JCB ENERGY ELECTRIC POWER INDUSTRY

JCBENERGY

Transford

MADRID / SPAIN





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





GENERATOR GENERAL INFORMATION

GENERATOR	FREQUENCY	VOLTAGE	POWER FACTOR	SPEED	DIESEL	ENGINE		ALTERN	IATOR		TYPE OF	GENEF	RATOR O	UTPUT
Model	Hz	V	Cos Q	Rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	A
								Ľ			Standby	18,0	14,4	26,0
JCN 18	50	231/400	0.8	1500							Prime	16,4	13,1	23,6
					JCN	E22C	EII	Ð	ICP	CB 160L	Continuous	11,5	9,2	16,6
					JCIN	EZZC	CII		JCB		Standby	22,0	17,6	31,8
JCN 22	60	277/480	0.8	1800				ũ			Prime	20,0	16,0	28,9
								· · ·			Continuous	14,0	11,2	20,2
 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 					• Fue • Lov • Glo	el Filter w w Fuel Co bal Tech	vith Wate onsumption nical Serv	er and Par on , Low (ticle Sep Dil Consu Maintena					

Low Operating Cost, Suitable for Heavy-Duty

Durability , Low Noise Level

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):**

High Quality and Reliable Technology

Half Century Experience in Generator Manufacturing

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):

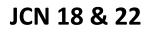
PRP (Prime Power) is available for an unlimited number of hours per year in a variable load application. Variable load should not exceed a 70% average of the Prime Power rating during any operating period of 250 hours. The total operating time at 100% Prime Power shall not exceed 500 hours per year. 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

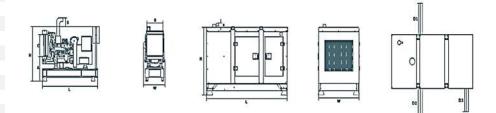




VALUES		OPEN TYPE GENERATOR	CANOPY TYPE GENERATOR
WIDTH	mm	597	1000
LENGTH	mm	1400	2000
HEIGHT	mm	1309	1190
WEIGHT (NET)	Kg	531	670
FUEL TANK CAPACITY	L	58	100

SYMBOL	OPEN	CANOPY	
L	1400	1916	
W	597	942	
н	871	1272	
S	438	172	
Α	438		
В	438		
С	480		
D1		630	
D2		630	
D3		360	
D4			
D5			

BENERG



FUEL CONSUMPTION

PERCENT OF PRIME POWER	1500 rpm	1800 rpm
	l/hr	l/hr
110 %	4,39	5,27
100 %	3,99	4,79
75 %	3,06	3,68
50 %	2,63	2,63



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DIESEL ENGINE MAIN TECHNICAL PARAMETERS

CENERAL		
GENERAL		
Number of Cylinders		4
Configuration		Vertical, In Line
Aspiration		Naturally
Combustion System		Direct Injection
Compression Ratio		19.1:1
Bore	mm	85
Stroke	mm	100
Displacement	L	2,27
Governing Type		Mechanic
Governing Class		G2
Rotation		Counter clockwise
Firing Order		1-3-4-2
Emission		Tier II
Moments of Rotation Inertia		
	Ka m²	0.44
Engine	Kg - m²	0,44
Flywheel	Kg - m²	2,55
Performance Rating		
Speed Droop	%	≤3
Steady State Speed Band	%	≤0,5
FILTERS		
Air Filter		Dry Type, Replaceable
		Dry Type, Replaceable With Water Separator
Air Filter		
Air Filter Fuel Filter		With Water Separator
Air Filter Fuel Filter Oil Filter	SAE (J620)	With Water Separator
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING	SAE (J620) Inch (")	With Water Separator Element Type, Particulate Trap
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing		With Water Separator Element Type, Particulate Trap 4
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc		With Water Separator Element Type, Particulate Trap 4
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS	Inch (")	With Water Separator Element Type, Particulate Trap 4 7,5
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature	Inch (") %	With Water Separator Element Type, Particulate Trap 4 7,5 25
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity	Inch (") % KPa Rh (%)	With Water SeparatorElement Type, Particulate Trap47,52510030
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance	Inch (") % KPa Rh (%) KPa	With Water SeparatorElement Type, Particulate Trap47,525100305
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit	Inch (") % KPa Rh (%)	With Water SeparatorElement Type, Particulate Trap47,52510030
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS	Inch (") % KPa Rh (%) KPa KPa	With Water SeparatorElement Type, Particulate Trap47,5251003055
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length*	Inch (") % KPa Rh (%) KPa KPa	With Water SeparatorElement Type, Particulate Trap47,5251003055538±21087
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length*	Inch (") KPa KPa KPa KPa C mm mm mm	With Water SeparatorElement Type, Particulate Trap47,525100305558±21087597
Air Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length* Width	Inch (") Inch (") KPa KPa KPa C mm mm mm mm	With Water SeparatorElement Type, Particulate Trap47,525100305558±21087597749
Air Filter Fuel Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length* Width Height Dry Weight	Inch (") KPa KPa KPa KPa C mm mm mm	With Water SeparatorElement Type, Particulate Trap47,525100305558±21087597
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Air Filter Fuel Filter Fuel Filter Fuel Filter Gil Filter FLYWHEEL HOUSING AND FLEX COUPLING FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Atmospheric Pressure Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length* Width Height Dry Weight *From front end of radiator to near end of air filter FAN Diameter Dirive Ratio Number of Blades	Inch (") % KPa Rh (%) KPa KPa °C mm mm mm kg	With Water Separator Element Type, Particulate Trap 4 7,5 25 100 30 5 5 38±2 1087 597 749 275 410 1,61:1 7
Air Filter Fuel Filter Fuel Filter Oil Filter FLYWHEEL HOUSING AND FLEX COUPLING Flywheel Housing Flex Coupling Disc TEST CONDITIONS Ambient Temperature Atmospheric Pressure Atmospheric Pressure Relative Humidity Max. Operating Intake Resistance Exhaust Backpressure Limit Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS Length* Width Height Dry Weight *From front end of radiator to near end of air filter FAN Diameter Diameter	Inch (") % KPa Rh (%) KPa KPa °C mm mm mm kg	With Water Separator Element Type, Particulate Trap 4 7,5 25 100 30 5 5 38±2 1087 597 749 275 410 1,61:1



