

# GQW1400V

1MWe TWINGEN in container 20' HC



Pramac TWINGEN system designed and engineered to work in a wide variety of applications where high power, modular and safe supply is needed.

## Power Rating

Frequency	Hz	50
Voltage	V	400
Phases	№	3
Standby power LTP	kVA	1394
Standby power LTP	kW	1114
Prime power PRP	kVA	1252
Prime power PRP	kW	1000
Dual Frequency Switch	50/60Hz	√
Frequency	Hz	60
Voltage	V	480
Phase	№	3
Standby power LTP	kVA	1562
Standby power LTP	kW	1250
Prime power PRP	kVA	1436
Prime power PRP	kW	1140



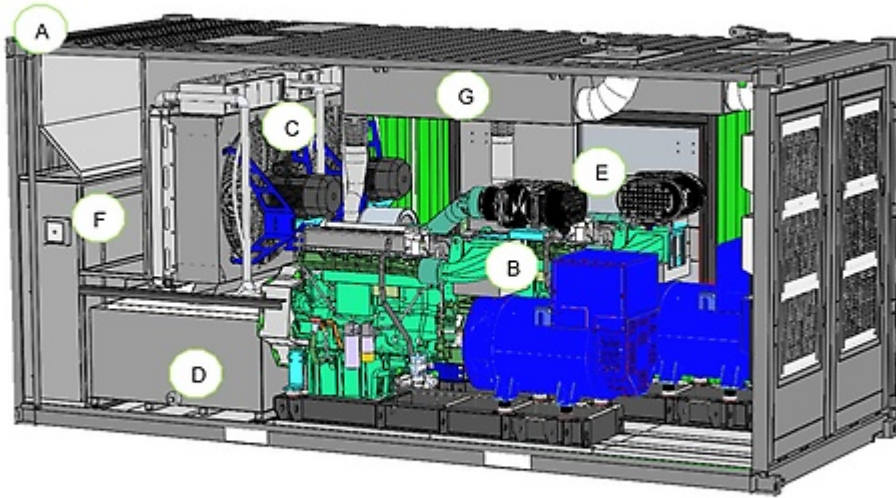
## Ratings definition (According to standard ISO8528 1:2005)

### 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.

### LTP - Limited-Time running Power:

It is defined as the maximum power available, under the agreed operating conditions, for which the generating set is capable of delivering for up to 500 h of operation per year (whose no more than 300 for continuative use) with the maintenance intervals and procedures being carried out as prescribed by the manufacturers. No overload capability is available.



**A. 20' HQ SOUNDPROOF CONTAINER:**

Soundproof and weatherproof 20 feet High Cube container with proper insulation and openings for twingen service and maintenance

**B. GENSETS:**

Two gensets placed inside the container assembled on a skid base without radiator

**C. COOLING SYSTEM:**

Complete with two remote electrical radiators (one for each genset)

**D. FUEL SYSTEM:**

Complete with double wall metal fuel tank (for both gensets)

**E. AIR FILTER:**

Heavy-duty air filters

**F. COMMAND AND CONTROL PANEL:**

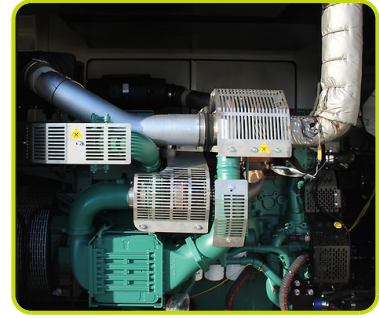
Single automatic synchronizing control panel to run one or both gensets according to power demand

