

ENGINEERING
TOMORROW

Danfoss

Case Study | VLT® HVAC Drive FC102

Totally reliable air conditioning for 6,000 m² Equinix server rooms

**Best-
practice**
motor optimization

A long line of pumps controlled by the VLT® HVAC Drive FC 102. Each pump has been installed in duplicate, allowing an immediate switchover, if necessary.

drives.danfoss.com **VLT® | VAGON®**

VLT® HVAC Drive ensures that **maximal Internet uptime** is also **cost-effective**

The Internet has become a part of our lives, and almost everyone uses it on a daily basis. We take for granted that it will always be there and work fast and reliably. But what is the Internet exactly? The Internet comprises a worldwide public system of computer networks that are connected to each other. The network therefore consists of multiple networks. The Internet therefore has no central servers. The data transmitted via the Internet can take many different routes. This is usually done via data centers. For companies and government authorities, it is essential that they are always available to their customers and employees. This requires powerful and expensive servers. The installation, setup and maintenance of a datacenter is no easy task, which is why this is usually outsourced to data centers. Data centers are set up using top-end equipment which is kept running with the utmost care, ensuring a correctly operating Internet connection.



Outdoor installation for the regulation of the cooling towers, comprises two VLT® HVAC Drive FC 102 drives in IP55 enclosures, with built-in disconnect switch.

Equinix has eight data centers in Amsterdam, with over 35,000 m² of server rooms. Internet use is still growing exponentially, partly as a result of the IoT (Internet of Things), streaming and big data.

We are talking to Etienne Boeracker, Senior IBX Facility Engineer at Equinix. Boeracker: "The technique required for the correct and reliable operation of all this digital equipment requires a lot of attention."

Boeracker compares a data center with a kind of hotel, where customers (companies, organisations, governments) can hire a room or a suite to locate their own server, or may opt to use hired equipment. The site we are visiting today in the south of Amsterdam has six zones, each with 1,000 m² of client space, making a total of 6,000 m².

"Everything has to be just right: the temperature, the humidity, the quality of the mains voltage, the networks. All with a 100% guarantee that the equipment can continue running. All the servers are running behind a UPS which is fed by enormous batteries. These batteries ensure that the emergency power units can be switched on in the event of a power cut without the customer even noticing. After all, if a company's server goes down, it really affects the heart of the company. That is why everything is done in duplicate, so that if any one component fails, the other one takes over. The same applies to the building's

air conditioning system. Each UPS, each pump, each fan has built-in redundancy. This means that even if mains power is lost, the data center will be able to continue to run as normal using the emergency power units.

Energy-efficient heat extraction

The customer servers at this location use approximately 7.2 MW in power. All that energy is eventually converted into heat. Air conditioning is therefore essential in the server rooms. As much heat as possible needs to be extracted to ensure a long service life for the sensitive digital equipment. That's why the building has no less than six cooling towers on the roof. These cooling towers allow it to continue running under even the most extreme conditions.

The building's cooling system is also powered by an underground Aquifer Thermal Energy Storage (ATES), instead of mechanical cooling. ATES is an innovative thermal technology that allows cold to be stored in the winter to be used during the hot summer months.

Fast return on investment

Sustainable operating principles, which ensure the data center uses power as

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Etienne Boeracker, Senior IBX Facility Engineer at Equinix

efficiently as possible, are essential to remaining competitive.

As such, an important parameter or KPI (Key Performance Indicator) is the Power Usage Effectiveness (PUE). This expresses the ratio between the total power consumption of the customer’s equipment and the total capacity of the site. The PUE in the most modern of plants today is 1.2. Many savings can be made by having a good design and good control systems. For example, the most energy-efficient data centers use heat/cold storage and heat recovery is applied where possible. Having multiple options available offers the freedom of using the best combination of facilities such as cooling towers and sources. Boeracker: “We use Danfoss AC drives for all the pumps and ventilators.

