Jobber Plus +

Instruction Manual

April 14, 2009

Press Control

Die Protection & Press Automation

METAL TECH CONTROLS CORP.

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WARRANTY

Metal-Tech Controls Corp. - herein after referred to as MTCC warrants its products to be free from defects of material and workmanship and will, without charge, replace or repair any equipment found defective upon inspection at its factory, provided the equipment has been returned, transportation prepaid, within TWO years from date of shipment. At MTCC's option: Upon receipt of a purchase order from the owner for the price of the part needing replacement or repair MTCC may opt to send a replacement part. Upon receipt of the defective part from the owner and inspection by MTCC and where the part is found to be defective by no cause of the owner a credit will be issued.

Ten Year Controller Board exchange warranty and policy: After the initial 2 year warranty period MTCC will replace the defective controller board for the exchange fee of $600.00 provided the defective board is repairable. A purchase order for the full price of an exchange board must be provided to MTCC. Upon receipt of the defective board from the owner and inspection by MTCC and where the part is found to be defective by no cause of the owner a credit will be issued less the $600.00 exchange fee.

Warranty is specifically at the MTCC's factory. Any on site service will be provided at the sole expense of the purchaser at MTCC's standard field service rates.

THE FOREGOING WARRANTY IS IN LIEU OF AND EXCLUDES ALL OTHER WARRANTIES NOT EXPRESSLY SET FORTH HEREIN, WHETHER EXPRESSED OR IMPLIED BY OPERATION OF LAW OR OTHERWISE INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No representation or warranty, express or implied, made by any sales representative, distributor, or other agent or representative of MTCC which is not specifically set forth herein shall be binding upon MTCC. MTCC shall not be liable for any incidental or consequential damages or loss arising from reduced or lost production, or expenses directly or indirect arising from the sale, handling, improper application or use of goods or from any other cause relating thereto and MTCC's liability thereunder, in any case is expressly limited to the repair or replacement (at MTCC's option) of goods supplied by MTCC.

All associated equipment must be protected by properly rated electronic/electrical protection devices. MTCC shall not be liable for any damage due to improper engineering or installation by the purchaser or third parties. Proper installation, operation and maintenance of the product becomes the responsibility of the user upon receipt of the product.

Returns and allowances must be authorized by MTCC in advance. There will be a 30 percent restocking charge on items normally held in inventory. There will be a percent restocking charge for custom or special request items. MTCC will assign a RETURNED GOODS AUTHORIZATION (RGA) number which must appear on all related papers and outside of the shipping carton.

WARNING! Any attempt to repair or troubleshoot MTCC's products except as limited to the user replaceable components will void the warranty and may render the product unsafe for use. MTCC's products contain complex electronics which may only be tested and repaired by an authorized MTCC trained technician.

Notes

Safety Message

Please read this message first!

The **Jobber Plus** is a partial revolution punch press control which also acts as an interface between light curtains which in turn are designed to guard personnel working around moving machinery. Whenever the operator's safety is dependent on the machine's ability to stop quickly enough to prevent an injury, it is absolutely imperative that the safe stopping time of the machine shall be known and the light curtains be set the proper distance from the nearest pinch point as is regulated in the United States by the Occupational Safety and Health Administration (OSHA). The **Jobber Plus** is totally dependent on the proper operation of the light curtains used to safeguard the operator. Be certain the light curtains used meet all OSHA requirements before interfacing them to the **Jobber Plus**. Be certain that the light curtains are mounted the proper distance from the nearest pinch point as prescribed by the light curtain manufacturer. Regardless of the calculated distance, you should never mount the light curtains closer than 7.5 inches (191 mm) from the nearest pinch point. This is required by OSHA Table 0-10 in OSHA 1910-217 and Table 1 in ANSI B11-19-1990.

The **Jobber Plus** can and should be used to monitor the machine stopping time and the drive mechanism of the E-Cam for loss of motion. Proper setting of the programmable set-point is the sole responsibility of the employer, purchaser and final owner of the equipment.

The proper application, installation, maintenance and operation of the **Jobber Plus**, the light curtains used and the machine itself is the responsibility of the purchaser and or employer.

It is the purchaser's and or employer's responsibility to inspect the **Jobber Plus**, the light curtains, and any other pertinent equipment daily for proper operation. It is also the purchaser's and or employer's responsibility to know that the brake monitoring Set points and the mute Set points are proper and safe for the operator.

The purchaser and or employer is also responsible for the selection and training of the personnel necessary to properly install, operate and maintain the machine and its safeguarding systems. For example; the **Jobber Plus** should only be installed, checked out and maintained by a qualified person, as "a person or persons who, by possession of a recognized degree or certificate of professional training, or who, by extensive knowledge, training and experience, has successfully demonstrated the ability to solve problems relating to the subject matter and work." (ANSI B30.2-1983)

The user is the person(s) identified and designated by the employer as being appropriately

Trained and qualified to perform a specific procedure. Often the user is the installer, die setter, electrician, maintenance personnel, supervisor, foreman, etc. involved with the setup, daily test and checkout of the machine and the safety devices.

The **Jobber Plus** should never be accessed by anyone other than properly trained personnel so designated by the purchaser and or employer. If the machine operator is not properly trained to set up the machine or the **Jobber Plus**, then a setup person so designated should perform the setup.

The machine operator must receive specific proper training on exactly which machinery is protected by the light curtains, the machine's operating controls, warning signs and safety instructions. The machine operator must thoroughly understand and follow the company's safety rules and always use the safeguards and proper hand tools provided by the employer. The machine operator must notify management if the machine, tooling or safety devices are not operating properly. Never use the machine if it or the safety equipment is not in proper working order.

The **Jobber Plus** is provided with keyed selector switches. The purpose is to prevent untrained and unauthorized personnel from changing or modifying the operating modes. It is the purchaser's and or employer's responsibility to insure that only trained and authorized personnel have access to these functions.

The following are additional requirements the purchaser and or employer must meet before using the **Jobber Plus**.

The machine on which the **Jobber Plus** and light curtains are to be installed MUST be capable of stopping motion anywhere in the stroke or cycle in a safe time as prescribed by the OSHA formula for safe stopping times.

Do not use the **Jobber Plus** or light curtains on any device with inconsistent stopping time or inadequate control devices or mechanisms.

When the **Jobber Plus** and light curtains are used to protect a machine operator from a hazard, the purchaser and or employer has the responsibility to ensure that all applicable federal, state and local Occupational Safety and Health Act (OSHA) requirements and any such rules, codes and regulations which may apply are satisfied.

All Safety related machine control circuit elements, including pneumatic, electric or hydraulic controls must be control reliable.

Any power press which uses the **Jobber Plus** and light curtains must meet the requirements and inspection procedures of OSHA regulation 1910.217, ANSI standards B11.3-1988 and B11-19-1990 plus any other applicable state and local regulations.

All brakes and other stopping mechanisms and controls must be inspected regularly to ensure proper working order. If the stop mechanisms and associated controls are not working properly, the machine may not stop safely even though the **Jobber Plus** and the light curtains are functioning properly and should be taken out of service until repairs are made.

DO NOT OPERATE A MACHINE IN AN UNSAFE CONDITION.

A daily test must be performed by properly trained and designated personnel of the light curtains as prescribed by the manufacturer and the **Jobber Plus** and its associated equipment must be tested for proper functioning.

The enforcement of these regulations are beyond Metal-Tech Controls. Corp.'s and its agent's control. The purchaser and or employer has the sole responsibility to follow the proceeding requirements and any other procedures, conditions and requirements specific to the machine.

Installation Instructions

If you follow this step by step procedure, you will find that installing the Jobber Plus+ is easier than any other punch press control on the market.

Jumpers

Do NOT remove any of the factory installed jumpers until the control is installed and functioning without any additional components. I.E.. Light Curtains, Foot Switches, Remote Top Stop or E-Stop buttons,Tonnage Monitors, Die Protection, etc. In this way you know that the control is operating properly before you add additional components. You can pull the necessary wires for these additional components, but don't hook them up until the machine is operating properly without them. When adding them, do so one at a time, testing the machine and the control's operation after each one is wired.

Direction of Rotation

Determine the machine's direction of rotation , CW or CCW You will need this information later during the installation process. Rotation is determined by facing the front surface of the E-Cam chain sprocket.

Move the ram to TDC (top dead center).

Mounting The Jobber Plus+

Determine where on the machine you want to mount the Jobber Plus+. Always mount the control so that the control is easily accessible to the operator and easy to view the display. Use the shock mounts supplied with the control. **Failure to shock mount the Jobber Plus+ will void the warranty!**

Mounting brackets are available for both side mounting and for mounting from the rear of the control.

E-Cam Installation

With the machine **positioned at TDC** install the E-CAM. Be certain that the drive chain and sprockets are secure and aligned properly. Do NOT load the E-CAM drive shaft. There should be some slack in the chain so that the bearings are not overloaded. The E-CAM is supplied pre-wired from the factory with a 12 foot long cable and connectors (longer length cables are available). Do not, under any circumstances remove the E-CAM cover or alter the wiring in any way. **Doing so will void the warranty!** Connect the E-CAM cable to the control. Make sure the connector on the E-Cam is tightened properly.

Palm Buttons

Wire the operator palm buttons to the control. **NOTE: All inputs are 12 to 48 vdc 12 vdc** is supplied at the terminal and could be used for dc voltage inputs. The palm button inputs require a normally open contact for each palm button and a normally closed contact. (The normally closed contacts are wired in series).

Air Pressure Switches

Wire the air pressure switches. Again using 12 to 48 vdc to the switch's normally open (held closed) contacts and back to the air pressure input If there is a pressure switch for a counter balance, wire that to input otherwise jumper the terminal to 12 to 24 vdc.