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



DIESEL ENGINE MAIN TECHNICAL PARAMETERS

COOLING SYSTEM		
Radiator Type	50ºC	Tropical
Total Coolant Capacity	L	13
Max. Perm. Coolant Outlet Temperature	₅C	103
Max. Perm. Flow Resist. (Cool. System And Piping)	bar	0,5
Max. Temperature of Coolant Warning	₅C	95
Max. Temperature of Coolant Shutdown	°C	98
Thermostat Operation Temperature - Initial Open	°C	68
Thermostat Operation Temperature - Full Open	ōC	72
Delivery of Coolant Pump	m ³/ h	1,60
Min. Pressure Before Coolant Pump	bar	0,15
Radiator Face Area	m²	0,21
Rows	Row	2
Matrix Density	Per / Inch	15,5
Material		Aluminum
Width of Matrix	mm	438
Height of Matrix	mm	480
Pressure Cap Setting	kPa	90
Estimated Cooling Air Flow Reserve	kPa	0,125
Engine Pre Heater-Tube (with Circulation Pump)	W	1500
LUBRICATION SYSTEM		
Total System	L	8
Minimum Oil Level	L	7
Nominal Motor Operating Temperature	⁰C	40
Lubricating Oil Pressure (Rated Speed)	bar	5
Relief Valve Opens	kPa	352
Oil / Fuel Consumption Ratio	%	≤ 0,3
Normal Oil Temperature	₅C	110
ELECTRICAL SYSTEM		
Voltage	V	12
Starter	kW	3,2
Alternator Output Ampers	Α	25
Alternator Output Voltage	V	14
Batteries Capacity	Ah	55



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JCB ENERGY DIESEL ENGINE POWER RATINGS

ENGINE MODEL	E22C		ENGINE FAMILY	JC11	ENGINE SERIES	EII	
		TYPICAL GENERATOR OUTPUT (NET)		ENGINE POWER	3		
Speed (Rpm)	Type of Operation			Gr	oss	Net	
		kVA	kWe	KWm	Нр	kWm	Нр
1500	Stand By(Maximum)	17,5	14,0	18,5	24,8	16,5	22,1
	Prime		13,0	16,8	22,6	15,3	20,5
	Stand By(Maximum)	21,1	16,9	22,2	29,8	19,9	26,7
1800	Prime	19,5	15,6	20,2	27,1	18,4	24,7

