GMQ-1400V [3P- 50/60Hz - 400/480V]

1MWe TWINGEN in container 20’ HC

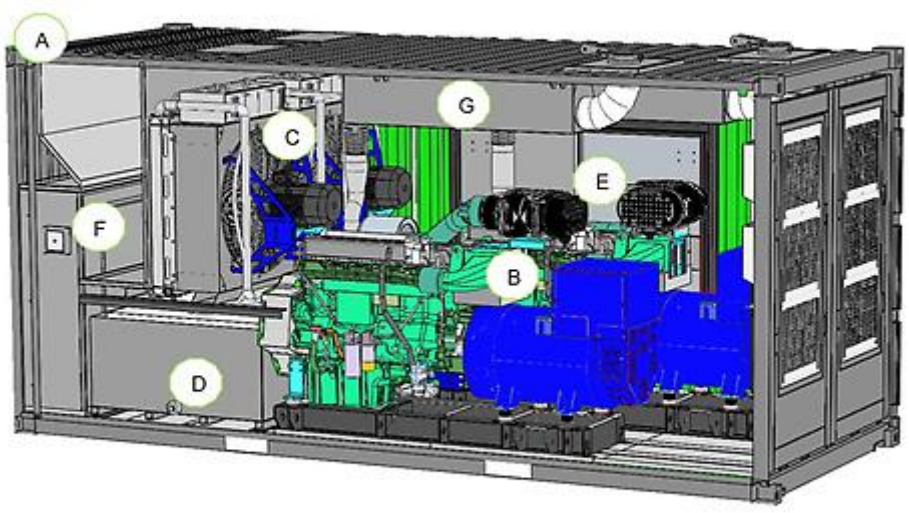
Power Rating		
Frequency	Hz	50
Voltage	V	400
Phases	№	3
Emergency Standby Power ESP	kVA	1394
Emergency Standby Power ESP	kW	1114
Prime power PRP	kVA	1252
Prime power PRP	kW	1000
Dual Frequency Switch	50/60Hz	√
Frequency	Hz	60
Voltage	V	480
Phase	№	3
Emergency Standby Power ESP	kVA	1562
Emergency Standby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

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.

TWINGEN PACKAGE



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)

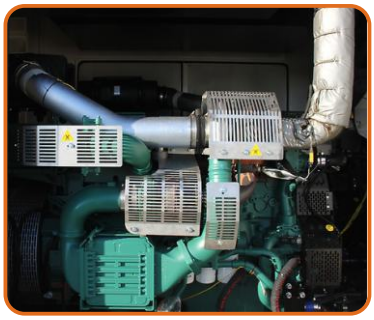
D. FUEL SYSTEM:
Complete with double wall metal fuel tank (for both gensets)

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. EXAUST SILENCERS:
Integrated with high insulation

Engine specifications		
Engine Brand		Volvo
Model		TWD1643GE
Engine cooling system		Water
Nr. of cylinder and disposition		6 in line
Displacement	cm^3	16120
Aspiration		Turbocharged
Cooling fan		Electric
Speed governor		Electronic
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 2L4 B
Type		Brushless
Class		H
IP protection		23
Poles		4
Winding leads		12
Voltage regulation system		Electronic
Standard AVR		DER1
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
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

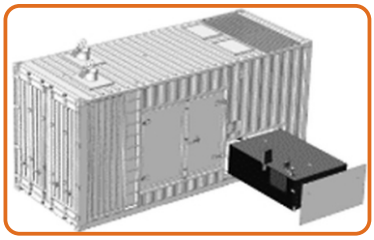
Genset Equipment

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)

Exaust System
- Exhaust thermal insulation:
- Each silencers is equipped of a double insulation to limit the increase of temperature inside the container.
- Insulated exhaust piping form 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

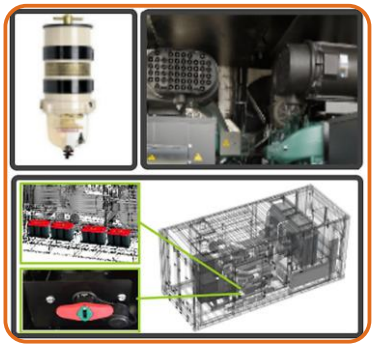
Fuel system
- Fuel tank integrated
- Double wall
- Metal (weld sealing certificated)
- Leak detection system
- External refiling cap under lockable panel
- Quick fuel connectors for external fuel tank
- Easy extraction from container without disassembly of other element



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 + InteliVision 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
- Eart 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).

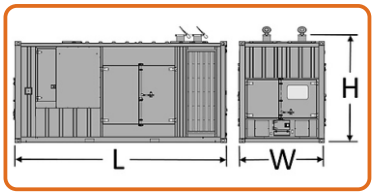
3. OUTPUT POWER SECTION:

- 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	15650
Fuel tank material		Metal
Fuel tank capacity	l	1800



Autonomy		
[50Hz] Fuel consumption 75% PRP	l/h	196.10
[50Hz] Fuel consumption 100% PRP	l/h	261.37
[50hz] Running time 75% PRP	h	9.18
[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 m	dB(A)	84

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