1332 CONNECTION GUIDE

Installation

Wiring Procedures

IMPORTANT: The National Electrical Code (NEC), requires that motor overload protection be provided in the motor branch circuit. The standard Bulletin 1332 does not provide this protection.

Eutectic Alloy or bi-metal overload relays can be utilized to provide running overcurrent protection. Due to the reduced cooling capacity of motors running at low speed (full load), overload relays typically can not provide accurate protection against overheating below 50% of base speed (30 Hz).

The National Electrical Code also requires that a circuit breaker or fusible disconnect switch be provided in the Drive branch circuit. The standard Bulletin 1332 does not provide this protection.

Refer to article 430 of the NEC and any additional local codes for specific requirements and additional information.

The National Electrical Code and local regulations govern the installation and wiring of the Bulletin 1332 Adjustable Frequency Drive. Input and output power wire, control wire, and conduit should be brought through the bottom of the Drive enclosure.

All signal wiring must be run separate from power wiring. Verify that shielded cable and/or conduit is used if indicated on any interconnection diagram. Since most start-up difficulties result from incorrect wiring, every precaution should be taken to assure that the wiring is as shown on the diagrams.

CAUTION: The voltage on each phase of the incoming line to the Drive must match the Drive input rating. Verify the Drive rating by referring to the input voltage listed on the Drive nameplate. If the incoming line voltage is out of this tolerance, equipment may be damaged or fail to operate.

POWER CIRCUIT TERMINALS

The power circuit terminals are located at an 8 position terminal block situated on the lower front portion of the Drive, under the enclosure cover. The following explanation indicates the function of each terminal.

GND:	This terminal is connected to earth ground or the ground of the building electrical system.
L1, L2, & L3:	Connect these terminals to a fused 3-phase AC input. Verify that the incoming line voltage matches the voltage listed on the Drive nameplate.
Ml, M2 & M3:	Connect the motor leads to these terminals (M1 to T1, M2 to T2 and M3 to T3).

The following statements apply for multimotor operation:

- The combined total of motor kVA cannot exceed the kVA output of the Drive.
- If output contactors are used, the operating Drive must be stopped before a switching sequence is initiated to avoid overcurrent trips.

WARNING: Any disconnecting means wired to the output of the controller must be capable of shutting down the Drive if opened during Drive operation. The Drive will continue to run into an open motor circuit causing equipment damage and/or personal injury if some type of hard wired, normally closed, STOP contact is not interlocked between terminals 14 & 15.

IMPORTANT: Verify that the induction motor windings are properly connected to match the Drive output rating.

Alternate Power Source Operation

Bulletin 1332 Drives rated for three-phase, 230 Volt inputs may be operated from a single-phase power source in lieu of three-phase power. The Drive output rating must be derated accordingly when operating with a single-phase input.

For single-phase operation, connect the AC power input to L2 and L3 (L1 is not used).

Alternate Voltage Operation - Bulletin 1332 Drives designed for 230 or 460 Volt inputs have the capability of being operated at voltages of 208 (Series B Drives, Only) or 380/415 Volts, respectively. Bulletin 1332 Drives designed for 575 Volt operation are for use at that voltage only.

