Wiring Manual
Millennium Tables

October 2003

AXYZ MILLENNIUM Startup Procedure

In order to properly boot up your AXYZ router table it is recommended that the following guidelines are performed on a daily basis, or whenever the table has been OFF.

- Make sure the E-stop is pulled out, before switching the table ON

- Connect the air supply to the table

- Push the Green ON button to power the table

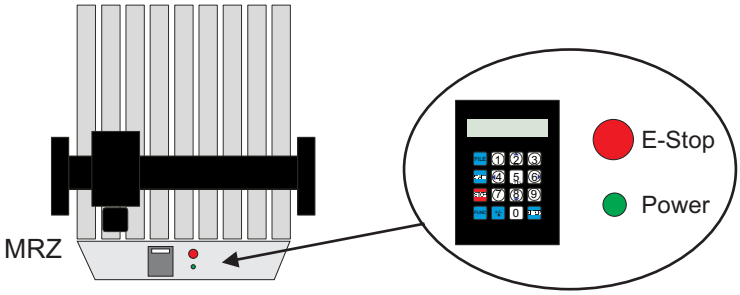
- Sub Console display will now read “Seek X Y Origin”, toggle  between Yes or No & press Enter 

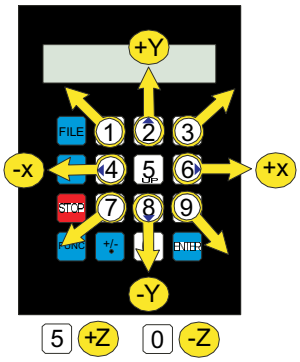
(by entering the default YES the machine will travel to MRZ (Machine Reference Zero) 0,0 origin or the home position)

- Next the display will read “Warm up Spindles? Default is YES”  Toggle if need be between Yes or No & press Enter 

(by selecting the Default YES, the spindle will run at 9000 RPM for 10 minutes. This warms up the bearings inside the spindle(Recomended), and the table remains immobile during the warmup)Note:

X Y Z axes initialize & the table locates its true 0,0 origin(MRZ).





WARNING!!!!!

Spindle will turn on after pressing ENTER. Ensure spindle & tooling are not touching any surface. DO NOT RUN unless Pressure Foot or Brushfoot is installed on machine

Note: During warmup the spindle RPM reaches 9000,

M Series Cable Descriptions

Cable Number	From Description	To Destination
M1	X1 Motor	J5 Millennium Connection Board
M2	Y1 Motor	J6 Millennium Connection Board
M3	Z1 Motor	J7 Millennium Connection Board
M4	X Limit Sensor	J2 Millennium Carriage Board
M5	Y Limit Sensor	J15 Millennium Connection Board
M6	Z Limit Sensor	J3 Millennium Carriage Board
M7	E Stop	J21 Millennium Connection Board
M8	Start/Stop	J22 Millennium Connection Board
M9	Carriage	J17 Millennium ConnectionBoard
M10	Inverter	P13 on AMC Board
M11	RS 485	P4 on AMC Board
M12	SubConsole	P9 on AMC Board

M Series Fuse Descriptions

Fuse Number	Size / Type	Description
F1	1A Fast Blow	Contactor Protection Fuse
F2	15A Slow Blow	Inverter L1 Fuse
F3	15A Slow Blow	Inverter L2 Fuse
F4	15A Slow Blow	Optional Fuse for 3-Phase
F5	5 A Slow Blow	Control Transformer Primary L2
F6	5 A Slow Blow	Control Transformer Primary L1
F7	15 A	Optional Engraver
F8	15 A	Optional Engraver
F9	5A Fast Blow	Optional (For 18V)
F10	5A Fast Blow	Optional (For 18V)
F11	5A Fast Blow	Electronics
F12	5A Fast Blow	Electronics
F13	20A Ceramic Slow Blow	Drive Power
F14	20A Ceramic Slow Blow	Drive Power
F15	1A Fast Blow Contact Protection Fuse	Contactor Protection Fuse

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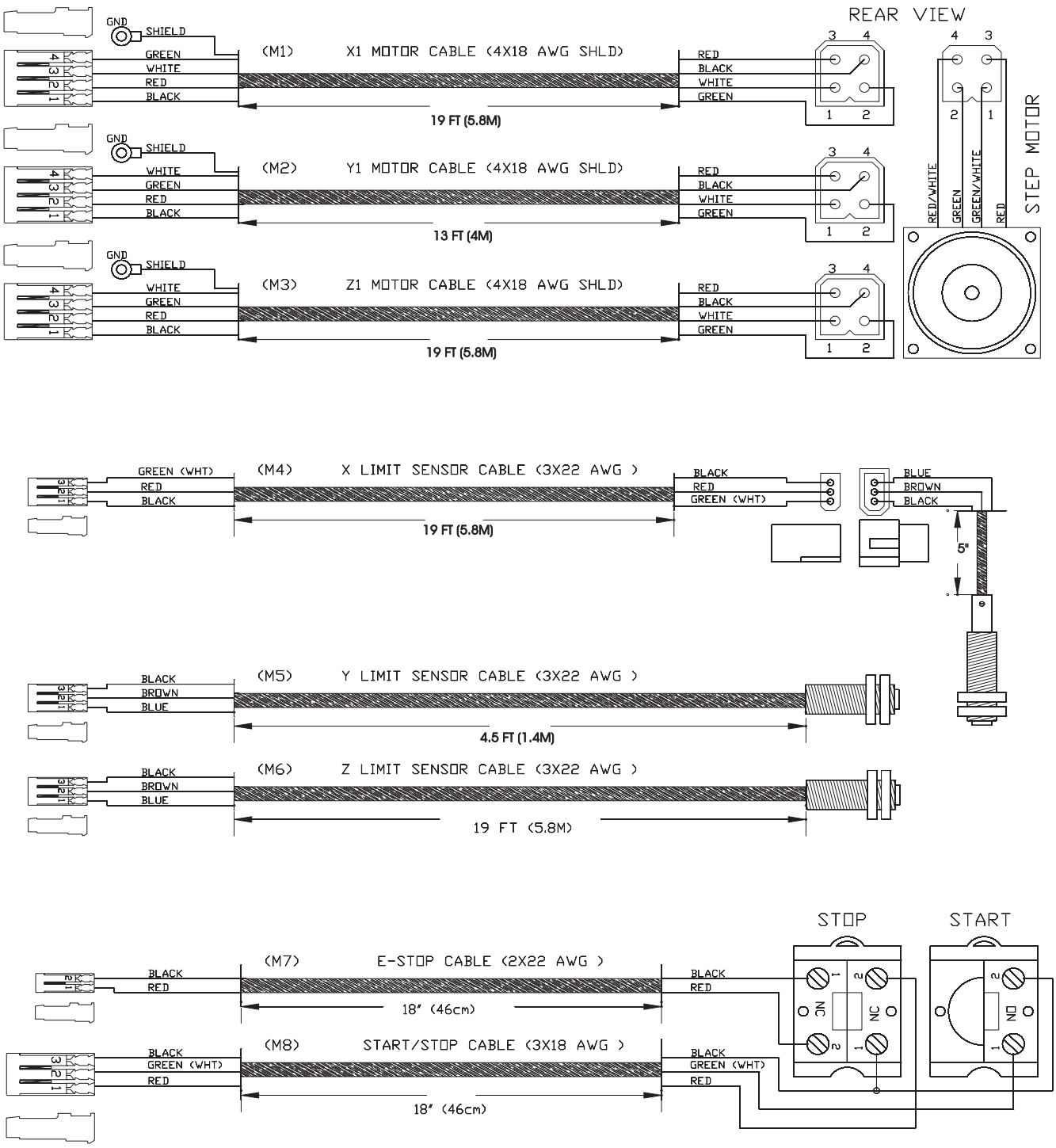
Millennium Wiring Diagram



