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Schematic/Electrical Parts

Vertical Costa Controller

Miltouch-EX

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

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

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MECOSTA1DE/17462A

COMPONENT PARTS LIST

W6VS6SPL/2017462N

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
BA	**>>PRINTED CIRCUIT BOARDS**				
BIO-1	BOARD-8OUTPUT/16INPUT #1	W6VS6SBD	08BS816CT	BD: SERIAL 8 OUT-16 INPUT TEST	LOGIC CNT BX
BIO-2	BOARD-8OUTPUT/16INPUT #2	W6VS6SBD	08BS816CT	BD: SERIAL 8 OUT-16 INPUT TEST	LOGIC CNT BX
BMTH1	BOARD-CARD CAGE MOTHER	W6VS6SBD	08BS5MTHAT	BD:SERIAL 5 CARD MOTHER-TEST	LOGIC CNT BX
BPB	BOARD-ARM9 PROCESSOR+TOUCH SCRN	W6VS6SBD	08BHA9E4T	ASSY:ARM9 PROC+8.4 OPTREX DSP-TESTED R	CONTROLLER BX
CP	**>>PHOTOEYE**				
CPBD1	PHOTOEYE-DISCHARGE END OF BELT 1	W6VS6SI1	09RPE011	PRXSW QK CONN 18M NO-DC UNSHLD	END OF SHUTTLE
CPBDO	PHOTOEYE-DISCHARGE END OF BELT 0	W6VS6SI1	09RPE011	PRXSW QK CONN 18M NO-DC UNSHLD	END OF SHUTTLE
CPBL1	PHOTOEYE-LOAD END BELT 1	W6VS6SI2	09RPEO11	PRXSW QK CONN 18M NO-DC UNSHLD	END OF BELT
CPBLO	PHOTOEYE-LOAD END BELT 0	W6VS6SI2	09RPEO11	PRXSW QK CONN 18M NO-DC UNSHLD	END OF BELT
CR	**>>RELAY-PILOT OR CONTROL**				
CRS+	RELAY-3-WIRE	W6VS6SS+	09C024D37	RELAY 3DPT DIFGOLD 11PIN 120VAC	LOGIC CNT BX
CS	**>>CONTACTOR-MOTOR STARTER**				
CSB1F	CONTACTOR-FORWARD BELT 1	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
CSB1R	CONTACTOR-REVERSE BELT 1	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
CSBOF	CONTACTOR-FORWARD BELT 0	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
CSBOR	CONTACTOR-REVERSE BELT 0	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
CSXSD	CONTACTOR-DOWN	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
CSXSU	CONTACTOR-UP	W6VS6SMC	09MR04B337	12A 3P REV+2N/C 1210V5/6 IEC	CONTACTOR BX
EB	**>>BUZZER OR AUDIBLE SIGNAL**				
EBSG	BUZZER-SIGNAL AUDIBLE	W6VS6SS+	09H015	BUZZ 115V W/6-32 CTR-6" LEADS	PROCESSOR BX
EBSGF	BUZZER-SIGNAL AUDIBLE	W6VS6SMC	09H020	ALARM, MALLORY SONALERT SC110 115V	CONTACTOR BX
EF	**>>FUSE OR FUSE HOLDER**				
EF37	FUSE-120V XFORMER SECONDARY	W6VS6SP	09FF0026AMG	FUSE BK/ABC 6AMP 250V BUSS	CONTACTOR BX
EFHV1	FUSE-120V XFORMER PRIMARY 1	W6VS6SP	09FF005AWN	FUSE #KTK 5A600V=HPS HOLDER	CONTACTOR BX
EFHV2	FUSE-120V XFORMER PRIMARY 2	W6VS6SP	09FF005AWN	FUSE #KTK 5A600V=HPS HOLDER	CONTACTOR BX
ELF	**>>FLASHER**				
EFSGF	FLASHER-SIGNAL	W6VS6SP	08FL007537	FLASHER 120V 1AMP 75FL/MIN	CONTROLLER BX
EL	**>>LIGHT-PILOT OR INDICATOR**				
ELM	LIGHT-MANUAL OPERATIONS	W6VS6SMC	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	CONTACTOR BX
ELSG	LIGHT-VISUAL FLASHING	W6VS6SS+	09J060WH37	LAMP 1/2" WHITE 120V TAB	PROCESSOR BX
ELSGF	LIGHT-VISUAL FLASHING	W6VS6SMC	09H025V37	BEACON ROT.120V 5.5"DIA AMB #MV110	CONTACTOR BX
ELT	LIGHT-TAUT CHAIN	W6VS6SS+	09J060A37	LAMP 1/2" AMB 125V IDI 1050QC3	CONTACTOR BX

COMPONENT PARTS LIST

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
EM	**>>EMERGENCY STOP**				
EMSR	SWITCH-EMERGENCY STOP	W6VS6SS+	09N505	SW ASSY-EMERGENCY STOP	SIDE OF SHUTTLE
EMSRO	SWITCH-EMERGENCY STOP	W6VS6SS+	09N505	SW ASSY-EMERGENCY STOP	CONTACTOR BX
ES	**>>POWER SUPPLY-ELECTRONIC**				
ESPS	POWER SUPPLY-120VAC +12-12+5VDC	W6VS6SBD	08PSS3401T	40 WATT POWER SUPPLY TESTED	LOGIC CNT BX
ESPS2	POWER SUPPLY-120VAC +12-12VDC	W6VS6SBD	08PSS2401T	PRW SUPY 40WATT 120/240V TO 12V TESTED	CONTROLLER BX
ESPS3	POWER SUPPLY 120VAC 24VDC	W6VS6SBD	08PSL224S	ASSY: PWR SUP 100-240VAC TO 24VDC	LOGIC CNT BX
EX	**>>TRANSFORMERS**				
EX37-1	TRANSFORMER-208/240VAC TO 120VAC	W6VS6SP	09U249AA37	XFMR 200-240V PRI/120VSEC/250VA	CONTACTOR BX
EX37-2	TRANSFORMER-380/480>120VAC	W6VS6SP	09U200AAB	XFMR 380-480V/240-120V-250VA	CONTACTOR BX
EX37-3	TRANSFORMER-600->120VAC	W6VS6SP	09U251AA37	XFMR 600VPRI/120VSEC/250VA	CONTACTOR BX
PX	**>>PROXIMITY SWITCH**				
PXLPO	PROX SW-LOAD POSITION 0	W6VS6SI1	09RPS18ADU	PRXSW QK CONN 18M NO-DC UNSHLD	SIDE OF BELT
PXUP0	PROX SW-UNLOAD POSITION 0	W6VS6SI1	09RPS18ADU	PRXSW QK CONN 18M NO-DC UNSHLD	SIDE OF BELT
PXUP1	PROX SW-UNLOAD POSITION 1	W6VS6SI1	09RPS18ADU	PRXSW QK CONN 18M NO-DC UNSHLD	SIDE OF BELT
PXUP3	PROX SW-UNLOAD POSITION 3	W6VS6SI2	09RPS18ADU	PRXSW QK CONN 18M NO-DC UNSHLD	SIDE OF BELT
SH	**>>SWITCH-HAND OPERATED**				
SHB1	SWITCH-BELT 1 FORWARD/REVERSE	W6VS6SMC	09N405S320	SWASS S32 2NO	CONTACTOR BX
SHBO	SWITCH-BELT 0 FORWARD/REVERSE	W6VS6SMC	09N405S320	SWASS S32 2NO	CONTACTOR BX
SHMD	SWITCH-ENABLE DOWN	W6VS6SMC	09N405PB10	SWASS PBBK 1NO	CONTACTOR BX
SHMO	SWITCH-MANUAL/AUTO	W6VS6SI1	09N405M211	SWASS S3W 2NO	CONTACTOR BX
SHMO	SWITCH-MANUAL/AUTO	W6VS6SMC	09N405M211	SWASS S3W 2NO	CONTACTOR BX
SHS+	SWITCH-START	W6VS6SS+	09N405PG10	SWASS PBGN 1NO	PROCESSOR BX
SHSMA	SWITCH-MASTER	W6VS6SS+	09N405M210	SWASS M2W 1N0	PROCESSOR BX
SHSO	SWITCH-STOP	W6VS6SS+	09N405PR01	SWASS PBRD 1NC	PROCESSOR BX
SHUD	SWITCH-UP/DOWN	W6VS6SMC	09N405S320	SWASS S32 2NO	CONTACTOR BX
SK	**>>SWITCH-KEY OPERATED**				
SKMD	SWITCH-ENABLE DOWN	W6VS6SMC	09N127C	KEYSW SPST 7A120VAC SCREW TERM	SWITCH PANEL
SM	**>>SWITCH-MECHANICAL OPERATED**				
SMSDL	SWITCH-HOIST DOWN	W6VS6SI1	09RM01406G	CAPSW 6FT ROTARY ACTUATED GOLD	TOP OF SHUTTLE
SMSUL	SWITCH-HOIST UP	W6VS6SI1	09RM01406G	CAPSW 6FT ROTARY ACTUATED GOLD	TOP OF SHUTTLE
SMTC1	SWITCH-UP LIMIT	W6VS6SS+	09R012	MICSW SPDT PAINTED BZE6-RN 01	TOP OF SHUTTLE
SMTC2	SWITCH-TAUT CHAIN	W6VS6SS+	09R012	MICSW SPDT PAINTED BZE6-RN 01	TOP OF SHUTTLE

COMPONENT PARTS LIST

W6VS6SPL/2017462N

COMPONENT NUMBER	FUNCTION OF THIS COMPONENT	WHERE TO FIND THIS COMPONENT	MILNOR P/N	DESCRIPTION	LOCATION
VE	**>>VALVE-ELECTRICAL**				
VELD	VALVE-LOAD FLAG	W6VS6SMC	96R301B37	1/8"AIRPILOT 3W NC 120V50/60	TOP OF SHUTTLE

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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.

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BIUUUD19 (Published) Book specs- Dates: 20081231 / 20081231 / 20081231 Lang: ENG01 Applic: UUU

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

— End of BIUUUD19 —

Shuttle Internal and System Connections

Connections Between Shuttle and Shuttle Controller

Leaving out of the Shuttle controller, there are 8 wires, a twisted pair of shielded cable, and a 14 guage ground. The 8 wires connect to WCM and they go into pins 1 through 7 and pin 9 (skip pin 8). The 14 guage ground wire is connected to the ground lug. The twisted pair connects to MTA 33-2 and MTA33-4. These wires go up to a 6x6 box which can be mounted on the end of a rail or a wall. They then connect into the festooning cable. The festooning connection is as follows:

The 8 wires connect to the 8 festooning. The 4 conductor will take the twisted pair. The 4 conductor for the 3 phase power connects into a separate 6x6 box mounted next to the 8 and 4 festooning 6x6 box. The festooning must be run as follows:

A. The twisted pair festoon on top.

B. The 8 festoon in the middle.

C. The 3 phase festoon on the bottom.

Please note that in this box the grounding is as follows:

The two spare wires in the twisted pair festooning, the 1 spare wire in the 3 phase power festooning and the 14 gauge ground must be secured to its 6x6 box. There's a possibility you'll have to scrape paint. Also, a ground wire must lead out of the 6x6 box and mount onto the railing. Please note that paint must be scraped on the rail so that there's a metal to metal contact.

Connections into the controls that are mounted on the Shuttle:

See schematic W6SH5SINT.

Connections Between MILTRAC and the Shuttle

MTA33-1 and MTA33-2 are the same connection point
MTA33-3 and MTA33-4 are the same connection point
MTA32-1 and MTA32-2 are the same connection point
MTA32-3 and MTA32-4 are the same connection point

This means that putting the wire on MTA33-1 and MTA33-2 creates the same connection.

Please note that a black wire is always used to notate a 1 and 2 pin connection on MTA32, MTA33 and a red wire is always used to notate a 3 and 4 pin connection on MTA32, MTA33. This is done to help keep the wiring consistent on the serial link since crossing the wires up will cause the machine not to operate.

MTA33 is the serial port used by the processors to talk to the 16 output, Digital-Analog, Analog-Digital, 16 input, 8 output boards. MTA32 is the MILNET/MILTRAC serial port.

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).

