

Franke Filter Oil Mist Separators

an individual solution for the treatment of oil mist





1. Introducing Franke Filter GmbH



- Midsize german company with 40 employees
- Specialist in producing Oil Mist Separators for steam and gas turbines, engines, gearboxes, compressors, generators and hydro turbines
- Development, design, production and sales from Bad Salzdetfurth, Germany
- Collaboration with partners in about 15 countries distributed worldwide
- Our Clients: Turbine manufacturers (Siemens, GE, Voith, Atlas Copco, Mitsubishi Hitachi, Ansaldo) Lube Oil System manufacturers, Power stations and others.



2. Franke Filter Oil Mist Separator

- Individual compact design
- Highest quality standards
- Certified according to ISO 9001:2008
- ATEX compliant filter systems
- IQ-Net certificate
- CE compliant
- WPAR certified







3. Franke Filter Oil Mist Separator

Components:

- S1 Suction flange
- S2 Suction pipe
- S3 Filter housing (containing filter cartridges)
- S4 Filter lid
- S5 Oil return line
- S6 Under pressure gauge I
- S7 Under pressure gauge II
- S8 Internal secondary air
- S9 Side channel vacuum pump
- S10 Motor
- S11 Clean air pipe
- S12 Clean air flange



S1



4. Filtration process of the OMS

Operation:

- Oil Mist is extracted using the vacuum generated by the side channel pump
- Oil Mist is catched and goes through the filter cartridges, remaining there the impurities and moisture contained
- Due coalescence effect and gravity force the recovered oil goes down to the bottom of the filter housing and clean air is exhausted to the atmosphere
- The recovered oil can be stored in a small tank and is completely clean retaining all its additives





5. The problem: Oil mist in Hydropower stations

a) Oil mist, when you can smell and see it

Condensation of oil everywhere, damage on electrical instrumentation,

Health problems,
Accidents and
Maintenance worksImage: Construction of the second second



5. The problem: Oil mist in Hydropower stations

b) Oil mist, when you can not easily see it



Generator lower bearing

Exciter: Oil mist condesate on the surface of the rings surfaces producing serious problems, the carbon brushes can not work properly, overheating and serious damages are the result at the end



Generator upper bearing

Rotor: Oil mist condensation together with carbon dust from the carbon brushes, producing a **dark paste**, difficult to eliminate and by cleaning it with agressive solvents, the conductivity with the time is actively affected; resulting in really costly maintenances works and stops







6. The solution: FF Oil Mist Separator

Special application in Hydroturbines, one filter for the individual extraction at more than one bearing at same time





6. The solution: FF Oil Mist Separator

Keeping clean and safety, with a long time continuos operation

- Extraction directly from the bearings avoiding to scape the oil mist
 - Individual adjustment, just the necessary vacuum each bearing need





Vertical Groups <u>Hohenwarte II</u> (Vattenfall Thüringen, Germany)





Horizontal Groups <u>Vianden</u> (SEO Luxemburg)







<u>Åsmulfoss Power Plant</u> (NTE, Grong Norway)/ One Filter, 4 extrations points

Installation Franke Filter

Principal Drawing FRANKE FILTER Filter Unit 1 **Turbine Control Desk** : xxxxxxxxxxxxxxxxxx SMW BULB TURBINE (H - 90) Turbine Oil Tank: XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXX Generator Guide/Trust Bearing: Turbine Bearing: XXXXXXXXXXXXXXXXXXXXXX xxxxxxxxxxxxxxx XXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXX



Bissorte Power Plant (EDF, Savoie France) one Filter, 3 extrations points







Suldal Power Plant (Hydro, Norway) one Filter, 2 extrations points, upper & lower generator bearings





Delivered and installed by Voith Hydro Sarpsborg AS



Porabka Zar Power Plant (PGE, Poland) one Filter, extraction to the turbine bearing











8. FF Oil Mist Separator some advantages



- Compact individual design, one Oil Mist Separator
 for one group
- Exact adjustment of the required vacuum for each bearing with one equipment, which is located in a central place
- **About 30, 000 hrs. of continuous work** (before the replacement of the filter cartridges is necessary)
- Reducing costs of maintenance and protection of the environmental and employees
- Protecting of the lifetime of the generator
- In general a clean work atmosphere and a workplace safety