ENGINEERING
TOMORROW

Industry Product Overview

# Our product portfolio
## – dedicated to your drive application

**37 million**

tons of $CO_2$ are saved every year by the 4 million VLT® variable speed drives installed worldwide from Danfoss

www.danfossdrives.com

VLT®
THE REAL DRIVE

# Product Overview

## VLT® AutomationDrive

An extremely flexible and cost-effective drive suitable for all industry applications – from simple speed control to dynamic servo applications.

VLT® AutomationDrive comes in a basic version (FC 301) and an advanced version (FC 302) with additional functionalities.

3 x 200 – 240 V..... 1/3 – 50 HP
3 x 380 – 500 V.....1/2 – 1200 HP
3 x 525 – 600 V ..... 1– 100 HP
3 x 525 – 690 V ..... 11 kW – 1200 kW

- Built-in DC coils and RFI-filter (optional)
- Bookstyle IP 20/IP 21/NEMA 1/NEMA 4X/IP 66 top
- Compact drive IP 55 and IP 66/NEMA 4 and IP 54/55/NEMA 12
- Integrated Smart Logic Controller, (USB and RS485) as standard
- Integrated optional communication options (Profibus DP/V1, DeviceNet, CanOpen, Ethernet/IP, Modbus TCP, PROFINET)
- Integrated optional additional I/O (digital I/O's, encoders, (incremental, absolute, sin/cos, resolver))
- Integrated Motion Control Option (PLC)

## VLT® AutomationVTDrive

VLT® Automation VT Drive is the perfect match for pumps and blowers in industrial pump and fan applications.

Advanced application protective features. Available with cascade control of up to 8 pumps in fixed speed mode or master/follower mode.

3 x 200 – 240 V .....1/3 – 60 HP
3 x 380 – 480 V .....1/2 – 1350 HP
3 x 525 – 600 V ..... 1 – 125 HP
3 x 525 – 690 V ..... 11 kW – 1400 kW

- Built-in DC coils and RFI-filter (optional)
- Bookstyle IP 20/IP 21/IP54/NEMA 12
- Compact drive IP 55 and IP 66/NEMA 4
- Integrated communication options (Modbus RTU, Profibus, DeviceNet, EtherNet IP)
- Multiple PID loops for advanced control
- Platinum and nickel temperature sensor inputs
- Application specific menus for quick and easy programming
- Capability for constant torque loads
- Preventive maintenance scheduling

## VLT® Micro Drive

A compact general purpose drive for AC motors up to 22 kW. It performs perfectly even in complex application set-ups, and optimizes energy efficiency and operation.

1 x 200–240 V ..... 1/4 – 3 HP
3 x 200–240 V ..... 1/3 – 5 HP
3 x 380–480 V ..... 1/2 – 30 HP

- Multipurpose
- Process PI-controller – removes need for external controller
- Automatic Energy Optimizer (AEO)
- Automatic Motor Adaptation (AMA)
- 150% motor torque up to 1 minute
- Smart Logic Controller
- True side-by-side mounting

## VLT® 2800 Series

An extremely compact series of drives prepared for side-by-side mounting and developed specifically for the low power market.

1 x 200 – 240 V .....1/2 – 2 HP
3 x 200 – 240 V .....1/2 – 5 HP
3 x 380 – 480 V ..... 3/4 – 25 HP

- Multipurpose
- Side-by-side mounting in any direction
- Built-in PID controller, RFI-filter and DC coils
- Bookstyle IP 20
- Integrated RS 485 interface as standard
- Integrated Profibus (optional)

## VLT® OneGearDrive®

The OneGearDrive® is designed especially for use in the food and beverage industry. It comes in two versions, the HygienicDrive and the Standard version. The HygienicDrive is certified for use in clean rooms and the pharmaceutical industry.

The compact construction of the OneGearDrive® makes it especially suitable for mounting on transport and conveyor systems.

- Permanent Magnet three-phase synchronous motor (better than Super Premium Efficiency Class IE4)
- High System efficiency when coupled with a Danfoss VLT® AutomationDrive or VLT® Decentral Drive FCD 302
- Completely smooth housing, preventing the accumulation of dirt and ensuring easy cleaning
- High protection, class IP 67 and IP 69 K
- No motor cooling fan necessary
- HygienicDrive paintwork is resistant to cleaning and disinfectant solutions (pH 2 to pH 14) – optional for Standard OneGearDrive®
- HygienicDrive EHEGD approved and surface coating FDA listed

## VLT® Decentral Drive FCD 302

The VLT® Decentral Drive FCD 302 is the new generation of the highly successful VLT® Decentral FCD 300, based on the VLT® AutomationDrive FC 302 platform. It combines the key features of both products in a completely re-designed enclosure, made for best fit on direct machine mounting.

- IP 66/IP 69K/NEMA 4X, corrosion resistant enclosure
- Profibus DP, EtherNet/IP, PROFINET as built-in communication options
- Connection of encoders, resolver, and functional safety as pluggable application options
- Integrated service switch/circuit breaker available
- Integrated power looping terminals
- Internal 24V DC supply for external sensors/actuators
- Twin-part design (installation box and electronic control section)
- Adapts to any brand of motor and geared motor, permanent magnet motors as well as induction

## VLT® Decentral FCD 300

The VLT® Decentral FCD 300 is a complete frequency converter designed for decentral mounting.

Reduces the need for central control panels and space consuming motor control cabinets are eliminated.

