

TRANSNET ENGINEERING

PRODUCT DEVELOPMENT WAGONS

Advanced Compressor Brake Wagon

Spares

Revision 00

Date of release

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PEW_NAT__SPEC_2002

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1. INTRODUCTION

1.1. Background SCOPE:

This specification document serves as a request for **information and quotation** on all the components mentioned on this specification. These components must be able to produce the desired output.

To comply with statutory requirements for the tippler operator Transnet Port Terminals (TPT) to reduce noise and dust generated by the tipping process, a pair of 'Compressor brake wagons' is coupled to the end of the unloaded wagons. One pair of Compressor brake wagons is required per tippler. These Compressor brake wagons apply their own brakes and resist the free motion of the unloaded wagons beyond the tippler, thereby keeping the lighter wagons 'bunched up' and preventing run-in and run out during indexing.

The Compressor Brake Wagon requires electrical components and tools to complete. The components are mainly used in the protection circuits, the tools are used during the installation and testing phase. The Compressor Brake Wagon is a high-pressure system ranging from 0 kPA to 950 kPA.

Components supplied must meet the requirement of rolling stock, according to the description supplied.

ANNEXTURE A has a table for additional components that the bidder can recommend if deemed necessary.

All the components supplied must comply with the **BS EN 60077-1: Railway application electric equipment**. This includes all other standard referenced by BS EN 60077 – 1.

The rolling stock vibrations and sudden stops at speeds ranging from 120 km/h must be considered.

The extreme temperatures and strong wind velocities in Saldanha coastal must be factored.

The components must have protection against extreme iron ore particles (dust)

2. SUPPLY AND DELIVERY REQUIREMENTS

2.1 Supply and deliver the listed components and tools.

Items/Services required, this includes installation instructions, manuals and licenses if required. If some certain components require reconfiguration of the current existing systems, this must be stated and included in the tenderer response.

The supplier must provide all the listed components:

2.1.1 Item 1: Lithium – Ion Batteries

- The batteries must be fully charged when delivered YES or NO
- Battery performance test results YES or NO
- Battery test conducted on sight (Transnet Engineering) YES or NO
- Instructions and required services to re-program the Victron Energy inverter to be compatible with the batteries delivered. YES or NO

Lithium – Ion Batteries	Lithium-Ion batteries, 24 V or 12 V (150Ah)/Victron Energy	Lithium-Ion	2
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2.1.2 Item 2: Analog Card Module

- The analog card must be compatible with the Inline, bus coupler, Modbus/RTU. YES or NO
- The analog card must be compatible with Modbus RTU. YES or NO
- The analog card must be compatible with the S7-400 Siemens PLC. YES or NO
- The analog card must allow be able to read/write or only read 16 bits (optional). YES or NO
- The analog card must support configuration of (0-20 mA/4-20 mA)/0-10VDC). YES or NO
- Installation instructions or any additional components to configure or install must be supplied. YES or NO

Analog Card Module	AI 4 PAC ANALOG CARD (0-20 mA/4-20 mA)/0-10VDC)	Modbus RTU	1
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2.1.3 Item 3: Diesel Generator Filters

- The oil and fuel filters must be according to the FAW (4DW91-29D), 1500 rpm diesel generator engine. **YES or NO**

Diesel Filters	Generator	Generator Oil and Fuel Filters (FAW 4DW/4DX Series)	FAW (4DW91-29D)	6
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2.1.4 Item 4: Radio/Transceiver

- The radio must be compatible with Modbus RTU. **YES or NO**
- The radio must allow a master – slave configuration **YES or NO**
- The radio must support long distance communication (Maximum range 2 km) **YES or NO**
- The radio must be powered by a 24 VDC supply **YES or NO**
- The radio must be configured to supported 16 bits (4-20 mA), consistently between 100 m – 2000 m. **YES or NO**

Comment:

- The radio must allow multiple communication speeds and compatible with the 9600 baud rate.

