

jobber Plus+

INSTRUCTION MANUAL

OCTOBER 07, 2000



Punch Press Control
Die Protection & Press Automation

**METAL
TECH
CONTROLS CORP.**

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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 Setpoints and the mute Setpoints 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 B 11.3-1988 and B 11-19-1990 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.

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jobber Plus+ Standard Functions

- Electronic Cam Switch with User Programmable Cam Dwell**
- Programmable Timed Based Brake Monitor**
- Lost Motion Detection with Programmable Set-points**
- Last Error Detection Message**
- Diagnostic Screen for Trouble Shooting**
- Terminal Connections for Remote E-Stop, Top Stop & Continuous Arm Push Buttons**
- Terminal Connections for E-Stop Connect Directly to Dual Solenoid Valve**
- Terminal Connections for Dual Palm Buttons and a Foot Switch**
- Terminal Connections for Preventing Ram Adjustments or Reversing the Main Motor except for in Inch Mode.**
- Light Curtain Interface with Automatic Mute On Up-Stroke of Machine**
- Programmable Micro Inch**
- Six User Programmable Inputs**
- Four User Programmable Outputs**

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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

{1} 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 into the **jobber Plus+**.

Direction of Rotation

{2} 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.

{3} Move the ram to TDC (top dead center).

Mounting The jobber Plus+

{4} 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

{5} 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 connectors are tightened properly.

Palm Buttons

{6} Wire the operator palm buttons to the control. **NOTE: All inputs to the blue terminals are 12 vdc.** Terminals labeled No. 21 are 12 vdc positive and should 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 Switch

{7} Wire the air pressure switch. Again using 12 vdc - No. 21 to the switch's normally open (held closed) contacts and back to the air pressure input. If there is more than one pressure switch wire them in series.

Remember: You have not removed any of the jumpers from the user side of the wire terminals. Right?

Grounding

{8} Connect the supply line voltage. 110 volt positive should be connected to the tan fuse block, the common is wired to orange terminal No. 2. A separate ground wire should be connected to the orange and green ground wire terminal. The **machine MUST have a true earth ground and the control transformer must be grounded to the machine.**

Dual Solenoid

{9} Connect the dual solenoid to terminal Nos. 3 and 4 for the load side and No. 2 for the common.

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 E-CAM.

E-Cam Programming for Single & Variable Speed Machines

{11} ACTS stands for Automatically Compensated Top Stop.

The automatic variable speed compensation function works as follows:

The user teaches the control speed ranges by cycling the machine in four different speed ranges. The control converts the four speed ranges through extrapolations to seven speed ranges and stores them in EEPROM (non-volatile memory). When the machine cycles, the machine's speed is calculated during the first portion of the stroke. The controller, to determine which of the seven ranges is appropriate to correctly stop the machine at TDC uses the speed factor.

Speed compensation may not function perfectly in INCH MODE if the machine is jogged through the first part of the first cycle.

What you need to know before performing the variable speed setup:

The lowest speed setting you will use with this machine.

The fastest speed setting you will use.

The two speed settings spaced equally between the lowest and the fastest.

The machine is positioned at TDC.

The machine's direction of rotation.

With the key in INCH go to the Setup menu by pressing the [Reset/Entry] key and then enter your password (1234 if you haven't changed it), then press [ENTER]. From the TOOL PROGRAM MENUS select 5=SETUP, enter the pass code, (1234 if you haven't changed it).

Select 1=SET ROTATION to enter the machine's direction of rotation. 1=Cwise (Clock wise) or 2=CCWise (Counter Clock Wise).

Note: Rotation is determined by facing the front of the E-CAM. The controller's default is CW (clockwise). If the machine's rotation is CW ignore this selection. If the machine rotation is CCW (counter clockwise) press 1 for SET ROTATION and select CCW.

Select 2=SETUP TDC – you are instructed to confirm that the RAM is at TDC, press [ENTER] to confirm that the machine is at TDC.

The next screen offers the choices of 1=Single Speed or 2=Variable Speed. If the machine is variable speed the select 2. If the machine is a single speed machine select 1 and perform the following:

1: The screen requests you to cycle the machine by holding in the palm buttons until the ram stops. Cycle the machine, when it comes to a stop, the stop position in degrees will be displayed. If the machine did not stop within 5 degrees of TDC you will be instructed to cycle the machine again until it does. Each time the machine is cycled the controller makes an adjustment to the stopping angle. It may take as many as five cycles to complete each speed setup.

NOTE: If it takes more than 5 cycles to complete one speed setup it could indicate that your clutch/brake system is not operating properly.

If the machine did stop within 5 degrees of TDC and it is a single speed machine skip to instruction (3) otherwise you will be instructed to change the machine's speed and move on to the next setting.

2: Once the first speed setting is completed, follow the instruction on the screen to perform the next three speed settings.

3: Exit the SETUP menu by pressing [Reset/Entry].

4: Cycle the machine in INCH mode by holding the palm buttons in until the machine stops at TDC. Check each speed range to determine if the machine is stopping at TDC. If the machine is stopping at TDC in the four speed ranges it will adjust automatically to speeds in between the high and low speeds you programmed. If you find that it is not stopping correctly at any particular range, note the stopping degree on the display and go to instruction 5.

Adjust TDC

5: Go to the SETUP menu as described above and use the down arrow key to display 3=ADJUST TDC. Press 3 and “ADJUSTING ACTS # 1- Top Stop Offset XXX” will be displayed. XXX represents the degree of the leading edge of the top stop cam dwell. **NOTE:** If the machine is setup for variable speed move to the particular speed (there are seven of them) you wish to adjust by pressing the ENTER key. Using the UP and DOWN arrow keys advance or decrease the offset degree setting. Make the adjustments by using two thirds of the stopping degree you noted earlier. If the machine is stopping after TDC decrease XXX by pressing the DOWN arrow key. If the machine is stopping before TDC advance XXX by pressing the UP arrow key. Press the ENTER key to save the new setting.

Stop Time Test

{11} Do a stop time test. **Note:** For variable speed machines use the highest speed. Press 5 for STOP-TIME TEST. Follow the instructions on the screen. When the test is completed the stop time maximum parameter will be stored in EEPROM 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

{12} Adjusting the STOP MAX parameter. 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 6 CHANGE STOP MAX. A new menu will appear. From the new menu use the UP and DOWN arrow keys to advance or decrease the STOP MAX setting. Pressing enter will save the new setting to EEPROM.

