AEOLUS®

Combination Infrared / Forced Air Conveyor Dryer

08/23/18 JP 1

Installation and Operation Instructions

BBC INDUSTRIES, INC.

800-654-4205 • 5 Capper Drive • Pacific, MO 63069 • Fax: 636-343-3952

www.bbcind.com

IMPORTANT INSTRUCTIONS:

Read all these instructions before installing or using this equipment. Verify that the proper tools, materials, and personnel are available for the safe and successful use of the dryer.

BBC Industries, Inc. is interested in the safe operation of its equipment. All wiring to this equipment must be connected to the electrical source in strict accordance with *National Electrical Code (N. E. C.)* and local codes having jurisdiction.

Before installing this equipment, the user must be aware of the safety requirements as specified by the *National Board of Fire Underwriters.*

 **CAUTION:** Puncture of a heating element face may result in a shock hazard.

The heating elements in the tunnel dryer are hot when in use. To avoid burns, do not let bare skin touch hot surfaces.

Extreme caution is necessary when any dryer is used by or near children or invalids and whenever the heater is left operating and unattended.

Do not operate any heater after it malfunctions. Disconnect power at service panel and have dryer inspected by a reputable electrician before reusing.

To disconnect dryer, turn off power to heater circuit at main disconnect panel.

Do not insert or allow foreign objects to enter any ventilation opening as this may cause an electric shock or fire, or damage to the heater.

A heater has hot and arcing or sparking parts inside. Do not use it in areas where gasoline, paint, or flammable vapors or liquids are used or stored.

Use this dryer only as described in this manual. Any other use not recommended by the manufacturer may cause fire, electric shock, or injury to persons.

SAVE THESE INSTRUCTIONS

Assembly Instructions:

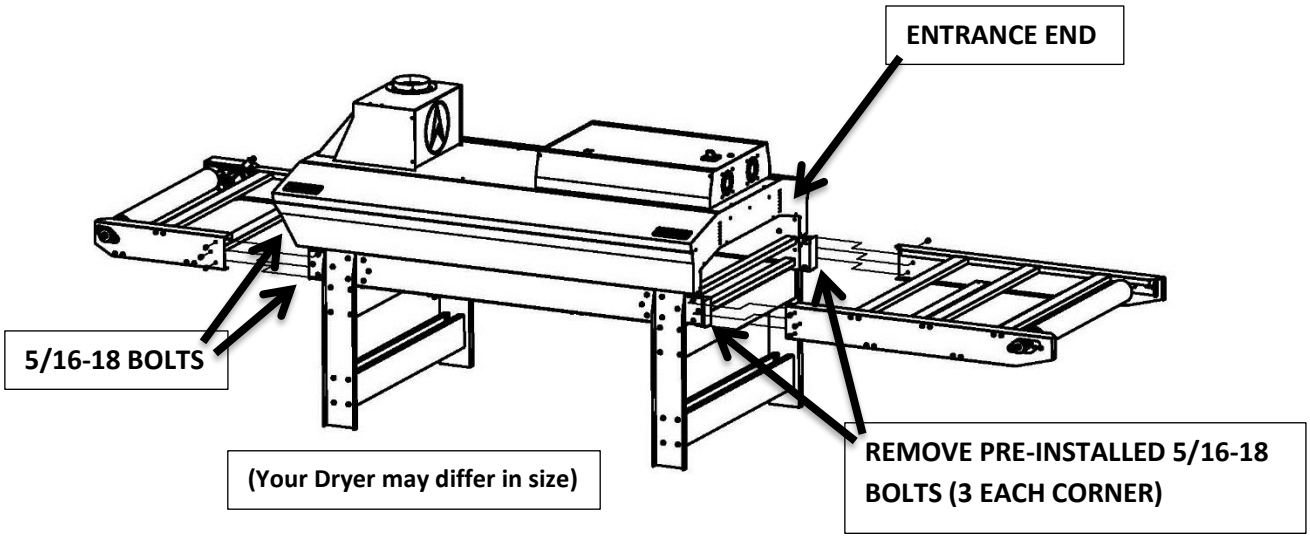
The Conveyor Oven is attached to a skid for shipping purposes.

Unpack, inspect and identify all of the shipped equipment and parts. Immediately report any suspected lost or damaged items to Customer Service 800-654-4205

Your Aeolus Dryer crate will include:

- **Tunnel Dryer**: The tunnel of your conveyor dryer is fully assembled.
- **Conveyor Drive Assembly:** Exit side of conveyor. This assembly contains the drive motor. Dryers with two-foot exit conveyor will be pre-assembled onto the Tunnel.
- **Conveyor Take-up Assembly:** Entry side conveyor. This assembly contains the apparatus that will take up the slack in the drive belt.
- **Conveyor Belt**
- **Tunnel Dryer *Curtain*:** The *curtain* or *door* that mounts on the entrance opening of the tunnel dryer to limit air currents.
- **Air Dam:** Two (2) steel parts placed on the entry and exit after the conveyor belt is installed to further limit air currents. Notched version is used on exit side.

Assemble Drive and Take-up:



1. Remove steel angle brackets attached at the base of each leg. Reuse the black 5/16-18 x 0.75L bolts in the leg assemblies.
2. Remove the 5/16-18 black bolts that are installed in the insert nuts of the connection bracket. There are twelve (12) total, three (3) in each bracket. Save these bolts. If Exit Conveyor is installed, proceed on Entrance Conveyor only.

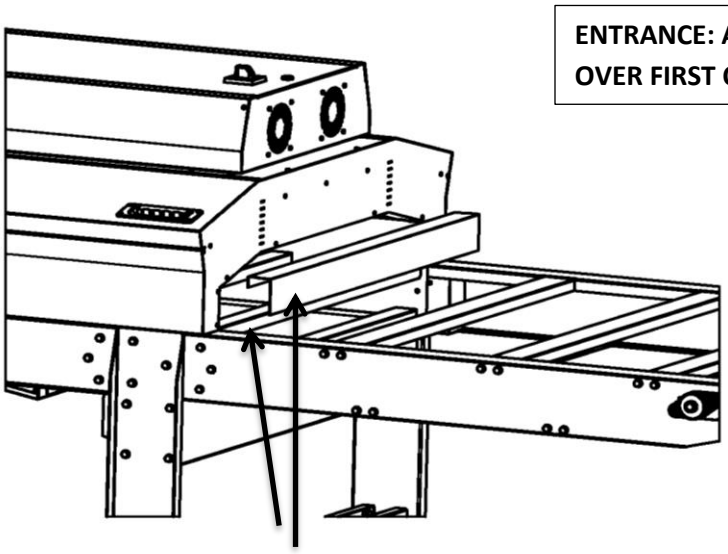
3. Slide the **Conveyor Take-up Assembly** over the connection bracket on the Entrance side until the three (3) holes on both sides align.
4. Re-insert the 5/16-18 bolts into the insert nut. Level the assembly and tighten the bolts.
5. Slide the **Conveyor Drive Assembly** over the connection bracket on the Exit side until the three (3) holes on both sides align.