Remember: Do not remove any of the jumpers from the user side of the wire terminals until the control has been tested and is working properly.

Grounding

The machine **MUST have a true earth ground** and the control transformer must be grounded to the machine.

Dual Solenoid

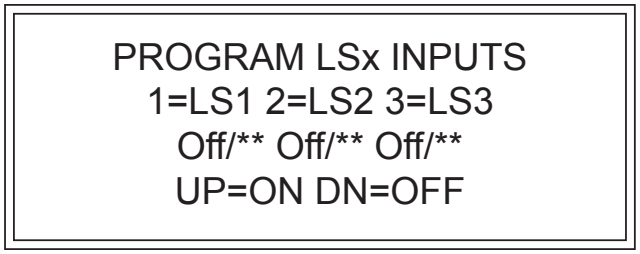
Connect the dual solenoid coils. **(NOTE!! You MUST wire both coils separately)**. The common for the dual valve coils should be connected to the controller board

I**nputs LS1, LS2 & LS3** (cannot be used if second operator station is installed)

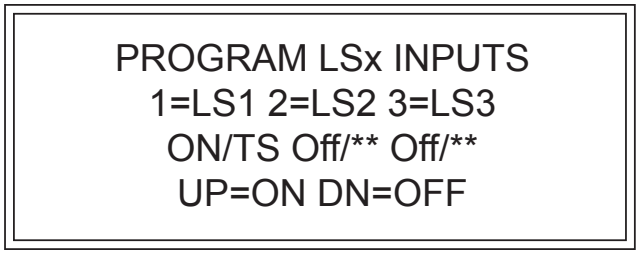
There are three inputs available to the user to connect devices such as Tonnage Monitors, Low Lubricator Signals, etc. These inputs must be DC sourcing. (12 to 32 vdc). If you use a DC power source external to the one supplied with the Jobber Plus+ the commons MUST be connected!

The terminal numbers are 23, 24 and 25. Marked, LS1, LS2 and LS3.

These inputs are by default disabled. To enable them you must enter the machine setup menu and sellect function (11).



To enable any of the inputs select the input by number, it will begin flashing, press the UP arrow by selecting the corresponding number.



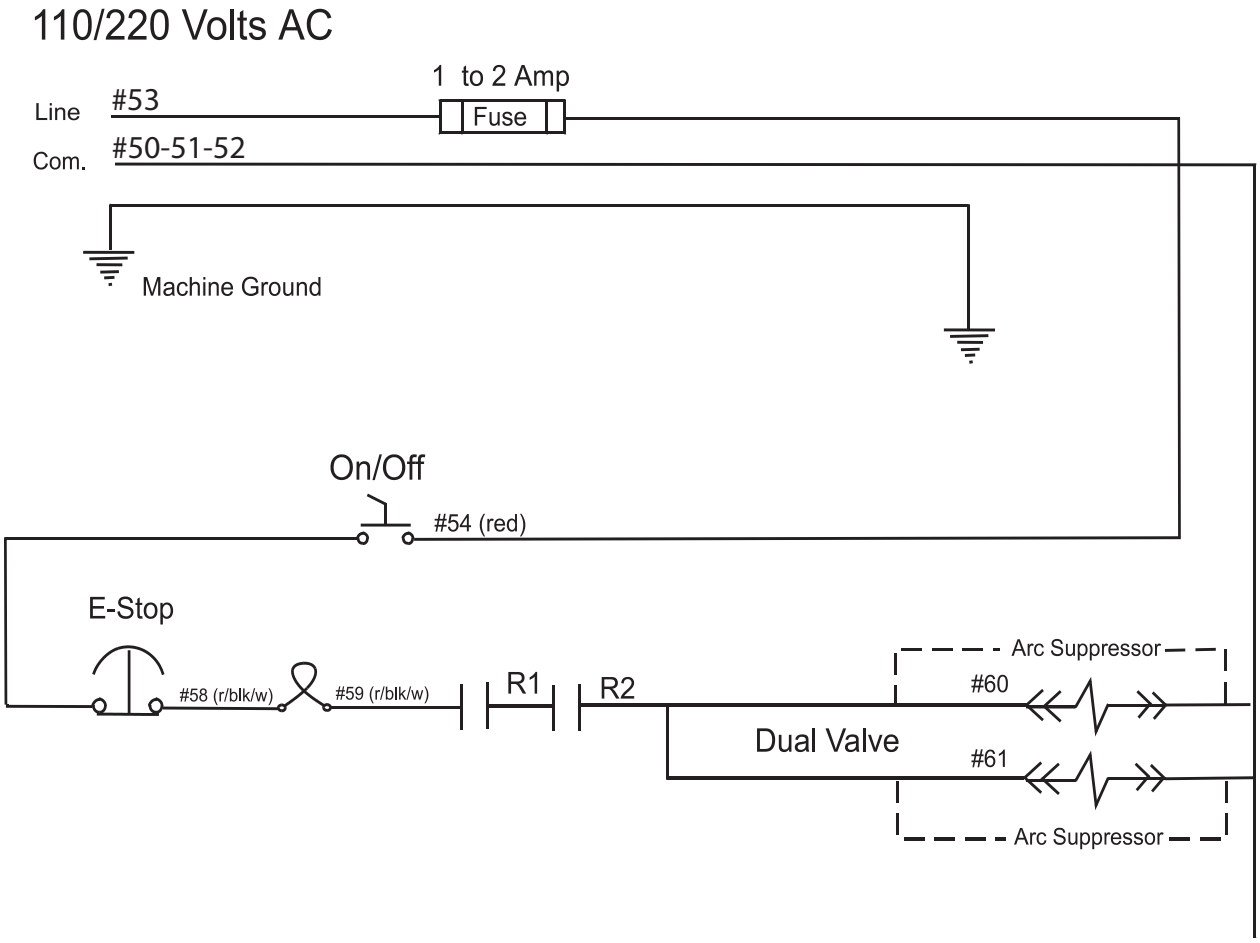
LS1 is ON and set for Top Stopping the machine

To disable any of the inputs select the input by number, it will begin flashing, press the DOWN arrow key and input will be disabled.

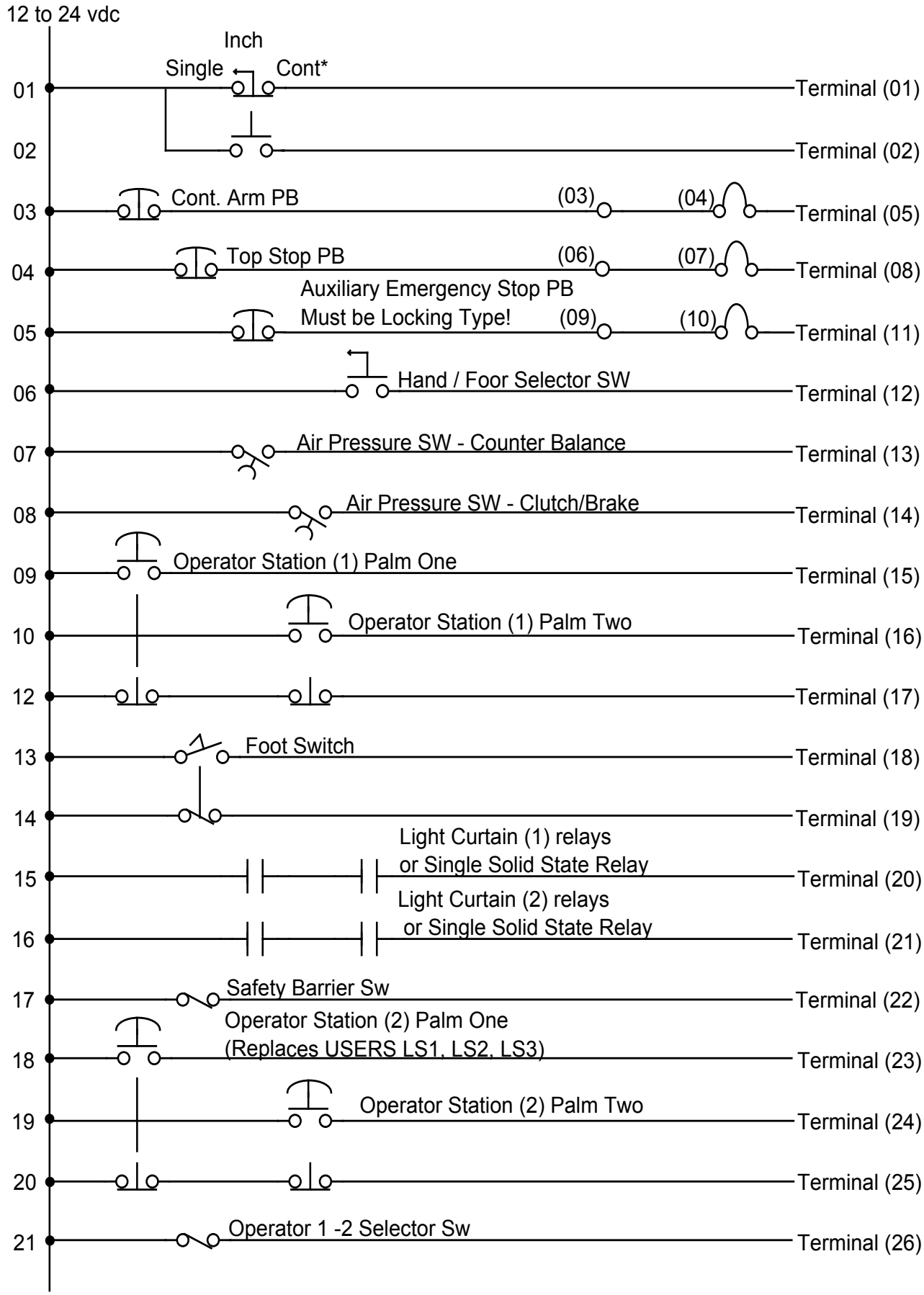
Double check the wiring. Turn the power on with the fuse block open. Check for proper voltage. Close the fuse block, turn the key to 'ON'. If it does not come on check the fuse and wiring.