Lost Motion Detection

{13} Set the lost motion detection parameter. 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. Set the time by trial and error. For example, set the time to 250 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.

Tool Memory

{14} Clearing the TOOL memory bank. As a precaution it is a good starting practice to clear the Tooling Memory Bank at the time of the initial setup. Select function 8 to erase all data in the memory bank. You will be asked to confirm that you want to perform this function. If you do want to continue with erasing the memory bank, press ENTER.

Passwords

{15} Changing the passwords. The last step is to change the passwords so that unauthorized personnel do not have access to the control programming functions. There are two sets of passwords. The first one is for access to the programmable cam switch inputs and outputs. This password will allow trained and authorized users to program TOOL SETUPS. The second password is for accessing the sensitive and critical machine E-Cam settings and other machine control functions. **This password should be given to only those persons authorized, properly trained and thoroughly knowledgeable of punch press control functions and safety.**

To Change either password select 5 from the main menu to get to the setup menu. Select 4 for PASSWORD SETTINGS. You are asked which password you want to change, USER or SETUP. The USER password is for normal press functions, SETUP is for programming the vital machine functions. Enter the new password and follow the instructions to save it. The next time you try to enter that password protected menu, the control will only accept the new password.

NOTE: In the event either of the passwords are lost or forgotten you can call the factory for passwords that will allow you to enter new ones. When calling please have the control's serial number available.

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. The interval is programmable. **Note:** Once the machine has reached TDC you must release the palm buttons and then press and hold them again to MICRO INCH for another cycle.

To turn on Micro Inch:

The control must be in Inch mode. Press the Right Arrow key, the message MICRO INCH MODE will appear at the bottom of the screen.

To turn off Micro Inch:

Press the Left Arrow key, the message at the bottom of the screen will change to INCH MODE.

Micro Inch Interval Programming:

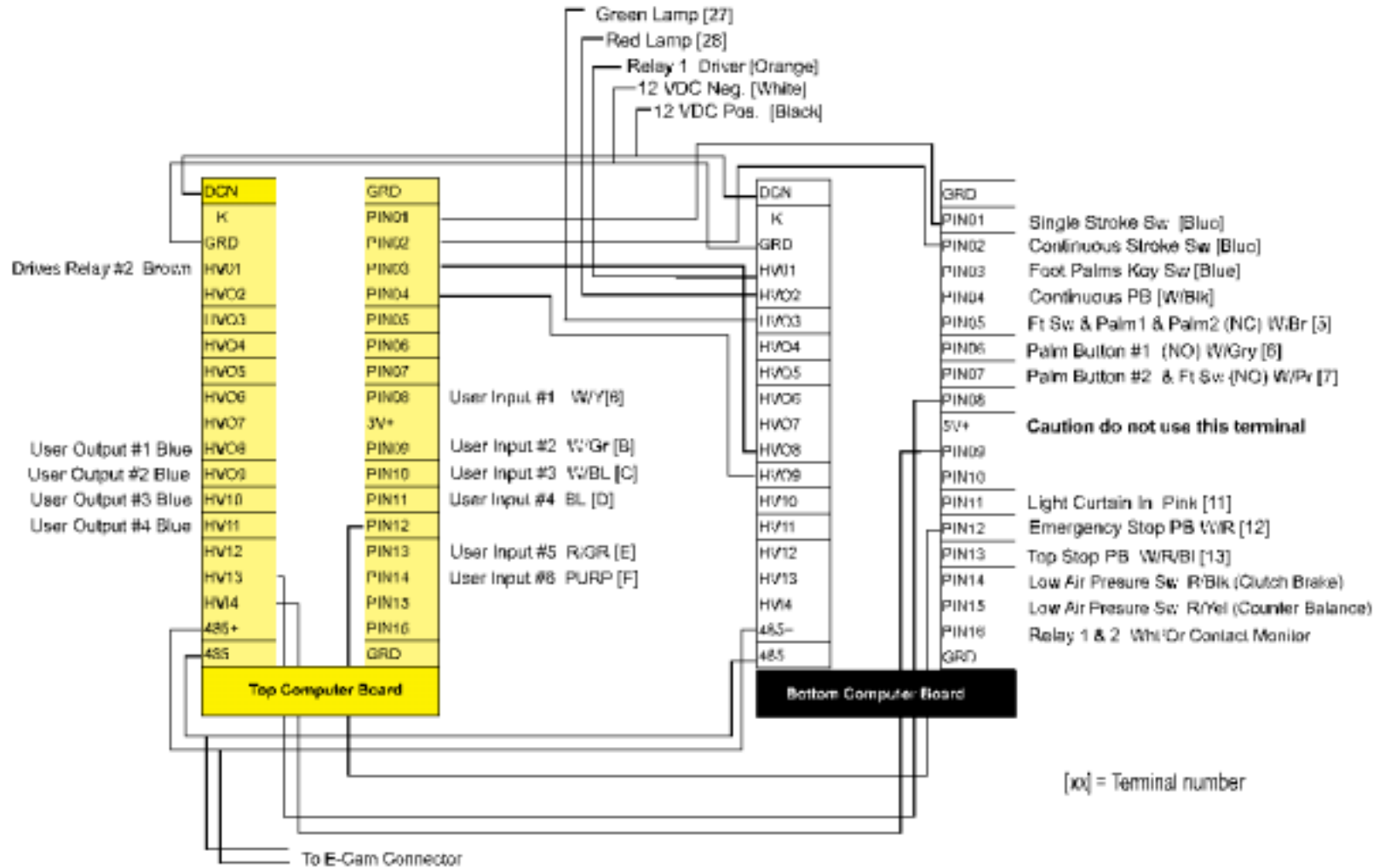
As with all setup functions, from the TOOL PROGRAM MENU select 5 for SETUP, enter the password. Using the Down Arrow key scroll down until you reach function 9, SET MICRO INCH. Press 9. Using the Up or Down arrow keys increase or decrease the time. The time is in increments of 1/100 seconds. Press Enter to save the new setting.

Last Error Message

The **jobber Plus+** controllers monitor each other continuously. The controllers also monitor all inputs and the outputs to the relays controlling the dual valve. All faults that occur will cause the controllers to stop the machine. Some clear themselves immediately, such as light curtain interrupts, low air pressure, a loose wire, bouncing contacts on user added switches, etc. If any of these faults clears immediately, even though the machine was stopped by the controller, the fault may not be displayed. You can find out what the last error was by pressing the ENTER key (as long as the machine is not activated), the error will be displayed on the screen.

