Continuous Mixed-Flow Grain Dryer

Grain Dryer
Operator’s Manual

This manual applies to the following models:
K600, K700, K800, K900
This product has been designed and manufactured to meet general engineering standards. Other local regulations may apply and must be followed by the operator. All personnel must be trained in the correct operational and safety procedures for this product. Use the sign-off sheet below to record initial and periodic reviews of this manual with all personnel.

<table>
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<th>Date</th>
<th>Employee Name and Signature</th>
<th>Employer Name and Signature</th>
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### 1. Introduction

Thank you for your purchase. Follow the instructions in this manual for safe use of this grain dryer. Following proper operation and maintenance will help to keep the grain dryer running in optimal condition.

Keep this manual handy for frequent reference and to review with new personnel. A sign-off form is provided on the inside front cover for your convenience. If any information in this manual is not understood or if you need additional information, please contact AGI or your representative for assistance.

This manual should be regarded as part of the equipment.

### 1.1. Product Information

Always give your dealer the following product information when ordering parts or requesting service. Please record the product information in the table below for easy reference.

<table>
<thead>
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<td>Fuel Type:</td>
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<td>Wiring Diagram Drawing Number:</td>
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### Figure 1. Dryer Rating Label — CE

### Figure 2. Dryer Rating Label — CSA

### Figure 3. Dryer Rating Label — Domestic

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**Table:**

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<th>Field</th>
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<td>Fuel Type:</td>
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</tr>
<tr>
<td>Wiring Diagram Drawing Number:</td>
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</table>
1.2. Intended Use

The NECO Grain-dryer is intended for use as listed below and described throughout this manual. Use in any other way is considered contrary to the intended use and is not covered by the warranty.

- Designed to dry free-flowing grains, field crops and oil seeds.

Misuse

Do not install/use the grain dryer for/with:

- drying grains at temperatures higher than recommended.
- applications other than drying farm crops.
- excessive chaff, seed pods, half cobs, leafy materials, and other foreign material.
- finely milled grain dust.
- bypassed safety sensors.
2. Safety

2.1. Safety Alert Symbol and Signal Words

This safety alert symbol indicates important safety messages in this manual. When you see this symbol, be alert to the possibility of injury or death, carefully read the message that follows, and inform others.

**Signal Words:** Note the use of the signal words **DANGER, WARNING, CAUTION, and NOTICE** with the safety messages. The appropriate signal word for each message has been selected using the definitions below as a guideline.

- **DANGER** Indicates an imminently hazardous situation that, if not avoided, will result in serious injury or death.
- **WARNING** Indicates a hazardous situation that, if not avoided, could result in serious injury or death.
- **CAUTION** Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.
- **NOTICE** Indicates a potentially hazardous situation that, if not avoided, may result in property damage.

2.2. General Safety Information

Read and understand all safety instructions, safety decals, and manuals and follow them.

- Owners must give instructions and review the information initially and annually with all personnel. Untrained users/operators expose themselves and bystanders to possible serious injury or death.

- Use for intended purposes only.

- Do not modify the grain dryer in any way without written permission from the manufacturer. Unauthorized modification may impair the function and/or safety. Any unauthorized modification will void the warranty.

- Follow a health and safety program for your worksite. Contact your local occupational health and safety organization for information.

- Always follow applicable local codes and regulations.

2.3. Overhead Power Lines

- Keep grain dryers a horizontal distance of at least 100 ft (30.5 m) from power lines.

- Do not use the grain dryer if there is a chance of any loading or unloading equipment contacting power lines.

- Do not locate grain dryers on both sides of a power line.

- Electrocution can occur without direct contact.
2.4. Grain Dryer Safety

- Do not overheat grain or operate the dryer temperature too high. Keep the maximum plenum temperature not more than the maximum set point temperature.
- Be cautious of spontaneous combustion when working with oil seeds.
- Grain dust is a fire hazard. Keep all areas (including areas under the perforated floors) free from dust and fines.
- Clean out the dryer after using to remove grain dust, husks, and other materials.
- Screen grain before it goes into a bin to help prevent dust and trash buildup. Using a grain spreader will help distribute dust/fines.
- Ventilate, purge all contaminates, and allow burner, and drying areas to cool inside the heater, in the heater area and the dryer area before any persons enter these areas.
- Do not remove covers, touch, or service internal components during operation.
- Do not install or combine with products from other manufacturers. The design and safety features may not be compatible.
- Do not store or use gasoline or other flammable vapors and liquids in the vicinity of dryer.
- Do not use the dryer where a high concentration of grain dust or flammable liquids or vapors exist, such as milled grain dust.
- Use the dryer only with the gas types intended, connecting alternate fuel sources to the dryer can result in fires.
- Shut off and lock out or disconnect power and close valve at gas source before inspecting or servicing the heater, or when not in use.
- Keep away from fan impeller/blade; high suction can pull a person toward the inlet. Contact with an unguarded impeller/blade will cause severe injury.
- Keep the fan inlet screen in place at all times.
- Remove foreign material from the fan inlet before operating.
- Do not operate the fan if there is excessive vibration or noise.
- When the power is locked out, fans can still be dangerous because of potential “windmilling.” Always block the impeller/blade before working on any moving parts.

**In case of a dryer fire:**
- Turn off gas at the heater and supply tank.
- Shut off and lock electrical power.
- Seal the aeration fan inlet and any other opening to smother the fire.
- Evacuate all personnel from the area.
- Call the fire department.
2.5. Gas Leak Hazards

**WARNING** If You Smell Gas:
- Turn off gas at the source if possible.
- Do not try to light or relight any appliance.
- Extinguish any flames and remove any sources of ignition from the vicinity of the bin.
- Do not touch any electrical switch.
- Evacuate all personnel from the vicinity of the source of the smell.
- Immediately call your gas supplier. Follow the gas supplier’s instructions.
- If you cannot reach your gas supplier, call the fire department.

2.6. Work Area Safety

**WARNING**
- Have another trained person nearby who can shut down the grain dryer in case of accident.
- Do not allow any unauthorized persons in the work area.
- Keep the work area clean and free of debris.

2.7. Drives and Lockout/Tagout Safety

Inspect the power source(s) before using and know how to shut down in an emergency. Whenever you service or adjust your equipment, make sure you shut down your power source and gas supply and follow lockout and tagout procedures to prevent inadvertent start-up and hazardous energy release. Know the procedure(s) that applies to your equipment from the following power sources.

For example:

- De-energize, block, and dissipate all sources of hazardous energy.
- Lock out and tag out all forms of hazardous energy.
- Ensure that only 1 key exists for each assigned lock, and that you are the only one that holds that key.
- After verifying all energy sources are de-energized, service or maintenance may be performed.
- Ensure that all personnel are clear before turning on power to equipment.

For more information on occupational safety practices, contact your local health and safety organization.
2.7.1 Electric Motor Safety

**Power Source**

- Electric motors and controls shall be installed and serviced by a qualified electrician and must meet all local codes and standards.
- Do not modify the magnetic starter. This component provides overload and under-voltage protection.
- Motor starting controls must be located so that the operator has full view of the entire operation.
- Locate main power disconnect switch within reach from ground level to permit ready access in case of an emergency.
- Motor must be grounded.
- Guards must be in place and secure at all times.
- Ensure electrical wiring and cords remain in good condition; replace if necessary.

**Lockout**

- The main power disconnect switch should be in the locked position during shutdown or whenever maintenance is performed.
- In the event of unexpected fan shutdown, the fan can be reset using the main power switch located on the fan or using a reset button when equipped.

2.8. Personal Protective Equipment

The following Personal Protective Equipment (PPE) should be worn when operating or maintaining the equipment.

- **Safety Glasses**
  
  ![Safety Glasses](image)
  
  Wear safety glasses at all times to protect eyes from debris.

- **Steel-Toe Boots**
  
  ![Steel-Toe Boots](image)
  
  Wear steel-toe boots to protect feet from falling debris.

- **Coveralls**
  
  ![Coveralls](image)
  
  Wear coveralls to protect skin.

- **Work Gloves**
  
  ![Work Gloves](image)
  
  Wear work gloves to protect your hands from sharp and rough edges.

- **Hard Hat**
  
  ![Hard Hat](image)
  
  Wear a hard hat to help protect your head.

- **Fall Protection**
  
  Use a fall arrester or fall restraint when climbing or working at heights.
2.9. Safety Equipment

The following safety equipment should be kept on site.

- **Fire Extinguisher**
  Provide a fire extinguisher for use in case of an accident. Store in a highly visible and accessible place.

- **First-Aid Kit**
  Have a properly-stocked first-aid kit available for use should the need arise, and know how to use it.

