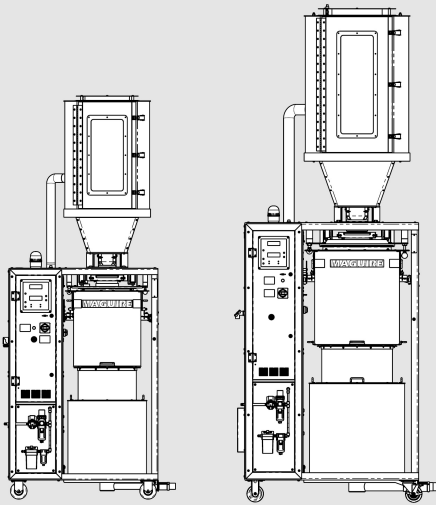


MAGUIRE PRODUCTS, INC.



VBD-150[®]

VBD-300[®]

Vacuum Batch Dryer[®]

INSTALLATION • OPERATION • MAINTENANCE

VBD-150® / VBD-300® - Vacuum Dryer®

This document is the Original Instructions manual of the Maguire VBD-150® and VBD-300® Vacuum Dryer.

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To every person concerned with use and maintenance of the Maguire VBD-150® and VBD-300® it is recommended to read thoroughly these operating instructions. Maguire Products Inc. accepts no responsibility or liability for damage or malfunction of the equipment arising from non-observance of these operating instructions.

To avoid errors and to ensure trouble-free operation, it is essential that these operating instructions are read and understood by all personnel who are to use the equipment.

Should you have problems or difficulties with the equipment, please contact Maguire Products Inc. or your local Maguire distributor.

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Accuracy of this Manual

We make every effort to keep this manual as correct and current as possible. However, technology and product changes may occur more rapidly than the reprinting of this manual. Generally, modifications made to the dryer design or to the operation of the software are may not reflected in the manual for several months. The date at the footer of this manual will indicate approximately how current this manual is. Likewise, your Dryer may have been produced at an earlier time and the information in this manual may not accurately describe your Dryer since this manual is written for the current line of Dryers in production (as of the date in the footer). We always reserve the right to make these changes without notice, and we do not guarantee the manual to be entirely accurate. If you question any information in this manual, or find errors, please let us know so that we may make the required corrections or provide you with accurate information. Additionally, we will gladly provide you with an updated copy of any manuals you need at any time. We welcome comments and suggestions on ways we can improve this manual.

For additional information, or to download the latest copy of this manual or any other Maguire manual, please visit our website or contact us directly.

On the Web at: www.maguire.com

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Warranty – Exclusive 5-Year

MAGUIRE PRODUCTS OFFERS THE MOST COMPREHENSIVE WARRANTY in the plastics auxiliary equipment industry. We warrant each MAGUIRE VBD – Vacuum Dryer manufactured by us to be free from defects in material and workmanship under normal use and service; excluding only those items listed below as 'excluded items'; our obligation under this warranty being limited to making good at our factory any Dryer which shall, within FIVE (5) YEARS after delivery to the original purchaser, be RETURNED intact to us, transportation charges PREPAID, and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligations or liabilities on our part, and MAGUIRE PRODUCTS neither assumes nor authorizes any other persons to assume for it any other liability in connection with the sale of its Dryers.



This warranty shall not apply to equipment repaired or altered outside MAGUIRE PRODUCTS INC. factory, unless such repair or alteration was, in our judgment, not responsible for the failure; nor which has been subject to misuse, negligence or accident, incorrect wiring by others, or installation or use not in accord with instructions furnished by Maguire Products, Inc.

Our liability under this warranty will extend only to equipment that is returned to our factory in Aston, Pennsylvania, PREPAID.

Please note that we always strive to satisfy our customers in whatever manner is deemed most expedient to overcome any problems they may have in connection with our equipment.

GETTING STARTED:

PROCEED TO: SAFETY WARNINGS

NEXT PAGE

SAFETY WARNINGS



HOT SURFACES:

As with all dryers, there are **HOT SURFACES** to avoid. Temperatures can reach 350F, (180C).



Typically, these surfaces are not at dangerous temperatures, however all hot surfaces should be avoided.



Warning Label indicate:
HOT SURFACES

USE CAUTION when removing
and installing canisters.

USE GLOVES

DO NOT REACH into the dryer
enclosure.



RISK OF SHOCK:

**Disconnect power supply before
servicing the Dryer.**



GETTING STARTED: PROCEED TO: INSTALLATION - NEXT PAGE

Installation

Transport and Setup

Shipment

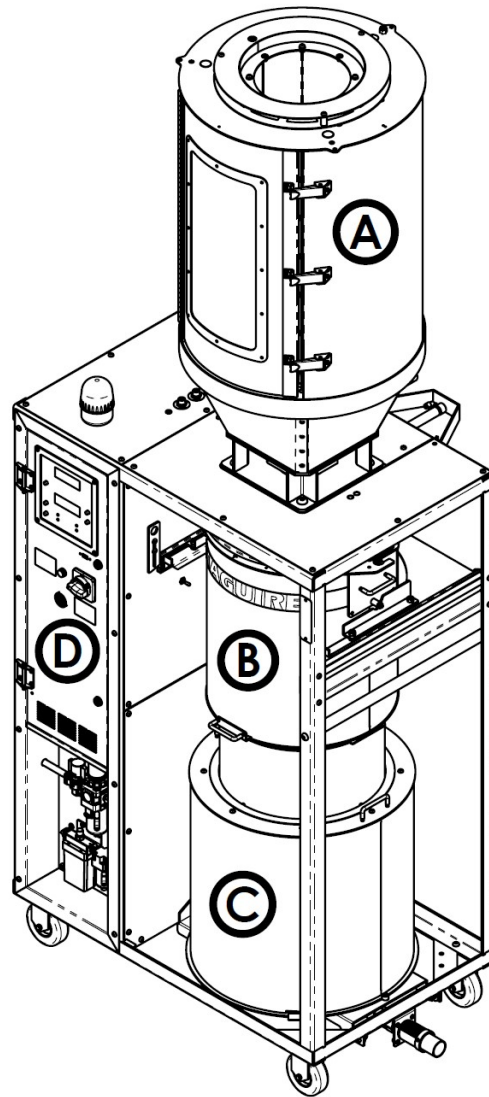
The VBD-150 Dryer is shipped on two pallets with 4 main sections:

(A) Heating Hopper Assembly

(B) Vacuum Chamber Assembly

(C) Retention Hopper Assembly

(D) Control Panel



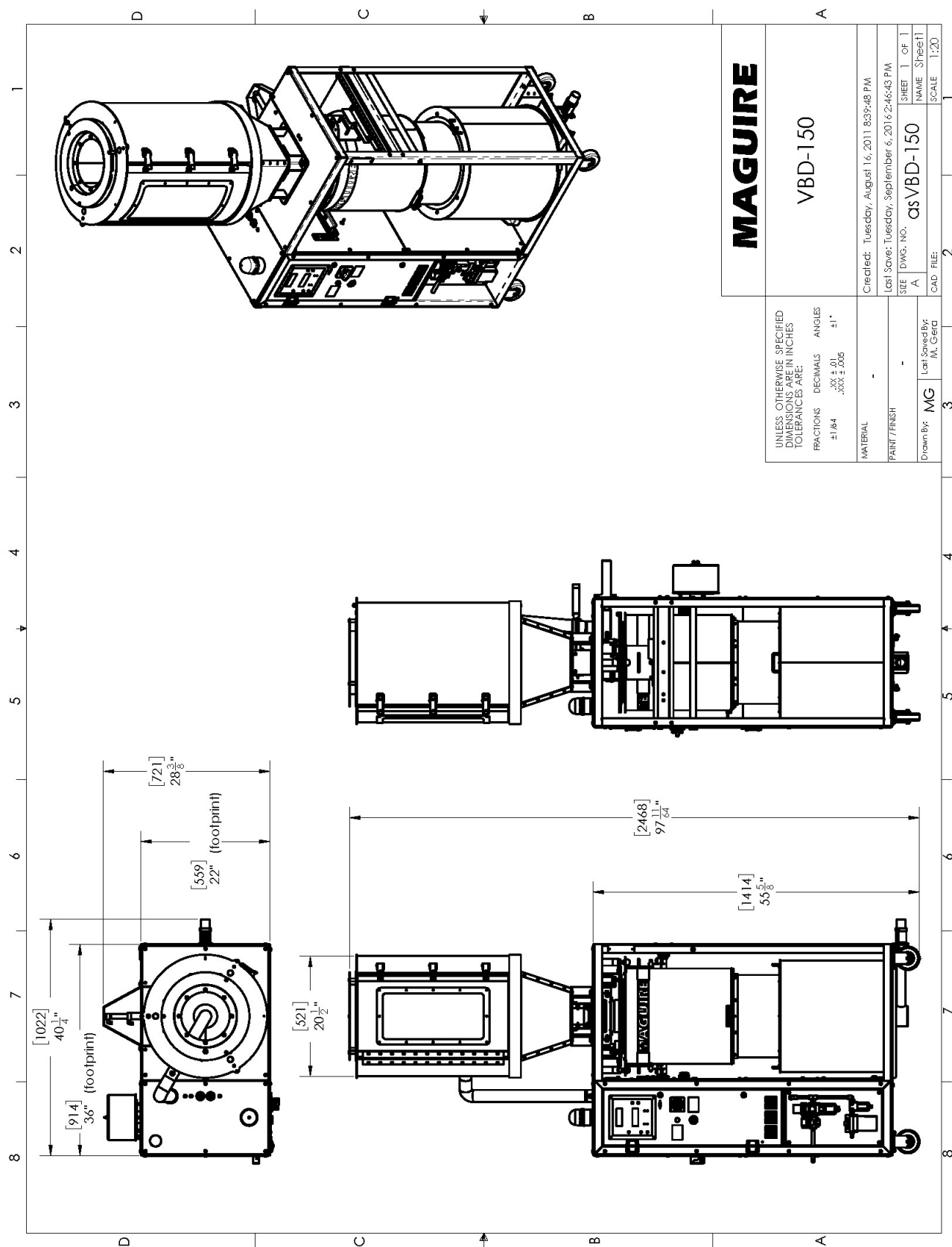
Lifting and Moving components of the Dryer



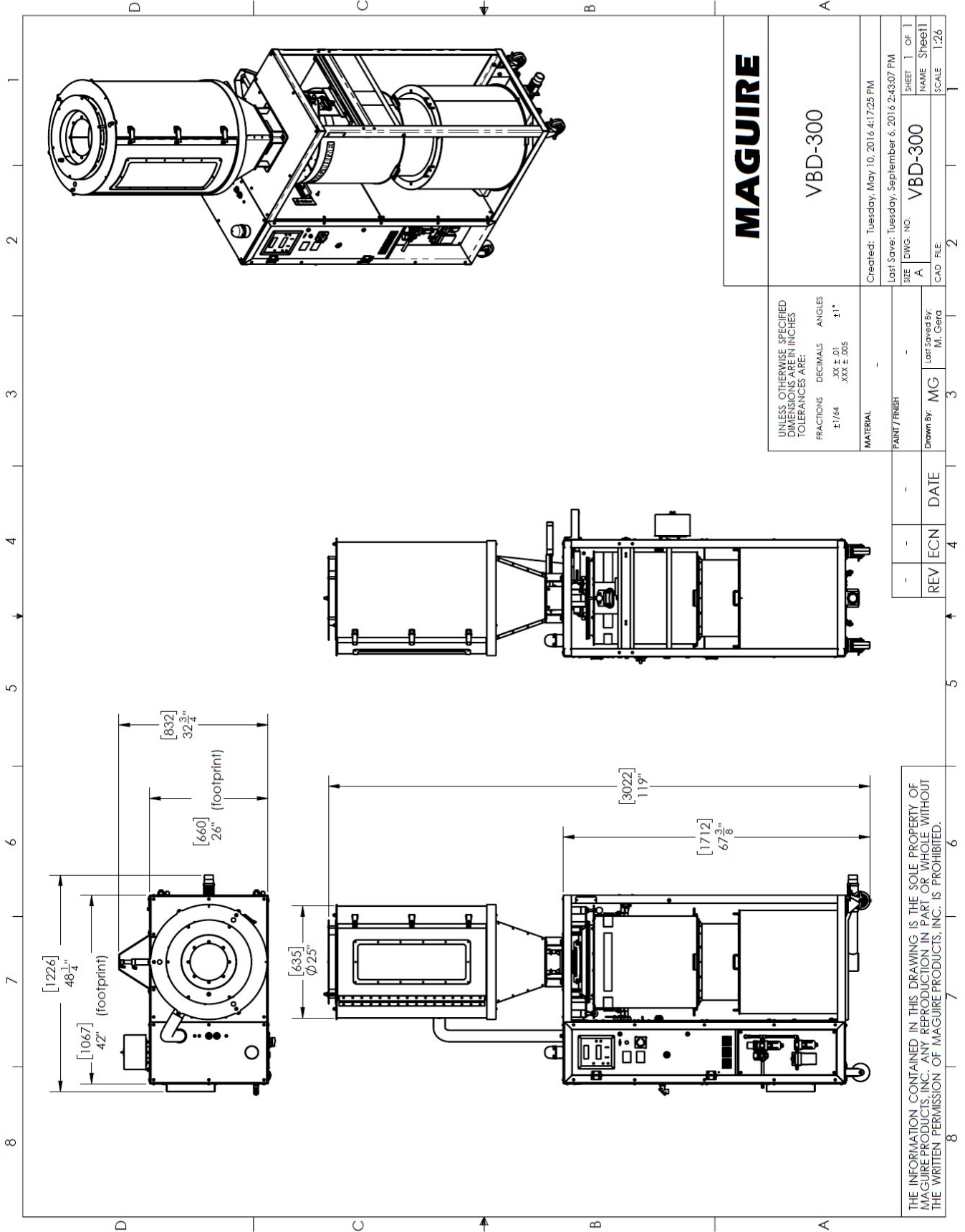
Ensure your lifting equipment is rated to lifting the weight of the individual sections of the VBD-150 or VBD-300. See Technical Documentation on page 73 for weights of the individual sections of both the VBD-150 and the VBD-300.

Overall layout and Dimensions

VBD-150



VBD-300



VBD-150 Assembly

Shipment Inventory

The VBD-150 is shipped on two pallets. One pallet holds the main body of the VBD-150 and two cardboard boxes containing the Vacuum Chamber, the Retention Hopper, and hardware for assembly. The second pallet holds the heating Hopper.

Hardware includes: 1 - 2" Hose Clamp, Two RTD Assemblies (RTD Sensor, wire, plug), 4 - ½" x13x1¼" Button Head bolts, 4 - ½" Lock Nuts, 8 - ½" Star Washers.

Unpacking the VBD-150 Main Body

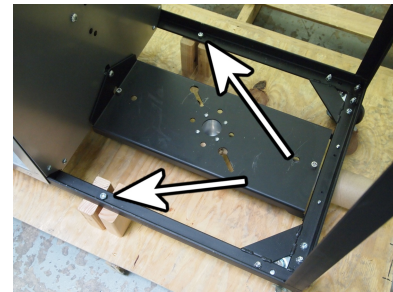
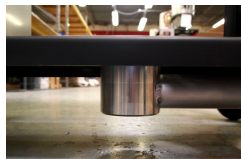
Remove the two boxes containing the Vacuum Chamber and Retention Hopper from the pallet.

With the VBD-150 pallet on the floor, secure the wheels so that it will not roll once it is unbolted from the pallet. Two wheels can be locked. With the wheels secured, locate the two shipping bolts that attach the VBD-150 to the pallet. Unbolt the upper visible nuts from the frame and allow the bolt to drop out of the VBD-150 frame. Remove the Wood blocks. The VBD-150 is now detached from the shipping pallet. Use caution.

Do not wheel the VBD-150 directly off of the pallet. Damage to the VTA can occur. The VBD-150 can be gently wheeled off of the pallet using stacked 2x4 pieces of wood. Use two or more people to guide the Dryer off of the pallet. Make sure enough clearance is given to the VTA.



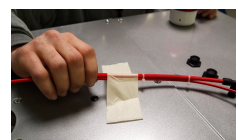
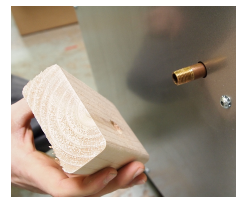
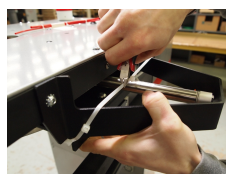
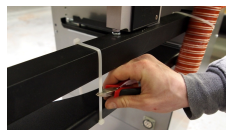
Under the Dryer there is a VTA. Use enough ramp clearance to prevent contact with the VTA below Dryer.



Remove all packing material from Dryer main body.



When cutting the zip-tie located at the top rear of the dryer, hold the Vacuum tray and lower it slowly onto load cell. →

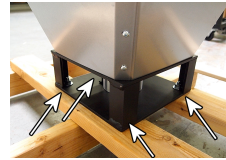


Heating Hopper Installation

The Heating Hopper is shipped on a separate pallet. The weight of the Heating Hopper is 115 lbs (52 kg).

It is secured to the pallet with four bolts.

While holding the heating hopper securely, remove these four bolts.



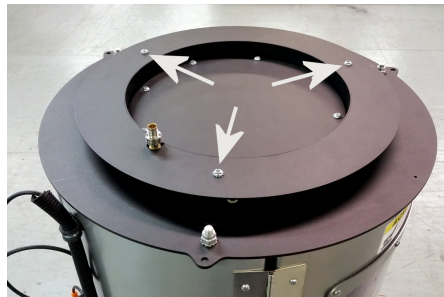
Heating Hopper Extension - OPTIONAL

The Heating Hopper Extension is used to increase heat residence time or running at higher throughputs.

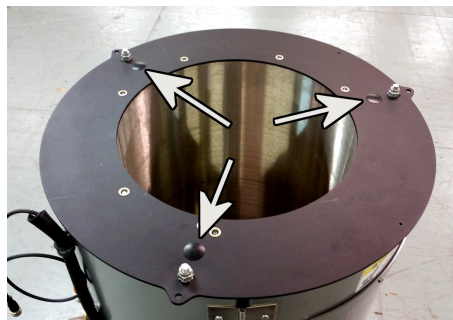
If the VBD Dryer will use a Heating Hopper Extension, it should be installed before the Heating Hopper is installed into the VBD Dryer.

If you do not have a Heating Hopper Extension, please skip to the next section, **Attaching the Heating Hopper**.

Remove Loader Adapter Plate / Diffuser Assembly from the top of the Heating Hopper by removing the three 1/4-20 button head screws and spacers. Lift the Loader Adapter Plate off of the Heating Hopper.



Remove the three black plastic plugs located on the upper plate of the Heating Hopper. See photos.



Install the Loader Adapter Plate / Diffuser Assembly onto Heating Hopper Extension. Either open end of the Heating Hopper Extension can be facing up, the open ends are the same.

Install Hopper Extension onto the top of the Heating Hopper, aligning the flange bolt holes. The protruding bolts on the bottom of the Heating Hopper Extension will insert into the holes on top of the Heating Hopper.

Secure the Heating Hopper Extension onto the Heating Hopper at the flange using the supplied 1/4-20 button head screws and Nyloc nuts.

Secure the RTD cable to the RTD located on the Loader Adapter Plate / Diffuser Assembly.

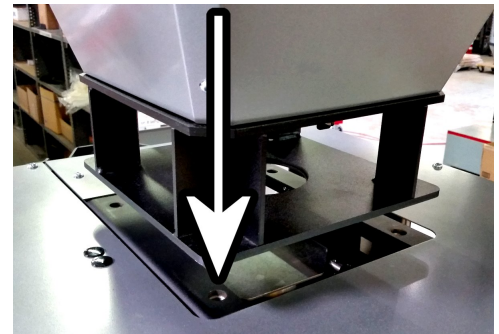
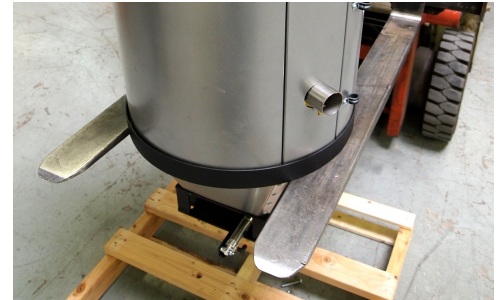


Attaching the Heating Hopper

A forklift can be used to raise the heating hopper onto the VBD-150 main body. Lifting points are located below on the lower black steel ring as shown in photo on right.

Install the Heating Hopper so that the Heating Hopper Access Door is facing the front of the Dryer, the same side as the Control Panel.

Lower the Heating Hopper onto the VBD-150. Line up the Heating Hopper bolt holes with the bolt holes on the VBD-150. Once lowered the Heating Hopper can be carefully moved to line up the bolt holes.



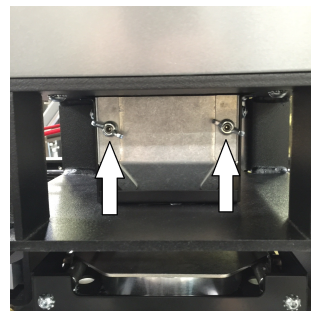
Install the four 1/2"-13 bolts as follows:

Each 1/2"-13 bolt will receive a 1/2" lock washer below the head.

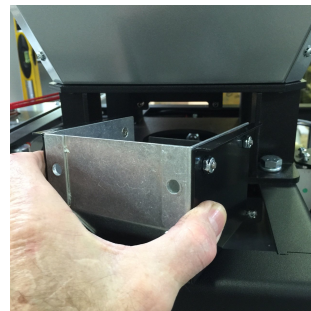


VBD-150 Heating Hopper Install - Drop Tube

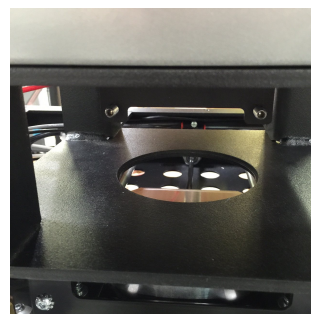
1. At the bottom of the heating hopper, remove the 2 wing nuts holding the Vacuum Chamber fill valve recollector hopper.



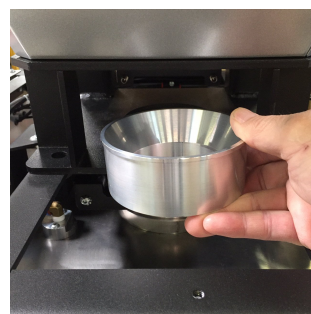
2. Remove the Vacuum Chamber fill valve hopper.



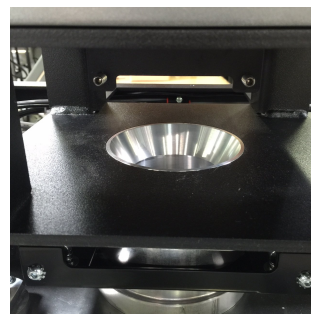
3. Install the supplied aluminum Drop Tube. Packed separately. See next photo.



4. Install Drop Tube in large hole in bottom of hopper frame.



5. Drop Tube installed.

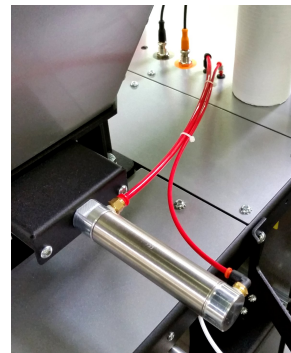


6. Reinstall the slide gate fill valve recollector hopper. Tighten wing nuts. Finish the Hopper installation by hooking up air lines and hoses per the manual.

Install Connections

Attach the Heating Hopper Slide Gate air lines.

The two air lines that connect the Heating Hopper Air cylinder to the VBD-150 are different sizes to prevent an incorrect connection.



Attach the Heating Hopper Hose

Using the 2" hose clamp, attached the red heating hose to the Heating Hopper.



Attach the RTD Plugs

The RTD plugs are different sizes and will only install on the correct outlet.



Installing the Retention Hopper

Unbox the Retention Hopper. The Retention Hopper is identified by the red handles located on the top of the hopper (the Vacuum Chamber has red handles on the upper sides).



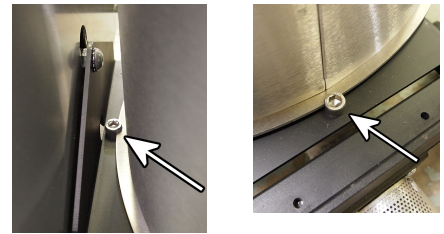
Close the slide-gate to allow the Retention Hopper to seat down onto the base of the VBD-150. Once seated open the slide-gate to allow material to flow.

Install the Retention Hopper so that the Retention Hopper manual slide-gate is located at the forward right corner of the Dryer.



At the base of the Retention Hopper are two slots that must be aligned with the locator bolts.

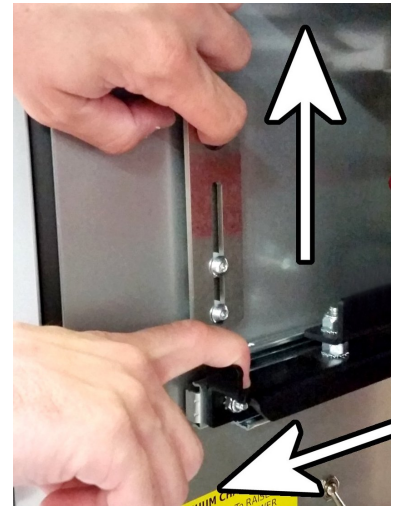
Once the locator bolts are aligned, press in the slide-gate to lock the Retention Hopper in place and open the base for material flow.



Installing the Vacuum Chamber

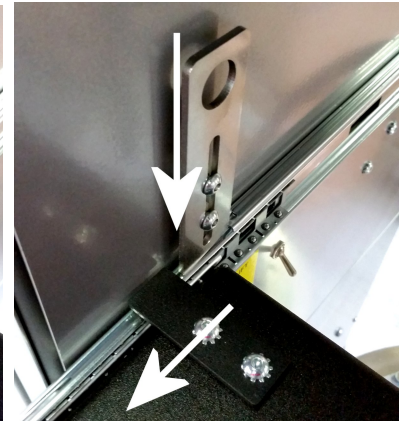
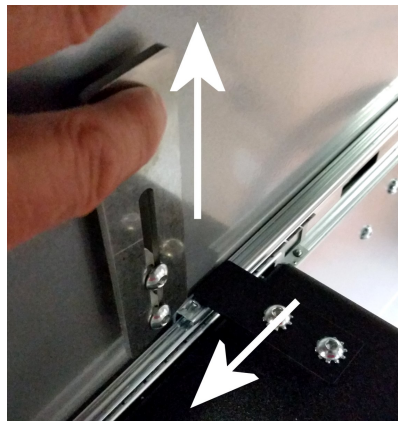
Unbox the Vacuum Chamber.

Lift the Slider Lock located on the right side of the VBD-150 cabinet.



Lock Slider into Open Position

While holding the Slider Lock up, pull the Vacuum Chamber slider out. When the slider is fully extended, release the Slider Lock, which will lock behind the retaining plate at the very rear of the opened slider locking the slider into the fully extended position (see photos below).



Rest the Vacuum Chamber onto the fully extended Sliders. The Vacuum Chamber has three resting pins. Orient the side with two resting pins on the left Slider rail.



Two people are required to lift the VBD-300 Vacuum Chamber.



Unlock Slider to Close

Hold the Slider Lock up and push the Vacuum Chamber Slider in until it clears the retaining plate. Release the Slider Lock and continue pushing the Vacuum Chamber Slider in.



Push the Slider rails and Vacuum Chamber back into the Dryer until the Slider Lock falls into place in front of the Vacuum Chamber Slider, locking the Vacuum Chamber Slider into the operating position.



Connect the air lines. Rotate the locking ring fully clockwise to secure the air connection.



Slide the Retention Hopper sealing collar up so that the magnets engage onto the bottom of the Vacuum Chamber.



Storage of the Optional Heating Hopper Dump Chute

The heating Hopper Drain Chute (optional) should be stored on the right of the dryer hanging on the black frame. See photo.



Dryer External Connections

Once assembled, installation requires connection of: pneumatic air line, electrical, intake and output material lines.

Compressed Air Connection

Connect an air supply to the air regulator's IN port using a female 1/4" NPT pipe fitting.

An operating air pressure of 80 psi (5.5 bar) while the vacuum generator is running is required for proper operation of the Dryer. Setting the air pressure to 85 psi while the machine is idle will usually attain the desired 80 psi while the vacuum generator is running.