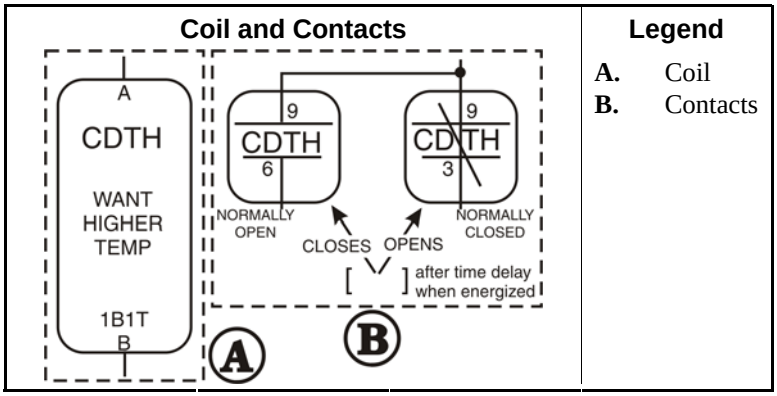
BA=Printed Circuit Board—Insulating substrate on which a thin pattern of copper conductors has been formed to connect discrete electronic components also mounted on the board.

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)

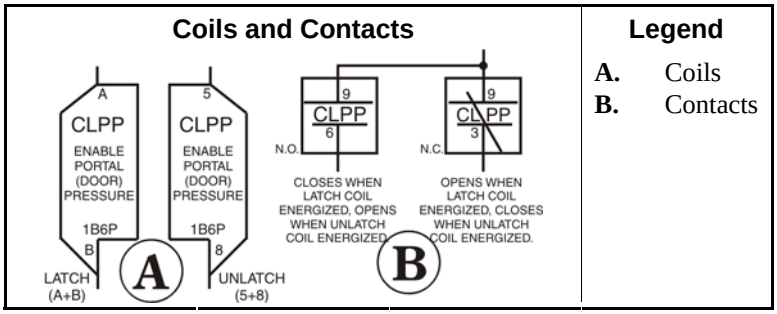
CD=Control, Time Delay Relay (Figure 2)—A relay whose contacts switch only after a fixed or adjustable delay, once voltage has been applied to its coil. The contacts switch back to normal (de-energized state) immediately when the voltage is removed.

Figure 2: Time Delay Relay (CD)



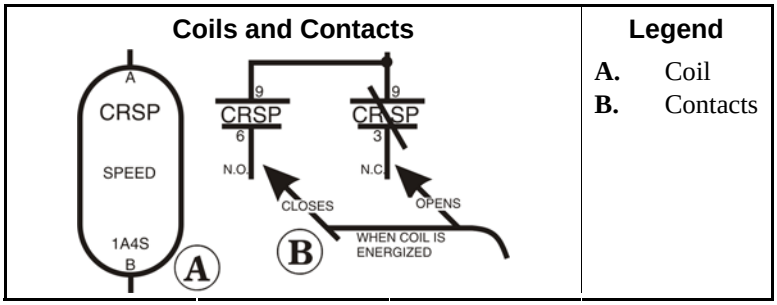
CL=Control, Latch Relay (Figure 3)—A relay which latches in an energized or set position when operated by one coil (the latch/set coil). The relay stays latched even though coil voltage is removed. The relay releases or unlatches when voltage is applied to a second coil (the unlatch/reset coil).

Figure 3: Latch Relay (CL)



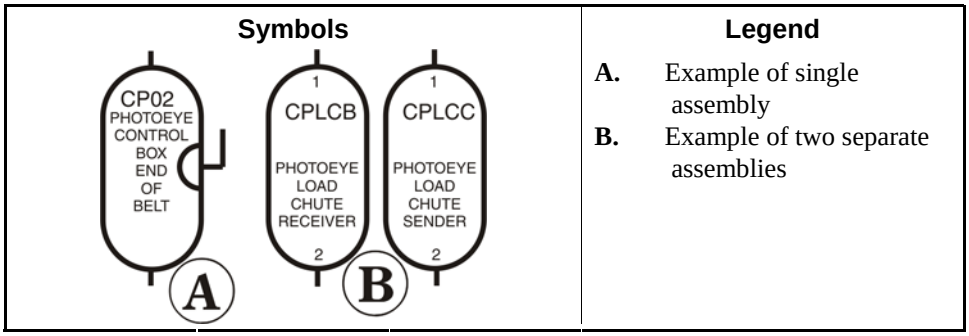
CR=Control, Relay (Figure 4)—A relay whose contacts switch immediately when voltage is applied to its coil and revert to normal when the voltage is removed.

Figure 4: Standard Relay (CR)



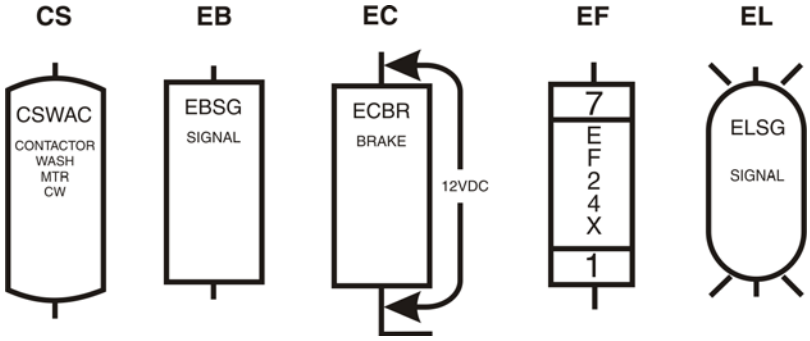
CP=Control, Photo-Eye (Figure 5)—Photo-eyes sense the presence of an object without direct physical contact. Photo-eyes consist of a transmitter, receiver, and output module. These components may be housed in one assembly with the transmitter bouncing light off of a reflector to the receiver, or these 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.

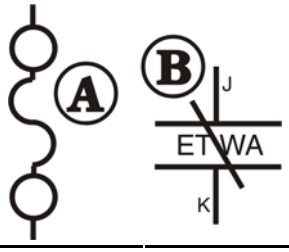
EL=Electric Light (Figure 6)—Indicator lights may be either incandescent or fluorescent.

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
	**A.** Heater (one per phase) **B.** Overload relay; contacts open if overload condition exists

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.

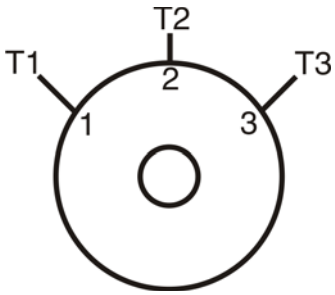
KB=Keyboard—Device similar to a typewriter for making entries to a computer.

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)

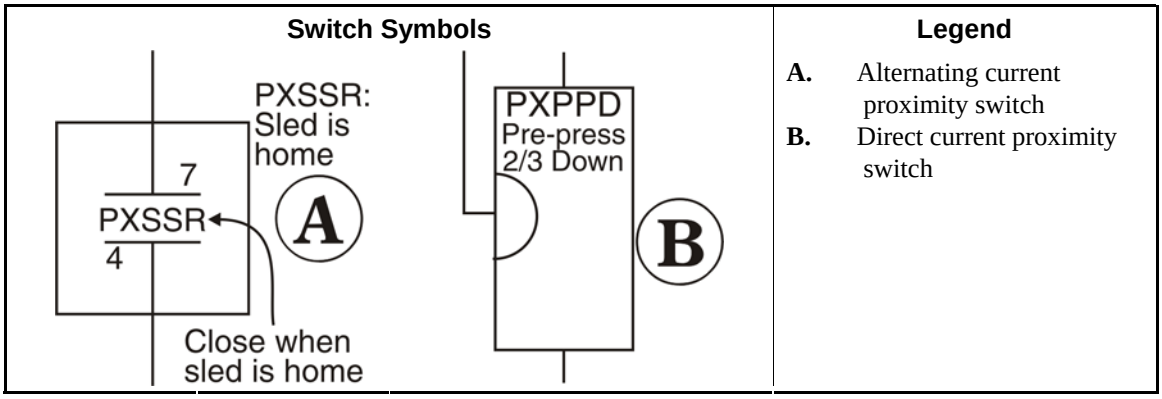


MV=Motor (Variable Speed) Inverter—To vary the speed of an AC motor, the volts to frequency ratio must be kept constant. The motor will overheat if this ratio is not maintained. The motor variable speed inverter converts three phase AC to DC. The inverter then uses this DC voltage to generate AC at the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

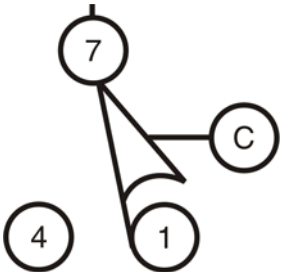
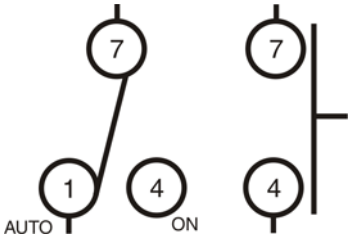


Figure 12: Hand Operated Switch (SH)



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)

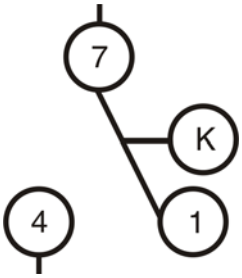
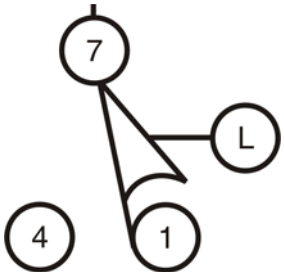


Figure 14: Level Switch (SL)



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)

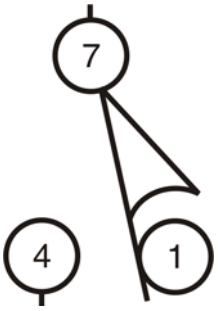
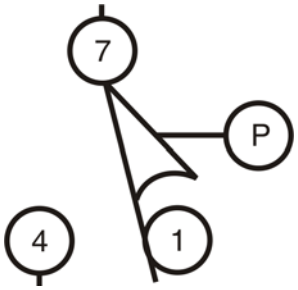


Figure 16: Pressure Switch (SP)



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)

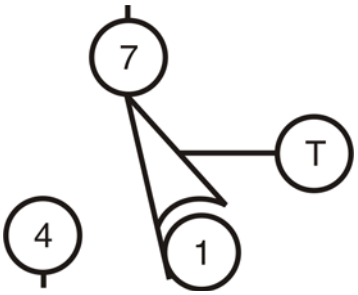
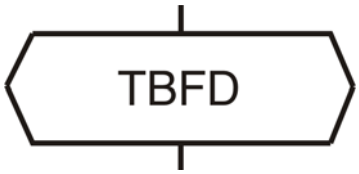


Figure 18: Terminal Board (TB)



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)

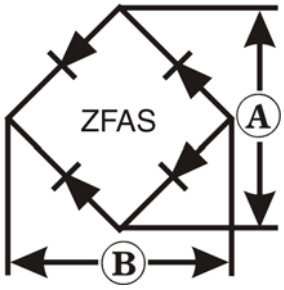
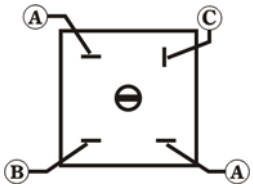
Component Symbol	Legend
	**A.** Alternating current input **B.** Direct current output

Figure 21: Bridge Rectifier

Component	Legend
	**A.** Alternating current in **B.** Negative direct current out **C.** Positive direct current out

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.

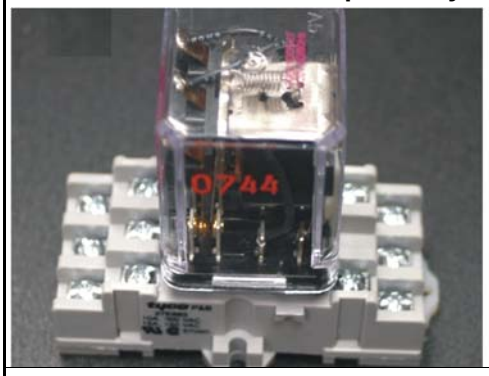
2. Component Terminal Numbering

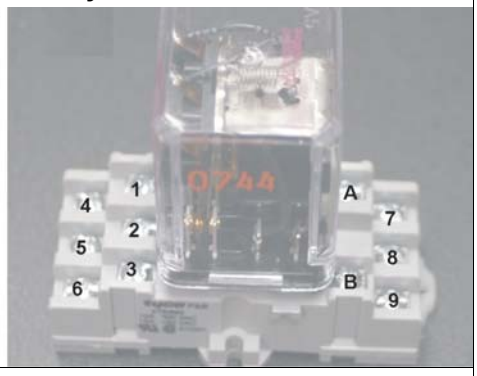
CAUTION 1: Risk of Mis-wiring—Due to electrical component manufacturing inconsistencies, the pin numbers imprinted on components such as connectors and relay bases used on Milnor machines often do not correspond to the pin numbers shown in the schematics.

- 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.

