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Instruction & Parts Manual for

# **CMZ-7R**

## Power Rotary Machine

Operator must read and understand  
Instruction Manual prior to operating the  
CMZ-7R Power Rotary Machine, as damage to  
machine or personal injury may result.

Electrician must refer to electrical schematics in  
this manual before initial startup.

## **ROTARY MACHINE SAFETY RULES**

CMZ-7R machine should be DISCONNECTED from power source before servicing.

Never place any part of the body including loose clothing near or onto the rotating rolls. (KEEP HANDS AWAY). Failure to follow this procedure will lead to personal body injury.

Never clean forming rolls while they are rotating.

Do not exceed specified material capacity of the machine.

Machine must be operated by authorized personal who have been trained in regards to working and safety features of the machine.

**Please read and understand the Operators Manual.**

Never operate machine with any guards removed.

Do not use machine if service is required.

Use safety glasses and required protective equipment.

Keep work areas clean and in proper order.

# START UP/OPERATION INSTRUCTIONS

## WIRING

Prior to electrical hookup please refer to Wiring Schematic on next page.

## CLEANING

Remove the factory applied rust inhibitor with a degreasing agent or oil soaked rags.

## LUBRICATION

Check gearbox Oil Sight Glass (2) for proper oil levels

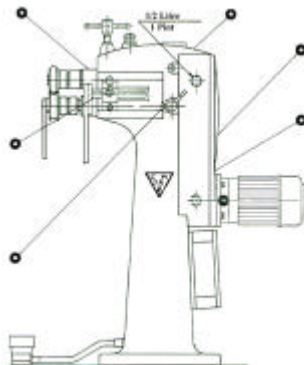
The following tables will provide you with manufacturers and types of oil and grease recommended by the factory.

Lubricate all points as marked with the proper grease using the fitting included in this information package.

### US GREASE & OIL SPECIFICATIONS CANADIAN GREASE & OIL SPECIFICATIONS

| BRAND  | GREASE                            | OIL             |
|--|-----------------------------------|-----------------|
| US Mobil Brand                                 | Mobilux Grease 2                  | Mobil DTE 24    |
| Shell OilUS<br>Product Info#1-<br>800-231-6950 | Alvania<br>EP2Alvania<br>Gerase 2 | Shell Tellus 32 |
| Esso   | Lonax/Lidok<br>EP2                | Nuto H32        |

| BRAND   | GREASE                         | OIL             |
|---|--------------------------------|-----------------|
| Nemco Available in:<br>Winnipeg, Regina,<br>Saskatoon | LCEP2                          | Hydrol AW32     |
| Shell Canada  | Alvania EP2Alvania<br>Grease 2 | Shell Tellus 32 |
| Esso  | Lonax/Lidok EP2                | Nuto H32        |



## **ELECTRICAL INSTALLATION**

CMZ-7R Power Rotary Machine Must Be Installed By a Certified Electrician

Please see wiring schematics for proper location to run your power lines to.  
(FAILURE TO WIRE ACCORDING TO WIRING SCHEMATICS WILL RESULT IN INVERTER DAMAGE)

## **ROLL INSTALLATION**

The CMZ-7R comes with a lower shaft adjustment (14) so rolls with differing centerlines can be lined up. Loosen the locking screw on the right hand side of the unit (12) and then bring the rolls together. Once the rolls have fit snugly together firmly lock the shaft in place.

## **THROAT GAUGE ADJUSTMENT**

The CMZ-7R is fitted with adjustable Throat Gauge Guides. For operation of machine where limited throat gauge depth is required the guides should be located to the front of the shafts. Where deeper operations are required the Throat Gauge Guides must be removed and placed in their proper locations near the back of the shafts.

## **DEPTH CONTROL**

The CMZ-7R comes standard with a manual screw adjustment for control of the upper shaft depth. (9). If you look directly behind the Adjusting Screw you will see the Upper Shaft Tensioning Screw (10). This is factory set and should never need adjustment.

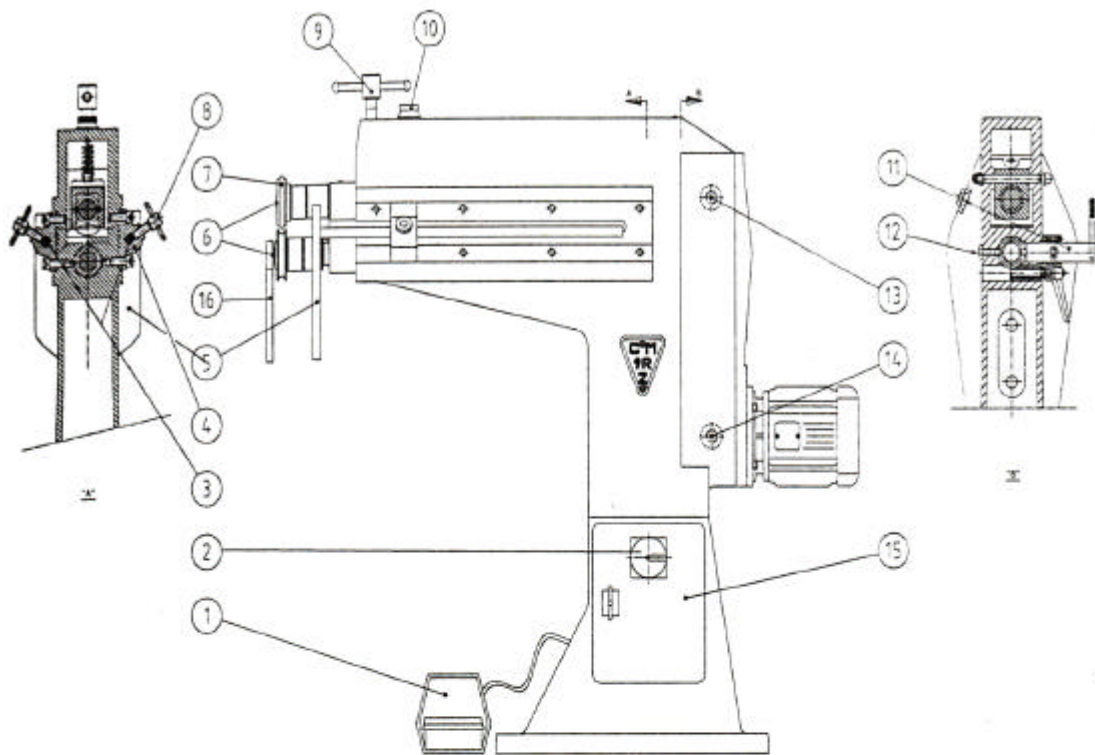
## **ROLL INSTALLATION**

Rolls must be secured by means of the Roll Locking Nuts (5) provided.  
Upper Roll Lock Nut is Left Hand Thread and the Lower Roll Lock Nut is Right Hand Thread.  
Failure to secure rolls will result in roll and shaft damage and will void all factory warranties.