If your air supply has oil in it, add an oil separator (coalescing filter). Oil in the air will combine with dust drawn from the Vacuum Chamber forming a paste inside the vacuum generator. It will stop working and require cleaning.

Observe the air pressure gauge to be sure the pressure maintains 80 psi (5.5 bar) while the vacuum generator is running as you check and adjust the regulator. If pressure drops below 80 psi, adjust the regulator. If the pressure cannot be maintained at 80 psi (5.5 bar) while the vacuum generator is running, then the air supply line is not adequate.



Do not supply Dryer with a lubricated air supply. Damage to Dryer may result. Use only a clean, dry, oil-free air supply.

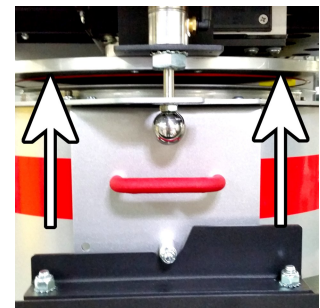


WARNING

Pinch Hazard - Keep fingers clear of seal deck, the mating surface above the Vacuum Chamber seal.

When air pressure is turned on and the Vacuum Chamber Lift Switch is flipped up, air cylinders lift the Vacuum Chamber off of the slider rails and up to the seal deck closing the gap between the top of the Vacuum Chamber and the seal deck.

KEEP FINGERS CLEAR



Electrical Connection



RISK OF INJURY!
Only qualified technicians should make electrical connections.

Connect Main Power

The electrical cable located on the left side of the Dryer on the power box supplies the power to the Dryer. Within the cable are four wires. Three of the wires are black and labeled with a number: 1, 2, and 3. The fourth wire is a green/yellow wire and is the ground wire.



Connect power to a properly fused disconnect.

VBD Fuse / Circuit Breaker Rating Table		
<i>Protect the unit with fuses or circuit breakers at the amp ratings shown below:</i>		
	AMPS	
Voltage	VBD-150	VBD-300
240	35	-
400	25	35
480	20	30
575	20	25

See the High Voltage Wiring Diagram section starting on page 76.

Confirm Correct 3-Phase Electrical Connection



THREE PHASE Unit - CONFIRM proper 3-Phase power connection prior to loading material. Failure to confirm proper 3-phase connection can result in reversed blower rotation and damage to blower if the blower sucks in material from heating hopper rather than blow heated air into heating hopper.

To confirm proper 3-phase connection following these instructions:

Turn power on using main power switch.

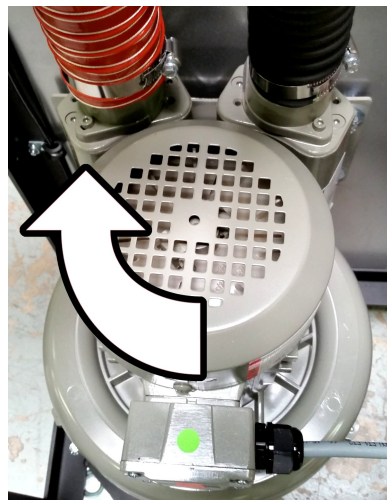
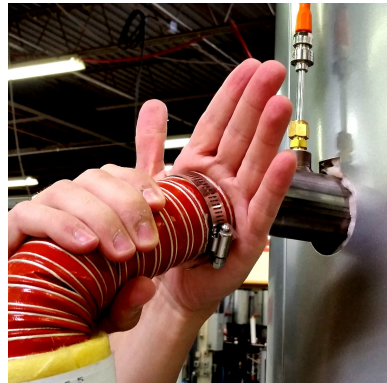
There are two methods to confirm proper 3-phase connection:

Incorrect 3-phase connection will result in reversed blower rotation. Both methods for checking correct 3-phase connection involve testing the blower rotation.

Method one requires the disconnecting the 2-inch hot air hose from the heating hopper and manually turning on the blower. The air from the blower should blow out of the 2-inch hose. Air should not suck into the hose. If air does not blow out and sucks in, the 3-phase connection is NOT correct.

Method two requires the removal of the left side panel to view the blower and confirm blower rotation on power up. Rotation must be clockwise as indicated by the red arrow.

1. From the Main Screen press  to highlight Manual Operations. Press ENTER.
2. Press  to select Operate Outputs. Press ENTER.
3. Press  to select Blower. Press ENTER to start blower. Press ENTER again to stop blower.



Dryer Overview

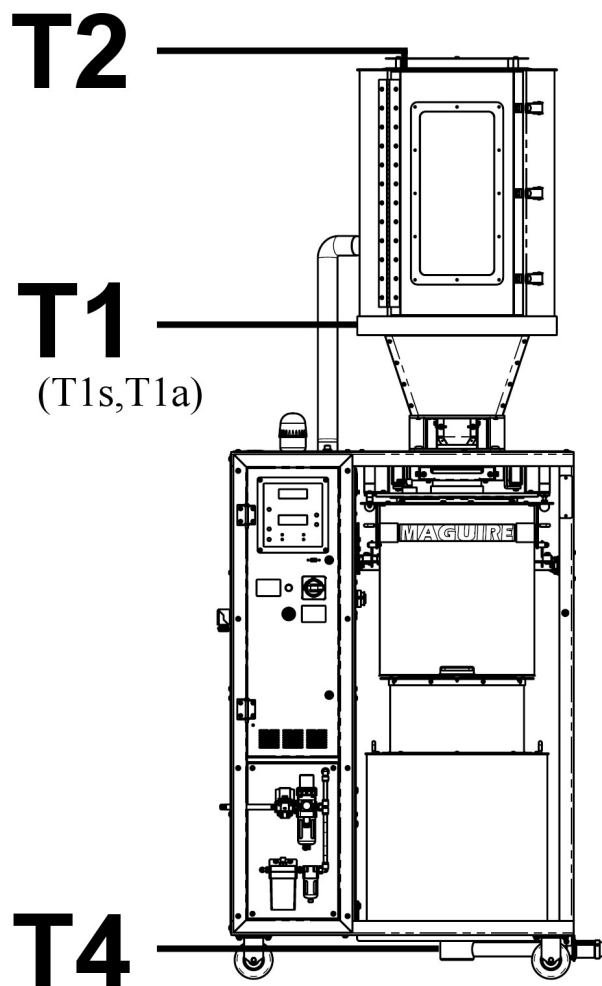
T2 – Heating Hopper Outlet Temperature

T1 – Heating Hopper Inlet Temperature

T1s – Heating Hopper Air Inlet
Temperature **Setting**

T1a – Heating Hopper Air Inlet
Temperature **Actual**

T4 – Material Outlet Temperature (optional)



Operating Station Overview

Control Panel Overview

Display Screens – The VBD control panel has two screens. The upper, red display shows Actual Temperature or Throughput. The lower, blue display shows various running mode information or setup and configuration information.



Control Panel Power Powers on the control panel (main power must be ON.) Also used to exit or cancel out of any menu option and return to the top level screen.

Top Level Menu:

- **Run Dryer** - See page 23
- **Run Dryer (Batch)** – See page 46
- **Clean Out** – See page 56
- **Manual Operations** - See page 30



Enter selects the highlighted menu option.

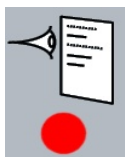


Select toggles between 4 different screen sets:



Arrow Buttons – Navigate menus, make adjustments. ▽ is also used to silence the alarm.

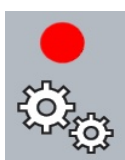
Navigating to **BACK** and pressing **ENTER** exits the current menu and back one level.



Status Screen

The Status Screen Displays:

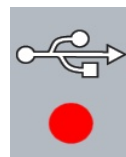
T1a - Actual Heating Hopper inlet air temperature
T1s - Setpoint Heating Hopper inlet air temperature
VTa – Vacuum Time Actual
VTs – Vacuum Time Set-point
ADV - Access to Advance Mode



Setup Mode

Access to advanced set up information.

See Page 32



Print Center

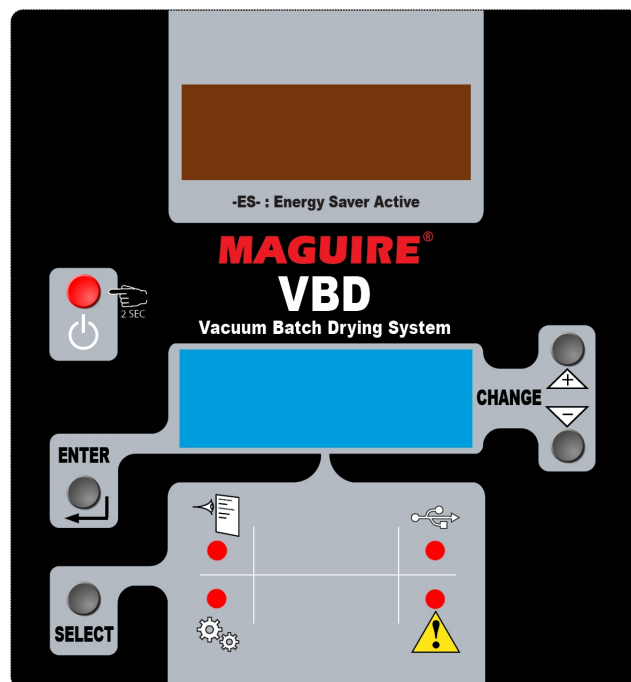
For printing parameters, event logs, alarm logs or printing all of the above to a USB flash drive.

Also see page 60 for print setup.



Alarm Log

Displays a buffer of 50 of the most recent alarm logs. Note: A printed alarm log will print the history of alarms since the last clear of alarm logs.



Startup and Operation

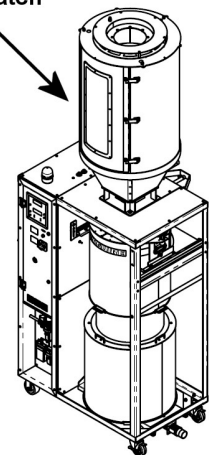
This section will help you understand what the dryer is doing during operation from a cold start. There are 3 concurrent operations. Heating, Vacuum and, Retention. Cold startup begins with Preheat. Preheat only occurs before the first cycle of the dryer's initial startup, otherwise each cycle begins with material heating. The vacuum operation pulls and holds a vacuum on the material for at least the Vacuum Time Set-point (or longer if material remains in the Retention Hopper). The Retention operation holds the dried material in the Retention Hopper. If equipped with the optional membrane air dryer, the material will be blanketed with hot dry air until it is conveyed away.

Important: Inspect the VBD, verify that machine is clear of all material from heating hopper, Vacuum Chamber and Retention Hopper. To facilitate a Clean Out, use the Clean Out function accessible from the home screen.

Startup and Operation Instructions

1. **ENSURE HATCH IS CLOSED.** There is a hatch located on the upper Heating Hopper. Ensure all 3 latches are closed. Also be sure the removable Lower Retention Hopper is in place.

Secure Hatch



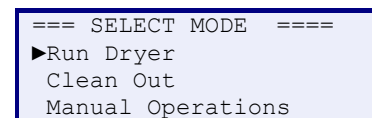
2. **Load material into the Upper Heating Hopper.** Wait for the Heating Hopper to fill with material before starting the Dryer.

3. **Turn on Main Power** by rotating the 25 AMP Main Disconnect Handle to the Red ON position. This powers up the VBD-150 Dryer.

On initial power up of the VBD, the Control Panel powers ON automatically. If the main power is ON but the Control Panel is OFF, press and hold the Red Power Button located on the Control Panel for 2 seconds. (Note: The VBD's Control Panel can be powered OFF without powering down the Main Power by pressing and holding the Red Power button for 4 seconds).



4. After material has been loaded into the Heating Hopper, select **Run Dryer** and press the **ENTER** button.



5. The display will show the Pre-Start screen. On this screen is:

Setpoint Temp – This is heat hopper inlet temperature. By the end of the preheat cycle time, all material in the Heating Hopper will be heated to this temperature. By default, the Setpoint temperature is set to 150°F. See Recommended Heat Temperatures on page 23 for general temperature recommendations or contact the material manufacturer.

Preheat Time – This is the duration of heating from a cold start.

Vacuum Time – This is the minimum duration of a vacuum cycle. Actual vacuum cycle times will vary according to the throughput. The default vacuum time is 20 minutes. In the vast majority of drying operations, this time is adequate and does not need to be adjusted. Special circumstances may require different vacuum times. Please consult Maguire Dryer Technical Support for additional information.

By default, START is selected (location of cursor). If the settings you desire have been entered previously, simply pressing ENTER once more will start the machine. Otherwise use the arrow buttons Δ ∇ to navigate to the desired settings for adjustment, then press **ENTER**. The display will highlight the adjustable digit.

Use the arrow buttons Δ ∇ to adjust the setting. Press **ENTER** to advance through the digits and to complete the setting adjustment.

6. When the display is no longer in the Edit Mode (highlighted setting), press ∇ to toggle the selection to **START**. With **START** selected, press the **ENTER** button to start the dryer.

7. The display will show that the dryer is running in **PREHEAT** mode and display the following:

T1a - Actual Heating Hopper inlet air temperature

T1s - Setpoint Heating Hopper inlet air temperature

VTa - Elapsed vacuum time.

VTs - Vacuum Time sepoint.

VAC - Actual vacuum chamber pressure.

```
Run Temp:      150°F
Preheat Time:   35m
▶Vacuum Time:   20m
===== START
```

```
Run Temp:      150°F
Preheat Time:   35m
Vacuum Time:    18m
=====▶START
```

```
===== PREHEAT: 35:00
T1a:130°F VTa: 00:00
▶T1s:150°F VTs: 18:00
ADV ===== VAC: 760mm
```

```
===== AUTO CYCLE =====
T1a:130°F VTa: 00:00
▶T1s:150°F VTs: 18:00
ADV ===== VAC: 760mm
```

What is happening when the dryer is running:

During the Pre-heat operation material in the heating hopper is brought up to temperature (T1s). Preheat time is determined by the specified Preheat Time on the Pre-Start screen (timed preheat, default 35 minutes) or by the Preheat Setup Auto option, which sets an inlet to outlet temperature delta and a minimum preheat time.

After pre-heat, approximately one third of the material in the heating hopper is dispensed into the vacuum chamber, and the first vacuum cycle begins. Each vacuum cycle has a minimum vacuum time, set on the Pre-start screen, or the main run screen (VTs). (default is 20 minutes).

The loader loads the Heating Hopper with new material as the Vacuum Chamber receives the heated material and heating cycle begins concurrent to vacuum cycle (the first vacuum cycle is timed). The new batch of material in the upper portion of the heating hopper will take less time to heat. Minimum time in the heating is dictated vacuum time.

After first vacuum cycle, material is then dispensed into retention hopper ready for use. Material in the retention hopper is blanketed with dry air (if equipped with optional membrane air dryer).

The rate of consumption of dried material from the retention hopper ultimately dictates the amount of time that the material will be preheated and under vacuum. **Examples:** If it takes 25 minutes to deplete the retention hopper, the vacuum cycle will run past its 20 minute setpoint (pre-start screen) to 25 minutes. This is normal operation. However if the retention hopper is depleted in 15 minutes and the vacuum time is set to 20 minutes, there will be a 5 minute window where no material is available. This indicates that the throughput of the dryer has been exceeded. If the Throughput Alarm is enabled (Alarm Setup), a Throughput Alarm (Alarm Code 20) will be triggered.

Pause, Shutdown, Auto Shutdown, Immediate Shutdown

At any point during the preheat cycle or standard operation (operation after initial preheat cycle), pressing the red button will bring up a screen with the following shutdown options:



Pause – Pauses the vacuum timer indefinitely. To restart after a pause, select Resume.

Shutdown – Shutdown will run to run the dryer and process the material in the Vacuum Chamber and the Retention Hopper until they are empty. Selecting Planned Shutdown will display the Cooldown option.

Cooldown (ON/OFF) – When enabled Cooldown will gradually bring down the temperature of the material in the heating hopper to the specified temperature (Cooldown Temp) over the specified time period (Cooldown Time).

To adjust the Cooldown Temperature and Cooldown Time use the arrow buttons Δ ∇ to adjust the setting. Press **ENTER** to advance through the digits and to complete the setting adjustment.

Press the ∇ to scroll down to **Shutdown** to continue with the shutdown. Press the ENTER button to proceed with the shutdown.

Pressing the red power button during a Planned Shutdown will display the Immediate Shutdown Screen allowing initiation of an immediate shutdown of the dryer.

Auto Shutdown – Initiates a shutdown (see above) as specified date and time. For further explanation on how to set the Auto Shutdown Date and Time see page 28.

Immediate Shutdown – Fast but controlled shutdown of the heater, blower, the vacuum system and the purge system.

Cancel - Exits the shutdown prompt screen, doing nothing.

Skip Preheat (shown only if in a preheat cycle) – Skips the preheat allowing material to immediately pass down to the Vacuum Chamber (example: material has already been heated and dryer has been taking offline briefly and powered back on).

```
===== SHUTDOWN =====
▶Pause
Shutdown
Auto Shutdown
Immediate Shutdown
Cancel
```

```
===== SHUTDOWN =====
Cooldown:OFF
Cancel
▶Shutdown
```

```
===== SHUTDOWN =====
Cooldown:ON
Cooldown Temp:120°F
▶Cooldown Time: 60m▼
```

```
===== SHUTDOWN =====
Cooldown:ON
Cooldown Temp:120°F
▶Cooldown Time: 30m▼
```

```
===== SHUTDOWN =====
Cooldown Temp:120°F
Cooldown Time: 30m
▶Cancel ▼
```

```
== PLANNED SHUTDOWN ==
Cooldown Time: 30m
Cancel
▶Shutdown
```

```
== COOLDOWN: 29:58
T1a: 120°F VTa: 14:37
▶T1s: 120°F VTs: 20:00
ADV ==== VAC: 82mm
```

```
Shutting Down...
--- Standby ---
H:OFF B:ON Pabs:752
```

Auto Shutdown

At any point during the preheat cycle or standard operation (operation after initial preheat cycle), pressing the red button will bring up a Shutdown Options screen and display.

Press :		to display the shutdown screen. Use the ▽ button to navigate down to Auto Shutdown.	Display will show:	<pre> ===== SHUTDOWN ===== Shutdown ▶Auto Shutdown Immediate Shutdown </pre>
Press :	The display will show the current date and time above the Auto-Shutdown date and time. You are adjusting the Auto-Shutdown date and time. Use the ▲ ▽ buttons to navigate down to the lower adjustment field to adjust the date and time for the Auto-Shutdown to occur.		Display will show:	<pre> AUTO-SHUTDOWN BACK Mon 10/30/2014 12:30 Mon 10/30/2014 00:00 ▶ Month: 1-12 </pre>
Press :	Use the ▲ ▽ buttons to adjust the digit and press ENTER to save that edited field and move to the next field. When complete (NEXT will display to indicate you have completed edit of all fields), press ENTER to finish. The Home Screen will now display "AUTO-SHUTDOWN" at the top to indicate the dryer is in an Auto-Shutdown mode.		Display will show:	<pre> AUTO-SHUTDOWN BACK Mon 10/30/2014 12:30 Mon 10/30/2014 16:30 ▶NEXT ===== </pre>

Advanced Mode (ADV)

Selecting ADV (advanced) will display additional information such as readings of all RTD thermometers, vacuum time elapsed, absolute pressure in the Vacuum Chamber, blower drive frequency. ADV also allows an option to abort preheat and proceed into vacuum cycle. (Aborting the preheat cycle does not shut down the machine). Advanced scrolls through 4 screens. To move to the next screen, use the $\triangle$ ∇ buttons to navigate.

```

===== AUTO CYCLE =====
T1a:149°F   VTa: 07:57
T1s:150°F   VTs: 20:00
▶ADV ===== VAC: 78mm
  
```

Fill Weight – The desired weight of material to be dispensed into the Vacuum Chamber.

```

I/O:BHVC      ▶BACK
Fill Weight:   35LB
Vac. Cham.:+   35LB
Ret. Hopp.:    27LB▼
  
```

Bulk Density - Bulk density of the material in either pounds per cubic foot or kilograms per liter (depending on the weigh unit of measurement in Loadcell Setup).

```

I/O:BHVC      ▶BACK
Thruput:       75LB/HR▲
Totalizer:     778LB
Last Cycle:    21:06▼
  
```

Vac Cham. - Current material weight in Vacuum Chamber.

Ret. Hopp. - Current material weight in Retention Hopper.

```

I/O:BHVC      ▶BACK
Cycle Count:   5▲
Fill Time:     18.697
T1:149/150°F H:19% ▼
  
```

Thruput - Calculated throughput, weight per hour.

Totalizer - Calculated total of all cycles since last clear of totals.

```

I/O:BHVC      ▶BACK
T1:149/150°F H:19% ▲
T2:106°F T4: 145°F
  
```

Last Cycle * - Total time to process a completed batch of dry material.

Cycle Count * - Total number of cycles since start button was pressed.

Fill Time * - Total time to fill the Vacuum Chamber.

Dump Time * - Total time to dump the Vacuum Chamber.

T1 - Show actual temperature of the heating hopper inlet. & heating %.

T2 - Show actual temperature of the heating hopper outlet.

T4 - Show actual temperature of the retaining hopper.

* These advanced menu options can be turned on / off in the DISPLAY SETUP menu.

Recommended Drying Temperatures

MATERIAL	FINAL MOISTURE % *	DRYING TEMPERATURE**	
		°C	°F
ABS	0.10	80 - 85	180 – 190
ABS/PC	0.02	100	210
LCP	0.02	150	300
PA	0.20 - 0.10	80 - 85	180 – 190
PBT	0.02	120	250
PC	0.02	125	250
PC/PBT	0.02	125	250
PEEK	0.20 - 0.10	150	300
PEI	0.02	150	300
PES	0.05 - 0.02	150	300
PET (Molding Grade)	0.010	150-180	300-350
PET (Preform, Extrusion)	0.005	150-180	300-350
PMMA (Acrylic)	0.02 - 0.04	79	175
POM (Acetal)	0.20 - 0.10	80 - 110	180 – 230
PPO	0.02	100 - 120	210 – 250
PPS	0.02	150	300
PUR	0.02	125 - 140	260 – 280
PSU	0.02	150	300
SAN	0.20 - 0.10	80	180
* Final moisture content as recommended by the raw material manufacturer.			
** Drying temperature as recommended by the material manufacturer.			

Drying is accomplished when all material reaches the proper temperature, and is then placed under sufficient vacuum for a sufficient period of time.

Measurement of moisture content of material, both prior to and after drying, is accomplished by using a moisture analyzer.

Description of Menu Options

Select Mode (Top Level Menu)

Three modes of operation: **Run Dryer**, **Clean Out** and **Manual Operations**.

Run Dryer - See Operation on page 23.

Clean Out – Clean Out opens all valves and allows for material evacuation and cleanout.

Dump Heat Hopper – Opens the Vacuum Chamber Fill Valve, drains the Heating Hopper.

Dump Vacuum Chamber – Opens Vacuum Chamber dump valve, draining Vacuum Chamber

Dump All – Opens both the Vacuum Chamber Fill Valve and Vacuum Chamber dump valve

Manual Operations – Options that allow direct control over specific outputs.

Operate Outputs

Alarm Audio – OFF/ON – Operates audible alarm.

Alarm Strobe – OFF/ON – Operates strobe.

Dry Purge Supply – CLOSED/OPEN of dry purge supply air valve

Vac Gate Upper – OPEN/CLOSED – Material gate above vacuum chamber.

Vac Gate Lower – OPEN/CLOSED – visible disk shaped gate below vacuum chamber.

Vac Cham Fill – OPEN/CLOSED - Gate located at the base of the heating hopper.

Vac Cham Dump – OPEN/CLOSED – Internal gate (not visible) located at the base of the vacuum chamber.

Vac Gen Supply – OPEN/CLOSED – Vacuum generator supply. When operating, the vacuum generator supply pulls a vacuum on the vacuum chamber.

Vac Gen Check – OPEN/CLOSED – Vacuum generator check valve located on the vacuum generator. Holds the vacuum on the vacuum chamber.

Vac Cham Purge – OPEN/CLOSED – Located below the vacuum generator. When open the vacuum on the vacuum chamber is released.

Heater Test – Operates the heater and blower that supplies heat to the Heating Hopper.

T1s: Heating Hopper inlet temp setpoint.

T1a: Heating Hopper inlet temp actual.

Start: Starts the heater test. Blower will run during test.

Heater Output: Heater duty cycle expressed in percent

Blower: Status of blower

Control: PID or manual. Controller will modulate the heater as it would during auto cycle. In manual mode the operator can select a heater duty cycle.

Edit Settings: Easy access to heater control parameters

Blower Test – Operates the blower.

Blower: OFF/ON toggle using ENTER button.

Aux: OFF/ON toggle using ENTER button.

Fail Safe: OFF/ON toggle using ENTER button.

T1s: Heating Hopper inlet temp setpoint.

T1a: Heating Hopper inlet temp actual.

Vacuum Test - Tests the Vacuum System

Vac: Vacuum pressure readout

Start Test: Starts the vacuum test. Runs the vacuum generator system.

Evac Time: Amount of time in minutes/seconds to attain the vacuum setpoint during the current test.

Cycle: Amount of time in minutes/seconds between vacuum generator runs during a vacuum hold. Used to determine vacuum chamber seal integrity.

Pset: Absolute pressure that the Vacuum Chamber will be evacuated to. See VPL parameter.

Pdel: The pressure difference above VPL at while the vacuum generator turns back on. See VPD parameter.

Purge Cham: OFF/CYC/ON

Input Status – Shows status of various inputs

Blower – OFF/ON

Level – Heating Hooper Level (0-100%)

Pressure – LOW/OK

VAC – Vacuum chamber absolute pressure (mmHg)

Primary OT – Primary Heater temperature switch - OK/OVERTMP

Purge OT - Purge Heater temperature switch - OK/OVERTMP

HH Rem. Dump – Remote heating hopper dump – ON/OFF

VC LC – Raw counts of the vacuum chamber loadcell

RH LC - Raw counts of the retention hopper loadcell

T1 – Heating hopper inlet temperature

T2 – Heating hopper outlet temperature

T4 – Material exit temperature (optional RTD)

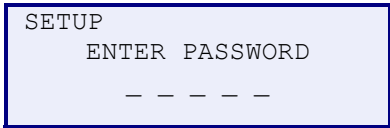
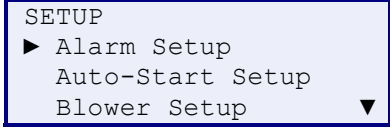
Timed Dispense – Opens valves for a user specified length of time in milliseconds.

Fill: Fill Time of the Vacuum Chamber in milliseconds.

Dump: Dump time of the Vacuum Chamber in milliseconds.

Setup Menu

The Setup Menu is accessed by pressing the Select button and choosing the Gears mode.

Press:	 	to toggle the Mode Selection to the Gears Icon.	Display will show:	
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	the  button several times to move down to the desired option. Press ENTER to select that Setup option for modification.			

Setup Menu Option

Description / Options

Alarm Setup

Material Shortage Alarm (labeled "Material")

- WARN:** In the event of a material shortage, activate the audible alarm and strobe light but continue retrying for material.
- SHUTDOWN:** In the event of a material shortage, activate the audible alarm and strobe light and automatically initiate a planned shutdown. Audible alarm with sound for 15 seconds and the strobe will flash until the dryer is completely shut down.
- OFF:** Disables the Material Shortage alarm

When Material Shortage Alarm is in Warn or Shutdown Mode Fill Retries are ENABLED. When set to OFF, Fill Retries are disabled.

Material Ready Alarm - If the Material Ready alarm is enabled, this alarm will trigger after the first and only first batch of material has completed a full vacuum cycle. After 15 seconds, the audible portion of this alarm will automatically silence. The first batch of material will remain under vacuum indefinitely until this alarm is cleared. There are two main purposes of this alarm:

1. To alert the operator that dry material is ready for the process.
2. To act as a hold-back, when necessary, giving the operator additional time to prepare the process.

- 1st:** Material Ready Alarm sounds after the first and only the first batch of material is ready to drop from the Vacuum Chamber.
- ON:** Material Ready Alarm sounds after every batch of material is ready to drop from the Vacuum Chamber. This mode can be useful in lab environments.
- OFF:** Disables the Material Ready Alarm

Material Temperature Alarm - When the Material Temp alarm is enabled, during any instance where the Heating Hopper is called upon to dispense material into the vacuum chamber and the T2 (heating hopper exit) temperature is below the ESM parameter level, this alarm will trigger. Its purpose is to alert the operator that insufficient heating has occurred, most likely from a process throughput that exceeds the capacity of the VBD.

