# JCB ENERGY ELECTRIC POWER INDUSTRY

JCBENERGY

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**MADRID / SPAIN** 



www.jcbenergy.com



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





#### **GENERATOR GENERAL INFORMATION**

GENERATOR	FREQUENCY	VOLTAGE	POWER FACTOR	SPEED	DIESEL ENGINE ALTERNATOR		TYPE OF	OF GENERATOR OUTPUT		т				
Model	Hz	V	Cos Q	Rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	А
							Ĺ			Standby	2.000,0	1.600,0	2.890,2	
JCN 2000	50	231/400	0.8	1500				YII ZE JO		450SX	Prime	1.818,2	1.454,5	2.627,4
					JCN	Y2473JCI	VII				Continuous	1.272,7	1.018,2	1.839,2
					JCIN	JCN Y2473JCI	ŶIJ		JCB		Standby	2.000,0	1.600,0	2.890,2
JCN 2000	60	277/480	0.8	1800				ĝ		400L2	Prime	1.818,2	1.454,5	2.627,4
											Continuous	1.272,7	1.018,2	1.839,2

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

#### 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.

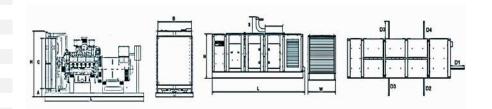
#### **GENERATOR DIMENSIONS AND TECHNICAL DRAWINGS**





VALUES		OPEN TYPE GENERATOR	CANOPY TYPE GENERATOR
WIDTH mm		2600	2800
LENGTH	mm	5700	9000
HEIGHT	mm	2643	2900
WEIGHT (NET)	Kg	13330	18350
FUEL TANK CAPACITY	L	3000	3000

SYMBOL	OPEN	CANOPY
L	5700	9000
W	2600	2800
н	2643	2000
S		900
Α	300	
В	2559	
С	2086	
D1		1044
D2		1044
D3		1044
D4		1044
D5		1044



### **FUEL CONSUMPTION**

PERCENT OF PRIME POWER	1500 rpm	1800 rpm
	l/hr	l/hr
110 %	397,15	397,15
100 %	363,29	363,29
75 %	273,84	273,84
50 %	191,69	161,69



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#### **DIESEL ENGINE MAIN TECHNICAL PARAMETERS**

GENERAL		
Number of Cylinders		12
Configuration		V-Type
Aspiration		Turbocharged & Intercooled
Combustion System		Direct Injection
Compression Ratio		13.5:1
Bore	mm	200
Stroke	mm	210
Displacement	L	79,17
Governing Type		ECU
Governing Class		G3
Rotation		Counterclockwise
Firing Order		L1-R6-L5-R2-L3-R4-L6-R1-L2-R5-L4-R3
Emission		Tier II
Moments of Rotation Inertia		
Engine	Kg - m²	39,53
Flywheel	Kg - m <sup>2</sup>	25,05
Performance Rating		23,03
Speed Droop	%	≤0,5
Steady State Speed Band	%	≤0,5 ≤0,5
FILTERS	/0	5,5
Air Filter		Dry Type, Replaceable
Fuel Filter		With Water Separator
Oil Filter		
FLYWHEEL HOUSING AND FLEX COUPLING		Element Type, Particulate Trap
	SAE (1620)	00
Flywheel Housing	SAE (J620)	00
Flex Coupling Disc	Inch (")	21
TEST CONDITIONS	~	
Ambient Temperature	%	25
Atmospheric Pressure	KPa	100
Relative Humidity	Rh (%)	30
Max. Operating Intake Resistance	КРа	<5
Exhaust Backpressure Limit	КРа	<10
Fuel Temperature (Fuel Inlet Pump) OVERALL DIMENSIONS	°C	38±2
Length*	mm	3320
Width	mm	2560
Height	mm	2255
Dry Weight	kg	9675
*From front end of radiator to near end of air filter		
FAN Diameter	mm	1700
Drive Ratio		1,26
Number of Blades		8
Material		PAG
Туре		Blowing



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#### **DIESEL ENGINE MAIN TECHNICAL PARAMETERS**

COOLING SYSTEM		
Radiator Type	50ºC	Tropical
Total Coolant Capacity	L	355
Max. Perm. Coolant Outlet Temperature	ōC	105
Max. Perm. Flow Resist. (Cool. System And Piping)	bar	0,5
Max. Temperature of Coolant Warning	°C	95
Max. Temperature of Coolant Shutdown	°C	98
Thermostat Operation Temperature - Initial Open	°C	75
Thermostat Operation Temperature - Full Open	°C	85
Delivery of Coolant Pump	m ³/ h	14,50
Min. Pressure Before Coolant Pump	bar	0,5
Radiator Face Area	m²	5,35
Rows	Row	7
Matrix Density	Per / Inch	12
Material		Aluminum
Width of Matrix	mm	2559
Height of Matrix	mm	2086
Pressure Cap Setting	kPa	50
Estimated Cooling Air Flow Reserve	kPa	0,125
Engine Pre Heater-Tube (with Circulation Pump)	W	2x4500
LUBRICATION SYSTEM		
Total System	L	340
Minimum Oil Level	L	280
Nominal Motor Operating Temperature	°C	40
Lubricating Oil Pressure (Rated Speed)	bar	7
Relief Valve Opens	kPa	200
Oil / Fuel Consumption Ratio	%	≤0,1
Normal Oil Temperature	₅C	110
ELECTRICAL SYSTEM		
Voltage	V	24
Starter	kW	2X11
Alternator Output Ampers	А	60
Alternator Output Voltage	V	28
Batteries Capacity	Ah	4X200



