



**Combined Heat & Power
Solutions**



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240 kWe Gas-engine Generator

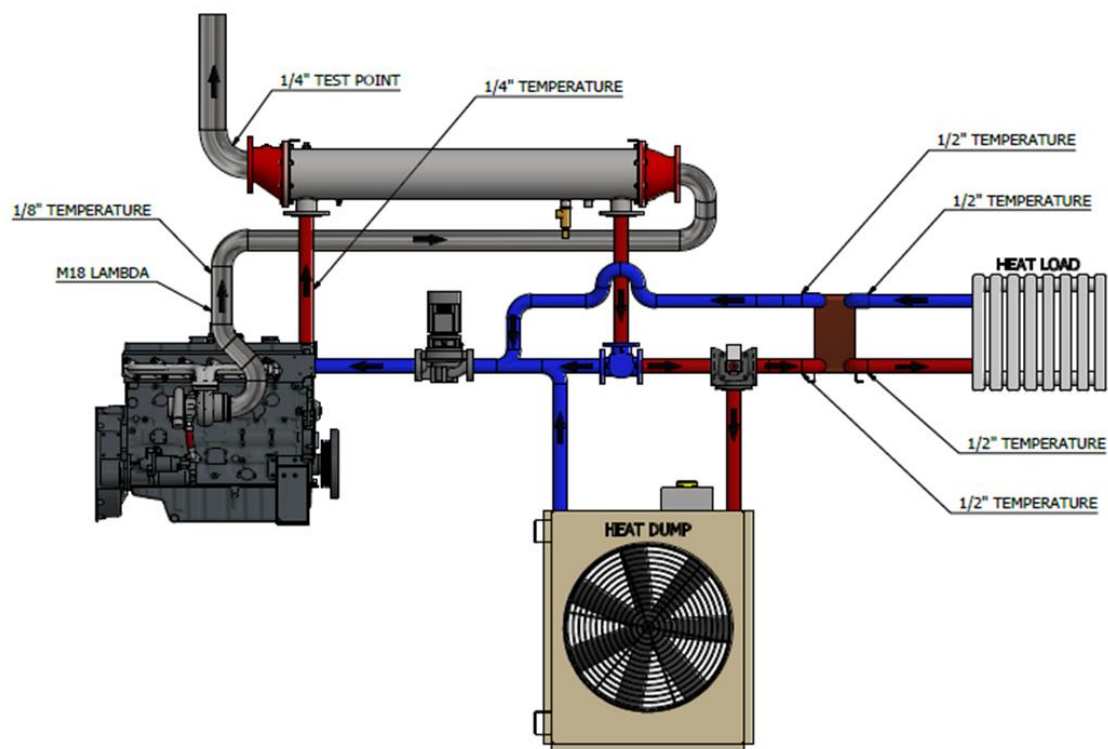
General specification

QS240LPG CHP

Fuel	LPG
Engine	Scania 6
Cylinder arrangement	1-6 in line
Compression ratio	12.6:1
Swept volume	12.6 litres
Machine running speed	1500 rpm
Engine flywheel power	266 kWm (Nat Gas)

Electrical system	400 v / 3 ph / 50 Hz
Alternator	Mecc Alte
Model	ECO40-1S
Alternator average efficiency	94.8% @ 1.0 p.f
Electrical output	400 kVA
AVR	Digital
Engine rating conditions	Sea level
	25°C
	80% RH

Heat balance data (customer side)	270kWth
	Flow 86°C
	Return 75°C
	Flow rate 275 l/min





Prime movers, though specially developed for gas burning, have as their basis compression ignition engines. With spark plugs, electronic ignition system the resulting engines are extremely tough units with block, heads and bottom end designed for the heavy loads of the CI type of engine and the top end able to withstand the different combustion process of an SI engine.

Engine fitted with

- Starter motor and 24v electrical system
- Electronic ignition
- Electronic governor
- Inlet air filters
- Block heater (240 volts)

