



ALLEN-BRADLEY BULLETIN 1336 MACHINE STOP-MECHANICAL

APPLICATION NOTE #6

January 2, 1997

PURPOSE

The purpose of this document is to provide guidelines for wiring and control schemes for the Bulletin 1336 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 1336 User Manual should be used as a reference to ensure that proper wire selection, routing, and fusing guidelines are followed.

WHAT THIS NOTE CONTAINS

The mechanical machine stop is utilized to rapidly decelerate the motor and connected load to a stop. This mode of stopping does not require the drive to control the motor deceleration and therefore power is not necessary for the circuit to operate. A mechanical brake will be utilized to stop the machine.

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 1336/1336VT.

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 Users may be necessary to apply the concepts of this document to a specific application.

TERMS AND DEFINITIONS

Output contactor - labeled 2K is located between the drive and the motor.

Enable - control input to the drive at TB3 terminal 30 used to enable or disable the inverter.

4K - Interposing RUN relay used to "hold-in" 2K.

BK1 - Mechanical brake relay used to energize the brake.

DESCRIPTION

The Machine Stop will be used to open the ENABLE circuit and also interrupt power to the coil of the MECHANICAL BRAKE. This circuitry should also include an INPUT or OUTPUT CONTACTOR on the drive that opens upon initiation of the Machine Stop. Refer to figure 1 for diagram.

Mechanical brakes require a snubber/surge suppressor on the coil to absorb the EMI when the coil is de-energized. When the contacts are opened, a large voltage transient will occur, therefore a surge suppressor must also be installed on the contacts, located as close to the brake as possible. The suppressor must be on load side of contactor.

In the drive enclosure, the brake contactor should be located as far from the drive as possible. Control wiring should be twisted pair where feasible or shielded. Separate brake wires from all others. If brake wires must cross control wires, keep them perpendicular to each other. The brake wires must be run in separate conduit from the drive and control wiring.

When utilizing a mechanical brake for a MACHINE STOP it is important to use a separate start/stop circuit for normal operation. This will allow the user to have a selectable stop mode (parameter #10).

Many large mechanical brakes have long coil pick-up times. The Users must ensure that the start command to the drive is coordinated with the actual release point of the brake. If this is not done properly, the drive will attempt to start the motor while the brake is engaged, causing a potential over current fault trip on the drive. To prevent this situation, the Users can implement one of the following:

- Delay the run command until the brake releases
- Use a low Dwell Frequency until the brake releases
- Use a 2-step acceleration ramp (slow until brake releases)
- Reduce low end voltage using the Custom V/HZ.
This will also reduce starting torque and may not be desired for a given application.

When the mechanical brake is used for the "normal" stop mode, the RUN contact of the drive should be used to hold-in the brake coil until the drive output is off. An interposing relay should be used to isolate the RUN contact from the brake coil. The mechanical brake should be used to hold the motor at zero speed for extended "off" periods. Refer to figure 2 for diagram.

SUPPRESSORS

ELECTRO-CUBE 1676-13 type suppressors are recommended for use on the brake contacts (230/460VAC).

Bulletin 100 contactors utilize suppressor 199-FSMA1 (120vac) this suppressor can also be utilized on the other relay coils unless otherwise specified.