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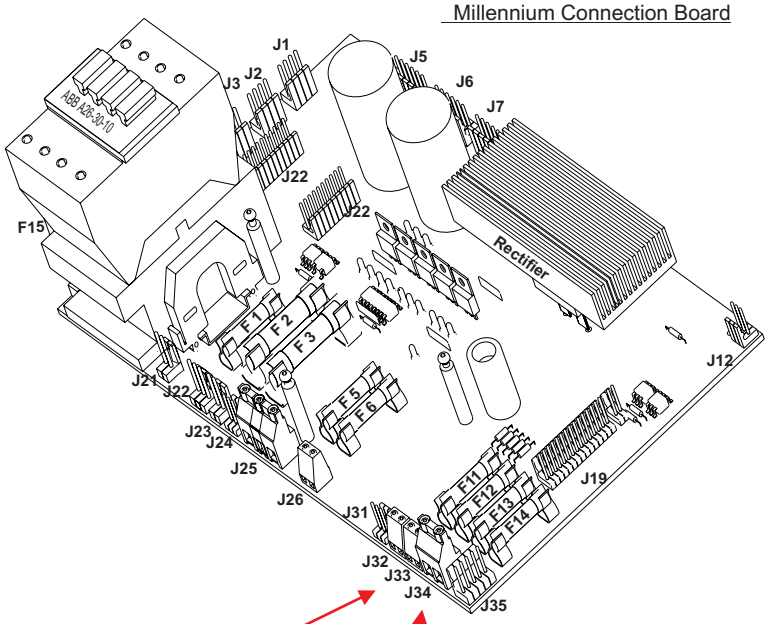
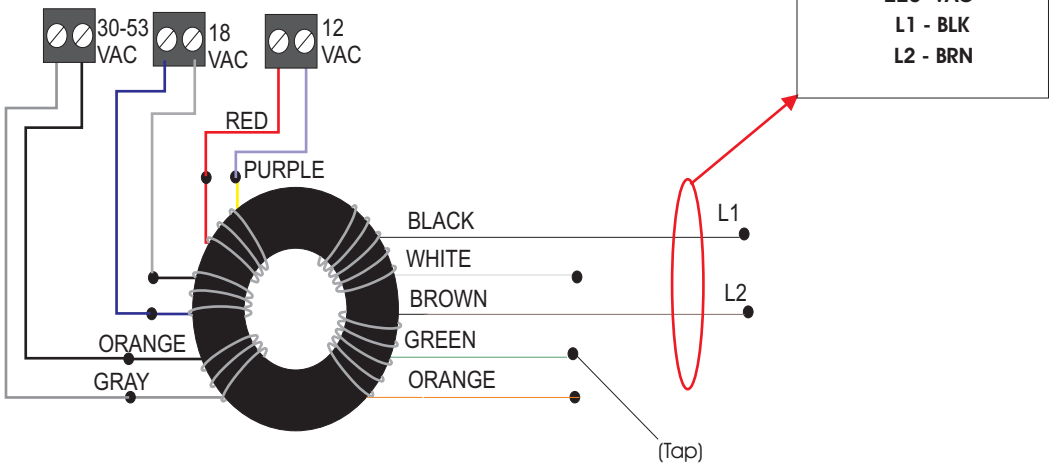
208-240 VOLT 9KW Power System

Millennium Connection Board





TRANSFORMER # 200214

220 VAC

L1 - BLK

L2 - BRN

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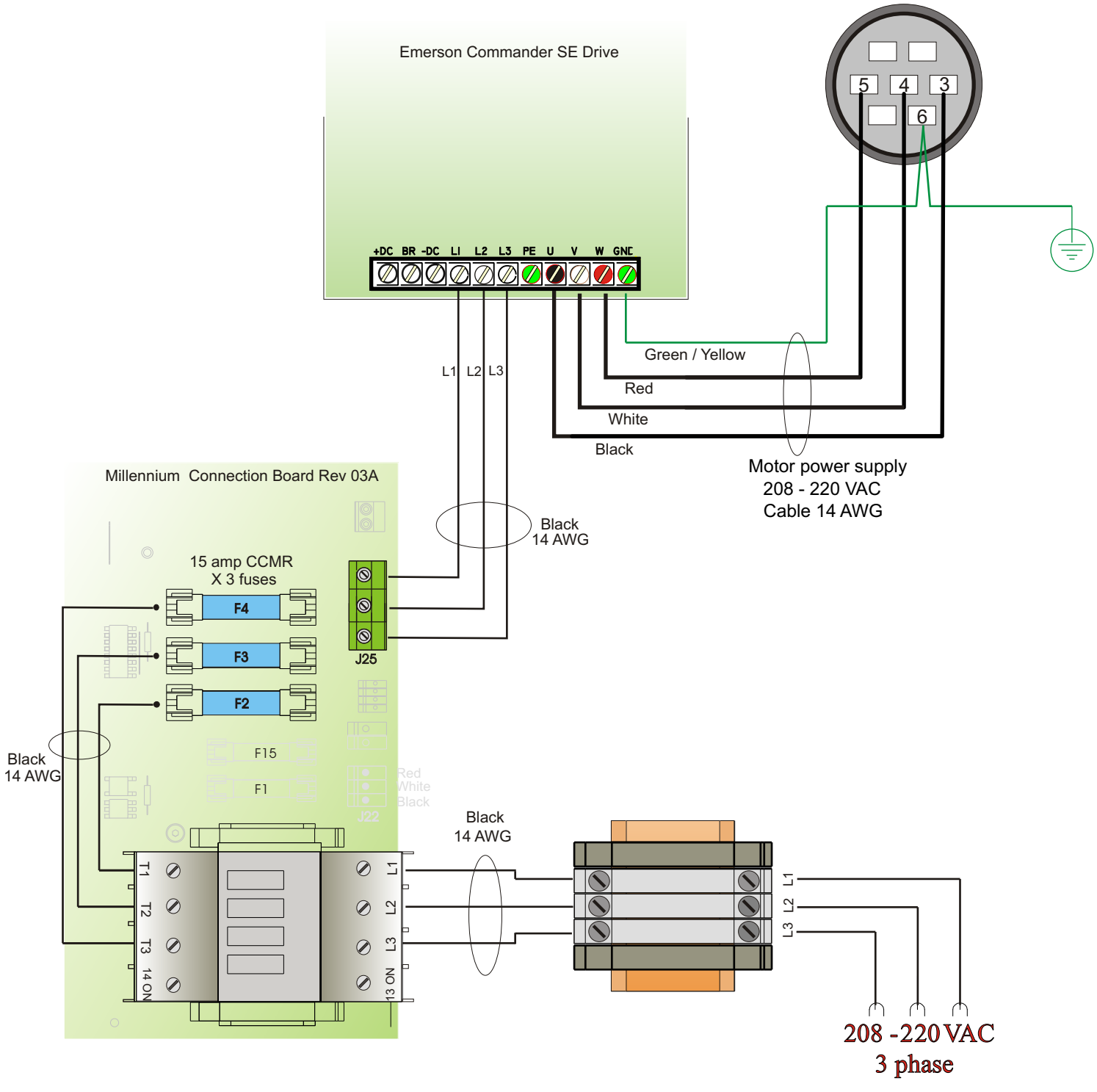
Millennium
208-220 3 ph wiring

3 Phase R (Black)
4 Phase S (White)
5 Phase T (Red)
6 GND (Green/Yellow)



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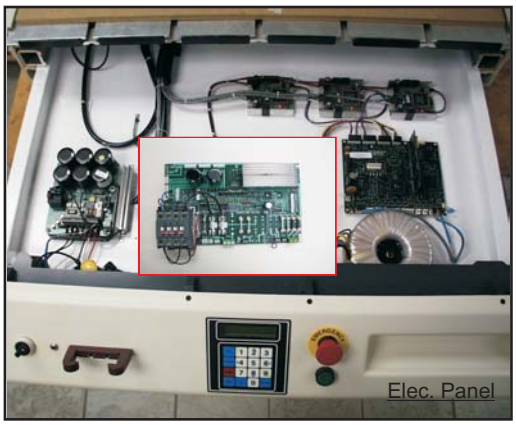
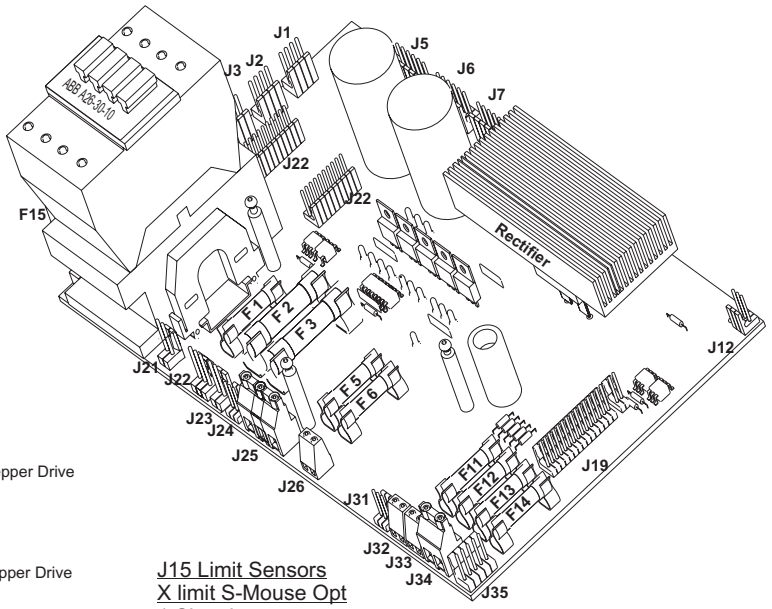
Millennium Connection Board





