HAMILTON AIR®

Model **HA-47**
with I/O Controller
Serial #1254 and higher

Installation and Service Manual

<u>Important Notice:</u>

<u>HA-47 Units</u>

Check electrical components and connectors for proper fit in their sockets. Vibrations created from shipping can cause electrical components and connectors to become loose in their sockets.

All Micro-Switches should be checked for proper adjustment and operation by manually moving the door and safety bar before operating unit. This will insure that all adjustments and operations are satisfactory.

Check the wiring details sheet for the proper field connections.

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HA47

The Hamilton Model HA-47 was designed to accommodate large heavy transactions typically required by commercial customers. It utilizes 4" by 7" inch oval shaped steel tubing and tube bends with a centerline radius of 48 inches. Tubes are joined with a seal and clamp over flared tube ends.

Operation:

The teller station has two operator controls:

1. Teller Send (operated by opening and closing the teller door)
   - The teller closes the teller unit door to send the carrier to the customer station. Opening the door stops the carrier.
2. Teller Recall
   - Momentarily pressing the teller recall button returns the carrier to the teller station. The teller recall button will stop the carrier if it is in transit to the customer and return it to the teller station.

The customer station has two operator controls:

1. Send Carrier
   - The customer presses the Send switch to return the carrier to the teller. The Customer Send switch is disabled when the carrier is in the teller station.
2. Teller Call
   - The customer presses the Call switch to ring the teller call tone on the intercom system.

There is a safety plate on the customer unit which, if operated, will reopen the door and cancel the send function. The obstruction can be removed and the send button can be press to start the procedure.

Motor run timers:

The HA47 system employees both carrier arrival switches and maximum run timers for each motor. In normal circumstances the limit switches and carrier arrival switches will shut off the motors, but in case of improper adjustment or failure, there are preset maximum run times for each motor to prevent system damage. The times exceed the normal time required to operate normally.

Maximum Run Times:

Door Motors   15 seconds
Turbine   180 seconds

The system can be reset by opening and closing the teller door after it has shut down due to maximum run time.

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Service

Electrical

The customer unit requires a dedicated 30 amp electrical circuit to power the unit and blowers. A single connection is made on the customer unit electrical control panel as shown in figure #3.

A Programmable Logic Controller is located in the HA 47 customer unit. Connection between the customer and teller unit is made using standard category 5 (CAT5) cable with RJ-45 connectors shown in figure #2.

The switches on the HA 47 are as follows

Teller Unit	**Customer Unit**
<u>Operators Control</u>	<u>Operators Control</u>
Teller Send	Customer Send
Teller Recall	Call Teller
<u>Operational Control</u>	<u>Operational Control</u>
Carrier Present	Door Open
	Door Closed
	Carrier Present
	Door Safety

Indicator Lights

The PLC has indicator lights located on the control circuit board mounted in the customer unit. These lights are very beneficial when trouble shooting a technical problem with the system. The PLC has an input from each of the above switches. These switches signal the PLC when they are operated and a light corresponding to the input is either turned on or off. The PLC has relay closure outputs to control external devices such as blower or door motors. When an output is active, a corresponding light is turned on. Troubleshooting is greatly aided by observing the input/output lights.

Action	Light condition
Teller Door Closed	**ON**
Customer Send Pressed	**ON**
Teller Recall Pressed	**ON**
Customer Door is Closed	**OFF**
Customer Door is Open	**OFF**
Customer Door Safety is operated	**OFF**
Teller Carrier Present switch is operated	**ON**
Customer Carrier Present is operated	**ON**
Call Teller Button Pressed	**ON**

Note: For safety reasons the door limit and safety bar switches are wired so that the input must be present before the motor will run and the motor stops when the input is lost.

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Control Board Details

Customer
Microphone
J13

Jumper
JP1

CAT5
Interconnect

Customer
Speaker J12

Relay Outputs:
1) N/A
2) Pressure Output
3) Close Door Output
4) N/A
5) Turbine Input
6) Door Motor Input
7) N/A
8) Vacuum Output
9) Open Door Output

Customer Audio Connection:
Speaker –
Speaker +
Teller Call –
Teller Call +
Microphone –
Microphone +
Shield

Mode
Switches

Jumper
JP3

Connector J4, pins
#1 and #2 can be
jumped for
optional auto
close customer
door. See notes
below.

