

ENGINEERING  
TOMORROW

*Danfoss*

VLT® Motion Control Option

Increase your **productivity**  
with **perfect synchronizing**,  
positioning and cam control

Up to  
**40%**

cost savings  
compared to a  
traditional motion  
control system

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**VLT**®









# Increase precision, accuracy and speed

Expand the standard functionality of a VLT® AutomationDrive with energy-enhancing motion control options.

## Increase productivity and performance

Replacing mechanical controls with intelligent, energy-saving electronic solutions is an effective way to reduce both installation and daily running costs.

The ability to set and control the packaging application with greater precision also reduces packaging errors and equipment breakdowns.

The result is a reliable, high-quality process that increases both productivity and bottom line performance.

## Reduce installation costs

Replacing mechanics by electronic synchronizing or cam control increases flexibility while reducing costs. For example, electronic cam control, a standard feature in the VLT® Motion Control Option MCO 305, both adds new functionalities and removes the need for mechanical cam discs and boxes.

## Increase capacity

In other cases, manufacturers might want to increase the capacity of their packaging application. This can be achieved with the VLT® Synchronizing Controller MCO 350, which offers unparalleled synchronizing control and can be set up easily via the user-friendly control panel on the VLT® AutomationDrive.

As well as increasing the performance, the controller adds extra value by being an intelligent way to simplify the control system.

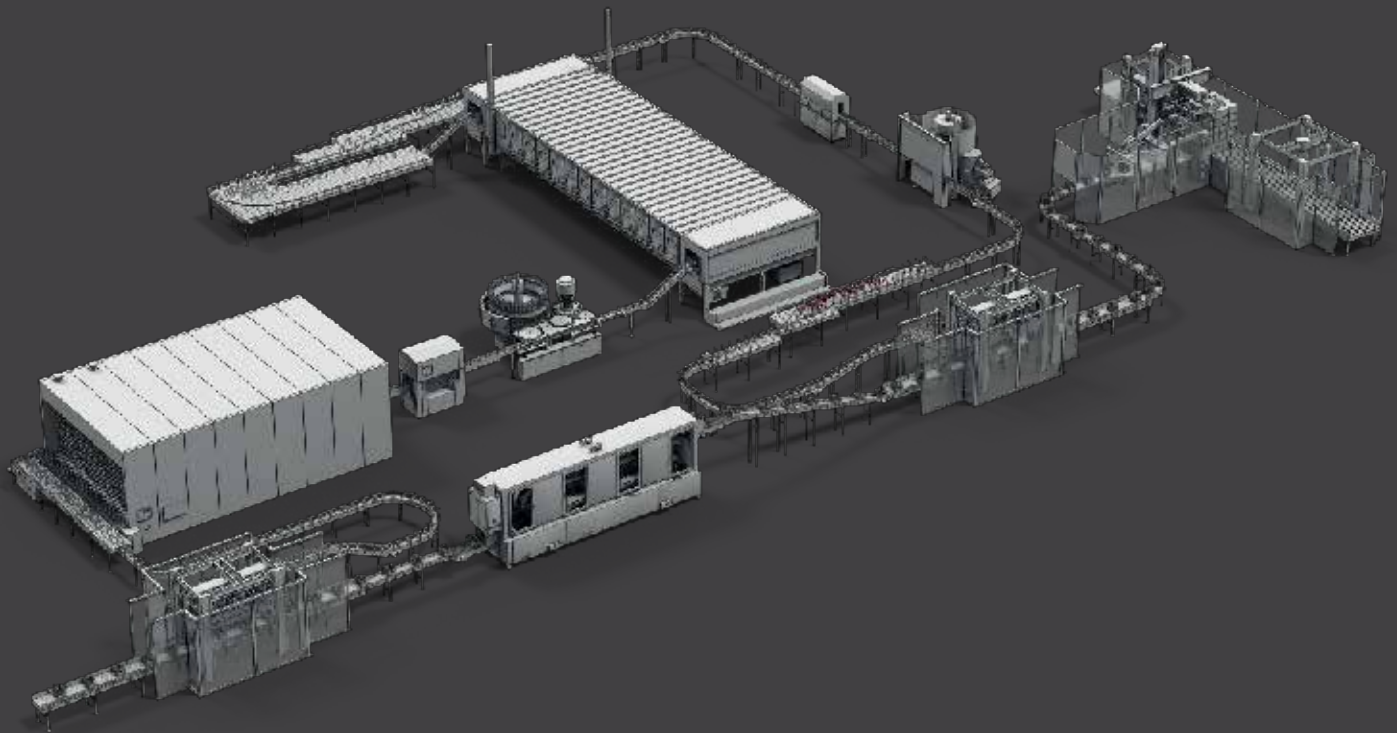
No matter which option you choose, the benefits of freedom of control and operational efficiency will provide a fast return on your investment.

