charge Alternator Error Unbalanced Load Maintenance Time Alarm Low Speed, High Speed Broken Oil Sensor Cable High Oil Temperature (Optional) Low Fuel Level (Optional), High Battery Voltage Low Battery Voltage, High Water Temperature Electronic Can bus Errors (ECU)

CONTROL PANEL SPECIFICATIONS





- ATS (Automatic Transfer P
 Optional
- Control Module
- Battery Charger
- Emergency Stop Button

- Terminal Blocks
- Load Output Terminal
- System Protection MSBs
- Circuit Breaker-Optional
- o LCD Screen
- o Control Relays
- Backlit, 128x64 Pixels

CONTROL MODULE TECHNICAL PARAMETERS

Brand	JCBENERGY	Brand	Trans-MIDIAMF.232.GP
Dimensions	120mmx94mm.	Protection Class	IP65 From the Front
Weight	260 gr.	Environmental Conditions	2000 meters above sea level
Ambient Humidity	Max. %90.	Ambient Temperature	-20°C to +70°C
DC Battery Supply Voltage	8 - 32 V	Battery Voltage Measurement	8 – 32 V
Network Frequency	5 - 99,9 Hz	Mains Voltage Measurement	3 - 300 V phase -Neutral, 5 - 99,9 Hz
Generator Voltage Measurement	3 - 300 V	Generator Frequency	5 - 99,9 Hz
Current Transformer Secondary	5A	Working Period	Continuous
Charge Alternator Voltage Measurement	8 - 32 V	Charge Alternator Excitation	210mA &12V, 105mA &24V Nominal 2.5W
Communication Interface	RS-232	Analog Sender Measurement	0 - 1300ohm
Generator Contactor Relay Output	5A & 250V	Mains Contactor Relay Output	5A & 250V
Solenoid Transistor Outputs	1A with DC Supply	Start Transistor Outputs	1A with DC Supply
Configurable-3 Transistor Outputs	1A with DC Supply	Configurable-4 Transistor Outputs	1A with DC Supply



231 / 400 V – 50 Hz & 277 / 480 V – 60 Hz



CONTROL MODULE FUNCTION

Mains Voltage Level Control	Generator Voltage Level Control	3 Phase Generator Protections	3 Phase AMF Function	Alarm Horn
Network Frequency Level Control	Generator Frequency level Control	- High / Low Voltage	- High / Low Frequency	Heater Tube Thermostat Control
Engine Operating Option Control	Generator Current Level Control	- High / Low Frequency	- High / Low Voltage	Modbus and SNMP
Engine Stop Option Control	Generator Powder Level Control	 Current / Voltage Asymmetry 	- High / Low Water Temperature	Working Hour
Engine Speed (RPM) Level Control	Generator work Schedule and Timing Control	- Overcurrent / Overload	- High / Low Load	Ground Leakage
Battery Voltage Options Times	Oil Pressure Controllers Control	Overheat Control	Mains., Generator ATS Control	Analog Modem
Check Engine Maintenance Times	Configurable Analog Inputs and Outputs	1 Phase or 3 Phase, Phase Selection	Network, Voltage, Frequency Display	Ethernet, USB, RS232, RS485
Communication Interfaces GPRS, GSM	Keeping Error Records of Past Events	Parameter Setting via Control Module	Parameter Setting via Computer	Selectable Protection Alarm / Shutdown
Engine Speed, Voltage, Earning	Configurable Programmable Digital Inputs and Outputs	Water Temperature Current and Frequency	Hours of Operation Phase sequence	Battery Voltage Oil Pressure

SOUND PROOF CANOPY AND BASE FRAME (CHASIS) SPECIFICATIONS

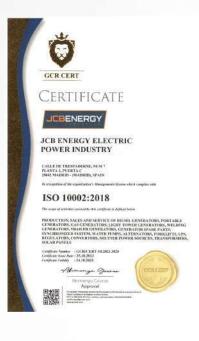


- Special, Registered JCB Energy Design and Colour
- A1 Quality DKP / HRU / Galvanized Steel
- Sensitive Twist on Automatic Press Brake
- Delicate Cut on Automatic Punch and Laser Bench
- Sensitive Welding on Robotic Welding Bench
- Chemical Cleaning Nano Technology Before Painting
- Robotic Painting with Electrostatic Powder Paint
- Drying and stabilizing on 200 ºC Ovens
- 1500 Hour Salt Test
- Glass wool Isolation, A1 Class Material -50/+500 ⁰C
- Special Covering Over Glass Wool
- Best Sound Level (in Dba)
- Temperature Tests
- Rustproof Accessories

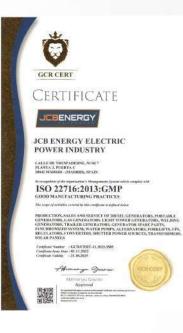
- Cable Exit Connectors and Glands
- Emergency Stop Button
- Fuel Level Gauge
- Fuel Drain Cap
- Fuel Inlet and Return Records
- Impermeability Test for Fuel Tank
- Vacuumed Rubber Mounted
- High Quality weatherstrips
- High Quality Shock Absorbers
- Fuel Filling Cap (with ventilation)
- o Lifting and Carrying Equipment
- Internal Exhaust Mufflers (Silencers)
- External Exhaust Mufflers (Silencers)
- Radiator water Filling Cap
- o Daily Fuel Tank, External Fuel Tank