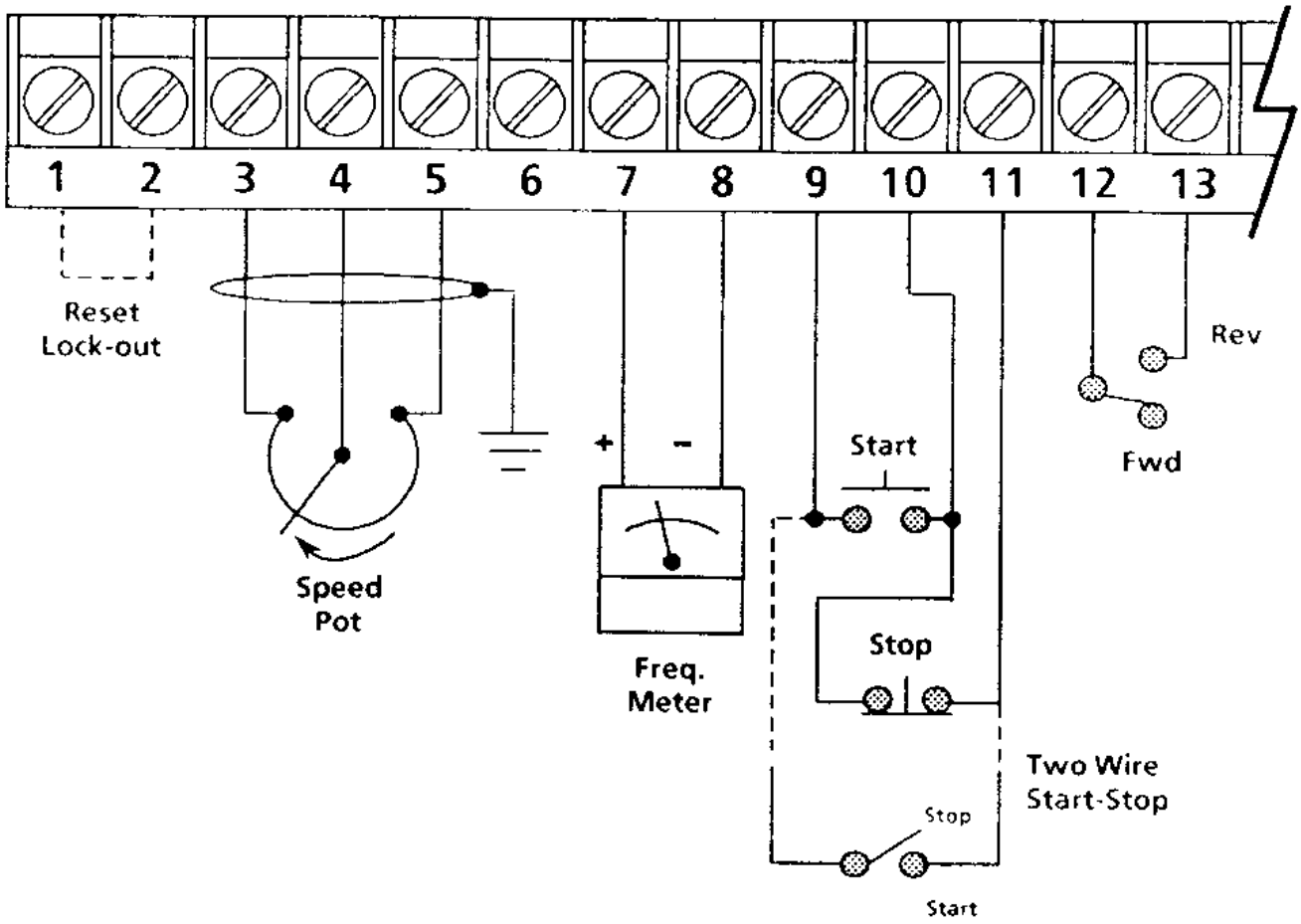
CONTROL TERMINALS

WARNING: The Start/Stop control circuitry in this Drive is composed of solid-state components. If hazards due to accidental contact with moving machine components or unintentional flow of liquid, gas or solids exist, NEMA standards require that a hard wired operator Emergency Stop circuit be used with this Drive. Use a device that removes AC input power when an Emergency Stop is initiated. When AC input power is removed, there will be a loss of inherent regenerative braking effect and the motor will coast to a stop. An auxiliary braking method may be required.

The control terminals are located at a 22 position terminal block situated on the lower front portion of the Drive, under the enclosure cover. The following explanation indicates the function of terminals 1 through 13.

IMPORTANT: The Drive is capable of operation from the built-in control panel without any connections to the customer terminal block, provided that SW3 and SW4 are both in the "LOCAL" position.

