

G9/H9 Application Guideline 9.0

DC Injection Braking

Introduction

DC Injection Braking is a braking system used with 3-phase motors. The VFD outputs a DC current that gets applied to two of the windings of the motor, which causes the motor to quickly brake. DC injection braking really is only effective at low speeds (less than 8 Hz). DC Injection can also be used to preheat the motor, and make sure that water vapor does not condense in the motor windings. Keep in mind that DC current applied across a winding, acts like a short circuit, so current must be limited, and a time limit needs to be set.

Programming

PARAMETER	MENU PATH	DEFAULT	NEW VALUE
F250	Program→Protection→DC Braking→DC Injection Braking Start Frequency	0.0 Hz	*
F251	Program→Protection→DC Braking→DC Injection Braking Current	50 %	*
F252	Program→Protection→DC Braking→DC Injection Braking Time	1.0 s	*
F253	Program→Protection→DC Braking→Forward/Reverse DC Injection Braking Priority	0: Disabled	**
F254	Program→Protection→DC Braking→Motor Shaft Fixing Control	0: Disabled	**
F255	Program→Special→Special Parameters→0 Hz Command Output	0: Standard(DC Injection Braking)	0: Standard(DC Injection Braking)
F261	Program→Frequency→Jog Settings→Jog Stop Pattern	0: Deceleration Stop	**
F603	Program→Protection→Emergency Off Settings→Emergency Off Mode Settings	0: Coast Stop	**
F604	Program→Protection→Emergency Off Settings→Emergency Off DC Injection Application Time	1.0 s	**

F721	Program→Special→Operation Panel Parameters→Panel Stop Pattern	0: Deceleration Stop	**
F106	Program→Terminal→Input Special Functions→Input Terminal Priority	0: Disabled	**

*Required for DC Injection Braking. To be determined by the user per application.

**NOT required for DC Injection Braking. To be determined by the user per application.

Parameter Descriptions:

F250: When the drive is decelerating, this is the frequency that DC Injection Braking will start.

F251: This is the percentage of rated current that the drive will use while braking.

F252: This is the amount of time that the DC Injection Braking will run.

F253: This parameter determines if DC Injection Braking will be used during a change in the direction of the motor.

F254: This parameter can be used to preheat the motor or to keep the motor from spinning freely. Once DC injection brake stops the motor, the drive will output a continuous DC injection at half the amperage percent that is set in F251. This will continue until the power is cut from the drive, ST-CC is opened, or an Emergency Off command is received.

F255: This parameter is used to set the go-to-zero method to be used by the VFD in the event that the VFD is commanded to go to 0 Hz.

F261: This parameter is used to select the stopping method used while operating in the jog mode. Change this only if you will be using a jog function, and you want to stop using DC Injection Braking.

F603: This parameter is used to select the stopping method used when the VFD is given an Emergency Off command.