If you have not removed any of the jumpers from the user side of the terminals the control should come on and be ready for setting up the Jobber Plus+.

Wiring Diagram - High Voltage



Wiring Diagram- Low Voltage



Multiple Operator Stations

The Jobber Plus provides for the use of two operator stations. The first operator station is wired to terminals 15, 16 and 17.

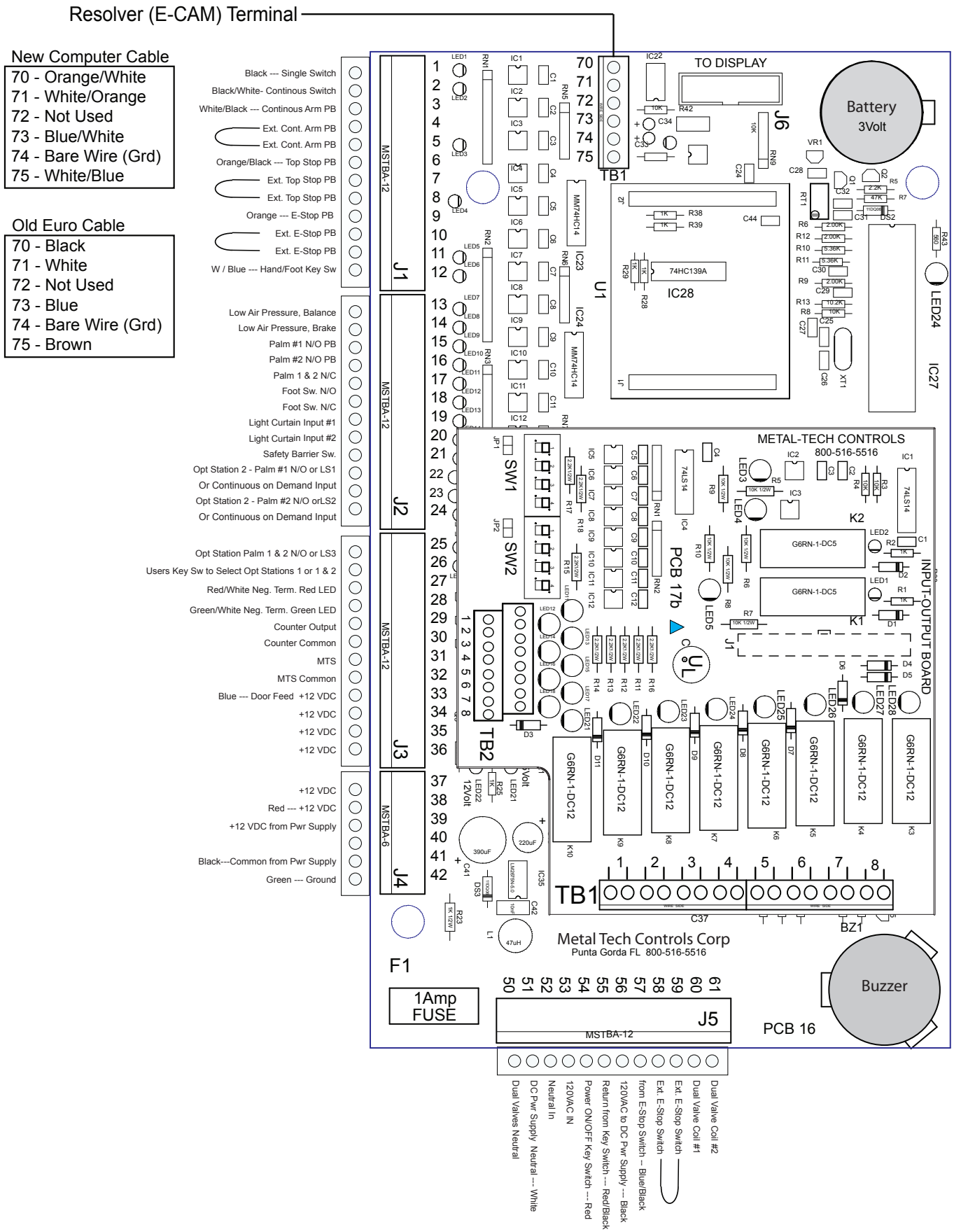
Operator Installation of two operator stations requires a "keyed" selector switch connected to terminal 26. This terminal is 12 to 24 vdc. The switch is wired so that when the switch is ON an input current is supplied to terminal 26. 'ON' indicates that two operator stations are being used.

Depending on this switch position the message "TWO OPERATOR" or "ONE OPERATOR" is displayed on the bottom line of the LCD.

For safety reasons the operator stations should be wired so that when TWO stations are selected an indicator light on the second operator stations is lit. A CAUTION label should be placed on the second operator station warning that if the light is not 'ON' the station is disabled and unsafe!

Wiring Notes and Changes

Board Layout



Operating the Press

Inch Mode
Press the palm buttons, as long as the palm buttons are maintained the press will cycle until the ram reaches TDC. Releasing the palm buttons will inniate a immediate stop. Once the ram has reached TDC you are required to release both palm buttons before initiating another stroke. Only two hand control is allowed in Inch Mode.

Micro Inch
Micro inch is provided to allow for very short precise jogs of the ram usually used when setting the die. The amount of ram movement is controlled by the setting chosen from the Machine Setup Menu.

Single Stroke
Single stroke is initiated in two ways, Two hand control and Foot Switch. When using the Foot Switch Mode the machine MUST be guarded by either physical barriers or light curtains. To initiate a single stroke, the machine must be at TDC. Press both palm buttons and hold them in until the machine has passed the bottom of the stroke (actual 175 degrees), the control will automatically auto return the ram to TDC. If you release the palm buttons or foot switch before 175 degrees the machine will immediately stop.

Continuous Stroke
Continuous stroke is initiated using the palm buttons only. Press the Continuous Arm button, a timer will start. You have 3.5 seconds to inniate the stroke. Hold the palm buttons in until the ram has passed through 175 degrees (bottom of stroke). Press the Top Stop Button to stop the ram.

Continuous on Demand
WARNING! When using Continuous on Demand mode the machine must be fully guarded to protect all personnel. Hard guards with safety interlocks, light curtains or some other means of safe guarding that meet OSHA requirements must be applied. You, the end user are solely responsible for operator safety!!!!

To use the Continuous on Demand mode of operation:
Place machine at top dead center (TDC), inputs 23 and 24 should be de-engerized, press the continuous arm (green) button for 3 to 4 seconds, (you will see the words “CONTINUOUS ON DEMAND” appearon the screen. The Red and Green panel lights will flash in this mode of operation. The Jobber Plus is now ready to run. Apply 12 to 24 vdc to terminals 23 and 24, (these inputs should be from separate sources, and independent of each other for safe operation). The machine will cycle continuously until inputs 23-24 go low (de-energized), the Top-Stop push button is pressed or there is an emergency situation. ie. e-stop, light curtain fault, etc. The machine will top stop when 23 and or 24 are de-engerized.

Dual operator stations cannot be used with CONTINUOUS ON DEMAND. There cannot be any voltage applied to terminal 26 (Select Opt Stations 1 & 2). If there is an error message will appear, “Two Operation Stations Cannot be Used”. You may wire the stations in but you cannot use them in this mode

Programming The Jobber Plus+

The program functions are password protected. There are two levels of password protection. The first is entry into the TOOL PROGRAM MENUS. The password to enter this function should only be known by personnel who are experienced, trained and authorized to load existing tool setups, edit existing tool setups and delete tool setups. This password can be changed if needed as explained below.

The second password protected function is the MACHINE SETUP. To enter this menu you must know the password to get to the TOOL MENU and the password to enter the MACHINE SETUP menus. The MACHINE SETUP password should only be known by fully trained and authorized personnel who are responsible for the initial setup of the machine's clutch/brake functions. These are vital and safety related functions and should only be accessed by fully competent and trained personnel.

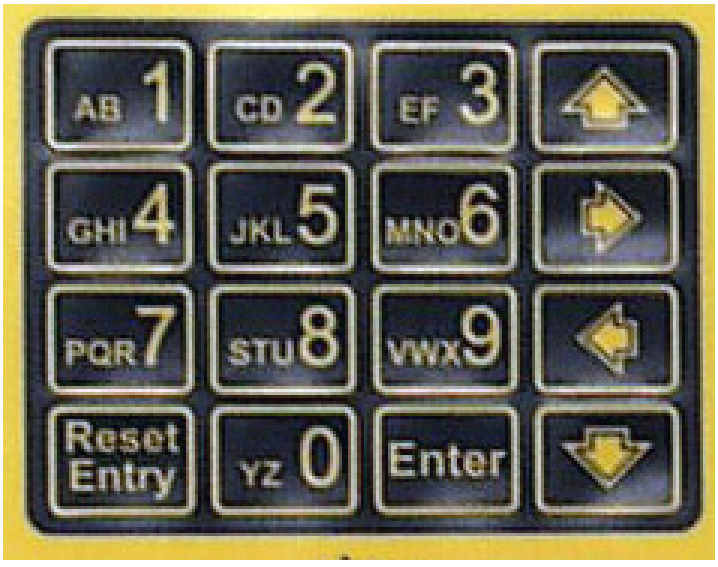
WARNING: Incorrect settings could result in serious injury to personnel.

WARNING: The control is shipped with both passwords programmed to "1234". Once the control is installed and ready for production the passwords MUST be change as outlined above. Instructions for changing them is outlined later.

