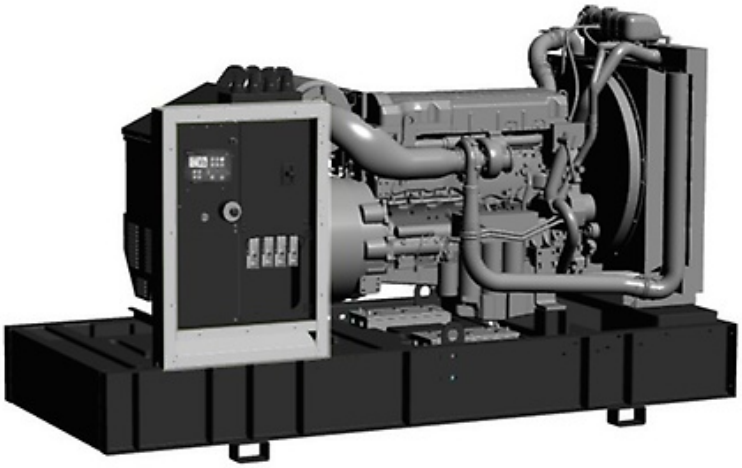
GMS-470P



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

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

Ratings definition (According to standard ISO8528 1:2005)

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.

LTP - Limited-Time running Power:
It is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 h of operation per year (whose no more than 300 for continuative use) with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. No overload capability is available.

Engine specifications		
Engine manufacturer		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	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

Alternator Specifications		
Alternator		Mecc Alte
Model		ECO 40-2s
Voltage	V	400
Frequency	Hz	50
Power factor	cos ϕ	0.8
Type		Brushless
Poles		4
Standard AVR		DER1-A
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

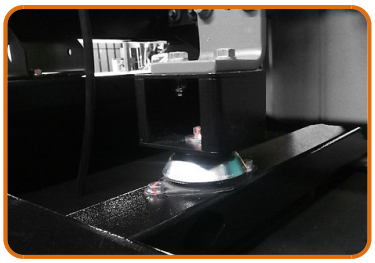
Windings / Excitation system
Generator stator is wound to 2/3 pitch. This eliminates triple (3rd, 9th, 15th …) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with 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

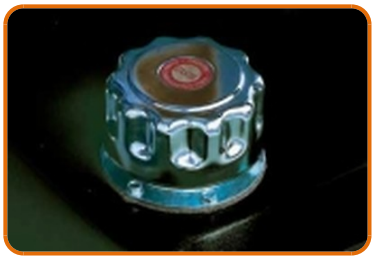
Genset equipment

BASE FRAME MADE OF WELDED STEEL PROFILE, COMPLETE WITH:



- Steel base frame with support legs
- Anti-vibration mountings properly sized
- Grounding point to connect all metal parts of the generating set

FUEL TANK WITH THE FOLLOWING COMPONENT:



- Filler neck
- Air breather (ventilation pipe)
- Minimum fuel level sensor

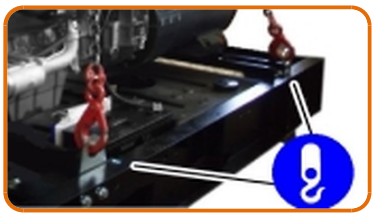
PROTECTIONS:

- Moving and rotating parts protection against accidental contacts.

ENGINE COMPLETE WITH:

- Battery
- Liquids (no fuel)

LIFTING:



- Lifting points frame structure.

EXHAUST (Standard):

- Industrial silencer (loose)

Dimensional data		
Length	(L) mm	3500
Width	(W) mm	1500
Height	(H) mm	2130
Fuel tank capacity	l	720
Fuel tank material		Metal

Autonomy		
Fuel consumption @ 75% PRP	l/h	66.52
Fuel consumption @ 100% PRP	l/h	86.40
Running time @ 75% PRP	h	10.82
Running time @ 100% PRP	h	8.33

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

Electrical Data		
MAX current	A	668.18
Circuit breaker	A	800

Control panel availability	
AUTOMATIC CONTROL PANEL	ACP

ACP - Automatic control panel

Mounted on the genset, complete with digital control unit AC03 for monitoring, control and protection of the generating set.

DIGITAL INSTRUMENTATION (through AC-03)
- 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 (depending on model)

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
- DC system disconnection switch
- Acoustic alarm
- Automatic battery charger
- RS232 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
- Earth Fault included in the control unit

OTHERS PROTECTIONS
- Emergency stop button

OUT PUT PANEL ACP

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

Supplements:	
To be ordered with the equipment	:

ENGINE SUPPLEMENTS

PHS - Coolant Pre-Heating System - available for models:	ACP

Accessories

RES - Residential silencer	•

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

Load Transfer Switch panel complete with:
• Two layers motorized change-over switch 4pole made by means of two switch disconnectors mechanically interlocked.
• Emergency stop button
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 mounted on the generating set, so therefore none logic device is required on the LTS panel.