2.10. Safety Decals

- Keep safety decals clean and legible at all times.
- Replace safety decals that are missing or have become illegible. See decal location figures that follow.
- Replaced parts must display the same decal(s) as the original part.
- Replacement safety decals are available **free of charge** from your distributor, dealer, or factory as applicable.

2.11. Decal Installation/Replacement

1. Decal area must be clean and dry, with a temperature above 50°F (10°C).
2. Decide on the exact position before you remove the backing paper.
3. Align the decal over the specified area and carefully press the small portion with the exposed sticky backing in place.
4. Slowly peel back the remaining paper and carefully smooth the remaining portion of the decal in place.
5. Small air pockets can be pierced with a pin and smoothed out using the decal backing paper.

2.12. Safety Decal Locations and Details

Replicas of the safety decals that are attached to the grain dryer and their messages are shown in the figure(s) that follow. Safe operation and use of the grain dryer requires that you familiarize yourself with the various safety decal s and the areas or particular functions that the decals apply to, as well as the safety precautions that must be taken to avoid serious injury, death, or damage.
Figure 5. Front Left Dryer Safety Decal Locations

Figure 6. Front Right Dryer Safety Decal Locations
Figure 7. Drag Unload Safety Decal Locations

Figure 8. Auger Unload Safety Decal Locations

Figure 9. Door Safety Decal Locations
### Table 1. Safety Decal Details — CSA

<table>
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<tr>
<th>Decal Number</th>
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| 036726       | **WARNING**
|              | CUTTING HAZARD
|              | To prevent serious injury, keep away from blade when fan is operating.
|              | Shut off and lockout or disconnect power before inspecting or servicing.
|              | Keep guards in place while operating. |
| 035691       | **WARNING**
|              | HIGH VOLTAGE
|              | To prevent serious injury or death, turn off and lock out power before servicing. |
| 036725       | **DANGER**
|              | HIGH VOLTAGE
|              | To prevent serious injury or death, turn off and lock out power before servicing. |
| 7713361      | **SAFETY INSTRUCTIONS**
|              | For proper operation:
|              | • Read your operator’s manual carefully. It contains valuable information on how to run this machine safely and economically.
|              | • Clean out dryer after initial filling to prevent fires.
|              | • When operating with oil seeds, be cautious of spontaneous combustion.
|              | • Check fuel line components for leaks after transport and periodically thereafter. |
| 036222       | **WARNING**
|              | BURN HAZARD
|              | To prevent burns from high temperature flame:
|              | • Keep door closed when operating.
|              | • Lock out power before opening inspection door. |
| 035690       | **WARNING**
|              | ENTANGLEMENT HAZARD
|              | To prevent serious injury or death:
|              | • Keep body, hair, and clothing away from rotating pulleys, belts, chains, and sprockets.
|              | • Do not operate with any guard removed or modified. Keep guards in good working order.
|              | • Shut off and lock out power source before inspecting or servicing machine. |
| 036737       | **CAUTION**
|              | DO NOT TOUCH!
|              | Door may be hot and under pressure.
|              | Be sure blower has completely stopped and allow unit to cool down before opening door. Failure to heed may result in minor to moderate injury. |
| 1001985      | **DANGER**
|              | ROTATING FLIGHTING HAZARD
|              | To prevent death or serious injury:
|              | • KEEP AWAY from rotating auger flighting.
|              | • Shut off and lock out power before removing cover or servicing. |
| 1002301      | **WARNING**
|              | To prevent serious injury or death:
|              | • Read and understand the manual before assembling, operating, or maintaining the equipment.
|              | • Only trained personnel may assemble, operate, or maintain the equipment.
|              | • Children and untrained personnel must be kept outside of the work area.
|              | • Do not modify the equipment. Keep in good working order.
|              | • Shut out power before performing maintenance.
|              | • If the manual, guards, or decals are missing or damaged, contact factory or representative for free replacements. |
To avoid injury from moving parts, disconnect power to the equipment before (removing, opening) this (cover, door).

**WARNING**

Pour éviter les blessures attribuables aux pièces mobiles debrancher l'appareil avant (de retirer, d'ouvrir) (ce couvercle, cette porte).

**AVERTISSEMENT**

Si les informations données dans le mode d'emploi ne sont pas respectées à la lettre, un incident ou une explosion pourrait survenir et entraîner des dommages matériels, des blessures ou la mort.

- Ne pas entreposer ni utiliser d'essence ou autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil.
- Quoi faire si vous sentez une odeur de gaz
  - N'allumez aucun appareil ;
  - Éteindre toutes les flamme nues ;
  - Ne toucher à aucun interrupteur ;
  - Appeler immédiatement votre fournisseur de gaz. Suivez les instructions du fournisseur de gaz ;
  - Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies.
- L'installation et les réparations doivent être confiés à un installateur ou un réparateur qualifié ou au fournisseur de gaz.

POUR VOTRE SÉCURITÉ - Il est dangereux d'utiliser et d'entreposer de l'essence et autres vapeurs et liquides inflammables se trouvant dans des contenants ouverts à proximité de cet appareil.

Une installation, un réglage, une modification, une réparation ou un entretien inadéquats peuvent entraîner des dommages matériels, des blessures ou la mort. Les attentivement les instructions d'installation, de fonctionnement et d'entretien avant de procéder à l’installation ou à la réparation de cet appareil.

To prevent serious injury or death, shut off power and reattach guard before operating machine.

**MISSING GUARD HAZARD**

Ce compartiment doit être fermé sauf pendant une réparation.

**WARNING**

Ce compartiment doit être fermé sauf pendant une réparation.

To prevent death or serious injury when operating or moving, keep equipment away from overhead power lines and devices.

This equipment is not insulated. Electrocution can occur without direct contact.

**DANGER**

Electrocution hazard.

**WARNING**

This compartment must be closed except when servicing.

**Note**

The towing label is only used on certain models that can be safely towed.
### Table 2. Safety Decal Details — CE

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<tr>
<th>Decal Code</th>
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<td>036726A</td>
<td>WARNING: MISSING GUARD HAZARD</td>
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<tr>
<td>043695</td>
<td>&quot;To prevent serious injury or death, shut off power and reattach guard before operating machine.&quot;</td>
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</table>
| 035690A    | SAFETY INSTRUCTIONS: For proper operation:  
• Read your operator’s manual carefully. It contains valuable information on how to run the machine safely and economically.  
• Clean out dryer after initial filling to prevent fires.  
• When operating with oil seeds, be cautious of spontaneous combustion.  
• Check fuel line components for leaks after transport and periodically thereafter. |
| 7713361    | SAFETY INSTRUCTIONS: For proper operation:  
• Read your operator’s manual carefully. It contains valuable information on how to run the machine safely and economically.  
• Clean out dryer after initial filling to prevent fires.  
• When operating with oil seeds, be cautious of spontaneous combustion.  
• Check fuel line components for leaks after transport and periodically thereafter. |
| 043696     | "To prevent serious injury or death, shut off power and reattach guard before operating machine." |
| 035690A    | SAFETY INSTRUCTIONS: For proper operation:  
• Read your operator’s manual carefully. It contains valuable information on how to run the machine safely and economically.  
• Clean out dryer after initial filling to prevent fires.  
• When operating with oil seeds, be cautious of spontaneous combustion.  
• Check fuel line components for leaks after transport and periodically thereafter. |
**Note**
The towing label is only used on certain models that can be safely towed.
3. Operation

Before continuing, ensure you have completely read and understood this manual’s Safety section, in addition to the safety information in the section(s) below.

3.1. Operation Safety

- Keep away from rotating and moving parts, including the flighting, drive components, shafts, and bearings.
- Lock the grain dryer access points (where equipped) and close all other access doors when not in use.
- Always operate with guards, covers, and shields in place.
- Ensure maintenance has been performed and is up to date.
- Ensure that electrical cords are in good condition; replace if necessary.
- The area around the heater should be kept clear and free from combustible materials and other flammable liquids.
- When heater is not in use, shut off gas valve on heater and at gas source.
- Have another trained person nearby who can shut down any powered loading, unloading, or internal equipment in case of accident.
- Keep the work area clean and free of debris.

