



ALLEN-BRADLEY BULLETIN 1336 PLUS MULTI - MOTORS

APPLICATION NOTE # 1336S - 17

June 24, 1997

PURPOSE

The purpose of this document is to provide guidelines for wiring and control schemes for the Bulletin 1336S AC Drive. This document is to be used as a suggestion only. Users must ensure that installations meet applicable codes and are suitable for the existing conditions.

The Bulletin 1336S User Manual should be used as a reference to ensure that proper wire selection, routing and fusing guidelines are followed.

WHAT THIS NOTE CONTAINS

This note contains application assistance in running multiple motors from one 1336 PLUS drive. There are two distinct methods of operating the motors, having all motors start with the drive accelerating and decelerating as a unit or having each motor start and stop individually. Sizing the drive as well as interlocks required are different for each case.

INTENDED AUDIENCE

This application note is intended to be used by personnel familiar with the hardware components and programming procedure necessary to operate the Bulletin 1336S.

WHERE IT IS USED

The diagrams, parameter settings and auxiliary hardware used in this application note are designed to address specific issues in many different applications. Some changes by the User may be necessary to apply the concepts of this document to a specific application.

TERMS AND DESCRIPTIONS

Leakage Current - Is current in the motor circuit that is capacitive coupled to ground. Unshielded cable has approximately 5ma of leakage current/foot of cable. Shielded cable has approximately 15ma of leakage current/foot of cable.

DESCRIPTION

Unit Start/Stop

When all the motors start and stop as one complete unit, the drive is sized by adding the full load currents of each of the motors and selecting the next larger drive. The amount of leakage current will vary with cable type and distance. Typically increasing the drive by one rating is sufficient to handle this increased

current. To more closely size the drive for the Unit Start/Stop applications, use the formula below.

$$\text{Drive Rated Current} = FLA_{M1} + FLA_{M2} + FLA_{M3} + AMPS_{Leakage}$$

The motor contactors (if used) need to be interlocked with the run contact to ensure that a motor is not started when the drive is running. Figure 1 shows an example of this type of operation where all motors do not necessarily have to be operating all the time but they can not be started when the drive is operating. Stopping an individual motor is acceptable as long as not more than 50% of the motor load on the drive is removed at any one time. This type of operation is the least expensive method because of the reduced drive size.

Individual Start/Stop

When all or some of the motors must be started while other motors are operating from the drive, the drive must be sized for the locked rotor current of the motor(s) starting (LRA_{MX}) as well as the full load current of the motors already in operation (FLA_{M2}) plus the leakage current ($AMPS_{Leakage}$).

$$\text{Drive Rated Current} = LRA_{MX} + FLA_{M2} + FLA_{M3} + AMPS_{Leakage}$$

Since the motors can be started or stopped at any time, interlocking is not required. Figure 2 shows an example of this type of operation. Again, the motors being stopped should not exceed 50% of the motor load current that is connected to the drive.

The starting current can use the intermittent overload capability of the drive which is 150% of the rated output. As an example, if there are 5 motors with a full load current of 20 amps and a locked rotor current of 125 amps connected to a drive. The drive will require a full load rating of (20x5) or 100 amps. The intermittent rating would be (20x4)+125 or 205 amps. Instead of a 75 HP drive being used which has the full load rating of 106 amps, a 100 Hp drive with a rating of 138 amps is required to get the 205 amp intermittent rating. (138x1.5 = 207 amps).

APPLICATION CONSIDERATION

Since the drive is providing power to several motors, the drive can not be used as a motor overload device and separate overloads for each motor are required. With multiple motors, volts per hertz mode is recommended.

PARAMETER SETTINGS

Number	Group	Name	Value
37	Setup	Overload Mode	No Derate
38	Setup	Overload Amps	(total amps)
77	Feature Select	Speed Control	No Control
201	Faults	Motor OL Fault	Disabled
9	Control Select	Motor Control	Fixed Boost

Note: Par.48 [START BOOST], 83 [RUN BOOST] and 169 [BOOST SLOPE] in MOTOR CONTROL group need to be set for the values required by the load.

