

GCW1850-50S

50 Hz

1.0 GENERAL CHARACTERISTICS

Technical data	PERKINS - STAMFORD	
COP (Continuous Power) ISO 8528	1464 kVA	1171 kWe
PRP (Prime Power) ISO 8528	1846 kVA	1477 kWe
LTP (Limited Time Power) ISO 8528	2030 kVA	1624 kWe
Overload admitted for 1h every 12h	10%	
Power Factor	0,8	
Frequency	50Hz	
Voltage	400/231V Three phases	
Working Speed	1.500 r.p.m.	
Reference Conditions for rated power. Contact PRAMAC LIFTER S.p.A. for other site conditions.	Altitude: 100m (100kPa) above sea level Air Temperature: 25°C Relative Humidity: 30%	

1.1 COUPLING

The engine-alternator set is assembled directly as a monoblock structure by means of SAE adaptor and flexible disc. The alternators used are subjected to MD35 type of construction with single bearing rotor and directly coupled to engine flywheel by means of flexible steel disc.

1.2 BASEFRAME

The base frame is made of welded steel profiles of proper thickness in order to provide a high strength to the skid of the engine-alternator set.

The frame structure allows the movements with lifter machines by means of lifting points placed at both sides of the frame (open set version), and some others fixed to the structure of the canopy (soundproof version).

Complete with **grounding point** for connection of all metallic parts of the genset. The connection from grounding point to earth must be carried out by the end user.

The engine-alternator assembly is frame mounted with the interposition of properly sized **anti-vibration mountings** in order to damp the vibrations transmitted to the frame.



1.3 FUEL TANK

The daily fuel tank integrated in the base frame foresees:

- ☐ Filler neck with tap, complete with air breather.
- ☐ Connection and pipes for diesel engine feeding.
- ☐ Connection and pipes diesel back-flow.
- ☐ Level sensor for minimum fuel level. Contact for alarm and shutdown.
- ☐ Safety electric-valve placed among engine and daily fuel tank for fuel supply interruption.
- ☐ Standard fuel tank capacity: **800 lt.**
- ☐ Automatic **fuel transfer system** from a storage fuel tank to daily fuel tank. It is compressed of:
 - ✓ Automatic electrical pump (220V a.c.) with bypass. Power supply in charge of the end user.
 - ✓ Manual pump for emergency use.
 - ✓ Fuel filter.
 - ✓ Minimum/maximum level sensors to start/stop the electrical pump.
 - ✓ Leak proof tray to retain eventually fuel leakages.

1.4 STARTING BATTERIES

The generating genset is delivered with batteries of heavy duty lead-acid type as power supply for the electric starting system and 24VDC circuit. Batteries are mounted on a purpose made coated metal tray for standing alongside the engine. Terminals with heavy duty clamps and connections to the engine by flexible cable.

2.0 DIESEL ENGINE: PERKINS 4-Stroke - Model 4016 TAG1A

2.1 Technical engine data

PRP (Prime Power) ISO 8528	1.537 ¹	kW _m
LTP (Limited Time Power) ISO 8528	1.690 ¹	kW _m
Working Speed	1.500	r.p.m.
Engine governor	ELECTRONIC	
Cylinders. No.	16	V angle
Bore/Stroke	160 x 190	mm
Total Displacement	61.123	c.c.
Compression ratio	13,6	
Injection	Direct	
Intake system	Turbocharged / Intercooler	

¹ The engine power output are data supplied by the manufacturer. Net power rated at 25°C, 100m a.s.l. and 30% R.H. Under other site conditions derating may be required.

2.2 Cooling system

- Single coolant circuit with gear driven coolant pump and thermostatic valve.
- Cooling radiator with fan (mechanical transmission) sized for intake temperatures up to 40°C.
- Coolant temperature switch for alarm and shut-down.
- Minimum coolant level switch for shutdown.
- Recommended coolant: fresh water with inhibited ethylene or inhibited propylene glycol, mixed in proper percentage. Check the engine manual for further information.
- Coolant preheating system with circulating pump, non-return-valve, thermostat and contact. Power supply in charge of the end user.



2.3 Lubrication system

- Gear driven lubricating pump.
- Lube oil fine filters with replaceable cartridge.
- Oil dipstick and filler cap.
- Lube oil pressure switch for alarm and shutdown.
- Manual oil draining pump.
- Recommended lubricating oil to conform with specifications of API CG4 and ACEA E2-96, multi-grade oil SAE 15W/40. Check the engine manual for further information.

2.4 Fuel system

- Direct fuel injection.
- Fuel lift pump.
- Fuel fine filters with replaceable cartridge.
- Fuel Stop Solenoid.
- Fuel data to conform with EN 590, ASTM D 975-00 Grade 1/2. Check the engine manual for further information.

2.5 Induction and exhaust system

- Dry type air filters.
- Air restriction indicator (dirty filters).
- Exhaust manifolds.

