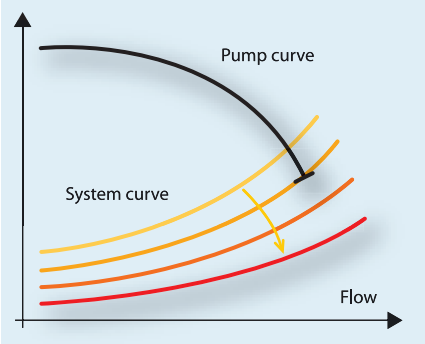
VLT® Dry Pump Feature



The VLT® HVAC Drive provides a special No Flow detection feature – Dry Pump – for pump systems. This feature is useful for detecting if a pump has run dry, such as improper system fill at start up or when a pump has been out of service and restarted without water. This condition can cause pump damage if not detected and corrected promptly.

Dry pump detection based on motor speed and power

Dry pump detection is based on measurement of the power consumption of the frequency converter and the speed of the motor. If there is no water in a pump (dry), it will not be able to produce an outlet pressure. The pump will accelerate to maximum speed to try increasing the system pressure to the design static head pressure. When the drive is running at maximum speed with low power consumption for a user-defined time period, a Dry Pump action is initiated. This can be used to give a warning or to generate an alarm and shut down the pump. The Dry Pump feature is used with the built-in PID controller or an external PID controller.

The perfect solution for

- Intelligent control
- HVAC system protection
- Remote status reporting

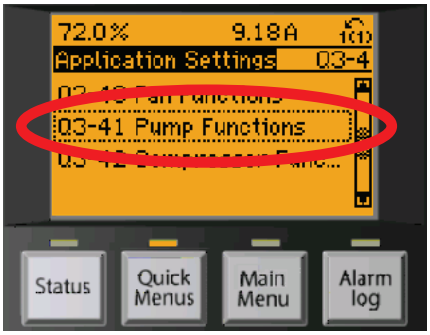
Auto or Manual Set Up are Available

Because Dry Pump is a special condition of the No-Flow feature (see No-Flow Feature fact sheet for a complete description) detection is based on the measurement of power and motor speed. Speed and power values can be set up either automatically or manually.

The Auto Set Up automatically steps the user through the commissioning process, storing the data measured. When the automatic set-up is selected the output frequencies used are 50% and 85% of maximum. Manual set-up can be used when a different pair of frequencies is desired.

Programming is quick and easy

The drive software makes programming the Dry Pump feature quick and easy by choosing Pump Functions, then No-Flow Function under the Quick Menu and selecting the Dry Pump parameters.



Features	Benefits
Eliminates an external differential pressure switch or flow meter	Reduces installation and maintenance cost
Eliminates wiring for external sensors	Reduces installation and maintenance cost
A warning or alarm can alert the operator of the problem	Provides proper operation of equipment and increases occupant comfort
Programming is quick and easy with pre-programmed software	Saves time and increases reliablity

VLT®
THE REAL DRIVE

Programming Dry Pump detection

Programming for Dry Pump 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 following steps for programming No-Flow detection and the specific Dry Pump parameters:

Par.#	Description	Settings		Comments
		Factory setting	Recommended setting	
1-00	Configuration mode		Open loop	VLT® HVAC Drive must be set in Open Loop for Auto Set-up
22-20	Low Power Auto Set-up	Disable	Enable	Close the outlet valve for the pump before starting Auto Set-up. Select Enable and follow the instruction on the LCP. After Auto Set-up is complete, open the pump outlet valve.
The following parameters are accessed through the Main Menu and will be stored after pressing the [OK] key to save the results after the auto-tuning				
22-33	Low Speed [Hz]			When Low Power Auto Set-up is used, 50% of the drive's maximum frequency will be stored here. This can be manually edited, if desired.
22-34	Low Speed Power [kW]			When Low Power Auto Set-up is used, the output power measured under no-flow conditions at 50% speed will be stored here. This can be manually edited, if desired.
22-37	High Speed [Hz]			When Low Power Auto Set-up is used, 85% of the drive's maximum frequency will be stored here. This can be manually edited, if desired.
22-38	High Speed Power [kW]			When Low Power Auto Set-up is used, the output power measured under no-flow conditions at 85% speed will be stored here. This can be manually edited, if desired.
1-00	Configuration mode	Open loop	Closed loop	Return the FC 102 to Closed Loop operation if required
These parameters are used after Auto Set-up and the No-Flow feature is operating				
22 - 30	No-Flow Power			When the drive is running, this parameter will show the power level that will be interpreted as producing no flow at the current motor speed.
22 - 31	Power Correction Factor	100%		This parameter is used to raise or lower the no-flow power curve as specified by the percentage entered here.
The following parameters determine the action that the drive will take if a dry pump condition is detected				
22-21	Low Power Detection	Disable	Enable	Dry Pump detection is based on power
22-26	Dry Pump Function	Off	Warning/Alarm	Select action
22-27	Dry Pump Delay	60 sec.		Set the time delay before the drive will perform the Dry Pump Function
The following parameters give an indication to a BMS if a dry pump condition is detected				
5-40	Function Relay		[191] Dry Pump	Program one of the relays to selection [191], Dry Pump. The selected relay will be activated when a Dry Pump condition occurs.
The following are used if Dry Pump is reported via serial communications				
	Protocol	**Alarm Word**		**Warning Word**
	BACnet	BV:78 Dry Pump		BV:142 Dry Pump
	LonWorks	nvoAlarmword Bit 40		nvoWarningword Bit 40
	Modbus RTU	Register 16910 Bit 6		Register 16930 Bit 6

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