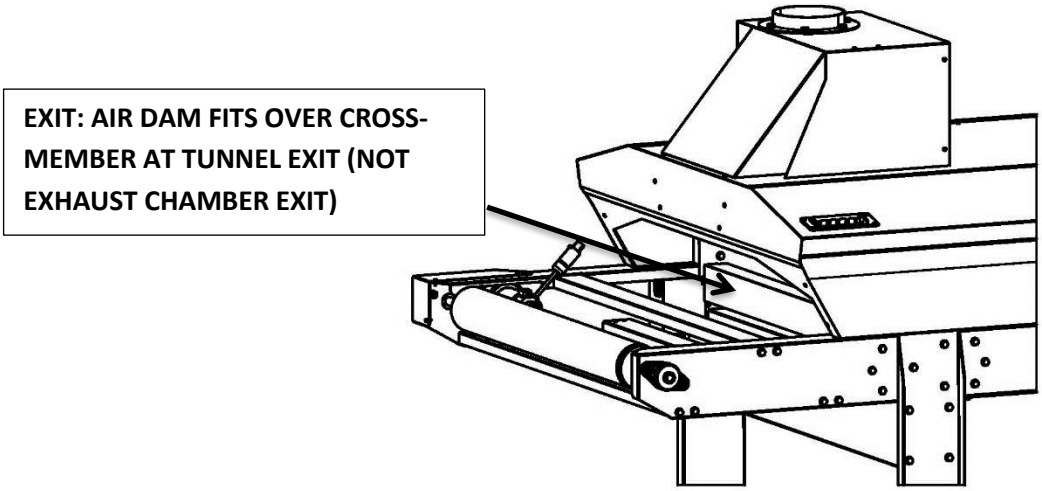
   Note: Drive Assembly may be installed when you receive your dryer.
6. Re-insert the 5/16-18 bolts into the insert nut. Level the assembly and tighten the bolts.
7. Plug the motor and blue hall-effect sensor into their corresponding receptacles. The cord labeled ***1*** into receptacle ***1***. Cord ***2*** into receptacle ***2***.

Install the Conveyor Belt:

1. Carefully remove the *splice pin* from one end the **Conveyor Belt** with a pair of needle nose pliers. DO NOT BEND. The pin will be inserted later.
2. Lay mesh belt flat on the conveyor bed, product side up with the *Belt Guide* on the same side as the double disks of the rollers. Then loop the belt around the conveyor bed until the splice connector can mesh on a topside panel of the conveyor. The belt must travel on the top-side of both the top and bottom rows of cross members. Placing something like a 2x4 through the oven over the cross members may help slide the belt through the oven.
3. Before reinserting the splice pin, it is important that the *Belt Guide* aligns exactly from the two ends of the belt. Check both possibilities of the tooth meshing to better determine the correct mesh.
4. While metal teeth are held together a *second person* may reinsert the splice pin (removed earlier) into the channel formed by the interlocked metal teeth. Using the needle nose pliers, fully insert so the pin is equally flush at both ends.
5. Slide the position the *Belt Guide* between two discs on each of the rollers.
6. Once the belt is installed, insert the two **Air Dams** inside the belt and over the top cross members at the Entrance and Exit of the tunnel.

   a.





Adjusting Belt Tension:

At the take-up end (Entrance) of the conveyor bed, loosen the bolt allowing each of the roller bearing plates to slide. Pull the bearing plate on disc end by hand to tension the belt. Tighten the bolt. Pull opposite end of roller to same position. Tighten bolt/nut. Bearing plates need to be the same distance from end of conveyor. The tension needs only to be great enough to prevent the belt from slipping during operation. Over-tightening will cause damage to the belt over time.

Finally, place the **Tunnel Dryer *Curtain*** by inserting the tabs on the curtain into the slots on the entrance of the dryer at your desired height.

Aeolus Electrical Supply Connection:

PRIOR TO CONNECTING POWER TO THE DRYER:

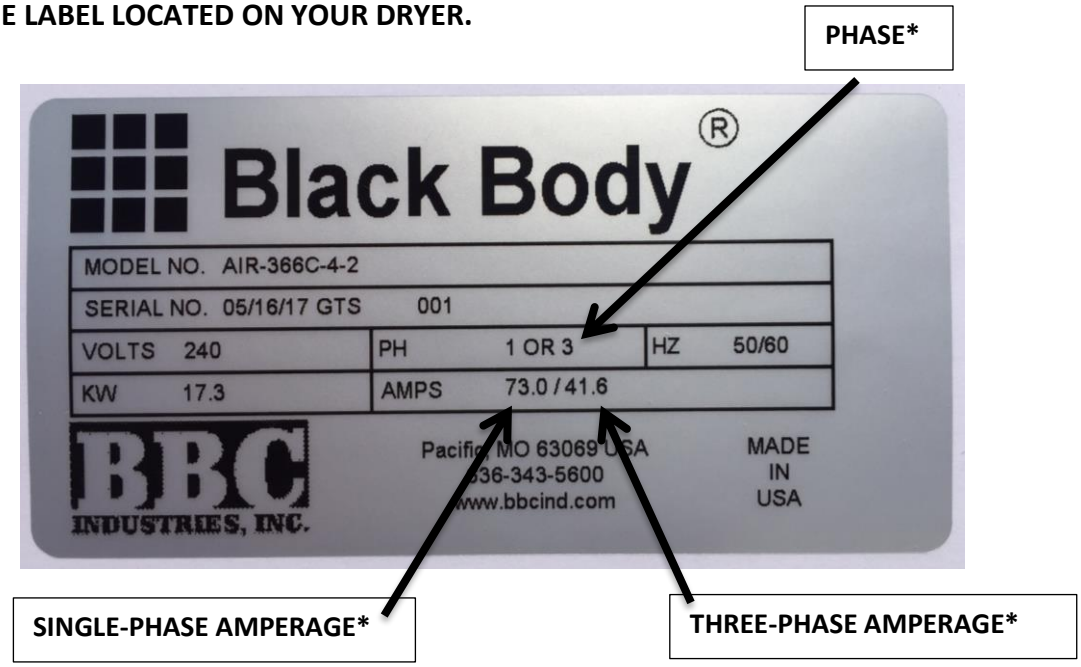
- A dedicated circuit disconnect and branch circuit protection is required for the proper operation / protection of this oven.
- Ground (earth) according to the National Electric Code (N.E.C.) or appropriate local codes.
- Assure that all appropriate **"LOCK-OUT / TAG-OUT"** procedures are followed to prevent power from being distributed to the control panel before called for in these instructions.
- This unit is not supplied with a power cord. Have a **certified electrician** connect the unit to power in accordance with local electrical codes.

Before servicing or cleaning, switch power ***OFF*** at service panel and lock service panel to prevent oven from being switched on accidentally. If service panel cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

Electrical Specifications:

Determine the electrical specifications of your dryer from the Power Label.

