



Optidrive Applications Support Library

Application Note	AN-ODV-3-015
Title	Constant or Variable Torque Operation
Related Products	Optidrive Eco
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 Eco uses a special Eco Vector Sensorless Vector method for motor control, designed to provide excellent motor control performance with maximum motor control efficiency, whilst remaining simple to set up.

When operating with standard induction motors, there are two modes of operation, intended to be used with either Constant or Variable Torque loads. In addition, further modes (described in a separate Application Note) allow operation with Permanent Magnet (PM), Brushless DC (BLDC) and Synchronous Reluctance (Syn RM) Motors.

This application note describes the selection of Constant or Variable Torque operating modes, and the use of the “Boost” function to improve starting torque.

Constant or Variable Torque Selection

Constant or Variable Torque operation with standard induction motors is selected using parameter P4-01 as follows:-

P4-01 = 0: Eco Vector Variable Torque

This is the default operating mode, and is suitable for simple fan and centrifugal pump type applications, which have a variable torque characteristic – torque required is proportional to the cube of the speed. In this mode, motor torque is reduced at low speed. This can result in excessive low speed current in some applications which have a higher low speed torque requirement, in which case the Constant Torque Mode should be used.

P4-01 = 1 Eco Vector Constant Torque

This mode should be used for pump and fan applications which have a constant torque characteristic, e.g.

- Blowers
- Displacement Pumps
- Gear Pumps
- Etc.

This operating mode provides greater low speed torque, reducing motor current.

P1 - 11 Torque Boost

P1-11 allows the user to increase the torque output at very low speed, which can help when starting loads which have some initial friction, which must be overcome before the load starts. In general, centrifugal pumps will not require any adjustment here, as the static friction is low, however this parameter may require some adjustment for displacement pumps.

Increasing the level here will result in increased low speed current, which can cause unwanted heating of the motor, and possible over current or thermal overload trips. For this reason, this parameter should only be set as high as necessary to start the load, and the user should ensure that the setting used does not lead to motor current greater than the motor rated current during operation in the 0 – 5Hz range.

Appendix

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