3.2. Equipment Pre-Check

This section provides information regarding primary tasks for checking and verifying the equipment condition that must be completed before grain dryer begins. Follow all Safety Rules.
### New Dryer Start-up Check List

#### SERIAL# | DATE
---|---

#### MODEL# | CUSTOMER
---|---

#### CONTROL TYPE: PLC/SWITCHES | ADDRESS
---|---

#### PROGRAM VERSION: PLC: | PHONE#
---|---

#### COMMENTS | INITIALS
---|---

1. BELTS-TENSION AND ALIGNMENT
2. CHAINS-TENSION AND ALIGNMENT
3. OIL LEVEL IN GEARBOX
4. METERING ROLLS CLEANED OUT
5. UNLOAD DOORS CLOSED PROPERLY
6. BLOWER MOTOR ROTATION

#### BLOWER MOTOR AMPS | 1. | 2. | 3. | 4. | 5. | 6.
---|---|---|---|---|---|---

#### AUGER/DRAG ROTATION

#### METERING ROLLS ROTATION

#### CROSS AUGER/DRAG ROTATION

#### GUARDS & SHIELDS IN PLACE

#### ALL GAS UNIONS

#### ADDITIONAL GAS LINE LEAKS

#### FILL DRYER SWITCH

#### LOW DRYER SWITCH

#### THERMOCOUPLE/HIGH LIMIT POSITION

#### THERMOCOUPLE/HIGH LIMIT CONDITION

#### DISCHAGE PLUG SWITCH

#### SET GAS PRESSURE

#### AIR SWITCH FUNCTIONALITY

#### BURNER SETTINGS

#### CHECK & CALIBRATE MOISTURE SENSOR

#### SET MIN & MAX METERING ROLL SPEEDS

### Belt Information—# of Belts & Sizes

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### ADDITIONAL COMMENTS

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## Pre-Season Checklist

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**SERIAL#**

**DATE**

**MODEL#**

**CUSTOMER**

**CONTROL TYPE: PLC/SWITCHES**

**ADDRESS**

**PROGRAM VERSION: PLC:**

**HMI:**

**PHONE #**

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<td></td>
</tr>
<tr>
<td><strong>BELTS-CONDITION &amp; TENSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DRIVE CHAINS-CONDITION &amp; TENSION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GEAR BOX OIL LEVEL &amp; CONDITION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLEAN METERING ROLLS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BEARINGS ON METERING ROLLS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BEARINGS ON BLOWER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BEARINGS ON AUGERS (UNLOAD AND FILL)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GREASE ALL BEARINGS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLEAN BURNER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLEAN AIR SWITCH TUBE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>AIRSWITCH ADJUSTMENT (IF NEEDED)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BACK DOOR SEAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>THERMOCOUPLE WIRE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CLEAN VAPORIZER TUBE FINS (LP)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>HIGH LIMIT/THERMOSTAT FUNCTION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FULL DRYER SWITCH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOW DRYER SWITCH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DISCHARGE PLUGGED SWITCH</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>START DRYER AND TEST BURNER</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEMPERATURE CONTROL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TEST ALL LIGHTS ON CONTROL PANEL</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BELT INFORMATION--# OF BELTS &amp; SIZES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOWER BELT SIZE: QUANTITY: WET 1 SIZE: QUANTITY:</td>
</tr>
<tr>
<td>UNLOAD BELT SIZE: QUANTITY: WET 2 SIZE: QUANTITY:</td>
</tr>
<tr>
<td>LEVEL AUGER SIZE: QUANTITY: DRY 1 SIZE: QUANTITY:</td>
</tr>
<tr>
<td>DRY 2 SIZE: QUANTITY:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADDITIONAL COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

---

**Figure 11.** Pre-season Checklist
3.3. Control Setup

3.3.1 Logging In and Out

**Before Logging In**

**Note**
On-screen controls (buttons, icons, tabs, etc.) that are unavailable (are not currently functional) appear with a “hatched” background pattern. This pattern switches to solid when the control becomes available. Some on-screen items are informational only, while others call up screens, sub-screens or menus.

Before logging in, the following controls are not available:
- Alarms
- Data
- Fill/Empty Dryer
- Go to Start Dryer

**Before Logging In: USB Device**

When the power is turned **On**, if the *The USB device is connected* message appears:

Tap **X** to clear the message. The **Main Menu** appears, with the **time/date** and **Log In** buttons near the middle-bottom of the screen.
### Before Logging In: Setup

1. Tap the **Setup** button to open the **Setup Screen**.
   - **Note**
     None of the controls on this screen are available before log in.

2. Tap the **Main Menu** button on the **Setup Screen** to return to the **Main Menu**.

3. Check that the **HMI** and **PLC** software version numbers appear in the upper-right corner of the **Setup Screen**, and that they are compatible.

#### Figure 16. Versions Compatible (Setup Screen)

![Version Compatible Screen](image)

### Before Logging In: Troubleshooting

1. Tap the **Troubleshooting** button to open the **Troubleshooting Screen**; **Dealer contact information** displays on the troubleshooting Screen.
   - **Note**
     None of the controls on this screen are available before log in.

2. Tap the **Main Menu** button to return to the **Main Menu** screen.

#### Figure 17. Troubleshooting Screen

![Troubleshooting Screen](image)
Logging In

Tap the **Log in to Operate** button; The **Log In** screen appears with the **Name** and **Password** fields in the upper-left corner.

**Figure 18. Log In to Operate Screen**

TAP THIS ICON TO BEGIN THE LOG IN PROCEDURE

**Figure 19. Log In Screen**

Temporary keypad touchscreen will appear here in order to enter **NAME and PASSWORD.**

** Note that both entries require case sensitive input.

SEE TOUCHSCREEN KEYPAD EXAMPLES BELOW
Enter Name and Password

**Note**
All entries for both the Name and Password are case-sensitive.

To enter a name:
1. Tap the Name field; The alpha-numeric keypad appears.
2. Type one of the following into the Name field:
   - For basic operation, enter: USER (case-sensitive)
   - To access Setup configuration, enter: Owner (case-sensitive)
3. Tap Enter.

To enter a password:
1. Tap the Password field; The alpha-numeric keypad appears.
2. Type one of the following into the Password field:
   - For USER (basic operation), enter: 123 (case-sensitive)
   - For Owner (setup), enter: MyDryer (case-sensitive)
3. Tap Enter.

**Note**
If an incorrect Name or Password is entered (including if the incorrect case was used), an error message is displayed. Tap X to acknowledge/dismiss the message and restart the Log In process.

---

**Figure 20. The alpha-numeric keypad**

**Figure 21. Log In Error Message**
Complete the Log In procedure

To continue logging in:

1. Tap Unlock; The Current User field displays the Name of the logged in user.
2. Tap Home; The Main Menu screen appears with the following changes:
   - The Log Out button is available in the lower-left corner of the screen.
   - The user Name appears directly above the Log Out button.
   - Depending on the login security level, additional buttons are now available, including the Operation Permitted indicator.

Main Menu— After Log In

Note
A flashing Setup button indicates the system configuration data must be restored. This may occur after installing new software, or replacing the PLC battery.

Depending on which screen is currently active, buttons and indicators may appear, or change status:

- The Operation Permitted indicator may change to a flashing E-Stop Active indicator.
- Tapping the Main Menu button displays the Main Menu screen. Tapping the Back button displays the previous screen.

After Log In, the following buttons are available, and the following screens are accessible:

- **Setup** — Verify or enter various setup parameters related to the dryer and auxiliary equipment.
- **Alarms** — View any current ALARM status
- **Troubleshooting** — Displays contact information for NECO or the local dealer.
- **Graphs** — Graphs can be charted for grain moisture, or grain discharge rate. Data values such as volume throughput are shown.
- **Fill/Empty Dryer** — Used for production filling or emptying of the dryer.
- **Go to Start Dryer Screen** — Used for setting up Start Dryer parameters such as which blowers and burners are enabled.
Verification

Important
Prior to startup or operation, all Setup information must either be verified or entered.

Note
Some information has been input at the NECO factory in order to do system testing prior to shipment of the equipment. Additional information, such as auxiliary equipment, can only be entered after all equipment has been installed.

1. Log in as Owner, go to Setup
2. Complete the Fill and Empty Setup, and Timers Setup fields.
   
   Note
   After this Setup data has been entered and verified these screens would generally only need to be accessed if there are changes made to the physical dryer configuration, motors replaced, or the status of any auxiliary equipment has changed.

3. If all Setup information has been entered and verified: Use the Section 3.2 – New Dryer Checklist on page 18 or Section 3.2 – Pre-season Checklist on page 18 as required.

Logging Out

The Log Out button can be activated at any time during the drying process.

Figure 25. Fill and Empty Setup Screen

Figure 26. Timers Setup Screen

Figure 27. LOG OUT button
3.3.2 Setting Up the Main Screen

<table>
<thead>
<tr>
<th>Version Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Important</strong></td>
</tr>
<tr>
<td>The current version of PLC and HMI software is shown at the top-right corner of this main Setup screen. The two version numbers must be compatible. Contact your dealer if indicator reads <strong>Versions Incompatible</strong>.</td>
</tr>
<tr>
<td><strong>Note</strong></td>
</tr>
<tr>
<td>The <strong>Security Setup</strong> button is not available if logged in as <strong>User</strong>. To have the button available, and be able to setup the quick login procedure, log in as <strong>Owner</strong> or NecoTech.</td>
</tr>
</tbody>
</table>

Figure 28. Setup Main Screen
Initialize or Save Configuration

Configuration data is periodically saved to the HMI’s USB drive. In the event of a battery failure, the configuration and settings can be restored by tapping the Initialize button.

