

*Danfoss*



**VLT® Solutions**

**The beverage industry relies on VLT® drives**



**Built to last**

*VLT® drives are built to last – even when it gets hot. VLT® drives are made with the highest quality standards and they are built to operate trouble-free in ambient temperatures up to 50°C, year after year. This guarantees maximum uptime and lowest possible cost of ownership.*





**Rugged and robust field enclosure**  
A range of drives designed for installation in the process environment with no need for any additional enclosure including in wash-down areas.

## Preferred drives provider among leading beverage companies globally

**Since 1968, when Danfoss launched the world's first frequency converters, VLT® has been the preferred brand among the world's leading beverage companies.**

### **Largest installed base**

Danfoss has an installed base of variable speed drives in the beverage industry globally that is larger than any other supplier, and we are committed to keeping this position.

### **Expert knowledge**

Our expert knowledge of beverage processing equipment, bottling and packaging machinery, and utilities within all types of beverage industries has helped us to design and build a portfolio of products for beverage plants, such as:

- Fruit juice
- Soft drinks and mineral water
- Beer
- Wine
- Spirits

### **Excellent VLT® features**

- Up to 150 metres screened motor cable
- Handles up to 50°C ambient temperature
- IP 66 versions for wash-down areas
- Safe stop function for safety category 3 – feedback not needed
- Integrated harmonics filter as standard
- Integrated RFI filters
- CTC coating available
- Real side-by-side mounting
- USB communication
- User interface won iF Award
- Standard platform – if you know one, you know all

### **Up to 150 metres between the drive and the motor**

The basic design of VLT® drives allows for up to 150 metres of screened motor cable – without disturbing other electronic equipment. This allows the VLT® to be installed in a

central control room – far away from some of the most remote variable speed conveyors and machines in a modern bottling plant.

### **Peace of mind**

You will find our dedicated sales and service staff all over the world 24-hours a day. They are always ready to support you with commissioning assistance, technical training and troubleshooting. They can even offer you a cost-efficient package of DrivePro service agreements to avoid any surprises to your maintenance budget.



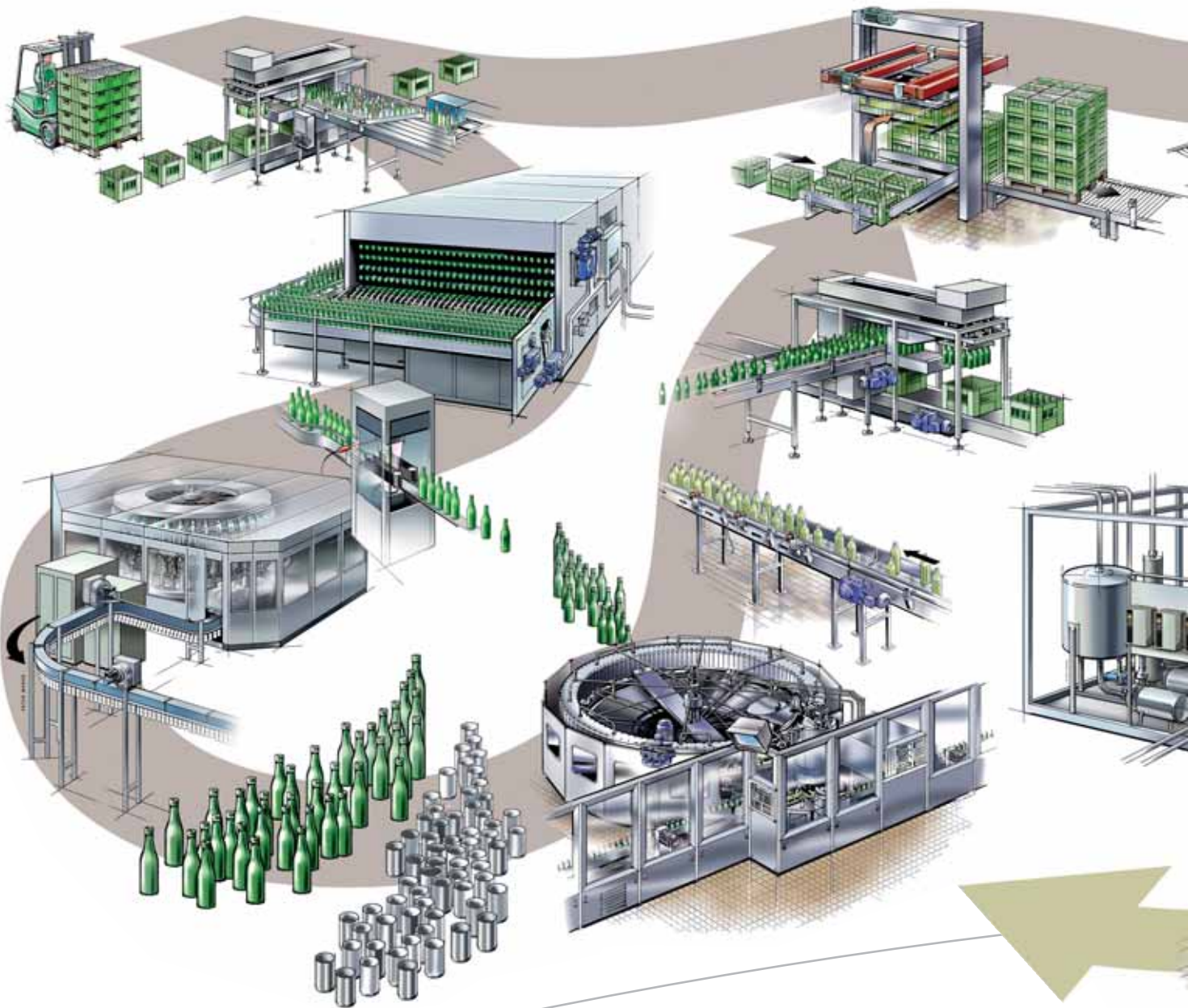
Danfoss Drives received the Frost & Sullivan Award for Product Innovation 2006 for the unique VLT® AutomationDrive series.