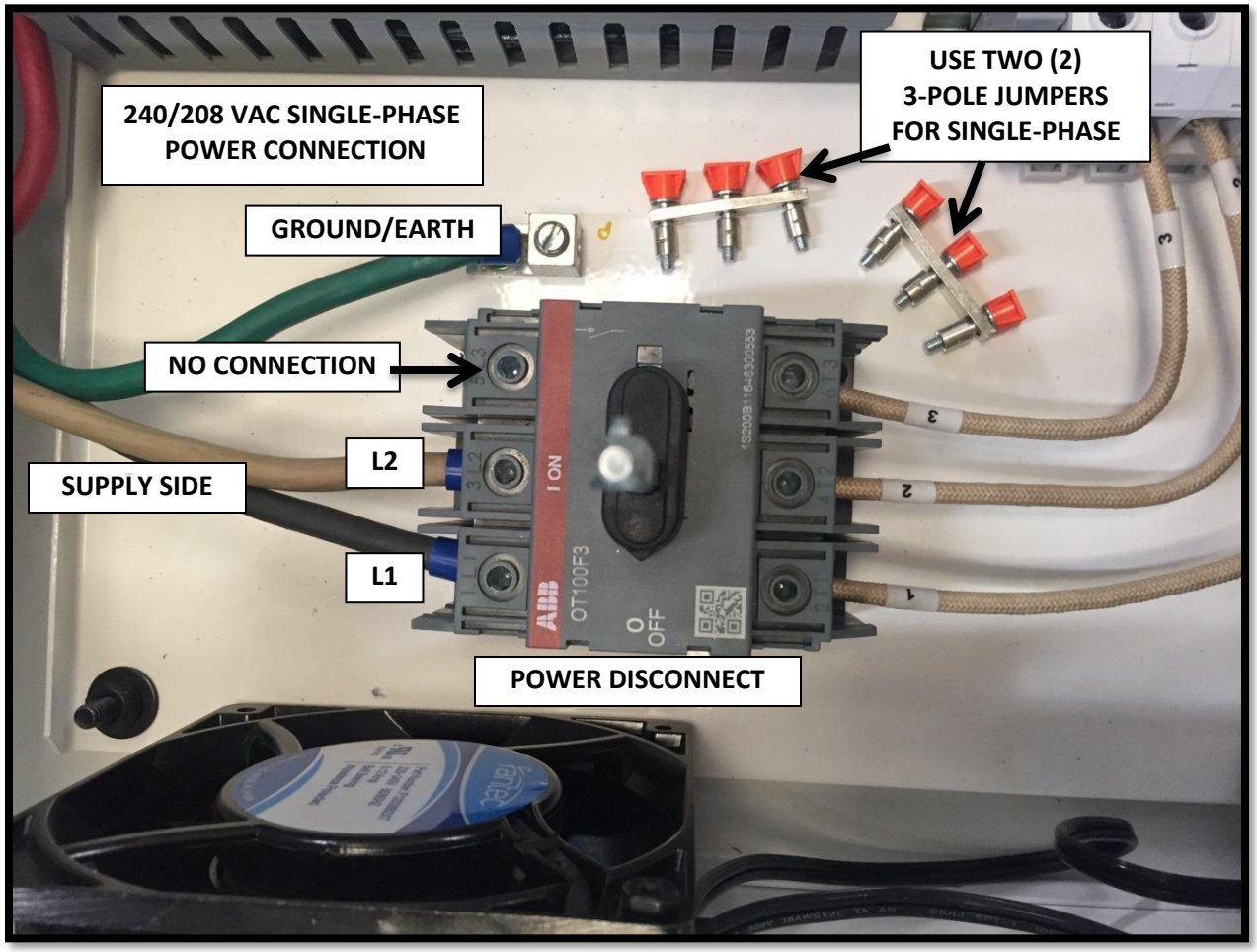
Below is an example of a Power Label. **THIS EXAMPLE MAY NOT REFLECT THE SPECIFICATIONS OF YOUR DRYER. USE ONLY THE INFORMATION FOUND ON THE LABEL LOCATED ON YOUR DRYER.**



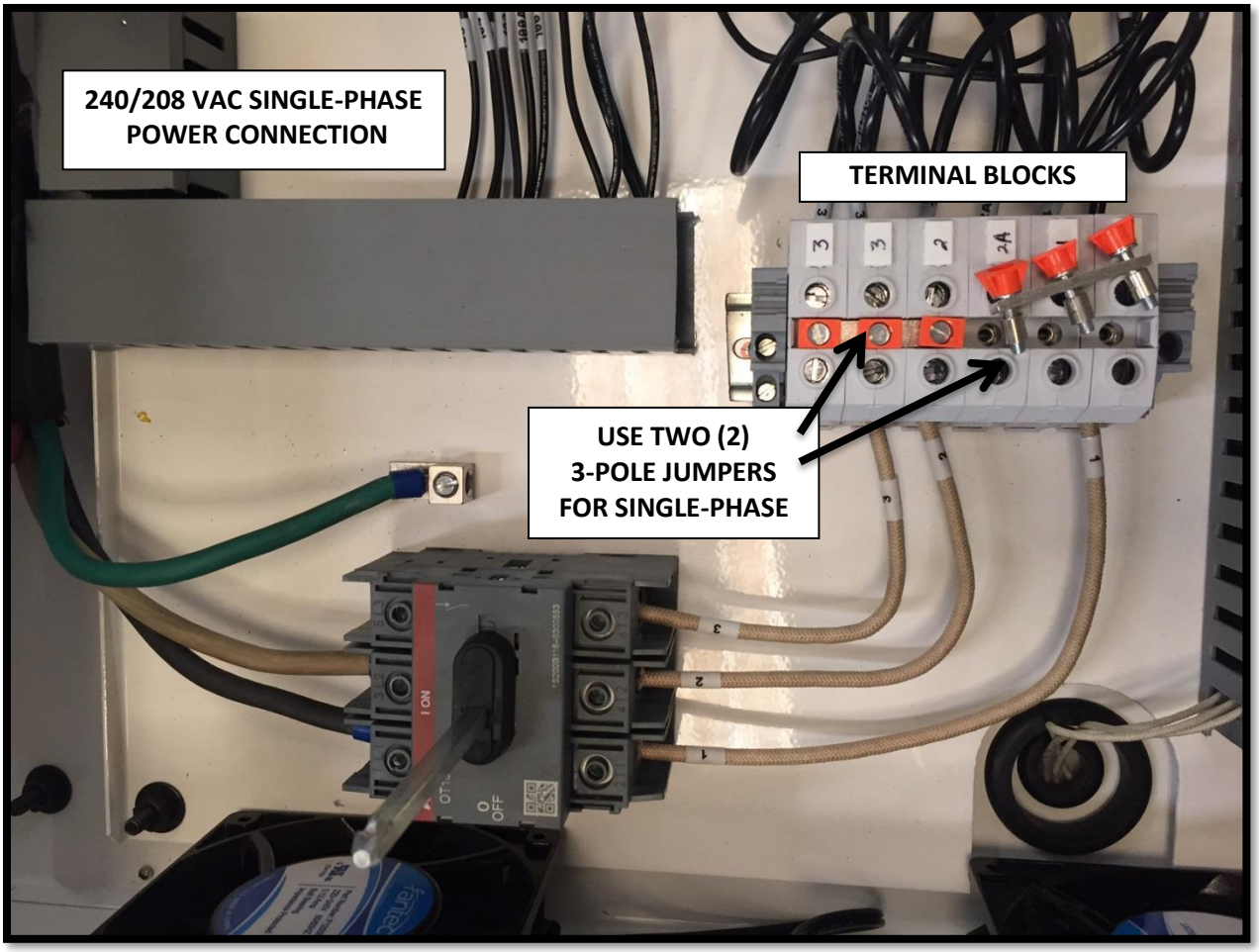
*Some models of the **Aeolus Dryer** are capable of running on either a *single-phase* or *three-phase* connection. Check the Power Label to see if your Dryer has this dual capability. Follow the installation instructions below for proper connection. If your Dryer is has a dedicated phase, connection of incoming power need only be connected to the power disconnect and your Dryer will be ready for **Normal Operation** (see below).

The Dryer is supplied with two (2) sets of *Jumpers*. One set consists of **Two (2) Three-Pole Jumpers**. The other set consists of **Three (3) Two-Pole Jumpers.** NEITHER SET OF JUMPERS ARE INSTALLED when you receive your dryer. Only one set will be used on the dryer, depending on whether the dryer is connected to a single or three-phase supply. The instructions below illustrate the procedure for the different connections. Please read all instructions completely before proceeding. Failure to follow the instructions exactly may damage the equipment.