3.3.3 NECO Entered Setup Data

In this Section:

- A. Units of measurement
- B. Dryer configuration screen
- C. User language
- D. Screen configuration
A. Units of Measurement

Imperial — Temperature: Fahrenheit (°F); Volume: bushels per hour (BPH)

Metric — Temperature: Celsius (°C); Volume: cubic meters per hour (CMH)

Note
If no unit of measurement is selected, the default is Imperial.

Note
If during initialization or setup, the units designation does not match the temperature controller configuration, a warning message displays, and the correct units must be chosen. It may be necessary to change temperature units to °C then back to °F to clear this message.

The system can switch between unit modes. Tap the required mode button. It takes approximately 45 seconds for the control to change over.

B. Dryer Configuration

Dryer configuration information is entered at the NECO factory and provides the software with the as-built dryer configuration.

The screen can be viewed by any login status, but only NecoTech login status can make changes.

Note
The screen example here shows a mock 24 ft dryer that has three blowers and burners, with each pair feeding four tiers. Units = Imperial (F); fuel system is liquid propane (LP). Since the example is a three blower system, and the dryer has no #4 blower present, the remaining buttons for line #4, as well as #5 and #6 are row inputs, are not visible.
C. User Language

User language information is entered at the NECO factory.

The screen can be viewed by any login status, but only Owner login status can make changes.

User language choices reflect NECO written programming screens only.

<table>
<thead>
<tr>
<th>Enter #</th>
<th>Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>English</td>
</tr>
<tr>
<td>2</td>
<td>French</td>
</tr>
<tr>
<td>3</td>
<td>German</td>
</tr>
<tr>
<td>4</td>
<td>Italian</td>
</tr>
<tr>
<td>5</td>
<td>Spanish</td>
</tr>
<tr>
<td>6</td>
<td>Chinese</td>
</tr>
<tr>
<td>7</td>
<td>Portuguese</td>
</tr>
</tbody>
</table>

NOTE: Do not change any other settings.
### 3.3.4 Dealer or Customer Entered Setup Data

<table>
<thead>
<tr>
<th><strong>Fill/Empty Setup</strong></th>
<th><strong>Figure 36. Fill/Empty Setup Screen</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>This information is entered by your dealer. It provides the software with “as-built” dryer and auxiliary equipment information required for filling and emptying the dryer.</td>
<td><img src="image" alt="Fill/Empty Setup Screen" /></td>
</tr>
<tr>
<td>The screen can be viewed by any login status, but only <strong>Owner</strong> login status can enter data or make changes.</td>
<td></td>
</tr>
<tr>
<td>See <a href="#">Section 7.2 – Optional External Transport Configurations</a> on page 74 for example layouts and related data.</td>
<td></td>
</tr>
</tbody>
</table>
### Equipment Choices

The following criteria are possible options available for the equipment choices.

**Note**
If *Motor Present* is set to *No*, no further options are displayed for that piece of equipment.

Based on the data entered, further options for that piece of equipment are available:

- For each piece of equipment, is a *Motor Present*? Yes or No
- If a motor is present, does it “RUN CONTINUOUS”? YES or NO
- If the motor runs continuous, should it stop after drying stops? YES or NO
- START or STOP DELAY values can be entered as required. (See Section 7.2 – Optional External Transport Configurations on page 74 for details.)

### Equipment To Be Controlled

- WET 1 TRANSPORT
- LEVEL AUGER (optional part of dryer)
- UNLOAD TRANSPORT (part of the dryer)
- DRY 1 TRANSPORT

### Switches To Be Monitored

- WET BIN EMPTY SWITCH INSTALLED? Yes or No
- DRY BIN FULL SWITCH INSTALLED? Yes or No
- UNLOAD TRANSPORT STALL SWITCH INSTALLED? Yes or No

### Metering Rolls Minimum and Maximum Speed

- The minimum speed default value is 10. This may need to be increased to ensure the moisture sensor remains covered with grain.
- The maximum speed value should reflect the unload system capabilities:
  - If the value is set too high, excessive plugged discharge alarms will occur.
  - If the value is set too low, production will not be maximized.

### Control Setup (overrides)

This screen allows the operator or technician to “override” switches, etc.

*Figure 37. Control Setup screen*
Timers Setup

Default timer values are set within the NECO program. These are to be considered a starting point only. The default data may require fine tuning for your specific equipment configuration. Your dealer will assist with this during startup.

Depending on the equipment configuration, some timer functions may not be used. These are unavailable and cannot be selected.

Use the Section 7.4 – PLC and HMI Recorded Data Sheet on page 76 to record this information.

To enter or edit Timer data:
1. Tap the field (box) to change the data; the alphanumeric keypad displays.
2. Enter the required data.
3. Tap Enter on the keypad. The Timer field displays the new data.
4. Edit additional timers or navigate to the Main Menu, or back to the Setup screen using the buttons at the bottom of the screen.

Security Setup

By default, a user name and a password are required to log in and gain access to the dryer operations. The log in security can be disabled for the User or Owner level access, if needed. Only one of the two is permitted to be active. Once activated and no one is logged in, a quick Login button is visible in the middle of the main screen.
Vijeo Design’Air Wi-fi

This is optional wi-fi access to the dryer HMI control. An application can be downloaded and installed on a tablet or cell phone to gain access to the dryer HMI when within wi-fi range. The addition of a wi-fi router, cabling, antenna are required for this access. Refer to the Commander Wi-Fi access section in the Appendix.

Figure 41. Vijeo Design’Air Wifi Option

VIJE0 DESIGN’AIR WI-FI

3.4. Operation Overview

The NECO continuous dryer system can be optimized using various setups and styles of operation. For instance, the steps of operation for a setup that allows for output grain to be directed back into the wet bin can start and operate differently than a setup where the output grain goes directly into a storage bin. Your dealer can help with auxiliary equipment utilization.

The following examples show two of the most popular equipment configuration and operation situation:

- Example A: Output grain is directed to dry bin grain storage.
- Example B: Output grain is directed back to the wet bin to be recycled through the dryer.

Both examples start by filling the dryer with wet grain using the Fill/Empty routine. Once the dryer is filled above the low level switch and any continuous equipment is running, the Start Auto Dryer button is available.

At this point the crop type can be verified or edited, cooling tiers can be designated, burner temperatures can be set, and a choice can be made to begin drying using either the BATCH (all heat) mode or AUTOMATIC mode.

Fuel Delivery

In both examples it is important to first verify that fuel is being delivered to the dryers:

- Before opening the fuel line to full OPEN, make sure that the plenum is heating up correctly.
- For LP units: The 3/4” return line from the vaporizer MUST be warm to the touch.
- Open the fuel line completely and verify the pressure settings on each of the system regulators:
  - LP systems = 4.0 to 6.0 PSI
  - NG systems = 3.0 to 5.0 PSI
3.4.1 Example A: Batch Drying

In this example output grain is directed to dry bin grain storage.

<table>
<thead>
<tr>
<th>Batch Drying Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fill the dryer with wet grain.</td>
</tr>
<tr>
<td>2. Select <strong>Batch Mode</strong>.</td>
</tr>
<tr>
<td>3. Dry the grain until the required moisture content is reached.</td>
</tr>
</tbody>
</table>

**Note**

After about 30 minutes, use the **Fill/Empty Bypass** to move some grain through the dryer. This short bypass (5 minutes) moves the cooler, higher moisture corn to the heat ducts, increasing the uniformity of grain drying. This also prevents over-temperature exposure to the drier corn kernel.

4. Monitor moisture levels on the **Dryer Master Status** screen during the drying process.

5. Once the output grain is within acceptable range for storage conditions, **Auto Drying** mode can be used.

![Batch Drying Screen](image)
3.4.2 Example B: Auto Drying

**Auto Drying Example**

1. Fill the dryer with wet grain.
2. Set the discharge equipment so that the grain output is directed back into the wet bin.
3. From the Start Dryer screen, set the temperatures so that the hottest temperature is set on to the highest burner (#1) and the temperatures decrease in each section going down through the dryer.
4. If cooling floors are present on the dryer, run in the all heat configuration until the moisture has reached an acceptable level for storage limitations in the dry bin.
5. Go to the Start Dryer screen.

