MAGUIRE PRODUCTS INC.

Vacuum Batch Dryer® - VBD-600®
Touchscreen Controller

VBD-600®
Vacuum Batch Dryer®
Touchscreen Controller

INSTALLATION • OPERATION • MAINTENANCE
VBD-600® - Vacuum Dryer®

This document is the Original Instructions manual of the Maguire VBD-600® Vacuum Dryer equipped with the Touchscreen Controller.

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To every person concerned with use and maintenance of the Maguire VBD-600® 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.

These operating instructions only apply to the equipment described within this manual.

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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 may not be 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 vacuum 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 vacuum 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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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.

GETTING STARTED: PROCEED TO: INSTALLATION - NEXT PAGE
Installation

Transport and Setup

Shipment

The VBD-600 Dryer is shipped as separate components that require re-assembly.

The 2 main sections that are shipped are:

Retention Hopper and Vacuum Chamber Assembly Frame (A & B) – The retention hopper (A) and vacuum chamber (B) assembly is identified by the large metal frame encompassing the recessed pneumatics cabinet, the electrical cabinet, the mounted vacuum chamber (B), and the removable material retention hopper (A). Total assembly weight is 1681 lb. (762 kg).

Heating Hopper Assembly (C) – Located on top of the vacuum chamber/retention hopper assembly frame. Weight is 349 lb. (158 kg).

Other smaller components will be included.

Lifting and Moving components of the Dryer

<table>
<thead>
<tr>
<th>WARNING</th>
<th>Ensure your lifting equipment is rated to lifting the weight of the individual sections of the VBD-600.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOLLOW</td>
<td>Follow forklift safety rules and regulations whenever moving portions of the VBD-600.</td>
</tr>
</tbody>
</table>

The VBD-600 platform is designed for ease of lifting and moving. The retention hopper and vacuum chamber assembly frame was designed with two steel channels spanning the depth of the machine to allow for a fork truck to safely and easily lift and position the machine into place.
Overall layout and Dimensions
Dryer Assembly

Leveling Feet

If using the leveling feet, make sure the surface that the VBD 600 will be placed on can support the weight at all 4 corners.

When adjusting the leveling feet, keep the frame as close to the floor as possible. Over extending the threads below the frame is not recommended for stability reasons.

Install the Heating Hopper

Following proper forklift safety regulations, carefully lift up the heating hopper, by positioning the forks underneath the intermediate retaining ring. Place the heating hopper on top of the machine frame. Ensure that the front hatch of the heating hopper faces the same direction as the VBD machine.

Install the four 1/2-13, 1-1/4” long, grade 8, hex head bolts and tighten.
Installing the Upper Vacuum Gate

**Note:** If your Upper Vacuum Slide Gate is already installed from factory, skip this step.

If the VBD-600 Upper Vacuum Gate was shipped detached from the VBD-600 it must be installed after the Heating Hopper is mounted and installed on the machine.

Items with this assembly:
- Upper Vacuum Gate
- Retainer Bracket
- two 1/4-20 1/2" button head screws

The Upper Vacuum Gate will install from the rear of the Dryer. Locate the slot on the mount ring at the very top of the Vacuum Tank. See photo at right.

With the Slide Gate facing up, slide the Upper Vacuum Gate assembly into the slot on the mount ring as shown in the photo to the right. Slide the Upper Vacuum Gate onto the mount ring until it fully seats into the slot. It may be helpful to slide the Upper Vacuum Gate left and right as it is installed.

**Note:** To fully seat the Vacuum Gate onto the mount ring, the tab in the inner arch of the Upper Vacuum Gate must go into the recessed hole of the mount ring on the Vacuum Chamber.

From the front side of the Dryer, install the Retaining Bracket onto the Upper Vacuum Gate and fully into the slot on the mount ring and secure it using the two 1/4-20 1/2" button head screws.

Install the two 5/32 (4mm) airlines onto the Upper Vacuum Gate air cylinder. The shorter line will connect to the air cylinder fitting closest to the slide gate.
Engaging the Load Cells

The load cells are immobilized prior to shipping and must be engaged for proper operation of the VBD-600 Dryer. There is a total of 4 load cells on machine: 2 for the vacuum chamber and 2 for the retention hopper.

Vacuum Chamber Load Cells

The first step in engaging the vacuum chamber load cells is to remove the 2 retaining bolts that secure the vacuum chamber to the frame.

Next, the jam nut located on the loadcell transfer bolt needs to be loosened.

To engage the load cell, tighten down the load cell transfer bolt until there is roughly a ¼ inch (6mm) gap between the hanger bumper stops and the frame.

Tighten down the jam nut to secure the position and ensure proper load cell engagement.
Repeat steps for the other side.

Retention Hopper Load Cells

To engage the Retention Hopper load cell pair, remove the packaging straps from the Retention Hopper Lifting Lever.
Lower the Retention hopper onto the load cell by pressing the lever back and down. This will engage the Retention Hopper lower frame onto the load cell pair.

When the Retention Hopper Lifting Lever is in its upright position, the lever’s cams lift the weigh off of the load cell pair and allow the Retention Hopper to be pulled out for servicing and cleaning purposes.
Dryer External Connections

**Heating Hopper Air Lines/RTD/Sensor Cables**

On top of the machine, next to the heating hopper, there are a series of air lines and cables that need to be connected.

There is a total of 3 air lines; two are which are for the vacuum chamber upper slide gate (red), and one to supply cooling air to the heating hopper level sensor (yellow).

There are 2 RTD cables that need to be connected. The orange connector indicates T1, which is the inlet temperature going into the heater hopper. The black connector signifies T3, which is the temperature at the top of the heating hopper.

Connect the level sensor cable to the corresponding CPC connection on the top of the machine.

If the air lines are not protruding through the top of the machine, through the grommets, the top panel will need to be removed. The air lines will have to be located and fed through the grommets on the top metal panel. Re-install the top panel.

**Install Heating Hopper Level Sensor and Bracket**

Install the heating hopper bracket and level sensor onto the adaptor plate located on top of the heating hopper (as shown). Locate the sensor cable that exits the top of the VBD Heating Hopper and attach the sensor cable to the sensor.
Compressed Air Connection

Connect an air supply to the air regulator’s IN port using a male 1/2” NPT 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.**

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

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

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

![](image)
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 is 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.

See page 77 for the High Voltage Wiring Diagram

THREE PHASE: 60 cycle 480 volts
            or 50 cycle 400 volts
Temperature Sensor (RTD) Locations

**T1 – Heating Hopper Air Inlet**
- T1s – Heating Hopper Air Inlet Temperature Setting
- T1a – Heating Hopper Air Inlet Temperature Actual

**T2 – Dry Purge Air Temperature**
- T2s – Dry Purge Air Temperature Setting
- T2a – Dry Purge Air Temperature Actual

**T3 – Heating Hopper Air Outlet Temperature**
- T3s – Heating Hopper Air Outlet Temperature Setting
- T3a – Heating Hopper Air Outlet Temperature Actual

**T4 – Material Outlet Temperature (optional)**
- T4s – Material Outlet Temperature Setting
- T4a – Material Outlet Temperature Actual
**Home Screen Overview**

*Shown with enabled options:* Auto Shutdown, Batch Mode, and Preheat, VBD-600 screen

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

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

**T3 Temp** – Actual Heating Hopper temperature

**Vacuum Time** – Vacuum Time Actual and Vacuum Time Setpoint. Touch to adjust.

**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

| **Home Screen** | Pressing the Home Screen button from any other screen will return the operator to the main Home Screen. |
| **Alarm and Event** | Alarm and Event Log displays a history of alarms and other events with a date and time stamps and description. |
| **Presets** | Interactive screen for material presets (recipes) that enable users to input, edit, and load material parameters to minimize testing setup time. |
| **Print Center** | A menu screen of print related options including Totals, Parameters, Alarm History, Events, Cycle History, Diagnostics. See page 63. |
| **Setup Login** | Password protected access to advanced Dryer and System configuration information. Also displays firmware/software, IP and MAC address info. |

**Run Dryer** - See page 19  
**Clean Out** – See page 53  
**Manual Operations** – See page 26

**Top Level Menu:**
Start Up 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, blanketing the material with hot, dry air, until the material is conveyed away.