CMZ-7R comes with a set of 3/8" Single Bead Rolls as standard.  
(We will quote on any roll application you may require)

## **SPEED CONTROL**

Your CMZ-7R is equipped with a Speed Control and Forward/Reverse Switch. Forward/Off/Reverse Switch must be in either Forward or Reverse position to operate. Machine will only run if foot pedal is depressed. Operator should never switch between forward and reverse while the rolls are turning as damage may occur. Speed may be adjusted while rolls are turning.



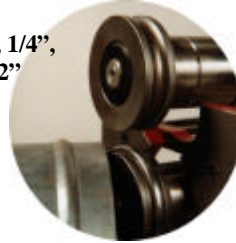
- 1 Switching pedal
- 2 Main disconnect switch
- 3 Axis guide supporting
- 4 Front guide supporting
- 5 Guide on front end
- 6 Right and left nuts
- 7 Shaping rollers
- 8 Guide locking screw
- 9 Nut for locking downward displacement limit height
- 10 Spring capsule
- 11 Displacement control
- 12 Lower spindle locking screw
- 13 Gearbox plug
- 14 Oil level
- 15 Electric box

### **Optional Accessories for CMZ-7R and CMZ-9R:**

- Single Bead Rolls (3/16", 1/4", 1/2")
- HEAVY Crimping Rolls (1-1/2") 16GA/18GA
- HEAVY Combination Crimp & 3/8" Bead Rolls (Inc. Spacer to allow use of crimp rolls only)
- NEW! LIGHT Crimping Rolls (20GA & lighter)
- LIGHT Combination Crimp & 3/8" Bead Rolls (Inc. Spacer to allow use of crimp rolls only)
- Ogee Bead Rolls
- Flattening Rolls
- Elbow Edging
- Offset Rolls
- Burring Rolls
- 1/4" Flanging Rolls
- 1/2" #20 Smooth Flanging Rolls (20Ga. & Heavier)
- 1/2" #20 KNURLED Flanging Rolls (better on lighter gauges)
- Wiring - specify -1/16", 1/8", 3/16", 1/4", 5/16"
- Closing
- Slitting Rolls
- Spin In Collar Rolls (22GA & lighter)
- Base (Raises working height from 31-1/2 – 42")
- Optional Electrics: (440V 3PH)
- Air Cylinder Package c/w Depth Stop  
(Raises & Lower Top Shaft with Foot Switch (Not to Be Used with #20 Flange Rolls or Spin In Rolls))
- Air Over Oil Hydraulic Cylinder (Foot Pedal Controlled)Top Shaft Control
- Digital Programmable Top Shaft Control
- Spring Loaded Pipe Support Stand
- Larger Front Face Plate c/w Internal Bearing Supports



**Bead**  
1/8", 3/16", 1/4",  
3/8", 1/2"



Optional Air Cylinder Op-  
tion Allows for Hands  
Free Operation

11" Throat Depth

Hardened Steel Back-  
ing Plate

High Efficiency Motor Dual  
Voltage Motor

Optional Speed Control gives  
operator infinitely variable speed  
and forward/reverse at the flip of  
a switch

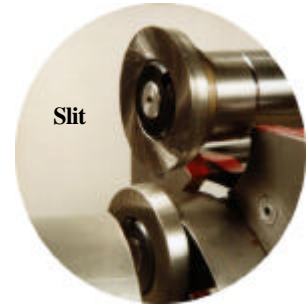
Optional Base Raises the  
Standard Working Height  
from 33" to 38"

Safety Covered  
Footswitch

**Offset**



**Slit**

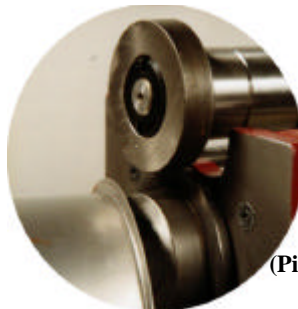


**Crimp or  
Combination  
Bead & Crimp**



# CMZ 7R Power Rotary Machine

1/4" or 1/2" 90° Flange Rolls  
(Pipe Stays in Horizontal Position)



## Offset Rolls

With large spacers on the top and bottom shafts install the male offset roll on the top shaft and the female offset roll on the bottom shaft

Tighten locking collars.

Bring top shaft down until rolls are just touching.

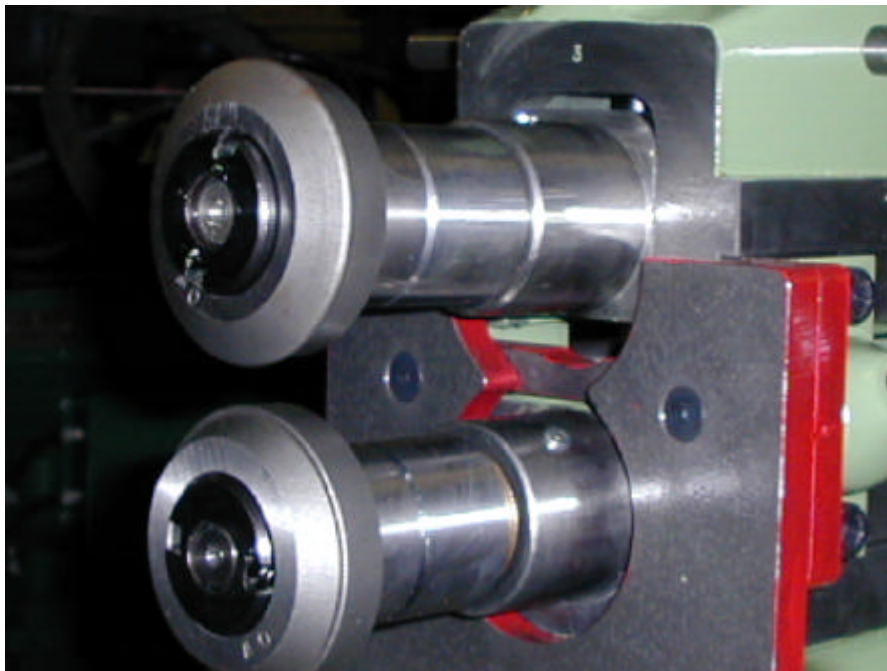
Loosen locking screw on the bottom shaft and adjust the bottom roll until there is about 2 times material thickness between the male and female portion of the rolls.