MECHANICAL BRAKE MACHINE STOP

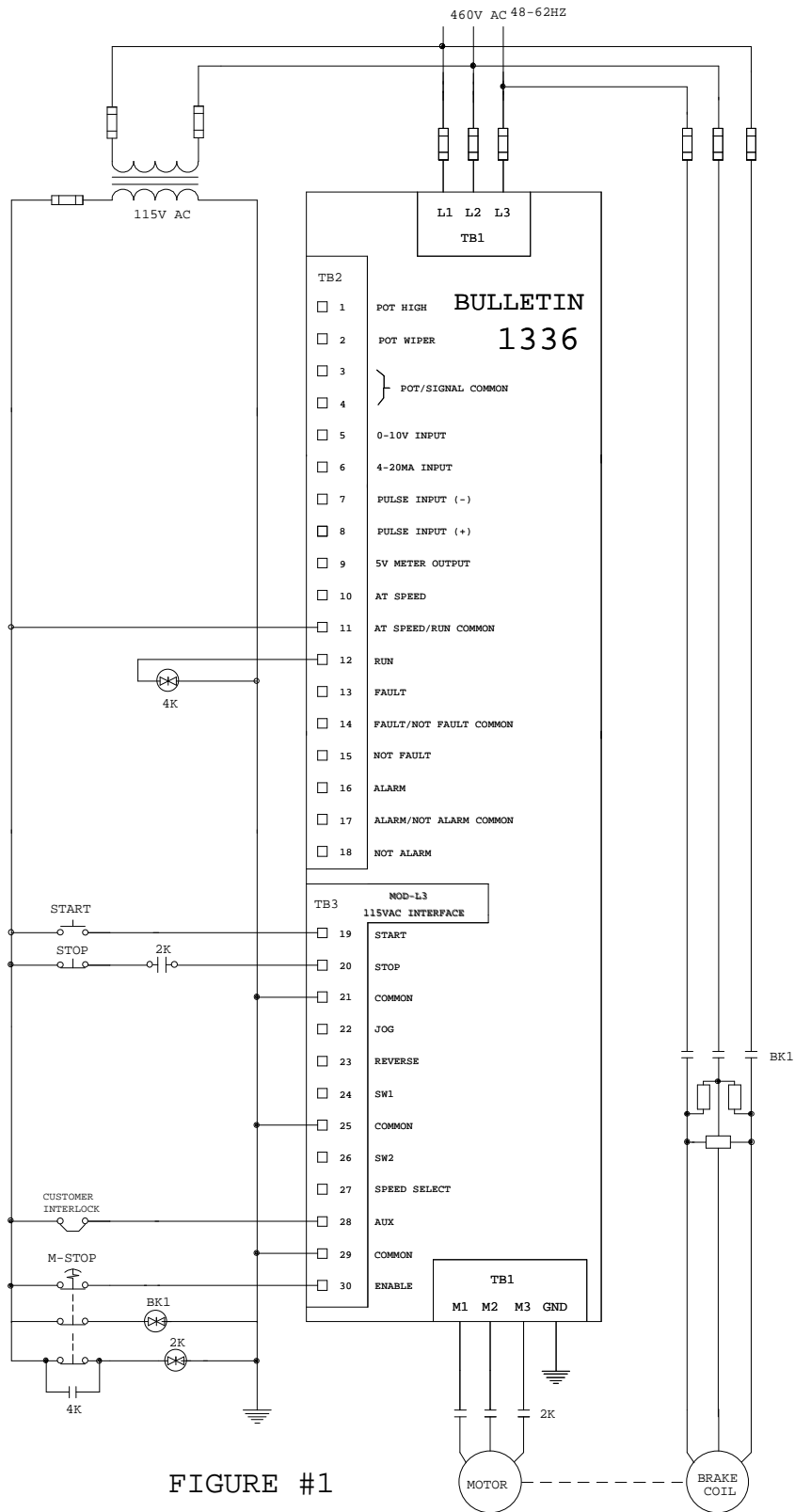


FIGURE #1

NORMAL STOP WITH MECHANICAL BRAKE

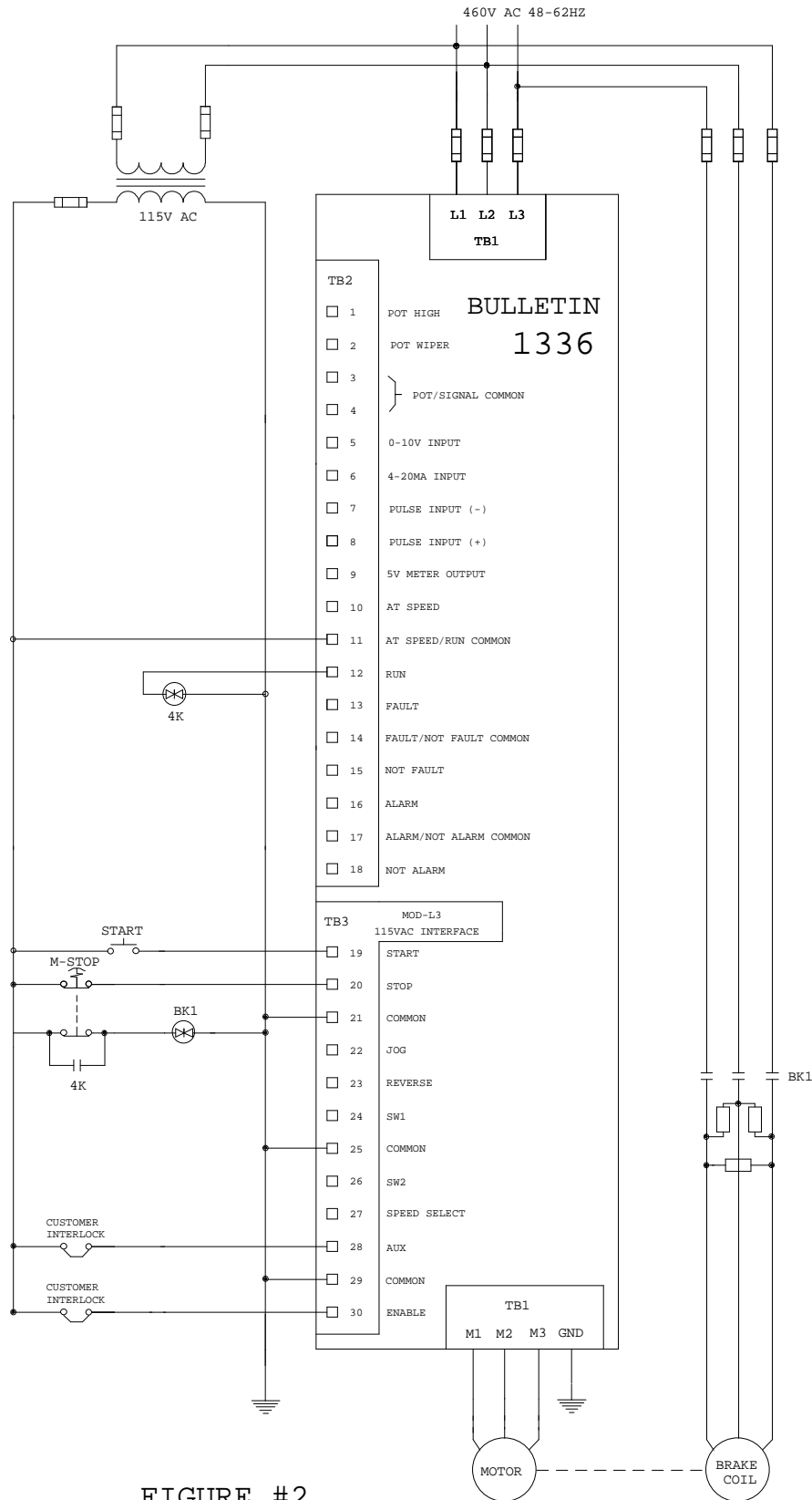


FIGURE #2