The new VLT® series local control panel (LCP) was given the international iF design award in 2004. The panel was chosen from a total of 1,003 entries from 34 countries in the category "interface in communication".

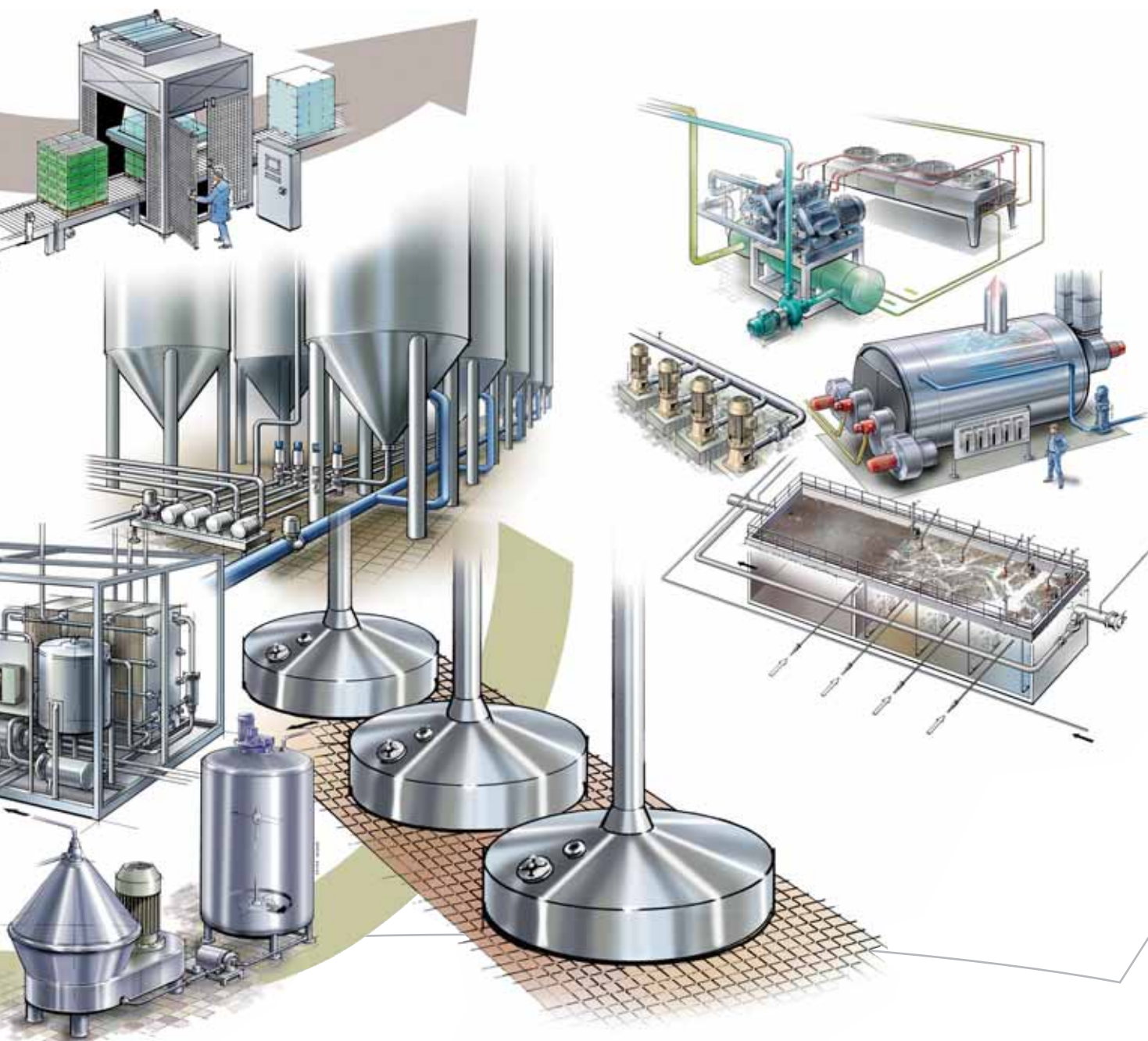


# Improved process control using less energy in the beverage industry



## **For flexible and reliable handling**

Reliable automation is crucial in the handling of bottles, cans, cases and pallets. From sorting and rinsing of reused bottles to moulding, filling, labelling and packing, Danfoss offers dedicated features and solutions.



### **For better products**

Pumps, centrifuges, mixers and agitators are meticulously and reliably controlled by VLT® drives. VLT® drives come in all power sizes and offer all the features required to optimise beverage production.

### **For energy saving**

Heating, cooling, pressurised air, water and waste water are all Danfoss core competencies. Dedicated VLT® drives series offer dedicated features for these applications.

# Energy savings, less waste, better product quality

**Wherever wheels turn, VLT® drives will provide the optimal control, by controlling the power supply to the motor according to the actual power demand, speed, torque, pressure, flow etc. Change of recipe requires merely shifting between several fixed set-ups.**

**VLT® benefits are:**

- Less energy consumption
- Less waste and material
- Better, constant product quality

**Improved pump control**

VLT® drives have several pump dedicated features that optimise production and protect the drive, the motor, and the equipment.

**Two-step ramps**

The pump quickly reaches minimum speed and fills the system without stressing the valves.

**Flow compensation**

Flow resistance is dependant on flow speed. The drive will ease the pressure when low flow is sufficient to save energy.

**Motor alternation**

Built-in logic controls alternation between two pumps in duty/standby applications. Motion of the standby pump prevents the pump from sticking.

An internal timer assures equal usage of the pumps.

**Energy optimisation**

VLT® drives have Automatic Energy Optimisation, assuring optimal magnetification in the motor.

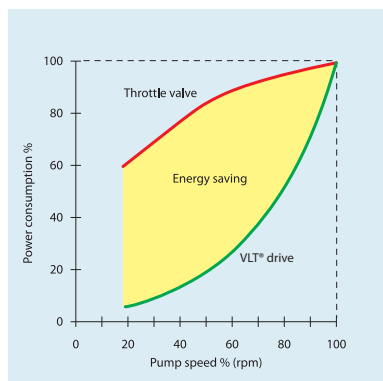
**Bus control**

Automation means less waste and better process control. VLT® drives handle the most common bus protocols in the industry and integrate seamlessly into the overall control system.



