GSW470P



Main Features		
Frequency	Hz	50
Voltage	V	400
Power factor	cos ϕ	0.8
Phase		3

Power Rating		
Emergency Standby Power ESP	kVA	462.91
Emergency Standby Power ESP	kW	370.33
Prime power PRP	kVA	410.88
Prime power PRP	kW	328.70

Ratings definition (ISO-8528)

ESP - Emergency Standby Power:
It is the maximum power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage or under test conditions for up to 200 h of operation per year with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. The permissible average power output over 24 h of operation shall not exceed 70 % of the ESP.

PRP - Prime Power:
It is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year under the agreed operating conditions with the maintenance intervals and procedures being carried out as prescribed by the manufacturer. The permissible average power output over 24 h of operation shall not exceed 70 % of the prime power.

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Engine specifications		
Engine Brand		Perkins
Model		2206A-E13TAG3
[50Hz] Exhaust emission level		Non Emission Certified
Engine cooling system		Water
Nr. of cylinder and disposition		6 in line
Displacement	cm³	12500
Aspiration		Turbocharged
Speed governor		Electronic
Prime gross power PRP	kW	368.4
Maximum gross power LTP ESP	kW	412.5
Oil capacity	l	40
Lube oil consumption PRP (max)	%	0.1
Coolant capacity	l	51.4
Fuel		Diesel
Specific fuel consumption 75% PRP	g/kWh	199
Specific fuel consumption PRP	g/kWh	197
Starting system		Electric
Starting engine capability	kW	7.8
Electric circuit	V	24



Cooling system
- Gear-driven circulating pump
- Mounted belt-driven pusher fan
- Radiator incorporating air-to-air charge cooler, (supplied loose)
- System designed for ambients up to 50ºC (122ºF)

Electrical equipment
- 3 level engine protection system
- 2 4 volt starter motor and 24 volt 70 amp alternator with DC output

Fuel system
- Fuel cooler
- Governing to ISO 8528-5 class G2 with isochronous capability
- Mechanically actuated electronically controlled unit fuel injectors with full authority electronic control
- Replaceable ‘Ecoplus’ fuel filter elements with primary filter/water separator

Oil system
- Full-flow replaceable ‘Ecoplus’ filter
- Oil cooler integral with filter header
- Wet sump with filler and dipstick

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Alternator Specifications		
Alternator		Mecc Alte
Model		ECO 40-2s
Voltage	V	400
Frequency	Hz	50
Power factor	cos ϕ	0.8
Poles		4
Type		Brushless
Voltage tolerance	%	1
Efficiency @ 75% load	%	94.6
Class		H
IP protection		23



Mechanical structure
Robust mechanical structure which permits easy access to the connections and components during routine maintenance check-ups.

Voltage regulator



Voltage regulation with DER 1. The digital DER 1 is a Digital controlled regulator, based on DSP (Digital Signal Processor) that combines function as Voltage Regulation and Alternator Protections and Diagnostic into a very small single board.
Voltage supply: 40Vac÷270Vac
Maximum continuous output current: 4Adc
Frequency range: 12Hz÷72Hz
Single phase sensing automatic recognition
Average value of voltage regulation
Voltage regulation range (sensing) from 75Vac to 300Vac
Precision of voltage regulation: ± 1% from no-load to nominal load in static condition, with any power factor and for frequency variations ranging from -5% to +20% of the nominal value.
Precision of voltage regulation: ± 0,5% in stabilized conditions (load, temperature).
Transient voltage drop and overvoltage within ± 15%
Voltage recovery time within ± 3% of the value set, in less than 300 msec.
Underspeed protection with adjustable threshold and slope
Overvoltage and undervoltage alarms
Excitation overcurrent protection with delayed intervention
Alarm conditions storage (type of alarm, number of events, duration of the last event, total time)
Memorization of the regulator operation time

Windings / Excitation system
Generator stator is wound to 2/3 pitch. This eliminates triple (3rd, 9th, 15th …) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches. MAUX (Standard): The MAUX MeccAlte Auxiliary Winding is a separate winding within the main stators that feeds the regulator. This winding enables to take an overload of 300% forced current (short circuit maintenance) for 20 seconds. This is ideal for motor starting requirements. PMAUX (optional): Alternator can be equipped with the optional PMAUX (Permanent Magnet Generator) which matches the performance and is capable of supporting both linear and distorted loads.

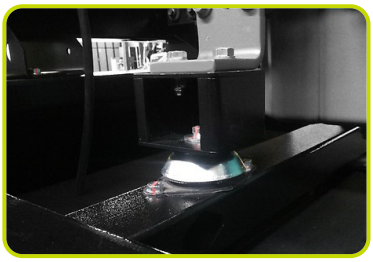
Insulation / Impregnation
Insulation is of class H standard. Impregnation is made with premium tropicalised epoxy resins by dipping and dripping. High voltage parts are impregnated by vacuum, so the insulation level is always very good. In the high-power models, the stator windings undergo a second insulation process. Grey protection is applied on the main and exciter stator to give enhanced protection.

