



FILTERALL Limited

INDUSTRIAL FILTRATION AND ALLIED SERVICES

Technical Specification Number S124 Coalescer Turbine Oil Purifier Type CT rev Q 2013
www.filterall.com

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1. GENERAL

In turbine operation, there are usually factors present which hasten oxidation and cause deterioration of lubrication oil. These are air, heat, moisture, metallic and non-metallic solids which act as a catalyst. Since there is continuous ingress of contaminants into the turbine oil, the only way to prevent its deterioration is by continuous removal of these contaminants. This demand for continuous purification of turbine oil can be met by incorporating a three stage, solids/water separation purifier requiring minimum attention and operating 24 hours per day.

2. SCOPE of SUPPLY

Work Included:- The scope of supply of this specification shall include the design, fabrication and factory testing of a **Coalescer Type Turbine Oil Purifier Type CT**. The equipment will be mounted on a common base or on castors and be supplied in the form of a pre-piped and pre-wired package and shall provide a fully workable unit in accordance with this specification when received by the purchaser.

Exclusions & Deviations:- Foundations, installation of foundations, connection of services, electrical connections and any site work are excluded from the scope of supply.

3. PERFORMANCE

Performance in a single pass through the purifier at a full flow rate shall be as follows:

Water Removal: - Free and emulsified water shall be removed from oil containing up to 5% water, down to less than 0.01%

Particular Matter Removal: - 98% of particles over 5 micrometre.

4. PROCESS DESCRIPTION

Turbine oil passes through a Strainer, and is pumped by a positive displacement pump to an electric heater. After heating to 50°C, which is the normal operating temperature, the oil is filtered down to 5 micron in the pre-filter. Solid-free oil then enters the coalescer/separator. The action of **coalescence** transforms minute droplets of water, visible as haziness or cloudiness in the oil, into large droplets, which by gravity forces settle down to the bottom of the coalescer/separator housing. Separator cartridges will prevent any carryover of droplets, which are not large enough to settle down. Collected water is discharged automatically to drain or to a collection tank.

Filterall's electric heater will heat oil by indirect heating of very low watt density and therefore prevent overheating or burning of oil.

The heater will raise the temperature of oil by 20°C. If oil purification should continue during turbine shut down a double heater (**Option H**) is recommended.



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5. MAIN COMPONENTS

Inlet Pump :- One positive displacement internal gear type pump complete with mechanical seal direct driven by TEFC motor. Built in pressure relief valve prevents over pressurizing of the purifier.

Electric Heater :- A low watt density heater (max 2.0 watts/cm²) is used to prevent heat degradation of oil. Heater elements are encapsulated in steel tubes and are thus completely protected.

Pre Filter :- Solid particles are retained in pre filter by pleated cellulose cartridges of large surface area. When the retaining capacity of the filter cartridge (element) is reached, it must be replaced by a new one. A differential pressure gauge will indicate when replacement is required.

Coalescer/separator :- Coalescer cartridges are made of strictly controlled thickness and density glass fibres, having a nominal micron rating of 5 microns. Their main purpose is to transform the water in the oil into a separable form (large droplets). They will also retain some of the solid particles which passed through the filter.

6. INSTRUMENTATION and CONTROLS

Starter :- Comprising magnetic contactor and overload relay protects electric motor.

Pressure/Vacuum Gauge :- Indicates blockage of inlet strainer.

Temperature Controller :- Electronic type, controls and protects the heater.

Differential Pressure Gauges :- Indicates condition of pre-filter and filter/separator.

Flow Control Valve :- Allows operation of purifier at reduced capacity from 0 - 100%.

Main Circuit Breaker :- Protects electric circuitry from shorting or overload situation.

7. OPTIONAL EQUIPMENT

Option F Flow Meter :- with non-re-settable register (up to 999999) is recommended to record quantity of oil purified.

Option H Double Capacity Heater :- is recommended if oil temperature in the tank is below 20°C.

Option P Portable Installation :- on castors is suitable for movement of purifier within the turbine house. Oil inlet/outlet hoses (7m long up to CT2500 and 10m long from CT5000) are included with the P option.



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8. GUARANTEES

Mechanical Warranty :-

Filterall warrants the machinery supplied under this specification against defects in material and workmanship under normal use and service for a period of **12 months** from date of shipment. Filterall's obligation under this warranty is limited to repairing or furnishing without charge, F.O.B. point of manufacture similar part to replace any part which within warranty period is proven defective. Filterall shall not in any event be held responsible for any specials, indirect or consequential damages.

Performance Guarantee :-

Filterall guarantees that the performance of the equipment will be within limitations as detailed in "Duty and Performance" in this specification.

9. DOCUMENTATION

Two copies of **Operating and Maintenance Manuals** are supplied with each purifier.

*FILTERALL RESERVES THE RIGHT TO CHANGE ANY PART
OF THIS SPECIFICATION WITHOUT NOTIFICATION*