Kanadevia INOVA

Fabric filter cleaning system

Intelligent control and optimisation

Monitoring – control – optimisation

The fabric filter control and optimisation solution monitors, controls and manages the cleaning of filter bags, reporting filter malfunctions instantly to the operator. This optimises the service life of filter bags, minimises cleaning air consumption and simplifies maintenance. The system is also easy to use and highly flexible.

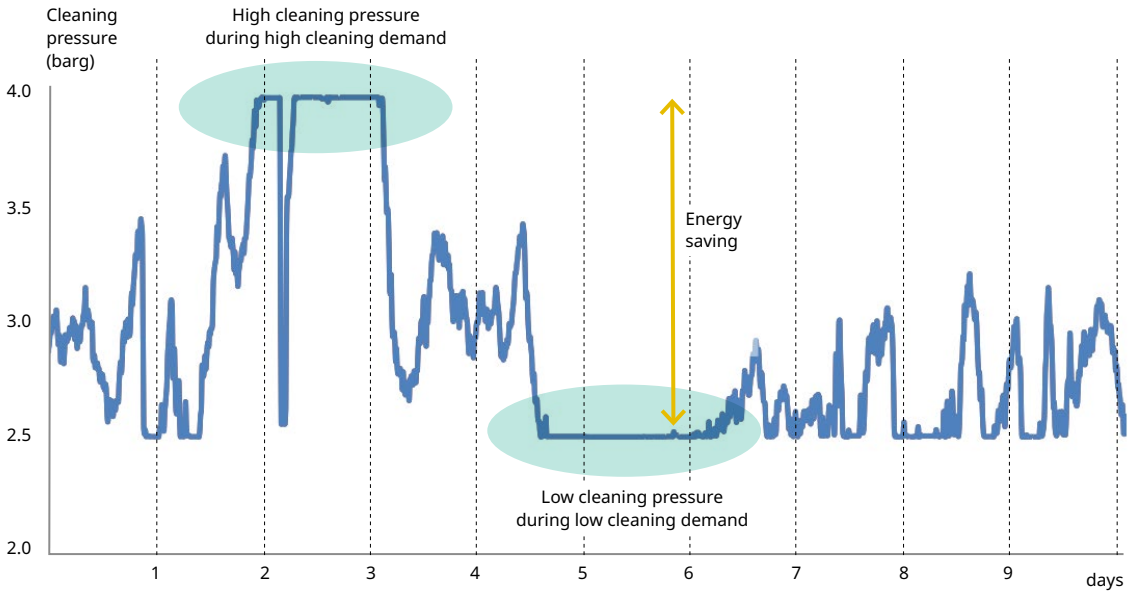
The fabric filter control and optimisation solution is built on the basis of tried-and-tested technology. Our automation experts have refined the traditional filter cleaning system and improved its functionality in terms of monitoring and utilising fabric filters. The result is an easy-to-use, individually adaptable control unit.

The system gathers measurement data as the basis for coordinating the selective cleaning of filter bags on a fully automated basis, regulates cleaning sequences for individual filter bag lines, and minimises the cleaning air pressure to the necessary minimum. It uses high-performance sensors to instantly detect valve failures and damage to bags, and to display the position and type of defect. It also monitors valve function, differential pressure, and flue gas volumetric flow.

Condition-based maintenance

If there is a defect in the cleaning system leading to an increase in differential pressure, the control unit pinpoints the relevant valve or filter bag instantly, allowing timely replacement of the faulty element. The control system thus ensures cleaning is timed perfectly, helping extend the service life of filter bags and reliably detect damage early on to avoid unscheduled downtime and excess emissions.

