

## Generatorius Pramac GSW 220V su garsui nepralaidžiu gaubtu

Pramac GSW 220V generatorius su aukštos kokybės garsui nepralaidžiu korpusu ir moderniu dizainu gali būti pritaikytas bet kuriai konkrečiai specifikacijai.



Generatorius GSW 225 Volvo Pramac

**generatoriaus gamintojas** Pramac  
**nuolatinė galia** 202,7kVA / 162,1kW  
**įtampa** 230V / 400V  
**dažnis** 50 Hz  
**variklis** Volvo TAD733GE  
**kuro dyzelinas**  
**bako talpa** 350 litrų  
**generatoriaus tipas**  
Apsaugos klasė IP23  
**pradžios tipas** elektrinis  
Generatorius su AVR valdymu

Pramac GSW 220V energijos generatorius su Volvo TAD733GE varikliu yra pritaikomas įrenginys su aukštos kokybės garsui nepralaidžiu korpusu ir dideliu priedų asortimentu. Šis galingas avarinis maitinimo šaltinis garantuoja profesionalų naudojimą statybvietėse, pramonėje, nuomai / renginiams ir taip pat versle.

Dėl žemo triukšmo lygio Pramac GSW 220V elektros generatorius buvo specialiai sukurtas, kad būtų galima efektyviai tiekti avarinį elektros energijos tiekimą namų ūkiuose, žemės ūkyje, statybvietėse ir pramonėje.

Pramac GSW 220V elektros generatorius standartiškai turi elektrinį greičio reguliatorių.

Galimi maitinimo generatoriui Pramac GSW 220V įrangos variantai MANUAL PANEL ir AUTOMATIC PANEL.

## Charakteristikos

Charakteristika	vertė
Generatoriaus modelis Pramac	GSW 220V su apsaugos nuo triukšmo gaubtu
Straipsnis Nr.	GSW 220V su gaubtu
<b>Trifazis - 400 V</b>	
(Didžiausia galia) kW/kVA	176,00/220,00
(nuolatinė galia) kW/kVA	162,14/202,67
<b>pasirodymo data</b>	
įtampos voltų	400/230
Dažnis Hz	50
Galios koeficientas cos φ	0.8
<b>variklis</b>	
Gamintojas	Volvo
modelis	TAD733GE
kuro	dyzelinas
Poslinkis cm <sup>3</sup>	7150
greičio aps./min	1500
cilindras	6 iš eilės
vėsinimo sistema	vandens
Starteris	elektrinis
<b>vartojimo</b>	
Degalų sąnaudos esant 75 % apkrovai (l/val.)	34.90
Degalų bakas (l)	350
Veikimo laikas esant 75 % apkrovai (h)	10.03
<b>triukšmo emisija</b>	
Garso galia LWA DB(A)	94
Garso slėgis esant 7 m DB(A)	65
<b>išmatavimus ir svorį</b>	
ilgis (mm)	3400
plotis (mm)	1250 m

Charakteristika	vertė
aukštis (mm)	1980 m
Svoris, sausas (kg)	2540
apsaugos klases	
klasė	H
IP apsaugos klasė	23

