Vacuum Batch Dryer® Touchscreen

VBD-150
VBD-300

Vacuum Batch Dryer®
Touch Screen Controller

INSTALLATION • OPERATION • MAINTENANCE

Rev. October 5, 2018

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

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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 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.

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# Table of Contents

## INSTALLATION

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBD-150 Dryer Assembly</td>
<td>11</td>
</tr>
<tr>
<td>Dryer Connections</td>
<td>18</td>
</tr>
<tr>
<td>Compressed Air Connection</td>
<td>18</td>
</tr>
<tr>
<td>Electrical Connection</td>
<td>19</td>
</tr>
<tr>
<td>Dryer Overview</td>
<td>21</td>
</tr>
</tbody>
</table>

## Home Screen Overview

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Controller Overview</td>
<td>22</td>
</tr>
<tr>
<td>Setup Menu Map - Brief Explanation</td>
<td>30</td>
</tr>
<tr>
<td>Setup Menu Options Explained</td>
<td>35</td>
</tr>
<tr>
<td>Parameters Explained</td>
<td>40</td>
</tr>
<tr>
<td>Changing Parameters</td>
<td>47</td>
</tr>
<tr>
<td>Batch Mode</td>
<td>48</td>
</tr>
<tr>
<td>Communication Setup</td>
<td>49</td>
</tr>
</tbody>
</table>

## Operation

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Startup and Operation</td>
<td>23</td>
</tr>
<tr>
<td>Recommended Drying Temperatures</td>
<td>29</td>
</tr>
</tbody>
</table>

## Maintenance

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drain and purge Air Filter / Regulator</td>
<td>51</td>
</tr>
<tr>
<td>Air Pressure Adjustments</td>
<td>51</td>
</tr>
<tr>
<td>Replacing the Air Filter</td>
<td>51</td>
</tr>
<tr>
<td>Loadcell Calibration</td>
<td>52</td>
</tr>
<tr>
<td>Temperature and Pressure Verification</td>
<td>54</td>
</tr>
<tr>
<td>Cleanout Procedure</td>
<td>55</td>
</tr>
<tr>
<td>Vacuum Chamber Removal</td>
<td>58</td>
</tr>
<tr>
<td>Printing Parameters, Events and Alarms</td>
<td>62</td>
</tr>
<tr>
<td>Alarms - Cause and Solution</td>
<td>68</td>
</tr>
<tr>
<td>Save / Restore User Settings</td>
<td>72</td>
</tr>
<tr>
<td>Firmware Updates</td>
<td>73</td>
</tr>
<tr>
<td>Theory of Operation / Performance</td>
<td>74</td>
</tr>
</tbody>
</table>

## Technical Documentation

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VBD-150 Technical Specifications</td>
<td>75</td>
</tr>
<tr>
<td>VBD-150 Diagrams</td>
<td>76</td>
</tr>
<tr>
<td>VBD-150 Recommended Spare Parts List</td>
<td>86</td>
</tr>
<tr>
<td>VBD-300 Technical Specifications</td>
<td>87</td>
</tr>
<tr>
<td>VBD-300 Diagrams</td>
<td>88</td>
</tr>
<tr>
<td>VBD-300 Recommended Spare Parts List</td>
<td>96</td>
</tr>
</tbody>
</table>

## Declaration of Conformity

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical Support / Contact Information</td>
<td>98</td>
</tr>
</tbody>
</table>
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.
SAFETY WARNINGS

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.

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.
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

![Warning Icon]

Ensure your lifting equipment is rated to lift the weight of the individual sections of the VBD-150 or VBD-300. See Technical Documentation on page 75 for weights of the individual sections of both the VBD-150 and the VBD-300.
Overall layout and Dimensions

VBD-150
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 ½"-13 bolts as follows:

Each ½"-13 bolt will receive a ½" lock washer below the head.
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.

**WARNING**

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 Vacuum Chamber forming a paste inside the will stop working and require cleaning. Observe the air pressure gauge to be sure the psi (5.5 bar) while the vacuum generator is running adjust the regulator. If pressure drops below 80 regulator. If the pressure cannot be maintained at the vacuum generator is running, then the air adequate.

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

**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.

<table>
<thead>
<tr>
<th>Voltage</th>
<th>VBD-150</th>
<th>VBD-300</th>
</tr>
</thead>
<tbody>
<tr>
<td>240</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>25</td>
<td>35</td>
</tr>
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<td>480</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>575</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

See the High Voltage Wiring Diagram section starting on page 78.
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 Manual Operations.

2. Press Blower Test.

3. Press the Blower button once to turn ON the Blower. Press again to turn OFF.
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)
Home Screen Overview

Shown with enabled options: Auto Shutdown, Batch Mode, and Preheat.

T1 Actual - Actual Heating Hopper inlet air temperature

T1 Setpoint - Heating Hopper inlet air temperature Setpoint. Touch to adjust.

T2 Temp – Actual Heating Hopper temperature


Vacuum Chamber Weight Vacuum Chamber Actual and Maximum Weight

Retention Hopper Weight Actual and maximum weight

Title Bar - Located across the top of the screen, the title bar displays Model, ID, I/O status, current operating mode, date and time, Ethernet and USB status.

Navigation Menu - Located along the right side of the screen, these buttons allow quick navigation to frequently used and top level screens. The middle three buttons are soft buttons that can be changed or removed.

Start / Shutdown (Auto Shutdown shown above) Button - Main Start Stop Control Button of the Dryer.

Navigation Menu

<table>
<thead>
<tr>
<th>Screen</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Home Screen</td>
<td>Pressing the Home Screen button from any other screen will return the operator to the main Home Screen.</td>
</tr>
<tr>
<td>Alarm and Event</td>
<td>Alarm and Event Log displays a history of alarms and other events with a date and time stamps and description.</td>
</tr>
<tr>
<td>Info Screen</td>
<td>System Information including firmware versions, IP and MAC address and machine operating tags.</td>
</tr>
<tr>
<td>Print Center</td>
<td>A menu screen of print related options including Totals, Parameters, Alarm History, Events, Cycle History, Diagnostics. See page 62.</td>
</tr>
<tr>
<td>Setup Login</td>
<td>Password protected access to advanced Dryer and System configuration information. See Page 35.</td>
</tr>
</tbody>
</table>

Run Dryer - See page 23
Run Dryer in Batch Mode – See page 48
Clean Out – See page 58
Manual Operations - See page 30
**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.

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. **On the Home Screen:**

   **T1 Inlet Temp Setpoint** – 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 Drying Temperatures on page 29 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.

   Press the setpoint field to adjust the setting. Use the on-screen keypad to enter the setpoint and press the green check to complete the setting adjustment.

5. Press the **START** button to start the dryer.

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

   **T1 Actual** - Actual Heating Hopper inlet air temperature

   **T1 Setpoint** - Heating Hopper inlet air temperature Setpoint.

   **T2 Temp** – Actual Heating Hopper temperature

   **Vacuum Time** – Vacuum Time Actual and Vacuum Time Setpoint.

   **Vacuum Chamber Weight** - Vacuum Chamber Actual/Maximum Weight.
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.
End Preheat, Shutdown, Auto Shutdown, Immediate Shutdown and Pause

End 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).

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

Shutdown – Shutdown will continue 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 ▲ ▼ to adjust the setting. Press ENTER to advance through the digits and to complete the setting adjustment.

Press the Shutdown button to 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.

Pause – Press the Vacuum Chamber will display the Vacuum Chamber Setup screen. Pause is the red button at the bottom of the screen. Pauses the vacuum timer indefinitely. To restart after a pause, press RESUME.

Auto Shutdown – Initiates a shutdown (see above) at specified date and time. For further explanation on how to set the Auto Stop date and time see page 27.

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.
# Auto-Stop Setup

Auto-Stop initiates a shutdown at a specified time on specific days if the week. To enable and configure Auto-Stop follow the steps below.