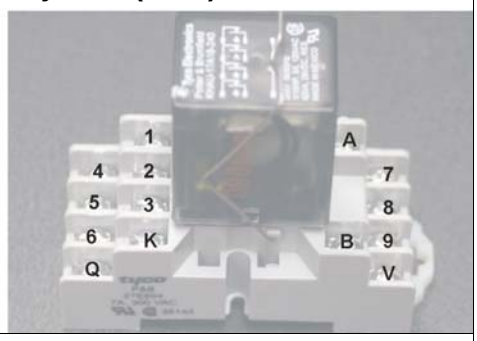
Figure 22: Plug-in Relays

11-pin Relay with Grey Base

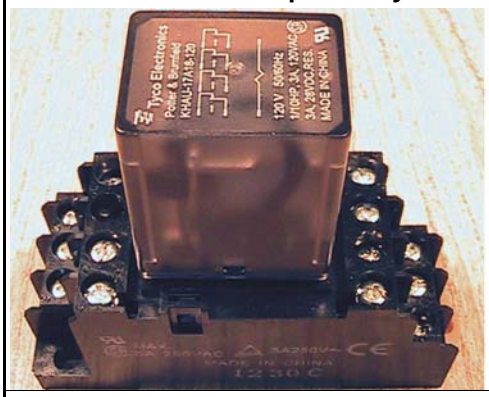


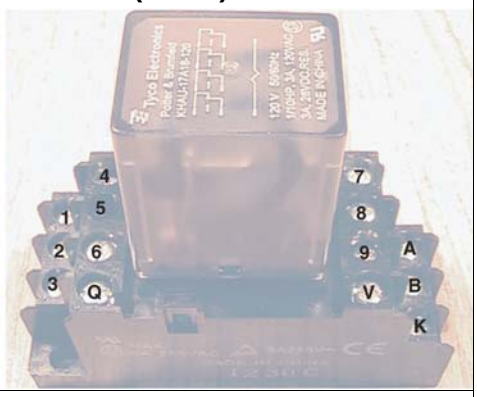


14-pin Relay with Grey Base (older)

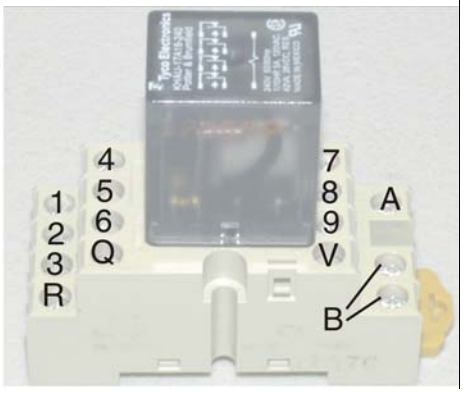


14-pin Relay with Black Base (newer)





14-pin Relay with Beige Base (rare)



Legend

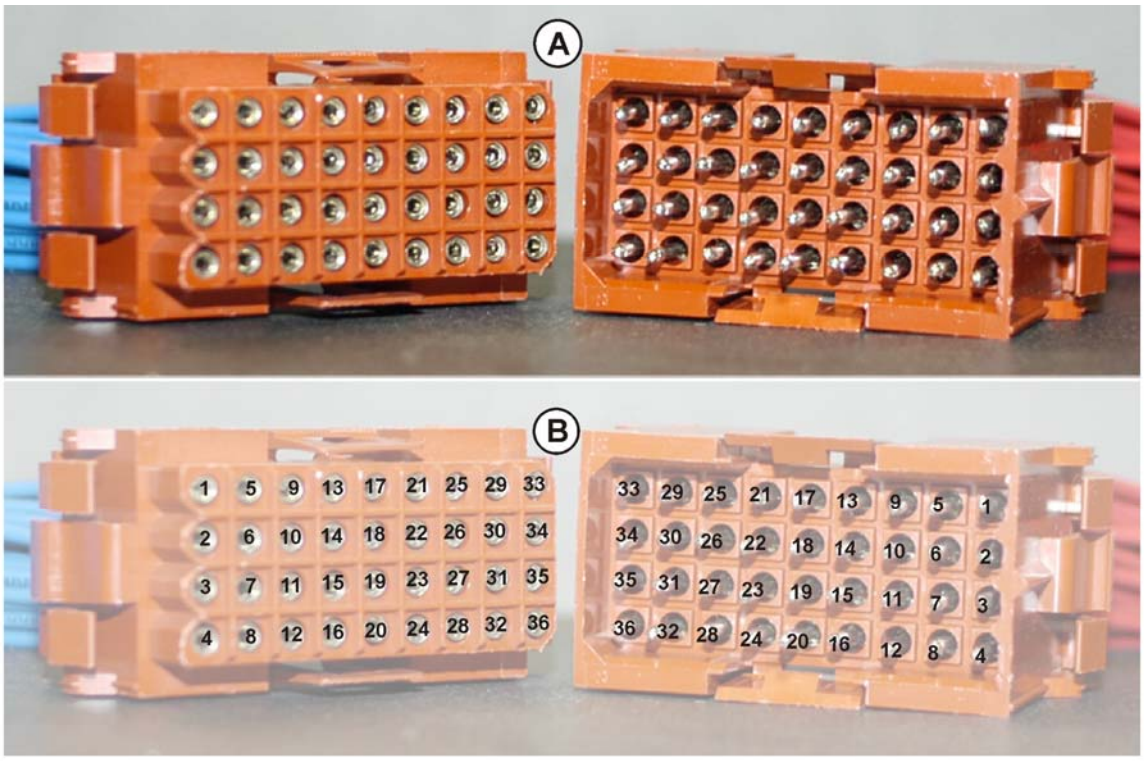
Left. View of relay and base

Right. Same view, showing pin numbers

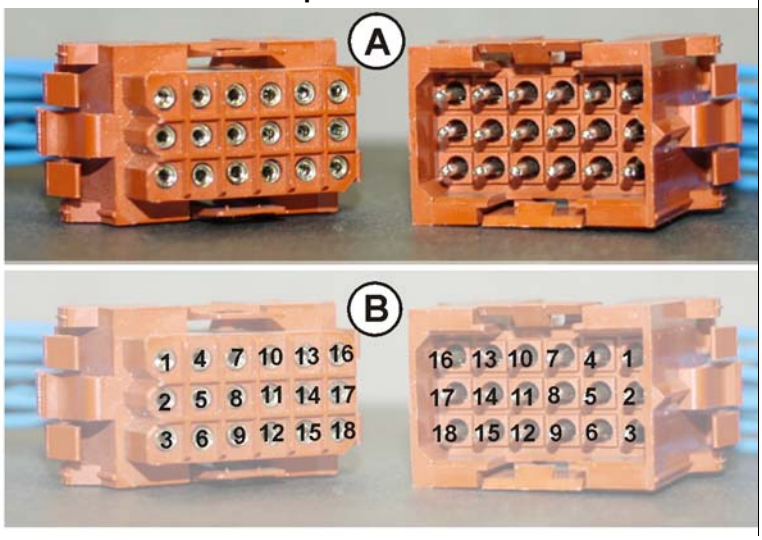
Note 3: Relay functional names ending with the letter "M" (e.g., CRxxM) are not discrete components but are a component of a printed circuit board. They are usually not individually replaceable.

Figure 23: AMP Connector Pin Locations

36-pin Connector



18-pin Connector

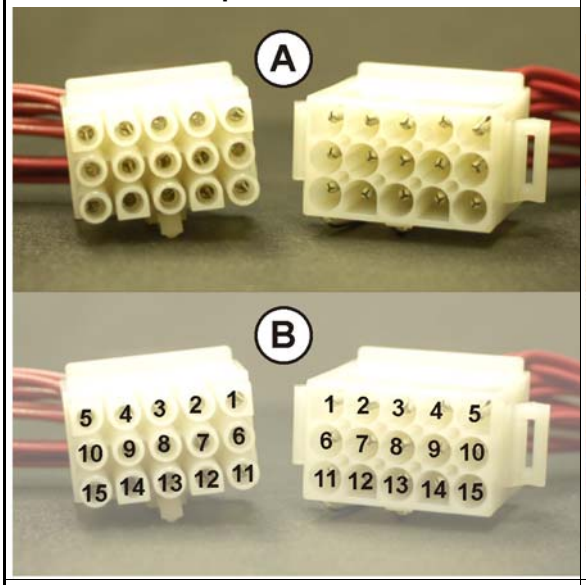


Legend

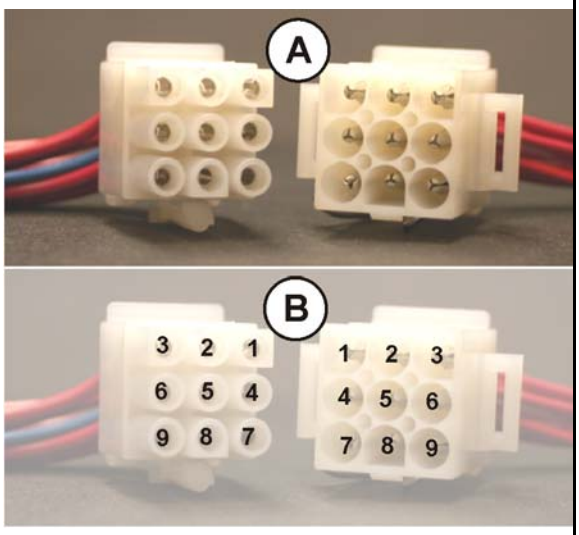
A. View of mating halves of connector
B. Same view, showing assigned pin numbers

Figure 24: Molex Connector Pin Locations

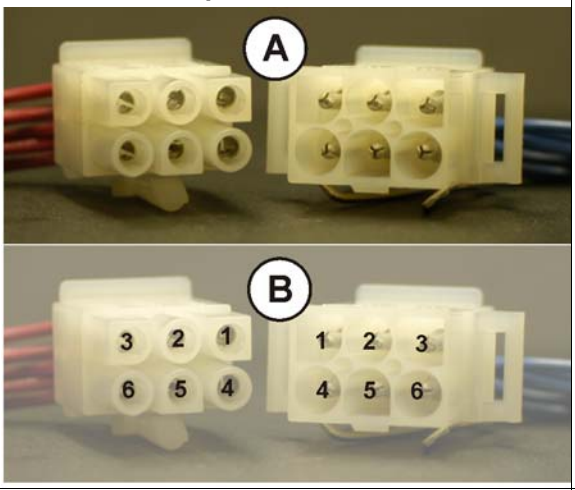
15-pin Connector



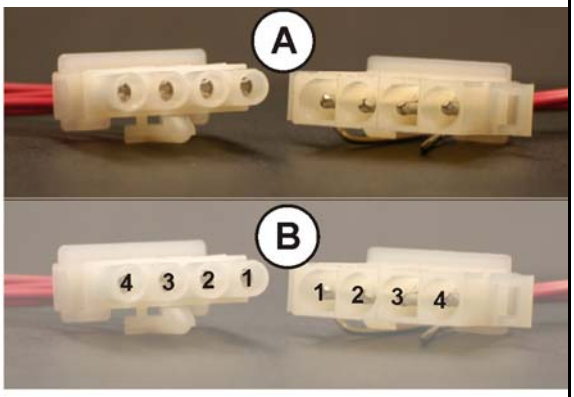
9-pin Connector



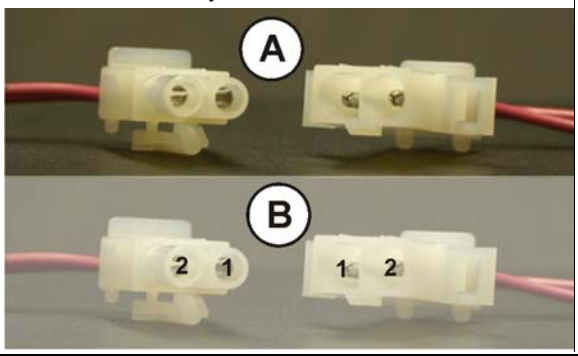
6-pin Connector



4-Pin Connector



2-pin Connector



Legend

A. View of mating halves of connector
B. Same view, showing assigned pin numbers

Figure 25: Pressure Switch

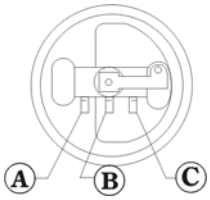
Component	Legend
	**A.** Contact 1—Normally open **B.** Contact 2—Normally closed **C.** Contact 3—Common

Figure 26: Toggle Switch

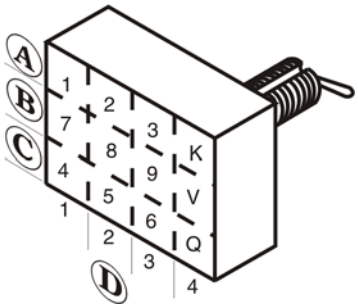
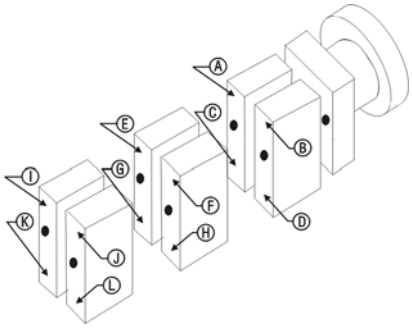
Component	Legend
	**A.** Normally closed contacts **B.** Common contacts **C.** Normally open contacts **D.** Pole

