

Drying of Water Cooled Vacuum Capacitors

1. General

All vacuum capacitors with water cooled bellows are to a certain extent susceptible to corrosion both during service but also when they are out of operation. To minimize bellows corrosion during service, one has to observe the max. flow rate i.e. water velocity/pressure and the water quality (see Service Bulletin SB-26 "Liquid Cooling System and Water Purity Requirements").

When a capacitor is taken out of service, the water has to be completely removed to avoid bellows corrosion. This is necessary e.g. when a capacitor has been used in factory testing at the OEM and is then taken out of service for an unknown amount of time prior to commissioning at the customer's site, or when a factory is shut down for a certain amount of time (summer shut down, lack of work etc.), or when a transmitter is idle for a relatively long time. It is the purpose of this Service Bulletin to give instructions of how to effectively dry these capacitors in order to gain service life.

2. Drying Procedure

In order to avoid corrosion of the removed capacitor, it should be dried by using a vacuum pump and the water connections should be closed by using plastic caps or rubber plugs. Please observe the following steps:

- a Disconnect water connections, empty out water
- b Make one of the connections vacuum tight
- c Connect hose of vacuum pump to other connection
- d Blow at mounting plate, variable side, using 60°C air (do not blow hot air directly onto water chamber as o'rings could be destroyed!)
- e Start using vacuum pump: pressure will reach about 10 mbar (~ 10 mm Hg) and will stay at this level as long as there is water in the system
- f Continue pumping for about 10 minutes so that pressure goes below 1 mbar

In case the end pressure is not reached after 20 - 30 minutes, the capacitor may be iced up or the vacuum system may show a leak.

3. Hardware Recommendations

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| Pump | Water proof membrane pump or 1 or 2 stage roughing pump (Edwards, Balzers or equivalent). Please observe manufacturer's instructions in regard to water in the oil. |
| Blower | Industrial heating blower, approx. 1 - 2 kW heating power |
| Measuring Equipment | Pirani vacuum gauge (Edwards, Balzers or equivalent) with end pressure < 10 ⁻¹ mbar (~ 10 ⁻¹ mm Hg) |

Vacuum Hose Plastic hose with spiral wire reinforcement