MAKING MODERN LIVING POSSIBLE

The real effect of VLT® HVAC drives – optimises your HVAC installation

56%

Energy use reduction

in Mumbai's VSNL building. 'Only by using Variable Frequency Drives in the HVAC system could we achieve this target' – General Manager VSNL, India.

www.danfoss.com/drives

VLT® THE REAL DRIVE

HVAC specific drives

The real effect

– of installing VLT® HVAC drives is lowest total cost of ownership from acquisition, installation and commissioning to energy-efficient operation.

When it comes to drives, Danfoss knows the business better than anyone. Danfoss' history in drives is a succession of firsts. Over 40 years ago, it started the inverter drive revolution, launching the world's first mass produced inverter drive onto the market. Danfoss was also first to develop application specific HVAC drives loaded with beneficial features to suit their specific applications, simplifying and cost-reducing system design, installation and commissioning. First to offer drives with integrated active harmonic filters and first to offer drives with efficiency greater than 98%.

The real effect of using VLT® HVAC drives is

– lowest cost acquisition

The modular design concept of Danfoss VLT® HVAC Drives means that much of the system control philosophy can be incorporated within the drive. This, along with a versatile field-bus range, means that simply buying Danfoss drives for your project will be financially less painful.

The real effect of using VLT® HVAC drives is

– lowest cost installation

VLT® drives are compact and designed with intelligent heat management. This lowers the cost of installation real estate and reduces the waste heat dissipated into the control room. IP 66 version right across the range, means that drives can be installed anywhere inside or outside the building, without the need for additional control cabinets. Integrated harmonic dissipation features also eliminates the need for additional control cabinets.

The real effect of operating VLT® HVAC drives is

– lowest cost commissioning

All Danfoss drives utilise a common, award winning HMI controller. This common approach to drive control means if you know one drive, you know them all. Settings and programmes can be stored and transferred to other drives, speeding and simplifying commissioning of multi-drive installations while self-tuning facilities means that every Danfoss inverter automatically operates its motor at the optimum point. The Smart Start and Auto PID tuning also takes time and money out of the commissioning process.

The real effect of operating VLT® HVAC drives is

– lowest cost

Improving drives efficiency has been a Danfoss focus throughout its history. Now Danfoss drives have set the standard with energy efficiency >98%. That's less expensive energy in and less heat dissipation out. That represents money saved at both ends. Of course, the motor too needs to be considered and VLT® Automatic Energy Optimisation ensures that the driven motor operates at its most energy efficient point right through the speed range.

Danfoss has brought the inverter drive a long way in only 40 years.

50%

Energy saving

Speed control of fans and pumps lead to significant energy savings typically more than 50%.

The most cost-effective drives range for your expanding application needs

Danfoss can't take all the credit for the economies represented by the VLT® HVAC Drive – some credit must go to our customers all over the world. It's they who told us what they really needed and we simply developed the technology to produce the drives that suit the needs of the HVAC market sector.

All the facilities you need

Gone are the days when you had to install your drive in a cabinet and build more control round the drive than was actually in it. Now a VLT® drive offers pretty well all the facilities you need, integrated within the drive.

- **Automatic Energy Optimisation**
  Ensures the motor runs at the most energy efficient point, taking care of daily and seasonal demand for building heating or cooling
- **Flexibility in setting up**
  VLT® HVAC Drive gives you four self-tuning PID loops, giving you greater flexibility in setting up system control.
- **Fieldbusses to suit your system**
  VLT® HVAC Drive offers a wide variety of fieldbus communications options, both standard and optional, to suit your system requirements.
- **Simplified motor multiplexing**
  Setting-up and running a multi-motor system is greatly simplified with software integrated within VLT® HVAC Drive.
- **Keeping escape routes free**
  Ignores 'soft' faults and keeps the drive running, to destruction if necessary, keeping escape routes free of smoke in the event of fire.
- Access to all free I/O points via fieldbus – read/write
- And many more dedicated functions for intelligent fan, pump and compressor control.

