

GSW-650V



Main Features

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

Power Rating

Emergency Standby Power ESP	kVA	657.87
Emergency Standby Power ESP	kW	526.30
Prime power PRP	kVA	597.31
Prime power PRP	kW	477.85

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	Volvo	
Model	TAD1642GE	
[50Hz] Exhaust emission level	Stage II	
Engine cooling system	Water	
Nr. of cylinder and disposition	6 in line	
Displacement	cm ³	16120
Aspiration	Turbocharged intercooled	
Speed governor	Electronic	
Prime gross power PRP	kW	514
Maximum gross power LTP ESP	kW	565
Oil capacity	l	48
Lube oil consumption PRP (max)	%	0.1
Coolant capacity	l	93
Fuel	Diesel	
Specific fuel consumption 75% PRP	g/kWh	195
Specific fuel consumption PRP	g/kWh	198
Starting system	Electric	
Starting engine capability	kW	7
Electric circuit	V	24



ENGINE EQUIPMENT

Standards

The engine performance corresponds to ISO 3046, BS 5514 and DIN 6271. Ratings are based on ISO 8528. Engine speed governing in accordance with ISO 3046/IV, class A1 and ISO 8528-5 class G3

Engine and block

- Optimized cast iron cylinder block with optimum distribution of forces
- Tapered connecting rods to reduce risk of piston cracking
- Piston cooling for low thermal load on pistons and reduced ring temperature
- Replaceable valve guides and valve seats
- Overhead camshaft and four valves per cylinder
- Keystone top compression rings for long service life

Fuel system

- Fuel prefilter with water separator and water-in-fuel indicator / alarm
- Fine fuel filter with manual feed pump and fuel pressure switch
- Electronic unit injectors

Cooling system

- Efficient cooling with accurate coolant control through a water distribution duct in the cylinder block. Reliable sleeve thermostat with minimum pressure drop
- Belt driven, maintenance-free coolant pump with high degree of efficiency

Lubrication system

- Full flow oil cooler
- Full flow disposable spin-on oil filters, for extra high filtration
- Gear type lubricating oil pump, gear driven by the transmission

Alternator Specifications

Alternator	Mecc Alte	
Model	ECO40 1.5L	
Voltage	V	400
Frequency	Hz	50
Power factor	cos ϕ	0.8
Poles	4	
Type	Brushless	
Standard AVR	DER1	
Voltage tolerance	%	1
Efficiency @ 75% load	%	95.1
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: $\pm 1\%$ 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: $\pm 0,5\%$ in stabilized conditions (load, temperature).

Transient voltage drop and overvoltage within $\pm 15\%$

Voltage recovery time within $\pm 3\%$ 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.

METAL FUEL TANK WITH THE FOLLOWING COMPONENT:

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

ENGINE COMPLETE WITH:

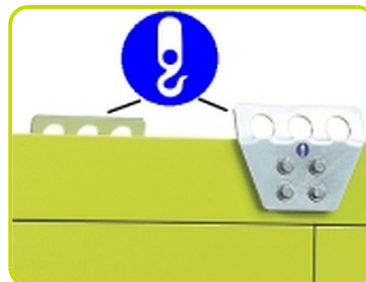
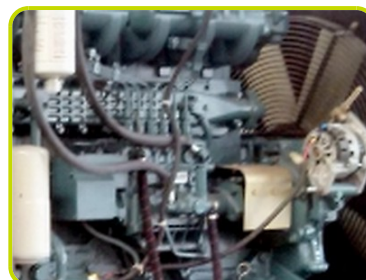
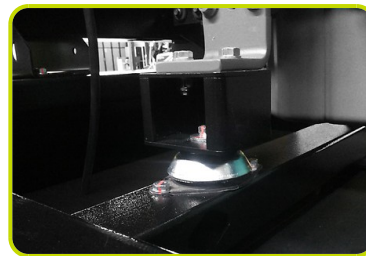
- Battery
- Liquids (no fuel)

CANOPY:

- Soundproof canopy made up of modular panels, realized with zinc-coated 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, through wet section protected by proper grid.
- Double lifting points frame structure.

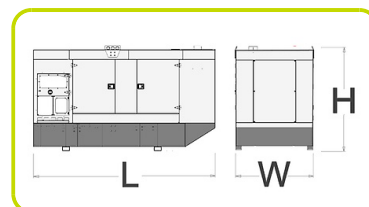
SOUNDPROOF:

- Noise attenuation thanks to soundproofing material
- Efficient residential silencer placed inside the canopy



Dimensional data

Length	(L) mm	4400
Width	(W) mm	1560
Height	(H) mm	2250
Dry weight	kg	5150
Fuel tank capacity	l	700
Fuel tank material		Metal



Autonomy

Fuel consumption @ 75% PRP	l/h	90.04
Fuel consumption @ 100% PRP	l/h	121.16
Running time 75% PRP	h	7.77
Running time 100% PRP	h	5.78

Noise level

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



Installation data

Total air flow	m³/min	407.00
Exhaust gas flow PRP	m³/min	94.4
Exhaust gas temperature LTP ESP	°C	482

Electrical Data

Battery capacity	Ah	180
MAX current	A	949.59
Circuit breaker	A	1000

Control panel availability

AUTOMATIC CONTROL PANEL	ACP
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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



Supplements:

To be ordered with the equipment :

ENGINE SUPPLEMENTS

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

Accessories

Items available as accessory equipment

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.

