



Project Quotation

Customer: *Bowkers Ltd*

Project: *Manchester Royal Infirmary
(Project Red)*

Generator: *2 x 1600Kva in 78dBA @ 1m Containers*

Quote Ref: *RE182 REV4*

Date: *07/02/2022*

Author: *Russ Evans*





To Bowkers Ltd
Attn. Simon Bowker
Email simon.bowker@chrisbowker.co.uk

From Russ Evans
Telephone 0161 4568288

Date 8th February 2022
Our Ref RE182v4

Subject Project Red – 2 x 1650Kva Prime Rated generators in 78dBA @ 1M Containers

Dear Simon,

Many thanks for inviting Ingram Installations Ltd to provide a quotation for the above project,

This offer is to supply, install and commission 2 x Containerised generators, each generator is 1650kva prime rated, mounted with in 40ft containers. Including full attenuation package to reduce the noise levels to 78dBA @ 1m from each container

Also included within this quotation is 2 x 1000lt day tanks, one mounted in each container. A further 34607LT brimful bulk tank including all pipe work, gauging and transfer equipment.

Generating Set Specification

- Ingram 1650kva Containerised Diesel Generator
- 1650kVA prime rated output at 400/230V, 1320kW(PRP) , 3Ph, 50Hz, 1500rpm
- Mitsubishi S16R PTA Engine
- Electronic Governor, providing 60-65% Load acceptance
- DEEP SEA 7310 DSE Generator Control panel,
- Deep Sea 2157 output card, (8 volt free BMS outputs)
- 4-pole set circuit breaker, (Schneider)
- Dual mains battery chargers, Dual battery sets with automatic change over.
- Water jacket heater, anti-freeze
- Fire Valve.
- Consumption: - 349 Litres/hr. = 100% Load. (Refer to Data sheet)

Please note we have assumed all start / stop signals will be coming from an ASCO unit as per other generators on site, and there is no requirement for synchronising equipment on the generators.

During commissioning voltage and frequency will be set to match the associated ASCO switches.

(PLEASE NOTE ALL ILLUSTRATIONS ARE FOR REFERENCE ONLY)

• SUPPLIERS OF ELECTRICAL POWER GENERATORS & BACKUP SYSTEMS •

HEAD OFFICE: Unit 13, Newby Road, Newby Road Industrial Estate, Hazel Grove, Cheshire, SK7 5DA
TEL: 0161 4568288 FAX: 0161 4568089 EMAIL: Sales@ingraminstallations.co.uk
Regd. In Eng. No. 1056948. Regd. Office: AS ABOVE. V.A.T. No. 157 5114 69



Photographs for Demonstration Purposes Only

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Containerised Sound Attenuation Package

The Containerised sound attenuation package is based on providing 78dBA @ 1m with one generator running in free field conditions.

CONTAINER SPECIFICATION

- Corrugated steel sides.
- Mono pitched flat steel water shedding roof.
- 1 x removable end wall.
- Acoustic lining on walls and ceiling with perforated sheet steel inner skin.
- 4 point base lifting facility.
- Access doors complete with lockable slam type door furniture, internal push button panic release & restraining door stays.
- Internal lighting with one battery emergency light & external lighting above control panel access door with emergency battery backup.
- Busbar link box connection (bus bar termination to be provided by others) entry via sidewall
- Internal 1000lt day tank

Note - Container requires a concrete plinth with flat float finish to +/- 3mm all over.

ATTENUATOR SPECIFICATION

- Roof Penthouse externally mounted cool air inlet attenuator.
- End, externally mounted cooling air outlet attenuator.
- Flat sheet steel outer skin, acoustically rated inner lining and perforated sheet steel inner skin to both casing and internal splitters.
- Outlet fitted with fixed blade weather louvres and bird mesh.
- Inlet fitted to roof

PAINT FINISH

- Container finish painted externally in 2 pack epoxy/acrylic to standard RAL 7040 Light Grey colour
- Internally painted white.

FLEXIBLE DUCT

1 x Flexible radiator connection duct made from a flame retardant polyester material to comply with BS5867 Part 2.

EXHAUST SYSTEM

- Roof mounted stainless steel exhaust gas silencer system.
- Internal connecting pipework between engine bellows and silencer.
- Thermal lagging and aluminium cladding of the connecting pipework between engine bellows and silencer.