<table>
<thead>
<tr>
<th>Press</th>
<th></th>
<th>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Display will show the Dryer Configuration categories.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Display will show the Auto-Stop screen.</td>
<td></td>
</tr>
</tbody>
</table>

To Enable Auto-Stop:

<table>
<thead>
<tr>
<th>Press</th>
<th>Auto-Stop Enabled</th>
<th>to enable Auto-Stop. Display will show Auto-Stop scheduling.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>Schedule</th>
<th>Set the time of day Auto-Stop should occur.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>to select the days of the week Auto-Stop should occur.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>to save the Auto-Stop settings.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>the Home Button to return to the Home Screen.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Advanced Information

Pressing the Home Screen will display additional information such as readings of all RTD thermometers, vacuum time elapsed, absolute pressure in the Vacuum Chamber, blower drive frequency.

**T1 Actual** - Actual Heating Hopper inlet air temperature.

**T1 Setpoint** - Heating Hopper inlet air temperature Setpoint.

**Heat Hopper** - Heating Percent (%) output.

**T2 Temp** – Actual Heating Hopper temperature

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

**Bulk Density** - Bulk density of material in either pounds per cubic foot or kilograms per liter.

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

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

**Valve Timing - Fill** - Total time to fill the Vacuum Chamber.

**Valve Timing - Dump** - Total time to dump the Vacuum Chamber.

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

**Thruput** - Calculated throughput, weight per hour.

**Vacuum** - Vacuum Chamber Actual Weight

**Retention** - Current material weight in Retention Hopper.

**Residence** – Actual Vacuum Time.
# Recommended Drying Temperatures

<table>
<thead>
<tr>
<th>MATERIAL</th>
<th>FINAL MOISTURE % *</th>
<th>DRYING TEMPERATURE** °C</th>
<th>°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>0.10</td>
<td>80 - 85</td>
<td>180 – 190</td>
</tr>
<tr>
<td>ABS/PC</td>
<td>0.02</td>
<td>100</td>
<td>210</td>
</tr>
<tr>
<td>LCP</td>
<td>0.02</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PA</td>
<td>0.20 - 0.10</td>
<td>80 - 85</td>
<td>180 – 190</td>
</tr>
<tr>
<td>PBT</td>
<td>0.02</td>
<td>120</td>
<td>250</td>
</tr>
<tr>
<td>PC</td>
<td>0.02</td>
<td>125</td>
<td>250</td>
</tr>
<tr>
<td>PC/PBT</td>
<td>0.02</td>
<td>125</td>
<td>250</td>
</tr>
<tr>
<td>PEEK</td>
<td>0.20 - 0.10</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PEI</td>
<td>0.02</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PES</td>
<td>0.05 - 0.02</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PET (Molding Grade)</td>
<td>0.010</td>
<td>150-180</td>
<td>300-350</td>
</tr>
<tr>
<td>PET (Preform, Extrusion)</td>
<td>0.005</td>
<td>150-180</td>
<td>300-350</td>
</tr>
<tr>
<td>PMMA (Acrylic)</td>
<td>0.02 - 0.04</td>
<td>79</td>
<td>175</td>
</tr>
<tr>
<td>POM (Acetal)</td>
<td>0.20 - 0.10</td>
<td>80 - 110</td>
<td>180 – 230</td>
</tr>
<tr>
<td>PPO</td>
<td>0.02</td>
<td>100 - 120</td>
<td>210 – 250</td>
</tr>
<tr>
<td>PPS</td>
<td>0.02</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>PUR</td>
<td>0.02</td>
<td>125 - 140</td>
<td>260 – 280</td>
</tr>
<tr>
<td>PSU</td>
<td>0.02</td>
<td>150</td>
<td>300</td>
</tr>
<tr>
<td>SAN</td>
<td>0.20 - 0.10</td>
<td>80</td>
<td>180</td>
</tr>
</tbody>
</table>

* 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.
**Setup Menu Map - Brief Explanation**

This section contains a brief explanation of the Setup menu. For detailed information see Setup Menu Full Explanation starting on page 35.

<table>
<thead>
<tr>
<th>►</th>
<th>Setup (password protected) – Settings and Options Menus</th>
</tr>
</thead>
<tbody>
<tr>
<td>►</td>
<td>Dryer Configuration - Dryer specific settings</td>
</tr>
<tr>
<td>►</td>
<td>Alarm Setup – Enable or disable various alarms.</td>
</tr>
<tr>
<td>►</td>
<td>Auto-Stop Setup - Scheduling Auto-Stop of the dryer.</td>
</tr>
<tr>
<td>►</td>
<td>Dry Purge Setup - Configuration of dry purge.</td>
</tr>
<tr>
<td>►</td>
<td>Preheat Setup - Configuration of Preheat.</td>
</tr>
<tr>
<td>►</td>
<td>Auto-Start Setup - Scheduling Auto-Start of the dryer.</td>
</tr>
<tr>
<td>►</td>
<td>Convey Setup - Configuration of material convey and loaders.</td>
</tr>
<tr>
<td>►</td>
<td>Load-cell Setup - Loadcell calibration, zero and full calibration.</td>
</tr>
<tr>
<td>►</td>
<td>Parameters - Operation Parameters</td>
</tr>
<tr>
<td>►</td>
<td><strong>Blower</strong></td>
</tr>
<tr>
<td></td>
<td>• BDT - Blower Delay Time (Seconds)</td>
</tr>
<tr>
<td></td>
<td>• BLF - VFD Low Limit</td>
</tr>
<tr>
<td></td>
<td>• BHF - VFD High Limit</td>
</tr>
<tr>
<td></td>
<td>• BDF - VFD Frequency</td>
</tr>
<tr>
<td></td>
<td>• BZL - VFD Zero Level</td>
</tr>
<tr>
<td></td>
<td>• BLA - VFD Level Adjustment</td>
</tr>
<tr>
<td></td>
<td>• BHT - VFD Heat Throttle</td>
</tr>
<tr>
<td></td>
<td>• BAC - VFD Air Flow Cutback</td>
</tr>
<tr>
<td></td>
<td>• BTC - VFD Temperature Cutback</td>
</tr>
<tr>
<td></td>
<td>• BTA - VFD Throttle Adjustment</td>
</tr>
<tr>
<td>►</td>
<td><strong>Heater</strong></td>
</tr>
<tr>
<td></td>
<td>• PTS - Preheat Temperature Setting</td>
</tr>
<tr>
<td></td>
<td>• PHT - Preheat Time</td>
</tr>
<tr>
<td></td>
<td>• PTD - Preheat Target Delta</td>
</tr>
<tr>
<td></td>
<td>• RTS - Run Temperature Set-Point</td>
</tr>
<tr>
<td></td>
<td>• PT1 - PD Loop Proportional</td>
</tr>
<tr>
<td></td>
<td>• DT1 - PD Loop Derivative</td>
</tr>
<tr>
<td></td>
<td>• UT1 - PD Loop Update Time</td>
</tr>
<tr>
<td></td>
<td>• OT1 - Heat1 Over-Target Alarm</td>
</tr>
<tr>
<td></td>
<td>• NH1 - Heat1 No Heat Alarm</td>
</tr>
<tr>
<td></td>
<td>• SO1 - Heat1 Set-Point Off. Percent</td>
</tr>
<tr>
<td></td>
<td>• MP1 - Heat1 Max Percent</td>
</tr>
<tr>
<td></td>
<td>• RO1 - Heat1 Restart Offset</td>
</tr>
<tr>
<td></td>
<td>• MAX - Max Temp Set-Point</td>
</tr>
<tr>
<td></td>
<td>• ESL - Energy Savings Limit</td>
</tr>
<tr>
<td></td>
<td>• ESD - Energy Savings Differential</td>
</tr>
<tr>
<td></td>
<td>• EST - Energy Saver Time</td>
</tr>
<tr>
<td></td>
<td>• RMP - Temperature Ramp Settings</td>
</tr>
<tr>
<td></td>
<td>• CTM - Cool-Down Temperature</td>
</tr>
<tr>
<td></td>
<td>• CTR - Cool-Down Timer</td>
</tr>
<tr>
<td>►</td>
<td><strong>System</strong></td>
</tr>
<tr>
<td></td>
<td>• ELT - Event Logging Time</td>
</tr>
</tbody>
</table>
### Dispensing
- 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)
- HHA - Heating Hopper High Level (optional)
- HLA - Heating Hopper Level Alarm (optional)
- HHL - Heating Hopper Low Level