In order to enter the TOOL PROGRAM MENUS the machine cannot be in motion. Press the RESET/ENTRY key and when asked to enter your password, enter it and press the ENTER key. If the password is correct the following will be displayed on the LCD.

```
TOOL PROGRAM MENUS

1=OPEN   2=NEW   3=EDIT
4=DELETE         5=SETUP
```



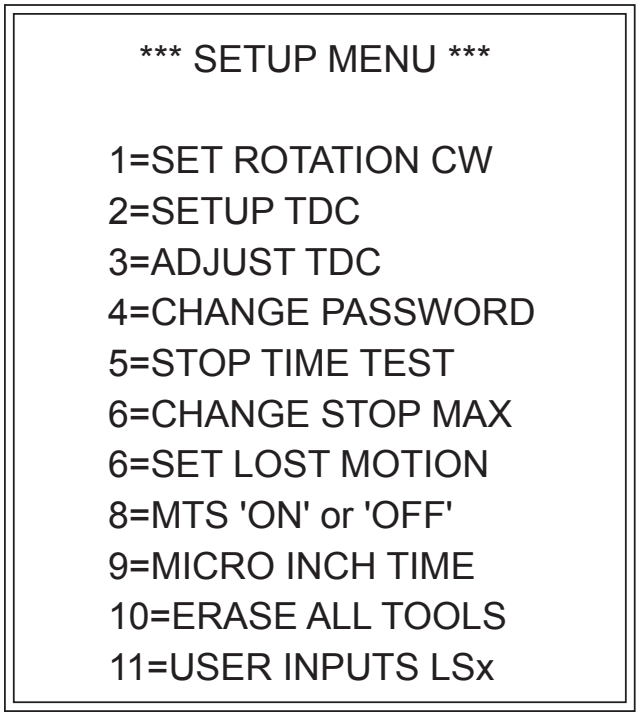
Machine Setup

From the previously shown TOOL PROGRAM MENU select '5' for SETUP. You will be asked to enter the second password. Once entered the following menus will be displayed. Use the UP and DOWN arrow keys to scroll through the SETUP menus.

KEYPAD & SCREEN NOTES:

When selecting a function from the menu in this screen you are required to enter the number and then press the ENTER key. This is because there are 10 or more functions. In other menus you will find that just entering the number will take you directly to that function without having to press the ENTER key. This is because there is less than 10 selections.

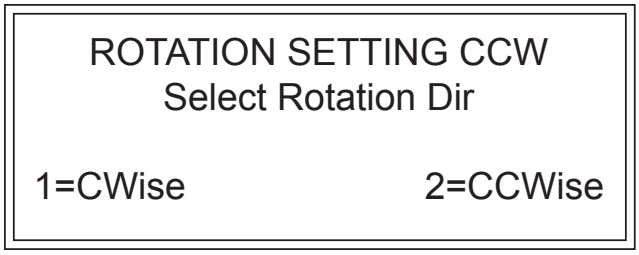
Because of limited space on the display, instructions are sometimes truncated to fit the screen.



A list of functions found in the SETUP MENU

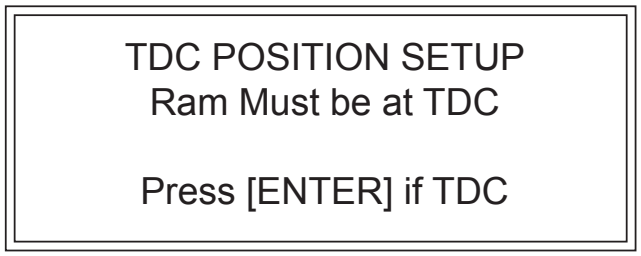
Direction of rotation is determined by facing the front of the E-Cam and looking at the chain sprocket. Select '1' or '2' for the correct direction of rotation.

Once the selection has been made the screen will display “Ctr Clock Saved” or “Clock Wise Saved”. The LCD will return to the MAIN MENU.



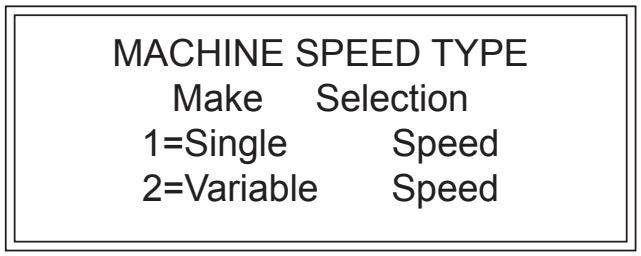
Setting the TDC (Top Dead Center)

The control must be taught the machine's TDC position. This is done by placing the machine's ram at TDC selecting function '2' from the SETUP menu and pressing the ENTER key. The control has now been taught the cams electronic position relative to the machine's TDC.

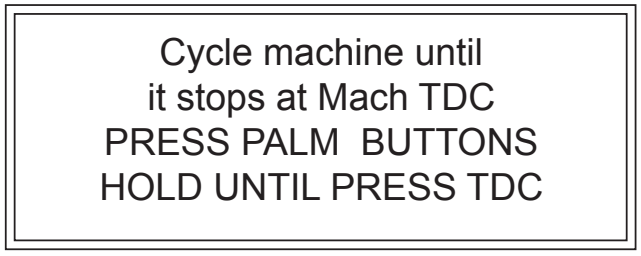


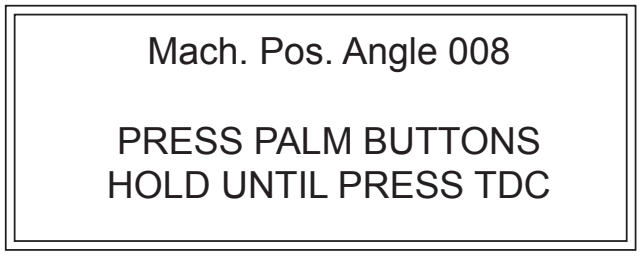
The next step in setting up the machine is to teach the control how it is to stop the machine at the TDC position. Each machine is different based on it's stopping capability. It also needs to be determined whether the machine is a single speed or variable speed.

Single Speed

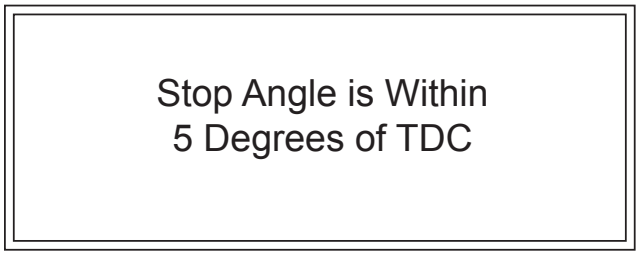


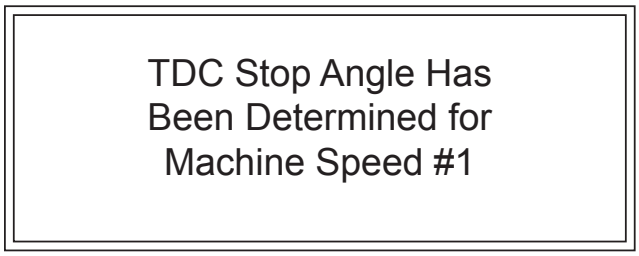
If the machine is single speed select '1'. You will be instructed to cycle the machine until the control determines the setting to stop the machine on TDC. Follow the screen instructions by cycling the machine as many times as it takes. The following screens will appear during this operation.





If the machine does not stop at TDC within a few degrees the Display will ask you to cycle the machine again. Each time the machine comes to a stop the angle is displayed. Repeat cycling the machine until the control displays the following message.





This is all there is to setting the TDC functions for a single speed machine.

Variable Speed Machines:

The Jobber Plus+ version provides automatically compensated top stop, “ACTS”. ACTS is only available when the user has selected VARIABLE SPEED from the machine setup menu.

The controller requires 4 speed tests for variable speed machines. You will need to divide the machine’s speed range into four parts - slowest speed, highest speed and two speeds in the middle. You do not need to know the actual SPM (strokes per minute) If the machine has a SPM or RPM indicator then write down the speed settings:

EXAMPLE: Low speed - 40 SPM, 2nd speed - 60 SPM, third speed - 90 SPM, highest speed - 120 SPM.

If you do not have a digital speed readout, mark the dial for the lowest speed, the 2nd speed, the third speed, and the highest speed. When changing from one speed to the next, simply move the dial to the next speed mark and follow the instructions.

Start with the slowest speed setting. The machine MUST BE AT TDC! Do exactly as described previously for single speed machines for the first variable speed (slowest speed). When the first speed setting has been completed proceed to the next step.

Adjust the machine to the second speed setting.

Adjust Motor Speed For
Setting No. 2
Press ENTER When OK
To Continue Setup.

SPEED SETUP FOR No. 2
READY to CYCLE

As was done with the first (slowest setting), cycle the machine until the control determines the proper stopping angle for the 2nd speed range.

You will be asked to prepare for the next two speeds by increasing the machine's speed to the third and forth speed range until all four settings are determined.

When all four speed ranges have been set the setup is complete.