**Important:** Inspect the VBD, verify that machine is clear of all material from all tanks, 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 HATCHES ARE CLOSED.** Ensure that all the latches are properly closed on both the heating hopper door and vacuum chamber access hatch. Also, make sure that the removable retention hopper is in place and that the load cells are properly engaged.

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 60 AMP Main Disconnect Handle to the Red ON position. This powers up the VBD-600 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).
Important Testing Parameters to Set

4. **On the Home Screen:**

   **Bulk Density** – Bulk density is the weight per unit volume of the raw plastic material as it is received from the material manufacturer. This parameter is important to set to ensure proper performance of the VBD-600. Bulk density can be edited under ‘Advanced Info’.

   ***WARNING: Without setting this parameter the machine may not maximize its material throughput and/or have a chance to overflow.***

   **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. Contact the material manufacturer for temperature recommendations.

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

   **Vacuum Time** – This is the duration of a vacuum and is what determines the cycle time. 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 a Maguire Dryer Technical 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.

6. **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 60 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 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.

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 30 minutes to deplete the retention hopper, the vacuum cycle will run past its 20-minute setpoint (pre-start screen) to 30 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.
**Shutdown Options**

**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 after the preheat cycle has ended (or forced to end), pressing the red Shutdown button will bring up the Shutdown Options screen with the following shutdown options:

**Shutdown** – Pressing the red ‘Shutdown’ button (after preheat has ended) will prompt a series of shutdown options

**Smart Stop** – With the ‘Smart Stop’ feature, the machine will not add more material into the machine and completely dry the remainder of the material in the machine. At the end of the ‘Smart Stop,’ there will be no material in the VBD which is essential for quick cleanout.

**Immediate Shutdown** – This causes an instantaneous, yet controlled, complete shutdown of all systems within the VBD (heater, blower, vacuum and purge system).

**Cooldown & Shutdown** – When this feature is selected, the VBD will gradually cool down the material in the heating hopper to a desired temperature over a specific designated time period.

**Cancel** - Exits the shutdown option screen

**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 Stop (must first be enabled)** – Initiates a shutdown at specified date and time. For further explanation on how to set the Auto Stop date and time see page 23.
## 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>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryer Setup</td>
<td>Display will show the Dryer Configuration categories.</td>
<td></td>
</tr>
<tr>
<td>Auto-Stop Setup</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>Schedule</td>
<td>Set the time of day Auto-Stop should occur.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to select the days of the week Auto-Stop should occur.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>to save the Auto-Stop settings.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the Home Button to return to the Home Screen.</td>
<td></td>
</tr>
</tbody>
</table>
Advanced Information

Pressing 📊 on 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

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

* Final moisture content as recommended by the raw material manufacturer.

** Drying temperature as recommended by the material manufacturer.

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

Measurement of moisture content of material, both prior to and after drying, is accomplished by using a moisture analyzer.
Setup Menu Map - Brief Explanation

This section contains a brief explanation of the Setup menu. For detailed information see Setup Menu Full Explanation immediately following this section.

<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>► Blower</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>
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<td></td>
<td>• BHT - VFD Heat Throttle</td>
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<tr>
<td></td>
<td>• BAC - VFD Air Flow Cutback</td>
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<td>• BTC - VFD Temperature Cutback</td>
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<td>• BTA - VFD Throttle Adjustment</td>
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<td>► Heater</td>
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<td></td>
<td>• PTS - Preheat Temperature Setting</td>
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<td>• PHT - Preheat Time</td>
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<tr>
<td></td>
<td>• PTD - Preheat Target Delta</td>
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<td>• RTS - Run Temperature Set-Point</td>
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<td>• PT1 - PD Loop Proportional</td>
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<td>• DT1 - PD Loop Derivative</td>
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<td>• OT1 - Heat1 Over-Target Alarm</td>
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<td>• NH1 - Heat1 No Heat Alarm</td>
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<td>• SO1 - Heat1 Set-Point Off. Percent</td>
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<td>• MP1 - Heat1 Max Percent</td>
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<td></td>
<td>• RO1 – Heat1 Restart Offset</td>
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<td>• MAX - Max Temp Set-Point</td>
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<td>• ESL - Energy Savings Limit</td>
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<td>• ESD - Energy Savings Differential</td>
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<td>• EST - Energy Saver Time</td>
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<td>• RMP - Temperature Ramp Settings</td>
</tr>
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<td>• CTM - Cool-Down Temperature</td>
</tr>
<tr>
<td></td>
<td>• CTR - Cool-Down Timer</td>
</tr>
<tr>
<td></td>
<td>► System</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)
- HHU - 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
- System specific settings

### 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 |
| ► Menu Bar Options - menu button preferences |
| ► 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

Three modes of operation (on Home Screen): **Run Dryer, Manual Operations, Clean Out.**

**Run Dryer** - See Operation on page 19.

**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 37.

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>Material Shortage Alarm</td>
</tr>
<tr>
<td></td>
<td>OFF: Disables the Material Shortage alarm</td>
</tr>
<tr>
<td></td>
<td>WARN: In the event of a material shortage, activate the audible alarm and strobe light but continue retrying for material.</td>
</tr>
<tr>
<td></td>
<td>SHUTDOWN: In the event of a material shortage, activate the audible alarm and strobe light and automatically initiate a planned shutdown. Audible alarm with sound for 15 seconds and the strobe will flash until the dryer is completely shut down. When Material Shortage Alarm is in Warn or Shutdown Mode Fill Retries are ENABLED. When set to OFF, Fill Retries are disabled.</td>
</tr>
</tbody>
</table>
**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.

**Print Alarm Log** - Prints the Alarm Log. See page 63.
**Clear Alarm Log** - Clears the Alarm Log. See page 63.

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

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

**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 at the end of this manual.
- **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 Cham** - OFF/CYC/ON – Controls when the vacuum chamber is purged with membrane dried air.

- **OFF** – No vacuum chamber purging occurs.
- **CYC** – Vacuum chamber purging occurs during allotted vacuum cycle time (VTs).
- **ON** – Vacuum chamber purging occurs during allotted vacuum cycle time (VTs) and extended vacuum if applicable.

**Purge Interval** - Interval in seconds between purges.

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

Preheat Setup

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

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

Parameters

Parameters access. See page 37.

System Configuration

**Print Options**

**Print Setup** - See page 63
- **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.

**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.

**Menu Bar Options** – Allows changes to right-side menu buttons.

**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 47.

**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 68.
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-600 firmware. See page 69.
Parameters

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

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

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

**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 Savings Mode
- EST  Energy Savings Time
- RMP  Temperature Ramp Settings
- CTM  Cool-Down Temperature
- CTR  Cool-Down Timer

**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
- VFD  Chamber Dump Threshold
- 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 Throughput Cutoff
- HHV  Heating Hopper Volume
- HHU  Heating Hopper High Level
- HLA  Heating Hopper Level Alarm

**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.

**PERCENTAGES**  
are expressed in full percentages.

**TEMPERATURES**  
are expressed in full degrees (Fahrenheit or Celsius).

**TERM**  
used to calculate a value.

---

### 3-letter Acronym  
**Parameter title (units) — default parameter value**  
**Parameter description**

---

### Blower Parameters

**BDT**  
**Blower Delay Time (Time in seconds) — 02002**  
The first two digits are the delay in seconds between powering the blower and powering the heating hopper heater. The last two digits are the delay in seconds between powering down the blower and powering down the heating hopper heater.

**BDF**  
**VFD Frequency (Hz) — 00060**  
The frequency, in Hz, that the VFD will power the blower motor with. The blower RPMs, as well as the airflow, are directly proportional to this frequency.

