

YORPOWER

TECHNICAL SUBMITTAL Diesel Generator Package Proposal

Our Reference: YML00326-20JR R09

For the supply of One off

Yorpower Model YXC550RSC

H E Simms

Project: New Victoria

Prepared by: Jim Riley 26-8-21

GENERATING SET SPECIFICATION

YORPOWER Weatherproof and Acoustic YXC550RSC Generating Set arranged for automatic mains failure operation.

One new Perkins YXC550RSC 500KVA 400KWE Prime power rated at 400V 3P 4W 50Hz 1500Rpm.

Model: YXC550RSC

Closed Set



Frequency	Phases	Power Factor	Prime Output	Standby Output
Ratings			500kVA / 400 kW	550 kVA / 440kW

- Prime output: This rating is applicable for supplying continuous electrical power at variable load. There is no limitation to the annual hours of operation and this model can supply 10% overload power for 1 hour in 12 hours.
- Standby output: This rating is applicable for supplying electrical power (at variable load) in the event of a utility power failure. No overload is permitted on these ratings.
- Standard reference conditions: 25°C, 100m A.S.L., 30% relative humidity

Design features

- High quality assembly, providing stiffness and low vibration
- Powder coated steel. Corrosion and scratch resistant.
- Compact and long service life
- Wiring and connectors with double protection.
- Protection guards in radiator and high voltage parts.
- Full 12 month YorPower warranty

Configuration

- 4-Stroke water-cooled diesel engine.
- Industrial silencer.
- Coolant recovery tank
- Single bearing, 4 pole brushless alternator.
- Anti vibration mountings
- Integral fuel tank
- Fuel level sensor
- Auto start control system with electronic digital control module
- Output circuit breaker.
- Emergency stop button
- High engine temperature and low oil pressure shutdown system.
- 24V starter battery with leads and switch

** The images above are for illustration purposes only.

Engine data

Engine brand	Cummins	Total coolant capacity	65.9 Litres
Engine model	QSK15-G8	Total lube oil capacity	91 Litres
Engine speed	1500 RPM	Cooling air flow	11.35
Number of cylinders	6	Exhaust gas flow	82.2m³/min
Aspiration	Turbo Charged and Charge Air Cooled	Exhaust gas temperature	515°C
Combustion system	Direct injection	Fuel cons. @ 110% standby load	
Piston Speed m/s	8.4	Fuel cons. @ 100% Prime load	104.2 l/hr
Governor type	Electronic	Fuel cons. @ 75% Prime load	80.6l/hr
Cooling system	Water Cooled	Fuel cons. @ 50% Prime load	57.4 l/hr

Alternator data

Alternator brand	Stamford	Number of wires	12 re-connectable
Alternator model	HC15D	AVR model	MX341
Excitation	Self excited	Voltage regulation	± 1.0%
Insulation class	H	Total Harmonic distortion	No load < 1.5%, on load < 5%
Drip proof protection	IP23	Telephone interference	THF < 2%
Winding pitch	2/3	Flanges and shield	Aluminium

Genset Model
C550D5E, 550kVA Standby, 500kVA Prime, Enclosed
Emergency Standby Power (ESP)
Emissions Level : EU SII
Local Codes and/or Regulation : CE
Output Voltage : 400/230, 3 Phase, Wye, 4 Wire
ENGINE
QSK15G8
Engine Air Cleaner - Duty Rating : Normal Duty
Engine Coolant Heater : 240V
Main Generator
HC5D, 50 Hertz (Hz), 200V and 400V, 150C, Emergency Standby Power (ESP)

Generator Accessories
Voltage Regulator - Torque Match
Main Generator Heater : None Supplied
Genset Housing
Sound Attenuated, Steel, Munsell Green
Two Point Enclosure lifting
Exhaust System
Silencer Grade : Enclosure Critical
Exhaust System Accessories : None Supplied
Cooling System
Genset Mounted Radiator, 50C / 122F, Genset Mounted
Engine Coolant Mixture : 50% Antifreeze, 50% Water
Primary Electrical Isolation Device
One Circuit Breaker
Primary Electrical Isolation Device
800A, 690V IEC, 4 Pole, 100%, Left Facing
Entrance Box / Terminal Housing
Cable Entrance Box Required : None Supplied
Control System Options
Power Command 2.2
Control Panel Mounting (Viewed From Generator End) : Left Facing
Control Language : English
Warning - Low Battery Voltage
Warning - Water in Fuel
Shutdown - Audible Alarm
Shutdown - Low Coolant Level
Display - Control LCD
Control Cabinet Heater : None Supplied
Starting Batteries
Lead Acid Batteries - Wet
Battery Charger
Set Mounted, 5A, 240V
Fuel Tank
In Skid, Single Wall, 820 Litres / 217 US Gallons, With Spillage Catchment
Fuel Tank Accessories
Fuel Level Alarms : None Supplied
Genset Testing
Genset Testing : Standard Factory Test
Test Records : Certified Test
Warranty
Standby, 1 Years, 500 Hours, Comprehensive Base Warranty
Literature Language
English

