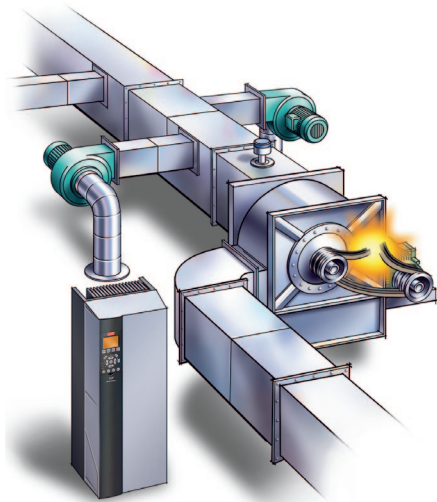*Danfoss*

VLT® Broken Belt Feature

VLT® HVAC Drive provides advanced broken belt detection for fans and compressors.
If a broken belt condition is determined, the drive can send a warning to the operator or
stop the motor if desired. The feature can work in either open or closed loop operation.

Advanced broken belt detection is based on motor torque. Torque is a better indication of a no-load condition because it avoids the need to compensate for motors with poor power factor (high current) at low load.

This feature can be used for any loss of load condition, such as a broken belt (fan) or broken coupling (pump).

During a loss of load, the motor runs at a high speed in an attempt to produce flow and the motor torque is low because there is no load on the motor.

Loss of load is detected when the drive's output frequency is greater than or equal to 15 Hz and the motor torque is below the programmed broken belt torque value for a programmed period of time.

No need for sensors, wiring and digital input

Broken belt detection is usually done using either an air flow or differential pressure sensor in the duct or a current sensor on the motor leads.

The Broken Belt detection function of the drive eliminates the need for an external sensor, wiring to the controller and a digital input.

A hard-wired digital output from the drive or serial communications can be used to alert the operator or maintenance personnel about the problem.

Easy programming
The drive software makes programming the Broken Belt feature quick and easy by choosing Fan Features and then Broken Belt Function under the Quick Menu.

Perfect
solution for:

– Intelligent control
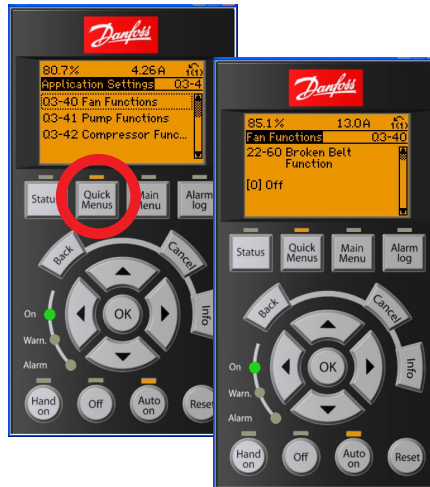– HVAC system protection
– Remote status reporting

Feature	Benefit
Eliminates need for an external sensor	– Reduced installation and maintenance cost
Reduced wiring	– Reduced installation cost
Alerts operator of a warning or alarm	– Improves operation of equipment – Improves occupant comfort
Pre-programmed software for easy setup	– Saves time and increases reliability

Facts about our products

VLT®
THE REAL DRIVE

Programming Broken Belt Detection

Programming for Broken Belt detection is simplified with a number of parameters that are pre-programmed into the drive.

Prior to programming this feature, commission the drive by using the parameters in the Quick Menu Q2 Quick Set-Up.

Then perform the few additional steps for programming Broken Belt detection:

Parameter	Description	Settings		Comments
		Factory setting	Recommended setting	
Prior to programming Broken Belt Detection				
16 - 22	Torque %			Run motor at 15 Hz and observe value of Torque %
In the Quick Menu select Q3 Function Setups and Q3-4 Application Settings				
Q3 - 40	Fan Functions			Select Function
Broken Belt Function Menu				
22 - 60	Broken Belt Fuction	Disabled	Warning/Trip	Select action to be performed
22 - 61	Broken Belt Torque	10%		Set the value of parameter below the measured value observed in parameter 16 - 22. The default value of 10% will often be adequate.
22 - 62	Broken Belt Delay	10 sec.		Set time for conditions to exist before carrying out the action in par. 22 - 62. In general, set longer than the programmed ramp down time in par. 3 - 42.
The following parameters give an indication to a BMS if a no flow condition is detected				
5-40	Function Relay		[194] Broken Belt	Program one of the relays to selection [194], Broken Belt. The selected relay will be activated when a Broken Belt condition occurs.

Warning words used to report broken belt via serial communications:

Protocol	Warning Word
BACnet™	BV:80 Broken Belt
LonWorks	nvoBrokenbelt
Modbus RTU	Register 16930 Bit 8