Single-Phase Connection:

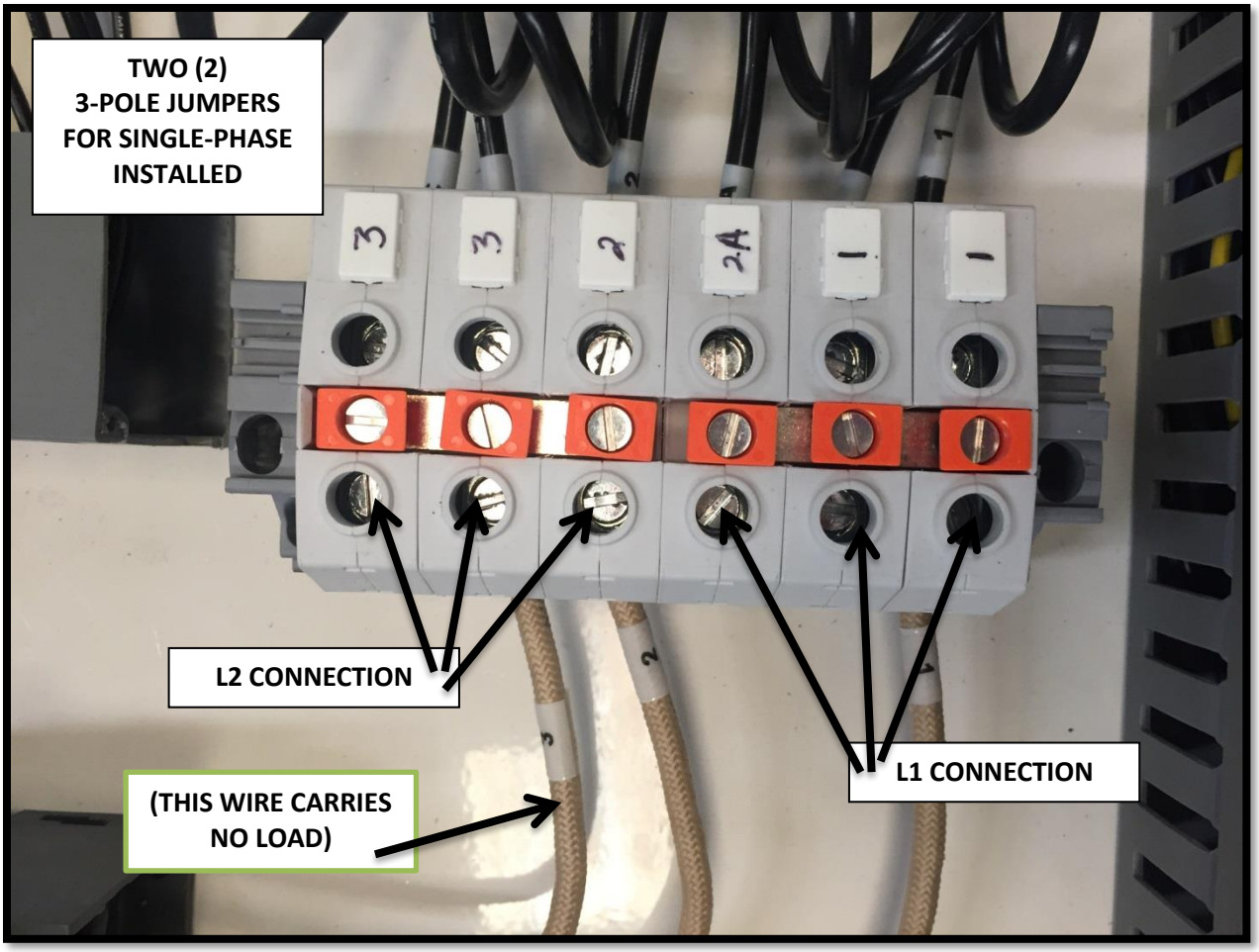


1. Supply connection to the **Aeolus Dryer** is made at the *Power Disconnect* inside the control panel mounted on the top of the Dryer.
2. Connect ground wire to terminal lug.
3. Connect the two supply leads to Terminals labeled, **1L1** and **3L2**. NO CONNECTION is to be made to the Terminal **5L3**!



The **Two (2) Three-Pole Jumpers** are installed across the S*ix Terminal Blocks* adjacent to the *Power Disconnect.*

4. Install one of the **Three-Pole Jumpers** across the *Terminal Blocks* labeled: **1 – 1 – 2A**.
5. Install the second **Three-Pole Jumper** across the *Terminal Blocks* labeled: **2 – 3 – 3.**
6. Use a flat head screwdriver to tighten all six screws to the manufactures recommended torque of 10.6 in.lb ± .885 (1.2N.m ± 0.1).

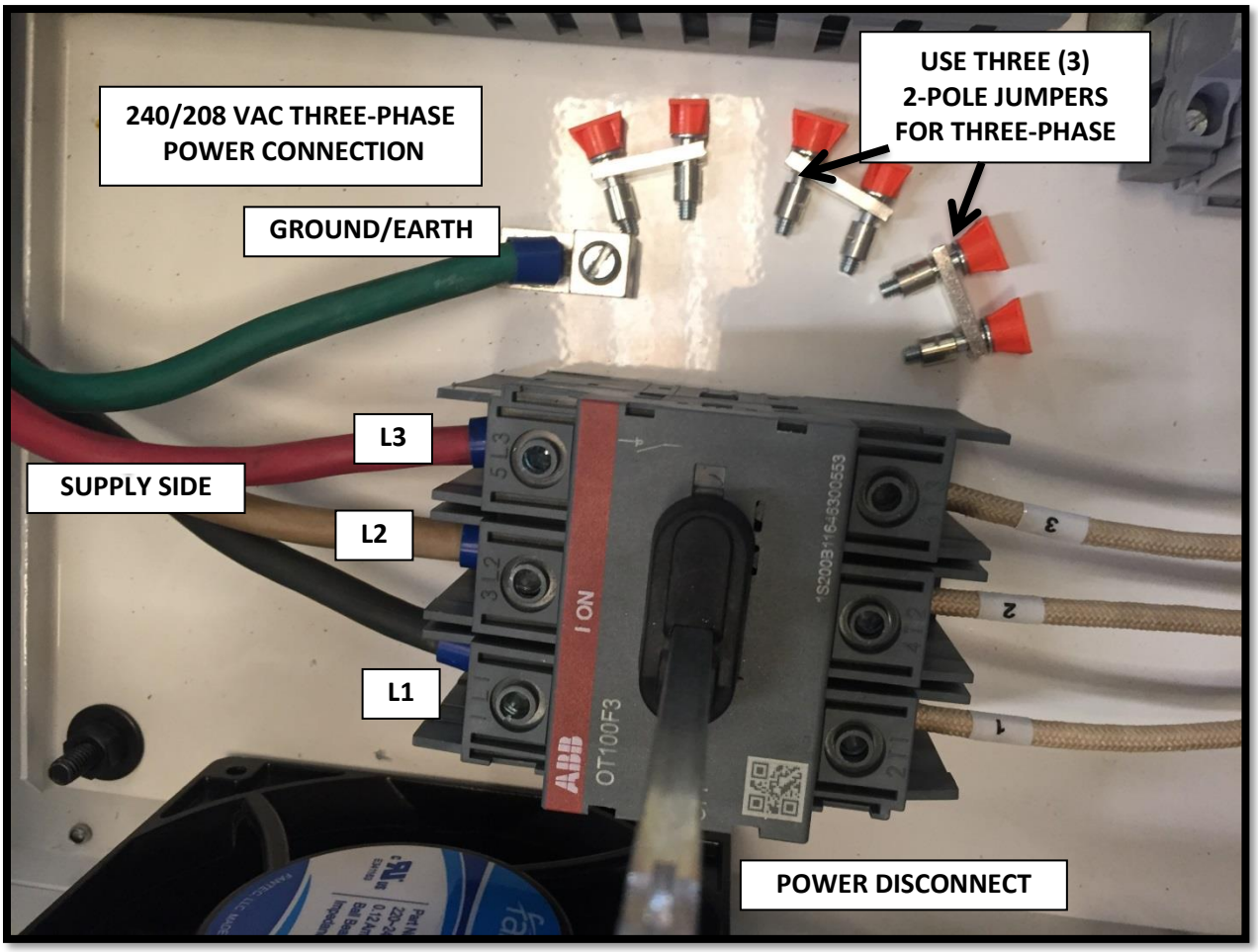


Please contact the service department at *BBC Industires, Inc.* (800-654-4205) or service@bbcind.com with any questions regarding these instructions.