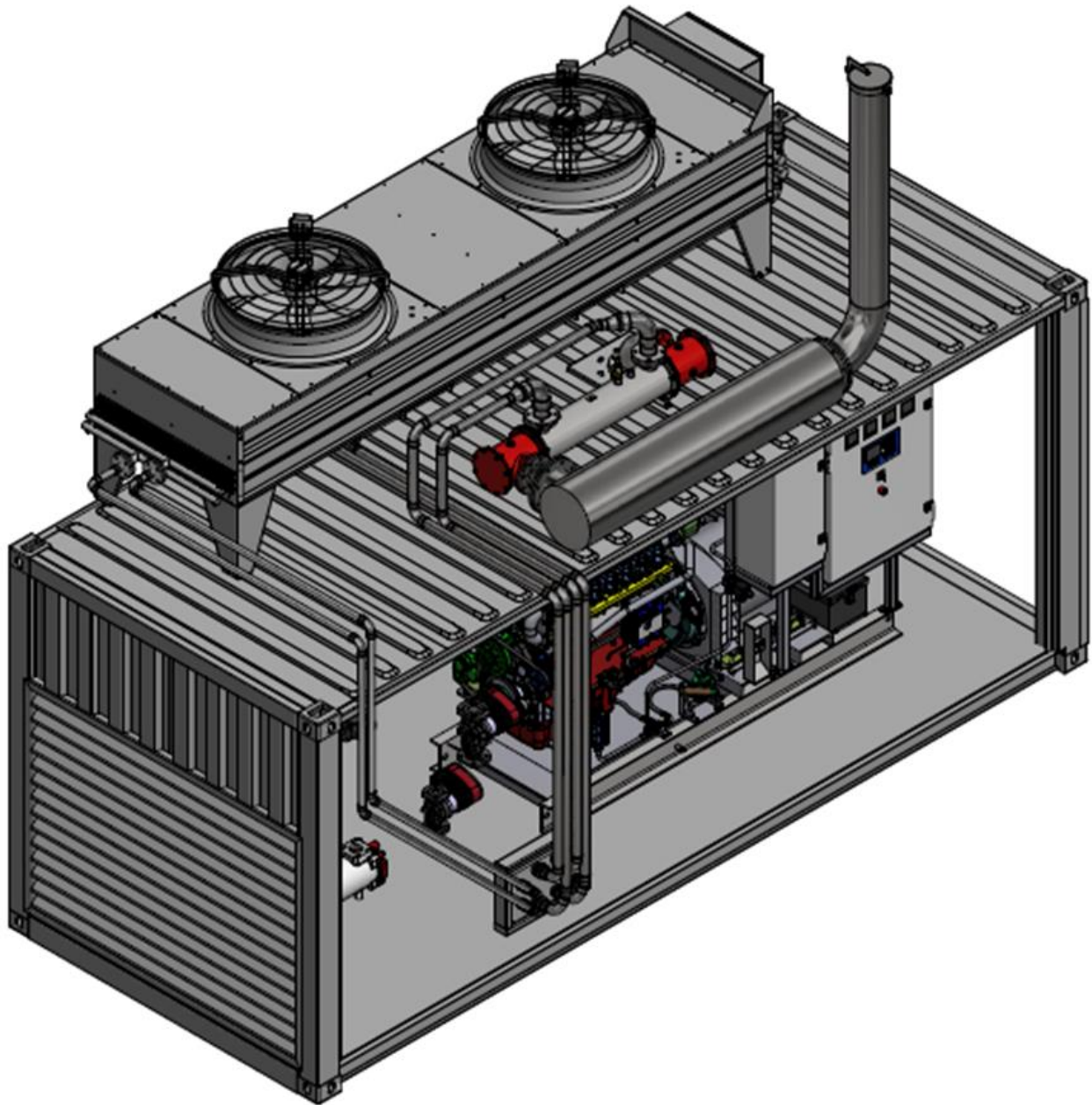
Engines are directly coupled via flexplate coupling to single bearing, self excited alternators. Alternator rated at Class H temperature rise for island operation.

Engine/alternator assembly is mounted to a substantial steel bedplate with anti-vibration mounts designed for 90% isolation.

The unit offered is a containerised generating set with the prime mover being a reciprocating engine fuelled by LPG gas and driving a synchronous alternator. The engine is started by maintenance free gel batteries and starter motor, electrical system 24v.

Once the engine has fired, it runs up to synchronous speed under control of an electronic governor. When up to speed and stable, motorised circuit breaker closes to allow the machine to export power to local distribution. If the machine is to be paralleled with another machine, synchronising and load sharing input connections will be necessary.

Voltage is controlled by automatic voltage regulator.



Typical Containerised Co-generation set

Control Panel

The Control Panel is a digital microprocessor electronic controller for monitoring, controlling, regulating and system protection. It's an expandable controller for both single and multiple gen-sets operating in standby or parallel modes, especially in cogeneration (CHP) and other complex applications.