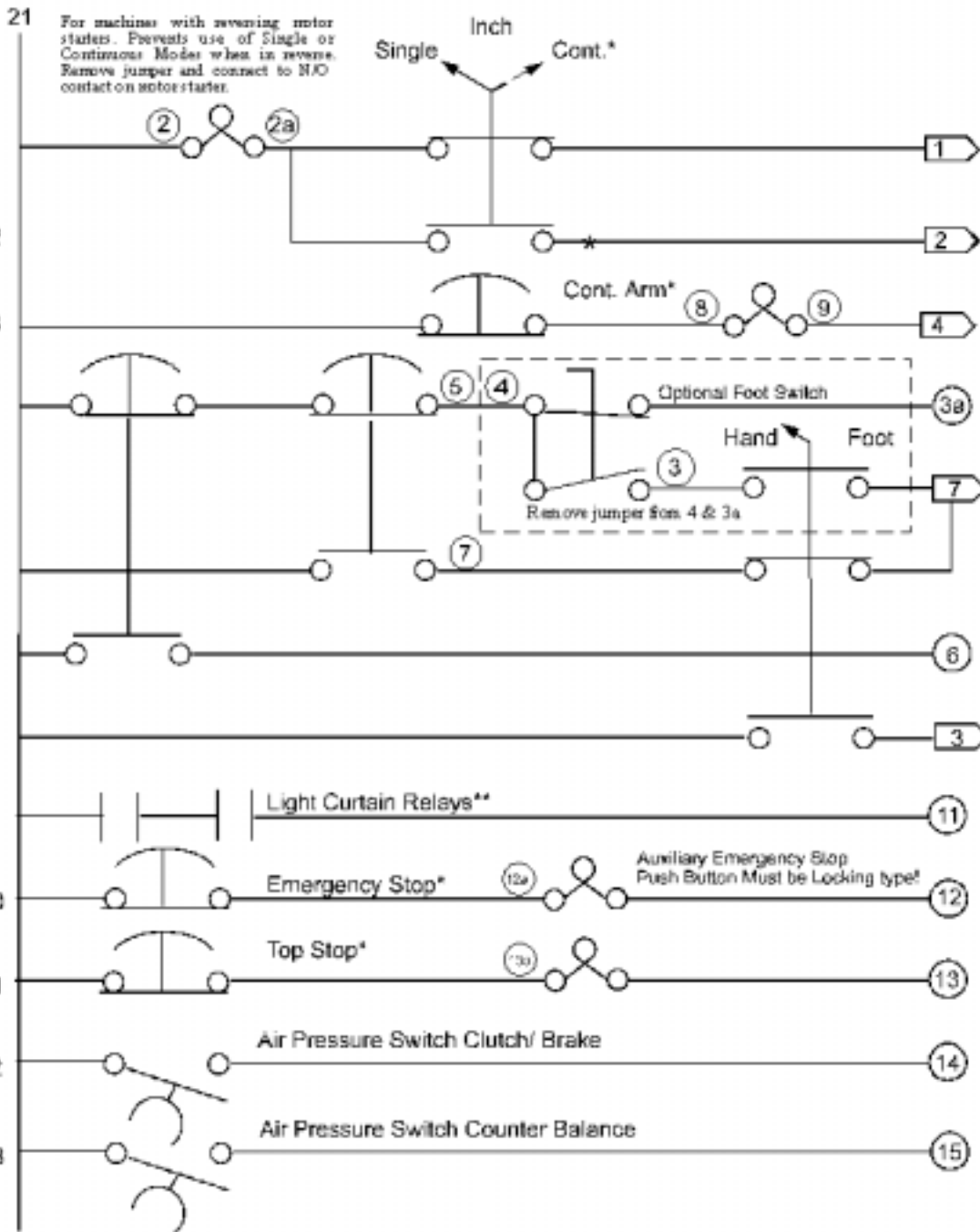
Faults that remain uncorrected will stop the machine, the red indicator light will come on and the fault will be displayed on the screen.

Controller Board Layout



DC Voltage I/O Wiring Diagram

12vdc Pos.