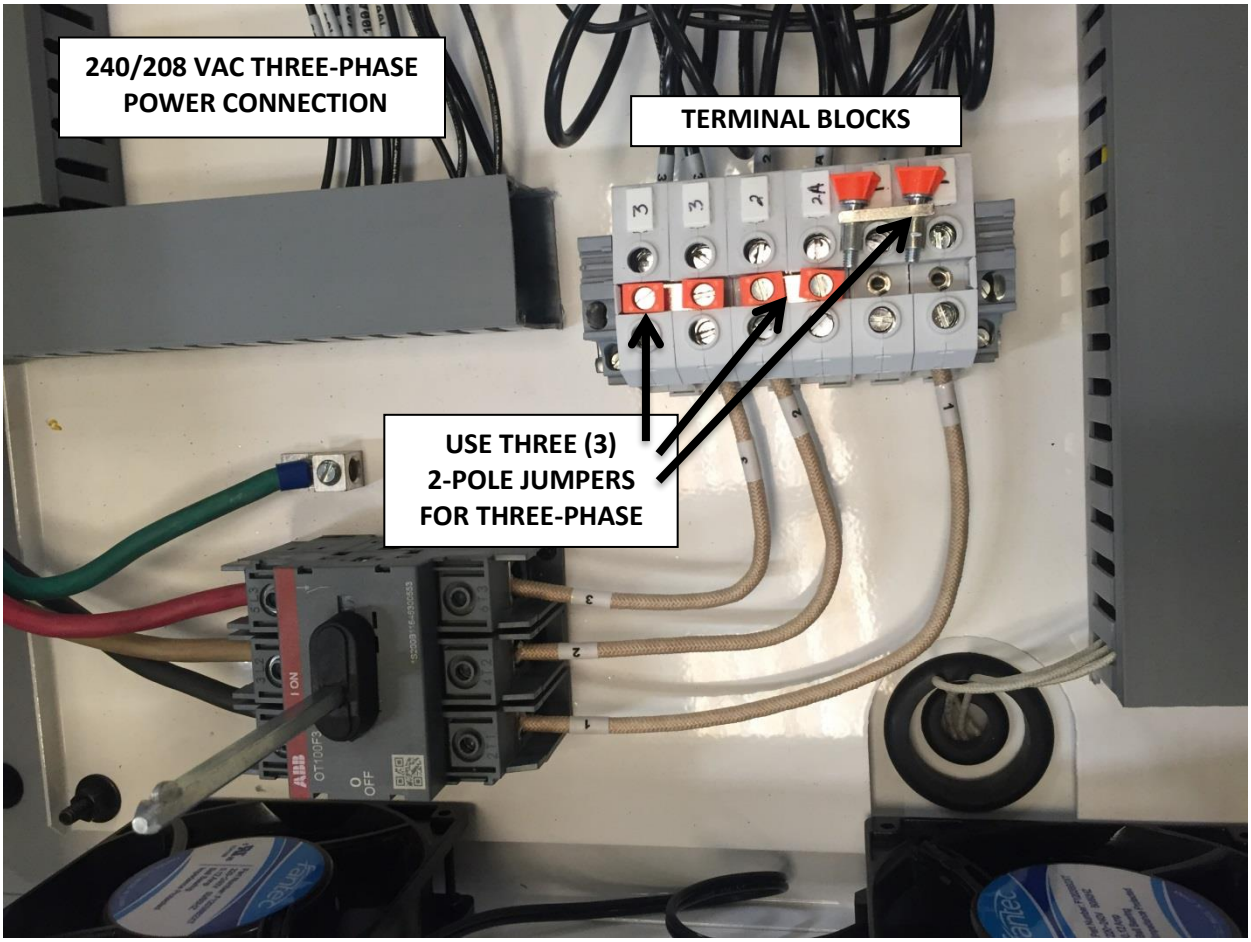
7. Close and latch the door of the control panel.

Your **Aeolus Conveyor Dryer** is now ready for normal operation.

Three-Phase Connection:

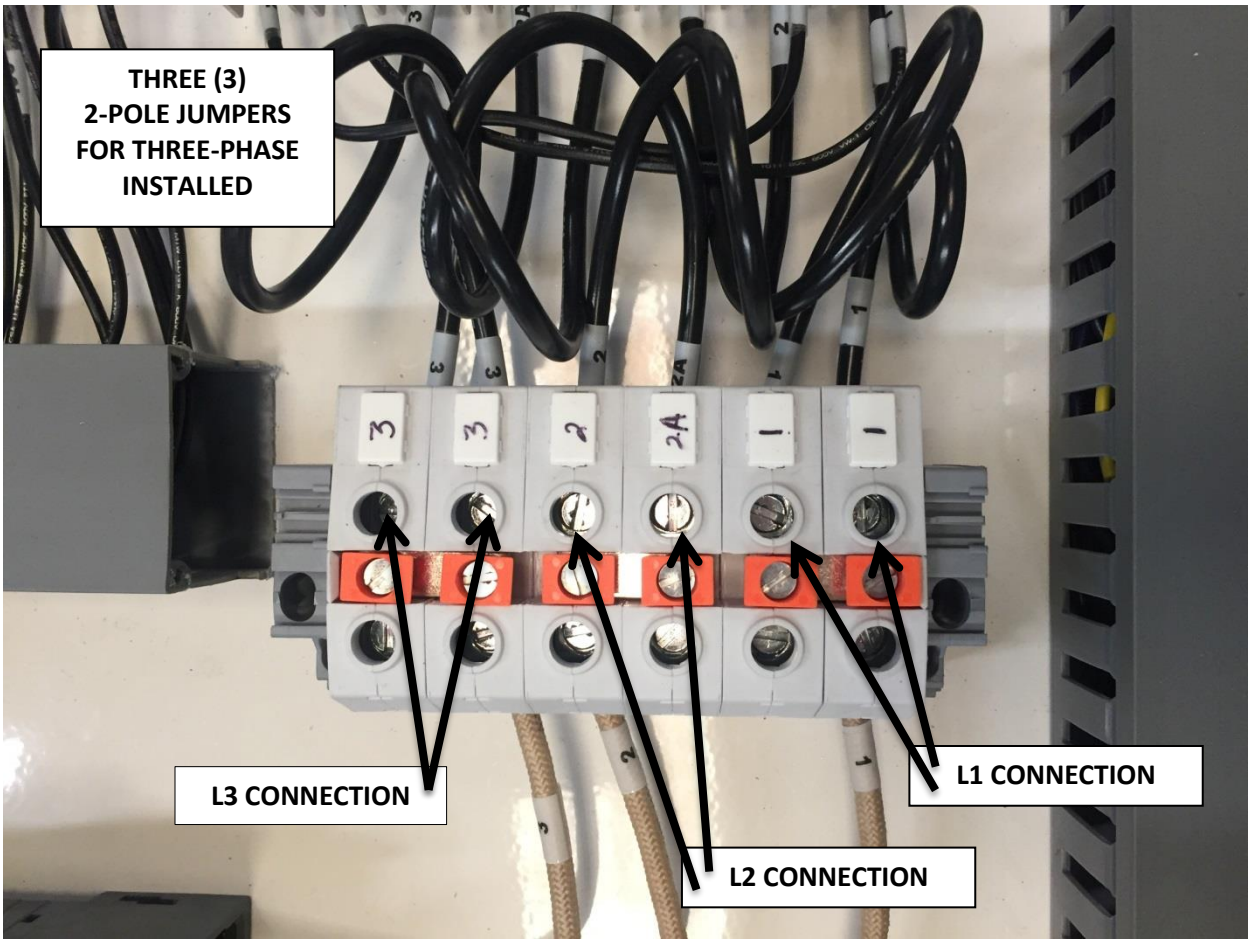


1. Supply connection to the **Aeolus Dryer** is made at the *Power Disconnect* inside the control panel mounted on the top of the Dryer.
2. Connect ground wire to terminal lug.
3. Connect the three supply leads to Terminals labeled, **1L1**, **3L2** and **5L3**.