**BHF**  
**VFD High Limit (Hz) — 00060**  
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 000060.

**BLF**  
**VFD Low Limit (Hz) — 00025**  
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 000025.

**BZL**  
**VFD Zero Level (%) — 00045**  
The heating hopper level, expressed as a percentage, that triggers the VFD to reduce speed to the BLA setting.

**BLA**  
**VFD Level Adjustment (Hz) — 00025**  
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 popcorning when the heating hopper material level is low.

**BHT**  
**VFD Heat Throttle (%) — 00100**  
Percentage of adjustment to the heater's on-time at the point when the material has finished exiting the heat hopper and the blower starts. A reduced heater on-time percentage (from 100%) reduces the heat exposure to the new material entering the heat hopper. Activated when the level sensor is below BZL (parameter). Setting the first digit to a 1 overrides the percent adjustment and effectively turns off the heater when material is below the BZL threshold.
Dispensing Parameters

**VCH**  Vacuum Chamber High Level – weight - 00035
Amount of material dispensed into the Vacuum Chamber from the heating hopper. Also known as the “Fill Weight”.

**VCL**  Vacuum Chamber Low Level – weight - 00005
Two conditions are triggered by VTL. When in Clean 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 RTL. When in Clean 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).

**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**  Vessel 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**  Vessel 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 (VTH 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 VTT, 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 Level Alarm (%) – 00050
The level, expressed as a percentage, that the Heating Hopper Level Alarm will trigger if enabled in the Alarm Setup menu. Any heating hopper level at or below this level will trigger the alarm.

Heater Parameters

PTS  Heat1 Temperature Set-Point (Temperature) – 00150
Heating hopper air inlet temperature setting in °F or °C.

PHT  Preheat Time – Time in Minutes – 00030
Time in Minutes that the material in the heating hopper is heated following a cold start before normal Run Dryer sequence starts.

PTD  Preheat Target Delta – Degrees – 00030
When preheat mode is set to AUTO (not time), the preheat cycle will end when the temperature of the air exiting the heating hopper (T2) is within PTD degrees of the air entering the heating hopper (T1).

RTS  Run Temperature Setting – Degrees – 00150
The heating hopper air inlet temperature setting in °F or °C. This is the temperature that the resin is heated to before the vacuum cycle, and is shown as “T1a” 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 PID updates if the heating hopper inlet temperature, T1a, is ABOVE setpoint. The last two digits is the amount of time, in seconds, between PID 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 Savings 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 Savings Time has elapsed, trigger Energy Saver Mode.

**EST  Energy Savings Time – minutes – 00030**
If Energy Savings Mode is enabled and Energy Savings Mode has been activated, the Energy Saving Time is the time that will elapse before Energy Savings Mode is reactivated to bring the temperature of the material back up.
RMP  Temperature Ramp Settings (Increments/Minute/Degrees) – 52036
Format: XYYZZ - X = number of increments, YY = duration of ramp in minutes, ZZ = temperature delta
For example, with RMP set to 52020: When temperature ramping is turned on, over the course of 20 minutes, a 20 degree C ramp will occur, in 5 increments of 4 degrees C.

CTM  Cool-Down Temperature – Degrees - 00120 Fahrenheit or 00050 Celsius
Cool-down target temperature for the heat hopper during the Planned Shutdown.

CTR  Cool-Down Timer – Minutes - 00030
Targeted elapsed time to cool-down target temperature (CTM parameter).

Load Cell Parameters

KDF  Loadcell Stable Weight – counts – 00006
Maximum allowable fluctuation in raw loadcell counts to produce a stable weight reading.

LST  Loadcell Stable Time – milliseconds – 00100
Duration in milliseconds that raw loadcell counts must remain within KDF to produce a stable loadcell reading.

LCZ  Loadcell Zero – counts – 01000
Minimal allowable counts when zeroing load cells.

WST  Weight Settle Time – seconds – 00005
Delay time in seconds after the vacuum chamber fill valve closes to allow material to settle and the dryer to acquire an accurate weigh reading.

LZ1  Load Cell 1 Zero – counts – 00000
Factory set reference point in counts for retention hopper load cell. This parameter should not be changed unless directed by a Maguire technician or if load cells are replaced. If load cells are replaced, instructions will be provided. When this parameter is set to zero (00000), restriction on loadcell calibration is disabled.

LZ2  Load Cell 2 Zero – counts – 00000
Factory set reference point in counts for vacuum chamber load cell. This parameter should not be changed unless directed by a Maguire technician or if load cells are replaced. If load cells are replaced, instructions will be provided. When this parameter is set to zero (00000), restriction on loadcell calibration is disabled.
Vacuum Parameters

**VTS**  Vacuum Time Setting (Time in minutes) – 00020  
The length of a vacuum cycle in minutes.

**VPL**  Vacuum Pressure Low (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) – 00020  
The pressure difference above VPL at while 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 opened and closed. The last two digits Amount of time in seconds the chamber pressure must reach 200mm of mercury below atmosphere to not trigger a 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 Dryer's 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></td>
<td>To save the parameter adjustment or press the red X to cancel and exit.</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.

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></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></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-600 communications enabled software communication over Ethernet using the MLAN Protocol. For more information about the MLAN Protocol and the VBD-600 Dryer see the MLAN Protocol manual, available on the Maguire Products Inc website.

**NOTE**
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>System Configuration Display will show the System Configuration categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>Communications Display will show the System Communications categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>MLAN I.D. Number Display will show the MLAN I.D. Number screen.</td>
<td>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></td>
<td>To save the Changes.</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>System Configuration Display will show the System Configuration categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>Communications Display will show the System Communications categories.</td>
<td></td>
</tr>
<tr>
<td>Press</td>
<td>TCP/IP Configuration 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>
<td></td>
</tr>
<tr>
<td>Press</td>
<td></td>
<td>To save the Changes.</td>
</tr>
</tbody>
</table>
Enabling Modbus

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

Press [System Configuration] Display will show the System Configuration categories.

Press [Communications] Display will show the System Communications categories.

Press [Modbus Server] Display will show the Modbus Server screen. On this screen, press the checkbox Enable to enable Modbus.

Press [OK] To save the Changes.
Maintenance

Drain and purge Air Filter / Regulator

The purpose of the air filter is to remove moisture and contaminants from the compressed air supply and protect the pneumatic 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.

Clean Air Filter

The purpose of the air filter located on the back of the dryer enclosure is to remove contaminants from the ambient air supply and protect the heating components of the Dryer. The air filter must be periodically checked and cleaned. Recommended cleaning interval is monthly. More frequent in very dusty environments.

Air Pressure Adjustments

Air Pressure

Air pressure affects the ability to draw a high vacuum. We recommend a pressure setting of **80 PSI while the dryer is running**. 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.
Loadcell Calibration

Zero Weight Calibration

BE SURE The Air supply is on.
BE SURE The Vacuum Chamber and Retention Hopper is EMPTY.
BE SURE The Vacuum Chamber and Retention Hopper are hanging / resting freely on the load cells.
BE SURE The air lines are connected.

LOAD CELL ZERO CALIBRATION
The sequence is as follows:

<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 menu options</td>
</tr>
<tr>
<td>Press</td>
<td>Load-Cell Setup</td>
<td>Display will show Load-Cell Calibration 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>EXIT</td>
<td>To return to the Load-Cell Setup screen.</td>
</tr>
<tr>
<td>Press</td>
<td>Retention Hopper 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 Retention Hopper is empty then press ZERO. Gram weight of 0 follows successful calibration.</td>
</tr>
<tr>
<td>Press</td>
<td>EXIT</td>
<td>To return to the Load-Cell Setup screen.</td>
</tr>
<tr>
<td>Press</td>
<td></td>
<td>To return to the Main Screen.</td>
</tr>
</tbody>
</table>

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

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

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

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

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

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

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.