   **Note**
   The grain moving through the dryer at this point should be discharged back to the wet bin.

6. After the moisture has been brought down to an acceptable level, divert the grain to the dry bin and make sure that some cooling is applied to the grain. Ideally, the grain should be as close to ambient temperature as possible upon exit of the dryer assuming limited aeration capabilities of the dry bin.
3.4.3 Plenum Door Safety Switch

**Plenum Door Safety Switch**

**WARNING** Be sure to follow proper lockout/tagout procedures before entering the dryer.

The plenum door safety switch is mounted on the top right-hand corner of the plenum entry door.

**Note**

When the door is open, the emergency stop alarm will appear on the HMI screen. This will turn off all outputs from the PLC. It does not shut off power into either Control Panel. The Power On lamp will remain lit on the main Control Panel. Close plenum door for dryer operation.

---

3.5. Fill/Empty Dryer

**Figure 45. Fill/Empty Dryer Screen**
Note
If an error occurs, a flashing alarm indicator button appears in place of the Back button. Tap this button to open the Alarms screen to view and reset the alarm after the condition has been resolved.

Set Manual Metering Roll Speed

See Section 7.1 – Manual Dryer Speed on page 73 for recommended metering roll speed starting point.

This speed will be used as the manual setpoint for Batch Mode drying and for initial Automatic Drying Mode.

Note
Only the equipment identified in Setup > Fill/Empty shows in this list. Status indicator is On or Off. If the equipment fails to run or a motor overload trips, a fault indicator appears. Once the problem is solved, the alarm indicator goes out. If Off, push Start or if On, push Off to start the delay timer for that piece of equipment.

• Wet Transport 1
• Level Auger
• Unload Auger
• Dry Transport 1

Fill Dryer

Used to initially fill the dryer with grain.
1. Tap Start to start filling.
2. Tap Stop to stop filling

Note
Filling will stop automatically when the Fill Switch is activated.

Figure 46. Manual Metering Roll Speed Buttons

Figure 47. Fill Dryer Screen
Fill and Empty (Bypass)

Used if the grain must pass through the dryer, but not actually be dried.

1. Tap **Start** to start.
2. Tap **Stop** to stop.

---

Empty Dryer

Used when no further filling of wet grain is required and the remaining grain must be discharged.

1. Tap **Start** to start.
2. Tap **Stop** to stop.

---

Figure 48. Fill and Empty (Bypass)

Figure 49. Empty Dryer
3.6. Start Dryer

3.6.1 Start Dryer Overview

Start Dryer Overview

The Start Dryer main screen is used for setting necessary drying parameters and then activating either Batch or Auto mode.

Refer to the following sections (designated A, B and C) to correctly set parameters for the required drying mode:

- Section – A. Crop Selection on page 40
- Section – B. Enable or Disable Blowers and Burners on page 40
- Section – C. Set Burner Temperature on page 42

A. Crop Selection

Crop Selection

To select a different crop, tap the new crop on the screen.

B. Enable or Disable Blowers and Burners

Overview

Dryer configuration is set at the factory. The screen displays only the actual blower/burner rows (number 1 to number 2) that are in this particular dryer configuration.

The Setup - Main and Batch Drying screens utilize this layout and can show from 1 to 2 blower rows.

On multiple blower dryers, the blower start time is staggered, starting with the upper-most section (number 1). The Blower Start Delay Timer is factory set for a five second delay.
Note
Increase the default delay time on dryers that have blower soft-starters or VFDs to allow each blower motor to ramp up to full speed before starting the next motor.

The **On** or **Off** status indicators show the current status as either **Off** or **On**. When the indicator is **On**, it appears to be illuminated.

### Startup Operation Sequence

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>1. The blower turns on and the <strong>Blower Indicator</strong> changes from off to on (A).</td>
<td>2. The <strong>Burner Start Delay Timer</strong> is factory set for a five second delay. Upon blower on, the delay timer starts. When the timer is complete the LP liquid valve opens and the <strong>Liquid Valve</strong> indicator changes from off to on (B).</td>
</tr>
</tbody>
</table>

### Figure 52. Status Indications (at the end of the startup operation sequence)

<table>
<thead>
<tr>
<th>STATUS INDICATORS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLOWER ON OFF</td>
</tr>
</tbody>
</table>

**CONTINUOUS MIXED-FLOW GRAIN DRYER – GRAIN DRYER 3. OPERATION**
Possible Burner Settings

Depending on whether **Batch** or **Auto** mode is selected, the blower/burner settings shown in (Blower Number) rows 1, 2, 3, and 4 opposite are possible:

- **Row 1**: Both blower and burner are enabled for use, so all of the remaining status indicators are visible.
- **Row 2**: The blower is enabled, but the burner is disabled, so the status indicators are not visible.

**Figure 53. Blower and Burner Indicators**

C. Set Burner Temperature

**Set Burner Temperature**

For each burner setpoint value, once a temperature has been entered, that value stays current until changed. Even if a dryer section burner is disabled, the setpoint value remains effective.

1. Tap the setpoint field for the temperature to be entered or changed to open the numeric keypad.
2. Enter a temperature setpoint value between a minimum value of 32°F and a maximum of 250°F (0°C - 121°C).
3. Tap **Enter** to lock in the value.
   
   **Note**
   The temperature setpoints can be modified at any time during the drying process.

**Figure 54. Setting Burner Temperature**
3.6.2 Completion of Dryer Setup

On completion of the preceding steps (A, B and C), and before starting either Batch or Auto drying modes:

- Current dryer status is displayed in the upper-right corner of the screen.
- The Start Batch Drying or Start Auto Drying buttons appear when all required conditions are met.

![Current Dryer Status](figure55)

3.6.3 Start Batch Drying

Batch Drying

Batch drying can be activated with any of the grain level status indicators.

**Note**

Batch drying can begin when grain is at any level within the dryer. If grain is below the top-most set of tier ducts, be aware that the drying heat from that section is wasted.

Tap the Start Batch Drying button to proceed. Immediately, the blower and burner starting sequence begins.

![Starting Batch Drying](figure56)

Start the Batch Timer

The Start Batch Timer indicator only appears after all enabled burners are on as shown in the Main Run status column.

As soon as the Start Batch Timer indicator appears, the control allows 30 seconds of the operator to tap/activate it. If this does not occur in the time allotted the system will change to Cooling mode.

![Batch Timer](figure57)
3.7. Batch Drying Mode

3.7.1 Batch Drying Overview

Batch operations are generally used to start or end a drying cycle and can utilize all or some of the system blowers and burners.

Refer to the following sections (designated A, B and C) to set up and operate in **Batch Drying Mode**: 

- **Section – A. Set Drying Time on page 44**
  
  **Note**
  
  If you switch from **Batch Drying Mode** directly into **Auto Drying Mode**, steps B and C are skipped. However, before **Auto Drying Mode** can start, two conditions must be met. For details, see **Section 3.8 – Auto Drying Mode on page 47**

- **Section – B. Cooling on page 45**
- **Section – C. Restart on page 46**

**General batch drying notes:**

- The operation run time is manually set and can be up to 120 minutes.
- Temperature setpoints can be changed at any time during the process. The actual temperature data per dryer section is shown in the final column.
- The status indicators on or off indicate the progression of startup or shutdown for the various equipment items such as blower, burner, liquid valves, pilot, main ignition, and main run. See **Section – B. Enable or Disable Blowers and Burners on page 40** for a complete description of this sequence.

A. Set Drying Time

<table>
<thead>
<tr>
<th>Total Batch Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Default total time = 30 minutes</td>
</tr>
<tr>
<td>• Tapping the up button (▲) increases the total time by 5 minutes (to a maximum run time of 120 minutes).</td>
</tr>
<tr>
<td>• Tapping the down button (▼) decreases the total time by 5 minutes (to a minimum run time of 5 minutes).</td>
</tr>
<tr>
<td>• The total run time can be changed at any time prior to the time remaining value reaching zero. When the total run time is modified, the time remaining changes accordingly.</td>
</tr>
</tbody>
</table>

![Figure 58. Setting Drying Time](image)
Minutes Remaining

- Shows the number of minutes remaining to operate in Batch Drying — Heated mode.
- At a value of 0 the dryer proceeds to Batch Drying — Cooling mode

Note

The Batch Timer can be disabled when all the burners are off. In this mode, the blowers are allowed to run continuously without heat being applied to the grain.

Switch to Auto Drying Mode

To switch directly to Auto Drying mode:

1. Skip the Batch Drying – Cooling mode, or Restart mode.

   Note

   One of the following appears in the upper-right button (see Figure 58 on page 44):
   - Fill Dryer
   - Start
   - Start Auto Drying

2. Tap the relevant button to select the pre-level of auto drying displayed by the button.

Stop Drying

Tap Stop Drying to stop the batch drying process and initiates Cooling mode.