Adjust the backstop up to the back of the bottom roll so it is almost touching the roll but not rubbing and lock in place.

Place material onto the bottom roll and up against the backstop.

Start the rolls turning and bring the top shaft down and form the offset.

You may be required to do some minor adjustments to the spacing for optimum parts.



## 1/2" #20 Flange Rolls

Install flat roll on the top shaft.

Remove bottom spacing collar and install the threaded spacing collar.

Loosen the bottom shaft locking screw and adjust shaft all the way in and then tighten the locking screw.

Install roll with shoulder on the bottom shaft with the shoulder towards the backstop

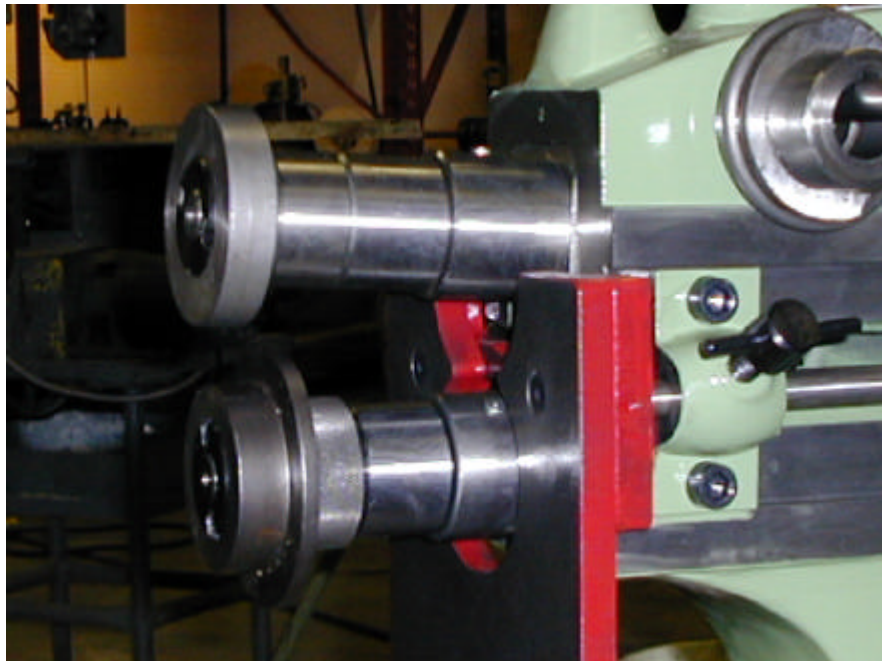
Bring the top roll down until the top and bottom roll just about touch.

Adjust the threaded collar on the bottom shaft until there is about 2 times the material thickness spacing.

Tighten the locking collars.

Bring the backstop up to the shoulder on the bottom roll just so it does not rub on the roll.

The capacity on the rolls is 14 Ga. To 22 Ga. If you are using lighter gauge material ie: 22 Ga. you must bring the top roll down slowly into the material otherwise you will wrinkle the material and it will not form.



## Crimp Rolls

Remove the large shaft spacing collars on the top and bottom shaft

Install the small spacers that came with the rolls on the shafts.

Install the top and bottom crimp roll with the recess in the face of the roll to the front of the machine.

Bring the top shaft down until the rolls mesh together.

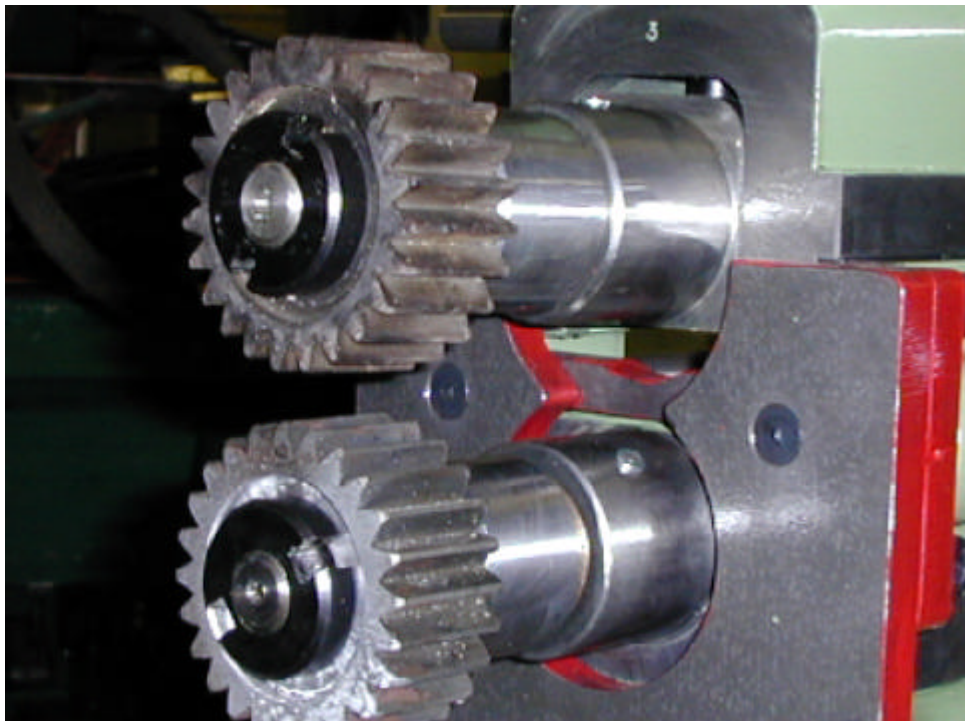
Tighten the locking collars.

Adjust the backstop up to the end of the crimp rolls and tighten.

When you are ready to form the crimp. With the rolls separated place your material over the bottom roll until the material is against the backstop.

