August 2010

Danfoss Soft Starter MCD 500 offers Adaptive Acceleration Control

Danfoss Drives has introduced the VLT MCD500 soft starter with adaptive acceleration control(AAC),

AAC enables users to select different acceleration and deceleration profiles according to specific application needs, optimizing performance and maximizing energy efficiency, according to the company.

The MCD500 is available in 23 models and five frame sizes, from 21A to 1,600A (7.5kW to 800kW).

The G1 frame size is IP20 rated and G2-G5 frame sizes are IP00 rated.

Optional finger guard kits are available for the G2-G5 frames to achieve IP20.

The MCD500 is smaller and more compact than its predecessor (the MCD3000).

The MCD500 series has earned certification and approvals by CE, CCC, C-Tick, RoHS, UL, cUL and Lloyds Register.

Doug Yates, product manager for Danfoss Drives, said: 'Using AAC, the soft starter learns the motor's performance during start and stop, then adjusts control to optimize performance.

'AAC control adapts itself to the motor's profile, making for more efficient and precise control of the motor.

'This benefits the user by being able to match the soft starter and the motor as a coordinated system,' he added.

Soft starters are typically used to limit motor start current or to control load acceleration and/or deceleration.

The former is best accomplished with constant-current control, while the latter is best carried out with AAC.

The MCD500 offers both constant current and AAC.

Soft starting, or gradual and shock-free acceleration, can be beneficial for all motor applications, but many situations need more precise acceleration and/or deceleration control, which is where AAC technology comes in.

For example, AAC is particularly dominant in controlling pumps, band saws and conveyor systems because it allows the selection of multiple deceleration profiles.

Yates continued: ' Consider pumping High Head in a water tower application.

'Here, constant-current control methods can be problematic because of the high back pressure, which can mean that even a small variation in speed can result in water flow switching rapidly from forward to reverse.

'This rapid change in water flow results in significant reverse flow, causing the non-return valve to slam shut, sending damaging shock waves [water hammer] throughout the system.

'AAC is an ideal solution because its late deceleration profile will prevent water hammering by providing slow ramp-down while the valve closes,' he said.

For example, an integral bypass contactor for models up to 215A/150hp reduces space requirements, eliminates the need for external equipment and simplifies installation.

MCD communication options support the following fieldbus networks: ASCII for Remote Operator and Winmaster, Profibus DP, Devicenet and Modbus RTU and a USB option.

Also featured is a four-line plain language and graphical display that supports eight languages, including Chinese.

A simulation function lets users test the external control circuits and equipment without connecting the MCD500 to line voltage or a motor.

MCD500 models of 360A and above have adjustable bus bars that allow top or bottom connectivity of input and output cabling; this also provides flexibility in retrofitting other starters where the bus bars or cables are located at the top or bottom.

In terms of stopping, the MCD500 pulses DC over all three phases and does not require an external contactor.

Various other soft starters pulse DC in only two phases and require an external contactor.

The MCD500 includes additional features to satisfy various application needs.

The MCD500 slow-speed (or Jog) function allows the operator to run the motor at part speed in either forward or reverse direction; this is ideal for load positioning in mixers or hopper bins ready for unloading.

In terms of activation, the MCD500's Emergency Run Mode initiates a start and deactivates all protection systems, which enables the motor to run as long as possible despite a deteriorating environment.

For example, in case of a fire, equipment such as ventilation fans in high-rise buildings can be required to run at all costs.

The MCD500 ' second order thermal' model allows motors to be used to their full potential without fear of damage from overloading.

The second order thermal model takes into consideration the difference between the motor winding and motor casing characteristics.

It also accounts for motor current, iron losses and winding resistance losses and even accounts for running the cooling fan at the back of the motor versus standstill.

This feature enables users to avoid having to utilise expensive motor protection relays.