*Danfoss provides a broad range of IP 66/NEMA 4 enclosed drives suited for mounting in production areas, exposed to humidity, dust and frequent washdowns.*

## Comparison of energy consumption



*Energy savings using a VLT® drive are achieved even with a modest reduction in speed.*

For centrifugal pumps, power consumed is directly proportional to the cube of the speed:

$$\%P = (\%rpm)^3$$

Therefore a small reduction in pump speed results in a large reduction in energy consumption.

Even a 20% reduction in pump speed results in almost 50% reduction in energy consumption.



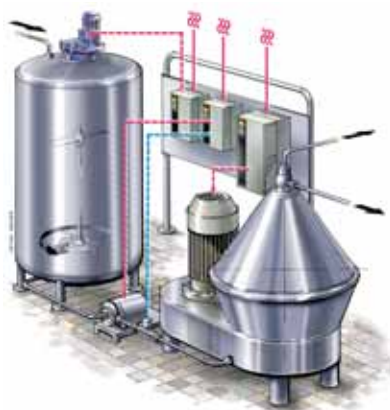


#### Pump/pasteuriser features

- Pump Cascade Controller
- Automatic Energy Optimisation
- Dry Pump Detection
- End of Curve
- Flow compensation

#### Benefits

- Minimise wear and tear
- Save energy
- Protect the pump
- Save energy
- Protect the pump
- Reduce energy consumption
- Save energy



#### Centrifuge/decanter features

- High motor torque (flux vector performance)
- Accurate torque control
- AC brake
- Flux mode motor control
- High enclosure classes
- Flying start

#### Benefits

- Tolerant against impact loads
- Suitable for backdrive applications (decanter)
- Dynamic braking without resistor
- Robust against load shifts
- Suited for washdown areas
- Catches a rotating centrifuge bowl



#### Rake features

- High starting torque
- Torque control
- Variable speed operation

#### Benefits

- Soft start/stop
- Gearbox failure elimination
- Reduced maintenance cost



# Rapid and reliable case and bottle handling

Usually optical image systems are applied to identify bottles, cases and foreign bodies, and cases are emptied and sorted automatically.

Drive systems with standard dynamic characteristics are sufficient for this. The horizontal and vertical movements must be coordinated to protect the products.

The drives are usually connected by a fieldbus that distributes status information.

## **Critical lift operations**

Lift operation is critical. Lifts must be able to hold any vertical position. VLT® drives assure this.

## **Flexible bottle washing**

VLT® drives with servo performance keep conveyors synchronous and ensure that on- and off loading of the bottles are synchronous with the conveyor chain, even in case of a change in set-up or disturbance.

## **Avoid torque damage**

Damage from over-torque can be avoided via online monitoring through fieldbus.

## **Easy change of set-up**

The electronic cam disc operation permits a simple change of setup for different bottle types.

## **Permanent magnet motor operation**

VLT® drives are available for permanent magnet motor operation for accurate positioning and synchronising control and fast ramp times.

An algorithm in the VLT® Automation-Drive can manage almost all servo motors in closed-loop control with an external encoder attached to the motor. It communicates via ENDAT, Hyperface, Resolver or incremental encoders.

## **Reliability is critical**

The internal speed controller provides stable and accurate circulation of the machine.

Short downtimes are provided by a brake chopper that turns the motor into a generator to absorb the energy. In the production row the blow moulding machine is followed by the filler. If it's down, the filler is not served with bottles.

Reliability of the blowing machine is critical for the entire production line. VLT® drives provide higher reliability of operation.







#### Bottle sorter features

- High dynamic performance
- Safe Stop (EN954-1 Cat.3 )
- IP 55/NEMA 12 to IP 66

#### Benefits

- Fast operation
- Smooth product handling
- Reduction in extra equipment
- Saves on commissioning
- Situated on production line
- Saves cabinet space
- Cable costs reduced
- Reduction of RFI

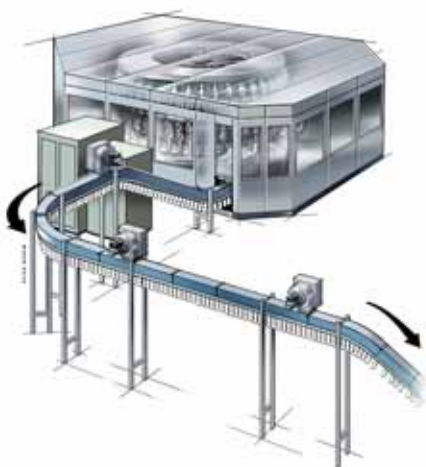


#### Bottle washer features

- Synchronisation via fieldbus
- Over-torque detection
- Multi setup

#### Benefits

- Online adjustability of torque limits (flexibility)
- Distributes the load of the individual drive
- Protects equipment and products
- Fast production changeover



#### Blow moulder features

- Field-bus
- PID controller
- Brake chopper
- Safe stop (EN 954-1 CAT. 4)
- IP 55/NEMA 12 to IP 66
- IP 20 available
- Compressor drive

#### Benefits

- Synchronisation with filler/rinser
- Constant speed
- High reliability
- Gentle dynamic stops
- Shorter breaking times
- No mechanical wear
- No mains power cut out to drive
- Situated on production line
- Saves cabinet space
- Cable costs reduced
- Reduction of RFI
- Size and price
- Save energy



# Accurate filling, dosing and labelling

## VLT® drives fit for fillers

VLT® drives provide accurate and precise dosing of bottles, flasks, cartons, cans, tubes, and containers. This goes for a wide variety of liquid products that are warm, hot, molten, cold, semi-frozen, viscous, abrasive, particulated, chunky or free flowing. Also acidic or alkaline bases are treated.

