

Suitable for “slave” operation

The drives modular structure makes it suitable for “slave” operation mastered by BMS, PLC’s or DDCs.

Sleep Mode

In Sleep Mode the drive detects situations with low or no flow.

Instead of continuous operation it boosts the system pressure and then stops to save energy. The drive starts automatically when the pressure falls below the lower set point.

Dry Pump Protection and End of Curve

Dry Pump Protection and End of Curve relates to situations where the pump runs without creating the desired pressure – as when a well runs dry or a pipe leaks.

The drive throws an alarm, shuts off the pump, or performs another programmed action.

Belt Monitoring

From the relation between current and speed, the VLT® HVAC Drive reliably recognize a broken belt. Lack of air flow is this way detected immediately, without dp-switches across the fan.

First cost and down-time is reduced.

Automatic Energy Optimisation

The unique Danfoss AEO function provides optimized motor magnetisation at all speeds and loads.

- | Increase energy efficiency by 5-15% at partial loads
 - | Reduced acoustic motor noise.
 - | Extended motor life by reduced motor heating
 - | High system efficiency even when using oversized motors
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Flow compensation

Significant energy savings and reduced installation costs comes from flow compensation in both fan and pumps systems. It takes only a pressure sensor mounted close to the fan or pump to give a reference to keep constant pressure at the discharge end of the system. The drive constantly adjusts the pressure reference to follow the system curve.

Fire override mode

In Fire Override Mode the VLT® HVAC Drive will not react on control signals, warnings or alarms. It will continue its reliable operation as long as possible and run - eventually - until self-destruction.

In Fire Override Mode the drive will ignore all its internal alarms and motor protecting features in order to secure operating – and if needed to bypass itself – until “meltdown”.

The feature is standard built-in intended for use in functions, where continued operation is vital in emergency situations like fire outburst.

This can be the case in HVAC applications, where smoke extraction and air supply is vital under any condition.

Clearly indicated

The Fire Override Mode is clearly indicated in the display to prevent any confusion. When set, the drive will override self protection and therefore is exposed to permanent damage in case of over heating or overload. But the goal is to keep the motor running even if it means self-destruction.

Bypass



If a bypass is available, the drive will not only sacrifice itself in case of an extreme condition, but is able to bypass itself and connect the motor directly to mains and this way keep operation going as long as power is provided and the motor is functioning.

Typical application

Smoke extraction from traffic tunnels, subway stations, stairwells.

Stairwell Pressurization

In the case of fire, the VLT® HVAC Drive can maintain a higher level of air pressure in stairwells than in other parts of the building and ensure that fire escapes remain free of smoke.

50° C ambient temperature

The robust VLT® HVAC Drive is designed to work at maximum output in an ambient temperature up to 50° C.

Pump Cascade Controller

The Pump Cascade Controller is the most sophisticated controller on the market - yet standard in VLT® HVAC Drive.

It distributes running hours evenly across all pumps, keeps wear and tear on individual pumps to a minimum and ensures all pumps are in great shape.

- | Improved system efficiency by up to 50% compared to constant speed pumps.
- | Standard and master/slave configuration with up to 5 pumps.
- | Lead pump alternation with up to 4 pumps assures equal usage of all pumps (standard configuration).
- | MUSEC PC calculation software available for optimum setup of master/slave system.

Standard cascade control mode provides bandwidth flow or pressure control in a system with one VLT® HVAC Drive with the cascade controller option and up to 4 constant speed pumps. A flow, pressure, or level transmitter provides feedback to the drive. According to the system demand, the cascade controller stages the constant speed blowers/pumps on and off while varying the speed of the lead blower/pump.

The constant speed devices may utilize a softstarter in order to avoid problems associated with across-the-line starting.

Master/slave control mode

Master/slave control mode offers the best performance, accurate control and maximum energy savings.

Master/slave systems control multiple pumps in parallel, running all blowers/pumps at the same speed. The controller stages the blowers/pumps on and off according to system requirements and along with the MUSEC™ software can be programmed to optimize system efficiency with its "best efficiency" mode.