## Įrangos variantai:

Charakteristikos	Rankinis valdymas - MCP	Automatinis valdymo skydelis - ACP
<b>Bendras aprašymas</b>	Ant elektros generatoriaus sumontuotas rankinis valdymas, įskaitant ekranus, stebėjimą ir jungtis su apsauginiais įtaisais.	AC03 valdiklis, sumontuotas elektros generatoriaus valdymo skydelyje, skirtas valdyti ir stebėti avarinį maitinimo režimą. Rakinamos durys su apžvalgos langeliu priešais valdymo pultą.
<b>darbo režimai ir komandos</b>	<ul style="list-style-type: none"> <li>▪ Paleidimas / sustabdymas ir išankstinis šildymas raktiniu jungikliu</li> <li>▪ Avarinio stabdymo mygtukas</li> </ul>	<ul style="list-style-type: none"> <li>▪ Darbo režimai: išjungtas, rankinis, automatinis, bandomasis</li> <li>▪ Maitinimo tinklo ir generatoriaus jungiklio valdymo mygtukas</li> <li>▪ Avarinio stabdymo jungiklis</li> <li>▪ nuotolinis paleidimas</li> <li>▪ Valdymo įtampos pagrindinis jungiklis</li> <li>▪ akumulatoriaus įkrovos išlaikymas</li> <li>▪ RS232 sąsaja</li> <li>▪ Garsinis signalas</li> <li>▪ Parametrų nustatymų apsauga slaptažodžiu</li> </ul>
<b>Pavojaus pranešimai:</b>	<ul style="list-style-type: none"> <li>▪ generatoriaus gedimas</li> <li>▪ Žemas alyvos slėgis</li> <li>▪ variklio temperatūra</li> <li>▪ įžeminimo gedimo srovė</li> </ul>	<ul style="list-style-type: none"> <li>▪ Variklio apsauga: žemas alyvos slėgis, variklio temperatūra</li> <li>▪ Generatorius: per maža / per didelė įtampa, perkrova, per mažas / per didelis dažnis, paleidimo klaida, akumulatoriaus įtampa,</li> </ul>
<b>Signalizacijos nutildymas:</b>	<ul style="list-style-type: none"> <li>▪ generatorius</li> <li>▪ alyvos slėgio trūkumas</li> <li>▪ Aukšta variklio temperatūra</li> <li>▪ Trumpojo jungimo išjungimas (3 polių grandinės pertraukiklis)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Variklio apsauga: žemas alyvos slėgis, variklio temperatūra</li> <li>▪ Generatorius: per maža / per didelė įtampa, perkrova,</li> <li>▪ 3 polių grandinės pertraukiklis</li> <li>▪ įžeminimo gedimo srovė</li> </ul>
<b>Rodmenys ir išmatuotos vertės:</b>	<ul style="list-style-type: none"> <li>▪ Voltmetras (1 fazis)</li> <li>▪ Ampermetras (1 fazis)</li> <li>▪ valandų skaitiklis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Tinklo parametrai įtampa, dažnis</li> <li>▪ Tinklo galia ir CosPhi</li> <li>▪ Generatoriaus įtampa (trifazių tikroji RMS)</li> <li>▪ generatoriaus dažnis</li> <li>▪ Generatoriaus galia ir cosphi (kW, kVA, kVAr)</li> <li>▪ akumulatoriaus įtampa</li> <li>▪ Darbo valandos ir variklio statistika</li> <li>▪ visi galimi variklio parametrai ir greitis</li> <li>▪ bako kiekis %</li> </ul>

Charakteristikos	Rankinis valdymas - MCP	Automatinis valdymo skydelis - ACP
<b>Papildoma įranga:</b>	<ul style="list-style-type: none"> <li>▪ Rakinamos durys su apžvalgos langeliu priešais valdymo pultą</li> </ul>	<ul style="list-style-type: none"> <li>▪ Rakinamos durys su apžvalgos langeliu priešais valdymo pultą</li> </ul>
<b>Lizdai:</b>	<ul style="list-style-type: none"> <li>▪ Maitinimo kabelis uždėtas ant pagrindinio jungiklio</li> <li>▪ ETB - variniai bėgiai jungiamųjų linijų tiesimui (pasirinktinai)</li> <li>▪ Lizdų rinkinys (pasirinktinai)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Gnybtų juostelė ACP prijungimui prie LTS</li> <li>▪ Maitinimo kabelis uždėtas ant pagrindinio jungiklio</li> <li>▪ RCG – paruošta nuotoliniam paleidimui</li> <li>▪ ETB - variniai bėgiai jungiamųjų linijų tiesimui (pasirinktinai)</li> <li>▪ Lizdų rinkinys (pasirinktinai)</li> </ul>
<b>Nuotraukos:</b>	 <p>Generator_Pramac_GSW_Manuel_Panel_02</p>	 <p>Generator_Pramac_GSW_Automatic_switchboard_ACP</p>

### Galimybės:

- MPF - analoginis skydelis su lizdais
- SKB/ETB lizdai.-+ gnybtų juostelė
- LTS - perjungimo kontaktoriai atskiroje valdymo spintoje (tik ACP)
- MPP – lygiagretus veikimas
- PHS – išankstinis pašildymas (tik AKR)
- AFP – kuro perpylimo siurblys (tik AKR)
- KRT – specialios įrangos nuomos parkas
- TLP 4/8 – potencialūs kontaktai (tik AKR)
- RCG16 – nuotolinis stebėjimas per GSM/GPRS modulį (tik ACP)
- EM – tinklo modulis (tik AKR)
- RAL 9016 3000 - specialios dažų apdailos garsui nepralaidus gaubtas
- RAL X - specialios dažų apdailos garsui nepralaidus gaubtas
- GSB - Cinkuotas papildomas pagrindo rėmas garso izoliaciniam gaubtui
- papildomos galimybės pagal pageidavimą