MACHINE SPEED SET UP
COMPLETED

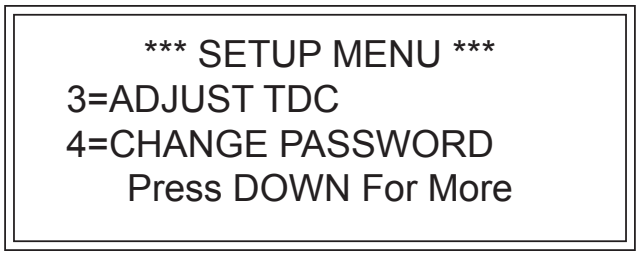
Adjusting TDC

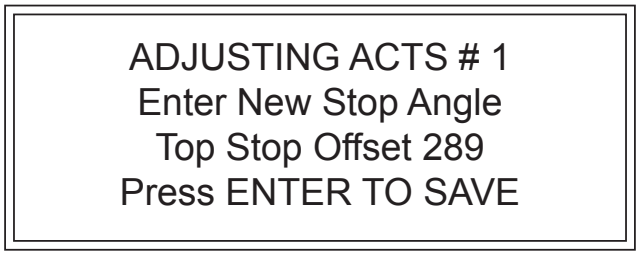
There may be times when you will need to make adjustments to the stop angle factor programed into the Jobber Plus+ . But before you do, answer these questions:

Did you check to see if you have the proper counter balance pressure set? Proper counter balance pressure improves your stopping time and therefore the stopping angle can be more accurate. It also reduces the wear on the clutch and brake.

Have you gotten machine stop time errors? If so you probably need to perform maintenance on themachine's clutch and or brake or - your counter balance pressures are not set correctly.

Have you had to change the stop time setting that was determined in the machine's initial setup? If you had to change the stop time settings the cause is in the clutch/brake or improper counter balance air pressures. To make adjustment to a single speed machine follow the previous instructions to get to the programming menu, scroll down to the following screen and press 3 then ENTER.



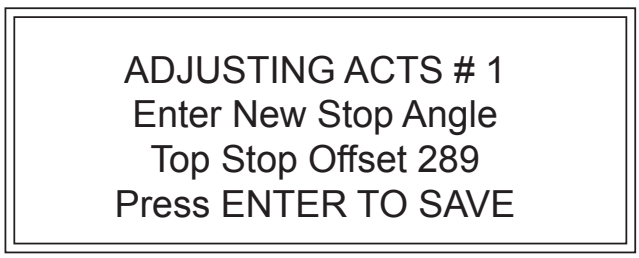


WARNING: You cannot set the stop angle less then 212 degrees. It will not show but any setting below 212 degrees is automatically reset to 212 degrees. If the machine is taking this long to stop, it is unsafe and should be repaired!

Adjusting Variable Speed Machines:

When you entered the four speed ranges during the initial machine setup the control automatically created a speed table by inserting additional angle settings between the four speed ranges, creating a total of seven speed ranges. These seven angle settings can be adjusted in the same way as for a single speed machine. For variable speed machines the following menu will appear after setting the first speed range.

When instructed enter each new Top Stop Offset. When completed you will be advised that all settings have been changed.

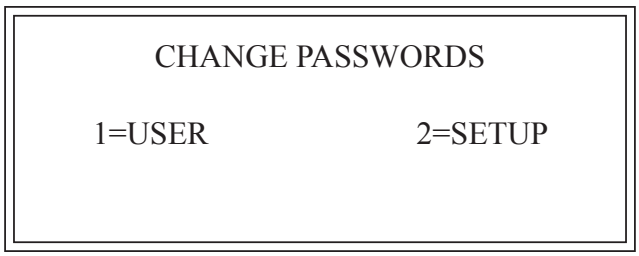


Changing Passwords

This function allows you to change the required passwords to any six digit or less number (up to 999999) The factory password is 1234. Once you change it, it is gone.

It is VERY IMPORTANT that this password does not become available to unauthorized persons. Improper settings could cause serious injury to personnel! Keep a copy of you password in a safe place where only authorized personnel have access to it.

To change the USER password. (User Password is the password allowing access to the TOOL PROGRAMMING MENUS) NOTE: This password should not be the same as the password for the SETUP functions.



You are requested to enter your current password. You are the requested to enter you new password. Hereafterthe new password must be used to access the MENUS.

To Change the SETUP password follow the above instructions.

Stop Time Test

This function performs a stop time test at 90 degrees of the machines stroke for determining the worst case stop time. It is advisable to mount your heaviest upper die to the ram for the most accurate test. Make sure the machine is at TDC, then select STOP TEST. Follow the instructions on the screen, you will make 10 strokes. Each time the machine will be stopped at 90 degrees. When the test is completed the stop time is averaged and the maximum averaged stop time will be stored in Flash Ram for reference each time the machine's ram is stopped. If the stop time should exceed this parameter a STOP-TIME ERROR will be displayed and the machine will have to be reset. If this occurs it is an indication that the stopping time of the machine is erratic and the clutch/brake system should be serviced.

Adjusting the STOP MAX

If after operating the machine you find that the stopping time is higher than determined by the test (usually caused by the normal heating of the brake lining during use), you can adjust the setting by entering the SETUP menu as previously described and selecting function CHANGE STOP MAX. A new screen will appear. Change the stop MAX value to the highest stop time you have been getting plus 10% . Remember

Setting and Adjusting Lost Motion Detection

The lost motion function is used to determine if the E-CAM is functioning properly. E-CAM failures can have several causes. A broken chain drive. A chain sprocket could be slipping or the cable and even the E-Cam itself could be defective.

The reason the lost motion time can be programmed is because every machine has some delay before it starts moving after the press is initiated. Obviously the quicker any of these errors are detected the safer the machine will be. If the factory default of 350 milliseconds causes lost motion faults. Try setting the time to 450 milliseconds. Test cycle the machine several times. If there are no lost motion errors, reduce the time

by half. If there is a lost motion error, increase the time by half and test cycle the machine. Continue until you obtain the lowest possible setting without causing a lost motion error. To adjust the setting enter the SETUP menu as previously described and select the function SET LOST MOTION. A new screen will appear. Change the value as described above.

! WARNING ! Setting the lost motion time too high could result in personal injury!

MTS (Machine Test Signal)

As a additional light curtain safety check the light curtain's output (relays) can be checked once during each stroke of the machine. The purpose of this test is to be certain the light curtain relays are working properly. Should the relay contacts weld closed the machine would not stop if the light curtains are interrupted during the downward portion of the stroke.

Some light curtain manufacturers do not have this input function. If they don't, we would advise against buying this type light curtain. However, if you have a set of light curtains without this function, the control will accept a light curtain interrupt caused by the operator or the part breaking the beam during the up stroke of the machine. Most operations cause this to happen anyway. This function can be turned off, however, it is very strongly recommended that it is left on for safety.

NOTE: If the machine cycles 500 or more strokes per minute and the light curtain relays are slow you could get MTS faults. In this case you will have to turn the MTS function to off.

Micro Inch

Micro inch is used in die setting. If the control is in inch mode and set to MICRO INCH the palm buttons may both be held in and the machine will increment 'jog' for a timed interval.

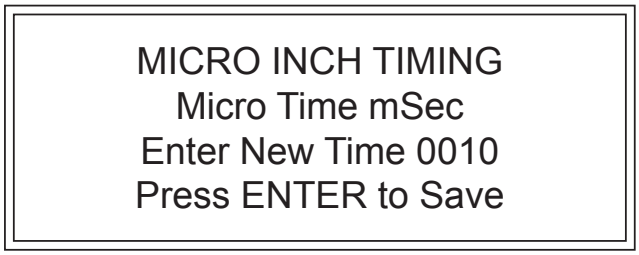
To turn on Micro Inch

The control must be in inch mode. Press and quickly release the Continuous Arm button. The display will read MICRO INCH MODE.

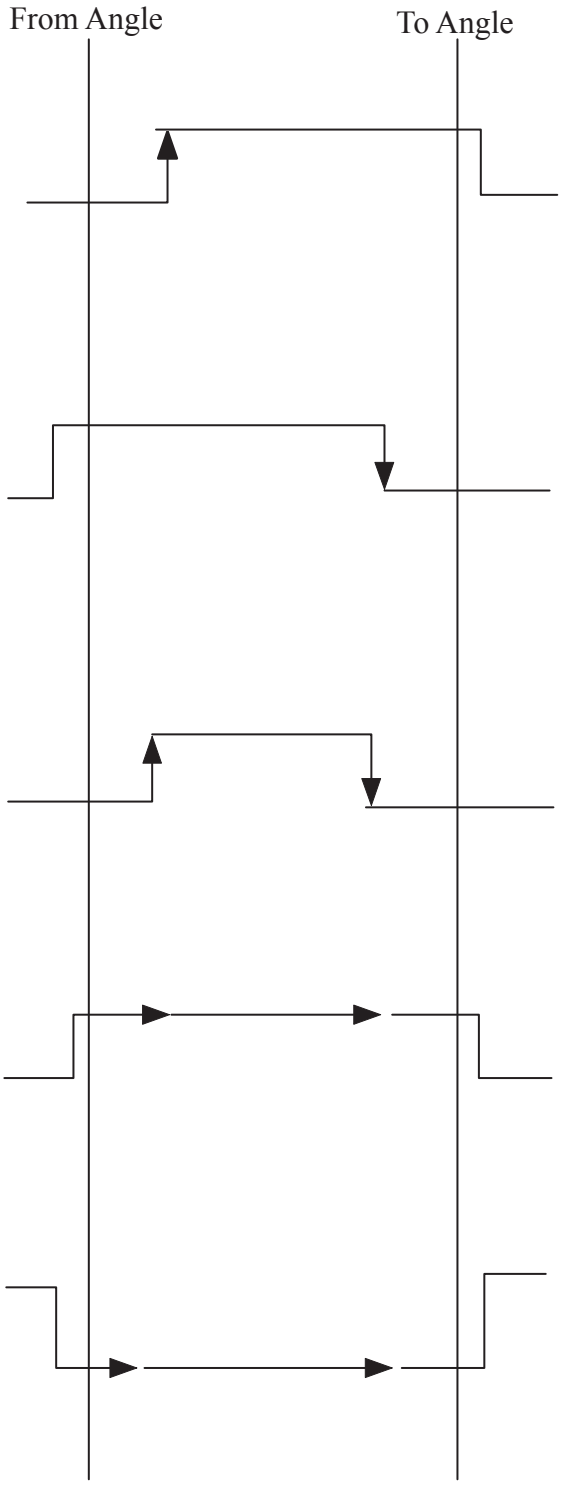
To turn off Micro Inch

Press and quickly release the Continuous Arm button.

The interval is programmable. The setting can be adjusted by entering the SETUP menu as previously described and selecting the function MICRO INCH TIME. The time increments are 1/100 of a second. Adjust to a time that best meets the machines clutch/brake timing.



Illustrates the Die Detection Faults



Eight programmable inputs

Five Types of inputs

[1] If the input is programmed as RISING, and the RISING EDGE of this input occurs before the From-Angle a Fault will be generated, this protects against a defective sensor. If the RISING EDGE occurs within the programmed From-Angle/To-Angle window, no fault will be generated. If no rising edge is detected within the window, a fault output will be generated per the Top-Stop or E-Stop selection after the To-Angle set point of the window is reached.

[2] If the input is programmed as FALLING, and the FALLING EDGE of this input occurs before the From-Angle a Fault will be generated, this protects against a defective sensor. If the FALLING EDGE of this input occurs within the programmed From- Angle/To- Angle window, no fault will be generated. If no falling edge is detected within the window, a fault output will be generated per the Top-Stop or E-Stop selection after the To-Angle set point of the window is reached.

[3] If an input is programmed as a PULSE, both rising and falling edges have to be detected within the window. If either rising edge or falling edge, or both are missing, a fault output will be generated per the Top-Stop or E-Stop selection.

[4] If an input is programmed as SW-HIGH (closed), this input has to stay high throughout the whole window. If it goes LOW anywhere within the window a fault output will be generated per theTop-Stop or E-Stop selection.

[5] If an input is programmed as SW-LOW (open), this input has to stay low throughout the whole window. If it goes HIGH anywhere within the window a fault output will be generated per the Top-Stop E-Stop selection.

NOTE:

Input types 1, 2, 3 are monitored for ON/OFF state. If they should fail in either state a FAULT will occur. Inputs 4 and 5 cannot be monitored for ON/OFF because if the From-To angle is set very wide, such as 10 degrees to 360 degrees the controller does not have time to detect the opposite state of the input.

Notes About Timing

The program that runs in the controller performs each line of code one at a time, just like the rungs in a ladder, when it reaches the bottom rung it starts over at the top rung. Each cycle takes about .8 millisecond.

Time Facters:

When selecting sensors or switches be aware of their switching times. Mechanical switches and mechanical relays may require 4 to 8 milliseconds to go from OFF to ON and 3 to 4 milliseconds to go from ON to OFF. Solid state sensors also require time to go from one state to the other. Check the specifications of the sensor and factor these switching times into the cam angle dwell and timing that you require

The speed of the machine needs to be factored in as well.

At 60 SPM a stroke takes 1 second and a degree takes 2.777 millisecond.
At 120 SPM a stroke takes .5 millisecond a degree takes 1.388 millisecond.
At 240 SPM a stroke takes .25 millisecond a degree takes .694 millisecond.

If you set From-To angles too small the sensor may not react fast enough to be detected.

Factor in the type of input detection you select. Rising (1) and Falling (2) inputs take 2 scans of the program. One scan to detect that the input is in the correct state entering the From-Angle and one scan to detect that is has risen of fallen during the From-To Angle (dwell).

In the case of a Pulse input (3), the input must be detected as OFF in the beginning of the dwell, then ON and then OFF again within the From-To Angle. That is 3 cycles of the progra

Sw-High and Sw-Low (4 & 5) inputs only require one scan for detection.

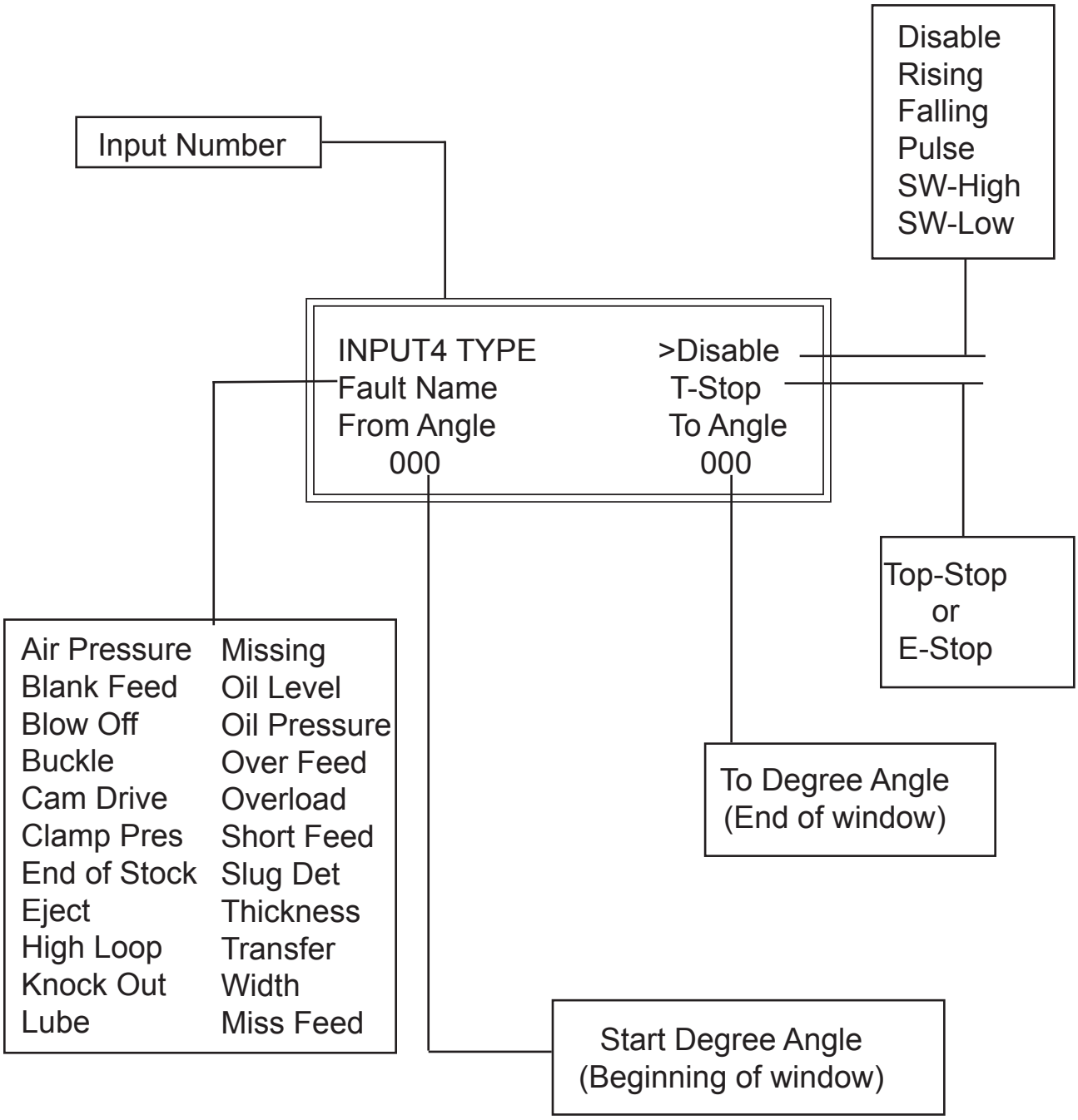
Output Relays:

Output relays are time sensitive also. The relays supplied on the I/O board require 7 milliseconds to go ON and 3 milliseconds to go OFF. You must also factor in the reaction time of whatever you are driving.

Contact Bounce:

There is no input debounce! That means that inputs that could have contact bounce, mechanical switches, relays, grounding whiskers and wands could and will bounce. The control will detect any bounce longer that .8 millisecond.

Die Protection Menu



The User Input/Output Menu

To get to the user input/output menu press the RESET/ENTRY key while the machine is not running. Enter the correct password and make your selection from the menu.

The Jobber Plus+ has the capacity to store 300 user programs (TOOL) setups. Each TOOL setup is identified by a number up to 10 digits long. The TOOL number is required to open an existing TOOL setup or to edit and existing TOOL setup.

You have four User Input/Output choices. 1= OPEN 2=NEW 3=EDIT 4=DELETE:

To open an existing TOOL setup, press (1) you are asked for the number you assigned.

New Tool Setup

From the menu select (2) for NEW and enter a unique identifying number and press ENTER. If the number was previously used ,the message "Duplicate Tool Number" will be displayed. Be sure to record the TOOL number somewhere in you records so that you can identify the job in the future. Follow the instruction on the next page "Navigating The Input/Output Menu".

Edit an Existing Tool Setup

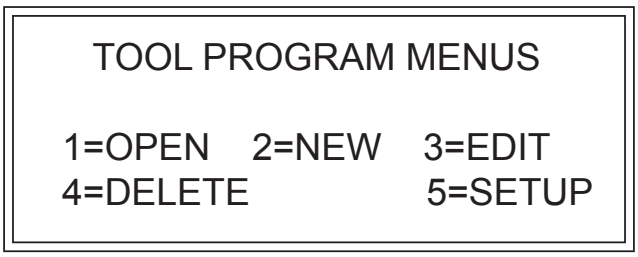
From the menu select (3) for EDIT, enter the TOOL number you wish to edit and press ENTER. Follow the instruction on the next page "Navigating The Input/Output Menu".

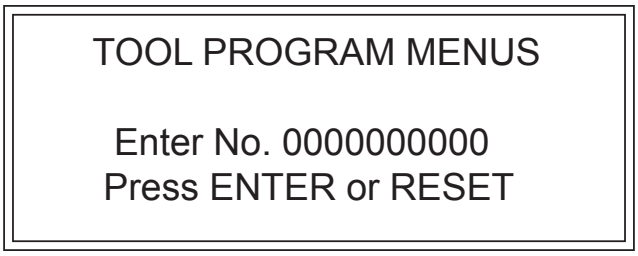
Open an Existing Tool Setup

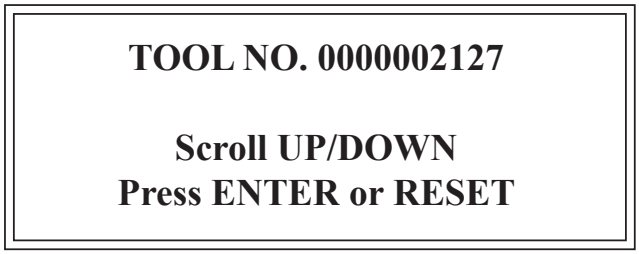
From the menu select (1) for OPEN and enter the TOOL number and press ENTER. The message "TOOL Number 00000XXXX OPENED. Do a few test cycles of the machine to be sure the program is running correctly.

Delete an Existing Tool Setup

From the menu select (4) for DELETE, enter the TOOL number and press ENTER. You will be asked several times to confirm that you want to delete the TOOL number. If you are sure, press the ENTER key. The TOOL setup is erased.







Moving through the menu selections is done with the RIGHT arrow key. Each time the RIGHT arrow key is pressed the arrow on the menu moves to the next selection.

When the arrow on the screen is pointing to a menu item that has a multiple selection, (HiLo, Input Types,Fault Name and T-Stop or E-Stop), press the ENTER key and the arrow on the screen will start blinking. Use the DOWN Arrow key to descend into the menu selections for that item, (you may also press the UP arrow key to move back up through the item selections), when you reach the selection you want, press the ENTER key. The arrow will move to the next selection. Press the ENTER key to enter into this item's menu.

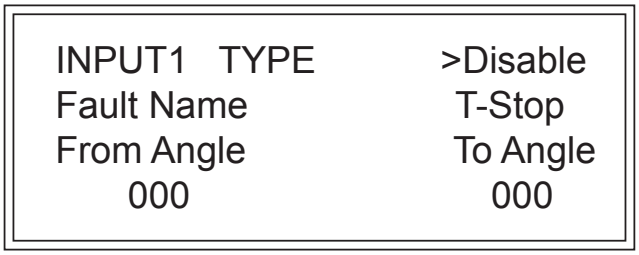
The FROM and TO Angles are the beginning and end of the desired window within the 360 degree circle of rotation. If the input is cyclic then enter the FROM angle (beginning of the window), press the RIGHT arrow key to move to the TO angle and enter it. If you would like to move back to the FROM angle press the LEFT arrow key. You can move back and forth between the FROM and TO angle by using the RIGHT and LEFT arrow keys. Pressing ENTER will put the screen arrow back on the HiLo menu selection.

If the input is non-cyclic then leave the FROM and TO angles at zero.

To move tho the next input, press the UP arrow key.

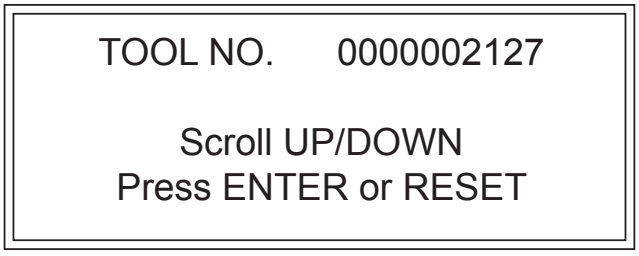
To move back and forth between the inputs use the UP and DOWN arrow keys.

If you scroll past the last input, Number 8, the User Output menu will begin. You can scroll completely through the menus by using the UP and DOWN arrow keys

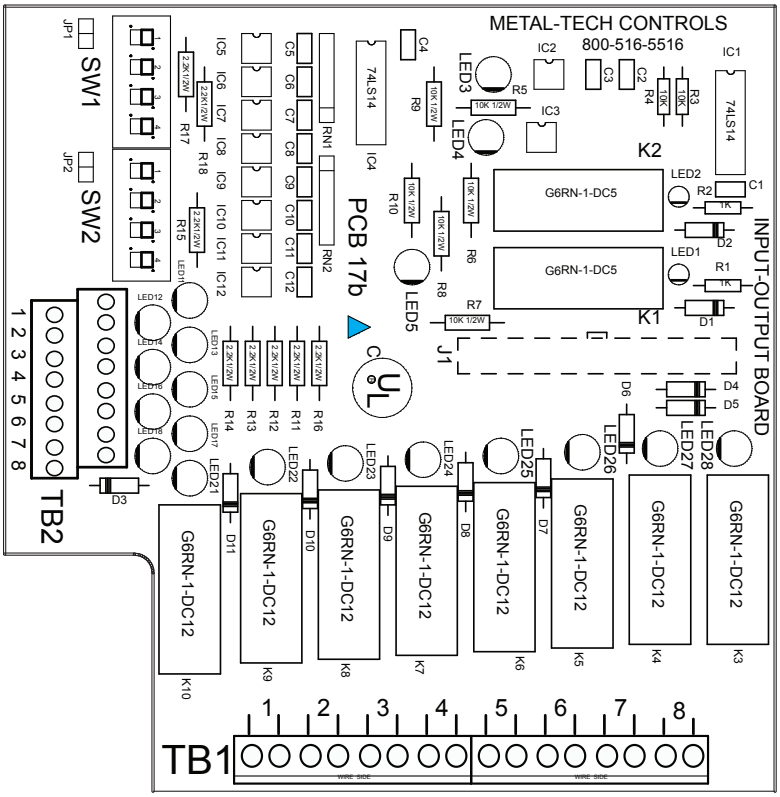


Saving the Tool Setup

Once all the inputs and outputs (see output section) are programmed you need to save the program to memory. If you are in the menu shown above either scroll to the menu shown bellow or press the RESET key to get to the menu shown below. If you are at the menu shown below when having completed your entries, press the ENTER key to save the TOOL setup. WARNING! If you press RESET while in this menu the program will be aborted and not saved!



INPUT-OUTPUT BOARD



Dip Switch Settings (SW1 & SW2)

You Can Select each individual input as either sinkingor sourcing by setting the dip switch for that particular input.

Sinking
(Example SW2)
If pulled to machine ground Connect to (+)
All inputs are sinking.
Contact Closure.
Sinking Sensors.
LED's for sinking inputs will be GREEN.

Sourcing:
(Example SW1)
DC + to top terminal marked (+).
All inputs are sourcing.
Any DC sourcing switch or sensor.
LED's for sourcing inputs will be RED.

Types of Input Devices (See Samples)
Any DC compatible contact switch.
2 or 3 wire solid state sensor, sinking or sourcing.
Wire probe to ground.

Output Relays

Warning!
Do NOT use TB2 terminal as a ground!
For DC outputs use terminal 41.
For AC outputs use terminal52.

Relays are rated 8 amp @ 240 vac.

Single Pole Single Throw.

When energized contacts are closed.

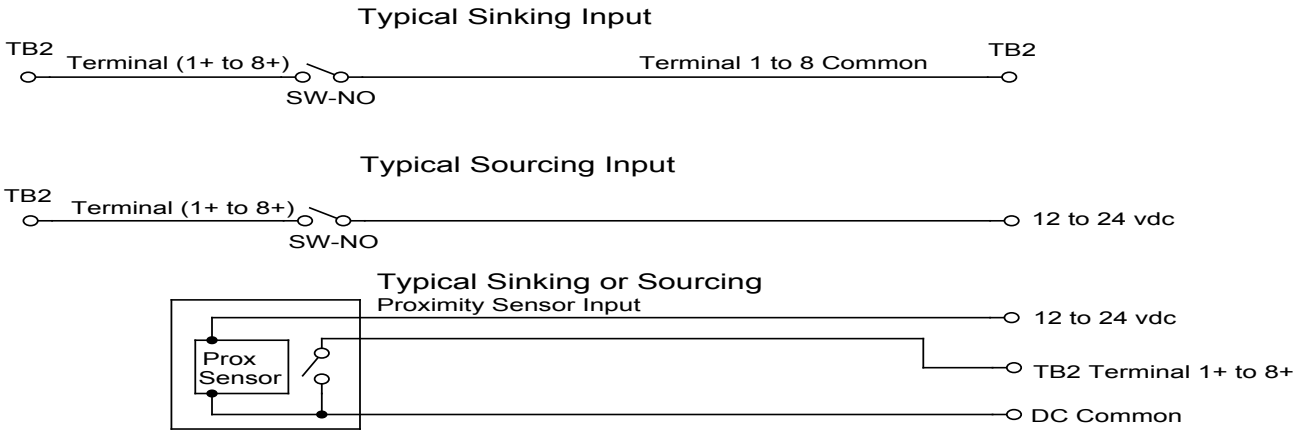
When energized LED 21 - 28 will be on.

User programs which assign dwell times (from/to settings) will energize the relays during the prorammed window (from/to) setting.

If you need N/O contacts during the To/From window, program the To/From angles just the opposite.

Example:
You want the contacts to be open from 60 degrees to 270 degrees. Program the From-Angle 270 and the To-Angle 60.

INPUT EXAMPLES



INPUT FAULTS

E-Stop Faults:
When an E-Stop fault occurs the machine is stopped immediately! No matter where the machine is within the stroke. Use this with caution, if stopping the machine could cause die damage or jamming then you should consider top stopping the machine instead.