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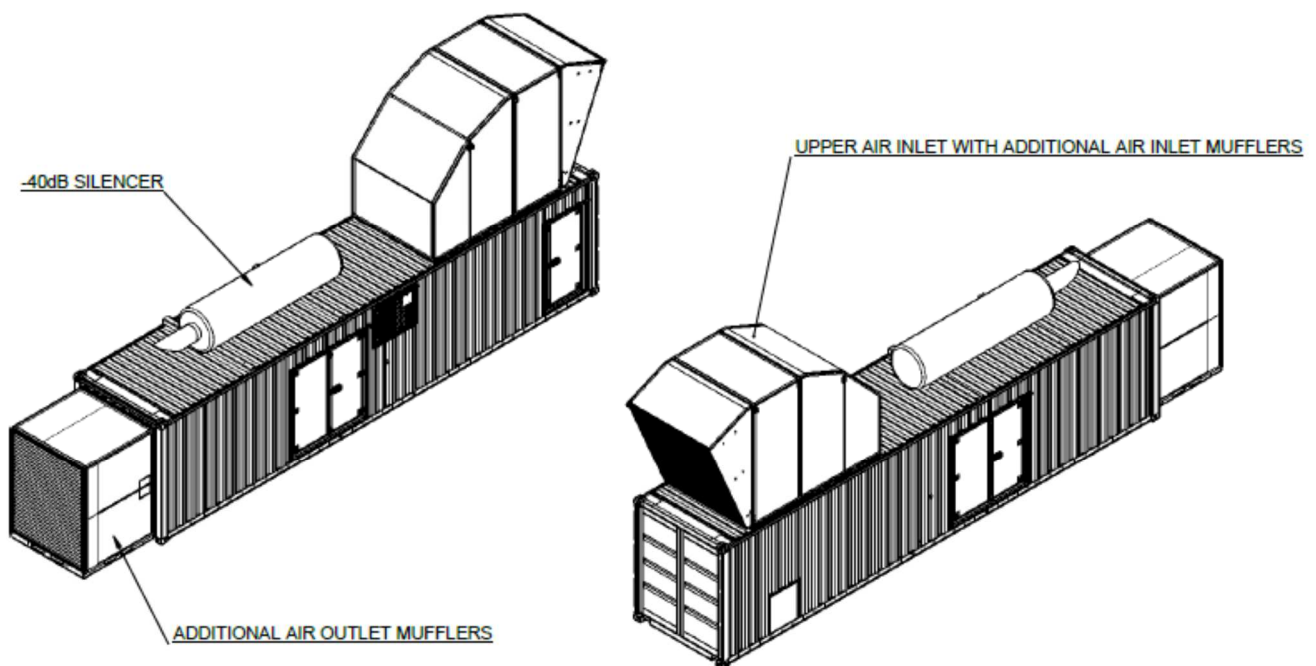
INTERNAL FUEL TANK

Supply and install 1 x 1000 Litre day tank:

- Screwed connections.
- Overfill and bund alarm.
- 50mm mushroom vent cap with overspill protection.
- 25mm low level feed connection.
- Fuel gauging equipment
- 40mm internal sludge suction pipe with cap.

Fire Rating

After discussion with our generator manufacturer, we/they are able to offer a 1-hour fire rating at additional cost. Please see option list below.



Drawings for Demonstration purposes only

Approximate Overall Container dimensions:

Length – 14152mm, Width – 2438mm, Height – 5852mm (top of inlet attenuator)

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External Fuel System Package

FUEL TANK

34,607 Litre brim-full (33,047 Litre Useable) bunded mild steel tank to BS799 part 5 type J 2010.
Manufactured with 5mm mild steel plate for tank and bund.

Tank manufactured to the Water Environment (Oil Storage) (Scotland Regulations 2006, the Control of Pollution (Oil Storage) (England) Regulations 2001 and to SEPA & EA Guidelines.

Sizes to be confirmed once order placed, please note the tank will be constructed to fit with in the room.

Tank complete with:

Raised Manway flanged neck.

50mm Fill Connection

50mm Vent unit

2 x 25mm Socket for level probe (Plugged) & 1 x 50mm socket (plugged)

25mm Draw line c/w valve - if required & 25mm Return line socket (Plugged) - if required

T Bar Handle for draw line, handle raised internal to tank in a 4" socket & cap

2" Overfill prevention device

Roller shutter end door to create enclosure.

