

Danfoss



Decentral Solutions

Distributed intelligence

makes for highly modular, flexible and communicative applications

Flexibility, easy installation and servicing were in focus when Danfoss designed the decentral product range. The motor controls are IP 66 designed to withstand the often harsh environment.

The Danfoss decentral product range covers all applications from basic start/stop through soft start to advanced variable speed control.

Decentral benefits:

Less need for:

- **Central control panels**
Space-consuming motor control cabinets are eliminated.
- **Long screened cables**
Reduced need for wiring long screened motor cables.
- **Cooling**
Heat from the power electronics is dissipated in the plant and not in cabinets requiring forced cooling or air conditioning.

Savings

Power is supplied through standard installation cables – looped from one drive to the next as a powerbus.

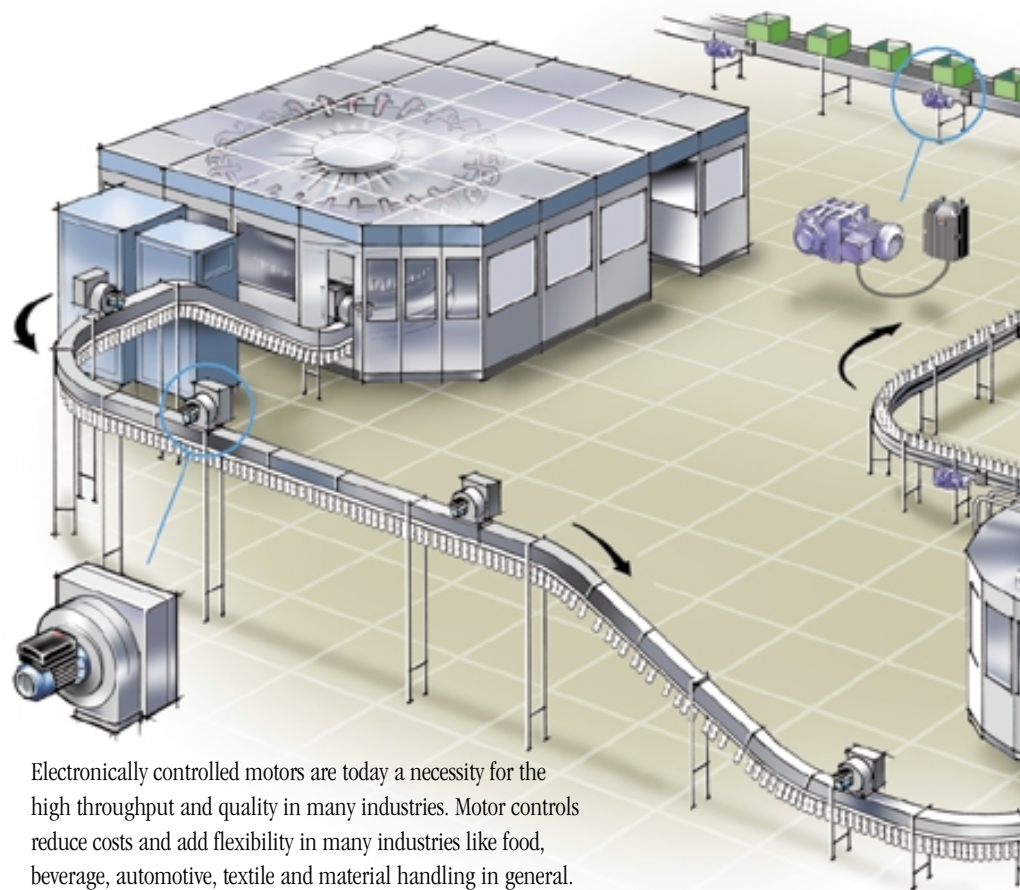
Service switch

Lockable service switch is integrated making local disconnect possible on either mains or motor side.