Less installation real estate

The compact format of VLT® drives, their high thermal efficiency and the ability to mount them tightly side-by-side means Danfoss drives take up less expensive real estate. IP 66 enclosures means the end of the control room if you wish, with drives mounted virtually anywhere – in the plant room or even externally.

Maintenance costs eliminated

With intelligent heat management keeping the cooling air away from vital components, there's no need for costly regular maintenance and maintenance downtime is minimised on Danfoss drives. Neither internal fans nor capacitors need replacement and self-protecting and monitoring features take care of everything.

Compliant EMC signature

Fully integrated EMC filters mean all VLT® drives live up to the product standard EN 61800-3 regarding EMC without additional external components and corresponds to the EMC guidelines 2004/108/EC, offering performance superior to other drives., with C2 and C1 options available as built-in filters.

Integrated harmonic reduction

Integrated DC link chokes ensure a low harmonic signature within EN 61000-3-12 and extend the lifespan of the dc link capacitors. They also ensure that the driven motor can perform to its full capacity.

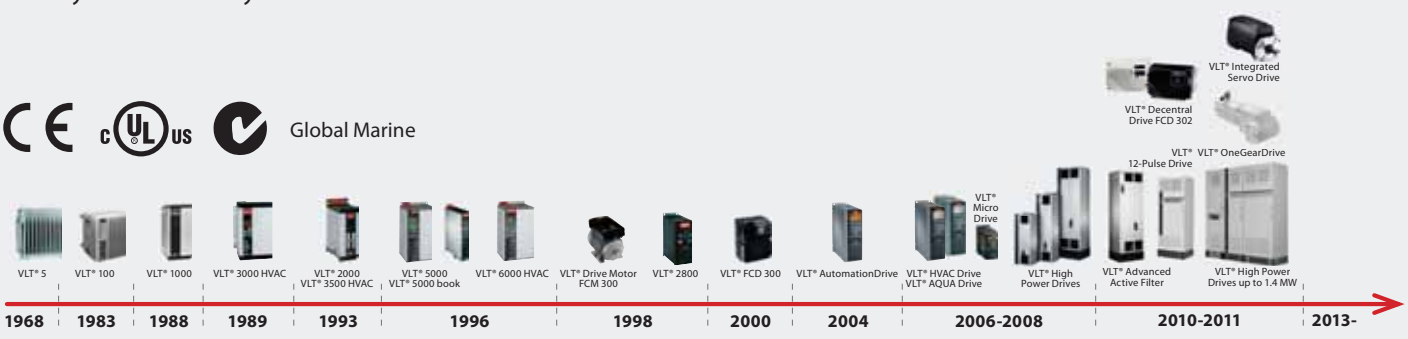
Intelligent heat management

Total separation of the cooling air from the electronics increases the drive's lifetime and excludes contaminants from the drive. Back channel cooling minimises heat loss and facilitates installation where heat is removed to the outside of the plant-room.

Proven reliability

The first VLT® drive – the VLT® 5 from 1968 – has proven the reliability of VLT® drives. Original VLT® drives installed in1968 are still functioning reliably more than 40 years later.

Global Marine



The real effect of VLT® HVAC drives is – money-saving right through the chain

The energy flow in a drive chain is a complex one. The drive absorbs energy, the motor absorbs energy and, most of all, the driven load absorbs energy. VLT® HVAC Drive is designed to save you money right through the drive chain.

Cut your speed, save money – lots of it!

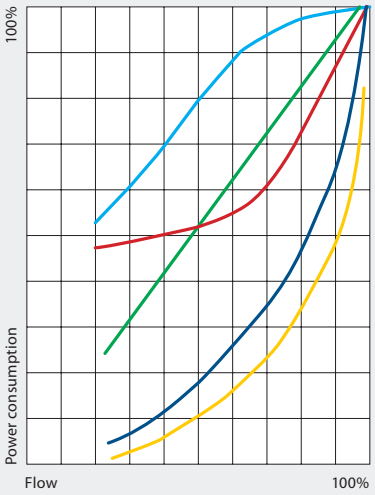
Never in the history of engineering has a designer ever specified a system just the right size for the circumstances. There's always a margin, sometimes several, and every margin costs money to support. HVAC systems are designed to cool hot days and heat cold days, and designed for extremes. Day-to-night conditions vary widely as do seasonal variations so the HVAC system needs to be versatile to suit. Only variable speed control of your HVAC system can deliver the control flexibility necessary under all conditions while offering enormous energy savings for even a small reduction in fan or pump speed. The Affinity Laws governing fan operation for instance dictate an energy saving of around 50% for a speed reduction of only 20% – frequently the reduction necessary to 'tune out' the designers in-built margin of error.