# GSW220V



## Main Features

Frequency	Hz	50
Voltage	V	400
Power factor	cos $\phi$	0.8
Phase		3

## Power Rating

Emergency Standby Power ESP	kVA	220.00
Emergency Standby Power ESP	kW	176.00
Prime power PRP	kVA	202.67
Prime power PRP	kW	162.14

## 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	TAD733GE	
[50Hz] Exhaust emission level	Stage II	
Engine cooling system	Water	
Nr. of cylinder and disposition	6 in line	
Displacement	cm <sup>3</sup>	7150
Aspiration	Turbocharged intercooled	
Speed governor	Electronic	
Prime gross power PRP	kW	181
Maximum gross power LTP ESP	kW	201
Oil capacity	l	34
Lube oil consumption PRP (max)	%	0.10
Coolant capacity	l	38.4
Fuel	Diesel	
Specific fuel consumption 75% PRP	g/kWh	214
Specific fuel consumption PRP	g/kWh	216
Starting system	Electric	
Starting engine capability	kW	5
Electric circuit	V	12



## ENGINE EQUIPMENT

### Standards

The engine performance corresponds to ISO 3046, BS 5514 and DIN 6271. Power output guaranteed within 0 to +2% at rated ambient conditions at delivery. 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
- Drop forged steel connecting rods
- Keystone top compression rings for long service life
- Replaceable valve guides and valve seats

### Fuel system

- Washable fuel prefilter with water separator
- Fine fuel filter of disposable type
- Rotary low-pressure fuel pump

### Lubrication system

- Rotary displacement oil pump driven by the crankshaft
- Deep centre oil sump – Oil filler on top – Oil dipstick, short in front
- Integrated full flow oil cooler, side-mounted– Integrated full flow oil cooler, side-mounted

### Cooling system

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

## Alternator Specifications

Alternator	Mecc Alte	
Model	ECO38-2S	
Voltage	V	400
Frequency	Hz	50
Power factor	cos $\phi$	0.8
Poles	4	
Type	Brushless	
Voltage tolerance	%	1
Efficiency @ 75% load	%	92.9
Class	H	
IP protection	23	

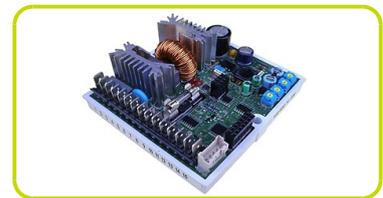


### Mechanical structure

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

### Voltage regulator

Voltage regulation with DSR. The digital DSR controls the range of voltage, avoiding any possible trouble that can be made by unskilled personnel. The voltage accuracy is  $\pm 1\%$  in static condition with any power factor and with speed variation between 5% and +30% with reference to the rated speed.



### Windings / Excitation system

Generator stator is wound to 2/3 pitch. This eliminates triplen (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.

### 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
- Welded or Screwed support legs. (according to canopy size)

### PLASTIC FUEL TANK WITH THE FOLLOWING COMPONENT:

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

### OIL DRAINING PIPE WITH CAP:

- Oil draining facilities

### ENGINE COMPLETE WITH:

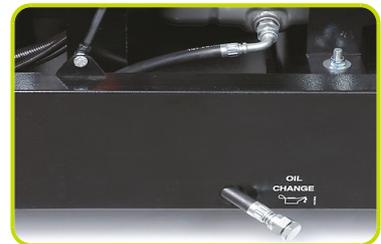
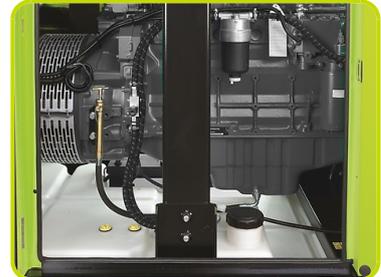
- Battery
- Liquids (no fuel)

### CANOPY:

- Soundproof canopy made up of modular panels, realized with zinc plated 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; 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.
- Single detachable lifting eye placed on the roof.