Control

Decentral drives are complete variable speed drives to be set up and controlled through a remote control panel or through fieldbus communication and Danfoss' dedicated MCT 10 set-up software.

As electronic components are getting smaller electronic motor controls can be built smaller and clever design allows for installation out in the production – on or near by the motors.



Electronically controlled motors are today a necessity for the high throughput and quality in many industries. Motor controls reduce costs and add flexibility in many industries like food, beverage, automotive, textile and material handling in general.



Hygienic

The electronics are protected in small, tight, robust, dirt repelling enclosures that can be mounted anywhere. This way it meets such conditions found in the food and beverage industry, where frequent wash downs are required.



Features

	FCD	FCM	DMS
• Compact solution	•	•	•
• High-energy efficiency	•	•	•
• Large power range	•	•	•
• Low earth leakage current (< 30 mA)	•	•	•
• Low harmonics (Comply with IEC 61000-3-2)	•	•	•
• Mounting			
– wall	•	•	•
– motor	•	•	•
• Adapt to any motor	•	•	•
• IP 66 / NEMA 4X	•	•	•
• Optimised variable torque operation	•	•	•
• Closed loop operation	•	•	•
• RFI compliance			
– IEC 61800 - 3 Class 1A	•	•	•
– IEC 61800 - 3 Class 1B	•	•	•
• Fully protected – motor and drive	•	•	•
• Flying start	•	•	•
• Full voltage to motor	•	•	•
• No additional motor heating	•	•	•
• 160 % over-torque	•	•	•
• Full slip compensation	•	•	•
• Flexible brake options	•	•	•
• Mechanical brake control and supply	•	•	•
• Thermal motor protection by ETR-function or motor thermistor	•	•	•
• Adjustable ramp times for soft start/soft stop	•	•	•
• Integrated Profibus DP, 12 Mbaud	•	•	•
• Profibus DP V1	•	•	•
• Devicenet	•	•	•
• AS-interface	•	•	•
• Remote I/O via fieldbus	•	•	•
• 24 V control supply			
– internal	•	•	•
– external	•	•	•
• Digital I/Os galvanically isolated acc. PELV	•	•	•
• 4 x M12 plugs for external sensors	•	•	•
• Visible status LED's	•	•	•
• Service switch	•	•	•
• Motor plug	•	•	•
• Power looping	•	•	•

Approvals





Adapts to standard and special motors

Danfoss' VLT® decentral motor controls, VLT® Decentral FCD 300, VLT® DriveMotor FCM 300 and VLT® Decentral Motor Switch DMS 300 are designed to control standard AC asynchronous motors. Their flexibility allows the FCD 300 and the Decentral Motor Switch DMS also to adapt to special motor types. An example is the AMT feature (Automatic Motor Tuning) in the FCD 300.

Combining the FCD 300 to Danfoss gear motors makes it even easier as they fit mechanically and the motor specifications are already stored in the FCD 300 memory. Combined motor drives are provided pre-assembled directly from Danfoss removing the need for mechanical fitting between motor and control. Standard motors with integrated inverters up to 7.5 kW are also available from Danfoss.

Made practical and reliable

Connections and loopings are done inside by maintenance-free cage clamps or pluggable terminals inside the bottom part. The electronics are placed in the lid and plugged into place.

The electromagnetic compatibility is taken care of by the standard built-in RFI filter.

The surfaces are protected by a double coating process leaving the surface robust and resistant to commonly used detergents.