Inputs

24VAC Connection:
24VAC
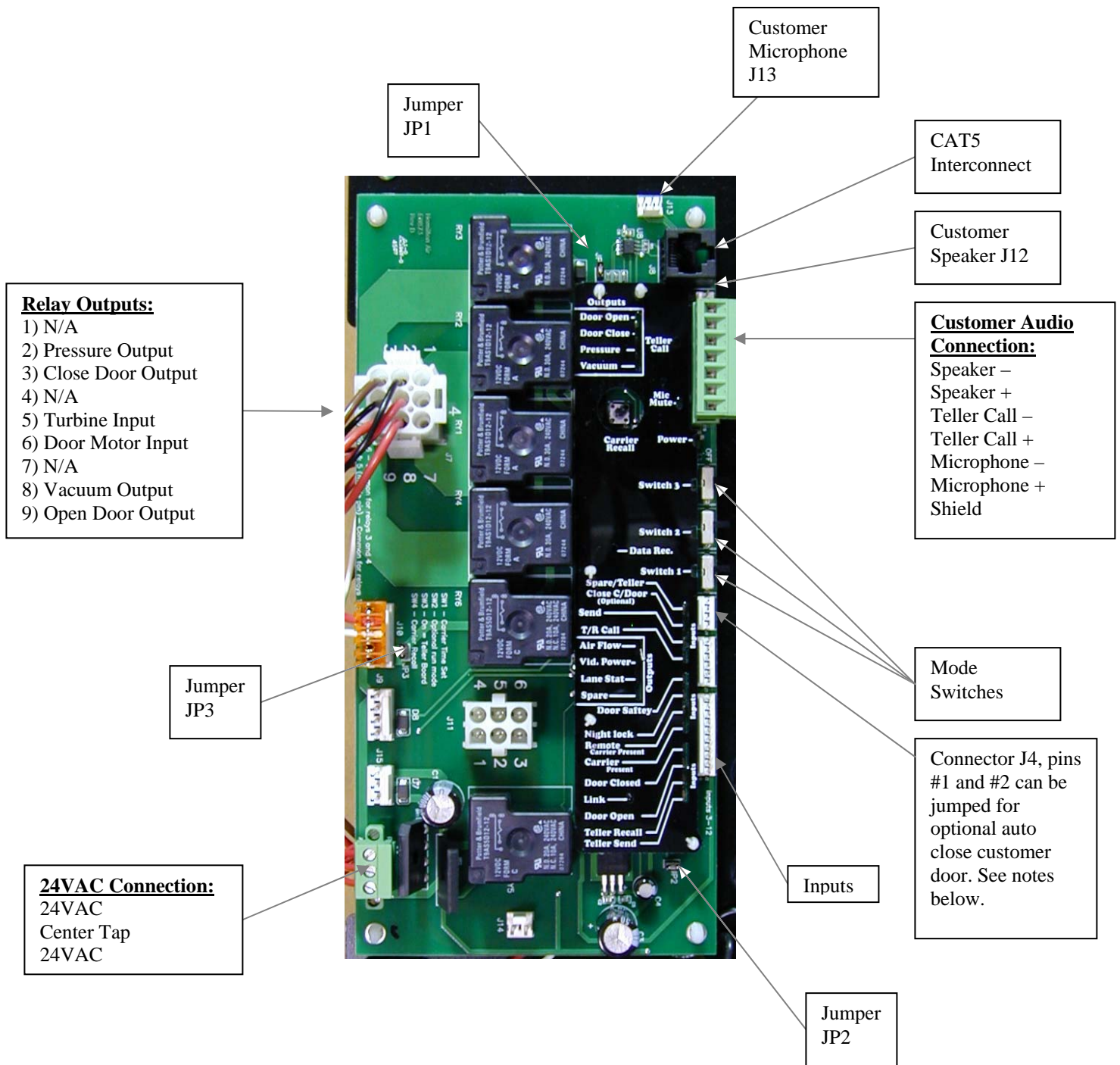Center Tap
24VAC

Jumper
JP2

Figure #1

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Control Board Component Description and Function

SW1   Switch 1: **Blower Run Time Set.** "Off" is normal setting. Switching "On" enables blower "Time-Set" mode. See "Blower Run Time Set" for full instructions on setting this function.
- Activate "Turbine Test Mode" by holding SW4 while switching SW1 "On" if customer door is open and turbines are connected to this control board. Send and teller call will activate the pressure and vacuum turbines.
- If SW3 is turned on before SW1, the unit will enter "Door Test Mode" which allows send and teller call buttons to operate the customer door motor open and closed.