ON: When the Material Temperature Alarm is enabled,.

OFF: Disables the Material Temperature Alarm

Residence Alarm (labeled "Residence") - When the Residence Alarm is enabled, an alarm will sound if dried material has sat in the retention hopper too long. The RAL parameter determines when a residence alarm will occur based on elapsed time and weight of remaining material in the retention hopper. See the RAL parameter for more information.

ON: When the Residence Alarm is enabled, the alarm will sound when this alarm is triggered.

OFF: Disables the Residence Alarm

Throughput Alarm (labeled "Thruput") - If the Throughput alarm is enabled, the alarm will sound if the material in the Retention Hopper is used faster than the dryer can produce dried material. (Material level reaches RTL parameter before the Vacuum Time Setting expires VTS parameter)

ON: If the Throughput alarm is enabled, the alarm will sound when this alarm is triggered.

OFF: Disables the Throughput alarm

VC Dump (Vacuum Chamber Dump) Alarm - If the Vacuum Chamber Dump alarm is enabled, the dispensing of material from the vacuum chamber into the retention hopper is monitored using the CDR (Chamber Dump Retries) parameter. CDR's default settings of 05003 requires that at least 50% of the material that is in the vacuum chamber be detected in the retention hopper after the dispense. If it's under 50% the dispense will retry 3 times before triggering the alarm. Retries will continue indefinitely until 50% is satisfied.

ON: If the Vacuum Chamber Dump alarm is enabled, the alarm will sound when this alarm is triggered.

OFF: Disables both the vacuum chamber dump alarm and vacuum chamber Dump retries.

Print Alarm Log - Prints the Alarm Log. See page 60.

Clear Alarm Log - Clears the Alarm Log. See page 60.

Auto-Start Setup Auto-Starts the Dryer at a specified Time and Day(s). Can be set to Auto-Start the Dryer at one time only or on a repeated schedule. Must be turned ON in Display Setup.

Auto-Stop Setup Auto-Stop the Dryer at a specified Time and Day(s). Can be set to Auto-Stop the Dryer at one time only or on a repeated schedule. Must be turned ON in Display Setup.

Communications Communication setup. See page 47.

Convey Setup **Convey Setup - Material Convey Options - Optional** - Uses dedicated outputs on the I/O board that may be used to control customer supplied Loader(s).
See the I/O Board Wiring Diagram on page 74

- **Loader 1** - Off / Auto - Stops loader that supplies the heating hopper for shutdown sequence.
- **Loader 2** - Off / Auto - When material is ready, loader will convey material away from dryer retention hopper. When enabled, select Throughput or Weight.
- **Reset Totalizer** - Resets Weighed totals to zero. Totals are the amount of material that has been conveyed away from the dryer since the Totalizer has been reset.

Dispense Setup **Fill Weight** – The desired weight of material to be dispensed into the Vacuum Chamber.

Bulk Density – Bulk density of the material in either pounds per cubic foot or kilograms per liter (depending on the weigh unit of measurement in Loadcell Setup).

Fill Wt. Adj (Fill Weight Adjust) – Off / On – When ON the dryer will automatically adjust the fill weight to be in appropriate proportion with the throughput. A Low throughput will result in a lower fill weight.

Display Setup **Show / Hide Information and options on the controller screens**

Batch Mode - ON/OFF – When ON, the option to dry a batch of material is displayed on the home screen.

Auto Shutdown - ON/OFF – When ON, the option to initiate an auto shutdown (shut down at a specified time) is

displayed on the shutdown options screen.

I/O Status – ON/OFF – Displays I/O info on main screen.

Cycle Info - ON/OFF – Displays Cycle info on main screen.

Fill Time - ON/OFF – Displays the fill time on main screen.

Residence Time - ON/OFF – When ON, displays a countdown timer (RAL parameter) indicating when an alarm will sound alerting that material has sat in the retention hopper too long.

Display – TEMP/THRUPUT – Sets the upper red display to show either actual temperature or throughput (lbs or kgs per hour).

Dry Purge Setup

Purge Cham - OFF/CYC/ON – Controls when the vacuum chamber is purged with membrane dried air.

OFF – No vacuum chamber purging occurs.

CYC - Vacuum chamber purging occurs during allotted vacuum cycle time (VTs).

ON – Vacuum chamber purging occurs during allotted vacuum cycle time (VTs) and extended vacuum if applicable.

Purge Interval - Interval in seconds between purges.

Purge Duration - Duration in seconds that the purge will occur.

Loadcell Setup

Loadcell Setup - See page 49.

Parameters

Parameters access. See page 37.

Preheat Setup

Preheat Mode - Auto or time - Preheat time for the material in the Material Hopper. Default preheat time is 30 minutes.

Preheat Time - The Preheat Time is the duration of preheat time.

Print Setup

Print Setup - See page 60

- **Event Log:** Enabled/disabled
- **Interval:** 60s (temperatures, pressure)
- **Content:** Standard/Detail
- **Print All** - Prints parameters, event log, and alarm log.
- **Print Parameters** - Prints the parameter list to a USB drive
- **Print Event Log** - Prints the event log to a USB drive
- **Print Alarm Log** - Prints the Alarm Log
- **Clear Event Log** - Deletes all entries in the Event Log
- **Clear Alarm Log** - Deletes all entries in the Alarm Log
- **Copy Log File** – Copies raw log file to USB drive.

System

Display Firmware - Displays CPU, I/O board, Model, Boot loader.

Language - Select Language

Set Clock - Set time, date and date format.

Memory - Current memory status.

Password - Sets the Setup Menu Password. Default password is 22222. Setting the password to 00000 disables password protection.

Restore Parameters - Restores all parameters back to factory defaults

Restore All - Restores Factory Defaults.

**WARNING: Only do a Restore All
when directed by a Maguire Technician.**

Update Firmware - Update VBD-150 Firmware. See page 71.

Temperature Setup

Units: Fahrenheit (°F) or Celsius (°C)

Display Precision: "Standard" displays temperature in whole degrees. "High" displays temperature in 10ths of a degree.

Energy Saver (OFF/ON): On enables Energy Saver Mode. Energy Saver Mode when enabled minimizes the amount of energy used to heat the pellets by shutting down the heater and blower when possible to conserve energy. When the heating hopper's outlet temperature has reached the temperature specified in the Energy Saver Setup (E.S. Temp), the heater and blower will shut down for the time period specified in Energy Saver Setup (E.S. Time) or until the cycle ends, which ever comes first.

E.S. Temp (ESM parameter): Default 125 degrees F.

E.S. Time (EST parameter): Default 30 minutes.

Ramp – OFF/PHT/ON: Temperature Ramping Control.

OFF – No temperature ramping occurs.

PHT – Temperature ramping (driven by the RMP parameter) occurs during the preheat cycle only.

ON – Temperature ramping (driven by the RMP parameter) occurs during the preheat cycle and all subsequent cycles.

Vacuum Setup

Vacuum Time (Tvac): Vacuum cycle time setpoint.

Pressure Set Point (Pset): Vacuum pressure setpoint.

Pressure Delta (Pdelt): Vacuum pressure deadband.

Display: ABS/DIFF Air pressure display, Absolute pressure (referenced from zero or perfect vacuum, differential pressure referenced from atmosphere.

Unit: Option to display mmHg (Millimeters of mercury) or inHg (inches of mercury)

Parameters

All Maguire VBD controllers operate according to certain internal PARAMETERS. Because customer requirements vary widely, we have made parameters accessible for change through the keypad. In most cases, these parameters will never need to be changed. Some parameters that are routinely adjusted values are adjustable from the main display. To access and edit the parameters, see **Changing Parameters** in this section:



IMPORTANT!

Changing parameters can have an impact on the Dryers performance. It is highly recommended that a supervisor change the default Program Mode password to protect the values. Prior to making any changes, make sure you understand what you are doing. If in doubt contact a Maguire Dryer Technician before making changes to your dryer.

Blower Parameters:

BDT	Blower Delay Time
BLF	VFD Low Limit
BHF	VFD High Limit
BDF	VFD Frequency
BZL	VFD Zero Level
BLA	VFD Level Adjustment
BHT	VFD Heat Throttle

Dispensing Parameters:

VCH	Vac. Chamber Hi Level
VCL	Vacuum Chamber Low Level
RHH	Ret. Hopper Hi Level
RHL	Retention Hopper Low Level
BLK	Bulk Density
VFR	Vacuum Chamber Fill Rate
VDR	Vacuum Chamber Dump Rate
VFT	Chamber Fill Time
VDT	Chamber Dump Time
FLA	Fill Lag Time
DLA	Dump Lag Time
VGD	Vacuum Gate Delay
VFA	Chamber Fill Adjust
HDD	Heating Hopper Dump Delay
VCT	Vacuum Chamber Dump Threshold
CDR	Chamber Dump Reties
RAL	Residence Alarm
BCH	Batch Size
LTP	Loader Trip Point
LTC	Loader Thruput Cutoff
HHV	Heating Hopper Volume (optional)
HHU	Heating Hopper High Level (optional)
HLA	Heating Hopper Level Alarm (optional)

Heater Parameters:

PTS	Preheat Temperature Setting
PHT	Preheat Time
PTD	Preheat Target Delta
RTS	Run Temperature Set-Point
PT1	PD Loop Proportional
DT1	PD Loop Derivative
UT1	PD Loop Update Time
OT1	Heat1 Over-Target Alarm
NH1	Heat1 No Heat Alarm
SO1	Heat1 Set-Point Off. Percent
MP1	Heat1 Max Percent
MAX	Max Temp Set-Point
ESM	Energy Saver Mode
EST	Energy Saver Time
RMP	Temperature Ramp Settings
CTM	Cool-Down Temperature
CTR	Cool-Down Timer

Load Cell Parameters:

KDF	Loadcell Stable Wt.
LST	Load Cell Stable Time
LCZ	Loadcell Zero
WST	Weight Settle Time
LZ1	Loadcell 1 Zero
LZ2	Loadcell 2 Zero

Vacuum Parameters:

VTs	Vacuum Time Setting
VPL	Vacuum Pressure Low
VPD	Vacuum Pressure Delta
VSO	Vacuum Shutdown Offset
LVT	Low Vacuum Timeout
NVT	No Vacuum Timeout
VPT	Chamber Purge Timer
VPI	Chamber Purge Interval
ATM	Atmospheric Pressure

System Parameters:

ELT	Event Logging Time
-----	--------------------

Parameter Units

TIMES	Are expressed as full seconds or full minutes.
PERCENTS	are expressed in full percents.
TEMPERATURES	are expressed in full degrees (Fahrenheit or Celsius).
TERM	used to calculate a value.

3-letter Acronym	Parameter title (units) – default parameter value Parameter description
-------------------------	---

Blower Parameters

BDT	Blower Delay Time (Time in seconds) – 00402 The first two digits are the delay in seconds between powering the blower and powering the heating hopper heater. The last three digits are the delay in seconds between powering down the blower and powering down the heating hopper heater.
BLF	VFD Low Limit (Hz) – 00025 <i>(visible when equipped with an optional VFD)</i> The minimum VFD frequency, in Hz, that the blower may be set to from the Blower Setup menu. The minimum settable value for this parameter is 00025.
BHF	VFD High Limit (Hz) – 00060 <i>(visible when equipped with an optional VFD)</i> The maximum VFD frequency, in Hz, that the blower may be set to from the Blower Setup menu. The maximum settable value for this parameter is 00060.
BDF	VFD Frequency (Hz) – 00060 <i>(visible when equipped with an optional VFD)</i> The frequency, in Hz, that the VFD will run the blower motor with. The blower RPMs, as well as the airflow, are directly proportional to this frequency.
BZL	VFD Zero Level (%) – 00045 <i>(visible when equipped with an optional VFD)</i> The heating hopper level, expressed as a percentage, that triggers the VFD to reduce speed to the BLA setting.
BLA	VFD Level Adjustment (Hz) – 00025 <i>(visible when equipped with an optional VFD)</i> The frequency, in Hz, that the blower will run at if the heating hopper level is at or below the BZL level. This reduced blower speed eliminates churning when the heating hopper material level is low.
BHT	VFD Heat Throttle (%) – 00100 <i>(visible when equipped with an optional VFD)</i> Percentage of adjustment to the heater's on-time at the point when the material has finished exiting the heating hopper and the blower starts. A reduced heater on-time percentage (from 100%) reduces the heat exposure to the new material entering the heat hopper. Activated when the level sensor is below BZL (parameter). Setting the first digit to a 1 overrides the percent adjustment and effectively turns off the heater when material is below the BZL threshold.

Dispensing Parameters

- VCH Vacuum Chamber High Level – weight - 00035**
Amount of material dispensed into the Vacuum Chamber from the heating hopper. Also known as the “Fill Weight”.
- VCL Vacuum Chamber Low Level – weight - 00005**
Two conditions are triggered by VCL.
When in Clean Out Mode, the Vacuum Chamber fill valve will be open when the amount of material in the Vacuum Chamber is at or below this weight. When starting in Auto Cycle, the “material in Vacuum Chamber” warning will be triggered when the amount of material is at or above this level.
- RHH Retention Hopper High Level – weight - 00035**
Amount of material (the high level) dispensed into the Retention Hopper from the Vacuum Chamber.
- RHL Retention Hopper Low Level – weight - 00005**
Three conditions are triggered by RHL.
When in Clean Out Mode, the Vacuum Chamber dump valve will be open when the amount of material in the Retention Hopper is at or below this weight. When starting an Auto Cycle, the “material in Retention Hopper” warning will be triggered when the amount of material is at or above this level. When in Auto Cycle, the amount of material in the Retention Hopper must be at or below this level in order for the Vacuum Chamber to dump.
- BLK Bulk Density - Bulk density of the material in either pounds per cubic foot or kilograms per liter (depending on the weigh unit of measurement in Loadcell Setup). Used for overfill prevention.**
- VFR Vacuum Chamber Fill Rate – grams/second – 00580**
Learned fill rate of the Vacuum Chamber in seconds. Used to calculate a precise Vacuum Chamber fill time.
- VDR Vacuum Chamber Dump Rate – grams/second – 00580**
Learned dump rate of the Vacuum Chamber in seconds. Used to calculate a precise Vacuum Chamber dump time.
- VFT Chamber Fill Time (Time in seconds) – 00035**
The time in seconds that the Vacuum Chamber fill valve will be open assuming that the Vacuum Chamber High Level (VTH) is not reached first.
- VDT Chamber Dump Time - (Time in seconds) – 00035**
The time in seconds that the Vacuum Chamber dump valve will be open assuming that the Retention Hopper High Level (RTH) is not reached first.
- FLA Fill Lag Time (ms) – 00175**
The time, in milliseconds, that is added to every vacuum chamber fill valve opening operation. This compensates for the fill valve opening delay caused by the inherent lag in any mechanical device.

DLA Dump Lag Time (ms) – 00100

The time, in milliseconds, that is added to every vacuum chamber dump valve opening operation. This compensates for the dump valve opening delay caused by the inherent lag in any mechanical device.

VGD Vacuum Gate Delay (Time in seconds) – 00303

Format: XXXYY - XXX = lower vacuum gate, YY = upper vacuum gate
The amount of time in seconds after a vacuum gates opens before the vacuum chamber fill or dump valve can open. (Opening of Vacuum Chamber fill valve or dump valve).

VFA Vacuum Fill Adjust (Retries, percent) – 00310

Two part parameter. The first three digits are the number of retries to fill the Vacuum Chamber (default 3 retries). Last two digits are the minimum allowable percent under the targeted maximum fill weight of the Vacuum Chamber (VCH parameter). After the third failed retry the “Low Batch” alarm is generated while the VBD continues to retry.

HDD Heat Hopper Dump Delay - Seconds - 0004

Delay in seconds between the heating system shutdown and material dump from the heating hopper to the Vacuum Chamber. This delay allows time for the blower to stop.

VCT Vacuum Dump Threshold – grams/second – 00115

During a Vacuum Chamber dump (into the Retention Hopper), the material flow rate is constantly calculated. When the flow rate reaches VCT, indicating that the chamber is empty, the Vacuum Chamber dump valve is closed.

CDR Chamber Dump Retries (%/Retries) – 05003

Controls the Vacuum Chamber Dump Alarm.

Format: XXXYY - XXX = percentage, YY = number of retries

When the vacuum chamber dumps material into the retention hopper, if less than 50% of the material that should have dropped is detected in the retention hopper, a dump retry will occur. After 3 failed retries a VC DUMP alarm will trigger.

RAL Residence Alarm – pounds / minutes - 05120

When the Residence Alarm is enabled, this parameter will determine when a residence alarm will occur. This parameter contains two variables. The first two digits are weight (in lbs or kgs) and the last three digits are minutes. For example, if after 120 minutes there are less than 5 lbs (or kgs) of material removed from the retention hopper, the Residence Alarm will sound (if enabled, see the Alarm Setup menu).

BCH Batch Mode – weight (lbs/kgs) – 00000

The amount of material in pounds or kilograms that will be dried during a batch run.

LTP Loader Trip Point – weight (1/10 pound or kilogram) – 00005

If loader 2 (downstream loader) is enabled, and the amount of material in the retention hopper is at or above this weight, the loader 2 output turns on.

LTC Loader Throughput Cutoff – weight/minute – 00005

When loader 2 (downstream loader) mode is set to “THRUPUT”, and the amount of material in the Retention Hopper is at or below the LTP parameter, and the throughput is below this parameter (LTC), turn the loader 2 output off.

HHV Heating Hopper Volume – 10ths of cubic feet or 10ths of liter.

The amount of material that the heating hopper can hold taking into account dead space at the top and how far the loader hangs into the heating hopper. This parameter is used to calculate the beginning of an auto shutdown when loader #1 is set to auto. Installation of an optional heating hopper extension would necessitate changing this parameter.

HHU Heating Hopper High Level (%) – 00095

The level, expressed as a percentage, that the heating hopper will be filled to when Loader #1 is set to AUTO (and the heating hopper loader signal cable is wired in series to the Loader #1 control relay). Note that the deadband is 5%.

HLA Heating Hopper Low Level Alarm (%) – 00050

The level, expressed as a percentage that the Heating Hopper Level Alarm will trigger if enabled in the Alarm Setup menu. Any heating hopper level at or below this level will trigger the alarm.

Heater Parameters**PTS Heat1 Temperature Set-Point (Temperature) – 00150**

Heating hopper air inlet temperature setting in F° or C°

PHT Preheat Time – Time in Minutes – 00030

Time in Minutes that the material in the heating hopper is heated following a cold start before normal Run Dryer sequence starts.

PTD Preheat Target Delta – Degrees – 00030

When preheat mode is set to AUTO (not time), the preheat cycle will end when the temperature of the air exiting the heating hopper (T2) is within PTD degrees of the air entering the heating hopper (T1).

RTS Run Temperature Setting – Degrees – 00150

The heating hopper air inlet temperature setting in °F or °C. This is the temperature that the resin is heated to before the vacuum cycle, and is shown as “T1s” on the status screen.

PT1 Heat1 Proportional – Term – 00040

This parameter is used to make adjustments to the heating hopper heat output. Changes to this parameter should not be made unless directed by a Maguire Technician. The proportional term (or “gain”) makes a change to the heating hopper heater output that is proportional to the current error value difference between set-point and actual temperature.

DT1 Heat1 Derivative – Term – 00015

This parameter is used to make adjustments to the heating hopper heat output. Changes to this parameter should not be made unless directed by a Maguire Technician. The rate of change of the process error is calculated by determining the slope of the error over time (i.e., its first derivative with respect to time) and multiplying this rate of change by the derivative gain.

UT1 Heat1 Update Time – Time – 00415

This parameter has two parts. The first three digits is the amount of time, in seconds, between heat control updates if the heating hopper inlet temperature, T1a, is ABOVE setpoint. The last two digits is the amount of time, in seconds, between heat control updates if the heating hopper inlet temperature, T1a, is BELOW setpoint.

OT1 Heat1 Over-Temp Alarm – Percent – 06006

The first three digits is the time in seconds by which the actual temperature must be above the set-point temperature of the heating hopper heater by the value in degrees represented in the 4th and 5th digits of this parameter before an over-temp alarm condition occurs.

NH1 Heat Hopper No Heat Alarm – Seconds – 120

This is the maximum time limit, in seconds, after the heat cycle begins, during which one of the following two conditions must be detected: Either the temperature must climb 20 degrees, or the temperature must move at least 20 percent toward the target temperature. If neither condition is met the “NO HEAT” alarm will sound. Such an occurrence would signal a failure of either the heater or the blower. This parameter protects the heater from burn out in the event the blower fails or airflow is blocked.

SO1 Heat Hopper Set-Point Offset – degrees – 03002

Heating hopper set-point temperature offset. Used for heat control. Offset from the target in degrees. First 3 digits are the number of seconds to hold the offset setpoint temperature. 4th and 5th digits are the number of degrees below the target setpoint.

MP1 Heat Hopper Maximum Percent – Percent – 00100

Limits the duty cycle of the heater.

MAX Max Temp Set-Point (Temperature) – 00350

The maximum allowable temperature in whole degrees.

ESM Energy Saver Mode – temperature – 000125

When Energy Saver Mode is enabled, and the temperature of the air exiting the heating hopper is at or above this level and the Energy Saver Time has elapsed, trigger Energy Saver Mode.

EST Energy Saver Time – minutes – 00030

When Energy Saver Mode is enabled and Energy Saver Mode has been activated, the Energy Saver Time is the time that will elapse before Energy Saver Mode is deactivated and normal Heating Hopper operation resumes.

RMP Temperature Ramp Settings (Increments/Minute/Degrees) – 52036

Format: XYYZZ - X = number of increments, YY = duration of ramp in minutes, ZZ = temperature delta

For example, with RMP set to 52020: When temperature ramping is turned on, over the course of 20 minutes, a 20 degree C ramp will occur, in 5 increments of 4 degrees C.

CTM Cool-Down Temperature – Degrees - 00120 Fahrenheit or 00050 Celsius

Cool-down target temperature for the heat hopper during the Planned Shutdown.

CTR Cool-Down Timer – Minutes - 00030

Targeted elapsed time to cool-down target temperature (CTM parameter).

Load Cell Parameters**KDF Loadcell Stable Weight – counts – 00006**

Maximum allowable fluctuation in raw loadcell counts to produce a stable weight reading.

LST Loadcell Stable Time – milliseconds – 00100

Duration in milliseconds that raw loadcell counts must remain within KDF to produce a stable loadcell reading.

LCZ Loadcell Zero – counts – 01000

Minimal allowable counts when zeroing load cells.

WST Weight Settle Time – seconds – 00005

Delay time in seconds after the vacuum chamber fill valve closes to allow material to settle and the dryer to acquire an accurate weigh reading.

LZ1 Load Cell 1 Zero – counts – 00000

Factory set reference point in counts for retention hopper load cell. This parameter should not be changed unless directed by a Maguire technician or if load cells are replaced. If load cells are replaced, instructions will be provided. When this parameter is set to zero (00000), restriction on loadcell calibration is disabled.

LZ2 Load Cell 2 Zero – counts – 00000

Factory set reference point in counts for vacuum chamber load cell. This parameter should not be changed unless directed by a Maguire technician or if load cells are replaced. If load cells are replaced, instructions will be provided. When this parameter is set to zero (00000), restriction on loadcell calibration is disabled.

Vacuum Parameters

- VTs Vacuum Time Setting (Time in minutes) – 00020**
The length of a vacuum cycle in minutes.
- VPL Vacuum Pressure Low Setpoint (mm Hg abs.) – 00080**
The pressure (absolute mm, absolute inches, differential mm, differential inches) at which the vacuum system will attempt to attain before stopping and holding said pressure. Default shown is absolute mm.
- VPD Vacuum Pressure Delta (mm of mercury) – 05020**
This parameter has two parts. The first two digits are the amount of time in seconds that the vacuum generator will run after reaching the VPL setpoint. The last three digits are the pressure difference above VPL at which the vacuum generator turns back on. This value is the mm of mercury above VPL.
- VSO Vacuum Shutdown Offset – Seconds – 00015**
Amount of time in seconds before the Vacuum Timer Setting (VTS) expires at which time Vacuum Chamber equalization will commence.
- LVT Low Vacuum Timeout – Seconds – 00120**
Time in seconds that the vacuum generator will run before a LOW VACUUM ALARM is triggered. Vacuum generator continues to attempt to pull a target vacuum pressure after alarm sounds.
- NVT No Vacuum Timeout (retries, time in seconds) – 00345**
The first three digits are the number of retries that the vacuum gates will cycle if vacuum is not achieved. During a retry, the vacuum gates are cycled open and closed. The last two digits are the amount of time in seconds for the vacuum chamber pressure to reach 200mm of mercury below atmosphere and not trigger a vacuum retry.
- VPT Vacuum Purge Timer – seconds – 00005**
During equalization of the Vacuum Chamber, this is additional time in seconds beyond calculated atmospheric pressure, to allow for true pressure equalization.
- VPI Vessel Purge Interval – seconds/seconds – 15180**
Frequency and duration of dry air purge of the Vacuum Chamber. Default is a frequency of 3 minutes (180 seconds) for a purge duration of 15 second.
- ATM Atmospheric Pressure – mm Hg (absolute) – 00760**
The measured ambient atmospheric pressure. This parameter is updated once per cycle. Do not change this parameter.

System Parameters

- ELT Event Logging Time (Time in seconds) – 00060**
Time in seconds between logging data (when logging is enabled).

Changing Parameters



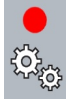
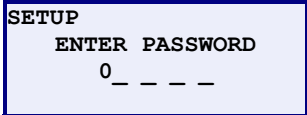
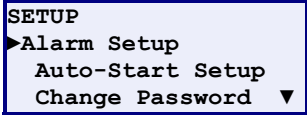
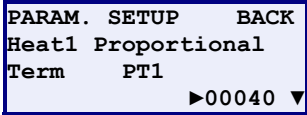
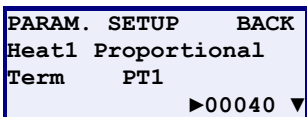
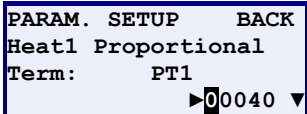
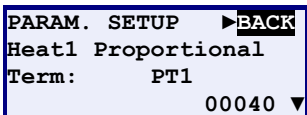
IMPORTANT!

Changing parameters can have an impact on the Dryers performance. It is highly recommended that a supervisor change the default Program Mode password to protect the parameter values. Prior to making any parameter changes, make sure you understand what you are doing.

To access the internal parameters you must enter into Setup Mode.

The Setup Mode default password is: 2222

To change a PARAMETER, the machine must be stopped.

Press:	 	to toggle the Mode Selection to Setup Mode (Gears Icon).	Display will show:	
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	the  button several times to move down to the option "Change Parameters". Press ENTER to select Change Parameters.		Display will show:	
Press:	the  button to move through the parameters. Press ENTER to select a parameter.		Display will show:	
Press:	When the parameter is selected, the left most digit is highlighted. Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	When parameter editing is complete, press the  button to move through the parameters to the bottom of the list the to BACK. With BACK selected, press ENTER to exit parameters. Pressing the red power button once will also back out of parameter editing.		Display will show:	

Batch Mode

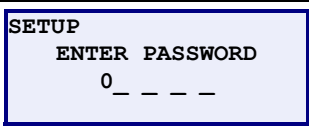
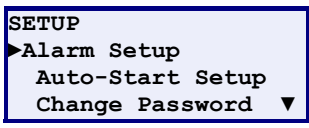
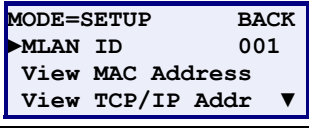
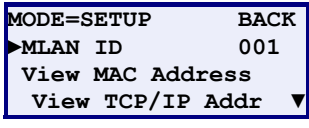
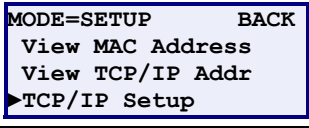
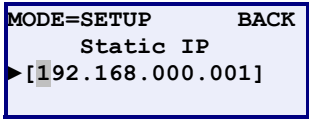
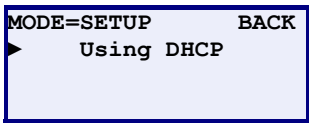
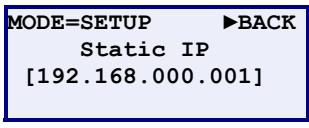
Batch Mode, when ON (to turn on see Display Setup under the Setup menu on page 32), enables the dryer to dry a predetermined amount of material and then automatically stop and display a message indicating the batch is complete.