Finish
Cummins Green - nearest shade RAL6000
Packing
Box - Corrugated

BASEFRAME / FUEL TANK

Engine and Alternator units are mounted via encapsulated anti-vibration mountings on a robust fabricated steel base frame with battery rack, 4 lifting points and incorporating a (800 litre 10hr 75% load day tank) into the generator base plus contents gauge, filler cap, vent and all necessary fuel pipes between tank and engine.

CONTROL SYSTEM POWER COMMAND 2.2 AND CIRCUIT BREAKER

The module is operated by soft touch membrane buttons on the front panel; these include the following discrete controls:

HAND/MANUAL: Pressing this button takes the generator control system out of AUTO. The generator is available to run but only via the START/STOP buttons.

START: Will start the set and run off load. If a mains failure occurs during this time a signal to transfer load will be given to the ATS and the generator will supply its building load.

STOP: Will stop the set in whatever mode it is running, without any timers delaying shutdown.

AUTO: Generator will await signal to start due to Mains Failure. The generator will run and instigate ATS changeover for the duration of the outage. The generator will return to AUTO standby after the outage has finished. Timers pre-programmed into the system will operate though this course of events.

START TIMER

The engine crank timer is factory preset for 3 start attempts of 10 seconds duration each with 10 seconds rest periods between each crank. After 3 failed attempts the system will lock out and an alarm will be raised on the LCD panel screen.

TIMERS

Under the AUTO operating scheme the following timers are inbuilt into pre-programmed system: Delay on Start; after a mains failure it delays the generator from starting for a few seconds to cover for the event of a swift return of supply (i.e. the operation of an auto-re-closer on an overhead line).

Delay on Restoration; allows the mains to return and become established prior to taking the generator supply off of the building.

Delay on Shutdown; allows the set to run on off load after a mains outage and cool down both itself and the enclosure or plant room.

DISPLAYS FROM MENU

Standard displays available from the menu are offered as follows. These are shown on the 132 x 64 pixel LCD. The menu is selected using the five position navigation buttons on the front panel of the module.

Generator

Volts
Frequency
Current
kW
KVA
Power factor
kWh
kVAr
kVAh

Standard Alarm parameters

Fail to start
Low oil pressure
High coolant temperature
Overspeed
Under voltage
Over voltage
Under frequency
Over frequency

Engine

RPM
Oil Pressure
Coolant Temperature
Hours Run
Charging Voltage
Battery Voltage

General

Real time clock
Event log with date and time record.

Standard Shutdown conditions

Low oil pressure
High coolant temperature
Overspeed
Emergency stop operated
Under voltage
Over voltage
Under frequency
Over frequency

Alarm and shutdown indications both displayed via LCD panel screen.

ADDITIONAL PANEL MOUNTED EQUIPMENT

Mains battery charger
Engine heater
Emergency stop push button
Audible Alarm
Fuses, relays etc as required

GENERATOR BREAKER PANEL

To protect the outgoing load cables we will supply a Schneider fixed pattern manual 800A 4P Micrologic 7.0 Circuit breaker.

The generator output is fed by flexible power cables from the alternator terminal box via the MCCB to the external end mounted Cable link box ref GS1.

CABLE LINK BOX – GS1

Generator Distribution Panel
H1260 x W1000 x D400 approx
IP55
Colour Manufacturers RAL Grey TBA
Rain Canopy
Key lockable door locks
Arranged for all cables - base entry

Block 1 Feeder

Schneider Compact NSX400N 4 Pole MCCB c/w
Rotary handle
Micrologic 6.3 Trip
Terminals to accept 3 x 150mm 4C SWA

Block 2 Feeder

Schneider Compact NSX630N 4 Pole MCCB c/w
Rotary handle
Micrologic 6.3 Trip
Terminals to accept 3 x 185mm 4C SWA

The panel also contains a bolted neutral/earth link and gland plate for outgoing multi-core cables. The enclosure is arranged for rear cable entry from the alternator and bottom cable exit to the load.

ACOUSTIC ENCLOSURE SPECIFICATION

Close fit Weatherproof and Acoustic enclosure finish RAL6000 Green to achieve a noise level of **79dBA at 1m in FFC.**

To be landed to a Flat and smooth concrete plinth – Please note - constructed by others.