Top-Stop Faults:

When a top stop fault occurs the machine is stopped when it reaches TDC (top dead center) if the fault occurs before the top stop leading edge.*

If the fault occurs after the top stop leading edge, the machine will be stopped on the next stroke!

* The top stop leading edge is the angle at which the controller determines a top stop command must be issued in order for the machine to stop on TDC.

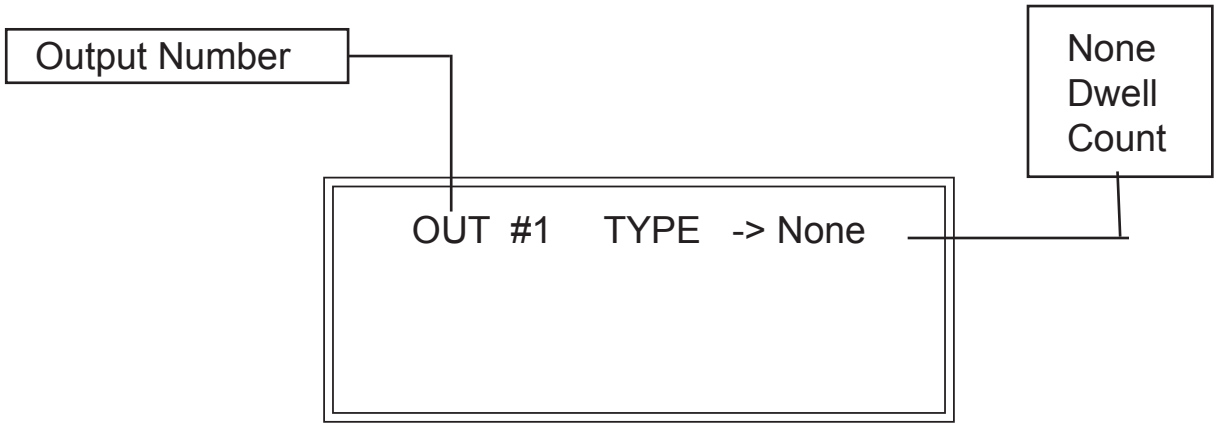
Input # 1 Top Stop
CLEAR-Input Name Press ENTER or CLEAR

Press the ENTER key to reset the Fault. This clears the fault until the next machine stroke. If the cause of the fault is not cleared the same error will occur.

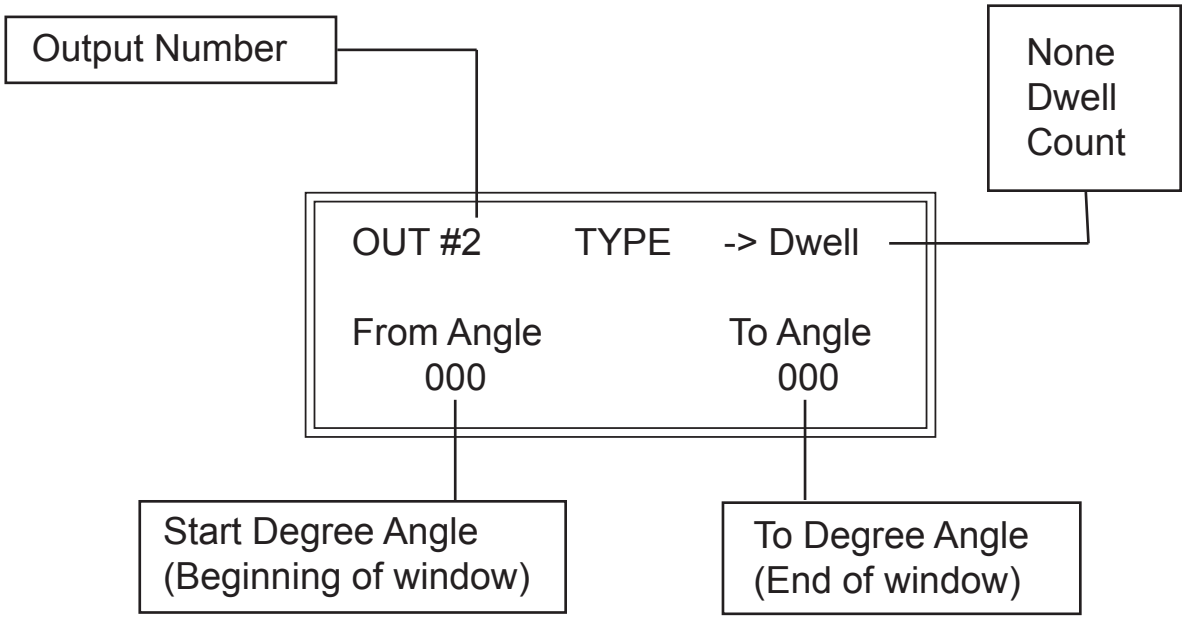
SETUP MODE:

To allow for machine setup, when in INCH mode only, the inputs can be shut off. Pressing the DOWN Arrow Key will turn the inputs off, press the UP arrow Key will turn them back on. If you turn the key selector to SINGLE or CONTINUOUS the inputs are turned to "ON". If you turn the key switch back to INCH the inputs will remain "ON". MODE:

PRESS AUTOMATION MENU



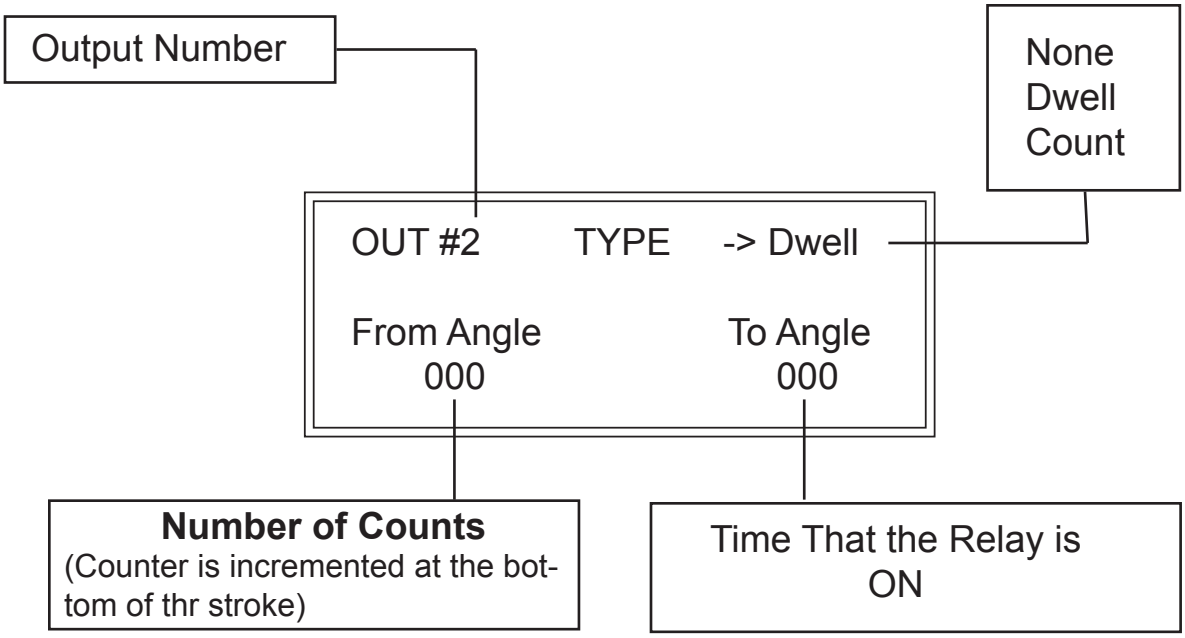
The Output menu as it appears with None selected as an output. When NONE is selected nothing happens on this output. To select Dwell or Count press the ENTER key when the arrow is pointing to the Type name. The arrow will begin blinking, press the UP or DOWN arrow key to select the type function you want.



Dwell

Select Dwell to have a relay come on and go off within a programmed window (From-Angle/To-Angle. After pressing the ENTER key to select DWELL the arrow will move to From Angle, enter the From Angle and press the Right arrow key to move to To Angle. Enter the To Angle and press the Down arrow key to move to the next Output screen.

NOTE:
Outputs are triggered by the leading edge of the programmed dwell time. The 'FROM ANGLE'. When you power up the control even if one of the programmaed outputs is in the From - TO window the relay will not come on. Upon machine rotation, when the FROM ANGLE is reached the relay will come on.



Count

Select "COUNT" if you want to count strokes of the machine and when a given count is reached, turn on the selected relay. The count can be up to 60000.

NOTE: The count is incremented at the bottom of the stroke. If you need the output to be ON at a specific degree angle you can set the dwell of a second relay output and then wire the count/timed relay through the second output to cause the output signal to be ON at a specific degree.

The time is in 1/10th of a second. Enter 10 and the relay will stay on for one second.

NOTE: The count will not increment when the relay is energized during it's programmed time on.

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Acceptance of orders by Metal Tech Controls Corporation (herein after referred to as MTCC), or affiliates whichever is appropriate is subject to credit approval and other terms that may be set by MTCC The laws of the State of Florida shall govern approved transactions and parties agree to resolve all issues in the State of Florida. MTCC's terms and conditions shall prevail notwithstanding any variance with terms and conditions on any order submitted by purchaser. No other terms and conditions shall be binding upon MTCC, unless specifically agreed upon in writing by an authorized official of MTCC.

Warranty and Warranty Restrictions
MTCC warrants its products to be free from defects of material and workmanship and will, without charge, replace or repair any equipment-found defective upon inspection at its factory, provided the equipment has been returned, transportation prepaid, within one year from date of factory shipment.

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Warranty is specifically at the factory. Any on site service will be provided at the sole expense of the Purchaser at standard field service rates.

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Notes