Reference standards
Alternator manufactured according to , and complies with , the most common specification such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 No14-95-No100-95

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Genset equipment

BASE FRAME MADE OF WELDED STEEL PROFILE, COMPLETE WITH:



• Anti-vibration mountings properly sized

• Screwed support legs.

PLASTIC FUEL TANK WITH THE FOLLOWING COMPONENT:

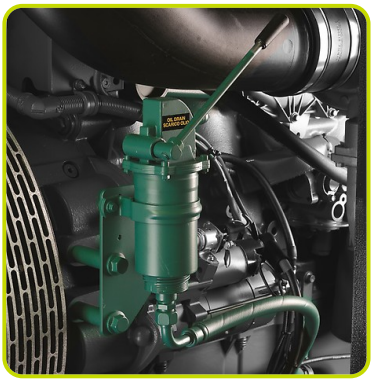


• Filler neck

• Air breather (ventilation pipe)

• Minimum fuel level sensor

MANUAL OIL DRAININ PUMP:



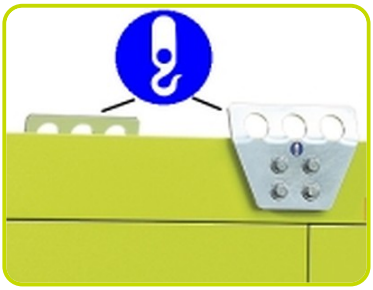
• Oil draining facilities

ENGINE COMPLETE WITH:

• Battery

• Liquids (no fuel)

CANOPY:



• Soundproof canopy made up of modular panels, realized with zinced steel as treatment against corrosion and aggressive conditions, properly fixed and sealed allowing a full weatherproof enclosure.
• Easy access to the genset for maintenance purposes thanks to: Wide lateral access doors fixed by stainless steel hinges and provided with plastic lockable handles and internal perforated galvanized steel-sheet; Detachable panels, with screws holes protected by rubber tap.
• Control panel protection door provided with suitable window and lockable handle.
• Lateral air inlet opening properly protected and soundproofed. Exhaust air outlet from the roof, trough wet section protected by proper grid.
• Double lifting points frame structure.

SOUNDPROOF:

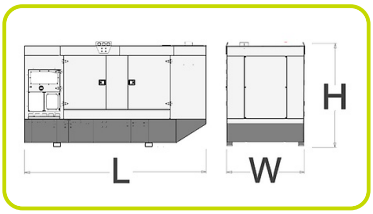


• Noise attenuation thanks to soundproofing material

• Efficient residential silencer placed inside the canopy

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Dimensional data		
Length	(L) mm	4400
Width	(W) mm	1560
Height	(H) mm	2250
Dry weight	kg	4250
Fuel tank capacity	l	636
Fuel tank material		Plastic



Autonomy		
Fuel consumption @ 75% PRP	l/h	66.52
Fuel consumption @ 100% PRP	l/h	86.40
Running time 75% PRP	h	9.56
Running time 100% PRP	h	7.36

Noise level		
Guaranteed noise level (LWA)	dB(A)	97
Noise pressure level @ 7 m	dB(A)	67

dB GUARANTEE

Installation data		
Total air flow	m³/min	732.30
Exhaust gas flow	m³/min	64.6
Exhaust gas temperature	°C	630

Electrical Data		
Max current	A	668.18
Circuit breaker	A	800

Control panel availability	
AUTOMATIC CONTROL PANEL	ACP
MODULAR PARALLEL PANEL	MPP

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ACP - Automatic control panel

Mounted on the genset, complete with digital control unit for monitoring, control and protection of the generating set, protected through door with lockable handle



DIGITAL INSTRUMENTATION
- Generating set voltage (3 phases)
- Mains voltage
- Generating set frequency
- Generating set current (3 phases)
- Battery voltage
- Power (kVA - kW - kVAr)
- Power factor Cos φ
- Hours-counter
- Engine speed r.p.m.
- Fuel level (%)
- Engine temperature



COMMANDS AND OTHERS
- Four operation modes: OFF - Manual starting - Automatic starting - Automatic test
- Pushbutton for forcing Mains contactor or Genset contactor
- Push-buttons: start/stop, fault reset, up/down/page/enter selection
- Remote starting availability
- Acoustic alarm
- Automatic battery charger
- USB Communication port
- Settable PASSWORD for protection level

PROTECTIONS WITH ALARM
- Engine protections: low fuel level, low oil pressure, high engine temperature
- Genset protections: under/over voltage, overload, under/over frequency, starting failure, under/over battery voltage



PROTECTIONS WITH SHUTDOWN
- Engine protections: low fuel level, low oil pressure, high engine temperature
- Genset protection: under/over voltage, overload, under/over battery voltage, battery charger failure
- Circuit breaker protection: III poles

OTHERS PROTECTIONS
- Emergency stop button
- Panel protected through door with lockable handle

OUT PUT PANEL ACP

Predisposed for remote control optional:	RCG
External Terminal Board (ETB)	Standard
Socket kit	Optional



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MPP - Modular parallel panel

Mounted on the genset, complete with digital control unit for monitoring, control, protection and load sharing for both single and multiple gen-sets operating in standby or parallel modes (up to 32 gen-sets in island).