### Load-Cell
- 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
- 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 Configuration
<table>
<thead>
<tr>
<th>System Configuration</th>
<th>System specific settings</th>
</tr>
</thead>
</table>

### Print Options
- **Print Parameters** - Prints parameter report to USB Flash Drive
- **Print Alarms and Events** - Prints alarms and events to USB Flash Drive
- **Copy Log File** - Copies raw log file to USB drive.
- **Print Alarm History** - Prints Alarm History to USB Flash Drive
- **Print All** - Prints all above reports to USB Flash Drive

### Diagnostics
- **System Information** - Firmware, bootloader, I/O versions
- **Load-Cell Diagnostics** - Loadcell raw counts
- **Alarm and Event Log** - Alarms and Events displayed and printable
- **Live Diagnostics** - Live Cycle diagnostic report, printable history
- **Communication Diagnostics** - Information for communications

### Resets
- **User Settings** - Save / Restore User entered Settings
- **Restore All** - Restores factory default settings
- **Firmware Updates** - Reads USB drive for updates, selects and updates firmware. Contact Maguire Products Inc. for updates.
| ► Factory Access - Factory Access Only |
| ► Restore Parameters - Restores factory default parameters |
| ► Preferences |
| ► Change Passwords - Change Admin and Operator passwords |
| ► Display Options – On-screen information display preferences |
| ► Language - Language selection |
| ► Screen Options - Screen saver, brightness, calibration, options |
| ► Date and Time |
| ► Weight Units - pounds, ounces, grams kilograms |
| ► Navigation Bar Options – configure right-side soft keys |
| ► Communications |
| ► MLAN I.D. Number - Set Dryer identification number |
| ► Modbus Server - enable/disable Modbus TCP |
| ► TCP/IP Configuration - Sets IP address, Subnet mask, gateway |
| ► MLAN Serial Baud Rate - Set baud rate of MLAN over serial |
Modes of Operation


Run Dryer - See Operation on page 23.

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.

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

Vacuum Chamber Timed Dispense – Opens valves for specified milliseconds.
- Fill: Fill Time of the Vacuum Chamber in milliseconds.
- Dump: Dump time of the Vacuum Chamber in milliseconds.

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)

**Heater Test** – Operates 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

**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
Setup Menu – Full Explanation

Setup is a password protected area for accessing Dryer or System specific configuration settings. Setup is accessible from the main screen by pressing:

Press Display will prompt for a password. (default: 22222) Then press:

Parameters – All Dryers operate according to certain internal PARAMETERS. Because customer requirements vary widely, we have made a wide range of parameters accessible for change through the touchscreen. Parameters are grouped into the following categories: Blower, Heater, System, Dispensing, Load-Cell, and Vacuum. Parameters are covered on page 40.

NOTE

Setup is divided into two categories: Dryer Configuration and System Configuration.

Dryer Configuration includes device specific settings such as: Alarm Setup, Auto-Stop Setup, Dry Purge Setup, Preheat Setup, Auto-Start Setup, Convey Setup, Load-Cell Setup, and Parameters.

System Configuration includes system wide general settings such as: print options, diagnostics, resets, system preferences, and communications settings.

The following section describes the features within the Setup Menu.

Dryer Configuration

<table>
<thead>
<tr>
<th>Setup Menu Option</th>
<th>Description / Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm Setup</td>
<td></td>
</tr>
<tr>
<td>Material Shortage Alarm</td>
<td>Disables the Material Shortage alarm</td>
</tr>
<tr>
<td>OFF:</td>
<td></td>
</tr>
<tr>
<td>WARN:</td>
<td>In the event of a material shortage, activate the audible alarm and strobe light but continue retrying for material.</td>
</tr>
<tr>
<td>SHUTDOWN:</td>
<td>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.</td>
</tr>
</tbody>
</table>

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.

**OFF:** Disables the Material Ready Alarm

**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.

**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, the alarm will sound when this alarm is triggered.

**OFF:** Disables the Material Temperature Alarm

**Residence Alarm (labeled “Material 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** - 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

**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.

<table>
<thead>
<tr>
<th>Auto-Start Setup</th>
<th>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 ENABLED in Display Setup.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto-Stop Setup</td>
<td>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 ENABLED in Display Setup.</td>
</tr>
</tbody>
</table>
| 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 76**  
- **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.  
|  |  
| Dry Purge Setup  | **Purge Chamber** - **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 52.  
|  |  
| Preheat Setup    | **Preheat Mode** – Material preheats prior to a vacuum cycle  
**Timed** – Preheat based on a set time  
**Auto (default)** – Preheat dependent on a min. time and delta temp.  
**Manual** – Preheat until heater is turned off  
| Parameters       | Parameters access. See page 40.  

**System Configuration**
Print Options

Print Parameters - Prints the parameter list to a USB.
Print Alarm History - Prints the Alarm History to USB.
Print Alarms and Event - Prints Alarm and Events to USB.
Print All - Prints parameters, events, and alarms to USB.
Copy Log File – Copies raw log file to USB.
Clear All Alarms and Events – Deletes all from memory

System Preferences

Change Passwords - Sets the Setup Menu Password. Default password is 22222. Setting the password to 00000 disables password protection.
Date and Time - Set time, date and date format.
Display Options - 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.
- Cycle Info - ON/OFF – Displays Cycle info on main screen.
- Dispense 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.
- Show Throughput – Displays throughput (lbs or kgs per hour)
- Show T4 Temperature - Displays actual temperature.

Display Units: Fahrenheit (°F) or Celsius (°C), Pounds (lbs) or Kilograms (kgs), Pressure: Absolute or Differential, Pressure units: mmHg or inHg.
Language – Set current language.
Navigation Bar Options – Configure right-side soft keys.
Screen Options – Screen Saver options, Screen Brightness, Screen Calibration and On-Screen Options. On-Screen Options is information shown across the top of the home screen including: Date/Time, Model Number, MLAN ID, USB Connectivity, Ethernet Connectivity.

Diagnostics

System Information – System Information displays specific system related information about the controller and Dryer.
Load-Cell Diagnostics – Displays Vacuum Chamber and Retention Hopper loadcell diagnostics information.
Alarm and Event Log – Displays the Alarm and Event Log screen.

Communications

Blender I.D. Number – Sets the Blender ID number. Enter an identification number for this particular weigh scale blender. This I.D. number will appear on all printed reports. If you have more than one unit, this helps to identify reports. If you are using the MLAN Protocol to automatically gather data, then
each controller must have a unique address. Valid numbers are 000 to 255.

**Modbus Server** – Enable or disable Modbus TCP.

**TCP/IP Configuration** – Enable DHCP or set a static IP address, subnet mask and default gateway.

For more information on communications see page 49.

### Resets

**User Settings – Save/Restore Settings** – Used for saving or restoring previously saved parameters. For more information on Saving and Restoring Settings, see “Saving Parameters in the User Backup Settings” on page 72.

**Factory Access** – For factory access only.

**Restore All** – Restores Factory Defaults.

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

**Restore Parameters** – Resets parameters back to factory defaults.

**Firmware Update** - Update VBD-150/300 firmware. See page 73.
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 Changed Parameters in this section:

**Changing parameters can have an impact on the Dryer's 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 Retries
- 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.

<table>
<thead>
<tr>
<th>3-letter Acronym</th>
<th>Parameter title (units) – default parameter value</th>
<th>Parameter description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blower Parameters</td>
<td>BDT Blower Delay Time (Time in seconds) – 00402</td>
<td>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.</td>
</tr>
<tr>
<td>BLF VFD Low Limit (Hz) – 00025 (visible when equipped with an optional VFD)</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>BHF VFD High Limit (Hz) – 00060 (visible when equipped with an optional VFD)</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>BDF VFD Frequency (Hz) – 00060 (visible when equipped with an optional VFD)</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>BZL VFD Zero Level (%) – 00045 (visible when equipped with an optional VFD)</td>
<td>The heating hopper level, expressed as a percentage, that triggers the VFD to reduce speed to the BLA setting.</td>
<td></td>
</tr>
<tr>
<td>BLA VFD Level Adjustment (Hz) – 00025 (visible when equipped with an optional VFD)</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>BHT VFD Heat Throttle (%) – 00100 (visible when equipped with an optional VFD)</td>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

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 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°
Maguire Products, Inc.

