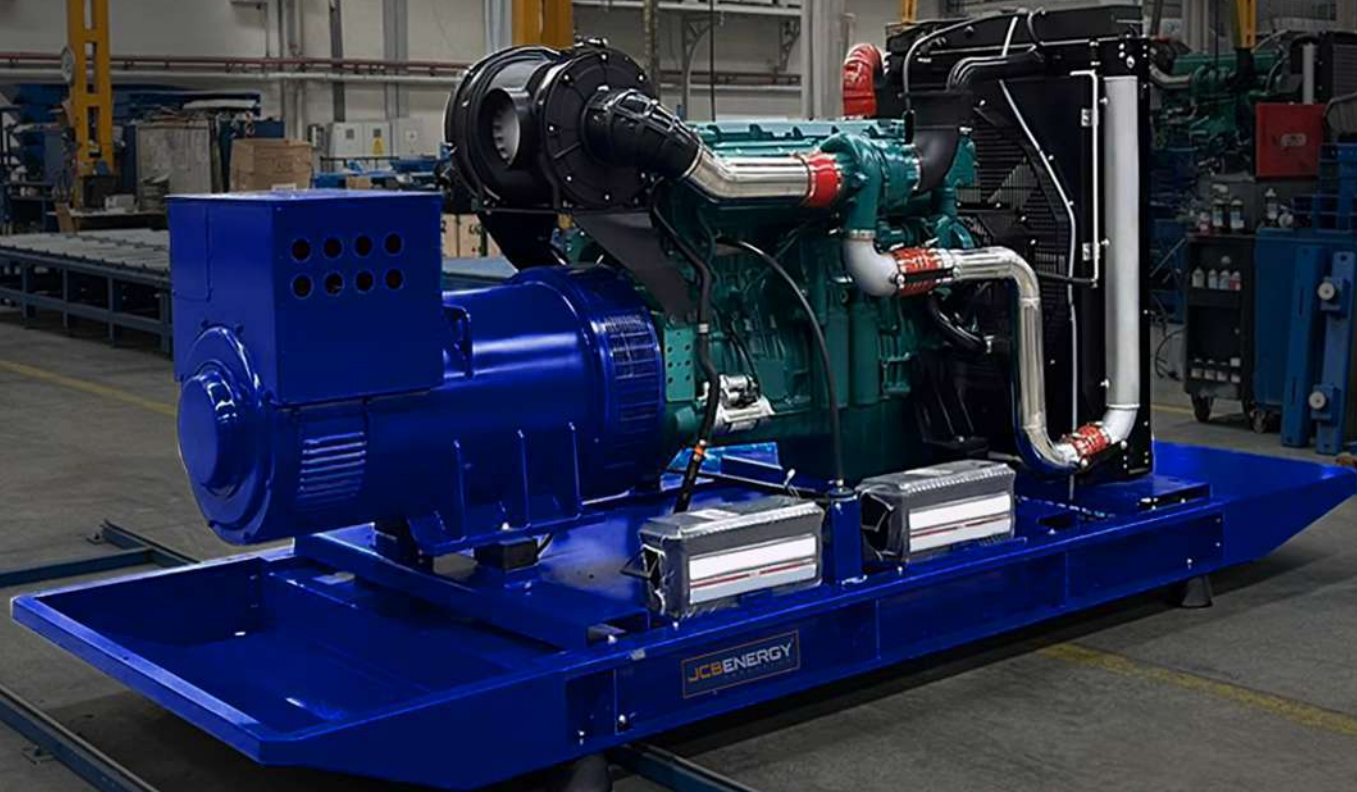




JCB ENERGY ELECTRIC POWER INDUSTRY

📍 MADRID / SPAIN





GENERATOR GENERAL INFORMATION

GENERATOR	FREQUENCY	VOLTAGE	POWER FACTOR	SPEED	DIESEL ENGINE			ALTERNATOR			TYPE OF	GENERATOR OUTPUT		
Model	Hz	V	Cos Q	Rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	A
JCD 44	50	231/400	0.8	1500		BFM3T	BF		JCB	180LA	Standby	44,0	35,2	63,6
JCD 52	60	277/480	0.8	1800							Prime	40,0	32,0	57,8
											Continuous	38,5	30,8	55,6
											Standby	52,0	41,6	75,1
											Prime	47,3	37,8	68,3
										Continuous	42,9	34,3	62,0	

- 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 Noise Level

- 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 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.