The **Three (3) Two-Pole Jumpers** are installed across the S*ix Terminal Blocks* adjacent to the *Power Disconnect.*

4. Install one of the **Two-Pole Jumpers** across the *Terminal Blocks* labeled: **1 – 1**.
5. Install a second **Two-Pole Jumper** across the *Terminal Blocks* labeled: **2 – 2A.**
6. Install the third **Two-Pole Jumper** across the *Terminal Blocks* labeled: **3 – 3.**
7. Use a flat head screwdriver to tighten all six screws to the manufactures recommended torque of 10.6 in.lb ± .885 (1.2N.m ± 0.1).



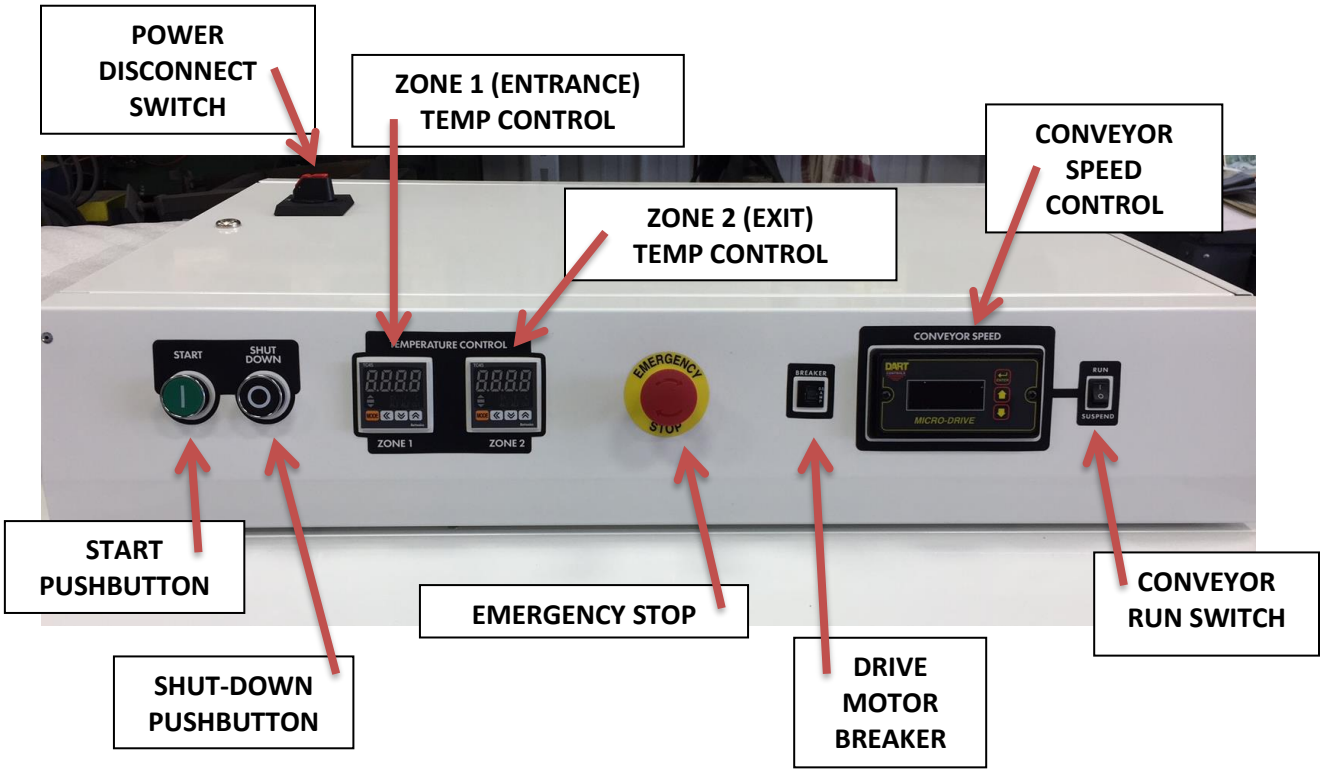
Please contact the service department at *BBC Industires, Inc.* (800-654-4205) or service@bbcind.com with any questions regarding these instructions.

8. Close and latch the door of the control panel.

Your **Aeolus Conveyor Dryer** is now ready for normal operation.

Normal Operation:

Dryer Controls:



POWER DISCONNECT SWITCH: Disconnects all power to the Dryer at the incoming supply line. The Power Disconnect must be *ON* for any and all functions of the Dryer to operate. The Control Panel door will not open unless the Power Disconnect is in the *OFF* position.

EMERGENCY STOP: Pressing the E-STOP will stop all functions immediately. The Heaters will turn *OFF* (but they will remain HOT). The conveyor will stop moving. To *RESET* the E-STOP, twist the button counterclockwise until it springs back.

START PUSHBUTTON: If the Disconnect Switch is *ON* and the E-STOP is out, the START button will power the Heaters, Conveyor, Circulation Blower, Exhaust Blower, and Control Panel Fans. The Temperature Controls and Conveyor Controls will illuminate.

SHUT-DOWN PUSHBUTTON: The Shut-Down Button is used to power down the Dryer after use. The Shut-Down sequence turns *OFF* the Heaters immediately. The Conveyor, Blowers and Fans will remain *ON* for an additional 10 minutes, allowing the Heaters to cool.

DRIVE MOTOR BREAKER: This breaker will trip if the Drive Motor is overloaded. If the Breaker trips, contact the service department at *BBC Industires, Inc.* (800-654-4205) or service@bbcind.com

CONVEYOR SPEED CONTROL: The Speed Control is displayed as time through the tunnel in MM:SS. For example: when 1:30 is displayed, an object will travel through the tunnel in 1 minute, 30 seconds.

CONVEYOR RUN SWITCH: In the *RUN* position, the conveyor will operate normally. Switching to the *SUSPEND* position, the conveyor will stop.

IMPORTANT
CONVEYOR BELT MUST BE MOVING WHILE HEAT IS ON
BELT MAY BE DAMAGED IF OVERHEATED

Dryer Temperature Control Calibration:

The Zone 1 and Zone 2 temperature controllers both have a maximum upper limit of 900°F. **Neither zone will likely reach this maximum**. Every dryer is tested before shipment. The maximum temperatures reached for this dryer at BBC were:

Zone 1: 885°F
Zone 2: 800°F

Operating Voltage: 241 VAC
Ambient Temp: 74 °F

Many factors influence the temperatures in your dryer including movement of the temperature probes during shipment, ambient conditions of your facility, and operating voltage among others. If the maximum temperatures at your facility differ from those listed above, the Recommended Settings listed below will also differ.

Recommended Settings:

Dryer Model	Conveyor Time	Zone 1 Temperature	Zone 2 Temperature
AIR-366C-X-X Zone 1: Row 1 Zone 2: Rows 2&3	:30 (30 seconds)	870-860°F	780-740°F
	0:45 (45 seconds)	870-860°F	690-665°F
	1:30 (1 min, 30 sec)	870-860°F	590-540°F
	3:00 (3 minutes)	770-760°F	540-490°F

The higher temperature setting is **Zone 1** is intended to get your product to curing temperatures at quickly as possible. The lower setting in **Zone 2** allows the product to remain in at the cure temperature for a longer period of time without overheating, penetrating to deeper layers of ink.

NOTE: The settings in the chart above are **suggested initial settings** for your Aeolus Dryer. There are many factors that influence the curing of different inks, including the ambient conditions in your shop. **Your setting may need to be adjusted** from the above listed temperatures and/or times. **Test prints need to be produced and wash-tested to determine the best possible settings for your application.**

Basic Trouble Shooting:

If oven does not hold temperature at set-point (within 5° – 10°F):

- Confirm the oven is getting proper voltage. A drop in voltage will decrease the temperatures in the oven.
- Reduce any drafts or air currents such as open doors, fans, air conditioners that could be blowing into the chamber. Do not direct fans at the oven this will cause temperature variations in the chamber.
- If temperature controller displays "OPEN" then the thermocouple has failed or become disconnected. Replace if necessary.
- If temperature does not rise at all or passes through set-point and continues to heat, Solid State Relay (SSR) may have failed. It can fail in the open or closed position. Replace if necessary.