DIESEL ENGINE MATCHING PARAMETERS - 50 HZ

50 HZ @ 1500 R/MIN		STAND BY	PRIME
Gross Engine Power	kW	18,5	16,8
Net Engine Power	kW	16,5	15,3
Fan Power Consumption (Belt Pulley Driven)	kW	1,5	1,5
Other Power Loss	kW	0,5	0,0
Mean Effective Pressure	MPa	0,65	0,59
Intake Air Flow	m ³ / min	1,25	1,25
Exhaust Temperature Limit	₅C	300	300
Exhaust Flow	m ³/ min	1,30	1,15
Boost Pressure Ratio		3,20	2,90
Mean Piston Speed	m / s	5,0	5,0
Cooling Fan Air Flow	m ³/ min	46,6	46,6
Typical Generator Output Power	kVA	18	16
Typical Generator Output Power HEAT REJECTION	kVA	18 STAND BY	16 PRIME
	kVA kW		
HEAT REJECTION		STAND BY	PRIME
HEAT REJECTION Energy in Fuel (Heat of Combustion)	kW	STAND BY 57,1	PRIME 48,1
HEAT REJECTION Energy in Fuel (Heat of Combustion) Gross Heat to Power	kW kW	STAND BY 57,1 18,5	PRIME 48,1 16,8
HEAT REJECTION Energy in Fuel (Heat of Combustion) Gross Heat to Power Energy to Coolant and Lubricating Oil	kW kW kW	STAND BY 57,1 18,5 18,6	PRIME 48,1 16,8 15,4
HEAT REJECTIONEnergy in Fuel (Heat of Combustion)Gross Heat to PowerEnergy to Coolant and Lubricating OilHeat Dissipation Capacity *	kW kW kW kW	STAND BY 57,1 18,5 18,6 -	PRIME 48,1 16,8 15,4 -

*Intake Intercooled system



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DIESEL ENGINE MATCHING PARAMETERS - 60 HZ

60 HZ @ 1800 R/MIN		STAND BY	PRIME
Gross Engine Power	kW	22,2	20,2
Net Engine Power	kW	19,9	18,4
Fan Power Consumption (Belt Pulley Driven)	kW	1,8	1,8
Other Power Loss	kW	0,5	0,0
Mean Effective Pressure	MPa	0,65	0,59
Intake Air Flow	m ³ / min	1,50	1,50
Exhaust Temperature Limit	°C	360	360
Exhaust Flow	m ³ / min	1,57	1,38
Boost Pressure Ratio		3,80	3,50
Mean Piston Speed	m / s	6,0	6,0
Cooling Fan Air Flow	m ³ / min	55,9	55,9
Typical Generator Output Power	kVA	21	20
HEAT REJECTION		STAND BY	PRIME
Energy in Fuel (Heat of Combustion)	kW	67,3	55,6
Gross Heat to Power	kW	22,2	18,4
Energy to Coolant and Lubricating Oil	kW	22,3	18,5
Heat Dissipation Capacity *	kW	-	-
Energy to Exhaust	kW	18,9	15,3
Heat to Radiation	kW	3,8	3,5

JCB ALTERNATOR TECHNICAL PARAMETERS AND SPECIFICATIONS



ALTERNATOR TECH	NICAL PARAIVIETERS				
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	%	< 5
Overspeed	rpm	2250	Wave Form: NEMA = TIF - (*)		< 50
Air Flow	m³/sec.	0.071	Wave Form: I.E.C. = THF - (*)	%	< 2
Bearing Drive	N/A	-	Bearing Non-Drive	Bearing	6306-2RZ
Rotor Winding	100%	Copper	Stator Winding	100%	Copper



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1 Phase

220

230

12,0

9,6

ALTERNATOR SPECIFICATIONS

50 HZ / 231-400V COSQ 0,8 / 1500 RPM STANDARD USING ALTERNATOR **OPTIONAL USING ALTERNATOR JCB 160L** BRAND/MODEL JCBENERGY TAL040E SOL2F LEROY-SOMER **STAMFORD** DUTY Continuous Stand By AMBIENT C° 40°C 27°C H/ 163° K CLASS / TEMP. RISE C° H/ 125° K 380/220 400/231 1 Phase 380/220 400/231 SERIES STAR ٧ 415/240 415/240 PARALLEL STAR ٧ 190/110 200/115 208/120 220 190/110 200/115 208/120 SERIES DELTA V 220 230 240 230 220 230 240 **OUTPUT POWER** kVA 16,0 16,0 10,0 17,5 17,5 18,5 17,0 **OUTPUT POWER** kW 12,8 12,8 13,6 8,0 14,0 14,0 14,8

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

STANDARD USING ALTERNATOR				OPTIONAL USING ALTERNATOR					
BRAND/MODEL	JCBENERGY	JCB 160L		LEROY-S	OMER	TAL040E	STAM	FORD	PIO44H- SOL2-F
DUTY				Continuou	S			Stand By	
AMBIENT	C°			40°C				27°C	
CLASS / TEMP. RISE	C°			Н / 125° К	ζ.			Н / 163° К	
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	19,0	20,0	20,0	13,3	21,0	22,0	22,0	14,6
OUTPUT POWER	kW	15,2	16,0	16,0	10,6	16,8	17,6	17,6	11,7



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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 Pa Optional
- o Control Module
- Battery Charger
- Emergency Stop Button

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

CONTROL MODULE TECHNICAL PARAMETERS

Brand	JEBENERGY	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



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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 ℃
- 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

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