



**Read the  
separate  
safety  
manual  
before  
installing,  
operating,  
or servicing**

Published Manual Number/ECN: ME7C4E11AE/2015162A

- Publishing System: TPAS2
- Access date: 05/04/2015
- Document ECNs: Latest

# Schematic/Electrical Parts

**30015 and 30022C4E,  
30010 and 30015CGE  
Coin Operated Washer**



PELLERIN MILNOR CORPORATION POST OFFICE BOX 400, KENNER, LOUISIANA 70063-0400, U.S.A.



## Table of Contents

### ME7C4E11AE/15162A

<b>Page</b>	<b>Description</b>	<b>Document</b>
1	Component Parts List	W7C4EPL/2009194N
5	Limited Standard Warranty	BMP720097/2008272A
6	How to Get the Necessary Repair Components	BIUUUD19/20081231
7	How to Use Milnor® Electrical Schematic Diagrams	BIUUUK01/20130308
20	Sample Schematic	BMP010012/2001503N
22	3 Phase Motor Connection Diagram	BMP850029/1999362B
23	3P Motor Diagram-Multivolt	W80008/2001253A
24	Control Box Layouts	W7C4ETG/2004064B
26	Board to Board Wiring	W7C4EBW/2010173B
28	Flushing Supplies	W7C4ECF/2006493B
30	Electric Valves	W7C4EEV/2002474B
32	Microprocessor Inputs	W7C4EIA/2010173B
34	Control Circuit Transformers	W7C4ELV/2003356B
36	Start Circuit and Door Interlock	W7C4ES+/2004064B
38	Variable Speed Inverter (30022 1 Phase before May,2009	W7C4EVPA/2002502B
40	Variable Speed Inverter (30010/15 1Ph. & 30010/15/22 3 Ph.before May 2009)	W7C4EVPB/2004064B
42	Variable Speed Inverter V1000	W7C4EVPC/2015162B



# COMPONENT PARTS LIST

<u>COMPONENT NUMBER</u>	<u>FUNCTION OF THIS COMPONENT NUMBER</u>	<u>WHERE TO FIND THIS COMPONENT</u>	<u>MILNOR P/N</u>	<u>DESCRIPTION</u>	<u>LOCATION</u>
	<b>&gt;&gt;&gt;CONTROL BOX DETAILS</b>				
001	DETAIL-CONTROL PANEL C4E	W7C4ETG	B2T2002037	TAG:C4E CONTROL PANEL	SEE FUNCTION
002	DETAIL-CONTROL PANEL CGE	W7C4ETG	B2T2004001	TAG:GGE CONTROL PANEL	SEE FUNCTION
003	DETAIL-INCOMING POWER BOX	W7C4ETG	B2T2003016	INCOMING POWER C4E,CGE	SEE FUNCTION
BA	<b>&gt;&gt;PRINTED CIRCUIT BOARDS</b>				
BAUP	BOARD-MICROPROCESSOR	W7C4EBW	08BT128AT	BD:120OUTPUT-8INPUT COIN->TEST	CONTROL PANEL
BAUS	BOARD-SWITCHPANEL	W7C4EBW	08BTCSTAS	BD:C4E COIN STATUS->TEST	SWITCH PANEL
CR	<b>&gt;&gt;RELAY-PILOT OR CONTROL</b>				
CRDL	RELAY-DOOR NOT LOCKED	W7C4EBW	09C02DDD12	RELAY 12VDC 3P FINE SIL CONT	CONTROL PANEL
CRDC	RELAY-DOOR CLOSED	W7C4ES+	09C024D71	RELAY 4PDT DIFGLD 14PN 240V	CONTROL PANEL
CS	<b>&gt;&gt;CONTACTOR-MOTOR STARTER</b>				
CSVP	CONTACTOR-ENABLE INVERTER	W7C4ES+	MESSAGE EW	SEE CSVP-1 OR -2 FOR CYL. SIZE	CONTROL PANEL
CSVP-1	CONTACTOR-ENABLE INVERTER 30010	W7C4ES+	09MC08A371	9A 3P BUL.100M CONT NR 240V5/6	CONTROL PANEL
CSVP-2	CONTACTOR-ENABLE INVERTER 30015/22	W7C4ES+	09MC08C371	16A 3P MCS CONT NR 240V5/6	CONTROL PANEL
EC	<b>&gt;&gt;CLUTCHES-ELECTRICAL</b>				
ECBK	CLUTCH-BRAKE CLUTCH	W7C4ES+	54H160A	CLUTCH 12VDC MA-7+3/8A-2G	DRIVE MOTORS
ECBS	SOLENOID=BLOCKING COIN	W7C4ES+	38C080S	SOLENOID(LOCK MECH) FOR 38C080	COIN ACCEPTOR
EF	<b>&gt;&gt;FUSE OR FUSE HOLDER</b>				
EF1	FUSE-CONTROL CIRCUIT X-BUS	W7C4ELV	09FF002AMG	FUSE BK/MDX 2 AMP 250V BUSS	CONTROL PANEL
EF2	FUSE-CONTROL CIRCUIT Y-BUS	W7C4ELV	09FF002AMG	FUSE BK/MDX 2 AMP 250V BUSS	CONTROL PANEL
EM	<b>&gt;&gt;ELECTROMAGNET AND SOLENOID</b>				
EMDL	SOLENOID-DOOR LOCK	W7C4EEV	09K062B71	SOLENOID 240/60--220/50 = ILOC	DOOR LTCH BX
ES	<b>&gt;&gt;POWER SUPPLY-ELECTRONIC</b>				
ESPS	POWER SUPPLY-MICROPROCESSOR	W7C4EBW	08PSS11212	PWR SUP 12W/OUT 85-264VAC/IN	SWITCH PANEL
EX	<b>&gt;&gt;TRANSFORMERS</b>				
EXCL	TRANSFORMER-CLUTCH 120V TO 16V	W7C4ES+	09UB100A16	EFMR 120/240 EBR 12VDC 90WATTS	CONTROL PANEL
EXHV	TRANSFORMER-INCOMING VOLT.240VAC	W7C4ELV	MESSAGE EW	SEE EX37-1, -2, OR -3 FOR VOLTAGE	CONTROL PANEL
EXHV-1	TRANSFORMER-208VAC TO 240VAC	W7C4ELV	09UB25AT71	AUTOXFMR 208V-230V 250VA	CONTROL PANEL
EXHV-2	TRANSFORMER-380/480 V TO 240	W7C4ELV	09UA025AAB	XFMR 380-480PRI/120-240SEC250V	CONTROL PANEL
EXHV-3	TRANSFORMER-600V	W7C4ELV	09U251AB71	XFMR 600VPRI/240VSC-250VA-3%REG	CONTROL PANEL
MR	<b>&gt;&gt;MOTORS</b>				
MTWE	MOTOR-BASKET DRIVE	W7C4EVPB	MESSAGE EW	SEE MTWE-1 OR -2 FOR CYL. SIZE	BELOW SHELL
MTWE-1	MOTOR-BASKET DRIVE 30010	W7C4EVPB	39G552AATD	1.5HP4P OLSW 380/480 50/6DSHFT	BELOW SHELL

# COMPONENT PARTS LIST

W7C4EPL/2009194N

<u>COMPONENT NUMBER</u>	<u>FUNCTION OF THIS COMPONENT NUMBER</u>	<u>WHERE TO FIND THIS COMPONENT</u>	<u>MILNOR P/N</u>	<u>DESCRIPTION</u>	<u>LOCATION</u>
MTWE-2	MOTOR-BASKET DRIVE 30015/22	W7C4EVPB	39G553AATD	3HP4P OLSW 380/480 5/6 DBLSHFT	BELOW SHELL
MV	>>>INVERTERS				
MV/INV	INVERTER-BASKET DRIVE	W7C4E/PA, B or C	MESSAGE EW	SEE MV/INV-1,2 OR 3 FOR CYL. SIZE	CONTROL PANEL
MV/INV-1<05/09	INVERTER-BASKET DRIVE 30022C4E 1PH	W7C4E/PA	09MV050F74	VARSPEED V MACHINES 5HP 230V	CONTROL PANEL
MV/INV-2<05/09	INVERTER-BASKET DRIVE 30010CGE 3PH	W7C4E/VPB	09MV020G74	INVERTER 2HP 8A 230V (GPD305)	CONTROL PANEL
MV/INV-3<05/09	INVERTER-BASKET DRIVE 30010CGE 1PH, 30015CGE+C4E ALL, & 30022C4E 3PH	W7C4E/VPB	09MV030G74	VARSPEED 3HP 11A 230V GPD305	CONTROL PANEL
MV/INV-1=>05/09	INVERTER-BASKET DRIVE 30022C4E 1PH	W7C4E/VPC	09MWWB01774	V1000 INVERTER 17.5AMP 230V	CONTROL PANEL
MV/INV-2=>05/09	INVERTER-BASKET DRIVE CGE/C4E 3PH	W7C4E/VPC	09MWWB00874	V1000 INVERTER 8AMP 230V	CONTROL PANEL
MV/INV-3=>05/09	INVERTER-BASKET DRIVE 30010/15CGE 1PH, 30015CGE+C4E ALL, & 30022C4E 3PH	W7C4E/VPC	09MWWB01174	V1000 INVERTER 11AMP 230V	CONTROL PANEL
SK	>>SWITCH-KEYLOCK				
SKAT	SWITCH-ATTENDENT	W7C4EIA	09N127C	KEYSW SPST 7A120VAC SCREW TERM	SWITCH PANEL
SK	>>SWITCH-HAND				
SKAT	SWITCH-VOLTAGE SELECTOR	W7C4EIA	09N050	TOGSW SPDT NO OFF 10A250V	CONTROL PANEL
SM	>>SWITCH-MECHANICAL OPERATED				
SMD	SWITCH-DOOR INTERLOCK	W7C4ES+	09R014A	MINI-SW SPDT STAKON #V15G1C26K	DOOR LTCH BX
SMVB	SWITCH-VIBRATION	W7C4EIA	09R020A	SW NO/NC VIBRA#BZ-2RW84429-P52	CONTROL PANEL
SP	>>SWITCH-PRESSURE OPERATED				
SPLL	PRESSURE SW-LOW WATER LEVEL	W7C4EIA	09N086A	PRESS SWITCH EATON #738-761	CONTROL PANEL
PX	>>PROX-SWITCH				
PXCC	SWITCH-COIN COUNT QUARTER ONLY	W7C4EIA	38C080	REJECTOR F77.1-W2004-14	COIN ACCEPTOR
PXCCA	SWITCH-COIN COUNT QUARTER+DOLLAR	W7C5EIA	38C081	DUAL REJECTOR 240V	COIN ACCEPTOR
PXDL	SWITCH=DOOR UNLOCKED	W7C4EBW	09RPS03RDS	3MM SENSING RECTANGULAR SHLD	DOOR LTCH BX
VE	>>VALVE-ELECTRIC OPERATED				
VEDR	VALVE-DRAIN	W7C4EEV	96D350A71	DRINVAL 3"N/O MTRDR240V 50/60C	REAR CONSOLE
VEWC	VALVE-COLD WATER	W7C4EEV	96P053C71	3/4"INLET 3/4"HOSEOUT 220V	REAR CONSOLE
VEWH	VALVE-HOT WATER	W7C4EEV	96P053C71	3/4"INLET 3/4"HOSEOUT 220V	REAR CONSOLE
VEC1	VALVE-CHEM POCKET 1	W7C4ECF	N/A	PROVIDED BY OTHERS	
VEC2	VALVE-CHEM POCKET 2	W7C4ECF	N/A	PROVIDED BY OTHERS	
VEC3	VALVE-CHEM POCKET 3	W7C4ECF	N/A	PROVIDED BY OTHERS	
ZF	RECTIFIER				
ZFBK	RECTIFIER-BRAKE	W7C4ES+	09A020EBR	RECTIFIER (EBR) 15A/600PIV	CONTROL PANEL

# COMPONENT PARTS LIST

<u>COMPONENT NUMBER</u>	<u>FUNCTION OF THIS COMPONENT NUMBER</u>	<u>WHERE TO FIND THIS COMPONENT</u>	<u>MILNOR P/N</u>	<u>DESCRIPTION</u>	<u>LOCATION</u>
ZFBKS	RECTIFIER-BRAKE SAFETY	W7C4ES+	09A020EBR	RECTIFIER (EBR) 15A/600PIV	CONTROL PANEL





## **PELLERIN MILNOR CORPORATION LIMITED STANDARD WARRANTY**

We warrant to the original purchaser that MILNOR machines including electronic hardware/software (hereafter referred to as "equipment"), will be free from defects in material and workmanship for a period of one year from the date of shipment (unless the time period is specifically extended for certain parts pursuant to a specific MILNOR published extended warranty) from our factory with no operating hour limitation. This warranty is contingent upon the equipment being installed, operated and serviced as specified in the operating manual supplied with the equipment, and operated under normal conditions by competent operators.

Providing we receive written notification of a warranted defect within 30 days of its discovery, we will at our option repair or replace the defective part or parts, FOB our factory. We retain the right to require inspection of the parts claimed defective in our factory prior to repairing or replacing same. We will not be responsible, or in any way liable, for unauthorized repairs or service to our equipment, and this warranty shall be void if the equipment is tampered with, modified, or abused, used for purposes not intended in the design and construction of the machine, or is repaired or altered in any way without MILNOR's written consent.

Parts damaged by exposure to weather, to aggressive water, or to chemical attack are not covered by this warranty. For parts which require routine replacement due to normal wear such as gaskets, contact points, brake and clutch linings, belts, hoses, and similar parts the warranty time period is 90 days.

We reserve the right to make changes in the design and/or construction of our equipment (including purchased components) without obligation to change any equipment previously supplied.

ANY SALE OR FURNISHING OF ANY EQUIPMENT BY MILNOR IS MADE ONLY UPON THE EXPRESS UNDERSTANDING THAT MILNOR MAKES NO EXPRESSED OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE OR ANY OTHER WARRANTY IMPLIED BY LAW INCLUDING BUT NOT LIMITED TO REDHIBITION. MILNOR WILL NOT BE RESPONSIBLE FOR ANY COSTS OR DAMAGES ACTUALLY INCURRED OR REQUIRED AS A RESULT OF: THE FAILURE OF ANY OTHER PERSON OR ENTITY TO PERFORM ITS RESPONSIBILITIES, FIRE OR OTHER HAZARD, ACCIDENT, IMPROPER STORAGE, MIS-USE, NEGLIGENCE, POWER OR ENVIRONMENTAL CONTROL MALFUNCTIONS, DAMAGE FROM LIQUIDS, OR ANY OTHER CAUSE BEYOND THE NORMAL RANGE OF USE. REGARDLESS OF HOW CAUSED, IN NO EVENT SHALL MILNOR BE LIABLE FOR SPECIAL, INDIRECT, PUNITIVE, LIQUIDATED, OR CONSEQUENTIAL COSTS OR DAMAGES, OR ANY COSTS OR DAMAGES WHATSOEVER WHICH EXCEED THE PRICE PAID TO MILNOR FOR THE EQUIPMENT IT SELLS OR FURNISHES.