To enable and run the dryer in Batch Mode follow these steps:

Press:	 	to toggle the Mode Selection to Setup Mode (Gears Icon).	Display will show:	SETUP ENTER PASSWORD 0 _ _ _ _
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	SETUP ▶Alarm Setup Auto-Start Setup Change Password ▼
Press:	the  button several times to move down to the option “Display Setup” . Press ENTER to select Display Setup .		Display will show:	DISPLAY SETUP BACK ▶Batch Mode: OFF Auto Shutdown: ON I/O Status ON▼
Press:	the  button once to select Batch Mode. Press ENTER to toggle Batch Mode to ON.		Display will show:	DISPLAY SETUP BACK ▶Batch Mode: ON Auto Shutdown: ON I/O Status ON▼
Press:	When complete, navigate to BACK and press ENTER to exit the communication setup.		Display will show:	SETUP Convey Setup ▶Display Setup Dry Purge Setup ▼
Press:		To return to the home screen. This displays Run Dryer (Batch) on the home screen.		
To start the Dryer in Batch Mode:				
Press:	the  button to move to the home screen selection to Run Dryer (Batch).		Display will show:	=== SELECT MODE === Run Dryer ▶Run Dryer (Batch) Clean Out ▼
Press:	ENTER to run the dryer in Batch Mode.		Display will show:	BATCH RUN BACK ▶Batch Weight: 0 (lbs.) ===== NEXT
Press:	ENTER to select the batch weight field. Enter the weight (lbs or kgs) to dry after which the dryer will automatically stop. Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	BATCH RUN BACK ▶Batch Weight: 0 (lbs.) ===== NEXT
Press:	When complete use the  button to navigate down to NEXT, the press ENTER. From this screen the Setpoint Temperature, Preheat Time and Vacuum Time can be adjusted by using the   buttons. When complete, select START and press ENTER to start the drying processes in Batch Mode. When the Batch Mode has completed the specified weight, the dryer will automatically stop and display “BATCH SHUTDOWN”.		Display will show:	Setpoint Temp.:150F Preheat Time: 35m Vacuum Time: 20m =====▶START

Communications Setup

VBD-150 communications enabled software communication over Ethernet using the MLAN Protocol. For more information about the MLAN Protocol and the VBD-150 Dryer see the MLAN Protocol manual, available on the Maguire Products Inc website.

Press:	 	to toggle the Mode Selection to the Gears Icon.	Display will show:	
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	the  button several times to move down to the option “Communications” . Press ENTER to select Communications .		Display will show:	
MLAN communication over Ethernet requires an ID number between 001 and 255 and an IP address including a valid subnet and gateway (if applicable).				
Press:	the  button to move to the MLAN ID. By default the ID is 001. If you wish to change the ID number Press ENTER to select the MLAN ID. When the MLAN ID is selected, the left most digit is highlighted. Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	When ID editing is complete, press the  button to move to the bottom of the list the to TCP/IP Setup.		Display will show:	
Press:	ENTER to edit the IP address, subnet, and gateway. By default the VBD-150 is set to a static IP Address of 192.168.000.001 with a subnet of 255.255.255.0 and a default gateway of 192.168.000.001. Press the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish. After the IP address, Network Mask and Default Gateway will show and can be edited the same way.		Display will show:	
Press:	ENTER with Static IP selected will toggle to DHCP. Otherwise to specify a static IP, press the  button to move to the IP address.		Display will show:	
Press:	When complete, navigate to BACK and press ENTER to exit the communication setup.		Display will show:	

Maintenance

Drain and purge Air Filter / Regulator

The purpose of the air filter is to remove moisture and contaminants from the air supply and protect the air components of the Dryer. The air filter must be periodically purged of moisture.



IMPORTANT!

Do not supply Dryer with a lubricated air supply. Damage to Dryer may result. Use only a clean, dry, oil-free air supply.



Air Pressure Adjustments

Air Pressure



Air pressure affects the ability to draw a high vacuum. We recommend a pressure setting of **85 PSI while the dryer is resting idle**. Air is used when the **vacuum generator** is running so observe the PSI while the Dryer is drawing a vacuum. The gauge should continue to read this setting even when the vacuum unit is on. If it does not maintain pressure your supply line is not sized properly.

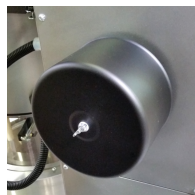


IMPORTANT!

Do not supply Dryer with a lubricated air supply. Damage to Dryer may result. Use only a clean, dry, oil-free air supply.

Replacing the Air Filter

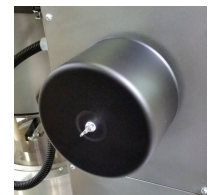
The purpose of the air filter is to remove contaminants from the ambient air. The air filter must be periodically replaced.



Remove wing nut and slide off filter housing and filter.



Replace with new filter.



Reinstall housing and wing nut.

Loadcell Calibration

Zero Weight Calibration

BE SURE The Vacuum Chamber air lines are connected.
 BE SURE The Air supply is on.
 BE SURE The Vacuum Chamber and Retention Hopper are EMPTY.
 BE SURE The Vacuum Chamber and Retention Hopper are hanging / resting freely on the load cells.
 BE SURE Clear guard is attached up onto the bottom of Vacuum Chamber.

LOAD CELL ZERO CALIBRATION

The sequence is as follows:

Press:	 	to toggle the Mode Selection to Setup Mode (Gears Icon) .	Display will show:	MODE=SETUP ENTER PASSWORD 0 _ _ _ _
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	MODE=SETUP ▶ Alarm Setup Blower Setup Change Password ▼
Press:	the  button several times to move down to the option " Loadcell Setup ". Press ENTER to select.		Display will show:	LOADCELL SETUP ▶BACK VC LC: + 0 RH LC: + 0 Unit: Pounds▼
Loadcell Setup displays: ▶ VC LC - Current reading in either pounds or kilograms of the Vacuum Chamber loadcell. ▶ RH LC - Current reading in either pounds or kilograms of the Retention Hopper loadcell. ▶ Unit - Selects units pounds or kilograms. ▶ Precision - Standard, whole pounds or kilograms. High tenths of pounds or kilograms. ▶ Calibrate Loadcell - See calibration routine below. ▶ LC1 (RH) - Raw counts of the Retention Hopper load cell. ▶ LC2 (VC) - Raw counts of the Vacuum Chamber load cell.				
Calibrate Loadcell - VC is Vacuum Chamber, RH is Retention Hopper.				
Press:	the  button to move to Calibrate Loadcell . Press ENTER to select.		Display will show:	LOADCELL SETUP ▶BACK VC ZERO CALIB. VC FULL CALIB. RH ZERO CALIB. RH FULL CALIB. Restore Defaults ▼
Press:	the   buttons to move to VC ZERO CALIB. (zero calibration of the Vacuum Chamber) BE SURE the Vacuum Chamber is empty. Press ENTER to advance to Zero Calibration			LOADCELL SETUP BACK ▶VC ZERO CALIB. VC FULL CALIB. RH ZERO CALIB. RH FULL CALIB. Restore Defaults ▼
Press:	the  button to move to Continue .			IF CALIBRATION IS DONE INCORRECTLY, IT MAY DISABLE SCALE BACK ▶Continue
Press:	ENTER to start the ZERO Calibration.			LOADCELL ZERO == Wait ==
Press:	the   buttons to move to RH ZERO CALIB (zero calibration of the Retention Hopper) BE SURE the Retention Hopper is empty.			LOADCELL SETUP BACK VC ZERO CALIB. VC FULL CALIB. ▶RH ZERO CALIB.

			RH FULL CALIB. Restore Defaults ▼
Press:	the ▽ button to move to Continue .		IF CALIBRATION IS DONE INCORRECTLY, IT MAY DISABLE SCALE BACK ►Continue
Press:	ENTER to start the ZERO Calibration.		LOADCELL ZERO --- Wait ---

The ZERO point of the load cells is now set properly. FULL weight calibration may also be done at this time, however, it probably is NOT NECESSARY. When load cell readings shift due to rough handling, the entire range of readings from ZERO to FULL shift together. The ZERO weight calibration routine resets the full range of the cells and, therefore, corrects FULL weight readings as well.

Full Weight Calibration

When SETTING FULL WEIGHT, BE SURE you know the exact weight (in grams or pounds) that you are adding to the chamber. Place this weight in the chamber.

Enter the EXACT weight that you have placed in the chamber. Weigh units are in tenths of a pound or tenths of a kilogram depending on the weigh units set in LOAD Cell Setup menu. The weight should be close to 35.0 lbs or 16.0 kilograms.

After FULL weight calibration, if the display says (BAD CELL), the weight you are using does not match the weight you entered, the chamber is not free to move, OR the load cells are bad.

Full Weight Calibrations - Full weight calibration will be done on both the Vacuum Chamber and Retention Hopper. It is recommended to use a known weight of material for the Full Calibration. Place approximately 35 lb of material into the Heating Hopper. Using Manual Operations, Operation Outputs, Vac Cham Fill, dispense the material from the Heating Hopper to the Vacuum Chamber prior to entering the Full Calibration Routine.

If material totals are being observed loadcell full weigh calibration is recommended periodically (approximately every six months).

Press:	 	to toggle the Mode Selection to the Gears Icon.	Display will show:	MODE=SETUP ENTER PASSWORD 0 _ _ _ _
Enter:	the 5-digit password. (Default password is 22222). Use the ▲ ▽ buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	MODE=SETUP ► Alarm Setup Blower Setup Change Password ▼
Press:	the ▽ button several times to move down to the option " Loadcell Setup ". Press ENTER to select.		Display will show:	LOADCELL SETUP ►BACK VC LC: - 0 RH LC: + 0 Unit: Pounds▼

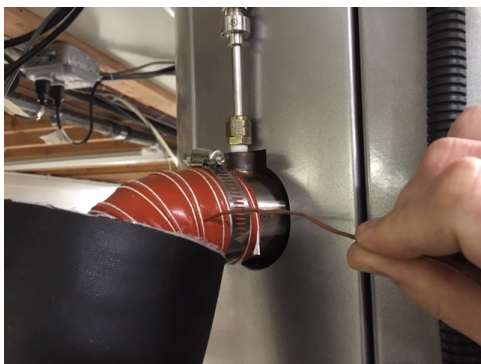
Press:	the ▽ button to move to Calibrate Loadcell. Press ENTER to select.	Display will show:	LOADCELL SETUP ►BACK VC ZERO CALIB. VC FULL CALIB. RH ZERO CALIB. RH FULL CALIB. Restore Defaults ▼
Press:	Use the ▽ button to move down to VC FULL CALIB. to do the Full Weight calibration of the Vacuum Chamber.		
Press:	ENTER to start the FULL Calibration. Press the ▽ button to move to Continue .	Display will show:	LOADCELL FULL Enter Weight: 0_._Lb
Press:	Use the ▲ ▽ buttons to set the weight value. Press ENTER to move between digits. ENTER to start the FULL Calibration.	Display will show:	LOADCELL ZERO -- Wait --
Press:	BACK multiple times to return top level menu. It is now necessary to move the material from the Vacuum Chamber down to the Retention Hopper. Using <u>Manual Operations</u> , <u>Operation Outputs</u> , <u>Ret Hop Fill</u> , dispense the material from the Vacuum Chamber to the Retention Hopper. Then enter the Full Calibration Routine once again.		
Press:	ENTER to start the FULL Calibration. Press the ▽ button to move to Continue .	Display will show:	LOADCELL FULL Enter Weight: 0_._Lb
Press:	Use the ▲ ▽ buttons to set the weight value. Press ENTER to move between digits. ENTER to start the FULL Calibration.	Display will show:	LOADCELL ZERO -- Wait --

Temperature and Pressure Verification

Should it be deemed necessary to verify the VBD's T1a RTD (heating hopper air inlet temperature measurement) and/or pressure sensor (vacuum level reading), this page outlines how to accomplish this. We would first like to state that "perfect" accuracy of both devices is not necessary for the machine to run properly. The manufacturer's advertised accuracy of the RTD sensor used in the VBD is to within 1/10th of a degree Celsius and, by the nature of the design, will either work or not work. The RTD should never vary in its accuracy nor can it be calibrated. With that being said, if the temperature were to vary +/- 3 degrees Celsius, most materials will complete the drying process within acceptable tolerance levels. This is not to say that the RTD will vary in the temperature reading, rather most materials dry fine within this tolerance. The pressure sensor, used for vacuum level readings, is accurate to within ± 2 mm Hg. The pressure sensor cannot be calibrated.

T1a RTD Sensor Verification:

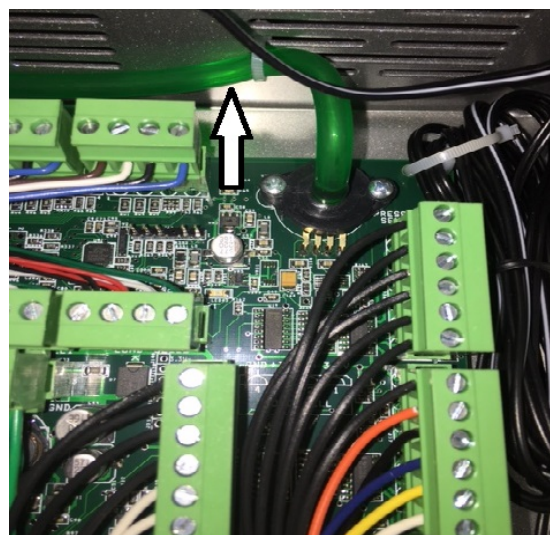
The T1a RTD sensor is located about 1/3rd the way up the heating hopper on the hot air inlet tube. Insert a handheld reference thermocouple or RTD through the red silicone hose (make a very small slit with a razor blade to allow for this) as close to the VBD's T1A RTD as possible.



Observe the temperature on the top red VBD display screen and compare this to your handheld reference temperature sensor. Note: Ambient air temperature shown in these pictures.

Pressure Sensor Verification:

The absolute pressure sensor (vacuum level reading) is located in the VBD electronics cabinet. Sensor accuracy can be verified using two methods. Method one: set the VBD to display in millimeters of mercury (default) and compare the reading on the display to a hand-held barometer device located next to the machine. Method two: tap into the 1/4" diameter green pressure sensor air line (see arrow in picture at right) with a barometer device. Measure the barometric pressure within the line. Compare that measurement to what is displayed on the VBD display.



Clean Out Procedure

Clean Out dumps the Heating Hopper or the Vacuum Chamber or both at the same time. The following explains how to perform these procedures.



HEATING HOPPER HOT SURFACES:

As with all dryers, there are **HOT SURFACES** to avoid. Temperatures can reach 350°F, (180°C). Typically these surfaces are not at dangerous temperatures, however all hot surfaces should be avoided.



Do Not Perform a Clean Out Unless VBD-150 Dryer is First Properly Shut Down.

For proper shutdown procedure, see Startup and Operation on page 26.

During the Clean Out, keep hands and tools clear of all valves. DO NOT reach into machine during Clean Out.

Using the Optional Heating Hopper Dump Chute (Does not come standard)

For easy cleanout, material in the Heating Hopper can be evacuated using the Heating Hopper Dump Chute, if equipped. The Heating Hopper has a front side door for access to the full internal height of the Heating Hopper. The Heating Hopper is non-removable. Prior to opening the front access door, removal of all material is recommended. To evacuate material from the Heating Hopper using the optional Heating Hopper Dump Chute, use the following procedure.

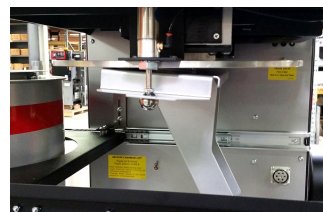
Note: use of the chute is optional. Material can be dumped into the vacuum chamber, then into the retention hopper and conveyed away from the VTA at the base of the dryer.

Lower the Retention Hopper Sealing Collar located at the bottom of the Vacuum Chamber. The Sealing Collar is attached to the base of the Vacuum Chamber with magnets. Detach the Sealing Collar by pulling down.	
Lower the Vacuum Chamber by switching down the Vacuum Chamber Lift Switch.	
Lift the Slider Lock located to the left of the Vacuum Chamber. While holding the Slider Lock up, pull the Vacuum Chamber slider out. Release the Slider Lock, which will rest on top of the opened slider.	

Slide out the Vacuum Chamber.

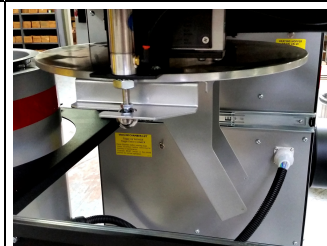
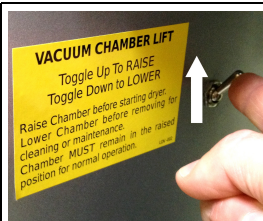


Install the Heating Hopper Dump Chute onto the Vacuum Chamber lift cylinders. Orient the Heating Hopper Dump Chute so that material will exit out the back of the dryer. Dump Chute to direct material to a holding vessel.

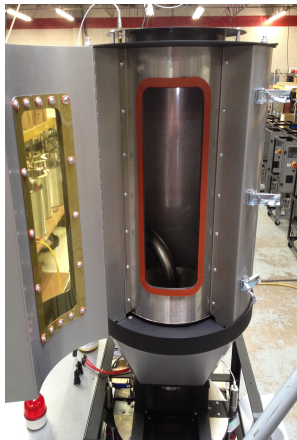


Pinch Hazard - Keep fingers clear of Heating Hopper Dump Chute when the Vacuum Chamber Lift Switch is flipped up.

Raise the Heating Hopper Cleanout Funnel by switching up the Vacuum Chamber Lift Switch.



Emptying the Heating Hopper

Press:	Use the ▽ button to move down to Clean Out.	Display will show:	===== SELECT MODE ===== Run Dryer ►Clean Out Manual Operations
Press:	ENTER to enter the Clean Out screen. In this screen both the Dump Heating Hopper menu item and the Heating Hopper Drain Valve button (located near the upper rear of the Vacuum Chamber area) can be used to empty the Heating Hopper. To use the menu continue to next step.	Display will show:	CLEAN BACK ►Dump Heating Hopper Dump Vacuum Chamber Dump All
Press:	ENTER to select Dump Heating Hopper and start the Clean Out.	Display will show:	CLEAN BACK Dumping Heat Hopper Press ENTER to Quit
To use the Heating Hopper Drain Valve button continue to next step.			
Press:	The Heating Hopper Drain Valve button. While in the Clean Out screen, press the Heating Hopper Drain Valve button once to open the valve. Press the button again to close the valve.		
Press:	ENTER when clean out is completed.	Display will show:	Exiting Clean Out -- Wait --
The Heating Hopper can now be opened and cleaned.			

Emptying the Vacuum Chamber

While the Vacuum Chamber is extended out, the Vacuum Chamber dump valve can be opened to dispense the material into a container using the following procedure.

IMPORTANT: During the Clean Out, keep hands and tools clear of all valves. **DO NOT** reach into machine during Clean Out.

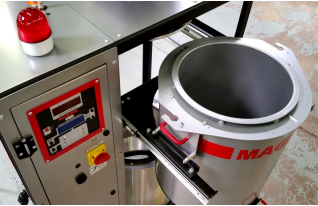
Press:	Use the ▽ button to move down to Clean Out.	Display will show:	==== SELECT MODE ==== Run Dryer ►Clean Out Manual Operations
Press:	ENTER to enter the Clean Out screen.	Display will show:	CLEAN BACK Dump Heating Hopper ►Dump Vacuum Chamber Dump All
Press:	Use the ▽ button to move down to "Dump Vacuum Chamber".	Display will show:	CLEAN BACK Dump Heating Hopper ►Dump Vacuum Chamber Dump All
Press:	ENTER to empty the Vacuum Chamber.	Display will show:	CLEAN ►BACK Dumping Vacuum Chamber Press ENTER to Quit
Press:	ENTER when clean out is completed.	Display will show:	Exiting Clean Out -- Wait --

Clean Out / Dump All – Dump All opens all valves allowing material to flow freely through the dryer. Material in the Heating Hopper will pass into the Vacuum Chamber and then pass into the Retention Hopper. In this mode, it is possible to empty the entire dryer using a conveying system pulling from the material outlet at the base of the dryer.

IMPORTANT: During the Clean Out, keep hands and tools clear of all valves. **DO NOT** reach into machine during Clean Out.

Press:	Use the ▽ button to move down to Clean Out.	Display will show:	==== SELECT MODE ==== Run Dryer ►Clean Out Manual Operations
Press:	ENTER to enter the Clean Out screen.	Display will show:	CLEAN BACK ►Dump Heating Hopper Dump Vacuum Chamber Dump All
Press:	Use the ▽ button to move down to "Dump All".	Display will show:	CLEAN BACK Dump Heating Hopper Dump Vacuum Chamber ►Dump All
Press:	ENTER to start Clean Out.	Display will show:	CLEAN ►BACK Dumping All Press ENTER to Quit
Press:	ENTER when clean out is completed.	Display will show:	Exiting Clean Out -- Wait --

Servicing / Removing the Vacuum Chamber

Turn OFF Main Power	 A close-up of a red emergency stop button with a yellow ring. The button is labeled 'MAIN POWER' and 'ON I'. The red handle is in the 'OFF' position, pointing downwards.
Lower the Vacuum Chamber by switching down the Vacuum Chamber Lift Switch.	 A close-up of a yellow label on a metal panel that reads 'VACUUM CHAMBER LIFT'. A finger is pointing to a switch on the panel.
Turn OFF Air Supply on Dryer	 Two images: on the left, a close-up of an air supply valve with a red handle; on the right, the same valve with a white arrow pointing to the red handle, indicating it should be turned to the 'OFF' position.
Disconnect Air Lines	 A close-up of a hand pulling a black air line connector out of a metal fitting. A white arrow indicates the direction of removal.
Lower the Retention Hopper sealing collar located at the bottom of the Vacuum Chamber. The sealing collar is attached to the base of the Vacuum Chamber with magnets.	 A close-up of a hand pulling a red handle on a metal base. A white arrow points downwards, indicating the direction of movement.
Lift the Slider Lock located to the left of the Vacuum Chamber. While holding the Slider Lock up, pull the Vacuum Chamber slider out. Release the Slider Lock, which will rest on top of the opened slider.	 A close-up of a hand pulling a metal slider out of a frame. A white arrow points upwards, indicating the direction of movement.
With the Vacuum Chamber slider fully slid out, the Vacuum Chamber can be cleaned or removed. Two people are required to lift the VBD-300 Vacuum Chamber.	 Two images: on the left, a close-up of the vacuum chamber slider fully extended; on the right, a person's hands lifting the vacuum chamber.
If the Vacuum Chamber is removed, use caution. Do not damage the upper seal or the lower frame. The Vacuum Chamber can be rested on the integrated support feet.	

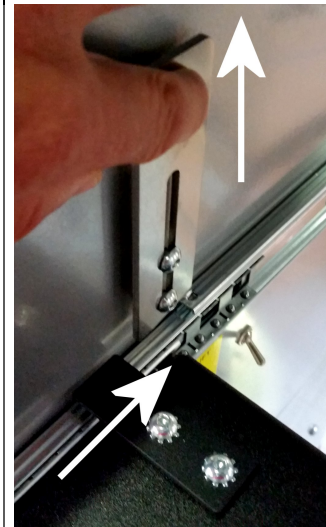
Installing the Vacuum Chamber

Rest the Vacuum Chamber back onto the fully extended Sliders. The Vacuum Chamber has three resting pins. Orient the side with two resting pins on the left Slider rail. Two people are required to lift the VBD-300 Vacuum Chamber.



Unlock Slider to Close

Hold the Slider Lock up and push the Vacuum Chamber Slider in until it clears the retaining plate. Release the Slider Lock and continue pushing the Vacuum Chamber Slider in.



Push the Slider rails and Vacuum Chamber back into the Dryer until the Slider Lock falls into place in front of the Vacuum Chamber Slider, locking the Vacuum Chamber Slider into the operating position.



Install the air lines. Rotate the locking ring fully clockwise to secure the air connection.



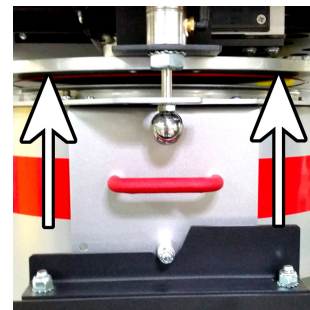
Turn on air pressure. Rotate counterclockwise.



Slide the Retention Hopper sealing collar up so that the magnets engage onto the bottom of the Vacuum Chamber.



Raise the Vacuum Chamber by switching up the Vacuum Chamber Lift Switch.



WARNING

Pinch Hazard - Keep fingers clear of Vacuum Chamber Main Seal when the Vacuum Chamber Lift Switch is flipped up.

Turn on Main Power.



Print Setup

The Print setup is available from the Setup menu. Print Setup prints to USB and has the following options:

Event Log - Enable/Disable, When enabled, prints events to the log file.

Interval - Seconds (default 60s), Automatic time interval to print VBD information to USB.

Content - Detail/Standard, Level of detail printed to the log file.

Print All - Prints the Alarm Log, Event Log and Parameters to a USB flash drive.

Print Parameters - Prints the full parameter and parameter values as well as other information list to the USB flash drive.

Print Event Log - A combination of machine status lines at defined intervals as well as mechanical events as they occur.

Print Alarm Log - Prints any alarms recorded since the alarm log was last cleared to USB.

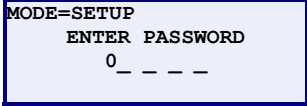
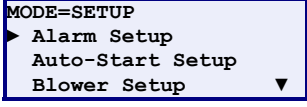
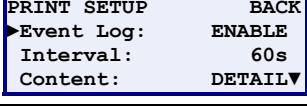
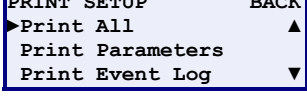
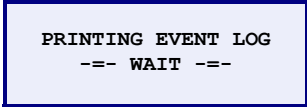
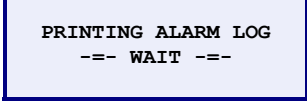
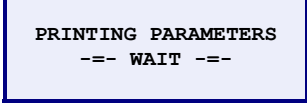
Clear Event Log - Clears all events from the event log in memory.

Clear Alarm Log - Clears all alarms from the event log in memory.

Copy Log File - Copies raw log file to USB stick for analysis by a Maguire technician.

How to print the Event Log, Parameters, or Alarm Log

To print the Alarm Log, Parameters or Event Log a USB Flash Drive must be plugged into the VBD-150.

Press:	 	to toggle the Mode Selection to Setup Mode (Gears Icon) .	Display will show:	
Enter:	the 5-digit password. (Default password is 22222). Use the   buttons to adjust the digit. Press ENTER to move to the next digit and to finish.		Display will show:	
Press:	the  button several times to move down to the option " Print Setup ". Press ENTER to select.		Display will show:	
Press:	Press the  button to move down to one of the print options.		Display will show:	
Press:	ENTER to print the selected option. Files will be created on the flash drive in the root of the drive. VBDALARM.LOG - Alarm Log VBDEVENT.LOG - Event Log VBDPARAM.TXT - Parameter Report		Display will show one or all of the following:	  

Interpreting the Event Log

The following is a description of the columns of information in a log.