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 – 00500  
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

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.

Navigating and Making Changes to Parameters:

<table>
<thead>
<tr>
<th>Press</th>
<th>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Dryer Configuration</td>
<td>Display will show the Dryer Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>Parameters</td>
<td>Display will show the categories of Parameters. Parameters are divided into 6 categories. Blower, Heater, System, Dispensing, Load-Cell, and Vacuum.</td>
</tr>
<tr>
<td>Press</td>
<td>The category that would contain the parameter you want to adjust.</td>
<td>Categories will have several parameters indicated by a 3-letter acronym on the left of the screen. Some categories have multiple pages. Navigate pages using the arrow buttons at the lower-left of the screen.</td>
</tr>
<tr>
<td>Press</td>
<td>The parameter that you want to adjust.</td>
<td>Display will show 5 digits. Press the up or down arrows to adjust.</td>
</tr>
<tr>
<td>Press</td>
<td>To save the parameter adjustment or press the red X to cancel and exit.</td>
<td></td>
</tr>
</tbody>
</table>
Batch Mode

Batch Mode enables the dryer to dry a predetermined amount of material and then automatically stop and display a message indicating the batch is complete. To turn on Batch Mode see: System Configuration / System Preferences / Display Options / Batch Mode, page 35.

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

<table>
<thead>
<tr>
<th>Press</th>
<th>Start Batch</th>
<th>Start Batch button is located on the Home Screen after Batch Mode is enabled. Display will show: Batch Start Options.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Set Batch Target</td>
<td>Keypad screen will display. Enter Batch Weight.</td>
</tr>
<tr>
<td>Press</td>
<td>![Check symbol]</td>
<td>To save the batch weight or press the red X to cancel and exit.</td>
</tr>
<tr>
<td>Press</td>
<td>Reset Totalizer</td>
<td>to reset the totalized value back to zero (if applicable).</td>
</tr>
<tr>
<td>Press</td>
<td>![Check symbol]</td>
<td>To save the entered batch weight and begin the batch and start the Dryer. Press the red X to cancel.</td>
</tr>
</tbody>
</table>
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.

MLAN communications over Ethernet use port 9999 to communicate. Modbus communications, when enabled (see below), use port 502.

Setting the MLAN ID Number

<table>
<thead>
<tr>
<th>Press</th>
<th>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Display will show the System Configuration categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>Communications</td>
<td>Display will show the System Communications categories.</td>
</tr>
<tr>
<td>Press</td>
<td>MLAN I.D. Number</td>
<td>Display will show the MLAN I.D. Number screen. On this screen, enter the new ID number using the keypad. Valid I.D. numbers are 1 through 254.</td>
</tr>
<tr>
<td>Press</td>
<td>To save the Changes.</td>
<td></td>
</tr>
</tbody>
</table>

Setting the IP Address, Subnet Mask, Gateway

<table>
<thead>
<tr>
<th>Press</th>
<th>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Display will show the System Configuration categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>Communications</td>
<td>Display will show the System Communications categories.</td>
</tr>
<tr>
<td>Press</td>
<td>TCP/IP Configuration</td>
<td>Display will show the TCP/IP Configuration screen. On this screen, enter the IP Address, Subnet Mask and Default Gateway. Use the keypad to enter the number into the field highlighted in green. To advance to the next field, touch the field you want to edit and type the desired value.</td>
</tr>
<tr>
<td>Press</td>
<td>To save the Changes.</td>
<td></td>
</tr>
</tbody>
</table>

Enabling Modbus
<table>
<thead>
<tr>
<th>Press</th>
<th><strong>Display will prompt for a password.</strong> (default: 22222) Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td><strong>Display will show the System Configuration categories.</strong></td>
</tr>
<tr>
<td>Press</td>
<td><strong>Display will show the System Communications categories.</strong></td>
</tr>
<tr>
<td>Press</td>
<td><strong>Display will show the Modbus Server screen. On this screen, press the checkbox Enable to enable Modbus.</strong></td>
</tr>
<tr>
<td>Press</td>
<td><strong>To save the Changes.</strong></td>
</tr>
</tbody>
</table>
**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.

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.

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  
Display will prompt for a password. (default: 22222) Then press:

Press  
Dryer Configuration  
Display will show menu options

Press  
Load-Cell Setup  
Display will show Load-Cell Calibration Screen

Press  
Vacuum Chamber  
Zero/Full Calibration  
Display will show the ZERO / FULL Calibration screen.

Press  
ZERO  
Display will say: Confirm Vacuum Chamber is empty then press ZERO. Gram weight of 0 follows successful calibration.

Press  
EXIT  
To return to the Load-Cell Setup screen.

Press  
Retention Hopper  
Zero/Full Calibration  
Display will show the ZERO / FULL Calibration screen.

Press  
ZERO  
Display will say: Confirm Retention Hopper is empty then press ZERO. Gram weight of 0 follows successful calibration.

Press  
EXIT  
To return to the Load-Cell Setup screen.

Press  
To return to the Main Screen.

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

In order for a full weight calibration to be performed, a ZERO WEIGHT Calibration must be completed, whether it be for the vacuum chamber or retention hopper.

Once, ZERO WEIGHT calibration is complete, a calibration weight or material of known weight can be placed into the corresponding chamber. The weight should be close to 35.0 pounds or 16.0 kilograms. Input the EXACT known weight (in kilograms or pounds).

After FULL weight calibration, if the display reads “BAD CELL,” the weight being used either does not match the weight you entered, the chamber is not free to move, OR the load cells are bad.

It is also recommended that a “Return to ZERO” test be performed where the weight or material is removed from the chamber being calibrated and it is observed returning to zero.

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

<table>
<thead>
<tr>
<th>Press</th>
<th>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Dryer Configuration</td>
<td>Display will show the Dryer Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>Load-Cell Setup</td>
<td>Display will show the Load-Cell Setup screen.</td>
</tr>
<tr>
<td>Press</td>
<td>Vacuum Chamber Zero/Full Calibration</td>
<td>Display will show the ZERO / FULL Calibration screen.</td>
</tr>
<tr>
<td>Press</td>
<td>ZERO</td>
<td>Display will say: Confirm Vacuum Chamber is empty then press ZERO. Gram weight of 0 follows successful calibration.</td>
</tr>
<tr>
<td>Press</td>
<td>FULL</td>
<td>Display will show a keypad and the message: Enter the known weight and then press ENTER. Enter your known weight in GRAMS and then press ENTER.</td>
</tr>
</tbody>
</table>

Place the known weight in the Vacuum Chamber and then properly re-install the Vacuum Chamber into the Dryer. Press CONTINUE to proceed.

Wait while calibrating load cells. Do not touch weigh bin during calibration. After Full calibration has proceeded successfully, you will be prompted.

Press | To exit Zero / Full Weight Calibration screen. Repeat procedure for Retention Hopper. |
|-------|--------------------------------------------------------------------------------------|

Press | EXIT |
|-------|------|

Press | EXIT |
|-------|------|
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.

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 ¼” 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.

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>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.</td>
</tr>
<tr>
<td>2.</td>
<td>Lower the Vacuum Chamber by switching down the Vacuum Chamber Lift Switch.</td>
</tr>
<tr>
<td>3.</td>
<td>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.</td>
</tr>
</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Press</th>
<th>Clean Out</th>
<th>The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen. Both the Dump Heating Hopper screen button 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.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Dump Heating Hopper</td>
<td>Confirmation window will appear. To use the Heating Hopper Drain Valve button continue to next step.</td>
</tr>
<tr>
<td>Press</td>
<td>![Image of a check mark]</td>
<td>Press to Dump Heating Hopper and start the Clean Out.</td>
</tr>
<tr>
<td></td>
<td>![Image of a button]</td>
<td>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.</td>
</tr>
</tbody>
</table>
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 | Clean Out | The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen. Both the Dump Heating Hopper screen button 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.

| Press | Dump Vacuum Chamber | status window will appear.

| Press | to return to the Home Screen.