Figure 27: Switch with Replaceable Contact Blocks

Rotary or Push-button Switch Component	Legend
	**A.** Terminal 7 **B.** Terminal 8 **C.** Terminal 4 if normally open; terminal 1 if normally closed **D.** Terminal 5 if normally open; terminal 2 if normally closed **E.** Terminal V **F.** Terminal 9 **G.** Terminal Q if normally open; terminal K if normally closed **H.** Terminal 6 if normally open; terminal 3 if normally closed **I.** Terminal W **J.** Terminal X **K.** Terminal R if normally open; terminal L if normally closed **L.** Terminal S if normally open; terminal M if normally closed

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

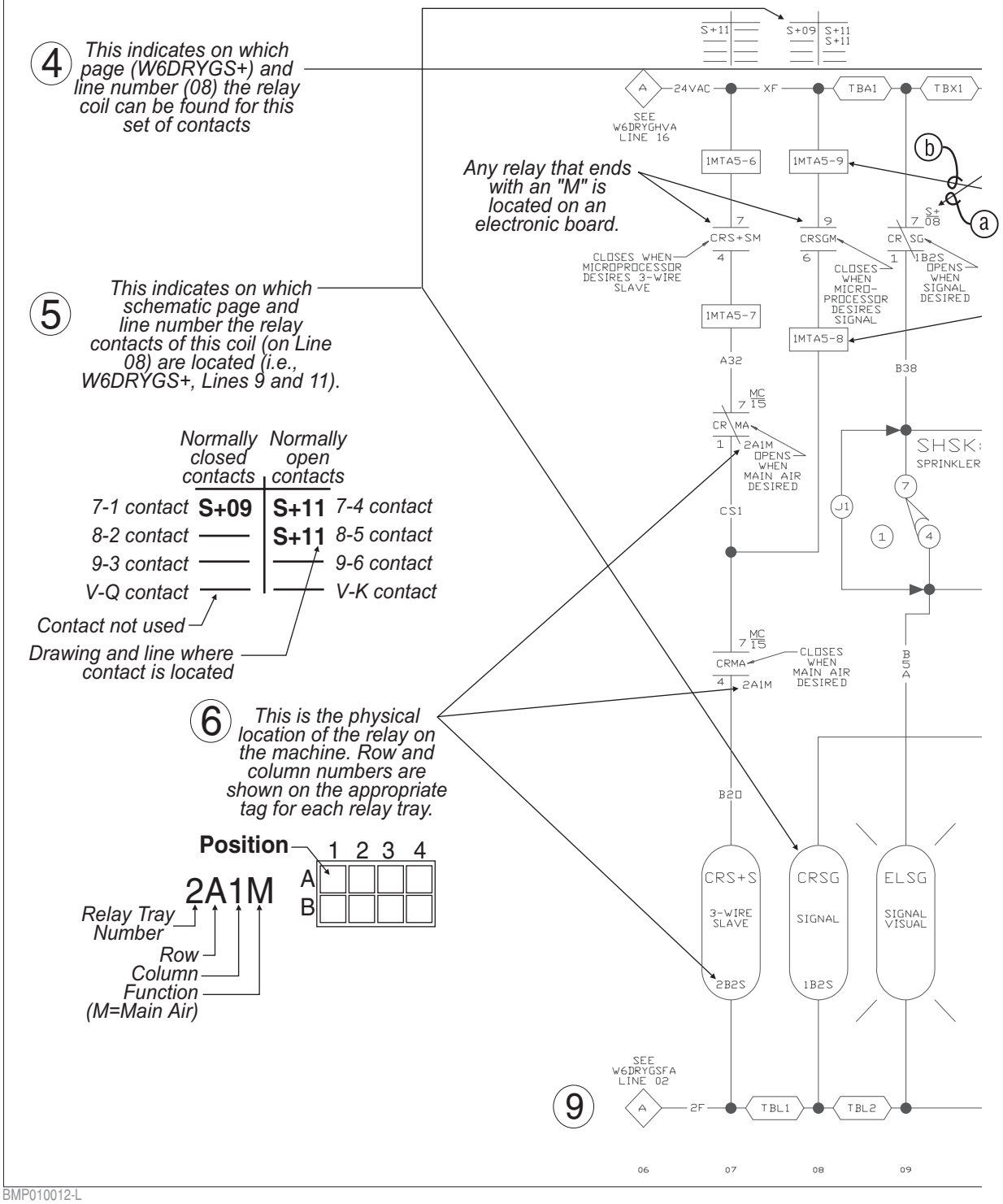
circuitry (S+=three-wire circuit) and establish the order in which the schematic occurs in the manual (schematics are arranged in alpha-numeric order in the manual).

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).

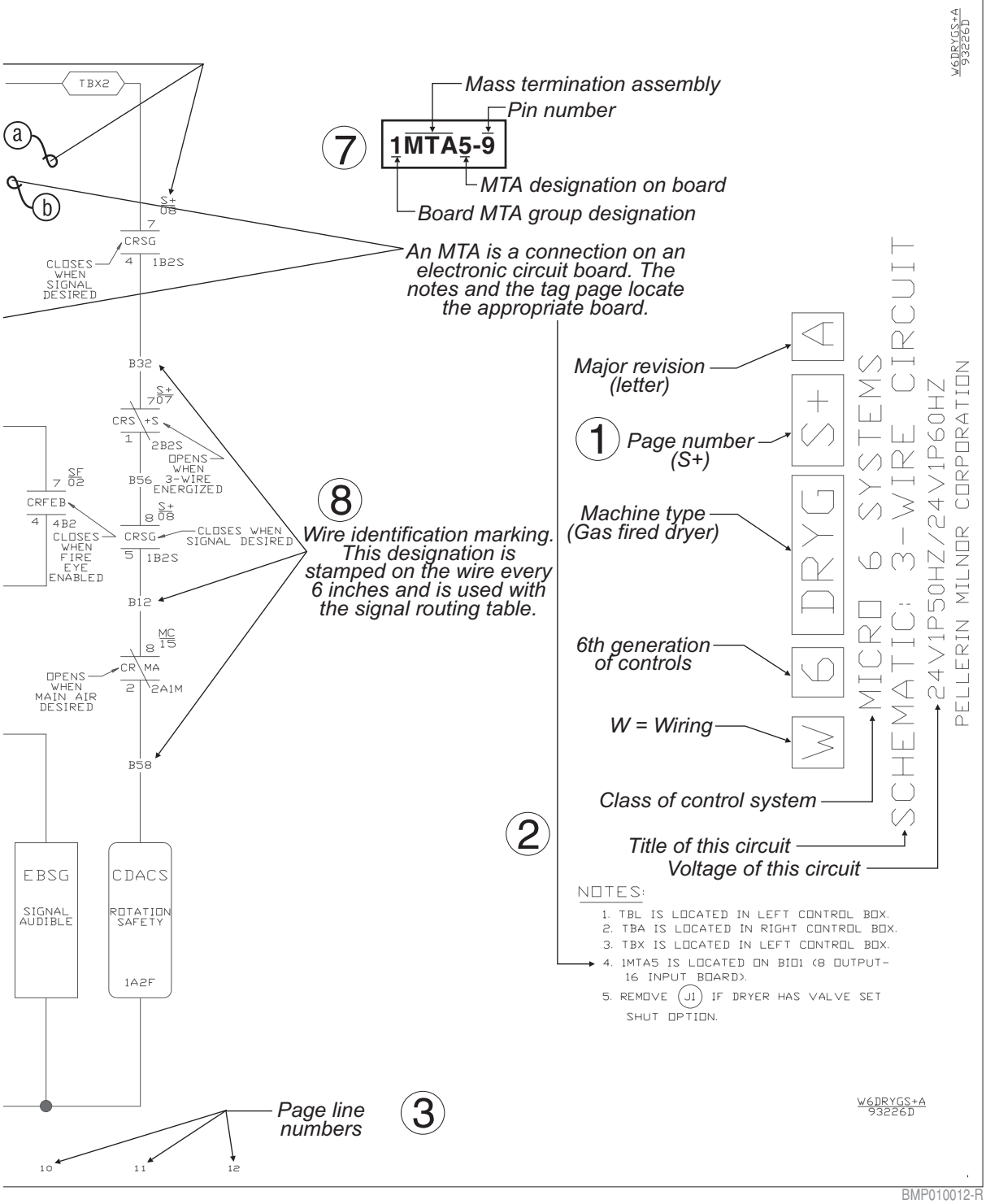
2. Included in the drawing title are the class of control system, the title of this circuit, and the circuit voltage.
3. Line numbers are provided along the bottom edge of the drawing. These permit service personnel in the field and at the Milnor® factory to quickly relate circuit locations when discussing 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.

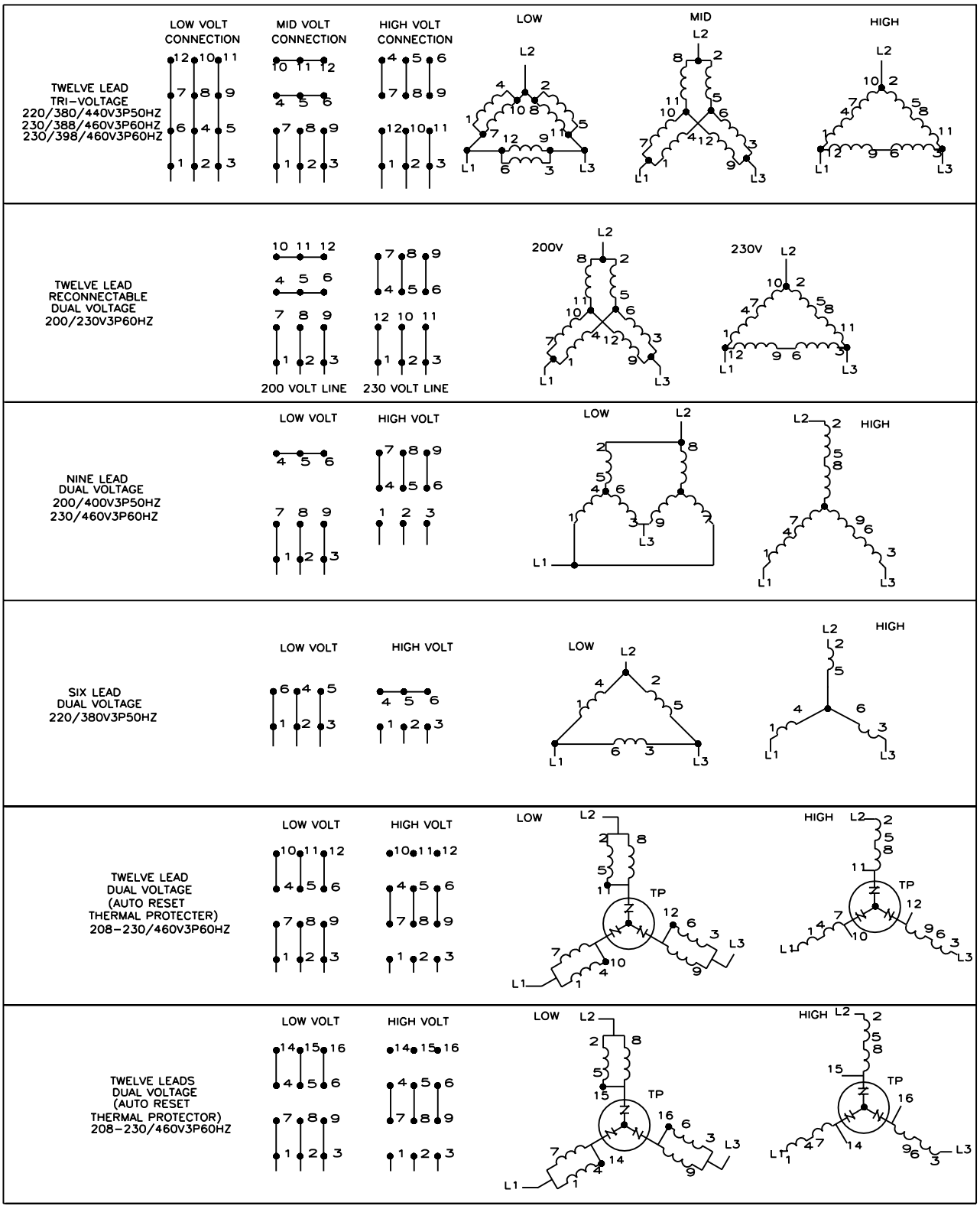
— End of BIUUUK01 —


4
This indicates on which page (W6DRYGS+) and line number (08) the relay coil can be found for this set of contacts
5
This indicates on which schematic page and line number the relay contacts of this coil (on Line 08) are located (i.e., W6DRYGS+, Lines 9 and 11).
Normally closed contacts
Normally open contacts
7-1 contact S+09 S+11 7-4 contact
8-2 contact S+11 8-5 contact
9-3 contact 9-6 contact
V-Q contact V-K contact
Contact not used
Drawing and line where contact is located
6
This is the physical location of the relay on the machine. Row and column numbers are shown on the appropriate tag for each relay tray.
Position 1 2 3 4
A
B
2A1M
Relay Tray Number
Row
Column
Function (M=Main Air)
Any relay that ends with an "M" is located on an electronic board.
S+11
S+09 S+11 S+11
A
24VAC
XF
TBA1
TBX1
SEE W6DRYGHVA LINE 16
1MTA5-6
1MTA5-9
b
a
S+08
CRS+SM
CRSGM
CR SG
CLOSES WHEN MICROPROCESSOR DESIRES 3-WIRE SLAVE
CLOSES WHEN MICRO-PROCESSOR DESIRES SIGNAL
1B2S OPENS WHEN SIGNAL DESIRED
1MTA5-7
1MTA5-8
A32
B38
MC 15
CR MA
2A1M OPENS WHEN MAIN AIR DESIRED
SHSK
SPRINKLER
CS1
J1
CRMA
CLOSES WHEN MAIN AIR DESIRED
B5A
B20
CRS+S
3-WIRE SLAVE
2B2S
CRSG
SIGNAL
1B2S
ELSG
SIGNAL VISUAL
SEE W6DRYGSFA LINE 02
9
2F
TBL1
TBL2
06
07
08
09