**DO NOT START THE MACHINE UNTIL YOU BRING THE TOP ROLL DOWN AND TIGHTEN FIRMLY TOGETHER SANDWICHING THE MATERIAL BETWEEN THE ROLLS.**

You can now press on the footswitch and begin the crimping process.



## Combination Bead & Crimp

Remove the large shaft spacing collars on the top and bottom shaft

Install the top and bottom crimp rolls with the recess in the face of the roll to the back of the shaft.

Install the male bead roll on the bottom shaft with the highest portion of the roll facing out.

Install the female bead roll on the top shaft with the highest portion of the roll facing out. Bring the top shaft down until the rolls mesh together.

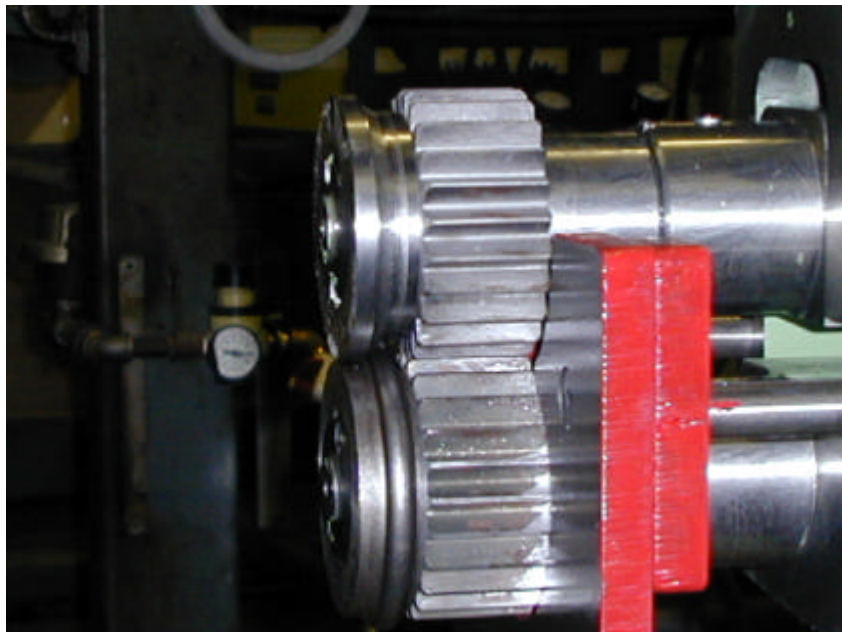
Tighten the locking collars.

Adjust the backstop up to the end of the crimp rolls and tighten.

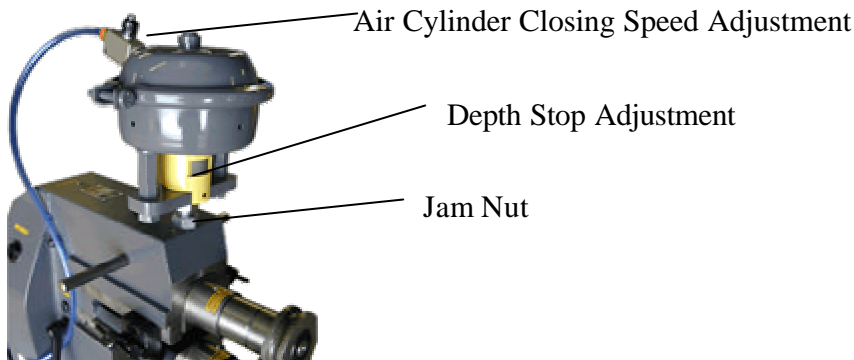
When you are ready to form the crimp. With the rolls separated place your material over the bottom roll until the material is against the backstop.

**DO NOT START THE MACHINE UNTIL YOU BRING THE TOP ROLL DOWN AND TIGHTEN FIRMLY TOGETHER SANDWICHING THE MATERIAL BETWEEN THE ROLLS.**

You can now press on the footswitch and begin the crimping process.



## CMZ-7R Air Cylinder Operation



The CMZ-7R Air Cylinder option is a cost effective way of allowing the operator hands free operation to maintain full control of the part being formed. This option is **not recommended** for Flanging Rolls or Spin In Collar Rolls as these rolls require a stepping down of the top shaft and the travel on the air cylinder is continuous and not able to stop & start during the forming process which is a requirement for these rolls.

The air cylinder is initialized when the foot pedal is depressed and returns to its home position when the foot pedal is released.

The air cylinder option comes standard with a closing speed adjustment valve which is used to control the speed of the top shaft coming together to pinch the material. Also included is a depth stop adjustment which allows the operator to stop the top shaft at a predetermined depth for production operations.

If for any reason the air cylinder must be removed to allow the operator to utilize the standard hand crank that was shipped with your CMZ-7R the following process must be followed. First disconnect the air supply from your compressor to the unit. Then remove the plastic air line from the top of the air cylinder that is connected to the end of the speed control valve by pushing and holding the plastic ring in while pulling on the air line. Next loosen the jam nut (shown in the picture above) and then spin the air cylinder out of the threaded hole and thread in the hand crank.

## **CMZ-7R Programmable Top Shaft Control**

The PLC Control for the top shaft on the CMZ-7R is a single program control that utilizes intervals of air being introduced to the air over oil hydraulic system and wait times between each burst of air. The control has three different operating modes and they are explained as follows:

**MANUAL:** In manual mode the top shaft is controlled by means of either pushing the **UP** or **DOWN** buttons on the keypad. Very few of the other buttons on the keypad will function when in manual mode.

**AUTOMATIC:** In automatic mode all the function buttons on the keypad are useable. After a program is entered and the home position is set then the foot pedal is activated and must remain activated until the end of the program. If the foot pedal is released before the end of the program then the top shaft will return to its home position and will begin at the start of the program.


**SEMI AUTOMATIC:** In semi automatic mode the functions are the same as in automatic mode but the only difference is if the foot pedal is released during the cycle it will remain in that position and then the top shaft can be repositioned by means of the up and down buttons on the keypad.

**PROGRAMMING THE CONTROL:** Each part may vary and must be programmed with this in mind. Some parts require a full revolution before the top shaft can be fed down i.e. Spin-In Collar and ½" Flange Rolls. With this in mind you will need to vary your speed of the rolls to match the settings on the control. This can only be done with a little bit of trial and error. There are three different settings that make up a program and they are as follows:

**INDEX TIME:** This is the amount of time that air will be introduced to the system thereby driving the top shaft down with each burst of air. The shorter the time the larger the number of steps will be required to get to the bottom of the stroke. **NOTE:** There is less than 1" of stroke required to get from the top of the stroke to the bottom. The number should never have to be much longer than ½ a second for a simple part like a bead or a fraction of a second for the spin collar rolls.

**WAIT TIME:** This is the amount of time required between the bursts of air. This number will be set according to the diameter of part and if the part requires a full revolution or not before the next downward movement of the top shaft.

**INDEX #:** This number is the number of downward movements of the top shaft is required to complete the program and the part. Once the control has counted this number of movements you will be instructed to release the foot pedal. This number is also a trial and error number that must be set by trying a part to determine the required movements of the top shaft to finish the part. **NOTE:** This number may need to be adjusted if you set the program without running material for purposes of setup.

The **ARROW KEYS**  are used to navigate between each setting and the **CLR** button clears the existing numbers. Using the numbers on the pad enter the required setting and then press **ENTER**. **NOTE:** If **ENTER** is not pressed after each change the number will not be accepted.

**HOME:** This button returns the top shaft to a preset home position no matter what mode or position the top shaft is in.

**LEARN HOME:** This button teaches the control the home position. **Extra care must be taken when entering the values in this area, as severe damage will occur to the machine as over travel may occur if too large a value is entered.** To program the home position press the **LEARN HOME** button on the keypad. Doing this will take you into a different screen, there will be three different settings that can be changed on this screen and they are explained as follows:

**RISE TIME:** This value is the time that the control allows for the top shaft to rise after the program is finished or the **HOME** button is pushed.

**WAIT TIME:** This value is the wait time allowed after the top shaft reaches the top of stroke. This value is important as some different roll profiles may take more time than others to remove the part from the rolls.

**DOWN TIME:** This value is the time allowed for the top shaft to return to its home position. Careful attention must be made when entering this value as damage to the machine will occur if too long a value is place here. You should never have a value much longer that 3 seconds.

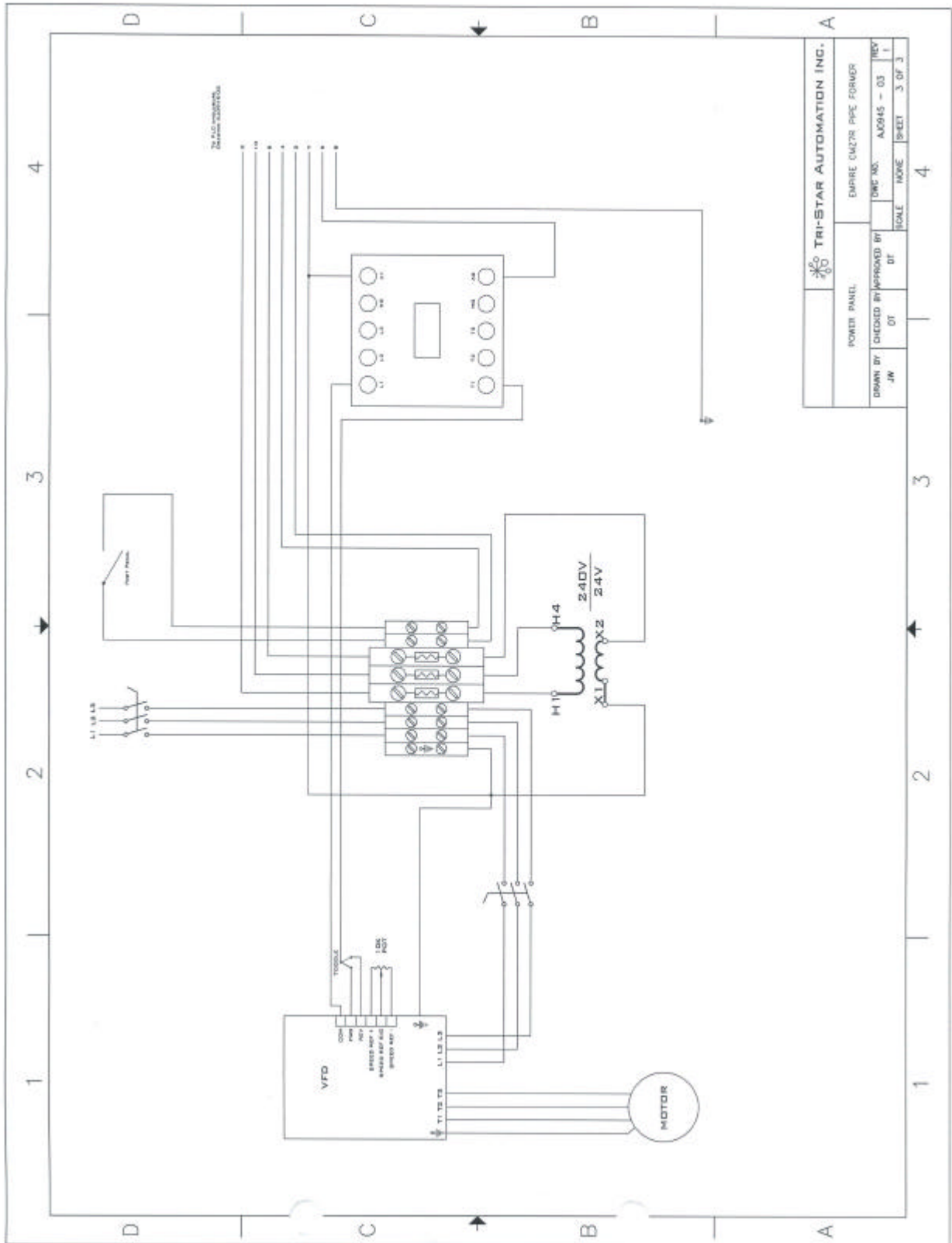
To program a new home position press **LEARN HOME** and then use the arrow buttons to move between the settings. Use the **CLR** button to clear each value and enter the new value. Remember to press **ENTER** after each change. Once you have made all the necessary changes you must press **LEARN HOME** to finish the teach function. You will now be back at the program screen and ready to run parts. To test your new home position press the **HOME** button.

**REMEMBER THE EMERGENCY BUTTON SHUTS DOWN ALL THE FUNCTIONS ON THE MACHINE. IF YOU SENSE THAT SOMETHING IS NOT RIGHT PRESS THE RED EMERGENCY LOCATED ON THE PANEL ABOVE THE KEYPAD.**

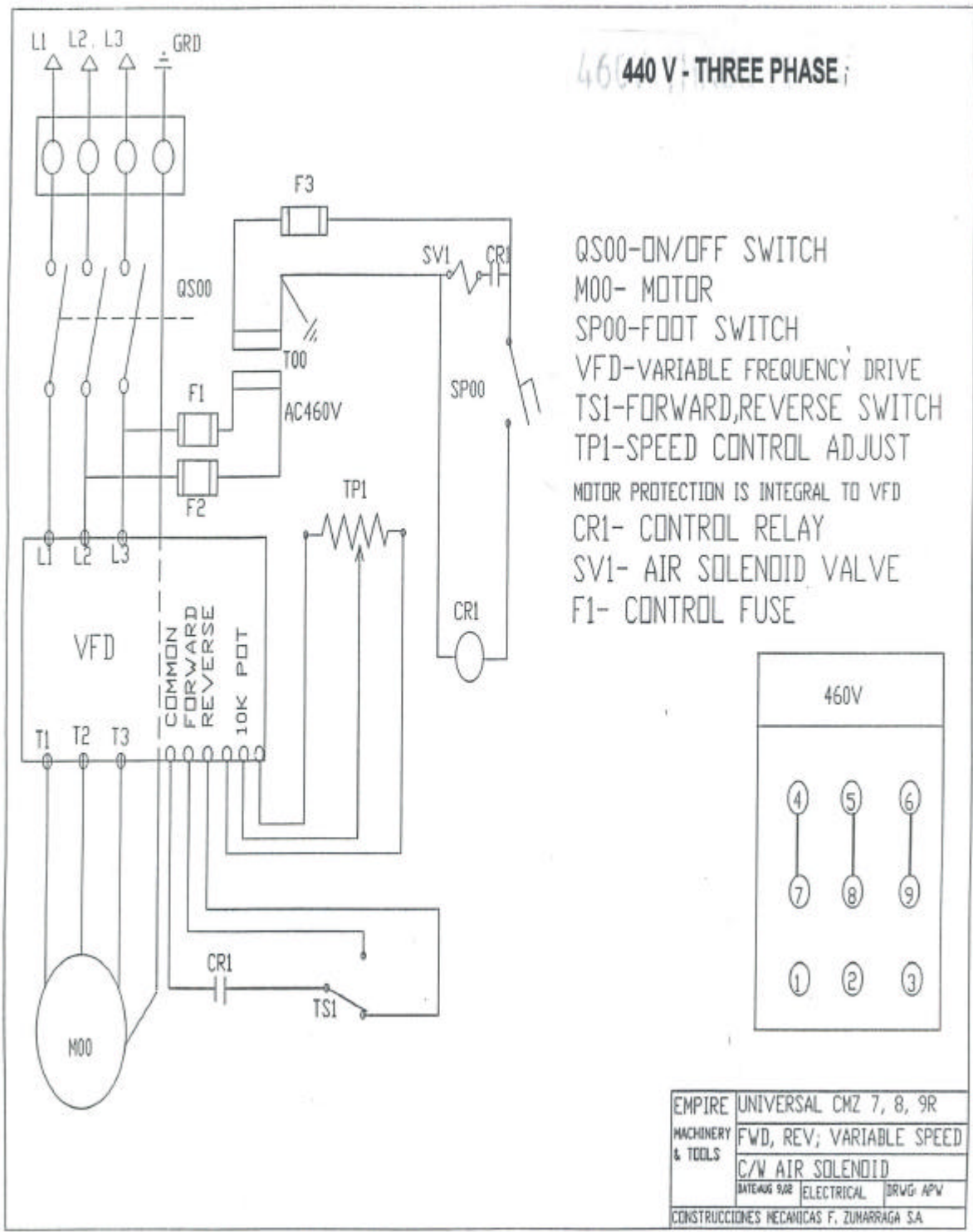
## **Air/Oil Hydraulic with Foot Pedal Control**

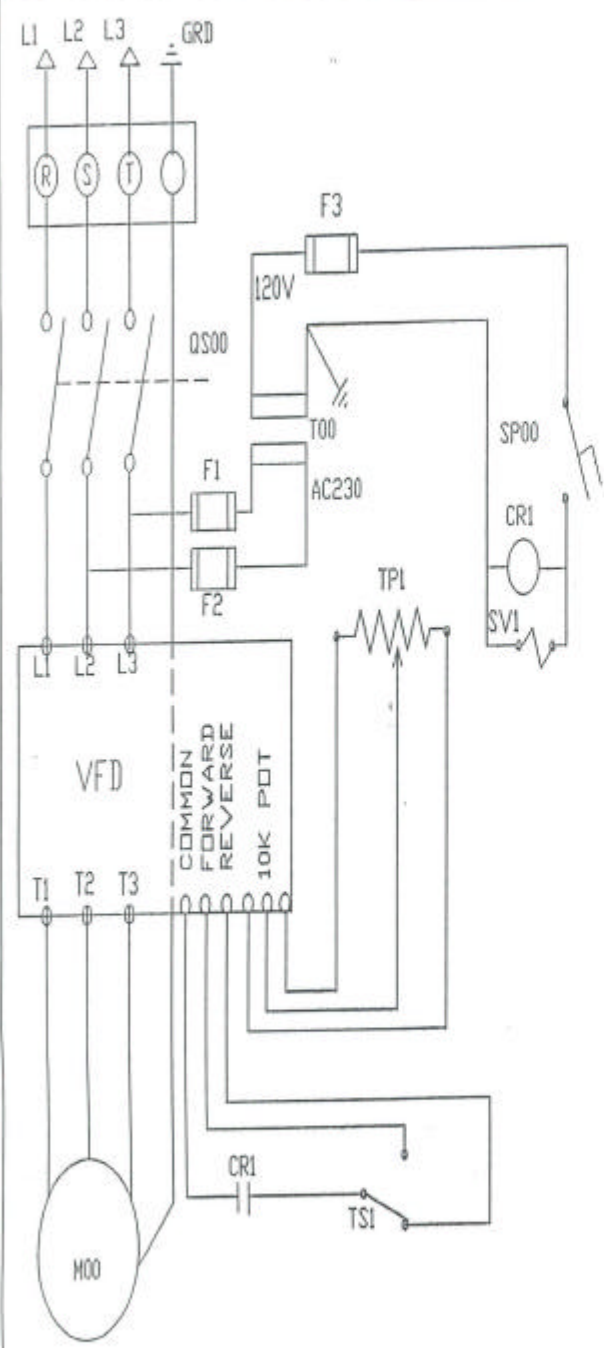
The Air/Oil with foot pedal control uses the same feed system as the programmable control for the top shaft but the difference in the way it is actuated is by means of a two position foot pedal allowing hands free operation of the CMZ-7R. There are two separate micro switches in the foot pedal and they operate as follows. When you press on the pedal halfway down the rolls begin to turn and then by pressing the pedal all the way to the floor you then activate the air/hydraulic system causing the top shaft to start traveling down. **(CAUTION IF THE OPERATOR HOLDS THE PEDAL TOO LONG AFTER THE ROLLS COME TOGETHER DAMAGE TO THE MACHINE AND OR THE OPERATOR WILL OCCUR).** To jog the top shaft down and then hold it at a desired position just bring the pedal back to the halfway point and keep your foot there and the top shaft will stop coming down and hold in the position. To continue stepping down the top shaft you can lightly tap your foot to the floor and bring it back to the center position until the desired profile is achieved. Once your part is finished raise your foot completely off the foot pedal and the top shaft will return to its home position and the rolls will stop rotating. For repetitive parts where a certain depth is required for each part the yellow stop nut on the top of the hydraulic cylinder can be turned up or down and can be used as an indicator to the operator that the desired depth has been reached.