<table>
<thead>
<tr>
<th>Press</th>
<th>Display will prompt for a password. (default: 22222) Then press:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Press</td>
<td>Dryer Configuration Display will show the Dryer Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>Load-Cell Setup Display will show the Load-Cell Setup screen.</td>
</tr>
<tr>
<td>Press</td>
<td>Vacuum Chamber Zero/Full Calibration Display will show the ZERO / FULL Calibration screen.</td>
</tr>
<tr>
<td>Press</td>
<td>ZERO 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 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 EXIT To exit Zero / Full Weight Calibration screen.
Repeat procedure for Retention Hopper.
Clean Out Procedure

Dumps the Heating Hopper and/or the Vacuum Chamber. 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 350F, (180C). Typically, these surfaces are not at dangerous temperatures, however all hot surfaces should be avoided.

Do Not Perform a Clean Out Unless VBD-600 Dryer is First Properly Shut Down.

For proper shutdown procedure, see Startup and Operation on page 22.

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

Using the Heating Hopper Clean Out

The Heating Hopper has a front hatch for access to the full internal height of the Heating Hopper. The Heating Hopper is non-removable. Prior to opening the front hatch, removal of all material is recommended. Material in the Heating Hopper can be evacuated by dropping the material down into the vacuum chamber.

Note: use of the Heating Hopper Manual Dump Valve 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.

Emptying the Heating Hopper

Press 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 Confirmation window will appear.

Press to Dump Heating Hopper and start the Clean Out.
Emptying the Vacuum Chamber

The Vacuum Chamber is non-removable. The Vacuum Chamber has a front facing cleanout hatch. Prior to opening the front access hatch, removal of all material is recommended.

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

Press  

The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen.

Both the Dump Heating Hopper 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  

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  

The Clean Out button is located on the Home Screen. Display will show: Batch Start Clean Out Mode screen.

Both the Dump Heating Hopper 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  

Confirmation window will appear.

Press  

to start the Clean Out.

Press  

to return to the Home Screen.
**Cleanout of the Vacuum Chamber**

<table>
<thead>
<tr>
<th>Access to the Vacuum Chamber through the cleanout hatch located on the front of the Vacuum Chamber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>To remove the hatch insert rotate the two butterfly latches and then unhook from the hatch faceplate.</td>
</tr>
<tr>
<td>Using two hands slide the hatch insert out of the Vacuum Chamber. Use caution handling the Vacuum Chamber Hatch. Do not drop.</td>
</tr>
<tr>
<td>Access the interior of the Vacuum Chamber through the hatch opening.</td>
</tr>
<tr>
<td>When cleanout is complete, clean the seal around the hatch insert and then re-secure the hatch to the Vacuum Chamber.</td>
</tr>
</tbody>
</table>
Cleanout of the Retention Hopper

The Retention Hopper will slide out for easy access. Prior to sliding out the Retention Hopper remove all material. Sliding out the Retention Hopper will open the bottom drain of the hopper.

To slide the Retention Hopper out, the sealing collar needs to be dropped. It is held up using a series of magnets. Grab the red handles and pull downward.

Locate the black lift handle and raise the Retention Hopper by rotating the lift handle up and towards the front of the Dryer.

With the lift handle raised, use the red handle to slide the Retention Hopper out towards the front of the Dryer.

When cleanout is complete, slide the Retention Hopper back into the Dryer, then lower the Retention Hopper using the black lift handle. Finally lift up on the retention hopper sealing collar.
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>
<tbody>
<tr>
<td>BLOWER FAILURE</td>
<td><strong>Problem:</strong> The blower is not running.</td>
</tr>
<tr>
<td>ALARM:01</td>
<td>Motor contactor overload relay has tripped. See wiring diagram on page 76 for</td>
</tr>
<tr>
<td></td>
<td>Blower Motor Contactor. Item # 3, overload relay on wiring diagram. This alarm</td>
</tr>
<tr>
<td></td>
<td>will trigger a dryer shutdown.</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> Reset contactor. Check that blower motor shaft is not locked.</td>
</tr>
<tr>
<td></td>
<td>Check line voltage to machine; make sure voltage is not too low which can cause</td>
</tr>
<tr>
<td></td>
<td>an increase in amperage. Check that power source has not lost a phase.</td>
</tr>
<tr>
<td>ALARM:02</td>
<td><strong>Problem:</strong> No heat or inadequate heat detected by the Heating Hopper inlet RTD.</td>
</tr>
<tr>
<td>HH NO HEAT</td>
<td>This alarm is triggered by the NH1 parameter. NH1 parameter is the maximum</td>
</tr>
<tr>
<td></td>
<td>time limit, in seconds, after the heat cycle begins, during which one of the</td>
</tr>
<tr>
<td></td>
<td>following two conditions must be detected: Either the temperature must climb</td>
</tr>
<tr>
<td></td>
<td>20 degrees, or the temperature must move at least 20 percent toward the target</td>
</tr>
<tr>
<td></td>
<td>temperature. If neither condition is met the “NO HEAT” alarm will sound. Such</td>
</tr>
<tr>
<td></td>
<td>an occurrence would signal a failure of either the heater or the airflow from</td>
</tr>
<tr>
<td></td>
<td>the blower. This parameter and consequent alarm protects the heater from burn</td>
</tr>
<tr>
<td></td>
<td>out in the event the blower fails or airflow is blocked.</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> Check for airflow from the blower. Check blower inlet obstruction,</td>
</tr>
<tr>
<td></td>
<td>check that 2” air duct from blower to heater is not detached, obstructed or</td>
</tr>
<tr>
<td></td>
<td>perforated. Check 2” air duct from top of heater to heating hopper inlet for</td>
</tr>
<tr>
<td></td>
<td>detachment, obstruction or perforation. Check resistance across heater.</td>
</tr>
<tr>
<td></td>
<td>Disconnecting heater from circuit is not necessary to measure resistance.</td>
</tr>
<tr>
<td></td>
<td>Measurement should read 80 ohms. See wiring diagram on page 76. If the dryer’s</td>
</tr>
<tr>
<td></td>
<td>heater shorted, the result would be a trip of the breaker or fuse supplying</td>
</tr>
<tr>
<td></td>
<td>power to the VBD-600 dryer.</td>
</tr>
<tr>
<td>ALARM:03</td>
<td><strong>Problem:</strong> The heating hopper air inlet temperature has drifted above set-point.</td>
</tr>
<tr>
<td>HH SP EXCEEDED</td>
<td>If the Heating hopper air inlet temperature (T1a sensor) is over the degrees</td>
</tr>
<tr>
<td></td>
<td>specified in parameter OT1 (default 6°F or 6°C) for a time greater than the</td>
</tr>
<tr>
<td></td>
<td>time in seconds specified in OT1, then the alarm is triggered and the heater</td>
</tr>
<tr>
<td></td>
<td>output will drop by 20%. The alarm will occur but the machine will keep running.</td>
</tr>
<tr>
<td></td>
<td>See OT1 parameter for more information.</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> No solution is necessary under normal circumstances as the dryer</td>
</tr>
<tr>
<td></td>
<td>is alerting to a temperature adjustment. If this alarm continued to repeat,</td>
</tr>
<tr>
<td></td>
<td>contact Maguire Technical Support.</td>
</tr>
</tbody>
</table>
| ALARM:04 HH OVERHEAT | **Problem:** The heating air temperature has drifted above set-point.  
If the heating air temperature (T1a sensor) is over the degrees specified in parameter OT1 (default 6°F or 6°C) for a time greater than the time in seconds specified in OT1, then the alarm is triggered and the heater output will drop by 20%. The alarm will occur but the machine will keep running. See OT1 parameter for more information.  

**Solution:** No solution is necessary under normal circumstances as the dryer is alerting to a temperature adjustment. If this alarm continued to repeat, contact Maguire Technical Support. |
| --- | --- |
| ALARM:05 PURGE HTR NO HEAT | **Problem:** No heat or inadequate heat detected by the Purge Heater RTD.  
This alarm is triggered by the NH2 parameter. NH2 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 10 degrees, or the temperature must move at least 10 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 compressed airflow. This parameter and consequent alarm protects the purge heater from burn out in the event the compressed air failure or airflow is blocked.  

