



Optidrive Applications Support Library

Application Note	AN-ODE-3-003
Title	Setting the Required Stopping Mode
Related Products	Optidrive E3
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

When Optidrive E3 is used to control the speed of an AC Motor, the user can select what should happen during a normal stop condition, and additionally, how the drive should react to a loss of mains power supply.

Parameter P-05 : Stop mode Selection

Parameter P-05 controls two functions within the drive.

- The behaviour when the enable signal is lost, e.g. a stop command is given to the drive
- The behaviour when the mains power supply is lost whilst the enable input is still present

There are four possible settings, summarised in the table below and explained in further detail in this application note.

Setting	On Disable	On Mains Loss
0	Ramp to Stop (P-04)	Ride through
1	Coast	Coast
2	Ramp to Stop (P-04)	Fast Stop (P-24)
3	Ramp to Stop (P-04)	Fast Stop (P-24)

P - 05 = 0, (default value), controlled ramp to stop with mains loss ride through

When P-05 = 0, removing the drive enable signal will decelerate the motor to stop at a rate defined by the first deceleration ramp time P-04. It is also possible to have selection between the normal ramp time, P-04 and the fast ramp time, P-24 based on digital inputs.

In the event of the mains supply being lost, the drive will automatically attempt to keep itself operating by using the rotational kinetic energy stored in the motor and load (Mains loss ride through). Providing the mains supply is lost for only a short time, and the load has sufficient inertia to maintain the internal electronics supply on the Optidrive, the drive will ramp back to its requested operational speed when the supply returns. If the load does not have sufficient inertia, or the supply is lost for an extended period of time, the drive will trip, and then disable the output.

P - 05 = 1, coast-to-stop with no mains loss ride through

In this case, the drive output will be disabled as soon as the enable signal is removed, leaving the motor to coast to stop, braked only by the system frictional losses. This mode is often used in conjunction with a mechanical motor brake.

For loss of mains supply the same coast to stop as when removing the enable will be performed.

P - 05 = 2, controlled ramp to stop with no mains loss ride through

Whenever the drive enable signal is removed, the motor will be ramped down to zero at a rate determined by the selected deceleration ramp rate (P-04) unless the second deceleration ramp rate (P-24) is selected via digital inputs.

However, in the event of mains loss, the drive will ramp the output down to zero at the rate defined by the second deceleration ramp (P-24). This can be used to provide a fast stop function where the braking time is much shorter than the normal ramp time.

If P-24 = 0, the drive will implement a coast to stop. This provides support for a mechanical brake that must engage immediately if the mains supply is lost, yet still provide controlled ramp to stop for under normal conditions.

P-05 = 3, AC Flux Braking

Setting 3 provides the same function as setting 2, however AC Flux braking is also enabled. This provides additional braking torque, suitable for high inertia applications where a shorter stopping time is desired.

P-04 and P-24 Ramp settings

If either deceleration ramp time is set to zero, the drive will implement a coast stop when this ramp time is selected.

Appendix:

Revision History			
Version	Comments	Author	Date
01	Document Creation	KB	07/09/15