REVISIONS	APPROVED	BY	DRAWN BY:	CHECK BY:	WIRING OF STEPPER MOTOR CONTROLLER	UDRAWING NO.
			DATE:	JOB #:		
			SCALE:	ACCT. #:		

C1	CAPACITOR PROVIDED BY 4AUPC KIT
D1	DIODE – 1N4001– [Allied No. 266-0001]
F1	FUSE PROVIDED BY 4AUPC KIT
F2	FUSE PROVIDED BY 4AUPC KIT
FAN1	12VDC FAN
L1	LED INDICATOR – EBT OPTRONIC 19501331, 130VAC, GREEN – [Allied No. 234-1024]
L2	LED INDICATOR – EBT OPTRONIC 19051357, 24VDC, BLUE – [Allied No. 234-1022]
L3	LED INCICATOR – EBT OPTRONIC 19051257, 12VDC, BLUE – [Allied No. 234-1018]
L4	LED INCICATOR – EBT OPTRONIC 19051253, 12VDC, RED – [Allied No. 234-1017]
MPS1	CNC4PC – MINI POWER SUPPLY
R1	RESISTOR PROVIDED BY 4AUPC KIT
R2	RESISTOR – 1K OHMS, 2W, WIREWOUND – [Allied No. 832-0388]
REC1	BRIDGE RECTIFIER PROVIDED BY 4AUPC KIT
RLY1	MAGNECRAFT RELAY, 12VDC, DPDT, 15AMP CONTACT – [Allied No. 850-0410 / (850-1074(Socket))]
S1	SWITCH DPDT PROVIDED BY 4AUPC KIT
S2	SWITCH – SAIA-BURGESS 880004, E–STOP TWIST RELEASE, 2NC – [Allied No. 804-8800]
SCP1	CNC4PC – SAFETY CHARGE PUMP
T1	TRANSFORMER, 30VAC 10A – [Allied No. 836-6250], 24VAC 10A – [Allied No. 967-8482]

This is a list of parts which can be obtained from Allied Electronics or other electronic stores.

DECRIPTION

L1 shows that S1is closed 120Vac is ON and does not have a blown fuse.

L2 shows that the main DC power is ON and does not have a blown fuse.

R2 is used as a current limiter for L2 sense it is a 24Vdc LED and the main DC power is about 40–45Vdc.

MPS1 outputs 12Vdc and 5Vdc and has it own fuse.

L3 shows that the Mini Power Supply (MPS1) is ON and does not have a blown fuse.

FAN1 is driven off the Mini Power Supply (MPS1) because it will run when S1 is closed.

SCP1 works by getting a 12.5KHz signal from Mach 1, 2 or 3 software and is turned on when the reset is pressed.

SCP1 prevents weird signals from the parallel port during system startup.

S2 is a twist release e-stop push button which is in series with the SCP1 contact to energize RLY1.

S2 also sends a signal back to the software that an E–stop is closed and ready.

        In the Mach software the reset will not engage unless S2 is closed.

RLY1 is a relay turning the power on and off to the 4AUPC board.

        This also helps in that power is removed from the 4AUPC board when S1, S2 or SCP1 is opened.

        Several minutes will pass before the power is bled down from the main DC power supply when S1 is opened, but power is OFF of the 4AUPC board. Please still wait before disconnecting stepper motors.

D1 is for coil suppression and is needed.

L4 is use to show that the 4AUPC board in powered and that system is engaged. If you have the output set at 24Vdc use a 24Vdc LED [Allied No. 234-1021]

L1, L3 and L4 have a + and a – lead. You can also choose another color for the different LEDs.

OPTIONS and CHANGES

Another push button can be added for more safety. The push button should activate the system when the E–stop is closed and the reset button on the software is pressed at the same time.

R2 should be recalculated if you are using the 24Vac transformer. If you use the same LED L2 described above it is a 24Vdc at
        .02A. Read the voltage across C1. The voltage across the resistor is $VC1 - 24Vdc(VL2) = VR2$. The resistance is
        $VR2 / .02A(CR2) = R2$. The resistor Wattage is $VR2 \times .02A(CR2) = WR2$.
        Example: Using the 30Vac transformer the $VC1 = 44Vdc$, $44Vdc(VC1) - 24Vdc(VL2) = 20Vdc(VR2)$.
        Then $20Vdc(VR2) / .02A(CR2) = 1K\Omega(R2)$ and $20Vdc(VR2) \times .02A(CR2) = .4W(WR2)$.
        The resistor above in the list was used because of size and cost even thou it is much higher than needed.

If another software is being used an output should go to a relay in place of the SCP1. CNC4PC makes a relay interface board. These inputs and output should be programmable in the software.

DISCLAIMER

This is to be used as a guide. The builder assumes all risks and liabilities with this construction. The builder should always think of safety first when working with machinery and potentially dangerous voltages. If you are not certain of your understanding of these added features or your software please ask questions and research before attempting. Hope this will help.