	SCOPE OF WORK	Grootvei Power Station
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Title: **Servicing and maintenance of FFP compressors and dryers by Atlas Copco, the Original Equipment Manufacturer.**

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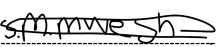

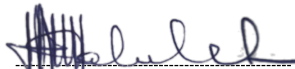

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CONTROLLED DISCLOSURE

1. Introduction

This document defines the detailed scope of work for the servicing and maintenance of the Fabric Filter Plant (FFP) compressors and dryers as per the OEM and Eskom Standards at Grootvei Power Station. FFP is a critical a is for scope of work the FFP compressor for sole source to maintain and service them as per the OEM standards and in line with Eskom.

2. Supporting Clauses

2.1 Scope

This specification covers requirements for maintenance and services the compressors, dryers, filters to ensure that oil free, dry compressed air is supplied to the units to pulse the PPS/Pi bags and maintain FFP differential pressure is maintained design enveloped. Furthermore, the compressors are always available and reliable.

2.1.1 Purpose

The purpose of this document is to:

- Ensure that scheduled maintenance is done according to Eskom and OEM standards and correct task are performed.
- Establish a common understanding between the contractor and Eskom stakeholders regarding activity as each service, quality standards, documentation and approvals.

2.1.2 Applicability

This document applies to:

- Grootvei Power station FFP compressors house.
- The appointed contractor performing activities related to maintenance and servicing of the FFP Compressors and dryers.
- All Grootvei personnel involved in the review, maintenance, approval, witnessing and acceptance of work, including system engineer and contract managers.
- All engineering, maintenance and quality activities directly impacting condition, performance, reliability, and documentation of the FFP compressor and dryers.

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2.2 Normative/Informative References

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems
- [2] 32-681 Generation Plant Safety Regulations
- [3] 32-727 SHEQ Policy
- [4] OHSACT Occupational Health and Safety Act of 85 of 1993
- [5] 240-123801640 Standard for Low Pressure Pipelines
- [6] 240-105929225 Compressed air System standard
- [7] VGB-R 171e, Guidelines for the supply of technical documentation for fossil-fired and regenerative power stations

2.2.2 Informative

- [8] Atlas Copco Compressed Air Manual (AIF108072)
- [9] Atlas Copco Desiccant dryer (APF194191)
- [10] ISO 12500, Filters for compressed air
- [11] ISO 12500, Compressed air dryers – Specifications and testing
- [12] ISO/DIS 18623-1, Air compressors and compressed air systems — Air compressors — Part 1: safety requirements

2.3 Definitions

Definition	Explanation
Compressed air	Compressed air in this case is air at a pressure of greater than 1.5Bar (g)
Dewpoint	The temperature at a given pressure at which a relative humidity of 100% will be reached. At this point, the water vapour and partial pressures are equal, and condensation will take place if the temperature is further reduced or if the pressure increases. The pressure dew point is the dew point at that particular operating pressure.
Free air delivery	It is the volume of air delivered by the compressor at the uncompressed inlet conditions that exist before the inlet filter.
Redundancy	Use of more than one independent means to accomplish a given function
Relative humidity	Ratio of the partial pressure of a vapour to the vapour saturation pressure at the dry bulb temperature of a mixture

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Definition	Explanation
Compressor Train	Includes an inlet filter, compressor with electrical, switchgear and control system, pre-filter, air dryer, post filter and all necessary isolating, control, blow off and non-return valves, up to but excluding the air receiver inlet manifold

2.4 Abbreviations

Abbreviation	Explanation
FFP	Fabric Filter Plant
FAD	Free Air Delivery
FD	Refrigerant dryer
CD	Desiccant dryer
ISO	International Standards Organisation
PDP	Pressure Dew Point
NRV	Non-Return Valve
QCP	Quality Control Plan
OEM	Original Equipment Manufacturer

2.5 Roles and Responsibilities

Grootvei power Station Boiler maintenance is responsible to ensure that activities are carry out as per this scope and maintenance strategy.

Grootvei Power station Quality department is responsible in ensuring that all stipulated documents quality documents and processes are adhered to along with maintenance.

Boiler Engineering to review and approve QCP prior to the work and issue scope based on the report finding after each visit.