J3 Z1
1 Not Used
2
3
4

J2 Y1
1 Not Used
2
3
4

J1 X1
1 Not Used
2
3
4

J5 X1
1 Black
2 Red
P3 X1 Stepper Drive

J6 Y1
1 Black
2 Red
P3 Y1 Stepper Drive

J7 Z1
1 Black
2 Red
P3 Z1 Stepper Drive

J19

6	Input 2	1 White	P40 ON AMC
5	Input 1	2 Yellow	
4	Limit Sensor	3 Grey	
3	Tool Sensor	4 Blue	
2	GND1	5 Black	
1	5 VDC	6 Red	
10	4 Down	7 Black	P29 ON AMC
9	4 Activate	8 Brown	
8	3 Down	9 Violet	
7	3 Activate	10 Red	
5	2 Down	11 Blue	
4	2 Activate	12 Green	
3	1 Down	13 Yellow	
2	1 Activate	14 White	
	P6 2 Spindle	Not Used	
	P6 4 Enable	Not Used	

J15 Limit Sensors
X limit S-Mouse Opt
1 Signal
2 12VDC
3 GND
Y limit
1 Signal Black
2 12VDC Brown
3 GND Blue
Z1 limit
1 Signal Not Used
2 12VDC Not Used
3 GND Not Used

J25 Spindle
1 Black — L1
2 Black — L2
Inverter

J22 START/STOP
1 GND BLACK
2 12V WHITE
3 IN RED

J21 E-Stop
1 Red
2 Black

J35 AMC Power
1 White
2 White
P11 AMC Board

J17 CARRIAGE

10	Y-Sen	Not Used
9	Z-Sen	Black
8	T1- Act	Yellow
7	T2-Act	Orange
6	T3-Act	Violet
5	T2-Sen	Brown
4	T3-Sen	Not Used
3	12 VDC	Red
2	GND	Green
1	Shield	Green+Silver

J32 18 VAC
1 Violet
2 Brown
Not Used

J34 30-50 VAC
1 Gray
2 Black
Transformer

Fuses

F1	1 A Fast Blow
F2	15 A Slow Blow
F3	15 A Slow Blow
F4	15 ASlow Blow Opt
F5	5 A Slow Blow
F6	5 A Slow Blow
F7	15 A Opt
F8	15 A Opt
F9	5 A Opt
F10	5 A Opt
F11	5 A Fast Blow
F12	5 A Fast Blow
F13	20 A Ceramic
F14	20 A Ceramic
F15	1 A Slow Blow

J12 12VDC FAN
Optional
1 24 VDC
2 12 VDC
3 GND

J33 12V AC
1 Black
2 Red

J26 Transformer

1 Black
Brown
2 White
Orange

J24 INVERTER CONTROL
Not Used
1 V+
2 FWD
3 V+
4 FWD

J 31 Spindle Switch
1 On Not Used
2 AUTO Black
3 Com Black
Connected Together

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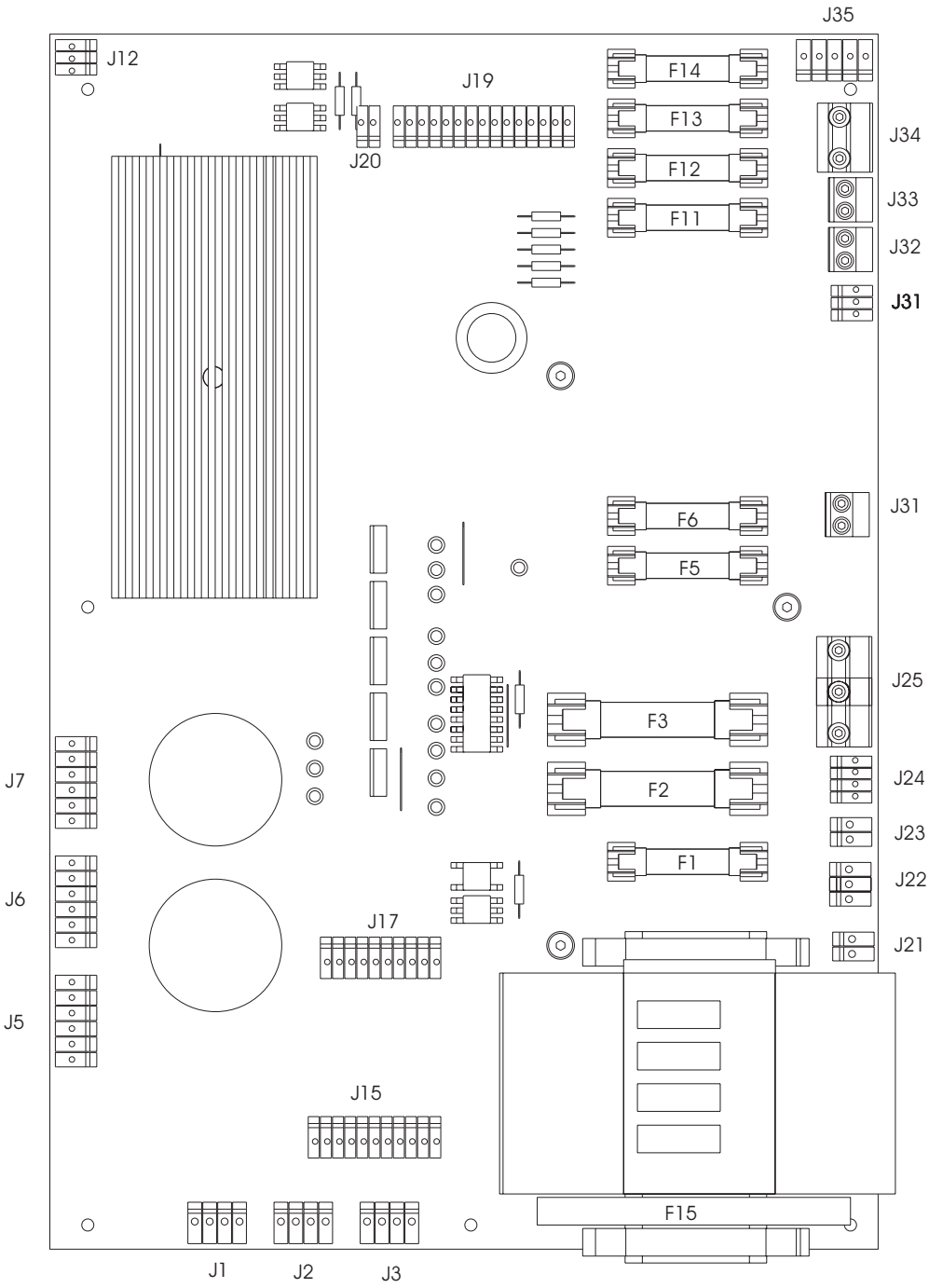
MILLENNIUM CONNECTION BOARD