*Panel Mounted

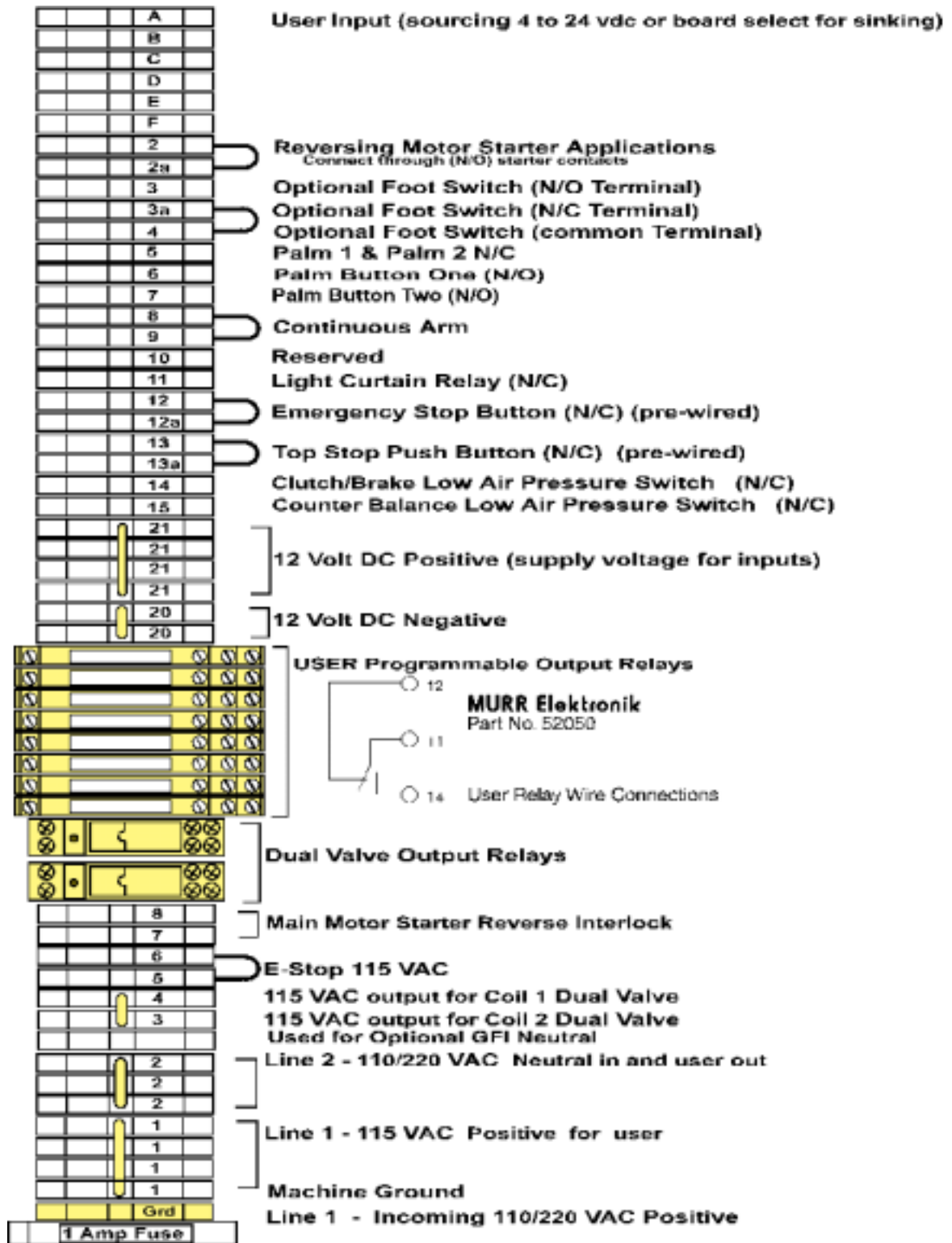
**If no light curtains jumper to 21

Denotes Board Terminal 

Denotes Blue Terminal Strip 

JFP_W2

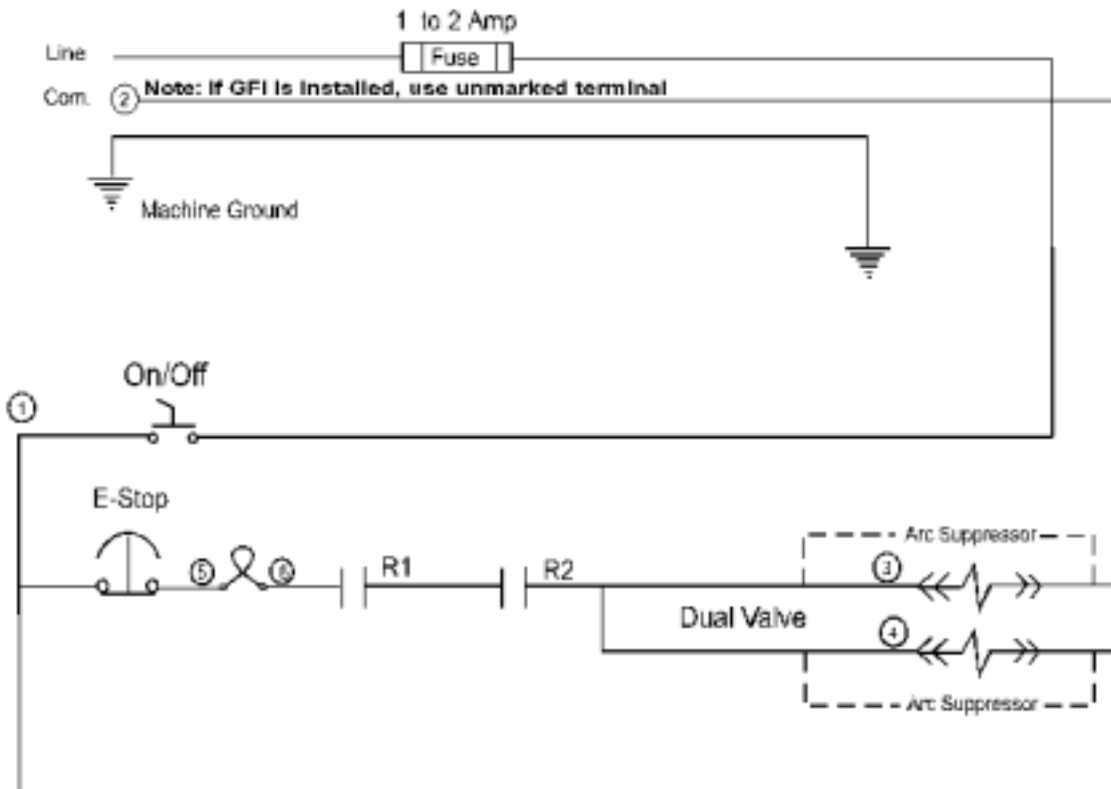
Wiring Terminal Diagram



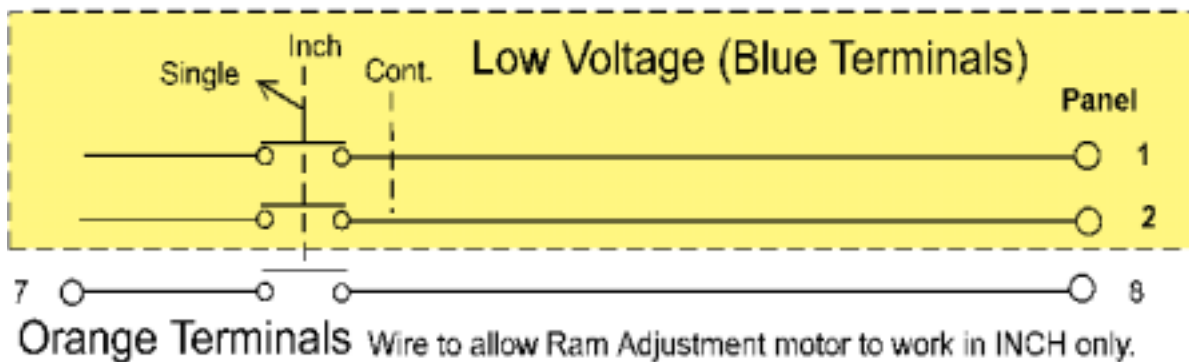
jpp_w3

110/220 Volt AC Wiring Diagram

110/220 Volts AC



OPTIONAL: Ram Adjust Switch Circuit



Diagnostics

A method of viewing the state of inputs is provided for trouble shooting and diagnostics. To turn 'ON' the diagnostic screen the control must be in Inch Mode. Press the Up Arrow Key to turn it on. To view the details and status of the E-Cam press the Up Arrow Key again. (Total of two UP arrow key presses) Press the Down Arrow Key to turn the diagnostics screen off.