- Flexible exhaust compensators and exhaust counter-flanges.

2.6 Electric system

- Electric starter motor.
- Battery charging alternator.

3.0 ALTERNATOR STAMFORD

3.1 Technical alternator data

Brand / model	STAMFORD PI 7 E
Continuous power at 27°C	1.980 kVA
Continuous active Power at 27°C	1.584 kW
Power Factor	0,8
Speed	1.500 r.p.m.
Frequency	50Hz
Output voltage	400/231V Three phases
Windings connection	Star with neutral
Mechanical degree of protection IP	IP23
Automatic voltage regulator	MX321

3.2 Construction

Three phases, self-regulated, self-excited, synchronous, brushless, 4 poles. The range of maximum voltage comprises up to 690V. Generator rated powers are given at 40°C, 60% R.H. and less than 1.000m a.s.l. according to the standard BS5000. Air cooled by incorporated fan connected to the steel shaft, and protected by a drip-proof grid.

The dynamic balanced of the whole rotor has been carried out during the construction process to guarantee the vibrations within the limits established by the rule BS4999 part 142.

Windings Pitch: Short 2/3 to minimize the content of harmonics.

Type of coupling: direct coupling by means of SAE adaptor and flexible disc with single bearing rotor.



3.3 Insulation and Impregnation

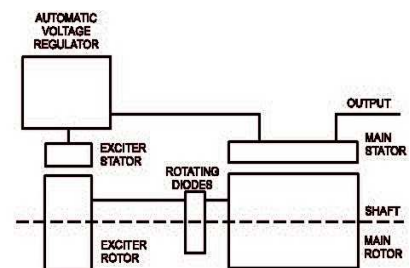
Insulation Class H. All wound components are impregnated with tropicalised epoxy-resins by dipping and dripping, it means materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components. High voltage parts (such as stators) are vacuum treated.

3.4 Electronic Regulation System

The automatic voltage regulator (AVR) is powered from the main stator for excitation of the exciter field. The AVR controls the level of excitation provided to the exciter field, and responds to a voltage sensing signal from the main stator winding. By controlling the low power of the exciter field, it becomes controlled and reached the high power demand of the main field through the rectified output of the exciter stator.

It is therefore maintained the generator output voltage within the specified limits, compensating the load, speed and power factor of the alternator.

The AVR MX321 is provided with 3 phases sensing as well as an engine speed detection system by means of which ensures an over-excitation protection: it adjusts the voltage fall off with speed (below a preset speed threshold) protecting the generator against over-excitation at low engine speeds. In case of over-exciter field voltage, the AVR de-excites the generator once a time delay is passed.



The AVR is equipped with the following controls or adjustable thresholds:

- ❑ **VOLTAGE ADJUSTMENT:** generator output voltage controlled by the proper trimmer on the AVR.
- ❑ **STABILITY:** provides good steady state and transient performance of the generator.
- ❑ **UFRO:** under-speed protection circuit which gives a volt/Hz characteristic when the speed of the generator falls below the presettable threshold.
- ❑ **DROOP:** droop setting normally preset to give 5% voltage droop at full load zero power factor. It is intended for generators for parallel running provided with a quadrature droop current transformer (CT), which provides a power factor dependent signal to the AVR.
- ❑ **V/TRIM ADJUSTMENT:** auxiliary input to connect to a VAr/PF controller. It allows to the user to adjust the sensitivity of the VPF controller.

3.5 Reference rules

CEI 2-3, BS EN60034, IEC 34, BS 4999-5000, VDE 0530, CAN/CSA C22.2-N°14-95 N°100-95, NEMA MG1-32, AS1359.

4.0 MODULAR AUTOMATIC SYNCHRONIZING CONTROL PANEL

The electric control panel realized in a single control panel mounted in a separate room of the container for floor standing; equipped with drives, protections (automatic shut down) and instrumentation to synchronize **GCW1850-50S** in Parallel with mains. Principal working operations:

- **As single genset:** GCW1850-50S works as single genset with automatic or manual starting.
- **Parallel with mains:** GCW1850-50S is synchronized with mains for production at constant load.