THE PROVISIONS ON THIS PAGE REPRESENT THE ONLY WARRANTY FROM MILNOR AND NO OTHER WARRANTY OR CONDITIONS, STATUTORY OR OTHERWISE, SHALL BE IMPLIED.

WE NEITHER ASSUME, NOR AUTHORIZE ANY EMPLOYEE OR OTHER PERSON TO ASSUME FOR US, ANY OTHER RESPONSIBILITY AND/OR LIABILITY IN CONNECTION WITH THE SALE OR FURNISHING OF OUR EQUIPMENT TO ANY BUYER.

## How to Get the Necessary Repair Components



This document uses Simplified Technical English.

Learn more at <http://www.asd-ste100.org>.

You can get components to repair your machine from the approved supplier where you got this machine. Your supplier will usually have the necessary components in stock. You can also get components from the Milnor® factory.

Tell the supplier the machine model and serial number and this data for each necessary component:

- The component number from this manual
- The component name if known
- The necessary quantity
- The necessary transportation requirements
- If the component is an electrical component, give the schematic number if known.
- If the component is a motor or an electrical control, give the nameplate data from the used component.

To write to the Milnor factory:

Pellerin Milnor Corporation  
Post Office Box 400  
Kenner, LA 70063-0400  
UNITED STATES

Telephone: 504-467-2787  
Fax: 504-469-9777  
Email: [parts@milnor.com](mailto:parts@milnor.com)

— End of BIUUUD19 —

BIUUUK01 (Published) Book specs- Dates: 20130308 / 20130308 / 20130308 Lang: ENG01 Applic: PCR UUU

## How to Use Milnor® Electrical Schematic Diagrams

Milnor® electrical schematic manuals contain a table of contents/component list and a set of schematic drawings. These documents are cross referenced and must be used together.

The table of contents/components list shows, for every component on every schematic in the manual, the component item number (explained in detail below), statement of function, parent schematic number, part number, description and electric box location. In older manuals, two component lists are provided: List 1 sorts the components by function, and List 2 by type of component. Newer schematic manuals include only the list sorted by component number.

The schematic drawings use symbols for each electromechanical component, and indicate the function of each. Integrated circuits are not shown, but the function of each microprocessor input and output is stated. Certain electrical components not pertinent to circuit logic, such as wire connectors, are not represented on the schematic.

Most machines require several schematics to describe the complete control system and all the options available on the included models. In most manuals there are some schematic pages that don't apply to your specific machine because certain options and configurations are mutually exclusive or are not necessary in all markets. You may find it helpful to mark or remove such pages. A schematic page that only applies to a subset of machines will normally state, in the title, which models and/or options it covers. Compare this with the nameplate on your machine and with your purchase records.

Each schematic is devoted to circuits with common functions (e.g., microprocessor inputs, motor contactors). Schematics appear in the manual in alphanumeric order.

### 1. Component Prefix Classifications and Descriptions

Component item numbers consist of up to six characters and appear as part of a component's symbol on the schematic. The first two characters indicate the general class of component, and the remaining characters are a mnemonic for the function. For example, "CD" is the code for all time delay relays, and "SR" stands for safety reset. Thus, CDSR is a time delay relay that serves as a safety reset.

The following are descriptions of electrical components used in Milnor® machines. Descriptions are in alphabetical order by the component class code (two character prefix).

**Note 1:** Some component class codes do not have a corresponding symbol, but are represented by a box and an accompanying note describing the component. Examples of such codes are BA (printed circuit board), ED (electronic display), and ES (electronic power supply).

**BA=Printed Circuit Board**—Insulating substrate on which a thin pattern of copper conductors has been formed to connect discrete electronic components also mounted on the board.

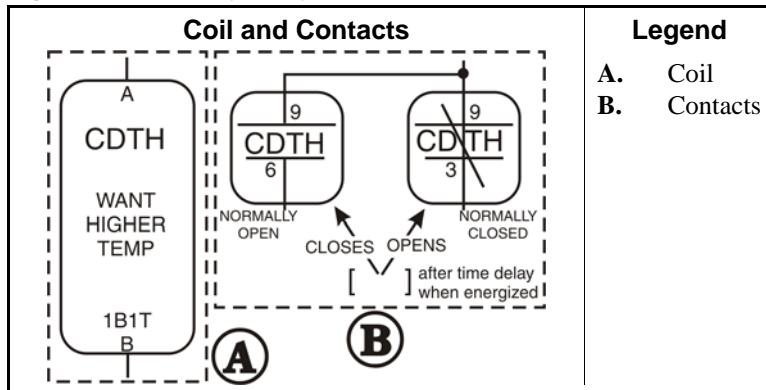
**CB=Circuit Breaker (Figure 1)**—Automatic switch that opens an electric circuit in abnormal current conditions (e.g., an overload).

**Figure 1: Circuit Breaker (CB)**



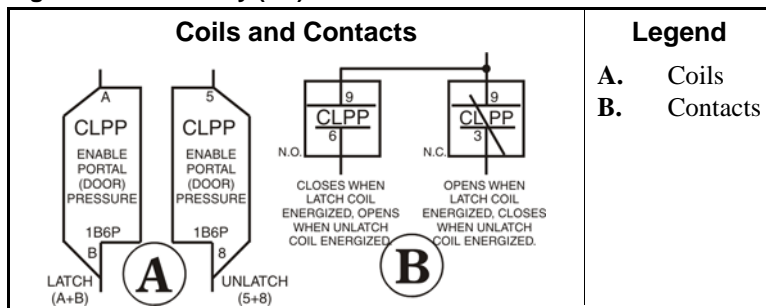
**CD=Control, Time Delay Relay (Figure 2)**—A relay whose contacts switch only after a fixed or adjustable delay, once voltage has been applied to its coil. The contacts switch back to normal (de-energized state) immediately when the voltage is removed.

**Figure 2: Time Delay Relay (CD)**



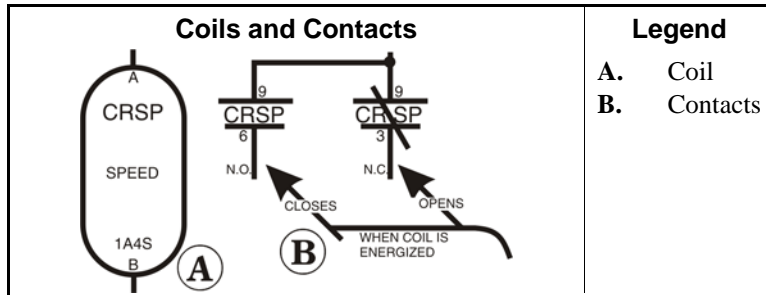
**CL=Control, Latch Relay (Figure 3)**—A relay which latches in an energized or set position when operated by one coil (the latch/set coil). The relay stays latched even though coil voltage is removed. The relay releases or unlatches when voltage is applied to a second coil (the unlatch/reset coil).

**Figure 3: Latch Relay (CL)**

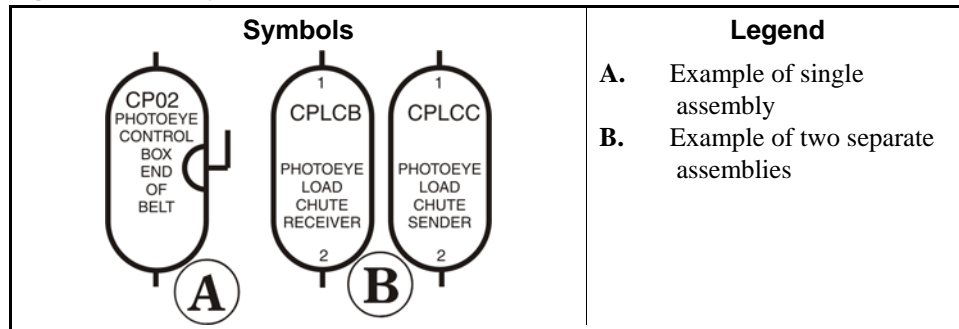


**CR=Control, Relay (Figure 4)**—A relay whose contacts switch immediately when voltage is applied to its coil and revert to normal when the voltage is removed.

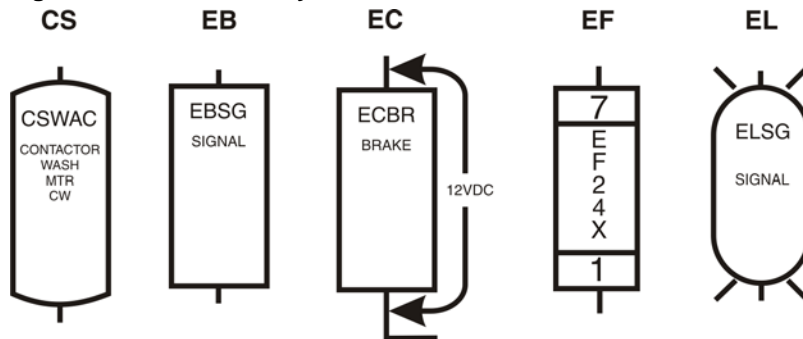
**Figure 4: Standard Relay (CR)**



**CP=Control, Photo-Eye (Figure 5)**—Photo-eyes sense the presence of an object without direct physical contact. Photo-eyes consist of a transmitter, receiver, and output module. These components may be housed in one assembly with the transmitter bouncing light off of a reflector to the receiver, or these components can be housed in two separate assemblies with the transmitter pointed directly at the receiver. The photo-eye can be set to turn on its output either when the light beam becomes blocked (dark operate) or when it becomes un-blocked (light operate).

**Figure 5: Photo-eye (CP)**

**CS=Control, Contactor/Motor Starter (Figure 6)**—A relay capable of handling heavier electrical loads, usually a motor.

**Figure 6: Other Control Symbols**

**EB=Electric Buzzer (Figure 6)**—An audible signaling device.

**EC=Electric Clutch (Figure 6)**—A clutch consists of a coil and a rotor. The rotor has two separate rotating plates. These plates are free to rotate independent of each other until the coil is energized. Once energized the two plates turn as one.

**ED=Electronic Display**—A visual presentation of data, such as an LCD (liquid crystal display), LED (light emitting diode) display, or VFD (vacuum florescent display).

**EF=Electric Fuse (Figure 6)**—A fuse is an over-current safety device with a circuit opening fusible member which is heated and severed by the passage of over-current through it.

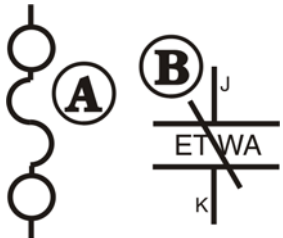
**EL=Electric Light (Figure 6)**—Indicator lights may be either incandescent or fluorescent.

**EM=Electro Magnet Solenoid**—A device consisting of a core surrounded by a wire coil through which an electric current is passed. While current is flowing, iron is attracted to the core (e.g., a pinch tube drain valve solenoid).

**ES=Electronic Power Supply**—A device that converts AC (alternating current) to filtered and regulated DC (direct current). The input voltage to the power supply is usually 120 or 240 VAC. The output is +5, +12, and -12 VDC.

**ET=Thermal Overload (Figure 7)**—A safety device designed to protect a motor. A thermal overload consists of an overload block, heaters, and an auxiliary contact. The auxiliary contact is normally installed in a safety (three-wire) circuit that stops power to the motor contactor coil when a motor overload occurs.

Figure 7: Thermal Overload (ET)

Schematic Symbol	Legend
	<p>A. Heater (one per phase)</p> <p>B. Overload relay; contacts open if overload condition exists</p>

**EX=Electrical Transformer (Figure 8)**—A device that transfers electrical energy from one isolated circuit to another, often raising or lowering the voltage in the process.

**KB=Keyboard**—Device similar to a typewriter for making entries to a computer.

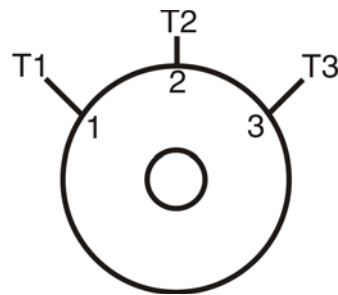
**MN=Electronic Monitor (CRT)**—A cathode ray tube used for visual presentation of data.

**MR=Motors (Figure 9)**—Electromechanical device that converts electrical energy into mechanical energy.

Figure 8: Transformer (EX)



Figure 9: Electric Motor (MR)

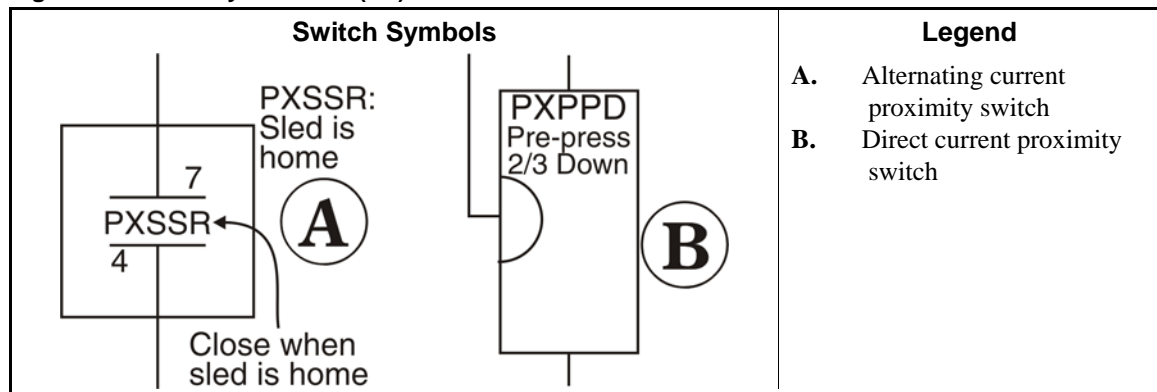


**MV=Motor (Variable Speed) Inverter**—To vary the speed of an AC motor, the volts to frequency ratio must be kept constant. The motor will overheat if this ratio is not maintained. The motor variable speed inverter converts three phase AC to DC. The inverter then uses this DC voltage to generate AC at the proper voltage and frequency for the commanded speed.