If Conveyor Belt stops, check to see if Circuit Breaker on Control Panel has tripped. Push to reset.

Control Panel Maintenance: Performed at initial installation, 30 days after initial installation, and 120 days after initial installation.

1. Turn ***OFF*** the power serving the main control panel where it is connected to the building electrical distribution system.

   Note: Assure that appropriate **"Lock-Out / Tag-Out"** procedures are followed before conducting any of these activities.

2. After double checking that the power is off, confirm that all electrical terminations inside of the main control panel are secure by checking the "tightness" of each termination screw (or wire nut as may be applicable) and then "tugging" on each conductor.

WARRANTY

BBC Industries, Inc. warrants their products to be free from defects in workmanship at the time of shipment.

The obligation under the above warranty shall be limited to the repair or replacement of any part or parts manufactured by BBC Industries, Inc. without charge F.O.B. factory that may prove defective within 12 months from the date of shipment, which are returned to BBC Industries, Inc.

The above warranties are the only warranties made with respect to the equipment. There is no implied warranty of merchantability or of fitness.

EXCLUSIONS:

There is no warranty on parts not manufactured by BBC Industries, Inc., other than the respective manufacturer's warranty, if any.

The warranty against defects shall not extend to damage caused from any of the following:

- Transport by carrier
- Corrosion
- Operation or use in a manner inconsistent with specifications and/or operating instructions
- Ordinary wear, accident, improper installation, or maintenance
- Alterations made to equipment in any way

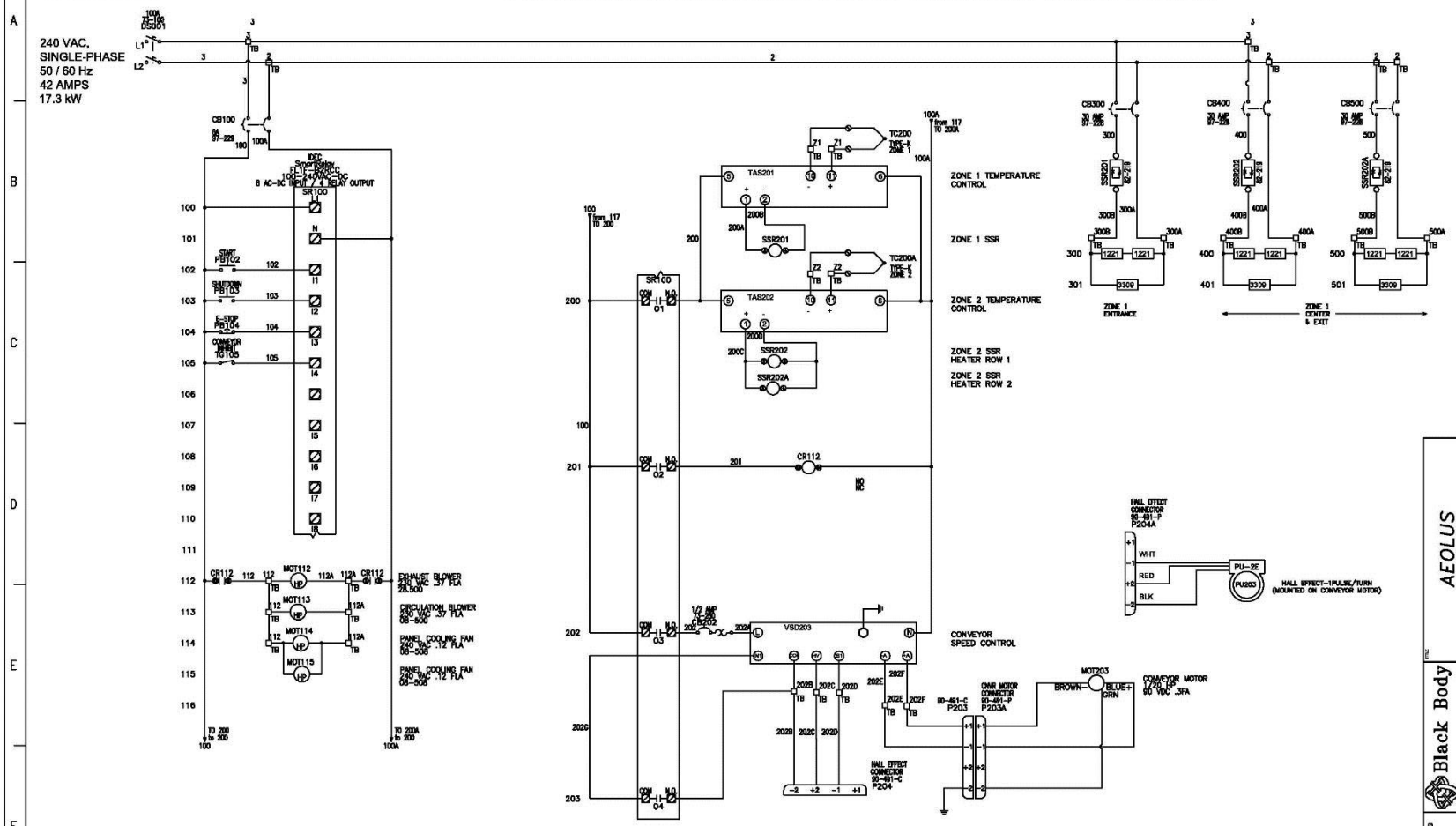
BBC Industries, Inc. shall not be liable for any losses or damages, including but not limited to incidental or consequential damages, suffered or incurred because the equipment proves to be defective either upon installation or during its operation or use.

Shipment of defective parts to BBC Industries, Inc. and the return shipment of any repaired or replacement parts from BBC Industries, Inc. shall be the purchaser's/user's expense.

AIR-366C-X-X SINGLE PHASE WIRING SCHEMATIC

CUSTOMER TO SUPPLY PROPERLY SIZED OVERCURRENT PROTECTION PER LOCAL CODES

240 VAC,
SINGLE-PHASE
50 / 60 Hz
42 AMPS
17.3 kW



LET.	NO.	REVISION	DN	CK	DATE

AEOLUS

Black Body

BBC INDUSTRIES, INC.

