

Subject: **Wiring integral holding brakes**  
 Applies to: M Series servo motors, BLu and SV servo drives  
 Date: October 22, 2008

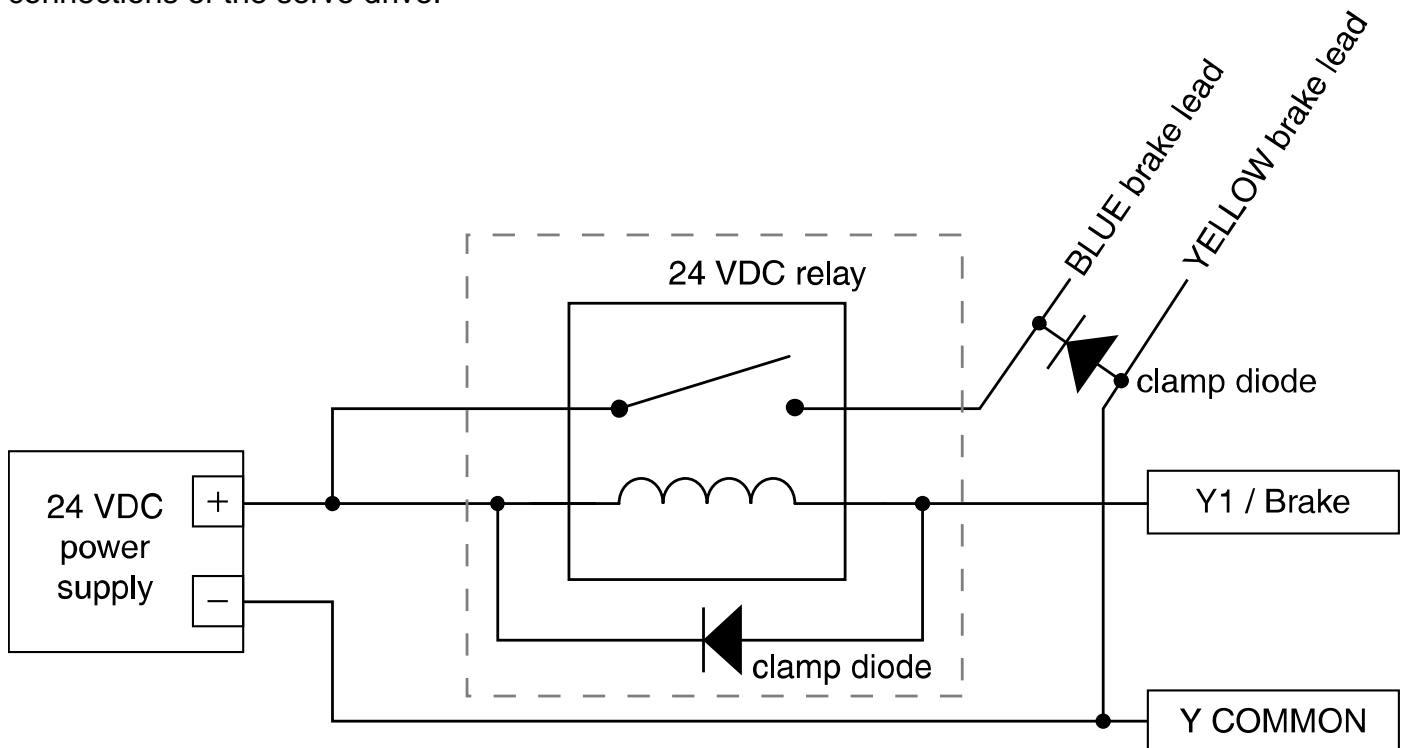
### Description

The integral holding brakes of M Series servo motors require between 200 and 400 mA at 24 VDC to operate properly. To wire and operate a holding brake from the Y1/Brake output of an Applied Motion servo drive requires the following items:

- A 24 VDC power supply with minimum output of 450 mA
- A 24 VDC relay\*
- Two clamp diodes, such as [1N4935](#)\*
- An M Series servo motor with integral holding brake, designated by a “5” in the 7<sup>th</sup> position of the motor part number. Example: M0400-151-4-000
- A “BK” type motor power cable. Example: BLUMTR-**BK**-FA-10

\* Relays with an integral clamp diode, like IDEC part number [RU2S-D-D24](#), greatly simplify the wiring effort by including the relay and a clamp diode in one unit. A relay of this type is represented by the dashed grey line in the diagram below.

Following the diagram below, connect the power supply, relay, and diodes to the BLUE and YELLOW brake leads of the servo motor’s “BK” type power cable, as well as the Y1/Brake output connections of the servo drive.



The holding brakes of M Series servo motors are fail-safe brakes, which means they are engaged when no power is applied to the brake. When setting up a servo drive in *Quick Tuner™*, be sure to set the Brake output options in the “Inputs-Outputs” tab as shown in the diagram below. Make sure to select the check box for “Automatically release brake when moving by” and selecting the radio button “closing the Brake output”.

Brake

Automatically release brake when moving by

closing the Brake output  
 opening the Brake output

Wait  msec before moving for brake to release

Wait  msec for brake to engage before disabling servo

The engaging and disengaging of the brake is done automatically by the servo drive. When the drive is enabled and not faulted the brake will be disengaged. When the drive is disabled and/or faulted the brake will be engaged.

There are two time delays associated with the Brake output function which are also set in *Quick Tuner™* (see diagram above). The first time delay controls how long the drive will delay a move command if the move command immediately follows the disengagement of the brake. The second time delay controls how long the drive will delay disabling the motor after engaging the brake when a motor disable command is issued.

### Reference Information

Below is a summary of specifications for the integral holding brakes available with M Series servo motors.

Motor Power (W)	30	50	100	100	200	400	200	400	600	750
Motor Frame Size	NEMA 17 40 mm	NEMA 17 40 mm	NEMA 17 40 mm	NEMA 23 60 mm	NEMA 23 60mm	NEMA 23 60 mm	NEMA 34 80 mm	NEMA 34 80 mm	NEMA 34 80 mm	NEMA 34 80 mm
Rated Voltage	24 VDC									
Static Friction (in-lb)	2.83				11.24				22.5	
Input Power (W)	5		9		9		9.5		9.5	
Input Current (A)	0.2		0.375		0.375		0.39		0.39	
Armature Release Time (msec Max)	20		20		20		50		50	
Armature Pull-In Time (msec Max)	40		40		50		80		80	

For further assistance with your application please contact Applied Motion at 800-525-1609 or via email at [support@applied-motion.com](mailto:support@applied-motion.com).