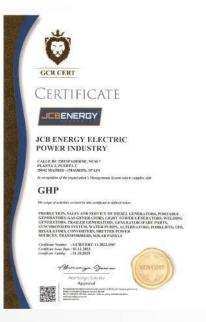


OUR CERTIFICATES







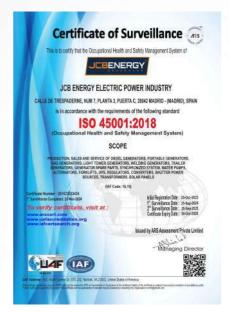








CE -VERTA-106188 -VERTA-106189







C E -VERTA-106188 -VERTA-106189

DNV

MANAGEMENT SYSTEM CERTIFICATE

Certificate no: Initial certification dele: D012084 14 August 2007

The site contribute the management system of **HD Hyundai Infracore Co., Ltd. Head Office & Incheon Plant** 40 (hipping) - Drops, Inderko, 2202, Republic of Korea and the sites an mentioned in the appendix accompanying this cartificate has been toxed to conform to the Environmental Management System standard. 150 (1400):1201

Valid: 14 October 2023 – 13 October 2026

This certificate is valid for the following scope: Design, Development, Manufacture, Sarvicing of Internal Combustion Engine for use in Marine Industry, General Industry and Automotive Industry, and Earth Moving Equipment[Excavator, Wheel Loader, Dezer], Testing of Earth Moving Equipment[Excavator and Wheel Loader].





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Lanuari de meterre monarmo de Madala SALIDA IF de Registra 1415 / 86.645 Fectos 2597 2023 12/82/69

RENE SUNCHEZ ROMAN, MANAGER OF THE DEPARTMENT OF LEGAL ADVISION SERVICES AND THE DATAMAGE OF THE OFFICIAL OMAZER OF COMMERCE, MOLETRY AND SERVICES OF MARINE, WITH REDISTRIED OFFICE AT PLAZA DE LA INDEPENDENCIA 1, MARINE, DAVIN

CERTIFY. That, according to the background data on moord at this Chambar and others produced by the Company

CB-ID-BERGY RECEISE FOOMER INCOMENTS II, a Company with Tax ID. Namine H1997554, and Is registreed office a strengt impactements in 20000 Masking is registreed on MMAy 2004. and the the Manage of the 10 Service, comparison, of the Economic Activities Tax Tarthi function S4C to perform the future of a schedule schedule.

· Menufacture of electrical meterial for use and equipment

In wheels whereof, for the appropriate purpose, I have recard and signed this Certificano, to which Latts the stamp of this Chamilier, in Madrial on 26 July 2004.





Libbitra de Alazarea Macina de Alazarea Saluta Nº de Registro: 859 / RG 600 Peche: 3607/3854 13.07.08

BERE SANCHEZ ROMAN, DIRECTONA DEL DERVICTIMENTO DE ASESCIAN IMPORTA CENSO DE LA CAMARA ORCINE DE COMBIEIO, INEDISTINA Y SERVICIOS DE MARIRO, CON DOCULO SOCIAL EN LA TILAZA DE LA NEDERENDENCIA ME LA MARIRO. CERTERICA Qua de los antesdentes que obrin en ensi Carponación y de coso exhíbidos por la necenda, munici

BIOLEU- Que la compañía XEI IMEROV ILECTRE DOMER ADALTRY LL es can excepted mercent de matemánica aparlada, constituíd metame estima pública de matemánica a constructiva estima a constituíd metamente estima pública de la matemánica de la constituída de la constituíd de matemánica la guida de la constituída de la constituída de la constituída estima adaltada de la constituída de la constituída de la constituída de antícuía de las dataturas de la compañía de la delación estima matemánica de las dataturas de la compañía de la delación este antícuía de las dataturas de la compañía de delación de la delación de antícuía de las dataturas de la compañía de delación este anticiana de las delas delacións de las delacións de las dataturas de las compañía de delación delación de las dataturas de las compañía de delación este activada delación delación delación delación delación de las dataturas de las compañías de las delacións de las delacións delacións delacións de las dataturas de las compañías de las delacións delacións de las dataturas de las compañías de las delacións delac

"Actividad principal 27.11. Fabricacian de matures, géneradores y transformadar eléctricos".

MITURE - BECTOR - Galaxy engines a despensable de la socitura de contribuctive, el capital racial de la compañía (a El DERIO) ELCERIA: POMERI INSUERT S.L. de 184 en los carticad de participaciones asociales, de 120 (0,01 EURO) de valor normal cada una mitimatidas participaciones asociales, de 120 (0,01 EURO) de valor normal cada una mitimatidas participaciones de la cli 120 (0,01 EURO) de valor normal cada una mitimatidas participaciones de la cli 120 (0,01 EURO) de valor normal cada una mitimatidas desembidoras (no el carcín funcidas).

CLANED: - due según combo en la encrima de communición relación en insolos antinoses la compania. Carl MIRER ELECTRO- COMER INCLUTIVE, su que por al instante de Admentandor Checo y nomina por la insolo insolitósio a don Medatured A M Balavin, con innorea de intercal do domayoro VMADATZ, juna cue autá alía in nombe y imposibilitado de la material Carl Carlto Se docitados Segúl y activitada insolundo en presentación de la material do alía alía históriado en conteciona da respuésión del manue.

Griggi productima de la compañía XII MINICAT HECTRIC COMPRENDENTIAL CON INFORMATION DE LA COMPAÑÍA DE LA COMPRENDENTIAL DE LA COMPRE









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