Harting plugs available

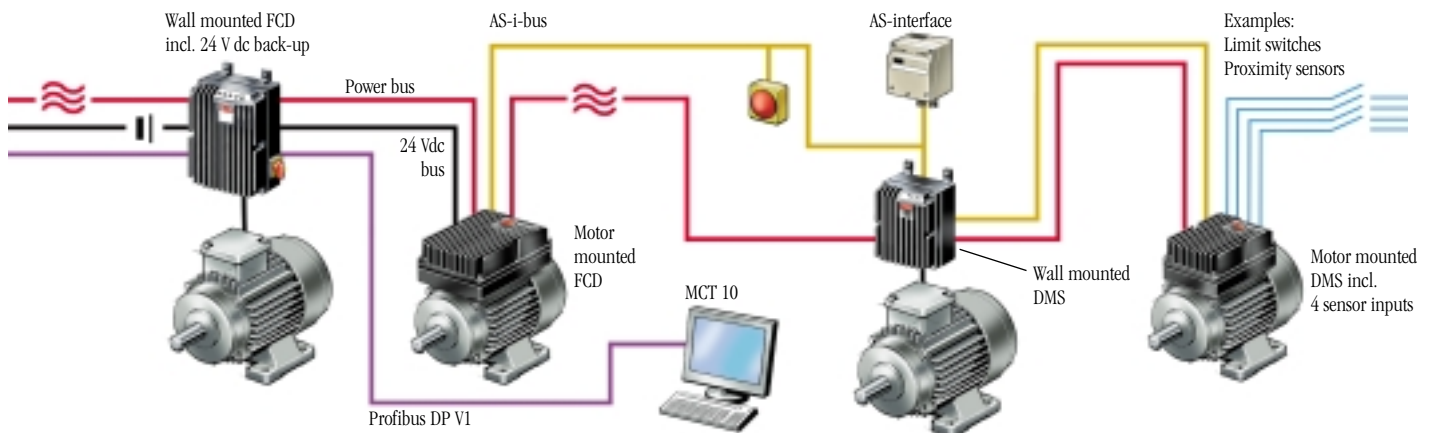


Visible LED's for easy status check



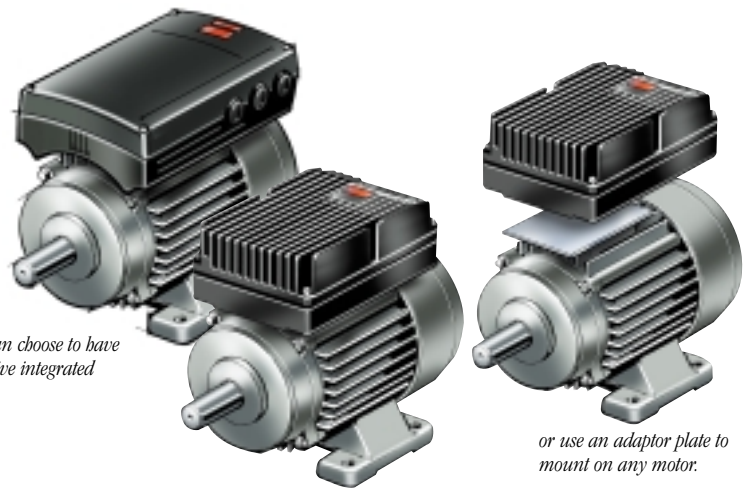
M12 connectors for sensor inputs

Decentral principle



On the motor

The VLT® electronic motor controls together with the motor totally eliminate motor cables and thereby minimises EMC problems. Heat from the drive is dissipated together with the motor heat.



You can choose to have the drive integrated

or use an adaptor plate to mount on any motor.