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 | Clean Out | The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen. Both the Dump Heating Hopper screen button 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.

| Press | Dump All | Confirmation window will appear.

| Press | to start the Clean Out.

| Press | to return to the Home Screen.

Servicing / Removing the Vacuum Chamber
<table>
<thead>
<tr>
<th>Turn OFF Main Power</th>
<th><img src="image" alt="Main Power Switch" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower the Vacuum Chamber by switching down the Vacuum Chamber Lift Switch.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Turn OFF Air Supply on Dryer</th>
<th><img src="image" alt="Air Supply Valve" /></th>
</tr>
</thead>
<tbody>
<tr>
<td>Disconnect Air Lines</td>
<td></td>
</tr>
</tbody>
</table>

| 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. | ![Sealing Collar](image) |

| 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. | ![Slider Lock](image) |

| 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. | ![Vacuum Chamber](image) |

| 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. | ![Support Feet](image) |

**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.

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

Turn on Main Power.
Print Center

Print Center is available from the Home Screen by pressing by pressing the Print Center button. Print Center displays a menu screen of print related options including Parameters, Events and Alarms, raw data log file and Alarm History. To print the Alarm Log, Parameters or Event Log a USB Flash Drive must be plugged into the VBD.

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

<table>
<thead>
<tr>
<th>Print Parameters</th>
<th>Prints the full parameter and parameter values as well as other information list to the USB flash drive.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Print Event and Alarms</td>
<td>A combination of machine status lines at defined intervals as well as mechanical events as they occur.</td>
</tr>
<tr>
<td>Print Alarm History</td>
<td>Prints to USB any alarms recorded since the alarm log was last cleared.</td>
</tr>
<tr>
<td>Copy Log File</td>
<td>Copies raw log file to USB stick for analysis by a Maguire technician.</td>
</tr>
<tr>
<td>Print All</td>
<td>Prints all of the above logs to USB.</td>
</tr>
</tbody>
</table>

Alarm and Event Log

Alarm and Event Log displays a history of alarms currently active alarms and other events with a date and time stamps and description. Press the upper or lower half of the event display windows to page up or page down. Alarms can be silenced from this screen. Other options in this screen include: Print to USB and Clear the Alarm Log. To print the Alarm and Events Log a USB Flash Drive must be plugged into the VBD.

Files will be created on the flash drive in the root of the drive.

- VBDALARM.LOG - Alarm Log
- VBDEVENT.LOG - Event Log
**Interpreting the Event Log**

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

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

---

**Example of a VBD Event Log:**

```
VBD® - Vacuum Dryer® TSC

Maguire Products, Inc.

Interpreting the Event Log

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

<table>
<thead>
<tr>
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<td>12</td>
<td>Current dryer throughput</td>
</tr>
<tr>
<td>13</td>
<td>Current Totalizer reading</td>
</tr>
</tbody>
</table>

---

**Example of a VBD Event Log:**