FIGURE 1 MULTI-MOTOR WITH UNIT START

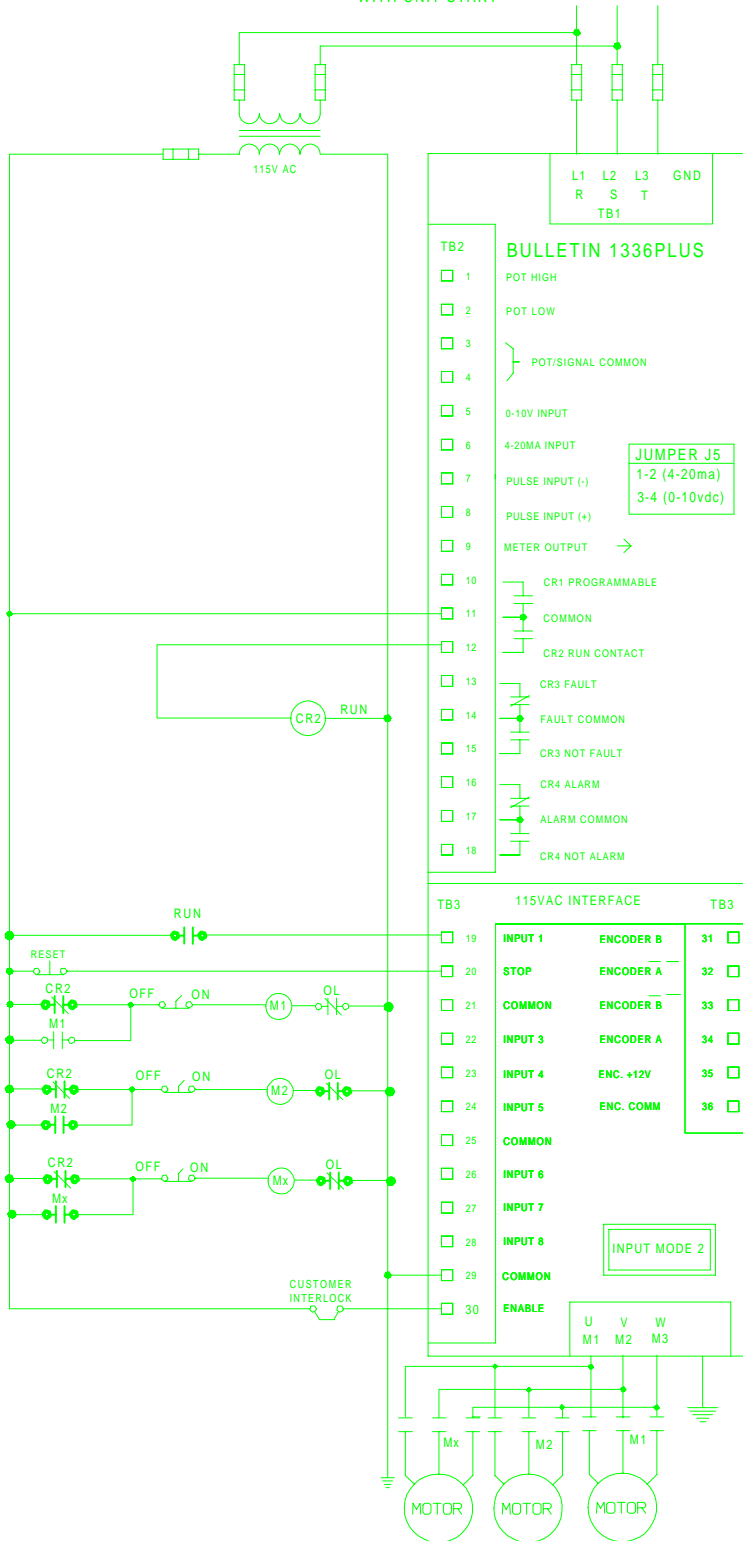


FIGURE 2 MULTI-MOTOR WITH INDIVIDUAL START

