

SYSTEM DESCRIPTION SAE VENTILATION SYSTEM GENERATOR	Respons. dept GPMI	Date 040211	Reg. M DB 101
	Prepared Peter Mattsson		YAMAMA CEMENT
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### Purpose of the system

The generator ventilation system is designed to supply the air-cooled generator with necessary amount of filtered air for cooling of the generator.

### General description of the system

Refer to P&ID 2046033.

Air enters the system from one side through the weather louver and one stage filter bank into the central part of the jet-pulse housing. Each combined filter bank is equipped with a number of pulse cleaning modules.

Air to the pulse clean ejectors is taken from an instrument air system, passing a filter, a pressure reducing valve and enters an air accumulator. Each is accumulating the air needed for one cleaning sequence on respective cleaning module.

The pulse cleaning sequence is activated on high differential pressure across the filter. The pulsing is performed by shut-off valves, one per two filter cartridges.

The dust collected during pulse cleaning is removed from the filter housing by dust removal fans.

The ventilation flow is generated by the shaft mounted fans on the generator rotor ends.

The inlet duct consists of weather louver, jet-pulse filters and silencer and the outlet duct silencer , check valve and louver.

The system is designed to match local air quality and weather conditions.

### Main components SAE

- Inlet silencers, generator cooling

SAE30BS015

SAE30BS020

The silencer prevents noise breakout to the environment.

- Outlet silencer, generator cooling

SAE30BS025

The silencer prevents noise breakout to the environment.

- Check valve , generator outlet .

SAE30AA005

The check valve prevents dust at standstill .

- Outlet weather louver, generator cooling

SAE30AT050

The weather louver prevents objects and precipitation from entering the ventilation outlet.

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- Differential pressure manometer , filter house  
SAE30CP020  
The manometer is monitoring the differential pressure across the filter sections .
  
- Purge air valves  
SAE40AA005  
The valve may be used to isolate the air accumulators during maintenance.
  
- Air accumulators  
SAE40BB005
  
- Diaphragm valves  
SAE40AA010  
One pulse of air from the nozzle into the blowpipe above each element set provides both a shock wave inside the filter cartridge and a momentary reverse flow.
  
- Weather louver  
SAE40AT035  
The weather louver prevents objects and precipitation from entering the air intake.
  
- Filter section  
SAE40AT045  
Each filter section consists of standard sized filter cartridges and prevents particles from entering the gas turbine.
  
- Dust removal fans  
SAE40AN005  
The dust removal fans are operated during the cleaning phase, each fan removes the dust collected in its filter section during pulse cleaning.
  
- Differential pressure transmitter  
SAE40CP015  
The differential pressure transmitter signal is used for monitoring of the differential pressure over the filters.  
High differential pressure (H1) initiates an alarm.
  
- Differential pressure switch  
SAE40CP025  
The differential pressure switch is measuring across the filter sections.  
High differential pressure (H1) starts the jet-pulse cleaning sequence.  
Low differential pressure (L1) stops the jet-pulse cleaning sequence.
  
- Pulse clean filter control box  
SAE40GH005  
The control box contains logic, contactors for the dust removal fans and cleaning logic for the filter elements. Fault in the equipment initiates an alarm.

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**Function**

*Start up*

*Continuous operation*

Air flows through the pulse clean filter and through the silencer before it enters the EG-inlet. The system is in operation and if a high differential pressure across the filter is measured, the pulse clean air equipment starts cleaning the filter. Dust is removed from the filter sections by the fans.

*Turbine stop*

*Stand still*

The ventilation EG can be manually operated any time during stand still, except when a gas warning is active.

**Disturbances**

*Gas turbine trip*

N/A

*Generator breaker trip*

N/A.

*Loss of power supply*

Loss of AC power supply stops the pulse clean cleaning function.

*System faults*

Faults on the fan or the control valve and the pressure reducing valve of the pulse clean air supply line, may cause clogged filter .

*Other faults*

N/A.

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## Technical specification

### *Design criteria and standards*

### *Dimensioning data*

Heat dissipation from generator: 524 kW (50 Hz)

Design flow air cooled generator: 9,1 m<sup>3</sup>/s (50Hz)

Max. total pressure drop: 400 Pa

### *Engineering data*

### *Emergency power supply*

N/A

### *Installation*

The jet-pulse filter is installed on a frame , the generator cooling air inlet duct is installed on the generator roof and on a separate support. The outlet duct is erected on the generator roof.

### *Materials*

Ducts and units in galvanised steel.

### *Component data*

See the system lists

## Testing and service

### *Testing during normal operation*

Check of the differential pressure trends and visual inspections of filters for planning of filter maintenance shall be done regularly .

### *Accessibility during normal operation*

Maintenance work on the pre-filter is possible during continuous operation .

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