



WRITE UP ON VACUUM BREAKER VALVE WITH PNEUMATIC ACTUATOR FOR 660/800 MW STEAM TURBINE SETS

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General Description:

Vacuum breaker valve is centerline butterfly valve. Vacuum breaker valve significantly shortens the duration of coastdown of the turbine generator unit, following turbine trip in critical operating conditions. The vacuum breaker valve can minimize the extent of possible damage resulting from emergency situations. Vacuum breaking is only performed automatically as a result of the signal “Turbine oil supply emergency operation TRIP”.

Manual activation of vacuum breaker is also allowed only through DCS (HMI) in events of critical fault conditions (e.g. bearing temperature protections, excessive absolute bearing pedestal vibrations) but to be kept to minimum and if absolutely necessary.

Function:

With normal shut down or tripping of the machine, the function of the vacuum breaker valve is to cause an increase in condenser pressure by admitting atmospheric air into the condenser together with bypass steam flowing into the condenser from the bypass station. When the pressure in the condenser increases, the ventilation of the turbine blading is increased, which causes the TG set to slow down so that the running down time of the TG set and the time needed for passing through critical speeds are shortened.

Salient Features of Vacuum Breaker valve with Pneumatic actuator:

- Valve type: Centerline Butterfly valve
- Valve parameters:
 - Nominal size/ Flange size/Pressure rating: 6” to 12”/ANSIB16.5RF/ Class150
- Operation medium:
 - At valve inlet: Air
 - At valve outlet: Wet Steam
- Operation pressure at valve inlet: 1 bar (a)
- Operation pressure at valve outlet: ≤ 0.3 bar (a)
- Temperature at inlet: -10°C to 55°C
- Temperature at outlet: 130°C (max.)
- Required operation time for the Vacuum Breaker Valve:
 - $T \leq 2.4$ sec (open direction)
 - $T \leq 2.0$ sec (close direction)
- Control air pressure for operation of actuator:
 - Minimum 5 bar

- Maximum 10 bar
- Leakage class: - Gas and Liquid tight According to DIN 3230, Leakage Rate 1 or Leakage class V according to ANSI FCI
- The vacuum breaker valve is operated through solenoid valve with pneumatic actuator.

The typical schematic diagram of Vacuum Breaker valve with Pneumatic actuator is shown below:

