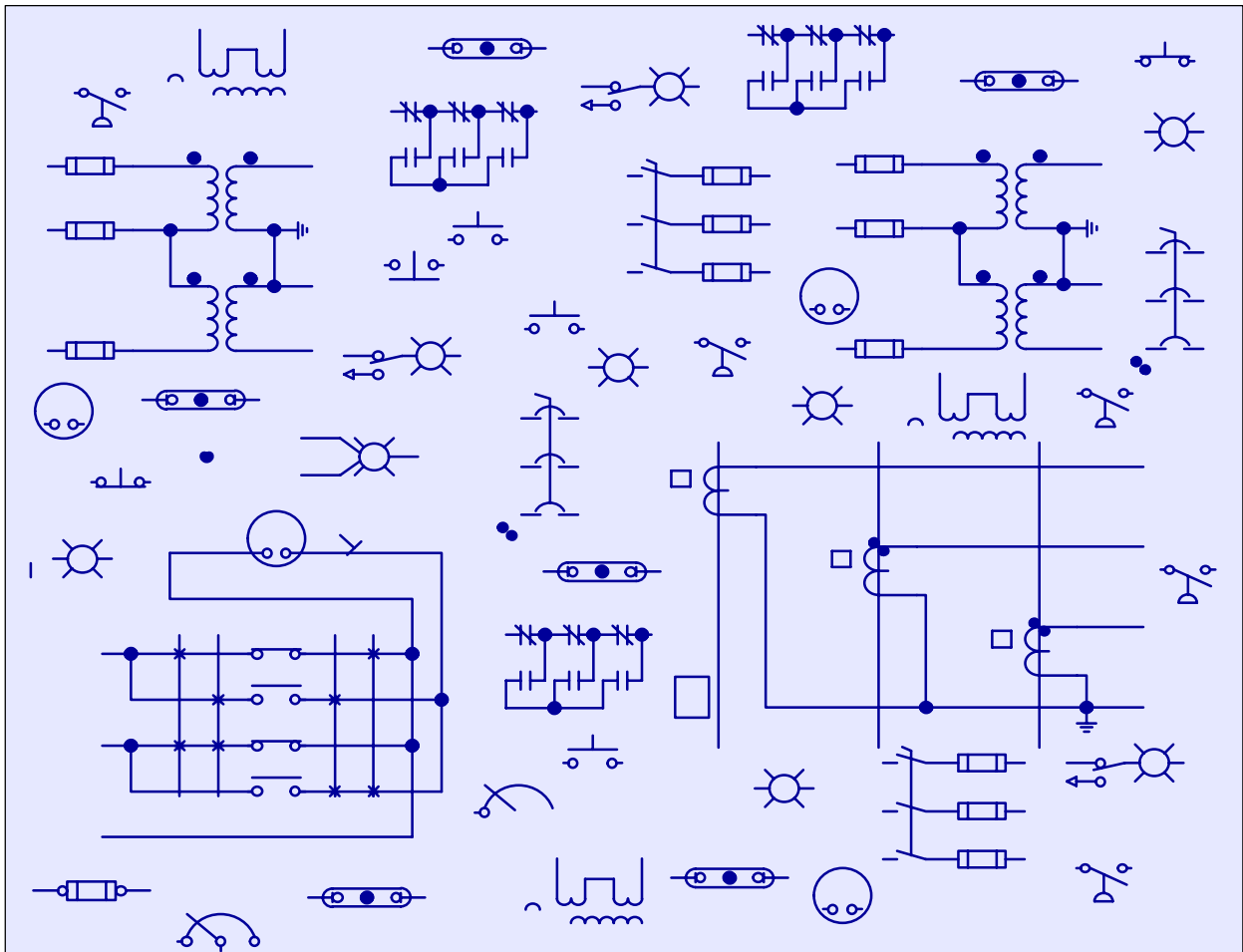




# WIRING DIAGRAMS

A Reference Resource for  
**CENTERLINE<sup>®</sup> Motor Control Centers**



Spare Allen-Bradley Parts

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# Wiring Class

## Class I Independent Units

Class I motor control centers (MCC) consist of mechanical groupings of combination starter units, feeder and other units, and electrical devices arranged in a convenient package.

Allen–Bradley furnishes drawings that include:

- Overall dimensions of the MCC, identification of units and their locations in the MCC, locations of incoming line terminals, mounting dimensions, and available conduit entrances.
- Standard diagrams for individual units consisting of drawings that identify electrical devices, indicate electrical connections, and indicate terminal numbering designations.

When a combination schematic and / or wiring diagram for a unit is supplied showing optional devices, Allen–Bradley provides information to indicate which devices are actually furnished.



# Spare Allen-Bradley Parts



91C-111

## **Class II Interconnected Units**

Class II motor control centers are the same as Class I but with the addition of factory furnished electrical interlocking and wiring between units, a specifically described in overall control system diagrams supplied by the purchaser. In addition to the drawings furnished for Class I MCCs, Allen–Bradley furnishes drawings that show factory interconnections within the MCC.

## **Class I–S & Class II–S Motor Control Centers Requiring Custom Drawings**

Class I–S and Class II–S motor control centers are the same as Class I and Class II MCCs except that custom drawings are provided as specified by the customer rather than standard drawings. Examples are:

- special identifications for electrical devices
- special terminal numbering designations
- special drawing sizes.

These drawings give the same information as those for Class I and Class II motor control centers, plus show customer modifications.

# WiringType

## **Type A Wiring – No Terminal Blocks**

Type A wiring is available for Class I motor control centers. When Type A wiring is specified, components within the unit are wired directly to each other, and no terminal blocks are supplied for customer wiring. The customer must connect external control and load wiring directly to the electrical devices within the unit. See Photo 1 on page 6.

## **Type B Wiring – Terminal Blocks**

Type B wiring is available for Class I and Class II motor control centers. NEMA/EEMAC defines Type B wiring as follows:

### **ICS 2-322.10 TYPES OF WIRING**

#### **.02 Type B**

a. Type B user field load wiring for combination motor control units size 3 or smaller shall be designated as B-D or B-T, according to the following

B-D connects directly to the device terminals, which are located immediately adjacent, and readily accessible, to the vertical wireway

B-T connects directly to a load terminal block in, or adjacent to, the unit.

NEMA Standard 3-6-1985

b. Type B user field load wiring for combination motor control units larger than size 3, and for feeder tap units, shall connect directly to unit device terminals.

NEMA Standard 3-6-1985

c. Type B user field control wiring shall connect directly to unit terminal block(s) located in or adjacent to each combination motor control unit.

NEMA Standard 3-6-1985

CENTERLINE Motor Control Centers provide the following:

	<b>Type B-T</b>  Power wired to terminal blocks (See Photo 2 on page 6)	<b>Type B-D</b>  Power wired to device terminals (see Photo 3 on page 7)	<b>Type B</b>
<b>Size 1, 2 (except 0.5 space factor)</b>	Pull apart control Pull apart power	Pull apart control No power terminal blocks	N/A
<b>Size 3</b>	Pull apart control Non-pull apart power	Pull apart control No power terminal blocks	N/A
<b>Size 4 and larger</b>	N/A	N/A	Pull apart control No power terminal blocks
<b>0.5 space factor units and Bul. 2400 units.</b>	Pull apart control terminal blocks No power terminal blocks		

**N/A = Not applicable, undefined by NEMA/EEMAC**

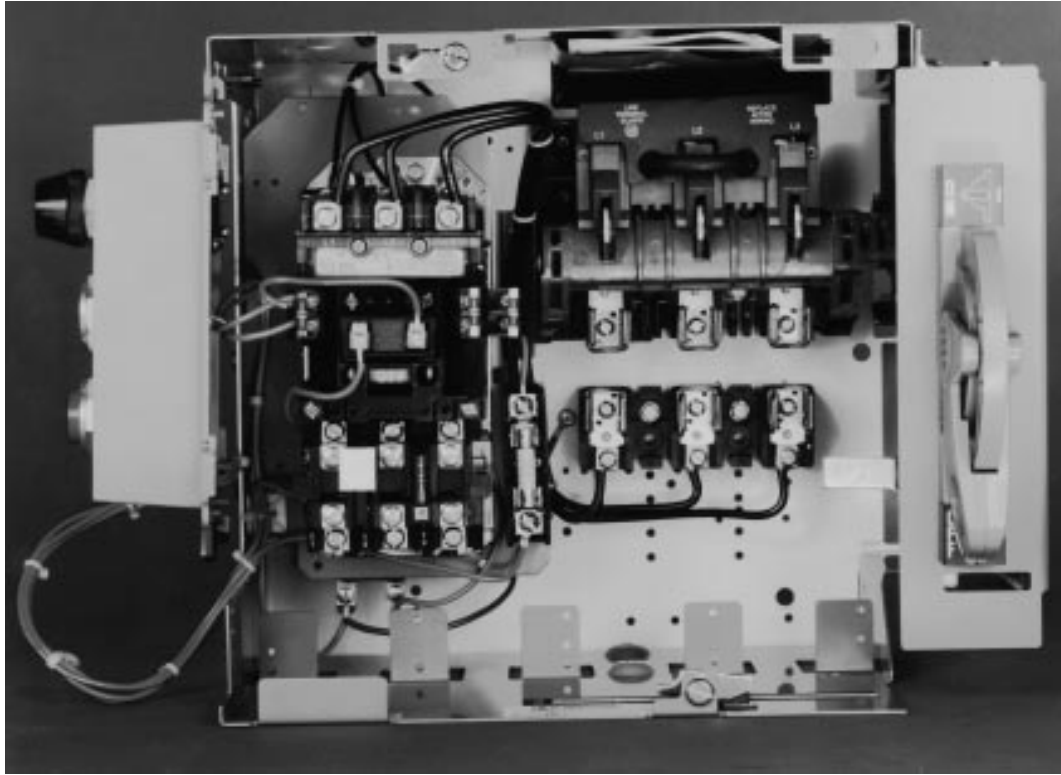
### **Type C Wiring – Master Terminal Compartment**

Type C wiring is available for Class II motor control centers. See Photo 4 on page 7.

Control wiring from each unit within an MCC section is wired from the unit's terminal blocks to master terminal blocks contained in a separate unit mounted at the top or bottom of that section.

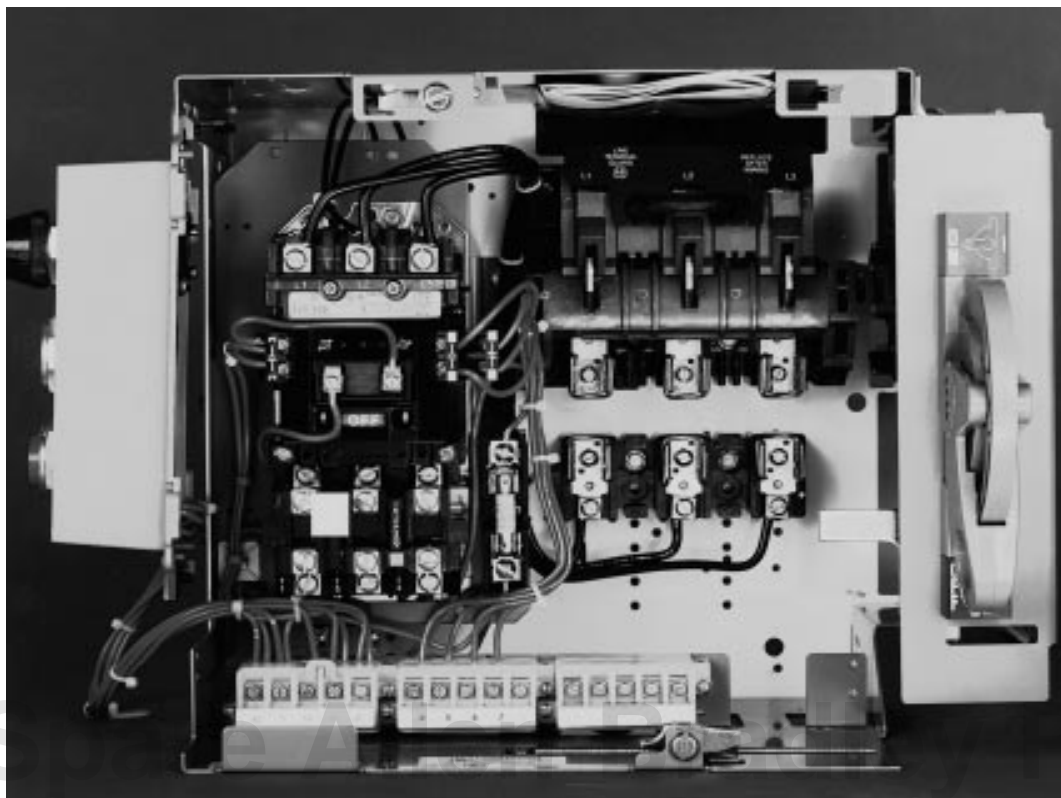
The customer connects the external control wires to the master terminal blocks. The customer connects the load wiring for size 3 or smaller to the master terminal blocks. The customer connect the load wiring for size 4 or larger to unit device terminals.

**Photo 1. Type A Wiring**



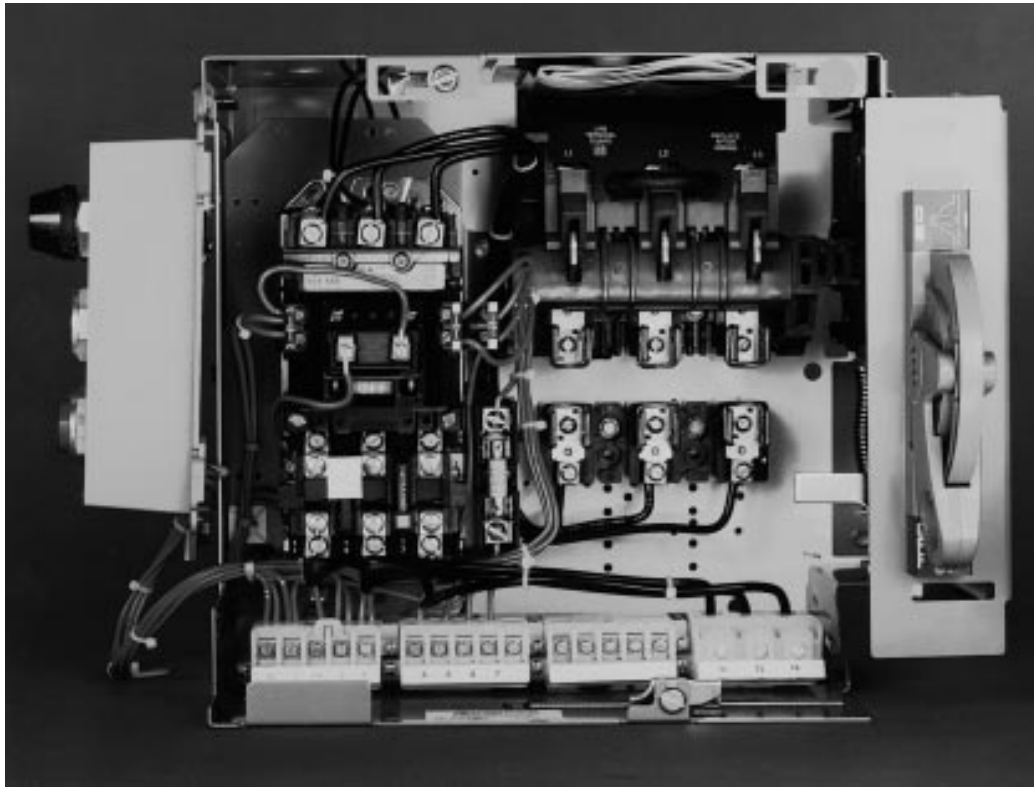
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**Photo 2. Type B-T Wiring**



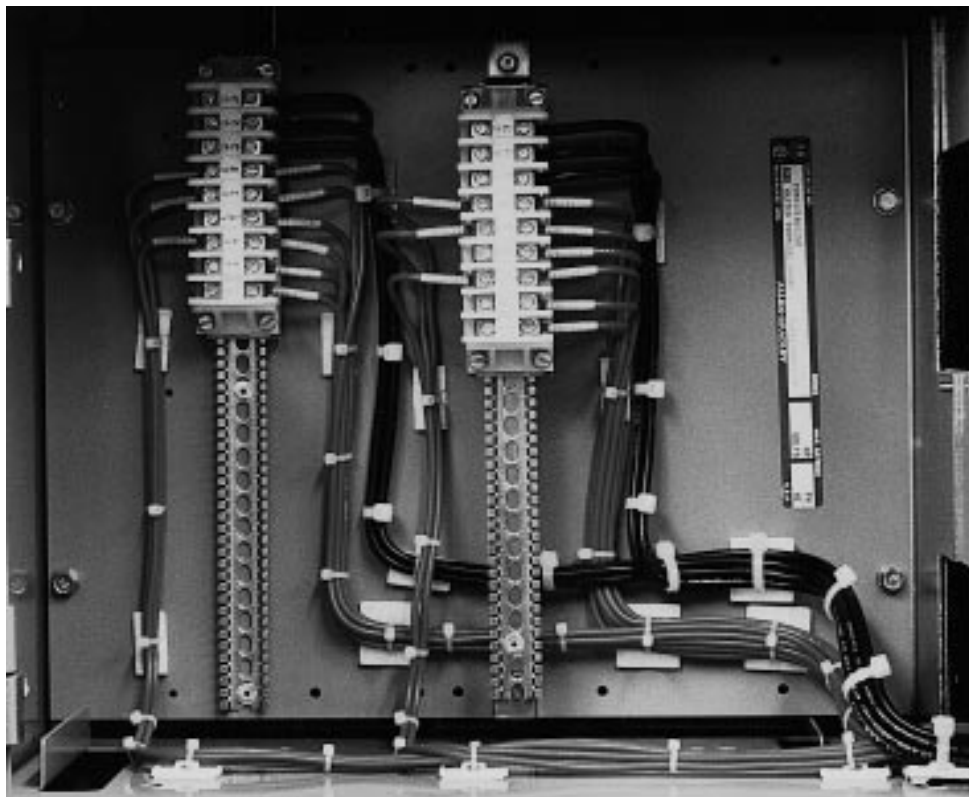
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**Photo 3. Type B-D Wiring**



93C-491-1

**Photo 4. Type C Wiring**



87C-143-13



## Customer Wiring

The method that a customer uses to connect their external wiring differs depending upon whether or not terminal blocks are supplied:

<b>When control and/or power terminal blocks are supplied:</b>	<b>When no terminal blocks are supplied:</b>
The customer's external control and/or load wires are connected to those blocks that are located adjacent to the vertical wireway and are readily accessible.	The customer must connect the external control and load wires directly to the applicable electrical devices internal to the unit.

# Control Circuit Wiring and Devices

## Control Circuit Wiring

For Bulletin 2100 units, the standard control circuit wiring is 16 AWG copper wire with Type MTW (TEW) insulation. 14 AWG (tinned) copper wire with Type MTW (TEW) insulation and 14 AWG (tinned) copper wire with Type SIS insulation are other available options (when specifications do not allow PVC insulation).

For Bulletin 2400 units, the standard control circuit wiring is 18 AWG copper wire with Type MTW (TEW) insulation. 16 AWG copper wire with Type MTW (TEW) insulation is also available as an option.

## Terminal Blocks

Different terminal blocks will accept different wire quantities and sizes. The maximum wire sizes accepted are as follows:

Pull-apart Terminal Blocks	Maximum Wires Per Pole
5-pole control	Two (2) 14 AWG wires or One (1) 12 AWG wire
3-pole power	One (1) 4 AWG wire
10-pole control (used on all 0.5 space factor units)	Two (2) 18 AWG wires or One (1) 16 AWG wire

## Pilot Devices

There are several types of pilot devices supplied on our Bulletin 2100 and 2400 units. The maximum wire sizes accepted are as follows:

Pilot Device	Maximum Wires Per Pole
Bulletin 800T	Two (2) 14 AWG wires
Bulletin 800M (w/small terminals)	One (1) 14 AWG wire
Bulletin 800M (w/large terminals)	Two (2) 12 AWG wires
Bulletin 800E	Two (2) 14 AWG wires or One (1) 12 AWG wire

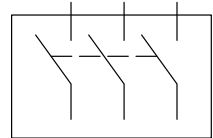
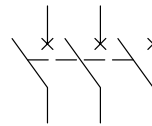
For further information on types of pilot devices supplied with each unit, see Publication 2100-3.0.

# Schematic Symbols

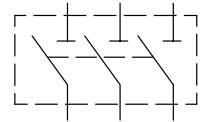
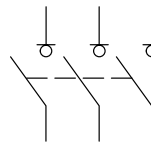
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**Three-Pole Circuit Breaker**

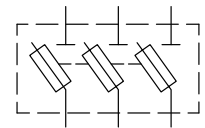
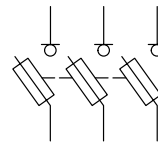
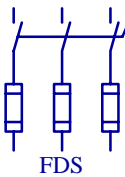


An automatic device that under abnormal conditions will open a current-carrying circuit without damaging itself (unlike a fuse that must be replaced when it blows).



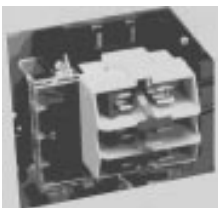
**Three-Pole Disconnect Switch**

Generally, an air-break switch, however, containing no fuses. A power circuit employing this type of switch must have some kind of circuit protection elsewhere.

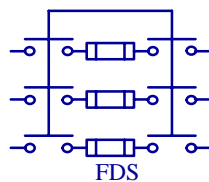


**Three-Pole Fusible Disconnect Switch**

Generally, an air-break switch with a fusing unit in the blade. Used for opening and closing power circuits.



**IEC Fusible Disconnect Switch**



An application-rated version of an air-break switch with a fusing unit in the blade.

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**Node**



Dark black nodes on a circuit schematic indicate that an electrical connection is made. It is a point of connection for two or more conductors in an electrical circuit.



**Terminal Block (TB)**



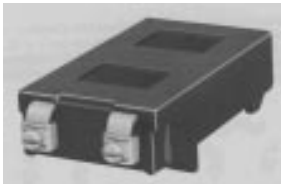
A device attached to the end of a wire or cable for convenience in making electrical connections.



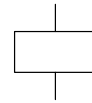
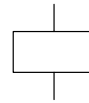
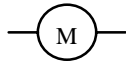
**Connector**



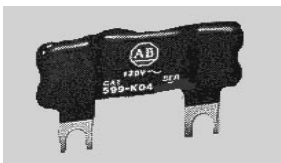
A coupling device that provides an electrical and/or mechanical junction between two cables.



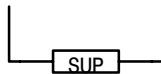
**Coil**



Part of a contactor, motor starter, or relay consisting of a number of turns of wire wound around an iron core. When voltage is applied, an electromagnetic field is set up in the coil causing the contacts of the contactor, starter, or relay to change state.

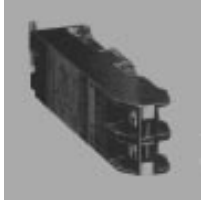


**Surge Suppressor**



This device is mounted directly across the coil terminals of contactors and starters with 120V or 240V AC coils. The purpose of the suppressor is to limit voltage transients for applications requiring interface with solid state components.

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**Contact - Normally Open (N.O.)**

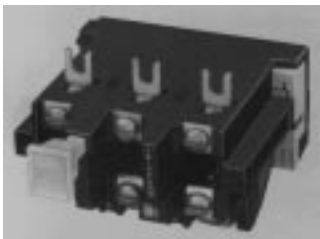


Symbolized by N.O. designation applied to the contacts of a relay or starter when they are connected so that the circuitry will be broken when the relay or starter coil is not energized.

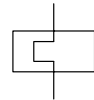
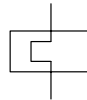
**Contact - Normally Closed (N.C.)**



Symbolized by N.C. designation applied to the contacts of a starter or relay when they are connected so that the circuit will be completed when the relay or starter coil is not energized.



**Overload Relay**



A device that automatically disconnects the circuit whenever the current or temperature becomes excessive.

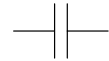
**Overload Relay Contact (OL)**



Relay contacts designed to open when its coil current rises above a predetermined value.

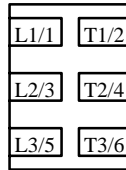
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**Power Factor Correction Capacitor**

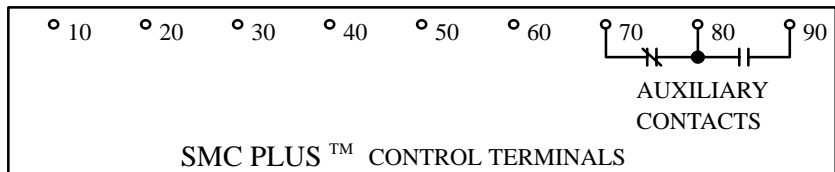


A device that stores electrical energy, blocks the flow of DC, and permits the flow of AC to a degree dependent upon the capacitance and the frequency. Used in an inductive (motor) circuit in order to increase the power factor by making the total current more nearly in phase with the applied voltage.

**SMC Reduced Voltage Motor Starter**



**SMC PLUS Interface Module**



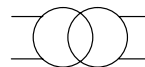
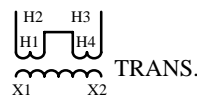
**Fuse**



A protective device that melts and breaks the circuit when the current exceeds the rated value.



**Control Circuit Transformer**



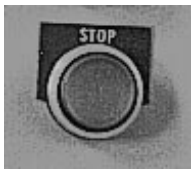
An electrical device that by electromagnetic induction transforms electric energy from the power circuit to the control circuit at the same frequency but at a lower voltage.

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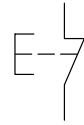
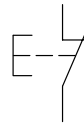
**Ground**



A conductor that carries no current but serves to connect exposed metal surfaces to an earth ground to prevent hazards in case of breakdown between current-carrying parts and the exposed surfaces.



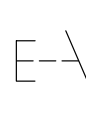
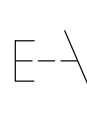
**Push Button - Normally Closed**



Switch where button must be depressed each time contacts are to be opened.



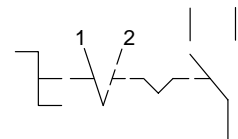
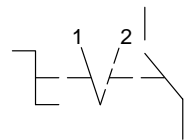
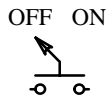
**Push Button - Normally Open**



Switch where button must be depressed each time contacts are to be closed.



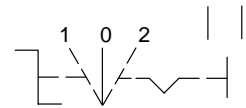
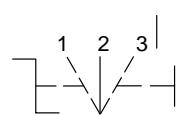
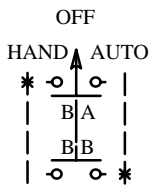
**Selector Switch - 2-Position**



A two position switch that permits one conductor to be connected to another conductor.



**Selector Switch - 3-Position**



A multiposition switch that permits one or more conductors to be connected to any of several other conductors.

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**Toggle Switch -  
Normally Open**



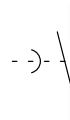
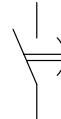
A two-position snap switch operated by a projecting lever to open or close circuits, contact is normally in the open position.

**Toggle Switch -  
Normally Closed**



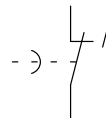
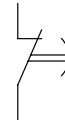
A two-position snap switch operated by a projecting lever to open or close circuits, contact is normally in the closed position.

**Timed Contact -  
Normally Open,  
Timed Open**



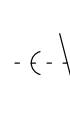
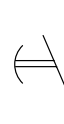
The contact of a timer relay with an appreciable time interval between the de-energizing of the coil and the opening of its contact.

**Timed Contact -  
Normally Closed,  
Timed Closed**



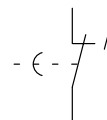
The contact of a timer relay with an appreciable time interval between the de-energizing of the coil and the closing of its contact.

**Timed Contact -  
Normally Open,  
Timed Closed**



The contact of a timer relay with an appreciable time interval between the energizing of the coil and the closing of its contact.

**Timed Contact -  
Normally Closed,  
Timed Open**



The contact of a timer relay with an appreciable time interval between the energizing of the coil and the opening of its contact.



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**Potentiometer**



An electromechanical device having a terminal on each end of the resistive element, and a third terminal connected to the wiper contact. The electrical input is divided as the contact moves over the element, thus making it possible to mechanically change the resistance.



**Pilot Light**



Insert color code inside symbol



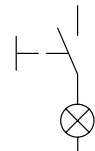
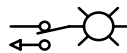
Insert color code next to symbol



A light that indicates the state of a circuit.



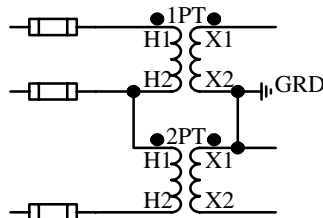
**Pilot Light – Push-To-Test**



Insert color code next to symbol

Similar to a regular pilot light but can be depressed to test if the bulb is functional.

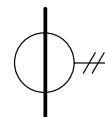
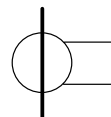
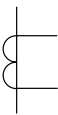
**Two Potential Transformers – Schematic Diagram**



Three-phase configuration of instrument transformers, the primary windings of which are connected in parallel with the circuit whose voltage is to be measured or controlled.



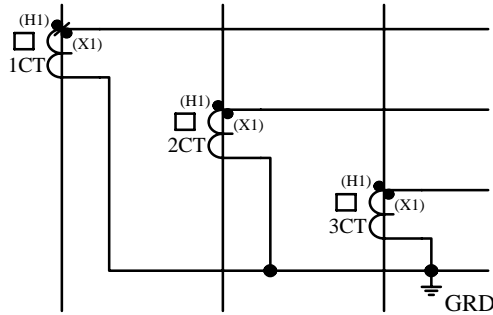
**Current Transformer**



A transformer intended for measuring or control purposes and designed to have its primary winding connected in series with a circuit carrying the current to be measured or controlled.

US/Canadian	International / British	German
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**3-Phase  
Current Transformer  
-Schematic Diagram**



Three-phase current transformer configuration used for inputs to digital metering system.

**Meter**



Insert function code inside symbol.



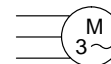
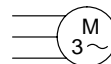
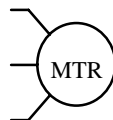
Insert function code inside symbol.



Insert function code inside symbol.

An electrical instrument used to measure electrical parameters, such as voltage, current, and power.

**Motor**



A machine that converts electric energy into mechanical energy to do work.

Notes

Spare Allen-Bradley Parts

# Wiring Diagrams

## Connection diagrams

Allen–Bradley connection diagrams are that portion of the wiring diagram that shows an approximate physical layout of the components that make up the unit. This diagram gives the relative locations of the electrical devices and includes wire numbers for easy identification of how the components are wired together.

## Schematic diagrams

Allen–Bradley schematic diagrams are the portion of the wiring diagram that shows an electrical representation of how the circuits operate. Both the power and control circuits are represented. The schematic diagram is often used by assemblers to wire the units and by maintenance electricians for installation and troubleshooting purposes.

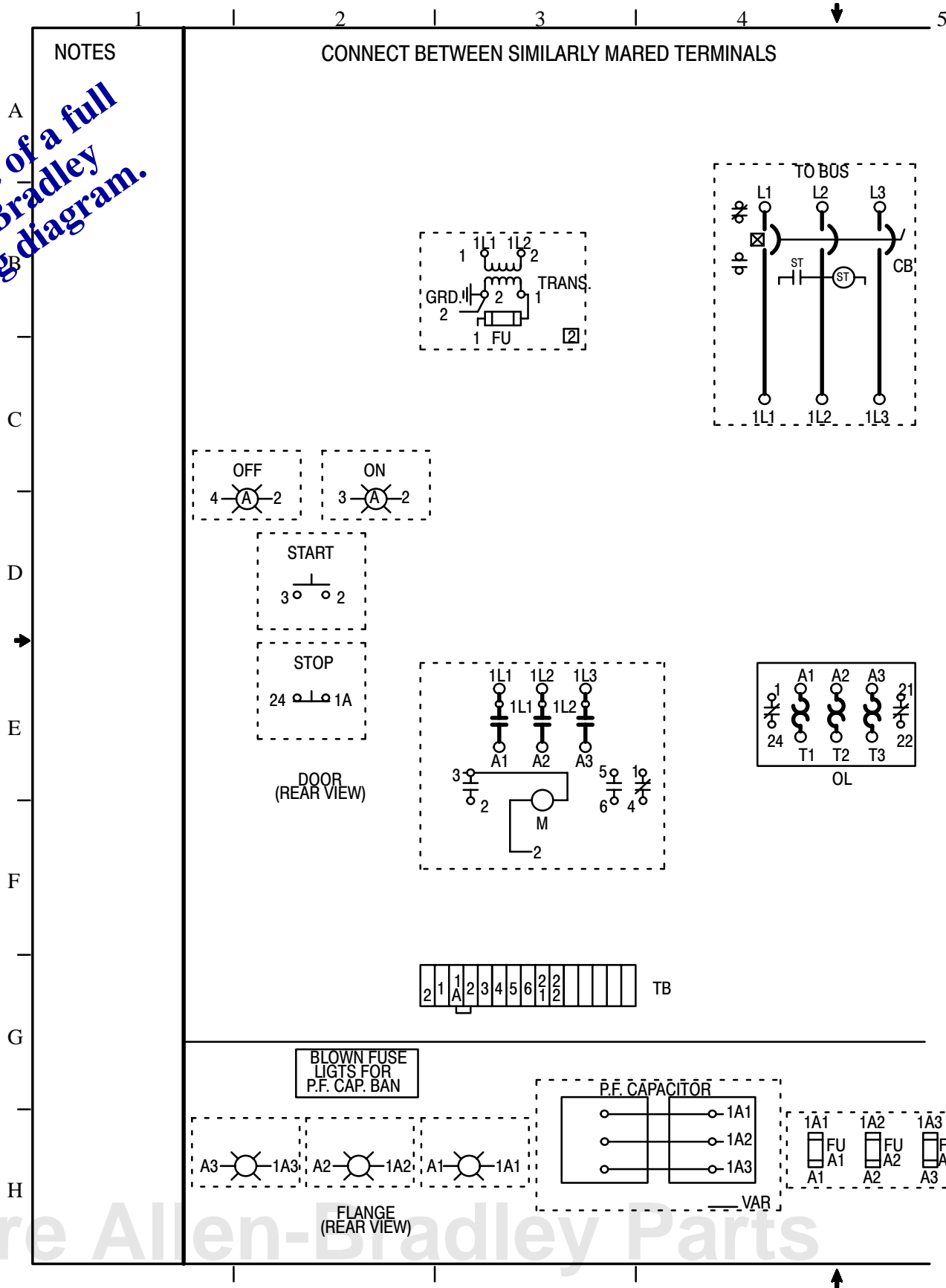
## Wiring diagrams

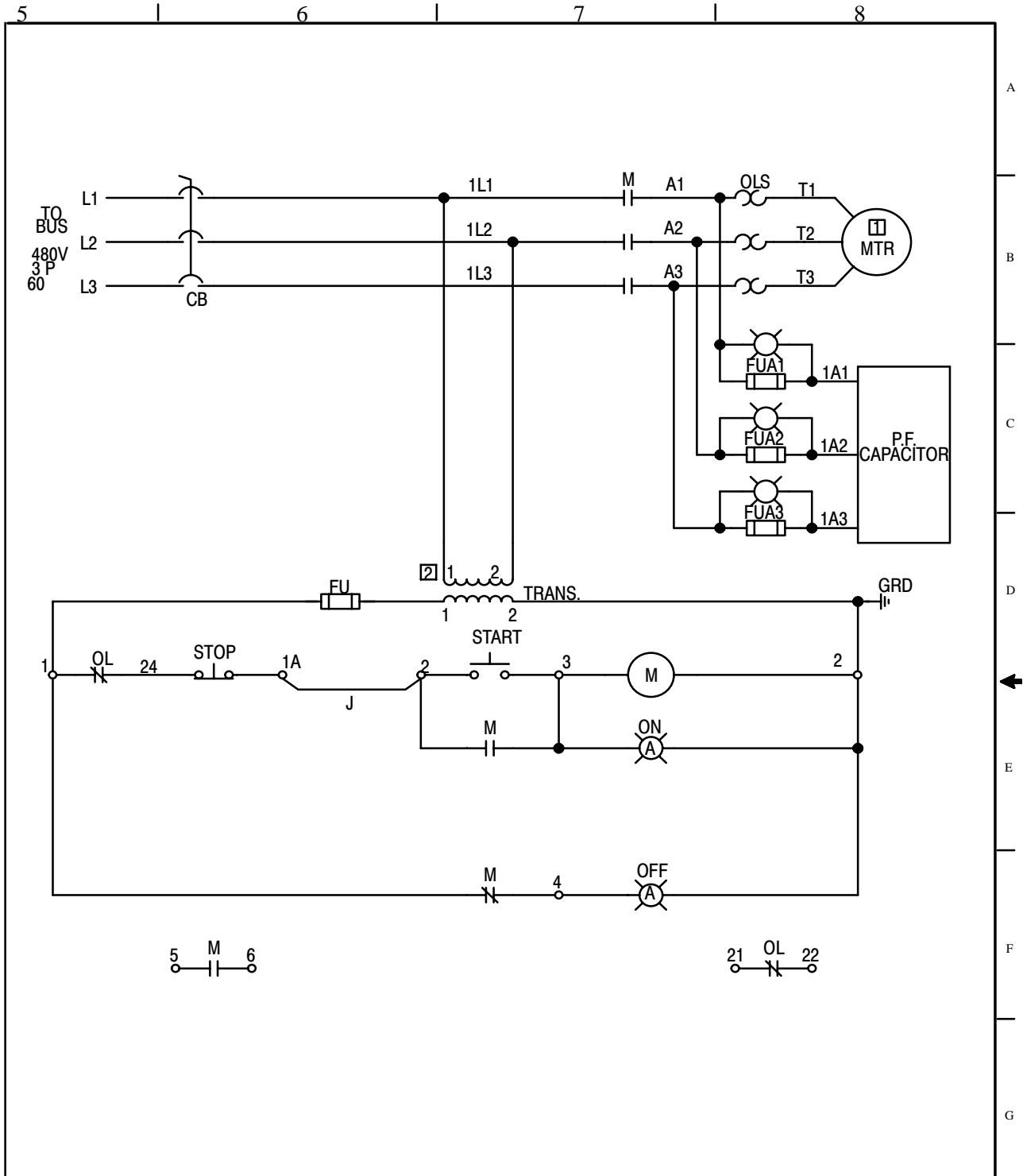
A schematic diagram together with a connection diagram make up an Allen–Bradley “customer specific” wiring diagram. See the following two pages for an example of a full wiring diagram (CS70024150 – Bul. 2113).

## Catalog number specific diagrams

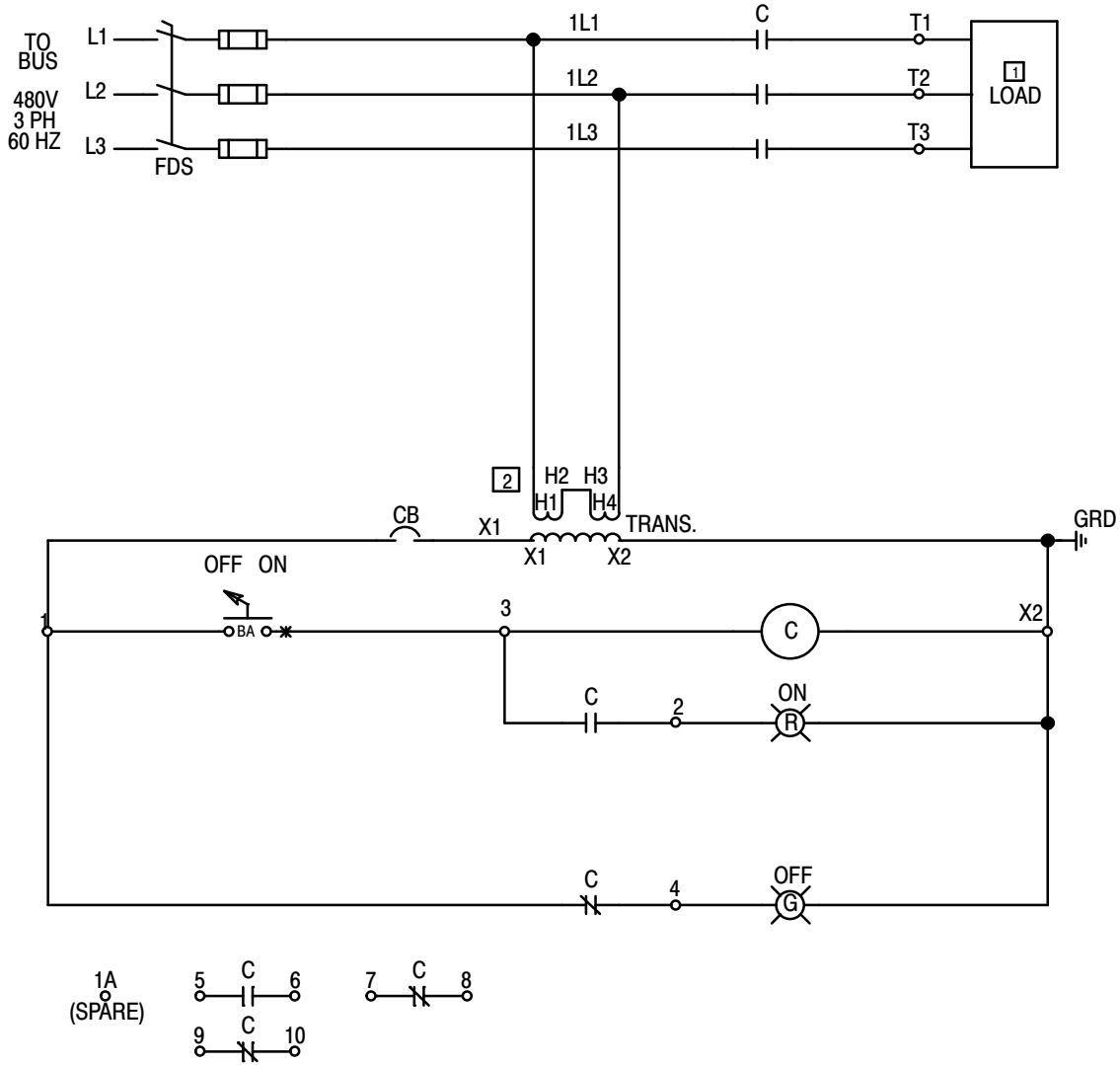
Beginning on page 22, you will find diagrams that are specific to Allen–Bradley catalog numbers. These diagrams are the schematic portions taken from the full wiring diagrams.

**Example of a full Allen-Bradley wiring diagram.**





References		BUL. 2113 SIE 4 (2.5SF)		ACAD
Revision		TYPE B		 ALLEN-BRADLEY A ROCKWELL INTERNATIONAL COMPANY
Release		DrPPEN577B		
A 10/18/93		Date 10/02/93		Dwg Size
Dimensions Apply Before Surface Treatment		Chkd N/A		CS70024150
Dimensions in Inches Tolerances Unless Otherwise Specified		Date N/A		
2 Place Decimal ± .02		Appd N/A		D
3 Place Decimal ± .005		Date N/A		
Angles ± 1°		Date N/A		
Refer. Book				



**NOTES:**

[1]  
REMOTE DEVICE

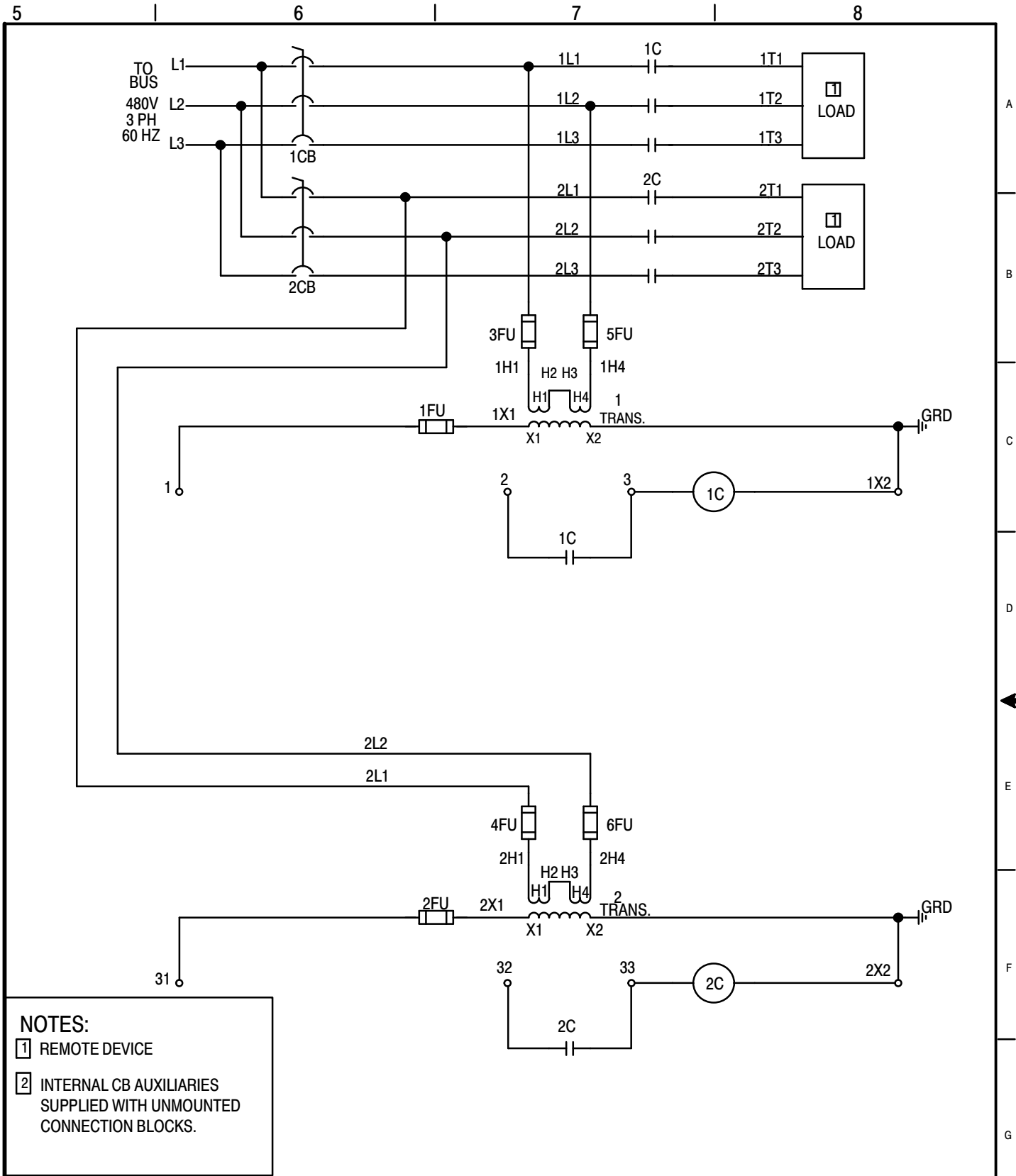
[2]  
THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

(TYPE "B" WIRING ONLY)


X	1	1	2	3	4	5	6	7	8	9	10				T	T	T
2	A														1	2	3

TB

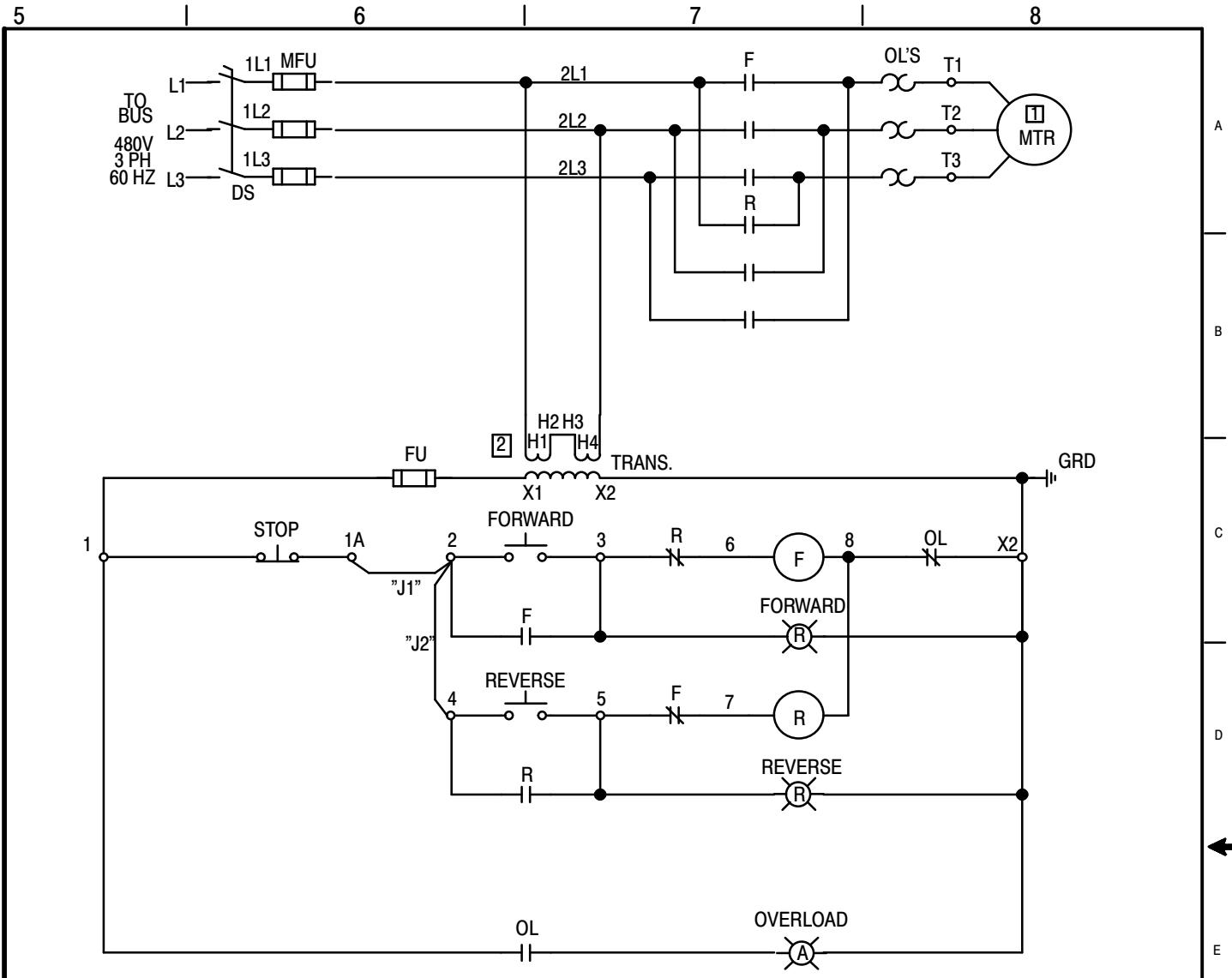
<b>References</b>		<b>BUL. 2102L 30-60AMP</b>				<b>ACAD</b>																							
<b>Revision</b>		<b>TYPE A</b>				 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>																							
<table border="1"> <tr> <td>Release</td> <td>Dimensions Apply Before Surface Treatment</td> </tr> <tr> <td>A 04/15/93</td> <td>Dimensions in Inches Tolerances Unless Otherwise Specified</td> </tr> <tr> <td></td> <td>2 Place Decimal</td> </tr> <tr> <td></td> <td>+ .02</td> </tr> <tr> <td></td> <td>3 Place Decimal</td> </tr> <tr> <td></td> <td>+ .005</td> </tr> <tr> <td></td> <td>Angles + 15</td> </tr> </table>		Release	Dimensions Apply Before Surface Treatment	A 04/15/93	Dimensions in Inches Tolerances Unless Otherwise Specified				2 Place Decimal		+ .02		3 Place Decimal		+ .005		Angles + 15	<table border="1"> <tr> <td>Dr. PPEN577B</td> <td>Date 10/02/93</td> </tr> <tr> <td>Chkd. N/A</td> <td>Date N/A</td> </tr> <tr> <td>Appd. N/A</td> <td>Date N/A</td> </tr> </table>		Dr. PPEN577B	Date 10/02/93	Chkd. N/A	Date N/A	Appd. N/A	Date N/A	<table border="1"> <tr> <td>Sheet 1</td> <td>Of 1</td> </tr> <tr> <td>Dwg Size D</td> <td><b>CS70006974</b></td> </tr> </table>		Sheet 1	Of 1
Release	Dimensions Apply Before Surface Treatment																												
A 04/15/93	Dimensions in Inches Tolerances Unless Otherwise Specified																												
	2 Place Decimal																												
	+ .02																												
	3 Place Decimal																												
	+ .005																												
	Angles + 15																												
Dr. PPEN577B	Date 10/02/93																												
Chkd. N/A	Date N/A																												
Appd. N/A	Date N/A																												
Sheet 1	Of 1																												
Dwg Size D	<b>CS70006974</b>																												
Refer. Book																													



**NOTES:**  
 [1] REMOTE DEVICE  
 [2] INTERNAL CB AUXILIARIES SUPPLIED WITH UNMOUNTED CONNECTION BLOCKS.

<b>References</b>		<b>Dual Bul. 2103L 30-60 Amp</b>		<b>ACAD</b>	
<b>Revision</b>	Dimensions Apply Before Surface Treatment	<b>Type A</b>		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
<b>Release</b>	Dimensions in Inches Tolerances Unless Otherwise Specified				
<b>A 10/18/93</b>	2 Place Decimal + .02	<b>Dr. PPEN577B</b>	<b>Date 10/02/93</b>	Sheet 1 Of 1	
	3 Place Decimal + .005	<b>Chkd. N/A</b>	<b>Date N/A</b>	Dwg Size <b>CS70024114</b>	
<b>Refer. Book</b>	<b>Angles + 15</b>	<b>Appd. N/A</b>	<b>Date N/A</b>	<b>D</b>	

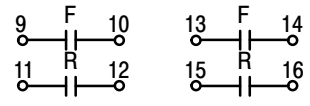




**NOTES:**

**1**  
REMOTE DEVICE

**2**  
THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

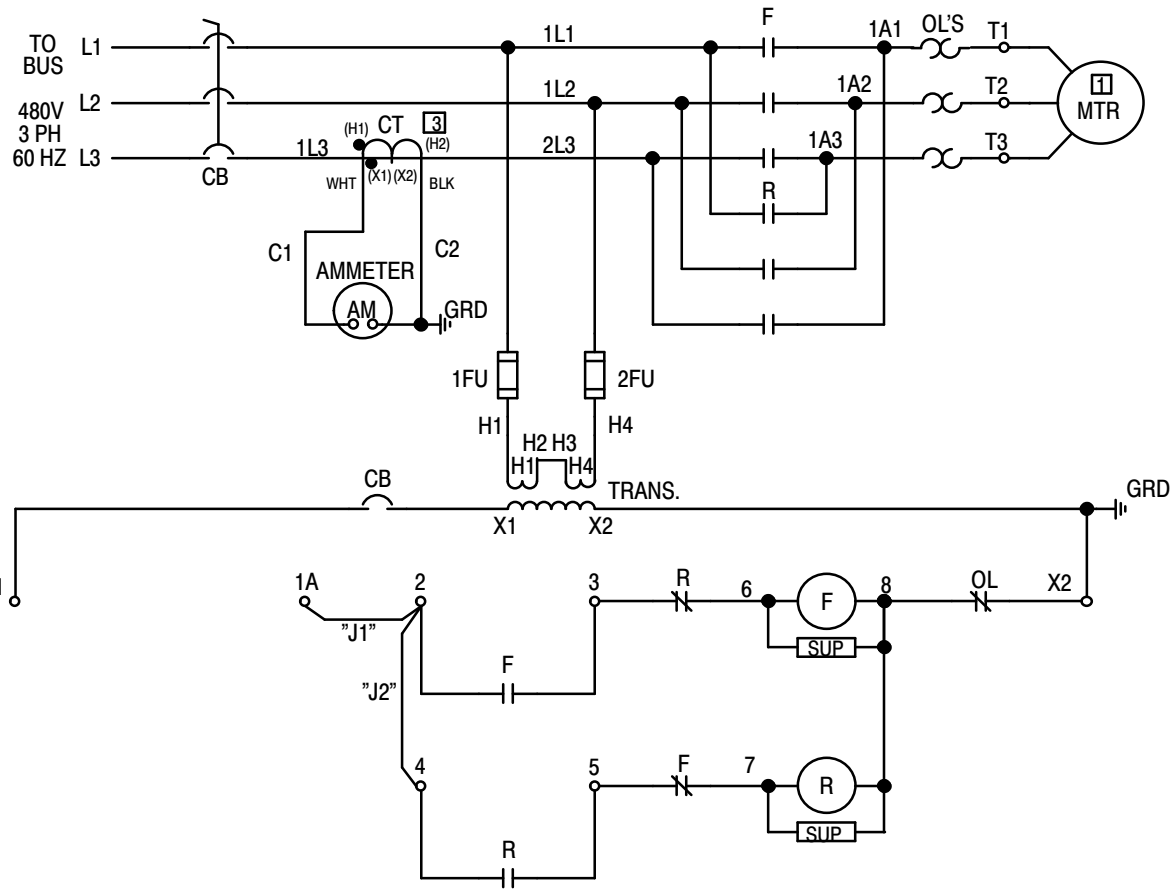


(TYPE "B" WIRING ONLY)

X	1	2	3	4	5	9	10	11	12	13	14	15	16	T	T	T	TB
2	1	A					0	1	2	3	4	5	6	1	2	3	

"J1" ON TYPE "A" WIRING, JUMPER "J1" WILL BE ON DOOR MOUNTED PUSH BUTTONS.

<b>References</b>		<b>BUL. 2106 SIZE 1-2 (2SF)</b>				<b>ACAD</b>	
Revision		Dimensions Apply Before Surface Treatment		Type A		 A ROCKWELL INTERNATIONAL COMPANY	
Release <b>A 10/18/93</b>		Dimensions in Inches Tolerances Unless Otherwise Specified					
		2 Place Decimal + .02		Dr. PPEN577B		Date 10/02/93	
		3 Place Decimal + .005		Chkd. N/A		Date N/A	
Refer. Book		Angles + 15		Appd. N/A		Date N/A	
						Sheet 1 Of 1	
						Dwg Size <b>D</b>	
						<b>CS70024115</b>	

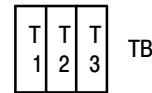
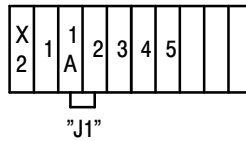


**NOTES:**

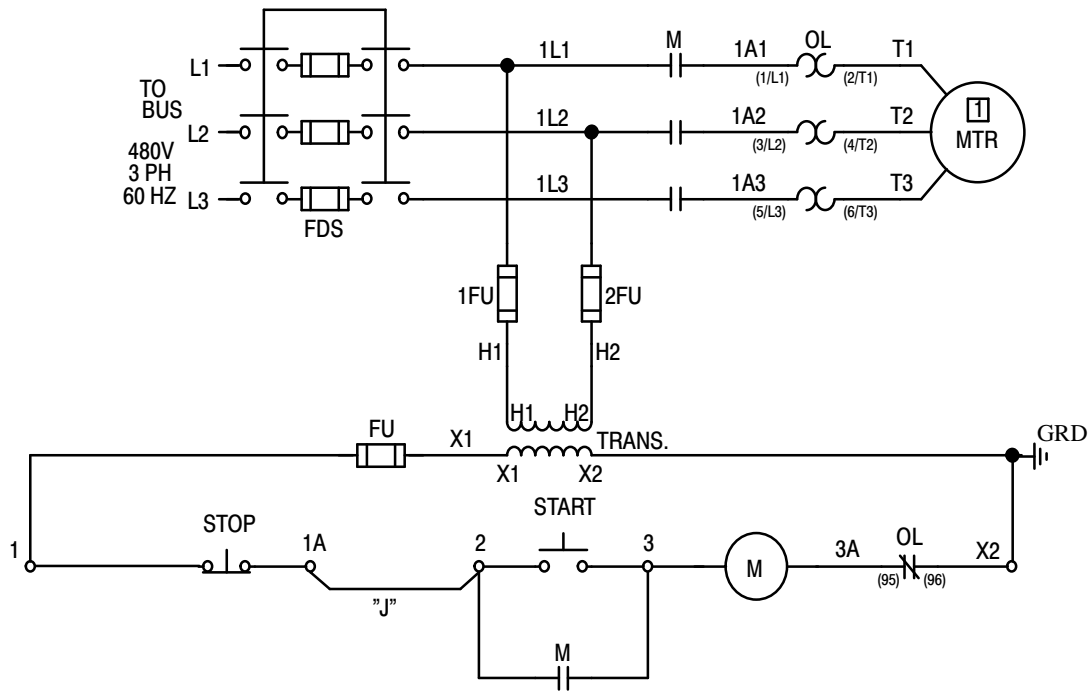
**[1]** REMOTE DEVICE

**[3]**  
 — AMPS NAMEPLATE RATIO  
 — AMPS EFFECTIVE RATIO WITH  
 PRIMARY TURNS  
 — SECONDARY TURNS  
 BE SURE TO CONNECT PER  
 POLARITY MARKINGS.

SECONDARY CONNECTIONS OF  
 CURRENT TRANSFORMER MUST  
 BE CONNECTED TO A LOAD OR  
 SHORTED TOGETHER TO AVOID  
 A HIGH VOLTAGE ACROSS  
 SECONDARY LEADS.



<b>References</b>		<b>Bul. 2107 Size 1-2 (1.5SF)</b>		<b>ACAD</b>	
<b>Revision</b>		<b>Dimensions Apply Before Surface Treatment</b>		<b>Type B</b>	
<b>Release</b>		<b>Dimensions in Inches Tolerances Unless Otherwise Specified</b>		 A ROCKWELL INTERNATIONAL COMPANY	
<b>A</b>	<b>10/18/93</b>	<b>2 Place Decimal + .02</b>			
		<b>3 Place Decimal + .005</b>		<b>Chkd. N/A</b>	<b>Date N/A</b>
<b>Refer. Book</b>	<b>Angles + 15</b>	<b>Appd. N/A</b>	<b>Date N/A</b>	<b>Sheet 1 Of 1</b>	<b>Dwg Size D</b>
				<b>CS70024116</b>	

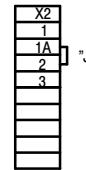


**NOTES**

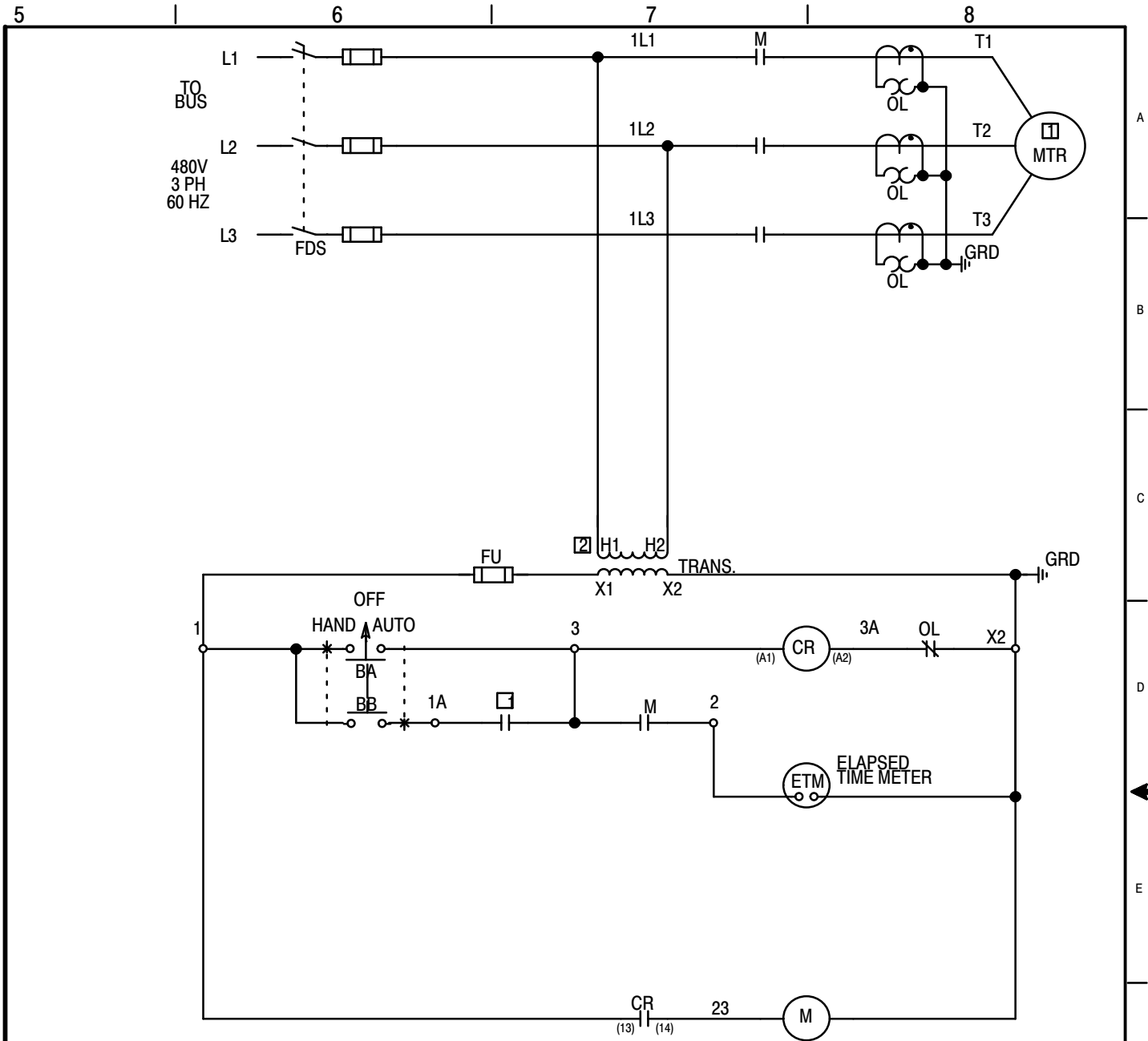
**1**  
REMOTE DEVICE

**UNIT INSTALLATION**

THE HANDLE EXTENDER KIT, 2100-NE1, MAY BE NECESSARY FOR ANY TOP UNIT OPERATING HANDLES THAT ARE HIGHER THAN 6-1/2 FEET OFF THE GROUND FOR COMPLIANCE WITH NEC.



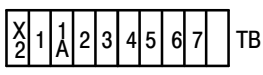
<b>References</b>		<b>BUL. 2112 SIZE 1 (0.5 SF)</b>		<b>ACAD</b>	
<b>Revision</b>		<b>Dimensions Apply Before Surface Treatment</b>		<b>Type B</b>	
<b>Release</b>		<b>Dimensions in Inches Tolerances Unless Otherwise Specified</b>			
<b>A</b>	<b>09/08/93</b>	<b>2 Place Decimal + .02</b>			
		<b>3 Place Decimal + .005</b>		<b>Chkd. N/A</b>	<b>Date N/A</b>
<b>Refer. Book</b>		<b>Angles + 15</b>		<b>Appd. N/A</b>	<b>Date N/A</b>
				<b>Sheet 1 Of 1</b>	<b>Dwg Size D</b>
				<b>CS70020770</b>	



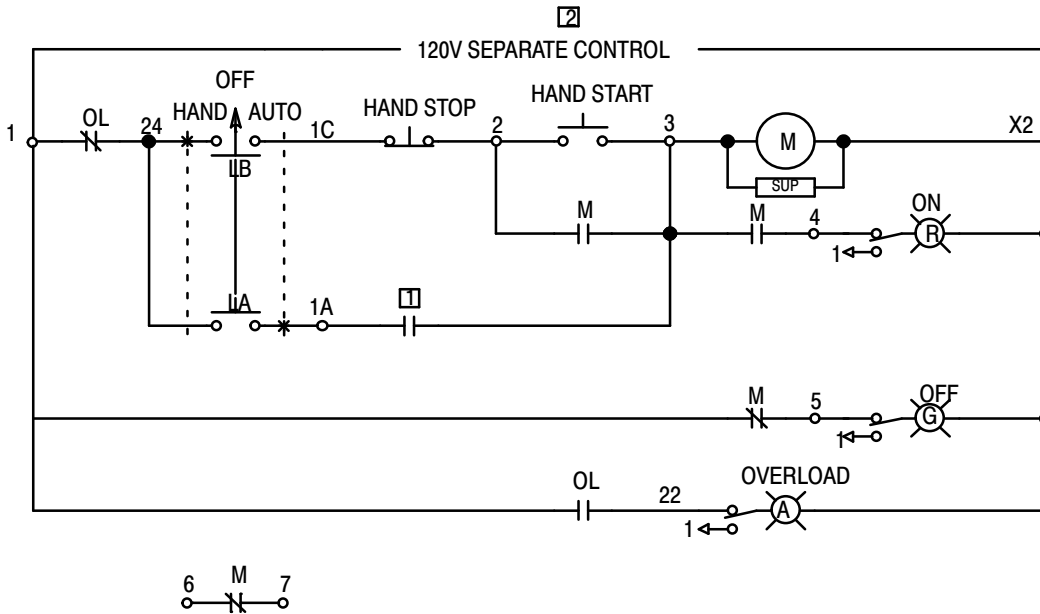
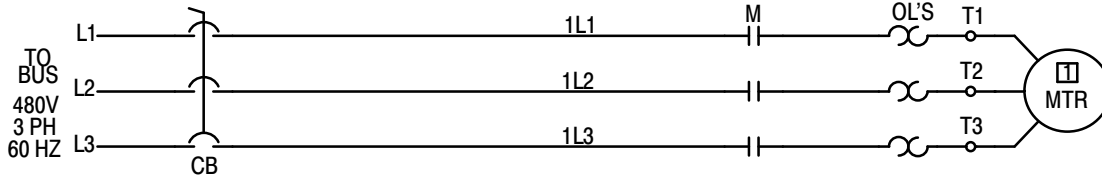
**NOTES:**

1  
REMOTE DEVICE

2  
THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.



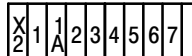
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<b>Revision</b>		<b>Type B</b>		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
<b>Release</b>					
<b>A</b>	<b>10/18/93</b>	<small>Dimensions Apply Before Surface Treatment</small> <small>Dimensions in Inches Tolerances Unless Otherwise Specified</small> <small>2 Place Decimal + .02</small> <small>3 Place Decimal + .005</small> <small>Angles + 15</small>		<small>Dr. PPEN577B</small> <small>Chkd. N/A</small> <small>Appd. N/A</small>	<small>Date 10/02/93</small> <small>Date N/A</small> <small>Date N/A</small>
<small>Refer. Book</small>		<b>Angles + 15</b>		<small>Sheet 1 Of 1</small> <small>Dwg Size D</small>	<b>CS70024134</b>



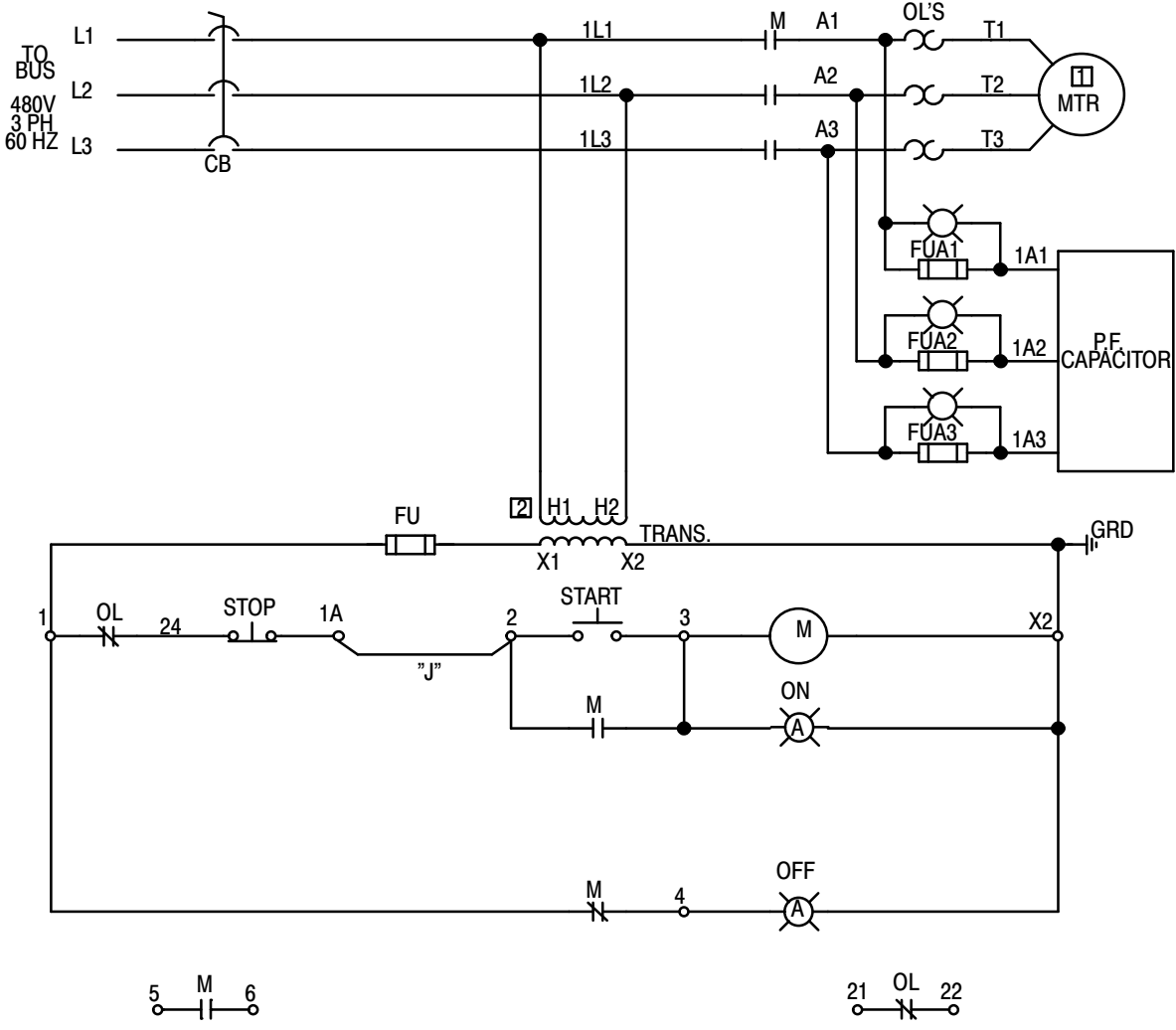
NOTES:

1  
REMOTE DEVICE ●

2  
ADDITIONAL CONTROL  
CIRCUIT OVERCURRENT  
PROTECTION MAY BE  
REQUIRED WHEN THE  
CONTROL CIRCUIT  
CONDUCTORS EXTEND  
BEYOND THE ENCLOSURE.  
REFER TO NATIONAL  
ELECTRICAL CODE.




References		BUL. 2113 SIZE 1-2		ACAD	
Revision		Type B		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release <b>A 10/18/93</b>					
Dimensions Apply Before Surface Treatment		Dr. PPEN577B		Sheet 1 Of 1	
Dimensions in Inches Tolerances Unless Otherwise Specified		Date 10/02/93		Dwg Size	
2 Place Decimal +.02		Chkd. N/A		Date N/A	
3 Place Decimal +.005		Appd. N/A		Date N/A	
Angles + 15				 <b>CS70024135</b>	
Refer. Book				D	

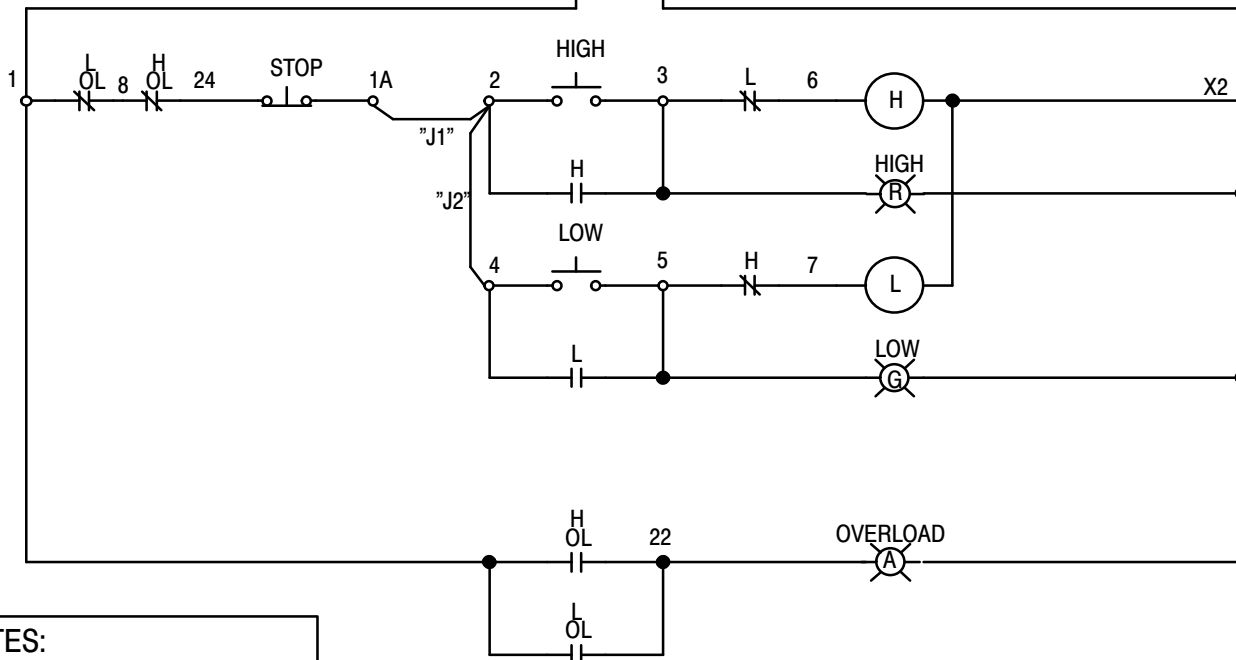
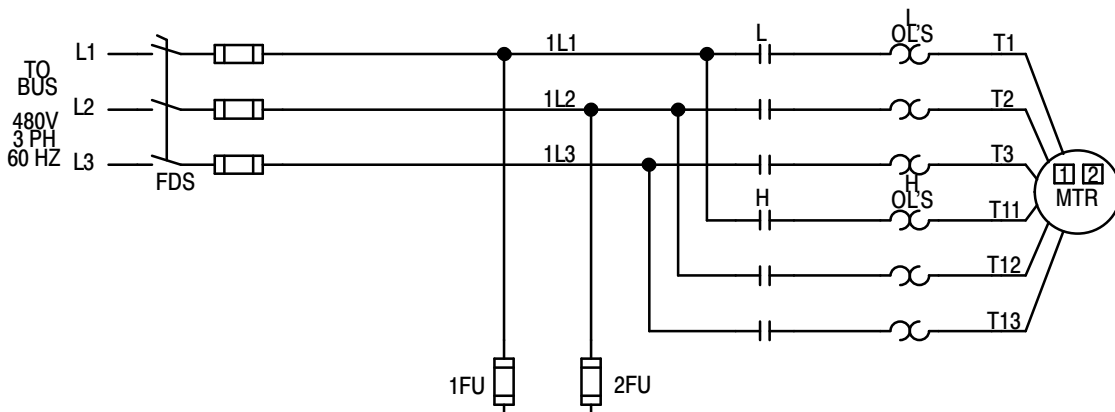


**NOTES:**

- 1 REMOTE DEVICE
- 2 THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.
- ⊗ THIS IS AN EXTERNAL CIRCUIT BREAKER AUXILIARY AND SHOULD NOT BE USED FOR BREAKER TRIP INDICATION.

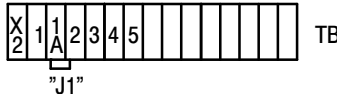
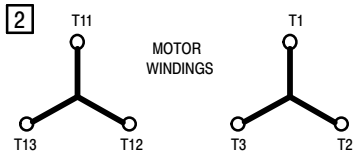


<b>References</b>		<b>Bul. 2113 Size 4 (2.5SF)</b>		<b>ACAD</b>	
Revision	Dimensions Apply Before Surface Treatment	<b>Type B</b>		 A ROCKWELL INTERNATIONAL COMPANY	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
<b>A 10/18/93</b>	2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93	Sheet 1 Of 1	<b>CS70024150</b>
	3 Place Decimal + .005	Chkd. N/A	Date N/A	Dwg Size	
Refer. Book	Angles + 15	Appd. N/A	Date N/A	<b>D</b>	



NOTES:

1 REMOTE DEVICE

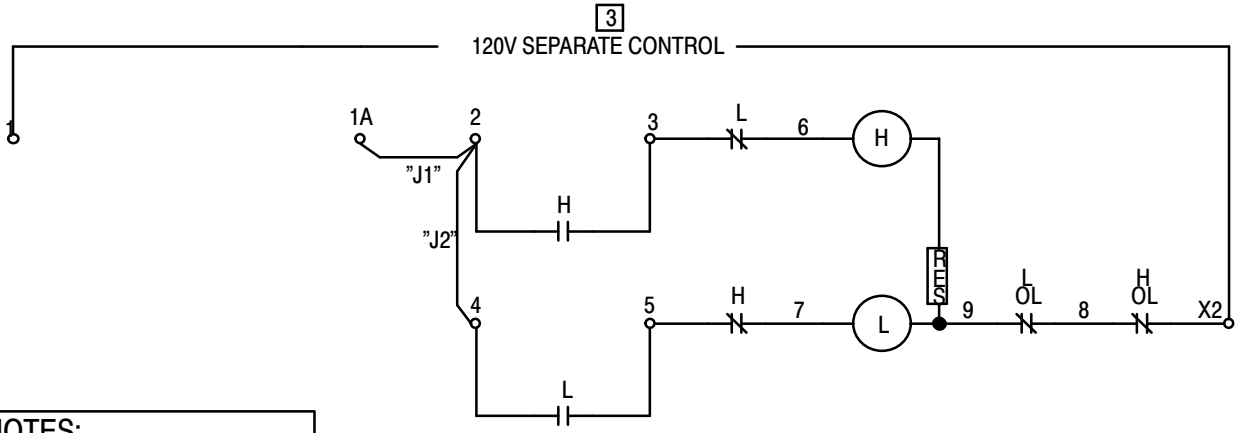
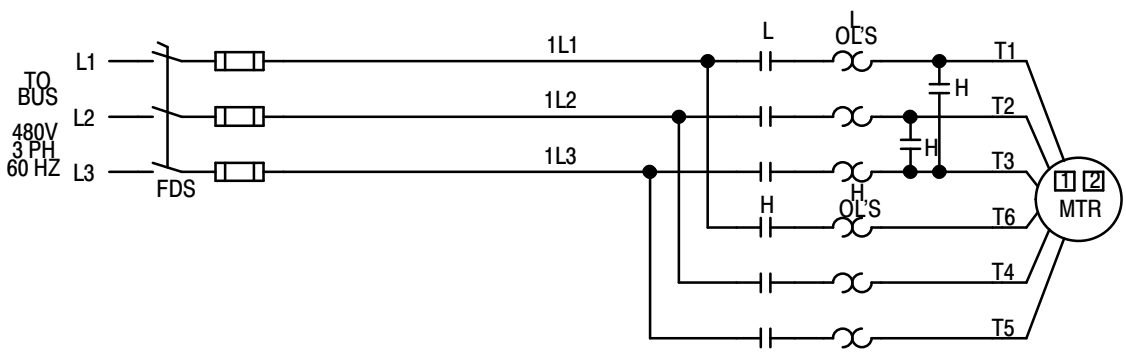


NEMA STANDARD MOTOR CONNECTIONS						
SPEED	LINES			OPEN		
	L1	L2	L3	T11	T12	T13
LOW	T1	T2	T3	T11	T12	T13
HIGH	T11	T12	T13	T1	T2	T3

References	
Revision	Dimensions Apply Before Surface Treatment
Release	Dimensions in Inches Tolerances Unless Otherwise Specified
A 10/18/93	2 Place Decimal +.02
	3 Place Decimal +.005
Refer. Book	Angles + 15

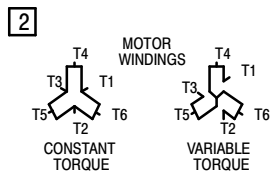
Bul. 2122E Size 1-2 Type B	
Dr. PPEN577B	Date 10/02/93
Chkd. N/A	Date N/A
Appd. N/A	Date N/A

ACAD	
Sheet 1	Of 1
Dwg Size D	CS70024136



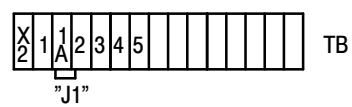
**NOTES:**

**1**  
REMOTE DEVICE



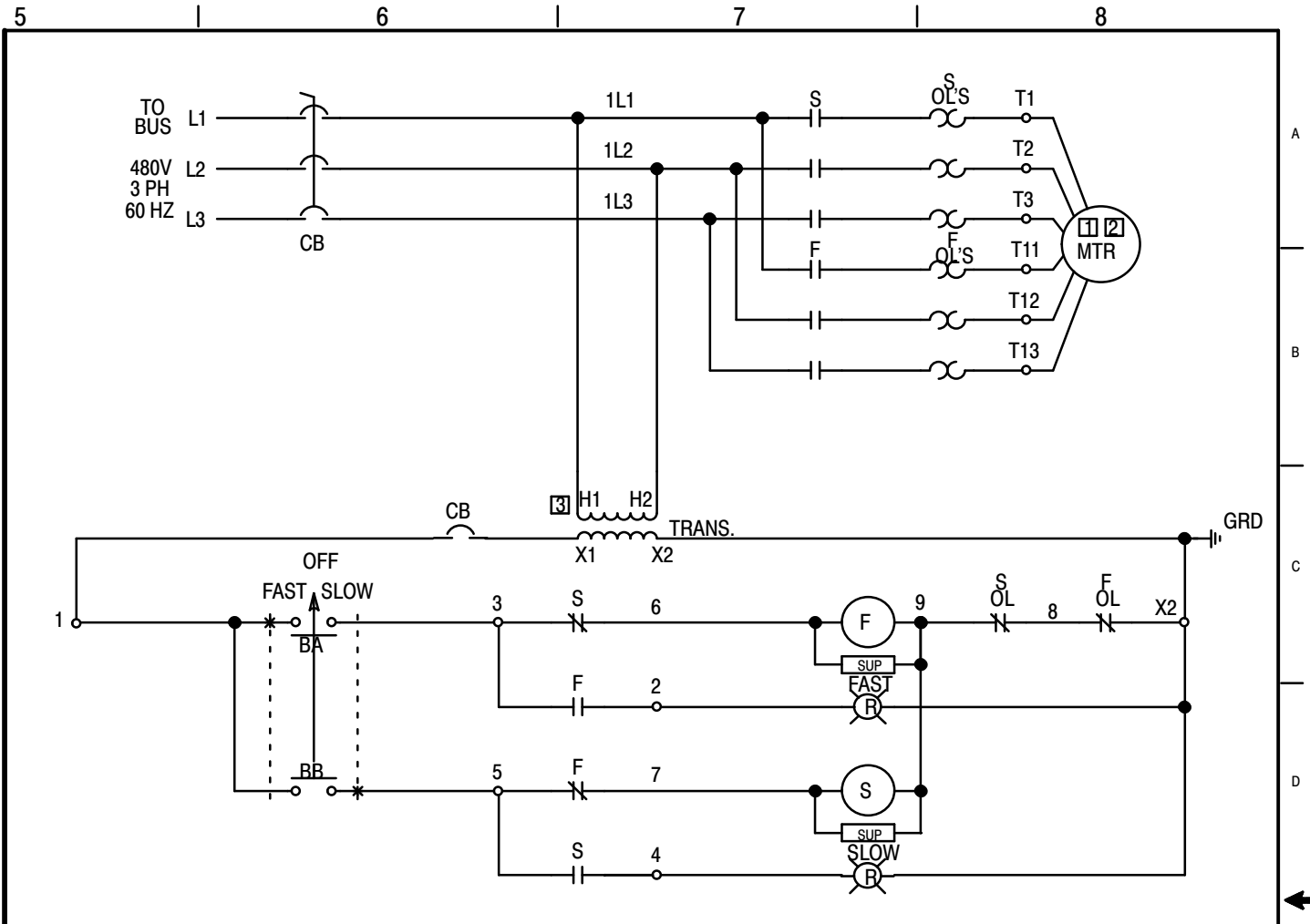
NEMA STANDARD MOTOR CONNECTIONS							
SPEED	LINES			OPEN	TOGETHER		
	L1	L2	L3				
LOW	T1	T2	T3	T4	T5	T6	NONE
HIGH	T6	T4	T5	NONE	T1	T2	T3

**3**  
ADDITIONAL CONTROL CIRCUIT OVERCURRENT PROTECTION MAY BE REQUIRED WHEN THE CONTROL CIRCUIT CONDUCTORS EXTEND BEYOND THE ENCLOSURE. REFER TO NATIONAL ELECTRICAL CODE.



<b>References</b>		<b>Bul. 2122F Size 4</b>		<b>ACAD</b>	
Revision		Dimensions Apply Before Surface Treatment		Type B	
Release		Dimensions in Inches Tolerances Unless Otherwise Specified		<b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
A 10/18/93		2 Place Decimal + .02			
		3 Place Decimal + .005		Dr. PPEN577B	
Refer. Book		Angles + 15		Date 10/02/93	
		Appd. N/A		Date N/A	
				Date N/A	
				Sheet 1 Of 1	
				Dwg Size D	
				<b>CS70006989</b>	





**NOTES:**

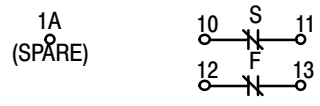
1 REMOTE DEVICE

2

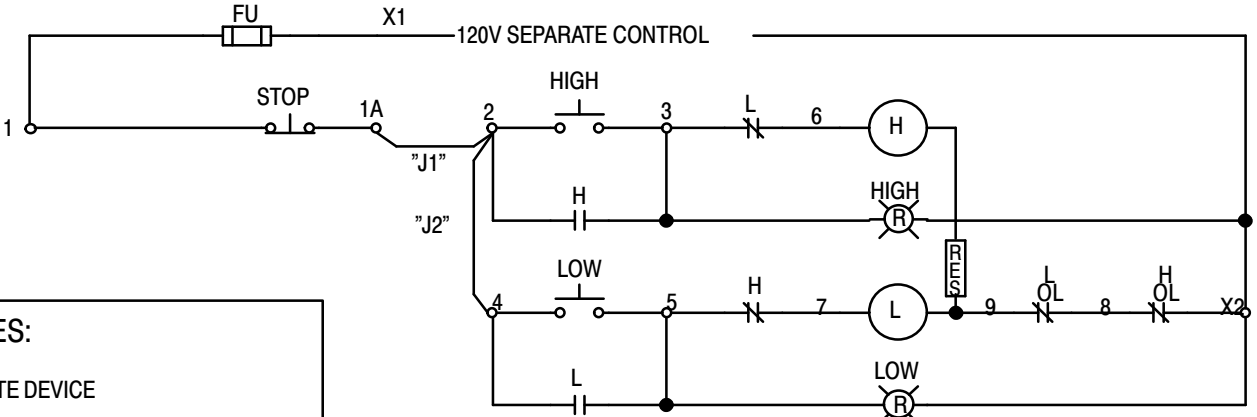
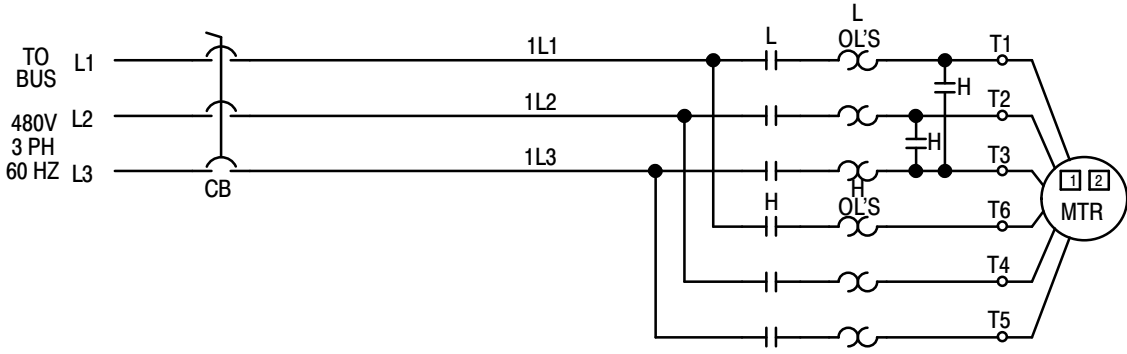
MOTOR WINDINGS

NEMA STANDARD MOTOR CONNECTIONS							
SPEED	LINES			OPEN			
	L1	L2	L3	T11	T12	T13	
SLOW	T1	T2	T3	T11	T12	T13	
FAST	T11	T12	T13	T1	T2	T3	

3 THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

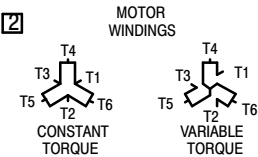


References		BUL 2123E SIZE 3		ACAD	
Revision	Dimensions Apply Before Surface Treatment	TYPE A		 ALLEN-BRADLEY A ROCKWELL INTERNATIONAL COMPANY	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
A 10/18/93	2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93	Sheet 1	Of 1
	3 Place Decimal + .005	Chkd. N/A	Date N/A	Dwg Size	CS70024137
Refer. Book	Angles + 15	Appd. N/A	Date N/A	D	

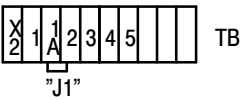


**NOTES:**

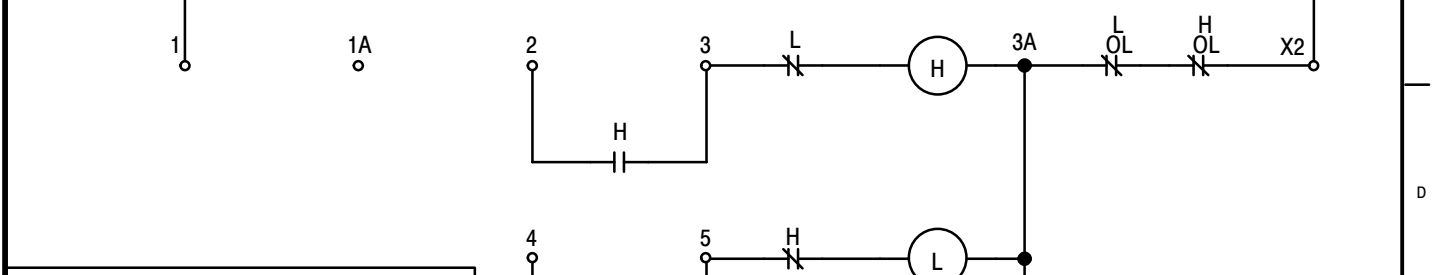
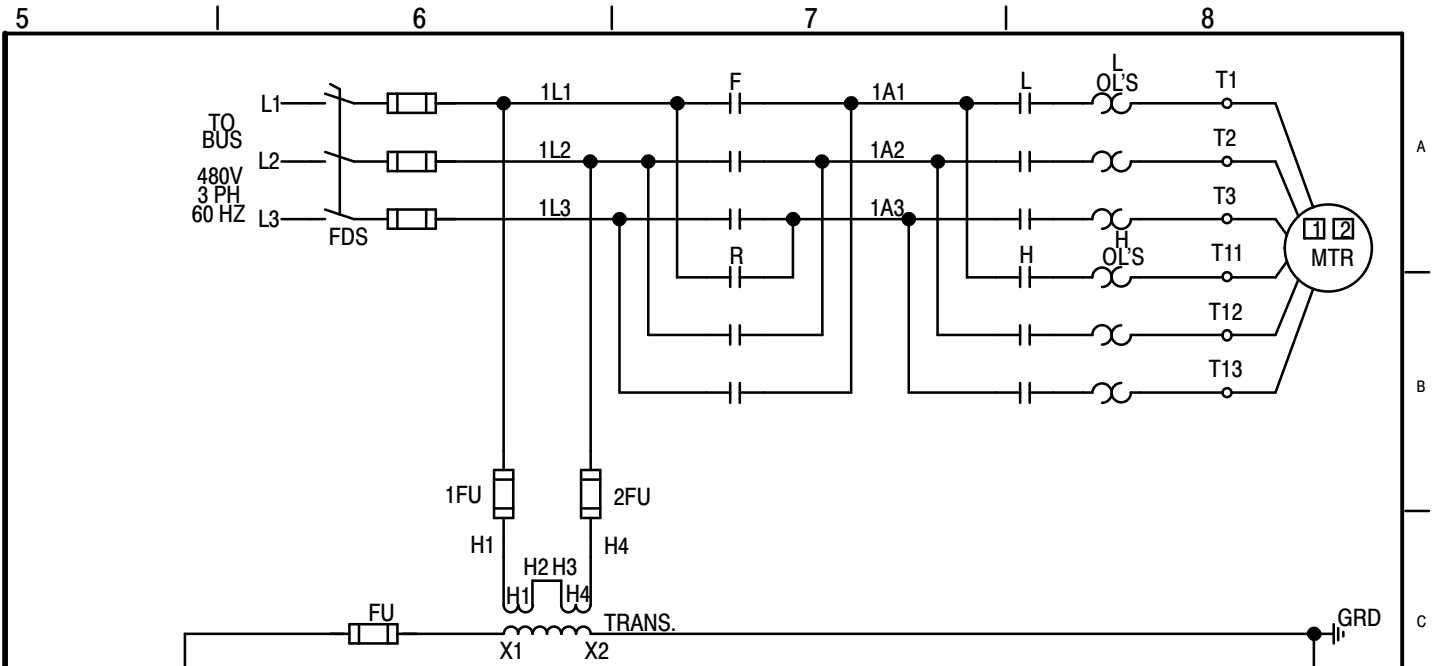
1 REMOTE DEVICE



NEMA STANDARD MOTOR CONNECTIONS							
SPEED	LINES			OPEN	TOGETHER		
	L1	L2	L3				
LOW	T1	T2	T3	T4	T5	T6	NONE
HIGH	T6	T4	T5	NONE	T1	T2	T3

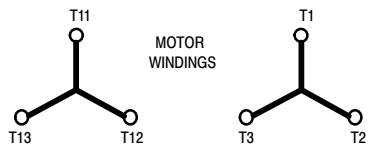


<b>References</b>		<b>BUL. 2123F SIZE 3</b>		<b>ACAD</b>		
Revision		Dimensions Apply Before Surface Treatment		<b>TYPE B</b>		
Release		Dimensions in Inches Tolerances Unless Otherwise Specified		<b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>		
<b>A 10/18/93</b>		2 Place Decimal + .02				Dr. PPEN577B
Refer. Book		3 Place Decimal + .005		Chkd. N/A	Date N/A	Sheet 1 Of 1
		Angles + 15		Appd. N/A	Date N/A	Dwg Size <b>D</b>
						<b>CS70024139</b>



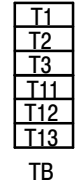
**NOTES:**

- 1** REMOTE DEVICE
- 2**

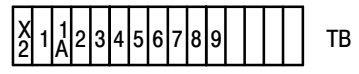


SYNOPSIS OF MOTOR CONNECTIONS						
SPEED	LINES			OPEN		
	L1	L2	L3	T11	T12	T13
LOW FOR.	T1	T2	T3	T11	T12	T13
HIGH FOR.	T11	T12	T13	T1	T2	T3
LOW REV.	T3	T2	T1	T11	T12	T13
HIGH REV.	T13	T12	T11	T1	T2	T3

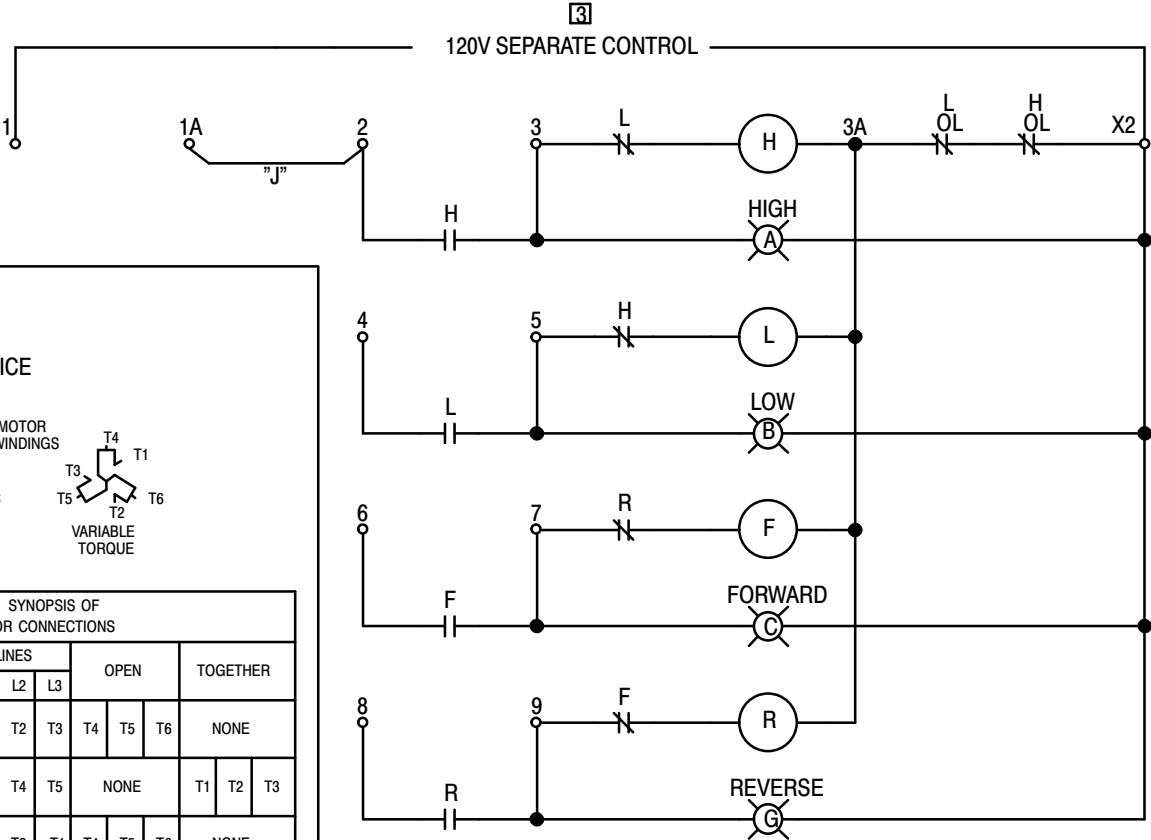
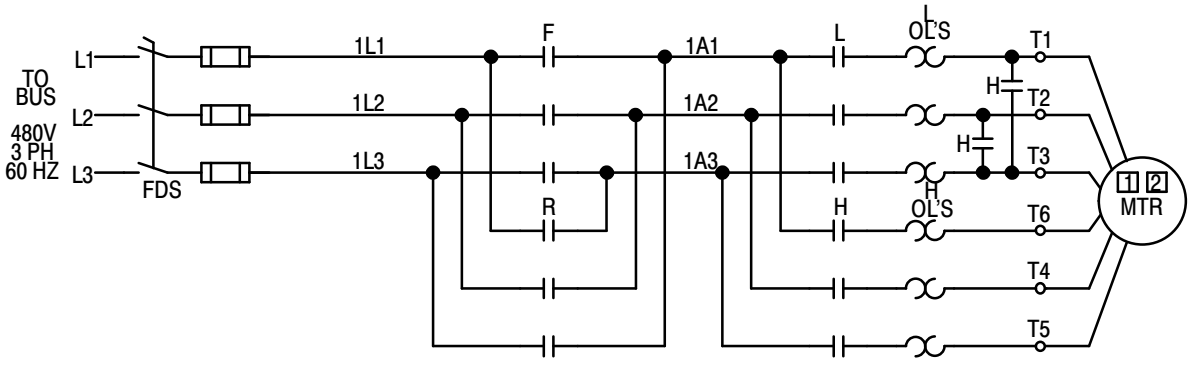
(TYPE "B" WIRING ONLY)



(TYPE "B" WIRING ONLY)

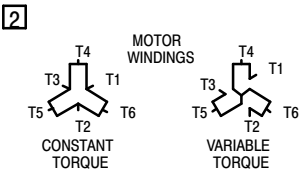


<b>References</b>		<b>BUL. 2126E SIZE 1-2</b>		<b>ACAD</b>	
Revision	Dimensions Apply Before Surface Treatment	<b>TYPE A</b>		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
<b>A</b>	Release <b>10/18/93</b>				
	Dimensions in Inches Tolerances Unless Otherwise Specified 2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93	Sheet 1	Of 1
	3 Place Decimal + .005	Chkd. N/A	Date N/A	Dwg Size <b>D</b>	<b>CS70043575</b>
Refer. Book	Angles + 15	Appd. N/A	Date N/A		



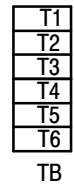
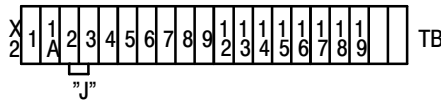
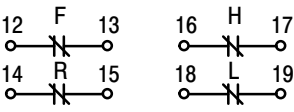
**NOTES:**

**1** REMOTE DEVICE

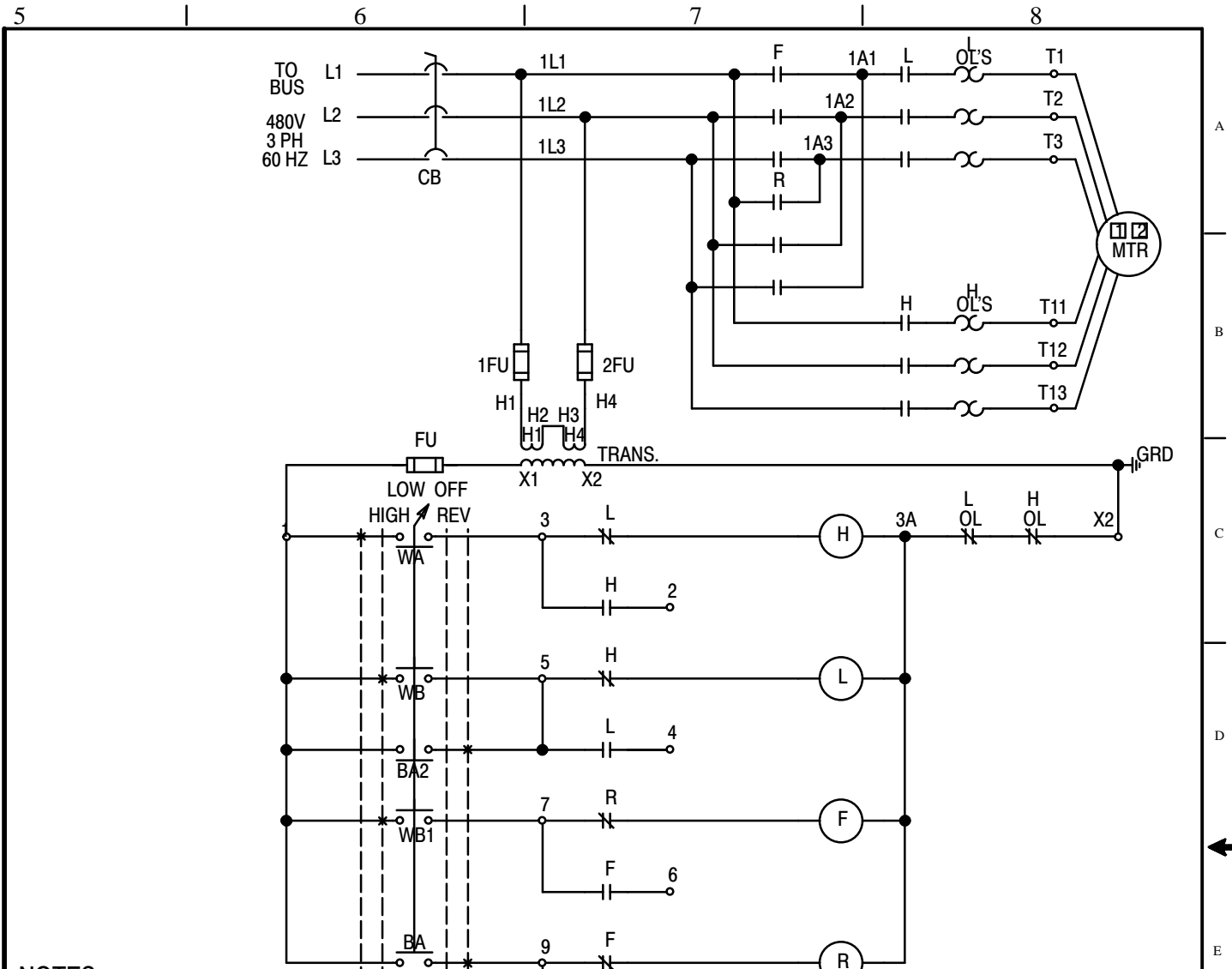


SPEED	LINES			OPEN			TOGETHER		
	L1	L2	L3	T4	T5	T6	T1	T2	T3
LOW FOR.	T1	T2	T3						
HIGH FOR.	T6	T4	T5				T1	T2	T3
LOW REV.	T3	T2	T1	T4	T5	T6			
HIGH REV.	T5	T4	T6				T1	T2	T3

**3** ADDITIONAL CONTROL CIRCUIT OVERCURRENT PROTECTION MAY BE REQUIRED WHEN THE CONTROL CIRCUIT CONDUCTORS EXTEND BEYOND THE ENCLOSURE. REFER TO NATIONAL ELECTRICAL CODE.

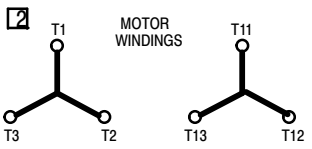


References		BUL. 2126F SIZE 1-2		ACAD	
Revision	Dimensions Apply Before Surface Treatment	TYPE B			
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
<b>A 10/18/93</b>	2 Place Decimal ±.02	Dr.PPEN577B	Date 10/02/93	Sheet 1 Of 1	<b>CS70043572</b>
	3 Place Decimal ±.005	Chkd.N/A	Date N/A	Dwg Size	
Refer. Book	Angles ± 1°	Appd.N/A	Date N/A	D	



NOTES:

☐ REMOTE DEVICE



SYNOPSIS OF MOTOR CONNECTIONS

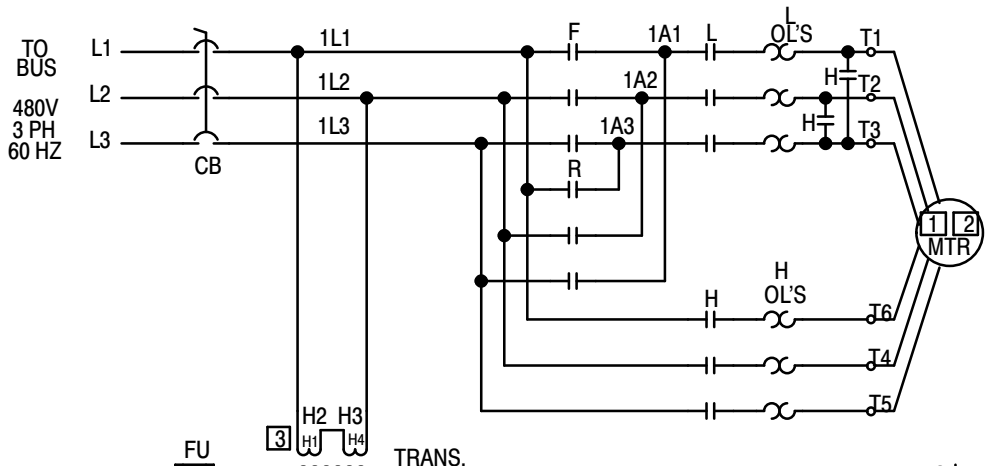
SPEED	LINES			OPEN		
	L1	L2	L3	T11	T12	T13
LOW FOR.	T1	T2	T3	T11	T12	T13
HIGH FOR.	T11	T12	T13	T1	T2	T3
LOW REV.	T3	T2	T1	T11	T12	T13

1A  
(SPARE)

T1
T2
T3
T11
T12
T13
TB

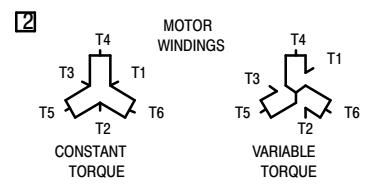
X	1	1	2	3	4	5	6	7	8	9								TB
	2	A																

References		BUL. 2127J SIZE 1-2		ACAD	
Revision	Dimensions Apply Before Surface Treatment	Type B		 A ROCKWELL INTERNATIONAL COMPANY	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
A 10/18/93	2 Place Decimal ±.02	Dr.PPEN577B	Date 10/02/93	Sheet 1 Of 1	 CS70043573
	3 Place Decimal ±.005	Chkd.N/A	Date N/A		
Refer. Book	Angles ± 1°	Appd.N/A	Date N/A		



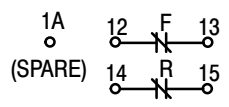
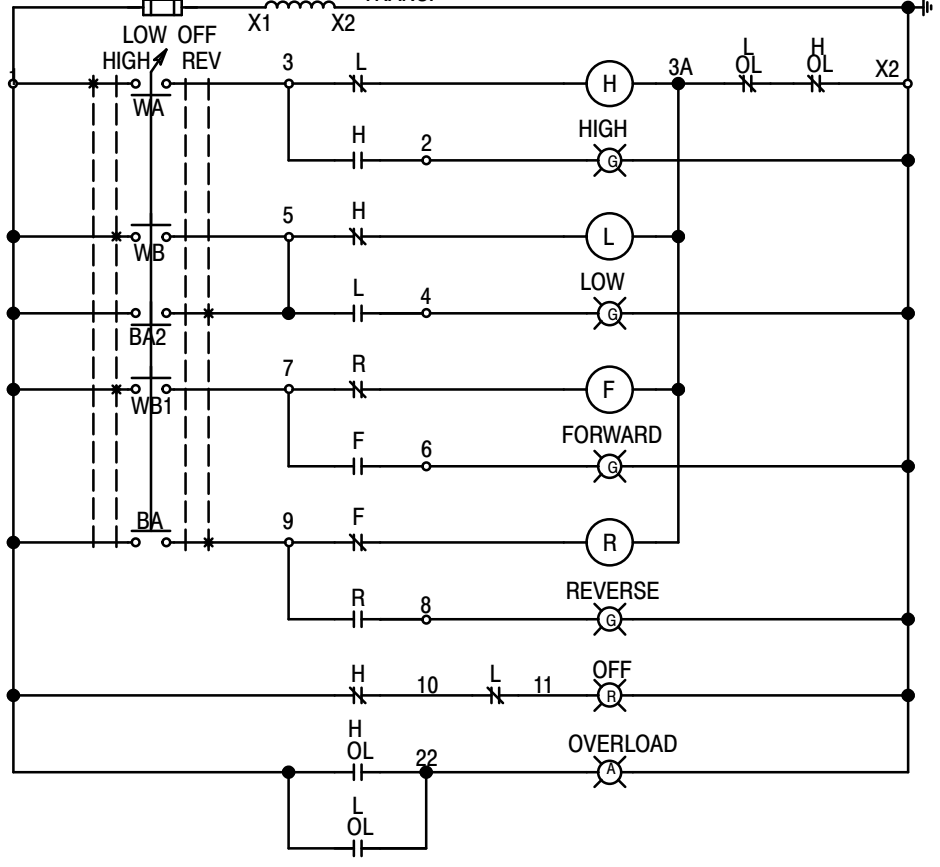
**NOTES:**

1 REMOTE DEVICE

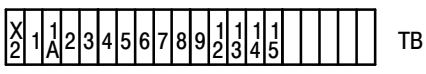


SYNOPSIS OF MOTOR CONNECTIONS							
SPEED	LINES			OPEN			TOGETHER
	L1	L2	L3	T1	T2	T3	T4
LOW FOR.	T1	T2	T3	T4	T5	T6	NONE
HIGH FOR.	T6	T4	T5	NONE	T1	T2	T3
LOW REV.	T3	T2	T1	T4	T5	T6	NONE

3 THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.



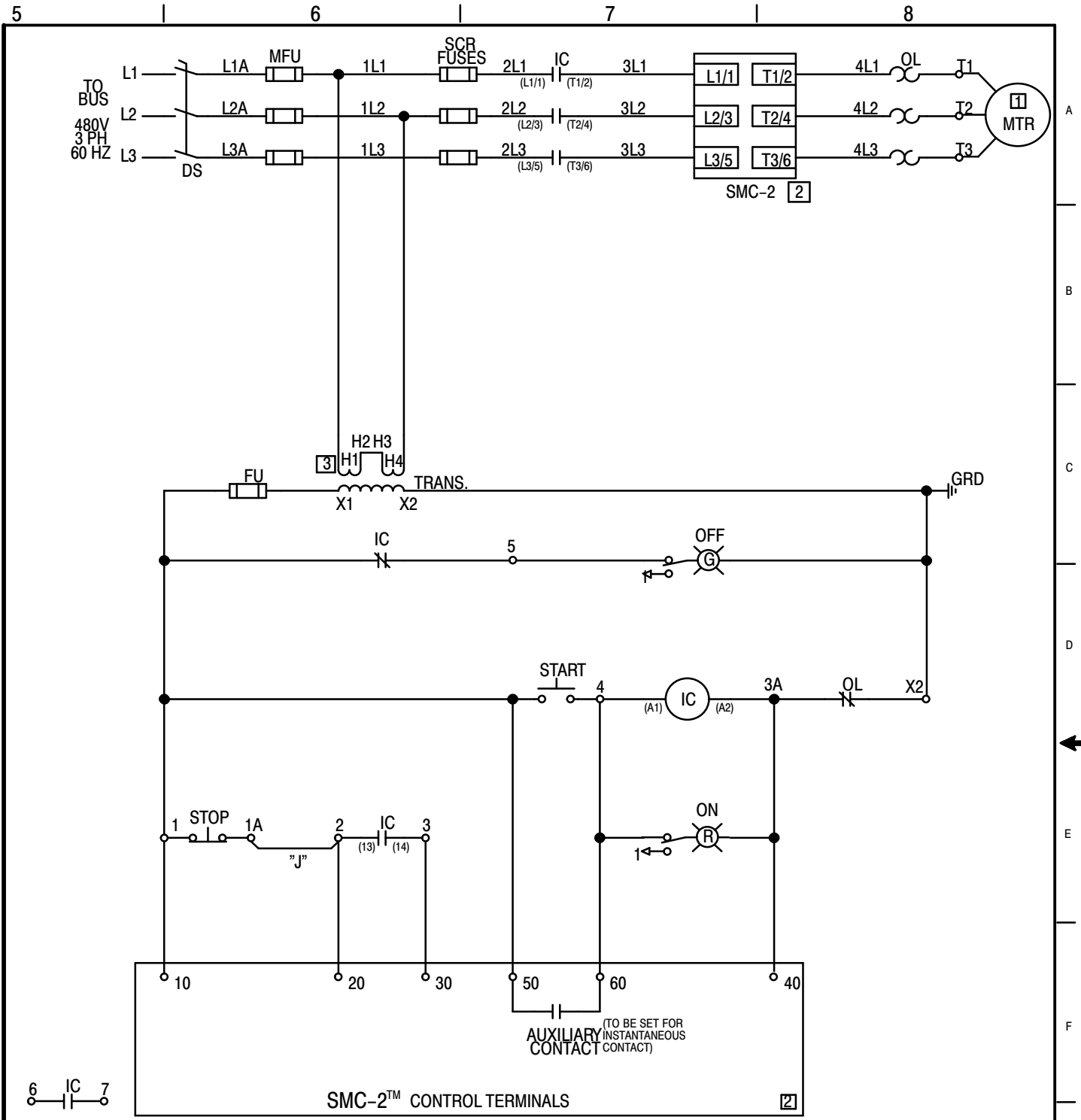
(TYPE "B" WIRING ONLY)



(TYPE "B" WIRING ONLY)



References		BUL. 2127K SIZE 1-2		ACAD	
Revision		TYPE A		 A ROCKWELL INTERNATIONAL COMPANY	
Release		Dr. PPEN577B			
A 06/16/94		Dimensions Apply Before Surface Treatment		Date N/A	
		Dimensions in Inches Tolerances Unless Otherwise Specified		Date N/A	
		2 Place Decimal ±.02		Date N/A	
		3 Place Decimal ±.005		Date N/A	
Refer. Book		Angles ± 1°		Appd. N/A	
				Sheet 1 Of 1	
				Dwg Size D	
				CS70043574	

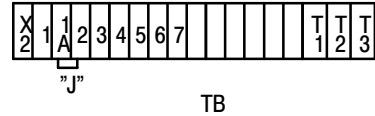


**NOTES:**

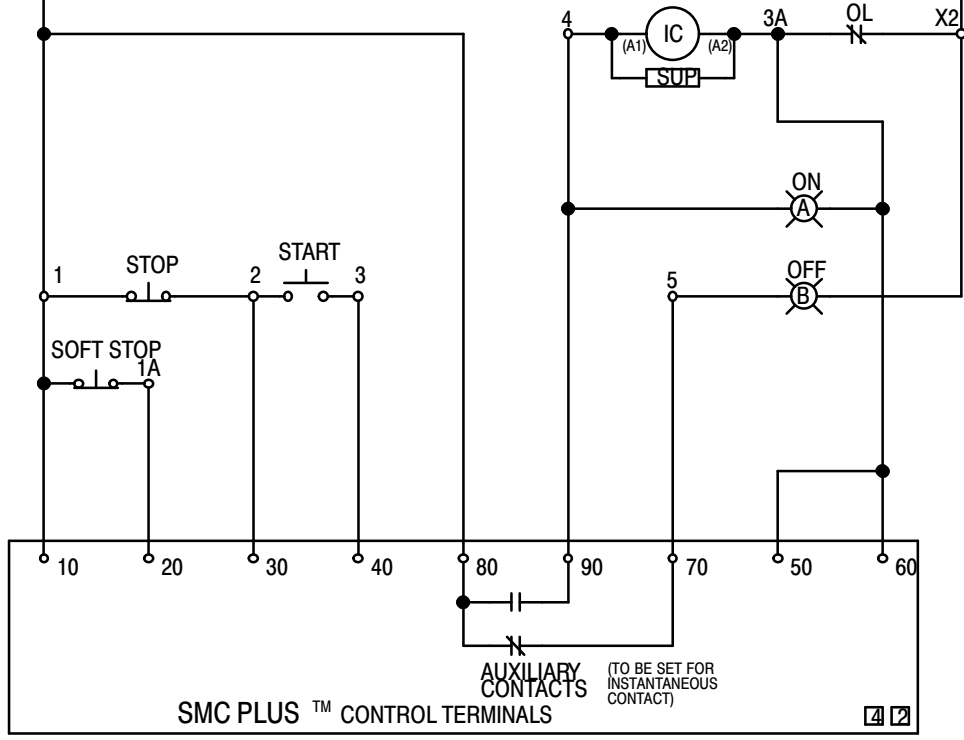
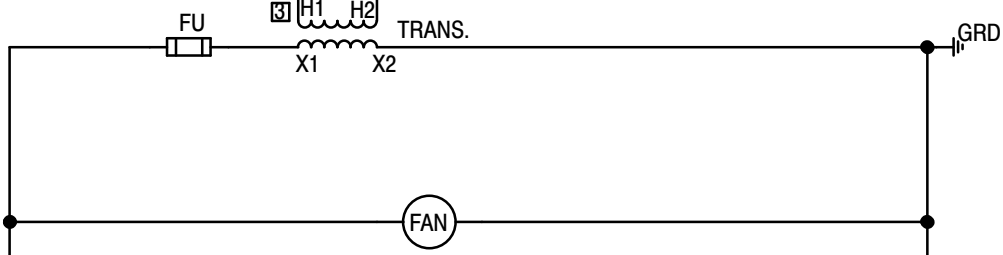
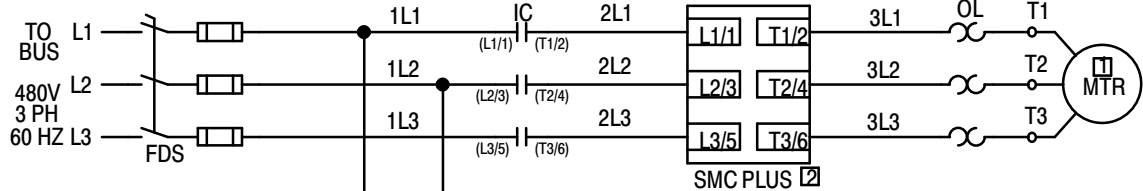
[1] REMOTE DEVICE

[2] BULLETIN 150 SOLID STATE MOTOR CONTROLLER. REFER TO PUBLICATION 150-804 FOR APPLICATION DATA.

[3] THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

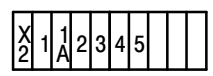


<b>References</b>		<b>Bul. 2154E 4-5 Amp</b>		<b>ACAD</b>	
Revision		Type B		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release					
A 10/18/93		Dr. PPEN577B		Date 10/02/93	
Refer. Book		Chkd. N/A		Date N/A	
Angles + 15		Appd. N/A		Date N/A	
				Sheet 1 Of 1	
				Dwg Size D	
				CS70006994	



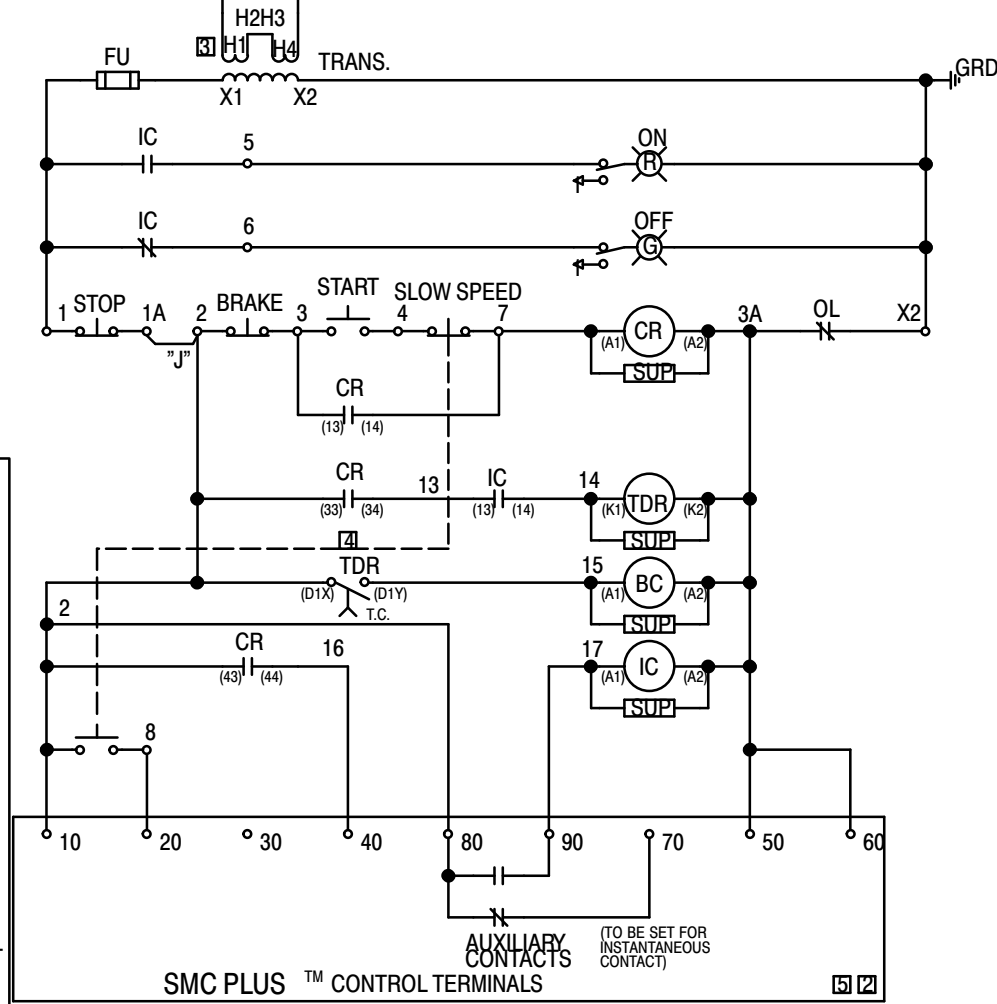
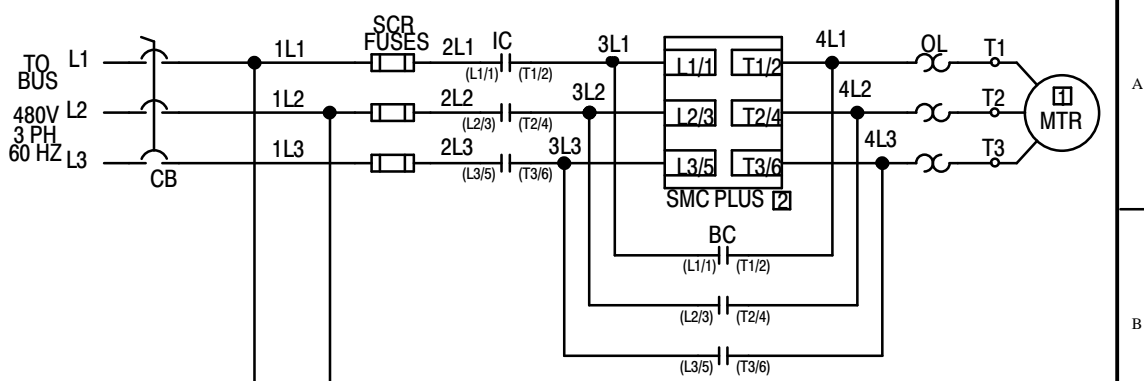
NOTES:

- 1 REMOTE DEVICE
- 2 BULLETIN 150 SOLID STATE MOTOR CONTROLLER. REFER TO PUB. 150-811 FOR APPLICATION DATA.
- 3 THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER PRIMARY FUSING NOT REQUIRED.
- 4 FOR SET-UP OF SOFT STOP FEATURE, REFER TO PUB. 150-805.



References		BUL. 2154F 45-54 AMP		ACAD	
Revision		TYPE B		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release		WITH SOFT STOP FEATURE			
A	10/18/93	Dr.PPEN577B		Date	10/02/93
Refer. Book		Chkd.N/A		Date	N/A
		Appd.N/A		Date	N/A
				Sheet	1 Of 1
				Dwg Size	D
				<b>CS70043576</b>	





**NOTES:**

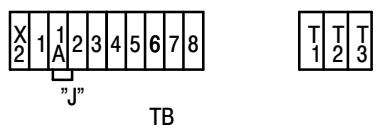
[1] REMOTE DEVICE

[2] BULLETIN 150 SOLID STATE MOTOR CONTROLLER. REFER TO PUBLICATION 150-811 FOR APPLICATION DATA.

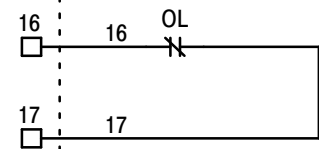
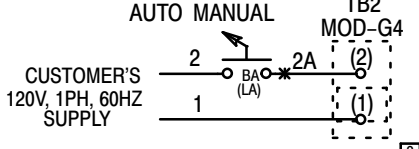
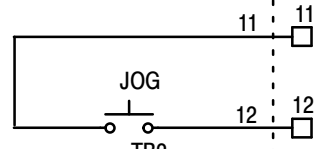
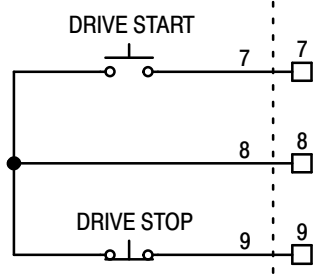
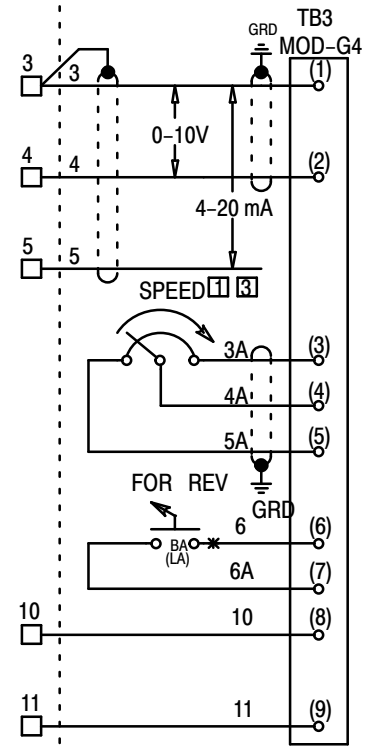
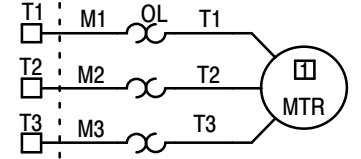
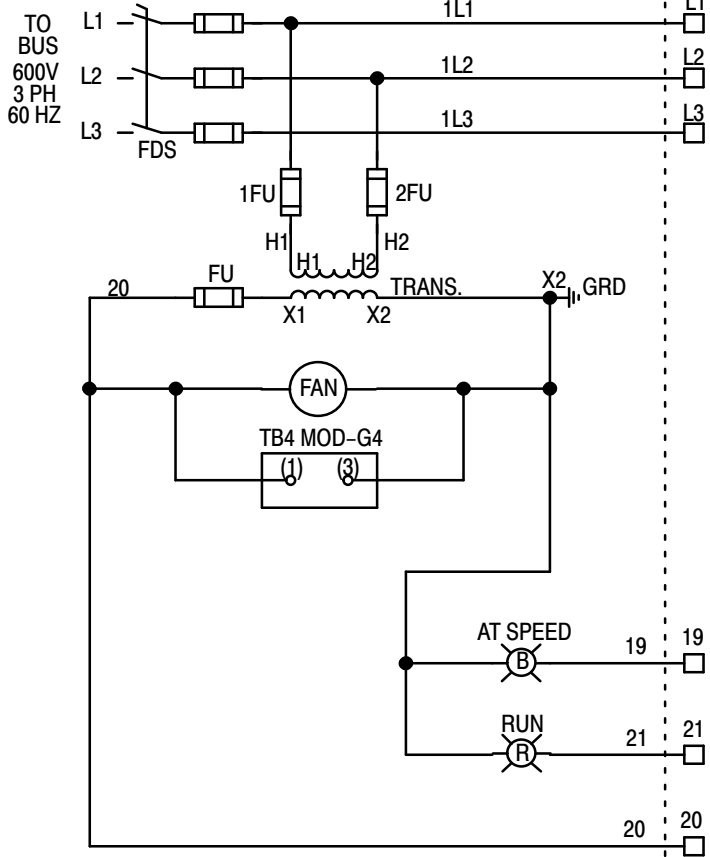
[3] THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

[4] TDR TIME DELAY SETTING MUST EXCEED SMC PLUS STARTING TIME & MOTOR ACCELERATION TIME BY 2 TO 5 SECONDS.

[5] FOR SET-UP OF SLOW SPEED WITH BRAKING FEATURE, REFER TO PUB. 150-810.



References		BUL. 2155F 30-35 AMP		ACAD
Revision		TYPE B		 A ROCKWELL INTERNATIONAL COMPANY
Release		WITH SLOW SPEED WITH BRAKING FEATURE		
A	10/18/93			
Dimensions Apply Before Surface Treatment		Dr.PPEN577B	Date 10/02/93	Sheet 1 Of 1
Dimensions in Inches Tolerances Unless Otherwise Specified		Chkd.N/A	Date N/A	Dwg Size
2 Place Decimal ±.02		Appd.N/A	Date N/A	D
3 Place Decimal ±.005				
Angles ± 1°				
Refer. Book		CS70043577		



**NOTES:**

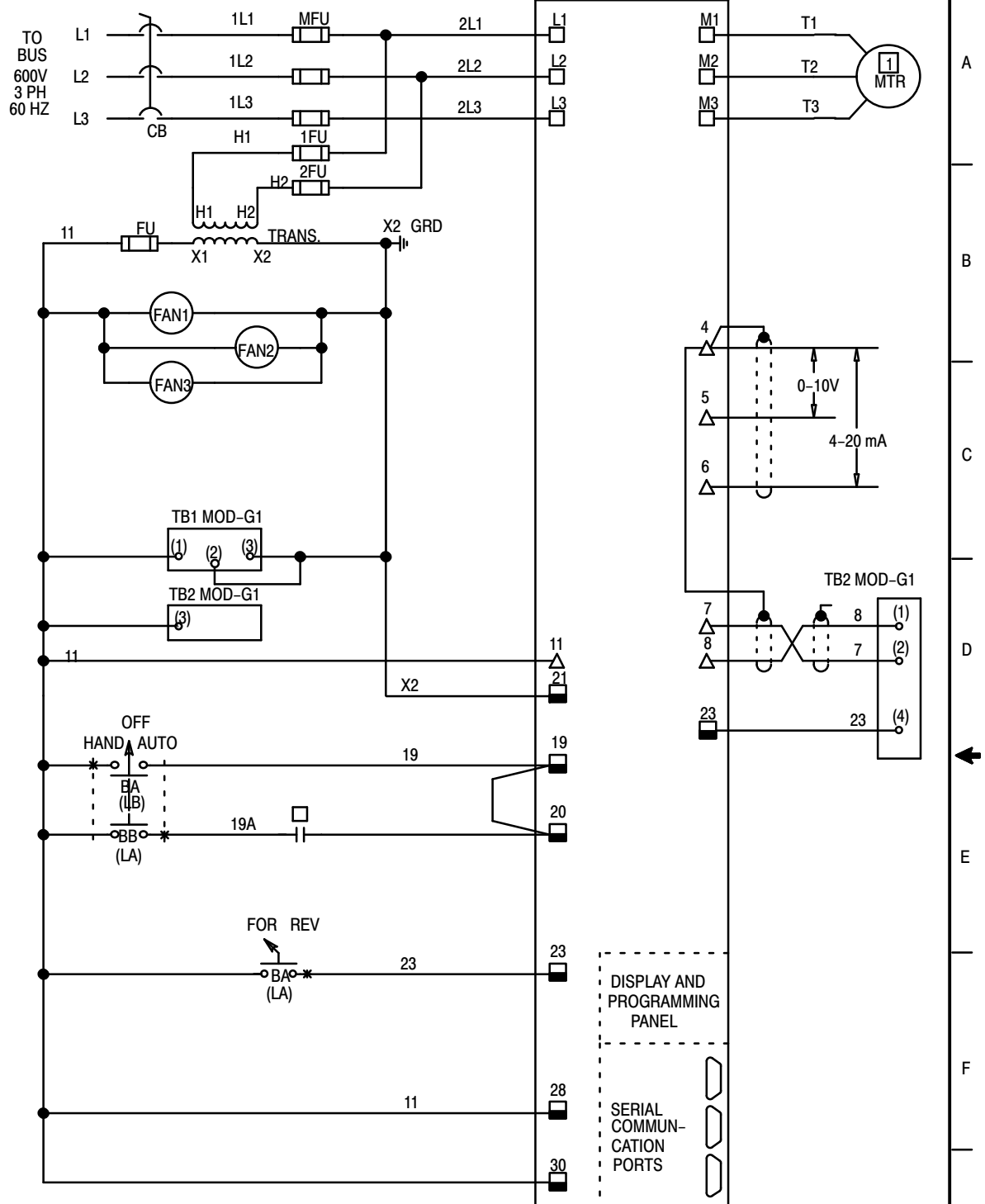
- 1 REMOTE DEVICE
- 2 REFER TO BUL. 1333-5.2 FOR INTERNAL WIRING.

3 SPEED POT 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.

**DRIVE LEGEND**  
 □ DRIVE TERMINAL BLOCKS

2 BUL. 1333 VARIABLE FREQUENCY AC DRIVE

<b>References</b>		<b>BUL. 2162J 15HP AC DRIVE-NEMA 1</b>		<b>ACAD</b>		
Revision	Dimensions Apply Before Surface Treatment			 A ROCKWELL INTERNATIONAL COMPANY		
Release	Dimensions in Inches Tolerances Unless Otherwise Specified					
<b>A 10/18/93</b>	2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93			Sheet 1 Of 1
	3 Place Decimal + .005	Chkd. N/A	Date N/A			Dwg Size
Refer. Book	Angles + 15	Appd. N/A	Date N/A	<b>D</b>	<b>CS70024152</b>	



NOTES:

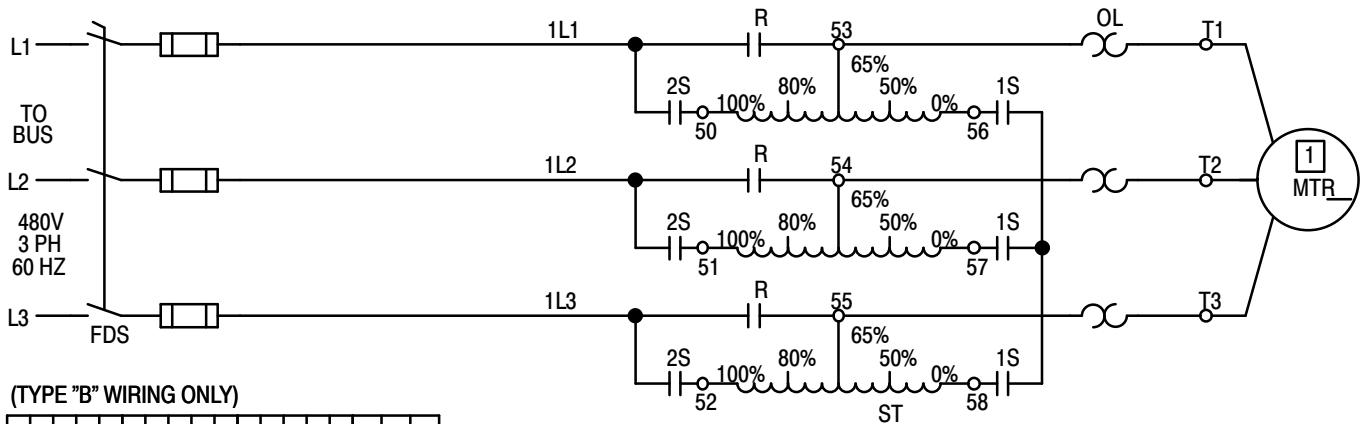
- 1 REMOTE DEVICE
- 2 REFER TO BUL. 1336-5.0 FOR INTERNAL WIRING.

DRIVE LEGEND

- TB1 TERMINAL BLOCKS
- △ TB2 TERMINAL BLOCKS
- TB3 TERMINAL BLOCKS

2 BUL. 1336 ADJUSTABLE FREQUENCY AC MOTOR DRIVE W/ 115VAC LOGIC INTERFACE BOARD

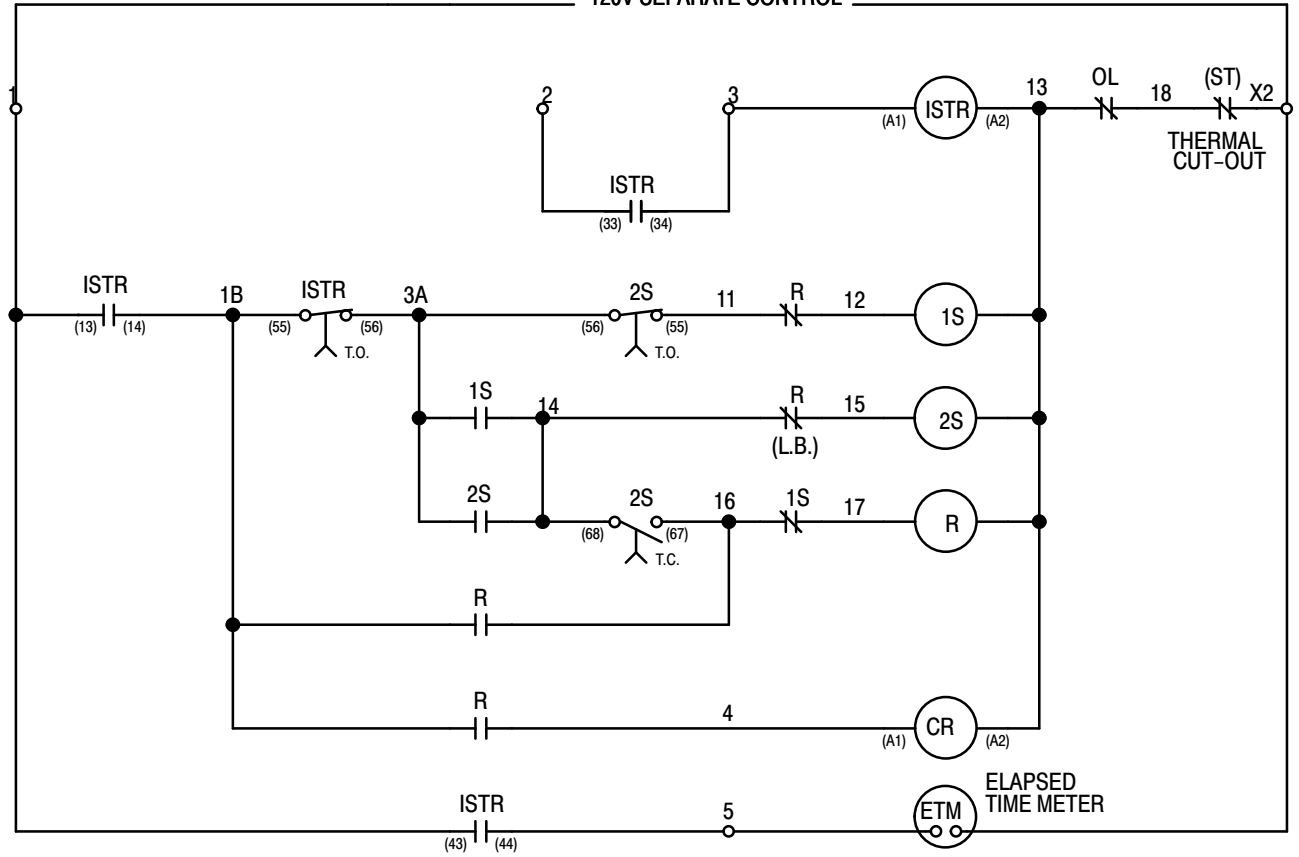
References		<b>BUL. 2163K 75HP AC DRIVE-NEMA 12</b>		ACAD	
Revision	Release	Dimensions Apply Before Surface Treatment			
A	0/18/93	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal * .02		Dr. PPEN577B	Date 10/02/93
		3 Place Decimal * .005		Chkd. N/A	Date N/A
Refer. Book		Angles * 15		Appd. N/A	Date N/A
				Sheet 1	Of 1
				Dwg Size D	<b>CS70024154</b>



(TYPE "B" WIRING ONLY)

X	1	1	2	3	5	6	1	2	2	2	2	2	T	T	T	TB
2	A						9	0	1	2	3	4	1	2	3	

120V SEPARATE CONTROL

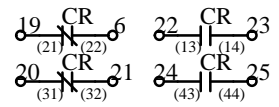


NOTES:

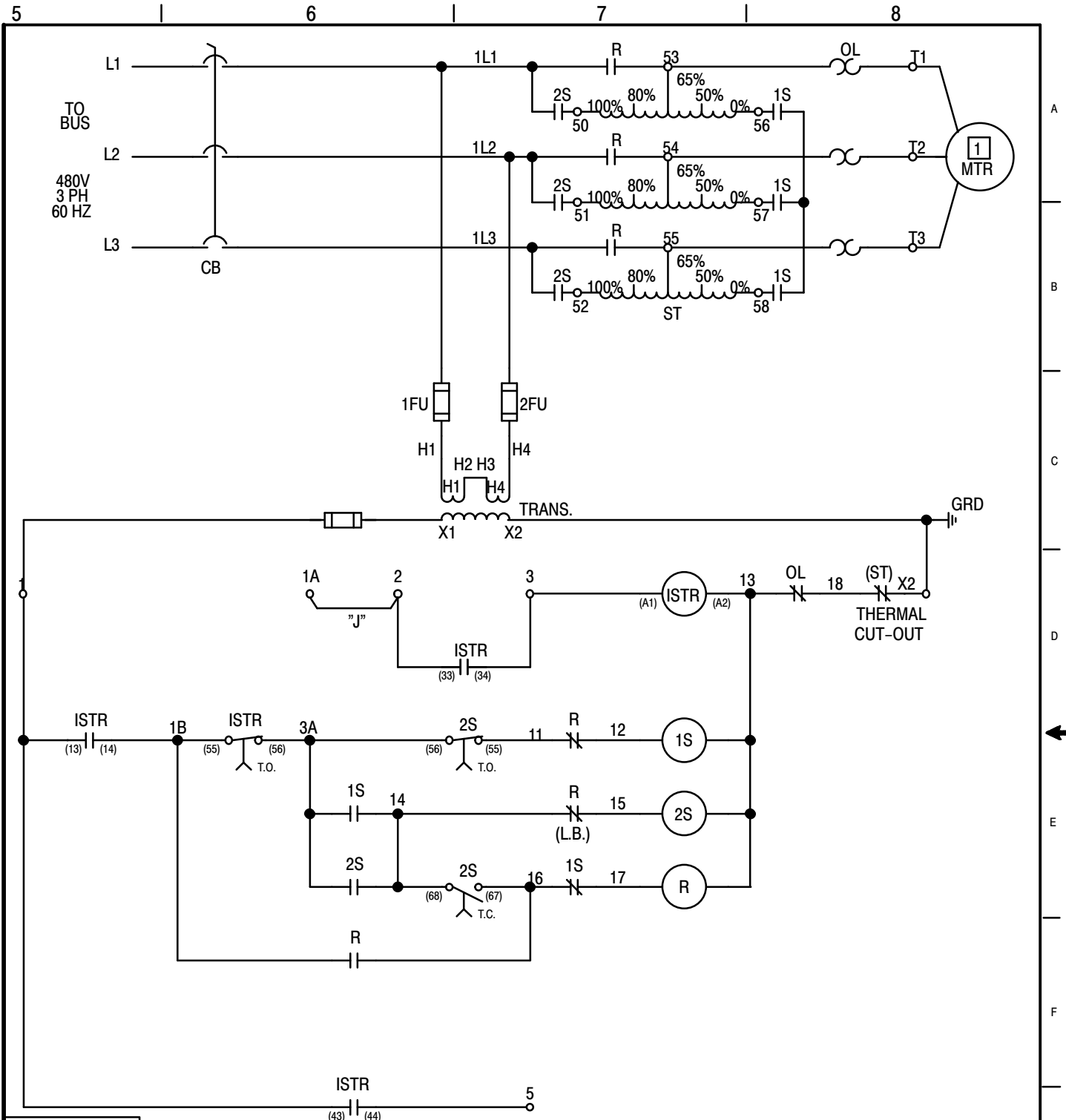
1 REMOTE DEVICE

2 ADDITIONAL CONTROL CIRCUIT OVERCURRENT PROTECTION MAY BE REQUIRED WHEN THE

CONTROL CIRCUIT CONDUCTORS EXTEND BEYOND THE ENCLOSURE. REFER TO NATIONAL ELECTRICAL CODE.




References		Bul. 2172 Size 2		ACAD	
Revision		Type A			
Release		Dr. PPEN577B		Sheet 1 Of 1	
A 10/18/93		Date 10/02/93		Dwg Size	
Dimensions Apply Before Surface Treatment		Chkd. N/A		D	
Dimensions in Inches Tolerances Unless Otherwise Specified		Appd. N/A		CS70024144	
2 Place Decimal + .02		Date N/A			
3 Place Decimal + .005		Date N/A			
Angles + 15					
Refer. Book					

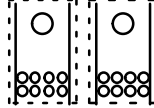
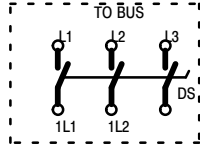
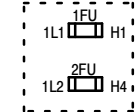


**NOTES:**

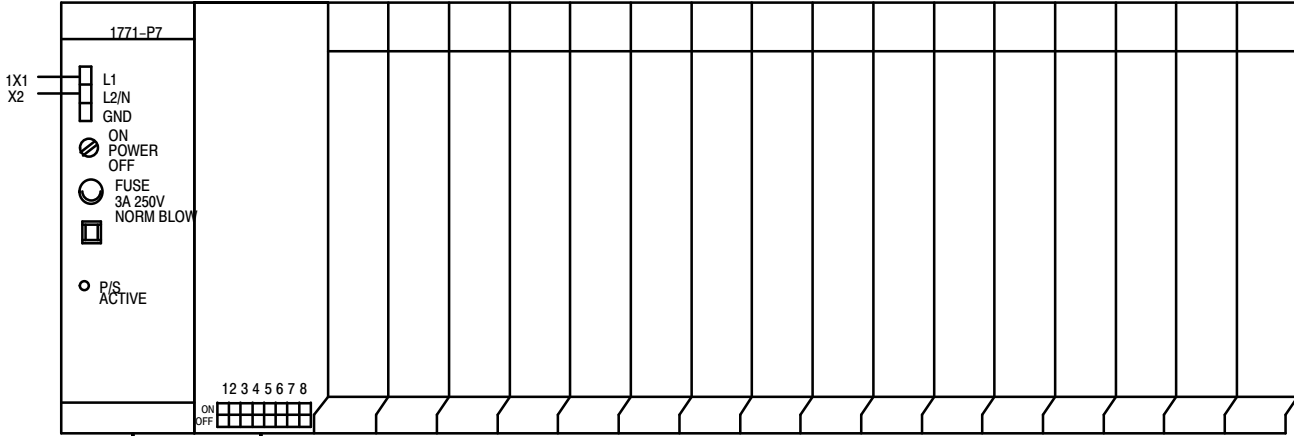
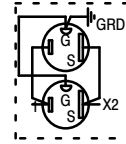
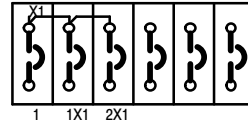
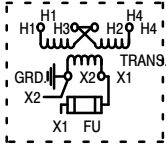
**1**  
REMOTE DEVICE

<b>References</b>		<b>BUL. 2173 SIZE 3</b>		<b>ACAD</b>	
Revision		<b>TYPE B</b>		 A ROCKWELL INTERNATIONAL COMPANY	
Release					
<b>A</b>	<b>04/15/93</b>	Dimensions Apply Before Surface Treatment Dimensions in Inches Tolerances Unless Otherwise Specified 2 Place Decimal +.02 3 Place Decimal +.005 Angles + 15		Dr. PPEN577B Date 10/02/93 Chkd. N/A Date N/A Appd. N/A Date N/A	
Refer. Book		Sheet 1 Of 1 Dwg Size <b>D</b> <b>CS70006998</b>			

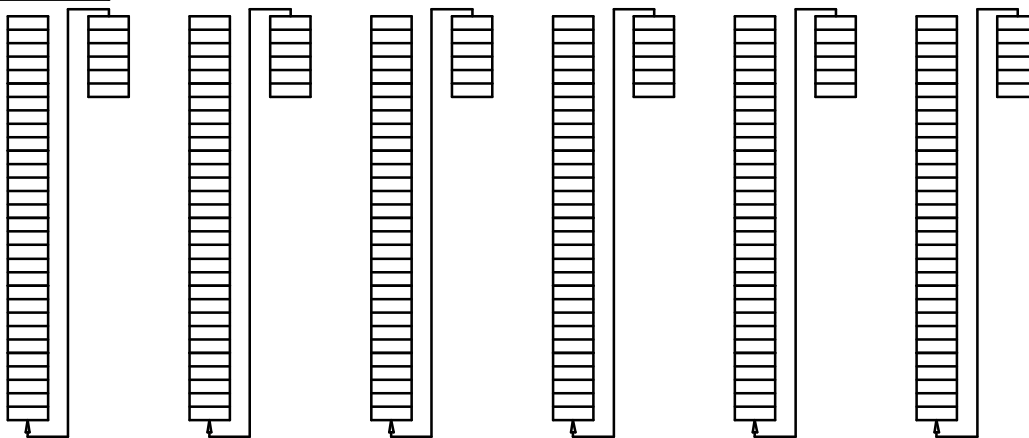
CONNECT BETWEEN SIMILARLY MARKED TERMINALS



POWER DISTRIBUTION BLOCKS



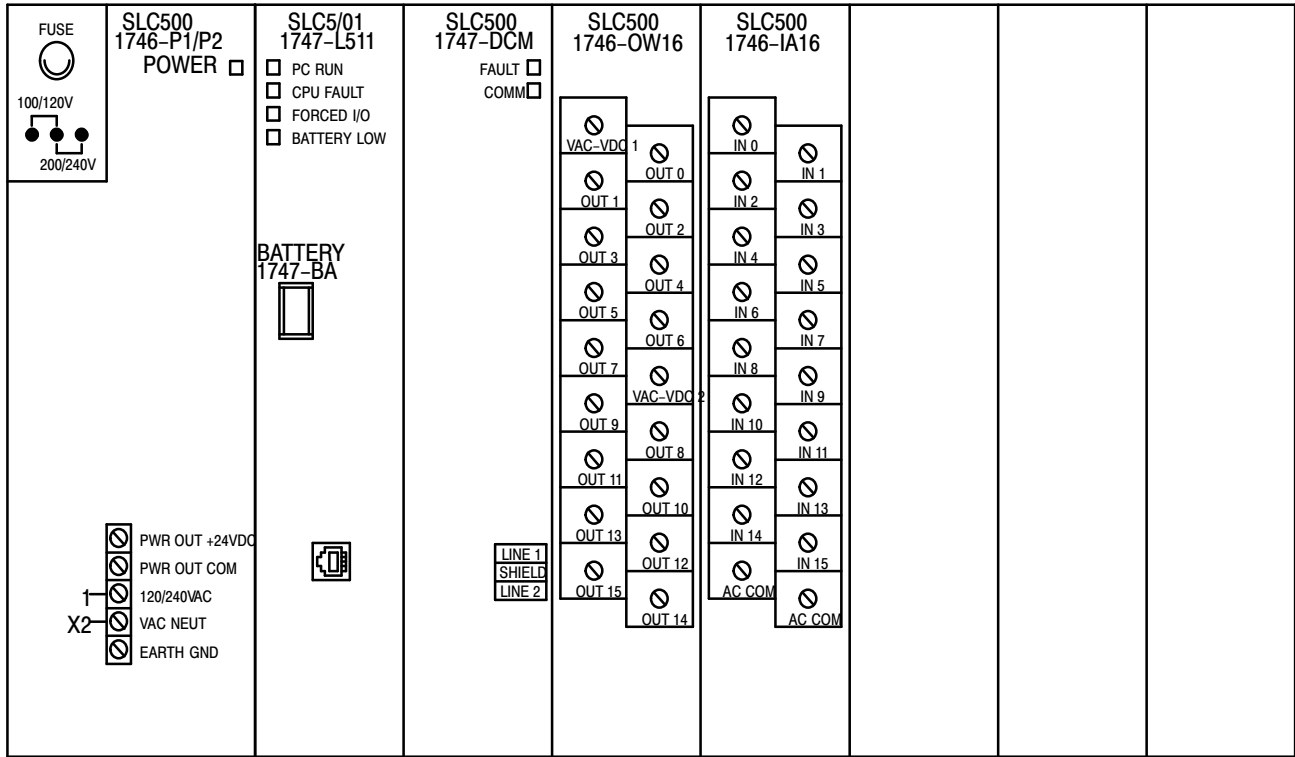
1771-CP2



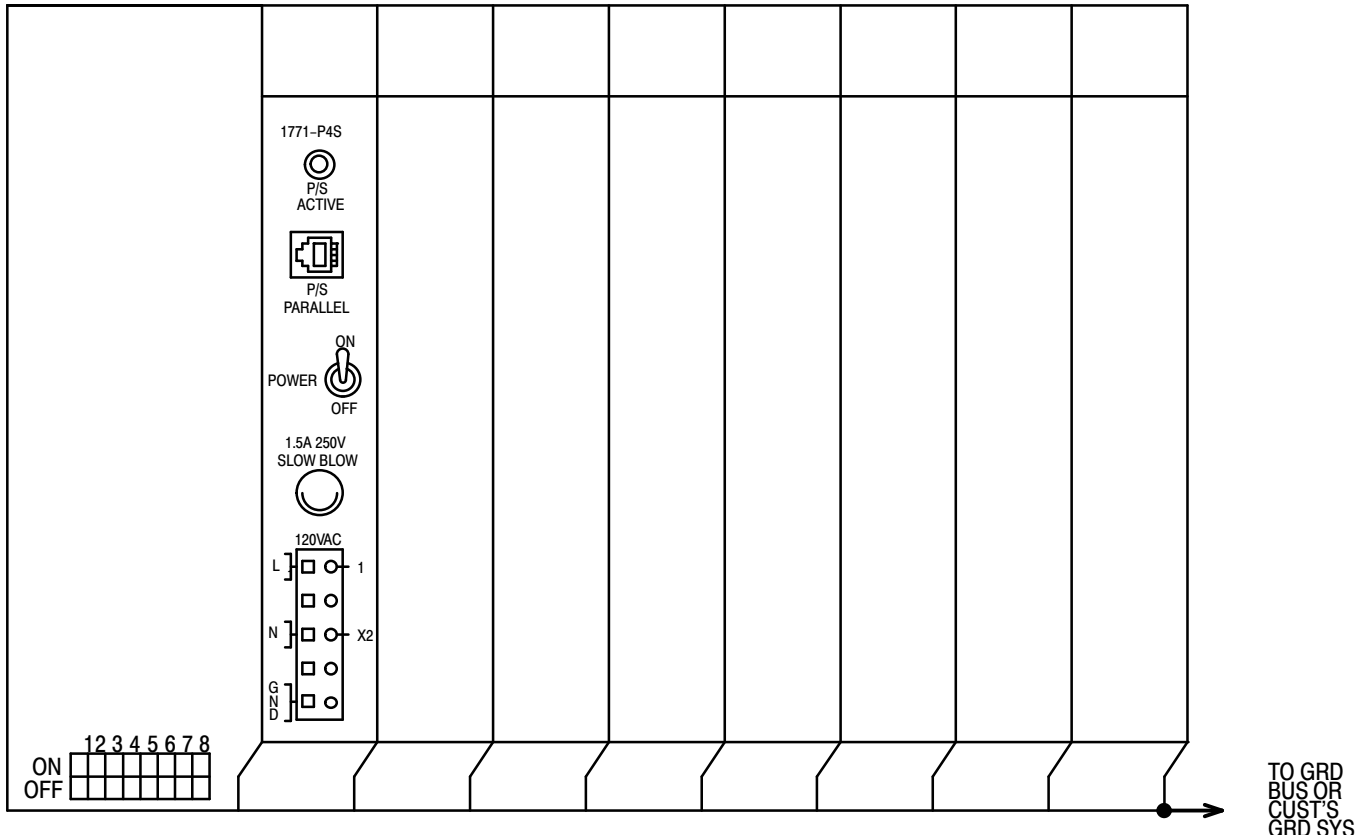
216 CA TB'S

References		<b>BUL. 2182E</b>		ACAD	
Revision	Release	Dimensions Apply Before Surface Treatment		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
A	10/21/93	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal +.02			
		3 Place Decimal +.005		Dr. PPEN577B	Date 10/02/93
Refer. Book		Angles + 15		Chkd. N/A	Date N/A
				Appd. N/A	Date N/A
				Sheet 1 Of 1	Dwg Size D
				<b>CS70024646</b>	

CONNECT BETWEEN SIMILARLY MARKED TERMINALS



<b>References</b>		<b>BUL. 2182J</b>		<b>ACAD</b>		
<b>Revision</b>	Dimensions Apply Before Surface Treatment			<b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>		
<b>Release</b>	Dimensions in Inches Tolerances Unless Otherwise Specified					
<b>A 10/18/93</b>	2 Place Decimal +.02	Dr. PPEN577B	Date 10/02/93			Sheet 1 Of 1
	3 Place Decimal +.005	Chkd. N/A	Date N/A			Dwg Size D
Refer. Book	Angles + 15	Appd. N/A	Date N/A	<b>CS70024147</b>		

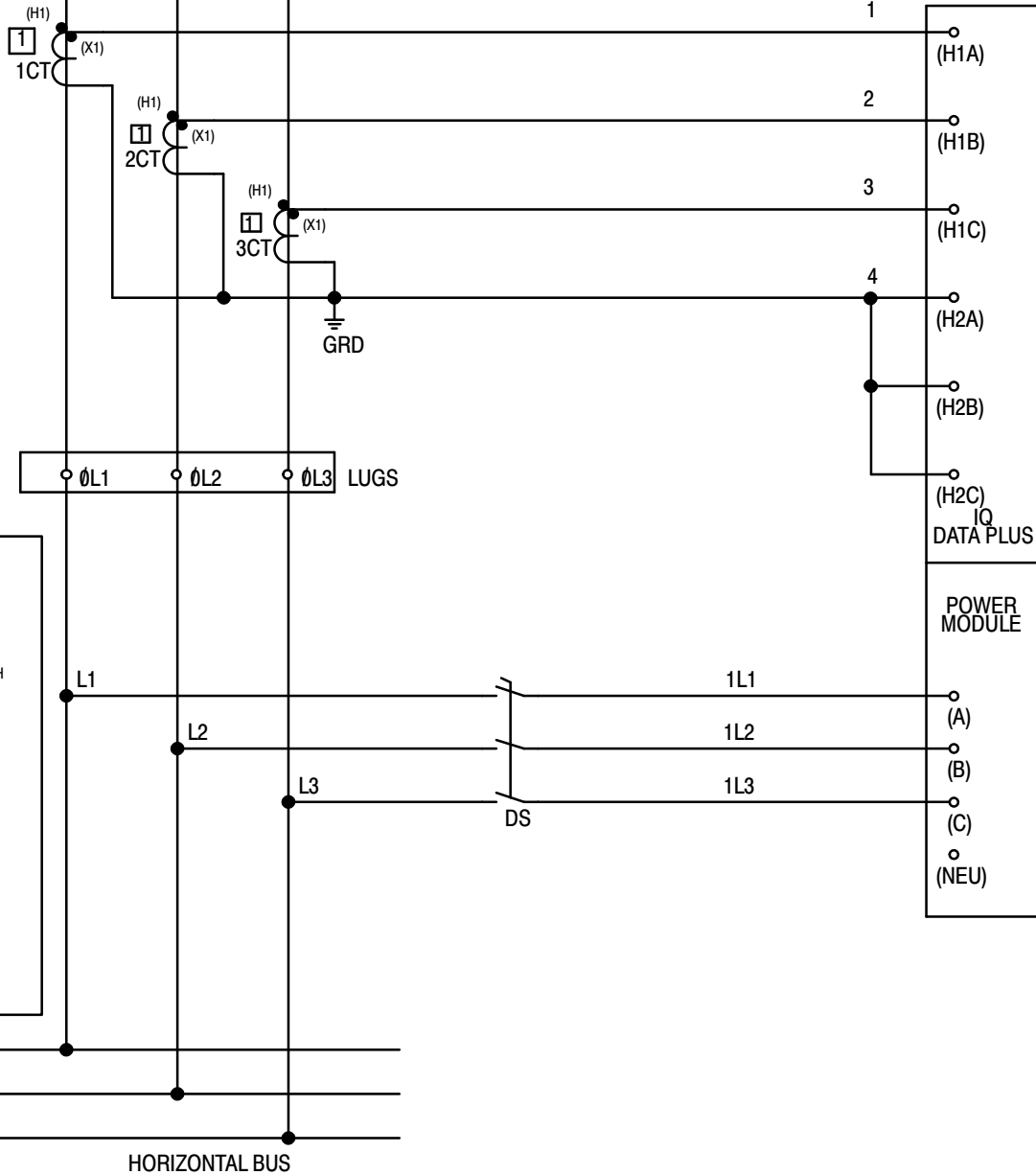


<b>References</b>		<b>Bul. 2183E</b>		<b>ACAD</b>	
Revision	Release	Dimensions Apply Before Surface Treatment			 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>
A	10/18/93	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93	
		3 Place Decimal + .005	Chkd. N/A	Date N/A	
Refer. Book		Angles + 15	Appd. N/A	Date N/A	Sheet 1 Of 1 Dwg Size <b>D</b> <b>CS70024148</b>



CUSTOMER'S  
INCOMING LINE CABLES  
VOLTS, 3 PH., HZ

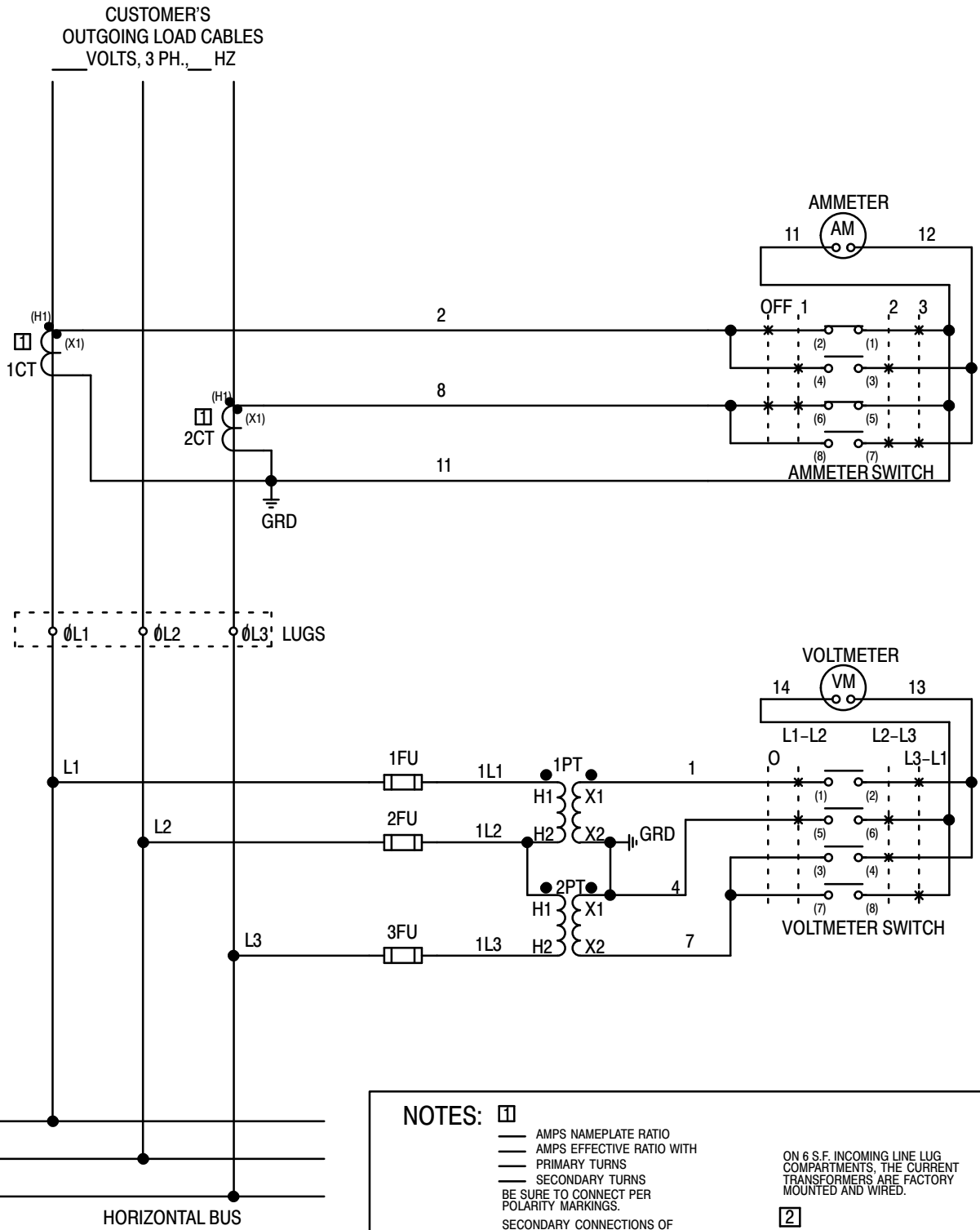
DIGITAL METERING SYSTEM



NOTES:

- 1 AMPS NAMEPLATE RATIO
  - AMPS EFFECTIVE RATIO WITH
  - PRIMARY TURNS
  - SECONDARY TURNS
- BE SURE TO CONNECT PER POLARITY MARKINGS.
- SECONDARY CONNECTIONS OF CURRENT TRANSFORMER MUST BE CONNECTED TO A LOAD OR SHORTED TOGETHER TO AVOID A HIGH VOLTAGE ACROSS SECONDARY LEADS.
- CUSTOMER IS TO MOUNT AND WIRE CURRENT TRANSFORMERS.

References		BUL.2190 METERING PANEL		ACAD	
Revision	Dimensions Apply Before Surface Treatment			 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
A 10/18/93	2 Place Decimal + .02	Dr. PPEN577B	Date 10/02/93	Sheet 1	Of 1
	3 Place Decimal + .005	Chkd. N/A	Date N/A	Dwg Size	D
Refer. Book	Angles + 15	Appd. N/A	Date N/A	CS70002602	



**NOTES:** [1]

- AMPS NAMEPLATE RATIO
- AMPS EFFECTIVE RATIO WITH
- PRIMARY TURNS
- SECONDARY TURNS

BE SURE TO CONNECT PER POLARITY MARKINGS.  
SECONDARY CONNECTIONS OF CURRENT TRANSFORMER MUST BE CONNECTED TO A LOAD OR SHORTED TOGETHER TO AVOID A HIGH VOLTAGE ACROSS SECONDARY LEADS.

CUSTOMER IS TO MOUNT AND WIRE CURRENT TRANSFORMERS.

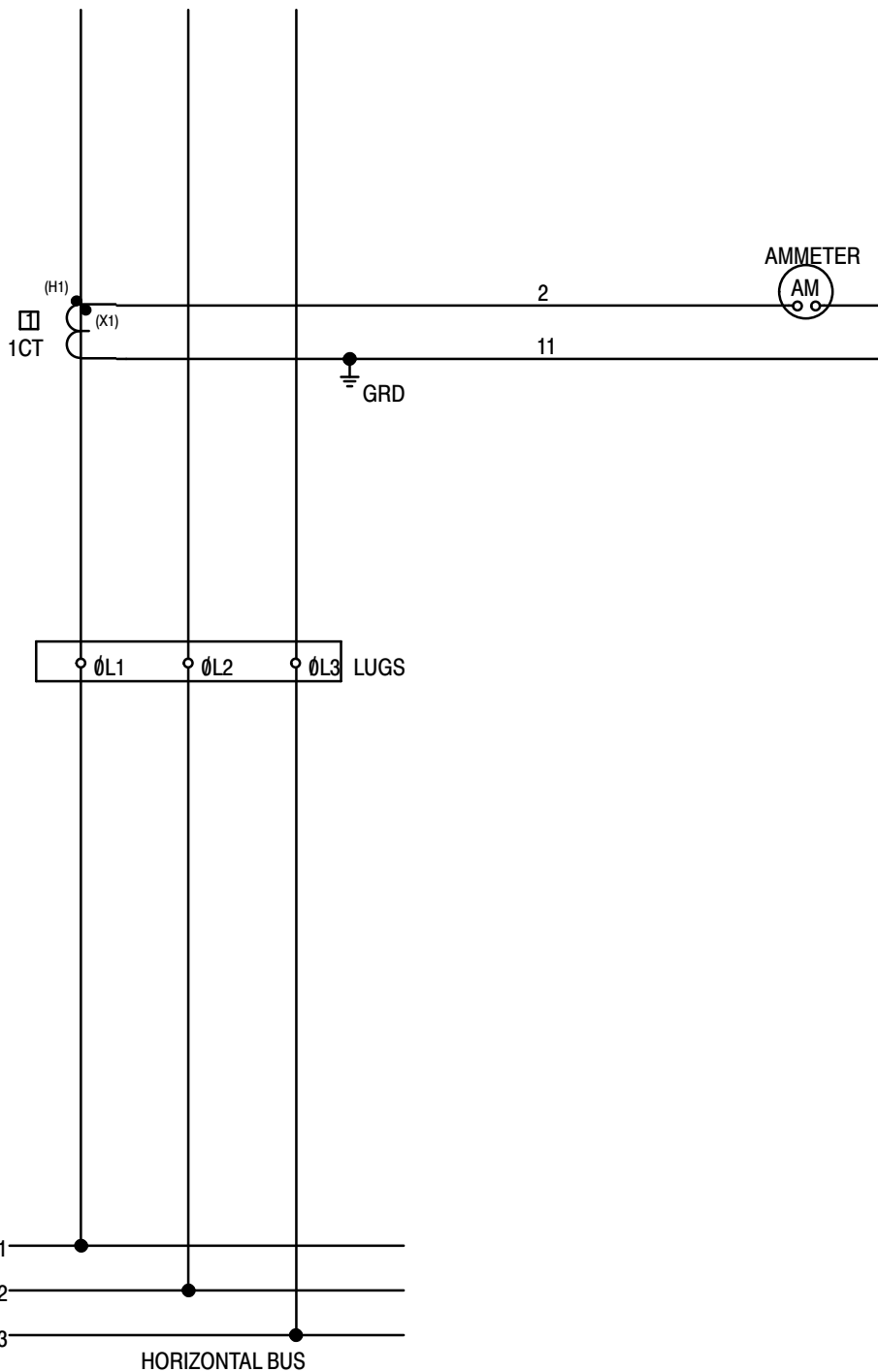
ON 6 S.F. INCOMING LINE LUG COMPARTMENTS, THE CURRENT TRANSFORMERS ARE FACTORY MOUNTED AND WIRED.

[2]

- - BOTTOM TERMINAL
  - - TOP TERMINAL
- VIEW FACING TERMINAL SCREWS WITH DRUM SWITCH IN VERTICAL POSITION.

<b>References</b>		<b>Bul. 2191F Outgoing Feeder Lug Compartment</b>		<b>ACAD</b>	
Revision	Dimensions Apply Before Surface Treatment	<b>Dr. PPEN577B</b>		<b>Date 10/02/93</b>	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
<b>A 10/18/93</b>	2 Place Decimal + .02	<b>Chkd. N/A</b>		<b>Date N/A</b>	
	3 Place Decimal + .005	<b>Appd. N/A</b>		<b>Date N/A</b>	
Refer. Book	Angles + 15			Sheet 1 Of 1	
				<b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
				Dwg Size <b>D</b> <b>CS70024643</b>	

CUSTOMER'S  
INCOMING LINE CABLES  
VOLTS, 3 PH., HZ



NOTES:

- 1 AMPS NAMEPLATE RATIO
  - AMPS EFFECTIVE RATIO WITH
  - PRIMARY TURNS
  - SECONDARY TURNS
- BE SURE TO CONNECT PER POLARITY MARKINGS.
- SECONDARY CONNECTIONS OF CURRENT TRANSFORMER MUST BE CONNECTED TO A LOAD OR SHORTED TOGETHER TO AVOID A HIGH VOLTAGE ACROSS SECONDARY LEADS.
- CUSTOMER IS TO MOUNT AND WIRE CURRENT TRANSFORMERS.
- ON 6 S.F. INCOMING LINE LUG COMPARTMENTS, THE CURRENT TRANSFORMERS ARE FACTORY MOUNTED AND WIRED.

References		Bul. 2191M Incoming Line Lug		ACAD	
Revision		Surface Treatment		ALLEN-BRADLEY A ROCKWELL INTERNATIONAL COMPANY	
Release		Dimensions in Inches		QUALITY	
A	10/18/93	Tolerances Unless		Sheet 1 Of 1	
		Otherwise Specified		Dwg Size	
		2 Place Decimal		D	
		+ .02		CS70024642	
		3 Place Decimal			
		+ .005			
Refer. Book		Angles + 15		Date 10/02/93	
		Dr. PPEN577B		Date N/A	
		Chkd. N/A		Date N/A	
		Appd. N/A		Date N/A	

A

B

C

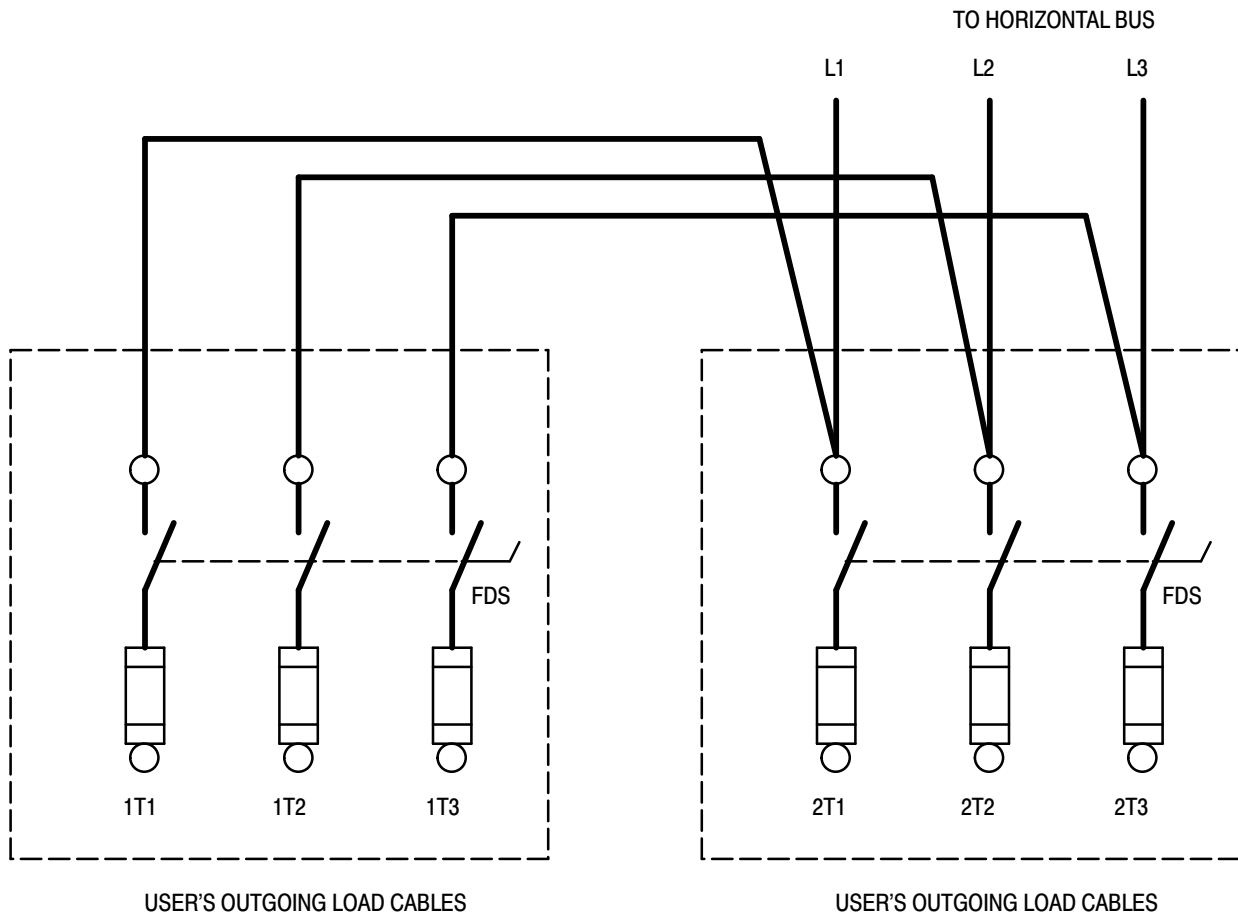
D


E

F

G

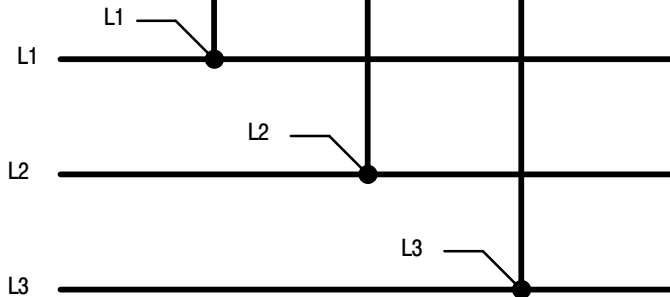
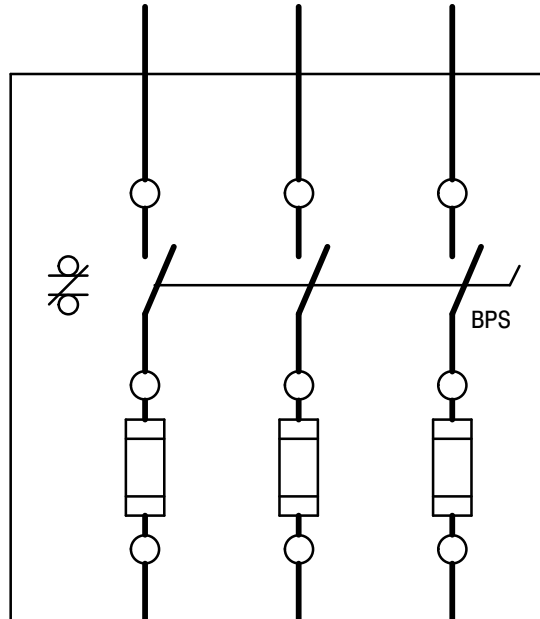
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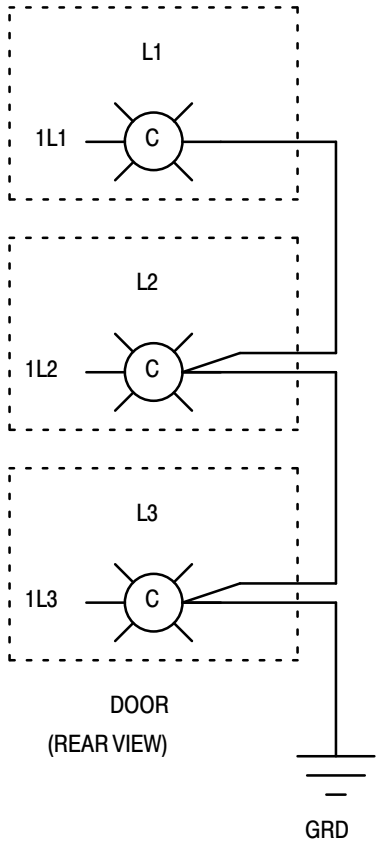
<b>References</b>		<b>BUL. 2192F DUAL</b>		<b>ACAD</b>	
Revision		Dimensions Apply Before Surface Treatment		 A ROCKWELL INTERNATIONAL COMPANY	
Release		Dimensions in Inches Tolerances Unless Otherwise Specified			
A	07/16/93	2 Place Decimal + .02		Dr. PPEN577B	Date 10/02/93
		3 Place Decimal + .005		Chkd. N/A	Date N/A
Refer. Book		Angles + 15		Appd. N/A	Date N/A
				Sheet 1 Of 1	Dwg Size D
				<b>CS70015974</b>	


USER'S INCOMING LINE CABLES

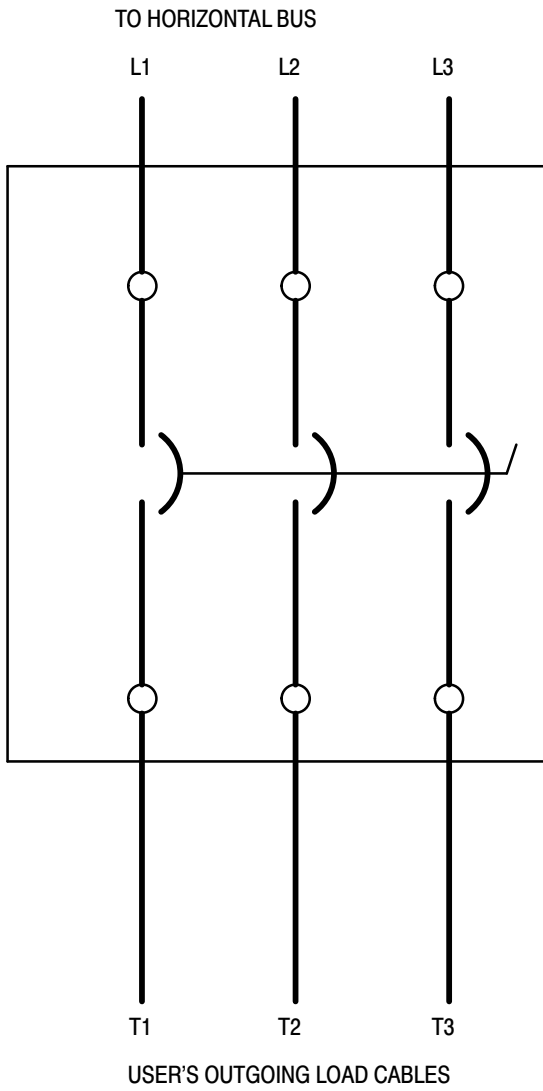
ØL1      ØL2      ØL3




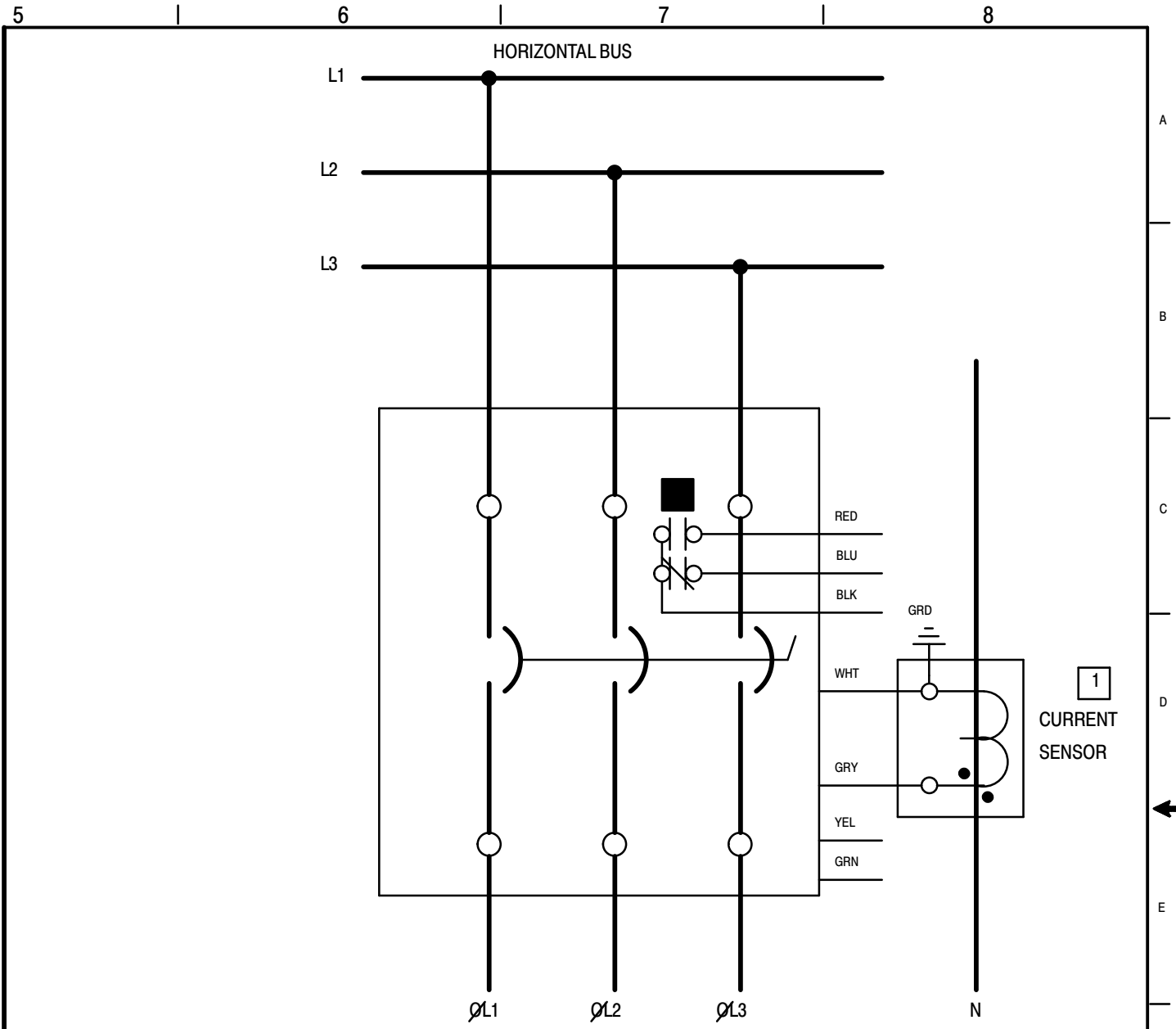
HORIZONTAL BUS



<b>References</b>		<b>BUL 2192M</b>		<b>ACAD</b>	
Revision	Dimensions Apply Before Surface Treatment			 <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
<b>A</b>	<b>10/21/93</b>	2 Place Decimal	Dr. PPEN577B	Date	10/02/93
		+ .02	Chkd. N/A	Date	N/A
		3 Place Decimal	Appd. N/A	Date	N/A
		+ .005			
		Angles + 15			
Refer. Book				Dwg Size	<b>D</b>
					<b>CS70024644</b>



<b>References</b>		<b>BUL. 2193F</b>		<b>ACAD</b>	
<b>Revision</b>		Dimensions Apply Before Surface Treatment			 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>
Release					
<b>A</b>	<b>10/18/93</b>	Dimensions in Inches Tolerances Unless Otherwise Specified	Dr. PPEN577B		Date 10/02/93
		2 Place Decimal + .02			
		3 Place Decimal + .005	Chkd. N/A		Date N/A
Refer. Book		Angles + 15	Appd. N/A		Date N/A
				Sheet 1 Of 1	<b>CS70002993</b>
				Dwg Size <b>D</b>	



NOTES: USER'S INCOMING LINE CABLES

**1** IF THE SYSTEM NEUTRAL IS GROUNDED AND PHASE TO NEUTRAL LOADS ARE USED, THEN THE NEUTRAL CURRENT SENSOR MUST BE USED.

IF THE SYSTEM NEUTRAL IS GROUNDED, BUT NO PHASE TO NEUTRAL LOADS ARE USED, THE NEUTRAL CURRENT SENSOR IS NOT NECESSARY.

BE SURE TO CONNECT PER POLARITY MARKINGS.

SECONDARY CONNECTIONS OF CURRENT SENSOR MUST BE CONNECTED TO A LOAD OR SHORTED TOGETHER TO AVOID A HIGH VOLTAGE ACROSS SECONDARY LEADS.

**■** INTERNAL CB AUXILIARIES SUPPLIED WITH UNMOUNTED CONNECTION BLOCKS.

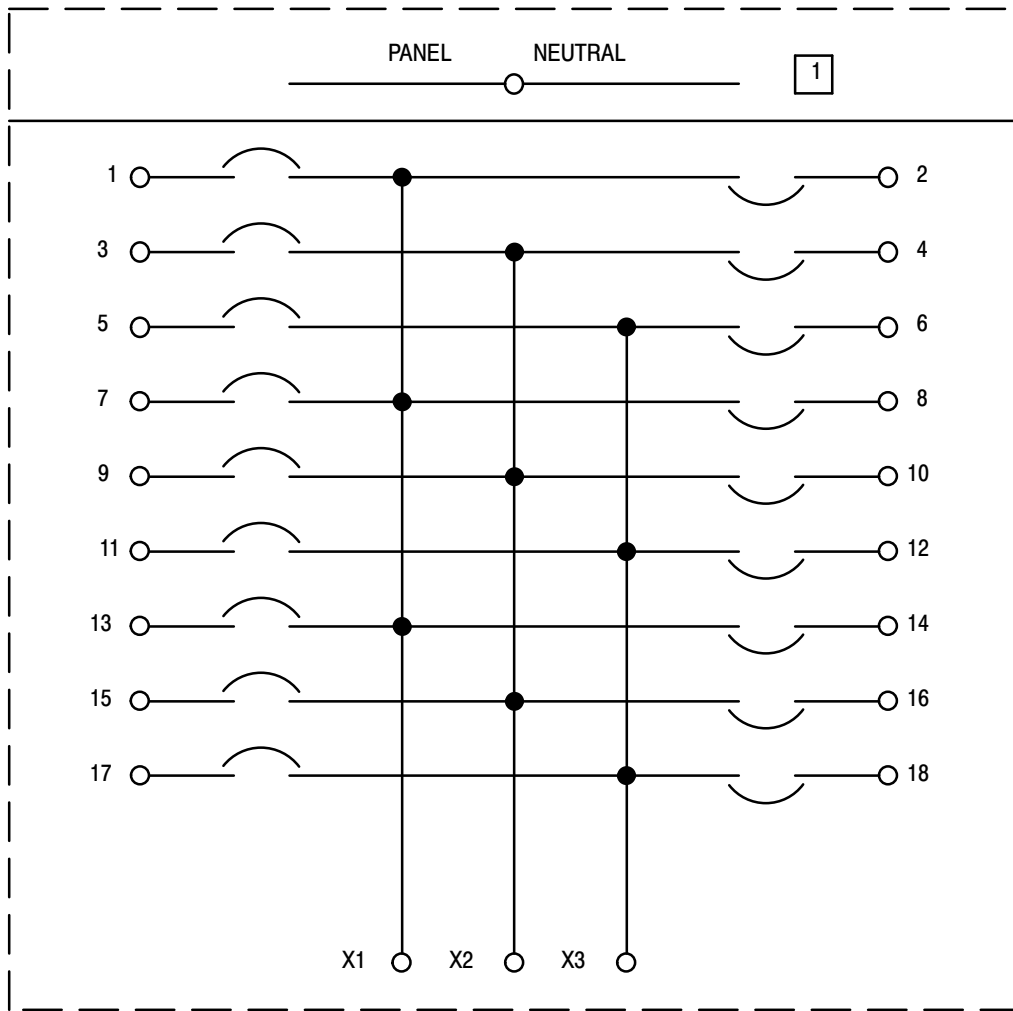
**⚠ ATTENTION**

**Line side power connected to bottom of switch.**

**De-energize power to switch before servicing.**

**Failure to de-energize power can result in severe injury or death.**

References		Bul. 2193M		ACAD	
Revision	Release	Dimensions Apply Before Surface Treatment			
A	10/18/93	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal +.02	Dr. PPEN577B	Date	10/02/93
		3 Place Decimal +.005	Chkd. N/A	Date	N/A
Refer. Book		Angles + 15	Appd. N/A	Date	N/A
				Sheet	1 Of 1
				Dwg Size	D
				<b>CS70003259</b>	



A  
B  
C  
D  
E  
F  
G  
H

**NOTES:**

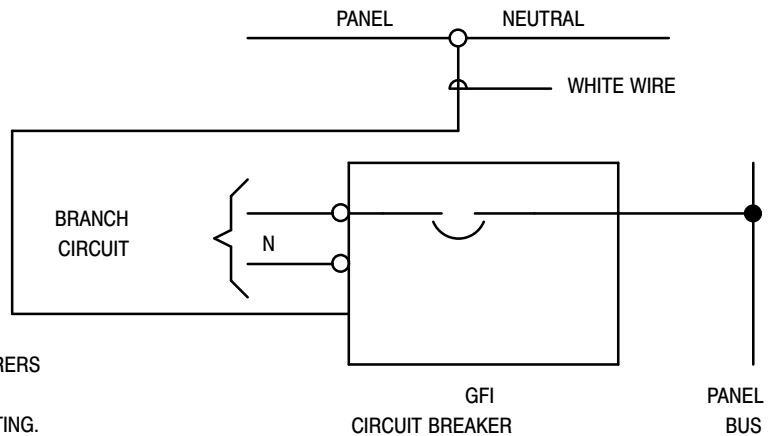
**1** OTHER SIDE OF EACH CIRCUIT IS ALSO CONNECTED TO PANEL NEUTRAL.

**LIGHTING PANEL SUPPLIED WITH:**

- 7 - 15A. - 1 POLE BREAKER(S)
- 6 - 30A. - 1 POLE BREAKER(S)
- 5 - 20A. - 1 POLE BREAKER(S)

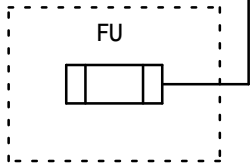
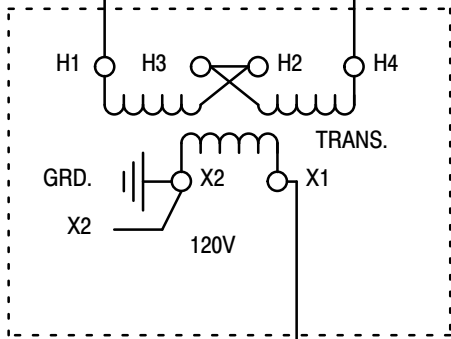
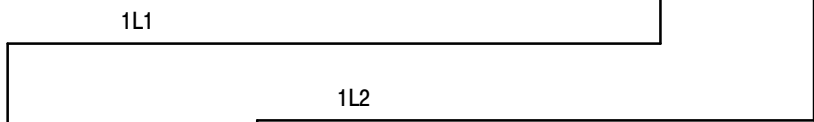
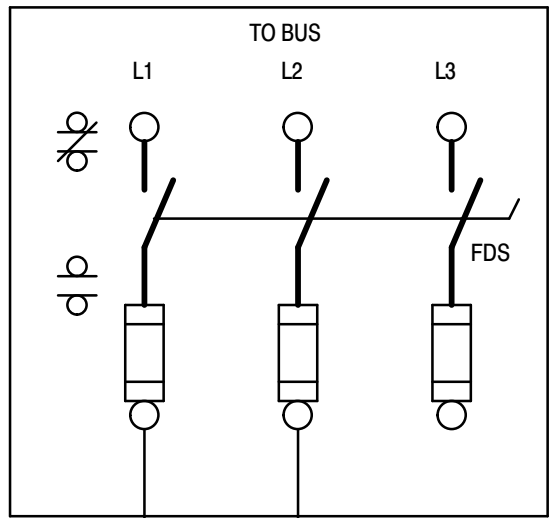
REFER TO MANUFACTURERS INSTRUCTIONS FOR INSTALLATION AND TESTING.

**GFI CIRCUIT BREAKER CONNECTIONS (WHERE SPECIFIED)**



<b>References</b>		<b>BUL. 2193LE 3-PHASE LIGHTING PANEL</b>		<b>ACAD</b>	
<b>Revision</b>	<b>Release</b>	Dimensions Apply Before Surface Treatment			
<b>A</b>	<b>10/18/93</b>	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal + .02	Dr. PPEN577B	Date	10/02/93
		3 Place Decimal + .005	Chkd. N/A	Date	N/A
Refer. Book		Angles + 15	Appd. N/A	Date	N/A
			Sheet 1 Of 1		Dwg Size <b>CS70024145</b>

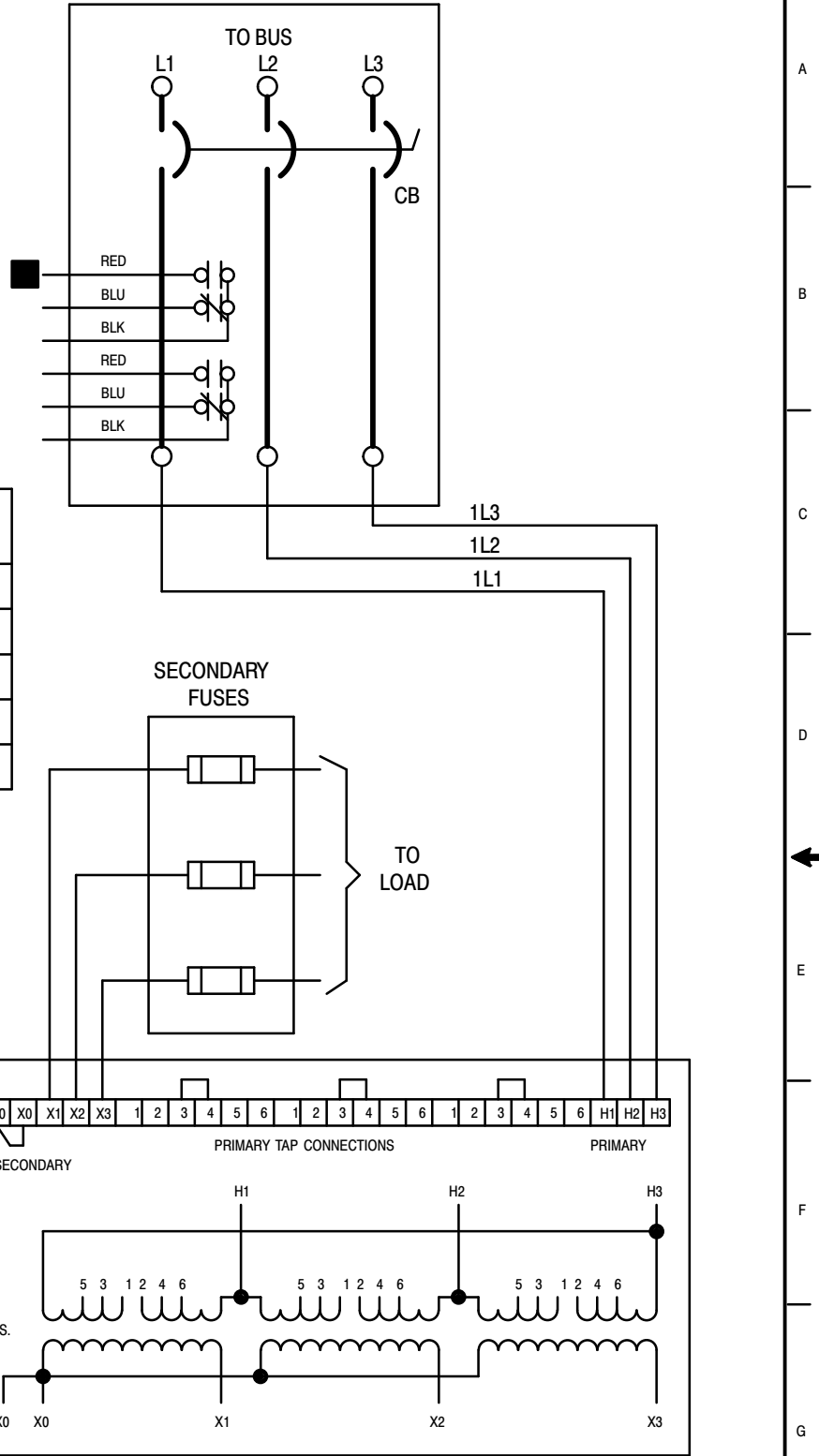




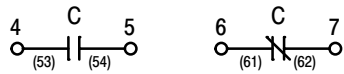
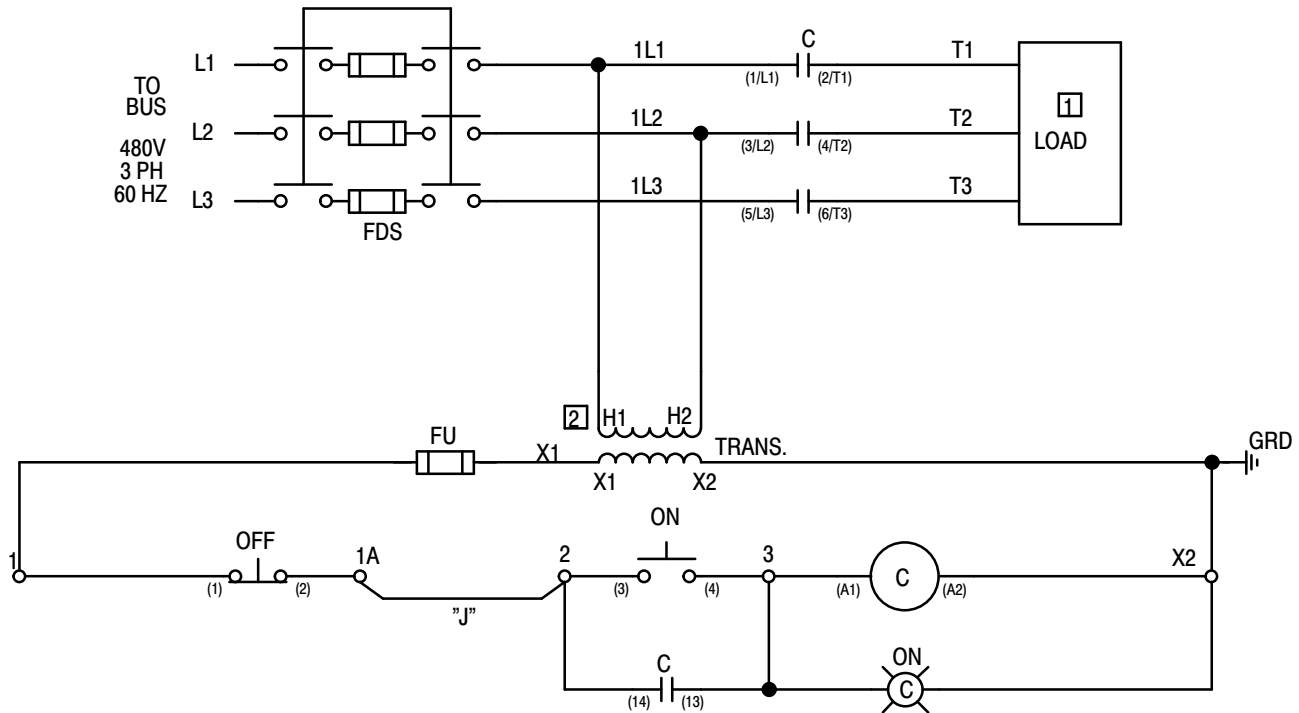
<b>References</b>		<b>Bul. 2196 2kVA</b>		<b>ACAD</b>	
Revision	Dimensions Apply Before Surface Treatment				
Release	Dimensions in Inches Tolerances Unless Otherwise Specified				
A 10/18/93	2 Place Decimal +.02	Dr. PPEN577B	Date 10/02/93	Sheet 1	Of 1
	3 Place Decimal +.005	Chkd. N/A	Date N/A	Dwg Size	CS70024146
Refer. Book	Angles + 15	Appd. N/A	Date N/A	D	

INTERNAL CB AUXILIARIES SUPPLIED WITH UNMOUNTED CONNECTION BLOCKS.

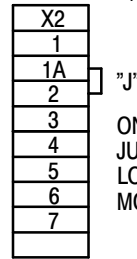
TAP CONNECTION	480 VOLTS	600 VOLTS
1 - 2	504	630
2 - 3	492	615
3 - 4	480	600
4 - 5	468	585
5 - 6	456	570



References		Bul. 2197 37.5 kVA		ACAD	
Revision	Release	Dimensions Apply Before Surface Treatment		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
A	10/18/93	Dimensions in Inches Tolerances Unless Otherwise Specified			
		2 Place Decimal + .02	Dr. PPEN577B	Date	10/02/93
		3 Place Decimal + .005	Chkd. N/A	Date	N/A
Refer. Book		Angles + 15	Appd. N/A	Date	N/A
				Sheet	1 Of 1
				Dwg Size	D
				<b>CS70024151</b>	



(TYPE "B" WIRING ONLY)



ON TYPE "A" WIRING, JUMPER "J" WILL BE LOCATED ON DOOR MOUNTED PUSH BUTTONS.

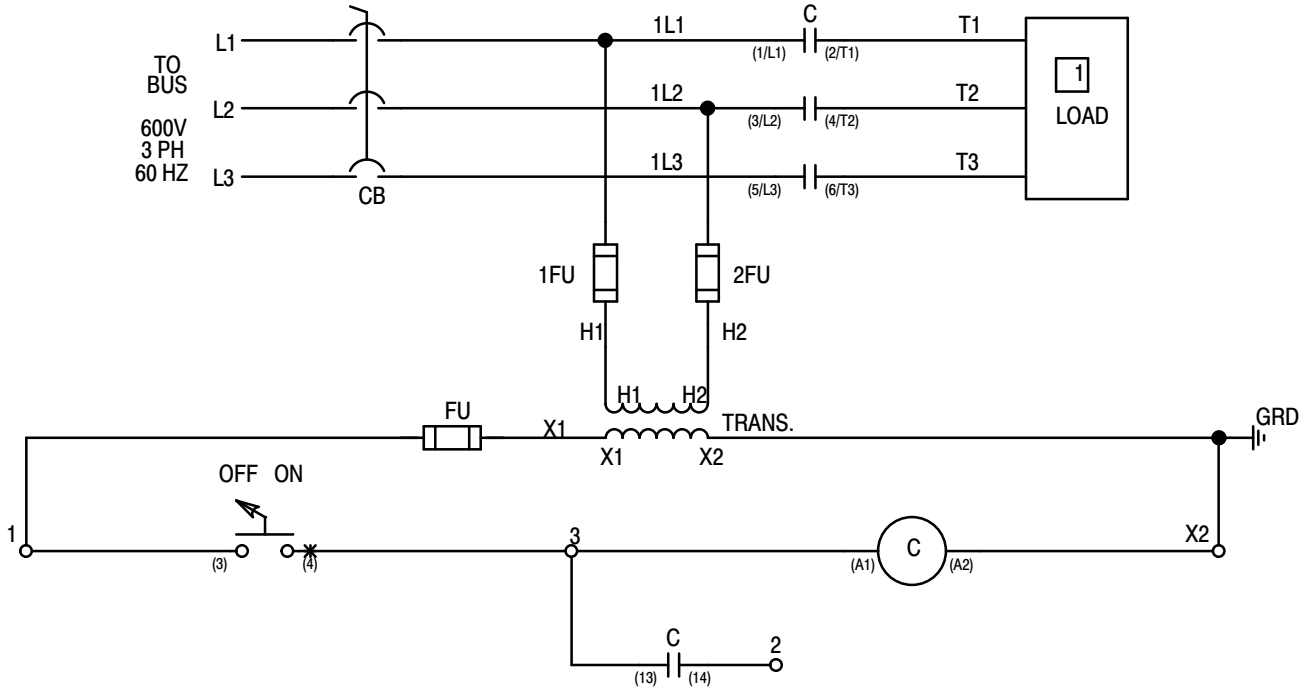
TB

**NOTES:**

**1**  
REMOTE DEVICE

**2**  
THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

<b>References</b>		<b>BUL. 2402 30 AMP (0.5 SF)</b>		<b>ACAD</b>	
Revision		TYPE A		 <b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
Release		Dr. PPEN577B			
A 10/18/93		Chkd. N/A		Date N/A	
Refer. Book		Appd. N/A		Date N/A	
Dimensions Apply Before Surface Treatment Dimensions in Inches Tolerances Unless Otherwise Specified 2 Place Decimal +.02 3 Place Decimal +.005 Angles + 15		Sheet 1 Of 1 Dwg Size <b>D</b>		<b>CS70024106</b>	

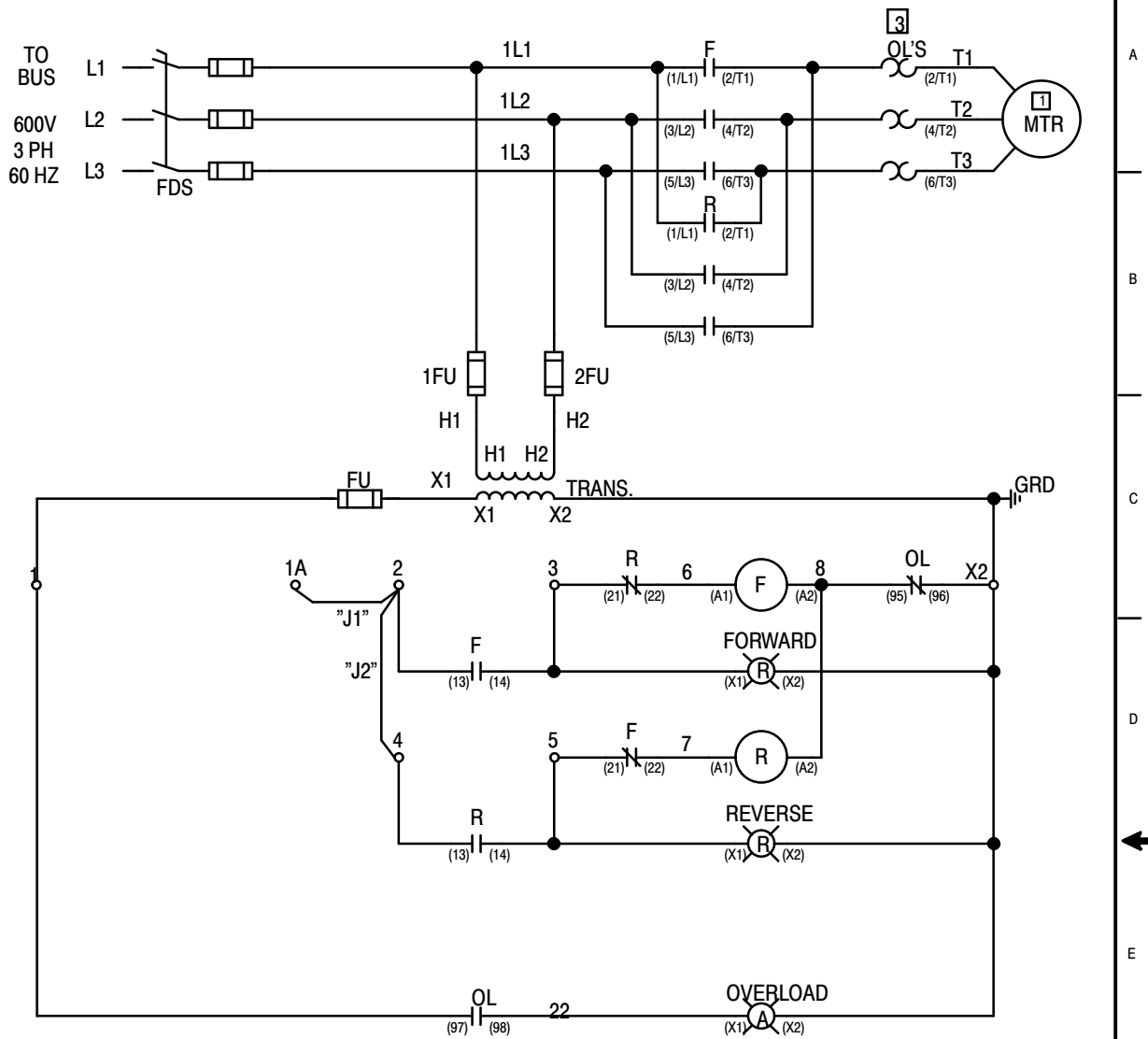


1A  
(SPARE)

X	1	1	2	3						TB
2		A								

**NOTES:**  
  
[1]  
REMOTE DEVICE

<b>References</b>		<b>BUL. 2403 100 AMP TYPE B</b>		<b>ACAD</b>	
<b>Revision</b>	<b>Release</b>	Dimensions Apply Before Surface Treatment			 ALLEN-BRADLEY A ROCKWELL INTERNATIONAL COMPANY
<b>A</b>	<b>10/18/93</b>	Dimensions in Inches Tolerances Unless Otherwise Specified	Dr. PPEN577B	Date 10/02/93	
		2 Place Decimal + .02	Chkd. N/A	Date N/A	
		3 Place Decimal + .005	Appd. N/A	Date N/A	
Refer. Book		Angles + 15			Sheet 1 Of 1
					Dwg Size <b>D</b>
					<b>CS70024107</b>

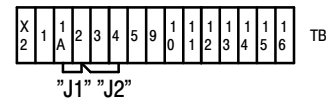
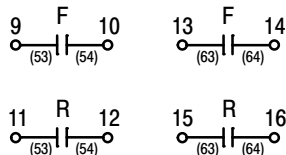


NOTES:

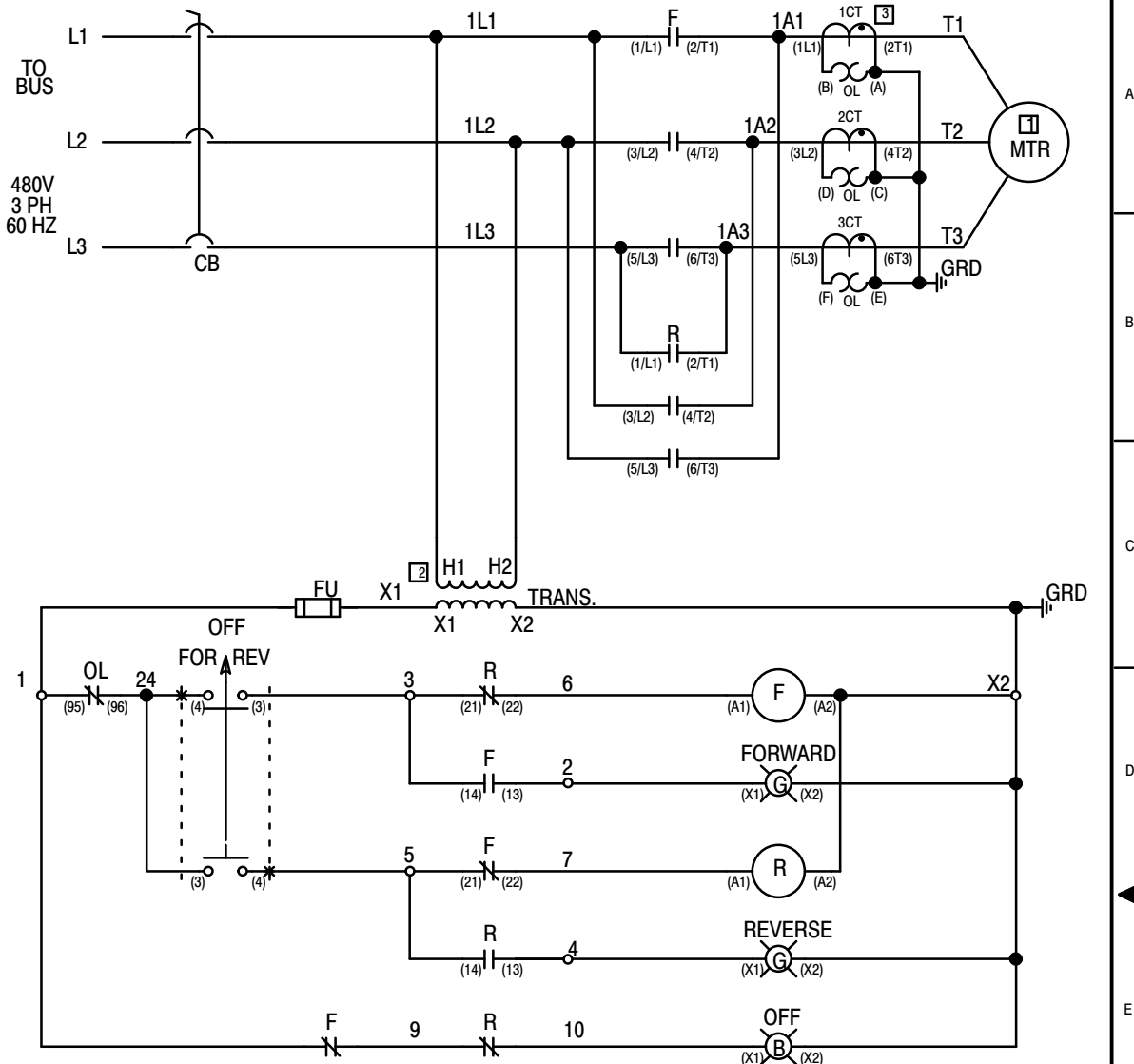
**1**  
REMOTE DEVICE

**3** **ATTENTION**

DO NOT USE AUTOMATIC RESET MODE IN APPLICATIONS WHERE UNEXPECTED AUTOMATIC RESTART OF THE MOTOR CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



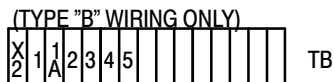
References		BUL. 2406 18-24 AMP		ACAD	
Revision		TYPE B		 A ROCKWELL INTERNATIONAL COMPANY	
Release		Dr. PPEN577B			
A 10/18/93		Chkd. N/A		Date N/A	
Refer. Book		Appd. N/A		Date N/A	
Angles + 15				Sheet 1 Of 1	
				Dwg Size D	
				CS70024108	



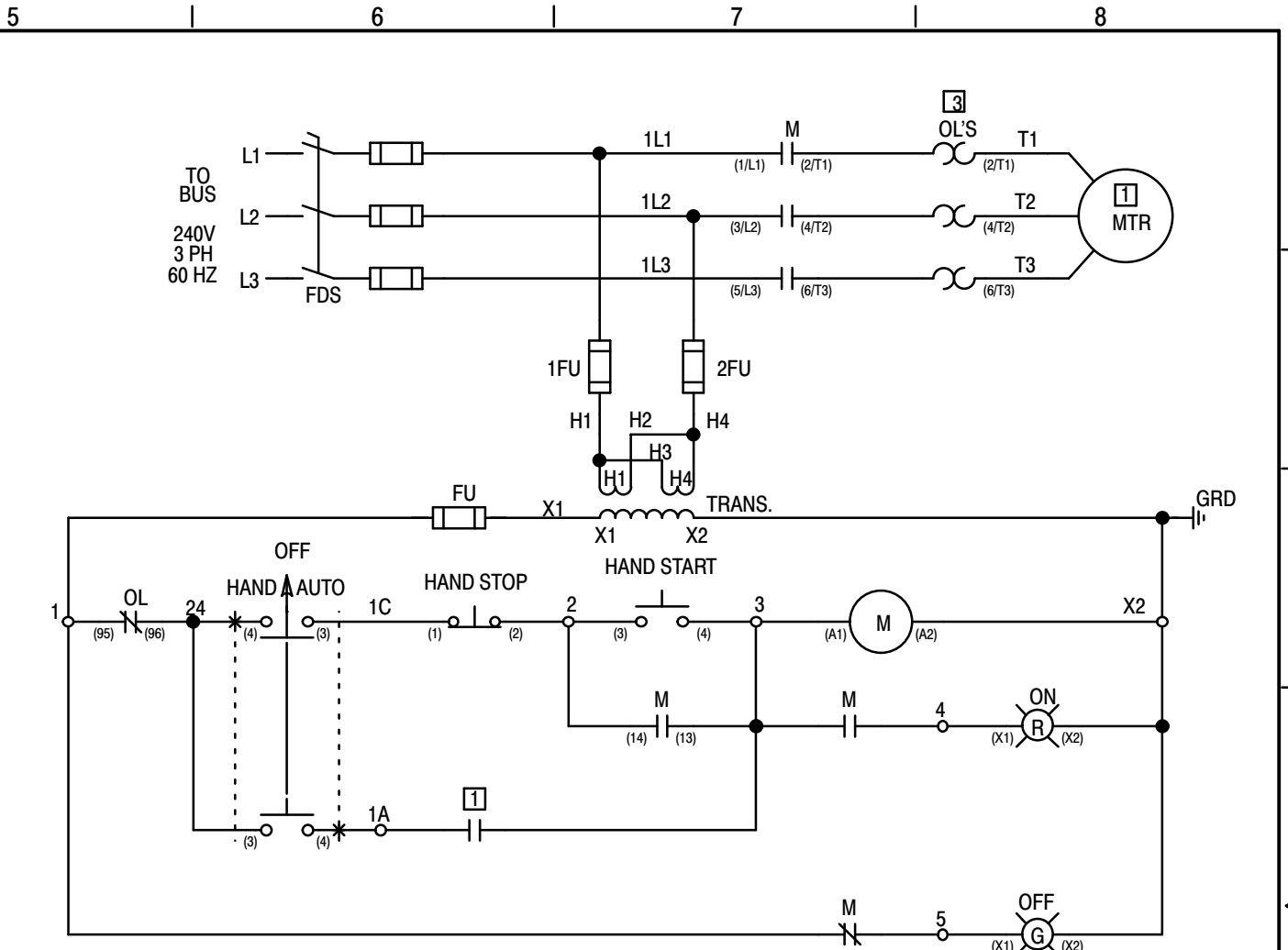
**NOTES:**

- [1] REMOTE DEVICE
- [2] THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.
- [3] **ATTENTION**  
DO NOT USE AUTOMATIC RESET MODE IN APPLICATIONS WHERE UNEXPECTED AUTOMATIC RESTART OF THE MOTOR CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.

1A (SPARE)



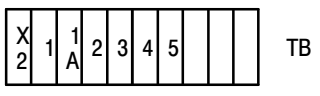
<b>References</b>		<b>Bul. 2407 304 Amp</b>		<b>ACAD</b>	
Revision		Type A			
Release					
<b>A</b>	<b>10/18/93</b>	Dr. PPN577B		Date 10/02/93	
Dimensions Apply Before Surface Treatment		Chkd. N/A		Date N/A	
Dimensions in Inches Tolerances Unless Otherwise Specified		Appd. N/A		Date N/A	
2 Place Decimal + .02				Sheet 1 Of 1	
3 Place Decimal + .005				Dwg Size <b>D</b>	
Angles + 15				Part No. <b>CS70024640</b>	
Refer. Book					



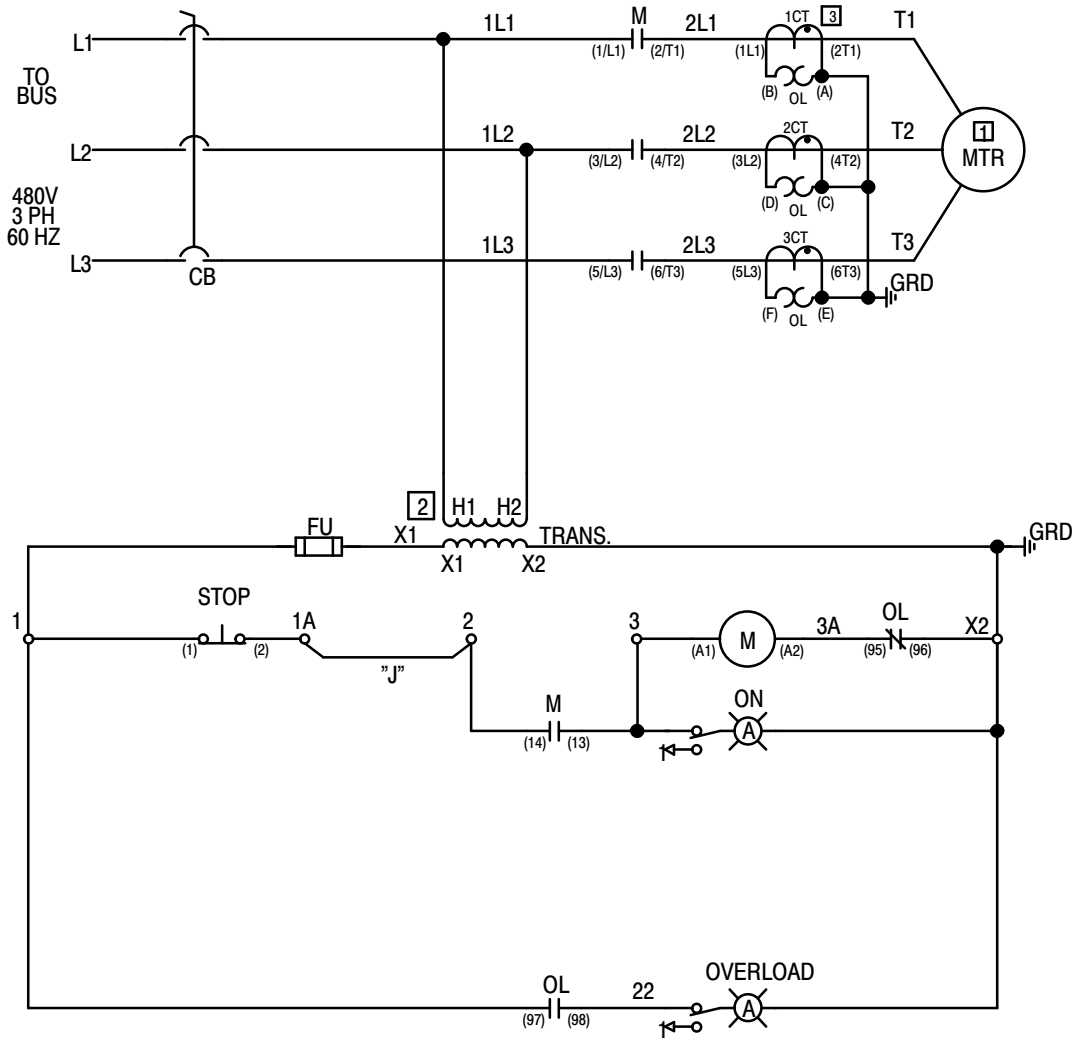
**NOTES:**

**1**  
REMOTE DEVICE

**3** **ATTENTION**  
DO NOT USE AUTOMATIC RESET MODE IN APPLICATIONS WHERE UNEXPECTED AUTOMATIC RESTART OF THE MOTOR CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



References		Bul. 2412 38 - 45 Amp Type B		ACAD	
Revision		Dimensions Apply Before Surface Treatment		 A ROCKWELL INTERNATIONAL COMPANY	
Release		Dimensions in Inches Tolerances Unless Otherwise Specified			
A	10/18/93	2 Place Decimal +.02		Dr. PPEN577B	Date 10/02/93
		3 Place Decimal +.005		Chkd. N/A	Date N/A
Refer. Book		Angles + 15		Appd. N/A	Date N/A
				Sheet 1 Of 1	Dwg Size
					<b>CS70024110</b>

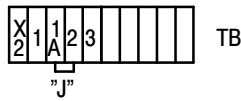


**NOTES:**

1 REMOTE DEVICE

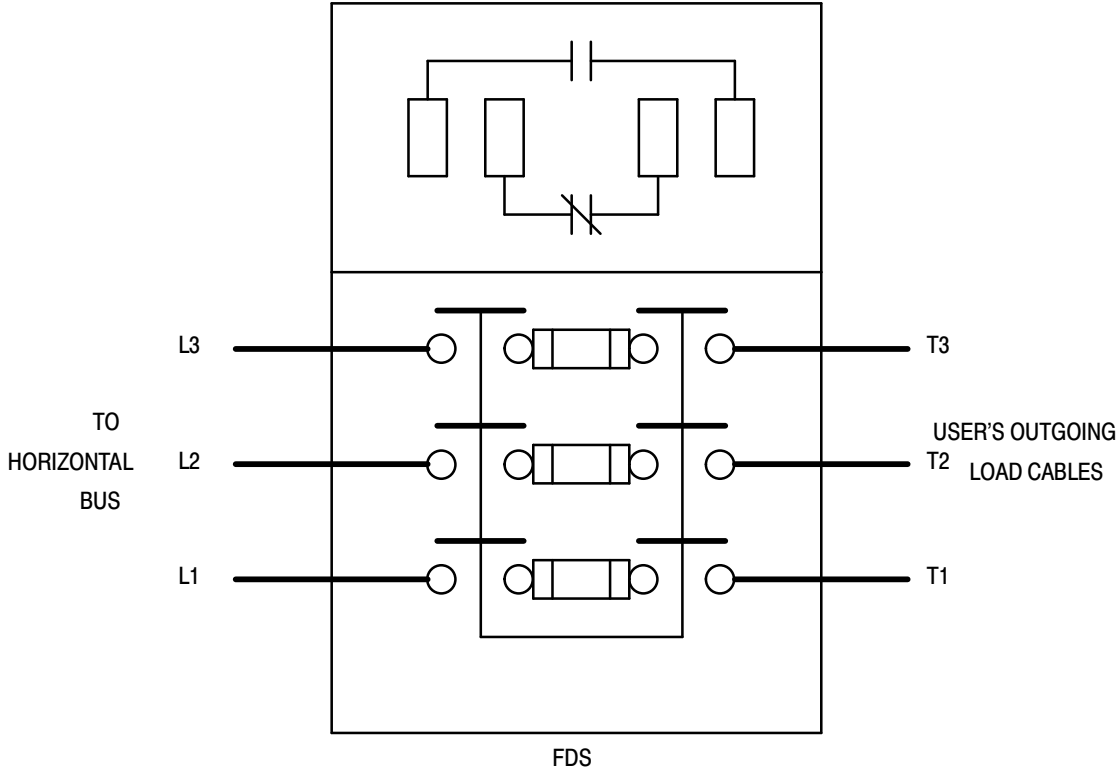
2 THIS UNIT IS SUPPLIED WITH AN INTERNALLY PROTECTED TRANSFORMER. PRIMARY FUSING NOT REQUIRED.

**ATTENTION**  
DO NOT USE AUTOMATIC RESET MODE IN APPLICATIONS WHERE UNEXPECTED AUTOMATIC RESTART OF THE MOTOR CAN CAUSE INJURY TO PERSONS OR DAMAGE TO EQUIPMENT.



<b>References</b>		<b>Bul. 2413 180 Amp (2.5 SF)</b>		<b>ACAD</b>	
<b>Revision</b>		<b>Dimensions Apply Before Surface Treatment</b>		<b>Type B</b>	
<b>Release</b>		<b>Dimensions in Inches Tolerances Unless Otherwise Specified</b>		<b>ALLEN-BRADLEY</b> <small>A ROCKWELL INTERNATIONAL COMPANY</small>	
<b>A</b>	<b>10/18/93</b>	<b>2 Place Decimal + .02</b>			
		<b>3 Place Decimal + .005</b>		<b>Chkd. N/A</b>	<b>Date N/A</b>
<b>Refer. Book</b>		<b>Angles + 15</b>		<b>Appd. N/A</b>	<b>Date N/A</b>
				<b>Sheet 1 Of 1</b>	<b>Dwg Size D</b>
				<b>CS70024111</b>	





NOTES:

UNIT INSTALLATION

THE HANDLE EXTENDER KIT, 2100-NE1, MAY BE NECESSARY FOR ANY TOP UNIT OPERATING HANDLES THAT ARE HIGHER THAN 6-1/2 FEET OFF THE GROUND FOR COMPLIANCE WITH NEC

<b>References</b>		<b>Bul. 2492F</b>		<b>ACAD</b>	
Revision		Dimensions Apply Before Surface Treatment			
Release		Dimensions in Inches Tolerances Unless Otherwise Specified			
A	10/21/93	2 Place Decimal +.02		Dr. PPE577B	Date 10/02/93
		3 Place Decimal +.005		Chkd. N/A	Date N/A
Refer. Book		Angles + 15		Appd. N/A	Date N/A
				Sheet 1 Of 1	Dwg Size <b>CS70024626</b>
				D	



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