**Note 2:** Switch symbols used in the schematics and described below always depict the switch in its un-actuated state.

**PX=Proximity Switch (Figure 10)**—A device which reacts to the proximity of a target without physical contact or connection. The actuator or target causes a change in the inductance of the proximity switch which causes the switch to operate. Proximity switches can be two-wire (AC) or three-wire (DC) devices.

Figure 10: Proximity Switches (PX)



**SC=Switch, Cam Operated (Figure 11)**—A switch in which the electrical contacts are opened and/or closed by the mechanical action of a cam(s). Applications include 35-50 pound timer operated machines, Autospot, timer reversing motor assembly, and some balancing systems.

**SH=Switch, Hand Operated (Figure 12)**—A switch that is manually operated (e.g., *Start button*, *Master switch*, etc.).

Figure 11: Cam Switch (SC)

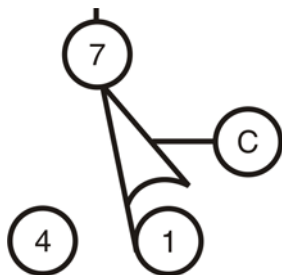
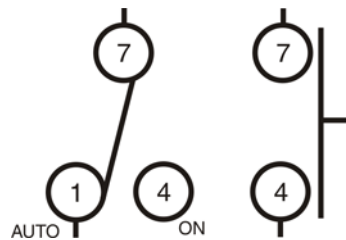


Figure 12: Hand Operated Switch (SH)



**SK=Switch, Key Lock (Figure 13)**—A switch that requires a key to operate. This prevents unauthorized personnel from gaining access to certain functions (e.g., the *Program menu*).

**SL=Switch, Level Operated (Figure 14)**—A switch connected to a float that causes the switch to open and close as the level changes.

Figure 13: Key Switch (SK)

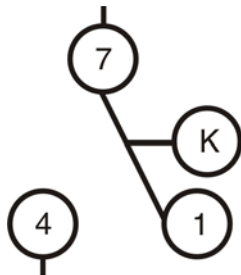
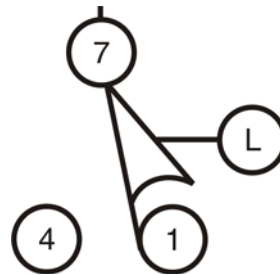


Figure 14: Level Switch (SL)



**SM=Switch, Mechanically Operated (Figure 15)**—A switch that is mechanically operated by a part of or the motion of the machine (e.g., door closed switch, tilt limit switches, etc.)

**SP=Switch, Pressure Operated (Figure 16)**—A switch in which a diaphragm presses against a switch actuator.

Figure 15: Mechanical Switch (SM)

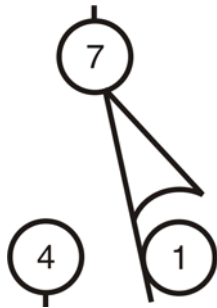
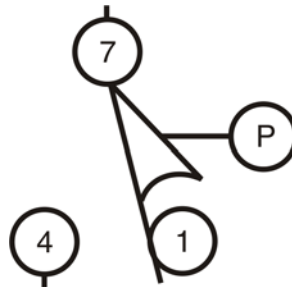


Figure 16: Pressure Switch (SP)



**ST=Switch, Temperature Operated (Figure 17)**—A switch that is actuated at a preset temperature (e.g., dryer safety probes) or has adjustable set points (e.g., Motometers or Combistats).

**TB=Terminal Board (Figure 18)**—A strip or block for attaching or terminating wires.

Figure 17: Temperature Switch (ST)

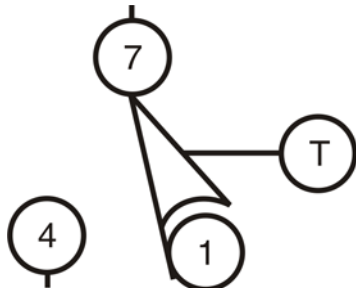


Figure 18: Terminal Board (TB)



**VE=Valve, Electric Operated (Figure 19)**—A valve operated by an electric coil to control the flow of fluid. The fluid can be air, water or hydraulic.

Figure 19: Electrically Operated Valve (VE)



**ZF=Rectifier (Figure 20)**—A solid state device that converts alternating current to direct current.



Figure 20: Bridge Rectifier (ZF)

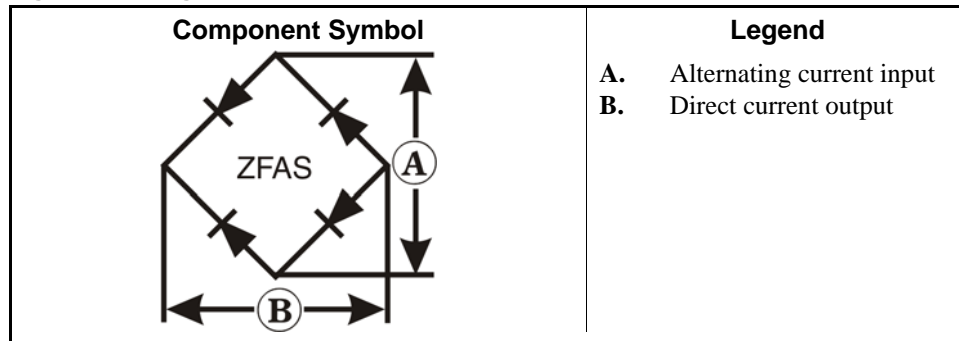
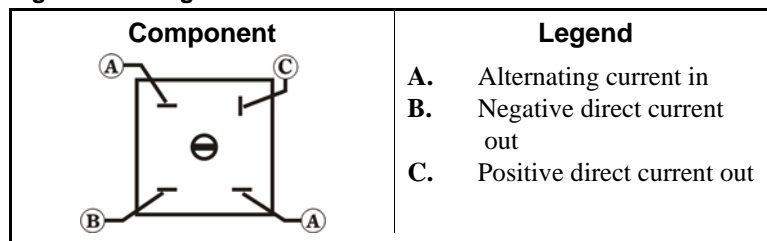


Figure 21: Bridge Rectifier



**WC=Wiring Connector**—A coupling device for joining two cables or connecting a cable to an electronic circuit or piece of equipment. Connectors are male or female, according to whether they plug into or receive the mating connector.

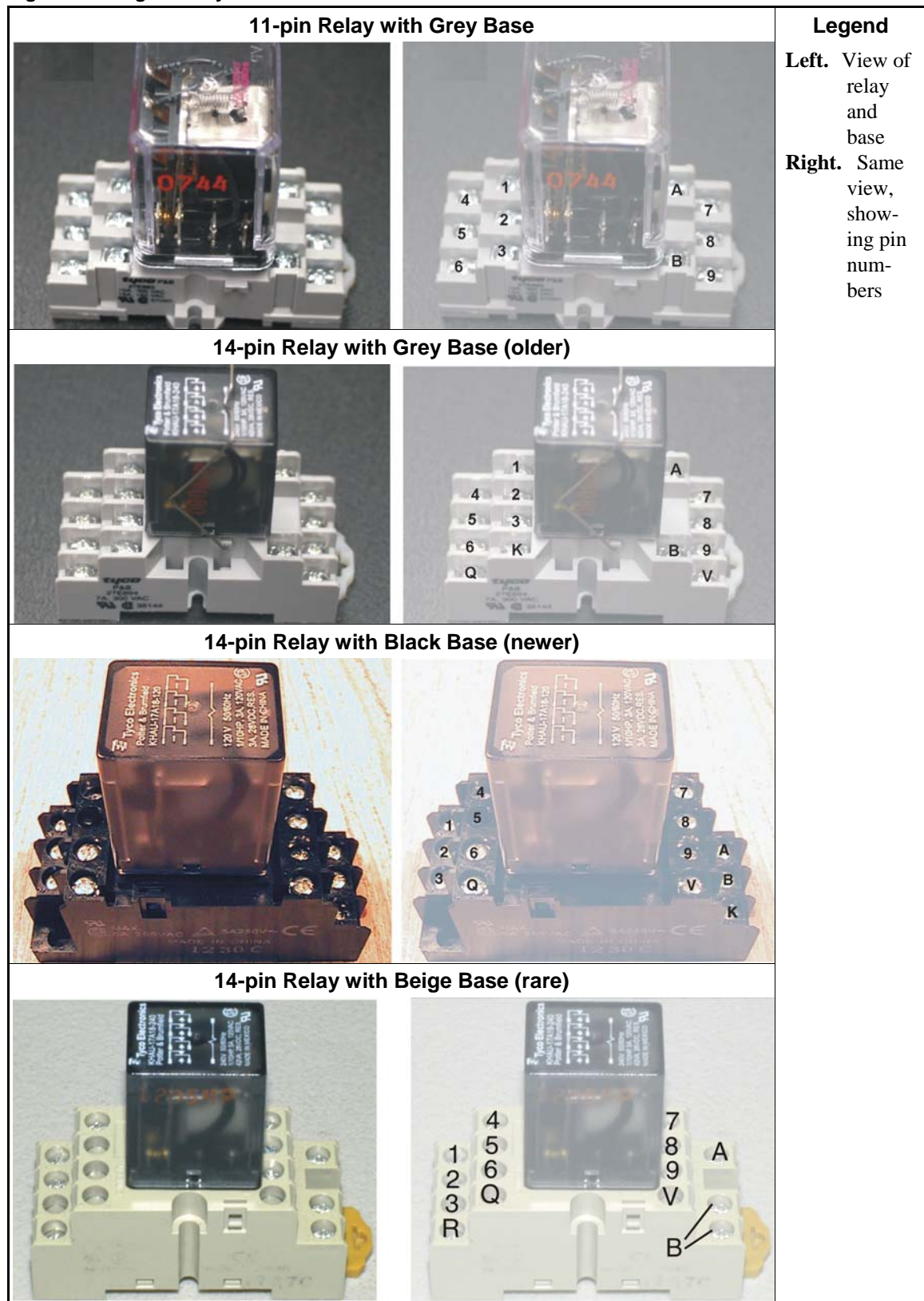
## 2. Component Terminal Numbering



**CAUTION 1: Risk of Mis-wiring**—Due to electrical component manufacturing inconsistencies, the pin numbers imprinted on components such as connectors and relay bases used on Milnor machines often do not correspond to the pin numbers shown in the schematics.

- Ignore pin numbers imprinted on in-line connectors (e.g., Molex connectors) and relay bases.
- Use the pin identification illustrations herein to identify pins on these components.

Figure 22: Plug-in Relays



**Note 3:** Relay functional names ending with the letter "M" (e.g., CRxxM) are not discrete components but are a component of a printed circuit board. They are usually not individually replaceable.