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

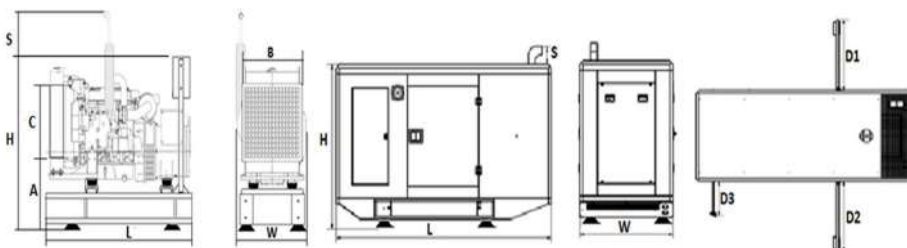
- * Generators can work on Continuous Power at 70% of Prime power value if only all maintenances are done on time with original spare parts and high-quality oils that manufacturer advice.
- * Generators should not operate below 50% of Prime Power value. In such a case, the engine will burn excessive 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	622	1002
LENGTH	mm	1600	2269
HEIGHT	mm	1329	1597
WEIGHT (NET)	Kg	685	850
FUEL TANK CAPACITY	L	55	100

SYMBOL	OPEN	CANOPY
L	1600	2269
W	622	1002
H	894	1392
S	435	205
A	565	
B	550	
C	480	
D1		750
D2		750
D3		360
D4		
D5		



FUEL CONSUMPTION

PERCENT OF PRIME POWER	1500 rpm	1800 rpm
	l/hr	l/hr
110 %	11,15	12,67
100 %	10,14	11,52
75 %	7,88	8,96
50 %	5,44	6,18