### SOUNDPROOF:

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



### Dimensional data

Length	(L) mm	3400
Width	(W) mm	1250
Height	(H) mm	1980
Dry weight	kg	2540
Fuel tank capacity	l	350
Fuel tank material		Plastic



### Autonomy

Fuel consumption @ 75% PRP	l/h	34.90
Fuel consumption @ 100% PRP	l/h	46.54
Running time 75% PRP	h	10.03
Running time 100% PRP	h	7.52

### Noise level

Guaranteed noise level (LWA)	dB(A)	94
Noise pressure level @ 7 m	dB(A)	65



### Installation data

Total air flow	m <sup>3</sup> /min	241.48
Exhaust gas flow	m <sup>3</sup> /min	31.8
Exhaust gas temperature	°C	530

### Electrical Data

Battery capacity	Ah	140
Max current	A	317.55
Circuit breaker	A	320

### Control panel availability

MANUAL CONTROL PANEL	MCP
MANUAL CONTROL PANEL FULL OPTION	MPF
AUTOMATIC CONTROL PANEL	ACP
MODULAR PARALLEL PANEL	MPP

## MCP - Manual control panel

Mounted on the genset and complete of: analogue instrumentation, control, protection of the generating set, protected through door with lockable handle.

### INSTRUMENTATION (ANALOGUE)

- Voltmeter (1 phase)
- Ammeter (1 phase)
- Hours-counter

### COMMANDS

- Start/stop selector switch with key
- Emergency stop button

### PROTECTION WITH ALARM

- Low fuel level
- Battery charger failure
- low oil pressure
- high engine temperature
- Earth Fault.

### PROTECTIONS WITH SHUTDOWN

- Low fuel level
- Battery charger failure
- low oil pressure
- high engine temperature.
- Circuit breaker protection: III poles
- Emergency stop button

### OTHERS PROTECTIONS

- Panel protected through door with lockable handle.



### OUT PUT PANEL MCP

Power cables connection to Circuit Breaker.	
External Terminal Board (ETB)	Optional
Socket kit	Optional
3P+N+T 400V 63A	n
3P+N+T CEE 400V 32A	n

## MPF - Manual control panel full option

Mounted on the genset and complete of: analogue instrumentation, control, protection of the generating set, protected through door with lockable handle

### INSTRUMENTATION (ANALOGUE)

- Voltmeter with selector switch (3 phases)
- Frequency meter
- Ammeter with selector switch (3 phases)
- Hours-counter
- Fuel level indicator
- Oil pressure indicator
- Engine temperature indicator

### COMMANDS

- Start/stop selector switch with key
- Emergency stop button

### PROTECTION WITH ALARM

- Low fuel level
- Battery charger failure
- low oil pressure
- high engine temperature
- Earth Fault

### PROTECTIONS WITH SHUTDOWN

- Low fuel level
- Battery charger failure
- low oil pressure
- high engine temperature
- Circuit breaker protection: III poles
- Emergency stop button

### OTHERS PROTECTIONS

- Panel protected through door with lockable handle

### OUT PUT PANEL MPF

ETB- External Terminal Board		ETB
Socket kit		Standard
Individual CB and Earth Fault protection		√
3P+N+T 400V 63A IP67	n	1
3P+N+T CEE 400V 16A IP67	n	1
230V/16A 2P+T CEE IP67	n	1
230V 16A SCHUKO IP68	n	1



## 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  $\phi$
- 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

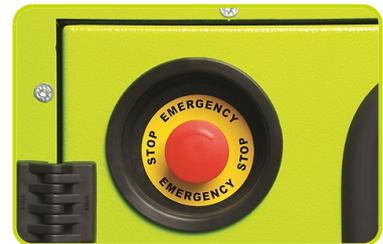
- Engine protections: low fuel level, low oil pressure, high engine temperature
- Genset protection: under/over voltage, overload, under/over battery voltage, battery charger failure
- Circuit breaker protection: III poles
- Earth Fault included in the control unit

### OTHERS PROTECTIONS

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

### OUT PUT PANEL ACP

Power cables connection to Circuit Breaker.	
Predisposed for remote control optional:	RCG
External Terminal Board (ETB)	Optional
Socket kit	Optional