Vital water supply

Vital water supply can be assured in case of leakage or a broken pipe e.g. Overload is prevented by reducing speed - and the vital supply is secured at lower flow.

Lower AHU costs

The VLT® HVAC Drive is born with a built-in Smart Logic Controller and 4 auto tune PID controllers and can control air handling functions with fans, valves, and dampers. The building managements DDC's is thereby released and valuable data points (DP) are saved.

Extends BMS capacity

When integrated into the BMS network, all the HVAC Drive I/O points are available as remote I/O's to extend BMS's capacity. For example, room temperature sensors (Pt1000/Ni1000) can be directly connected.

- | Built-in Real Time Clock

- | Programmable actions
- | Smart Logic Controller
- | 4 auto-tuned PID controllers

Intelligent AHU functions

The VLT® HVAC Drive handles logical rules and input from sensors, real-time functionality, and timer-related actions.

This enables the HVAC Drive to control:

- | Weekend and working-day operations
- | Cascaded P-PI for temperature control
- | Multi-zone pressure control
- | Flow balancing between fresh and outlet air

Resonance Monitoring

By pressing a few buttons on the Local Control Panel the drive is set to avoid frequency bands at which connected fans create resonances in the ventilation system. This improves building comfort.

Energy monitoring

The VLT® HVAC Drive provides a complete range of information on energy consumption. Choose to have the absolute energy consumption divided into hours, days or weeks. Or choose to monitor a load profile for the application.

Energy analysis

Data can be uploaded to the VLT® Energy Box, the PC software that performs in-depth real life/true energy analysis of your application and displays the payback time for the drive.

MCT Energy Box is a tool to calculate economy and energy savings in your application.

Enter specifications and requirements from your building, and the software will give you an overview of requirements and benefits from Danfoss HVAC control.

The MCT Energy Box is available at your local Danfoss drives provider.

Set point in temperature

The VLT® HVAC Drive calculate the actual room temperature from the pressure in the cooling media and refine compressor operation accordingly - without the need for additional software, sensors or controllers.

The calculation goes for the set point too, so the desired temperature is set via the Local Control Panel - and not a pressure value.

Replace a cascade with a single compressor

The VLT® HVAC Drive provides the same level of flexibility with one large compressor instead of a cascade of 2-3 smaller compressors.

As the HVAC Drive operate all compressors at a far more refined range of speeds than normally – even above nominal speed - one large compressor is now enough.

Fewer starts and stops

A maximum number of start/stop cycles within a given period of time can be set via the Local Control Panel. Since start-up is the most critical part of compressor operation (all parts of the unit are under mechanical stress before the system is sufficiently lubricated) this extends the compressor lifetime.

Quick start-up

To extend the life even further, the VLT® HVAC Drive opens a bypass valve and let the compressor start quickly without load.

The VLT® HVAC Drive provides 160% break away torque and can give 110% torque for 60 seconds in normal operation. This torque demand would normally require larger and more expensive drives.

Real Time Clock

Allows the building to keep track of time

The optional Real Time Clock (RTC) enables VLT® HVAC Drive to perform predefined actions in predefined sequences. This is a strong tool for controlling HVAC systems where the drive is not connected to a Building Management System (BMS), or if the drive is used as an intelligent component.

VLT® Real Time Clock gives the following advantages:

- o Start/stop of ventilation/heating cooling system on time – with the results of energy saving
 - o Change setpoint (closed loop, by changing setup) – adjusting temperature/humidity/pressure to the required level increases comfort and labor efficiency.
 - o Change speed based on the actual time – (weekday, time) to ensure the best ambient at the right time.
- Up to 20 events can be programmed.

Fault log

The Real Time Clock can also be used for other purposes like the fault log:

In the fault log memory, the RTC can be used to show the date and clock for each alarm that has been logged. This can assist in determine problems in HVAC systems.