**Figure 23: AMP Connector Pin Locations**

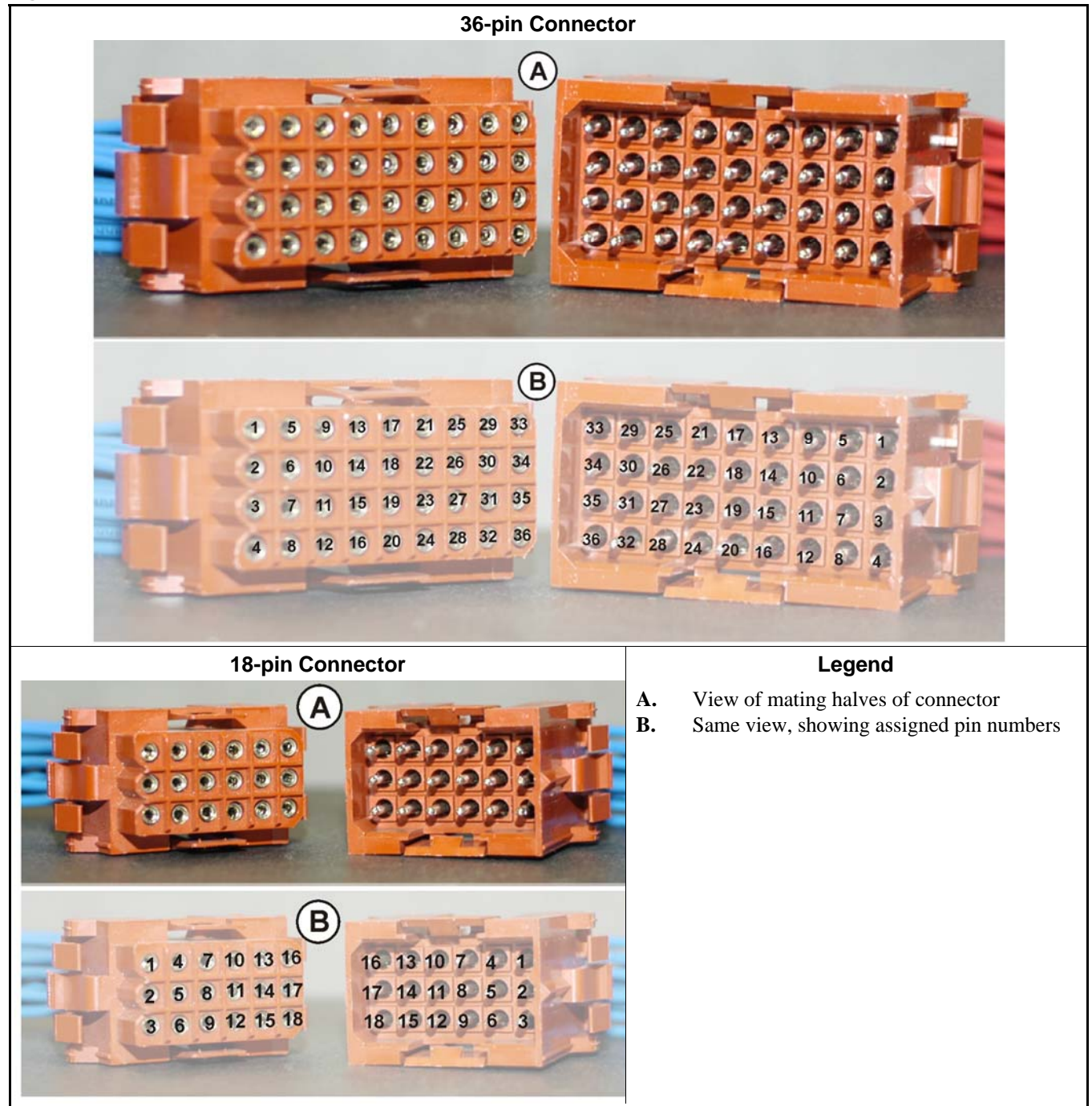




Figure 24: Molex Connector Pin Locations

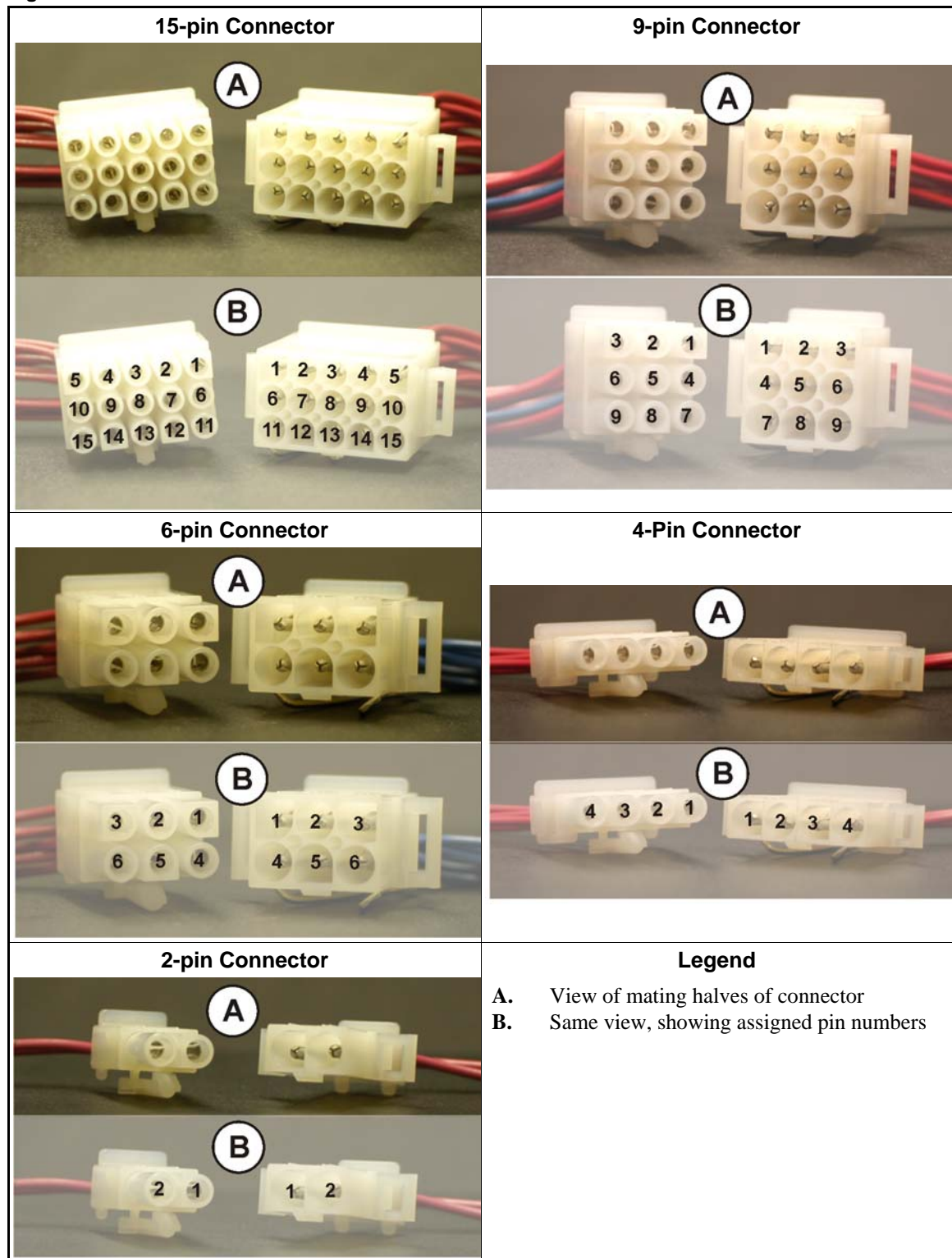


Figure 25: Pressure Switch

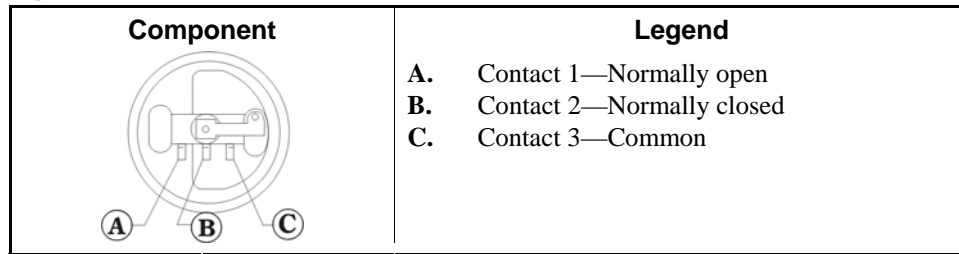


Figure 26: Toggle Switch

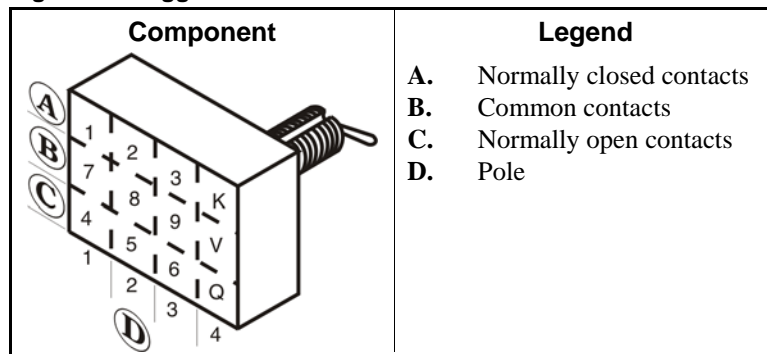
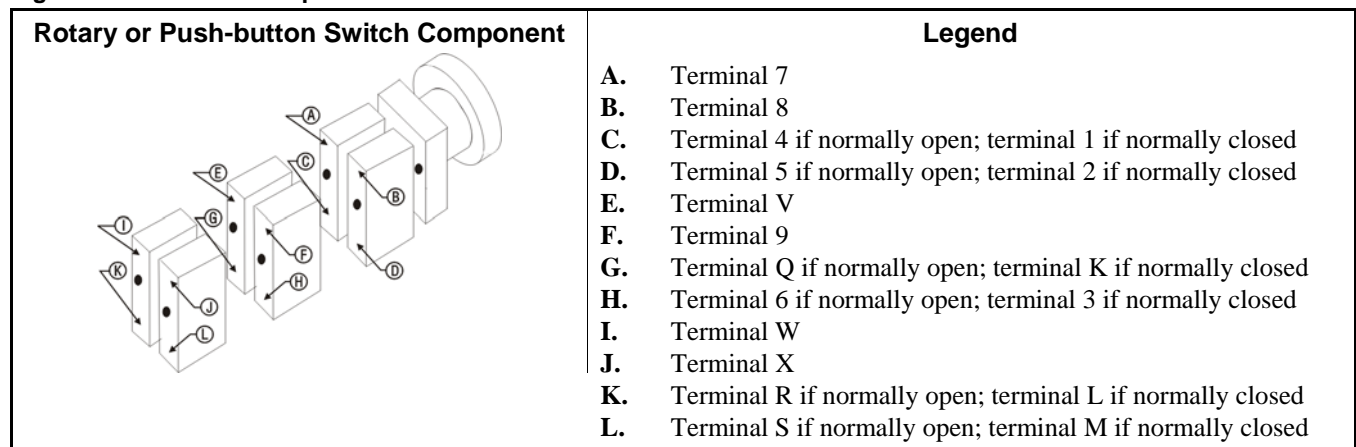


Figure 27: Switch with Replaceable Contact Blocks



### 3. Features of Milnor® Electrical Schematic Diagrams

Document BMP010012 (following this section) is a sample schematic, based on a schematic diagram for the Milnor® gas dryer. For the purposes of this exercise, the schematic is shown gray and explanations of the items on the schematic are shown black.

The item numbers below correspond to the circled item numbers shown on the drawing.

1. The first six characters of the drawing number (W6DRYG) indicate that this is a wiring diagram (W), identify the generation of controls (6), and identify the type of machine (DRYG=Gas Dryer). These characters appear in the drawing number of every schematic in the set.

The characters following the first six are unique to each drawing. The two characters identified as the page number are an abbreviation for the function performed by the depicted

circuitry (S+=three-wire circuit) and establish the order in which the schematic occurs in the manual (schematics are arranged in alpha-numeric order in the manual).

Whenever circuitry changes are significant enough to warrant publishing a new schematic drawing, the new drawing number will be the same as the old except for the major revision letter (A in the example).

2. Included in the drawing title are the class of control system, the title of this circuit, and the circuit voltage.
3. Line numbers are provided along the bottom edge of the drawing. These permit service personnel in the field and at the Milnor® factory to quickly relate circuit locations when discussing troubleshooting over the phone. Page and line numbers are referenced on the drawing as explained in items five and six below.
4. Relay contacts show the page and line number on which the relay coil may be found. This is the type of cross referencing most frequently used in troubleshooting.
5. Relay coils show the page and line number on which its associated contacts are located.
6. Relay contacts and relay coils show the physical location of the relay.
7. The designation MTA applies to electronic circuit board connections. Typically, a control system will contain several different types of circuit boards and one or more boards of each type. A numerical suffix identifies the board type and a numerical prefix identifies which one of several boards of a given type is being depicted. For example, the designation 1MTA5 identifies this as the first I/O board (8 output, 16 input board) in the control system. As shown on the drawing, a pin number follows the board number, separated by a dash. Thus, 1MTA5-9 is pin 9 on this board. The numerical designations for board types vary from one control system to another. Some of the board types commonly encountered on the Mark V and Mark VI washer-extractor control and their designations are as follows:
  - MTM1-MTM8 = Mother board
  - MTA1-MTA5 = 8 output, 16 input (8/16) boards
  - MTA11-MTA14 = 24 output boards
  - MTA30-MTA40 = processor boards
  - MTA41-MTA43 = digital to analog (D/A) boards
  - MTA51-MTA55 = analog to digital (A/D) boards
  - MTA81-MTA85 = balance A-D board

The complete listing of the boards utilized in a given control system can be found in the component list for that system.

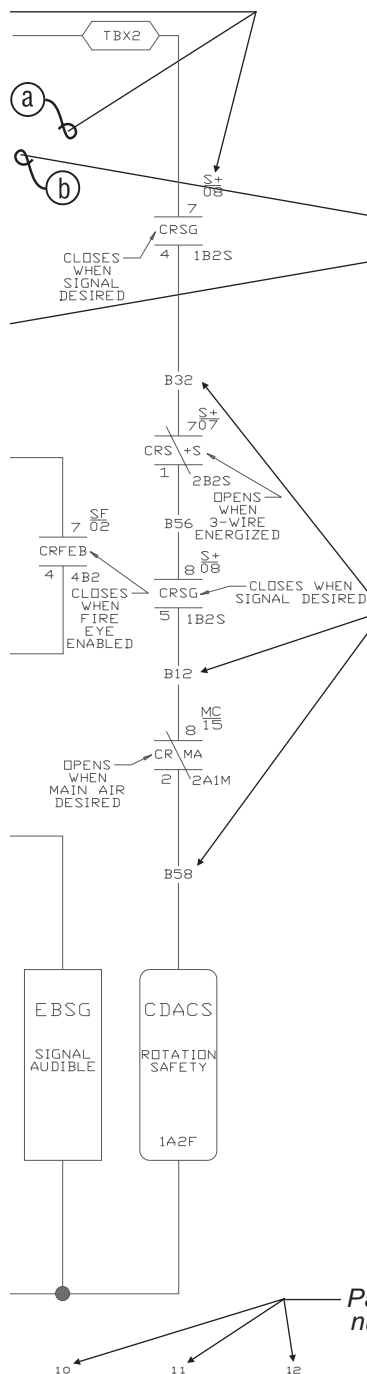
8. Wire numbers, as described earlier in this section, are shown at appropriate locations on the schematic drawing.
9. Where diamond symbols appear at the end of a conductor, these are match points for continuing the schematic on another drawing. The page and line number that continues the circuit is printed adjacent to the diamond symbol. Where more than one match point appears on the referenced page, match diamonds containing corresponding letters.

— End of BIUUUK01 —









7 **1MTA5-9**

Mass termination assembly  
Pin number  
MTA designation on board  
Board MTA group designation

An MTA is a connection on an electronic circuit board. The notes and the tag page locate the appropriate board.

8 **Wire identification marking.**  
This designation is stamped on the wire every 6 inches and is used with the signal routing table.

Major revision (letter) **A**  
Page number (S+) **1**  
Machine type (Gas fired dryer) **S+**  
6th generation of controls **6**  
W = Wiring **W**  
Class of control system **DRYG**  
Title of this circuit **SCHEMATIC: 3-WIRE CIRCUIT**  
Voltage of this circuit **24V1P50HZ/24V1P60HZ**

PELLERIN MILNOR CORPORATION

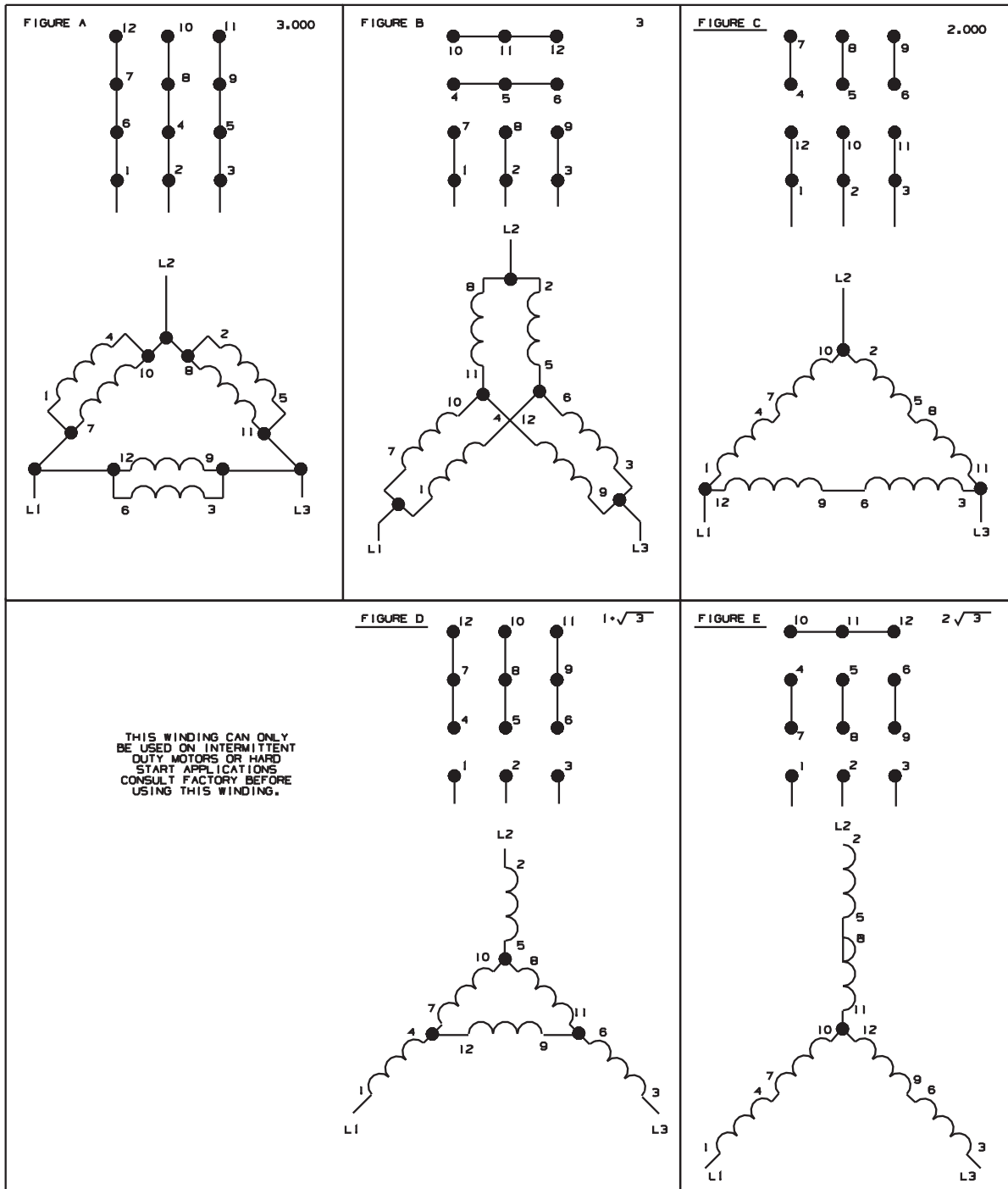
NOTES:

1. TBL IS LOCATED IN LEFT CONTROL BOX.
2. TBA IS LOCATED IN RIGHT CONTROL BOX.
3. TBX IS LOCATED IN LEFT CONTROL BOX.
4. 1MTA5 IS LOCATED ON BID1 (8 OUTPUT-16 INPUT BOARD).
5. REMOVE (J1) IF DRYER HAS VALVE SET SHUT OPTION.

Page line numbers

3

FIGURE	ELECTRICAL VALUES	SUFFIXES							
		B		H		M		T	
		50HZ	60HZ	50HZ	60HZ	50HZ	60HZ	50HZ	60HZ
A	1,000	208	230			200	220	220	240
B	$\sqrt{3}$			208	240	346	380	380	
C	2,000	416	460	220	240	400	440	440	480
D	$1 + \sqrt{3}$						600		
E	$2\sqrt{3}$			380					



06 07 08 09 10 11 12 13 14 15 16 17

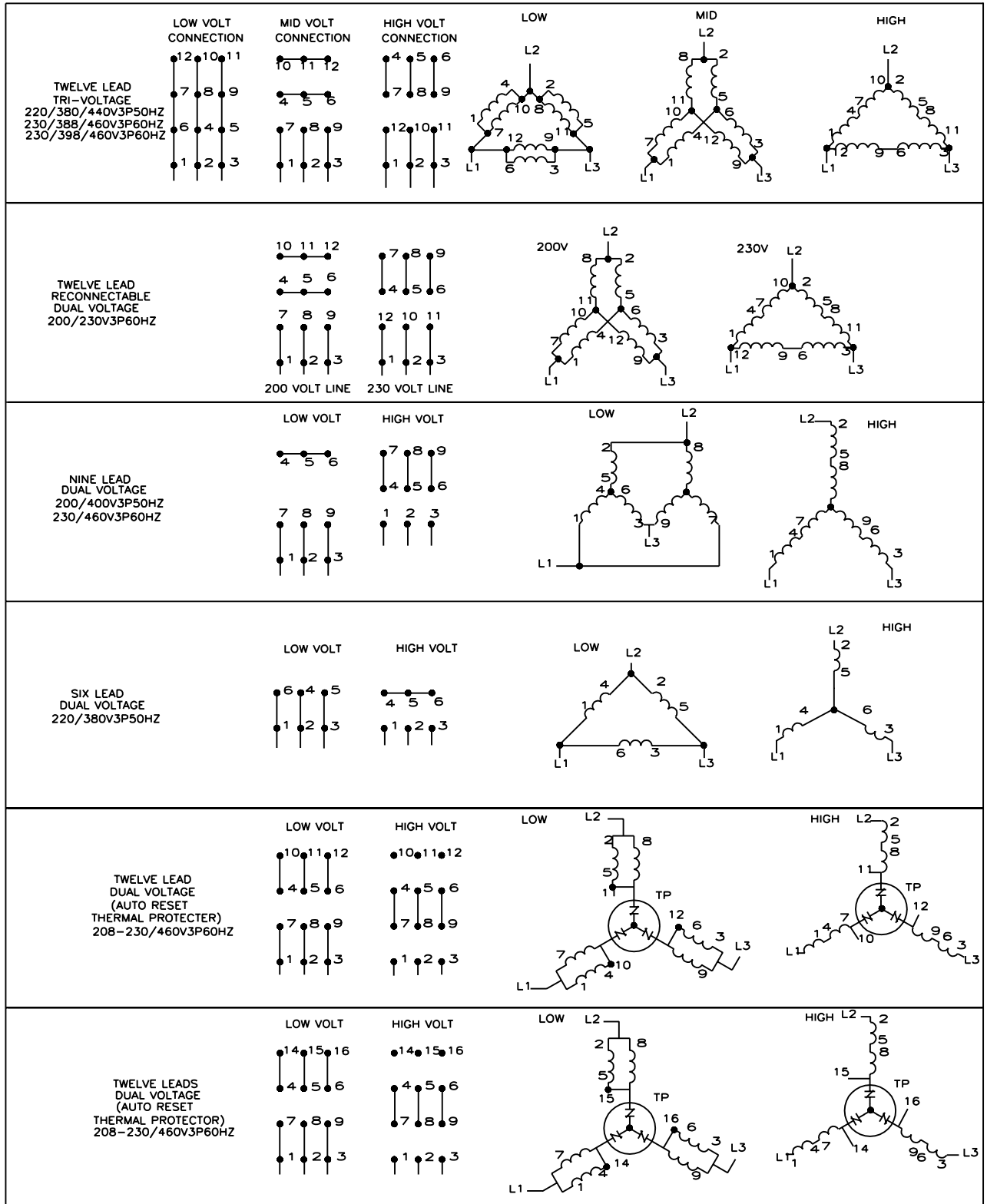
# BMP850029

## MOTOR CONNECTION DIAGRAMS

THREE PHASE SINGLE SPEED MOTORS WITH MULTIPLE VOLTAGE RATINGS

(ONLY FOR MOTOR SUFFIXES LISTED)

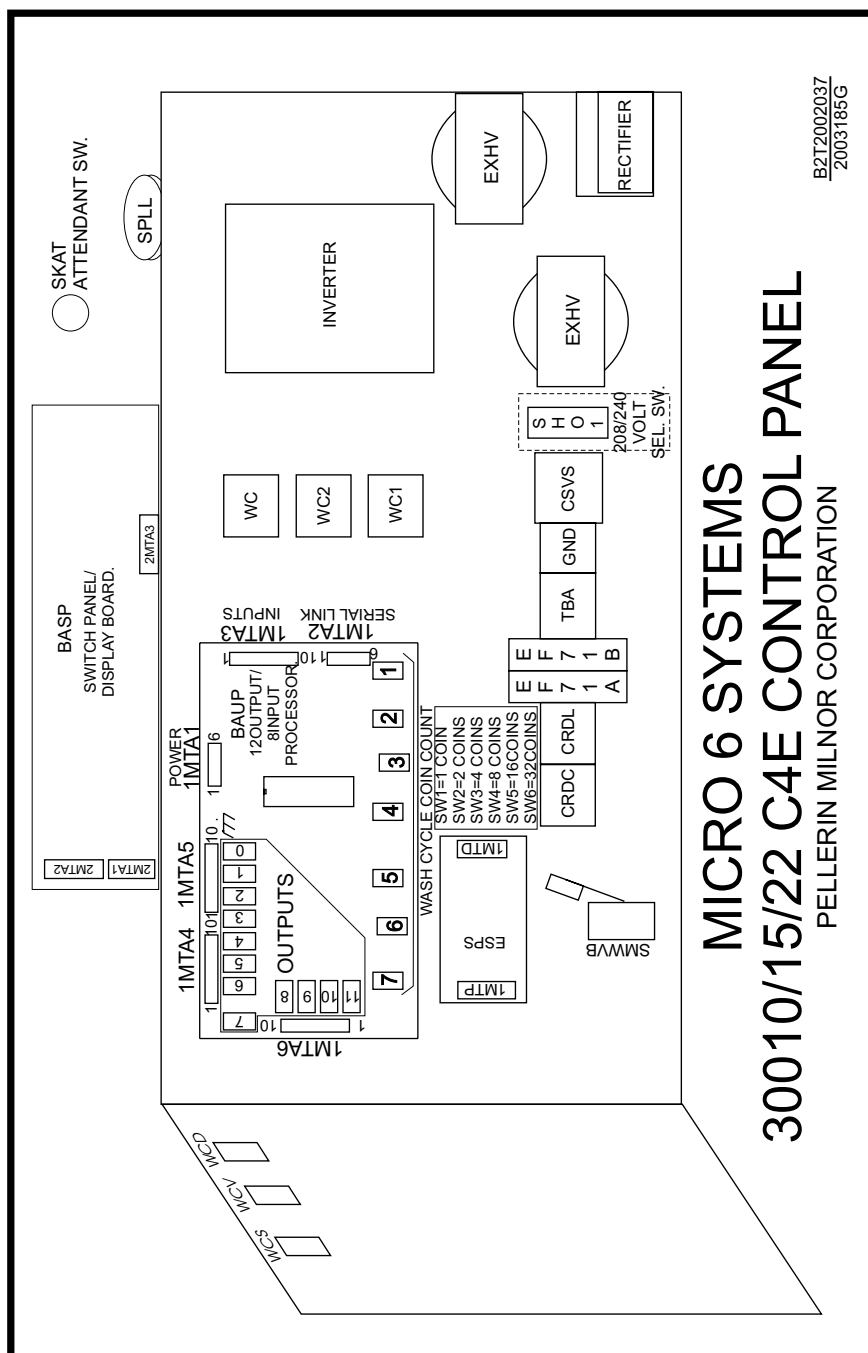
PELLERIN MILNOR CORPORATION

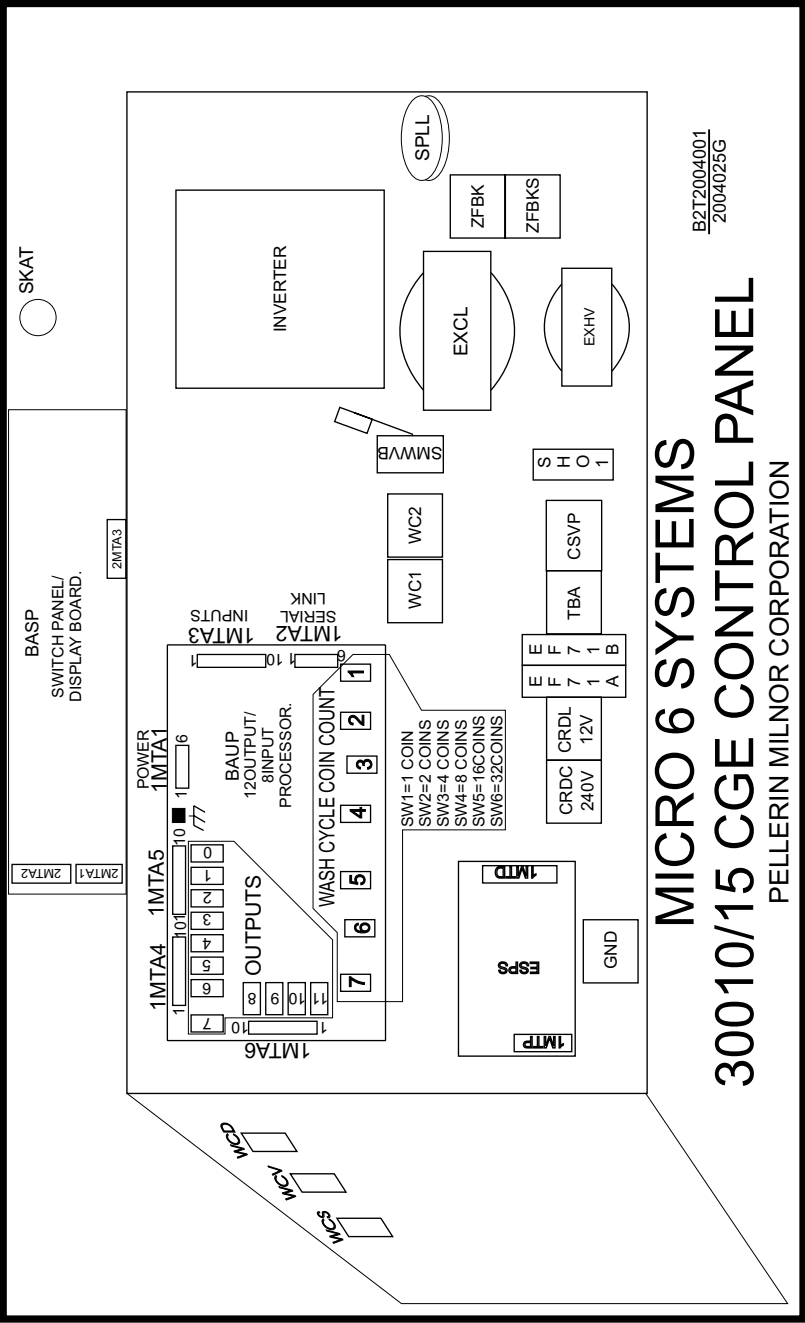


# W80008

THREE PHASE  
MOTOR CONNECTION DIAGRAMS  
SINGLE SPEED MOTORS WITH MULTIPLE VOLTAGE RATINGS  
PELLERIN MILNOR CORPORATION

W80008  
2001253A





**MICRO 6 SYSTEMS**  
**30010/15 CGE CONTROL PANEL**  
 PELLERIN MILNOR CORPORATION

**W7C4ETG**  
 MICRO 6 SYSTEMS  
 C4E, CGE  
 CONTROL BOX LAYOUTS  
 PELLERIN MILNOR CORPORATION

**INCOMING POWER**

COPPER CONDUCTORS ONLY

SEPARATE BRANCH CIRCUIT PROTECTION

3P WIRE NUMBERS L1 L2 L3

1P WIRE NUMBERS BL/WH WHITE N/A

TERMINAL STRIP 1 2 3

GROUND TBL4

**CAUTION**

IF AN EXTERNAL SUPPLY DISPENSER IS TO BE CONNECTED NOTE THE FOLLOWING

1. SUPPLY SIGNALS ARE 240 VAC AT 9VA (MAXIMUM OF 38 MILLIAMPS AT 240 VAC)
2. DO NOT USE MACHINE CONTROL VOLTAGE TO POWER DISPENSER. POWER MUST COME FROM A SEPARATE DISCONNECT.

