



## ALLEN-BRADLEY BULLETIN 1336 E-STOP CIRCUIT

### APPLICATION NOTE #4

January 2, 1997

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#### 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 emergency stop circuitry described in this document can be utilized to quickly remove power from the motor should an Emergency Stop be initiated. This circuitry will not control the braking of the motor, but will allow the motor to coast to a stop.

Other means of "braking" the motor and connected load should be utilized for stopping the machine. Refer to Application note #6, 1336 Machine Stop-Mechanical.

The normal operation of the drive (start/stop functions) should be through the control inputs, **NOT** the E-STOP.

Two different control methods are commonly implemented to address the E-STOP condition. It is important to note the subtle differences and how they suit a given application.

#### 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

Input contactor - labeled 1K is located between the line supply and the drive.

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.

**DESCRIPTION**

One way to accomplish the E-STOP is by coordinated control of the ENABLE input of the drive and an INPUT CONTACTOR. The ENABLE signal must be present at terminal 30 located on TB3 to "enable" the drive. This signal is used as a permissive to allow the transistors to be turned on.

The E-STOP button should open the ENABLE circuit and also interrupt power to the coil of the INPUT CONTACTOR. This circuit will turn off the drive output and remove power from the drive. Refer to figure 1 for the circuit diagram.

The second method for removing power to the motor during an E-STOP is coordinated control of the drive ENABLE input and OUTPUT CONTACTOR. The E-STOP will be used to open the circuit to the ENABLE input of the drive and the OUTPUT CONTACTOR. The Bulletin 100 type contactor has a 6-20msec coil drop out time. This time delay will ensure that the drive output has been turned off and the motor flux field has decayed prior to opening the contactor. The OUTPUT CONTACTOR must be energized (closed) prior to a start command. This allows the contactor to be rated for the drive amperage rather than full HP rated (600% FLA). Actual drop out time is dependent upon the rating of the contactor. The times stated above are based on 120vac coils and specific Allen-Bradley contactor models.

**APPLICATION CONSIDERATIONS**

Several items will effect the actual timing of each circuit. The following items should be considered prior to implementing these circuits for use during an E-STOP.

- The Auto Restart function of the drive will be "active" when two-wire control of the start/stop functions is used. If these inputs are logically true, the drive will restart when the ENABLE input returns.
- Systems using this control configuration should utilize a separate "reset" switch or appropriate logic to ensure that the drive is not unintentionally started when the ENABLE signal is reapplied.
- The input contactor must remain de-energized for at least one minute after power has been removed from the drive. No more than 3 cycles are allowed within a five minute period. A ten minute delay is required before attempting the next three cycles.
- The type of Logic Interface card used on the 1336 will determine how fast the drive will react to input signals.

INTERFACE CARD	PICK-UP TIME	DROP-OUT TIME
1336-MOD-L1 (TTL)	20msec	20msec
1336-MOD-L2 (24VDC)	20msec	20msec
1336-MOD-L3(115VAC)	90msec	90msec

**NOTE:** For ungrounded 120V AC systems, refer to application note #12, 1336 120V AC Interface Grounded/Ungrounded.

E-STOP CIRCUIT WITH INPUT CONTACTOR

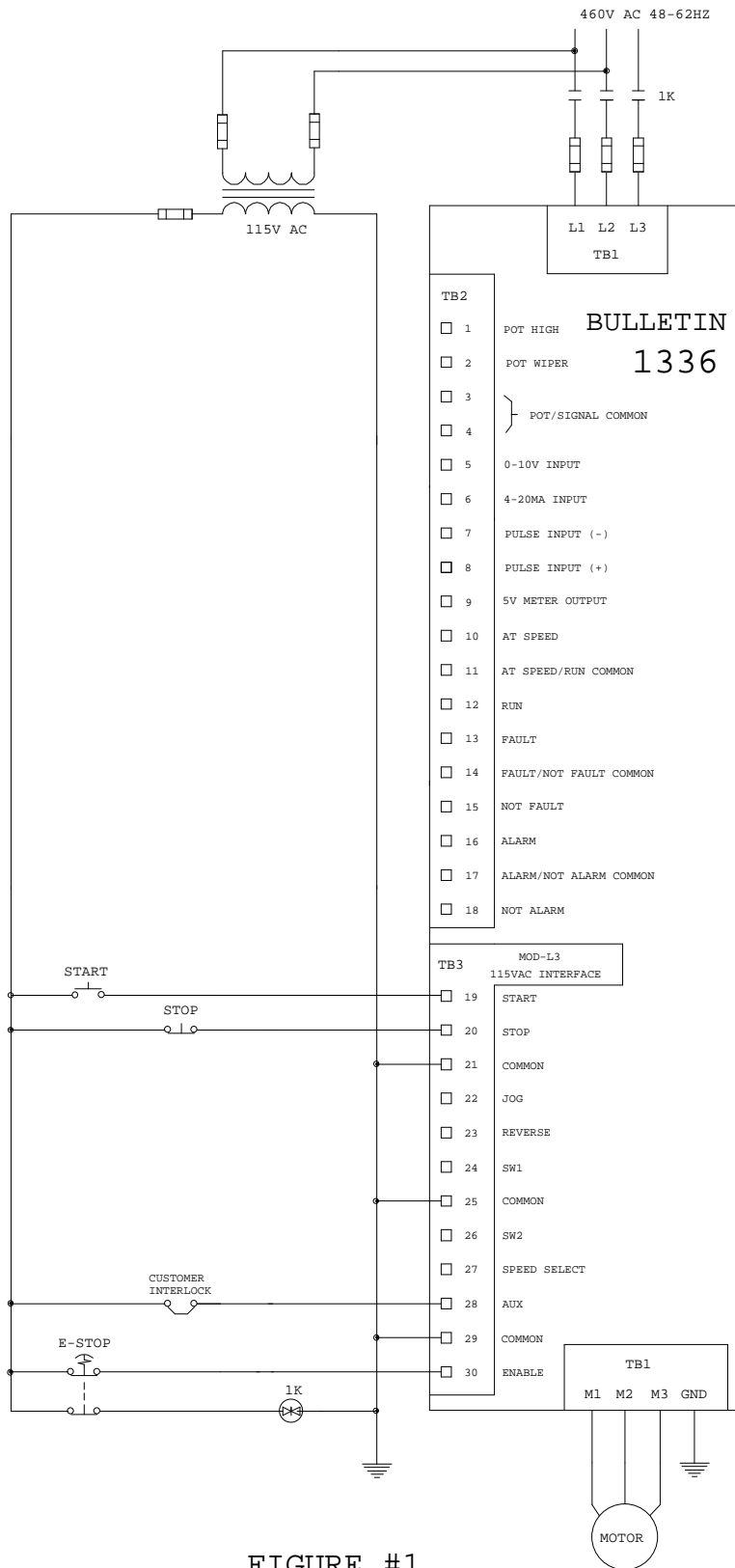


FIGURE #1

E-STOP CIRCUIT WITH OUTPUT CONTACTOR

