



A Division of Transnet SOC Limited

INFRASTRUCTURE MAINTENANCE

SPECIFICATION

Specification For A three phase 7.5kVA , 400V Petrol Generator

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Transnet Freight Rail - Infrastructure

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1. General requirements

- 1.1 This specification outlines the requirements of a portable petrol driven generator for power supply of small electrical tools.
- 1.2 The complete generator and equipment shall be suitably protected to operate in all weather conditions.
- 1.3 Tenderers are to complete details as per annexure A and B.

2. Operating Conditions

- 2.1 Generators will be operated in all weather conditions at altitudes varying from sea level to 1850 m above sea level, relative humidity 10% to 90% and atmospheric conditions which vary from heavily saline to dry and dusty.
- 2.2 Ambient air temperatures ranging from -5° C to 45° C.
- 2.3 The generator will be used on and around railway tracks and on loose ballast.

3. Qualifications

- 3.1 The design of the generator is to be that of the manufacturer, but must be of robust construction in order to meet the sustained heavy-duty demands of railway infrastructure maintenance.
- 3.2 A “no-tool” adjustment machine is preferred.
- 3.3 Only products proven in service will be considered. A list of users, both South African and international, is to be submitted.

4. Performance

- 4.1 A service life of not less than 7 years is expected from the generator. The actual design life of the generator is to be stated.
- 4.2 The generator is to be easily and economically maintained with standard workshop tools and equipment.

5. Tests

- 5.1 The tests prescribed in the British Standards BS 5514 and BS 2757 shall be carried out on the equipment submitted. Transnet reserves the right to be represented at these tests.
- 5.2 Type test certificates in respect of the current design of the generator shall be submitted with the final product. Generators for which type test certificates are not available will not be accepted. Routine test certificates shall be submitted before delivery of the equipment.
- 5.3 Notwithstanding the successful completion of tests or the submission of test results, the tenderer shall still be responsible for the satisfactory operation of the generator.

6. Technical Requirements

6.1 Power output

6.1.1 The generator with a 7.5kVA rating, 400V at 50Hz-Three phase is required.

6.1.2 The generator must be of a power factor of 0.9.

6.2 Engine

6.2.1 The generator must be petrol engine driven

6.2.2 The engine must have sufficient power to comfortably meet requirements of this specification.

6.2.3 The engine must be fitted with an automatic shut-down in event of either low engine oil level, low oil pressure level or overheating.

6.2.4 The engine must be air cooled and naturally aspirated.

6.2.5 The engine of a recoil starting design is preferred.

6.3 Fuel Tank

6.3.1 The capacity of the fuel tank shall be specified by the tenderer and evaluated by Transnet.

6.4 Switchboard

6.4.1 The switchboard shall be of the totally enclosed type with removable panel to give ready access to all internal equipment.

6.4.2 The switchboard shall be fully wired internally with wire and cable of adequate capacity and having high grade insulation suitable for service conditions as per CLAUSE 2. This shall be water proofed.

6.4.3 The following equipment shall be provided on the switchboard:

6.4.3.1 Flush mounting, class 2 indicating and measuring instruments shall be provided, the meters shall include a Volt meter, Amp meter connected to outgoing supply.

6.4.3.2 A suitably rated circuit breakers for the outgoing supply. The circuit breaker must be rated according to the rated output of the generator. Earth leakage must also be provided with the switchboard.

6.4.3.3 Two 16A-3pin all weather socket outlets of approved design and fitted with on/off switches. The two sockets must work independently at rated output.

6.4.3.4 Three phase four-wire welding plug must be included in the design. The welding plug top must also be provided together with a stranded four-core 2.5mm² rubber or silicon sheath insulated 30 meter cables. The cable ends must be fitted with four insulated industrial clamps capable of handling currents more than 16A.

6.4.4 All switches, circuit breakers, etc., shall be clearly marked in English to indicate their purpose. Labels shall be of the metal plastic engraved type, screwed or rivetted in position. Dynotape labelling will not be acceptable.

6.5 Generator Unit Mobility

- 6.5.1 The generator must be fitted with a 2/3 wheels to allow for manoeuvrability by one person.
- 6.5.2 The generator weight must not exceed 120kg.

6.6 Frame

- 6.6.1 The frame and components of the generator unit must be robust.
- 6.6.2 The unit must be well protected against rust.
- 6.6.3 The unit must have a compact design with manoeuvring arms and handles.
- 6.6.4 The arms and handles must be designed and positioned in a manner that would allow the unit to be manoeuvred safely and easily. They should also be retractable.
- 6.6.5 The grip on the handles must have a non-slip surface.
- 6.6.6 A lifting point must be fitted and situated such that the unit is balanced when lifted.
- 6.6.7 The generator must be designed and manufactured in a manner that would prevent accidental damage and damage when the generator is lifted onto/over the rail.

