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Chloride Power Protection
Fraser Road,
Priory Business Park
Bedford
MK44 3BF
Tel: 0844 633 0106
Fax: 0800 007 3026

PLANNING
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JAB Designs

Contact number: 01625 537533

Date: 12th February 2008
Our ref: INS 3472 A

For the attention of: Errol Ruddock

Re: Hale Court Generator

Dear Sir,

Further to your recent enquiry, we are please to revise our proposal to suit your requirement. We would like to take this opportunity to thank you for your interest in Chloride Power Protection and giving us the opportunity to submit our commercial quotation for the works required.

We have put forward a proposal which includes for a 500kVA Standby Rated generator c/w Electronic Governor and PMG excitation. The advantages of having a Permanent Magnetic Generator (PMG) is that in the event of a load change due to motor starting applications or even a sudden short-circuit condition on the generator output; the PMG will supply rated voltage to the regulator. This will force the generator into saturation and supply the necessary output current to start the motor or clear the fault condition.

The generator will be housed in our standard 81dBA @ 1m acoustic enclosure. We have included for a 2000 litre bulk fuel tank to allow for approximately 24hrs of run time at 400kVA load. We have also included for appropriate switchgear as detailed in our scope of supply section on page 4 of this proposal.

We have assumed all installation works and electrical cabling is to be carried out by others and have therefore excluded all installation works; however we have a dedicated team of installations engineers who have the capability to offer you a full turnkey solution and will be happy to provide this service following a detailed site survey visit.

Please speak to us with regards to our new Easy Payment Plan and other payment options which may be available to you (see options on page 14)

We trust that this quotation will prove of interest to you. If you wish to discuss the contents further, we will be pleased to assist in any manner.

Yours faithfully

Mr Jesse Mearns
Proposals Engineer
Integrated Power Solutions Department.
Chloride Power Protection

Hale Court Generator

Manchester

Our Ref: INS 3472 Rev A

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Scope of Supply



Scope of Supply

Supply 1 x 500kVA Standby Rated generator in accordance to the attached plant specifications.

Generator Delivery, off-load and position

- To deliver 1 x 500kVA canopied generator from the factory to site on a suitable hi -ab.
- Delivery to include off-loading and positioning to your UK mainland destination, assuming free and easy unrestricted access, no special lifting equipment is required and that all works can be undertaken between the hours of 8am – 5pm Monday - Friday.

Generator Acoustics

The generator shall be supplied and installed within a purpose built close fit acoustic enclosure:

- Designed to achieve a noise level of (see specification) in free field, non-reverberant conditions.
- Bunded base fuel tank.
- Enclosures are of 12 gauge steel. Steel sheet are electro zinc coated before painting (inside and outside) with a polyester powder rust inhibiting coat.
- Sound foam between 20 and 50 mm (1 to 2 in) acoustical sound treatment.
- Lifting eye(s) fixed to the skid
- Large doors allow easy access to the generator set for service and monitoring purposes.
- Window in "security" glass mounted on enclosure door for control viewing.
- Colour White
- A critical silencer is mounted inside the enclosure.
- Emergency stop button is accessible from outside enclosure

Exhaust System

- The exhaust silencers are in board to the canopy with the exhaust outlet protruding from the canopy in the vertical direction.
- We have not included for any extension flue work.

Builders Works

- We have excluded all builders works at this stage as we believe these to be to the care of others.

Generator Fuel Transfer System

Supply and install 1 x 2000 litre usable capacity rectangular double skinned storage tank manufactured from 5mm mild steel plate to BS 799 type J. Complete with:

- 1 x 460mm dia. raised neck manhole with bolted cover.
- Lifting eyes.
- Screwed connections.
- 2" vent unit.
- 2" offset fill complete with valve and cap.
- Drip tray for fill.
- 1" internal suction pipe complete with foot valve and strainer.
- 1" drain suction pipe.
- Overfill alarm unit } Next to
- 6" dial pull button hydrostatic gauge } fill
- 100mm RSC's underneath.
- Finish 1 x primer 1 x enamel.
- Approximate dimensions: 1200mm L x1000mm W x 2200mm H



- Supply and install single skinned screwed connection mild steel pipe work to and from the bulk fuel tank.
- We have proposed that the bulk tank will be situated the side of the generator canopy.
- Pipe route length no greater than 8m with no more than 8 bends.
- Supply: 1" MS single skinned screwed pipe work from the bulk fuel tank to the generator base fuel tank.
- Overfill / Vent: 2" MS single skinned screwed pipe work from the base fuel tank to the bulk fuel tank.
- Include 1 x single fuel pump system with controller.
- Include all appropriate valves and solenoid valves for operation.