CONTROL SIGNALS  
TO LTS PANEL

## MPP - Modular parallel panel

Mounted on the genset, complete with digital control unit IG-NTC 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 (through IG-NTC control unit)

- 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

- Graphical display 128x64 pixels.
- Operation modes: OFF - AMF function - Single Parallel to mains Island application - Single Parallel to Mains AMF application - 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.
- Multiple parallel and Power Management operation with digital load AVR sharing.
- Automatic synchronizing and power control (via speed goveroner or ECU)
- Baseload Import/Export and Peak shaving
- Voltage and PF control (AVR).
- Configurable digital I/O (12/12) and analogue inputs (3).
- Integrate PLC programmable functions.
- Event-based history (up to 500records).
- Selectable measurement range 120/277V and 0-1/0-5A.
- Remote starting and Blocking signal availability.
- DC system disconnection switch.
- Acoustic alarm.
- Automatic battery charger.
- 2xRS232/RS485/USB Communication ports.
- Settable PASSWORD for protection level.

### PROTECTION WITH ALARM AND SHUTDOWN

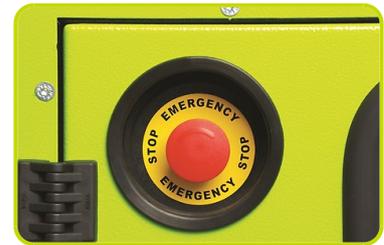
- Engine protections: low fuel level, low oil pressure, high engine temperature.
- Genset protections: under/over voltage, overload, under/over frequency, starting failure, under/over battery voltage
- Others: overcurrent, shortcircuit, reverse power, Earth fault

### 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



## Supplements:

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 MCP
ETB - External Terminal Board - available for models:	MCP ACP



### Socket kit

SKB socket kit B - available for models:	ACP MCP
Component version	IP67
Individual CB and Earth Fault protection	√
3P+N+T 400V 63A IP67	n 1
230V/16A 2P+T CEE IP67	n 1
230V 16A SCHUKO IP68	n 1
3P+N+T CEE 400V 16A IP67	n 1
NB: for assembly is necessary:	ETB

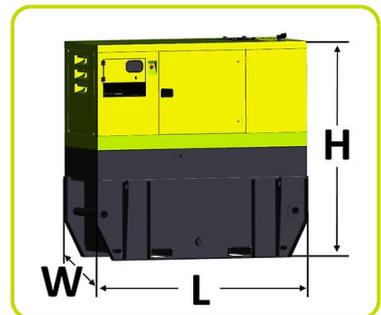


### GENSET EQUIPMENT

KPR - Premium Kit (Leak Proof Tray - Leakage detection sensor - Manual oil drain pump)	
AFP - Automatic Fuel Pump	ACP MPP
KRT - Kit Rental which includes fuel filter with water separator, 3-way fuel valve, battery switch, earth rod, docs folder)	

### Extended Fuel Tank

Fuel tank capacity	l	1750
Length (Genset)	(L) mm	3414
Width (Genset)	(W) mm	1398
Height (Genset)	(H) mm	2749



### ENGINE SUPPLEMENTS

PHS - Coolant Pre-Heating System - available for models:	ACP MPP
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## Accessories

Items available as accessory equipment

Site trailer

Road Trailer



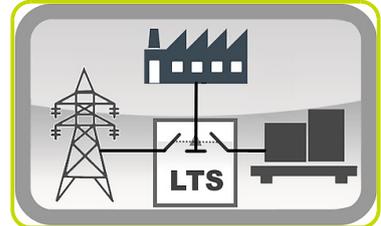
### LTS - Load Transfer Switch [Accessories for ACP Automatic Control Panel]

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.