**Solution:** Check compressed airflow to the purge heater is adequate. Check that the air line that supplies the solenoid valve in the inlet of the purge heater is properly attached. |
| ALARM:06 PURGE SP EXCEEDED | **Problem:** The purge air temperature has drifted above set-point.  
If the purge air inlet temperature (T2a sensor) is over the degrees specified in parameter OT2 (default 6°F or 6°C) for a time greater than the time in seconds specified in OT2, then the alarm is triggered and the heater output will drop by 20%. The alarm will occur but the machine will keep running. See OT2 parameter for more information.  

**Solution:** No solution is necessary under normal circumstances as the dryer is alerting to a temperature adjustment. If this alarm continued to repeat, contact Maguire Technical Support. |
| ALARM:07 PURGE OVERHEAT | **Problem:** The purge air temperature has drifted above set-point.  
If the purge air temperature (T2a sensor) is over the degrees specified in parameter OT2 (default 6°F or 6°C) for a time greater than the time in seconds specified in OT2, then the alarm is triggered and the heater output will drop by 20%. The alarm will occur but the machine will keep running. See OT2 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</th>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>08</td>
<td><strong>NO VACUUM</strong>&lt;br&gt;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.  &lt;br&gt;<strong>Solution:</strong> 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.</td>
</tr>
<tr>
<td>09</td>
<td><strong>RETEN.NOT PRESENT</strong>&lt;br&gt;Problem: The Retention Hopper is missing. If retention hopper loadcell (pair) is reading 23.2 pounds (10000 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, or faulty loadcells.  &lt;br&gt;<strong>Solution:</strong> If Retention Hopper is missing replace Retention Hopper. If Retention Hopper is in place, ensure the tank is empty and zero calibrate the load cells. If load cells are damaged, a zero calibration may detect this.</td>
</tr>
<tr>
<td>11</td>
<td><strong>RTD FAILURE</strong>&lt;br&gt;Problem: RTD (temperature sensor) reading is above or below max/min reading  &lt;br&gt;RTD Sensor is probably disconnected or damaged. Check temperature display reading in a cool state. Temperature should display room temperature. If reading is below -25C or above 450C RTD sensor has failed.  &lt;br&gt;<strong>Solution:</strong> Contact Maguire Technical Support for a replacement RTD Sensor.</td>
</tr>
<tr>
<td>12</td>
<td><strong>MATERIAL SHORTAGE</strong>&lt;br&gt;Problem: Maximum Fill Time (VFT parameter) has been reached before target material weight (VTH parameter) has been achieved.  &lt;br&gt;This alarm is triggered when the VFT parameter has been reached (Vessel Fill Time) before the VTH (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.  &lt;br&gt;<strong>Solution:</strong> Check material supply. Check Vacuum Chamber fill valve located at the base of the heating hopper.</td>
</tr>
<tr>
<td>15</td>
<td><strong>LOW AIR PRESSURE</strong>&lt;br&gt;Problem: Air pressure sensor has detected air pressure below 50 psi.  &lt;br&gt;<strong>Solution:</strong> Check exhausting lockout valve located on the front lower left side of VBD-600. Ensure that the valve is open. Check pressure of air supply.</td>
</tr>
<tr>
<td>Alarm Code</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>HH FAIL-SAFE</td>
<td>Problem: The heating hopper heater thermal safety switch has opened due to an overheat condition.</td>
</tr>
<tr>
<td>ALARM:16</td>
<td></td>
</tr>
<tr>
<td>PH FAIL-SAFE</td>
<td>Problem: The purge heater thermal safety switch has opened due to an overheat condition.</td>
</tr>
<tr>
<td>ALARM:17</td>
<td></td>
</tr>
<tr>
<td>VC MISSING</td>
<td>Problem: The Vacuum Chamber is missing.</td>
</tr>
<tr>
<td>ALARM:18</td>
<td></td>
</tr>
<tr>
<td>RH MISSING</td>
<td>Problem: The Retention Hopper is missing.</td>
</tr>
<tr>
<td>ALARM:19</td>
<td></td>
</tr>
<tr>
<td>Alarm Type</td>
<td>Problem</td>
</tr>
<tr>
<td>-------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>THROUGHPUT ALARM:20</strong></td>
<td>Problem: The throughput of the dryer has been exceeded.</td>
</tr>
<tr>
<td></td>
<td>This alarm is triggered when the Retention Hopper low level has been</td>
</tr>
<tr>
<td></td>
<td>reached before the vacuum timer has elapsed.</td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> This is cause by exceeding material demand.</td>
</tr>
<tr>
<td><strong>LOW VACUUM ALARM:21</strong></td>
<td>Problem: Dryer failed to pull vacuum down to target vacuum pressure set</td>
</tr>
<tr>
<td></td>
<td>in VPL parameter.</td>
</tr>
<tr>
<td></td>
<td><strong>Possible causes and Solution:</strong> If dryer alarms, check: compressed</td>
</tr>
<tr>
<td></td>
<td>air connection and pressure (dryer's regulator should be reading</td>
</tr>
<tr>
<td></td>
<td>85psi). Check for debris in seals above and below Vacuum Chamber.</td>
</tr>
<tr>
<td></td>
<td>Alarm may also have been caused by a vacuum leak. Contact Maguire</td>
</tr>
<tr>
<td></td>
<td>technical support if cause is not found.</td>
</tr>
<tr>
<td><strong>LOW BATCH ALARM:22</strong></td>
<td>Problem: Material supplied to Vacuum Chamber is below minimum allowable</td>
</tr>
<tr>
<td></td>
<td>weight.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> Check material supply feeding the heating hopper. Check</td>
</tr>
<tr>
<td></td>
<td>heating hopper material flow (sticking material, melted material, hard</td>
</tr>
<tr>
<td></td>
<td>to flow regrind). Check Vacuum Chamber Fill Valve (butterfly valve</td>
</tr>
<tr>
<td></td>
<td>below heating hopper). Check air pressure (80 psi).</td>
</tr>
<tr>
<td>**RESIDENCE ALARM</td>
<td>Problem: Material has been in the retention hopper too long.</td>
</tr>
<tr>
<td>ALARM:23</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Solution:</strong> To prevent this alarm: decrease fill weight, or turn on</td>
</tr>
<tr>
<td></td>
<td>Fill Weight Adjust (Material Setup menu).</td>
</tr>
<tr>
<td><strong>BATCH COMPLETE ALARM:24</strong></td>
<td>Batch is complete</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Material Shutdown Alarm:25 | Material Shutdown  
This alarm triggers if the Material Shortage alarm is set to "SHUTDOWN" and is 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. |
| Auto Shutdown Alarm:27 | Auto Shutdown  
This alarm triggers when an Auto Shutdown, that is, a shutdown at a pre-determined time, has commenced. "Commencement" is defined as the time at which the final vacuum chamber fill has occurred. |
| Heating Hopper Material Alarm:28 | Heating Hopper Material  
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 Temp  
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. |
Print Center Logs and Print Outputs

Print Center is available from the Home Screen by pressing by pressing the Pinter 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

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

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

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

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

Print All
Prints all of the above logs to USB.

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
Logs and Print Outputs

Alarm Log - Display of the most recent log outputs. Toggle Select button to Alarm Log.

Event Log - The Event log is written to a file on a USB drive. To write the log file, toggle to wrench mode, Print Setup, Print Event Log. Each log entry is a single line of information that was recorded about the Dryer at the moment the line in the log was written.