Comment:

Radio/Transceiver	868 MHz wireless transceiver	Modbus RTU	1
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2.1.5 Item 5: Radio cable

- The radio cable must be compatible with the radio used. **YES or NO**
- The radio cable must be accompanied with the relevant software and instructions to set up and operate. **YES or NO**

Radio cable	RAD-CABLE-USB - Cable for programming	Modbus RTU	1
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2.1.6 Item 6: Proportional Pressure regulator

The Proportional Pressure Regulator must:

- Have a maximum working pressure of 10 Bars. **YES or NO**
- Support digital input and serial communication (RS 232/485). **YES or NO**

Comment

- Vent out pressure out the system when powered off. **YES or NO**
- Display LED screen (digital pressure gauge) **YES or NO**

Proportional Pressure regulator	Pneumax 171E2N.T.D.009 Proportional Pressure regulator. With Serial communication, 10 bar	RS 232/485	1
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2.1.7 Item 7: Pressure Transducer

- The pressure transducer must be able to monitor pressures between, **YES or NO**
- 0 – 10 bars/ 0 – 1000 kPA **YES or NO**
- The pressure transducer must have a working input voltage of 24 VDC. **YES or NO**
- The pressure transducer must work in a closed current loop with the analog card module (Two- wire connection with an optional three-wire connection) **YES or NO**

Pressure Transducer	Pressure transmitter, WIKA model A-10 (0 – 10 Bar, 4 – 20 mA), Input : 24 VDC	10 Bar, 4-20 mA	2
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Item 8: Inverter Drive Top Fan

- The Top fan must be compatible with the Sinamics G120c, FSC, Frame Size C. **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

Inverter Drive Top Fan	SINAMICS Invertor Drive G120C Series top internal fan (15 kW), FSC	G120c, FSC, 15 kW	2
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2.1.9 Item 9: Inverter Drive Bottom Fan (Double)

- The bottom fan must be compatible with the Sinamics G120c, FSC, **YES or NO**
- Frame Size C. **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

Inverter Drive Bottom Fan	SINAMICS Invertor Drive G120C Series Bottom Fan (15 kW)	G120c, kW, FSC	15	2
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2.1.10 Item 10: Radio Antenna

- Gain: 4 dBi **YES or NO**
- IP 67 **YES or NO**
- Clear site maximum range 2000 m **YES or NO**

Radio Antenna	Omnidirectional antenna for wall or mast mounting, 868 MHz, gain: 4 dBi, degree of protection: IP67. Compatible with 868 MHz Radio.	RS232		2
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2.1.11 Item 11: Radio Antenna (cable RS 232)

- Compatible with the 868 MHz wireless transceiver **YES or NO**

Radio Antenna (cable RS 232)	Omnidirectional antenna for wall or mast mounting, 868 MHz, gain: 4 dBi, degree of protection: IP67. Cable with connection to 868 MHz wireless transceiver.	RS 232		10 metres
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2.1.12 Item 12: In-line Filter Kit for external diesel tank

The fuel filter must be according to FAW (4DW91-29D) or equivalent. **YES or NO**

Comment

performance criteria. **YES or NO**

Contaminants	Flow rate	Operating pressure	Micron rating	Filter material	Maintenance
It should filter an expected common type of contaminants includes water, dirt, rust, and microbial growth.	5 to 30 GPM or 0.315 to 1.89 litres per second	3.5 Bar maximum	10 to 30 microns	Metal mesh	Yearly

Connection type and dimension

- It should connect to all purposes 25mm fuel rubber hose.
- The fittings material should be stainless steel.

Comment:

2.1.13 Item 13: IP67 Green Beacon LED light, 24 VDC

- Optional flashing light **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

IP67 Green Beacon LED light, 24 VDC	IP67 Green Beacon LED light, 24 VDC, with water resistance seals.	GREEN Beacon LED, 24 VDC	2
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2.1.14 Item 14: IP67 Red Beacon LED light, 24 VDC

- Optional flashing light **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

IP67 Red Beacon LED light, 24 VDC	IP67 Red Beacon LED light, 24 VDC, with water resistance seals.	RED Beacon LED, 24 VDC	2
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2.1.13 Item 15: IP67 Push button

- Spring Release **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

Diesel Primer Pump (12 VDC)	IP67 Push button, 24 VDC, Spring release	Heavy duty 24 VDC spring release switch	2
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2.1.13 Item 16: Diesel Primer Pump (12 VDC)

- Stainless steel (Anti-corrosive covering material) **YES or NO**
- Installation, datasheet, maintenance documents must be supplied. **YES or NO**

IP67 Green Beacon LED light, 24 VDC	Diesel Primer Pump (12 VDC), compatible with the (FAW 4DW/4DX Series) generator	Electronic Diesel Primer Pump, 12 VDC	1
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2.2 Component Overview

Items/Services required, this includes installation instructions, manuals and licenses if required. If some certain components require reconfiguration of the current existing systems, this must be stated and included in the tenderer response.