2.6 Process for Monitoring

The contractor is supposed to submit a quality control plan prior to any work done and be approved by the system engineer where intervention points will be made.

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3. Scope of work

3.1 Description of the Service

The provision of FFP compressor Plant service and maintenance.

To ensure that the compressors, dryers, filters are maintained in a good working / operational running condition as per OEM standards. The maintenance intervals of the compressors would be planned, and shutdowns are scheduled well in advance. Grootvei Power station is retrofitted with Fabric filter plant which requires dry compressed air to control differential pressure across the FFP. Purpose of FFP compressor house is to supply dry compressed air at 700 kPa, 24 degrees Celsius and 0% moisture and oil contamination to the FFP plant. Furthermore, once of installation of equalizer 4.0 PRO control of 4 compressors which will include 2 visits per annum based on all the compressors running hours. Training of employees which will be 3 sessions per annum.

3.1.1 FFP compressor house/ train consists of:

- a. Four 2-stage, oil free screw electric motor driven compressors (ZT250) (04 SCA 10/20/30/40 AN001)
- b. Two refrigerant air dryers (FD1000) (04 SCA 10/40 AT002)
- c. Two desiccant dryers (CD850+) (04 SCA 20/30 AT002)
- d. Drier inlet filters (PD 850+F) (04 SCA 10/20/30/40 AT001)
- e. Drier out filter (PD 780F) (04 SCA 10/20/30/40 AT001)
- f. Four air receivers having capacity of 2,6 m³ (04 SCC 10/20/30/40 BB001)

3.2 Supplier is required to do the following as per OEM recommendations

- Minor (A) service on the interval of 4000 hours on the Compressors, drier inlet and outlet filters and filter drain and air dryers FD and CD as per OEM manual.
- Major (B) service on interval of 8000 hours on the Compressors, pre-filter and filter drain and air dryers FD and CD as per OEM manual.
- Overhaul (E) service on the intervals of 40 000 hours on the compressors.
- Report finding should be send for review along with QCP for these inspections and work to be done.

3.2.1 Minor service shall include the following amongst other things:

Compressor (04 SCA 10/20/30/40 AN001)

- Taking service readings (air and oil)
- Check cooler functions (approach temperature)
- Change intercooler condensate check valve
- Check for air, water and oil leakage
- Check for presence of water in lube oil
- Inspect/change air filter elements
- Replace filter elements of gear case breather
- Check cycle of air intake throttle valve

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- Check/service condensate drain(s)
- Check motor (coupling) alignment
- Check condition: balance piston diaphragm
- Clean fan cowl of electric motor
- Grease main drive motor bearings
- Check rubber inserts, drive coupling
- Blast clean cubicle, dry air max. 1bar
- Check loose wiring & connections cubicle
- Check sensitive bolt/cpling connections
- Clean injector nozzle breather (needle)
- Check safety valves and switches
- Change compressor oil filter
- Check condition of air intake chamber

Two refrigerant air dryers (04 SCA 10/40 AT002)

- Check display and setting on the digital panel
- Check and clean air inlet strainer
- Perform refrigerant leak test
- Measure dewpoint
- Check and adjust refrigerant expansion valve if needed
- Test setting of fan control switch
- Test setting: refrigerant HP shut down switch
- Take service reading
- Overhaul water drain
- Check for leaks
- Check Pdp, (gauge – instrument panel)
- Check refrigerant sight glass: bubbles and moist
- Check condenser (AC) and clean external.
- Check condition of cooling fan assembly (AC)

Two desiccant dryers (CD850+) (04 SCA 20/30 AT002)

- Drain condensate water and oil if present
- Check all dryer components
- Check condition of the desiccant
- Measure dewpoint
- Replace silencers

Drier inlet filters (04 SCA 10/20/30/40 AT001)

- Inspect
- Check/clean condensate drain
- Check pressure drop
- Change filter cartridge

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Drier out filter (PD 780F) (04 SCA 10/20/30/40 AT001)

- Inspect
- Check/clean condensate drain
- Check pressure drop
- Change filter cartridge

Drier inlet filters (04 SCA 10/20/30/40 AT001)

- Inspect
- Check/clean condensate drain
- Check pressure drop
- Change filter cartridge