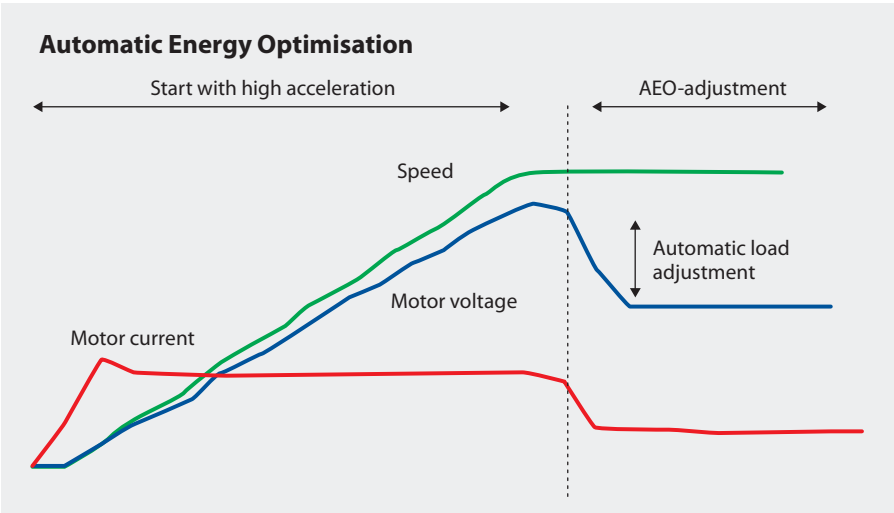
Optimise your motor performance, save more money

Motors work most efficient at full load, but seldom if ever work at that duty point. The effect of this is a significant reduction in energy efficiency at reduced load points. Danfoss VLT® HVAC Drive counters this with Automatic Energy Optimisation, an ingenious control algorithm that ensures your motors are always operating at the optimum efficiency, regardless of speed and load reduction. Automatic Energy Adaptation means that just by entering motor nameplate details into the drive, your motors will run much more efficiently, saving you even more money.

The most energy efficient drive

Danfoss VLT® HVAC Drive sets the standard for drive efficiency. With drive efficiency greater than 98% at full load, Danfoss has raised the bar to a new high which saves you money in ways you never considered. Less heat generated means less waste heat to get rid of in enclosures and plant rooms. This in turn makes for more compact drives enclosure and thus smaller installation real estate. Every kW of heat losses costs 0.5 kW of energy to dissipate that heat so VLT® is cheaper to run and cheaper to keep cool. It also facilitates the availability of IP 66 enclosures that need no plant room and the ability to operate at ambient temperatures up to 50° C.





VLT® HVAC drives – High reliability in any environment

VLT® IP 20 drives – perfect for enclosure mounting

The current generation of VLT® drives is up to 60% more compact than the previous series. That makes it perfect for cabinet mounting, especially as supplementary equipment such as EMC filters, harmonic suppression chokes and brake modules are fully integrated within the enclosure