DIESEL ENGINE MAIN TECHNICAL PARAMETERS

50 Hz – 1500 min ⁻¹			60 Hz – 1800 min ⁻¹		
Type		BFM3T	Type		BFM3T
Speed	min ⁻¹	1500	Speed	min ⁻¹	1800
Net Frequency	Hz	50	Net Frequency	Hz	60
Power Standard		LTP	Power Standard		LTP
Power Level			Power Level		
GENERAL			GENERAL		
Aspiration		Turbo	Aspiration		Turbo
Governing System		Electronic	Governing System		Electronic
Governor Brand		GAC	Governor Brand		GAC
No of Cylinders		4	No of Cylinders		4
Configuration		in-line	Configuration		in-line
Injection System		In-line pump	Injection System		In-line pump
Displacement	L	3,168	Displacement	L	3,168
Bore	mm	98	Bore	mm	98
Stroke	mm	105	Stroke	mm	105
Compression Ratio		18,5:1	Compression Ratio		18,5:1
Mean Effective Pressure	Bar	11,1	Mean Effective Pressure	Bar	11,1
Piston Speed	m/s	5,25	Piston Speed	m/s	6,30
Rotation (looking at flywheel)		ccw	Rotation (looking at flywheel)		ccw
No of Teeth on Flywheel Ring Gear		103	No of Teeth on Flywheel Ring Gear		103
GOVERNOR PERFORMANCE			GOVERNOR PERFORMANCE		
Speed droop (static) mech. gov.	%	4-6	Speed droop (static) mech. gov.	%	4-6
Speed droop (static) electr. gov.	%	0	Speed droop (static) electr. gov.	%	0
Governing standards		G3	Governing standards		G3
MOMENT OF INERTIA			MOMENT OF INERTIA		
Engine without flywheel	kg m ²	5,50	Engine without flywheel	kg m ²	5,50
Flywheel (standard genset spec.)	kg m ²	0,2	Flywheel (standard genset spec.)	kg m ²	0,2
Max. step load acceptance, 1st step	%	-	Max. step load acceptance, 1st step	%	-
Sound power at full load, incl. cooling system	dB(A)	100	Sound power at full load, incl. cooling system	dB(A)	102
Sound press. (1m average, full load), incl. cool. syst.	dB(A)	88	Sound press. (1m average, full load), incl. cool. syst.	dB(A)	91
ENGINE WEIGHT			ENGINE WEIGHT		
Engine Dry, w/o Cooling System	kg	265	Engine Dry, w/o Cooling System	Kg	265
LUBRICATION SYSTEM			LUBRICATION SYSTEM		
Oil specification		15W40/CI-4/SL	Oil specification		15W40/CI-4/SL
Oil consumption (as % of fuel consumption)	%	0.5	Oil consumption (as % of fuel consumption)	%	0,5
Oil capacity (sump)	l	7,5	Oil capacity (sump)	l	7,5
Min. oil pressure (warning)	Bar	1,5	Min. oil pressure (warning)	Bar	1,5
Min. oil pressure (shut down)	Bar	1.0	Min. oil pressure (shut down)	Bar	1,0
Max. permissible oil temperature (oil pan)	°C	120	Max. permissible oil temperature (oil pan)	°C	120
OUTPUT			OUTPUT		
Gross Output(LTP or StandBy Power)	Kw	44	Gross Output(LTP or StandBy Power)	Kw	50
Fan Reduction	Kw	3	Fan Reduction	Kw	3,0