B. Cooling

Cooling

Minutes

This field displays the cooling mode time remaining.

Stop Cooling

Tapping Stop Cooling shuts down all blowers; The Restart Dryer button appears.

Start Batch Drying

Tapping Start Batch Drying restarts the process without stopping the blowers. The Start Dryer screen appears and displays the blower starting process.
C. Restart

Restart

Tap **Restart Dryer** to go to the **Start Dryer– Main** screen. This enables the operator to continue drying using either **Batch** or **Auto** mode.

![Restart Dryer Screen]

**Figure 61. Restart**
3.8. Auto Drying Mode

3.8.1 Auto Drying Pre-Conditions

For the Start Auto Drying button to be available, the following two conditions must be met:

- The dryer status must display Dryer Full or Dryer Level OK. If neither of these are displayed:
  1. Tap the Fill Dryer button; the Fill/Empty Dryer screen appears.
  2. Tap the Start button to fill the dryer. The grain level condition indicator must display Dryer Full prior to initiating Auto Drying mode.

- All required transports must be started prior to initiating Auto Drying mode. If transports are enabled, but not running, the Start Transports indicator will appear.

The FILL/EMPTY Dryer screen appears.

1. Tap the Start button to fill the dryer.
2. Allow the dryer to fill past the top level indicator.
3. When ready, the dryer status indicator displays Dryer Level OK or Dryer Full.
3.8.2 Auto Drying Overview

Refer to the following sections A, B, C, and D to set up and operate in Auto Drying Mode:

- Section – A. Manual Speed on page 50
- Section – B. Moisture Manager on page 51
- Section – C. Cooling on page 51
- Section – D. Restart on page 52

Note

When drying in Auto mode, use small increments of change when making adjustments to either the burner temperatures or target moisture percentage. For example, to change a burner temperature from 180 to 220, adjust to 200 for five to ten minutes, then increase to 220. Use a similar approach to making moisture percentage changes.

---

Metering Roll Pause/Resume

Pause the metering rolls to temporarily stop the discharge of grain from the dryer. This is typically used when switching between drying bins. When paused, the grain stops discharging from the dryer. The unload and dry transports keep running and empty out. Once empty, the grain is re-directed to a new dry bin location. If the Resume button is not pushed before the timer reaches zero, the dryer will shut down.

---

Note

As the various operation stages occur, the display screen center panel area provides the operator with important status information. See the following examples:
The **Burner Setup** screen appears. Initially it shows the current status.

**Figure 68. The Burner Setup Button on the Auto Drying Screen**

**Figure 69. The Burner Setup Screen**
Change in Progress

In the following example, the screen shows that burner number 2 has been Enabled.

Note
The Change in Progress indicator appears until changes are completed.

As burner number 2 is going through the process of turning ON, the screen does not allow additional changes, or return to the previous stage, until that change is completed. Note that the Main Menu button is unavailable, but the Stop Drying button is available.

After changes are completed, the screen shows the current status.

Options to proceed include return to Main Menu, Back, or Stop Drying.

A. Manual Speed

Manual Speed Control

The dryer runs at the manual metering roll speed entered. The manual speed can be dialed in and changed to come closer to target moisture. Tap Enable Moisture Manager to allow the dryer control to automatically regulate the metering speed.

Figure 71. Enable Moisture Manager Screen
B. Moisture Manager

**Moisture Manager**

The operator should regularly check the grain moisture graph for abnormalities.

**Moisture Calibration** for the lower moisture sensor should be done at least every 2-3 hours.

When changing the **Target Moisture**, the screen will switch to the Moisture Manager setup screen.

---

**Figure 73. Moisture Manager Setup**

- Moisture Manager Setup screen with various options and settings.

**Figure 74. Moisture Manager Controlling**

- Moisture Manager control screen showing settings and options.

---

C. Cooling

**Cooling**

The **Cooling** mode default timer setting is five minutes. See **Setup - Timers**, to modify.

Blowers continue to run and the burners turn OFF.

When the timer runs out or if the **Stop Cooling** button is activated, all blowers shut down immediately and the **Restart Dryer** button appears.

---

**Figure 75. Cooling Screen**

- Cooling screen with current settings and options.
D. Restart

**Restart**

Tap **Restart Dryer** to go to the **Start Dryer– Main screen**. This enables continuation of drying using either **Batch** or **Auto** modes.

<table>
<thead>
<tr>
<th>Figure 76. <strong>Restart</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTO DRYING</td>
</tr>
<tr>
<td>OPERATE FILLING</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>GRAIN LEVEL</td>
</tr>
<tr>
<td>LEVEL</td>
</tr>
<tr>
<td>SLOW</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>START DRYER</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>OFF</td>
</tr>
<tr>
<td>MAIN MENU</td>
</tr>
</tbody>
</table>

### 3.8.3 Slide Gate Adjustment

**Slide Gate Adjustment**

For either auger or drag unload systems, grain passes through a discharge chute, and a portion of the grain is directed over the outlet moisture sensor. The flow of the grain over the moisture sensor is controlled by a metering roll which rotates at a constant speed whenever the unload system is operating.

<table>
<thead>
<tr>
<th>Figure 77. <strong>Grain Flow Over Outlet Moisture Sensor</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>OVER FLOW</td>
</tr>
<tr>
<td>OVER</td>
</tr>
<tr>
<td>FLOW</td>
</tr>
<tr>
<td>OVER</td>
</tr>
<tr>
<td>MOISTURE</td>
</tr>
<tr>
<td>SENSOR</td>
</tr>
<tr>
<td>OVER</td>
</tr>
<tr>
<td>FLOW</td>
</tr>
<tr>
<td>OVER</td>
</tr>
<tr>
<td>MOISTURE</td>
</tr>
<tr>
<td>SENSOR</td>
</tr>
</tbody>
</table>
Although it is not the primary means of controlling the flow, a slide gate can be used to make small adjustments. Typically, the slide gate will not need to be adjusted during normal operation.

**To adjust the slide gate position:**
1. Lift up on the sliding lock plate.
2. Push or pull the slide gate to the desired location.
3. Lower the sliding lock plate, ensuring that it engages with one of the notch sets on the slide gate.

During normal operation, grain should cover the fin of the outlet moisture sensor at all times, and a steady flow of grain should be observed through the viewing window on the side of the discharge chute. If the drying rate is low enough that grain does not consistently keep the chute full enough to cover the moisture sensor, try pulling the slide gate out of the chute one notch at a time until the flow is backing up sufficiently. If grain is backing up too much in the chute, try pushing the slide gate further into the chute one notch at a time.

**Note**
The notch furthest out from the chute and closest to the slide gate handle is used to position the slide gate for cleanout, and is not intended for normal operation.
Viewing doors are available for both auger and drag unloads. For auger systems, the viewing door is located on the discharge chute itself. Note that there are two identical doors on the discharge chute. The viewing door is on the opposite side of the chute as the plug switch. If the other door is opened, the switch will indicate a plugged discharge, and the dryer will shut down. For drag unloads, the viewing door is located on top of the cross drag and is not tied into the plugged discharge switch.
3.8.4 Moisture Calibration

**Note**
For grains requiring lower range moisture sensing (e.g. 8% for rape seed) contact your dealer for instructions on how to re-calibrate the moisture sensor, or order the low range moisture sensor #059250WLR

<table>
<thead>
<tr>
<th>Moisture Calibration</th>
</tr>
</thead>
<tbody>
<tr>
<td>To calibrate moisture levels</td>
</tr>
<tr>
<td>1. Start the Outlet Sensor calibration routine by tapping its associated <strong>Initiate</strong> button.</td>
</tr>
<tr>
<td><strong>Note</strong> On starting the calibration routine for either sensor, the Sampling indicator displays.</td>
</tr>
<tr>
<td>2. The Dryer Master obtains an average of moisture readings for the next 30 seconds. During this same time period, collect several grain samples near the sensor being calibrated. When the automated sampling period ends, the <strong>Done</strong> indicator appears.</td>
</tr>
<tr>
<td>3. Have the samples tested for actual grain moisture content.</td>
</tr>
<tr>
<td>4. Average the values for the actual grain moisture content.</td>
</tr>
<tr>
<td>5. Enter the calculated average for the actual grain moisture content using the Sample Test Moisture button.</td>
</tr>
<tr>
<td>6. Tap the <strong>Done</strong> button; a new Current Reading is calculated and displayed.</td>
</tr>
</tbody>
</table>

---

**Figure 82. Moisture Calibration Screen**

**Figure 83. Sampling in Progress Screen**

**Figure 84. Sampling Done Screen**

**Figure 85. Current Reading Updated after Entering Sample Test Moisture Average**
### 3.9. Data and Graphs Screens

#### 3.9.1 Data Screen

**Figure 86. Data Screen**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes in Dryer at Current Rate</td>
<td>Minutes required for grain to move from the inlet sensor to the outlet sensor at the current discharging rate.</td>
</tr>
</tbody>
</table>
| Discharge Rate Factor                     | • The value used to calculate the throughput bushels or cubic meters value.  
                                           | • Initial adjustment may be necessary to obtain correct throughput value. Also, the discharge rate factor will likely need to be adjusted for different grains. |
| Discharging Rate (bu/h or m³/h)           | Current discharging rate of the dryer.                                                                                                                                 |
| Metering Roll Percent                     | Meter speed percent, maximum.                                                                                                                                 |
| Total Throughput (bu or m³)               | Volume of grain run through the dryer. Note this value increases with or without grain when the metering rolls are running.                   |
| Dryer Run Time                            | Running hours of the dryer.                                                                                                                                 |
| Dry Grain Storage                         | • Grain Bin volume counters.  
                                           | • Select the desired grain bin counter.                                                                                                                                 |

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
</table>
| Discharge Rate Factor                     | • The value used to calculate the throughput bushels or cubic meters value.  
                                           | • Initial adjustment may be necessary to obtain correct throughput value. Also, the discharge rate factor will likely need to be adjusted for different grains. |
| Discharging Rate (bu/h or m³/h)           | Current discharging rate of the dryer.                                                                                                                                 |
| Metering Roll Percent                     | Meter speed percent, maximum.                                                                                                                                 |
| Total Throughput (bu or m³)               | Volume of grain run through the dryer. Note this value increases with or without grain when the metering rolls are running.                   |
| Dryer Run Time                            | Running hours of the dryer.                                                                                                                                 |
| Dry Grain Storage                         | • Grain Bin volume counters.  
                                           | • Select the desired grain bin counter.                                                                                                                                 |
Figure 87.  Dry Grain Storage Screen

<table>
<thead>
<tr>
<th>BIN</th>
<th>TOTAL</th>
<th>REMAINING</th>
<th>MAX</th>
<th>BIN</th>
<th>TOTAL</th>
<th>REMAINING</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>008556</td>
<td>051444</td>
<td>060000</td>
<td>7</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
<tr>
<td>2</td>
<td>039850</td>
<td>000150</td>
<td>040000</td>
<td>8</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
<tr>
<td>3</td>
<td>040000</td>
<td>000000</td>
<td>040000</td>
<td>9</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
<tr>
<td>4</td>
<td>000000</td>
<td>030000</td>
<td>030000</td>
<td>10</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
<tr>
<td>5</td>
<td>000000</td>
<td>030000</td>
<td>030000</td>
<td>11</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
<tr>
<td>6</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
<td>12</td>
<td>000000</td>
<td>999999</td>
<td>999999</td>
</tr>
</tbody>
</table>

Owner: LOG OUT

Main Menu

Operation Permitted

Back
3.9.2 Performance Data Graphs

The graph is represented using the current mode of units, showing BPH (bushels per hour) or m³/hr (cubic meters per hour).

The graph time period can be switched at any time and can be represented for 3, 6, 12, or 24 hour periods.

Graphs also give current readings for applicable sensors. For instance, the moisture graph shows target moisture, current actual inlet moisture, and current outlet moisture rates. The temperature graph shows current inlet and outlet temperature. The discharge graph toggles, showing either current metering roll speed (%) or volumetric throughput.

Press the up or down arrow on the Grain Moisture Graph to increase or decrease the moisture range displayed.

Note
All graphs capture a data point every three minutes.
3.10. Emergency Shutdown Procedure

1. Push the E-STOP button.
   
   **WARNING** Pushing the E-STOP button will turn OFF all outputs from the PLC. It does NOT shut off power into either Control Panel. The Power ON lamp will remain lit on the main Control Panel.

2. Turn OFF the electrical power at the main electrical disconnect.

3. Turn OFF the fuel supply at the main ball valve in the bottom dryer section and then at the main fuel source.

4. If the emergency requires grain to be removed from the dryer more quickly than the unload system can operate, there are several alternative routes to clear the grain. With power shut off and locked out, the following methods can be used:
   
   - Open up one or more of the emergency unload doors around the perimeter of the frame. To open, pull the pin on the clamp assembly. Use caution as the doors can swing open with great force.

Figure 90. Emergency Door Closed
Figure 91. Emergency Door Open

- For auger unloads, the cleanout doors can be opened to allow grain to flow by the metering rolls and augers.
- For drag unloads, both the metering roll doors on the sides of the drag conveyors and the cleanout doors on the drag conveyors themselves can be opened to let grain flow out.
4. Maintenance

Before continuing, ensure you have completely read and understood this manual’s Safety section, in addition to the safety information in the section(s) below.

4.1. Maintenance Safety

⚠️ WARNING

- Keep components in good condition. Follow the maintenance procedures.
- Ensure the service area is clean, dry, and has sufficient lighting.
- Do not modify any components without written authorization from the manufacturer. Modification can be dangerous and result in serious injuries.
- Lock out power source and shut off gas valves.
- All gas components, connections, and appliances are to be serviced or maintained by a qualified gas technician.
- After maintenance is complete, replace all guards, service doors, and/or covers.
- Use only genuine NECO replacement parts or equivalent. Use of unauthorized parts will void warranty. If in doubt, contact NECO or your local dealer.

4.2. Maintenance Overview

NECO takes pride in choosing quality vendors and products in association with the design and manufacture of our products:

- OEM products have a service life related to operating conditions and usage.
- Vendor supplied products consist of motors, gear reducers, bearings, valves, switches, etc.
- This information is to assist you in keeping the equipment in operating condition and to help obtain correct OEM data for proper maintenance.

Prior to each season or usage:

- Complete the Section 3.2 – Equipment Pre-Check on page 18 section and verify completion for each step.

During regular usage, based on overall conditions and amount of usage:

- Check for debris buildup within the plenum and throughout the system.
- Check all pipe fittings and fuel train components with a qualified detection method.
- Check the burner ports for blockage. See Section 4.3 – Burner Gas Ports on page 62.
- Check all fan and discharge auger belts tension and alignment monthly. Be careful not to over tension.
- Check metering roll chain tension monthly.
- Clean air switch line monthly.
• Perform lubrication checks when needed.

End-of-season equipment shutdown:

• Open the clean-out doors on both sides and let any grain fall through. If needed, the discharge augers can be run briefly to ensure no grain is left on the topside of a stationary auger system.
• Clean out the rear cross auger.
• For storage, the cleanout doors should be left open so that rain may fall through.
• The belts should be loosened and removed, then stored in a dark place.
• The chains should be removed and lubricated, then stored in an air tight container.

4.3. Burner Gas Ports

Burner Gas Ports

Conduct initial inspection within the first month after commissioning. Visually check the gas ports of the new burner assemblies for any piping scale or debris. Use a pin vise with drill sizes as shown below:

Annual inspections are normally adequate once the initial piping debris is removed. Heavy usage of the burner may require checking and cleaning monthly or more.

4.4. Solenoid Valves

All solenoid valves should be cleaned annually. The time between cleanings will vary depending on the service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise, or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close.

Cleaning instructions and rebuild kits for valves can be obtained online from vendors such as ASCO, etc.

4.5. Lubrication

On greaseable sealed bearings, apply grease only until a thin bead of new grease is visible along the seal edge. Applying excessive grease may force out the seals, causing contamination and rapid bearing wear.
### Table 4. Lubrication Data

<table>
<thead>
<tr>
<th>Part Description</th>
<th>Lubrication Product</th>
<th>Per Time Period of Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blower Drive Motor</td>
<td>Mfg Recommendation</td>
<td>Mfg Recommendation</td>
</tr>
<tr>
<td>Cross Auger Gearbox</td>
<td>80/90 Gear Oil 1/2 Full</td>
<td>Check Weekly</td>
</tr>
<tr>
<td>Fan Shaft Bearings</td>
<td>Mfg Recommendation</td>
<td>80 Hours</td>
</tr>
<tr>
<td>Cross Auger Bearings</td>
<td>Mfg Recommendation</td>
<td>100 Hours</td>
</tr>
<tr>
<td>Roller Chains</td>
<td>Le 451/452 Almasol</td>
<td>Annually</td>
</tr>
</tbody>
</table>

### 4.6. Motors

The OEM drive motors can vary in size and manufacturer, depending on the dryer size and usage requirements. In order to properly maintain the various drive motors within your system, record the manufacturer, model number, etc. from the motors ID tag. Follow manufacturers instructions for proper maintenance, including possible lubrication of shaft bearings.
5. Troubleshooting

5.1. Solutions Table

The following section covers some causes and solutions to some of the problems that may be encountered. If there is a problem that is difficult to solve, even after having read through this section, please contact your representative or AGI. Have this manual and the serial number available.