All remote signal wiring must be run separate from power and control wiring. Nearby relays, solenoids, or brake coils can produce electrical noise transients and cause erratic Drive behavior Transient suppression networks must be added across the coils of these devices.



Control Terminals Interconnection (Remote Devices)

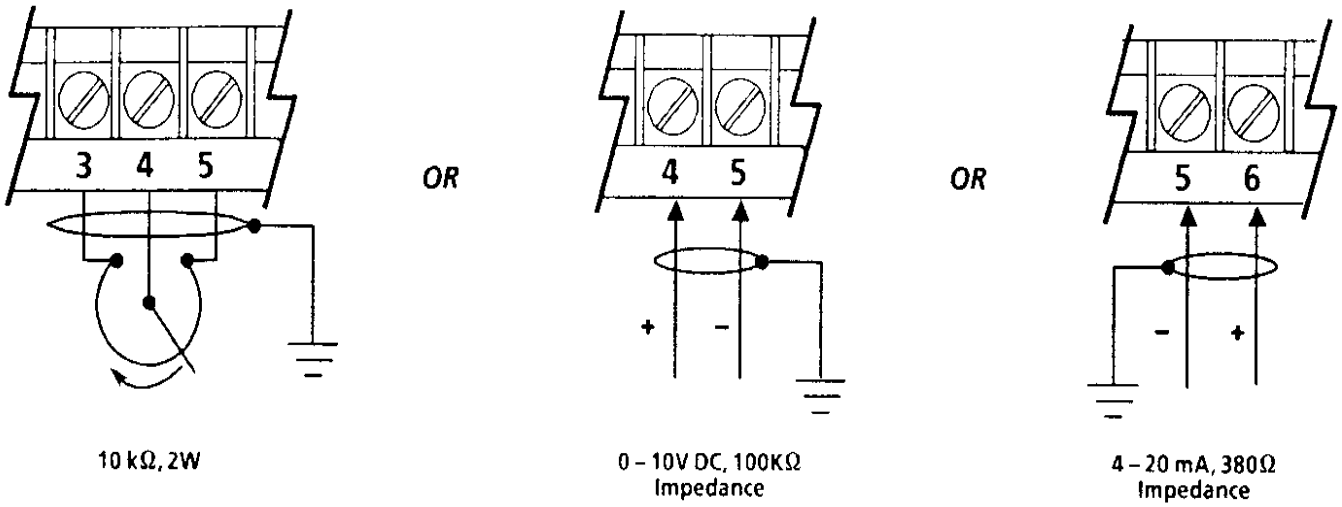
l1 & 2: Connection of these terminals determines how the Drive is reset after a Fault condition. When the terminals are not jumpered, a Fault trip can be reset by pushing the STOP button, opening the r emote STOP circuit or removing AC line voltage. When these terminals are jumpered, a Fault trip can only be reset by removing and re-applying incoming line voltage to the Drive.

3,4,5 & 6: These terminals are available for connection to a 10k Ohm, 2W Speed Potentiometer, a zero to 10V DC supply (input impedance, 100k ohm) or a 4 to 20 mA supply (input impedance, 380 ohm) signal. Only one speed reference signal may be connected to the Drive remote reference terminals at a time. Switch SW4 must be in the REMOTE position.

WARNING: Incorrect polarity of remote inputs may cause personal injury from uncontrolled machine motion. Connect remote inputs (terminals 4 & 5 or terminals 5 & 6) only as shown in Figure 3-4

IMPORTANT: Speed Pot(signal) wiring must be twisted, three conductor shielded wire, having (2) to (3) twists per inch. If the pot is remotely mounted, the wiring must be run in separate steel conduit to eliminate the possibility of electrical noise. The shield must be grounded at the controller end only.

For Distances less than 150 ft., use a minimum wire size of 22 AWG. For Distances between 150 and 200 ft., use a minimum of 16 AWG, or follow local codes.



10 k ohm, 2W 0 -10V DC, 100K ohm Impedance 4 - 20 mA, 380 ohm Impedance

Remote Speed Reference Connections

7 & 8:
These terminals provide connections for an external analog speed or frequency meter. This is calibrated for use with a full scale meter (1 mA corresponds to full speed or highest frequency)

9, 10 & 11:
These terminals are designed for remote control of the Drive using either a two wire switch or three wire push-button scheme. Switch SW3 on the Local Control Panel must be in the Remote position to allow for Drive remote control. When using a two wire START/STOP switch, a single pole maintained switch or contact must be connected.

When remotely mounted, wiring for control switches and associated control must be run in conduit separate from any speed reference (signal) wiring.

WARNING: If a two wire START/STOP switch is used and the switch is in the START position, the Drive will automatically restart after an incoming AC line power outage condition. Personal injury may occur if labels are not located at the Drive and associated machinery to warn operators / service personnel of the potential hazard. Warnings should include procedures to lock-out power at the disconnect when servicing equipment.

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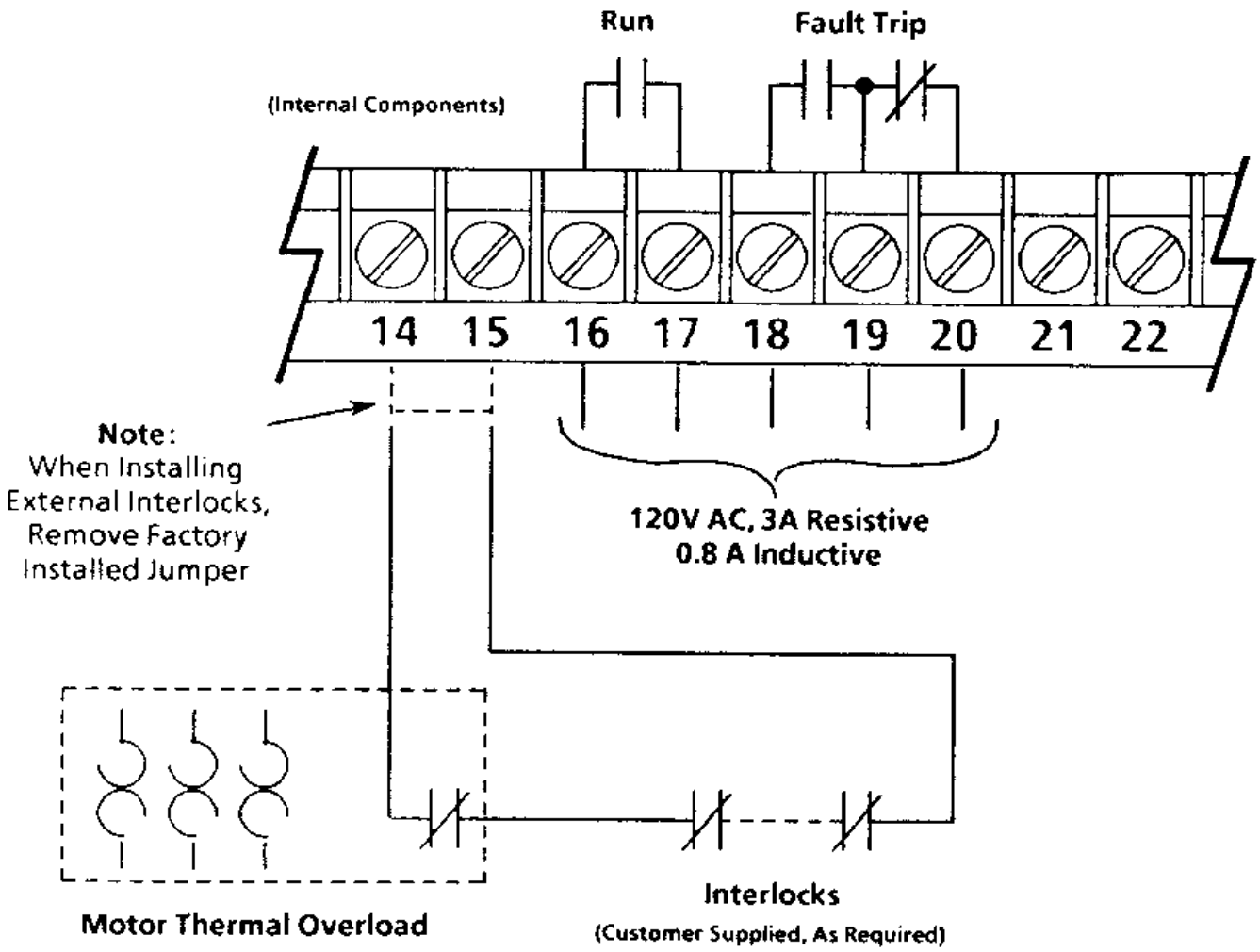
12 & 13:
FORWARD / REVERSE operation can be accomplished by connection of a single pole switch to these terminals Connection to these terminals allows for operation through controller's anti-plug reversing circuit. With SW3 in the REMOTE position and the single pole switch open, the Drive allow motor operation in the Forward direction. A switch closure between terminals 12 and 13 will provide for Reverse motor rotation.

Fault Interlock Terminals

Terminals 14 through 22 are dedicated to Fault interlock interconnections. The following explanation indicates the function of these terminals and the connections made to each terminal



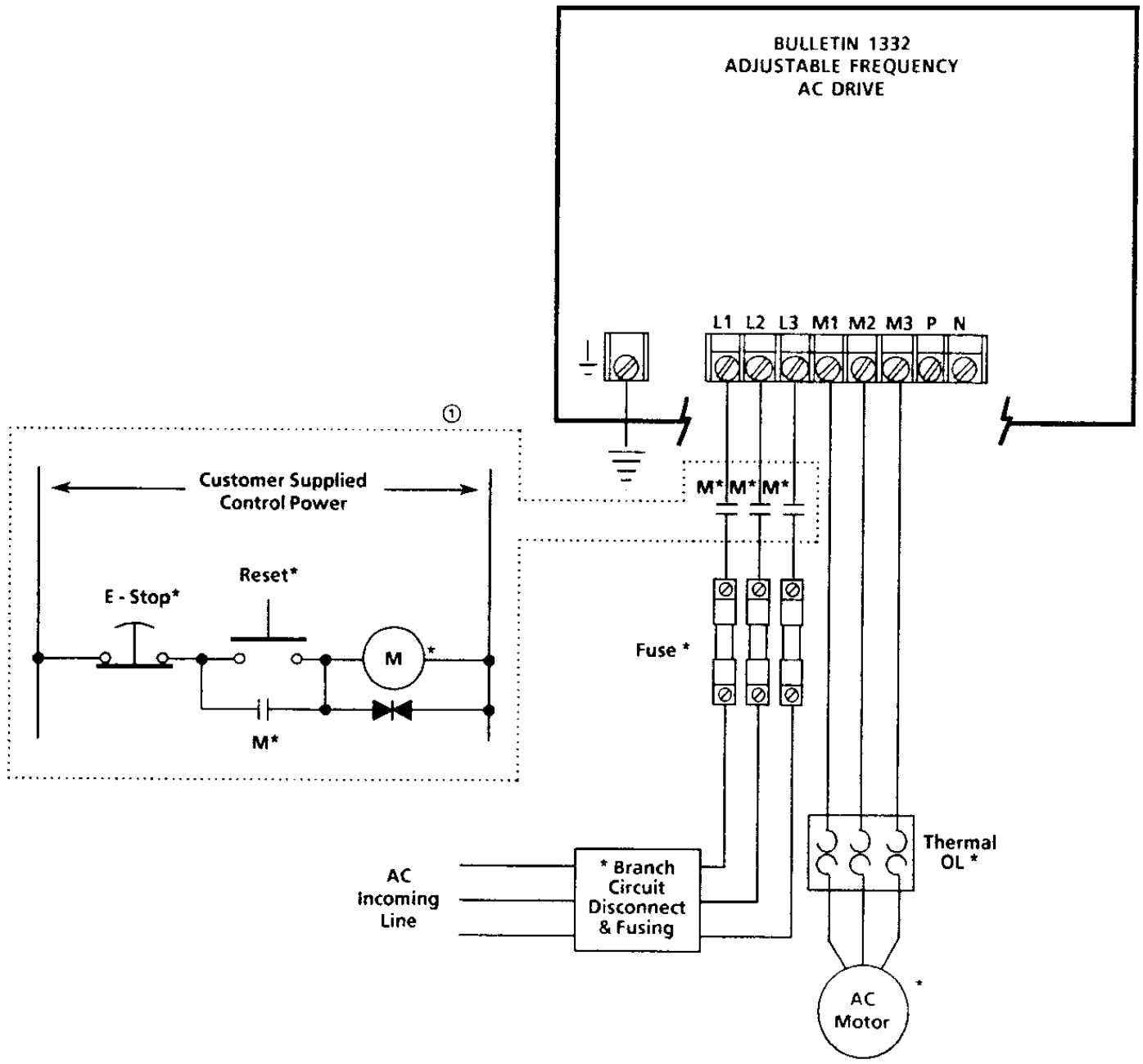
Fault Interlock Interconnection

14 & 15: These terminals are available for connection of a customer-supplied motor overload trip interlock. Typically, the N.C. pilot contacts will be wired to these terminals. An open contact will indicate an "AUXILIARY" Fault condition and stop the Drive on a Fault trip. Additional Fault interlocks can be wired in series with the OL contact.

16 & 17: This normally open, isolated contact is available for use with an alarm, a run light or a remote indication that the Drive is in a running condition. The contact is closed in the running mode and is rated for 3 amperes resistive (0.8 amperes inductive) at 120V AC.

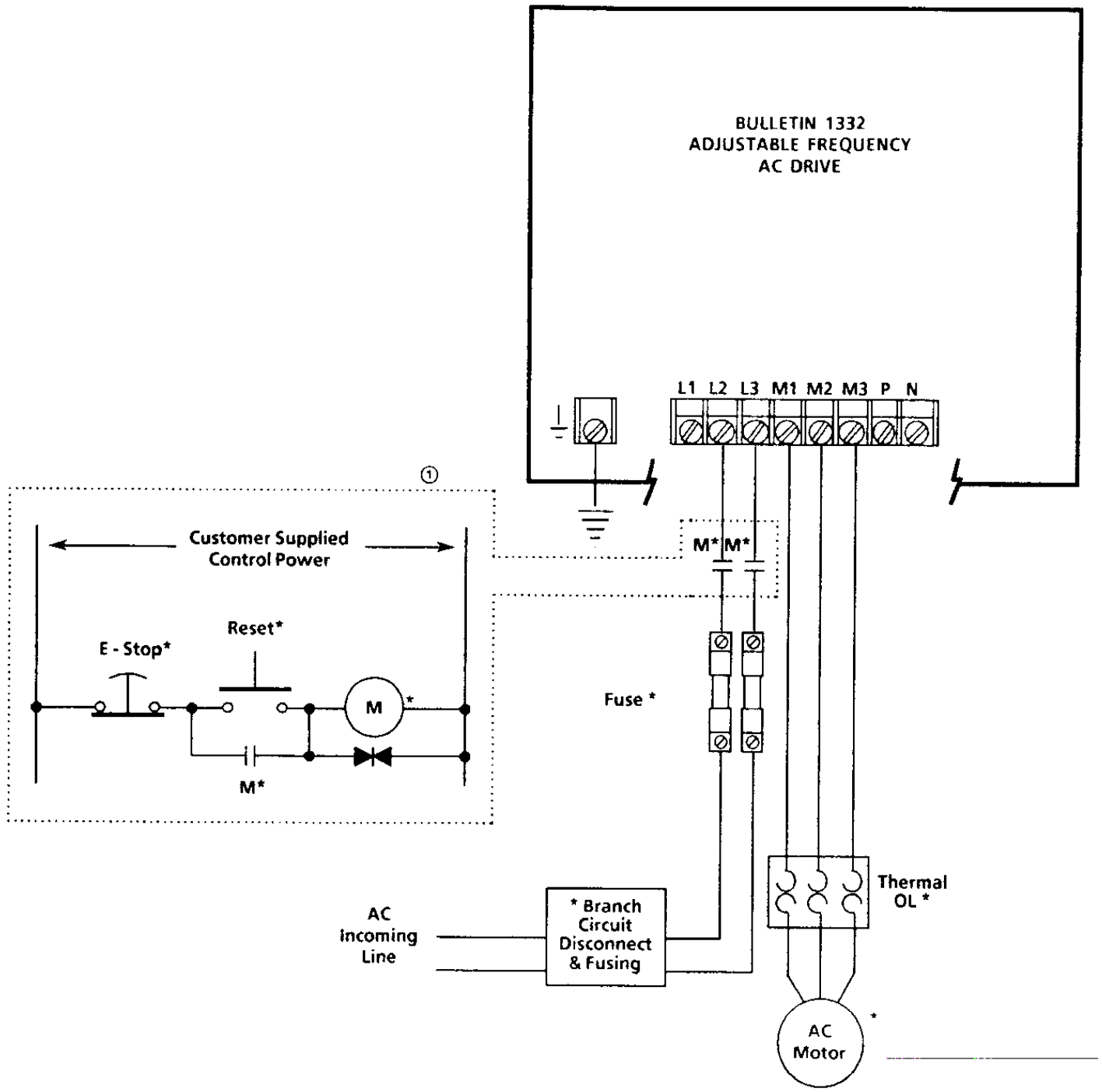
18, 19 &20: These terminals are available for a remote Fault indication when the Drive trips due to an overcurrent, overvoltage, low voltage, over temperature, or auxiliary Fault. The isolated form C contacts are rated for 3 amperes resistive (0.8 amperes inductive) at 120V AC . Terminals 18 and 19 allow for connection to a N.O. Contact with terminals 19 and 20 a N.C. contact.

21 & 22: These terminals are not used on the standard Drive package. Do Not use these terminals for tie points.



(1) Devices and control circuitry for applications requiring Emergency Stop.