Electrical Output (Stand By)	Kva	44	Electrical Output (Stand By)	Kva	52
Gross Output(PRP or Prime Power)	Kw	40	Gross Output(PRP or Prime Power)	Kw	45
Gross Output(Continous Power)	kw	36	Gross Output(Continous Power)	kw	42

DIESEL ENGINE MAIN TECHNICAL PARAMETERS

50 Hz – 1500 min ⁻¹			60 Hz – 1800 min ⁻¹		
COOLING SYSTEM, GENERAL ENGINE COOLING DATA			COOLING SYSTEM, GENERAL ENGINE COOLING DATA		
Max. perm. Coolant Outlet Temperature	°C	103	Max. perm. Coolant Outlet Temperature	°C	103
Max. perm. Flow Resistance (cool. syst. and piping)	Bar	0.5	Max. perm. Flow Resistance (cool. syst. and piping)	Bar	0.5
Max. Temperature of Coolant (warning)	°C	97	Max. Temperature of Coolant (warning)	°C	97
Max. Temperature of Coolant (shutdown)	°C	103	Max. Temperature of Coolant (shutdown)	°C	103
Temperature at Which Thermostat Starts to open	°C	78	Temperature at Which Thermostat Starts to open	°C	78
Temperature at Which Thermostat is Fully Open	°C	90	Temperature at Which Thermostat is Fully Open	°C	90
Delivery of Coolant Pump	m ³ /h	4,2	Delivery of Coolant Pump	m ³ /h	4,2
Min. Pressure Before Coolant Pump	Bar	0.15	Min. Pressure Before Coolant Pump	Bar	0.15
ENGINE COOLING SYSTEM			ENGINE COOLING SYSTEM		
Coolant Capacity (engine)	l	4.8	Coolant Capacity (engine)	l	4.8
Coolant Capacity (incl. cooling unit)	l	-	Coolant Capacity (incl. cooling unit)	l	-
Fan Power Consumption	kW	3	Fan Power Consumption	kW	4
Air to Boil (max. permissible cool. air temp. at fan)	°C	50	Air to Boil (max. permissible cool. air temp. at fan)	°C	50
Air Pressure Loss, external	mbar	1.5	Air Pressure Loss, external	mbar	2.0
Cooling air Flow	m ³ /h	4680	Cooling air Flow	m ³ /h	5760
HEAT BALANCE			HEAT BALANCE		
Heat Dissipation (engine radiator)	kW	34	Heat Dissipation (engine radiator)	kW	42
Heat Dissipation (CAC)	kW	-	Heat Dissipation (CAC)	kW	-
INLET / EXHAUST DATA			INLET / EXHAUST DATA		
Max. intake Depression (Switch setting)	mbar	30	Max. intake Depression (Switch setting)	mbar	30
Combustion Air Volume	m ³ /h	153	Combustion Air Volume	m ³ /h	220
Max. Exhaust Back Pressure	mbar	100	Max. Exhaust Back Pressure	mbar	100
Max. Exhaust Gas Temperature	°C	560	Max. Exhaust Gas Temperature	°C	560
Exhaust Gas Flow (at above temp)	m ³ /h	315	Exhaust Gas Flow (at above temp)	m ³ /h	430
ELECTRICAL SYSTEM			ELECTRICAL SYSTEM		
Voltage	V	12	Voltage	V	12
Starter	KW	3	Starter	KW	3
Alternator Output	A	55	Alternator Output	A	55
Batteries (minimum capacity, cold start limit -5°C)	Ah	1*55	Batteries (minimum capacity, cold start limit -5°C)	Ah	1*55