6.7 Measuring Gauges & Indicators

- 6.7.1 The generator unit must be fitted with a well-protected and reliable electric hour meter and fuel gauge.
- 6.7.2 A light indicator for low engine fuel and oil level is to be included in the power unit design.
- 6.7.3 The gauges and light indicators must be positioned such that they are clearly visible.

6.8 Colour and Finish

- 6.8.1 The generator frame and components will be accepted in standard factory finish and colour. Due cognisance must be given to the life requirement of the generator.

6.9 Safety And Protection

- 6.9.1 It must be easy to stop the generator in an emergency. If the normal shutdown device is not readily accessible for this purpose, additional emergency shutdown must be fitted.

6.10 Ergonomics

- 6.10.1 The generator unit must be ergonomically designed for maximum operator productivity and safety.

7. Quality Control

- 7.1 All generators must be manufactured in an environment that complies to the latest ISO 9000 to ISO 9004 or similar quality control standards. Details must be furnished.
- 7.2 The generator will be subject to a technical evaluation and the final decision will, amongst others, be based on these findings.

8. Legal and Operational

- 8.1 All generators must comply with the requirements of the Machinery and Occupational Safety Act,
(Act 85 of 1993 – General Machinery Regulations) and The Machinery Directive 98/37/EC.
- 8.2 The petrol generator unit must be completely assembled and filled with lubricants and ready for service in all respects.
- 8.3 Where grease nipples are fitted these are to be to DIN 71412 in easily accessible positions.
Full details of lubrication applicable to the generator on offer to be submitted.
- 8.4 An operator's handbook, service manual and spare parts list must be supplied with the generator in order to ensure that the generator is operated in accordance to the manufacturer's instructions.
- 8.5 The generator must be supplied complete with essential tools such as Allen keys, spanners etc. in order to make essential adjustments.
- 8.6 Suppliers of petrol generators will be required to stock a full range of readily available spare parts required for the maintenance of the generator throughout its life span.
Full details of service organisation is to be submitted.
- 8.7 The generator is to be guaranteed for a minimum period of 12 months against faulty material and workmanship - fair wear and tear excluded. Full details of guarantee is to be submitted.
- 8.8 The information as requested by the various clauses in this specification are to be supplied in the form of technical data, pamphlets and/or drawings. If this is not complied to, offers may be overlooked.
- 8.9 Sufficient training must be given to all operators of the generator.
- 8.10 Generators not already in service with Transnet Freight Rail must be made available for testing/evaluation during the adjudication of the tender. Technical improvements on existing machines/equipment is to be substantiated by physical examples.

ANNEXURE A

TECHNICAL DATA SHEET (To be completed by tenders)

1. ENGINE**1.1** Maker's name and type number:

1.2 Rated output (continuous) at rated speed in kW at sea level and 30⁰ C ambient temperature:

1.3 Output at 22 % derating : _____ (Natural aspirated) kW output at 8 %
derating : _____
(Exhaust gas turbo charge kW with or without charge air cooler)

1.4 Fuel consumption in l/ kW/h at :**1.4.1** 100 % alternator output: _____**1.4.2** 50 % alternator: _____**1.5** Fuel tank capacity in litres: _____**1.6** Rated speed in R.P.M: _____**1.7** Maximum change of speed on suddenly taking off or throwing on the rated load:

1.7.1 Temporary change as percentage of rated speed:

1.7.2 Permanent change as percentage of rated speed:

1.8 Guaranteed cyclic irregularity

1.9 Turbo charger – boost pressure (where offered)

1.10 Dry mass of engine (including flywheel) in kg:

1.11 Is engine still in production?

1.12 By what year is it anticipated that this engine will be out of production?

1.13 State number of year's spare parts will be freely available after production of the engine offered has been discontinued:

1.14 The maximum load that can be suddenly applied to the engine while it is running at full rated speed, no load, and at normal running temperature:

1.15 The transient and permanent speed changes that will result from the application of this load

1.16 The transient and permanent speed rise resulting from full load being thrown off

1.17 The transient and permanent speed change resulting from a change of load, both off and on by any step of 25 % of the rated full load

1.18 The steady load speed band and recovery time to this speed band from all conditions stated above:

2. Alternator

2.1 Maker's name and type number:

2.2 Rated output:

2.3 Maximum output:

2.4 Temperature rise of windings at rated output not more than.....degrees centigrade.

2.5 Voltage, frequency and no. of phases

2.6 Guaranteed voltage regulation

_____.

2.7 Efficiency at: 100 % load.

at: 50 % load

2.8 Speed in R.P.M.

2.9 Mass of alternator in kg:

2.10 Maker's name and number of bearings :

ANNEXURE B**LUBRICATION ANNEXURE****LUBRICATION AND SERVICE**

a)	Units	Capacity (ℓ)	Specification	Drain at (hrs)
	Engine			
	Alternator			

b)	Filters	Clean (hrs)	Replace (hrs)	Part No.
Engine :	By-pass			
	Full flow			
	Crankcase breather			
	Fuel filters			
	Engine air cleaner			
	Other (specify)			