DIGITAL INSTRUMENTATION
- Mains: voltage, Intensity, Frequency.
- Mains kW - kVAr -Power factor Cos f.
- Generating set voltage (3 phases).
- Generating set frequency.
- Generating set current (3 phases).
- Generating set Power (kVA - kW - kVAr).
- Generating set Power factor Cos f.
- Generating set kWh and kVAh.
- Battery voltage.
- Hours-counter.
- Engine speed r.p.m.
- Fuel level (%).
- Engine temperature (depending on model).
- Oil pressure (depending on model).



COMMAND AND OTHERS
- Operation modes: OFF - AMF function - Multiple parallel genset Island application.
- Pushbutton for forcing Mains Breaker/contactor or Genset Breaker/contactor.
- Push-buttons: start/stop, fault reset, up/down/page/enter selection.
- Voltage and PF control (AVR).
- Integrate PLC programmable functions.
- Event-based history.
- Acoustic alarm.
- Automatic battery charger.
- Ethernet Rj 45port.
- RS232/RS485/USB Comunication ports.
- Settable PASSWORD for protection level.



PROTECTION WITH ALARM AND SHUTDOWN
- Engine protections: low fuel level, low oil pressure, high engine temperature.
- Genset protections: under/over voltage, overload, under/over frequency, starting failure, under/over battery voltage
- Others: overcurrent, shortcircuit, reverse power, Earth fault

OTHERS PROTECTION:
- Circuit breaker protection: IV poles Motorized.
- Emergency stop button.
- Panel protected through door with lochetable handle

OUT PUT PANEL MPP

Multi-pin connectors (in and out) for parallel with other generators	n	2
Connecting cable with 2 connectors multipin (length 10m)	n	1
External terminal board		ETB



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OPTIONAL FEATURES:

To be ordered with equipment (when necessary)	:

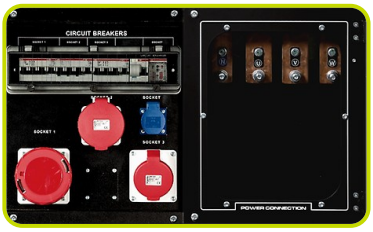
CONTROL PANEL SUPPLEMENT

RCG - Various supplements for remote controls - available for models:	ACP MPP
TLP - Various supplements for remote signals - available for models:	ACP MPP
ADI - Adjustable Differential Intensity - available only for models:	ACP
TIF - IV Poles Circuit Breaker instead of III - available for models:	ACP



Socket kit

Kit SKB or Kit SKC (for total n. 4 socket) - available for model:		ACP
Individual CB and Earth Fault protection		
3P+N+T 400V 63A	n	1
3P+N+T CEE 400V 32A	n	1
230V/16A SCHUKO	n	1
With version SKB:		
3P+N+T CEE 400V 16A	n	1
With version SKC:		
400V/125A 3P+N+T CEE	n	1

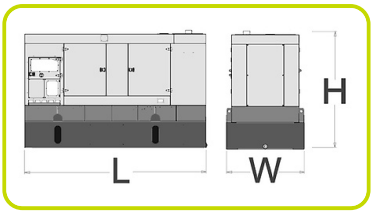


GENSET EQUIPMENT

LPT - Leak Proof Tray	•
Automatic Fuel Pump	•
KRT- Kit Rental for HEI gensets which includes: 3-way fuel valve, battery switch	•

Extended Fuel Tank

Fuel tank capacity	l	3330
Length (Genset)	(L) mm	3977
Width (Genset)	(W) mm	1618
Height (Genset)	(H) mm	2571



ENGINE SUPPLEMENTS

Coolant Pre-Heating System	PHS

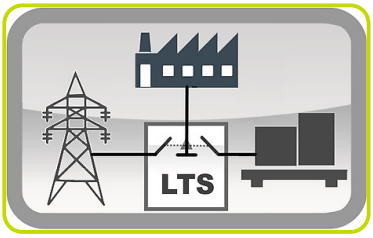
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Accessories

Items available as accessory equipment

LTS - Load Transfer Switch [Accessories for ACP Automatic Control Panel]

The Load Transfer Switch (LTS) panel operates the power supply changeover between the generator and the Mains in backup applications, guarantying the feeding to the load within a short period of time.
It consists of a standalone cabinet which can be installed separate from the generating set. The logic control of the power supply changeover is operated by means of the Automatic Control Panel (ACP) mounted on the generating set, so therefore none logic device is required on the LTS panel.



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