1 2 3 4 5 6 7 8

1=BLEACH 2=DETERGENT 3=SOFTENER

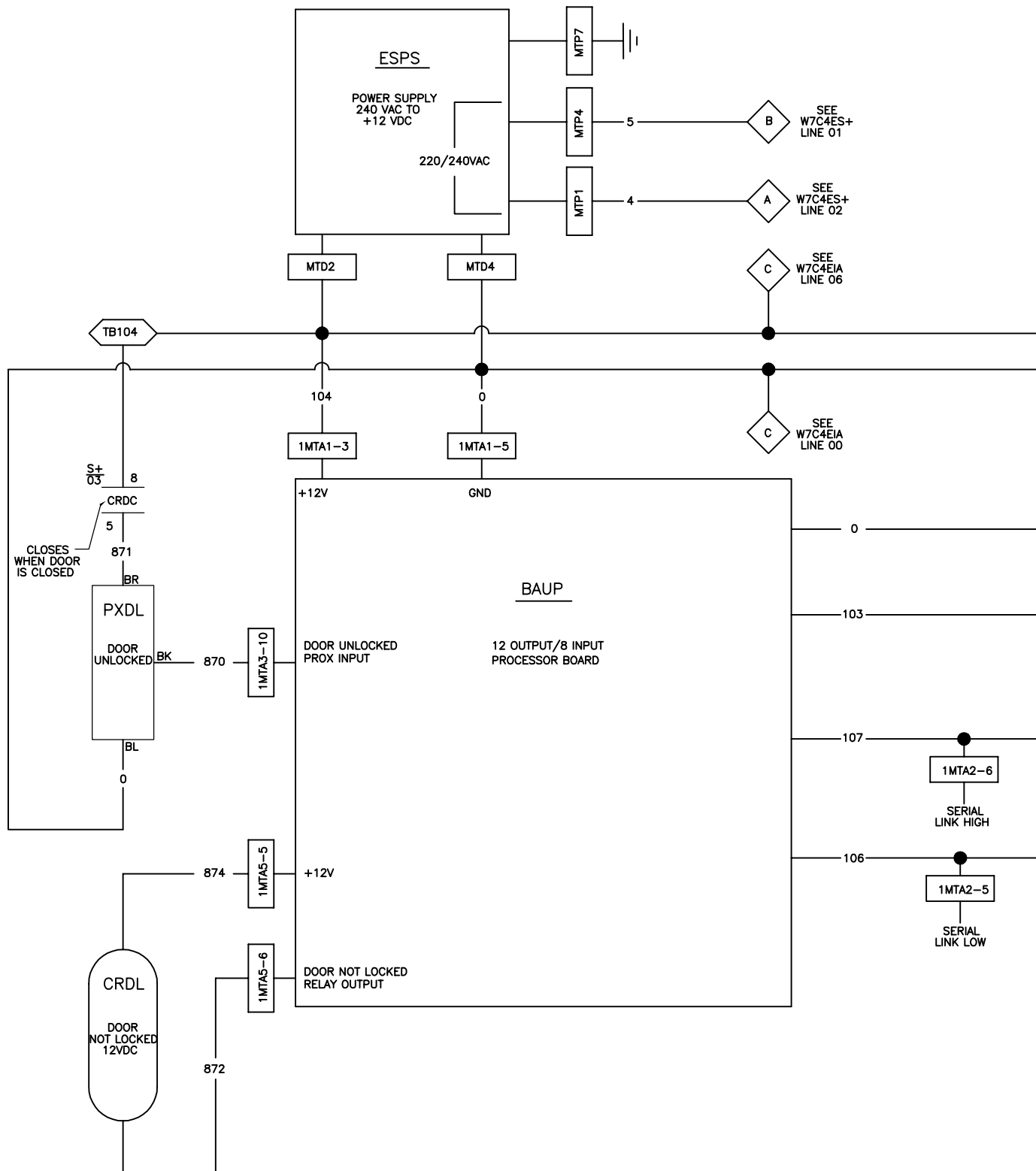
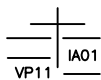
NOT USED NOT USED NOT USED NOT USED NOT USED NOT USED

SUPPLY COMMON

TBS USE COPPER CONDUCTORS ONLY

30°C4E

B2T2003016/2003243G



00

01

02

03

04

05

06

07

08

09

10

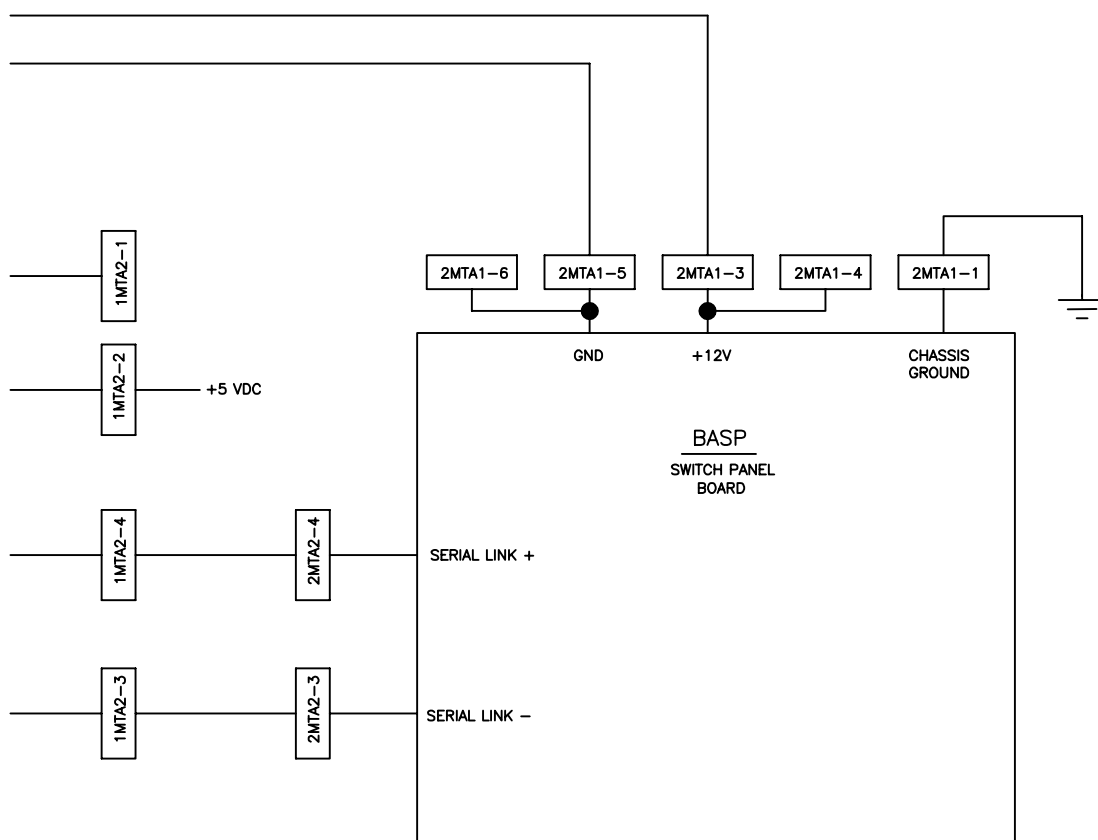
W7C4EBW  
2010173B

# WIRE COLOR CODE

WIRE COLOR	APPLICATION
RED	A.C. CONTROL
RED/WHITE	A.C. COMMON
BLUE -103	+5 VDC
BLUE/ORANGE -104	+12VDC
YELLOW/GREEN	GROUND
BLUE/WHITE -7	D.C. GROUND
BLUE/BLACK -105	D.C. CONTROL SIGNALS

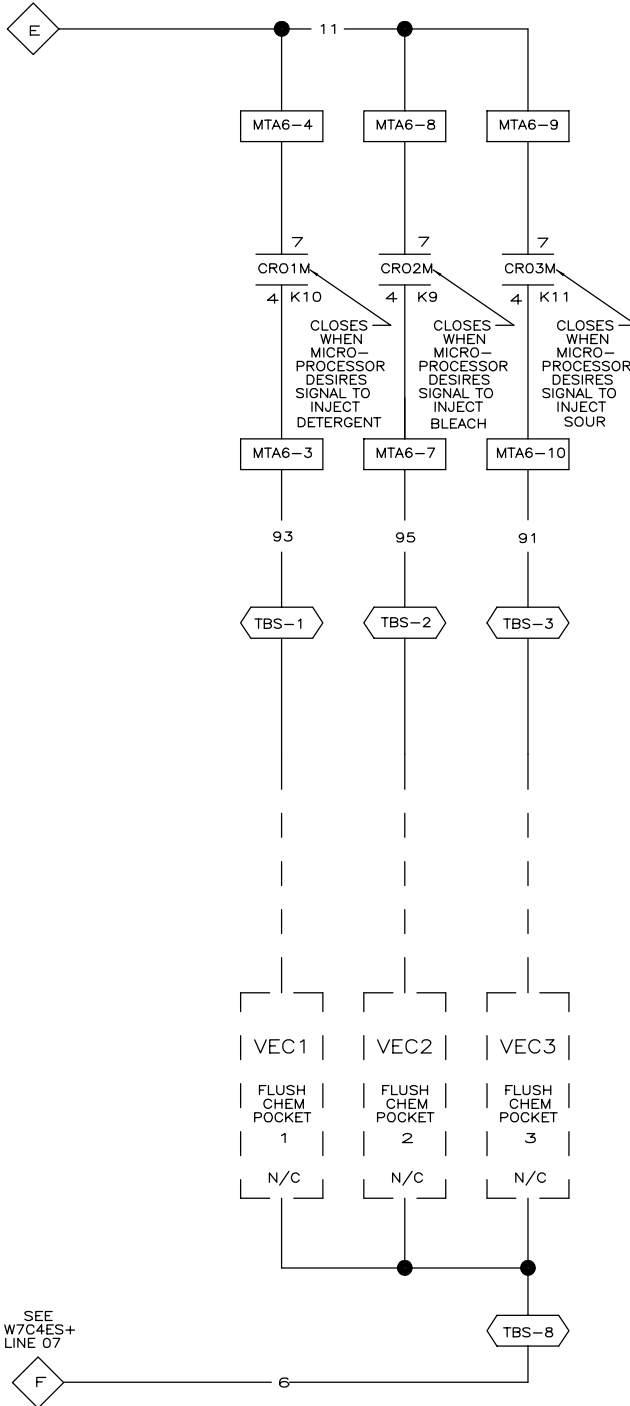
## NOTES

1. 1MTA1, 1MTA2, 1MTA3 AND 1MTA5  
LOCATED ON BAUP PROCESSOR BOARD.
2. 2MTA1 AND 2MTA2 ARE LOCATED  
ON BASP SWITCHPANEL BOARD.



W7C4EBW  
MICRO 7 SYSTEMS  
SCHEMATIC: BOARD TO BOARD WIRING  
PELLERIN MILNOR CORPORATION

SEE  
W7C4ES+  
LINE 12



SEE  
W7C4ES+  
LINE 07

00

01

02

03

04

05

06

07

08



NOTES:

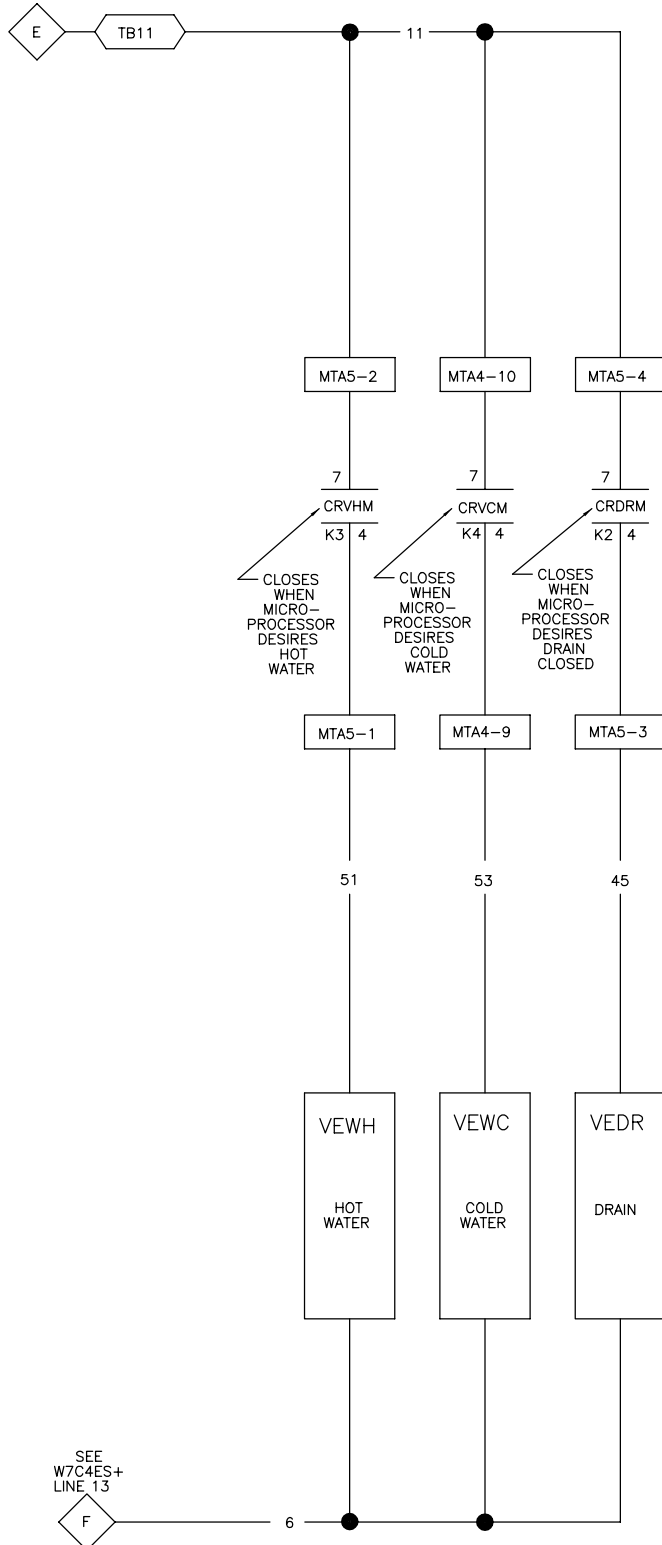
1. MTA-6 IS LOCATED ON THE PROCESSOR BOARD.
2. TBS IS LOCATED NEAR THE REAR ACCESS PANEL  
NEXT TO THE INCOMING POWER CONNECTIONS.

