

APPLICATION NOTE	FECA-AN-146
MEGA Common DC Bus Single AC Powered Drive	

Inverter type	FRENIC MEGA
Software version	ALL
Required options	None
Related documentation	FRENIC-MEGA Instruction Manual INR-SI47-1457a-E, MEGA User's Manual MEHT536
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Revision	

Introduction

A decelerating motor can regenerate voltage back onto the DC bus, turning the motor into a generator. In this instance, the VFD can trip a fault for over voltage. A braking unit and resistor can be used to dissipate the additional voltage, but the drawback is the energy is turned into heat. An alternative method is a common DC bus configuration. When one motor is decelerating, a second VFD can use the regenerated voltage on the bus to operate its motor. This app note will provide capacities and a wiring example for the setup.

Configuration

Set H72 to 0 for drives 2hp and up, to disable the incoming power down protection. The first drive is connected to the incoming AC line and the second is powered by connecting the DC buses together. Consult the drive's manuals for breaker sizing. Refer to **Figure 1** below.

Driving

The total amount of the driving power should only be up to 100% of the rating of the VFD connected to the line. Any more than this, would cause damage to the diode bridge of the line connected VFD.

Braking

In the event that the total power being used is negative, or the driving VFD doesn't use up the extra voltage on the bus and the voltage approaches 800V for 460V drives, and 400V for 230V drives a braking units and resistors are needed. The braking units and resistors should be sized for the VFD connected to the AC line or the largest HP rated VFD.

AC VFD selection

In most cases, the first VFD can be paired together with a VFD of equal horsepower. However, there are some instances where the second VFD must be different. The special cases are highlighted, in the Max second VFD column from **Table 1** below.

Table 1

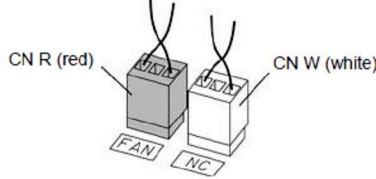
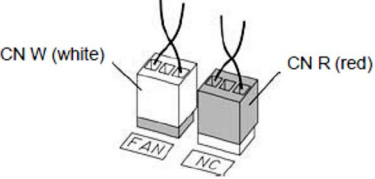
Voltage	First VFD	Max Second VFD
230V	FRNF50G1S-2U	FRNF50G1S-2U
	FRN001G1S-2U	FRN001G1S-2U
	FRN002G1S-2U	FRN002G1S-2U
	FRN003G1S-2U	FRN003G1S-2U
	FRN005G1S-2U	FRN005G1S-2U
	FRN007G1S-2U	FRN007G1S-2U
	FRN010G1S-2U	FRN010G1S-2U
	FRN015G1S-2U	FRN015G1S-2U
	FRN020G1S-2U	FRN005G1S-2U
	FRN025G1S-2U	FRN025G1S-2U
	FRN030G1S-2U	FRN030G1S-2U
	FRN040G1S-2U	FRN020G1S-2U
	FRN050G1S-2U	FRN050G1S-2U
	FRN060G1S-2U	FRN060G1S-2U
	FRN075G1S-2U	FRN060G1S-2U
	FRN100G1S-2U	FRN040G1S-2U
	FRN125G1S-2U	FRN125G1S-2U
FRN150G1S-2U	FRN150G1S-2U	
460V	FRNF50G1S-4U	FRNF50G1S-4U
	FRN001G1S-4U	FRN001G1S-4U
	FRN002G1S-4U	FRN002G1S-4U
	FRN003G1S-4U	FRN003G1S-4U
	FRN005G1S-4U	FRN005G1S-4U
	FRN007G1S-4U	FRN007G1S-4U
	FRN010G1S-4U	FRN010G1S-4U
	FRN015G1S-4U	FRN015G1S-4U
	FRN020G1S-4U	FRN005G1S-4U
	FRN025G1S-4U	FRN025G1S-4U
	FRN030G1S-4U	FRN030G1S-4U
	FRN040G1S-4U	FRN025G1S-4U
	FRN050G1S-4U	FRN050G1S-4U
	FRN060G1S-4U	FRN060G1S-4U
	FRN075G1S-4U	FRN075G1S-4U
	FRN100G1S-4U	FRN100G1S-4U
	FRN125G1S-4U	FRN125G1S-4U
	FRN150G1S-4U	FRN150G1S-4U
	FRN200G1S-4U	FRN200G1S-4U
	FRN250G1S-4U	FRN250G1S-4U
	FRN300G1S-4U	FRN300G1S-4U
	FRN350G1S-4U	FRN350G1S-4U
	FRN450G1S-4U	FRN450G1S-4U
FRN500G1S-4U	FRN450G1S-4U	
FRN600G1S-4U	FRN600G1 S-4U	
FRN700G1S-4U	FRN700G1S-4U	
FRN800G1S-4U	FRN700G1S-4U	
FRN900G1S-4U	FRN800G1S-4U	
FRN1000G1S-4U	FRN800G1S-4U	