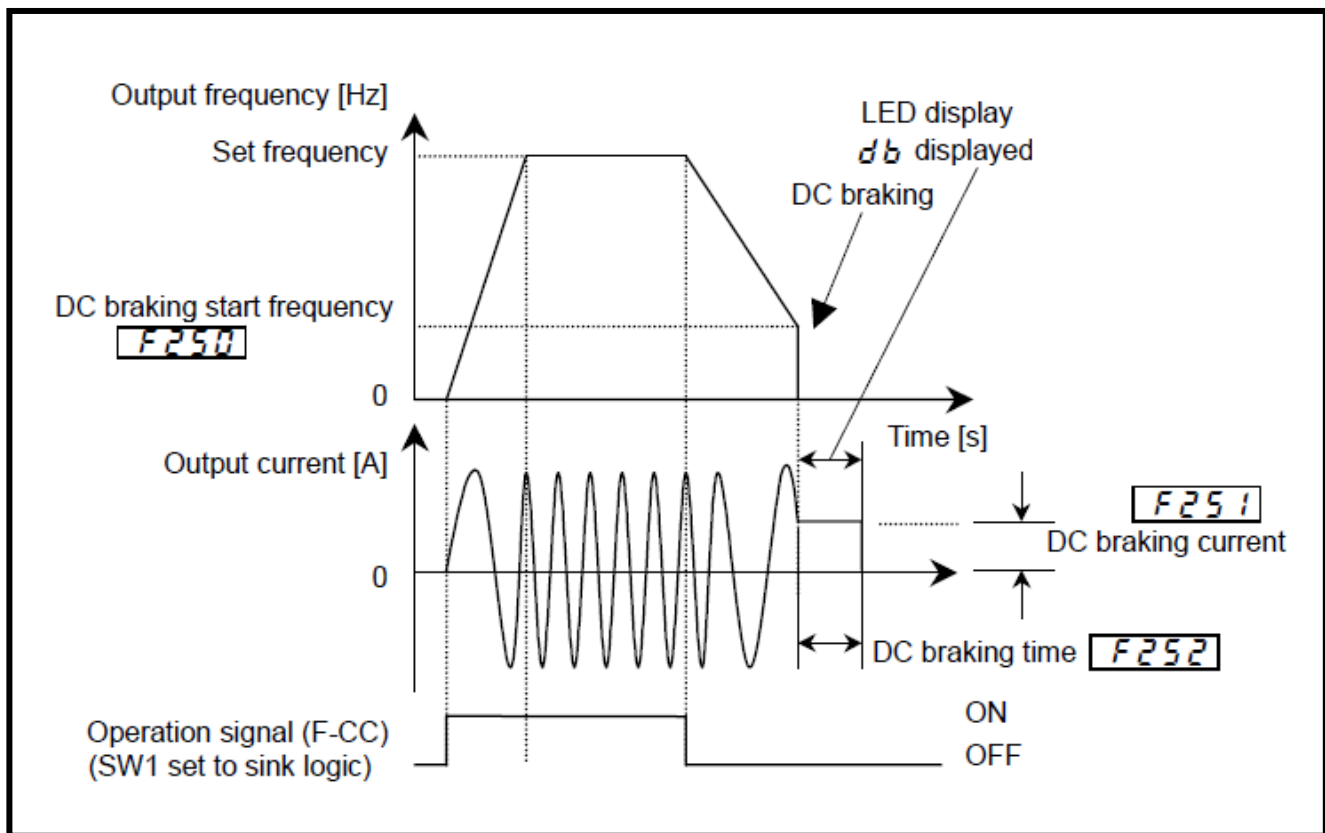
F604: When DC Injection is selected in the **F603** parameter, this parameter determines the time that the DC Injection Braking is applied to the motor.

F721: This parameter is used to select the stopping method used while the drive is operating in Local mode. The Deceleration Stop setting does enable Dynamic Braking or DC Injection Braking if it is set up.

F106: This parameter is used to allow the Jog and DC Injection Braking input signals to control the VFD when received via the Terminal Board even though the system is in Local mode. If enabled, these two signals will receive priority over commands from the EOI (keypad).

Notes:

There are a lot of parameters that have been listed above, but to run basic DC Injection Braking you do not need to use all of them. The three parameters that you will need to look at will be F250-252. Those three will get your process working. Parameters F253-721 are additional stopping options available for DC Injection Braking. These parameters deal with stopping methods in different scenarios. F106 deals with signal priority while in the Local mode. You also need to be careful when setting F252, the current percentage, because, if high enough, it could be above the motor protection level, and cause the VFD to trip on motor overload. Below is a graphical explanation of what can be achieved through DC Injection Braking.



Revision History:

Rev.	Date	Written/Revised By	Approved By	Description
0	7/18/2011	Joshua Austin	Doug Napier	Original Document.

For additional assistance, please contact Toshiba Adjustable Speed Drive Marketing Dept. at (800) 872-2192.