- ComAp Intellsys 8" screen
- Full system status
- 3 phase sensing digital voltage regulator
- Remote ports
- RS232
- RS485
- Canbus
- Built in PLC

Digital controls for all safety shutdowns

- Isochronous governor control
- Digital 3ø sensing voltage regulator
- Sealed Digital Circuit Board
- 2A static battery charger
- Mates with any 2-wire start ATS switch
- Alarm and event logging
- Built-in diagnostics
- Internal PLC

Full range stand-by operation

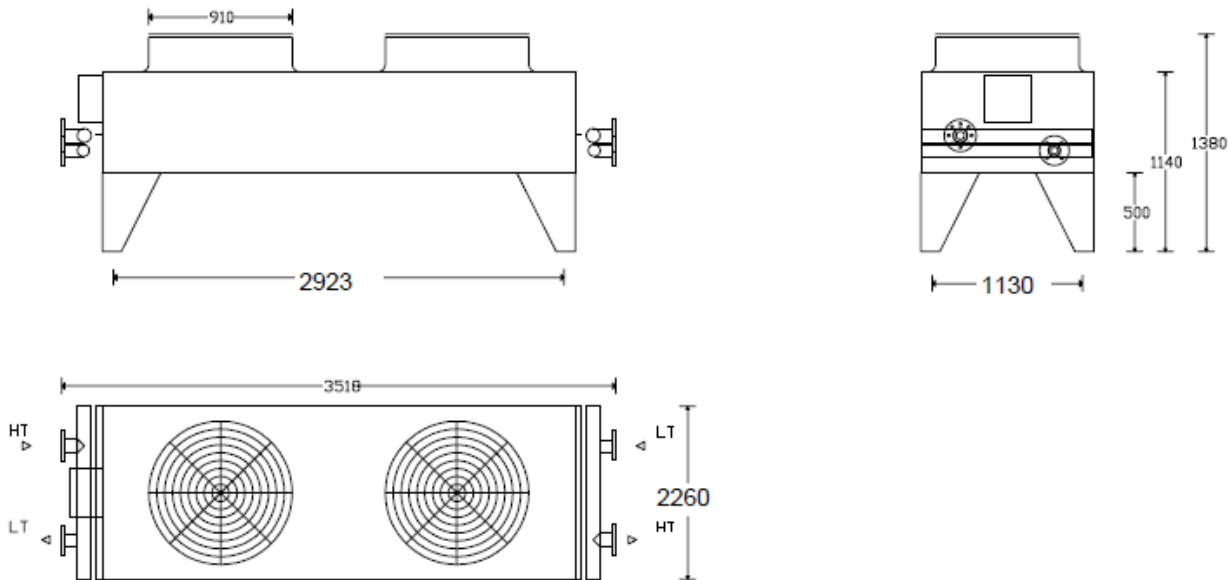
- Full system status
- 3 phase AC volts
- 3 phase amps
- kW
- Power factor
- Reactive power
- Oil pressure
- Water temperature
- Oil temperature (optional)
- Engine speed
- Battery voltage
- Alternator frequency

- Time
- Date
- Transfer switch status
- Run hours
- Service reminders
- Trending
- Fault history (alarm log)
- I2t function for full generator protection
- Built in PLC for special applications
- Shutdowns
- Overvoltage
- Overspeed
- Low oil pressure
- High coolant temperature
- Low coolant level
- Remote communication
- RS232
- Optional modem
- Canbus
- Programmable auto crank
- Emergency Stop
- On Off Manual Switch
- Not in Auto flashing light
- Audible alarm for fault condition
- Transfer switch logic communicates with ATS transfer Panel
- Weekly exerciser (programmable)
- Selectable Low speed exercise
- Digital voltage regulator with 3 phase sensing (3 phase units)
- Isochronous governor



Cooling system

There are two cooling circuits, the intercooler and the jacket with engine oil.



These will be cooled by electric fan cooled radiator. These will be floor mounted unless and connection points will be either on the end or the side of the container for connection on site.

Engine circuits assumed as being filled with 30% glycol solution.

Connecting pipework and flexibles are not included for connections between engine and radiators.

Engine jacket and intercooler pumps are electrical and mounted within the skid frame.

Jacket water heater included on set to ensure engine is in ready condition.

Secondary water pump not included in this offer.

Gas Train

The gas train is designed in accordance with British Regulations for gas supply. From an isolating ball valve, gas flows via a 50 micron filter to duplicated solenoid valves and zero pressure regulator. Gas should be delivered to the train in vapour or gaseous form (not liquid) at the required flow and pressure for maximum operation.

The solenoid valves fail closed and the majority of engine and electrical faults will close these valves to guarantee stoppage of the engine. The gas train is also fitted with high and low gas pressure switches.