The following is a description of the columns of information in a log. Note: line wrap in the manual due to page space constraints. Actual log file continues as a single line with a carriage return after “ABS:”

<table>
<thead>
<tr>
<th>Column</th>
<th>Example</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>08-20-2017</td>
<td>Date of the log (the date is stored in the Dryer).</td>
</tr>
<tr>
<td>2</td>
<td>10:10:08</td>
<td>Time of the log.</td>
</tr>
<tr>
<td>3</td>
<td>MODE: PHT</td>
<td>Current mode of the dryer when the log entry was written.</td>
</tr>
<tr>
<td>4</td>
<td>T1s: 180F</td>
<td>T1s (Heating Hopper Inlet temperature Setpoint)</td>
</tr>
<tr>
<td>5</td>
<td>T1a: 90F</td>
<td>T1a (Heating Hopper Inlet Actual Temperature)</td>
</tr>
<tr>
<td>6</td>
<td>H1: 0.0</td>
<td>Heating Hopper Heater Duty Cycle</td>
</tr>
<tr>
<td>7</td>
<td>T2s: 180F</td>
<td>Dry Purge Air Temperature Setpoint</td>
</tr>
<tr>
<td>8</td>
<td>T2a: 77F</td>
<td>Dry Purge Air Actual Temperature</td>
</tr>
<tr>
<td>9</td>
<td>H2: 7.5</td>
<td>Dry Purge Heater Duty Cycle</td>
</tr>
<tr>
<td>10</td>
<td>T3: 84F</td>
<td>Heating Hopper Outlet Air Temperature</td>
</tr>
<tr>
<td>11</td>
<td>T4: 78F</td>
<td>Optional T4 Material Exit Temperature</td>
</tr>
<tr>
<td>12</td>
<td>BLW: 0.00ma</td>
<td>Blower Speed Reference (4-20 mA)</td>
</tr>
<tr>
<td>13</td>
<td>LS: 98%</td>
<td>Heating Hopper Level Sensor (percent)</td>
</tr>
<tr>
<td>14</td>
<td>VTIME: 00:00/20:00</td>
<td>Vacuum Time (actual/setpoint in seconds)</td>
</tr>
<tr>
<td>15</td>
<td>ABS: 753mmHg</td>
<td>Vacuum Chamber Pressure</td>
</tr>
<tr>
<td>16</td>
<td>VT LC: 7</td>
<td>Vacuum Chamber Loadcell Reading (weight in lbs or kgs)</td>
</tr>
<tr>
<td>17</td>
<td>RH LC: 6</td>
<td>Retention Hopper Loadcell Reading (weight in lbs or kgs)</td>
</tr>
<tr>
<td>18</td>
<td>THROUGHPUT: 0</td>
<td>Throughput (lbs or kgs / hour)</td>
</tr>
</tbody>
</table>

Example of a VBD Event Log:

08-20-2014 12:25:17

08-20-2014 10:08:40 *** OPERATOR START ***

08-20-2014 10:10:05 *** DRYER STARTED ***

08-20-2014 10:10:15 *** HEATING HOPPER HEATER STARTED ***

08-20-2014 10:10:23 *** DRY PURGE SUPPLY VALVE: ON ***

08-20-2014 10:10:39 *** HEATER FAIL SAFE: HIGH ***

08-20-2014 10:10:55 *** BLOWER STARTED ***

08-20-2014 10:10:15 *** HEATING HOPPER HEATER STARTED ***

08-20-2014 10:10:23 *** DRY PURGE SUPPLY VALVE: ON ***

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08-20-2014 10:10:39 *** HEATER FAIL SAFE: HIGH ***

08-20-2014 10:10:55 *** BLOWER STARTED ***
Interpreting the Parameter Printout

First column is the parameter’s description.
Second column is the parameter’s 3-letter acronym.
Third column is the parameter’s setting in RAM, which is the currently loaded user settings.
Fourth column is the parameter’s default setting in ROM (Read Only Memory). This is the factory default.
Fifth column is the lower limit of the parameter’s value.
Sixth column is the upper limit of the parameter’s value.
Seventh column is the units of the parameter.

Example of a Parameter Printout:

VBD-600 Parameters

Mon 08/15/2016 17:04
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

<table>
<thead>
<tr>
<th>INDEX</th>
<th>NAME</th>
<th>ABBR</th>
<th>RAM</th>
<th>DFT</th>
<th>LO LIMIT</th>
<th>HI LIMIT</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blower:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Blower Delay Time</td>
<td>BDT</td>
<td>01002</td>
<td>01002</td>
<td>00000</td>
<td>99999</td>
<td>Second</td>
</tr>
<tr>
<td>B2</td>
<td>VFD Low Limit</td>
<td>BLF</td>
<td>00025</td>
<td>00025</td>
<td>00025</td>
<td>00060</td>
<td>Freq</td>
</tr>
<tr>
<td>B3</td>
<td>VFD High Limit</td>
<td>BHF</td>
<td>00060</td>
<td>00060</td>
<td>00050</td>
<td>00070</td>
<td>Freq</td>
</tr>
<tr>
<td>B4</td>
<td>VFD Drive</td>
<td>BDF</td>
<td>00400</td>
<td>00400</td>
<td>00000</td>
<td>65535</td>
<td></td>
</tr>
<tr>
<td>B5</td>
<td>VFD Zero Level</td>
<td>BZL</td>
<td>00445</td>
<td>00445</td>
<td>00000</td>
<td>00100</td>
<td>Percent</td>
</tr>
<tr>
<td>B6</td>
<td>VFD Level Adjustment</td>
<td>BLA</td>
<td>00225</td>
<td>00225</td>
<td>00025</td>
<td>00060</td>
<td>Freq</td>
</tr>
<tr>
<td>B7</td>
<td>VFD Heat Throttle</td>
<td>BHT</td>
<td>01000</td>
<td>01000</td>
<td>00000</td>
<td>65535</td>
<td>Percent</td>
</tr>
<tr>
<td>B8</td>
<td>VFD Air Flow Cutback</td>
<td>BAC</td>
<td>00000</td>
<td>00000</td>
<td>00000</td>
<td>65535</td>
<td>Percent</td>
</tr>
<tr>
<td>B9</td>
<td>VFD Temp. Cutback</td>
<td>BTC</td>
<td>00000</td>
<td>00000</td>
<td>00000</td>
<td>65535</td>
<td>Freq/Deg</td>
</tr>
<tr>
<td>B10</td>
<td>VFD Throttle Adjust</td>
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Dispensing:

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Heater:

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<td>Preheat Temperature</td>
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### Vacuum Dryer

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**Load Cell:**

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<td>Loadcell Zero</td>
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**Vacuum:**

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<td>Vac. Pressure Delta</td>
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**System:**

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</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: On
- 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
- DryPurge Temp.: Auto
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: Off

LOADCELL CALIBRATION

<table>
<thead>
<tr>
<th>NAME</th>
<th>ZERO</th>
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<th>FULL</th>
<th>LAST ZERO</th>
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<tr>
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<td>3303829</td>
<td>1588575</td>
<td>15422</td>
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<td>VT LC:</td>
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<td>16147</td>
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**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>Display will prompt for a password. (default: 22222)</th>
<th>Then press:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>System Configuration</th>
<th>Display will show the System Configuration categories.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>Resets</th>
<th>Display will show the categories of System resets: User Settings, Factory Access, Restore All, Restore Parameters, Firmware Update.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
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<th>User Settings</th>
<th>Display will show Restore User Settings / Save User Settings.</th>
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</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>Save User Settings</th>
<th>Display will prompt for confirmation to save user settings.</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>To save the user settings including parameters or press the red X to cancel and exit.</th>
</tr>
</thead>
</table>

**Restoring Parameters from Backup**

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<table>
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<tr>
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<th>Display will show the System Configuration categories.</th>
</tr>
</thead>
</table>

<table>
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<tr>
<th>Press</th>
<th>Resets</th>
<th>Display will show the categories of System resets: User Settings, Factory Access, Restore All, Restore Parameters, Firmware Update.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
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<th>User Settings</th>
<th>Display will show Restore User Settings / Save User Settings.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
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<th>Restore User Settings</th>
<th>Display will prompt for confirmation to Restore user settings.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Press</th>
<th>To restore the user settings including parameters or press the red X to cancel and exit.</th>
</tr>
</thead>
</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.

