

## Case story

# International airport cleans up its power supply with active filters

**Danfoss VLT® Advanced Active Filter AAF 006 units reduce grid disturbances and help secure the power supply at “Region de Murcia” International Airport in Spain.**

The new international airport in Murcia is envisioned to become the gateway to a wide range of Spanish destinations with significant growth potential. With an annual capacity of 3 million passengers the airport can handle 23,000 annual passenger movements (landings and take-offs) per year. Two Danfoss VLT® Advanced Active Filter AAF 006 units are used to secure reliable operation of the airport's emergency generators.

#### Securing stable power is critical

Airports are critical installations, where an interruption in the power supply can cause serious failures in aeronautical navigation systems such as radios, runway lighting, communication systems, etc. Emergency generators must therefore be able to start up instantly and keep crucial systems online.

“It is extremely important that we don't lose our power supply during incidents in the grid,” says Juan Manuel Jiménez Checa (SAMPOL), who was responsible for the implementation of this new solution.

SAMPOL already had experience with Danfoss filters in connection with a similar challenge at Fuerteventura Airport in Spain. With this in mind the company contacted Danfoss to hear if a similar solution was possible in the new airport.

#### Experience with Danfoss from previous project

According to Sergej Kalashnikow, Business development manager at Danfoss, who together with his Spanish colleague Aranzazu Rodriguez cooperated with the Spanish contractor, SAMPOL, in the project, the actual start-up of an emergency generator is the most critical part of its operation. It is also here that reactive currents can pose a risk.

“We want to avoid reactive currents because they place an additional load on the generator and grid, which prevents the power source from providing the rated power,” he explains.



Before the Danfoss filters were installed the lagging reactive current reached 600 kVAr due to the extensive length of the power cables at the airport. This is well above the expected maximum of 120 kVAr. As a result the generator did not work correctly.

"In the worst case the generator will not start up at all and ultimately cause the entire emergency system to fail. For obvious safety reasons the airport cannot allow this to happen," says Sergej Kalaschnikow.

#### The solution

Issues related to reactive currents are typically solved by using passive components such as reactors (inductors). However, the most efficient way is to use filters that handle currents actively, without causing negative effects such as resonances, which often appear when using passive solutions.

In this project the Danfoss active filters were installed on the secondary side of the auxiliary services transformer, which is a medium voltage dual secondary coil transformer. One of the coils is used to power auxiliary service equipment and the other to supply the filters. Combined,

the filters guarantee that the reactive currents always stay well below 120 kVAr when the generator starts up.

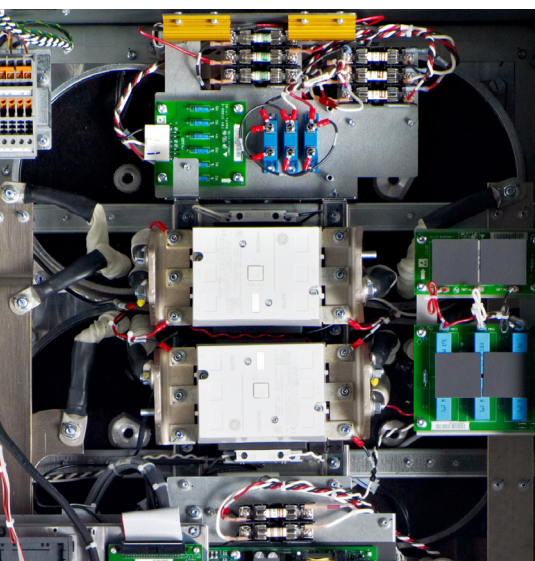
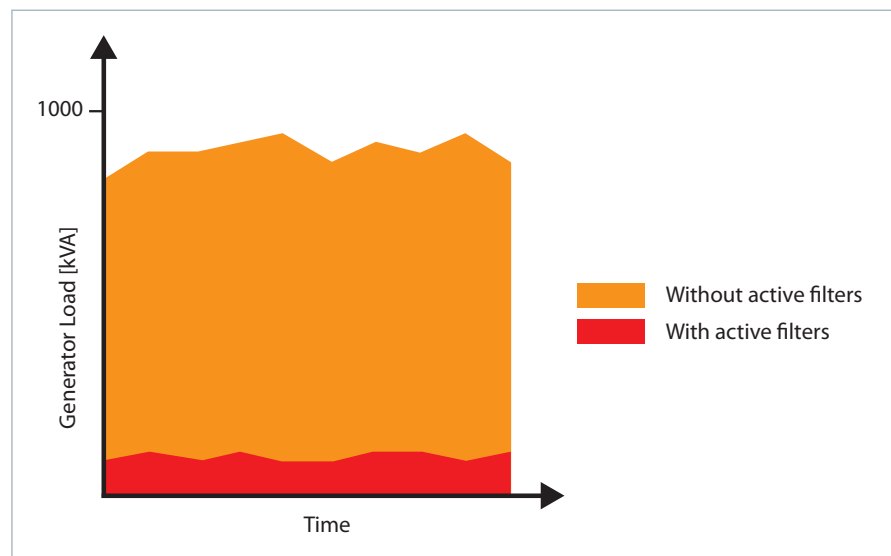
The new filters were installed in October 2012 and passed the final tests in January 2013. Juan Manuel Jiménez Checa is satisfied with the solution.

"The two active filters compensate for lagging reactive currents and ensure safe and reliable operation of the airport's emergency generators, he concludes".



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Juan Manuel Jiménez Checa,  
SAMPOL



#### Advantages of Danfoss active filters

- **Small dimensions** compared to alternative solutions as the chokes are dimensioned to counteract the reactive power in the specific application
- **Expandable solution.** Should the grid grow in the future, the reactive power generated by longer cable lengths can easily be met by installing an additional filter in parallel to the existing one. This can be achieved without significant modifications to the overall system
- **Easy to use.** Even without expert knowledge operators can vary the parameters for compensation and operation modes easily. Filters can be integrated into the SCADA (Supervisory Control and Data Acquisition) system easily and controlled via MODBUS
- **Minimum maintenance.** After being set up, active filters need no maintenance

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