# When **positioning** and **synchronization** make the **difference**

Efficiency, speed and accuracy are keys to quality, competitiveness and profit. For many applications, positioning and synchronization make the difference between manual and automatic operation.

## Add flexibility to applications such as

- Printing lines
- Bottle washers
- Conveyor belts
- Packaging systems
- Material handling systems
- Palletizers
- Indexing tables
- Storage systems
- Pick-and-place systems
- Positioning on the fly
- Foil wrapping
- Flow packing
- Filling and sealing
- Crane, lift and hoist applications
- Product-rejection systems
- Winder applications



# Accurate and dynamic motion control

The VLT® Motion Control Option MCO 305 adds functionality and flexibility to the VLT® AutomationDrive FC 301 and FC 302 series, expanding built-in functionalities in an integrated solution.

## Benefits of the MCO 305

- Accurate and dynamic motion control
- Synchronization (electronic shaft)
- Positioning
- Electronic cam control
- A variety of application functions such as monitoring and intelligent error handling can be programmed
- Limited-jerk function
- Easy implementation of application-specific functions
- Expands positioning functionality, replaces mechanical solutions

## Synchronizing functions

- Speed synchronizing
- Position synchronizing
- Position synchronizing with marker corrections
- Virtual master

## Positioning functions

- Absolute positioning
- Relative positioning
- Touch probe positioning

## Cam control function

The electronic cam control function can replace mechanical cam discs and cam boxes.

- Online marker correction
- Cam box
- Graphical cam editor

## Motion control bus

CANopen DS301 profile and master functionality NMT and SDO client.

- Multi-axes synchronization
- Floating master

## PC software

The VLT® Software Tool MCT 10 is designed to develop application programs for the Motion Control Option and for configuration/commissioning.

The PC software tool includes programming editor with program examples, graphical cam profile editor and “test-run” and “scope” functions for controller optimizing.

## Supports wide range of encoder feedback

- TTL
- SinCos
- SSI
- Hipurface
- Endat 2.1
- CanOpen

## Event-controlled programming

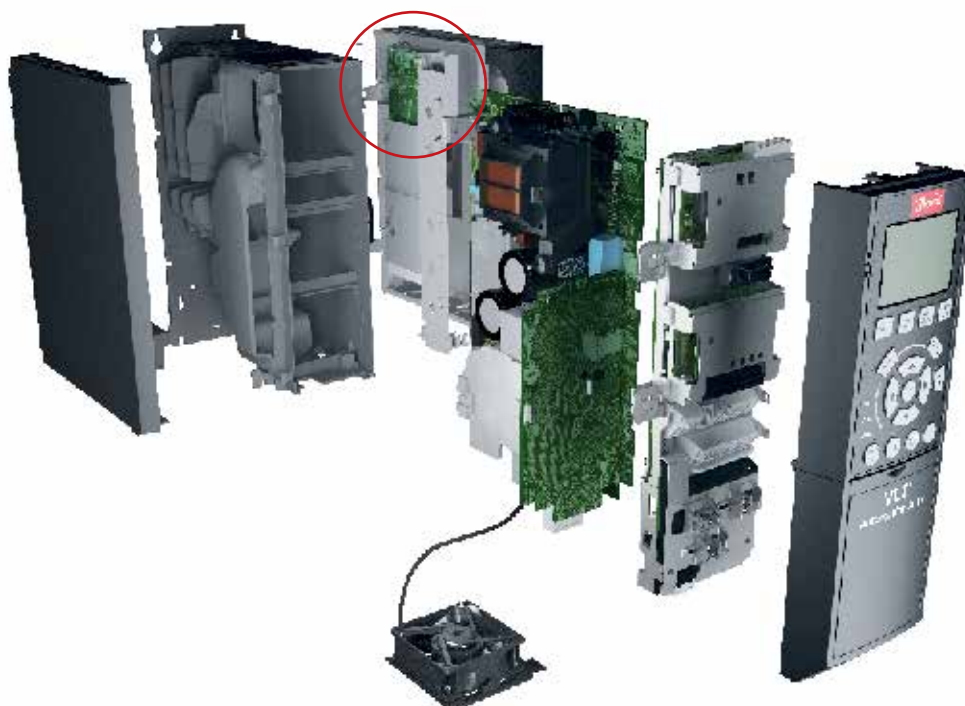
The VLT® Motion Control Option is based on event-controlled programming using a structured text programming language.