### Overall VLT® benefits are:

- Rapid changeovers
- Aseptic/sanitary
- Easily cleaned
- Reduced maintenance
- Ease of operation
- Connectivity
- Load sharing
- Kinetic backup
- Bus communication

## Safe blending of propellants

The propellants ( $\text{CO}_2$ ,  $\text{N}_2$ ,  $\text{O}_3$ ) require safe blending of the viscous, abrasive or free flowing liquid and propellant without leaks.

## Synchronisation and positioning

With VLT® drives' wide range of motion control options they allow positioning, synchronising and cam control with almost any motor and feed-back system.

Whether you need an absolute or an incremental feedback system, VLT® drives offer innovative and easy to use motion control solutions.

## Capper

Traditionally the rotating motion necessary to seal the bottles was realized with mechanical components. Rising requirements of flexibility in operation have led to the introduction of servo-drives.

With the increasing use of cold aseptic filling it's critical to avoid germ formation in assigned machine components. Special servo-drives are necessary for this.

## Labeller

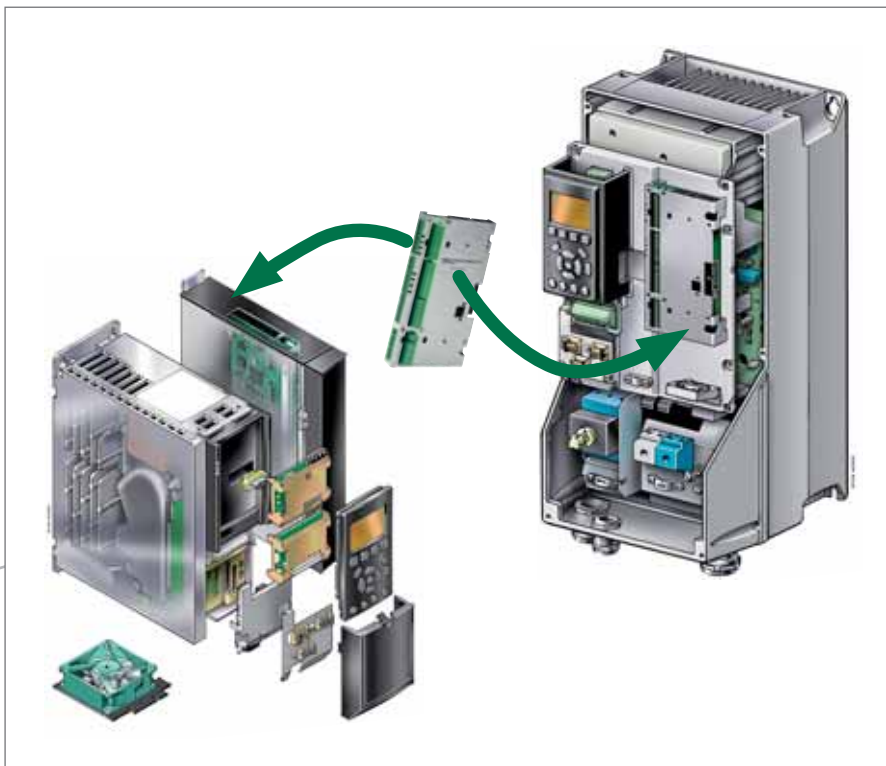
Extremely precise positioning and synchronising is required for labelling. Servo performance is a must.

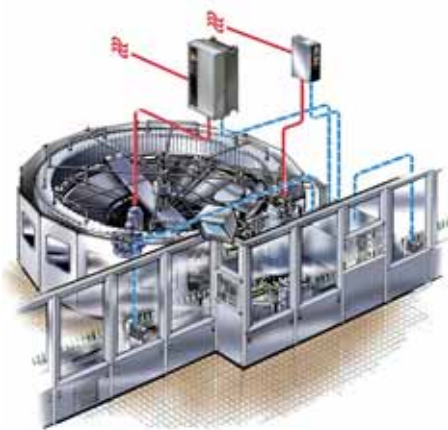
*Application specific solutions are available.*

## VLT® Motion Control Option

VLT® Motion Control Option is an integrated free programmable Motion Controller for VLT® AutomationDrive. It adds functionality and flexibility to the already comprehensive standard functionality of these drives.

The option is also available pre-programmed for synchronising or positioning.





#### Filler/capper features

- Servo performance
- Aseptic drives
- Multi setup
- Fieldbus
- Hygienic optimized design
- Synchronisation

#### Benefits

- Fast and accurate
- Easy cleaning
- Reduced machine setup
- Permanent monitoring and documentation of the capping
- Hygienic production
- Avoid caps jams
- More flexible machine
- Less mechanical wear and tear



#### Labeller features

- Servo performance
- Multi setup
- Compact servo solution

#### Benefits

- Fast and accurate labelling
- Reduced machine setup
- More flexible machine
- Cost reduction





# Precise and configurable speed synchronisation

VLT® drives provide optimum speed regulation between all process stations and meet different torque requirements. Wide conveyors require low speeds and higher torques where narrow conveyors require high speeds and lower torques.

Single bottle/item conveyors require high speeds and high torques for quick starts.

Single bottle lines are designed to feed bottle washers, bottle sorters, de-cappers, fillers, cappers, labellers and general control checks.

## **Reduced bottlenecks**

Bottle inspectors require vision systems, sensors and an intelligent free programmable drive. Bottles are rejected when they contain foreign objects, plastic is deformed, over and under filling, etc.

The sensor will give input to the VLT® drive to count the number of bottles processed during a set time frame. If the number of bottles is less than is required for the next station, then the inspection system is accelerated to

meet the demand. The opposite occurs when the count gets too high to reduce bottlenecks in the conveyor and “Qing” systems.

## **Fewer encoders**

New VLT® drives provide open-loop positioning with high accuracy and minimum installation cost, so that encoders and encoder cables often can be omitted.

## **Less downtime**

Adjustable ramps ensure that bottles don't fall over during starts and stops. Positioning functions ensure that bottles are placed correctly in an inspection situation – regardless of production speed.

## **Less noise – less waste**

Synchronisation features adjust conveyor speeds according to the overall production to prevent congestions, broken bottles, noise and energy waste.