Electrical Equipment

Supply the following switching devices:

- 1 x 450A Free Standing Automatic Changeover Panel. Cable entry and exit is from the bottom.
- Approximate dimensions: 1000mm H x 600mm W x 450mm D.

- 1 x 800A Free Standing Automatic Changeover Panel. Cable entry and exit is from the bottom.
- Approximate dimensions: 1600mm H x 800mm W x 500mm D.

- 1 x 800A Distribution Panel for generator output, includes 1 x 800A Input Isolator, 1 x 400A and 1 x 800A outgoing way. Cable entry and exit is from the bottom.
- Approximate dimensions: 800mm H x 600mm W x 250mm D

Note: It is the responsibility of the client to ensure that the above switchgear will fit in the desired location. The above panels are free standing and will require interconnecting cabling, we have excluded these works.

Power, Control and Earth cabling

- We have excluded all cabling at this stage as we believe this to the care of others.
- We have included a budget cost for the supply and installation of an independent generator earth nest as required by legislation. This is budgetary at this stage due to local ground resistivity conditions which can be determined following a site survey or during installation. Should the system require further materials to achieve the required resistivity levels we reserve the right to amend our costs accordingly.

Generator Supply

- The generator will require a maintained supply to connect the on board battery charger and engine heaters.
- We have excluded this from our offer as this is deemed to form part of the electrical installation.



Generator Commissioning

- Carry out the commissioning utilising site load.
- We have optioned for the hire of a 400kW resistive load bank complete with 25m cable, hired for 1 day during our normal working hours.
- All works to be carried out during normal working hours (NWH's). Unless specifically specified.
- We have included a budget cost for the first fill of fuel this is budgetary due to the continuously altering fuel costs and will be confirmed closer to the date of fuel delivery.
- (It is the responsibility of the Client to ensure sufficient fuel is in the generator fuel tank at the time of commissioning and testing if the fuel option is not taken)
- Lube oil and coolant supplied with the generator.

Maintenance Service

- Whilst not part of this offer, Chloride Power Protection is pleased to advise it has a comprehensive set of maintenance packages available to offer its customers. Services include reporting and fault analysis via remote supervision at our 24/7 service centre*, emergency call-out and routine inspection and maintenance services including battery replacements. Should such services be of interest, please advise and we will arrange for a service specialist to call and discuss your specific requirements.



2

Generator Specification



CPP 500S – 500kVA/400kW 3 Phase, 400/230V, 50Hz, 1500rpm, 0.8 pf

Digital diesel generator, mounted in a sound attenuated canopy, rated at 500kVA Standby power, 400/230V, 3-phase, 4 wire, 0.8 power factor, 50Hz, 1500rpm powered by Scania engine DC12-59A.

Engine
Make: Scania Model: DC12-59A

Water cooled, 6 cylinders, 4 stroke, direct injection, turbo charged diesel engine complete with the following equipment;

- Tropical capacity cooling system with engine driven fan
- 24 volt starter motor
- Heavy duty dry charged lead acid type battery complete with cables
- Battery charging alternator 24 volt
- Electronic speed governor in accordance with ISO 8528 G2
- Heavy duty dry air cleaner with replaceable element.
- Full flow lube oil & fuel filters with replaceable elements
- Engine protection for low oil pressure and high engine temperature
- Exhaust silencer connector
- Coolant Heater

Alternator (4 Pole)

Newage Stamford, brushless self exciting, self regulating screen protection and drip proof.