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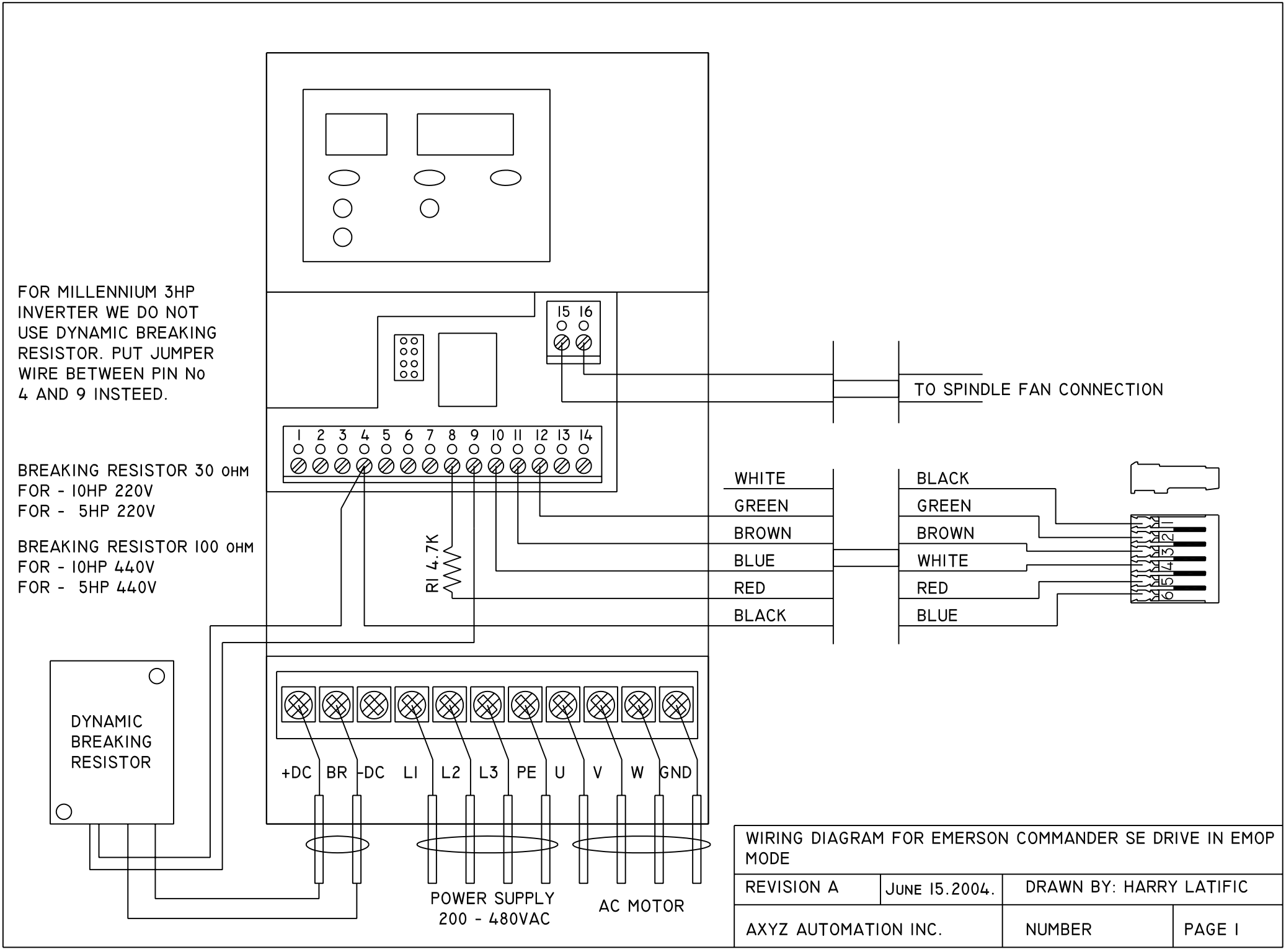
FOR MILLENNIUM 3HP INVERTER WE DO NOT USE DYNAMIC BREAKING RESISTOR. PUT JUMPER WIRE BETWEEN PIN No 4 AND 9 INSTEED.
BREAKING RESISTOR 30 OHM
FOR - 10HP 220V
FOR - 5HP 220V
BREAKING RESISTOR 100 OHM
FOR - 10HP 440V
FOR - 5HP 440V
15 16
TO SPINDLE FAN CONNECTION
1 2 3 4 5 6 7 8 9 10 11 12 13 14
RI 4.7K
WHITE
GREEN
BROWN
BLUE
RED
BLACK
BLACK
GREEN
BROWN
WHITE
RED
BLUE
DYNAMIC BREAKING RESISTOR
+DC BR -DC LI L2 L3 PE U V W GND
POWER SUPPLY 200 - 480VAC
AC MOTOR
WIRING DIAGRAM FOR EMERSON COMMANDER SE DRIVE IN EMOP MODE
REVISION A
JUNE 15.2004.
DRAWN BY: HARRY LATIFIC
AXYZ AUTOMATION INC.
NUMBER
PAGE 1

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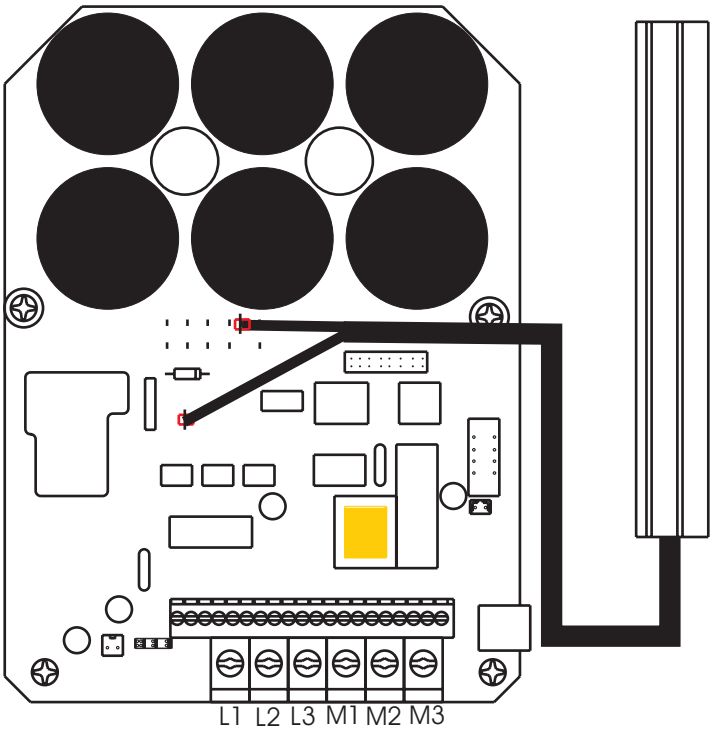
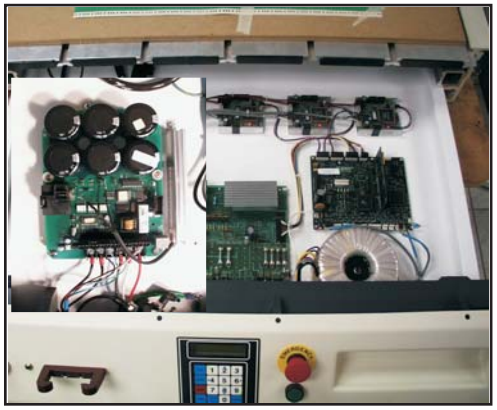
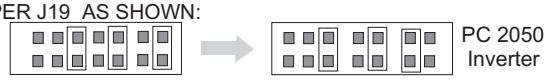
Millennium Inverter Control Wiring

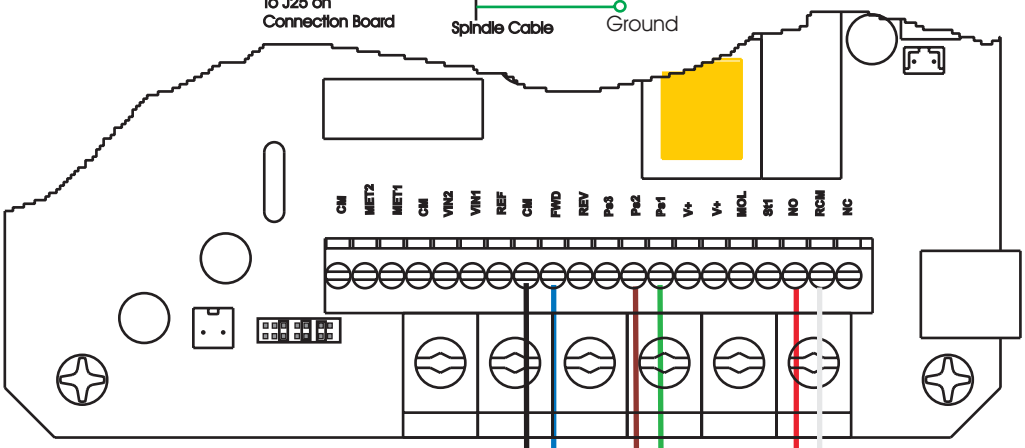




1. ADJUST J19 FROM PULL UP TO PULL DOWN LOGIC
2. WIRED CONTROL TERMINAL TO AMC AS SHOWN BELOW

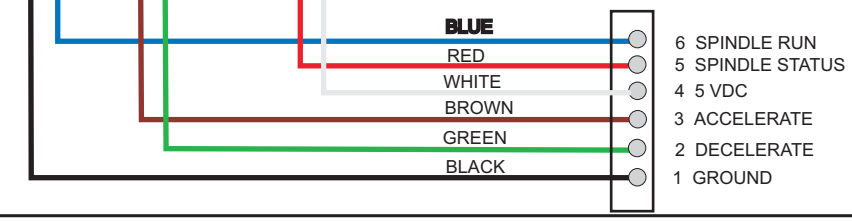
INVERTER CONTROL MUST BE SWITCHED FROM PULL UP LOGIC (FACTORY DEFAULT) TO PULL DOWN LOGIC. MOVE JUMPER J19 AS SHOWN:





INVERTER CONNECTOR ON AMC BOARD:
INVERTER 1 - P13
INVERTER 2 - P12

USE 6 CONDUCTOR 22 AWG CABLE



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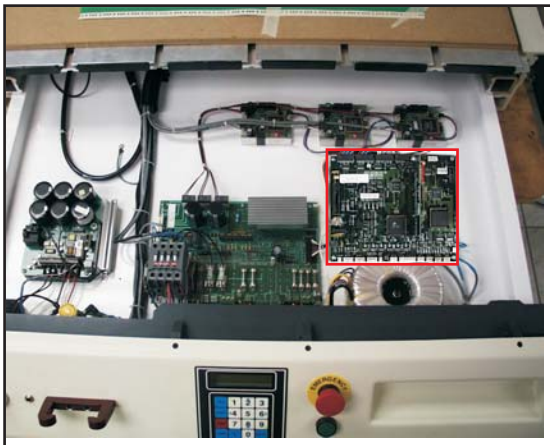
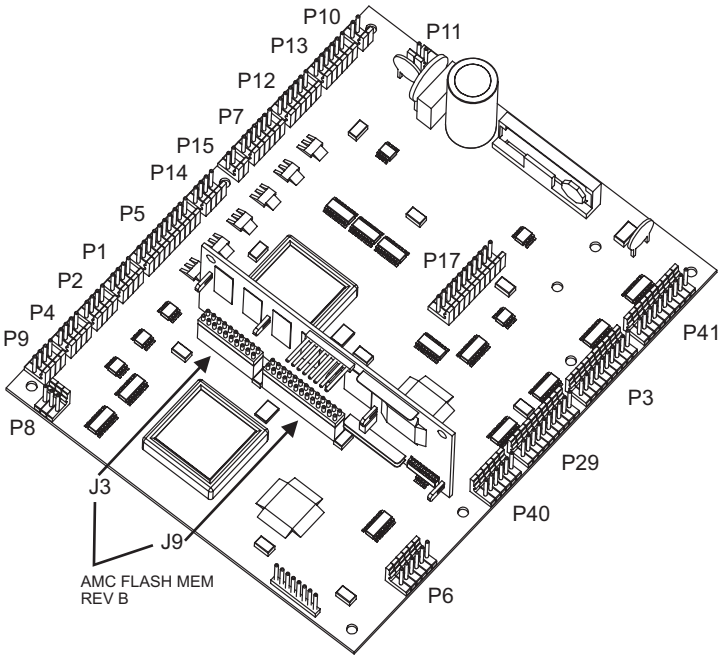
AMC Board
Revision G



Elec. Panel



P11 12AC/DC POWER

P41 X AND Y MOTOR CONTROL

1 12 VDC	RED
2 X1 STEP	BLACK
3 X1 DIRECTION	BLUE
4 X2 STEP	BLACK
5 X2 DIRECTION	BLUE
6 12 VDC	RED
7 Y1 STEP	BLACK
8 Y2 DIRECTION	BLUE
9 Y2 STEP	BLACK
10Y2 DIRECTION	BLUE

P3 Z MOTOR CONTROL

1 12 VDC	RED
2 Z1 STEP	BLACK
3 Z1 DIRECTION	BLUE
4 Z2 STEP	BLACK
5 Z2 DIRECTION	BLUE
6 12 VDC	RED
7 Z3 STEP	BLACK
8 Z3 DIRECTION	BLUE
9 Z4 STEP	BLACK
10Z4 DIRECTION	BLUE

P29 TOOL OUTPUTS

1 12 VDC	
2 T1 ACTIVATE	WHITE
3 T1 DOWN	YELLOW
4 T2 ACTIVATE	GREEN
5 T2 DOWN	BLUE
6 12 VDC	
7 T3 ACTIVATE	RED
8 T3 DOWN	PURPLE
9 T4 ACTIVATE	BROWN
10T4 DOWN	BLACK

P40 BASIC INPUTS

1 5 VDC	RED
2 GND	BLACK
3 TOOL BUSY	BLUE
4 LIMIT SENSORS	GREY
5 MACHINE MOTION	YELLOW
6 INPUT 2	WHITE

P6 SPINDLE OUTPUTS

1 12 VDC	
2 INVERTER 1 ON/OFF	
3 12 VDC	GRAY
4 MOTOR ENABLE	BLUE
5 ACCELERATE	BROWN
6 DECELERATE	WHITE

P8 LRC

1 12 VDC	GREEN
2 TRANSMIT	RED
3 RECEIVE	BLACK

P9 SUB CONSOLE

1 12 VDC	RED
2 RECEIVE	GREEN
3 TRANSMIT	WHITE
4 GROUND	BLACK

P4 Rs485 CHANNEL B

1 GROUND	
2 DIFF INPUT B	RED
3 DIFF INPUT A	BLACK
4 12 VDC	

P2 Rs485 CHANNEL D

1 GROUND	
2 DIFF INPUT B	OPTIONAL
3 DIFF INPUT A	FOR
4 12 VDC	UPGRADE

P1 Rs485 CHANNEL C

1 GROUND	
2 DIFF INPUT B	OPTIONAL
3 DIFF INPUT A	FOR
4 12 VDC	UPGRADE

P5 ATC CONTROL

1 GROUND	BLACK
2 MANUAL BUTTON INPUT	PURPLE
3 ZERO SPEED INPUT	BLUE
4 SENSOR 2	ORANGE
5 SENSOR 3	GREEN
6 SENSOR 4	YELLOW
7 NOT CONNECTED	
8 GROUND	BLACK
9 TOOL CLAMP SOLENOID	RED
1012 VDC	RED

P14 ATC CARROUSEL

1 GROUND	BLACK
2 POSITION INPUT	WHITE
3 DOOR SOLENOID	GREEN
4 12 VDC	RED

P15 DUST COLLECTOR

1 GROUND	
2 12 VDC SOURCE OUTPUT	RED

P7 PUMP CONTROL (INVERTER 3)

1 GND	BLACK
2 VACUUM PUMP COM	RED
3 VACUUM PUMP START	GREEN
4 VACUUM PUMP STOP	WHITE
5 VACUUM PUMP FEEDBACK	BLUE
6 INVERTER 3 ON/OFF	

P12 INVERTER 2

1 GND	BLACK
2 DECELERATE	GREEN
3 ACCELERATE	BROWN
4 5 VDC	WHITE
5 FEEDBACK	RED
6 ON/OFF	BLUE

P13 INVERTER 1

1 GND	BLACK
2 DECELERATE	GREEN
3 ACCELERATE	BROWN
4 5 VDC	WHITE
5 FEEDBACK	RED
6 ON/OFF	BLUE

P10 E-STOP

1 5 VDC	
2 N.C. E-STOP	JUMPER

P17 ENCODER CONNECTOR

1 0utput 1	
2 0utput 2	
3 0utput 3	
4 0utput 4	
5 Input 1	GREEN
6 Input 2	YELLOW
7 Input 3	
8 Input 4	
9 5V	ORANGE
10GND	BLACK
1112V	

For Service refer to this item as:
Part # 20810 Description: Board - AMC - 4G 4 Layers

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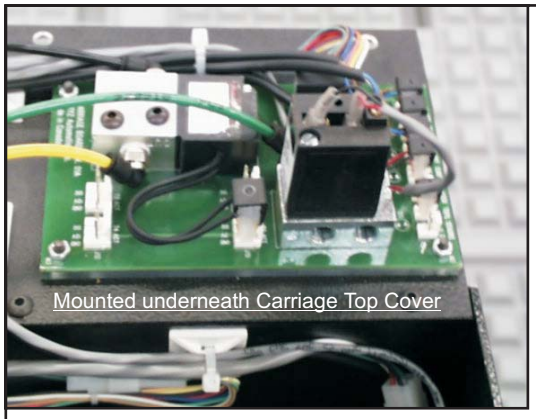
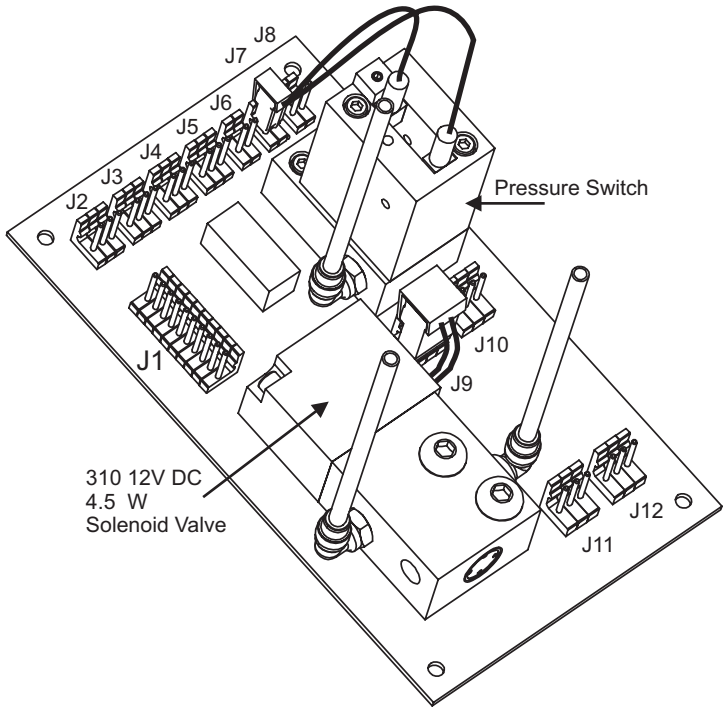
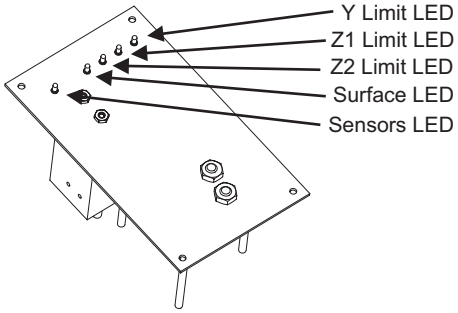
Carriage Connection Board