SW2   Switch 2: **Turbine Mode.** "On" is normal setting for HA47 systems.
SW3   Switch 3: **Unit Selection.** "Off" is normal setting for HA47 systems.
SW4   Switch 4: **Recall Switch.** Momentarily pressing switch recalls carrier to customer unit.
JP1   Jumper 1: **Multiple Board Jumper.** Jumper "On" for HA47 systems.
JP2   Jumper 2: **Remote Input Jumper.** Jumper "On" for HA47 systems.
JP3   Jumper 3: **Door Motor Thermal Protection Jumper.** Jumper "On" for HA47 systems.
RY1   Control Relay 1: **Pressure Motor Relay.** Operates pressure motor.
RY2   Control Relay 2: **Vacuum Motor Relay.** Operates vacuum motor.
RY3   Control Relay 3: **Customer Door Close Relay.** Runs door motor closed.
RY4   Control Relay 4: **Customer Door Open Relay.** Runs door motor open.
RY5   Control Relay 5: **Spare Relay.** Not Used.
RY6   Control Relay 6: **Spare Relay.** Not Used.

Blower Run Time Set

The "blower run time" is set using switch number one (SW1), which is located on the control board in the customer unit. The unit is shipped factory set to work with the carrier arrival switches located in the HA47 customer and teller units. **Power failure will NOT affect the settings stored, although powering the unit on with SW1 set to "ON" will set the blower run time to approximately 3 seconds.** Follow the directions below to reset the unit to work with the HA47 carrier arrival switches.

Setting procedure for blower run time. (Single time for both directions)
1) Recall the carrier to the HA47 customer unit so that the door will open.
2) Turn SW1 to the "ON" position. (LED indicator will light)
   Push and hold either "Customer Send" or "Teller Recall" button until carrier arrives in the teller unit. When the carrier arrives at the teller unit and activates the carrier arrival switch, the blowers will automatically turn off. Release the button held.
3) Turn SW1 to the "OFF" position to store switch setting. The system will now operate until it arrives and activates the carrier arrival switches at both the HA47 customer and teller units.

Auto Door Close Option

If enabled, the customer door will close automatically after 3 minutes of inactivity. This feature helps prevent the carrier compartment of the customer unit from weather.

To activate, apply a jumper to connector J4, Pins #1 & #2 located on the control board. See figure #1 below that shows connector J4 located below mode switches.

When the customer door has closed after a three-minute period of no activity, opening and then closing the teller door or if either the customer-send or call-teller switch is pressed the customer door will open and present the carrier to the customer.

Additional Functions of Control Board

Microphone Muting:

The control board is factory set-up to mute the microphone during blower operation with the HA47 systems. The control board can also be set-up not to mute the customer microphone during blower operation if desired.

1) Recall carrier to customer unit. (Press SW4 "Recall" located on control board)
2) Press and hold SW4 and press the teller call button on customer unit. The output LED for microphone mute will flash.

One flash = the microphone is set to mute.
Two flashes = the microphone is set to NOT mute.

- (Note: the input LED for the teller call button will light when the button is pressed. This is NOT the output LED for microphone mute and therefore NOT the LED that will signal the setting of microphone muting.)

3) Repeat step #2 to toggle between settings as needed.
- (Note: SW4 and teller call must be released to toggle setting.)
4) System is now functional as normal with the new setting for muting the microphone.

Troubleshooting the Control Board

Motorized Door Test (Automatic):

1) Disconnect the interconnection cable from the board.
2) If the door is open, turn SW3 "ON", if door is closed, turn SW3 "OFF".
3) Cycle power "OFF" and back "ON".
4) Door should open or close depending on the setting of SW3.
5) Repeat test in both directions with both switch settings.