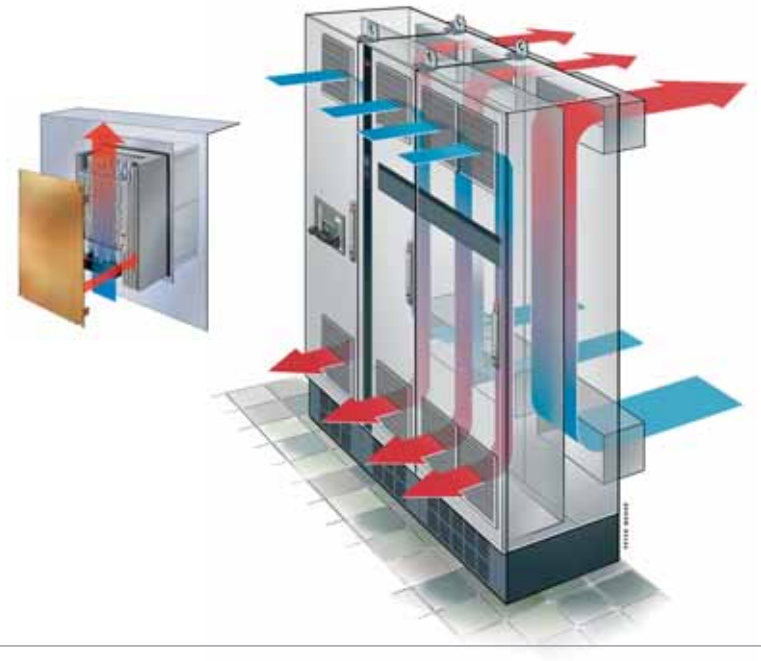
The IP 20 series is designed for easy accessibility time-efficient installation, with mechanical fastening points easy to access from the front even with power tools.

Intelligent heat management

Up to 90 kW, there is no ambient airflow over the electronics. IP 20 and 55 enclosures has a smooth, easily cleaned, manganese phosphor rear body keeps it cool in enclosures but also allows it to be through-hole mounted for even more effective cooling. Above 90 kW, the isolation of cooling air from the control components goes even further and back channel cooling enables a heat management solution where waste heat is exhausted to the outside of the plant room. This Intelligent Heat Management philosophy excludes contaminants from the drive, enhances drive reliability and extends drive lifetime.

VLT® HVAC drive – ignores the toughest environments

No matter what the environment, VLT® HVAC Drives keep running. Salt-laden atmospheres, wet environments like cooling towers, high chlorine environments like swimming pools – none of these pose a danger to VLT® HVAC Drive. Although protected from the cooling air, the circuit boards all have a coating to protect them from the ravages of chemicals that might attach the copper and silver on the PCBs. IP 66 enclosures allow drives to be mounted on rooftops. Cable mounting is through glanding in the base of the units and all components, such as DC chokes and EMC filters for compliance with EN 61800-3, class C1 (residential) and Class C2 (industrial area).



The VLT® HVAC Drive is also available with a mains switch option. This switch interrupts the mains supply and has a free useable auxiliary contact.

An external watertight USB plug connected to the control card inside IP 55/66 enclosures makes USB access easy.

The real effect of VLT® filtering is – better power quality and money saved

Integrated harmonics reduction chokes

With the widespread adoption of semiconductor switching in drives, power back-up systems, battery chargers, lighting control systems, heating controllers and other equipment powered by switched-mode power supplies, harmonic corruption is increasingly common and must be taken into consideration with every drive installation. It can particularly be problematical in installations where the primary or back-up power source is from a local generator set, which has poorer tolerance to non-sinusoidal currents. To combat this, each VLT® drive features integrated DC link chokes to ensure a low harmonic signature within EN61000-3-12 and to extend the lifespan of the dc link capacitors. These coils also ensure that the driven motor can perform to its full capacity. This is usually sufficient to comply with local harmonic limitations. In some cases additional harmonic suppression can be needed due to grid conditions or when multiple drives are installed.

Passive filters for tighter harmonic control

Where local grid pre-distortion demands a higher level of harmonic dissipation, Danfoss offers a range of external passive harmonic filters. However, as different harmonic solutions only provide their set functionality, and so guaranteed THiD levels, under certain grid conditions, this effect has to be taken into account when choosing the optimal mitigation equipment. Danfoss will upon request, carry out a full harmonic survey and recommend the most appropriate and most cost-effective solution for your site, taking into consideration the installed load, the regulatory norms to be met, the diversity factor of your operations and the needs of your installation for a high quality supply.

Integrated active filtering – the complete solution

Individual compensation

Danfoss is the first company to offer an active filter fully integrated within the drive. Because a Danfoss active filter is always on-line, it constantly monitors your power quality and automatically generates opposing harmonics to negate the effects of all your non-linear loads at once. It provides the simplest and most effective means to mitigate harmonic corruption of your supply, improving overall plant reliability and cutting your costs. Harmonic dissipation to 10% THiD or 5% THiD is offered to suit your site requirements.