```
10:08:31 06:31:06
10:07:41 08:14:39 | 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
10:07:41 08:14:09 | 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
10:07:41 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
10:07:41 08:12:10 | *** HEATER FAIL-SAFE: HIGH ***
10:07:41 08:12:09 | 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
10:07:41 08:11:09 | 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
10:07:41 08:10:09 | *** DRYER STARTED ***
10:07:41 08:09:09 | *** STARTER MATERIAL STARTED ***
10:07:41 08:08:09 | MODE: PHT | T1s: 150F | T1a: 110F | H1:  22.5 | T2:  72F | T4:  71F | VC: 00:00/20:00 | ABS: 760mmHg | VC:   1 | RH:   0 | TPT:   0 | TOT: 105
10:07:41 08:07:09 | *** UPPER VACUUM GATE: CLOSED ***
10:07:41 08:06:09 | *** VACUUM GENERATOR SUPPLY VALVE: OPENED ***
10:07:41 08:05:09 | MODEL: 150 |
10:07:41 08:04:09 | *** VACUUM GENERATOR CHECK VALVE: OPENED ***
10:07:41 08:03:09 | CPU Firmware: N1000A |
10:07:41 08:02:09 | I/O Firmware: N1000A |
10:07:41 08:01:09 | Serial#: 123456-78 |
10:07:41 08:00:09 | 78 |
```
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: F0812A
I/O Firmware: F0812A
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 00100 Weight
D3 Ret. Hop. Hi Level RHH 00015 00015 00000 00728 Weight
D4 Ret. Hop. Low Level RHL 00002 00002 00000 00000 Weight
D5 Bulk Density BLK 00560 00560 00000 65535 Weight
D6 Vac.Cham. Fill Rate VFR 01050 01050 00000 65535 Weight
D7 Vac.Cham. Dump Rate VDR 00000 00000 00000 02000 Gram/Sec
D8 Chamber Fill Time VTT 00335 00335 00000 99999 Second
D9 Chamber Dump Time VCT 00060 00060 00000 99999 Second
D10 Fill Lag Time PLA 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 Sec/Pct
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 65535 Mt/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 Heatl Temp Set-Point RTS 00150 00150 00074 00375 Degree
H1-5 Heatl Proportional P1 00040 00040 00000 00100 Term
H1-6 Heatl Derivative D1 00015 00015 00000 00100 Term
H1-7 Heatl Update Time U1 00415 00415 00000 65535 Sec/Sec
H1-8 Heatl OverTarg Alarm OT1 06006 06006 00000 65535 Sec/Sec
H1-9 Heatl No Heat Alarm N1 00120 00120 00000 65535 Second
H1-10 Heatl Set-Point Off. SO1 03002 03002 00000 65535 Sec/Sec
H1-11 Heatl Max. Percent M1 00100 00100 00000 00100 Percent
H1-12 Max Temp Set-Point MAX 00356 00356 00074 00375 Degree
H1-13 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/Adj
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 00500 00000 65535 Number
L2 Loadcell Stable Time LST 00100 00100 00000 65535 MilliSec
L3 Loadcell Zero LCE 01000 01000 00000 65535 Number
L4 Weight Settle Time WST 00805 00805 00002 65535 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 VFD 05020 05020 00000 65535 Number

MAC Address: 1C:1A:00:4B:0F

Setup, Print Parameters.

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.
V4 Vac. Shutdown Offset VBO 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 00000 65535 Second

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 Through
Purge Chamber On

Admin. Settings:

Blower VFD
T4 On
T5 On

LOADCELL CALIBRATION

<table>
<thead>
<tr>
<th>NAME</th>
<th>ZERO</th>
<th>DELTA</th>
<th>FULL</th>
<th>LAST ZERO</th>
<th>LAST FULL</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH LC</td>
<td>3308245</td>
<td>1588575</td>
<td>15422</td>
<td>Tue 08/16/2016 11:33</td>
<td>Thu 01/01/1970 00:00</td>
</tr>
<tr>
<td>VC LC</td>
<td>3365199</td>
<td>1408275</td>
<td>16147</td>
<td>Tue 08/16/2016 11:33</td>
<td>Thu 01/01/1970 00:00</td>
</tr>
</tbody>
</table>
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 DPT 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 BHP 00060 00060 00050 00070 Freq
B4 VFD Drive BDF 00060 00060 00000 65535 Freq
B5 VFD Zero Level BXL 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 VCT 00355 00355 00000 99999 Second
D9 Chamber Dump Time VDT 00060 00060 00000 65535 Second
D10 Fill Lag Time FLA 00175 00175 00000 05000 Time
D11 Dump Lag Time DLA 00100 00100 00000 05000 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 29999 Wt/Min
D16 Chamber Dump Retries CDR 05003 05003 00000 10000 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 Load Lag Time LCT 00002 00002 00000 65535 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 P1 00040 00040 00000 01000 Term
H1-6 Heat1 Derivative DTI 00015 00015 00000 01000 Term
H1-7 Heat1 Update Time UTL 00415 00415 00000 65535 Sec/Sec
H1-8 Heat1 OverTarg Alarm OTL 06006 06006 00000 65535 Sec/Sec
H1-9 Heat1 No Heat Alarm NH1 00120 00120 00000 65535 Second
H1-10 Heat1 Set-Point Off. SOL 03002 03002 00000 65535 Sec/Sec
H1-11 Heat1 Max. Percent MPL 00100 00100 00000 01000 Percent
H1-12 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 09999 Min/Deg
H1-17 Cool-Down Temp. CTR 00120 00120 00032 00300 Degree
H1-18 Cool-Down Timer CTR 00030 00030 00000 65535 Minutes

Load Cell:
L1 Loadcell Stable Wt. KDF 00200 00500 00000 65535 Number
L2 Loadcell Stable Time LST 00100 00100 00000 65535 Millisecc
L3 Loadcell Zero LCE 01002 01002 00000 65535 Number
L4 Weight Settle Time WST 00805 00805 00000 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
### System:

<table>
<thead>
<tr>
<th>Setting</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cham. Purge Interval</td>
<td>VPI 20240 20240 00000 65535 Sec/Sec</td>
</tr>
<tr>
<td>Atmospheric Pressure</td>
<td>ATM 00760 00760 00000 00999 mmHg</td>
</tr>
</tbody>
</table>

### 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

<table>
<thead>
<tr>
<th>Name</th>
<th>Zero</th>
<th>Delta</th>
<th>Full</th>
<th>Last Zero</th>
<th>Last Full</th>
</tr>
</thead>
<tbody>
<tr>
<td>RH LC</td>
<td>3308245</td>
<td>1588575</td>
<td>15422</td>
<td>Tue 08/16/2016 11:33</td>
<td>Thu 01/01/1970 00:00</td>
</tr>
<tr>
<td>VT LC</td>
<td>3365199</td>
<td>1406275</td>
<td>16147</td>
<td>Tue 08/16/2016 11:33</td>
<td>Thu 01/01/1970 00:00</td>
</tr>
</tbody>
</table>
# 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.

<table>
<thead>
<tr>
<th>Alarm Display:</th>
<th>Troubleshooting:</th>
</tr>
</thead>
</table>
| **BLOWER FAILURE**<br>ALARM:01 | **Problem:** The blower is not running.  
Motor contactor overload relay has tripped. See wiring diagram on page 76 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. |
| **NO HEAT**<br>ALARM:02 | **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 76. If the dryer’s heater shorted, the result would be a trip of the breaker or fuse supplying power to the VBD-150 dryer. |
| **SETPOINT EXCEEDED**<br>ALARM:03 | **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 |
| **TEMP OVER TARGET**<br>ALARM:04 | **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. |
<table>
<thead>
<tr>
<th>Alarm Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **NO VACUUM ALARM: 08** | **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. |
| **RTD FAILURE ALARM: 11** | **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. |
| **MATERIAL SHORTAGE ALARM: 12** | **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 35.  
**Solution:** Check material supply. Check Vacuum Chamber fill valve located at the base of the heating hopper. |
| **LOW AIR PRESSURE ALARM: 15** | **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. |
| **HEATER FAIL-SAFE ALARM: 16** | **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. |
| **VC MISSING ALARM: 18** | **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. |
**RH MISSING ALARM: 19**

*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.

**THROUGHPUT ALARM: 20**

*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 cause by exceeding material demand.

**LOW VACUUM ALARM: 21**

*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.

**RESIDENCE ALARM ALARM: 23**

*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 40.

*Solution:* To prevent this alarm: decrease fill weight, or turn on Fill Weight Adjust (Material Setup menu).

**BATCH COMPLETE ALARM: 24**

*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.

**MATERIAL SHUTDOWN ALARM: 25**

*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.

**MATERIAL READY ALARM: 26**

*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.
<table>
<thead>
<tr>
<th>Alarm Type</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Auto Shutdown Alarm:27** | *Auto Shutdown*  
This alarm triggers when an Auto Shutdown, that is, a shut down at a pre-determined time, has commenced. "Commencement" is defined as the time at which the final vacuum chamber fill has occurred. |
| **HH Material Low Alarm:28** | *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. |
| **Material Temp Alarm:29** | *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. |
| **VC Dump Failure Alarm:30** | *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. |
# Saving and Restoring User Settings

All parameter information can be saved to the User Backup Settings for future retrieval.

To SAVE all parameter information to the User Backup Settings:

<table>
<thead>
<tr>
<th>Press</th>
<th>Description</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Password Icon]</td>
<td>Display will prompt for a password. (default: 22222)</td>
<td>![Save Icon]</td>
</tr>
<tr>
<td>Press</td>
<td>System Configuration</td>
<td>Display will show the System Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>Resets</td>
<td>Display will show the categories of System resets: User Settings, Factory Access, Restore All, Restore Parameters, Firmware Update.</td>
</tr>
<tr>
<td>Press</td>
<td>User Settings</td>
<td>Display will show Restore User Settings / Save User Settings.</td>
</tr>
<tr>
<td>Press</td>
<td>Save User Settings</td>
<td>Display will prompt for confirmation to save user settings.</td>
</tr>
<tr>
<td>Press</td>
<td>![Save Icon]</td>
<td>To save the user settings including parameters or press the red X to cancel and exit.</td>
</tr>
</tbody>
</table>

## Restoring Parameters from Backup

<table>
<thead>
<tr>
<th>Press</th>
<th>Description</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Password Icon]</td>
<td>Display will prompt for a password. (default: 22222)</td>
<td>![Save Icon]</td>
</tr>
<tr>
<td>Press</td>
<td>System Configuration</td>
