

GSW165P



Main Features

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

Power Rating

| | | |
|-----------------------------|-----|--------|
| Emergency Standby Power ESP | kVA | 165.00 |
| Emergency Standby Power ESP | kW | 132.00 |
| Prime power PRP | kVA | 152.62 |
| Prime power PRP | kW | 122.10 |

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 | Perkins | |
| Model | 1106A-70TAG2 | |
| [50Hz] Exhaust emission level | Non Emission Certified | |
| Engine cooling system | Water | |
| Nr. of cylinder and disposition | 6 in line | |
| Displacement | cm ³ | 7000 |
| Aspiration | Turbocharged | |
| Speed governor | Mechanical | |
| Prime gross power PRP | kW | 136 |
| Maximum gross power LTP ESP | kW | 149.1 |
| Oil capacity | l | 14.9 |
| Lube oil consumption PRP (max) | % | 0.1 |
| Coolant capacity | l | 21 |
| Fuel | Diesel | |
| Specific fuel consumption 75% PRP | g/kWh | 199.7 |
| Specific fuel consumption PRP | g/kWh | 203.3 |
| Starting system | Electric | |
| Starting engine capability | kW | 4.2 |
| Electric circuit | V | 12 |



Engine Equipment

Standards

All ratings data based on operating under ISO/TR 14396/ISO 8528 conditions using typical fan sizes and drive ratios

Fuel system

Rotary fuel injection pump

Lube oil system

- Flat bottomed aluminium sump
- Oil cooler

Filter

- Fuel filter
- Air filter
- Oil filter

Cooling system

- Mounted radiator
- Thermostat controlled cooling system with gear driven water pump

Alternator Specifications

| | | |
|-----------------------|-------------|------|
| Alternator | Mecc Alte | |
| Model | ECP34-1L/4C | |
| Voltage | V | 400 |
| Frequency | Hz | 50 |
| Power factor | cos ϕ | 0.8 |
| Poles | 4 | |
| Type | Brushless | |
| Standard AVR | DSR | |
| Voltage tolerance | % | 1 |
| Efficiency @ 75% load | % | 93.7 |
| 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

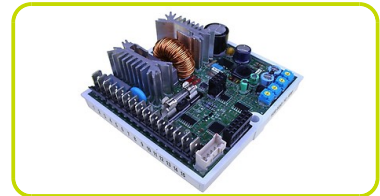
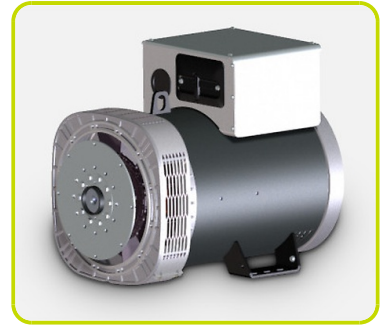
Generator stator is wound to 2/3 pitch. This eliminates triplen (3rd, 9th, 15th ...) harmonics on the voltage waveform and is found to be the optimum design for trouble-free supply of non-linear loads. The 2/3 pitch design avoids excessive neutral currents sometimes seen with higher winding pitches.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

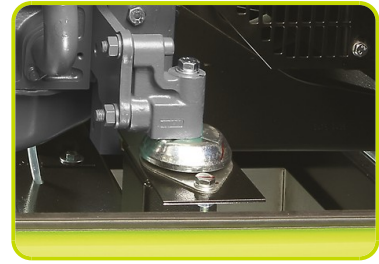
Alternator manufactured according to , and complies with , the most common specification such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, CAN/CSA-C22.2 No14-95-No100-95.



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)



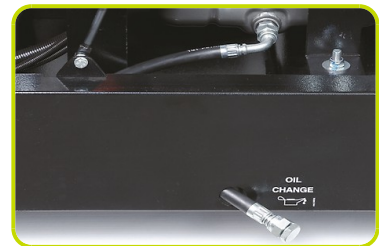
PLASTIC FUEL TANK WITH THE FOLLOWING COMPONENT:

- 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 | 1770 |
| Dry weight | kg | 1980 |
| Fuel tank capacity | l | 350 |
| Fuel tank material | | Plastic |



Autonomy

| | | |
|-----------------------------|-----|-------|
| Fuel consumption @ 75% PRP | l/h | 24.42 |
| Fuel consumption @ 100% PRP | l/h | 32.92 |
| Running time 75% PRP | h | 14.33 |
| Running time 100% PRP | h | 10.63 |

Noise level

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



Installation data

| | | |
|---------------------------------|---------------------|-------|
| Exhaust gas flow PRP | m ³ /min | 23.78 |
| Exhaust gas temperature LTP ESP | °C | 484 |

Electrical Data

| | | |
|------------------|----|--------|
| Battery capacity | Ah | 140 |
| MAX current | A | 238.16 |
| Circuit breaker | A | 250 |

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 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

| | |
|---|----------|
| 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 - kVA - Power factor Cos f.
- Generating set voltage (3 phases).
- Generating set frequency.
- Generating set current (3 phases).
- Generating set Power (kVA - kW - kVA).
- 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 governor 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 lockable 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 the equipment :

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 |

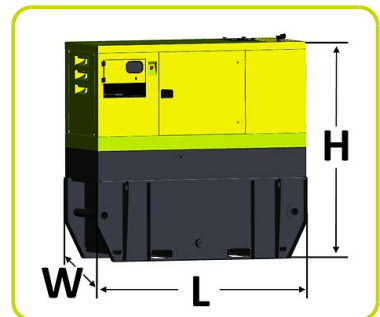


GENSET EQUIPMENT

| | |
|---|---------|
| 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 | 2539 |



ENGINE SUPPLEMENTS

| | |
|--|---------|
| PHS - Coolant Pre-Heating System - available for models: | ACP MPP |
| EEG - Engine Electronic Governor | • |

Accessories

Items available as accessory equipment

STR - Site trailer

RTR - Road Trailer



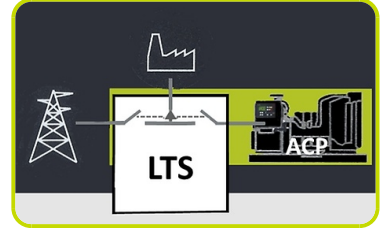
LTS - Load Transfer Switch [Accessories for ACP Automatic Control Panel]

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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