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#### JCB ENERGY DIESEL ENGINE POWER RATINGS

ENGINE MODEL	Y2473JCI		ENGINE FAMILY	JC17	ENGINE SERIES	YII		
Speed (Rpm)					ENGINE POWER			
	Type of Operation	TYPICAL GENERATOR OUTPUT (NET)		Gr	OSS		Net	
	_	kVA	kWe	KWm	Нр	kWm	Нр	
1500	Stand By(Maximum)	2.000,0	1.600,0	1.725,0	2.315,4	1.667,0	2.237,6	
	Prime	1.815,0	1.452,0	1.570,0	2.107,4	1.513,0	2.030,9	
1800	Stand By(Maximum)	2.000,0	1.600,0	1.725,0	2.315,4	1.667,0	2.237,6	
	Prime	1.815,0	1.452,0	1.570,0	2.107,4	1.513,0	2.030,9	

### **DIESEL ENGINE MATCHING PARAMETERS - 50 HZ**

50 HZ @ 1500 R/MIN		STAND BY	PRIME
Gross Engine Power	kW	1725,0	1570,0
Net Engine Power	kW	1667,0	1513,0
Fan Power Consumption (Belt Pulley Driven)	kW	56,0	56,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	1,74	1,58
Intake Air Flow	m <sup>3</sup> / min	145,00	135,00
Exhaust Temperature Limit	₀C	550	550
Exhaust Flow	m ³/ min	328,00	304,00
Boost Pressure Ratio		3,15	2,88
Mean Piston Speed	m / s	10,5	10,5
Cooling Fan Air Flow	m ³/ min	2520,0	2520,0
Typical Generator Output Power	kVA	2000	1815
HEAT REJECTION		STAND BY	PRIME
Energy in Fuel (Heat of Combustion)	kW	4312,5	3925,0
Gross Heat to Power	kW	1725,0	1570,0
Energy to Coolant and Lubricating Oil	kW	580,0	522,0
Heat Dissipation Capacity *	kW	705,0	635,0
Energy to Exhaust	kW	948,0	849,0
Heat to Radiation	kW	203,0	196,3
*Intoleo Interno closi custom			

\*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	1725,0	1570,0
Net Engine Power	kW	1667,0	1513,0
Fan Power Consumption (Belt Pulley Driven)	kW	56,0	56,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	1,74	1,58
Intake Air Flow	m <sup>3</sup> / min	145,00	135,00
Exhaust Temperature Limit	ōC	550	550
Exhaust Flow	m <sup>3</sup> / min	328,00	304,00
Boost Pressure Ratio		3,15	2,88
Mean Piston Speed	m / s	10,5	10,5
Cooling Fan Air Flow	m <sup>3</sup> / min	2520,0	2520,0
Typical Generator Output Power	kVA	2000	1815
HEAT REJECTION		STAND BY	PRIME
Energy in Fuel (Heat of Combustion)	kW	4312,5	3925,0
Gross Heat to Power	kW	1725,0	1570,0
Energy to Coolant and Lubricating Oil	kW	580,0	522,0
Heat Dissipation Capacity *	kW	705,0	635,0
Energy to Exhaust	kW	948,0	849,0
Heat to Radiation	kW	203,0	196,3
*Intake Intercooled system			

#### JCB ALTERNATOR TECHNICAL PARAMETERS AND SPECIFICATIONS



ALTERNATOR TECHN	IICAL PARAMETERS				
Insulation Class		Н	Field Control System		Self-Excited
Winding Pitch		2/3 - (N° 6)	A.V.R. Model	Standard	MX321+PMG
Wires		6	Voltage Regulation	%	± 0.5
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.	2,69	Wave Form: I.E.C. = THF - (*)	%	< 1.5
Bearing Drive	N/A	-	Bearing Non-Drive	Bearing	6319-2RZ
Rotor Winding	100%	Copper	Stator Winding	100%	Copper



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## **ALTERNATOR SPECIFICATIONS**

50 HZ / 231-400V COSQ 0,8 / 1500 RPM									
STANDARD USING ALTERNATOR				OPTIONAL USING ALTERNATOR					
BRAND/MODEL	JCBENERGY	JCB 450SX		LEROY-SO	OMER	LSA 52.3S5	STAMFORD	Р7Е	
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	1818,0	1818,0	1854,0	-	2000,0	2000,0	2039,0	-
OUTPUT POWER	kW	1454,4	1454,4	1483,2	-	1600,0	1600,0	1631,2	-

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

STANDARD USING ALTERNATOR				OPTIONAL USING ALTERNATOR					
BRAND/MODEL	JCBENERGY	JCB 400L2		LEROY-S	SOMER <sup>®</sup> LS	A 50.2L8	STAMFO	ORD	S7L1D-C4
DUTY				Continuous				Stand By	
AMBIENT	C°			40°C				27°C	
CLASS / TEMP. RISE	C°			Н / 125° К				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	1818,0	1818,0	1854,0	-	2000,0	2000,0	2039,0	-
OUTPUT POWER	kW	1454,4	1454,4	1483,2	-	1600,0	1600,0	1631,2	-



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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**





- Powder Painted Steel Panel with Lockable Door
- ATS (Automatic Transfer Panel)
   Optional
- o Control Module
- o 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.	<b>Environmental Conditions</b>	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	<ul> <li>Current / Voltage</li> <li>Asymmetry</li> </ul>	- 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 °C 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)
- Lifting and Carrying Equipment
- Internal Exhaust Mufflers (Silencers)
- External Exhaust Mufflers (Silencers)
- Radiator water Filling Cap
- Daily Fuel Tank, External Fuel Tank

# **OUR CERTIFICATES**

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