Item No	Item Description	Specification (Similar to)	Type	Qty	Total Price ('R)
1	Batteries	Lithium-Ion batteries, 24 V or 12 V (150Ah)/Victron Energy	Lithium-Ion	2	
2	Analog Card Module	AI 4 PAC ANALOG CARD (0-20 mA/4-20 mA)/0-10VDC)	Modbus RTU	1	
3	Diesel Generator Filters	Generator Oil and Fuel Filters (FAW 4DW/4DX Series)	FAW (4DW91-29D)	6	
4	Radio cable	RAD-CABLE-USB - Cable for programming	Modbus RTU	1	
5	Radio/Transceiver	868 MHz wireless transceiver	Modbus RTU	1	
6	Proportional Pressure regulator	Pneumax 171E2N.T.D.009 Proportional Pressure regulator. With Serial communication	RS 232/485	1	
7	Pressure Transducer	Pressure transmitter, WIKA model A-10 (0 – 10 Bar, 4 – 20 mA), Input: 24VDC	10 Bar, 4-20 mA	2	
8	Inverter Drive Top Fan	SINAMICS Invertor Drive G120C Series Top Fan (15 kW)	G120c, 15 kW, FSC	1	
9	Inverter Drive Bottom Fan	SINAMICS Invertor Drive G120C Series Bottom Fan (15 kW)	G120c, 15 kW, FSC	1	
10	Antenna	Omnidirectional antenna for wall or mast mounting, 868 MHz, gain: 4 dBi, degree of protection: IP67. Compatible with 868 MHz.		2	
11	Antenna cable	Omnidirectional antenna for wall or mast mounting, 868 MHz, gain: 4 dBi, degree of protection: IP67. Cable with connection to 868 MHz wireless transceiver		10 meters	
12	In-line Filter Kit for external diesel tank	Flowrate: 5 to 30 GPM, metal mesh, 10 to 30 microns, fitting diesel rubber hose 25mm	In-line filter Kit- 25mm fuel rubber hose	1	

13	IP67 Green Beacon LED light, 24 VDC	IP67 Green Beacon LED light, 24 VDC, with water resistance seals.	GREEN Beacon LED, 24 VDC	2	
14	IP67 Red Beacon LED light, 24 VDC	IP67 RED Beacon LED light, 24 VDC, with water resistance seals.	RED Beacon LED, 24 VDC	2	
15	IP67 Push button	IP67 Push button, 24 VDC, Spring release	Heavy duty 24 VDC spring release switch	2	
16	Diesel Primer Pump (12 VDC)	Diesel Primer Pump (12 VDC), compatible with the (FAW 4DW/4DX Series) generator	Electronic Diesel Primer Pump, 12 VDC	1	

3. TECHNICAL INFORMATION REQUIRED

3.1. Component and Tool Specification.

3.1.1 All items supplied must be according to the specification, using the description as a strong reference point.

3.1.2 The bidder may contact the Transnet Engineering technical team for further information regarding the required items.

Sibusiso Nkosi: Sibusiso.nkosi@transnet.net (063 299 9722) – Wagons (Mechanical)

Mthokozisi Cele: Mthokozisi.cele2@transnet.net (066 033 5363) – EDO (Electrical)

4. GENERAL REQUIREMENTS

4.1. Delivery

4.1.1. Delivery of all items quoted on shall be included within the offer of the supplier.

4.1.2. All items shall be delivered to the following address:

Bay 8, Transnet Engineering KDS Depot,

Cnr. Lynette Street and Koedoespoort Rd,
Koedoespoort,
Pretoria,
Gauteng,
0186.

4.2. Documentation and Support

The following documentation and supporting items shall be provided upon delivery on the items which forms part of this specification:

- 4.2.1 All technical datasheets.
- 4.2.2 All maintenance manuals and documentation.
- 4.2.3 All application brochures.
- 4.2.4 All other items which the supplier may deem beneficial.

DOCUMENT AUTHORITIES

COMPILER

Mthokozisi Cele

SIGNATURE




24/07/2023

CHECKED BY

Sibusiso Nkosi

SIGNATURE

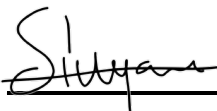


25/07/2023

APPROVED BY

Pfarelo Siligana

SIGNATURE



25/07/2023

APPROVED BY

JP Kruger

SIGNATURE



24/7/2023

ANNEXURE A

List of Additional Components: No.	Type	Qty	Description