CAUTION: Use of the diagnostic screen functions slow the processor down. This function should only be used to test the machine's inputs. Turn the function off to run the machine in INCH for normal use.

INPUTS 1=ON 0=OFF															
1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6
0	0	0	1	0	0	1	1	0	1	0	1	0	1	1	0
INC Key Encoder Diag															

The inputs, 1 through 16 are shown on the second line. The state of the input is indicated by a '1' or '0' on the third line. A '1' indicates that the input is on and a '0' indicates that the input is off.

Inputs by number *

Bottom Main Machine Control Board

1. Single Stroke Key Switch Contact
2. Continuous Stroke Key Switch Contact
3. Foot/Palm Key Selector Switch
4. Continuous Arm Push Button
5. Foot Switch
6. Palm Button #1
7. Palm Button #2
- 8.
- 9.
- 10.
11. Light Curtain
12. Emergency Stop Push Button (Low Voltage Side)
13. Top Stop Push Button
14. Low Air Pressure Switch (Clutch/Brake)
15. Low Air Pressure Switch (Counter Balance)
16. Dual Valve Relay Contact Monitor

Top Monitor Board

1. Single Stroke Key Switch Contact
2. Continuous Stroke Key Switch Contact
3. Input from Bottom Board HV08
4. Input from Bottom Board HV09
- 5.
- 6.
- 7.
8. User Input #1
9. User Input #2
10. User Input #3
11. User Input #4
12. Emergency Stop Push Button (Low Voltage Side)
13. User Input #5
14. User Input #6
- 15.
- 16.

* Input numbers are controller board terminal inputs marked PIN01-16

Encoder Diagnostics

ENCODER DIAGNOSTICS				
TLS L		TLS T		DWE
	INIT		STOP	
340	340	070	035	090

TLS L is Top Stop Limit Switch leading edge. **TLS T** is the trailing edge. The two make up the electronic dwell of the Top Limit Switch Functions. **DWE** is the dwell in degrees. **INIT** is the position in degrees when the controller sent the stop signal to the machine. **STOP** is the degree position where the machine came to a full stop.

By holding in the palm buttons, cycle the machine until it stops at the top of the stroke. Release the buttons and then read the display. (The **STOP** position is not displayed until the buttons are released) The difference between the **INIT** degree subtracted from 360 plus the **STOP** degree reading is how far the machine travelled in degrees. ($360-340=20+35=55$) in the above example the machine took 55 degrees to come to a stop. Keep in mind that distance travelled is not necessarily a function of the stop time in milliseconds. A 160 strokes per minute press will travel 55 degrees in a lot less time than a machine doing 60 SPM. If you find that the machine is travelling an excessive distance before stopping you should consider adjusting and or rebuilding the clutch and brake. Another possibility is the dual air valve. If it is not sized properly or the exhaust port is restricted the machine will be slow to stop.

A press should stop in less than 45 degrees otherwise the machine is being stressed and could be unsafe.

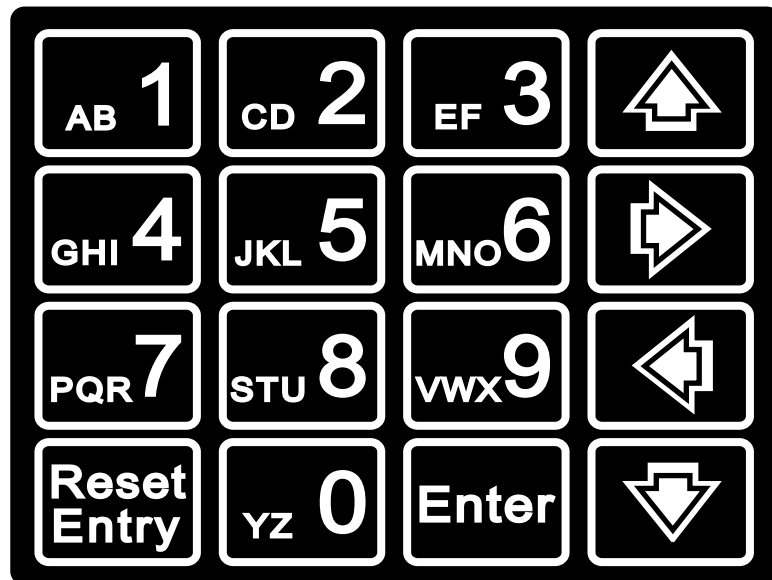
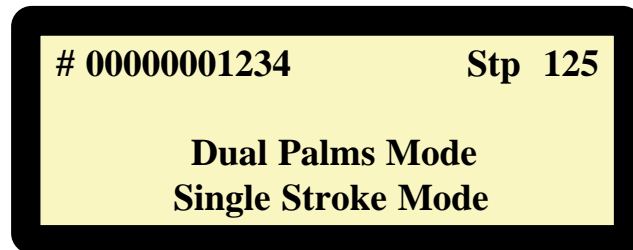
Other Diagnostic Error Messages:

Whenever an error occurs, the red indicator light will come on and an error message along with a helpful hint as to how to find the cause of the error will be displayed. There will be times when an error occurs and is cleared so rapidly that the error message is replaced by the next appropriate message i.e. SINGLE STROKE MODE This is caused by the extremely fast scan time of the processors. To help with this situation a special diagnostic tool is provided. Each time an error occurs the message is stored in the controller's memory. You can access this message by pressing the ENTER key while the machine is idle. Do not turn the power off before reading the message. If you do, you will get the message POWER FAILURE, which was the last error to occur.

Keypad and Display Functions

The **jobber Plus+** Keypad is alphanumeric however the alpha keys are not used as of this printing. The numeric, arrow, Enter and Reset/Entry keys are used to access all the menus and functions.

The display as shown below, displays the current tool number, the stop time, the mode of operation and the stroke mode (Inch, Single or Continuous).



USER PROGRAMMABLE INPUTS

There are four possible types of user inputs:

None

Top Stop

Emergency Stop

Part Eject (input six only)

NONE: Selecting 'None' simply does nothing. This is the default. Leave it as 'None' if you do not have a need for this input.