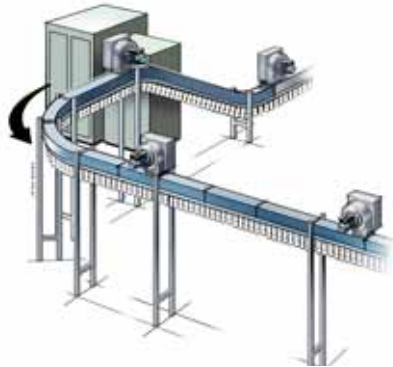
## **Overall VLT® benefits**

- Line efficiency
- Prevent bottle scuffing
- Reduce maintenance
- Gentle starts and stops
- Minimize noise

## **Fieldbuses available**

- Profibus
- DeviceNet
- CanOpen
- Ethernet IP
- Powerlink



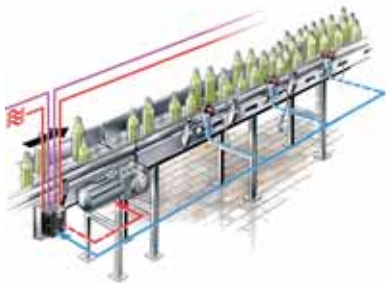


#### Air conveyor features

- Load dependent operation
- Fieldbus control
- Variable torque for ventilators

#### Benefits

- Save energy
- Easy setup
- Coordinated operation
- Avoid bottle jam



#### Bottle conveyor features

- Ramping
- Coordinated operation
- One drive modulating acc. to a reference for each track

#### Benefits

- Protect products
- Less noise
- Easy line modulation
- No congestion
- More efficient line
- Modulation
- Product preservation
- Less noise
- More flexible and faster line



#### Case conveyor features

- Coordinated operation
- Multi-setup configuration, for multipack lines

#### Benefits

- Less noise
- Easy line modulation
- No congestion
- More flexible lines
- Reduced time for line setup



#### Pallet conveyor features

- Accurate ramping
- Variable speed

#### Benefits

- Protect bottles
- Efficiency



# Fast and flexible packaging

## No need for expensive servo systems

VLT® drives provide very fast accelerations even with high load in packing machines.

With built-in synchronising and positioning control the VLT® drives make packing/unpacking machines extremely efficient and flexible. Equipped with VLT® drives expensive servo systems are saved.

## One wire safety

The VLT® AutomationDrive comes standard with the safe-stop functionality suitable for category 3 installations according to EN 954-1.

This feature prevents the drive from unintended starts by activating a safe stop. The terminal 37 can be used as "safe coast" for this purpose – the stop function satisfies stop category 3 EN 60204-1.

## No need for external components

Expensive and bulky external components can be omitted, wiring is considerably simplified, and production downtime is minimised with this solution. The safety related signals can be transferred via discrete signals wiring (in compact machinery) or via safe bus communication.

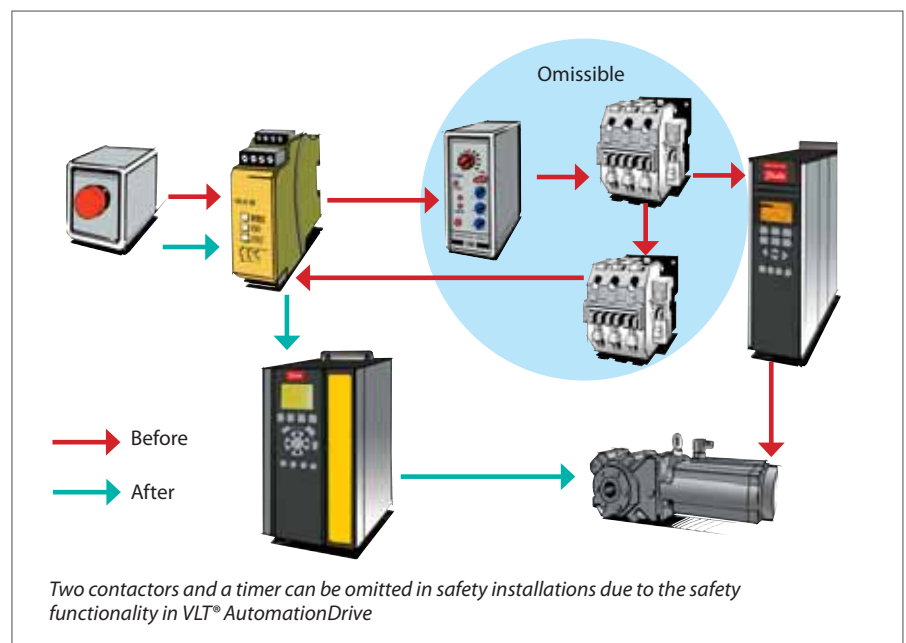
## Replace mechanical systems and add flexibility

Wrapping requires precise positioning and synchronising. VLT® operated motors replace mechanical systems and add flexibility.

## Optimise palletising

To move cans, for example from a pallet to a conveyor, requires precise stopping. Dynamic braking of the vertical operation with heavy load optimises the process and reduces mechanical wear.

Positioning, synchronising, and load estimation are features that make palletiser operation faster and more flexible.







#### Packer features

- Synchronisation/positioning features
- Cam control

#### Benefits

- VLT® drives can replace expensive servo drives
- Fast operation
- Flexibility

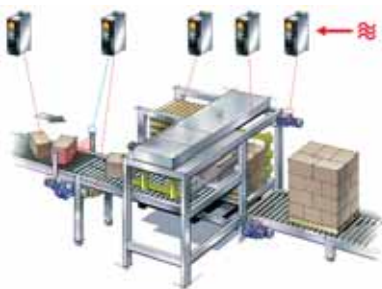


#### Wrapper features

- Synchronisation/positioning
- Safe stop

#### Benefits

- Use of cams
- Integrated positioning
- Nonlinear synchronous motion sequence on leading axis
- Precision stop
- No additional cabling
- Manual shutdown of motors
- VLT® drive is still functional



#### Palletiser features

- Synchronisation/positioning features
- Cam control

#### Benefits

- VLT® drives can replace expensive servodrives
- Fast operation
- Flexibility



# Optimise supply of water, heating, and cooling

**In any industry – beverage industry included – VLT® drives are employed to optimise water supply, heating, cooling, and other functions supporting the production.**

## **Optimised compressor control**

VLT® drives can optimise control of compressors, reduce energy consumption and provide constant pressure regulation.