<td>Display will show the System Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>Resets</td>
<td>Display will show the categories of System resets: User Settings, Factory Access, Restore All, Restore Parameters, Firmware Update.</td>
</tr>
<tr>
<td>Press</td>
<td>User Settings</td>
<td>Display will show Restore User Settings / Save User Settings.</td>
</tr>
<tr>
<td>Press</td>
<td>Restore User Settings</td>
<td>Display will prompt for confirmation to Restore user settings.</td>
</tr>
<tr>
<td>Press</td>
<td>![Save Icon]</td>
<td>To restore the user settings including parameters or press the red X to cancel and exit.</td>
</tr>
</tbody>
</table>
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 a firmware update supplied by Maguire Products. Firmware updates use the USB port located below the control screen. The following instructions detail how to do a firmware update.

**IMPORTANT!**

Do not turn off controller or remove the flash drive while firmware is updating! Doing so may corrupt the controller’s firmware.

<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copy</td>
<td>the new firmware update into a USB flash drive. (do not put in a directory)</td>
</tr>
<tr>
<td>Insert</td>
<td>the USB Flash drive into the USB port on the VBD.</td>
</tr>
</tbody>
</table>

**Press**

Display will prompt for a password. (default: 22222) Then press:

<table>
<thead>
<tr>
<th>Press</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>System Configuration</td>
<td>Display will show the System Configuration categories.</td>
</tr>
<tr>
<td>Resets</td>
<td>Display will show System reset options.</td>
</tr>
<tr>
<td>Firmware Update</td>
<td>The controller will search the USB drive for a firmware update file with the XUF extension.</td>
</tr>
</tbody>
</table>

**Select**

the file from the white display area on the left. If more than one firmware version is stored on the flash drive, multiple version will be displayed in the white display area. If the display is blank check USB for the file and that the file is location directly on the drive (not in a sub-folder). Exit out of this screen and enter again to refresh the display window.

**Highlight**

the version in the white panel on the left and press PROGRAM.

**Press**

To proceed with the firmware update or press the red X to cancel and exit.

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.” At this time, remove the flash drive, power off the controller then on. When the controller restarts the display will show progress updating to the new firmware. When complete, the display will show: UPDATES COMPLETE Toggle power. At this time turn off power, then turn back on.

**Additional Firmware 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 VTQ0620A.XUF can be interpreted as VT=Vacuum Touchscreen, Q=2017 (R=2018), 06=June, 20=June 20th, 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 UPDATE.XUF. This renamed software can be copied onto the Flash Drive and inserted into the USB port of the VBD. When the VBD is turned on, this UPDATE.XUF 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.
## VBD-150 Technical Specifications

<table>
<thead>
<tr>
<th>line no.</th>
<th>parameter</th>
<th>Domestic/Canadian</th>
<th></th>
<th>European</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>design throughput</td>
<td>150 lbs./hour</td>
<td>68 kgs./hr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>maximum run temperature</td>
<td>375 °F</td>
<td>190 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>maximum vacuum level, absolute</td>
<td>75 mm Hg.</td>
<td>75 mm Hg.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>complete unit weight, empty</td>
<td>501 lbs.</td>
<td>227 kgs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>overall unit height</td>
<td>96 inches</td>
<td>2.44 meters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>overall unit height w/ extension</td>
<td>108 inches</td>
<td>2.74 meters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>voltage</td>
<td>240/480/575 volts</td>
<td>400 volts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>full load amps (FLA)</td>
<td>16.4/8.2/6.8 amps</td>
<td>9.7 amps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>phase</td>
<td>3 Ø</td>
<td>3 Ø</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>frequency</td>
<td>60 Hz</td>
<td>50 Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>compressed air requirement, sustained pressure</td>
<td>85 psi</td>
<td>5.86 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>compressed air requirement, max flow rate</td>
<td>13.5 SCFM</td>
<td>382 L/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>compressed air requirement, average flow rate</td>
<td>5.2 SCFM</td>
<td>147 L/min</td>
<td></td>
<td></td>
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<tr>
<td>14</td>
<td>blower model</td>
<td>RBH3 All-Star</td>
<td>RBH3 All-Star</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>blower power</td>
<td>1.1 HP</td>
<td>0.75 kW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>blower max flow</td>
<td>105 SCFM</td>
<td>2464 L/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>blower max pressure</td>
<td>58 in H₂O</td>
<td>139 mbar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>blower noise level</td>
<td>64 dB(A)</td>
<td>63 dB(A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>heater power</td>
<td>11,000 watts</td>
<td>11,000 watts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>vacuum generator model</td>
<td>JS-250 Vaccon</td>
<td>JS-250 Vaccon</td>
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<td>13.5 in.</td>
<td>343 mm</td>
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<tr>
<td>22</td>
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<tr>
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<td>56.6 L</td>
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<td>2.5 cu. ft.</td>
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<tr>
<td>25</td>
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<td>28</td>
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<tr>
<td>29</td>
<td>vacuum chamber cylinder height</td>
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<tr>
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High Voltage Wiring Diagrams

VBD-150 240V Wiring Diagram

Bill of Materials

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<th>DESCRIPTION</th>
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<td>23022016</td>
<td>motor contactor, 20A</td>
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<tr>
<td>3</td>
<td>32R6-5</td>
<td>overload relay, 2.8 A - 4.0 A</td>
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<tr>
<td>4</td>
<td>24C19</td>
<td>240V power supply, 35W, 1.3A</td>
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<td>5</td>
<td>63U1A</td>
<td>transformer, 50VA, 115 VAC secondary</td>
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<tr>
<td>6</td>
<td>9-16</td>
<td>RF filter, 54R1</td>
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<tr>
<td>7</td>
<td>37803</td>
<td>relay, solid state, 480V, 25A</td>
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<tr>
<td>8</td>
<td>fire-HS2</td>
<td>heat sink, SSR, 2.0 C/W</td>
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<tr>
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<td>sng-67</td>
<td>ground bar, 7 terminals</td>
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<tr>
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<td>24TH24</td>
<td>tube heater, 11kW, 240 VAC 3p</td>
</tr>
<tr>
<td>11</td>
<td>rcw1.1</td>
<td>regenerative blower, 1.1 hp</td>
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<tr>
<td>12</td>
<td>600-06</td>
<td>fuse, 1/2 amp time-delay, &quot;ATD&quot;</td>
</tr>
<tr>
<td>13</td>
<td>enh21</td>
<td>relay, 24 VDC SPDT, slim DIN mount</td>
</tr>
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Model: VBD-150
Schematic: Main high/low
Voltage: 240V 3p 60 Hz
drawings No.: DWS5100.dwg
Drawn by: MG
Date drawn: 4/10/13
Rev by: MG
Last Updated: 10/2/13

Maguire Products, Inc.
11 Cozzarella Road, Aston, PA 19014
Tel: (680) 459-1412
Fax: (610) 459-2200
http://www.maguires.com
VBD-150 240V Wiring Diagram with VFD

Bit of Materials

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<thead>
<tr>
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<tbody>
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<td>sta10-1-40</td>
<td>msh disconnect switch, 40A 3-pole</td>
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<tr>
<td>2</td>
<td>VFD-141M2</td>
<td>VFD, 1 HP 208V - 240V 3Ph</td>
</tr>
<tr>
<td>3</td>
<td>-</td>
<td>-</td>
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<tr>
<td>4</td>
<td>e129</td>
<td>24VDC power supply, 35W, 1.5A</td>
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<tr>
<td>5</td>
<td>el34</td>
<td>transformer, 50VA, 110 VAC secondary</td>
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<tr>
<td>6</td>
<td>el16</td>
<td>filter, 50/60Hz</td>
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<td>7</td>
<td>el09</td>
<td>relay, solid state, 480V, 25A</td>
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<tr>
<td>8</td>
<td>elr112M2</td>
<td>heat sink, 53PL, 2.0 C/W</td>
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<tr>
<td>9</td>
<td>dbg3-07</td>
<td>ground bar, 7 terminals</td>
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<td>10</td>
<td>el111-24</td>
<td>tube heater, 11KW, 208 VAC 3Ph</td>
</tr>
<tr>
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<td>mnc1.1</td>
<td>regenerative blower, 1.1 HP</td>
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<td>12</td>
<td>edo-06</td>
<td>fuse, 1/2 amp time-delay, &quot;ATO&quot;</td>
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<tr>
<td>13</td>
<td>elr21</td>
<td>relay, 24 VDC DPDT, slim DIN mount</td>
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<tr>
<td>14</td>
<td>el-2MT2016</td>
<td>motor contactor, 20A</td>
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VFD Parameter Settings

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<tr>
<td>P1.3</td>
<td>electronic thermal OIL</td>