J1 Carriage

1	Shield	Shield
2	GND	Green
3	12V DC	Red
4	Tool Sensor	
5	Limit Sensor	Brown
6	Tool 4 Activate	Violet
7	Tool 3 Activate	Orange
8	Tool 2 Activate	Yellow
9	Tool 1 Activate	Black
10	Signal	

J2 Y Limit

1	GND	Blue
2	12V	Brown
3	SIG	Black

J3 Z1 Limit

1	GND	Blue
2	12V	Brown
3	SIG	Black

J4 Z2 Limit

1	GND	Blue
2	12V	Brown
3	SIG	Black

J5 Surface

1	GND	
2	12V	Black
3	SIG	Red

J6 Laser

1	GND
2	Vcc

J7 Tool

1	12V	Black
2	SIG	Red

J8 Sensors

1	12V
2	SIG

J9 T1 ACT

1	GND
2	12V
3	SIG

J10 T2 ACT

1	GND
2	12V
3	SIG

J11 T3 ACT

1	GND
2	12V
3	SIG

J12 T4 ACT

1	GND
2	12V
3	SIG

For Service refer to this item as:
Part # 21314 Description: Board - Carriage, Rev. 01A

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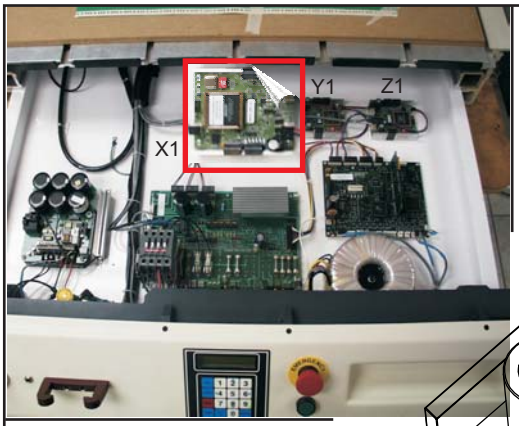
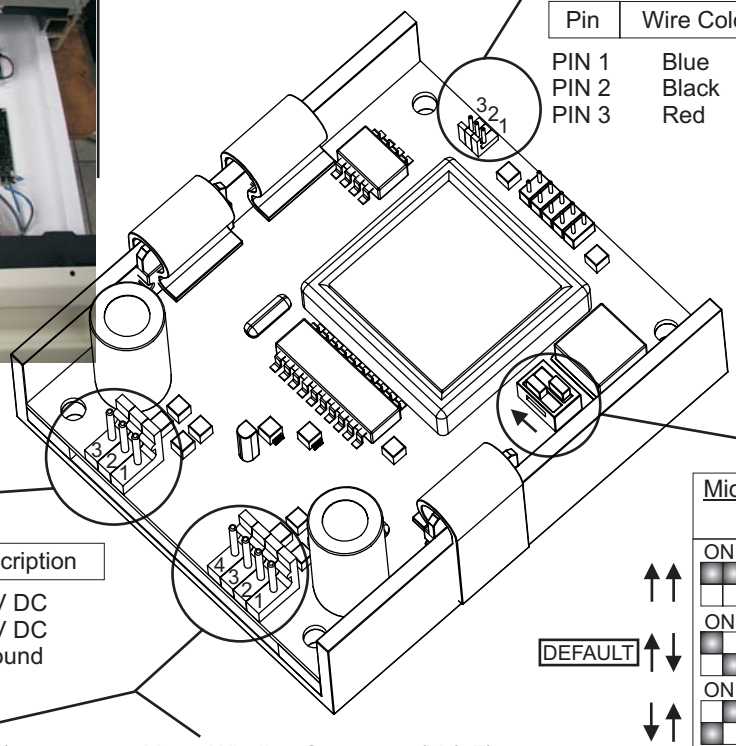
AXI Stepper Motor Drive



Elec. Panel



Control Connector

Pin	Wire Colour	Description
PIN 1	Blue	Step
PIN 2	Black	Direction
PIN 3	Red	+5V DC

Power Connector

Pin	Wire Colour	Description
PIN 1	Red	40V DC
PIN 2	Black	0. V DC
PIN 3		Ground

Micro Stepping Selector Switch

ON	6400 microstep/rev
DEFAULT ON	1600 microstep/rev
ON	3200 microstep/rev
ON	800 microstep/rev

Motor Winding Connector (X AXIS)

Pin	Wire Colour	Description
PIN 1	Green	Phase -A
PIN 2	White	Phase +A
PIN 3	Red	Phase +B
PIN 4	Black	Phase -B

Motor Winding Connector (Y & Z)

Pin	Wire Colour	Description
PIN 1	White	Phase +A
PIN 2	Green	Phase -A
PIN 3	Red	Phase +B
PIN 4	Black	Phase -B

Model AXI Stepper Drives are a new generation of drives specifically designed for AXYZ machines.

They operate at 4 amps peak power and can be programmed to 800, 1600, 3200 or 6400 steps

- AXI drives operate extremely quietly and smoothly
- The step size is much more uniform than any other drive available on the market
- AXI drives are specifically designed and programmed for the motors and loads characteristic of AXYZ machines and are suitably optimized
- A much easier and reliable connection system
- No terminal screws, thereby avoiding connection problems and burning of connectors
- Two DIP switches to program the step size, greatly reducing the probability of incorrect set up
- Compact and highly efficient, greatly reducing heat in the control box

For Service refer to this item as:
Part # 21033 Description: Drive - Microstepper 8

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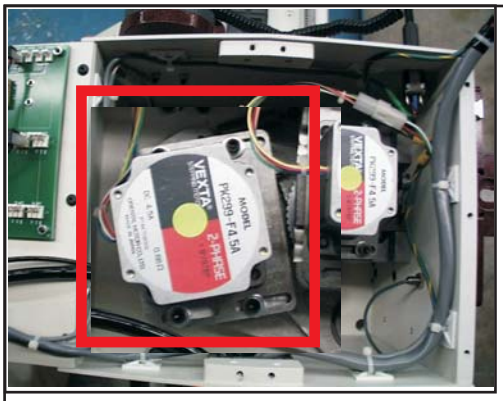
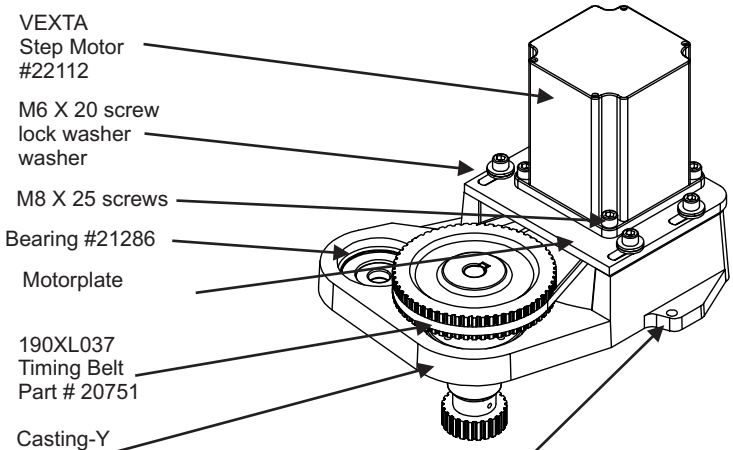
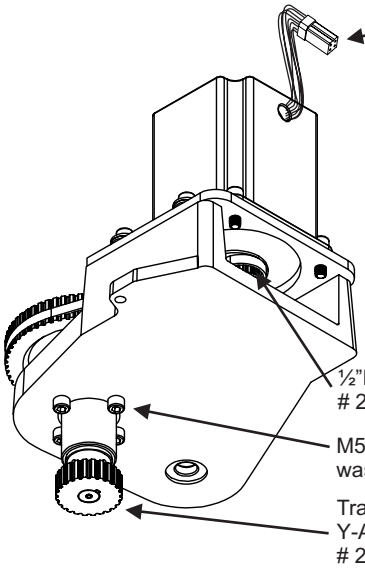
Carriage Transmission X-Axis