Column	Description
1	Date and time of the log (the date is stored in the Dryer).
2	Current mode of the dryer operation
3	Current Heating Hopper inlet air temperature setpoint
4	Current actual Heating Hopper temperature
5	Current heater duty cycle, expressed as a percentage
6	Current heating hopper air outlet temperature
7	Current material exit temperature (optional RTD)
8	Current vacuum cycle elapsed time and set time
9	Current vacuum chamber pressure
10	Current vacuum chamber material weight
11	Current retention hopper material weight
12	Current dryer throughput
13	Current Totalizer reading

Example of a VBD Event Log:

VBD Event Log

MODEL: 150

CPU Firmware: N1006A

I/O Firmware: N1006A

Serial#: 123456-78

10-08-2014 08:31:06

```

10-07-2014 08:11:42 | *** LOADER 2: OFF ***
10-07-2014 08:12:09 | *** OPERATOR START ***
10-07-2014 08:12:09 | *** DRYER STARTED ***
10-07-2014 08:12:09 | MODE: PHT | T1s: 150F | T1a: 75F | H1: 0.0 | T2: 74F | T4: 71F | VC: 00:00/20:00 | ABS: 762mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:12:09 | *** BLOWER STARTED ***
10-07-2014 08:12:10 | *** HEATER FAIL-SAFE: HIGH ***
10-07-2014 08:12:13 | *** HEATING HOPPER HEATER STARTED ***
10-07-2014 08:12:39 | MODE: PHT | T1s: 150F | T1a: 93F | H1: 16.5 | T2: 75F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:13:09 | MODE: PHT | T1s: 150F | T1a: 121F | H1: 23.4 | T2: 77F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:13:39 | MODE: PHT | T1s: 150F | T1a: 136F | H1: 26.0 | T2: 79F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:14:09 | MODE: PHT | T1s: 150F | T1a: 143F | H1: 27.0 | T2: 80F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:14:39 | MODE: PHT | T1s: 150F | T1a: 148F | H1: 26.7 | T2: 81F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:15:09 | MODE: PHT | T1s: 150F | T1a: 149F | H1: 26.2 | T2: 82F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:15:39 | MODE: PHT | T1s: 150F | T1a: 150F | H1: 25.9 | T2: 83F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:16:09 | MODE: PHT | T1s: 150F | T1a: 151F | H1: 25.1 | T2: 84F | T4: 71F | VC: 00:00/20:00 | ABS: 758mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:16:39 | MODE: PHT | T1s: 150F | T1a: 150F | H1: 24.7 | T2: 85F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:17:09 | MODE: PHT | T1s: 150F | T1a: 150F | H1: 24.6 | T2: 86F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:17:39 | MODE: PHT | T1s: 150F | T1a: 150F | H1: 24.3 | T2: 87F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105
10-07-2014 08:18:09 | MODE: PHT | T1s: 150F | T1a: 149F | H1: 24.4 | T2: 88F | T4: 71F | VC: 00:00/20:00 | ABS: 760mmHg | VC: 1 | RH: 0 | TPT: 0 | TOT: 105

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1	2	3	4	5	6	7	8	9	10	11	12	13	<- COLUMN #
10-07-2014 08:38:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.1	T2: 96F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:39:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.1	T2: 96F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:39:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.1	T2: 96F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:40:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.0	T2: 95F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:40:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.1	T2: 95F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:41:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.1	T2: 95F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:41:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.9	T2: 95F	T4: 71F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:42:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.9	T2: 95F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:42:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 23.0	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:43:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.8	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:43:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.7	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:44:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.5	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:44:40	MODE: PHT	T1s: 150F	T1a: 149F	H1: 22.6	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:45:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.7	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:45:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.5	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:46:10	MODE: PHT	T1s: 150F	T1a: 149F	H1: 22.5	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:46:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.5	T2: 95F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:47:10	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.5	T2: 95F	T4: 72F	VC: 00:00/20:00	ABS: 762mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:47:40	MODE: PHT	T1s: 150F	T1a: 150F	H1: 22.6	T2: 95F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:48:00	*** BLOWER STOPPED ***												
10-07-2014 08:48:00	*** HEATING HOPPER HEATER PAUSED ***												
10-07-2014 08:48:04	*** HEATER FAIL-SAFE: LOW ***												
10-07-2014 08:48:06	*** UPPER VACUUM GATE: OPENED ***												
10-07-2014 08:48:09	*** VACUUM CHAMBER FILL VALVE: OPENED ***												
10-07-2014 08:48:10	MODE: FILL	T1s: 150F	T1a: 147F	H1: 22.5	T2: 95F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 1	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:48:23	*** VACUUM CHAMBER FILL VALVE: CLOSED ***												
10-07-2014 08:48:28	*** VACUUM CHAMBER FILL VALVE: OPENED ***												
10-07-2014 08:48:32	*** VACUUM CHAMBER FILL VALVE: CLOSED ***												
10-07-2014 08:48:37	*** BLOWER STARTED ***												
10-07-2014 08:48:38	*** UPPER VACUUM GATE: CLOSED ***												
10-07-2014 08:48:40	MODE: FILL	T1s: 150F	T1a: 132F	H1: 22.5	T2: 94F	T4: 72F	VC: 00:00/20:00	ABS: 760mmHg	VC: 32	RH: 0	TPT: 0	TOT: 105	
10-07-2014 08:48:41	*** HEATING HOPPER HEATER STARTED ***												
10-07-2014 08:48:42	*** HEATING HOPPER HEATER UNPAUSED ***												
10-07-2014 08:48:45	*** VACUUM GENERATOR SUPPLY VALVE: OPENED ***												
10-07-2014 08:48:46	*** VACUUM GENERATOR CHECK VALVE: OPENED ***												

Parameter Printout

The Parameter Printout is written to a file on a USB drive. To write the parameter printout, toggle to the Gear Icon, Print Setup, Print Parameters.

Example VBD-150 Parameter Printout:

VBD-150 Parameters

Tue 09/06/2016 14:34
 CPU Firmware: P0812A
 I/O Firmware: P0812A
 CPU Bootloader: 1.03
 I/O Bootloader: 1.03
 Serial#: 000000-00
 MAC Address: 00:1C:1A:00:4B:0F

INDEX	NAME	ABBR	RAM	DFT	LO LIMIT	HI LIMIT	UNITS
Blower:							
B1	Blower Delay Time	BDT	00402	00402	00000	99999	Second
B2	VFD Low Limit	BLF	00025	00025	00025	00060	Freq
B3	VFD High Limit	BHF	00060	00060	00050	00070	Freq
B4	VFD Drive	BDF	00060	00060	00000	65535	Freq
B5	VFD Zero Level	BZL	00045	00045	00000	00100	Percent
B6	VFD Level Adjustment	BLA	00025	00025	00025	00060	Freq
B7	VFD Heat Throttle	BHT	00100	00100	00000	65535	Percent
Dispensing:							
D1	Vac. Cham. Hi Level	VCH	00013	00013	00000	00560	Weight
D2	Vac. Cham. Low Level	VCL	00002	00002	00000	00010	Weight
D3	Ret. Hop. Hi Level	RHH	00015	00015	00000	00728	Weight
D4	Ret. Hop. Low Level	RHL	00002	00002	00000	00010	Weight
D5	Bulk Density	BLK	00560	00560	00000	65535	Weight
D6	Vac.Cham. Fill Rate	VFR	01050	01050	00000	02500	Gram/Sec
D7	Vac.Cham. Dump Rate	VDR	00000	00000	00000	02000	Gram/Sec
D8	Chamber Fill Time	VFT	00035	00035	00000	99999	Second
D9	Chamber Dump Time	VDT	00060	00060	00000	99999	Second
D10	Fill Lag Time	FLA	00175	00175	00000	00500	Time
D11	Dump Lag Time	DLA	00100	00100	00000	00500	Time
D12	Vacuum Gate Delay	VGD	00303	00303	00000	65535	Second
D13	Chamber Fill Adjust	VFA	00405	00405	00000	65535	Cnt/Pct
D14	HH Dump Delay	HDD	00004	00004	00000	65535	Second
D15	Vac. Dump Threshold	VCT	00050	00050	00000	65535	Gram/Sec
D16	Chamber Dump Retries	CDR	05003	05003	00000	10099	Perc/Ret
D17	Residence Alarm	RAL	02120	02120	00000	29999	Wt/Min
D18	Batch Size	BCH	00000	00000	00000	65535	Weight
D19	Loader Trip Point	LTP	00006	00006	00000	00250	Weight
D20	Ldr. Thruput Cutoff	LTC	00002	00002	00000	65536	Wt/Min
D21	Heat Hopper Volume	HHV	00056	00056	00000	65535	Volume
Heater:							
H1-1	Preheat Temperature	PTS	00150	00150	00074	00375	Degree
H1-2	Preheat Time	PHT	00035	00035	00001	00999	Minute
H1-3	Preheat Targ. Delta	PTD	00030	00030	00000	65535	Degree
H1-4	Heat1 Temp Set-Point	RTS	00150	00150	00074	00375	Degree
H1-5	Heat1 Proportional	PT1	00040	00040	00000	00100	Term
H1-6	Heat1 Derivative	DT1	00015	00015	00000	00100	Term
H1-7	Heat1 Update Time	UT1	00415	00415	00000	65535	Sec/Sec
H1-8	Heat1 OverTarg Alarm	OT1	06006	06006	00000	65535	Sec/Deg
H1-9	Heat1 No Heat Alarm	NH1	00120	00120	00000	65535	Second
H1-10	Heat1 Set-Point Off.	SO1	03002	03002	00000	65535	Sec/Deg
H1-11	Heat1 Max. Percent	MP1	00100	00100	00000	00100	Percent
H1-13	Max Temp Set-Point	MAX	00356	00356	00074	00375	Degree
H1-14	Energy Saver Mode	ESM	00125	00125	00000	65535	Degree
H1-15	Energy Saver Time	EST	00030	00030	00000	65535	Minute
H1-16	Ramp Settings	RMP	52036	52036	00000	99999	Min/Deg
H1-17	Cool-Down Temp.	CTM	00120	00120	00032	00300	Degree
H1-18	Cool-Down Timer	CTR	00030	00030	00000	65535	Minutes
Load Cell:							
L1	Loadcell Stable Wt.	KDF	00200	00006	00000	65535	Number
L2	Loadcell Stable Time	LST	00100	00100	00000	65535	Millisec

L3	Loadcell Zero	LCZ	01000	01000	00000	65535	Number
L4	Weight Settle Time	WST	00805	00805	00002	65536	Second
L5	Loadcell 1 Zero	LZ1	00000	00000	00000	65535	Number
L6	Loadcell 2 Zero	LZ2	00000	00000	00000	65535	Number

Vacuum:

V1	Vacuum Time Setting	VTs	05020	05020	00001	65535	Minute
V2	Vac. Pressure Low	VPL	00080	00080	00000	65535	Number
V3	Vac. Pressure Delta	VPD	05020	05020	00000	65535	Number
V4	Vac. Shutdown Offset	VSO	00060	00060	00000	65535	Second
V5	Low Vacuum Timeout	LVT	00120	00120	00000	65535	Second
V6	No Vacuum Timeout	NVT	00345	00345	00000	65535	Cnt/Sec
V7	Cham. Purge Timer	VPT	00010	00010	00000	65535	Second
V8	Cham. Purge Interval	VPI	20240	20240	00000	65535	Sec/Sec
V9	Atmospheric Pressure	ATM	00760	00760	00000	00999	mmHg

System:

S1	Event Logging Time	ELT	00060	00060	00001	65535	Second
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Alarm Flags:

Material Shortage Alarm	Warn
Material Ready	Off
Material Temp	Off
HH Level Alarm	Off
Residence	Off
Throughput Alarm	On
Dump Retry	On

Display Flags:

Auto Shutdown	Off
Batch Mode	Off
Cycle Info	On
Display	Temp.
Fill Time	On
Dump Time	On
I/O Status	On
Preheat Temp	Off
Preheat Temp.	On
Residence Time	Off
Screen Timeout	Off
Vacuum Time	On

Heat Settings:

Temperature Unit	Fahrenheit
Preheat Mode	Timed
Energy Saver	Off
Ramp	Off

Misc. Settings:

Auto-Fill Adjust	Off
HH Level Sensor	Off
Loader 1	Off
Loader 2	Off
Loader 2 Mode	Thruput
Purge Chamber	On

Admin. Settings:

Blower	VFD
T4	On
T5	On

LOADCELL CALIBRATION

NAME	ZERO	DELTA	FULL	LAST ZERO	LAST FULL
RH LC: 3308245	1588575	15422	Tue 08/16/2016 11:33	Thu 01/01/1970 00:00	
VC LC: 3365199	1408275	16147	Tue 08/16/2016 11:33	Thu 01/01/1970 00:00	

Example VBD-300 Parameter Printout:

VBD-300 Parameters

Tue 09/06/2016 14:25
 CPU Firmware: P0812A
 I/O Firmware: P0812A