**W7C4ECF**  
**SCHEMATIC: FLUSHING SUPPLIES**  
**220V1P50HZ/240V1P60HZ**  
**PELLERIN MILNOR CORPORATION**

~~W7C4ECF~~  
~~2006493B~~

~~W7C4ECF~~  
~~2006493B~~

SEE  
W7C4ES+  
LINE 12



SEE  
W7C4ES+  
LINE 13

# W7C4EEV

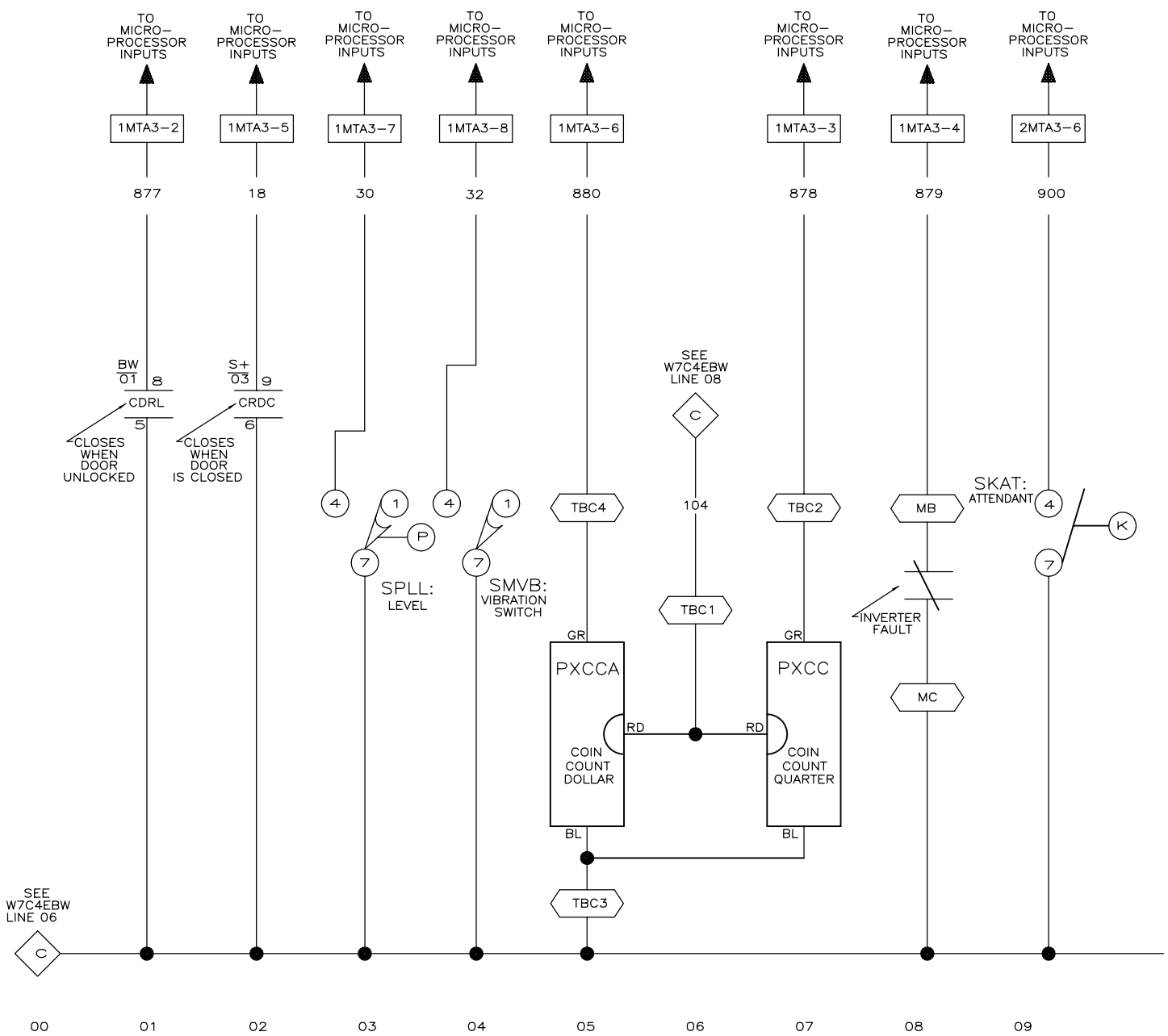
## SCHEMATIC: ELECTRIC VALVES

### 220V1P50HZ/240V1P60HZ

PELLERIN MILNOR CORPORATION

NOTE

1. MTA4, 5, & 7 ARE LOCATED ON THE DISPLAY BOARD.



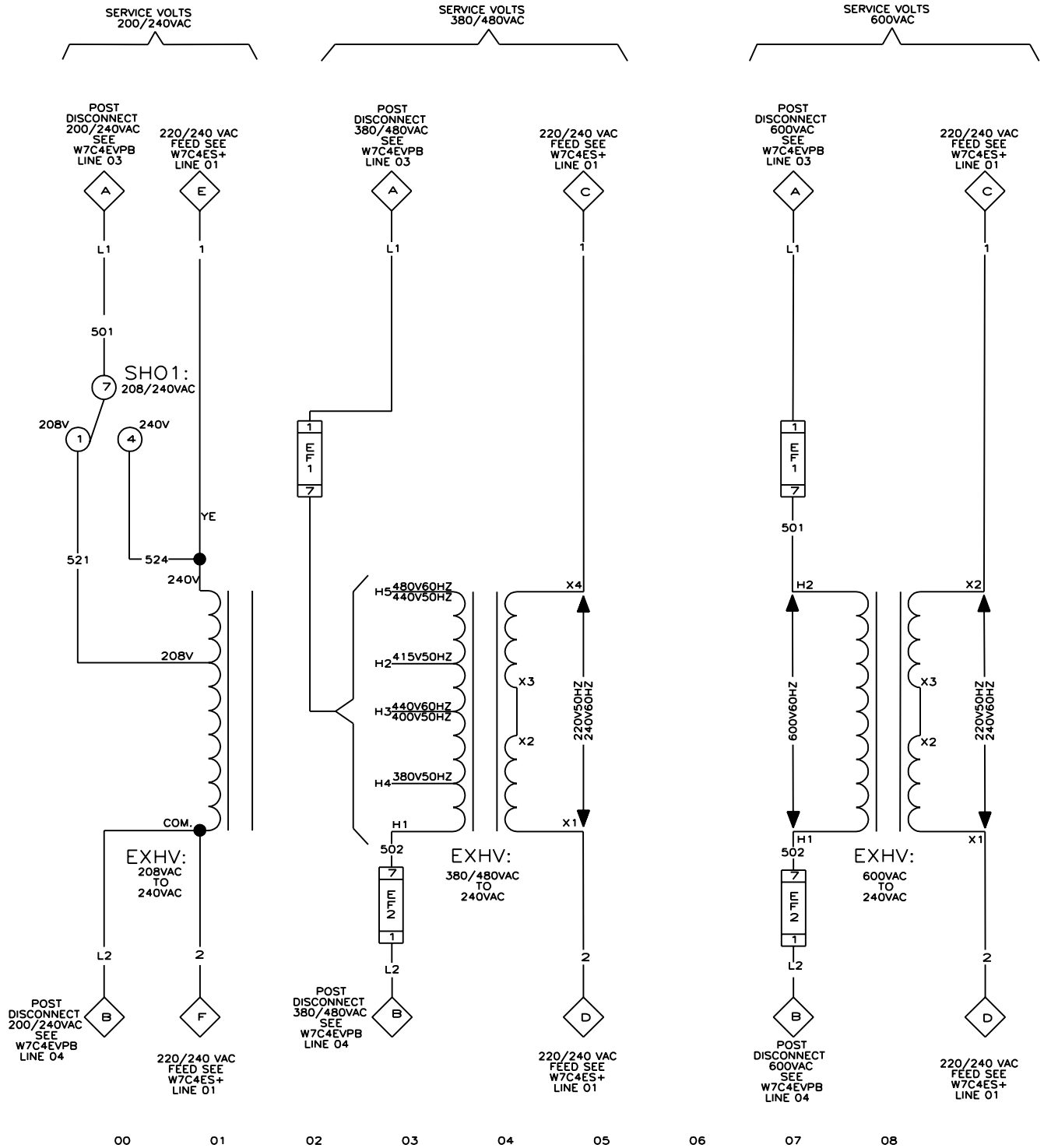
W7C4E1A  
SCHEMATIC: MICROPROCESSOR INPUTS  
PELLERIN MILNOR CORPORATION

NOTES  
COMPONENT LOCATED WITHIN  
DOTTED LINES ARE ON SWITCH  
PANEL BOARDS.

- NOTES
- 1. MTA-3 AND Q ARE LOCATED ON THE PROCESSOR BOARD.
  - 2. MB AND MC ARE LOCATED ON INVERTER.
  - 3. TBC ONLY SUPPLIED WHEN CARD READER INTERFACE ORDERD.



10 11 12



W7C4ELV  
2003356B

09

10

11

12

13

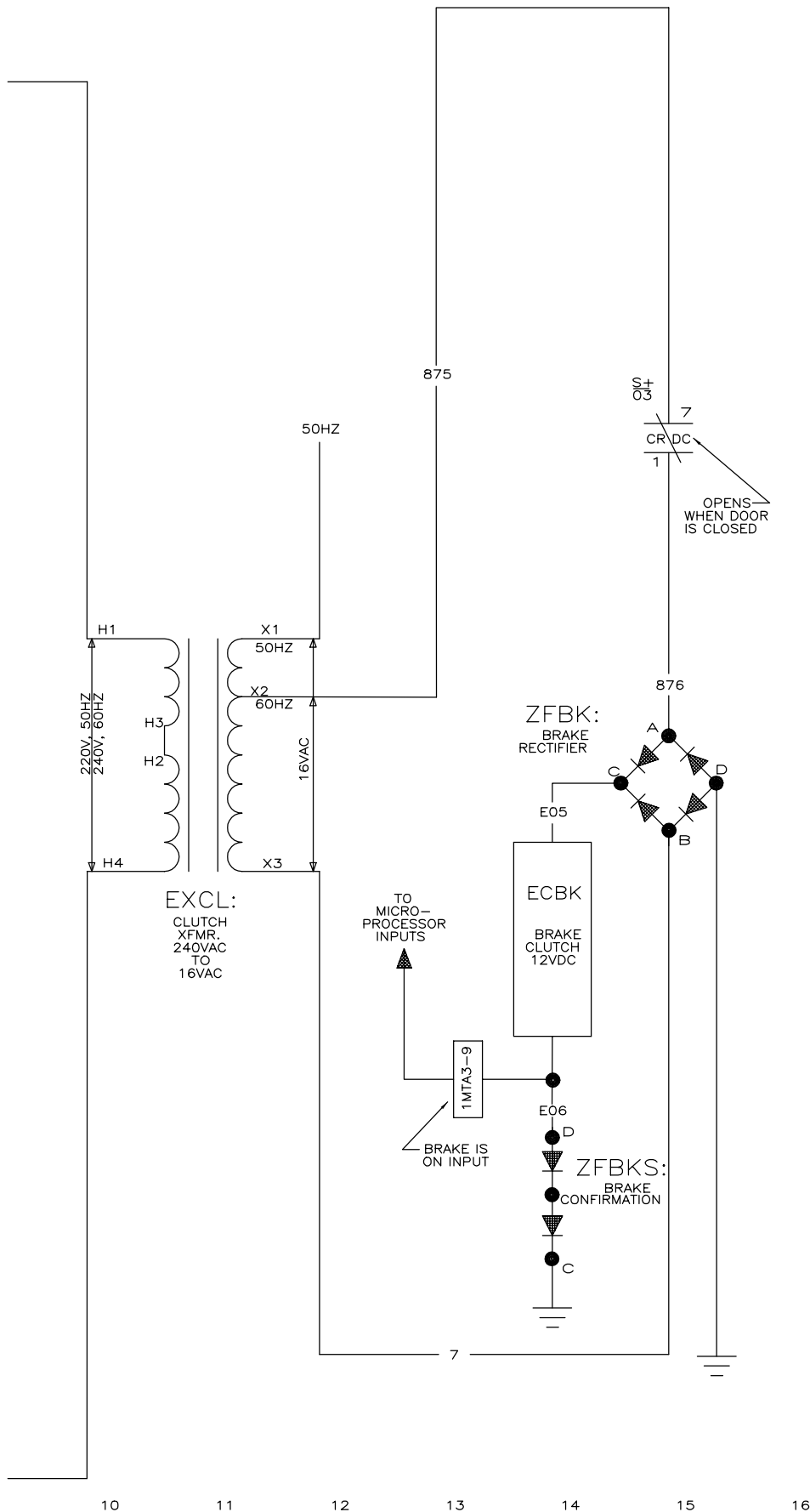
**W7C4ELV**  
SCHEMATIC: CONTROL CIRCUIT TRANSFORMER  
220V1P50HZ/240V1P60HZ  
PELLERIN MILNOR CORPORATION

W7C4ELV  
2003356B

W7C4ELV  
2003356B







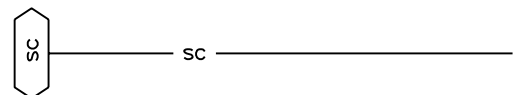
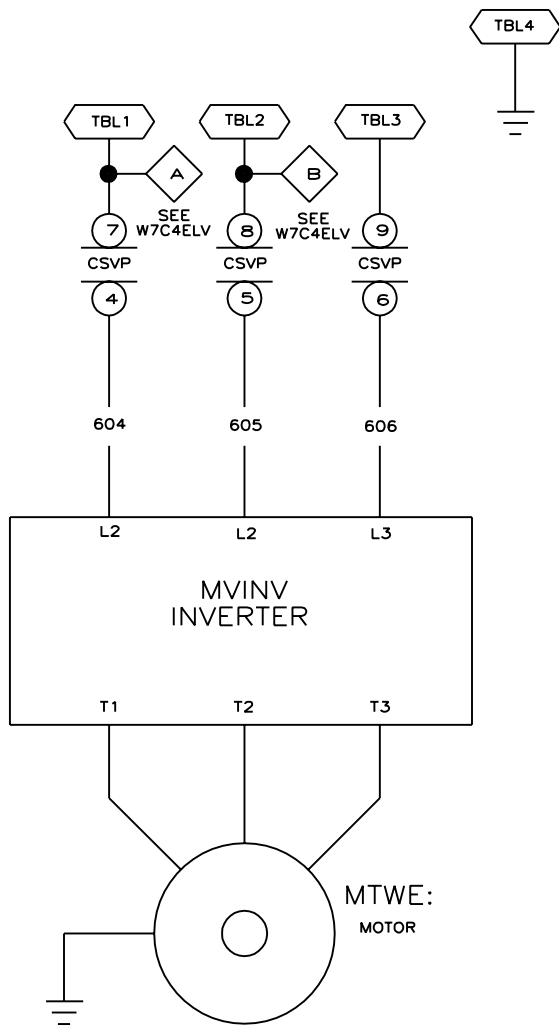
# W7C4ES+