Shown: Transmission assembled inside of carriage





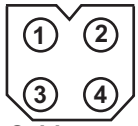
Transmission Gear Ratios

24 Tooth Pinion Effective Diameter: 1.2 inches (30.48 mm)
Main Pulley: 60 tooth
Minor Pulley: 18 tooth

Transmission Ratio: .88422 REV/INCH
.3481 REV/CM

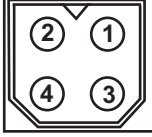
Stepper Motor TO Stepper Drive Connection

Motor Connector



PIN	Motor Conn.	Description
1	Black & Orange	Phase +A
2	Yellow & Green	Phase - A
3	Pink & Light Brown	Phase +B
4	White & Blue	Phase - B

Cable Connector



PIN	Cable Conn.	Description
1	White	Phase +A
2	Green	Phase - A
3	Red	Phase +B
4	Black	Phase - B

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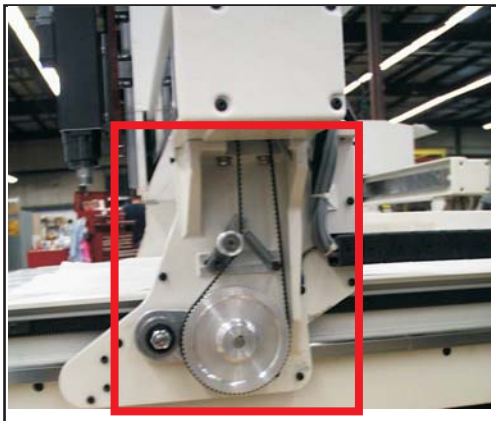
Gantry Transmission Y-Axis



Assembled on Gantry

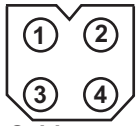
Transmission Gear Ratios

24 Tooth Pinion Effective Diameter: 1.2 inches (30.48 mm)
Main Pulley: 60 tooth
Minor Pulley: 18 tooth

Transmission Ratio: .88422 REV/INCH
.3481 REV/CM

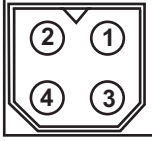
Stepper Motor TO Stepper Drive Connection

Motor Connector



PIN	Motor Conn.	Description
1	Black & Orange	Phase +A
2	Yellow & Green	Phase - A
3	Pink & Light Brown	Phase +B
4	White & Blue	Phase - B

Cable Connector



PIN	Cable Conn.	Description
1	White	Phase +A
2	Green	Phase - A
3	Red	Phase +B
4	Black	Phase - B

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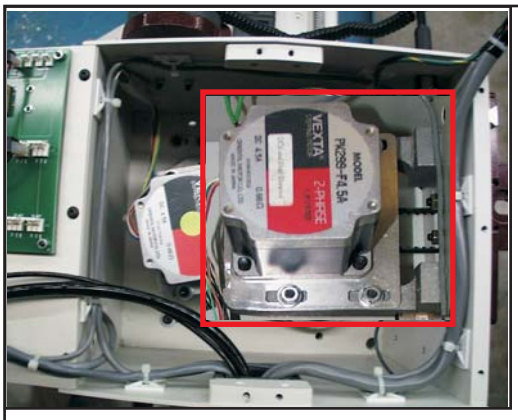
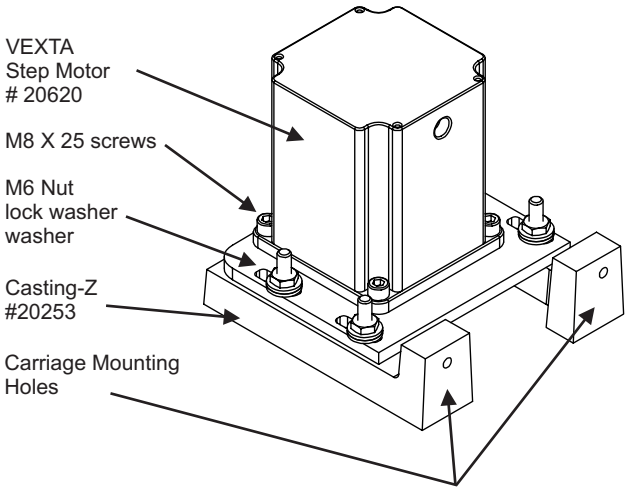
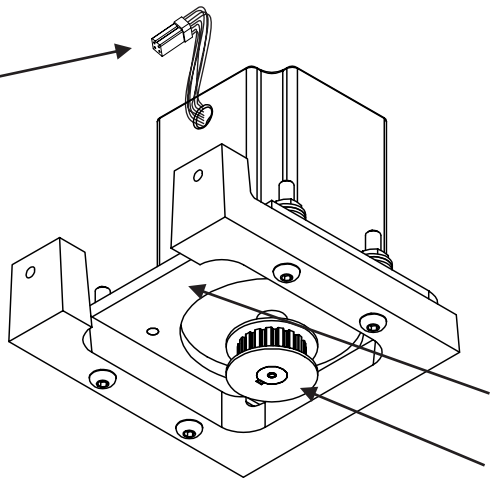
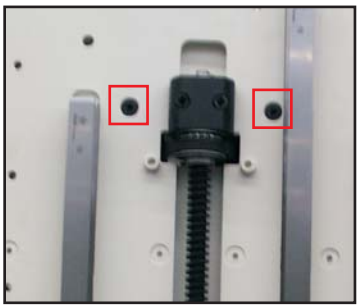
Transmission Z-Axis







Timing Belt Required
120XL037
Part # 20754



Carriage Mounting Location
(Note: Z-Plate must be removed
to access the holes)

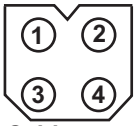
Transmission Gear Ratios

24 Tooth Pinion Effective Diameter: 1.2 inches (30.48 mm)
Main Pulley: 60 tooth
Minor Pulley: 18 tooth

Transmission Ratio: .88422 REV/INCH
.3481 REV/CM

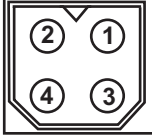
Stepper Motor TO Stepper Drive Connection

Motor Connector



PIN	Motor Conn.	Description
1	Black & Orange	Phase +A
2	Yellow & Green	Phase - A
3	Pink & Light Brown	Phase +B
4	White & Blue	Phase - B

Cable Connector



PIN	Cable Conn.	Description
1	White	Phase +A
2	Green	Phase - A
3	Red	Phase +B
4	Black	Phase - B

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Elte Motor

Manufacturer: ELTE SRL

General Info: Elte motors are designed and built for a wide variety of applications whether it be drilling, engraving, facing etc. for many industries such as wood and light alloy processing. Features such as precision balancing, and maintenance free sealed bearings ensure fast, clean cutting, quiet operation and years of trouble free use. Also, with speeds up to 18 000RPM, the consumer is guaranteed to find the best suited model.

