PROUDLY 100% AUSTRALIAN OWNED

MACFARLANE GENERATORS

ESTABLISHED 1949

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Macfarlane Generators PTY. LTD. ACN 006 849 074 ABN 74 006 849 074

GSW-545I

** The Generator colour is white RAL9016

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

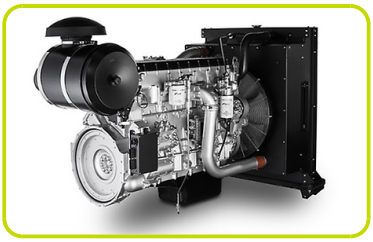
Power Rating		
Emergency Standby Power ESP	kVA	542.77
Emergency Standby Power ESP	kW	434.22
Prime power PRP	kVA	502.56
Prime power PRP	kW	402.05

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.

Engine specifications		
Engine Brand		FPT
Model		C13TE7
Engine cooling system		Water
Nr. of cylinder and disposition		6 in line
Displacement	cm³	12880
Aspiration		Turbocharged aftercooled
Speed governor		Electronic
Prime gross power PRP	kW	446
Maximum gross power LTP ESP	kW	480
Oil capacity	l	32
Lube oil consumption PRP (max)	%	0,2
Coolant capacity	l	48
Fuel		Diesel
Specific fuel consumption 75% PRP	g/kWh	191.7
Specific fuel consumption PRP	g/kWh	192.7
Starting system		Electric
Starting engine capability	kW	7.8
Electric circuit	V	24



Standards

ISO 8528 standard certification of excellent performance related to load acceptance.

Injection system

Accurate fuel delivery, provided by electronic controlled unit injectors and heavy-duty Common Rail system, to achieve top performance in terms of load response and top power with low fuel consumption.

Air handling

Cursor series are available in turbocharged with air-to-air charge cooled air system with 4 valves per cylinder to increase engine efficiency thanks to the optimization of thermodynamic performance in terms of load response & fuel consumption.

600h Oil interval change

Cursor series adopt combustion chambers and high pressure injection system optimized to reduce oil dilution. Optimum engine design in terms of mechanical clearances, piston rings and oil system calculation.

Engine design

Multiple injections, balancer counterweights incorporated in crankshaft webs, rear geartrain layout, camshaft in crankcase, suspended oil pan, ladder frame cylinder block.

Alternator Specifications		
Alternator		Mecc Alte
Model		ECO40-3S
Voltage	V	400
Frequency	Hz	50
Power factor	cos ϕ	0.8
Type		Brushless
Poles		4
Voltage tolerance	%	1
Efficiency @ 75% load	%	94.8
Class		H
IP protection		23
PMG configurable (supplement)		Yes

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

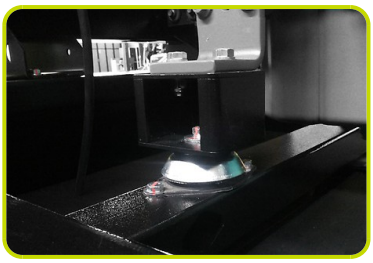
Windings / Excitation system
Generator stator is wound to 2/3 pitch. This eliminates triple (3rd, 9th, 15th …) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with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



• 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:

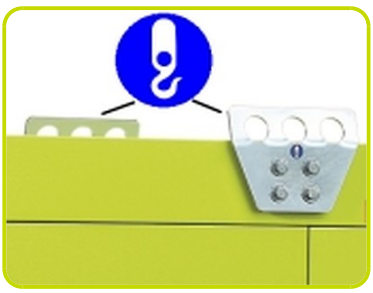
• Oil draining facilities

ENGINE COMPLETE WITH:

• Battery

• Liquids (no fuel)

CANOPY:



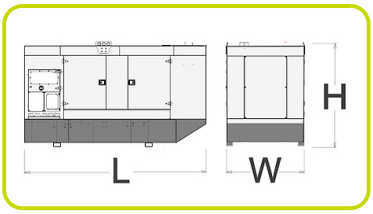
• Soundproof canopy made up of modular panels, realized with zinced steel as treatment against corrosion and aggressive conditions, properly fixed and sealed allowing a full weatherproof enclosure.
• Easy access to the genset for maintenance purposes thanks to: Wide lateral access doors fixed by stainless 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

Dimensional data		
Length	(L) mm	4400
Width	(W) mm	1540
Height	(H) mm	2355
Dry weight	kg	4245
Fuel tank capacity	l	1000
Fuel tank material		Metal



Autonomy		
Fuel consumption @ 75% PRP	l/h	77.38
Fuel consumption @ 100% PRP	l/h	102.31
Running time 75% PRP	h	12.9
Running time 100% PRP	h	9.8

Noise level		
Guaranteed noise level (LWA)	dB(A)	105
Noise pressure level @ 7 m	dB(A)	75

Installation data		
Total air flow	m³/min	488.30
Exhaust gas flow	m³/min	86.73
Exhaust gas temperature	°C	520

Electrical Data		
Battery capacity	Ah	120
Max current	A	783.45
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, protected through door with lockable handle

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
- Panel protected through door with lockable handle

OUT PUT PANEL ACP

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