have it delivered ready mounted



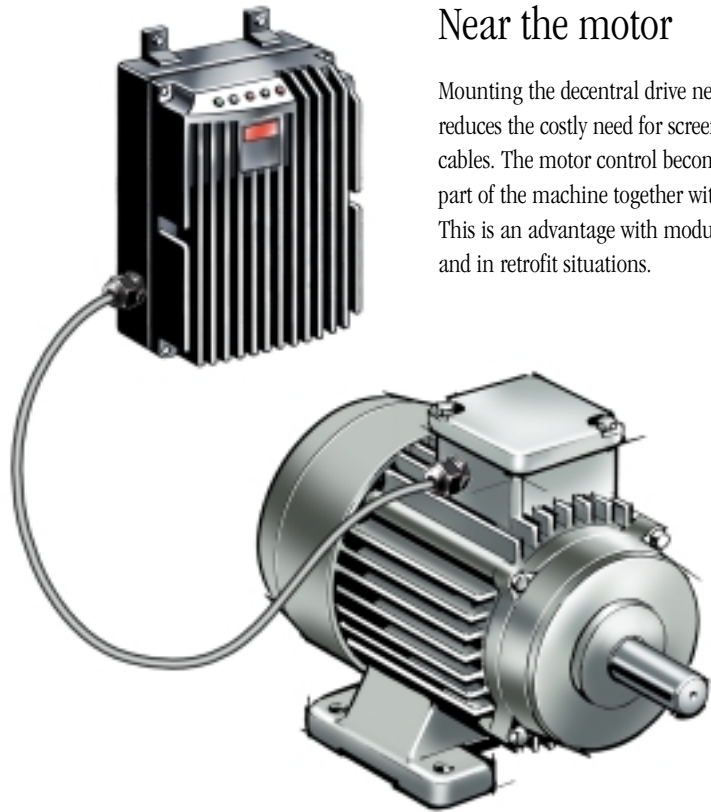
The service switch is an option



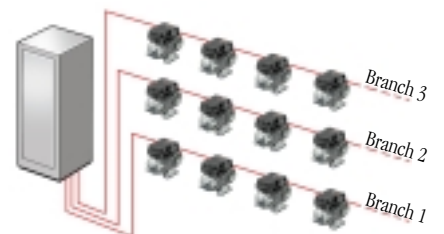
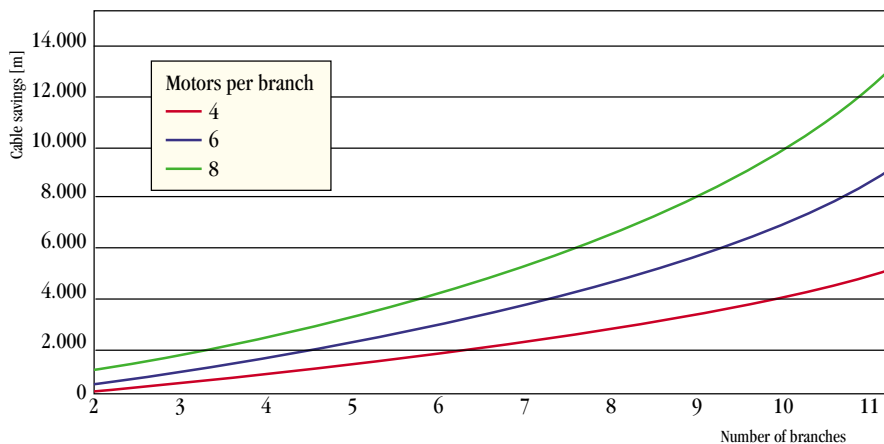
Easy accessible terminals

Near the motor

Mounting the decentral drive near to the motor reduces the costly need for screened motor cables. The motor control becomes an integrated part of the machine together with the motor. This is an advantage with modular plant designs and in retrofit situations.



Cable Savings



Savings depend on the size of the plant. The more drives, the more savings potential.

VLT® Decentral FCD 300

Input/output	No	
Analogue input signal:	2	+/-10VDC and 0 (4) - 20 mA
Analogue output signal:	1	0 to 20 mA programmable
Digital input:	5	Fully programmable
Digital/frequency output:	1	Programmable (150 – 110 kHz)
Relay output:	1	Programmable (240 V/ 2 A)
Motor protection:	1	Thermistor