TOP STOP: Select 'Top Stop' if you want the machine to stop at TDC in the event of a user input. You may select this input to be either N/O or N/C. Either way, if detected during the programmed dwell time the machine will be issued a Top Stop signal. And the LCD will display the User input that caused it.

EMERGENCY STOP: Select 'E-Stop' if you want the machine to stop immediately upon receiving the input. Use caution when selecting this function. Stopping the machine anywhere in the stroke could cause die damage, over tonnage, locking on the bottom or miss feeds of material. You may select this input to be either N/O or N/C. Either way if detected during the programmed dwell time the machine will be issued an Emergency Stop signal. And the LCD will display the User input that caused it.

PART EJECTION: This is a special User Input and is provided for in User Input number Six. This function is designed to be used with part ejection devices that switch when the part passes through or past the detector. When the device detects the part, it opens or closes a circuit. The **jobber Plus+** if programmed for this function looks for this input and if it is not detected during the programmed dwell time, the machine will be issued a Top Stop signal. The LCD will display Part Ejection Fault.

Turning User Inputs - On & Off

It is now possible to turn the user inputs on and off to facilitate machine setup. When in INCH mode the LCD will display **TOGGLE INPUTS KEY 5**
USER INPUTS are OFF

By pressing the 5 key you can toggle the inputs ON or OFF as long as the key is in INCH mode.

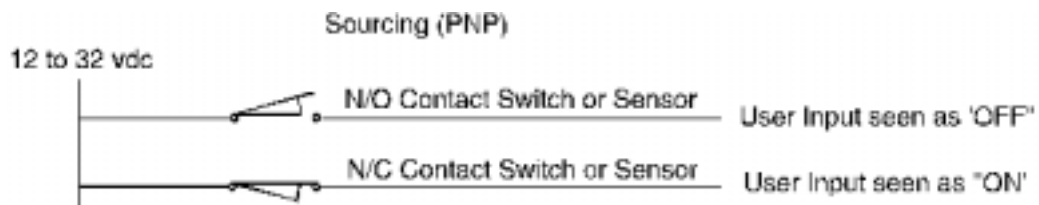
If the control is turned on while the key is in INCH mode the inputs will be turned OFF (programmed inputs not functioning). If you turn the control on while the key is in either SINGLE or CONTINUOUS mode the inputs will be ON.

NOTE: The outputs will still function as programmed.

HOW THE CONTROL “SEES” INPUTS

Sinking or Sourcing? You can have both, or a combination of sourcing and sinking.

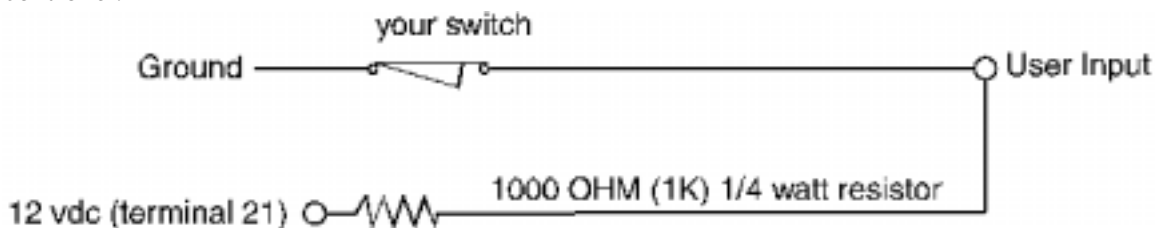
The control as shipped from the factory is set for sourcing inputs (PNP). Sourcing means, supplying voltage. In this case between 5 and 24 volts VDC. Blue terminal # 21 is 12 volts. Connecting terminal # 21 through a switch will supply 12 vdc to the user input you have selected.



You may use other sources for the DC supply to your switches and sensors, however the DC source **must** have a common ground with the Jobber Plus+. If you do not have a common ground the inputs may not be recognized by the controller.

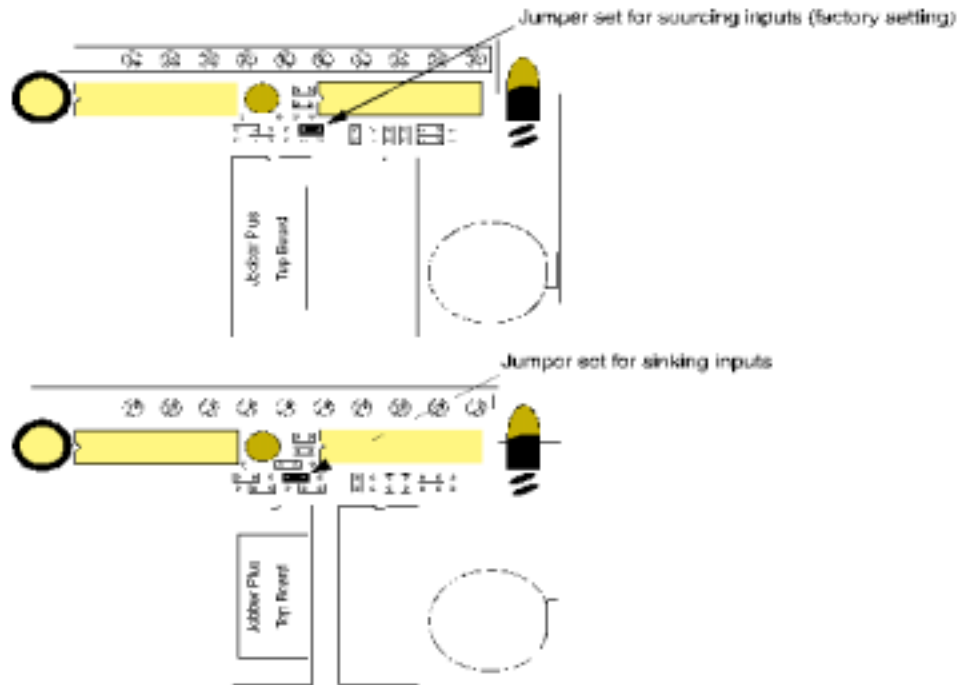
What if you need a sinking (NPN) input?

There may be times when you will need a sinking or grounded input such as an end of stock feeler switch. To make a sinking input work with the controller set to sourcing, connect a 1000 ohm (1k) 1/4 watt resistor in parallel as shown below. This resistor overcomes the pull-up resistor on the controller.