## Comes as

- “All-in-one” drive with the module pre-installed
- Option module for field installation

## Protection

- All inputs, outputs and supply connections are galvanically isolated from high-voltage connections such as mains supply and motor cables (PELV)
- Encoder signals are monitored during operation and standstill
- Customer-specific application programs can be copy protected





# Electronic cam function offers flexibility

Replace mechanical cam discs and boxes with electronic cam control.

## Benefits of electronic cam control

- Increased flexibility, as cam profiles are easily modified
- Cost reduction, fewer mechanical parts
- Fast and easy design and modification of curves via user-friendly graphical cam editor
- Fast and easy commissioning: cam profiles can be modified during commissioning
- Reduced maintenance costs owing to fewer mechanical parts
- Reduced machine size
- Limited jerk function



Electronic cam control is a standard feature in the VLT® Motion Control Option for the VLT® AutomationDrive.

With several thousand interpolation points and a high-resolution cam profile, very accurate cam control is obtained.

This function is adaptable to most cam applications because of multiple cam profiles, selectable coupling/decoupling behavior and on-line marker correction.

# PLC functionality built in

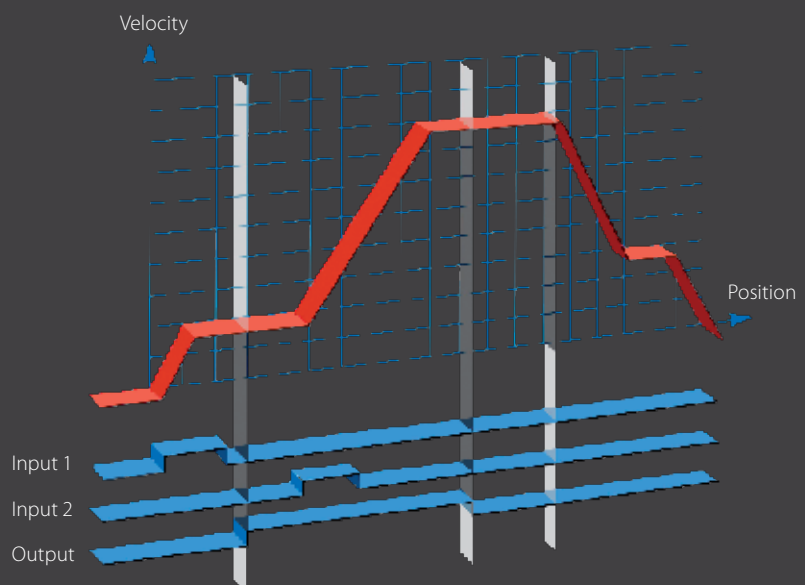
Release the load on the PLC or even make it redundant.

In such cases, the drive becomes an intelligent stand-alone control system.

Transition between multiple operation modes: Speed control, synchronizing, positioning and cam control is easy.

## Benefits

- Easier installation due to less wiring
- Fewer sources of error, adding to robustness and reliability
- Greater flexibility for the design of sophisticated applications
- Savings on panel space and installation costs (using the fieldbus option, communication wiring is much simpler)



# VLT® Synchronizing Controller

## – the **right position** at the **right time**

The VLT® Synchronizing Controller MCO 350 option for the VLT® AutomationDrive expands the functional properties of AC drives in synchronizing applications. It replaces traditional mechanical solutions.