Standard Paint Finish

Wire brush & Degrease steelwork where necessary, 1 coat primer & 2 top coats of enamel paint

Minimum Paint Thickness - 70Microns

Colour – RAL 7040 Light Grey (To match Container colour)

Tank base & bearers 2 coats Bitumen – Nominal Thickness 50 Microns



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Fuel Polishing Kit

Fuel polisher can polisher and condition diesel fuel tanks up to 60,000 Litres.

The polisher comes complete with:

- Single phase fuel pump
- 10micron particulate & water separator fitted as standard (other micron options available)
- Magnetic condition
- Flow sensor
- Water detector sensor
- Water drain valve
- Control panel

Our standard fuel polisher control panel functionality comes complete:

- Service Filter warning lamp
- Drain Water warning lamp
- Fault Shutdown warning lamp
- Power on lamp
- Start/stop switch
- 7day programmable timer
- Outputs for a BMS system



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Gauging

OLE C2020A Digital Tank Content Gauge

- 1% Tank Gauge Kit with High & Low Audible Alarm. Suitable for tanks 0.3 meters to 3.0 meters high diesel.
- 24vdc or 100/240vac supply. 1" Tank Connection
- Sensor cable is 6 meters long
- Litres and % Bar graph are displayed. Low and High trigger points are displayed
- 4-20 milliamp output
- Front panel calibration
- Rated weatherproof IP65



Alarm Panel

- Mains multi-channel tank alarm for alerting of a combination or all of the following tank states: high, low and/or bund
- 90db sounder & flashing orange strobe to warn of a problem
- Zone in question lights up on the screen to clearly indicate the activated tank state
- Test & alarm mute functions
- Automatically reversed float logic for low zones
- Weatherproof IP55 enclosure
- Standard box with multiple input voltages 110v/230v, 12v/24v DC
- Complete with 3 relays and probes



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Fuel Delivery & Pipe Work

Please note we have allowed for up to

- 20 Metres of 2" delivery pipework between the fill cabinet and bulk tank.
- 30 Meters in total of 1" pipe work between bulk tank and generators. (10m) per generator
- All lengths and prices are budget based upon latest drawing.

Leak Monitored Fuel Pipe System

Bulk Tank Fill Pipework;

20m x DN50 Double Press Pipework; carbon steel core pipe, stainless steel 304 outer pipe, c/w 6 x 90° bends and 2 x end terminations with leak monitoring ports.

Generator Fuel Supply Pipework:

30m x DN25 Double Press Pipework; carbon steel core pipe, stainless steel 304 outer pipe, c/w 12 x 90° bends and 6 x end terminations with leak monitoring ports.

Mechanical Containment:

Brackets and containment from Unistrut materials for all supplied fuel pipework. All pipework labelled with 'Fuel Oil' vinyl stickers and flow direction.



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Leak Detection:

VL410E Vacuum Leak Detection System w/leak detection tubing and fittings to connect to Double Press pipework & 4 way leak detection manifold. PLEASE NOTE – Leak detection system must be mounted in weather protected area.



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Remote Fuel Fill Point

Lockable steel industrial enclosure suitable for direct wall mounting (not recessed) housing the following;

- 2" tanker fill connection assembly; IV, NRV, Fill Nipple with cap/chain, pressure gauge and interconnecting pipe fittings.
- Digital Bulk Tank Contents Gauge
- Overfill Alarm Unit
- Local isolator and BMS junction box.
- Removable drip tray, mounted in enclosure base.



Fuel Transfer system

Ingram Installations use their own design of fuel transfer system, most installers use one duplex fuel pump set and a single fuel line to feed two or more generators. We believe this is a single point of failure, should the duplex pump set or supply line fail all the generators will fail/run out of fuel.

Ingram Installations install a duplex pump set into each generator the pump sets are supplied with dedicated individual supply lines from the bulk tank. Therefore, should one fail the other generator is not affected in anyway.

Each pump set is specifically designed for the generators being installed and site requirements.

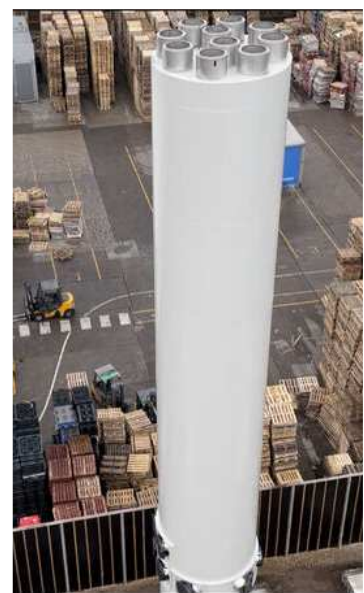
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EXHAUST CHIMNEY

To Design, Manufacture and Erect 1 off 14 metre high free-standing chimney with 2 x 500mm diameter internal 316L S.S. liners and one internal safety ladder with top hinged door and aircraft warning lights with hinged access for maintenance.