Filter cleaning pressure (regulated)

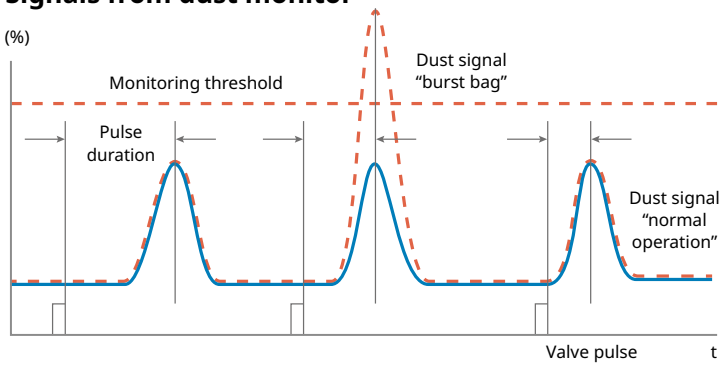


Set-up and process

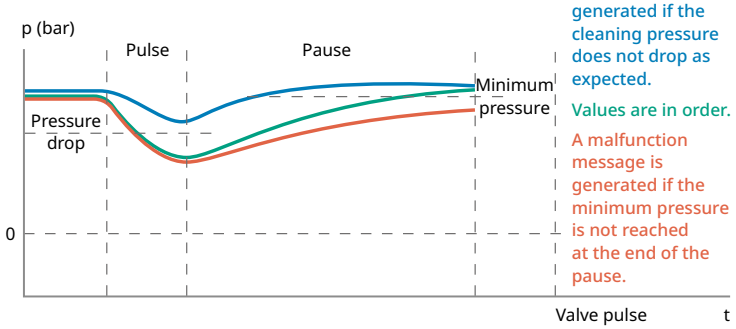
By permanently collecting a range of measurement data, the system is able to regulate the differential pressure in the filter independently of volume flow. During the cleaning process, the pressure drop in the compressed air vessels is also monitored and compared against the opening time of the valve to give a clear indication of the condition of the diaphragm and solenoid valve. The solenoid valve is also monitored by measuring electric current consumption of the valve.

The new control unit rapidly processes data locally to indicate faults that were not detectable using the old system. The new model can also be integrated with the plant's distributed control system (DCS) as required. This enables filter cleaning to be managed via the DCS, with the local monitoring system capturing all the necessary parameters. Alternatively, filter cleaning can be both monitored and managed locally.

Signals from dust monitor



Pressure monitoring of manifold



A malfunction message is generated if the cleaning pressure does not drop as expected.

Values are in order.

A malfunction message is generated if the minimum pressure is not reached at the end of the pause.

Cleaning pressure adjustment (patented)

The filter cleaning system uses an electro-pneumatic air pressure regulator to lower the cleaning pressure whenever possible and increase the cleaning pressure during high demand peaks. This not only saves electrical energy, but helps to extend the life time of the filter bags.

Filter bag monitoring

The filter cleaning system uses the volumetric flow to calculate the current gas flow speed and work out the time required for a cloud of particulate emissions from chamber X to reach the sensor. If a bag is damaged, the particulate signal exceeds the monitoring threshold set in the system. In this case a malfunction message is generated, precisely localising the filter bag line in question. Changes in the particulate signal over longer observation periods also enable the lifetime of filter bags to be predicted.

Tank pressure measurements and valve control

To check the valve function, the pressure measurement system monitors the pressure drop in the tanks during the cleaning process with millisecond precision. A malfunction message is generated if the cleaning pressure does not drop as anticipated. A message is likewise generated if the pressure fails to return to the starting value within a prescribed period of time after cleaning. Measurement of the electric current consumption of the valves also enables the solenoid valves to be monitored.

The advantages at a glance

- Precise cleaning of filter bags evens out the load on filter surfaces
- Faulty valves are detected and pinpointed immediately
- Early detection and localisation of defective filter bags enables rapid intervention
- Saving electrical energy for cleaning air and extending the bag life time
- Comprehensive monitoring facilitates condition-based maintenance
- Short, plannable inspection windows
- Easy to use locally, via distributed control system, or remotely

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