For larger multi-drive installations, it may be more cost effective to consider external Danfoss Active Filters on a central or group compensation basis.

Central compensation

Simply add the filter in parallel at the point of common coupling without disturbing your existing installation and the whole facility can be compensated centrally, even at medium voltage, through an auto-transformer

Group compensation

A select group of loads can be compensated together. The AAF adjusts automatically to the load and is independent of the supply stability

Save money and reduce running costs

On the basis that it is better to avoid a problem rather than cure one after it happens, it is preferable to calculate the effect of installing non-linear loads before doing so, to estimate the degree of harmonic distortion that may result. Trying to achieve this on a spreadsheet basis can be time consuming and inaccurate.

VLT® Harmonic Calculation Tool for free

To help, Danfoss offer *free* to download, the VLT® Harmonic Calculation Tool MCT 31, a simple to use, fast and accurate software tool for calculating the harmonic disruption from your existing or intended drives installation. An accurate assessment is vital as in this case, more is not better, simply more costly, so the MCT 31 can help save money when selecting harmonic mitigation solutions.

The common approach to drive programming

VLT®'s award winning HMI drive programmer was developed in consultation with drive users around the world. This makes commissioning or monitoring a Danfoss VLT® drive easy and intuitive.

1 Graphical display
- International letters and signs
- Graphical display with bar-charts
- Easy overview
- 27 languages selection

2 Menu structure
- Based on the well understood matrixsystem in today's VLT® drives
- Easy shortcuts
- Edit and operate in different set-ups simultaneously

3 Other benefits
- Demountable during operation
- Up- and download functionality
- IP 65 rating when mounted in a panel door
- Up to 5 different variables visible at a time (Two for FC 101)
- Manual speed/torque setting
- 100% user defined information and size

4 Illumination
- Relevant buttons are illuminated when active
- Other LEDs indicate the status of the drive

5 Quick Menus
- A Danfoss-defined Quick Menu
- A user-defined Quick Menu
- A Changes Made menu lists the parameters unique to your application
- A Function Setup menu provides quick and easy set-up for specific applications
- A Logging menu provides access to operation history

6 Intuitive functions
- Info ("on board manual")
- Cancel ("undo")
- Alarm log (quick access)

design award winner

The user interface may be mounted remotely on a control panel fascia. This enables full advantage to be taken of the LCP, eliminating the need for additional switches and instrumentation.

The intuitive VLT® HVAC Basic control panel

- Alphanumeric display
- 7 languages + numeric menu
- Status LED's
- Quick menus (wizard for open loop applications, wizard for closed loop applications, motor setup and changes made)
- IP 54 when mounted in a panel front
- Password protection
- Same parameter structure as other Danfoss FC drives
- Demountable during operation
- Up- and download of parameters

Three panel options: Graphical, numerical, blind cover.

The VLT® drives are controlled locally via a control panel. This is plugged in directly or connected via a cable.

VLT® drives can be remotely-commissioned and monitored via a USB cable or fieldbus communication. Special software is available: Energy Box, Wizards, Data transfer tool, VLT® Set-up Software, and Language changer.

Three HVAC dedicated VLT® drives

VLT® HVAC Drive – provide lowest lifetime cost in HVAC systems

The VLT® HVAC Drive is the safe choice for fan, pump or compressor applications. It provides a high flexibility with regard to the place of installation, range of available bus systems via RS485 or Ethernet, broadest HVAC control intelligence and functionality, and respecting the building environment by using and keeping the best EMC and harmonics behaviour in the market. Offers both highest efficiency solution with both Asynchronous motor control and Permanent Magnet Control and ability to log & record it's own energy load profile for both estimation and validation of actual nergy savings performance.

The VLT® HVAC Drive is a singular engineering platform for all your variable speed needs designed to minmize the total applied system cost and lifecycle cost.

