

## **New drive technologies bridge gap between flexible decentral drive solutions and central monitoring and control.**

The concept of accurate, dynamic shaft performance from ac motors in industrial applications has been developed to near perfection through the last decade. Microprocessors and new circuit board techniques allied with more effective vector control strategies have made decentral drive solutions not only possible but highly practical. Even sophisticated frequency converters are now squeezed into tiny enclosures and can be mounted directly on the motor or close to it, allowing the drives to become integrated parts of their applications.

The benefits of decentral motor control are well defined: simplicity of installation, flexibility, reduced drive real estate, less power cabling and the elimination of EMC problems. Hence decentralisation of drives has been the rising trend for all kinds of material handling, warehouse systems, airport luggage handling, and also in the food and beverage industry.

The option of having the drive and motor integrated – or at least located very close to each other – offers a significant benefit in eliminating the need for lengthy cables from drive to motor and consequently, potential problems with electro magnetic compatibility (EMC). EMC filters can provide a partial answer but are not wholly effective for cable lengths over 50 meters. By running the mains supply closer to the motor and reducing the drive-to-motor cable length, EMC problems are eliminated. By looping the power cabling inside the drive, an absolute minimum of power cabling is required, cutting installation costs. Controlling each drive via short sensor or fieldbus cables means control cabling too is greatly simplified and cost reduced compared to a standard drive system installed in a central control cabinet. The added flexibility of being mounted on or in close proximity to the motor provides the freedom to relocate the whole drive assembly with simple fast re-connection to mains and fieldbus cabling for rapid re-commissioning.

Reduced cabling especially offers particular benefits to food and beverage applications where traps for dirt and germs must be eliminated. Allied with Aseptic motors and specially designed gear units such as the Danfoss Bauer 2000 series, decentral drives offer a valid hygienic solution in food and beverage applications.

A major German car plant recently selected decentral drives for a substantial paint shop refurbishment. Danfoss provided 560 DMS300 decentral motor switches, 100 FCD300 decentral frequency converters and 120 VLT® 5000, all of which are mounted into small panels for decentral installation, but with higher power ranges and additional components integrated in the panel.

On the other side of the world, The South Australian Brewing Company, located in Adelaide, recently undertook a major upgrade of their bottling hall. Danfoss supplied 96 decentral frequency converters complete with DeviceNet and special mounting boxes with gland holes on one side only. All the converters were mounted directly onto gear motors with locally machined aluminum mounting adaptors, eliminating screened motor cables and their associated costs.

To bridge the gap and benefit from both decentral flexibility and centralised control, remote monitoring and control of the drives is critical. Fieldbus communication such as ProfiBus and DeviceNet not only offer this facility but simplify the control cabling, while Danfoss' DPV1 software enables drive set-up using PC based software communicating via fieldbus to control remote drives.

Placing the drive in, on or near by the motor can heavily expose it to contamination such as water, dirt, oil, cleansing agents, high pressure hosing, and even to mechanical wear. The motor-drive combination therefore has to be extremely robust and designed to resist these adverse conditions while preserving the benefits of simple installation, ease of commissioning and minimum maintenance needs. IP66 enclosures are a must and to protect against adverse site conditions and aggressive cleaning agents, Danfoss units are coated with an acid and alkali resistant CORO2 paint finish.

In addition, Danfoss Drives in their new FCD & DMS series of decentral drives solutions up to 3.3kW, have gathered all the connections together in the bottom of the IP 66 cast aluminium shell. Spring operated cable clamps provide easy and maintenance free connections and looping of both power and fieldbus cables inside the shell, independent from the control electronics. These are housed in the top part of the shell; easily removed or replaced without interfering with the cabling.

The top control section connects with plugs to the bottom power section, minimising commissioning or upgrading downtime for a real plug-and-play decentral drives solution.

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Legend:

Profibus DPV1 allows you to address drives, sensors and other equipment via fieldbus from anywhere to monitor and control production.