Motorized Door Test (Manual):

1) Turn SW3 "ON" if not already "ON"
2) Turn SW1 "ON"
3) Send and Call activates the door manually. Releasing the button stops the door. Tripping the limit switches will also stop door travel.
4) Turn SW1 "OFF" and SW3 "OFF" for normal operation.

Blower Run Test:

1) Recall carrier to the HA47 customer unit so that the door will open.
2) Hold SW4 while switching SW1 "ON".
3) Pressing send and teller call or recall will activate the pressure and vacuum turbines.
4) Turn SW1 "OFF" to return to normal operation.

CAT5 Interconnect Cable Wiring

The HA47 system requires an interconnect cable to connect the teller unit to the control board located in the customer unit. This cable is a category 5 (CAT5) cable with male RJ-45 connectors on both ends. The connectors should be wired in the straight through design as shown below on both ends. There are commercially available testers that can be used to verify correct connector installation and function.
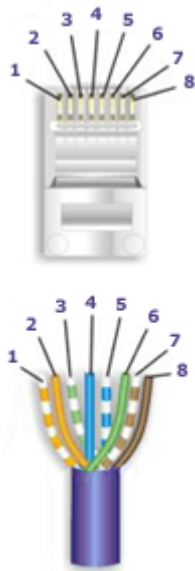
Wire	Pin #	Teller Connections
White/Orange	1	
Orange	2	
White/Green	3	Carrier Arrival
Blue	4	Recall
White/Blue	5	Door Closed
Green	6	Common
White/Brown	7	
Brown	8	

Figure #2

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Figure #3

HA47 Serial #1046 and Higher

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J7-1: Pressure Motor
J7-2: Pressure Motor
J7-3: Close Customer Door
J7-4: Common for blower motors
J7-5: Common for blower motors
J7-6: Common for Door Motors
J7-7: Vacuum Motor
J7-8: Vacuum Motor
J7-9: Open Customer Door

NEUTRAL
120VAC
60Hz
GND/EARTH
TSA#4
TSA#5
Power Switch

Vacuum
Pressure
TSA#2
TSA#1
TSA#3
TSB#3

20A
3A
3A

Customer Door
15mfd Capacitor
TSB#1
TSB#2

24V
24VAC POWER

JP1 JUMPER 1: MULTIPLE BOARD JUMPER. JUMPER "ON" FOR NORMAL OPERATION.
JP2 JUMPER 2: REMOTE INPUT JUMPER. JUMPER "ON" FOR NORMAL OPERATION.
JP3 JUMPER 3: DOOR MOTOR AUXILARY THERMAL PROTECTION JUMPER. JUMPER "ON" FOR NORMAL OPERATION.

Input 1: Door Open
Input 2: Door Close
Input 3: N/A
Input 4: N/A
Input 5: N/A
Input 6: Door Safety
Input 7: Call Button
Input 8: Send Button
Input 9: Optional auto door close
Input 10: N/A

E0873 Board

GND
GND
JP3
JP2
JP1

RY_T9A
RY6   RY5   RY_T9A
RY_T9A   RY3+   RY1+
RY2-   RY4+   RY2+

RY9   RY10

Input1 Input2 Input4 Input5 Input6 Input7 Input8 Input9 Input10

SW1   SW2   SW3
On   Off

SHLD MC- TC- SP-
MC+   TC+ SP+

MICROPHONE
MC+
MC-
SHLD

RJ45 INTERCONNECT
RS485 B
RS485 A
Comm line to remote board (+12V_)
Teller Send Button
Teller Recall Button
Teller Carrier Present (input 4)
Night Lock
Spare (input 5)
(input 10)

RJ45JACK
J8

SPEAKER
SP-
SP+

LS3   DOOR OPEN LIMIT SWITCH
LS2   DOOR CLOSE LIMIT SWITCH
Teller Call Button
Customer Send Switch
LS4   DOOR SAFETY BAR SWITCH
AUTO DOOR CLOSE OPTION