- Class H insulation with severe environmental protection
- 2/3 pitch winding
- IP 23 enclosure protection
- Tropical protected with impregnated windings
- Single bearing and close coupled
- PMG
- RFI Kit
- Automatic voltage regulator +/- 1.0%, MX341 incorporating voltage adjustment potentiometer and under frequency protection.

Newage Stamford alternator meet the requirements of BS EN 60034, and the relevant section of other international standards, BS 5000, VDE 0530, NEMA MG1-32, IEC 34, CSA C22.2.100, AS 1359.

Baseframe

Heavy duty steel baseframe with anti vibration mounts located between the engine / alternator feet and the frame. This reduces the level of vibration transmitted to the baseframe. 4 lifting eyes are fitted to the base frame.

Dimensions

4750mm L x 1600mm W x 2233mm H

Weight

Approximately 4600kg (excluding fuel)



Silencer System

A residential silencer class absorptive/reactive silencer is internally mounted for operator safety.

Sound Attenuated Canopy Enclosure (81dBA @ 1m)

Low air velocity, fully waterproof sound attenuated enclosure of compact design with complete service access by four vertically hinged, generous sized lockable doors. The enclosure is manufactured from galvanised sheet steel suitable treated with polyester powder coated paint for additional durability. An emergency stop button is mounted on the canopy exterior.

Fuel Tank

A 750 litre fuel tank defra compliant is incorporated into the baseframe of the machine.

Control panel

Automatic Mains Failure panel, Series 5000 including 5Amp constant voltage battery charger mounted on a vibration isolated robust steel stand.

LCD High resolution Monitor with brightness control displaying.

Instrumentation:

Generator

Voltmeter, phase to phase, phase to neutral
Ammeter three phases
Frequency meter
Power factor indicator
Power (kVA, kW, KVAR)
Energy (kWh)
Start attempts
Hours run

Engine

Water temperature
Lubricating oil pressure
Battery Voltage

Control Functions

Automatic initiation of generating set from mains failure, phase failure, low voltage (programmable)
Remote initiation of generating set starting
Manual initiation of generating set starting
5 attempt starting programmable (start logic)
Engine cool down timer

Mains

Voltmeter
Ammeter



Protection:

Shutdowns for

Low oil pressure
High water temperature
High coolant temperature
Overspeed
Emergency stop operated
Fail to start

Alarms for

Low battery voltage
Battery charging system failure
Low oil pressure
High coolant temperature
Overspeed
Low coolant level
Low fuel level

Control Media

Configuration via panel soft keys
Multi level password access
Emergency stop button control panel
Emergency stop button acoustic enclosure

Control Monitoring

Generator voltage, phase to phase, phase to neutral
Generator Current 3 phases
Mains Voltage, phase to phase, phase to neutral
Mains Current (One phase only)
Engine Magnetic Pick up
Engine coolant temperature
Engine oil pressure
Battery voltage
Generator circuit breaker / contactor status
Mains circuit breaker / contactor status
Enable Mains circuit breaker / contactor
4 x Volt free alarm contacts

Panel complete with all control relays switches buttons and wiring labelled and numbered where appropriate.

Wiring

DC and AC wiring looms utilising multi-pin connectors, thus permitting fast fault finding diagnosis.

Circuit Breaker

Suitably rated circuit breaker mounted in a sheet steel box with adequate access for out going cables.

Manuals

English - one complete set of operation manuals.



Testing

Each set is individually load tested, and all protection device and control functions are simulated and checked prior to despatch.

Applicable standards

BS 4999, BS 5000, IEC 34, VDE 0530, NEMA MG 1-22, ISO 3046, BS 5514.
CE Certification provided.

Rating Definitions;

Prime Power
These ratings are applicable for supplying continuous electrical power (at variable load) in the lieu of commercially purchased power. There is no limitation to the annual hours of operation and this model can supply 10% overload power for 1 hour in any 12 hour period.

Standby Power
These ratings are applicable for supplying continuous electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings.

Standard Reference Conditions
25degC Air inlet temperature, 152.4 metres ASL and a relative humidity of 60%