Fewer starts and stops will reduce mechanical wear, and speed control is attractive when an air compressor is running for long periods at part-load. VLT® soft starters, high-power drives, AHF harmonic filters with built-in cascade controller option, DC coils, and PID controllers are applied.

## **Optimised boiler efficiency**

VLT® drives optimise the combustion efficiency by controlling both forced draft and induced draft. The flow rate in the feed water is also controlled via VLT® drives. Overall energy consumption – electricity and fuel – is minimised.

## **Energy savings and comfort**

Fans and compressors benefit from dedicated features in VLT® drives. With the “skip resonance” function you easily identify for the drive which frequencies to pass to avoid frequency noise and damage.

## **Smart Logic Control**

The new VLT® drives have Smart Logic Control built in. With this feature you can make the drive react expedient on inputs and events and often replace PLC.

## **Optimise water and wastewater treatment**

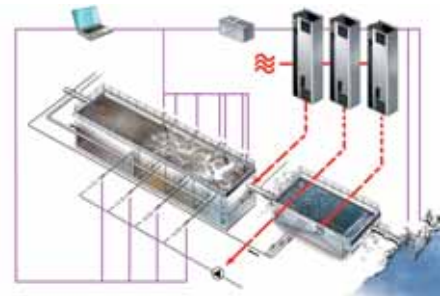
Danfoss Drives' long-term involvement within Water and Wastewater resulted in dedicated drives and features for water handling. The VLT® features improve system hydraulic performance and system efficiency.

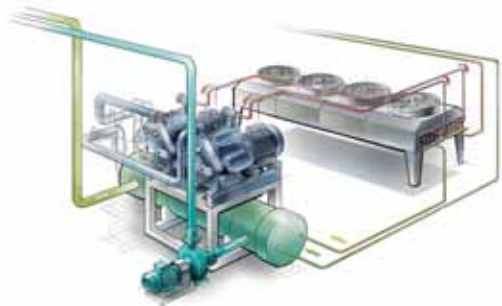
- Saves energy
- Saves commissioning time
- Saves auxiliary equipment
- Optimises pump control
- Optimises process in aeration tank

## **Pump Cascade Controller**

The Pump Cascade Controller is the most sophisticated controller on the market.

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

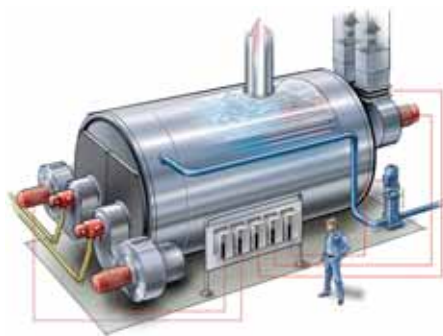




#### Compressor features

#### Benefits

- |                            |  |
|----------------------------|--|
| • Over capacity            | – No need for larger compressor/drive    |
| • Reduced current limit    | – Ensure functionality of cooling system |
|                            | – Protect the application                |
| • Running at current limit | – Extend the systems' capacity           |
| • Minimum starts and stops | – Protect compressor                     |
|                            | – Reduce energy consumption              |
| • Setpoint in temperature  | – Easy commissioning                     |
| • Monitor running hours    | – Schedule maintenance                   |
| • Electronic control       | – Less maintenance                       |
| • Cascade control          | – Stable pressure                        |



#### Fan features

#### Benefits

- |  |                                      |
|--|--------------------------------------|
| • Load dependent capacity control  | – Energy saved                       |
| • Skip resonance   | – Noise reduction                    |
| • Operate single fans as well as multiple parallel operating fans – or in cascades | – Save installation cost             |
| • VLT® Pre-heat function   | – Eliminate anti-condensation heater |

#### Boiler features

#### Benefits

- |  |                                  |
|--|----------------------------------|
| • Accurate speed control of blowers              | – Less energy consumption        |
|  | – Reduced pollution              |
|  | – Stable temperature             |
| • Electronic control replaces mechanical control | – Reduced maintenance time/costs |





# Two concepts – two sets of benefits

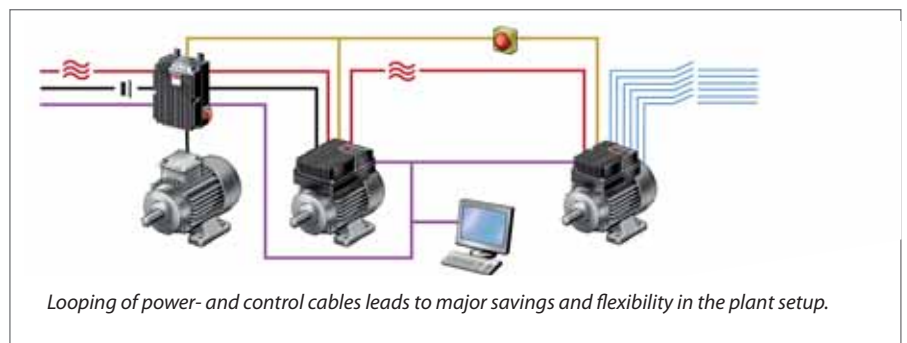
*Whether to use central or decentral drives depends on the layout of the bottling plant, the distance from the control room to the conveyor motors and the installation cost for electrical cabinets and cables.*

## Decentral concept

The physical layout of many bottling halls typically require a long distance between the electrical cabinets and some of the conveyor equipment. Motor and control cables up to 100 – 150 metres are thus very common.