- Design calculations and drawings to BS EN13084-7 and EN1090 using UK windspeeds all CE marked.
- Velocity calculations to confirm flue sizing.
- Base bolt frame for casting into foundations (casting by others)
- Carbon steel S275J2 structural shell, shot blast to SA2.5 and painted internally with 2 coats of heat resistant aluminium and externally 3 coats of 2 pack epoxy 200 microns.
- 2 x liners 500 diameter in 3mm thick 316L Stainless Steel with 80mm thick Prorox 960 wired rockwool after wrapping in aluminium foil.
- Flue run based on 12 metres total length for each generator.
- 2 x flanged tees approximately 5m high
- 2 x cones to drain points and soot doors at low level, drains and drainage by others.
- Delivered to site in one section and installation.
- One set of 500 diameter duct to 2 engines including: - Galvanised fixed and floating support system
- High temperature 800°C gaskets
- A2 S.S. bolting
- To erect on site including all necessary access and lifting plant
- To insulate and clad on completion of all as previously described with 80mm Prorox rockwool and 0.7mm Aluzinc.

Please note all structural calculations will be provided to the main contractor structural engineers to enable them to design and install a suitable foundation block. (done by others)



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Delivery, Offload, Position and Installation

All equipment will be delivered in sections on articulated lorries, we have included for full mechanical installation of the generators and fuel system,

The exhaust stack will be delivered in one complete section.

All load cabling, signal cabling, and containment from generator output breaker to generator switchboard with generator room has not been included. This will be carried out by the designated electrical contractor

Please note we have currently not included for any crane lifts that will be required to position the generators, canopies or fuel tank, once we have confirmed layout drawings and a defined crane set up area, a full site survey will be carried out. Following the site survey a full quotation will be compiled and submitted for approval.

We have not included:-

- Any cabling or connections between the generator switchboard, LV panels, load bank panel
- Any distribution boards, power and lighting within the room
- 240/415vac supplies for the generator heater / charger circuits, these are to be supplied, installed and terminated by others. Ingram Installations will assist in any control cable termination as and when required.
- Design & installation of exhaust mast foundation block.
- Any builders / ground works and making good works.
- Fitting of any external drains or drainage pipework that may be required
- Any earth Bonding

Fuel

We have included a first fill of fuel, however the price is based on today's fuel rate, currently fuel costs are changing on a daily basis. We will provide a updated cost just prior to delivery.

We would recommend that the NHS trust organize their own fuel delivery just prior to us commissioning as they will be able to get it at a far better rate than ourselves.

Commissioning

We have allowed for 3 days during normal working hours for pre-commissioning and resistive load testing. Plus 1 day out of hours (weekend or during the night) to carry out final black start / mains fail test per generator.

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FAT & SAT Tests

FAT TEST

Please note that due to the current COVID 19 situation FAT tests may not be possible, however the manufacturer has confirmed that the entire test will be filmed if required. Or a Teams view can be arranged.

If the current COVID situation changes and the client wishes to do a full FAT a price will be provided nearer to the date of testing.

SAT TEST

We have included for a 4hr Resistive load bank test at full load, and one out of hours testing session to carry out a full black start test, and run generator on site load for 1 hr.

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Pricing Schedule – (Please refer to previous pages for full descriptions)