Radiator Type	Ambient Temp	Combustion Air Flow	Cooling Air Flow	Duct Allowance
Standard	UK 30°C	0.61m ³ /s	7.94m ³ /s	125pa

ENCLOSURE Dimensions

Enclosed set approx dimensions mm 5106L x 1553W x 2447H

EXHAUST SILENCERS

1 x Mild steel silencer finish painted in heat resistant black paint, integral to the enclosure.
Silencer – 8" nom bore, 600mm body diameter, 1400mm overall length.

SINGLE LEAF ACOUSTIC DOORS

4 Off Single leaf doors c/w mating door frame, comprehensive door seals, lockable slam type door fastener.

YORPOWER FACTORY TESTING

Standard Factory testing – Not witnessed

The completed generator plant will be subject to functional, operational and load acceptance endurance checks with its associated control panel for a ½ hr period on full load of 400KWE plus 1/2 hr at 440KWE. Engine control operations will be performed by simulating inputs/outputs where necessary.

Test results will be recorded on Yorpower Generator Test Sheet and will be copied to the Client along with the Operation and Maintenance Manuals.

Load testing will be with a resistive load bank giving rated kW at Unity Power Factor

DELIVERY AND TESTING CLARIFICATION

DRAWINGS/DESIGN

As part of the installation service we will produce equipment GA drawings and circuit diagrams.

MECHANICAL INSTALLATION SPECIFICATION

DELIVERY CRANE OFFLOAD & POSITION	HIRE,	To deliver to site by flatbed transport, optional costs provided for Hiab transport or Crane with plant movement team, all subject to site survey. The generating set delivered and positioned on a single week day, assumes free and unobstructed access to a pre prepared concrete plinth provided by others.
EXHAUST SYSTEM		Integral to the canopy - included
CABLING		CABLE LINK BOX – Enhanced GS1 To assist with final termination of Power and control cables between the clients LVSB - Auto transfer switch and generator. Please note All Power control and Aux mains and power cabling supplied and installed by the main contractor under separate package.
FUEL SYSTEM		Integral to canopy – included.
ATTENUATION		Integral to canopy – included.
SILENCER		Integral to canopy – included.
COMMISSIONING		To provide first fills of lubricating oil, coolant, charge batteries. To supply the services of engineers to commission the generating set on completion of the installation and against available site load.
SITE TEST	ACCEPTANCE	To perform a site acceptance test on the installed system on the same day as Commissioning.

H E Simms to manage site and provide free passage of all equipment including levelling of any approaches within site and Ramps (If required) to the plinth area.

COMMISSIONING

Following the completion of the installation as detailed above together with other necessary works by other parties, the client should contact our offices to arrange the commissioning of the generating plant.

These works involve putting the generator into service and handing its control over to the client in a fully operative state. Within these works our Commissioning engineer shall carry out the following:

- Check over the installation to ensure all works have been installed in accordance with the approved drawings.
- Confirm the electrical installation has been completed and inspection certificates are in place, together with any applicable permits to energise circuits.
- Ensure that there is sufficient fuel oil within the day tank to complete the expected load runs. (Please note All fuel is excluded)
- Ensure the coolant system is charged with the correct mix.
- Ensure the engine has the correct level of lubricant.
- Ensure all airways, vent grills, breathers and exhaust openings are free of obstruction.
- Energise auxiliary supplies and check battery charge output and engine heater operates correctly.
- Run generator offload and check for any leaks.
- Shutdown set, ensure engine heaters and battery chargers re-energise.
- Select “Auto”, operate mains failure device to check automatic start of generator.
- If building manager can enable a black start test, this can be carried out at this occasion.
- Sign off commissioning certificate with client.

EXCLUSIONS AND COMMENTS

- 110V supply and task lighting, if required.
- Out of normal weekday working hours
- All electrical install including Earth networks and bonding.
- All builders works including Plinths, Ducts Trenches, Fire stops, tank supports, bunding, backfilling, making good etc.

HAND OVER VISITS

Two additional weekday handover visits included

These can be Re commissioning, Black start or Training days dependant on the clients requirements.

DOCUMENTATION

We have included for one electronic copies of our standard operation and maintenance manuals. This will contain specific information regarding the installed solution.

INCLUDED DRAWINGS

Two copies of the following drawing will be supplied:

Generating set GA

Control panel schematics.

INCLUSIONS

Cummins Genset - Base build data sheets Pub DS349-CPGK.pdf

Cummins Control – 2.2 Control System data sheets Pub S-1568.pdf

Cummins Load Step report

Cummins Stamford HC5D Data sheets

Our preliminary Site Layout Model