Type		303	305	307	311	315	322	330	335	
Input current										
3 * 380 V – 480 V	I _{L,N} [A]	1.2	1.6	1.9	2,6	3.2	4.7	6.1	6.8	
Output current	I _N [A]	1.4	1.8	2.2	3.0	3.7	5.2	7.0	7.6	
Typical shaft output	P _{M,N} [kW]	0.37	0.55	0.75	1.1	2.5	2.2	3.0	3.3	
	P _{M,N} [Hp]	0.5	0.75	1.0	1.5	2.0	3.0	4.0	5.0	
Dimension L * W * D	[mm]	244 * 192 * 142					300 * 258 * 151			
Enclosure		IP 66/NEMA 4X (indoor)								



VLT® DriveMotor FCM 300

Input/output	No	
Analogue input signal:	1	+/-10VDC or 0 (4) - 20 mA
Analogue output signal:	1	0 to 20 mA programmable
Digital input:	4	Fully programmable
Digital output:	1	Programmable
Relay output:	1	Programmable (240 V/ 2 A)

Type		305	307	311	315	322	330	340	355	375
Input current [A]										
3 * 380 V – 480 V	I _{L,N} 2 pole	1.5	1.8	2.3	3.4	4.5	5.0	8.0	12.0	15.0
	I _{L,N} 4 pole	1.4	1.7	2.5	3.3	4.7	6.4	8.0	11.0	15.5
Typical shaft output	P _{M,N} [kW]	0.55	0.75	1.1	1.5	2.2	3.0	4.0	5.5	7.5
	P _{M,N} [Hp]	0.75	0.1	1.5	2.0	3.0	4.0	5.0	7.5	10
Frame size	[mm]	80	80	90	90	100	100	112	132	132
Enclosure		Motor IP 55 and inverter IP 66								

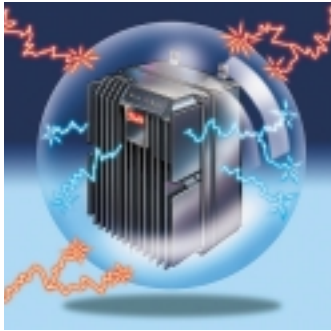


VLT® Decentral Motor Switch DMS 300

Input/output	No	
Digital input:	4	Start CW, start CCW, reset/stop, release mech. brake
Digital output:	1	“Run”-signal
Motor protection	1	Thermistor

Motor power range	[kW]	0.18 – 3.0
Supply voltage	[V]	3 * 380 – 480 +/- 10%
Dimension L * W * D	[mm]	267 * 176 * 134
Enclosure		IP 66/NEMA 4x (indoor)