ALTERNATOR TECHNICAL PARAMETERS






ALTERNATOR TECHNICAL PARAMETERS

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

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

STANDARD USING ALTERNATOR




OPTIONAL USING ALTERNATOR

BRAND/MODEL		JCB 180LA				TAL042E			S1L2-K1/PI144J
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	40,0	40,0	42,0	27,0	44,0	44,0	46,0	29,0
OUTPUT POWER	kW	32,0	32,0	33,6	21,6	35,2	35,2	36,8	23,2

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

STANDARD USING ALTERNATOR

OPTIONAL USING ALTERNATOR

BRAND/MODEL		JCB 180LA			TAL042F			S1L2N/PI144K	
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	45,0	48,0	48,0	32,0	50,0	53,0	53,0	35,0
OUTPUT POWER	kW	36,0	38,4	38,4	25,6	40,0	42,4	42,4	28,0

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
- Control Module
- Battery Charger
- Emergency Stop Button
- Terminal Blocks
- Load Output Terminal
- System Protection MSBs
- Circuit Breaker-Optional
- LCD Screen
- Control Relays
- Backlit, 128x64 Pixels

CONTROL MODULE TECHNICAL PARAMETERS

Brand		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

CONTROL MODULE FUNCTION

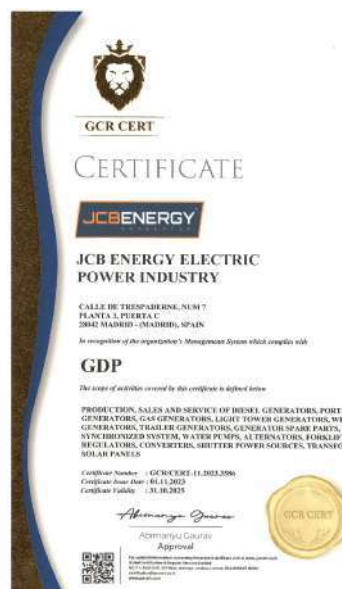
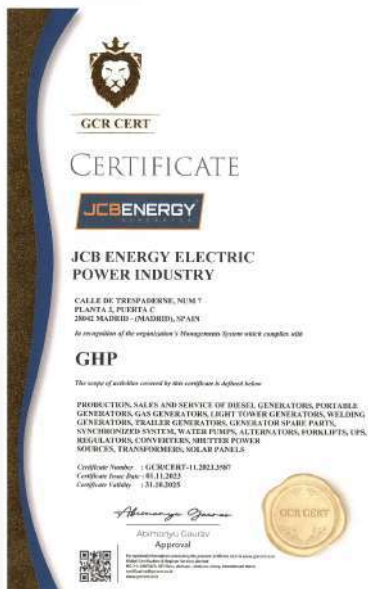
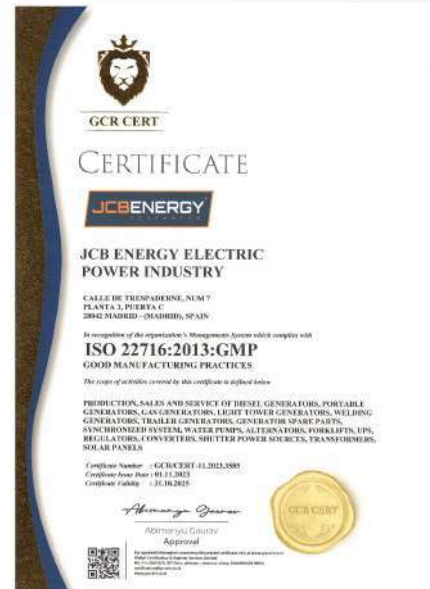
Mains Voltage Level Control	Generator Voltage Level Control	3 Phase Generator Protections	3 Phase AMF Function	Alarm Horn
Network Frequency Level Control	Generator Frequency level Control	- High / Low Voltage	- High / Low Frequency	Heater Tube Thermostat Control
Engine Operating Option Control	Generator 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 °C Ovens
- 1500 Hour Salt Test
- Glass wool Isolation, A1 Class Material -50/+500 °C
- 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



JCB Energy Electric Power Industry S.L.

HAS OUR TOTAL SUPPORT

We are pleased to certify that this company, with its registered office (address as below), is fully authorized as an Original Equipment Manufacturer partner to incorporate Mecc Alte AC Generators when selling and distributing generating sets.

Mecc Alte also certifies that its products sold to this company are fully covered by the Mecc Alte Warranty.

Mecc Alte provides this company access to its extensive product knowledge in order to incorporate Mecc Alte AC Generators when selling and distributing generating sets.

World-class alternators 1 - 5.000kVA.

APPROVED MANUFACTURER

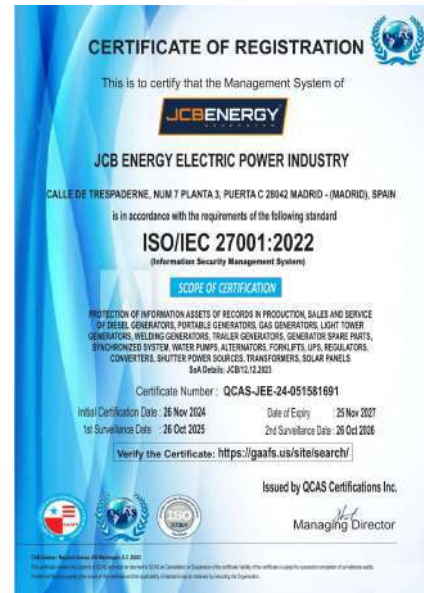
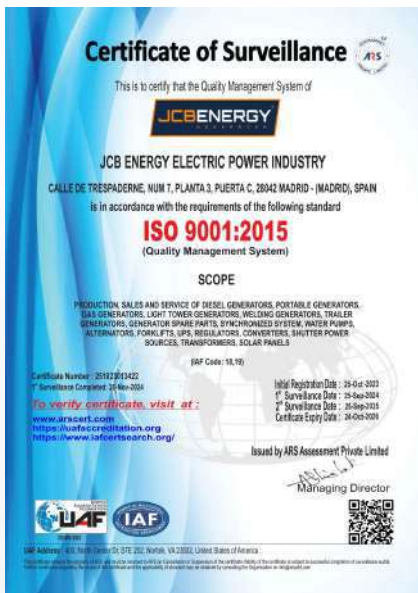
CERTIFICATE NO.
MAD0163