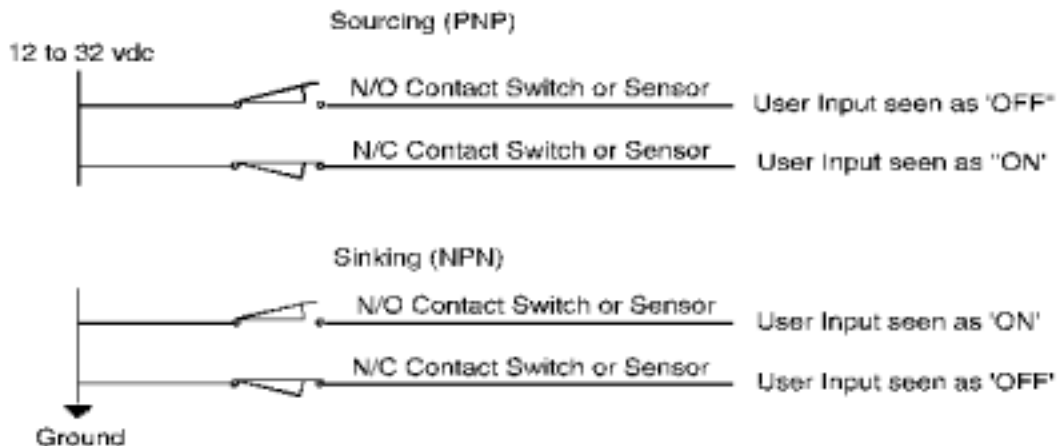
Selecting Sinking or Sourcing User Inputs

Version 4.0 and higher only



The user inputs, A thru F can be changed from sourcing (PNP) to sinking (NPN) inputs by moving the jumper JP 2 as indicated.

When set to sourcing (PNP) a closed contact is recognized by the controller as 'ON' and an open contact is recognized by the controller as 'OFF'. When set to sinking (NPN) a closed contact is recognized by the controller as 'OFF' and an open contact is recognized by the controller as 'ON'.



Changing the Jobber Plus+ from Sourcing to Sinking:

If you find that you need all sinking (NPN) inputs you can set the Jobber Plus+ to accept all sinking inputs. Follow the board jumper setting instructions on the previous page.

There are two very important facts to keep in mind when using sinking inputs.

One: You must have a good stable ground connection.

Two: The sensor must be able to pull the circuit down to within 2 ohms of ground

Tips on programming:

The dwell window is the portion of the stroke during which the control looks for the input.

Inputs have three choices; **None**, **Off** and **On**. **None** means the input is not used.

NOTE: There is a distinct difference between Sourcing (PNP) and sinking (NPN) and how the computer “sees” the input, please refer to the previous page for a full description of “**ON**” and “**OFF**”.

ON means the control will look for an ‘ON’ during the programmed dwell window. If an ‘ON’ is detected the stop function selected will be activated (Top Stop or E-Stop).

OFF means the control will look for an ‘OFF’ during the programmed dwell window. If an ‘OFF’ is detected the stop function selected will be activated (Top Stop or E-Stop).

When programming an input you will need to establish what the input is to accomplish.

Top Stop or E-Stop:

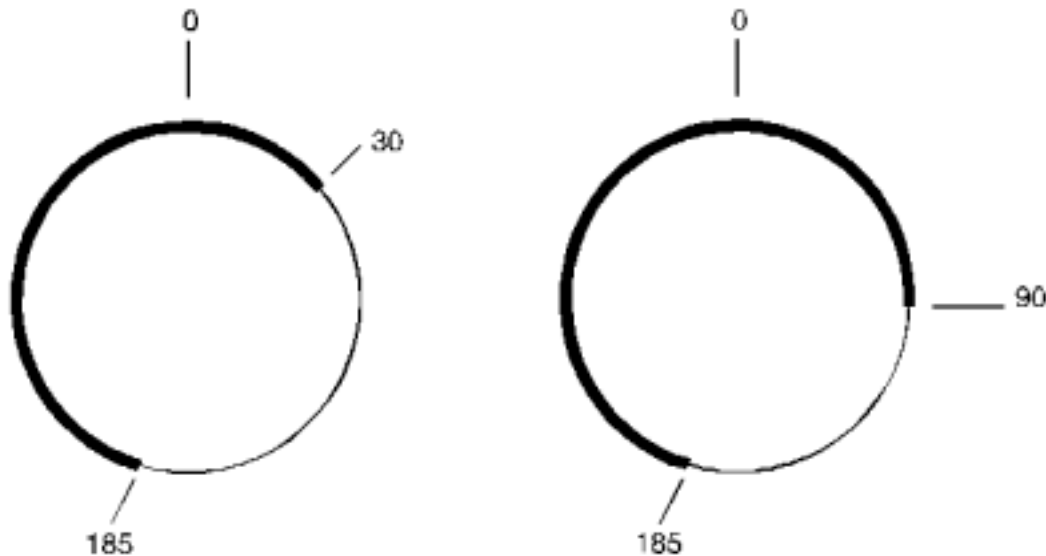
E-Stop - if a signal to E-Stop the machine is received, the control will stop the machine immediately. In the event the press is E-Stop’d when the die is closed it is possible that the press could jam on the bottom causing serious damage to the press as well as to the tooling.

E-Stop is best used with dwell settings which create a window between 200 and 120 degrees. In these situations the machine has time to come to a stop before bottom. Don’t forget to consider the number of degrees the machine takes to actually stop. For example - a material feed is started at 220 degrees - the material must be in place no later than 120 degrees - the machine takes 30 degrees to stop - the E-Stop input dwell should be set for the material in place switch to be actuated at 80 degrees, otherwise the press would be signaled to E-Stop at 80 degrees and by the time it came to a full stop the machine would be close to 120 degrees.

Top Stop - Top stop is the safest stop selection. If a fault is detected the machine will be stopped at the top of the stroke. Keep in mind that dwell settings close to TDC may come too late causing the machine to stop as far as 60 degrees past TDC. Ideal settings are between 30 and 270 degrees.

Part Ejection:

The Jobber Plus+ Part Ejection detection function (input 6) has been changed. The dwell window is now preset and cannot be changed. This change creates a much larger window for the control to detect the part. In INCH and SINGLE mode the window is between 185 and 30 degrees. In CONTINUOUS the window is between 185 and 90 degrees. If the part is not detected within this window the machine is E-Stop'd.



onds, longer is better. The sensor can be either N/O (normally open) or N/C (normally closed). If part ejection is set for 'ON' the control has to sense an 'ON' input between 185 and 30 degrees. If set to 'OFF' an 'OFF' input must be sensed within the window.