BMP010012-L


W6DRYGS+A
93226D
TBX2
a
b
Mass termination assembly
Pin number
7
1MTA5-9
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.
S+ 08
7
CRSG
4
1B2S
CLOSES WHEN SIGNAL DESIRED
B32
S+ 707
CRS
1
+S
2B2S
OPENS WHEN 3-WIRE ENERGIZED
B56
SF 7 02
CRFEB
4
4B2
CLOSES WHEN FIRE EYE ENABLED
S+ 8 08
CRSG
5
1B2S
CLOSES WHEN SIGNAL DESIRED
8
Wire identification marking. This designation is stamped on the wire every 6 inches and is used with the signal routing table.
B12
MC 8 15
CR
2
MA
2A1M
OPENS WHEN MAIN AIR DESIRED
B58
EBSG
SIGNAL AUDIBLE
CDACS
ROTATION SAFETY
1A2F
Page line numbers
3
10
11
12
Major revision (letter)
1
Page number (S+)
Machine type (Gas fired dryer)
6th generation of controls
W = Wiring
Class of control system
2
Title of this circuit
Voltage of this circuit
W 6 DRYG S+ A
MICRO 6 SYSTEMS
SCHEMATIC: 3-WIRE 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 BIO1 (8 OUTPUT-16 INPUT BOARD).
5. REMOVE J1 IF DRYER HAS VALVE SET SHUT OPTION.
W6DRYGS+A
93226D

BMP010012-R



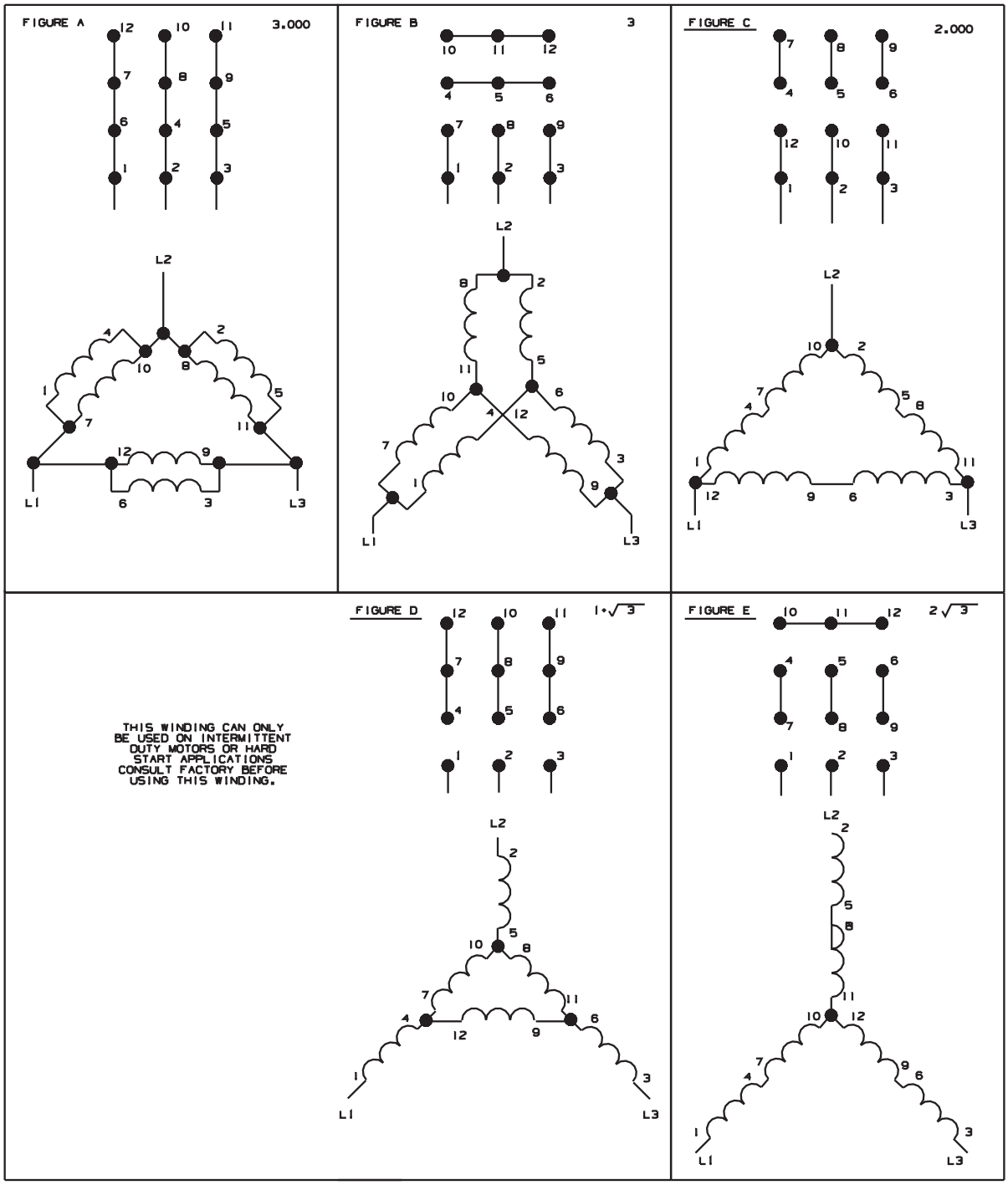
W80008

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

PELLERIN MILNOR CORPORATION

W80008
2001253A

FIGURE	ELECTRICAL VALUES	SUFFIXES									
		B		H		M		T		U	
		50HZ	60HZ	50HZ	60HZ	50HZ	60HZ	50HZ	60HZ	50HZ	60HZ
A	1.000	208	230			200	220	220	240	200-220	208-240
B	$\sqrt{3}$				208	346	380	380		346-380	380
C	2.000	416	460	220	240	400	440	440	480	400-440	440-480
D	$1 \cdot \sqrt{3}$						600				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

BMP850029
993628

BMP850029
993628

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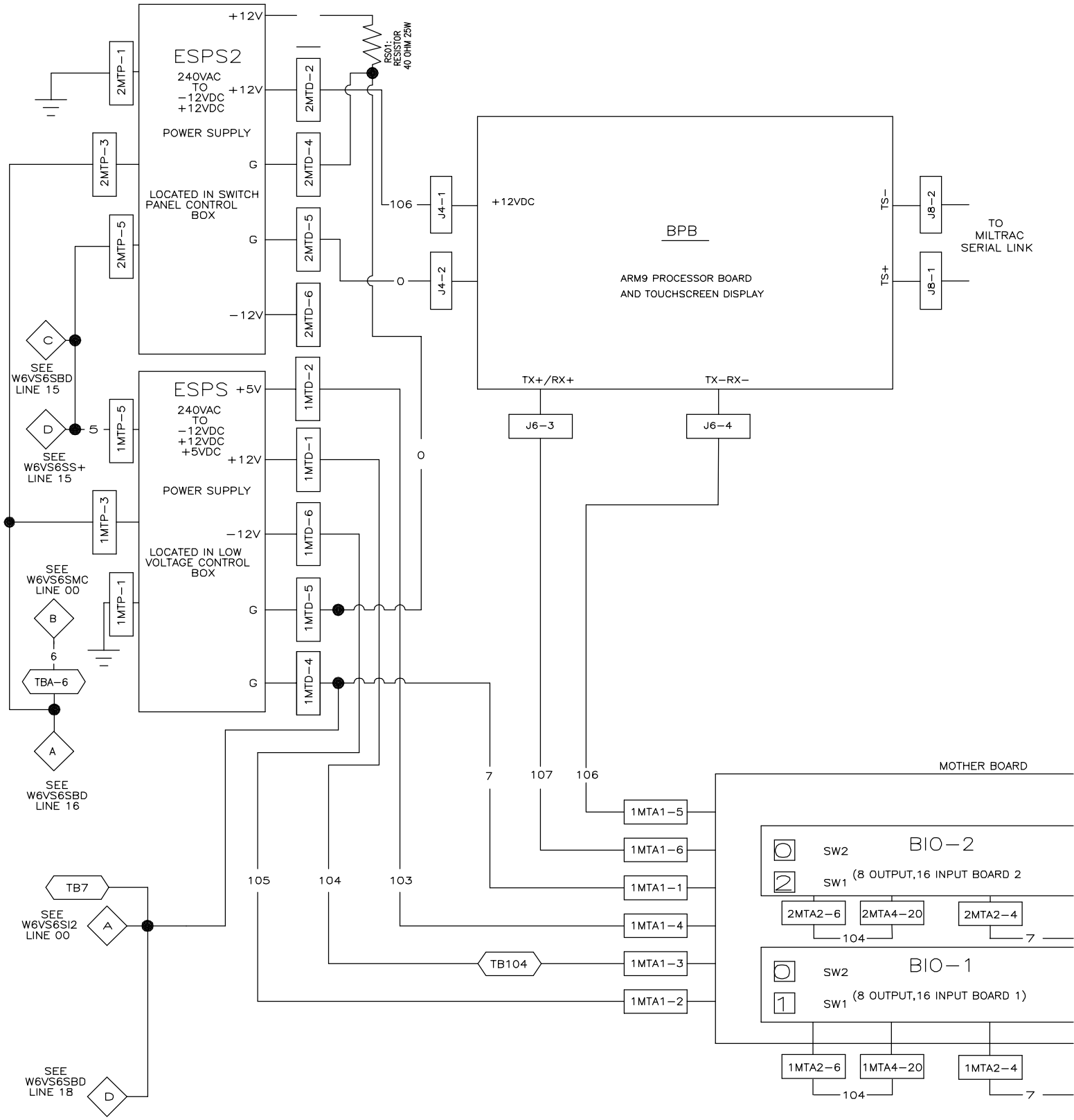