VLT® HVAC Basic Drive – for compact simple fan and pump applications

The VLT® HVAC Basic is a compact and simple solution for simple fan and pump applications where the drive is used nearby the motor. Designed to deliver best fit for compact and basic functional performance HVAC applications, offering simple control features and most common HVAC protocols for a limited integration into your building management system.

It offers a simpler control pad based upon the award-winning VLT® design, since it's got fewer features to set-up and monitor, a simplification that pays back at every stage from acquisition to commissioning.

It's a Real Drive, with all the pedigree and reliability of the VLT® HVAC Drive but offering a cost-effective solution to more basic applications in simpler systems.

VLT® Drive Motor – Mechanically integrated, all in one solution

The VLT® Drive motor is a EFF1/IE2 motor integrated solution for pump- and fan applications. It offers a robust mechanically integrated design maintaining standard IEC Motor frame size with simple control features and limited integration in your building management system.

Due to the high capacitance of long cables on switched supplies it can be problematic to have long cables from the control cabinet to the motor.

The simple answer is the VLT® Drive Motor.

Up to 7.5 kW, it's a brilliant solution with many benefits, especially for locations remote from the control room.

Installation is simplified – just connect in the mains cable and an RS485 or fieldbus control cable and you're good to go.

HVAC Features	Benefits	VLT® HVAC Drive	VLT® HVAC Basic Drive	VLT® Drive Motor
> 98% basic energy efficiency	Energy saving, cost saving	■	■	
Automatic Energy Optimisation	Energy saving, cost saving	■	■	
Quick menu	Easy commissioning	■	■	■
Fire Override Mode	Reduce risks in the event of fire	■	■	
DC coils as standard	Protect your system and the drive; reduce harmonics	■	■	■
Protection mode	Extremely reliable and robust drive	■	■	■
Enhanced advanced monitoring	Increased lifetime, reduced costs and less downtime.	■	■	
Auto-derating	Maintain a period of reduced operation, enabling technicians to respond to the situation	■	■	■
Automatic Motor Adaptation	Saves time adjusting to the motor.	■	■	NR
Suitable for "follower" operation	Fits in BMS, PLC or DDC mastered systems	■	■	■
Sleep Mode	Saves energy	■	■	■
Belt monitoring	Saves energy and time	■	■	
Resonance Monitoring	Improves building comfort	■	■	
Stairwell Pressurisation / Fire Override Mode	In the event of fire, escapes remain free of smoke	■	■	
Catches spinning motor at start-up	Prevent mechanical stress of system	■	■	■
Local Control Panel (LCP)		■	■	■
Embedded fieldbus protocols:	Interacts with your system			
BACnet, N2 Metasys, FLN Apogee,		■	■	
Modbus RTU (std.), FC protocol,		■	■	■
Built-in RFI	Meet the IEC 61800-3 and EN 55011 standards	■	■	■
IP 20 / IP 21 kit		■	■	
Optional fieldbus protocols:				
– LonWorks, DeviceNet. Profinet, Ethernet IP, Modbus TCP		■		
Profibus		■		■
Application menus	Easy commissioning	■		
Motor Rotation Check	Easy commissioning	■		
PID-auto tuning	Easy commissioning	■		
IP 55/66	Always appropriate protection	■		■
IP 21/54		■		■
Nema 4X outdoor versions	Outdoor installation	■		
Fully integrated EMC filters	Eliminate the cost of external EMC filters	■		
Extendable I/O	Reduce total BMS costs	■		
Energy metering	Keep track on the energy consumption	■		
Design lifetime of 10 years	Lower life-time cost	■		
50° C ambient temperature w/o derating	Stabile operation	■		
Atex thermistor input		■		
24 V DC supply	Keeping the control card and the bus option alive when mains is off	■		
I/O option – additional to standard configuration				
– General Purpose I/O (3DI + 2AI + 2DO + 1AO)	Expandable I/O	■		
– Analogue I/O option (3AI (0 – 10 V/PT1000/NI 1000) + 3AO (0 – 10 V))	Flexible I/O configuration	■		
– Relay output (3 x relays)		■		
Mains switch option	Safe commissioning	■		
Panel through mounting	Less cabinet heating	■		
Smart Start	Quick and safe set-up	■		
External watertight USB plug	Easy acces to control board information	■		
Choise of graphical, numerical, or no control panel	Pay only for what you need	■		
Embedded Pump Cascade Controller	Can save the cost of a PLC	■		
Dry Pump Protection and End of Curve	Protects the pump in the event of leakage or dry running	■		
Flow compensation	Significant energy savings and reduced installation costs	■		
Velocity-to-flow conversion	Optimized comfort and energy consumption. A pressure sensor is less costly than a flow sensor	■		
Weekend and working-day operations	Energy savings	■		
Cascaded P-PI for temperature control	No PLC cost	■		
Multi-zone "3" control	Energy savings and improved comfort	■		
Flow balancing between fresh and outlet air	Energy saving and comfort	■		
Replace a cascade with a single compressor	Save money	■		
Quick start-up (Opens a bypass valve to let the compressor start without load)	Release stress on the drive and supply grid	■		
Refrigeration functions: Compressor starting torque, Compressor safety function, Refrigerant pressure to temp converting		■		

