

# JCB ENERGY ELECTRIC POWER INDUSTRY

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	ATOR		TYPE OF	GENERA	ATOR OU	TPUT
Model	Hz	V	Cos Q	Rpm	Brand	Model	Series	Brand	Model	Series	Operation	kVA	kW	А
						24020101		BII BII	JCB JCB		Standby	825,0	660,0	1.192,2
JCN 825	50	231/400	0.8	1500						355MXA 355MX	Prime	750,0	600,0	1.083,8
					ICN		OLCI DII				Continuous	525,0	420,0	758,7
					JCN	B1020JCI	BII				Standby	930,0	744,0	1.343,9
JCN 930	60	277/480	0.8	1800							Prime	845,5	676,4	1.221,8
											Continuous	591,8	473,5	855,2

- 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 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.



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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.

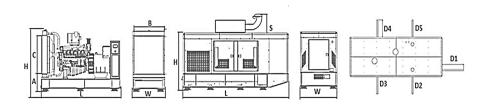
## **GENERATOR DIMENSIONS AND TECHNICAL DRAWINGS**





VALUES		OPEN TYPE GENERATOR	CANOPY TYPE GENERATOR
WIDTH	mm	1400	1942
LENGTH	mm	4000	5166
HEIGHT	mm	2188	2920
WEIGHT (NET)	Kg	4240	5530
FUEL TANK CAPACITY	L	1193	530

SYMBOL	OPEN	CANOPY
L	4000	5166
W	1400	1942
Н	2188	2282
S		638
Α	560	
В	1302	
С	1446	
D1		1057
D2		961
D3		961
D4		961
D5		961



#### **FUEL CONSUMPTION**

PERCENT OF PRIME POWER	1500 rpm	1800 rpm
	l/hr	I/hr
110 %	163,55	184,75
100 %	150,42	169,79
75 %	113,39	127,99
50 %	76,36	86,19



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## **DIESEL ENGINE MAIN TECHNICAL PARAMETERS**

GENERAL		
Number of Cylinders		12
Configuration		V-Type
Aspiration		Turbocharged & Intercooled
Combustion System		Direct Injection
		15.5:1
Compression Ratio		
Bore	mm	128
Stroke	mm	155
Displacement	L	23,922
Governing Type		Electronic
Governing Class		G3
Rotation		Counterclockwise
Firing Order		1-12-5-8-3-10-6-7-2-11-4-9
Emission		Tier II
Moments of Rotation Inertia		
Engine	Kg - m²	4,54
Flywheel	Kg - m²	2,1
Performance Rating		
Speed Droop	%	≤0,5
Steady State Speed Band	%	≤0,5
FILTERS		,
Air Filter		Dry Type, Replaceable
Fuel Filter		With Water Separator
Oil Filter		Element Type, Particulate Trap
FLYWHEEL HOUSING AND FLEX COUPLING		
Flywheel Housing	SAE (J620)	1
Flywheel Housing Flex Coupling Disc		1 14
Flywheel Housing Flex Coupling Disc TEST CONDITIONS	SAE (J620) Inch (")	
Flex Coupling Disc TEST CONDITIONS		
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature	Inch (") %	14 25
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature  Atmospheric Pressure	Inch (") % KPa	14 25 100
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature  Atmospheric Pressure  Relative Humidity	Inch (") % KPa Rh (%)	14 25 100 30
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature  Atmospheric Pressure  Relative Humidity  Max. Operating Intake Resistance	Inch (") % KPa Rh (%) KPa	14 25 100 30 <5
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature  Atmospheric Pressure  Relative Humidity  Max. Operating Intake Resistance  Exhaust Backpressure Limit	Inch (")  %  KPa  Rh (%)  KPa  KPa	14 25 100 30 <5 <10
Flex Coupling Disc  TEST CONDITIONS  Ambient Temperature  Atmospheric Pressure  Relative Humidity  Max. Operating Intake Resistance	Inch (") % KPa Rh (%) KPa	14 25 100 30 <5
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	14  25  100  30  <5  <10  38±2  2075
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 (")  %  KPa Rh (%)  KPa  KPa  C  mm  mm	14  25  100  30  <5  <10  38±2  2075  1456
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	Inch (")  %  KPa  Rh (%)  KPa  KPa  C  mm  mm  mm	14  25  100  30  <5 <10  38±2  2075  1456  1558
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 Rh (%)  KPa  KPa  C  mm  mm	14  25  100  30  <5  <10  38±2  2075  1456
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  *From front end of radiator to near end of air filter	Inch (")  %  KPa  Rh (%)  KPa  KPa  C  mm  mm  mm	14  25  100  30  <5 <10  38±2  2075  1456  1558
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  *From front end of radiator to near end of air filter  FAN	Inch (")  %  KPa  Rh (%)  KPa  KPa  C  mm  mm  mm	25 100 30 <5 <10 38±2 2075 1456 1558 1820
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  *From front end of radiator to near end of air filter	Inch (")  %  KPa Rh (%)  KPa  KPa  CC  mm  mm  mm  kg	14  25  100  30  <5 <10  38±2  2075  1456  1558
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  *From front end of radiator to near end of air filter  FAN  Diameter  Drive Ratio  Number of Blades	Inch (")  %  KPa Rh (%)  KPa  KPa  CC  mm  mm  mm  kg	25 100 30 <5 <10 38±2 2075 1456 1558 1820
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  *From front end of radiator to near end of air filter  FAN  Diameter  Drive Ratio	Inch (")  %  KPa Rh (%)  KPa  KPa  CC  mm  mm  mm  kg	25 100 30 <5 <10 38±2 2075 1456 1558 1820



