

**Contents of QUBE system:**

- Meltog depackaging system
- Reception chamber with mono flow pump
- Two bioQUBE digesters
- 7.5kW powerQUBE CHP plant
- Heat exchangers
- Control panel
- Biogas storage bladder
- Connection points for export of heat and power with grid tie
- Digestate store
- PLC linked to GSM
- Vehicle biomethane upgrade station with compressor to 300bar and vehicle fuel dispensing pack



**Feedstock Specification:**

Various de-packaged food waste stream (non-meat)

**Feedstock Quantity:**

Approx 900kg per day, 325 tonnes per year (yielding 190m<sup>3</sup> biogas per tonne of food waste (fresh weight))

**System type:**

bioQUBE – 2 stage  
powerQUBE – 7.5kW electrical  
Biomethane upgrade pod to 300bar

**Dimensions:**

H; 2,500mm x W; 2,100mm x L; 6,100mm  
(Standard 20ft Shipping container)

**Digester Space Nominal Capacity:**

Modules of 18m<sup>3</sup>

**Units:**

2 no.

**Overall footprint:**

10m x 10m to include gas store and associated tanks

**Weight:**

6,000 Kg as shipped  
24,000 Kg when filled

**Engine (CHP):**

Cummins with Bowman heat exchanger

**CHP generator Size:**

Peak Power: 7.5kW<sub>e</sub>  
Peak Heat: 14.1kW<sub>th</sub>

**Electrical Energy Output:**

45,000 kWh per year (Electricity 29%) approx 6000 hours per year

**Heat Output:**

84,600 kWh per year (Heat 80% (as hot water at 60 – 80°C)) approx 6000 hours per year

**Efficiency:**

Electrical 29%  
Combined 80%

**Parasitic energy use as CHP:**

Approx. 8%

**As Biomethane upgrade:**

Approx. 20%

**Grid Export requirement:**

Grid Tie G59/2 connection

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<b>Grid Connection:</b>	3 Phase
<b>Nominal Voltage:</b>	415VAC
<b>Safety features:</b>	G59/2 grid connection with earth tying/bonding HS <sub>2</sub> and CH <sub>4</sub> sensor for leakage detection and automated shut down Fault notification setting – GSM Gas over pressure feature on compression plant Fire stop safety system
<b>Gas output:</b>	Biogas (approx 54% CH <sub>4</sub> and 40% CO <sub>2</sub> ) Biomethane (97% pure)
<b>Design flow rate:</b>	6m <sup>3</sup> /hr
<b>Gas Store Capacity:</b>	18m <sup>3</sup> bladder – bioQUBE container roof storage
<b>Bladder materials:</b>	PVC fabric
<b>CHP Fuel Consumption:</b>	0.8-1m <sup>3</sup> per hour per kWh
<b>Permit requirements (UK):</b>	T25 exemption and an exemption for digestate spreading from the Environment Agency (UK only)
<b>Routine Service:</b>	Monthly (H <sub>2</sub> S and Moisture filter cartridge change) Engine oil check
<b>Service Interval:</b>	Engine oil change every 500 hours, spark plug, tappets. Full service every 3000 hours, timing, gaskets, head removal Biomethane plant: gas fixtures and fittings, water seals, compressors check every 100 hrs. Major service every 3000 hrs
<b>CHP Operating Temp, min to max:</b>	45 to 75 degrees C
<b>Sound Level:</b>	56 dBLeq at 10m.
<b>Installation and delivery:</b>	100% self-contained; placed directly from off-loading lorry (6 wheeler with HIAB crane for easy access) Tanks installed on level hard core base.



<b>Net Carbon Balance:</b>	Production and embedded carbon 114 tonnes Carbon payback from electricity and heat production 16 months
<b>Warranty:</b>	12 months on CHP, 5 years on digester
<b>Technical Support:</b>	Provided for the first 12 months of operation
<b>Design Criteria:</b>	Designed to meet ATEX and DSEAR safety regulations and compliant with current UK biogas regulations.