Optidrive Applications Support Library

Application Note	AN-ODV-2-015
Title	**Modifying the VF Characteristic**
Related Products	**Optidrive HVAC**
Level **1**	1 – Fundamental - No previous experience necessary 2 – Basic – Some Basic drives knowledge recommended 3 – Advanced – Some Basic drives knowledge required 4 – Expert – Good experience in topic of subject matter recommended

Overview

Optidrive HVAC provides enhanced V/F (volts to Hertz) control for general purpose AC motor control applications.

The motor start up / low speed voltage can be increased using the V/F voltage boost parameter to give improved starting / low speed torque performance. This is referred to as the V/F voltage boost function.

V/F Voltage Boost Function

P1 - 11 V/F Voltage Boost

P1-11 allows the user to directly adjust the voltage output applied to the motor at low speeds to improve starting and low speed performance.

P1-11 defines the voltage applied to the motor at 0.0Hz, as a percentage of P1-07, Motor Rated Voltage. If P1-07 = 0, the voltage will be proportional to the incoming supply voltage. As the output frequency from the drive increases, the voltage boost is reduced linearly up to 50% of the motor rated frequency. This is shown clearly in the graph below.

P1-11 is intended to allow the user to adjust the V/A (Volts to Amps) characteristic of the drive to compensate for the motor losses at low frequencies. If P1-11 is too low, the motor may not develop sufficient output torque at low frequency. If P1-11 is too high, the motor current will also be too high, and will likely result in the drive tripping O-I (Instantaneous Over-Current) or It.trp (Thermal Over-Current Trip). When adjusting P1-11, it is advisable to check that the output current does not exceed the motor rated current when operating at low frequencies; otherwise P1-11 should be reduced.

Example

For a typical 230V, 50Hz AC induction motor, the user should set P1-07 (Motor Rated Voltage) = 230V and P1-09 (Motor Rated Frequency) = 50Hz to give standard linear V/F operation.

If for any reason the user wishes to change this operation, e.g. to increase the voltage applied to the motor at lower speed

- Set P1-11 to an increased value.
  For example, if set to 20% the drive output will give the V/F characteristic indicated by the blue line in the graph below.

- - - - - Normal V/F Characteristic

——— Boost Adjusted V/F Characteristic
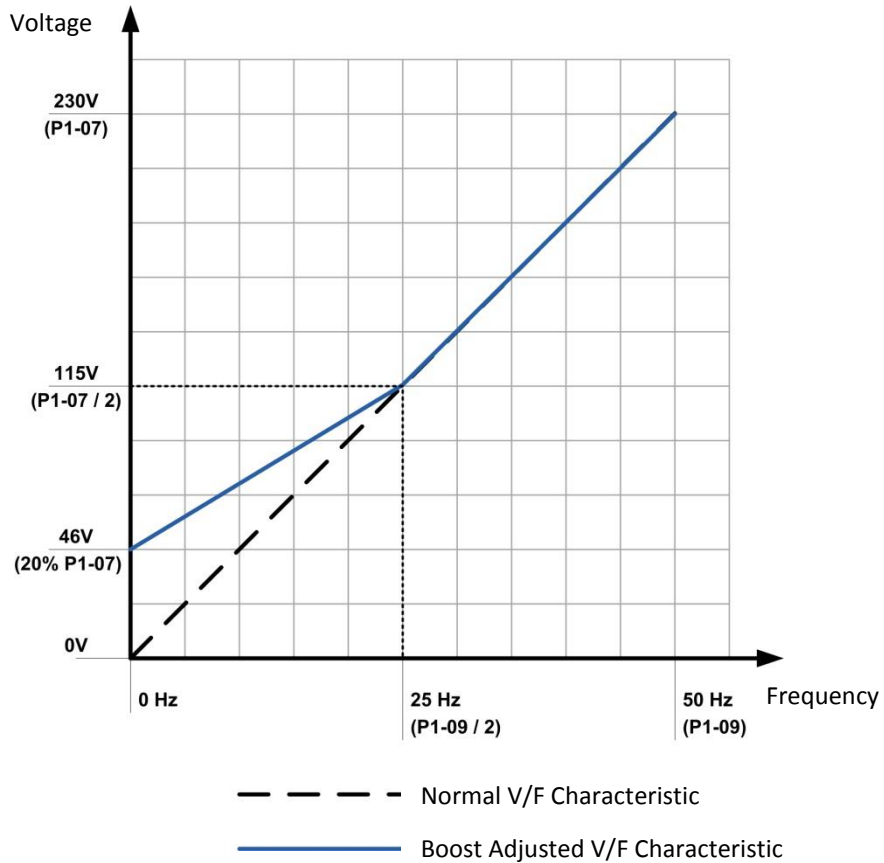
⚠	**It is important to remember that increasing the motor voltage at any point will result in increased current and therefore increased heating of the motor, and so this function should be used with care.**
	For applications where the motor may operate continuously at low speed, a force ventilated motor may be required.

Appendix

Revision History			
Issue	Comments	Author	Date
01	Document Creation	JP	16/02/12
02	Updated to new format	KB	28/04/14