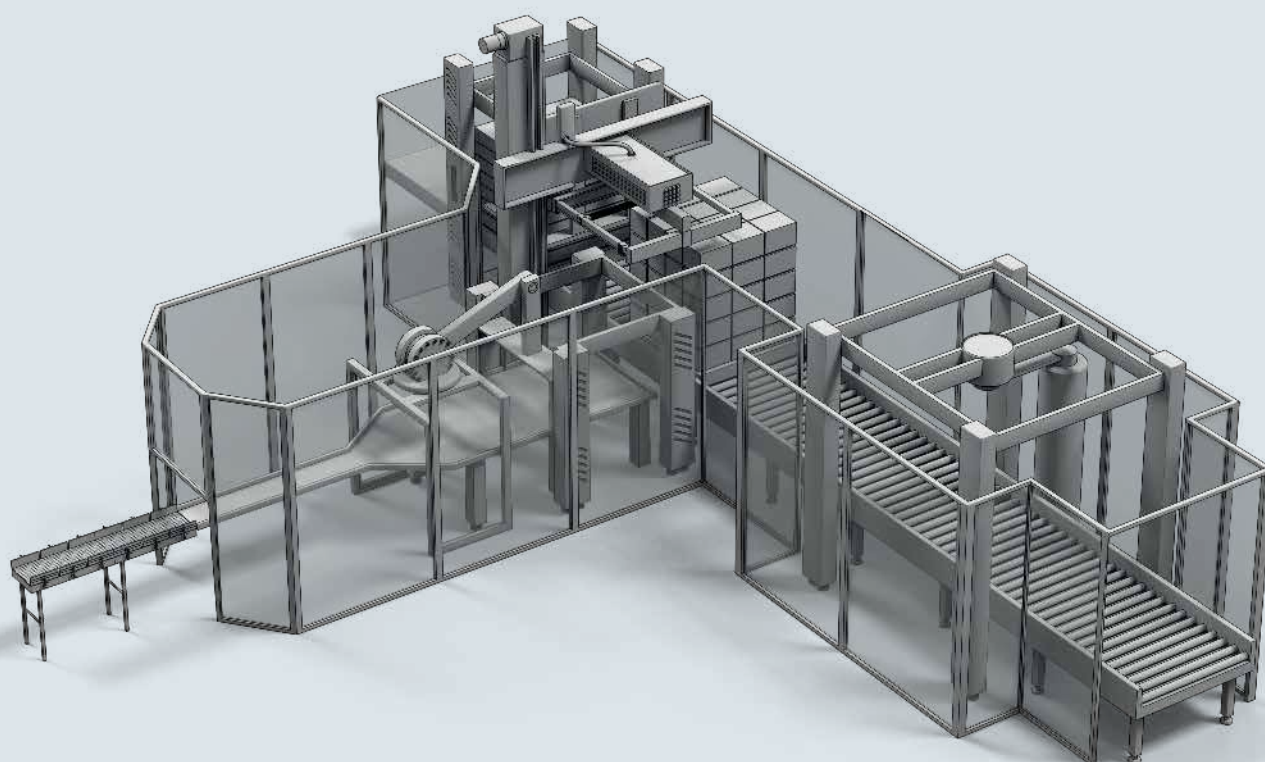
### Innovative features

- Readout of all relevant synchronizing status in the Local Control Panel
- Speed synchronizing
- Position (angle) synchronizing with or without marker correction
- On-line adjustable gear ratio
- On-line adjustable position (angle) offset
- Encoder output with virtual master function for synchronization of multiple followers
- Homing
- Automatic mechanical brake control
- Hold function, speed up/down
- Four fixed gear ratios

### Easy commissioning

As the VLT® Synchronizing Controller is a standard product with fixed functional properties, no additional application programming is required. To make commissioning easy, a test run function is included.

The VLT® Synchronizing Controller is user-friendly, enabling set-up of all parameters via the VLT® AutomationDrive Local Control Panel or via the VLT® Software Tool.





## Proven **experience**

The VLT® Motion Control Option MCO, in combination with the VLT® AutomationDrive FC 302, has proven itself in a variety of applications across different industries.

### **Packaging machine in dairy plant in Belgium**

Danfoss solution replaced the old servo drives keeping the existing PM motors.

### **Filling machine in bottling plant in Italy**

Synchronization of filler with blower machine solved with VLT® AutomationDrive FC 302 + MCO 305 + PROFIBUS.

### **Stage control in theater in Korea**

Distributed positioning and synchronization of batten and stage lifting, customer's own PLC system.

### **Horizontal form filling and sealing machine in food plant in India**

Four axis to be synchronized on position with accuracy of 1 mm; Danfoss solution with standard induction motor and incremental encoder is 15-20% cheaper than existing servo solution.

### **Crate-washing plant in Belgium**

>200 conveyor drives; approx. 15 positioning applications solved with MCO 305 + PROFIBUS.

### **Textile ring frame spinning machine in Bangladesh**

Applying MCO 305 has improved machine flexibility and production.

### **Rubber cutting machine in Brazil**

Two axis lathe controlled by MCO 305 to cut rubber or tape cylinder in smaller rolls; two pole asynchronous motor, low-cost solution.

### **High-speed paper printer in Brazil**

MCO 305 applied to synchronize machine axis; achieved high speed synchronization and accurate winding at lower cost than a servo solution.

### **Aluminum winder application in Brazil**

MCO 305 runs the rotating table, fast encoder reading for high precision.

## Follow us and learn more about AC drives



**VLT® | VAGON®**

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