#### LTS Type ATyS\_D:

- Box type: steel enclosures
- Installation mode: Wall mounted <400A; Floor Standing =>630A
- Door: Hinged door closed with double barb locking.
- Ingress Protection: IP43
- Gland Plates: Removable on the top & bottom side
- Connections: Bottom/Bottom
- Motor unit
- Gland Plates: Removable on the top & bottom side
- Connections: Bottom/Bottom
- Motor unit
- Switch position indicator
- Auto/Manual cover selector
- Housing for manual handle
- Padlocking mechanism
- Two side by side mounted load break switches
- Poles 4
- Double coils self-powered
- Voltage (coils): 208/277VAC (Tolerance+/-20% 166/333VAC)
- Frequency 50 & 60HZ
- Interface ATyS D10, fixed on the door for the status indication: Two lights to indicate the voltage presence of the grid and the diesel generator; Two lights for the switch position; Functionality mode (auto/manual) and cover protection IP65.
- Compliant with IEC 60947-3, EN 61439-6-1 and GB 14048-11



#### LTS SUPPLEMENTS AVAILABLE ON REQUEST:

- **ESB** - Emergency Stop Button (installed on the panel front)
- **APP** - Additional IPXXB Protection (internal plexiglass)

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# GSW420V



## Main Features

Frequency	Hz	50
Voltage	V	230
Power factor	cos $\phi$	0.8
Phase		3

## Power Rating

Emergency Standby Power ESP	kVA	421.92
Emergency Standby Power ESP	kW	337.54
Prime power PRP	kVA	383.35
Prime power PRP	kW	306.68

## 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	TAD1354GE	
[50Hz] Exhaust emission level	Stage IIIA	
Engine cooling system	Water	
Nr. of cylinder and disposition	6 in line	
Displacement	cm <sup>3</sup>	12780
Aspiration	Turbocharged intercooled	
Speed governor	Electronic	
Prime gross power PRP	kW	339
Maximum gross power LTP ESP	kW	372
Oil capacity	l	36
Lube oil consumption PRP (max)	%	0.10
Coolant capacity	l	24
Fuel	Diesel	
Specific fuel consumption 75% PRP	g/kWh	204
Specific fuel consumption PRP	g/kWh	196
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. Power output guaranteed within 0 to +2% at rated ambient conditions at delivery. Ratings are based on ISO 8528. Engine speed governing in accordance with ISO 8528-5.

### Engine and block

- Optimized cast iron cylinder block with optimum distribution of forces
- Wet, replaceable cylinder liners
- Crankshaft induction hardened bearing surfaces and fillets with seven bearings for moderate load on main and high-end bearings
- Keystone top compression rings for long service life
- Replaceable valve guides and valve seats
- Tapered connecting rods for increased piston lifetime
- Over head camshaft and four valves per cylinder

### Fuel system

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

### Lubrication system

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

### 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 coolant pump with high degree of efficiency

## Alternator Specifications

Alternator	Mecc Alte	
Model	ECO40-1S	
Voltage	V	230
Frequency	Hz	50
Power factor	cos $\phi$	0.8
Poles	4	
Type	Brushless	
Voltage tolerance	%	1
Efficiency @ 75% load	%	94.4
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

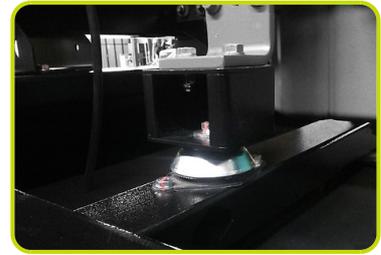
Alternator manufactured according to , and complies with , the most common specification such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 No14-95-No100-95



## Genset equipment

### BASE FRAME MADE OF WELDED STEEL PROFILE, COMPLETE WITH:

- Anti-vibration mountings properly sized
- Screwed support legs.



### PLASTIC FUEL TANK WITH THE FOLLOWING COMPONENT:

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



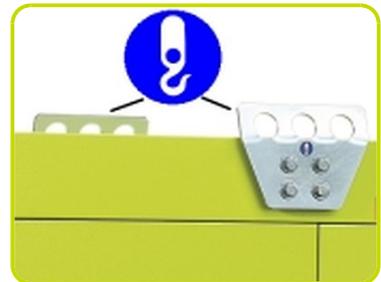
### MANUAL OIL DRAININ PUMP:

- Oil draining facilities



### ENGINE COMPLETE WITH:

- Battery
- Liquids (no fuel)



### CANOPY:

- Soundproof canopy made up of modular panels, realized with 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 screw 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.