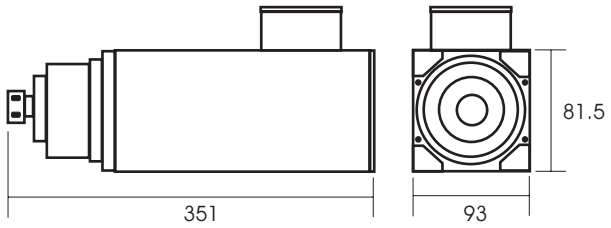
Models used by AXYZ Automation:

PE3-TMPE3 PE4-TMPE4

Model Specs:

PE3-TMPE3
- Type TMPE3 12/2
- Voltage 230
- Hz 300
- kW 2.2
- 3 Hp
- 10 A
- RPM 18000
- weight 8 Kg

Dimensions: (in mm)



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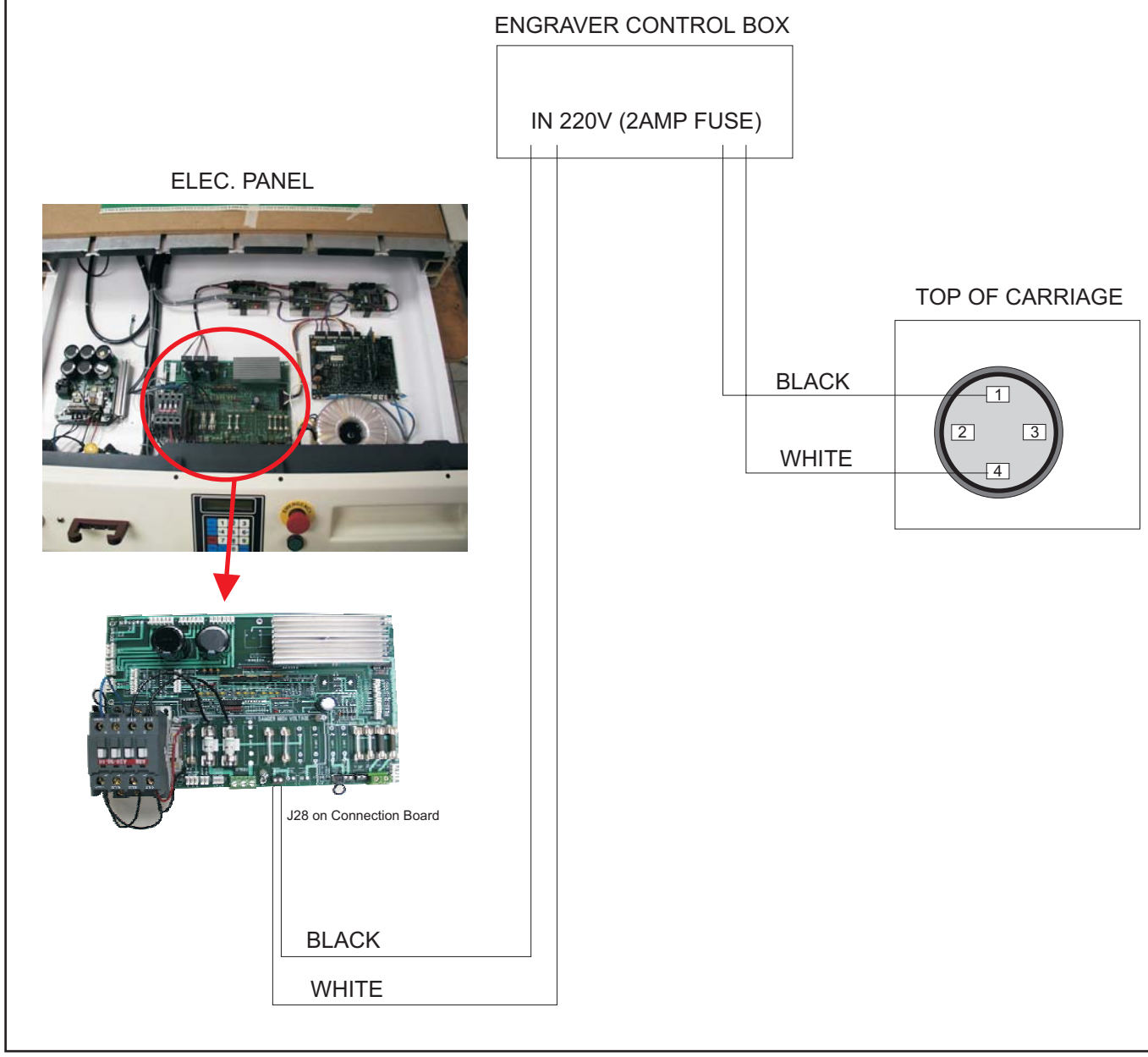
AUTOMATION INC.

Venture Engraver Wiring



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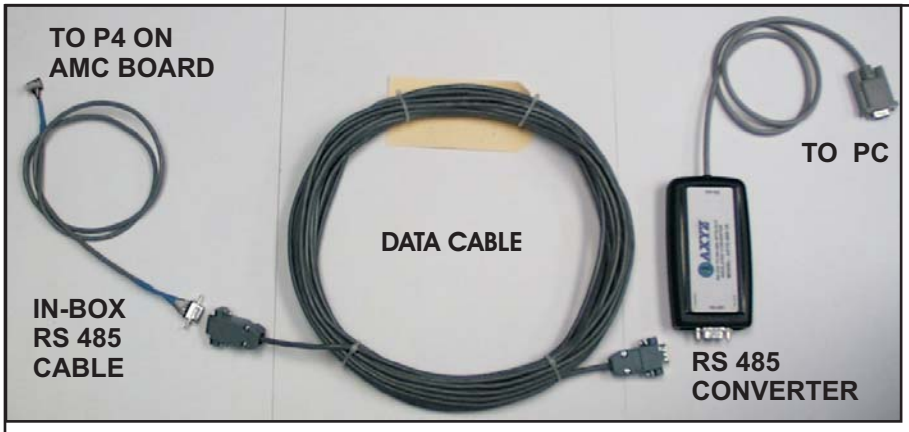
RS485 Converter

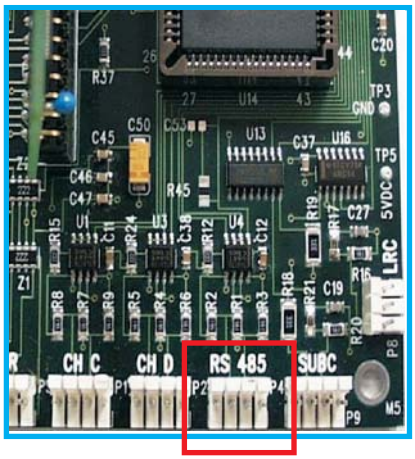


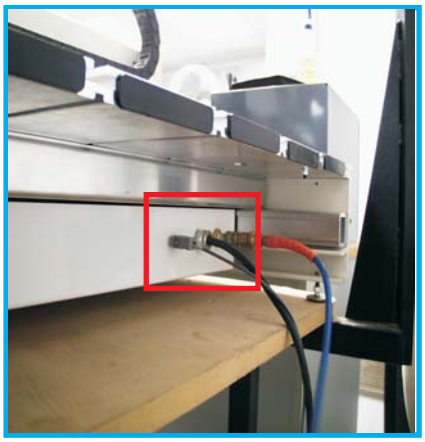
- RS485 converter box, with PC comm port connector.

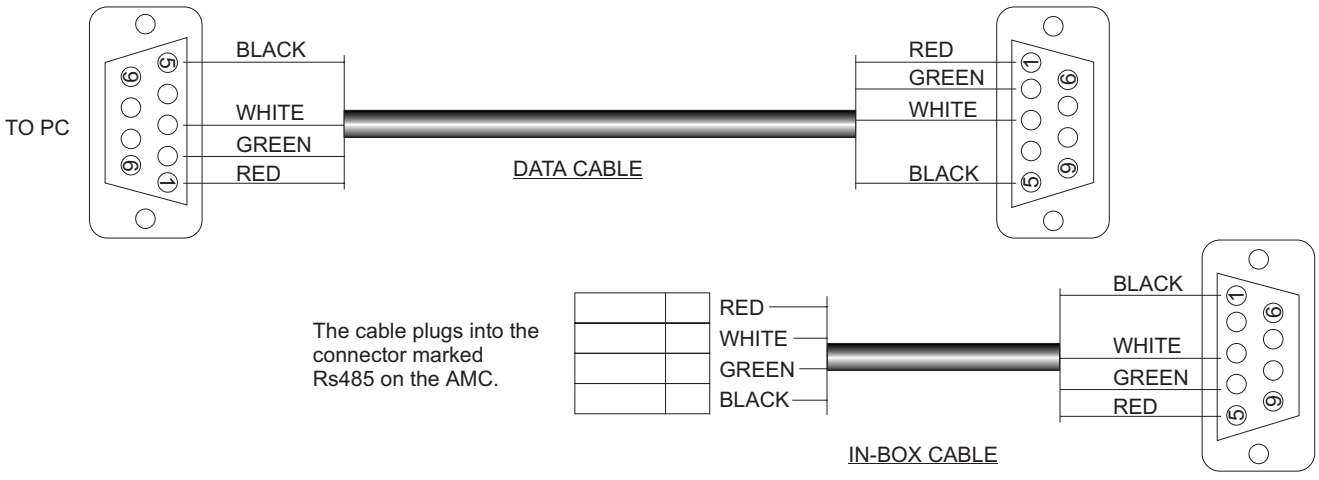
- Data cable (various lengths can be specified)

- In-Box RS485 cable, which completes the connection between the AMC and your PC

The Toolpath software must be version 2.7 or greater in order to properly control the communication ports.







For Service refer to this item as:
Part # 21850 Description: RS232/RS485 Converter Kit

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Pneumatic Drill Wiring