 CPU Bootloader: 1.03
 I/O Bootloader: 1.03
 Serial#: 000000-00
 MAC Address: 00:1C:1A:00:4B:0F

INDEX	NAME	ABBR	RAM	DFT	LO LIMIT	HI LIMIT	UNITS
Blower:							
B1	Blower Delay Time	BDT	00402	00402	00000	99999	Second
B2	VFD Low Limit	BLF	00025	00025	00025	00060	Freq
B3	VFD High Limit	BHF	00060	00060	00050	00070	Freq
B4	VFD Drive	BDF	00060	00060	00000	65535	Freq
B5	VFD Zero Level	BZL	00045	00045	00000	00100	Percent
B6	VFD Level Adjustment	BLA	00025	00025	00025	00060	Freq
B7	VFD Heat Throttle	BHT	00100	00100	00000	65535	Percent
Dispensing:							
D1	Vac. Cham. Hi Level	VCH	00031	00031	00000	01120	Weight
D2	Vac. Cham. Low Level	VCL	00002	00002	00000	00020	Weight
D3	Ret. Hop. Hi Level	RHH	00038	00038	00000	01344	Weight
D4	Ret. Hop. Low Level	RHL	00004	00004	00000	00020	Weight
D5	Bulk Density	BLK	00560	00560	00000	65535	Weight
D6	Vac.Cham. Fill Rate	VFR	03000	03000	00000	04500	Gram/Sec
D7	Vac.Cham. Dump Rate	VDR	00000	00000	00000	04000	Gram/Sec
D8	Chamber Fill Time	VFT	00035	00035	00000	99999	Second
D9	Chamber Dump Time	VDT	00060	00060	00000	99999	Second
D10	Fill Lag Time	FLA	00175	00175	00000	00500	Time
D11	Dump Lag Time	DLA	00100	00100	00000	00500	Time
D12	Vacuum Gate Delay	VGD	00303	00303	00000	65535	Second
D13	Chamber Fill Adjust	VFA	00414	00414	00000	65535	Cnt/Pct
D14	HH Dump Delay	HDD	00004	00004	00000	65535	Second
D15	Vac. Dump Threshold	VCT	00115	00115	00000	65535	Gram/Sec
D16	Chamber Dump Retries	CDR	05003	05003	00000	10099	Perc/Ret
D17	Residence Alarm	RAL	02120	02120	00000	29999	Wt/Min
D18	Batch Size	BCH	00000	00000	00000	65535	Weight
D19	Loader Trip Point	LTP	00013	00013	00000	00250	Weight
D20	Ldr. Thruput Cutoff	LTC	00002	00002	00000	65536	Wt/Min
D21	Heat Hopper Volume	HHV	00118	00118	00000	00060	Volume
Heater:							
H1-1	Preheat Temperature	PTS	00150	00150	00074	00375	Degree
H1-2	Preheat Time	PHT	00035	00035	00001	00999	Minute
H1-3	Preheat Targ. Delta	PTD	00030	00030	00000	65535	Degree
H1-4	Heat1 Temp Set-Point	RTS	00150	00150	00074	00375	Degree
H1-5	Heat1 Proportional	PT1	00040	00040	00000	00100	Term
H1-6	Heat1 Derivative	DT1	00015	00015	00000	00100	Term
H1-7	Heat1 Update Time	UT1	00415	00415	00000	65535	Sec/Sec
H1-8	Heat1 OverTarg Alarm	OT1	06006	06006	00000	65535	Sec/Deg
H1-9	Heat1 No Heat Alarm	NH1	00120	00120	00000	65535	Second
H1-10	Heat1 Set-Point Off.	SO1	03002	03002	00000	65535	Sec/Deg
H1-11	Heat1 Max. Percent	MP1	00100	00100	00000	00100	Percent
H1-13	Max Temp Set-Point	MAX	00356	00356	00074	00375	Degree
H1-14	Energy Saver Mode	ESM	00125	00125	00000	65535	Degree
H1-15	Energy Saver Time	EST	00030	00030	00000	65535	Minute
H1-16	Ramp Settings	RMP	52036	52036	00000	99999	Min/Deg
H1-17	Cool-Down Temp.	CTM	00120	00120	00032	00300	Degree
H1-18	Cool-Down Timer	CTR	00030	00030	00000	65535	Minutes
Load Cell:							
L1	Loadcell Stable Wt.	KDF	00200	00006	00000	65535	Number
L2	Loadcell Stable Time	LST	00100	00100	00000	65535	Millisec
L3	Loadcell Zero	LCZ	01000	01000	00000	65535	Number
L4	Weight Settle Time	WST	00805	00805	00002	65536	Second
L5	Loadcell 1 Zero	LZ1	00000	00000	00000	65535	Number
L6	Loadcell 2 Zero	LZ2	00000	00000	00000	65535	Number

Vacuum:

V1	Vacuum Time Setting	VTs	05020	05020	00001	65535	Minute
V2	Vac. Pressure Low	VPL	00080	00080	00000	65535	Number
V3	Vac. Pressure Delta	VPD	05020	05020	00000	65535	Number
V4	Vac. Shutdown Offset	VSO	00060	00060	00000	65535	Second
V5	Low Vacuum Timeout	LVT	00120	00120	00000	65535	Second
V6	No Vacuum Timeout	NVT	00345	00345	00000	65535	Cnt/Sec
V7	Cham. Purge Timer	VPT	00010	00010	00000	65535	Second
V8	Cham. Purge Interval	VPI	20240	20240	00000	65535	Sec/Sec
V9	Atmospheric Pressure	ATM	00760	00760	00000	00999	mmHg

System:

S1	Event Logging Time	ELT	00060	00060	00001	65535	Second
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Alarm Flags:

Material Shortage Alarm	Warn
Material Ready	Off
Material Temp	Off
HH Level Alarm	Off
Residence	Off
Throughput Alarm	On
Dump Retry	On

Display Flags:

Auto Shutdown	Off
Batch Mode	Off
Cycle Info	On
Display	Temp.
Fill Time	On
Dump Time	On
I/O Status	On
Preheat Temp	Off
Preheat Temp.	On
Residence Time	Off
Screen Timeout	Off
Vacuum Time	On

Heat Settings:

Temperature Unit	Fahrenheit
Preheat Mode	Timed
Energy Saver	Off
Ramp	Off

Misc. Settings:

Auto-Fill Adjust	Off
HH Level Sensor	Off
Loader 1	Off
Loader 2	Off
Loader 2 Mode	Thruput
Purge Chamber	On

Admin. Settings:

Blower	VFD
T4	On
T5	On

LOADCELL CALIBRATION

NAME	ZERO	DELTA	FULL	LAST ZERO	LAST FULL
RH LC: 3308245	1588575	15422	Tue 08/16/2016 11:33	Thu 01/01/1970 00:00	
VT LC: 3365199	1408275	16147	Tue 08/16/2016 11:33	Thu 01/01/1970 00:00	

Alarms - Cause and Solution

Typically problems are indicated by an alarm condition on the Dryer controller's display with an audible alarm and a flashing strobe light. The following alarm troubleshooting chart will describe the alarm condition and possible causes and solutions.

Alarm Display:

Troubleshooting:

*** ALARM:01 *** BLOWER FAILURE Press Any Button To SILENCE alarm	Problem: The blower is not running. Motor contactor overload relay has tripped. See wiring diagram on page 74 for Blower Motor Contactor. Item # 3, overload relay on wiring diagram. This alarm will trigger a dryer shutdown. Solution: Reset contactor. Check that blower motor shaft is not locked. Check line voltage to machine; make sure voltage is not too low which can cause an increase in amperage. Check that power source has not lost a phase.
*** ALARM:02 *** NO HEAT Press Any Button To SILENCE alarm	Problem: No heat or inadequate heat detected by the Heating Hopper inlet RTD. This alarm is triggered by the NH1 parameter. NH1 parameter is the maximum time limit, in seconds, after the heat cycle begins, during which one of the following two conditions must be detected: Either the temperature must climb 20 degrees, or the temperature must move at least 20 percent toward the target temperature. If neither condition is met the "NO HEAT" alarm will sound. Such an occurrence would signal a failure of either the heater or the airflow from the blower. This parameter and consequent alarm protects the heater from burn out in the event the blower fails or airflow is blocked. Solution: Check for airflow from the blower. Check for a blower inlet obstruction, check that 2" air duct from blower to heater is not detached, obstructed or perforated. Check 2" air duct from top of heater to heating hopper inlet for detachment, obstruction or perforation. Check continuity across heater leads. See wiring diagram on page 74. If the dryer's heater shorted, the result would be a trip of the breaker or fuse supplying power to the VBD-150 dryer.
*** ALARM:03 *** SETPPOINT EXCEEDED Press Any Button To SILENCE alarm	Problem: The heating hopper air inlet temperature has exceeded set-point by an excessive amount. If the Heating hopper air inlet temperature (T1a sensor) goes 20F over set-point (PTS parameter), this fatal alarm is triggered. Solution: Contact Maguire Technical Support

*** ALARM:04 *** TEMP. OVER TARGET Press Any Button To SILENCE alarm	Problem: The heating hopper air inlet temperature has drifted above set-point. If the Heating hopper air inlet temperature (T1a sensor) is over the degrees specified in parameter OT1 (default 6° F or 6° C) for a time greater than the time in seconds specified in OT1, then the alarm is triggered and the heater output will drop by 20%. The alarm will occur but the machine will keep running. See OT1 parameter for more information. Solution: No solution is necessary under normal circumstances as the dryer is alerting to a temperature adjustment. If this alarm continued to repeat, contact Maguire Technical Support.
*** ALARM:08 *** NO VACUUM Press Any Button To SILENCE alarm	Problem: The dryer failed to pull a vacuum after three attempts. Dryer attempted to pull a vacuum 200mm below atmosphere within 45 seconds (default). Dryer attempted three times (number of default retries). After each attempt vacuum was equalized and vacuum gates were opened and closed in an attempt to reseal the Vacuum Chamber (possible debris or pellets preventing adequate seal). Defaults are controlled the NVT parameter (retries and seconds). This alarm is non-fatal. Dryer will continue to reseal after alarming. Solution: If Dryer continues to alarm, check: compressed air connection and pressure (dryer's regulator should be reading 85psi). Check for debris in seals above and below Vacuum Chamber.
*** ALARM:11 *** RTD FAILURE Press Any Button To SILENCE alarm	Problem: RTD (temperature sensor) reading is above or below max/min reading RTD Sensor is probably disconnected or damaged. Check temperature display reading in a cool state. Temperature should display room temperature. If reading is below -25°C or above 450°C RTD sensor has failed. Solution: Contact Maguire Technical Support for a replacement RTD Sensor.
*** ALARM:12 *** MATERIAL SHORTAGE Press Any Button To SILENCE alarm	Problem: Maximum Fill Time (VFT parameter) has been reached before target material weight (VTH parameter) has been achieved. This alarm is triggered when the VFT parameter has been reached (Vessel Fill Time) before the VCH (Vacuum Chamber High level), indicating shortage of material in heating hopper or possible valve jam. The outcome of this alarm is controlled by the Material Shortage Alarm settings. See page 32. Solution: Check material supply. Check Vacuum Chamber fill valve located at the base of the heating hopper.
*** ALARM:15 *** LOW AIR PRESSURE Press Any Button To SILENCE alarm	Problem: Air pressure sensor has detected air pressure below 50 psi. Solution: Check exhausting lockout valve located on the front lower left side of VBD-150. Ensure that the valve is open. Check pressure of air supply.

*** ALARM:16 *** HEATER FAIL-SAFE Press Any Button To SILENCE alarm	Problem: The temperature safety switch has opened due to an overheat condition. Located on the top of the Heater Tube is a Temperature Safety Switch. If the temperature of the heater exceeds the safety switch maximum, this switch opens, shutting down the entire dryer (FATAL Alarm). Solution: Allow the dryer to cool. Open the left side panel of the dryer and locate the Heater Tube Safety Switch on the upper side of the stainless steel heater tube. Press the red safety switch button to reset the Temperature Safety Switch. If problem occurs repeatedly, contact Maguire Technical Support.
*** ALARM:18 *** VC MISSING Press Any Button To SILENCE alarm	Problem: The Vacuum Chamber is missing. If Vacuum Chamber load cell is reading 4.5 pounds (2000 grams) below tare during AUTO run, this alarm is triggered and Dryer stops (fatal). This alarm is generally caused by a missing Vacuum Chamber but may also be caused by the dryer Vacuum Chamber load cells having been zero calibrated while material was in the Vacuum Chamber. Solution: If Vacuum Chamber is missing replace Vacuum Chamber. If Vacuum Chamber is in place, ensure the chamber is empty and zero calibrate the load cells. If load cells are damaged, a zero calibration may detect this.