## SCHEMATIC: START CIRCUIT & DOOR INTERLOCK

220V, 1P, 50HZ/240V, 1P, 60HZ  
PELLERIN MILNOR CORPORATION

W7C4ES+  
2004064B

W7C4ES+  
2004064B

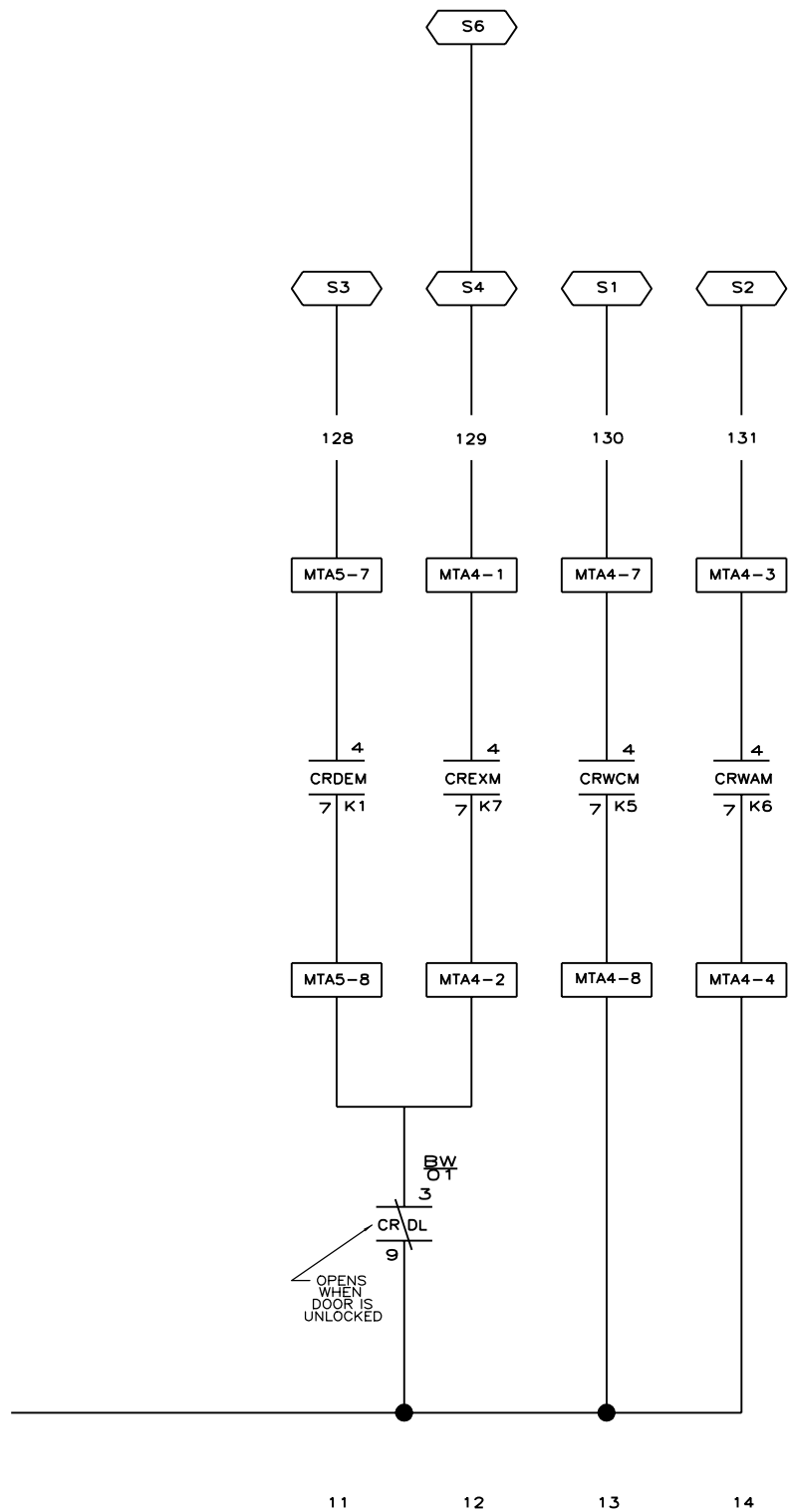


LITHO IN U.S.A.

00 01 02 03 04 05 06 07 08 09 10

W7C4EVPA  
2002502B

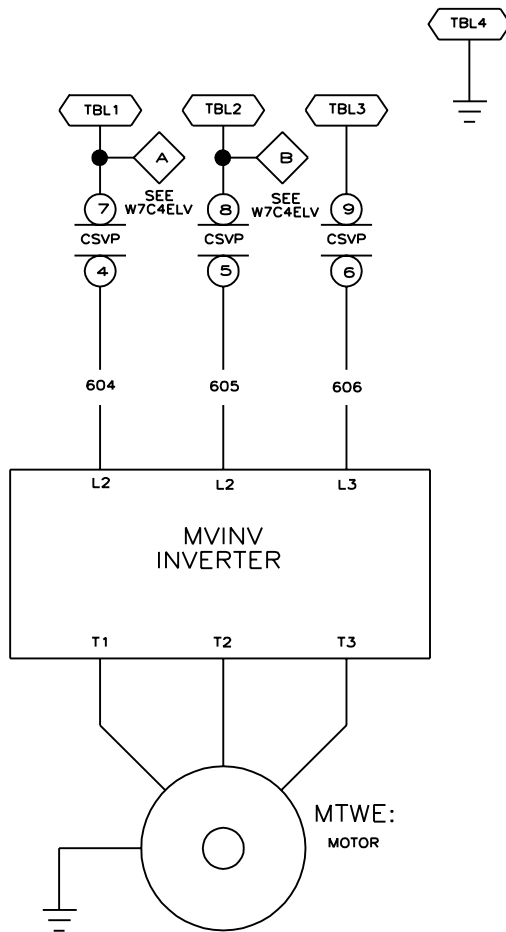
	CW		CCW	
	K5	K6	K1	K7
WASH	X			
DRAIN	X		X	
EXTRACT	X			X



NOTES  
MTA4 & MTA5 ARE LOCATED  
ON THE PROCESSOR BOARD.

W7C4EVPA  
SCHEMATIC: VARIABLE SPEED  
CONTROLLER 3022 SINGLE PHASE ONLY  
(GPD315)

PELLERIN MILNOR CORPORATION



LITHO IN U.S.A.

00

01

02

03

04

05

06

07

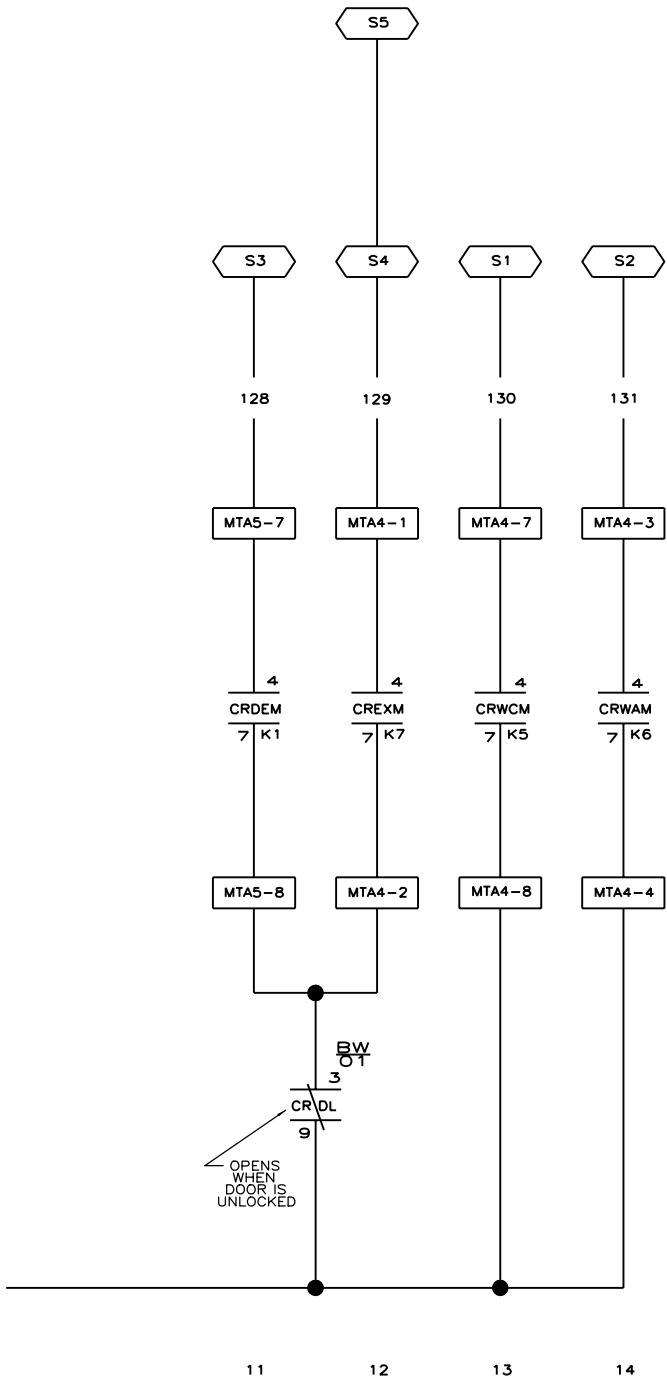
08

09

10

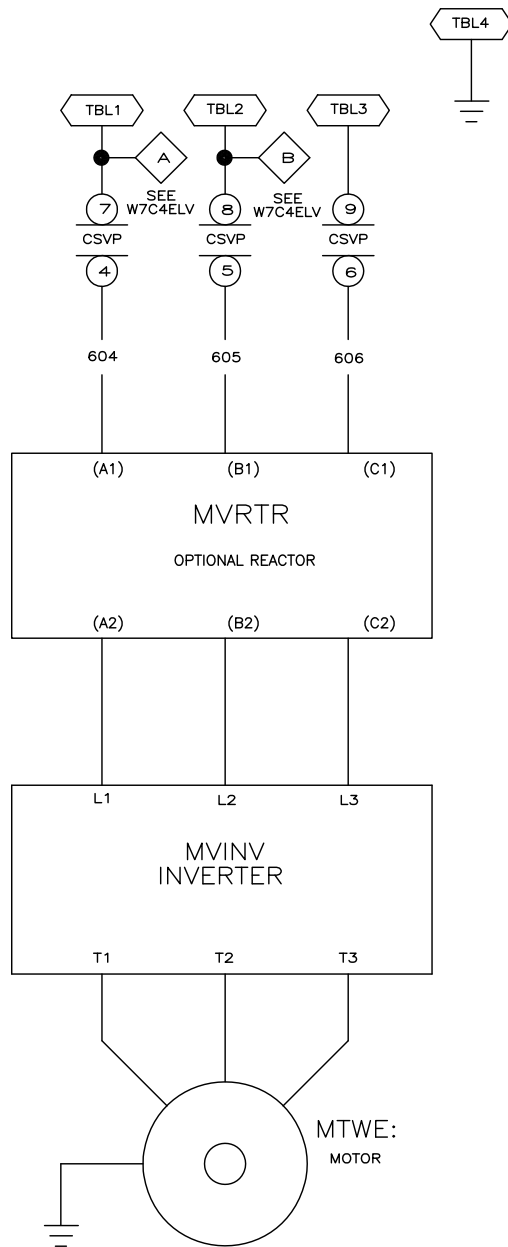
W7C4EVPB  
2004064B

	CW		CCW	
	K5	K6	K1	K7
WASH	X			
DRAIN	X		X	
EXTRACT	X			X



NOTES  
MTA4 & MTA5 ARE LOCATED  
ON THE PROCESSOR BOARD.

W7C4EVPB  
SCHEMATIC: VARIABLE SPEED  
CONTROLLER 30010, 3015, & 3022 3 PHASE  
30010 & 3015 SINGLE PHASE. (GPD305)  
PELLERIN MILNOR CORPORATION



SC

SC

LITHO IN U.S.A.

00

01

02

03

04

05

06

07

08

09

10

W7C4EVPC  
2015162B

Diagram illustrating the wiring for the door lock system, showing four columns of components and their connections.

**Column 11 (Left):**

- S6 (Switch)
- MTA5-7 (Module)
- CRDEM (4/7 K1) (Relay)
- MTA5-8 (Module)
- CRDL (9) (Relay)

**Column 12:**

- S5 (Switch)
- S3 (Switch)
- MTA4-1 (Module)
- CREXM (4/7 K7) (Relay)
- MTA4-2 (Module)
- CRDL (9) (Relay)

**Column 13:**

- S1 (Switch)
- MTA4-7 (Module)
- CRWCM (4/7 K5) (Relay)
- MTA4-8 (Module)
- CRDL (9) (Relay)

**Column 14 (Right):**

- S2 (Switch)
- MTA4-3 (Module)
- CRWAM (4/7 K6) (Relay)
- MTA4-4 (Module)
- CRDL (9) (Relay)

**Connections:**

- MTA5-7 and MTA4-1 are connected to the common ground line.
- MTA4-7 and MTA4-3 are connected to the common ground line.
- MTA5-8 and MTA4-2 are connected to the common ground line.
- MTA4-8 and MTA4-4 are connected to the common ground line.
- CRDL (9) is connected to the common ground line.

**Notes:**

- OPENS WHEN DOOR IS UNLOCKED (Indicated by a diagonal line pointing to CRDL (9) in Column 11).

W7C4EVP C

## SCHEMATIC: VARIABLE SPEED

### CONTROLLER 30010, 3015, & 3022 3 PHASE

30010, 3015 & 30022 1PHASE. (V1000 INVERTER)