**G. EXHAUST SILENCERS:**

Integrated with high insulation

## Engine specifications

Engine manufacturer	Volvo	
Model	TWD1643GE	
Engine cooling system	Water	
Nr. of cylinder and disposition	6 in line	
Displacement	cm <sup>3</sup>	16120
Aspiration	Turbocharged	
Speed governor	Electronic	
Fan	Electric	
Lube oil consumption @ PRP (max)	%	0.1
Coolant capacity	l	60
Electric circuit	V	24
VERSION SWITCHABLE [50/60Hz]	YES	
ENGINE DATA	Hz	50
[50Hz] Operating Speed-Nominal	rpm	1500
[50Hz] Exhaust emission level	Stage IIIA	
[50Hz] Specific fuel consumption @ 75% PRP	g/kWh	196
[50Hz] Specific fuel consumption @ 100% PRP	g/kWh	199
ENGINE DATA	Hz	60
[60Hz] Operating Speed-Nominal	rpm	1800
[60Hz] Exhaust emission optimized for EPA tier (EPA)	Tier 3	
[60Hz] Specific fuel consumption @ 75% PRP	g/kWh	197
[60Hz] Specific fuel consumption @ 100% PRP	g/kWh	202



### 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
- Overhead camshaft and four valves per cylinder
- Hot parts protection with metal grids
- Heavy-duty air filters

### Fuel system

- Electronic unit injectors
- Fuel prefilter with water separator and watering-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 2L
Type	Brushless
Class	H
IP protection	23
Poles	4
Winding leads	12
Voltage regulation system	Electronic
Standard AVR	DSR
Voltage tolerance	% 1



### 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

Allarm 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 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. 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.

### Container 20 feet High Cube

- High structural resistance
- ISO lifting hooks
- CSC SAFETY APPROVAL
- Double seal gaskets
- Roof access ladder – roof security anchorage points
- Leak proof basement with double leak detection system
- Double draining
- Aspiration: available with standard aspiration or with sand trap filter (optional).
- Internal canopy lighting system with manual switch for easy operation even with low ambient light conditions.
- Hot part and rotating part protection.

### Coolin system

The cooling system includes n°2 electro-fans mounted on a common monobloc support, main features of the system:

- N°2 Electrical Motors Siemens with PTC thermal sensor and oversized shaft bearing (2x30kW, 26KW certificated up to 55°C)
- Double water circuit (LT and HT)
- Fan profile optimized for greater efficiency
- Metal water piping with draining valves
- Thermal sensor on engine hot water outlet
- Easy control (front doors) and refiling (from roof)
- The cooling system fans speed can be controlled by inverter (optional)

### Exhaust System

- Exhaust thermal insulation:
- Each silencers is equipped of a double insulation to limit the increase of temperature inside the container.
- Insulated exhaust piping from engine exhaust manifold to exhaust silencer.
- Flexible exhaust compensator (one for each engine)
- Efficient roof fixed exhaust silencers – rectangular type – (one for each engine)
- Rain flaps on container roof

### Fuel system

- Fuel tank integrated
- Double wall
- Metal (weld sealing certificated)
- Leak detection system
- External refiling cap under lockable panel
- Quick fuel connectors for external fuel tank
- Easy extraction from container without disassembly of other element

**Water Separator Filter RACOR** (n.1 common filter for two gensets)

**Heavy-Duty air Filters** Donalson (N.2 - One for each genset)

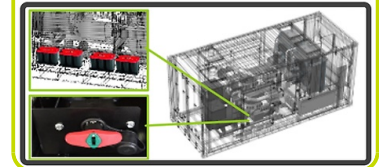
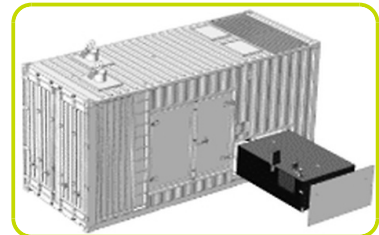
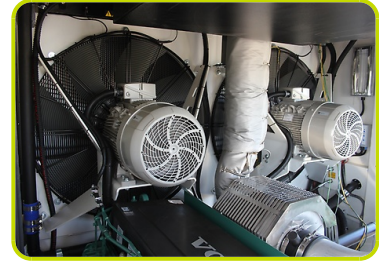
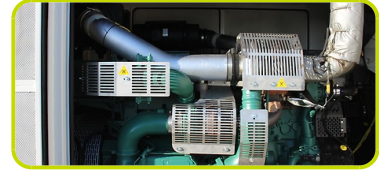
**Battery** 4 Optima battery 75Ah/12V/975A with manual battery switch.