*** ALARM:19 *** RH MISSING Press Any Button To SILENCE alarm	Problem: The Retention Hopper is missing. If Retention Hopper load cell is reading 6.6 pounds (3000 grams) for the VBD-150 or 11 pounds (5000 grams) below tare during AUTO run, this alarm is triggered and Dryer stops (fatal). This alarm is generally caused by a missing Retention Hopper but may also be caused by dryer Retention Hopper load cells having been zero calibrated while material was in the Retention Hopper. Solution: If Retention Hopper is missing replace Retention Hopper. If Retention Hopper is in place, ensure the hopper is empty and zero calibrate the load cells. If load cells are damaged, a zero calibration may detect this.
*** ALARM:20 *** THROUGHPUT Press Any Button To SILENCE alarm	Problem: The throughput of the dryer has been exceeded. This is an optional alarm (under alarms menu), defaulted to enabled. This alarm is triggered when the Retention Hopper low level has been reached before the vacuum timer has elapsed. This means demand for material has exceeded dried material supplied. This alarm is non-fatal, dryer continues to run. Solution: This is caused by exceeding material demand.
*** ALARM:21 *** LOW VACUUM Press Any Button To SILENCE alarm	Problem: Dryer failed to pull vacuum down to target vacuum pressure set in VPL parameter. Dryer attempted to pull a vacuum down to target vacuum pressure within 120 seconds (default value in LVT parameter). Possible causes and Solution: If dryer alarms, check: compressed air connection and pressure (dryer's regulator should be reading 85psi). Check for debris in seals above and below Vacuum Chamber. Alarm may also have been caused by a vacuum leak. Contact Maguire technical support if cause is not found.

*** ALARM:23 *** RESIDENCE ALARM Press Any Button To SILENCE alarm	Problem: Material has been in the retention hopper too long. This alarm is triggered by the RAL parameter. When the Residence Alarm has been enabled, this alarm will sound if not enough material has been removed from the retention hopper in the time specified in the RAL parameter. For more information, see the RAL parameter on page 37. Solution: To prevent this alarm: decrease fill weight, or turn on Fill Weight Adjust (Material Setup menu).
*** ALARM:24 *** BATCH COMPLETE Press Any Button To SILENCE alarm	Batch is complete This alarm triggers at the end of a batch run, the end being defined as the time at which the retention hopper is depleted to the HHL parameter level after the final vacuum chamber dump of said batch run.
*** ALARM:25 *** MATERIAL SHUTDOWN Press Any Button To SILENCE alarm	Material Shutdown This alarm triggers if the Material Shortage alarm is set to "SHUTDOWN" and is it determined that the heating hopper has been fully depleted of material via the VFA parameter criteria. When this alarm triggers, the VBD enters a Shutdown state automatically. This alarm can be useful. For example: at the end of the day, one can intentionally run the heating hopper empty (by turning off its feed loader) and have the VBD automatically initiate a shut down at the appropriate time.
*** ALARM:26 *** MATERIAL READY Press Any Button To SILENCE alarm	Material Ready If the Material Ready alarm is enabled under the "Alarm Setup" menu, this alarm will trigger after the first and only first batch of material has completed a full vacuum cycle. After 15 seconds, the audible portion of this alarm will automatically silence. The first batch of material will remain under vacuum indefinitely until this alarm is cleared. There are two main purposes of this alarm: 1. To alert the operator that dry material is ready for the process. 2. To act as a hold-back, when necessary, giving the operator additional time to prepare the process.
*** ALARM:27 *** AUTO SHUTDOWN Press Any Button To SILENCE alarm	Auto Shutdown This alarm triggers when an Auto Shutdown, that is, a shut down at a pre-determined time, has commenced. "Commencement" is defines as the time at which the final vacuum chamber fill has occurred.
*** ALARM:28 *** HH MATERIAL LOW Press Any Button To SILENCE alarm	Heating Hopper Material Low On VBD's with an optional Heating Hopper Level sensor, this alarm triggers when the "HH Mat. Level" alarm is enabled under the "Alarm Setup" menu and the level in the heating hopper has dropped below the HHA parameter value.
*** ALARM:29 *** MATERIAL TEMP Press Any Button To SILENCE alarm	Material Temperature Alarm When the Material Temp alarm is enabled under the "Alarm Setup" menu, during any instance where the Heating Hopper is called upon to dispense material into the vacuum chamber and the T2 (heating hopper exit) temperature is below the ESM parameter level, this alarm will trigger. Its purpose is to alert the operator that insufficient heating has occurred, most likely from a process throughput that exceeds the capacity of the VBD.

*** ALARM:30 ***
VC DUMP FAILURE
Press Any Button
To SILENCE alarm

VC Dump Failure

When the VC Dump alarm is enabled under the Alarm Setup menu, vacuum chamber dumping is monitored. When it has been determined that the vacuum chamber has failed to dump sufficient material into the retention hopper after a certain amount of retries as defined by the VDR parameter, this alarm will trigger. The vacuum chamber will continue dump attempts indefinitely, until the "successful dump" criteria is satisfied, at which point this alarm will auto-silence.

Updating the VBD Firmware

When the VBD control panel is turned on, the first screen displayed will show the current firmware version. If necessary the firmware in the VBD can be updated using the USB port located below the control panel. Maguire can supply VBD firmware updates. The following instructions detail how to do a firmware update.

- | | | |
|---------------|---|--|
| Copy | | the new firmware update into a USB flash drive. (do not put in a directory) |
| Insert | | the USB Flash drive into the USB port on the VBD. |
| Press | SELECT | To highlight Setup Mode (gears icon). |
| Press | ENTER | Display will say:
MODE=SETUP
ENTER PASSWORD 0 _ _ _ _ |
| Enter | 22222 | Default password is 22222. Use the   buttons to adjust the number. Press ENTER to advance to the next digit. |
| Press |  | to scroll the display down to System. |
| Press | ENTER | to select the System menu. |
| Press |  | to scroll the display down to Update Firmware. |
| Press | ENTER | The display will show:
Reading from USB WAIT
and then display the update version found on the drive.

NOTE: If the VBD is not able to read from the Flash Drive you will see this message: Error: No Files Found. Press BACK and try again or try a different Flash Drive. |
| Press |  | to select the XUF file found on the Flash Drive. |
| Press | ENTER | to select the firmware update. If more than one .XUF file is present, use the  to scroll down to the firmware bin file you want to use.
The display will show: Update To: VDxxxxxx.XUF Press Any Key to Update Firmware |
| Press | ENTER | to start the update. |

The display will show progress in transferring to the internal SD card, then it will show progress in verifying the update file. Then the controller will prompt: "Please toggle power to start the update process." At this time, power off the controller then on. When the controller restarts the display will show progress in reflashing to the new firmware. When complete, the display will show: **UPDATES COMPLETE Please toggle power.** At this time turn off power, then turn back on.

Further software update information

Software updates can be supplied electronically, via email or by download. Software updates are named according to their date of release. For instance **VDP0916A.XUF** can be interpreted as VD=Vacuum Dryer, P=2016 (Q=2017), 09=September, 16=September 16th, A=the first revision for that day. During the update process detailed above, new software found on the USB flash drive is first copied to an internally mounted SD card. From the SD card, the software is then loaded into the VBD. If there is ever a problem with the VBD and the USB port cannot be used or the VBD software is corrupted and cannot load new software through the menu, new software can be acquired from Maguire and renamed **UPDTFILE.BIN**. This renamed software can be loaded onto the internal SD card and re-inserted within the VBD. When the VBD is turned on, this **UPDTFILE.BIN** file will be automatically loaded into the VBD, restoring the software.

Theory of Operation / Performance

THEORY OF VACUUM DRYING

Water boils at 212° F (100° C) degrees. However, this is only true at sea level, which is to say at standard atmospheric pressure, which is 14.7 pounds/sq in (1 bar), also expressed as 29.92 inches (760mm) of Mercury (Hg).

At lower pressures the boiling point of water is reduced.

Standard atmospheric pressure can support a column of Mercury 29.92 inches (760mm) high. If we pull a perfect vacuum above a column of Mercury, the mercury will rise in that column 29.92 inches and, for that reason, the number we can expect to read on the vacuum gauge, at full vacuum, is 29.92 inches. Lesser vacuums read lower numbers. No vacuum reads zero.

When water is subjected to a vacuum level of 25 inches (635mm) of mercury, it will boil at 133°F (56°C) degrees. When plastic pellets are heated to 160°F (71°C) degrees, or greater, and subjected to a vacuum of 25 inches (635mm), the water vapor within wants very much to boil. This increased molecular activity within the pellet and the greatly reduced pressure surrounding the pellet drives the moisture from the pellet in a remarkably short time. This then is the reason for the remarkable short drying time of a vacuum dryer.

PERFORMANCE

The true measure of a dryer's performance is determined by the moisture content of the resin after the dryer has done its job. Resin moisture content, however, is not easily measured, so dryer manufactures use other criteria to assure performance.

Conventional "desiccant" dryers use DEW POINT as a measure of performance. This is a measure of the dryness of the air passing over the resin, but not the dryness of the resin itself.

For example, for a particular resin, experience may tell us that 180° F (82° C) degree air dried to minus 40 dew point, and passed over the material for 4 hours, is sufficient to reduce the moisture content of that resin to the required level of dryness.

Since our VBD Dryer does NOT use dry air, we have no "dew point" to measure.

In our case, for the same resin, experience tells us that a vacuum of 25 inches of mercury (635mm) applied for 20 minutes to material that has been heated to 180° F (82° C) degrees, is sufficient to reduce the moisture content of that same resin to the correct level of dryness.

Therefore, just as desiccant driers assure dry material by measuring temperature and DEW POINT over time, we assure dry material by measuring temperature and VACUUM over time.

When we assure that a certain temperature has been reached and a certain vacuum level achieved for a correct length of time, we can then be assured the material is dry.

You may visually assess performance by monitoring temperature and vacuum levels yourself. Of course, the final test is in the quality of the product you manufacture. We welcome your comments and observations.

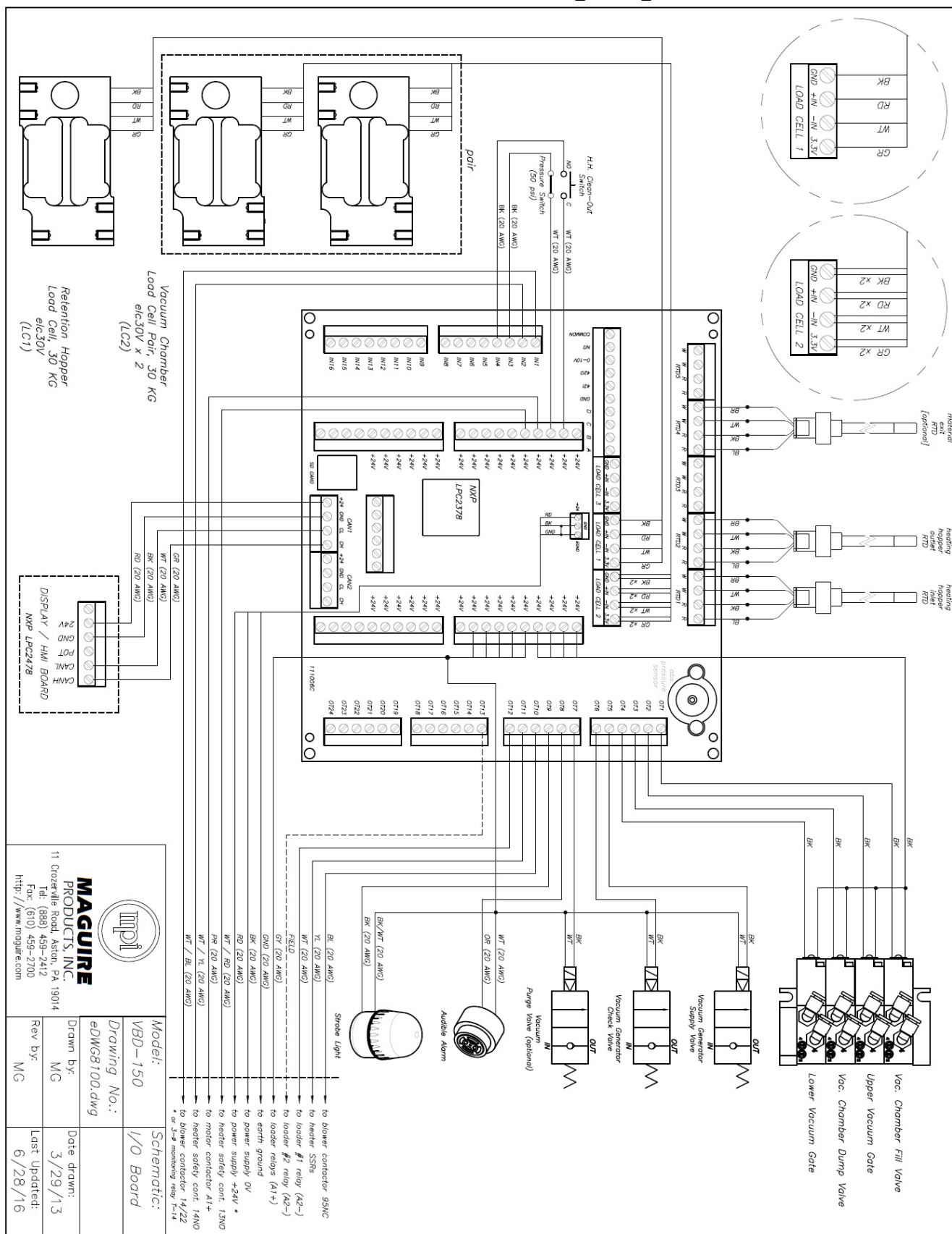
Technical Documentation

VBD-150 Technical Specifications

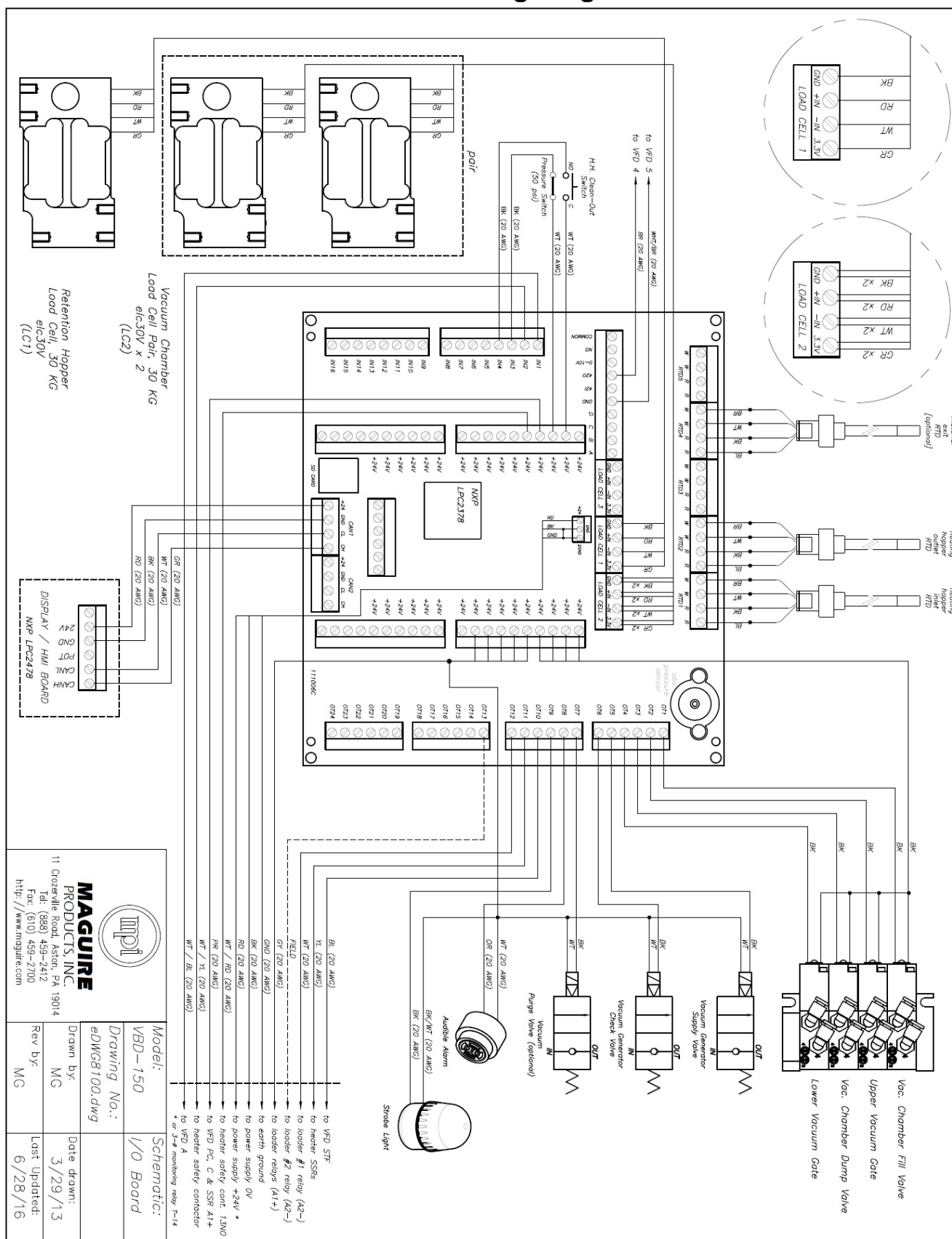