It foresees:

- DST4601/P Control Board.
- Automatic Synchronizer.
- Load sharing.
- Synchronoscope.
- **3 poles/2500A motorized circuit breakers** for protection (against overloads and short circuits) and coupling to the parallel bar.
- Selector switch by key for Genset operation: LOCKED-PROGRAM-MANUAL-AUTOMATIC-TEST.
- Selector switch for parallel operation: MAN-AUT.
- Select switch for synchronizing instrument: ON-OFF.
- Selector switch for type of plant activation: LOCAL –0– REMOTE.
- Opening genset circuit breaker push button.
- Closing genset circuit breaker push button.
- Automatic battery charger.
- Supply for auxiliary services: preheating, automatic fuel transfer system.
- Sound alarm with switch for disconnection.
- Emergency stop button.
- Automatic switch over for alternative running.
- GSM modem kit for remote communication. It includes:
 - Board for interfacing with DST4601/P, mounted on control panel.
 - GSM modem with antenna, mounted on control panel.
 - CD with software and technical manual



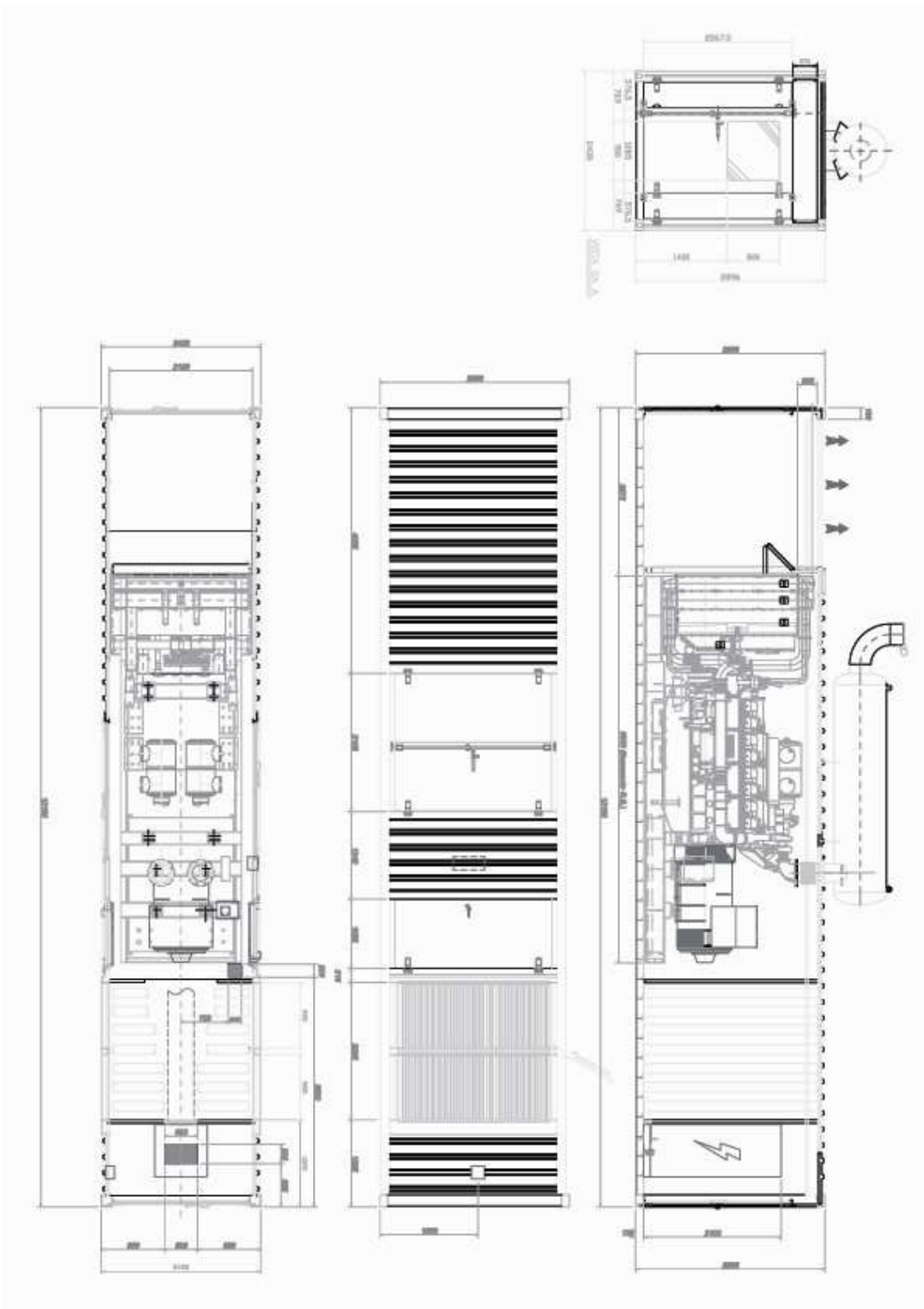


5.0 SOUNDPROOF CONTAINER 40'

Soundproof Container 40' ISO high cube with residual sound pressure level within 75 ± 3 dB(A) at 7m according to ISO 3744, measured in open space at full load. It also includes:

- Residential exhaust silencer on the roof of the container.
- Exhaust compensators.
- Walls and roof covered by using rock wool layer of proper density and quantity.
- Internal wiring and lights.
- ISO lifting hooks.
- Openings at both sides with removable plates for power cables and piping.
- 2 Access doors (more under request).
- Separate room for the electrical panel.
- Colour: Green PRAMAC.





Preliminary drawing