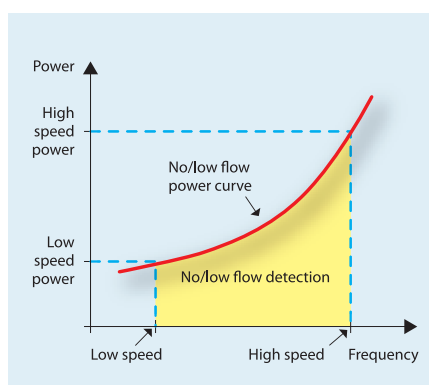


VLT® No Flow Feature



No flow based on motor power and frequency

No-Flow Detection is based on the measurement of power at specific motor speeds. The drive monitors actual power and motor frequency and compares it to the calculated no-flow power at specific speeds. If the power measured at a specific frequency is greater than the no-flow power calculated by the drive, the pump is producing flow. If the power measured is less than the no-flow power calculated by the drive, a warning or alarm is generated to notify the operator of the condition.

The perfect solution for

- Intelligent control
- HVAC system protection
- Remote status reporting

The VLT® HVAC Drive provides a new No-Flow detection feature for pump systems. This feature is useful for detecting conditions where a pump is producing no flow – a condition that can cause pump damage if not detected and corrected.

To determine the no-flow power level throughout the speed range, the drive generates a power vs. frequency curve that represents the no-flow condition. This curve is generated by the drive from two data points. These power/frequency points can be entered into the drive automatically or manually.

Manual or Auto Set Up are available

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 No-Flow feature quick and easy by choosing Pump Functions and then No-Flow Function under the Quick Menu.



Features	Benefits
Eliminates an external differential pressure switch or flow meter	Reduce installation and maintenance cost
Eliminates wiring for external sensors	Reduce installation and maintenance cost
A warning or alarm can alert 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 reliability

Programming No-Flow detection

Programming for No-Flow 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:

Par.#	Description	Settings		Comments
		Factory setting	Recommended setting	
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.
22-3	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.

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%	110%	This parameter is used to raise or lower the no-flow power curve to the percentage entered here. Values above 100% help ensure the drive reliably detects no-flow.

The following parameters determine the action that the drive will take if a no flow condition is detected

22-21	Low Power Detection	Disable	Enable	To activate no-flow based on power
22-23	No-Flow Function	Off	Sleep Mode/Warning/Alarm	Select action
22-24	No-Flow Delay	10 sec.		Set the time delay before the drive will perform the No-Flow Function. Generally set longer than the decel ramp time.

The following parameters give an indication to a BMS if a no flow condition is detected

5-40	Function Relay		[190] No-Flow	Program one of the relays to selection [190], No-Flow. The selected relay will be activated when No-Flow occurs.
	Digital Output		[190] No-Flow	A digital output can be used to indicate a no flow condition. Use the parameter that sets the function of the desired digital output.

The following are used if No-Flow is reported via serial communications

	Protocol	Warning Word
	BACnet	BV:77 No Flow
	LonWorks	nvoWarningword Bit 37
	Modbus RTU	Register 16930 Bit 6 = 1