We normally recover the investment in a Danfoss drive within a matter of months; that’s how much impact it has on power consumption. Not only do these drives conserve lots of energy in the motor as a result of the reduction in revs, they also ensure that pumps achieve the highest possible hydraulic efficiency. This has a substantial impact on the efficiency achieved by the overall installation. By running the pump in the correct curve, its service life is also extended. Monitors have

been installed on the pumps to track them as closely as possible.

IE4 motor compatibility

Boeracker is convinced that there is still room for improvement in the energy efficiency. “We are also looking at using IE4 motors for the new sites we are currently planning. Luckily Danfoss drives are prepared for this, being designed for compatibility with all typical motor technologies. This will allow us to select the best performing combination together with the pump supplier.”

Only the best will do

The reliability of the installation is essential. In achieving total reliability, Boeracker considers the quality of the equipment used to be of the utmost importance, but also the availability, the quality of the service provided and the relationship with the supplier play a major role when deciding, for example, on AC drives.

Boeracker: “Our standard is the VLT® HVAC Drive FC 102 in an IP55 enclosure. We can use it for everything, thanks to the excellent training our technical team received at Danfoss. The VLT® Motion Control Tool MCT 10 communication software is another valuable tool we frequently use.

Recently, we discovered that the Automatic Motor Adaption (AMA) function gives us much faster commissioning, and at the same time ensures the best-case energy-conserving combination of engine and drive.”

“Approximately 135 Danfoss drives are currently in operation at this location, with power sizes varying from 1 to 45 kW. They are extremely reliable. Still, if something unexpected does happen, Danfoss always helps us to resolve the matter quickly and efficiently.”

Remote monitoring and analysis

“The AC drives communicate with a higher-level building control system via Modbus. Each drive generates a lot of information which is loaded into the CMS (Cooling Management System), allowing us to take the right decisions. Everything can be monitored and analyzed remotely. If a failure occurs outside of working hours, I don’t have to leave home to check what’s going on and often I can see where I need to look for the problem.”

People make the difference

Boeracker is clear on one thing. The people working for Danfoss, both in the sales and service department,

make the difference. If the current team were to supply a different brand of the same quality, then he would probably opt for the people and follow them. "Danfoss is, without a doubt, an extremely good and reliable supplier of AC drives, but the value added by the Danfoss team in Rotterdam and in the Service Center in Herveld is absolutely what tips the scales."

Each year, Boeracker joins the motor tour a social and networking event organized by Danfoss. "It is a great opportunity for me to meet people face-to-face and get to know them better," says Boeracker.

Preventive maintenance

An installation this size can only operate reliably if preventive maintenance is carried out regularly according to a strict schedule. This keeps unplanned failures and the associated corrective maintenance to a minimum. The information supplied from the drives is a great help in scheduling preventive maintenance.

All in all, Etienne Boeracker is extremely satisfied. He has excellent control of the installations and manages to achieve an extremely high level of reliability.

He concludes by saying: "I can now concentrate on making the installation even more energy-efficient and improving the PUE even further. We focus continuously on further improving reliability, allowing our customers and their customers to use the Internet without interruption."



People make the difference. Roy Looren de Jong of Danfoss in an interview with Etienne Boeracker (right).



Neat, well-organized installations ensure the best possible up-time.

About Equinix

Equinix, Inc. (Nasdaq: EQIX) connects the world's leading businesses to their customers, employees and partners inside the most interconnected data centers. In 48 markets across five continents, Equinix is where companies come together to realize new opportunities and accelerate their business, IT and cloud strategies. In a digital economy where enterprise business models are increasingly interdependent, interconnection is essential to success. Equinix operates the only global interconnection platform, sparking new opportunities that are only possible when companies come together.

Equinix globally

1400+ Networks, 2500+ Cloud and 600+ IT providers, 475+ financial buy-side and sell-side firms, 200 datacenters, 48 markets.

Equinix in Amsterdam

8 sites, 35,750 m² whitespace, 150+ network services providers (AMS-IX and NL-IX).

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