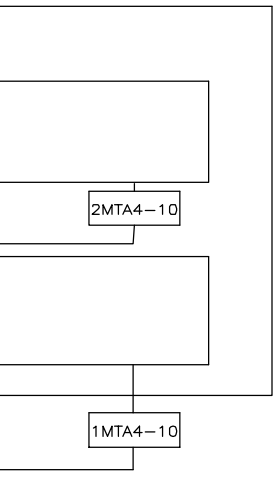
W6VS6SBD
2017462B

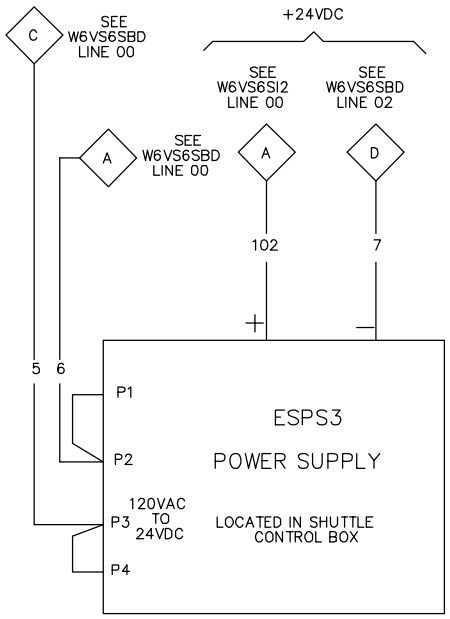
W6VS6SBD
MILTOUCH–EX™ CONTROLS
SCHEMATIC: BOARD TO BOARD WIRING

PELLERIN MILNOR CORPORATION

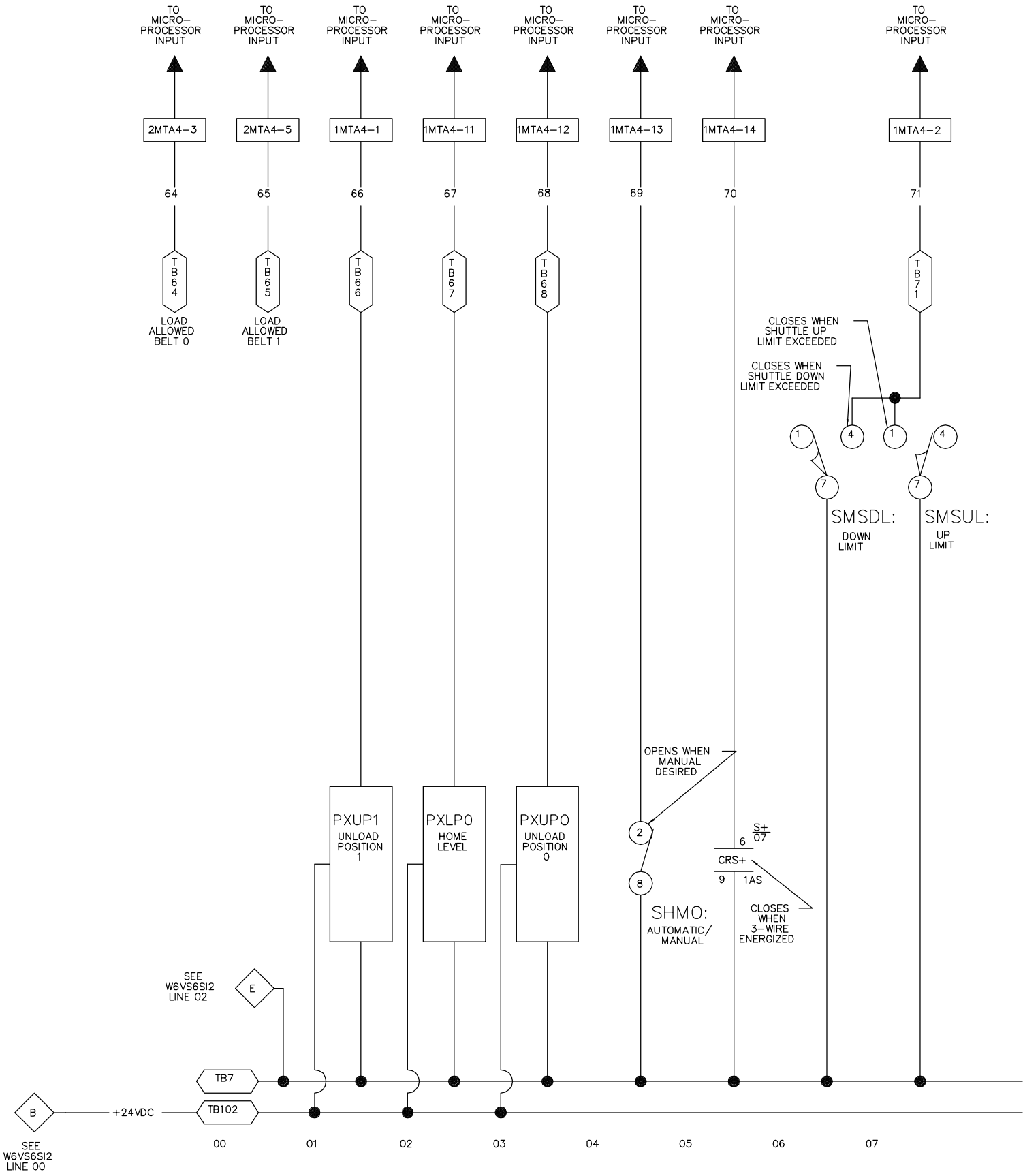
NOTES:

1. 1MTP, 1MTD ARE LOCATED ON ESPS (POWER SUPPLY).
2. 2MTP, 2MTD ARE LOCATED ON ESPS2 (POWER SUPPLY FOR PROCESSOR).
3. J4 AND J6 ARE LOCATED ON BPB (ARM 9 PROCESSOR BOARD)
4. 1MTA2, 1MTA3,AND 1MTA4 ARE LOCATED ON BIO–1(8 OUTPUT–16INPUT BOARD).
5. 2MTA2 AND 2MTA4 ARE LOCATED ON BIO–2(8 OUTPUT–16INPUT BOARD).
6. 1MTA1 IS LOCATED BMTH (MOTHER BOARD).