The need for long screened motor cables is also reduced.

- 1/2 – 5 HP
- Mounted on the wall close to the motor, or directly on the motor
- IP 66, a corrosion resistant coating
- CE, also IEC 61000-3-2, UL, and C-tick
- Twin part design makes commissioning and service easy

## VLT® DriveMotor FCM 300

The VLT® FCM 300 Series is a very compact alternative to the traditional solution with a VLT® frequency converter and motor as separate units.

No panel space is required. The DriveMotor is placed on the machine.

- 380 – 480 V, 3/4 – 10 HP
- Pre-set adaptation between drive and motor giving precise and energy efficient control
- Meets the EMC directive
- IP 55 enclosure, optionally IP 56 and IP 66
- RS 485 protocol as standard and Profibus as built in option

## VLT® Soft Starter MCD 500

VLT® Soft Starter MCD 500 is a total motor starting solution. Current transformers measure motor current and provide feedback for controlled motor ramp profiles.

AAC, the Adaptive Acceleration Control, automatically employs the best starting and stopping profile for the application.

Adaptive Acceleration Control means that for each start and stop, the soft starter compares and adapts the process to the chosen profile best suited to the application.

- 21 – 1600 A, Versions for 200 – 690 VAC, 7.5 – 850 kW
- Internal bypass contactors (21 – 215 A, 7,5 – 110 kW)
- Total motor starting solution
- Advanced start, stop and protection features
- Adaptive Acceleration Control
- Inside Delta connection
- 4-line graphical display
- Multiple programming setup menus
- Adjustable bus bars allow for both top and bottom entry (360 – 1600 A, 160 – 850 kW)

## VLT® Advanced Harmonic Filter AHF

Easily and effectively reduce harmonic distortion by connecting the AHF 005/010 harmonic filter in front of a Danfoss frequency converter. With a >98% efficiency, the passive AHF offers cost effective and very robust harmonic solutions specifically for power up to 335 HP.

- AHF 005 reduces total harmonic current distortion to 5%
- AHF 010 reduces total harmonic current distortion to 10%
- Small compact housing that fits into a panel
- Easy to use in retrofit applications
- User-friendly start-up – no adjustment necessary
- No routine maintenance required
- VLT® MCT 31 Harmonic Calculation Software

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## VLT® Power Option dV/dt Filters

dV/dt filters reduce the dV/dt values on the motor terminal phase-to-phase voltage.

An important issue for short motor cable. Compared to sine-wave filters, dV/dt filters cut-off frequencies above the switching frequency.

Having small inductance and capacitance, the filter is cost efficient.

The filters reduce the motor insulations stress and are recommended in applications with risk of flashover.

Designed and tested for operation with the VLT® AutomationDrive (FC 302), the VLT® AQUA Drive (FC 202), and the VLT® HVAC Drive (FC 102).

Ratings of IP 00 and IP 20/23 are available on the entire power range. IP 54 is available on units up to 180 amps.

**Range**
3 x 200 – 500 V
3 x 525 – 690 V

## VLT® Power Option Sine-wave Filters

Sine-wave Filters reduce motor insulation stress and switch acoustic noise from the motor. Bearing currents are also reduced, especially in larger motors.

The perfect solution for:
- Applications with older motors
- Aggressive environments
- Applications with frequent braking

**Range:**
3 x 200 – 500 V (2.5 - 1200 Amp)
3 x 525 – 690 V (13 - 1320 Amp)

**Advantages:**
- Protect the motor against dV/dt stress which prolongs the lifetime
- Lower the frequency depending losses in the motor, eddy current losses and stray flux losses
- Diminish acoustic switching noise on the motor
- Reduce semi conduct losses in the drive with long motor cables
- Decrease electromagnetic radiated emissions on unshielded motor cables
- Reduce voltage peaks
- Reduce electrical discharges in the motor construction thus prolonging bearing life
- Protect motor insulation against premature aging

## VLT® Low Harmonic Drive

Danfoss Low Harmonic Drive offers well known drive features without putting unnecessary strain on the power grid.

The perfect solution for:
- Meeting IEEE519 recommendation
- Generator powered installation
- Installation with generator backup
- Soft power grid
- Installation of HP-drive in grids with limited excessive power capacity

**Voltage range**
- 380 – 480 V AC, 225 - 950 HP

**Power range**
- 160 – 710 kW (matching drive frames D, E, and F)

Where the performance of other low harmonic technologies depends on stability and load, or affects the controlled motor, the new Danfoss Low Harmonic Drive continuously regulates the network and load conditions without affecting the connected motor.

The VLT® Low Harmonic Drive causes no increased winding stress or reduction of the bearing lifetime.

The VLT® Low Harmonic Drive has the same modular build-up as our normal high power drives and shares features like high energy efficiency, backchannel cooling, and user-friendly operation.

## VLT® Motion Control Tool MCT 10

For Managing drive parameters in systems the new Motion Control Tool MCT 10 is perfect for handling all drive-related data.

**The MCT10 offers:**
- Project orientation, one file that contains all parameter settings plus user-defined documents
- Explorer like view gives the user a low learning curve
- VLT® Motion Control Tool offers programming of synchronization and positioning in same environment; one PC tool for all tasks
- Online and offline commissioning
- Support of different interfaces: RS485, RS232, USB, and Profibus (plus more to come)
- Import of drive setting from Windows and DOS version of Dialog


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