<u>DESCRIPTION</u>	<u>COST EACH</u>	<u>QUANTITY</u>	<u>TOTAL</u>
<u>Generator</u> - Ingram 1650kva prime rated generator housed within a 78dBa @1m Container - Deepsea 7310 Controller 4 pole manual circuit breaker - Mitsubishi S16R2 PTA engine - Electronic Governor - Stamford Alternator	£253,776.33	Two	£507,552.66
<u>Fuel System Package</u> - Bunded bulk fuel tank c/w integrated fill cabinet containing gauging/alarm panels and sensors. - Fuel polishing unit - Surface mount fill cabinet (not recessed) - Double press twin walled pipework - Leak detection on all external pipework - Drop weight fire valve	£58,711.40	One	£58,711.40
<u>Exhaust Stack</u> 14m High Free standing Chimney 2 x 500mm individual Liners - Internal ladder access to top with access hatches - Interconnecting pipe work for each generator - Aircraft warning lights	£150,295.00	One	£150,295.00
<u>Delivery / Mechanical Installation</u> - Delivery to site and positioning - Mechanical installation of all new equipment - Full pipe work transfer system installation - Exhaust stack erection and connection 240/415vac power supplies for heaters, chargers, fuel tank supplies by others. Control Cabling and Load cabling to and from generators by others.	£11,000.00	Two	£22,000.00

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<u>Commissioning & Testing</u> 4hr Resistive Load bank test per set - Mains failure (black start) test out of hours - Training for up to 4 persons	£5,800.00	Two	£11,600.00
<u>Documentation</u> 1 set electronic manuals 1 set paper manuals - Installation and commissioning certification	£500.00	Two	£1,000.00
Total (excluding VAT)			£751,159.06
VAT			£150,231.81
Total			<u>£901,390.86</u>

Options

<u>DESCRIPTION</u>	<u>COST EACH</u>	<u>QUANTITY</u>	<u>TOTAL</u>
Motorised inlet and outlet Louvres	£5,307.02	Two	£10,614.04
1 hour fire rating	£4,500.00	Two	£9,000.00
First Fill of fuel (32,000Lts)	£32,000.00	One	£32,000.00

Global Economy

Currently the global metal markets are very unstable, steel and copper prices and fluctuating massively on a daily basis, to that end our suppliers will only validate they prices for 7 days. Due to this uncertainty the above pricing will have to be confirmed just prior to orders being placed. This could mean a increase or decrease in the above pricing which is beyond our control.

Installation Notes

- Ingram Installations Ltd have not included any cabling between the bulk fuel tank and generator, or any cabling between the generator and LV board. This is to be done and carried out by the nominated electrical contractors. A full list of required cabling can be issued on receipt of orders.
- Load cables are to be terminated on to the generator and tested by others.
- Any delay's onsite due fault of others, or aborted site visits due to others may be chargeable at Ingram Installations standard hourly rates.
- We have allowed for 1hr per man for Inductions,

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Dispatch

Approximately 16-18 weeks at current time,

Warranty

Warranty Ingram Installations standard warranty will apply, this comes into effect on delivery, as follows. 24 months from start-up or 30 months from the time the generator leaves the factory or 1000 hours operation based on 500 hours per year, whichever comes first.

Exclusions

We have NOT included for the following: -

- Builders works
- Non specified electrical installation works
- Working outside normal Monday to Friday Hours (08:00 to 17:00 hours)

Validity

This quotation is valid for 30 days from the date of this quotation.

Payment Terms

- 20% deposit of contract order with order to secure production slot
- All capital equipment (generator, fuel system package, attenuation package), to paid for prior to dispatch.
- All remaining equipment / works will be invoiced as and when completed, to be paid 30days from date of invoice.
- Exhaust Stack – 20% with Order, 30% on receipt of main materials (shell material), 30% on starting welding activities, 20% Ex works completion.

VAT

All prices are subject to VAT at the rate ruling on the day of invoicing.

Commercial

- This offer is made in accordance with Ingram Installations terms and conditions of sale
- Liquidated Damages are not acceptable.
- Retentions are not acceptable.
- The manufacturer reserves the right to modify any feature of their product without prior notice.
- Ingram Installations currently use two quality European generator manufacturers, Ingram installations reserves the right to change manufacturers if deemed to be a better option for the client.

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COVID 19

Due the threat of the COVID 19 Virus, which is having a major effect on the global economy we are not able at this time to provide firm costs or delivery, all prices quoted would be subject to changes that are outside our control.

We will quote delivery dates as advised by our suppliers, however deliveries may be affected by measures again outside our control. We will endeavour to advise of any changes as we are informed.

We look forward to receiving your instructions in the near future. In the meantime, if you require any further information or assistance please do not hesitate to contact us.

If this quotation is acceptable please date and sign below and return to sales@ingraminstallations.co.uk with a valid purchase order.

Assuring you of our best attentions at all times.

Yours sincerely

A handwritten signature in black ink, appearing to read "Russ Evans", is written over a horizontal line.

Russ Evans
General Manager

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