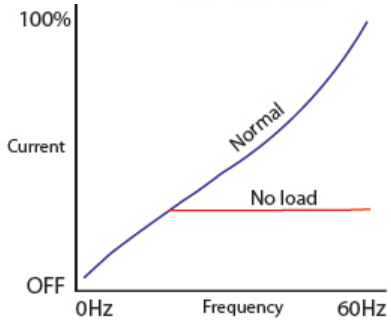
How to detect proof of flow on VFDs with current sensors

The challenge with monitoring variable frequency drives (VFDs) is the necessity to monitor both amperage and frequency to ensure the drive is operating normally. To monitor this ratio, a current sensor must learn the VFD curve and alarm the controller when the relationship is outside the normal operating range. VFD current sensors are installed on the load side of the variable frequency drive and use a microprocessor to set the proper threshold. The sensor will detect motor undercurrent conditions such as belt loss, coupling shear, and mechanical failure on fans and pumps.

Positive proof of flow for VFD driven fans and pumps



How is the current sensor trip point calibrated for VFDs?

In order to detect belt loss/coupling shear on variable frequency drives, the current sensor trip point is set by a microprocessor that establishes a proper threshold between current and frequency at one or multiple frequency bands. The current sensor then alarms the controller with a change in state when the monitored current deviates from the learned load at a particular frequency band, indicating belt loss or other mechanical failure. So, how does a technician calibrate a current sensor to monitor mechanical failure on a VFD? Some VFD current sensors require manual calibration from a field technician by running the VFD at different bands for 2 minutes each, taking a minimum of 10 minutes per sensor to install. To save time and money on install, a Senva VFD current sensor self-calibrates in 10 seconds of the VFD operating above 50 Hz.

Selecting the correct VFD current sensor

The biggest constraint when working with VFD sensors is ensuring the VFD will be operating within the amperage requirements. Standard VFD current sensors require a minimum of 3.5 amps on the lowest frequency. Most issues stem from having insufficient amperage to power the microprocessor in the current sensor. For example, for a Senva C-2350VFD current sensor, if the minimum amperage is not present in the 20 Hz range, the sensor will not operate properly. The options at this point are to wrap the wire to double the current present, or to select a VFD current sensor that can operate with a lower amperage range, such as Senva's C-2350VFD-L (0.5-15 A range).

For assistance on calculating the amperage for your specific VFD, feel free to utilize our motor amperage calculator:

Senva Motor Amperage Calculator

AutoSet™ ORDERING INFORMATION

SPLIT CORE	Min (on)	Max A	Output*	Sensor Power
C-2350VFD-L	0.5A	15 A	1.0A@30VAC/DC	12 to 30VDC/ 24VAC
C-2350VFD	3.5A	135A	1.0A@30VAC/DC	Induced
C-2350VFDHV	3.5A	135A	0.2A@120VAC	Induced

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