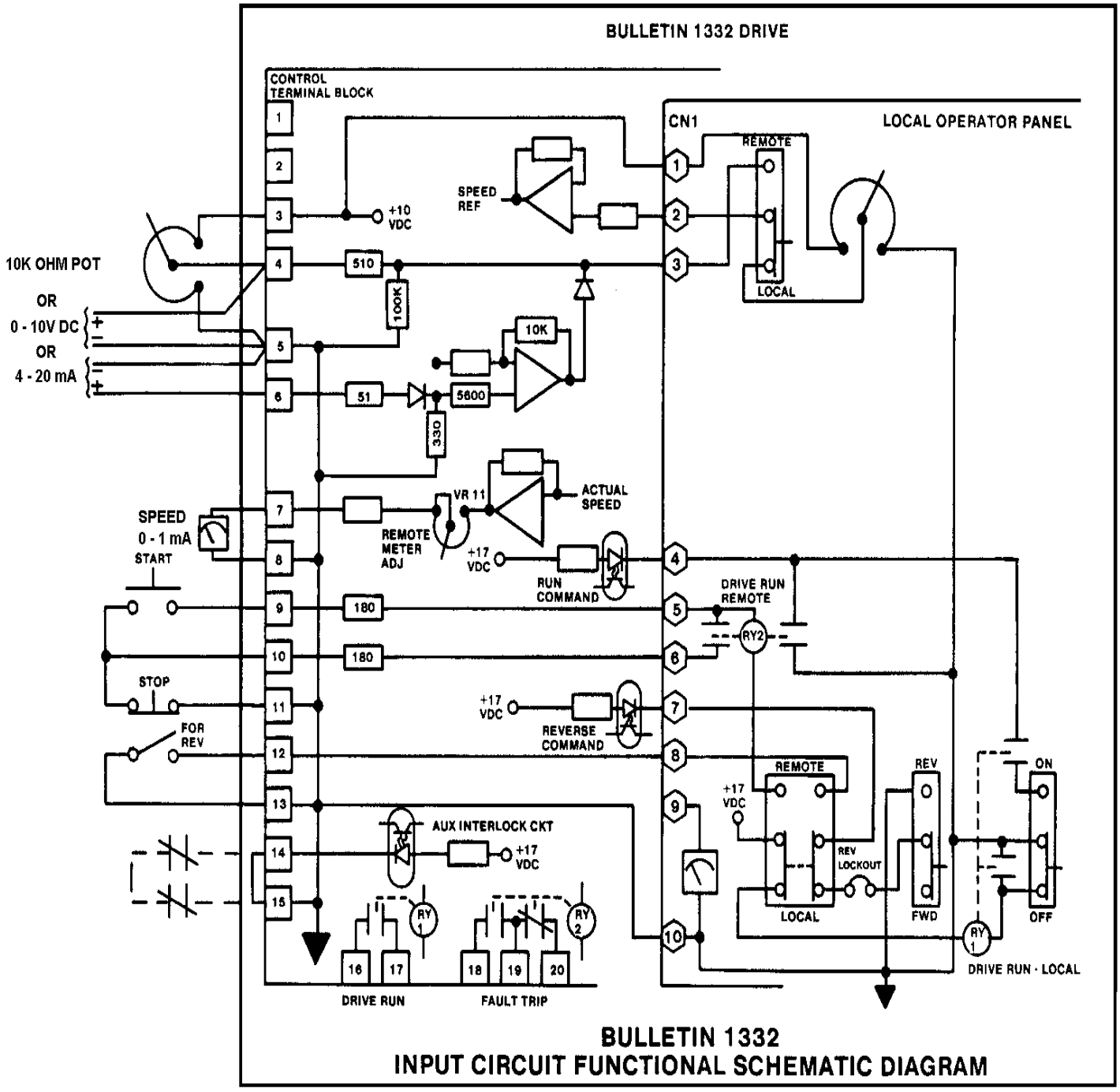
* Customer Supplied Components



Single-Phase Connections for Derated 230 or 575 Volt Drives Only

(1) Devices and control circuitry for applications requiring Emergency Stop.

* Customer Supplied Components


BULLETIN 1332 DRIVE
CONTROL TERMINAL BLOCK
CN1
LOCAL OPERATOR PANEL
REMOTE
LOCAL
SPEED REF
+10 VDC
10K OHM POT
OR
0 - 10V DC
OR
4 - 20 mA
510
100K
10K
51
5600
330
VR 11
ACTUAL SPEED
REMOTE METER ADJ
+17 VDC
RUN COMMAND
SPEED
0 - 1 mA
START
STOP
FOR REV
180
180
DRIVE RUN REMOTE
RY2
REVERSE COMMAND
AUX INTERLOCK CKT
REV LOCKOUT
REV
FWD
ON
OFF
RY 1
RY 2
DRIVE RUN
FAULT TRIP
DRIVE RUN - LOCAL
BULLETIN 1332
INPUT CIRCUIT FUNCTIONAL SCHEMATIC DIAGRAM