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<td>P1.4</td>
<td>output max. frequency</td>
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<td>P1.5</td>
<td>PWM setting</td>
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<td>P1.7</td>
<td>normal motor voltage</td>
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<td>FL thermal fren set</td>
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<td>P1.9</td>
<td>KFC thermal fren set</td>
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<td>P1.10</td>
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<td>P1.11</td>
<td>regen. speed op. level</td>
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Model: VBD-150
Schematic: main high/low
Voltage: 240V 3Ph 60 Hz
Drawing No.: edwgb100.dwg
Drawn by: MG
Date drawn: 4/10/13
Rev by: MG
Last Updated: 6/28/16

Maguire Products, Inc.
11 Grandview Road, Aston, PA 19014
Tel: (888) 409-2412
Fax: (610) 459-2700
http://www.maguire.com
**VBD-150 Recommended Spare Parts List**

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

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

**Other Potential Replacement Parts**

<table>
<thead>
<tr>
<th>line item</th>
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<td>9</td>
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<td>overload relay, 1.4 A - 2.0 A</td>
<td>electrical cabinet</td>
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<tr>
<td>10</td>
<td>Es3RU-5</td>
<td>overload relay, 2.8 A - 4.0 A</td>
<td>electrical cabinet</td>
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<td>11</td>
<td>Es3RT2016</td>
<td>motor contactor, 3 pole, 20A, 24 VDC</td>
<td>electrical cabinet</td>
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<td>12</td>
<td>ehr09</td>
<td>relay, SS, 480V 25A, 24-265 VAC signal</td>
<td>electrical cabinet</td>
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<tr>
<td>13</td>
<td>ezd-.5t</td>
<td>fuse, 1/2 amp time delay, Midget style</td>
<td>electrical cabinet</td>
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<tr>
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<td>eRTD6-100</td>
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<td>heating hopper</td>
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<td>15</td>
<td>elc30V</td>
<td>load cell, 30 kg capacity</td>
<td>ret., vac. chamber</td>
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<td>esp-50</td>
<td>pressure switch, 50 psi set-point, 1/8&quot; NPT</td>
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<tr>
<td>17</td>
<td>eabVBD-01</td>
<td>I/O circuit board</td>
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<tr>
<td>18</td>
<td>eabVBD-02</td>
<td>display / HMI circuit board</td>
<td>front control panel</td>
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<td>19</td>
<td>ebTS-7V</td>
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<td>eht10-24</td>
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<td>eht10-40</td>
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<td>ehb-2</td>
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## VBD-300 Technical Specification

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<td>in.</td>
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<td>cu. ft.</td>
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<tr>
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<td>kg</td>
<td></td>
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<tr>
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<td>vacuum chamber cylinder I.D.</td>
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<td>16.35</td>
<td>in.</td>
<td>415</td>
<td>mm</td>
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<tr>
<td>29</td>
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<td>in.</td>
<td>445</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>vacuum chamber material capacity</td>
<td></td>
<td>2</td>
<td>cu. ft.</td>
<td>56.6</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>vacuum chamber absolute air capacity</td>
<td></td>
<td>2.5</td>
<td>cu. ft.</td>
<td>70.8</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>32</td>
<td>vacuum chamber normal evacuation volume</td>
<td></td>
<td>1.6</td>
<td>cu. ft.</td>
<td>45.3</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>vacuum chamber empty weight</td>
<td></td>
<td>72.5</td>
<td>lbs.</td>
<td>32.9</td>
<td>kgs.</td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>retention hopper cylinder I.D.</td>
<td></td>
<td>19</td>
<td>in.</td>
<td>483</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>retention hopper cylinder height</td>
<td></td>
<td>14</td>
<td>in.</td>
<td>356</td>
<td>mm</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>retention hopper material capacity</td>
<td></td>
<td>2.25</td>
<td>cu. ft.</td>
<td>63.7</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>retention hopper absolute capacity</td>
<td></td>
<td>2.8</td>
<td>cu. ft.</td>
<td>79.3</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>retention hopper empty weight</td>
<td></td>
<td>31.5</td>
<td>lbs.</td>
<td>14.3</td>
<td>kgs.</td>
<td></td>
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VBD-300 I/O Board Wiring Diagram
VBD-300 I/O Board Wiring Diagram with VFD
VBD-300 400V Wiring Diagram

Model: VBD-300
Schematic: main high/low
Voltage: 400V 3Ø 50 Hz
dwg

Drawn by: MC
Date drawn: 2/16/16
Rev by: MC
Last Updated: 10/3/18

Maguire Products, Inc.
11 Cressona Road, Hazen, PA 18014
Tel: (888) 450-2422
Fax: (814) 450-2100
http://www.maguire.com
VBD-300 480V Wiring Diagram

Bill of Materials

<table>
<thead>
<tr>
<th>ITEM</th>
<th>p/n</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ass10-1-40</td>
<td>main disconnect body, 40A 3-pole</td>
</tr>
<tr>
<td>2</td>
<td>ass3tt2016</td>
<td>motor contactor, 20A</td>
</tr>
<tr>
<td>3</td>
<td>ass3rr-6</td>
<td>overload relay, 4.5A – 6.3A</td>
</tr>
<tr>
<td>4</td>
<td>w29</td>
<td>240VAC power supply, 35k, 1.5A</td>
</tr>
<tr>
<td>5</td>
<td>tfk</td>
<td>transformer, 50VA, 115 VAC secondary</td>
</tr>
<tr>
<td>6</td>
<td>sh15</td>
<td>RFI filter, 5kVR</td>
</tr>
<tr>
<td>7</td>
<td>sh70</td>
<td>relay, solid state, 600V, 50A</td>
</tr>
<tr>
<td>8</td>
<td>shr-452</td>
<td>heat sink, SSR, 2.0 C/W</td>
</tr>
<tr>
<td>9</td>
<td>shsp-07</td>
<td>ground box, 7 terminals</td>
</tr>
<tr>
<td>10</td>
<td>sh1t5-48</td>
<td>tube heater, 15kW, 480VAC 30</td>
</tr>
<tr>
<td>11</td>
<td>mrc3.5.3</td>
<td>regenerative blower, 3.5 HP</td>
</tr>
<tr>
<td>12</td>
<td>ezd-06</td>
<td>fuse, 1/2 amp time-delay, &quot;ATG&quot;</td>
</tr>
<tr>
<td>13</td>
<td>shr21</td>
<td>relay, 24 VDC 1PO, slim DIN mount</td>
</tr>
</tbody>
</table>

Model: VBD-300
Voltage: 480V 3Ø

Schematic:: main high/low

Drawn by: MG
Date drawn: 2/16/16
Rev by: MG
Last Updated: 10/3/18
VBD-300 Pneumatic Diagram
### VBD-300 Recommended Spare Parts List

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

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

#### Other Potential Replacement Parts

<table>
<thead>
<tr>
<th>Line Item</th>
<th>MPI p/n</th>
<th>Description</th>
<th>General Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>es3RU-6</td>
<td>overload relay, 3.5 A - 5.0 A</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>10</td>
<td>es3RU-7</td>
<td>overload relay, 4.5 A - 6.3 A</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>11</td>
<td>es3RT2016</td>
<td>motor contactor, 3 pole, 20A, 24 VDC</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>12</td>
<td>ehr09</td>
<td>relay, SS, 480V 25A, 24-265 VAC signal</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>13</td>
<td>ezd-.5t</td>
<td>fuse, 1/2 amp time delay, Midget style</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>14</td>
<td>eRTD6-100</td>
<td>RTD temp. sensor, 6mm dia x 100mm long, Pt100</td>
<td>heating hopper</td>
</tr>
<tr>
<td>15</td>
<td>elc50V</td>
<td>load cell, 50 kg capacity</td>
<td>ret., vac. chamber</td>
</tr>
<tr>
<td>16</td>
<td>esp-50</td>
<td>pressure switch, 50 psi set-point, 1/8&quot; NPT</td>
<td>main cabinet</td>
</tr>
<tr>
<td>17</td>
<td>eabVBD-01</td>
<td>I/O circuit board</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>18</td>
<td>eabVBD-03</td>
<td>display / HMI circuit board</td>
<td>front control panel</td>
</tr>
<tr>
<td>19</td>
<td>ebTS-7V</td>
<td>touchscreen</td>
<td>front control panel</td>
</tr>
<tr>
<td>20</td>
<td>eabVBD-04</td>
<td>pendant circuit board (.8&quot; 4-digit numeric)</td>
<td>front control panel</td>
</tr>
<tr>
<td>21</td>
<td>nmd-03E</td>
<td>replacement element, for membrane air dryer</td>
<td>pneumatics cabinet</td>
</tr>
<tr>
<td>22</td>
<td>eht15-24</td>
<td>tube heater, 15,000 watt 3 phase 240 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>23</td>
<td>eht15-40</td>
<td>tube heater, 15,000 watt 3 phase 400 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>24</td>
<td>eht15-48</td>
<td>tube heater, 15,000 watt 3 phase 480 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>25</td>
<td>eht15-56</td>
<td>tube heater, 15,000 watt 3 phase 575 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>26</td>
<td>ehs1-02</td>
<td>strobe light, red, magnetic base, 24VDC</td>
<td>top deck</td>
</tr>
<tr>
<td>27</td>
<td>ehb-2</td>
<td>piezo buzzer, 24VDC</td>
<td>front control panel</td>
</tr>
<tr>
<td>28</td>
<td>esh-01</td>
<td>interlock handle, red/yellow pistol</td>
<td>front control panel</td>
</tr>
</tbody>
</table>
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 Road, Aston, Pennsylvania 19014, USA

Description of product

Name, type or model, batch or serial number
Model: 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 (2008)

Name of Responsible Person within the EU - Mr Paul Edmondson Director

Full postal address if different from manufacturers
Maguire Europe Sales Limited, Unit F, Vanguard, 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.

Responsible Person: Mr Steve Maguire
Signature: ........................................
Position: ........................................
Date: ........................................

www.maguire.com
Technical Support and Contact Information

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