Termination at flange on container wall. Gas to be maintained in the pressure range 37 mbar under all conditions of loading.

Site isolating valve, spark arrestor and flow meters not included but can be included on request.

Exhaust system

Exhaust silencer is supplied loose. We have included stainless steel residential silencer. If exhaust is to be extended, we are to be consulted to check that unacceptable back-pressure is not imposed on the engine.

Connections should also be made for exhaust condensate especially if the exhaust system is going a long way from the engine or if the pipework is to go more than one storey vertically. Exhaust condensate can be slightly acidic so provisions should be made to remove and dispose of safely.

If other environmental condition applies, such as;

Lower sound level

Emissions

Dispersion

Please let us know as they may not have been accounted for.

Sound attenuated enclosure/container

20ft HC ISO container for sound level 70 dba@5meter
Steel/Aluminium reinforced floor- Made with skid-proof knurled black-painted, press-formed welded metal, with suitable thickness. Steel rail for engine and alternator
Walls - Made with corrugated metal sheet and sound-proofed with noise absorbing panels in a class 0 with perforated steel protection
2 x access doors on either side of the container.
All doors are equipped with emergency handle
Painting made with suitable pre-treatment of protection against rust and corrosion and fitted with rubber door seals
channelled airflow intakes and outlets equipped with water traps.
RAL / colour can be your choice and your logo also optional.



Literature

Full set of O & M manuals drawings and circuit wiring diagram available with units.

Summary of supply scope

20ft ISO style container	Included
Stainless Steel exhaust silencer	Included
Engine block heater	Included
Bulk Lub. Oil tank and auto fill	Included
Oil transfer pump	Included
Power factor regulator	Included
Low engine water level switch	Included
Low sump oil level protection switch	Included
Gas and fire detection system	Included
Full heat recovery	Included
Heat Dump System	Included
Gas Train	Included
Remote monitoring	Requires Wifi connection Included
Tests	Engine test at manufacturer's works (unwitnessed) Included Alternator test at manufacturer's works (unwitnessed) Included Panel functional tests (works) Included

Exclusions

- Site tests and commissioning
- Delivery
- Unloading and placing
- Mechanical installation
- Electrical installation

3. Price and contract

Supply of machine to above scope, ex-works UK

QES240LPG CHP	Containerised CHP	£301,896.00 plus VAT
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Commercial

This offer is based on Helec Limited Standard terms and conditions of sale.

Prices-Validity

The prices quoted are net prices in GBPS (£) valid for acceptance until **31.08.2023**

The prices quoted do not include VAT taxes, customs duties, stamp fees or other fees or any other charges levied outside of the United Kingdom. All prices quoted Ex-works, factory United Kingdom.

Terms of Payment

50% with order and balance prior to delivery.

Helec Limited reserves to charge cancellation fees/cost, adjustment just cost and storage charges, if orders are unworkable or cancelled by lack of payments/payment securities

Warranty

Warranty period: 12 months or 8000 operating hours whichever comes first.

Claims for consequential damages or claims for loss of profit, interruption of operation or loss of production shall be excluded.

Delivery

The delivery period for shipment ex works typically 30 weeks from a technically and commercially clarified order placed to Helec Limited. The final delivery time will be confirmed by Helec Limited after clarification of all necessary technical and commercial details and with receipt of the purchase order, along with the initial payment.

Technical modifications requested after the order may result in corresponding changes in prices and delivery period. If collection of goods is not made during 14 days after Helec's notification of readiness for dispatch Quantum ES Limited reserves the right, to charge storage fees or cost for external storage (freight, storage, crane cost, ext. handling) at actual cost plus 15% handling charges.

Fuel

The requirements for gas specification are described in the current "**D079E2 Gas specification and limits**".

Uniform gas quality and constant flow pressure are assumed.

The engine controls are fitted with a remote monitoring system, which should be connected always, from time of commissioning. Records of routine and unplanned maintenance should also be kept along with oil sampling. Both maintenance records and remote coms should be available for inspection at any time, throughout the life time of the warranty period and or service contract. Records of gas sampling and analysis should also be made available upon request.

Failure to produce such documents or have interruption in communication will void warranty.

Jurisdiction

Place of jurisdiction for all present and future claims resulting from the business relationship shall be England and Wales.

Law Applicable and Binding Force of Contract

This contract shall be construed under and governed by the English law. CISG (Convention on Contracts International Sale of Goods) law shall be not applicable

We have tried to offer a specification to your requirements, but it remains your responsibility to ensure that the supply specification is what you require. We consider this quotation to be a supply only of equipment, with responsibility for the installation of associated items by others.