# Electrical Schematics for Air/Oil Hydraulic Package



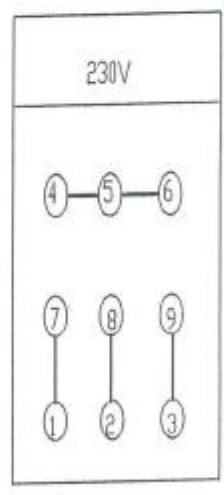
|                                     |                           |
|-------------------------------------|---------------------------|
| <br><b>TRI-STAR AUTOMATION INC.</b> |                           |
| POWER PANEL                         | EMERRE DUC27R PIPE FORMER |
| DRAWN BY                            | CHECKED BY                |
| JW                                  | DT                        |
| DATE                                | DATE                      |
| SCALE                               | SCALE                     |
| NO. OF SHEETS                       | NO. OF SHEETS             |
| 3 OF 3                              | 3 OF 3                    |





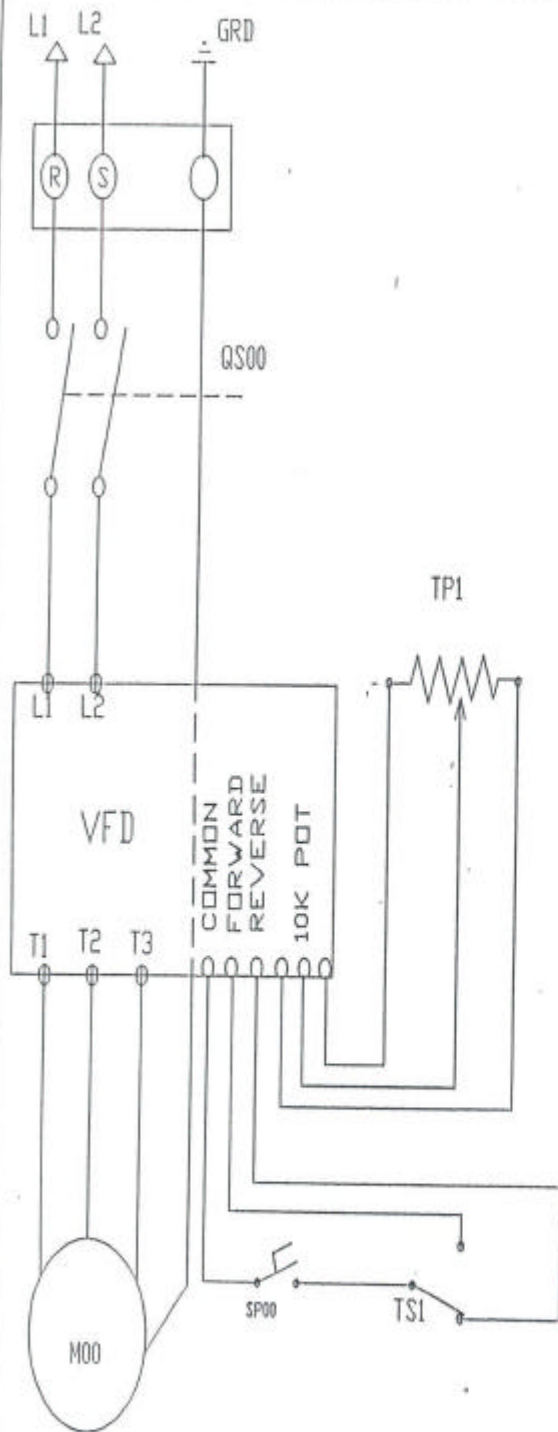
## 230V THREE PHASE

- QS00-ON/OFF SWITCH
- M00- MOTOR
- SP00-FOOT SWITCH
- VFD-VARIABLE FREQUENCY DRIVE
- TS1-FORWARD,REVERSE SWITCH
- TP1-SPEED CONTROL ADJUST
- MOTOR PROTECTION IS INTEGRAL TO VFD
- CR1- CONTROL RELAY
- SV1- AIR SOLENOID VALVE
- F1 & F2 XFMR LINE FUSES
- F3 - CONTROL FUSE

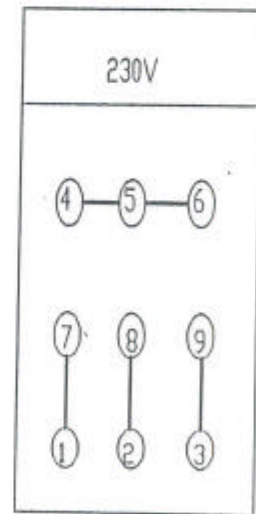


|  |                          |
|--|--------------------------|
| EMPIRE                                     | UNIVERSAL CHZ 7, 8, 9R   |
| MACHINERY & TOOLS                          | FWD, REV, VARIABLE SPEED |
|  | C/W AIR SOLENOID         |
| DATE: 06/92                                | ELECTRICAL DRWG: APV     |
| CONSTRUCCIONES MECANICAS F. ZUBARRAGA S.A. |                          |

