

Application Note

AN-ODP-34

## ***Configuring the Optidrive Plus for Hoist applications***

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- **General:**

For applications such as hoists where a high starting or holding torque must be available as soon as the drive is enabled (for example to support a weight), it is necessary to pre-magnetise the motor prior to releasing the mechanical brake. Additionally, the electrical frequency must be increased from zero prior to releasing the brake. This will effectively prevent the load from dropping down.

Optidrive Plus 3<sup>GV</sup> provides a function to support these types of applications. This document describes how to enable the hoist function via parameter settings.

### **Important Safety Notice**

**Any control function provided by Optidrive Plus 3<sup>GV</sup> cannot be regarded as fail-safe. All applications where malfunction of any component in the drive, motor or otherwise could cause injury or loss of life must be subject to a safety risk assessment which is relevant to the application in which the drive will be used.**

**In the case of a hoist application, a secondary independent protection against dropping the load in the event of component malfunction or failure must be provided.**

**Before applying a supply voltage to the drive disconnect all connections from the control terminals.**

**By default the drive is set to close the relay contacts when a drive healthy status is given and this usually occurs on power up. This can result in the motor brake being released hence releasing the load on drive power up.**

**Please set the parameters in the drive as outlined in this document before connecting any of the control terminals.**

- **Parameters:**

**Note:** *the following guidelines apply equally to V/F and 3GV vector control modes. Ensure that Auto-tune has been carried out prior to normal operation in all cases.*

**P2-13: Relay output function select**

This parameter should be set to 3, resulting in the relay contacts closing when the speed exceeds the value set in P6-04. For this type of application, the brake should be released between 2Hz and 3Hz. P6-04 should be adjusted accordingly.

When the speed reduces towards zero, the relay contacts will open and the brake will re-engage when the speed drops below the frequency set in P6-04.

Ensure that P2-15 = 0 (normally open – default setting).

**P6-04: Speed hysteresis band for relay output control**

When P2-13 = 0, this parameter represents the speed hysteresis band around zero above which the relay contacts will close. This parameter is expressed as a percentage of P1-01.

For hoist applications, this parameter allows the user to ensure that the mechanical brake cannot be released below a specified speed level.

A value in P1-14 = 702 is required for access to the hidden parameter group 6.

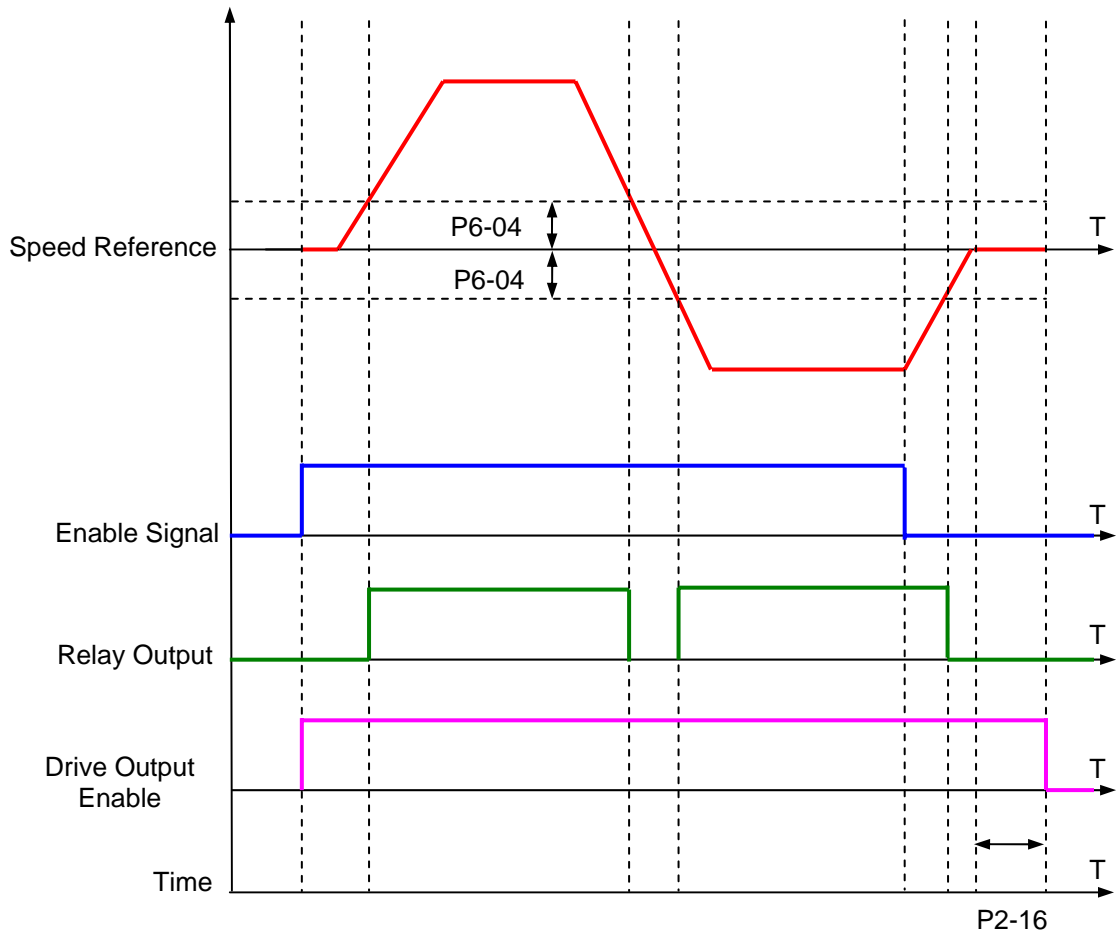
**P2-16: Zero speed holding time**

The Zero speed holding time can be used to enable the drive to stay at zero speed (0Hz) for a certain time whenever the drive receives a stop command and reduces the output speed to zero before the drive output enable signal is removed. Adjusting this parameter can compensate for delays in the brake engaging and ensure no dropping of the load can occur.

The holding time can be set from 0.0s (disabled) to a maximum of 60s.

**Example :**

If P1-01 = 50Hz, setting P6-04 = 5% results in the relay closing when the speed exceeds 2.5Hz thus releasing the brake. When the speed reduces below 2.5Hz, the relay contacts will open and the brake will re-engage. Figure 1, illustrates how the drive will operate in a typical application.



**Figure 1**

**Further information :**

**For all hoist applications, a braking resistor must be used and the brake control enabled in P2-23. Please refer to the drive rating tables in the user guide for more information on recommended braking resistor values.**

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