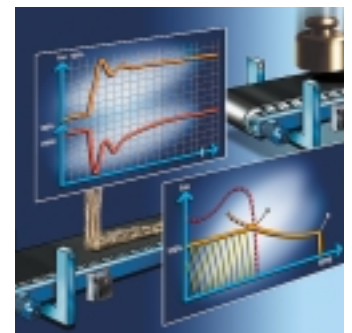
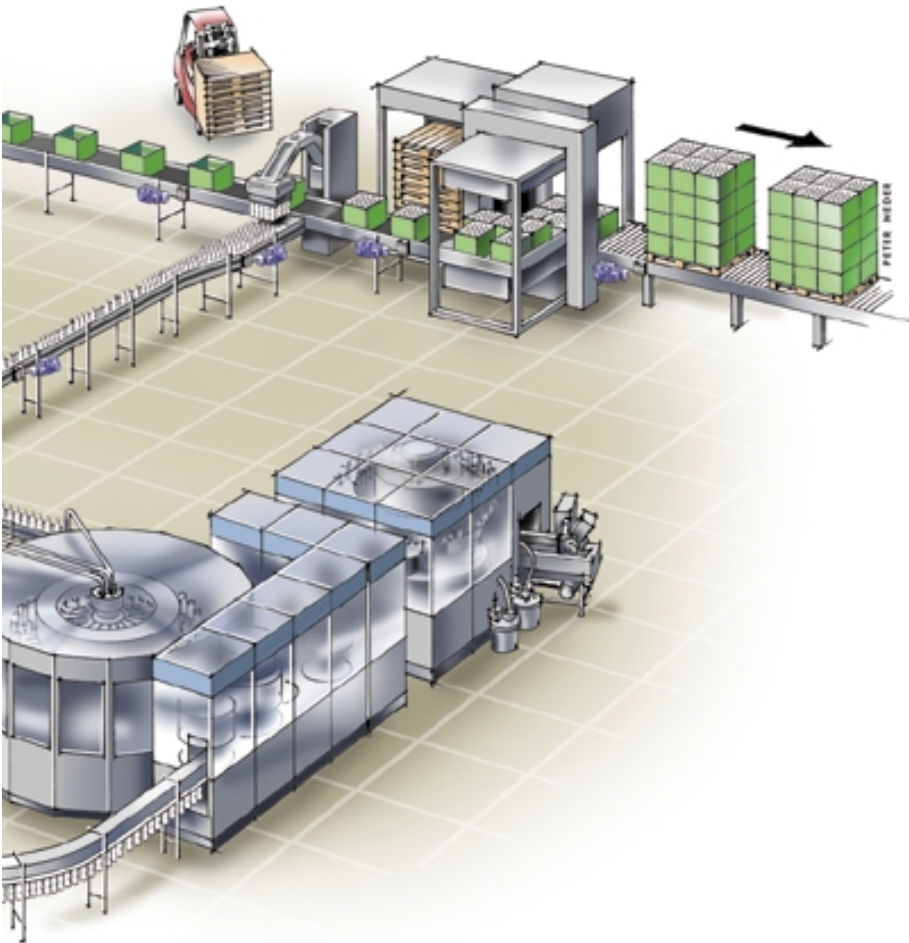
No EMC problems

Electromagnetic disturbances are proportional to cable lengths. As decentral drives are located near to or on the motors, the problem is minimised.



Limited need for extra fieldbus cables

Fieldbus communication is an excellent way of distributing information in a plant, and works perfectly together with decentral installations. You will be able efficiently to set-up and control your process from a central location.



Optimal operation

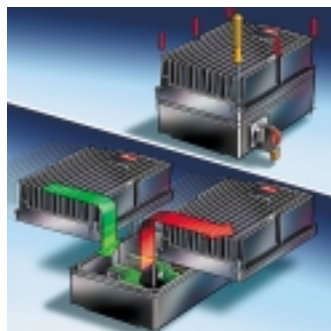
Danfoss variable speed drives react optimally on both sudden and continuous load changes. Production will continue while the drives adapt speed and torque to the changing conditions.

Due to the unique VVC switching principle used to generate motor voltages in Danfoss variable speed drives, power losses in the motor are never higher than the losses in a motor connected direct-on-line.

The VVC switching principle also ensures nominal torque at nominal speed and eliminates bearing currents.

Fast service

In case of service you just unplug the electronic part. All installations stay intact in the bottom part. After installing the new electronic part the variable speed drive can be configured via the fieldbus, making the configuration operator independent.



Easy retrofit

Upgrading a plant to variable speed control used to require room and cabinets for the motor controls. With decentral installations you can mount the motor control in the application close to the motor or on a wall. You can even mount the motor control on the motor to save space and installation time.





Customers World Wide Require Local Service

A breakdown of Danfoss variable speed drives or geared motors will occur only in exceptional circumstances. However, such circumstances do arise, and knowing the importance of minimising down-time, Danfoss has established a unique worldwide service concept.

All over the world

Global sales must be complemented by local service and support of customers and products all the way. Danfoss variable speed drives and geared motors are integral parts of applications sold all

over the world, and Danfoss' application knowledge and drives expertise accompany them everywhere, available from service companies around the globe.

Local contacts

All customers receive service directly from local Danfoss service companies familiar with not only the applications, the drives and the motors, but also with the local language, culture and circumstances. This ensures efficient communication and service.

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