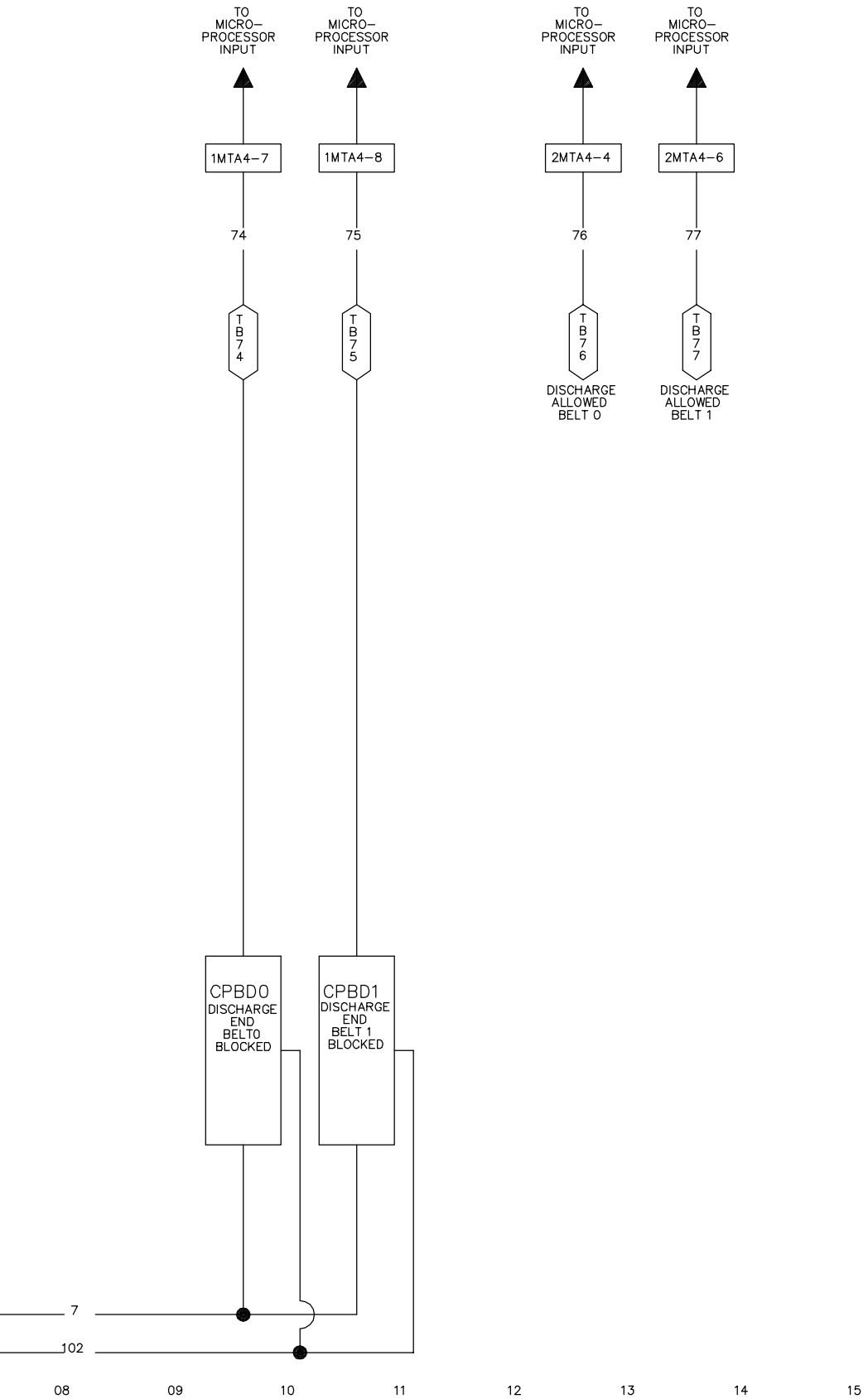




11 12 13 14 15 16 17 18 19



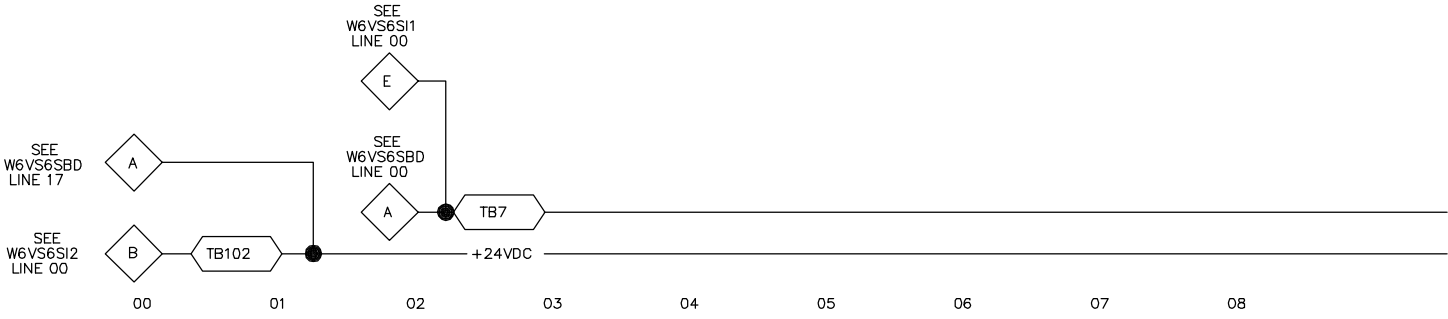
W6VS6SI1
2017462B



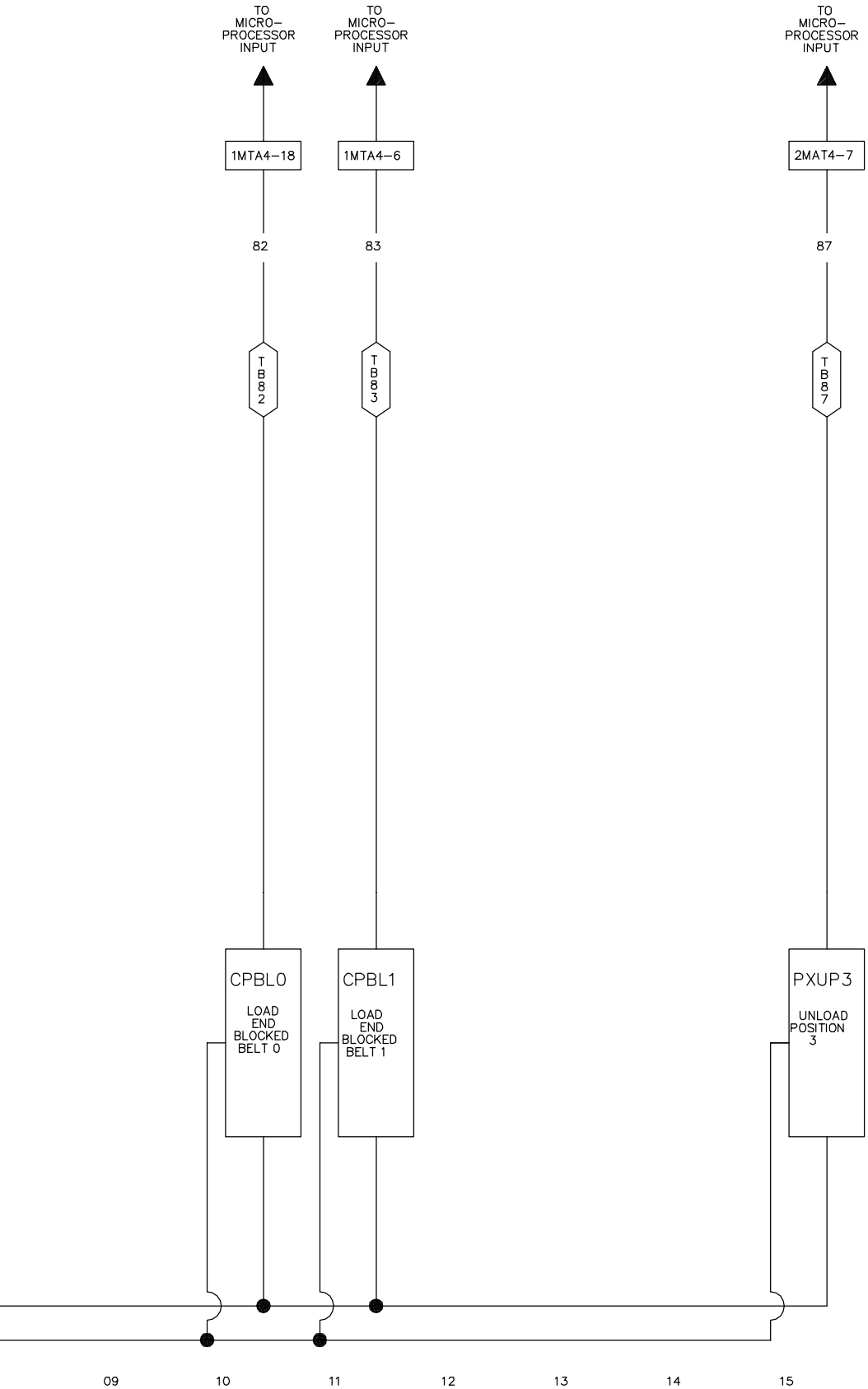
W6VS6SI1

MILTOUCH–EX™ CONTROLS SCHEMATIC: INPUTS

PELLERIN MILNOR CORPORATION



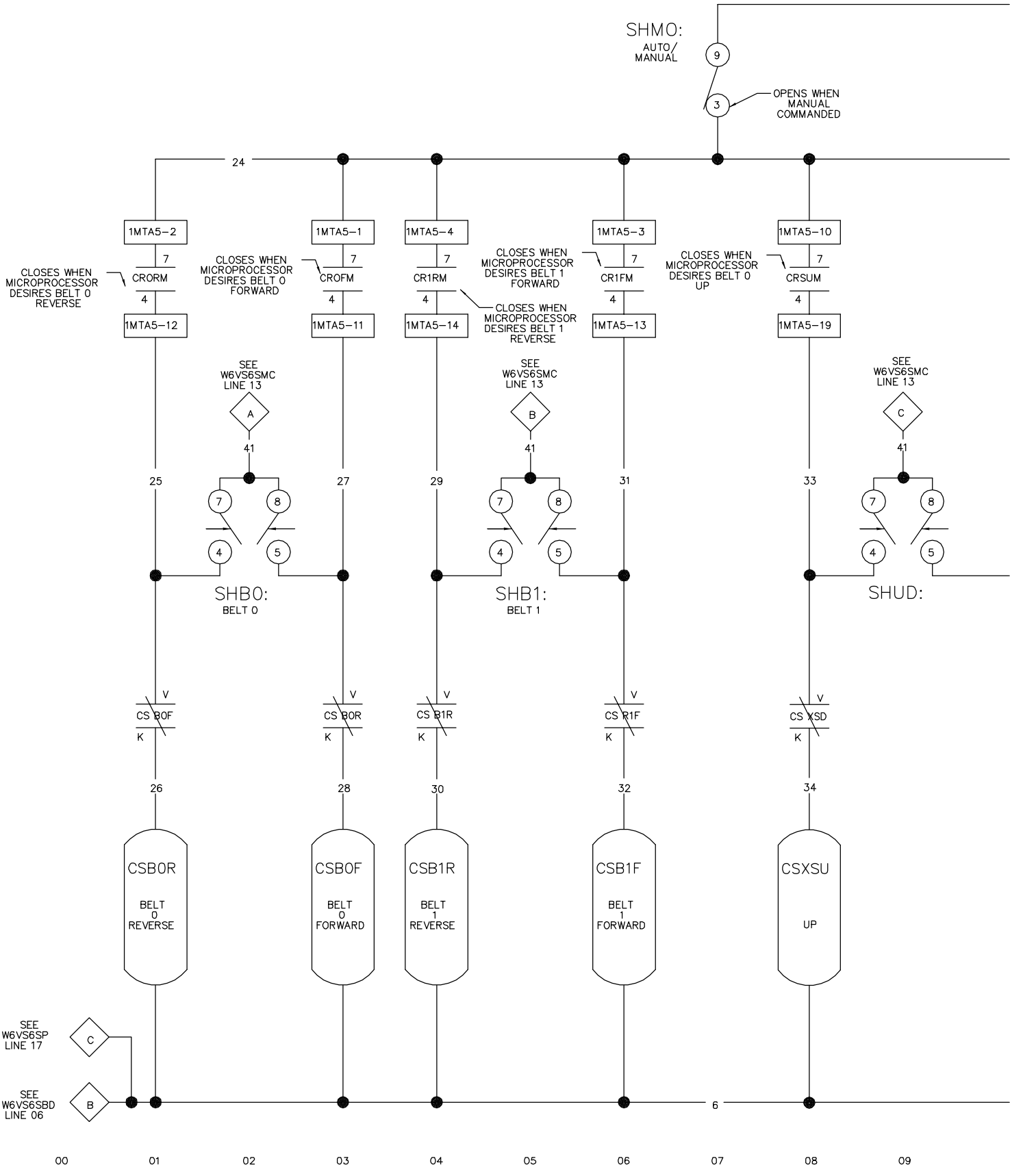
W6VS6SI2
2017462B



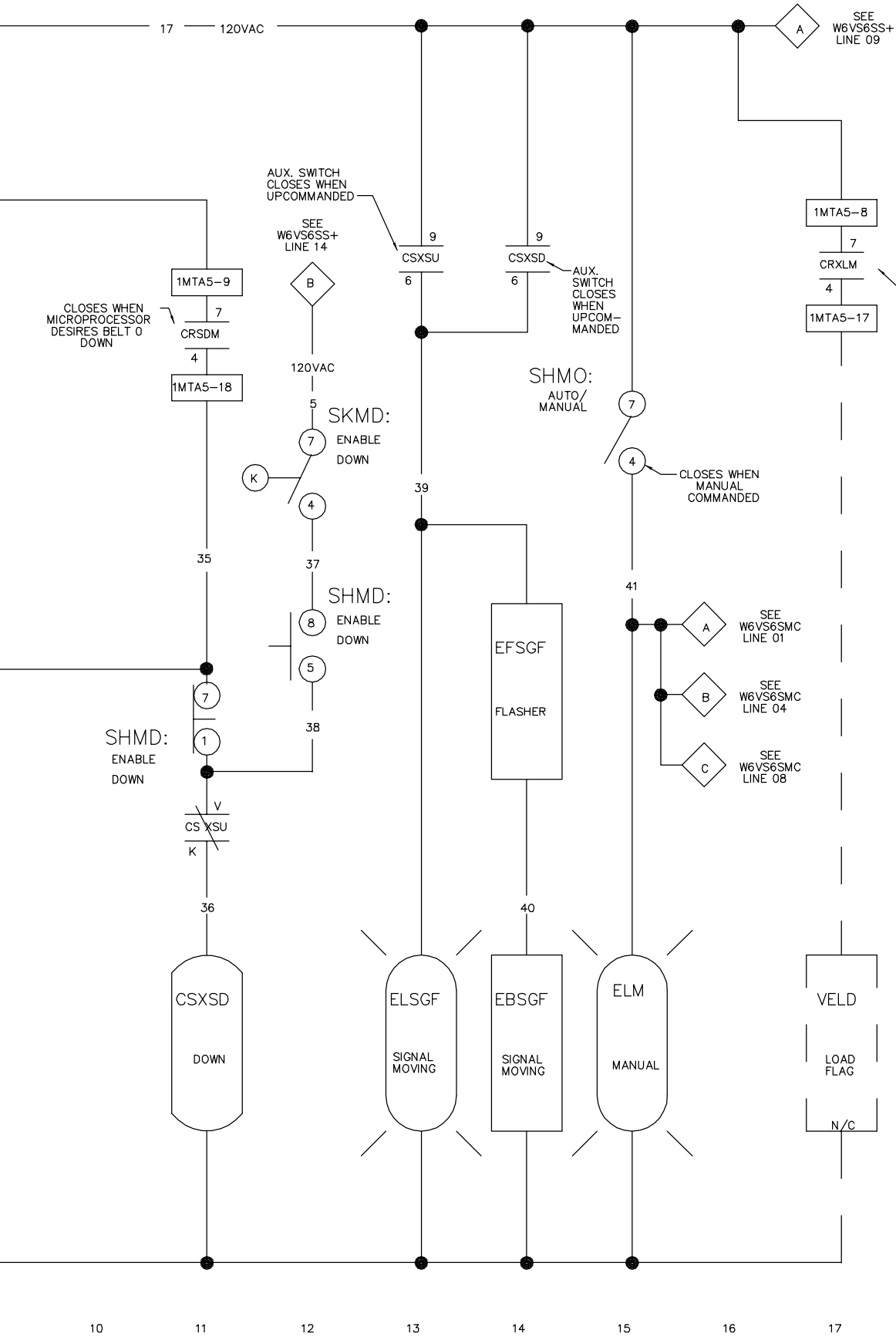
W6VS6SI2

MILTOUCH–EX™ CONTROLS SCHEMATIC: INPUTS

PELLERIN MILNOR CORPORATION



W6VS6SMC
2017462B



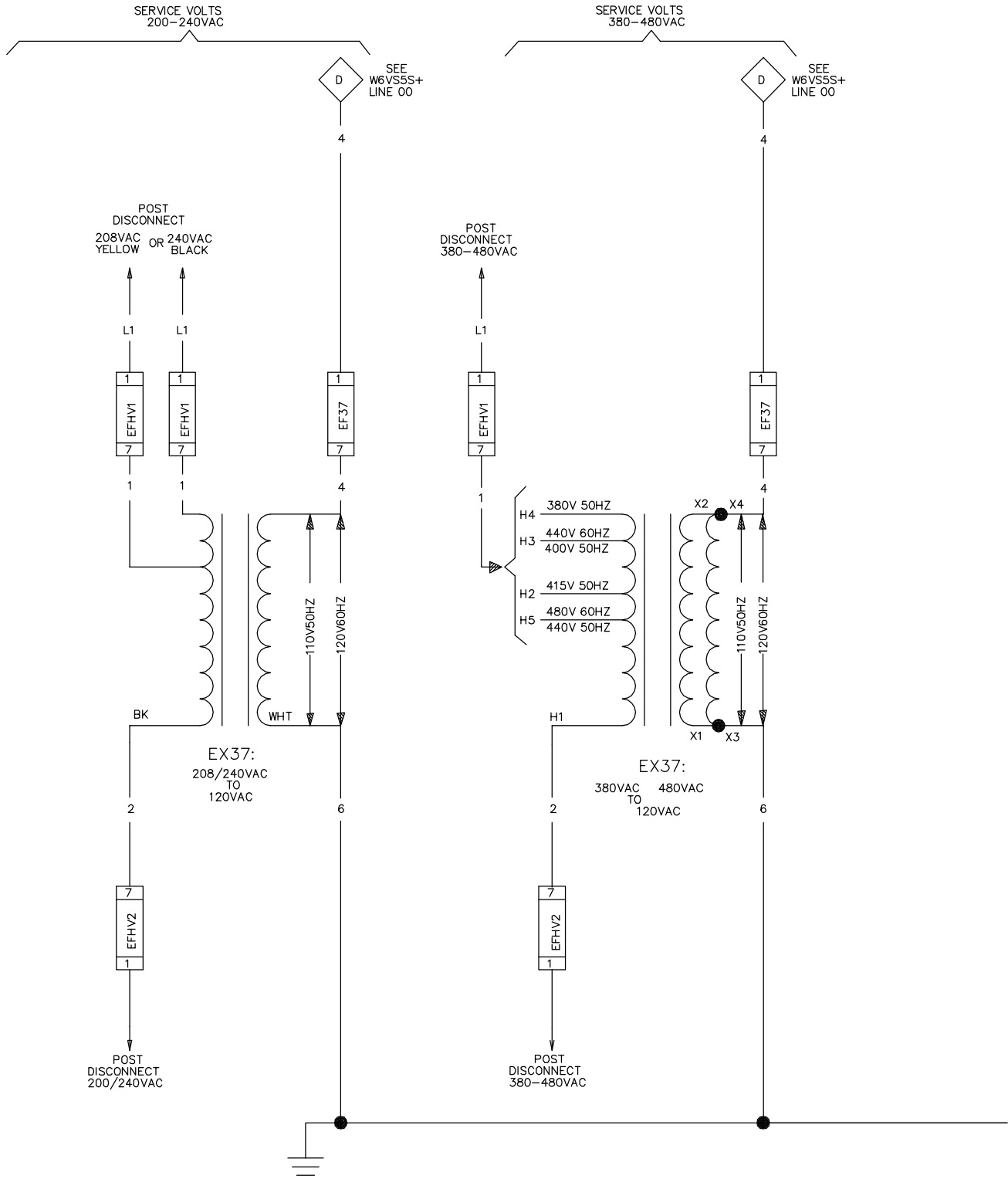
W6VS6SMC

MILTOUCH-EX™ CONTROLS