Wiring

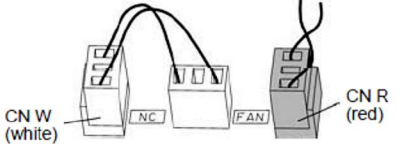
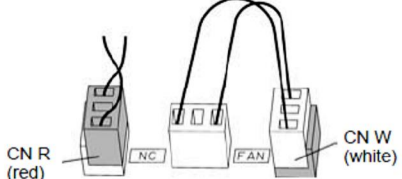
When installing the wiring, follow all local and national wiring codes. Connect the three phase AC input to the first drive only. An AC reactor is recommended, but not necessary. Connect the P(+) and N(-) terminals to the same connections on the second drive. Leave the factory installed jumper on P1 to P(+) on the first drive, but remove it on the second drive. For drives rated at 60HP at 230V and 125HP at 460V and up need to have AC supplied to R1 and T1 for the cooling fans. Connect L1 to R1 and L3 to T1 on the drive. See **Figure 1** for the connections.

Figure 1

(a) FRN060G1-2U to FRN125G1S-2U, FRN125G1S-4U to FRN200G1S-4U

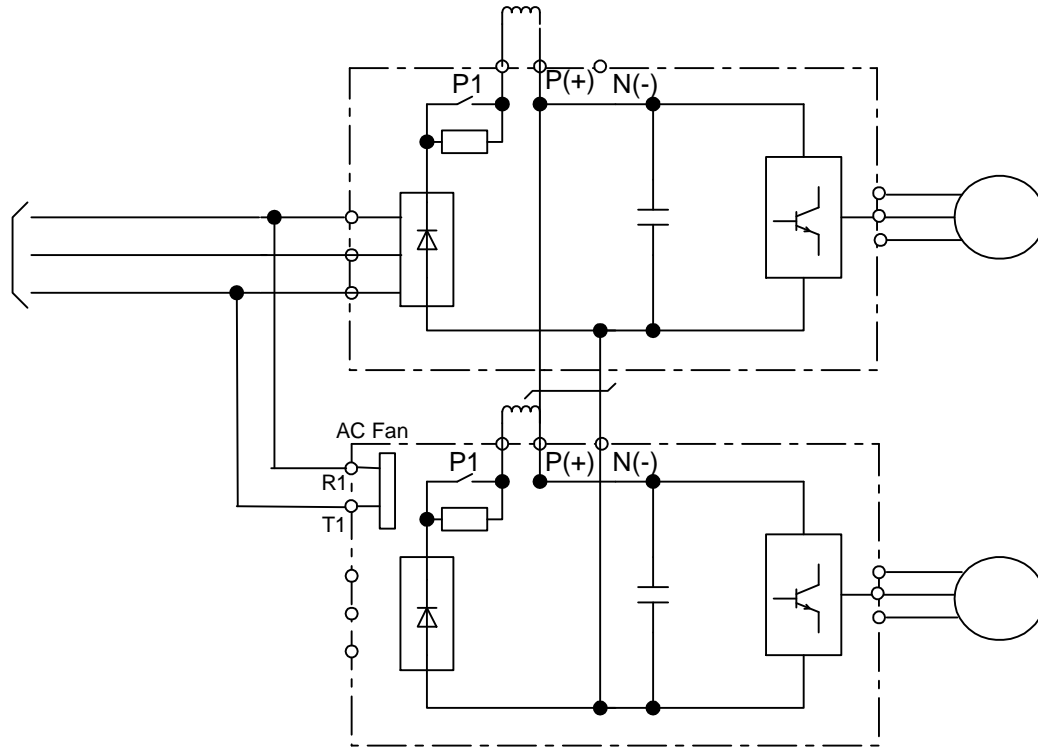
Connector configuration		
Use conditions	When not using terminal R1 or T1 (Factory default)	When using terminals R1 and T1 <ul style="list-style-type: none"> • Feeding the DC-linked power • Combined with a PWM converter

b) FRN150G1S-2U, FRN250G1S-4U to FRN1000G1S-4U

Connector configuration		
Use conditions	When not using terminal R1 or T1 (Factory default)	When using terminals R1 and T1 <ul style="list-style-type: none"> • Feeding the DC-linked power • Combined with a PWM converter

Some drives at certain HP ratings ship with a DC Reactor. It must be installed when provided. The length of the P(+) and N(-) cables need to be kept to a maximum of 6Ft (2m) max between the connections. The cables should be run parallel to minimize inductance.

Figure 2



For further information:

See **MEGA User's Manual MEHT536** and **FRENIC-MEGA Instruction Manual (INR-SI47-1457a-E)**.