# 230V SINGLE PHASE

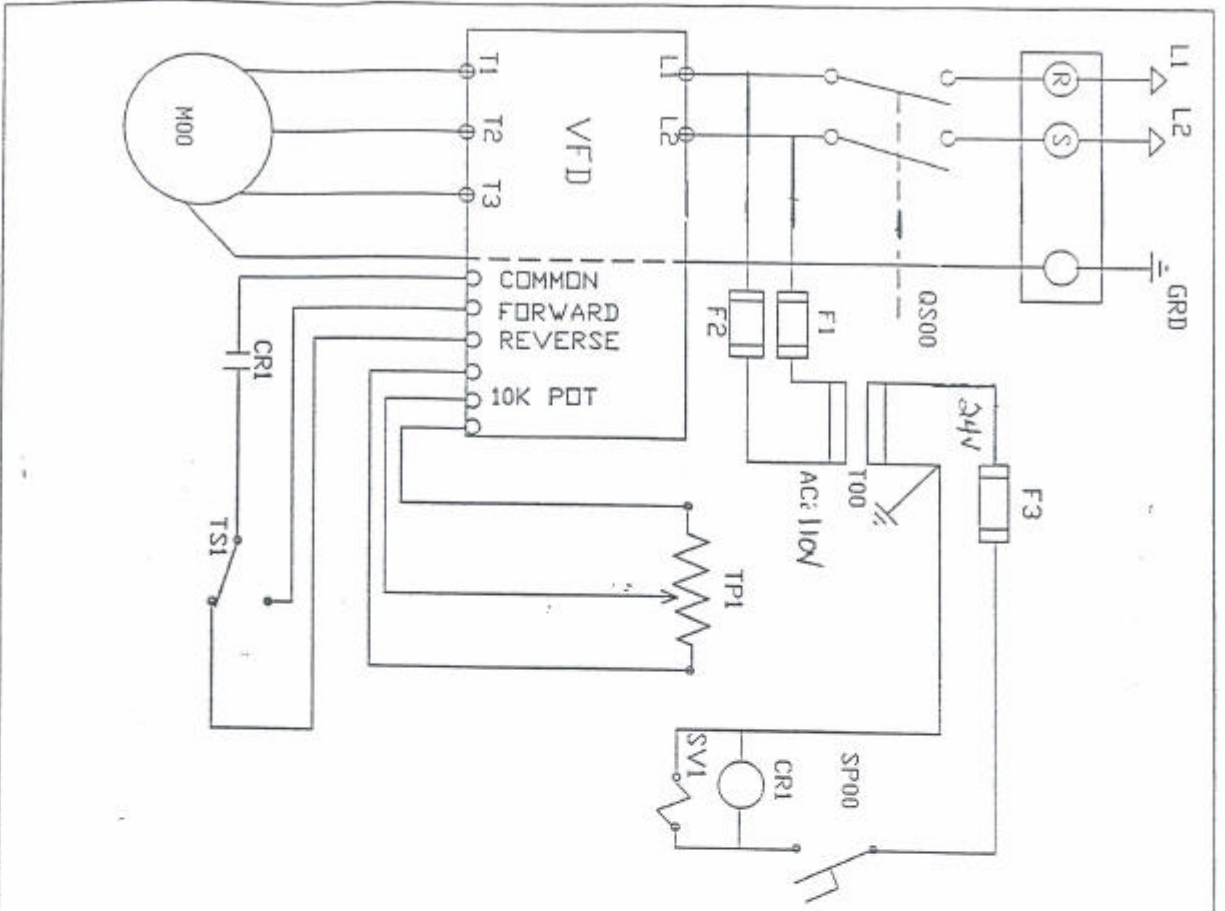


QS00-ON/OFF SWITCH  
 M00- MOTOR  
 SP00-FOOT SWITCH  
 VFD-VARIABLE FREQUENCY DRIVE  
 TS1-FORWARD,REVERSE SWITCH  
 TP1-SPEED CONTROL ADJUST  
 MOTOR PROTECTION IS  
 INTEGRAL TO VFD

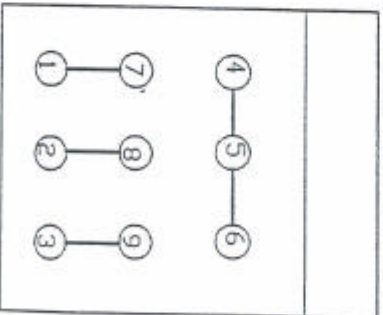


|  |                          |           |
|--|--------------------------|-----------|
| EMPIRE                                     | UNIVERSAL CMZ 7, 8, 9R   |           |
| MACHINERY & TOOLS                          | FWD, REV, VARIABLE SPEED |           |
|  | NO AIR SOLENOID          |           |
|  | DATE: 08/9/02            | DRWG: APV |
|  | ELECTRICAL               |           |
| CONSTRUCCIONES MECANICAS F. ZUMARRAGA S.A. |                          |           |

110V Single Phase w Air Cylinder



- Q500-DN/OFF SWITCH
- M00- MOTOR
- SP00-FDDT SWITCH
- VFD-VARIABLE FREQUENCY DRIVE
- TSI-FORWARD, REVERSE SWITCH
- TP1-SPEED CONTROL ADJUST
- MOTOR PROTECTION IS INTEGRAL TO VFD
- CR1- CONTROL RELAY
- SV1- AIR SOLENOID VALVE
- F1 & F2 XFMR LINE FUSES
- F3 - CONTROL FUSE



|   |                        |
|---|------------------------|
| EMPIRE MACHINERY & TOOLS                  | UNIVERSAL CMZ 7, 8, 9R |
| FWD, REV, VARIABLE SPEED                  |                        |
| C/M AIR SOLENOID                          |                        |
| DATE: 04/02/2008                          | DESIGN: JPV            |
| ELECTRICAL                                |                        |
| CONSTRUCTORES MECANICAS F. ZUHARRAGA S.A. |                        |