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## **DIESEL ENGINE MAIN TECHNICAL PARAMETERS**

COOLING SYSTEM		
Radiator Type	50ºC	Tropical
Total Coolant Capacity	L	96
Max. Perm. Coolant Outlet Temperature	ōС	105
Max. Perm. Flow Resist. (Cool. System And Piping)	bar	0,5
Max. Temperature of Coolant Warning	ōС	95
Max. Temperature of Coolant Shutdown	ōC	98
Thermostat Operation Temperature - Initial Open	ōC	68
Thermostat Operation Temperature - Full Open	<sup>o</sup> C	71
Delivery of Coolant Pump	m³/h	10,50
Min. Pressure Before Coolant Pump	bar	0,5
Radiator Face Area	m²	1,88
Rows	Row	5
Matrix Density	Per / Inch	18
Material		Aluminum
Width of Matrix	mm	1302
Height of Matrix	mm	1446
Pressure Cap Setting	kPa	70
Estimated Cooling Air Flow Reserve	kPa	0,15
Engine Pre Heater-Tube (with Circulation Pump)	W	3000
LUBRICATION SYSTEM		
Total System	L	57
Minimum Oil Level	L	55
Nominal Motor Operating Temperature	ōC	40
Lubricating Oil Pressure (Rated Speed)	bar	5
Relief Valve Opens	kPa	200
Oil / Fuel Consumption Ratio	%	≤0,5
Normal Oil Temperature	ºC	110
ELECTRICAL SYSTEM		
Voltage	V	24
Starter	kW	9
Alternator Output Ampers	Α	45
Alternator Output Voltage	V	28
Batteries Capacity	Ah	2X135



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## **JCB ENERGY DIESEL ENGINE POWER RATINGS**

ENGINE MODEL	B1020JCI		ENGINE FAMILY	GINE FAMILY JC35		BII	
		TYPICAL GENERATOR OUTPUT (NET)		ENGINE POWE	R		
Speed (Rpm)	Type of Operation			Gr	oss	Net	
		kVA	kWe	KWm	Нр	kWm	Нр
1500	Stand By(Maximum)	825,0	660,0	725,0	973,2	695,0	932,9
	Prime	749,0	599,0	660,0	885,9	631,0	847,0
	Stand By(Maximum)	934,0	747,0	819,0	1.099,3	786,0	1.055,0
1800	Prime	846,0	677,0	745,0	1.000,0	712,0	955,7