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>Step</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>
<tr>
<td>Press</td>
<td>Display will prompt for a password. (default: 22222) Then press:</td>
</tr>
<tr>
<td>Press</td>
<td>System Configuration Display will show the System Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>System Configuration categories.</td>
</tr>
<tr>
<td>Press</td>
<td>The controller will search the USB drive for a firmware update file with the XUF extension.</td>
</tr>
<tr>
<td>Select</td>
<td>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.</td>
</tr>
<tr>
<td>Highlight</td>
<td>the version in the white panel on the left and press PROGRAM.</td>
</tr>
<tr>
<td>Press</td>
<td>To proceed with the firmware update or press the red X to cancel and exit.</td>
</tr>
</tbody>
</table>

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 (Q=2017), 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, the UPDATE.XUF file will be automatically loaded into the VBD, restoring the software.
General Information

VBD-600 Technical Specifications

SCOPE
- Provide up to 600 pounds per hour (272 kg/hr) of dry material to an injection molding or extrusion platform utilizing energy efficient vacuum drying technology. Drying temperature up to 350° F (185° C).

POWDER REQUIREMENTS
- Voltage: 480 Vac, 3 Phase, 60 Hz or 400 Vac, 3 Phase, 50 Hz
- FLA: 49 / 54
- Disconnect: 60 amp
- Air: 85 psi / 6 bar
- Heating Element: Primary: 20 Kw, Secondary: 1.25 kW (purge circuit)
- Blower: 8.5 HP, 350 SCFM @ 40” water

HEATING HOPPER
- Capacity: 420 lbs. (191 kg)
- Insulated construction, 4” of R-15 insulation
- Large Access Door
- Diffuser cone
- 304 Stainless steel internal wall construction, material contact

VACUUM CHAMBER
- Capacity: 195 lb. (88 kg)
- Rail mounted for ease of removal
- Insulated construction, 4” of R-7.5 insulation
- Access Hatch, insulated glass with captive air gap insulation
- 304 Stainless steel internal wall construction, material contact
- Unions on most air connections for ease of maintenance
- Load cell based continuous level control

MATERIAL SHUT-OFF / VACUUM VALVE
- Slide gate style material shut-off valve
- Camming slide gate style vacuum shut-off valve

RETENTION HOPPER
- Capacity: 215 lb. (98 kg)
- Insulated construction, 4” of R-7.5 insulation
- 304 Stainless steel internal wall construction, material contact
- Load cell based continuous level control
CONTROLLER
- Microprocessor based control (Motorola 6812)
- 4 x 20 character Blue back lit display
- 4 Digit 1” high Red LED for display of Actual or Set Temperature
- Icon representation of function
- Flash Memory, SD card with micro capability
- Ethernet & USB ports
- Optional CANbus communications for remote / repeater control

ELECTRICS
- Main Disconnect, 60 Amp, class J fuses
- Altec Euro style disconnects
- Step down transformer with regulated DC power supply
- 70 cfm cooling fan, bottom vented
- 8.5 HP regenerative blower, 350 SCFM w/ VFD
- RTD Inputs, 3: Heating hopper inlet, Heating hopper exit, Dry Purge inlet

DRY AIR PURGE CIRCUIT
- Air filter regulator
- Coalescing Filter, 1/10th micron for removal of oil and fine particulates
- Exhaust Shut-off
- Compressed Air Dryer, 75 L/min.
- 1,250 kW heater dedicated for dry air purge
  The majority of the dry air is directed to the retention hopper, the vacuum chamber receives a constant low volume of -40 C dew point dry air. At the end of the vacuum cycle during atmospheric equalization a valve shifts to allow an inrush of dry air.

VACUUM CIRCUIT
- 6 Element, 3 Stage PIAB configuration for maximum effectiveness
- 1” Electro-pneumatic check valve
<table>
<thead>
<tr>
<th>line no.</th>
<th>parameter</th>
<th>Domestic/Canadian</th>
<th>European</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>design throughput</td>
<td>600 lbs./hour</td>
<td>454 kgs./hour</td>
</tr>
<tr>
<td>2</td>
<td>maximum run temperature</td>
<td>350 °F</td>
<td>176 °C</td>
</tr>
<tr>
<td>3</td>
<td>maximum vacuum level, absolute</td>
<td>75 mm Hg.</td>
<td>75 mm Hg.</td>
</tr>
<tr>
<td>4</td>
<td>complete unit weight, empty</td>
<td>1824 lbs.</td>
<td>827 kgs.</td>
</tr>
<tr>
<td>5</td>
<td>overall unit height</td>
<td>161.5 inches</td>
<td>4.10 meters</td>
</tr>
<tr>
<td>6</td>
<td>voltage</td>
<td>480/575 volts</td>
<td>400 volts</td>
</tr>
<tr>
<td>7</td>
<td>full load amps (FLA)</td>
<td>49.0 amps</td>
<td>54.1 amps</td>
</tr>
<tr>
<td>8</td>
<td>phase</td>
<td>3 Ø</td>
<td>3 Ø</td>
</tr>
<tr>
<td>9</td>
<td>frequency</td>
<td>60 Hz</td>
<td>50 Hz</td>
</tr>
<tr>
<td>10</td>
<td>compressed air requirement, sustained pressure</td>
<td>85 psi</td>
<td>5.86 bar</td>
</tr>
<tr>
<td>11</td>
<td>compressed air requirement, max flow rate</td>
<td>28 SCFM</td>
<td>727 NL/min</td>
</tr>
<tr>
<td>12</td>
<td>compressed air requirement, average flow rate</td>
<td>11.2 SCFM</td>
<td>291 NL/min</td>
</tr>
<tr>
<td>13</td>
<td>blower model</td>
<td>RBH8-805-3 All-Star</td>
<td>RBH8-805-3 All-Star</td>
</tr>
<tr>
<td>14</td>
<td>blower power</td>
<td>8.5 HP</td>
<td>5.5 kW</td>
</tr>
<tr>
<td>15</td>
<td>blower max flow</td>
<td>400 SCFM</td>
<td>5380 L/min</td>
</tr>
<tr>
<td>16</td>
<td>blower max pressure</td>
<td>116 inches H₂O</td>
<td>270 mbar</td>
</tr>
<tr>
<td>17</td>
<td>blower noise level</td>
<td>79 db(A)</td>
<td>74 db(A)</td>
</tr>
<tr>
<td>18</td>
<td>primary heater power</td>
<td>20000 watts</td>
<td>20000 watts</td>
</tr>
<tr>
<td>19</td>
<td>purge heater power</td>
<td>1250 watts</td>
<td>1250 watts</td>
</tr>
<tr>
<td>20</td>
<td>vacuum generator model</td>
<td>JS-350 Vaccon</td>
<td>JS-350 Vaccon</td>
</tr>
<tr>
<td>21</td>
<td>heating hopper cylinder I.D.</td>
<td>24 in.</td>
<td>610 mm.</td>
</tr>
<tr>
<td>22</td>
<td>heating hopper cylinder height</td>
<td>46 in.</td>
<td>1168 mm.</td>
</tr>
<tr>
<td>23</td>
<td>heating hopper material capacity</td>
<td>12 cu. ft.</td>
<td>339.8 L</td>
</tr>
<tr>
<td>24</td>
<td>heating hopper absolute capacity</td>
<td>13.875 cu. ft.</td>
<td>392.9 L</td>
</tr>
<tr>
<td>25</td>
<td>heating hopper empty weight</td>
<td>349 lbs.</td>
<td>158 kgs.</td>
</tr>
<tr>
<td>26</td>
<td>vacuum chamber cylinder I.D.</td>
<td>24 in.</td>
<td>610 mm.</td>
</tr>
<tr>
<td>27</td>
<td>vacuum chamber cylinder height</td>
<td>17.875 in.</td>
<td>454 mm.</td>
</tr>
<tr>
<td>28</td>
<td>vacuum chamber material capacity</td>
<td>5.5 cu. ft.</td>
<td>155.7 L</td>
</tr>
<tr>
<td>29</td>
<td>vacuum chamber absolute air capacity</td>
<td>6.5 cu. ft.</td>
<td>184.1 L</td>
</tr>
<tr>
<td>30</td>
<td>vacuum chamber normal evacuation volume</td>
<td>3.75 cu. ft.</td>
<td>106.2 L</td>
</tr>
<tr>
<td>31</td>
<td>vacuum chamber weight, empty</td>
<td>217 lbs.</td>
<td>98.4 kgs.</td>
</tr>
<tr>
<td>32</td>
<td>retention hopper cylinder I.D.</td>
<td>28 in.</td>
<td>711 mm.</td>
</tr>
<tr>
<td>33</td>
<td>retention hopper cylinder height</td>
<td>16.5 in.</td>
<td>419 mm.</td>
</tr>
<tr>
<td>34</td>
<td>retention hopper material capacity</td>
<td>6.125 cu. ft.</td>
<td>173.4 L</td>
</tr>
<tr>
<td>35</td>
<td>retention hopper absolute capacity</td>
<td>7.625 cu. ft.</td>
<td>215.9 L</td>
</tr>
<tr>
<td>36</td>
<td>retention hopper weight, empty</td>
<td>77 lbs.</td>
<td>34.9 kgs.</td>
</tr>
</tbody>
</table>
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 133F (56C) degrees. When plastic pellets are heated to 160F (71C) 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 manufacturers 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 180F (82C) 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 (635mm) applied for 20 minutes to material that has been heated to 180F (82C) degrees, is sufficient to reduce the moisture content of that same resin to the correct level of dryness.