Sourcing inputs if 'closed' are seen as an 'ON', if 'open', seen as an 'OFF'.
Sinking inputs if 'closed' are seen as 'OFF', if 'open', seen as an 'ON'.

Programming the User I/O's

This screen is displayed when you press the Reset/Entry key.

ENTER USER PASSWORD

Password

After entering the password this screen menu is displayed.

TOOL PROGRAM MENU

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

OPEN: Press 1 to open an existing programmed tool. Enter the tool number without the leading zeros and press enter. If the tool has been previously saved the controller will find and display **TOOL OPENED** then the screen will automatically return to the run menu.

NEW: Press 2 to program a new tool.

TOOL PROGRAM MENU

Enter No. 0000000000
Press ENTER or RESET

Enter a unique tool number and press enter. If you changed your mind press Reset to exit. If the tool number you entered is not a duplicate the display will change to the tool programming menu. If the number is a duplicate you will get an error message.

TOOL NO. 000000012345

**Scroll Up/Down
Press ENTER To Save**

Programming a tool requires scrolling through the menus and making selections using the arrow keys. Pressing the Enter key will save the tool setup. Pressing the Reset key at any time while programming will return you to the Run Menu.

INPUT #1 TYPE=NONE

**0=None 1=Emerg Stop
2=Top Stop**

The first menu is for programmable inputs. There is a total of six user inputs. Scrolling down will bring you to the next input menu. Select the function you want this input to perform when a signal is received. Selecting Emergency Stop will stop the machine anywhere in the stroke if an input is received within the dwell time. Selecting Top Stop will stop the machine at the top of stroke when an input is received within the dwell time.

INPUT #1 INPUT TYPE

1=ON 2=OFF

Select whether the input will be ON or OFF during the DWELL time.

INPUT #1 DWELL TIME

**On Deg Off Deg
000<--- 000**

Once you have selected the stop function you are asked to enter the dwell. Enter the degree you want the control to start monitoring the input. Using the right arrow key, enter the degree where you want the control to stop monitoring the input. Example: You set the start at 60 degrees and the end at 180 degrees. If an input is received between 60 and 180 the machine will be stopped immediately if programmed for E-Stop or at the top stop position if programmed for Top Stop.

INPUT #1	DWELL TIME
On Deg	Off Deg
060	-->180

The right arrow key shifted the --> indicator to the Off Deg position. Pressing the Left Arrow key will shift you to the On Deg position.

Unless you are finished programming this tool, do not press the Enter key. Press the down arrow key to move to the next input, or keep pressing it until you reach the outputs.

INPUT #2	TYPE=NONE
0=None	1=Emerg Stop
2=Top Stop	

In this example only input #1 is used, the Down Arrow key was pressed five times to reach the OUTPUT #1 menu.

With outputs you have several options. The Count function will count the number of strokes you program and then turn the appropriate relay on for the specific time that you programmed, in this example five. In the time function, each increment of one equals 25 milliseconds. Example: you program time to be 100, 100 will equal 2500 milliseconds or 2.5 seconds. The control will count 5 strokes of the machine and then turn on the specific OUTPUT relay for 2.5 seconds. This function will be repeated over and over again until it is cancelled. Strokes that pass during the Time-On period will not be counted.

TYPE=NONE	OUTPUT #1
0=None	1=Count
2=Time	3=Dwell

After selecting Count by pressing the 1 key enter the number of strokes to count.

TYPE=COUNT	OUTPUT #1
COUNTS	TIME ON
005<--	0000

Press the Right Arrow key to move to TIME ON and enter the time to be ON in 1 x 25 milliseconds. If you are done programming this tool, press Enter to save it or the Down Arrow key to move to the next output. If you want to review or edit previous functions use the UP or Down Arrow keys to move from one function to another.

TYPE=COUNT	OUTPUT #1
COUNTS	TIME ON
005	-->0100

Programming a Time function on Output #2.

TYPE=NONE	OUTPUT #2
0=None	1=Count
2=Time	3=Dwell

Select the Time function by pressing 2. The TIME function menu is displayed.

TYPE=NONE	OUTPUT #2
Time Off	Time On
0000<--	0000

Enter the time 'Off' you require; 1=25 milliseconds, then press the Right Arrow key to move to Time On. Enter the time you want it to remain on. This function performs as long as the control is turned on. Each time the 'On' time is reached it will turn the Output relay 'ON' and then off when the 'Off' time has been reached.

TYPE=NONE	OUTPUT #2
Time Off 0250<--	Time On 0000

TYPE=NONE	OUTPUT #2
Time Off 0250	Time On -->1020

Dwell: Programming an output for dwell on/off.

Dwell On/Off is programmed to an output by pressing 3 for Dwell.

TYPE=NONE	OUTPUT #3
0=None	1=Count
2=Time	3=Dwell

TYPE=DWELL	OUTPUT #3
ON Deg	OFF Deg
075<--	000

Enter the degree that you want the output to come On. Press the Right Arrow key to enter the Off degree position. Each time the machine cycles, the specified output relay will come on and then go off when the Off degree is reached.

TYPE=DWELL	OUTPUT #3
ON Deg	OFF Deg
075	-->320

Editing an existing programmed tool:

Editing an existing programmed tool is much the same as programming a new tool. After pressing Entry and entering your password select from the TOOL PROGRAM MENU screen, 3 for EDIT.

You will be asked to enter a tool number, enter the number and press Enter. If the tool number exists the control will display the Tool Program just like it does for a New Tool except there will be entries in the input and output parameters. Using the same method as with the New Tool's explanation, modify the inputs or outputs. Always use the Up and Down Arrow keys to move from one function to the other. Pressing the Enter key will save whatever you have changed. Pressing the Reset key will take you back to the run screen.

Open an existing programmed tool:

To open an existing programmed tool press Entry, enter your password, select 2 for OPEN, enter the tool number and verify that you want to open it by pressing Enter.

Delete an existing programmed tool:

To delete an existing programmed tool press Entry, enter your password, select 4 for DELETE, enter the tool number and verify that you want to delete it by pressing Enter.

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 one year from date of 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 MTCC's standard field service rates.

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 all returns. 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.

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