line no.	parameter	Domestic/Canadian		European	
		value	units	value	units
1	design throughput	150	lbs./hour	68	kgs./hr
2	maximum run temperature	375	°F	190	°C
3	maximum vacuum level, absolute	75	mm Hg.	75	mm Hg.
4	complete unit weight, empty	501	lbs.	227	kgs.
5	overall unit height	96	inches	2.44	meters
6	overall unit height w/ extension	108	inches	2.74	meters
7	voltage	240/480/575	volts	400	volts
8	full load amps (FLA)	16.4/8.2/6.8	amps	9.7	amps
9	phase	3	Ø	3	Ø
10	frequency	60	Hz	50	Hz
11	compressed air requirement, sustained pressure	85	psi	5.86	bar
12	compressed air requirement, max flow rate	13.5	SCFM	382	L/min
13	compressed air requirement, average flow rate	5.2	SCFM	147	L/min
14	blower model	RBH3	All-Star	RBH3	All-Star
15	blower power	1.1	HP	0.75	kW
16	blower max flow	105	SCFM	2464	L/min
17	blower max pressure	58	in H ₂ O	139	mbar
18	blower noise level	64	db(A)	63	db(A)
19	heater power	11,000	watts	11,000	watts
20	vacuum generator model	JS-250	Vaccon	JS-250	Vaccon
21	heating hopper cylinder I.D.	13.5	in.	343	mm
22	heating hopper cylinder height	27	in.	686	mm
23	heating hopper material capacity	2	cu. ft.	56.6	L
24	heating hopper absolute capacity	2.5	cu. ft.	70.8	L
25	heating hopper material capacity w/ extension	3	cu. ft.	85.0	L
26	heating hopper absolute capacity w/ extension	3.5	cu. ft.	99.1	L
27	heating hopper empty weight	115	lbs.	52.2	Kgs.
28	vacuum chamber cylinder I.D.	12.5	in.	318	mm
29	vacuum chamber cylinder height	14	in.	356	mm
30	vacuum chamber material capacity	1	cu. ft.	28.3	L
31	vacuum chamber absolute air capacity	2.25	cu. ft.	63.7	L
32	vacuum chamber normal evacuation volume	1.82	cu. ft.	51.5	L
33	vacuum chamber empty weight	44	lbs.	20.0	kgs.
34	retention hopper cylinder I.D.	15	in.	381.0	mm
35	retention hopper cylinder height	11.5	in.	292.1	mm
36	retention hopper material capacity	1.3	cu. ft.	36.8	L
37	retention hopper absolute capacity	1.6	cu. ft.	45.3	L
38	retention hopper empty weight	21.5	lbs.	9.8	kgs.

VBD-150 Diagrams

VBD-150 I/O Board Wiring Diagram

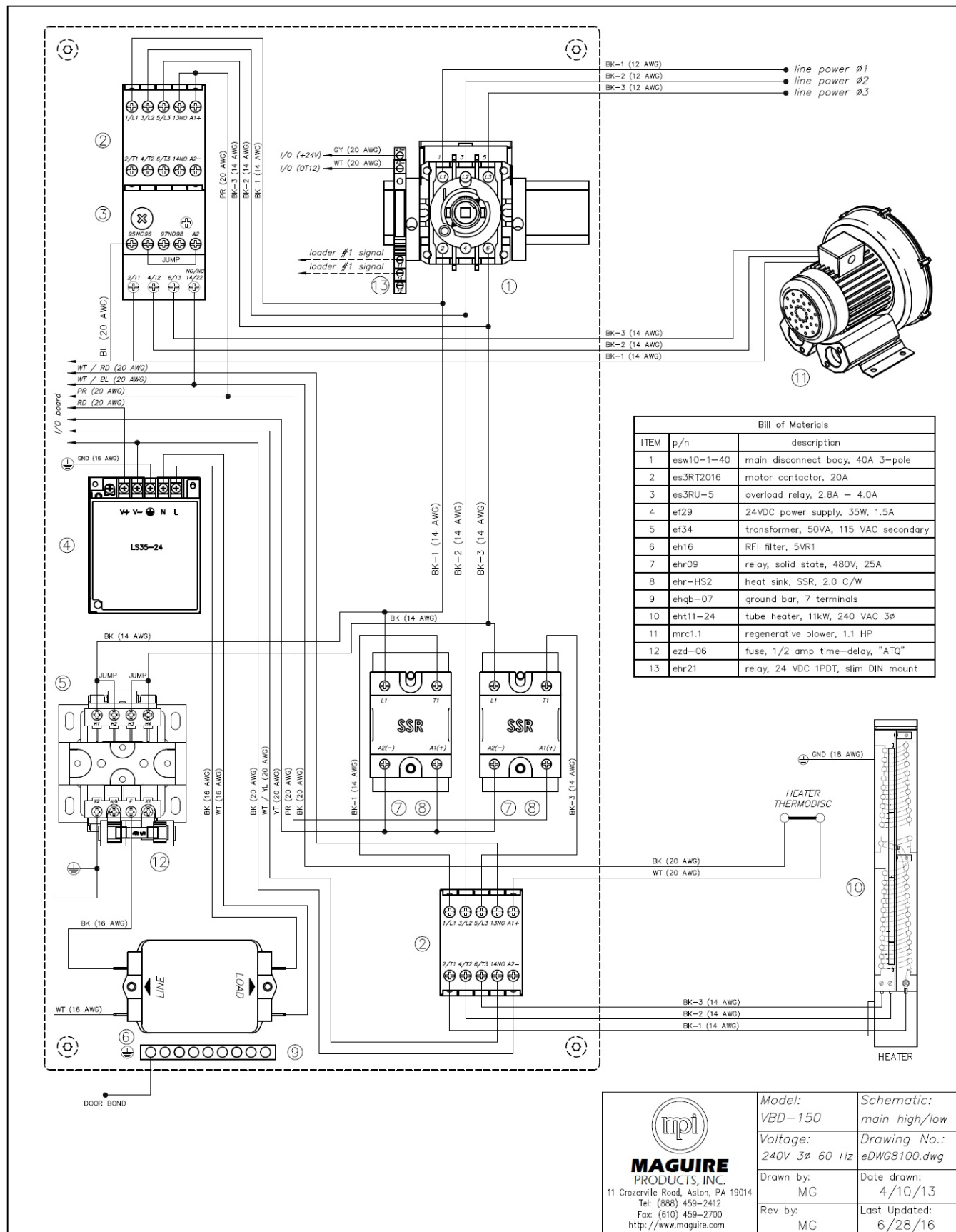


VBD-150 I/O Board Wiring Diagram with VFD

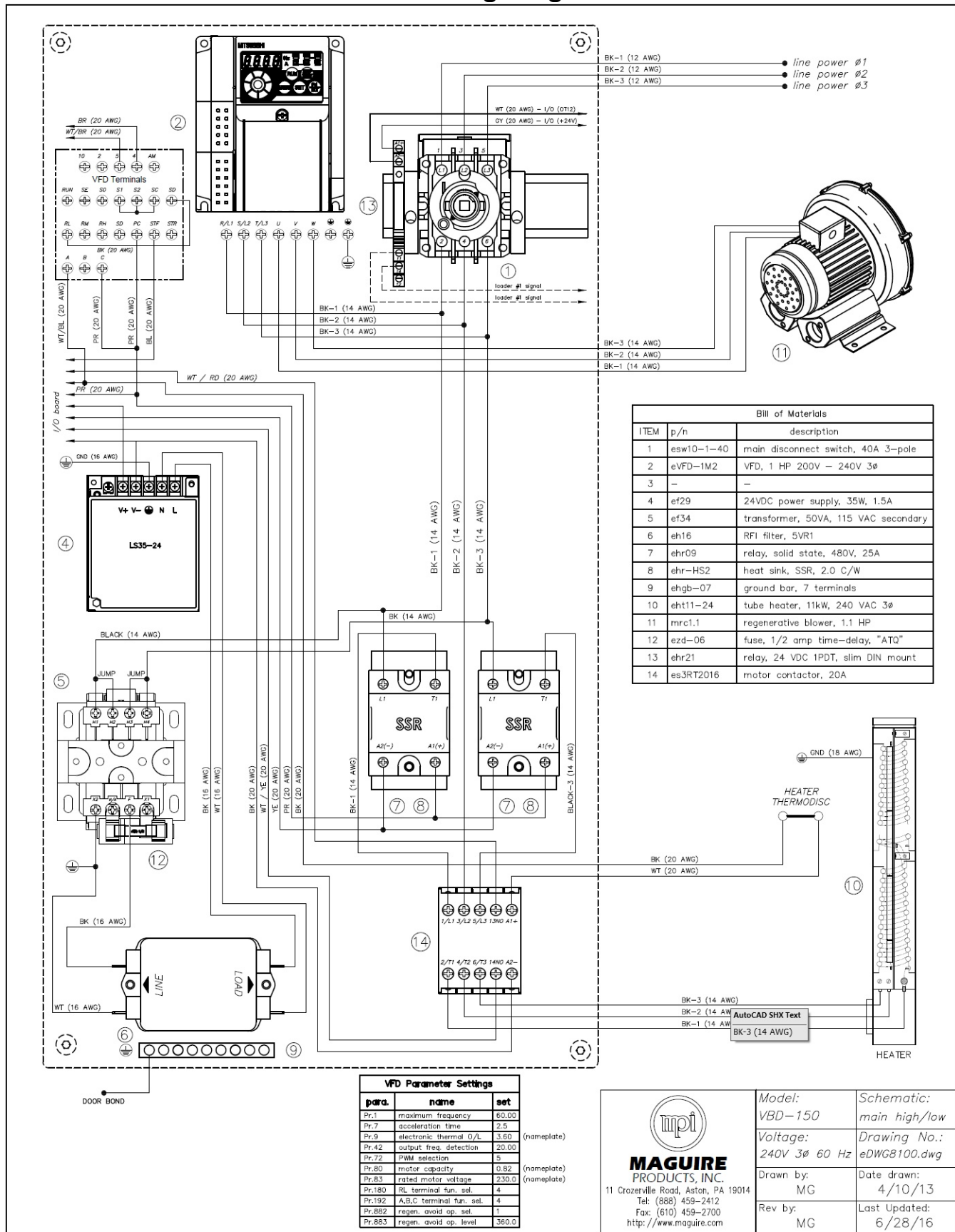


High Voltage Wiring Diagrams

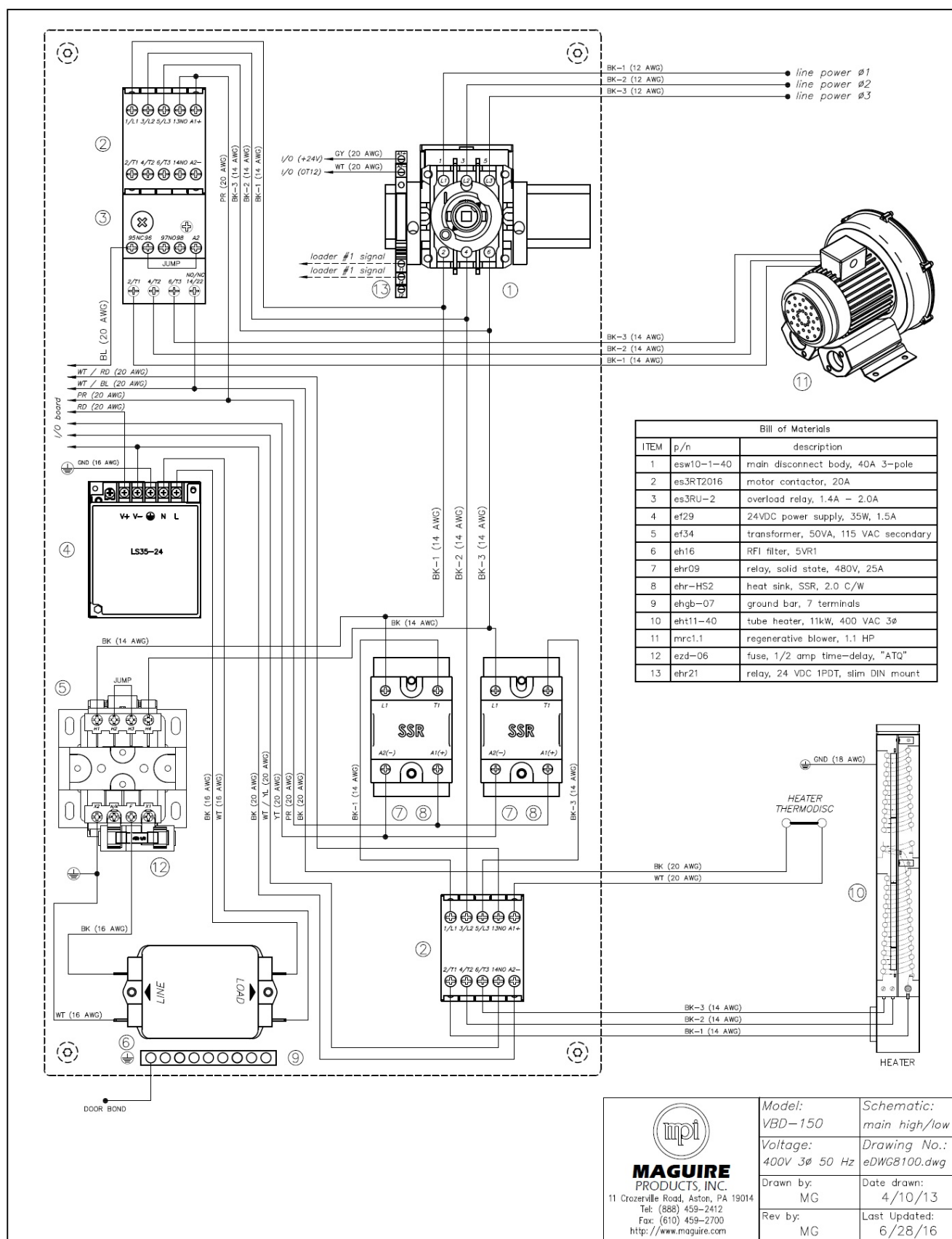
VBD-150 240V Wiring Diagram



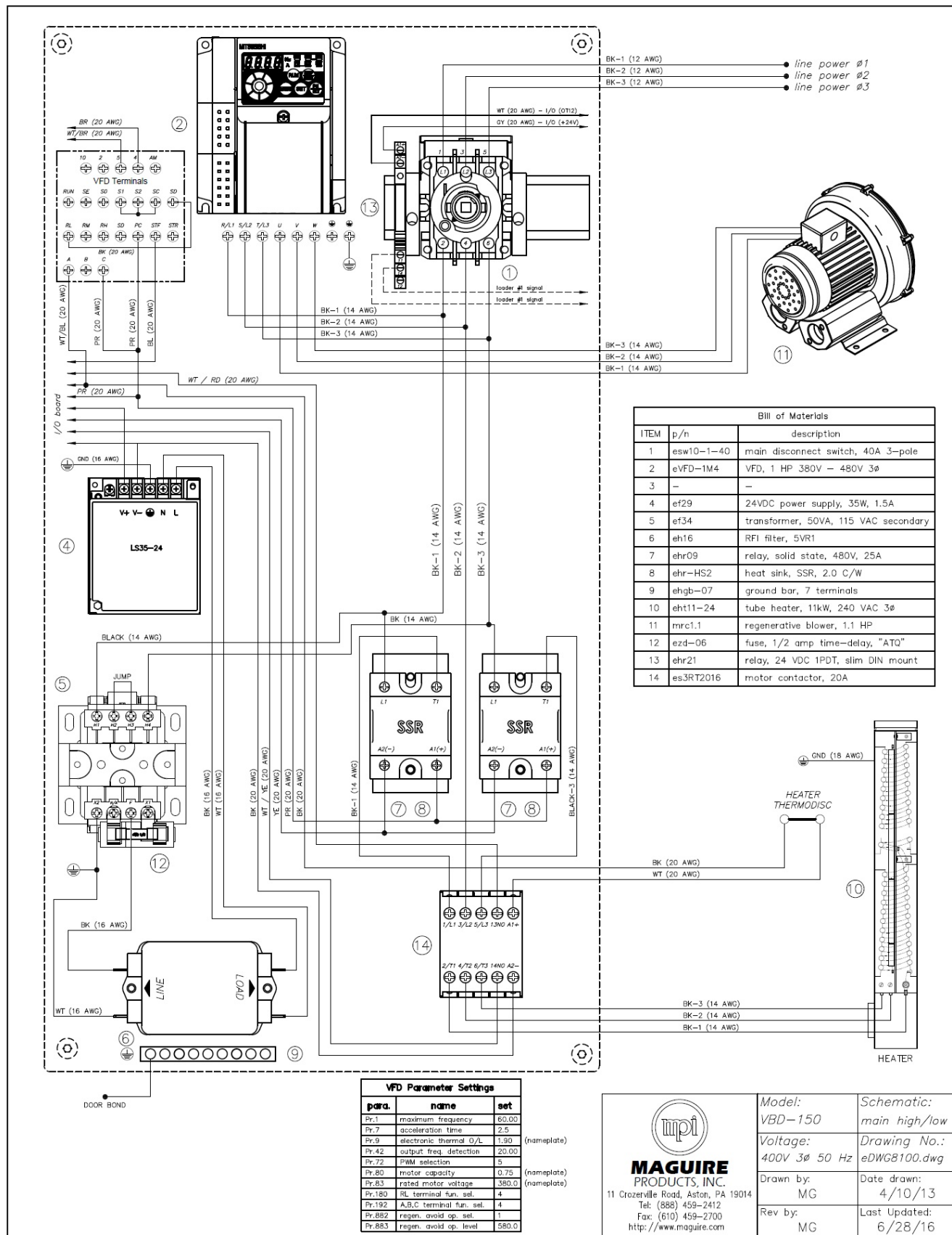
VBD-150 240V Wiring Diagram with VFD



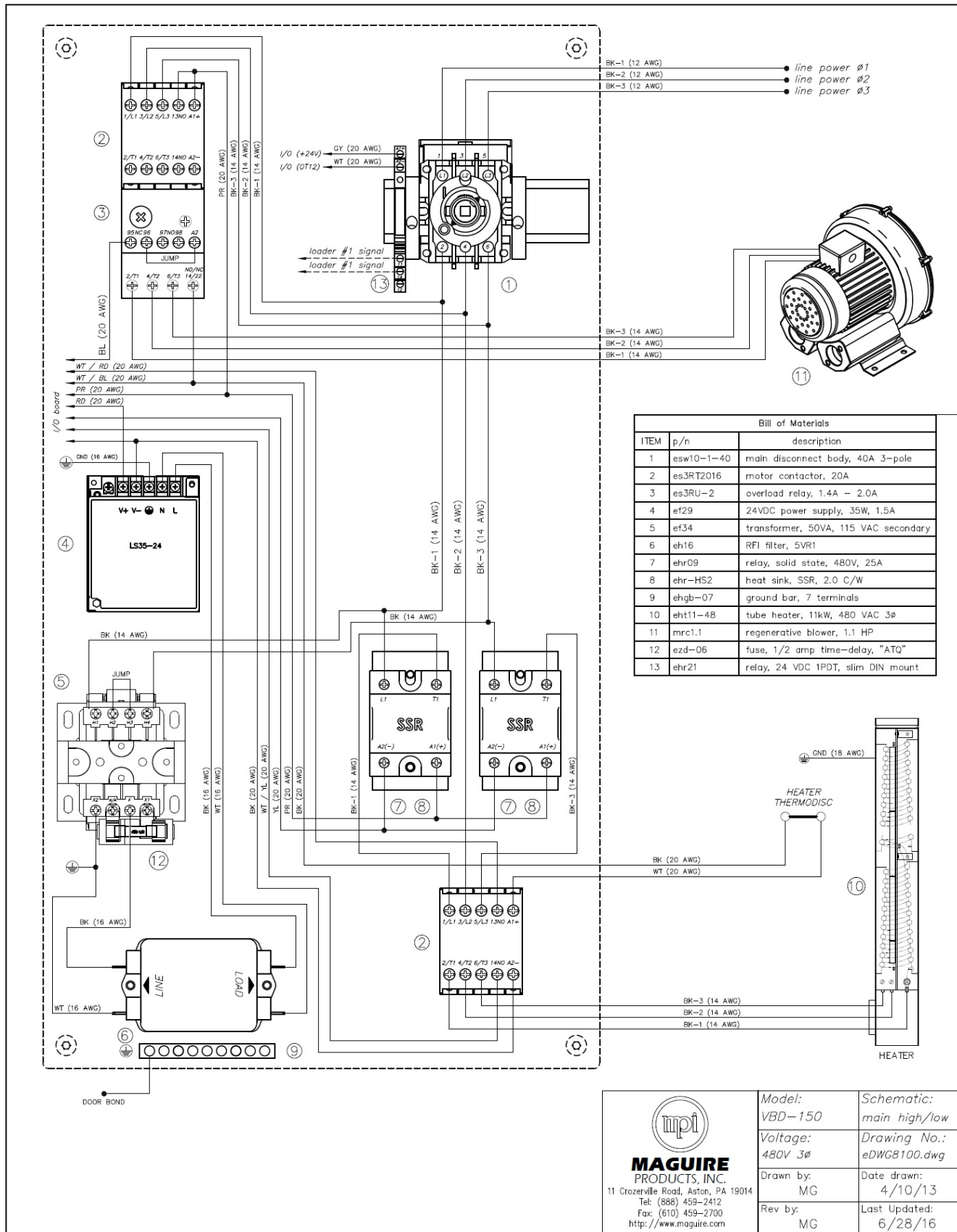
VBD-150 400V Wiring Diagram



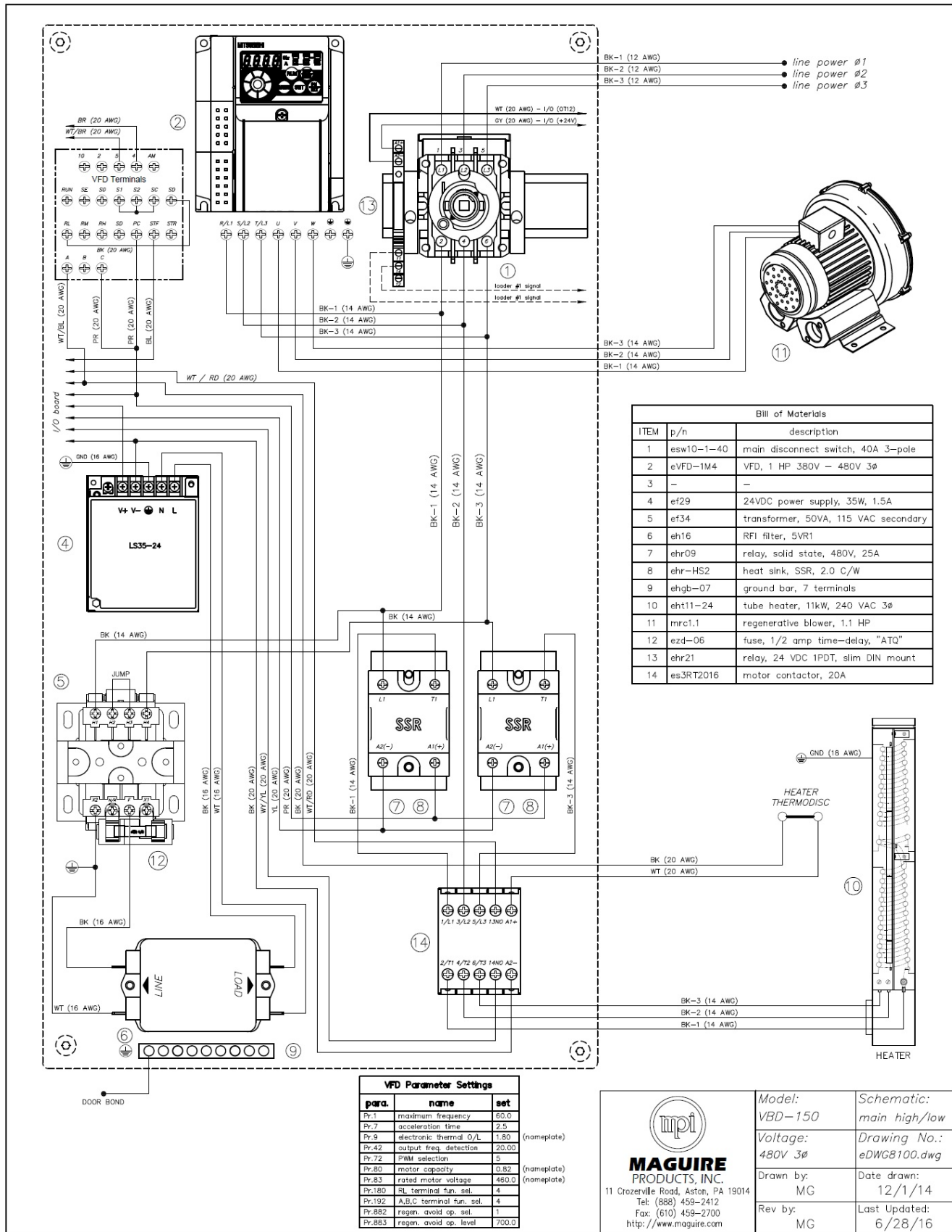
VBD-150 400V Wiring Diagram with VFD



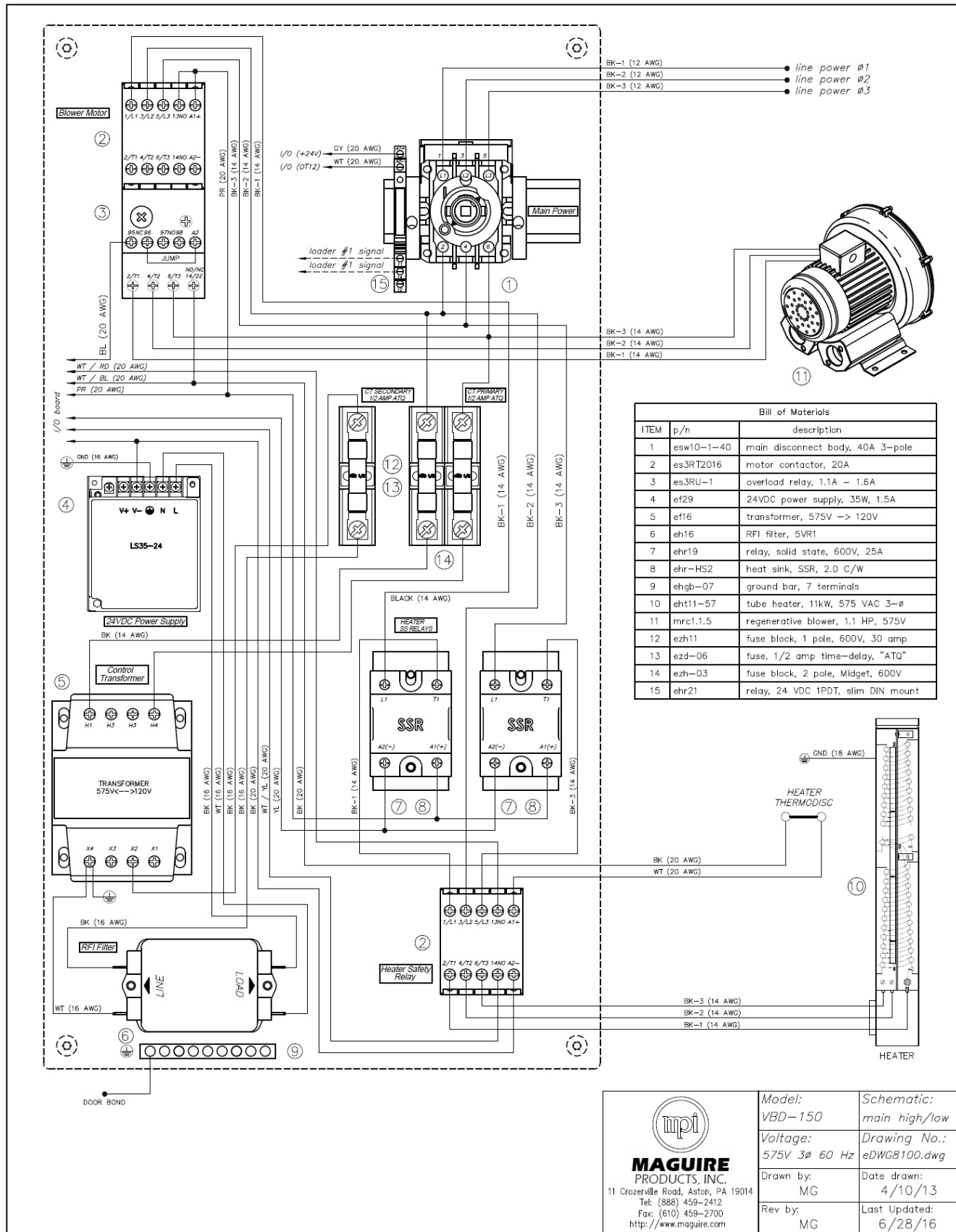
VBD-150 480V Wiring Diagram



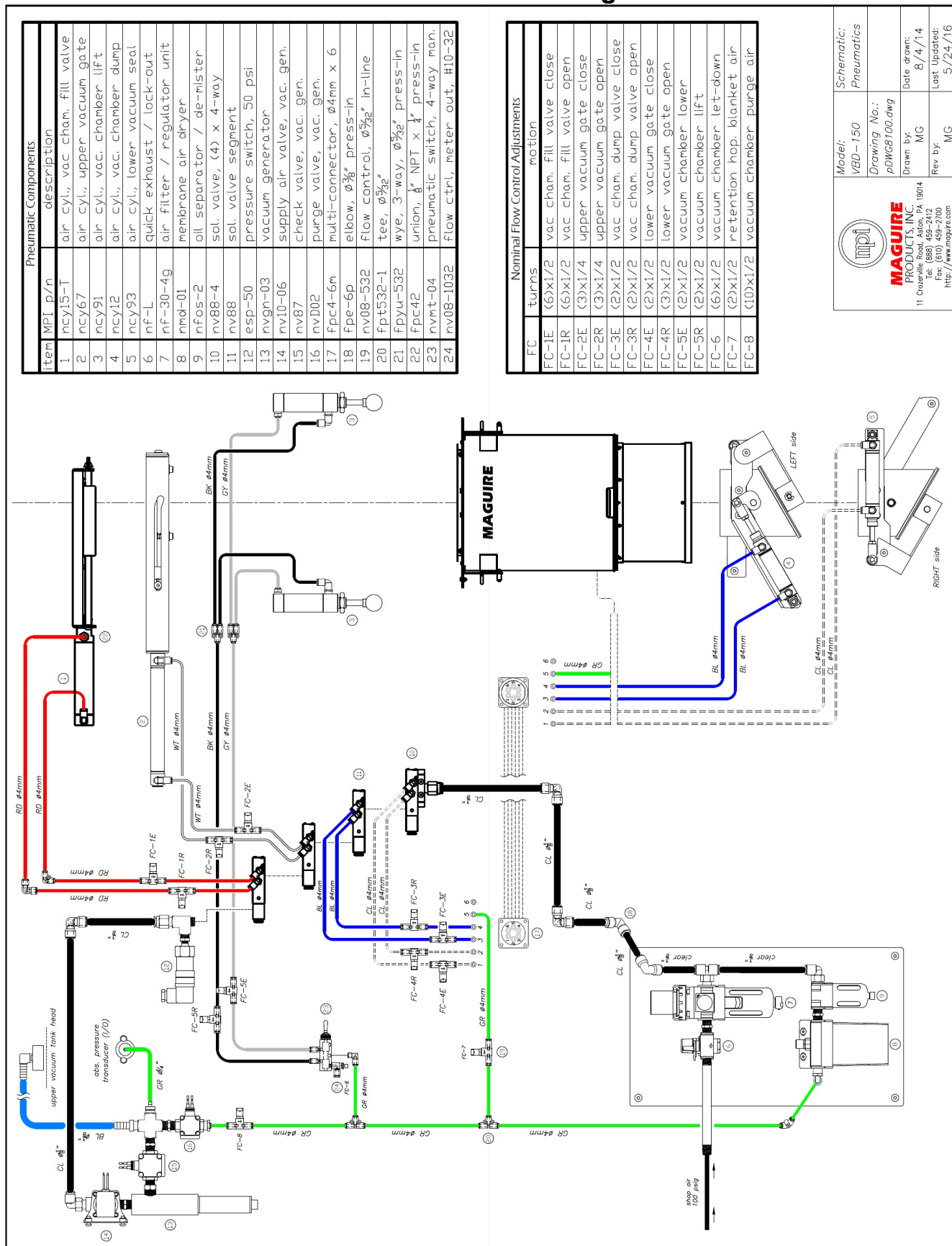
VBD-150 480V Wiring Diagram with VFD



VBD-150 575V Wiring Diagram



VBD-150 Pneumatic Diagram



VBD-150 Recommended Spare Parts List

Note: it is recommended that items #1 - #8 be kept on hand by the maintenance department.

line item	MPI p/n	Description	General Location
1	hf19-E	replacement filter element, blower intake	rear panel
2	8124-11	silicone seal, vacuum chamber dump valve	vacuum chamber
3	go-349V	o-ring, size 349, Viton	upper vacuum gate
4	go-341V	o-ring, size 341, Viton	lower vacuum gate
5	as8124-03	vac. seal plate assy., vac. cham. dump valve	lower vacuum gate
6	nv88	solenoid valve segment, 4-way, 24 VDC	main cabinet
7	nf-30E	filter element, for "AW30" series regulator	pneumatics cabinet
8	nfos2E	filter element, for oil separator	pneumatics cabinet

Other Potential Replacement Parts

9	Es3RU-2	overload relay, 1.4 A - 2.0 A	electrical cabinet
10	Es3RU-5	overload relay, 2.8 A - 4.0 A	electrical cabinet
11	Es3RT2016	motor contactor, 3 pole, 20A, 24 VDC	electrical cabinet
12	ehr09	relay, SS, 480V 25A, 24-265 VAC signal	electrical cabinet
13	ezd-.5t	fuse, 1/2 amp time delay, Midget style	electrical cabinet
14	eRTD6-100	RTD temp. sensor 6mm dia x 100mm long, Pt100	heating hopper
15	elc30V	load cell, 30 kg capacity	ret., vac. chamber
16	esp-50	pressure switch, 50 psi set-point, 1/8" NPT	main cabinet
17	eabVBD-01	I/O circuit board	electrical cabinet
18	eabVBD-02	display / HMI circuit board	front control panel
19	ebTS-7V	touchscreen	front control panel
20	eabVBD-03	pendant circuit board (.8" 4-digit numeric)	front control panel
21	nmd-01E	replacement element, for membrane air dryer	pneumatics cabinet
22	eht10-24	tube heater, 10,000 watt 3 phase 240 VAC	main cabinet
23	eht10-40	tube heater, 10,000 watt 3 phase 400 VAC	main cabinet
24	eht10-48	tube heater, 10,000 watt 3 phase 480 VAC	main cabinet
25	eht10-56	tube heater, 10,000 watt 3 phase 575 VAC	main cabinet
26	ehsl-02	strobe light, red, magnetic base, 24VDC	top deck
27	ehb-2	piezo buzzer, 24VDC	front control panel

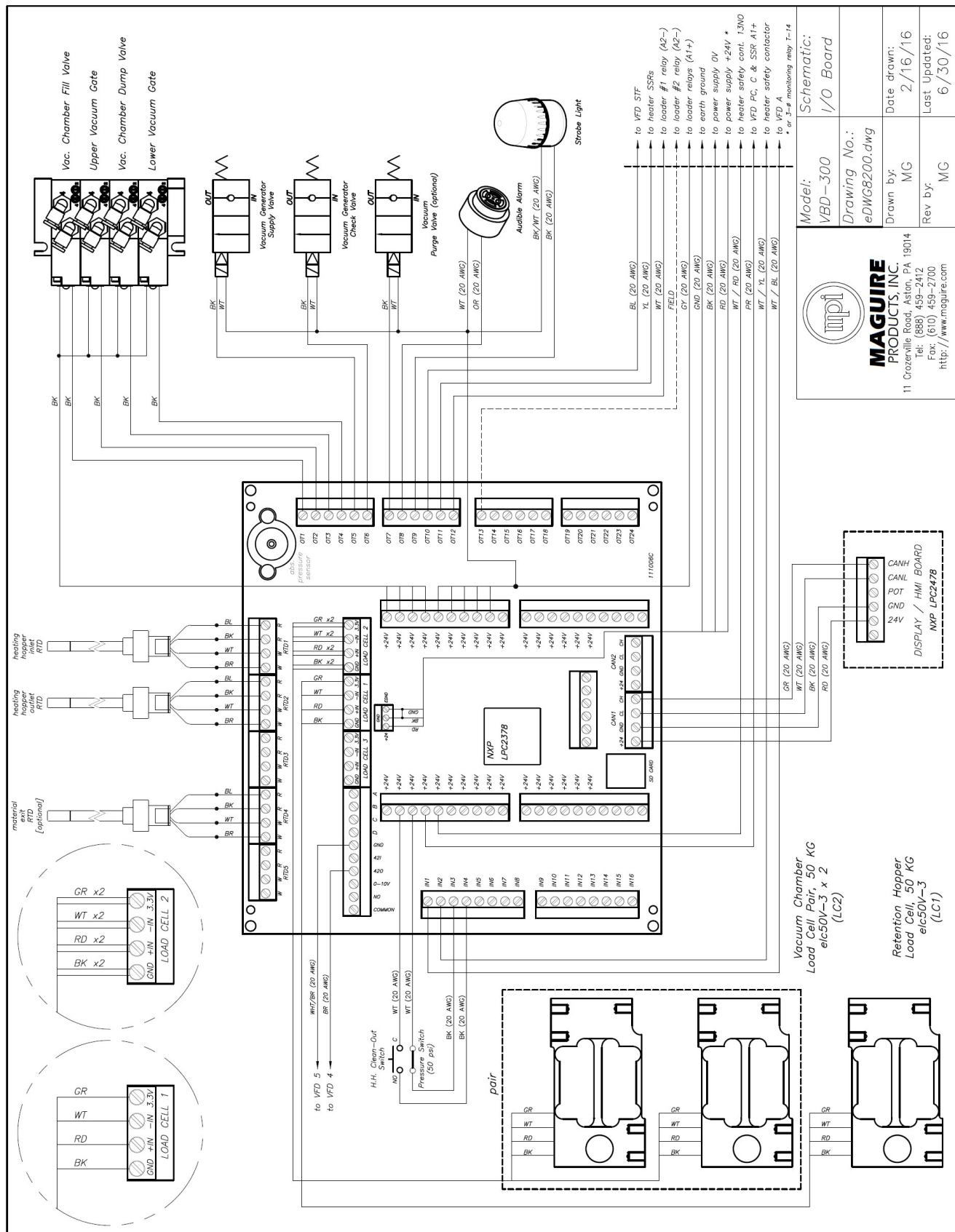
28	esh-01	interlock handle, red/yellow pistol	front control panel
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VBD-300 Technical Specification

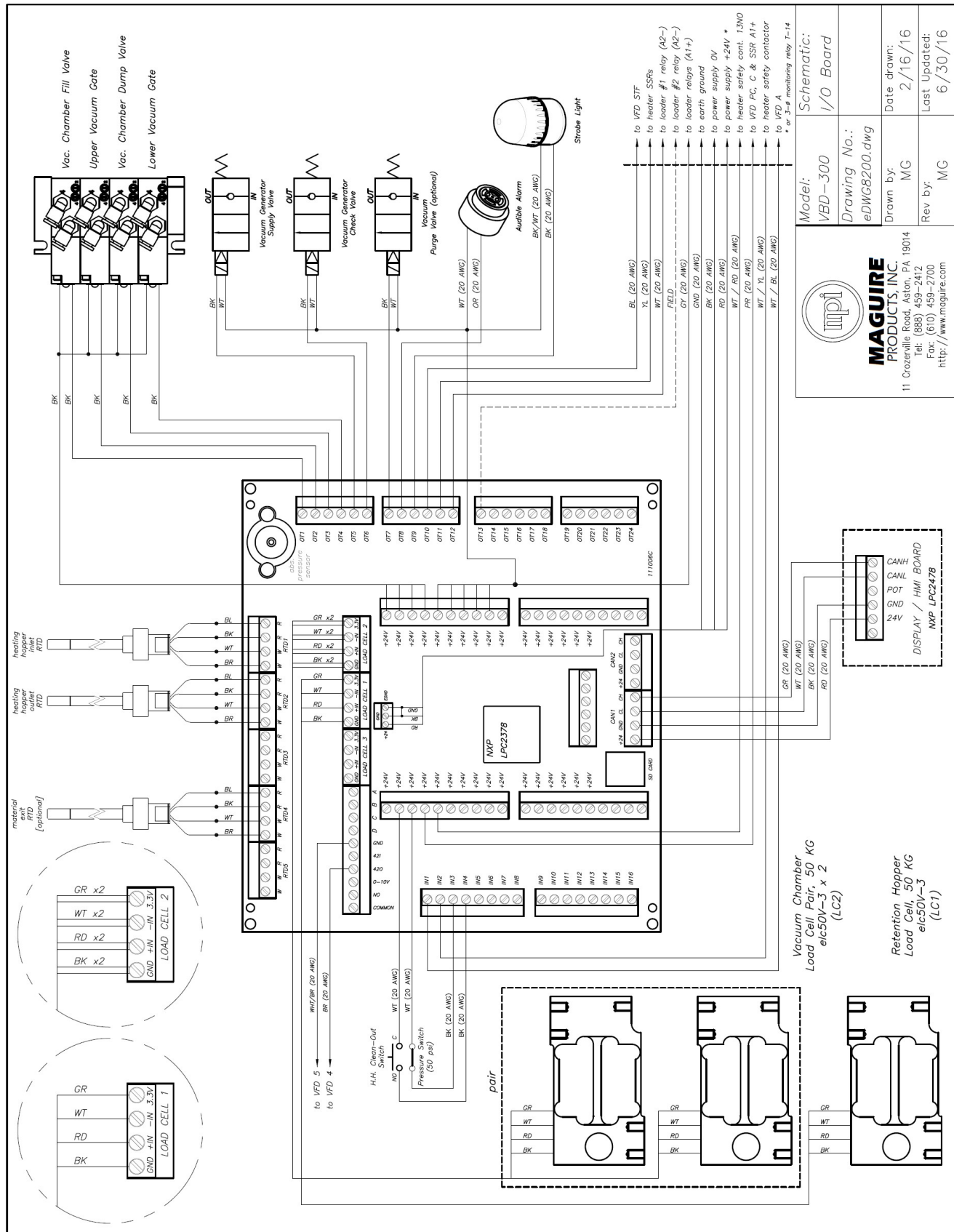
Line no.	parameter	Domestic/Canadian		European	
		value	units	value	units
1	design throughput	300	lbs./hour	136	kgs./hour
2	maximum run temperature	375	°F	190	°C
3	maximum vacuum level, absolute	75	mm Hg.	75	mm Hg.
4	complete unit weight, empty	918	lbs.	416	kgs.
5	overall unit height	119	inches	3.02	meters
6	overall unit height w/ extension	134	inches	3.40	meters
7	voltage	480 / 575	volts	380	volts
8	full load amps (FLA)	27 / 22	amps	33	amps
9	phase	3	∅	3	∅
10	frequency	60	Hz	50	Hz
11	compressed air requirement, sustained pressure	85	psi	5.86	bar
12	compressed air requirement, max flow rate	13.5	SCFM	382	L/min
13	compressed air requirement, average flow rate	6.5	SCFM	184	L/min
14	blower model	RBH6-305-3	All-Star	RBH4-2-3	All-Star
15	blower power	3.5	HP	2.2	kW
16	blower max flow	228	SCFM	5380	L/min
17	blower max pressure	89	inches H ₂ O	228	mbar
18	blower noise level	77	db(A)	72	db(A)
19	heater power	18,000	watts	18,000	watts
20	vacuum generator model	JS-250	Vaccon	JS-250	Vaccon
21	heating hopper cylinder I.D.	17	in.	432	mm
22	heating hopper cylinder height	27	in.	686	mm
23	heating hopper material capacity	4.25	cu. ft.	120.3	L
24	heating hopper absolute capacity	5.125	cu. ft.	145.1	L
25	heating hopper material capacity w/ extension	6.25	cu. ft.	177.0	L
26	heating hopper absolute capacity w/ extension	7.125	cu. ft.	201.8	L
27	heating hopper empty weight	201	lbs.	91.2	kg
28	vacuum chamber cylinder I.D.	16.35	in.	415	mm
29	vacuum chamber cylinder height	17.5	in.	445	mm
30	vacuum chamber material capacity	2	cu. ft.	56.6	L
31	vacuum chamber absolute air capacity	2.5	cu. ft.	70.8	L
32	vacuum chamber normal evacuation volume	1.6	cu. ft.	45.3	L
33	vacuum chamber empty weight	72.5	lbs.	32.9	kgs.
34	retention hopper cylinder I.D.	19	in.	483	mm
35	retention hopper cylinder height	14	in.	356	mm
36	retention hopper material capacity	2.25	cu. ft.	63.7	L
37	retention hopper absolute capacity	2.8	cu. ft.	79.3	L
38	retention hopper empty weight	31.5	lbs.	14.3	kgs.

VBD-300 Diagrams

VBD-300 I/O Board Wiring Diagram



VBD-300 I/O Board Wiring Diagram with VFD



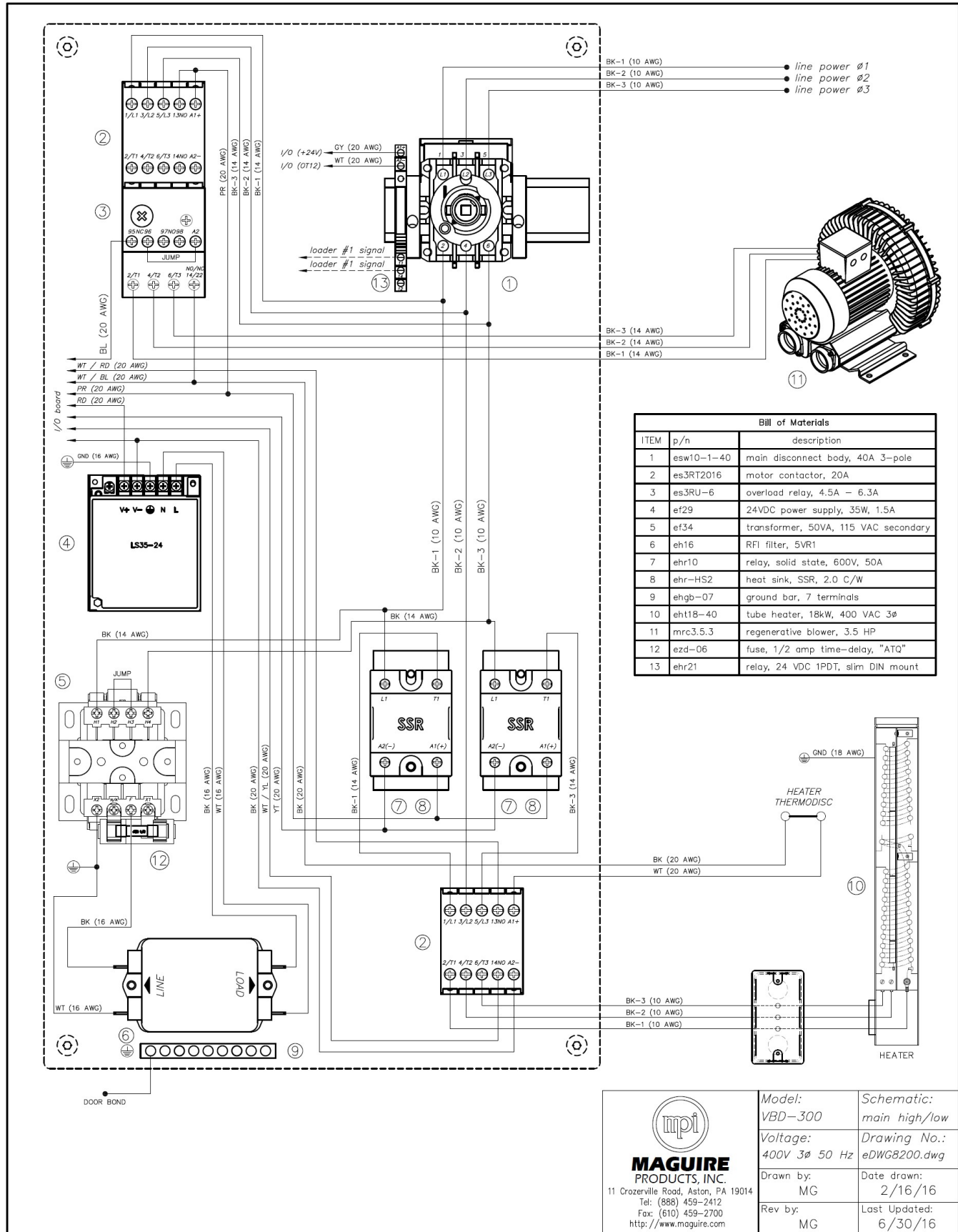
Model: VBD-300
Drawing No.: eDWG8200.dwg
Drawn by: MG
Rev by: MG

Schematic: I/O Board

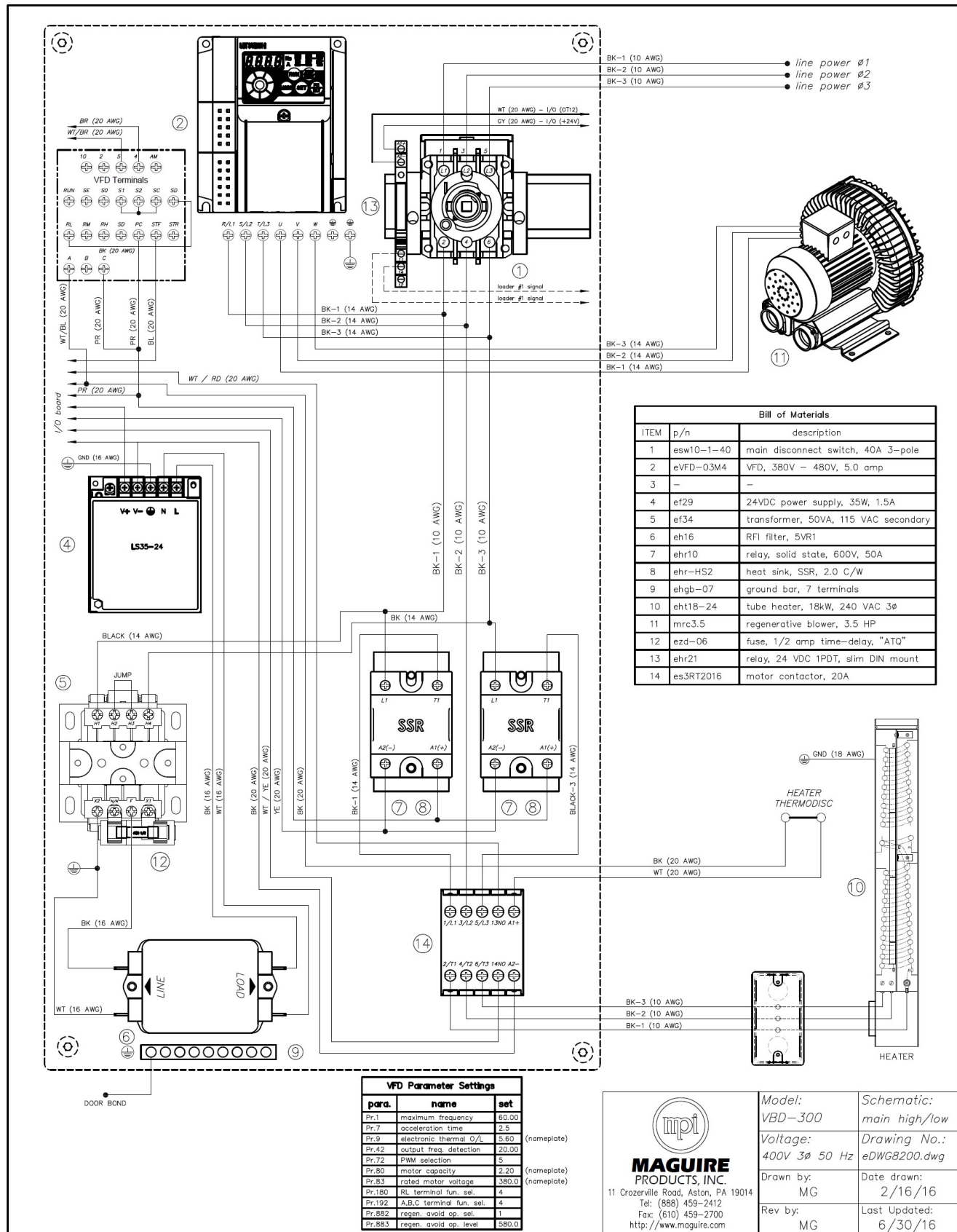
Date drawn: 2/16/16
Last Updated: 6/30/16

MAGUIRE PRODUCTS, INC.
 11 Crozerville Road, Aston, PA 19014
 Tel: (888) 459-2412
 Fax: (610) 459-2700
 http://www.maguire.com

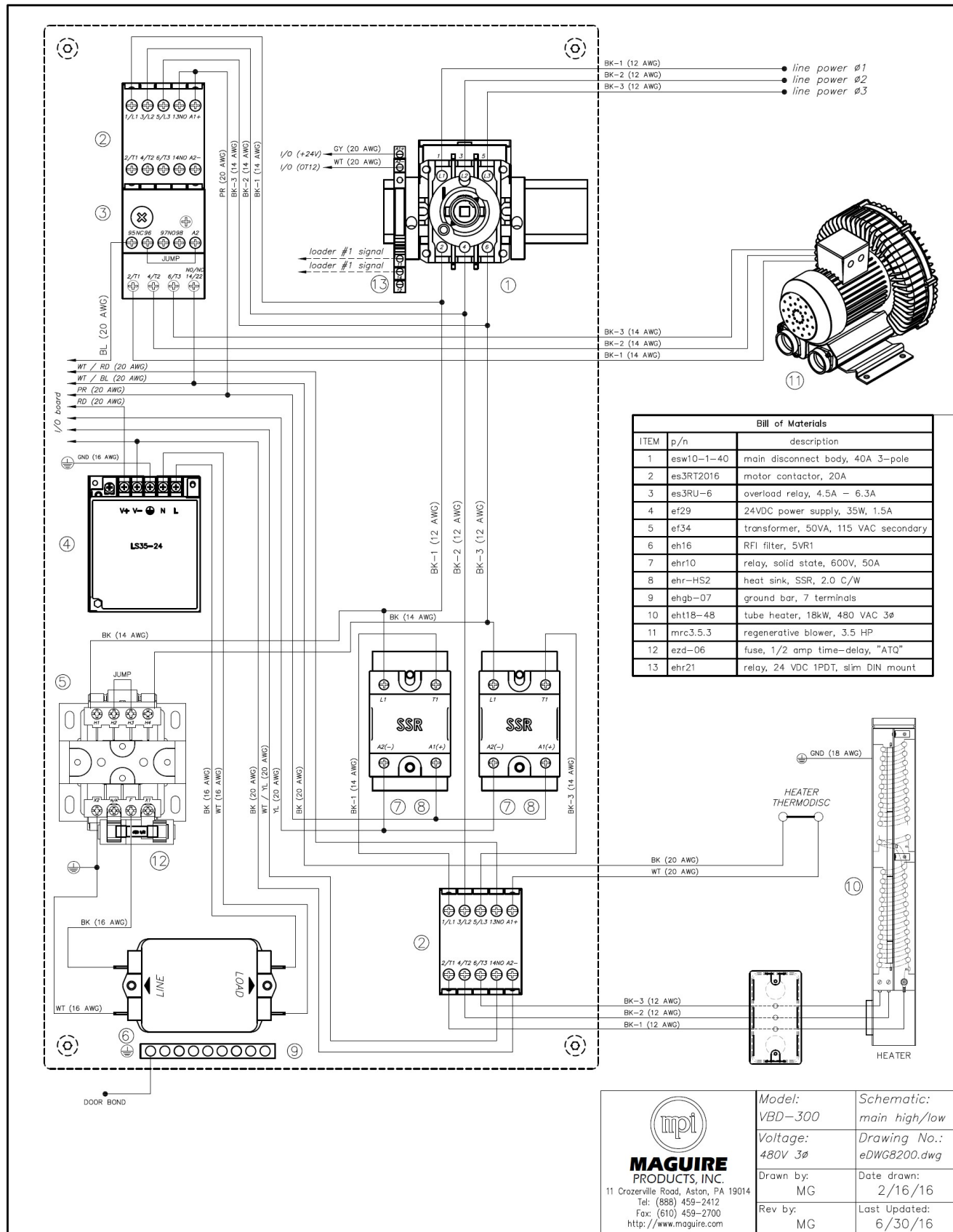
VBD-300 400V Wiring Diagram



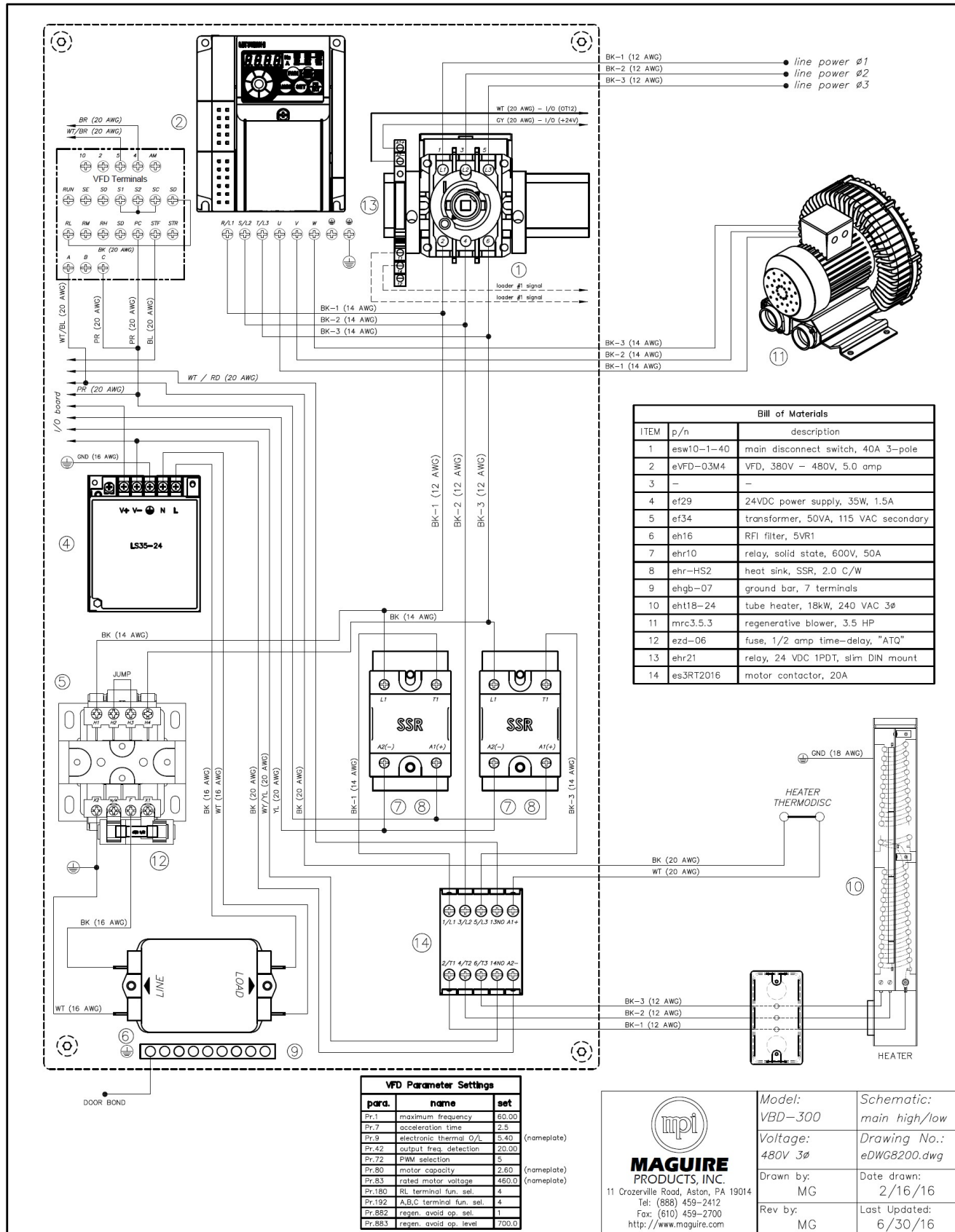
VBD-300 400V Wiring Diagram with VFD



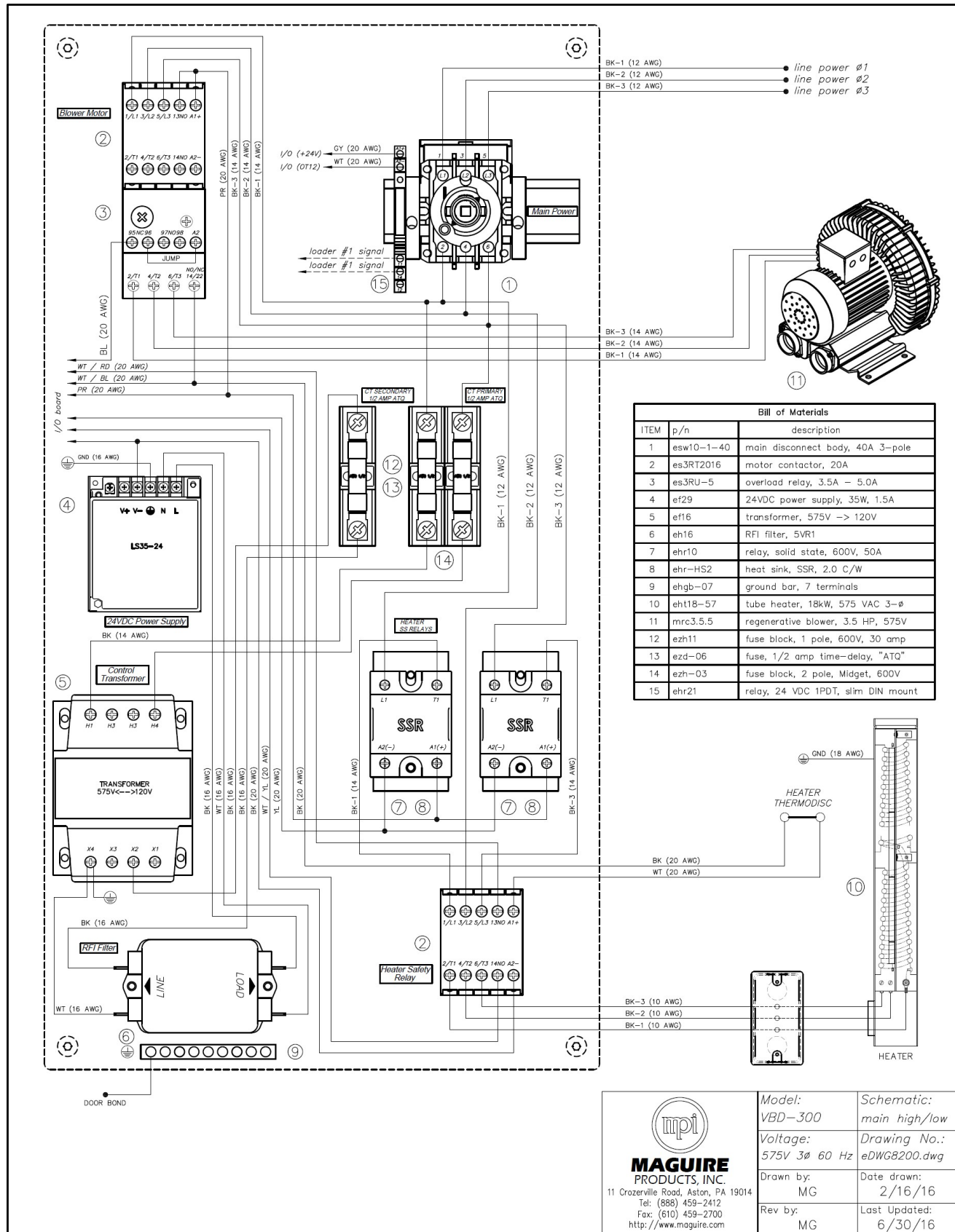
VBD-300 480V Wiring Diagram



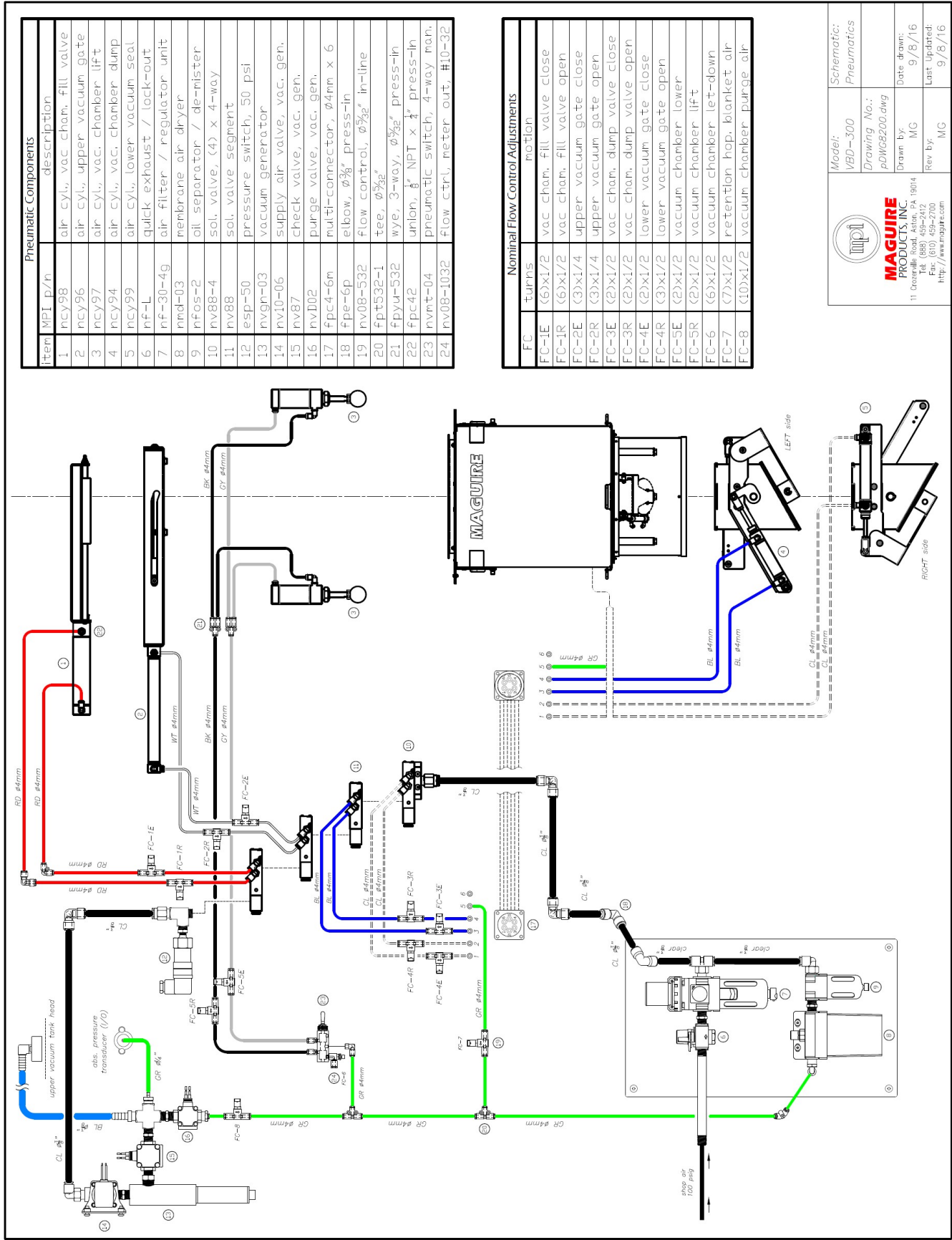
VBD-300 480V Wiring Diagram with VFD



VBD-300 575V Wiring Diagram



VBD-300 Pneumatic Diagram



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PRODUCTS, INC.
11 Crozesville Road, Aston, PA 19014
Tel: (888) 459-2472
Fax: (610) 459-2700
http://www.maguire.com

Model: VBD-300
Drawing No.: pDWG8200.dwg
Drawn by: MG
Rev by: MG
Date drawn: 9/8/16
Last updated: 9/8/16

Schematic: Pneumatics

VBD-300 Recommended Spare Parts List

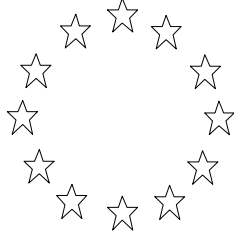
Note: it is recommended that items #1 - #8 be kept on hand by the maintenance department.

line item	MPI p/n	Description	General Location
1	hf19-E	replacement filter element, blower intake	rear panel
2	8224-11	silicone seal, vacuum chamber dump valve	vacuum chamber
3	go-357V	o-ring, size 357, Viton	upper vacuum gate
4	go-350V	o-ring, size 350, Viton	lower vacuum gate
5	as8224-03	vac. seal plate assy., vac. cham. dump valve	lower vacuum gate
6	nv88	solenoid valve segment, 4-way, 24 VDC	main cabinet
7	nf-30E	filter element, for "AW30" series regulator	pneumatics cabinet
8	nfos3E	filter element, for oil separator	pneumatics cabinet

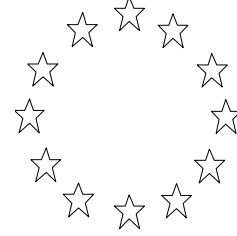
Other Potential Replacement Parts

9	es3RU-6	overload relay, 3.5 A - 5.0 A	electrical cabinet
10	es3RU-7	overload relay, 4.5 A - 6.3 A	electrical cabinet
11	es3RT2016	motor contactor, 3 pole, 20A, 24 VDC	electrical cabinet
12	ehr09	relay, SS, 480V 25A, 24-265 VAC signal	electrical cabinet
13	ezd-.5t	fuse, 1/2 amp time delay, Midget style	electrical cabinet
14	eRTD6-100	RTD temp. sensor, 6mm dia x 100mm long, Pt100	heating hopper
15	elc50V	load cell, 50 kg capacity	ret., vac. chamber
16	esp-50	pressure switch, 50 psi set-point, 1/8" NPT	main cabinet
17	eabVBD-01	I/O circuit board	electrical cabinet
18	eabVBD-02	display / HMI circuit board	front control panel
19	ebTS-7V	touchscreen	front control panel
20	eabVBD-03	pendant circuit board (.8" 4-digit numeric)	front control panel
21	nmd-03E	replacement element, for membrane air dryer	pneumatics cabinet
22	eht15-24	tube heater, 15,000 watt 3 phase 240 VAC	main cabinet
23	eht15-40	tube heater, 15,000 watt 3 phase 400 VAC	main cabinet
24	eht15-48	tube heater, 15,000 watt 3 phase 480 VAC	main cabinet
25	eht15-56	tube heater, 15,000 watt 3 phase 575 VAC	main cabinet
26	ehsl-02	strobe light, red, magnetic base, 24VDC	top deck
27	ehb-2	piezo buzzer, 24VDC	front control panel
28	esh-01	interlock handle, red/yellow pistol	front control panel

DECLARATION OF CONFORMITY



2006/42/EC Machinery Directive
2014/30/EU EMC Directive

**Name of manufacturer or supplier**

Maguire Products Inc.

Full postal address including country of origin

11 Crozerville Rd, Aston, PA 19014 ,USA

Description of product

VBD-150, VBD-300

Name, type or model, batch or serial number

Model: VBD-150, VBD-300

Serial Number:

Standards used, including number, title, issue date and other relative documents

EN4414 (2010); EN11201 (2010); EN12100 (2010); EN13849-1 (2015); EN13850 (2015); EN13857 (2008); EN14119 (2013); EN14120 (2015); EN60204-1 (AC:2010) and EN61310-1 (2008)

Name of Responsible Person within the EU - Mr Paul Edmondson (Director)**Full postal address if different from manufacturers**

Maguire Europe: Tame Park, Tamworth, Staffs, B77 5DY, UK

Declaration

I declare that as the Manufacturer, the above information in relation to the supply / manufacture of this product, is in conformity with the stated standards and other related documents following the provisions of the above Directives and their amendments.

Signature of Manufacturer: _____

Position Held: _____

Date: _____

Technical Support and Contact Information

Maguire Products Inc.

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