VALID UNTIL
31 December 2025

COMPANY ADDRESS
Calle de Trespaderne, 7, P.O. 28042, Madrid, Spain

GENUINE PARTS

POWER FROM WITHIN



MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 2372384

Initial certification date: 14 August 2021

Valid: 14 October 2021 – 13 October 2026

This is to certify that the management system of **HD Hyundai Infracore Co., Ltd. Head Office & Incheon Plant** 489, Injung-ro, Dong-gu, Incheon, 22502, Republic of Korea and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Environmental Management System standard: **ISO 14001:2015**

This certificate is valid for the following scope: **Design, Development, Manufacture, Servicing of Internal Combustion Engine for use in Marine Industry, General Industry and Automotive Industry, and Earth Moving Equipment (Excavator, Wheel Loader, Dozer), Testing of Earth Moving Equipment (Excavator and Wheel Loader).**

Place and date: Barcelona, 09 October 2021

For the issuing office: DNV Business Assurance

DNV Business Assurance

DNV AS, Strandveien 69, NO-1300 Sandnessjøen, Norway

Site Lead: Management Representative

Issued in accordance with conditions as set out in the Certification Agreement may render this Certificate invalid.
 ACCREDITED UNIT: DNV Business Assurance S.L. - Certification - DNV AS, Strandveien 69, NO-1300 Sandnessjøen, Norway - TEL: +47 9133 1000 - www.dnv.com/assura

MANAGEMENT SYSTEM CERTIFICATE

Certificate no.: 2372385

Initial certification date: 13 January 2021

Valid: 14 October 2021 – 13 October 2026

This is to certify that the management system of **HD Hyundai Infracore Co., Ltd. Head Office & Incheon Plant** 489, Injung-ro, Dong-gu, Incheon, 22502, Republic of Korea and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard: **ISO 45001:2018**

This certificate is valid for the following scope: **Design, Development, Manufacture, Servicing of Internal Combustion Engine for use in Marine Industry, General Industry and Automotive Industry, and Earth Moving Equipment (Excavator, Wheel Loader, Dozer), Testing of Earth Moving Equipment (Excavator and Wheel Loader).**

Place and date: Barcelona, 09 October 2021

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CE DECLARATION OF CONFORMITY

Certification no.: 2372384

Initial certification date: 14 August 2021

Valid: 14 October 2021 – 13 October 2026

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Valid: 14 October 2021 – 13 October 2026

This is to certify that the management system of **HD Hyundai Infracore Co., Ltd. Head Office & Incheon Plant** 489, Injung-ro, Dong-gu, Incheon, 22502, Republic of Korea and the sites as mentioned in the appendix accompanying this certificate

has been found to conform to the Occupational Health and Safety Management System standard: **ISO 45001:2018**

This certificate is valid for the following scope: **Design, Development, Manufacture, Servicing of Internal Combustion Engine for use in Marine Industry, General Industry and Automotive Industry, and Earth Moving Equipment (Excavator, Wheel Loader, Dozer), Testing of Earth Moving Equipment (Excavator and Wheel Loader).**

Place and date: Barcelona, 09 October 2021

For the issuing office: DNV Business Assurance

DNV Business Assurance

DNV AS, Strandveien 69, NO-1300 Sandnessjøen, Norway

Site Lead: Management Representative

Issued in accordance with conditions as set out in the Certification Agreement may render this Certificate invalid.
 ACCREDITED UNIT: DNV Business Assurance S.L. - Certification - DNV AS, Strandveien 69, NO-1300 Sandnessjøen, Norway - TEL: +47 9133 1000 - www.dnv.com/assura

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