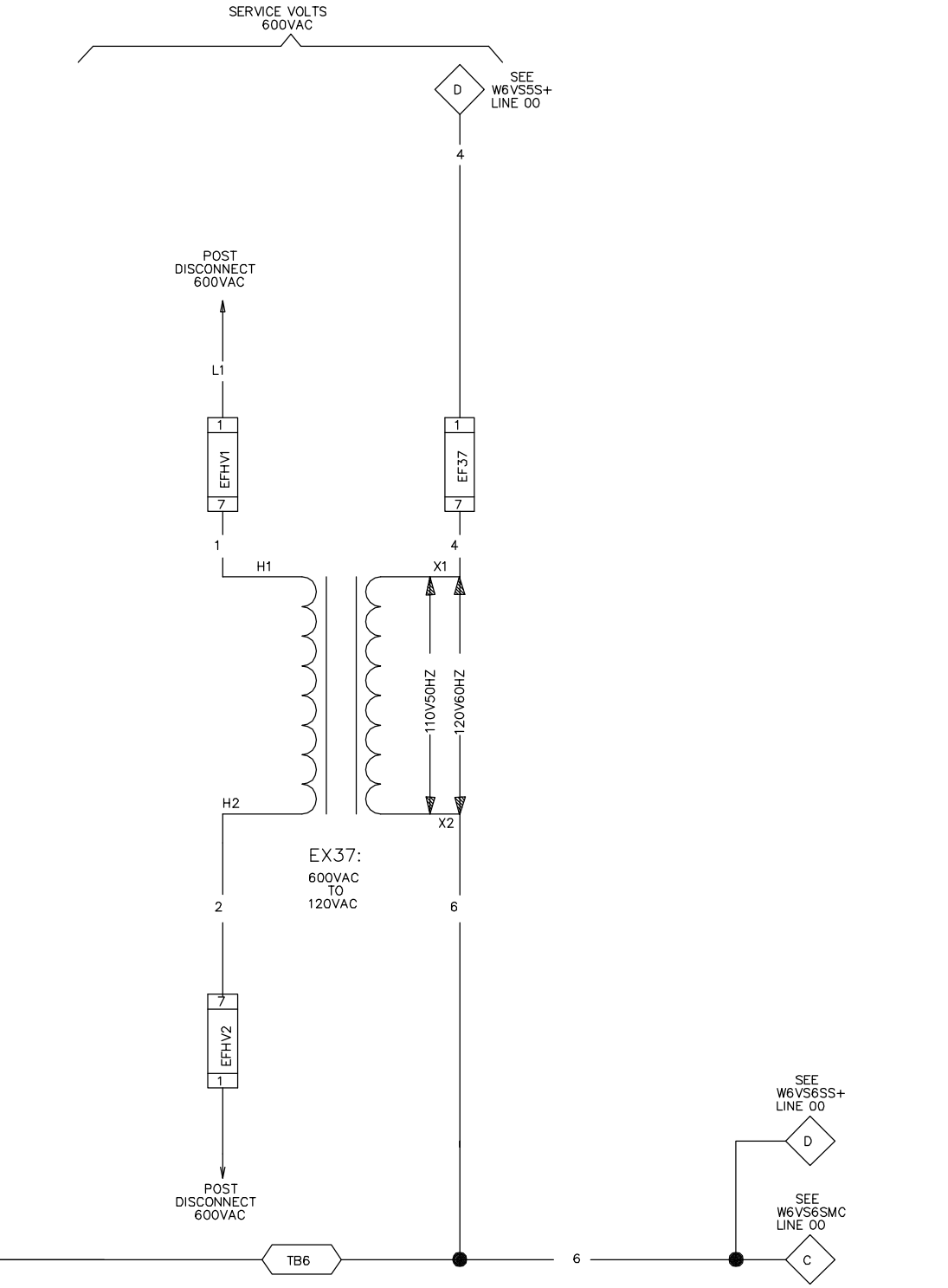
SCHEMATIC: LOAD: NO EXTENSION
UNLOAD: NO EXTENSION

110V1P50HZ/120V1P60HZ

PELLERIN MILNOR CORPORATION



W6VS6SP
2017462B

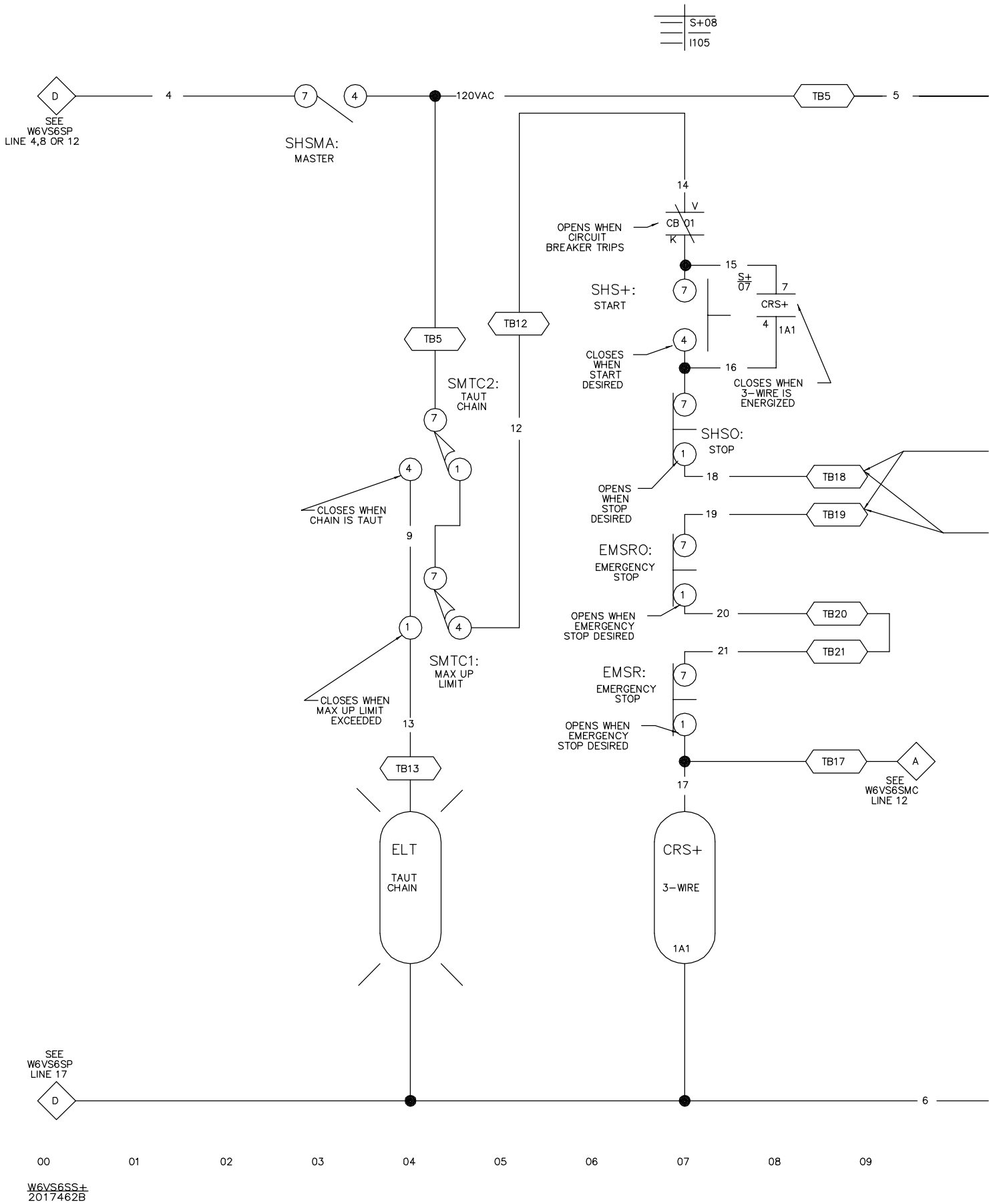


W6VS6SP

MILTOUCH–EX™ CONTROLS

SCHEMATIC: SOURCE 110V50HZ/120V60HZ CONTROL CIRCUIT POWER

PELLERIN MILNOR CORPORATION



W6VS6SS+
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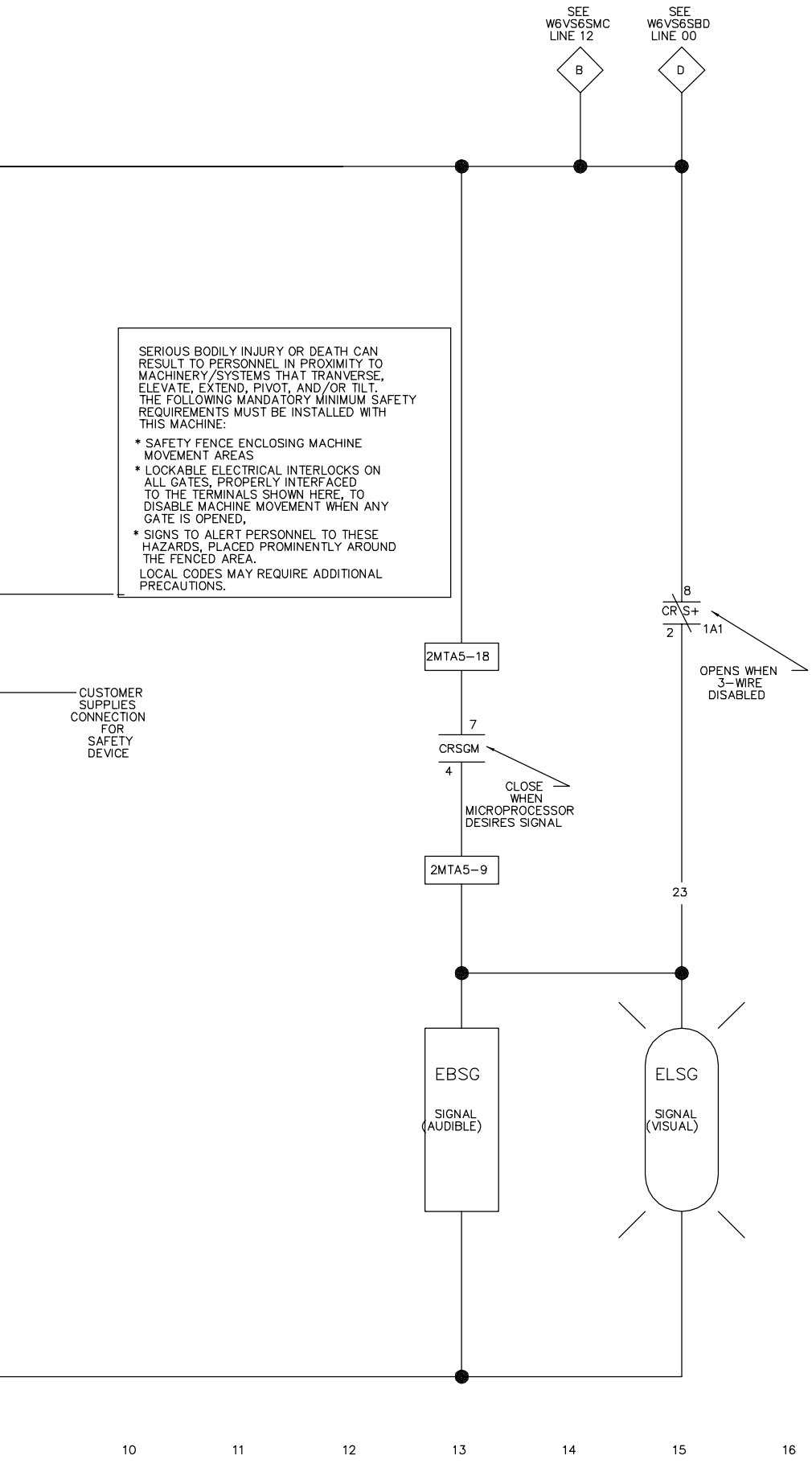

W6VS6SS+
MILTOUCH-EX™ CONTROLS
SCHEMATIC: 3-WIRE CIRCUIT
110V50HZ/120V60HZ
PELLERIN MILNOR CORPORATION