Drier out filter (PD 780F) (04 SCA 10/20/30/40 AT001)

- Inspect
- Check/clean condensate drain
- Check pressure drop
- Change filter cartridge

3.2.2 Major (B) service shall include the following amongst other things:

Compressor (04 SCA 10/20/30/40 AN001)

- Taking service readings (air and oil)
- Change air filter elements
- Replace filter elements of gear case breather
- Check cycle of air intake throttle valve
- Replace diaphragm of air throttle valve
- Replace bearing block (air intake valve)
- Check motor (coupling) alignment
- Check cooler functions
- Functional test check valve
- Check condition: balance piston diagram
- Check/drain condensate drains
- Grease main drive motor bearings
- Clean fan cowl of electric motor
- Check rubber inserts, drive coupling
- Check for air, water and oil leakage
- Check condition of drive gear teeth
- Blast clean cubicle, dry air max 1 bar
- Check loose wiring & connections cubicle
- Check sensitive bolt/ coupling connections
- Clean injector nozzle breather
- Check safety valves and switches
- Check presence of water in lube oil
- Change compressor oil filter

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- Check condition of air intake chamber
- Inspect electrical contactors

Desiccant dryer

- Drain condensate water and oil
- Check ally dryer components
- Recalibrate or replace dewpoint sensor
- Check condition of the desiccant
- Measure dewpoint
- Replace silencers
- Replace desiccant as per the condition of it or every 4 years.

For refrigerant dyers same activities should be conducted. Overhaul shall include the following amongst other things:

Compressor (04 SCA 10/20/30/40 AN001)

- Taking service readings (air and oil)
- Change air filter elements
- Replace filter elements of gear case breather
- Check cycle of air intake throttle valve
- Replace diaphragm of air throttle valve
- Replace bearing block (air intake valve)
- Check motor (coupling) alignment
- Overhaul air intake valve
- Replaced blow-off silencer
- Check cooler functions
- Check functioning of check valve
- Overhaul check valve
- Change balance piston diaphragm
- Check/clean condensate drain
- Grease main drive motor bearings
- Clean fan cowl of electric motor
- Overhaul main drive motor
- Clean cooler block internal and external
- Check for air water and oil leakage
- Replace inserts, drive coupling
- Check condition of drive gear teeth
- Replace LP/HP element
- Replace main shaft bearings
- Replace rubber buffers
- Blast clean cubicle, dry air max. 1 bar
- Check loose wiring & connections cubicle
- Overhaul oil pump
- Check sensitive bolt/cpling connections
- Clean injector nozzle breather (needle)

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- Check safety valve and switches
- Check for presence of water in lube oil
- Oil change
- Change compressor oil filter
- Check condition of air intake chamber
- Inspect electrical contactors

3.3 Maintenance on the compressors and FD dryers

Monthly inspections shall include the following amongst other things:

Compressor:

- Taking service readings (air and oil)
- Check air filter elements
- Check filter element of gear case breather
- Check cycle of air intake throttle valve
- Check coolers functions and build up if any
- Check function of check valve
- Check/clean condensate drains
- Check air-water and oil leakage
- Check sensitive bolt/cpiling connections
- Clean injector nozzle breather
- Check safety valves s and switches
- Operate the safety valves manually to verify valve mechanism if functioning correctly
- Check for presence of water in lube oil
- Check the condition of air intake chamber

FD dryers:

- Check display setting on the panels
- Take service reading
- Check for leaks
- Check/ clean condensate drains and test functionality
- Check Pdp Gauge
- Check refrigerant sight glass: bubbles and moist
- Check the condenser (AC) and clean external
- Check condition of cooling fan assembly (AC)

Additionally, there are once off projects to be covered on this contract these are:

- Compressor electrical repairs which include replacing of contactors and cables for all the compressors and AC.
- Piping modifications if there is a need, where a technical report which supporting documentation will have to be submitted prior

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- Dryers repairs including replacement of condensers of the FD dryers and consumable and accessories for both trains.

4. Acceptance

This document has been seen and accepted by:

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5. Revisions

Date	Rev.	Compiler	Remarks
August 2025	1	M.S. Mweshe	Original document

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