BLOWER RUN TIME SET
ON = TIMING MODE / OFF = RUN MODE

UNIT SELECTION
ON = TELLER / OFF = CUSTOMER

TURBINE MODE
ON = MULTI-MOTOR / OFF = SINGLE MOTOR

= DEFAULT SETTING

MATRIX AUDIO CABLE CONNECTIONS
J5
1 SP-
2 SP+
3 TC-
4 TC+
5 MC-
6 MC+
7 SHLD

Rev - 1
Rev - 2

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MODEL HA-47 CUSTOMER UNIT
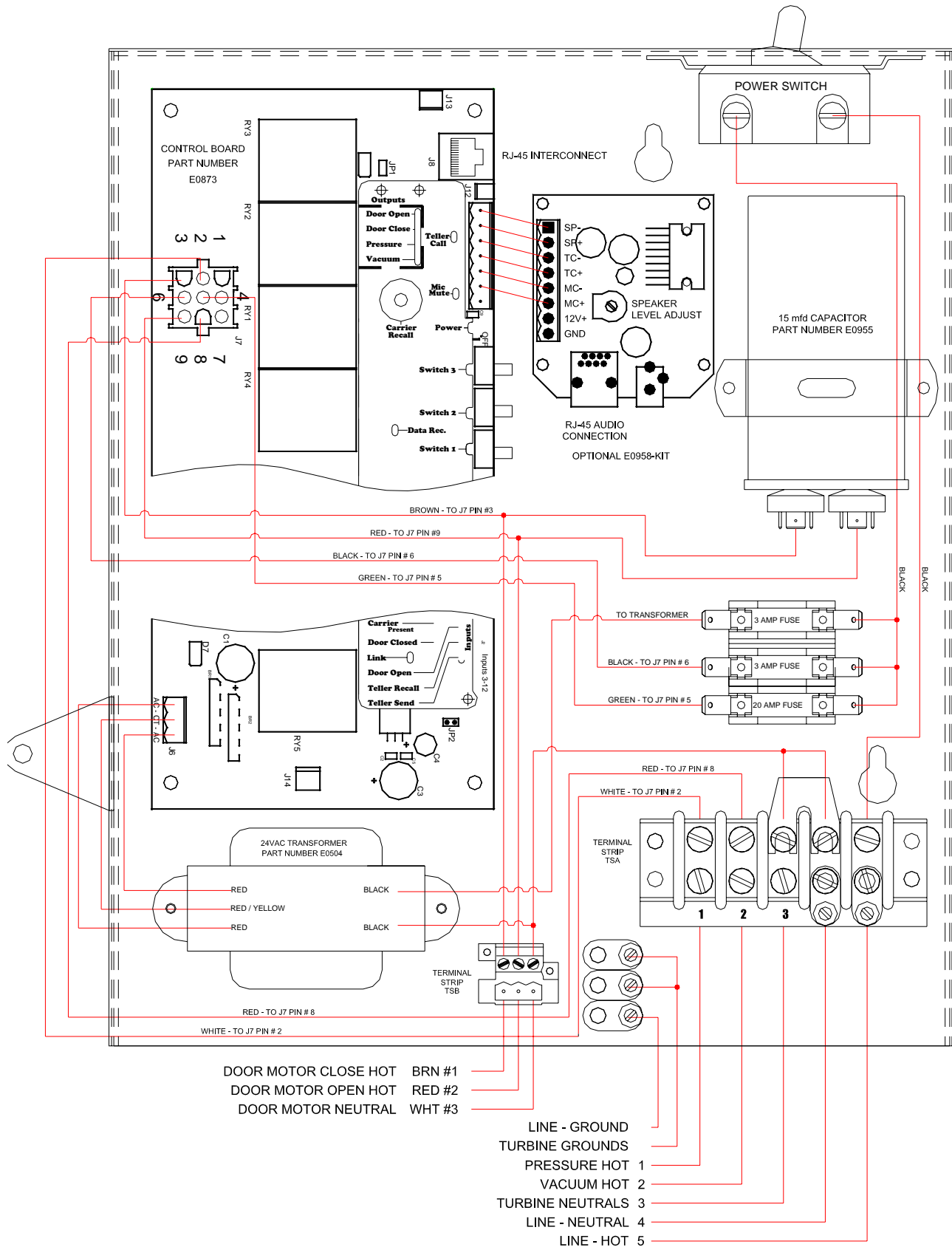ELECTRICAL DIAGRAM
WITH I/O CONTROL E0873

Drawing Number :   99-1026   Date :   11/19/08

Figure #4

HA47 Serial #1046 and Higher

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