Turbine oil filtration in power plants

Duplex Filters: Offering Better Protection for Power Generating Turbines

Contamination — be it abrasive solid particles or water — leads to shortened equipment service life and reduced reliability in steam, gas and hydro turbines and turbo compressors. Oil purity is key to protecting bearings, shafts and hydraulic system components at challenging temperatures and pressures. Continuous control of lube oil contamination is critical in order to maximize the potential of power generation turbines and prevent unplanned shutdowns.

Duplex filters help turbine operators improve oil purity and eliminate downtime due to filter element changeout. Eaton DA, EDA, DU and DWF series duplex filters are field-proven, continuous filtration solutions with trouble-free changeover valves. This design allows the process flow to be diverted to a secondary filter chamber so that one chamber is always in operation to minimize production stoppages or disruptive and costly system shutdowns. An integrated pressure balance valve also ensures easy operation of the changeover valve.

Eaton duplex filters are designed according to EN13445, AD2000 and ASME Sec. VIII, Div. 1 standards and meet PED requirements including CE-marking where applicable. With solutions conforming to most major industry certifications, Eaton can solve virtually any filtration challenge for power generating turbines.

Antistatic Filter Elements: Safe and High-efficient

The trend to use synthetic instead of zinc-based additives in hydraulic oil is increasing. The lack of zinc additive reduces the conductivity of the oil. The lower conductivity can result in the development of an electrostatic charge when the oil flows through a standard hydraulic filter.

When an electrostatic discharge takes place, it can cause damage to the filter, oil degradation, and interrupt electronics. For oils with a conductivity below 300 pS/m Eaton recommends using the IS27 anti-static elements that are designed to provide optimum filtering efficiency while reducing electrostatic discharge.

Features:
- Anti-static design
- High surface area

Benefits:
- Increased machine safety
- Protect electronic systems
- Long filter service life
- Low differential pressure
- High dirt-holding capacity

	Specifications Duplex Filters		
	DWF	**DU**	**DA/EDA**
Connection size	Up to DN200 (8")	Up to DN125 (5")	Up to DN80 (3")
Operating pressure	Up to 16 bar	Up to 63 bar	Up to 40 bar
			

Features and Benefits:

- System flow rates up to 6,000 l/min
- Solid particle removal from 4 to 25 microns and according to API 614 standards
- Several connection options including ANSI, DIN, and SAE
- Three-way changeover ball valve to ensure easy and fast operation
- Available in carbon and stainless-steel material conforming to ASME design and specifications

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In all Types of Power Plants, additional Filtration Products for Hydraulic, Lubrication and Cooling Systems are required for Safe Operation.

HDD

US UM

IFPM

Effective protection of components

Turbine control and auxiliary hydraulic systems require filters to protect the hydraulic equipment and components against contaminants like solid particles and moisture.

Duplex pressure filters HDD 170–450 are suitable for operating pressure up to 315 bar.

The pressure peaks are absorbed by a sufficient margin of safety. Duplex filters can be serviced without interruption of operation.

Oil service equipment for hydraulic and lubrication systems

Eaton recommends additional off-line filtration. In combination with 01.WSNR elements, the US and UM filtration units are used for side-stream return line of the lube oil systems to remove solid particle and free water from the oil. Eaton's oil treatment systems simplify offline filtration and reduce maintenance costs by extending oil and component life.

Filter elements for water absorption and particle retention

01. WSNR Watersorp elements are ideal for use in off-line filters to remove particles and free water from the hydraulic systems.

Features:

- Absorb free and emulsified water from oil
- Filter particulate contamination
- Reduce oil aging
- Nominal sizes: 250–1,000 (10 bar)

Effective removal of free water

Water is one of the most frequently occurring contaminants and is second only to particulate contamination as a destructive foreign substance in a system.

The fully-automated, PLC-controlled purifiers IFPM 33 and IFPM 73 effectively remove free, emulsified and dissolved water, free and dissolved gases, and particulate contamination down to 3 µm from light transformer oils to heavy lubricating oils at a flow rate of 30 l/min or 70 l/min.

OE

Clogging indicator for continuous contamination control

Reliable indication of when to change the filter element is as important as the filter itself. As the filter element becomes clogged the differential pressure increases. A clogging indicator is designed to monitor the differential pressure and alert an operator when the filter element needs to be replaced. For reliable indication of duplex filter systems Eaton recommends the rugged and explosion proof OE indicator. It is available with two electrical set points at 70% and 100% clogged and is easily integrated into automatic control systems.

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