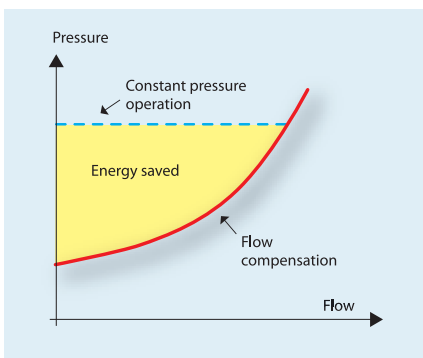


VLT® Flow Compensation Feature



The VLT® HVAC Drive provides a special flow compensation feature for pump systems to reduce energy consumption. This feature is useful when it is not possible for a pressure transducer to be placed at the most distant significant load in the system and it can only be located close to the pump.

Flow compensation based on pressure reset

A pressure sensor for control of the pump speed is normally placed at the most distant significant load in the system to maintain constant system pressure at all flows. With traditional variable speed control, the drive reduces the pump speed to produce a constant pressure at the remote location in the system.

requirements of the system. At reduced flow, the energy that went into producing this excess pressure is wasted.

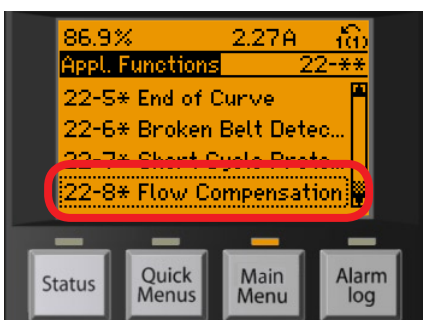
The VLT® HVAC Drive efficiently controls such conditions by calculating the control curve of the system and electronically reducing the pressure required at the pump's outlet. This significantly reduces the power required to provide reduced flows. Flexibility to adjust this control curve is provided to handle a wide variety of hydraulic systems.

(Flow compensation can also be used with the built-in Cascade Controller. See the Programming Guide parameter group 25 for using flow compensation.)

The perfect solution for

- Intelligent control
- HVAC system efficiency improvement
- Energy Savings

It is not always practical to put the pressure sensor in this ideal location. With traditional variable speed control, when a pressure sensor is located near a pump discharge, the drive controls the pump speed to produce a constant pressure at the outlet of the pump, needed for maximum flow, regardless of the



The drive software makes programming the Flow Compensation feature quick and easy by choosing Application Functions Group 22, under the Main Menu and selecting 22-8* Flow Compensation.

Features	Benefits
• Eliminates placing an external pressure sensor in a distant location	• Reduced installation cost
• Eliminates wiring for external sensors	• Reduce installation cost
• Can be used in combination with Energy Box software	• Provides estimate of additional energy savings
• Programming is quick and easy with pre-programmed software	• Saves time

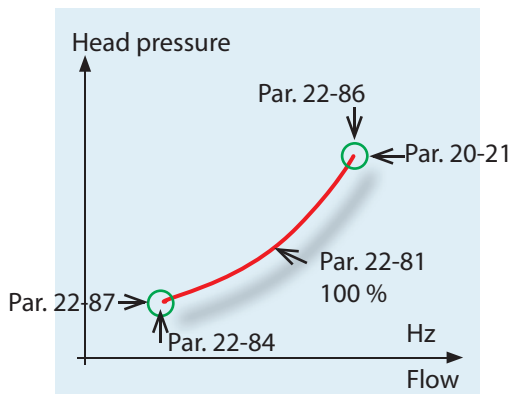
Programming is quick and easy

There are two methods which can be used for flow compensation depending whether the design speed is known or unknown. The most common method of using flow

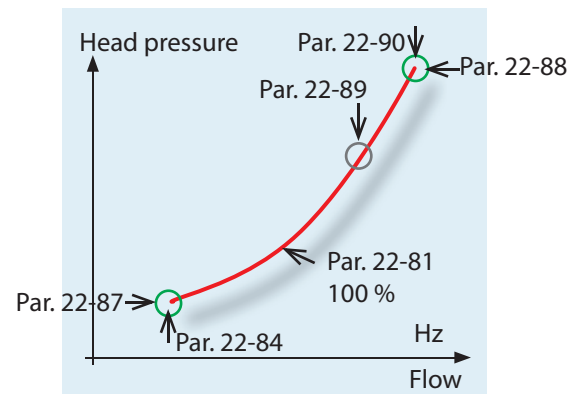
compensation is when the pump curve and design data are known. Simply reading the design head and flow from the pump curve data sheet and programming the frequency for

this flow is required. If the design point is unknown, the flow and frequency are estimated using the pump curve.

Design speed known



Design speed not known



Par.#	Description	Settings		Comments
		Factory setting	Recommended setting	
1-00	Configuration mode		Closed loop	FC 102 must be set in Closed Loop for Flow Compensation
These parameters are used for Flow Compensation when the design speed is known				
22-80	Flow Compensation	Disable	Enable	Enable allows Flow Compensated Setpoint operation.
22-84	Speed at No-Flow [Hz]	10		The speed of the motor at which the flow has stopped and minimum head pressure is achieved. Closing balancing valves and reducing the speed until minimum pressure is achieved determines this value.
22-86	Speed at Design Point [Hz]	50/60 Hz		The output frequency of the drive at which the design flow is reached.
22-87	Pressure at No-Flow Speed			Enter the minimum head pressure observed at No-Flow speed [Par. 22-84]
These parameters are used for Flow Compensation when the design speed is unknown				
22-82	Work Point Calculation	Disable	Enable	Select Enable when the Design Speed is unknown.
22-88	Pressure at Rated Speed			The pressure at the pump outlet when it is running at design speed.
22-89	Flow at Design Point			This is the design flow of the system obtained from plans or specifications. Read the value on the horizontal axis of the pump curve and plot vertically for other system points.
22-90	Flow at Rated Speed			Determine from pump curve, the flow at design setpoint [Par. 20-21].
These parameters are common to both setups				
20-21	Setpoint 1	0.000		The static head pressure at Design Point from the pump curve.
22-81	Square - Linear Curve Approximation	100%	100%	Adjustment of this parameter allows the shape of the control curve to be adjusted. This parameter provides flexibility to simulate a variety of hydraulic systems.