NR = Not Relevant

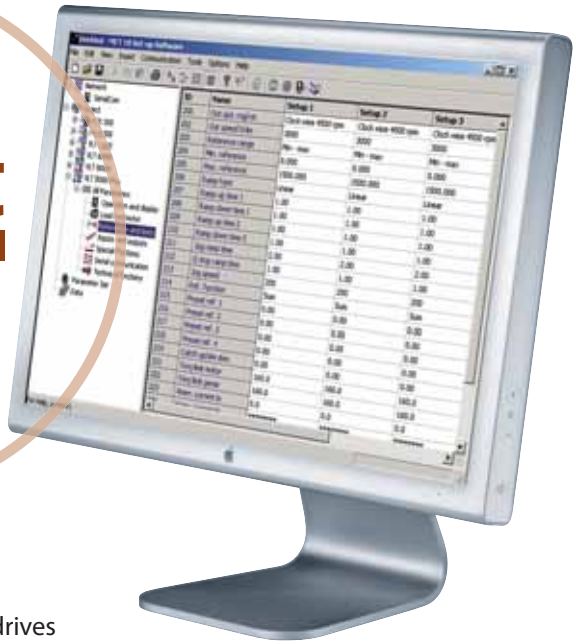
VLT® Motion Control Tool
The real effect is money saved

Set-up software provides easy control of details as well as a general overview of drive systems, large or small. The tool handles all drives-related data.

Perfect

tool for:

- Commissioning
- Servicing
- Programming



Explorer-like interface
The VLT® Motion Control Tool software features an explorer-like interface design and functionality to ease both use and learning of the facilities.

More efficient service organisation
- Scope & logging: Analyse problems easily
- Read out alarms, warnings and fault log in one view
- Compare a saved project with an on-line drive

More efficient commissioning
- Off-line commissioning offsite
- Save/send/mail projects anywhere
- Easy fieldbus handling, multiple drives in project file. Enables service organisation to be more efficient

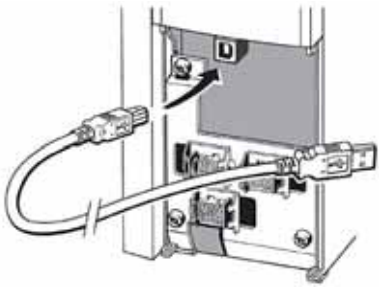
Basic
- Scope & Graph
- Alarm history in saved projects
- Graphical time based actions, preventive maintenance and basic cascade controller
- Multiple fieldbus support

Advanced
- No limitation in number of drives
- Motor database
- Real-time logging from drive
- Sensorless pump control

Two modes
On-line and off-line mode
In the online mode, you work with the actual setup of the drives in question. Your actions will have immediate effect on the performance of the drive(s).

Project oriented
In project mode you work with the drive parameters as a "virtual" set-up. This allows you to adjust the whole system before you implement it into the drives and put it in action. In project mode you can set the system up even before the drives are installed. A single command will update the whole system. In case a drive is exchanged, it is easily set up to perform exactly as its predecessor.