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

50 HZ @ 1500 R/MIN		STAND BY	PRIME
Gross Engine Power	kW	725,0	660,0
Net Engine Power	kW	695,0	631,0
Fan Power Consumption (Belt Pulley Driven)	kW	28,0	28,0
Other Power Loss	kW	2,0	1,5
Mean Effective Pressure	MPa	2,42	2,20
Intake Air Flow	m³/min	59,92	57,07
Exhaust Temperature Limit	ōC	600	600
Exhaust Flow	m ³/ min	146,25	139,28
Boost Pressure Ratio		3,40	3,20
Mean Piston Speed	m / s	7,8	7,8
Cooling Fan Air Flow	m ³/ min	870,0	870,0
Typical Generator Output Power	kVA	825	749
HEAT REJECTION		STAND BY	PRIME
Energy in Fuel (Heat of Combustion)	kW	1813,0	1650,0
Gross Heat to Power	kW	725,0	660,0
Energy to Coolant and Lubricating Oil	kW	308,0	281,0
Heat Dissipation Capacity *	kW	127,0	116,0
Energy to Exhaust	kW	526,0	479,0
Heat to Radiation	kW	54,0	50,0

<sup>\*</sup>Intake Intercooled system



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## **DIESEL ENGINE MATCHING PARAMETERS - 60 HZ**

COLUZ © 1900 D (MAIN)		CTAND DV	DDIME
60 HZ @ 1800 R/MIN		STAND BY	PRIME
Gross Engine Power	kW	819,0	745,0
Net Engine Power	kW	783,1	709,7
Fan Power Consumption (Belt Pulley Driven)	kW	33,6	33,6
Other Power Loss	kW	2,3	1,7
Mean Effective Pressure	MPa	2,28	2,08
Intake Air Flow	m <sup>3</sup> / min	67,72	64,40
Exhaust Temperature Limit	ōС	650	650
Exhaust Flow	m³/min	165,27	157,17
Boost Pressure Ratio		3,80	3,60
Mean Piston Speed	m / s	9,3	9,3
Cooling Fan Air Flow	m³/min	983,0	983,0
Typical Generator Output Power	kVA	934	846
HEAT REJECTION		STAND BY	PRIME
Energy in Fuel (Heat of Combustion)	kW	1962,0	1751,0
Gross Heat to Power	kW	819,0	712,0
Energy to Coolant and Lubricating Oil	kW	348,0	317,0
Heat Dissipation Capacity *	kW	144,0	130,0
Energy to Exhaust	kW	594,0	540,0
Heat to Radiation	kW	57,0	52,0

## **JCB ALTERNATOR TECHNICAL PARAMETERS AND SPECIFICATIONS**



ALTERNATOR TECHNIC	CAL PARAMETERS				
Insulation Class		Н	Field Control System		Self-Excited
Winding Pitch		2/3 - (N° 6)	A.V.R. Model	Standard	MX341+PMG
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.	1,035	Wave Form: I.E.C. = THF - (*)	%	< 2
<b>Bearing Drive</b>	N/A	-	Bearing Non-Drive	Bearing	6314-2RZ
<b>Rotor Winding</b>	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 U	OPTIONAL USING ALTERNATOR						
BRAND/MODEL	JEBENERGY	JCB 355MXA		LEROY-S	OMER"	TAL049C	STAMFORD	LV6C			
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	750,0	750,0	778,0	-	825,0	825,0	856,0	-		
OUTPUT POWER	kW	600,0	600,0	622,4	-	660,0	660,0	648,8	-		

60 HZ / 277-480V COSQ	0,8 / 1800 RPM									
STANDARD USING ALTERNATOR					OPTIONAL USING ALTERNATOR					
BRAND/MODEL	JCBENERGY	JCB 355MX	(	LEROY-S	OMER"	TAL049B	STAMF	ORD	HC5F	
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	789,0	831,0	875,0	-	868,0	914,0	963,0	-	
OUTPUT POWER	kW	631,2	664,8	700,0	-	694,4	731,2	770,4	-	



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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

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**



**Low Water Temperature** 



- Powder Painted Steel Panel with
  Lockable Door
- ATS (Automatic Transfer Panel)-Optional
- Control Module
- o Battery Charger
- Emergency Stop Button
- Terminal Blocks
- o Load Output Terminal
- System Protection MSBs
- Circuit Breaker-Optional
- o LCD Screen
- 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.	<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		
<b>Current Transformer Secondary</b>	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
- o 1500 Hour Salt Test
- o Glass wool Isolation, A1 Class Material -50/+500 ºC
- 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**