Installation cost savings can often be achieved using a decentral drives concept:

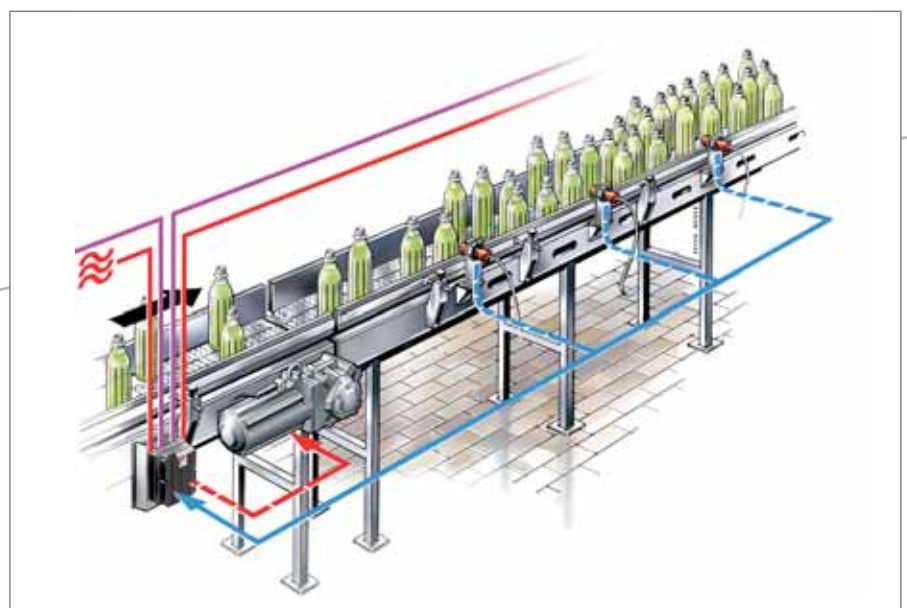
- **Less need for central control panels/rooms**
- **Less need for screened cables**
- **Less need for cooling**



Decentral features	Benefits
• Mounted on or near the motor	– No screened cabling – Less need for cooling – Save cabinet space
• Mounted on the conveyor	– Flexible design
• Fieldbus control	– Easy setup – Coordinated operation
• Enclosure class IP 66/NEMA 4	– Suitable for wash-down areas
• Easily changed electronics	– Maximum uptime
• Decentral I/O	– Less cabling
• Automatic Motor Adaptation	– Easy commissioning
• Smooth surfaces	– Easy cleaning
• Epoxy coated surfaces	



*Danfoss provides a broad range of IP 66 enclosed drives suited for mounting in production areas, exposed for humidity, dust and frequent washdowns.*



*A smart, dedicated kit allows larger drives' enclosures to be mounted in Rittal cabinets so cool air removes 85% of excess heat without contact to the electronics.*

## Central concept

Traditionally drives are placed in control cabinets with other control equipment.

### 150 metre motor cables

The long motor cables, built-in EMC filters and excellent EMC performance supports the central solution.

### 50° C ambient temperature

### Intelligent cooling solutions

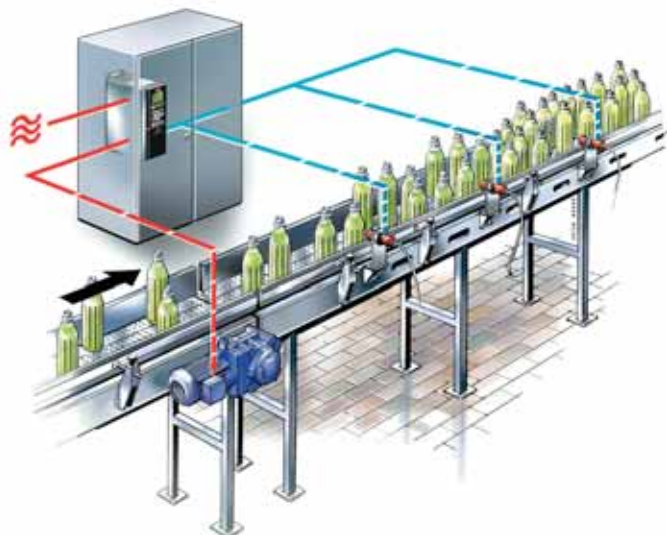
Intelligent cooling solutions, cold-plate solutions, coating solutions, and smart duct cooling solutions for high power drives are available.

### Real side-by-side

All central VLT® drives are designed for side-by-side mounting in ambient temperatures up to 50° C without derating.



Central features	Benefits
• Multiple I/O's	– Easy set-up and commissioning
• Remote mounting	– Low enclosure class sufficient
• Cold-plate cooling available	– No derating issue
• Rittal kit available	– Easy commissioning – No derating issue
• Multiple set-up	– Flexible
• Automatic Motor Adaptation	– Easy commissioning
• Book style concept	– space-saving cabinet mounting
• True side-by-side mounting	



### Modular concept

VLT® drives are designed for maximum customisation from the factory and maximum flexibility once installed. Choose from thousands of hardware configurations, built and tested from factory. Upgrades and further options are a matter of plug-and-play.



# Proven beverage experience



## **Heineken, Netherlands**

*The Heineken company, which traces its roots to 1864, is one of the world's leading international brewers. Available in almost every country on the planet, the Heineken brand is the most valuable international beer brand.*





**Asia Pacific Breweries, Singapore**

Asia Pacific Breweries is an Asian brewery company founded as Malayan Breweries Limited (MBL) in 1931. It currently controls 23 breweries in 9 countries in the Asia Pacific area. Heineken is the majority shareholder with a 42.5% stake.



**AmBev, Brazil**

AmBev is known worldwide in the brewing industry. Possessing the largest portfolio in Brazil's brewing sector, AmBev consolidated its operation in the Brazilian beer market. Market share of the company exceeded 68.1% in 2004. Ambev is also a major producer of soft drink.



**Veltins, Germany**

Sorting bottles at the brewery C. & A. Veltins new plants work rapidly and reliably, due to VLT® solutions. Since the late 90's more and more different bottle shapes and colours entered the market.



**Evian, France**

Evian is the best selling brand of mineral water in the world, with 1.5 billion bottles sold every year, and presence on the five continents, in 125 countries. Since 1878, Evian is recognised as favourable by the Medicine academy. It has also become the preferred water in the hospital environment.