ELECTRICAL, 3-PHASE

AIR-366C-X-X

AIR-366C-X-X

SHT: 1 OF: 2

SCALE: NTS | DATE: 01/12/16 | DRN: JRP | CHK: XXX

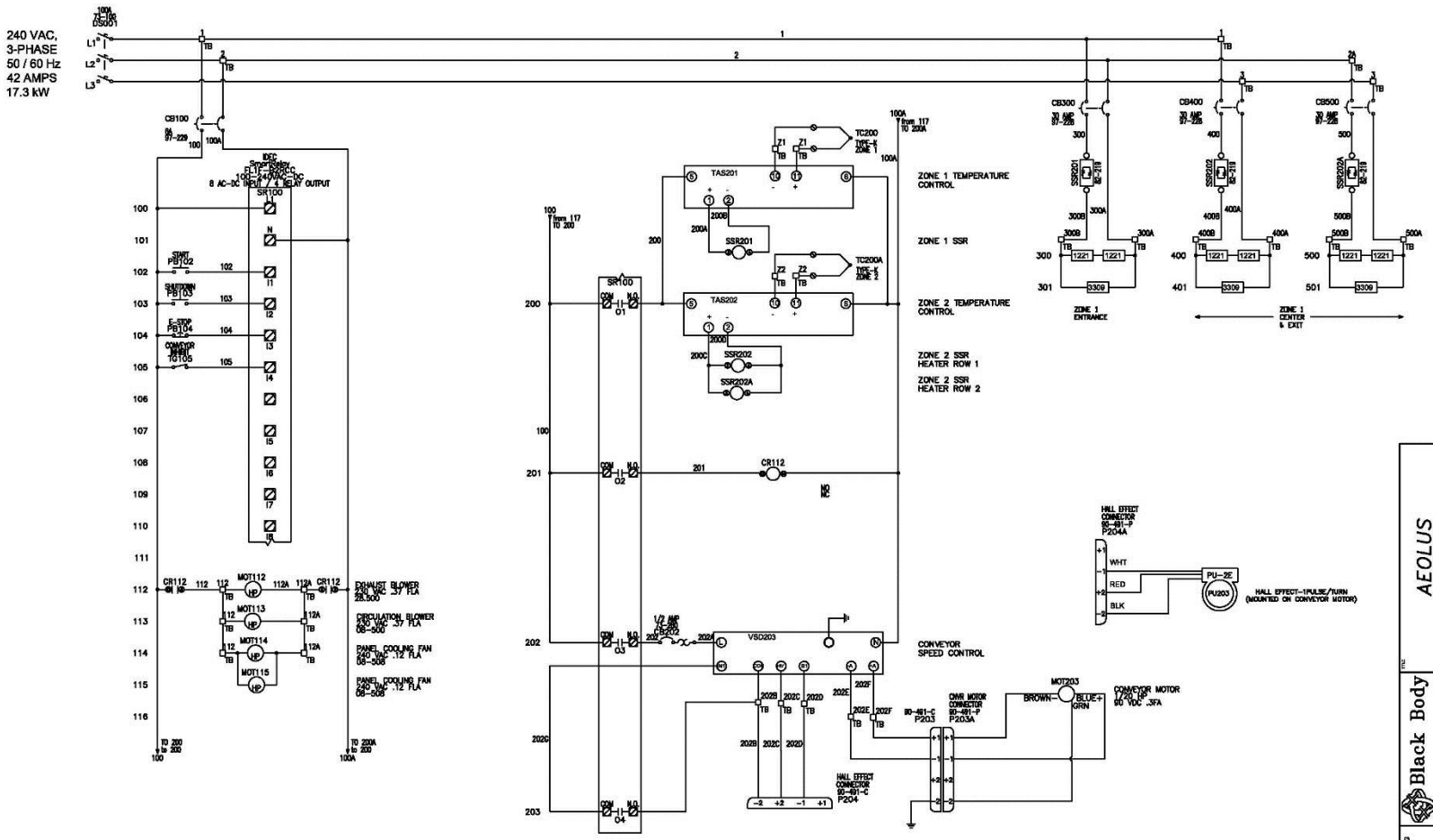
TOLERANCES (UNLESS NOTED)
ANGULAR: ±2°
FRACTIONAL: ± 1/64
DECIMAL: X ± .03, XX ± .02, XXX ± .010

PROPRIETARY DRAWING

XXXX

CUSTOMER TO SUPPLY PROPERLY
SIZED OVERCURRENT PROTECTION
PER LOCAL CODES

AIR-366C-X-X 3 - PHASE WIRING SCHEMATIC



AEOLUS

ELECTRICAL, 1-PHASE

AIR-366C-X-X

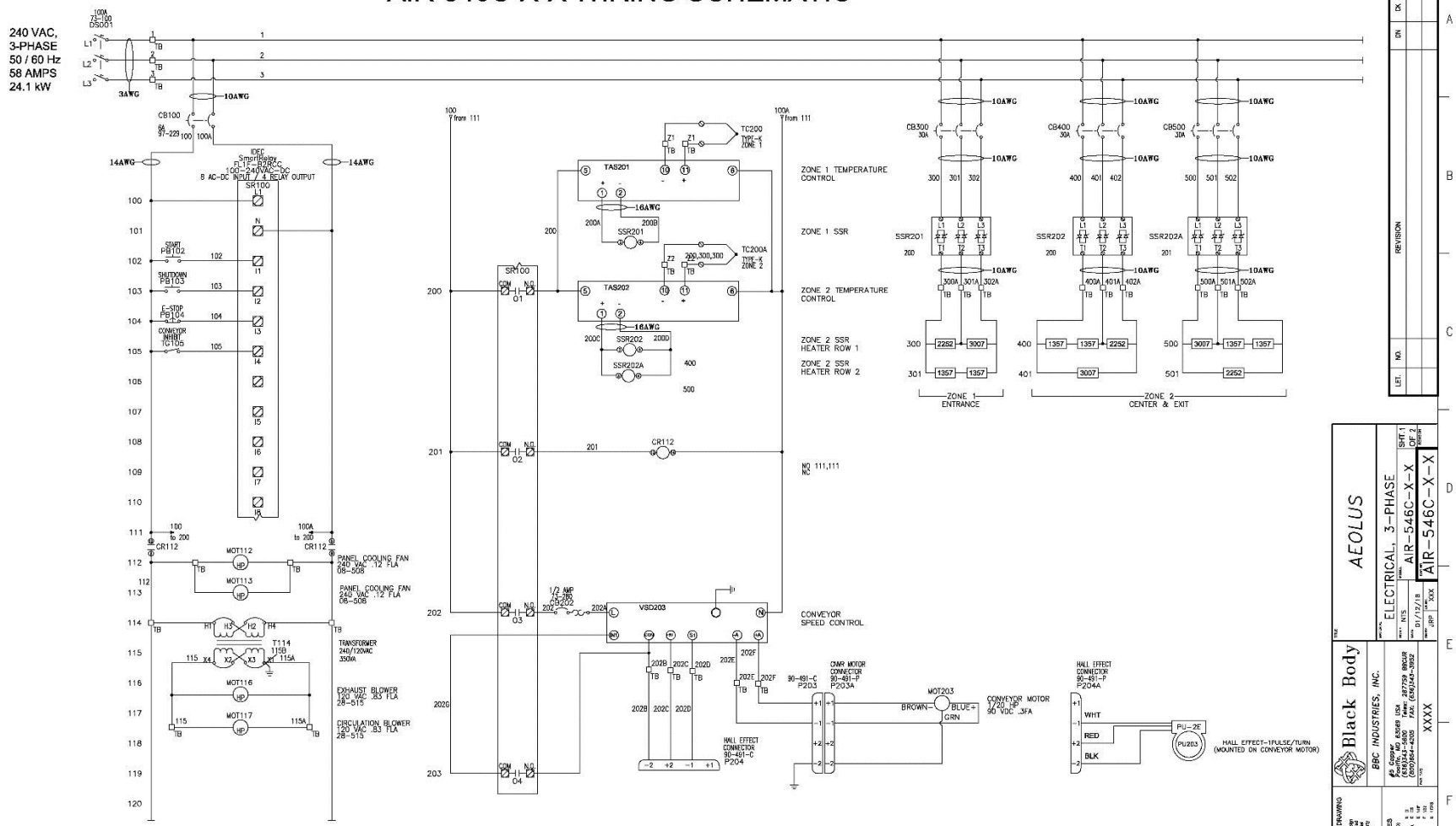
Black Body

BBC INDUSTRIES, INC.

CUSTOMER TO SUPPLY PROPERLY SIZED OVERCURRENT PROTECTION PER LOCAL CODES

AIR-546C-X-X WIRING SCHEMATIC

240 VAC, 3-PHASE
50 / 60 Hz
58 AMPS
24.1 kW



CONTROL REVISION

LET.	NO.	REVISION	DN	CK.	DATE

AEOLUS

Black Body

BBC INDUSTRIES, INC.

ELECTRICAL, 3-PHASE

AIR-546C-X-X

SHT. 1 OF 2

SCALE: NTS | DATE: 01/12/18 | DRWN: JRP | CHK: XXX

AIR-546C-X-X

XXXX

PROPRIETARY DRAWING

TOLERANCES (UNLESS NOTED)