### Easy and Fast Service & Maintenance

TWINGEN designed for easy inspection, service and maintenance through inspection doors and panels.

Each macro element is easily removable for extraordinary maintenance if needed:

- Generators
- Fuel tank
- Cooling system
- Control panel



## MPP - Modular Parallel Panel

The Twingen unit is equipped with an automatic synchronizing control panel that allow work with one or two gensets according to the load demand.

The control panel is set on a rear side with dedicated access doors to each section, which are:

1. CONTROL SECTION
2. POWER SECTION
3. OUTPUT POWER SECTION

### 1. CONTROL SECTION

It integrates all control and command devices such as:

- ON/OFF selector switch
- Comap Inteligen BaseBox control unit + IntelliVision 5 Display (one for each genset)
- Master genset selector switch (G1 – G2)
- Power Management selector switch (On-Off), in order to start/stop the gensets according to load demand with set parameters on the control units
- Mechanical hour counter (one for each genset)
- Fuel level gauge
- 5A Battery charger (one for each genset)
- Emergency push-button
- Ear fault current with selector switch
- Possible to synchronize up to n°16 Twingen units.

### 2. POWER SECTION

It includes:

- N°2 four poles motorized moulded case circuit breaker suitably rated with thermal and magnetic overloads (one for each genset).

### 3. OUTPUT POWER SECTION:

- OUTPUT POWER Common bus bar suitably rate
- Multi-pin connector IN and OUT for parallel with other gensets
- INPUT Plug for auxiliary power supply

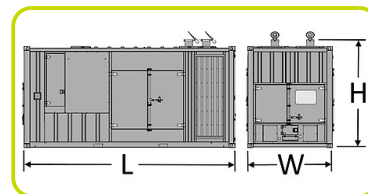
### Supplements available on request:

- Socket Kit
- Power lock



### Dimensional data

Length	(L) mm	6060
Width	(W) mm	2438
Height	(H) mm	3095
Dry weight	Kg	15500
Fuel tank material		Metal
Fuel tank capacity	l	1800



### Autonomy

[50Hz] Fuel consumption @ 75% PRP	l/h	195.72
[50Hz] Fuel consumption @ 100% PRP	l/h	261.37
[50hz] Running time @ 75% PRP	h	9.20
[50Hz] Running time @ 100% PRP	h	6.89
[60Hz] Fuel consumption @ 75% PRP	l/h	218.63
[60Hz] Fuel consumption @ 100% PRP	l/h	295.32
[60hz] Running time @ 75% PRP	h	8.23
[60Hz] Running time @ 100% PRP	h	6.10



### Noise level 50Hz

Guaranteed noise level (LWA)	dB(A)	105
Noise pressure level @ 1 mt	dB(A)	84
Noise pressure level @ 7 mt	dB(A)	75



### GENSET EQUIPMENT - Options Available:

TWINGEN TROPICAL VERSION (with variable speed fans)	TRV
Pre-heating system	PHS
Automatic Fuel Pump	AFP
Sand Trap	SAF
Kit with n.3 Water Separator Filter (Racor)	RWS
Different Canopy Colour	DCC



### CONTROL PANEL - Options Available:

Control section internal lighting (automatic with door switch)	CLS
Engine Analogue Gauges	EAG
Differential Protection type B	ADI-B
Insulation Monitoring Device (Replace standard differential protection)	IMD
Free Voltage Contacts with module IGS-PTM+IR-B8 relay board	TLP-M
Remote control trough with InternetBridge-NT	RCG-13



### OUTPUT POWER SECTION - Options Available:

Power lock 5x400A	PWL
Socket kit	SKT



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