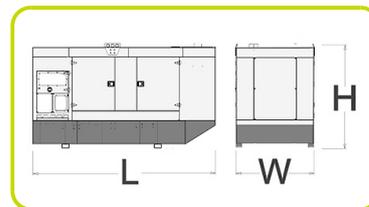
### SOUNDPROOF:

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



### Dimensional data

Length	(L) mm	3951
Width	(W) mm	1438
Height	(H) mm	2085
Dry weight	kg	3671
Fuel tank capacity	l	636
Fuel tank material		Plastic



### Autonomy

Fuel consumption @ 75% PRP	l/h	62.22
Fuel consumption @ 100% PRP	l/h	79.10
Running time 75% PRP	h	10.22
Running time 100% PRP	h	8.04

### Noise level

Guaranteed noise level (LWA)	dB(A)	97
Noise pressure level @ 7 m	dB(A)	68



### Installation data

Total air flow	m <sup>3</sup> /min	468.00
Exhaust gas flow	m <sup>3</sup> /min	54.8
Exhaust gas temperature	°C	500

### Electrical Data

Battery capacity	Ah	155
Max current	A	1059.16
Circuit breaker	A	1000

### Control panel availability

AUTOMATIC CONTROL PANEL	ACP
MODULAR PARALLEL PANEL	MPP

## 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

- Generating set voltage (3 phases)
- Mains voltage
- Generating set frequency
- Generating set current (3 phases)
- Battery voltage
- Power (kVA - kW - kVAr)
- Power factor Cos  $\phi$
- 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



## MPP - Modular parallel panel

Mounted on the genset, complete with digital control unit IntelliVision5 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

- Graphical display 320x240 pixels.
- Operation modes: OFF - AMF function - Single Parallel to mains Island application - Single Parallel to Mains AMF application - 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.
- Multiple parallel and Power Management operation with digital load AVR sharing.
- Automatic synchronizing and power control (via speed goveroner or ECU)
- Baseload Import/Export and Peak shaving
- Voltage and PF control (AVR).
- Configurable digital I/O (12/12) and analogue inputs (3).
- Integrate PLC programmable functions.
- Event-based history (up to 500records).
- Selectable measurement range 120/277V and 0-1/0-5A.
- Remote starting and Blocking signal availability.
- DC system disconnection switch.
- Acoustic alarm.
- Automatic battery charger.
- 2xRS232/RS485/USB Communication 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



### Supplements:

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



#### GENSET EQUIPMENT

LPT - Leak Proof Tray •

AFP - Automatic Fuel Pump •

KRT - Kit Rental for HEI gensets which includes: 3-way fuel valve, battery switch •

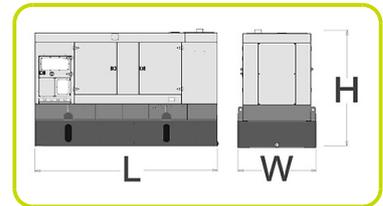
#### Extended Fuel Tank

Fuel tank capacity | 3330

Length (Genset) (L) mm 3977

Width (Genset) (W) mm 1618

Height (Genset) (H) mm 2571



#### ENGINE SUPPLEMENTS

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

## Accessories

Items available as accessory equipment

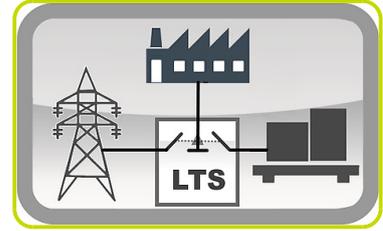
### LTS - Load Transfer Switch [Accessories for ACP Automatic Control Panel]

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.

#### LTS Type ATyS\_D:

- Box type: steel enclosures
- Installation mode: Wall mounted <400A; Floor Standing =>630A
- Door: Hinged door closed with double barb locking.
- Ingress Protection: IP43
- Gland Plates: Removable on the top & bottom side
- Connections: Bottom/Bottom
- Motor unit
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- Connections: Bottom/Bottom
- Motor unit
- Switch position indicator
- Auto/Manual cover selector
- Housing for manual handle
- Padlocking mechanism
- Two side by side mounted load break switches
- Poles 4
- Double coils self-powered
- Voltage (coils): 208/277VAC (Tolerance+/-20% 166/333VAC)
- Frequency 50 & 60HZ
- Interface ATyS D10, fixed on the door for the status indication: Two lights to indicate the voltage presence of the grid and the diesel generator; Two lights for the switch position; Functionality mode (auto/manual) and cover protection IP65.
- Compliant with IEC 60947-3, EN 61439-6-1 and GB 14048-11



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