Connections
- USB (Not VLT® HVAC Basic)
- RS485



VLT® Energy Box Software

VLT® Energy Box Software (not for VLT® HVAC Basic) allow energy consumption comparisons of HVAC fans and pumps driven by Danfoss drives and alternative methods of flow control. This tool may be used to project, as accurately as possible, the costs, savings, and payback of using Danfoss drives on HVAC fans and pumps.

Our experience is your guarantee
The real effect is trust

Dubai Metro
Danfoss Drives deliver a total of 260 drives rated from 90 to 325 kW for the new metro in Dubai, United Arab Emirates, to operate exhaust fans and tunnel ventilation.
Dubai Metro is projected to carry approximately 1.2 million passengers on an average day, and 355 million passengers per year.

Tropical Islands Resort near Berlin, Germany
A steady 25° C air temperature, 31° C water temperature, no rain, and a pleasant 40% to 60% humidity for the resort's tropical plants. Everyone's idea of perfect weather!
All this is possible with a first class climate and water control system driven by VLT® HVAC Drives.

Opera House in Sydney, Australia
The Sydney Opera House is one of the architectural wonders of the world, and perhaps the best known building of the 20th century. In 2001, the NSW Government provided $69 million for several projects to improve the facilities and environment for performing arts companies, patrons and visitors. Danfoss provided the drives.

Shanghai General Motors, China
Shanghai General Motors Co Ltd. is a 50-50% joint venture between General Motors and the Shanghai Automotive Industry Corporation Group (SAIC).Shanghai GM has an annual production capacity of 200,000 vehicles. Danfoss provides the VLT® HVAC drives to maintain the production environment.

Torre Mayor, Mexico City
With its 55 floors and a height of 225 m the Torre Mayor is the highest building in Latin America. Danfoss drives control the heating and ventilation.

Crowne Plaza Copenhagen Towers in Ørestad, Denmark
Copenhagen's latest luxury hotel, the elegant Crowne Plaza Copenhagen Towers in Ørestad, has been designed from the ground upwards with sustainability in mind. VLT® HVAC Drives are a natural part of the solution.

What VLT® is all about

Danfoss VLT Drives is the world leader among dedicated drives providers – and still gaining market share.

Environmentally responsible

VLT® products are manufactured with respect for the safety and well-being of people and the environment.

All activities are planned and performed taking into account the individual employee, the work environment and the external environment. Production takes place with a minimum of noise, smoke or other pollution and environmentally safe disposal of the products is pre-prepared.

UN Global Compact

Danfoss has signed the UN Global Compact on social and environmental responsibility and our companies act responsibly towards local societies.

EU Directives

All factories are certified according to ISO 14001 standard. All products fulfil the EU Directives for General Product Safety and the Machinery directive. Danfoss VLT Drives is, in all product series, implementing the EU Directive concerning Hazardous Substances in Electrical and Electrical Equipment (RoHS) and is designing all new product series according to the EU Directive on Waste Electrical and Electronic Equipment (WEEE).

Impact on energy savings

One year's energy savings from our annual production of VLT® drives will save the energy equivalent to the energy production from a major power plant. Better process control at the same time improves product quality and reduces waste and wear on equipment.

Dedicated to drives

Dedication has been a key word since 1968, when Danfoss introduced the world's first mass produced variable speed drive for AC motors – and named it VLT®.

Twenty five hundred employees develop, manufacture, sell and service drives and soft starters in more than one hundred countries, focused only on drives and soft starters.

Intelligent and innovative

Developers at Danfoss VLT Drives have fully adopted modular principles in development as well as design, production and configuration.

Tomorrow's features are developed in parallel using dedicated technology platforms. This allows the development of all elements to take place in parallel, at the same time reducing time to market and ensuring that customers always enjoy the benefits of the latest features.

Rely on the experts

We take responsibility for every element of our products. The fact that we develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories is your guarantee of reliable products.

Local backup – globally

VLT® motor controllers are operating in applications all over the world and Danfoss VLT Drives' experts located in more than 100 countries are ready to support our customers with application advice and service wherever they may be.

Danfoss VLT Drives experts don't stop until the customer's drive challenges are solved.