Therefore, just as desiccant dryers 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.
Warranty

MAGUIRE PRODUCTS offers THE MOST COMPREHENSIVE WARRANTY in the plastics auxiliary equipment industry. We warrant each MAGUIRE VBD DRYER manufactured by us to be free from defects in material and workmanship under normal use and service; 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.

DISCLAIMER - PRODUCTION of FAULTY PRODUCT

This dryer is of a new design. We have had excellent results in all tests performed to date, but we HAVE NOT tested every material available to the plastics industry. We have not anticipated all possible materials, processing conditions, and requirements. We are not certain that our equipment will perform properly in all instances. You must observe and verify the performance level of this equipment in your plant as part of your overall manufacturing process. You must verify to your own satisfaction that this level of performance meets your requirements. We CAN NOT be responsible for losses due to product not dried correctly, even when due to equipment malfunction or design incorrect for your requirements; and/or any consequential losses due to our equipment not drying material to your requirements.

We will only be responsible to correct, repair, replace, or accept return for full refund, our equipment if it fails to perform as designed, or we have inadvertently misrepresented our equipment for your application. If for any reason this disclaimer is not acceptable, we will accept return of the equipment for full refund, including freight costs both ways.
## VBD-600 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</th>
<th>MPI p/n</th>
<th>Description</th>
<th>General Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>hf23-E</td>
<td>replacement filter element, blower intake</td>
<td>upper rear panel</td>
</tr>
<tr>
<td>2</td>
<td>8324-11</td>
<td>silicone seal, vacuum chamber dump valve</td>
<td>vacuum chamber</td>
</tr>
<tr>
<td>3</td>
<td>go-365V</td>
<td>o-ring, size 365, Viton</td>
<td>upper vacuum gate</td>
</tr>
<tr>
<td>4</td>
<td>go-359V</td>
<td>o-ring, size 359, Viton</td>
<td>lower vacuum gate</td>
</tr>
<tr>
<td>5</td>
<td>8324-03</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-AW40f</td>
<td>filter element, for &quot;AW30&quot; series regulator</td>
<td>pneumatics cabinet</td>
</tr>
<tr>
<td>8</td>
<td>nf-AFM40f</td>
<td>filter element, for oil separator</td>
<td>pneumatics cabinet</td>
</tr>
</tbody>
</table>

## Other Potential Replacement Parts

<table>
<thead>
<tr>
<th>line</th>
<th>MPI p/n</th>
<th>Description</th>
<th>General Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>es4TAT5</td>
<td>fuse, 60 amp class J, AJT60</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>10</td>
<td>ezd-.5t</td>
<td>fuse, 1/2 amp time delay, Midget style</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>11</td>
<td>eg-.3E2</td>
<td>circuit breaker, .3 amp, E-trip, 2-pole</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>12</td>
<td>eg-10C2</td>
<td>circuit breaker, 10 amp, E-trip, 2-pole</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>13</td>
<td>eg-30C3</td>
<td>circuit breaker, 30 amp, C-trip, 3-pole</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>14</td>
<td>eg-40C3</td>
<td>circuit breaker, 40 amp, C-trip, 3-pole</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>15</td>
<td>es3RT2016</td>
<td>motor contactor, 3 pole, 20A, 24 VDC</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>16</td>
<td>esCGC32D</td>
<td>motor contactor, 3 pole, 50A, 24 VDC</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>17</td>
<td>ehr09</td>
<td>relay, SS, 480V 25A, 24-265 VAC signal</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>18</td>
<td>ehr11</td>
<td>relay, SS, 480V 50A, 24-265 VAC signal</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>19</td>
<td>eRTD6-100</td>
<td>RTD sensor, 6mm dia x 100mm long, Pt100</td>
<td>heating hopper</td>
</tr>
<tr>
<td>20</td>
<td>eRTD2-32</td>
<td>4-wire 100 ohm RTD, 1/8&quot; dia. x 2&quot; long</td>
<td>mat. outflow valve</td>
</tr>
<tr>
<td>21</td>
<td>elc50V</td>
<td>load cell, 50 kg capacity</td>
<td>retention hopper</td>
</tr>
<tr>
<td>22</td>
<td>elc150V</td>
<td>load cell, 150 kg capacity</td>
<td>vacuum chamber</td>
</tr>
<tr>
<td>23</td>
<td>esp-50</td>
<td>pressure switch, 50 psi set-point, 1/8&quot; NPT</td>
<td>main cabinet</td>
</tr>
<tr>
<td>24</td>
<td>eabVBD-01</td>
<td>I/O circuit board</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>25</td>
<td>eabVBD-02</td>
<td>display / HMI circuit board</td>
<td>front control panel</td>
</tr>
<tr>
<td>26</td>
<td>eabVBD-03</td>
<td>pendant circuit board (.8&quot; 4-digit numeric)</td>
<td>front control panel</td>
</tr>
<tr>
<td>27</td>
<td>ebTS-7V</td>
<td>touch screen board, 7&quot;, VBD</td>
<td>front control panel</td>
</tr>
<tr>
<td>28</td>
<td>nmd-07E</td>
<td>replacement element, for membrane air dryer</td>
<td>pneumatics cabinet</td>
</tr>
<tr>
<td>29</td>
<td>eht20-40</td>
<td>tube heater, 20,000 watt 3-phase 400 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>30</td>
<td>eht20-48</td>
<td>tube heater, 20,000 watt 3-phase 480 VAC</td>
<td>main cabinet</td>
</tr>
<tr>
<td>31</td>
<td>ehs1-02</td>
<td>strobe light, red, magnetic base, 24VDC</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>32</td>
<td>ehb-2</td>
<td>piezo buzzer, 24VDC</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>33</td>
<td>esw-09H</td>
<td>interlock handle, red/yellow pistol</td>
<td>electrical cabinet</td>
</tr>
<tr>
<td>34</td>
<td>ecf-120</td>
<td>cooling fan, 120mm, 106 CFM, 115VAC .24A</td>
<td>electrical cabinet</td>
</tr>
</tbody>
</table>
Wiring Diagrams

Low Voltage Wiring Diagram
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 [Signature]

Position [Position]

Date [Date]

www.maguire.com
Technical Support and Contact Information

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Tel: 65 6848-7117
Fax: 65 6542-8577
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