**SAB Miller, South Africa**

SAB Miller is the world's second largest brewery group following the acquisition of Miller Brewing. In Africa they own 44 breweries. The Alrode plant in South Africa is the largest brewery in the southern hemisphere. Capacity: 8.2 Mhl/year. Alrode uses about one thousand Danfoss drives.



**Peter Lehmann Wines, Australia**

Peter Lehmann Wines is one of Australia's most respected and innovative winemakers. The winery is member of the Hess Group, owner of four great wineries - Peter Lehmann Wines in the Barossa Valley, The Hess Collection Winery in the Napa Valley, Glen Carlou in South Africa and Bodega Colomé in Argentina.



**Warsteiner, Germany**

The new facility is not only highly efficient and environmentally friendly with a capacity for 50,000 0.5-litre or 55,000 0.33-litre glass bottles per hour; it's also designed to process other bottle sizes so that, if necessary, it can immediately respond to changing consumer requirements. VLT® made this possible.



**Krombacher brewery, Germany**

The Krombacher brewery is one of Europe's most modern breweries. The company's flagship brand, Krombacher Pils, Germany's best-selling beer brand, has evolved to become the area's most important ambassador far beyond its national boundaries.



**Carlsberg, Denmark**

Carlsberg is one of the largest brewery companies in the world, with 95 breweries in 50 countries. The group's main brand is Carlsberg supported by regional brands such as Tuborg, Baltika and Holsten. The company is now the 5th-largest brewery group in the world operating primarily in Western Europe and in growth markets in Russia, Eastern Europe and Asia.

# 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 (FC301) and an advanced version (FC 302) with additional functionalities.

- 0.25 – 3.7 kW, 200 – 240 V, 0.37 – 800 kW, 380 – 500 V, 37 – 1.2 MW\*, 525 – 690 V
- Built-in DC coils and RFI-filter (optional)
- Bookstyle IP 20/IP 21/NEMA 1/ IP4X top and IP 55/NEMA 12
- Compact drive IP 55 and IP 66/NEMA 4
- Integrated Smart Logic Controller, (USB and RS485) as standard
- Integrated optional communication options (Profibus DP/V1, DeviceNet, CanOpen and more)
- Integrated optional additional I/O (digital I/O's, encoders, (incremental, absolute, sin/cos, resolver))
- Integrated Motion Control Option (PLC)



## VLT® 2800 Series

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

- 0.37 – 2.2 kW, 200 – 240 V and 0.55 – 18.5 kW, 380 – 480 V
- 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® Soft Starters

Optimum motor starter for palletiser and other applications where smooth starting and stopping is essential. The MCD 3000 is ideal for turning stations and corner converters thanks to optional reverse operation.

- 7.5 – 800 kW, versions for 200 – 690 VAC
- Current limit soft start with initial current ramp up
- Four different auto-adjustable ramp down profiles
- Numerous motor protection features
- Manual or remote control and password protection of parameters



## VLT® Decentral Frequency Converter

Optimum variable speed drives for bottle conveyors.  
For mounting on (any) motor or near the motor. No additional installation box due to integrated T-distributor and loop-through cage clamp terminals.  
Integrated Profibus or DeviceNet fieldbus interface.  
Built-in optional service switch.  
Optional electromechanical brake control.

- 0.37 – 3.3 kW (FCD); 0.37 – 7.5 kW (FCM)
- 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® Motion Control Tool MCT10

For Managing Drive Parameter in systems the new Motion Control Tool MCT10 is the perfect tool to handle all drive-related data.

The MCT10 offers you:

- Project orientation, one file that contains all parameters settings plus user-defined documents
- Explorer like view, give the user a low learning curve
- VLT® Motion Control Tool offers programming of synchronisation 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

# Service you can rely on 24/7 – around the world

## Sales and Service Contacts worldwide

**Helping to optimise your productivity, improve your maintenance, and control your finances.**

- 24/7 availability
- Local hotlines, local language and local stock

The Danfoss service organisation is present in more than 100 countries – ready to respond whenever and wherever you need, around the clock, 7 days a week.

**Find your local expert team on [www.danfoss.com/drives](http://www.danfoss.com/drives)**

*Pick your dedicated solution from the VLT® service menu:*

### Keep you running

- Current drives update
- Commissioning and regular adjustments
- Preventive maintenance

Service features	Benefits
• 24/7 availability	– The base for efficient use of your resources and Danfoss Drives assets
• Hotline	– Quick response time
• Onsite-repair	– Reduced impact on production
• Certified repair with warranty	– More reliable production
	– Improved maintenance
• Start-up and commissioning	– Increased performance with on-time failure free operation
• Application experts	– Optimise performance
	– Reduced lifecycle cost
• Training	– Trained resources for optimal design and maintenance
• Harmonic survey	– Prevent failure
	– Optimise performance
• Preventive inspection	– Reduce downtime
	– Lower maintenance cost
• Optimisation and retrofit	– Life-cycle optimisation
• Installed base evaluation	– Reduced capital and space bindings
	– Optimised availability
• Stock maintenance and consignment	– Optimised availability with effective finance planning
• Extended warranty	– Predictable budget for repair cost
• Agreed response time	– Minimising downtime
• Fixed repair and maintenance cost	– Effective finance planning for maintenance
• Drives Upgrade Program	– Long-term finance planning for technology upgrade of drives

### Keep you fit

- Training
- Stock maintenance & consignment
- Harmonic Survey
- Environmental Disposal

### Fix your costs

- Fixed Price
- Post warranty agreement
- Transport insurance
- Response time







## Protects environment

VLT® products are manufactured with respect for environment, safety and well-being of its producers and users.

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 assured.

### 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 Drives implements in all product series 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).

### Products impact

One year's production of VLT® drives will save energy equivalent to the energy production of a power plant. Better process control improves product quality and reduces waste and wear on equipment.

# What VLT® is all about

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

### 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®.

Two thousand 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 Drives have fully adopted modular principles in development as well as in 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 in our products. We develop and produce our own features, hardware, software, power modules, printed circuit boards, and accessories, which is your guarantee for reliable products.

### Local backup – globally

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

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