### Temperature Controller

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature control communication error</td>
<td>If other temperature controls are visible</td>
<td>Incorrect address of the temperature controller</td>
<td>Re-address temperature controller</td>
</tr>
<tr>
<td></td>
<td>If other temperature controllers are not visible</td>
<td>Damaged Modbus communication wires</td>
<td>Starting at the front of the PLC, trace Modbus communication cables to the lowest burner box</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loose connection at gray communication tee connector</td>
<td>Tighten connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>If problem persists contact dealer</td>
</tr>
<tr>
<td>Temperature displays ***</td>
<td>Front of KS45 inside burner box displays FAIL on top display</td>
<td>Damaged thermocouple</td>
<td>Repair twisted end of thermocouple or replace whole wire</td>
</tr>
<tr>
<td>Unable to reach set point temperature</td>
<td>MAIN MENU-&gt; TROUBLESHOOTING-&gt; TEMPERATURE CONTROLS</td>
<td>If mod motor position is at 100% there is a fuel delivery problem</td>
<td>Turn fuel regulated pressure at individual burner up. CAUTION: DO NOT EXCEED 6 PSI for NG .10 PSI for LP</td>
</tr>
<tr>
<td>Actual temperature exceeds set point</td>
<td>MAIN MENU-&gt; TROUBLESHOOTING-&gt; TEMPERATURE CONTROLS</td>
<td>If mod motor position is at 0% there is a fuel delivery problem</td>
<td>Turn fuel regulated pressure down, trouble lighting may occur if operating pressures are turned below 1 PSI</td>
</tr>
<tr>
<td>Unsteady temperature control (high and low)</td>
<td>MAIN MENU-&gt; TROUBLESHOOTING-&gt; TEMPERATURE CONTROLS</td>
<td>Unsteady mod motor position</td>
<td>Turn fuel regulated pressure down, trouble lighting may occur if operating pressures are turned below 1 PSI</td>
</tr>
<tr>
<td></td>
<td>Thermocouple location and condition</td>
<td>Location inside the dryer too close or too far away from burner</td>
<td>Thermocouple should be located three tiers from the floor and five air ducts back from the burner unless otherwise instructed by NECO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thermocouple corrosion</td>
<td>Cut and strip and tightly re-twist 3/4&quot; of thermocouple wire</td>
</tr>
<tr>
<td></td>
<td>Natural gas applications</td>
<td>Too high of a ramp rate</td>
<td>Troubleshooting–&gt; temperature controls set ramp rate to 125</td>
</tr>
<tr>
<td>Problem</td>
<td>Check</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>Limits exceeded before plenum temperature is reached</td>
<td>Check set point of high limit switch</td>
<td>High limit switch set too low</td>
<td>High limit switch to be set 20-30 degrees F above operating temp of individual section. NOTE: V42 is changed to be Max temp on switch</td>
</tr>
<tr>
<td></td>
<td>Check location of thermocouple in relation to the high limit bulb</td>
<td>Thermocouple and high limit switch bulb are too far apart</td>
<td>Thermocouple twisted pair should be within inches of high limit bulb without touching anything conductive</td>
</tr>
</tbody>
</table>

### Honeywell Burner Control

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Will not remote reset</td>
<td>Check to see if a manual reset button on Honeywell works</td>
<td>If manual reset works, failure of 24VDC reset relay</td>
<td>Repair or replace 24VDC reset relay or resolve wiring problem</td>
</tr>
<tr>
<td></td>
<td>If manual reset does NOT work, read blink code and repair</td>
<td></td>
<td>Correct Honeywell fault</td>
</tr>
<tr>
<td></td>
<td>Check to make sure connector is firmly plugged into top of controller</td>
<td>Poor connection of reset signal</td>
<td>Tighten wires in connector and ensure that connector is firmly plugged in.</td>
</tr>
<tr>
<td>Honeywell communication error</td>
<td></td>
<td>Incorrect address of the Honeywell</td>
<td>Re-address Honeywell</td>
</tr>
<tr>
<td>If other Honeywells are visible</td>
<td>Baud rate jumper installed in the bottom of the Modbus module</td>
<td>Remove the baud rate jumper (NOTE: all new Modbus modules come with jumper installed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incorrect wiring on plug attached to Honeywell</td>
<td>Correct wiring error</td>
<td></td>
</tr>
<tr>
<td>If other Honeywells are not visible</td>
<td>Damaged Modbus communication wires</td>
<td>Starting at the front of the PLC, trace Modbus communication cables to the lowest burner box</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Loose connection at gray communication tee connector</td>
<td>Tighten connection</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If problem persists contact dealer</td>
<td></td>
</tr>
</tbody>
</table>

### Moisture Controls

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moisture drift on outlet sensor</td>
<td>Blockage in discharge chute</td>
<td>Debris bridging over outlet sensor blocking grain flow</td>
<td>Clean out discharge chute around sensor</td>
</tr>
<tr>
<td></td>
<td>Can sensor be seen through flow of grain</td>
<td>Insufficient grain flow over sensor</td>
<td>Adjust gate in discharge chute to restrict flow of grain</td>
</tr>
</tbody>
</table>
### Starting the Dryer in AUTO

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dryer will not light and goes directly into COOLING</td>
<td>If the ALARM screen has any errors in red…</td>
<td>Wet or Dry transport failure</td>
<td>Correct problem and reset the alarm</td>
</tr>
<tr>
<td>Dryer will not light</td>
<td>Fan is running but no flame present</td>
<td>Honeywell fault</td>
<td>MAIN MENU-&gt; TROUBLESHOOTING-&gt; BURNER CONTROLS, Identify and resolve issue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Spark plug failure</td>
<td>Clean/replace plug</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Fuel delivery</td>
<td>Identify if too much fuel or not enough and resolve issue</td>
</tr>
<tr>
<td></td>
<td>Fan is running and there is pilot light igniting, but not main ignition</td>
<td>Low or no VDC on UV sensor</td>
<td>Clean/replace sensor - Ensure that wires are tight behind the Honeywell</td>
</tr>
</tbody>
</table>

### General Operation

<table>
<thead>
<tr>
<th>Problem</th>
<th>Check</th>
<th>Cause</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGE BATTERY</td>
<td>Battery in PLC is low, if not replaced DRYER CONFIGURATION can be lost</td>
<td>Battery in PLC should be replaced approx. every 3 years</td>
<td>Replace 1/2 AA battery in the bottom of the PLC in the main control panel</td>
</tr>
<tr>
<td>DRYER CONFIGURATION is lost.</td>
<td>CHANGE BATTERY displayed in lower right corner of HMI screen when powered up</td>
<td>Battery died in PLC during time of non use</td>
<td>Contact dealer to replace battery and re-configure dryer</td>
</tr>
<tr>
<td>E-STOP ACTIVE</td>
<td>Both E-STOP switches must be released</td>
<td>One switch is active</td>
<td>Activate and release each switch</td>
</tr>
<tr>
<td></td>
<td>E-STOP Relay inside main control panel normally</td>
<td>If E-STOP button activated the relay displays</td>
<td>Repair or replace the E-STOP button or repair circuit</td>
</tr>
<tr>
<td></td>
<td>Supply–green</td>
<td>Supply–green</td>
<td>If only one K1 or K2 on check wiring of switch</td>
</tr>
<tr>
<td></td>
<td>K1 –green</td>
<td>K1 –off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>K2 –green</td>
<td>K2 –off</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reset –off</td>
<td>Reset –off</td>
<td></td>
</tr>
<tr>
<td>Unable to get Wet or Dry motors to start</td>
<td>MAIN MENU-&gt; SET UP-&gt; FILL &amp; EMPTY SETUP</td>
<td>Review FILL &amp; EMPTY SETUP page</td>
<td>Turn on necessary options</td>
</tr>
<tr>
<td></td>
<td>MAIN MENU-&gt; TROUBLESHOOTING-&gt; PLC INPUTS</td>
<td>Review PLC INPUT STATUS, blinking icons indicate configuration/wiring errors</td>
<td>Ensure that overloads are on for installed starters. If off, ensure that starters are not overloaded. If not overloaded and still off wiring error present</td>
</tr>
<tr>
<td></td>
<td>MAIN MENU-&gt; ALARMS</td>
<td>Alarm Present</td>
<td>Address any alarm problem in RED</td>
</tr>
<tr>
<td>Unable to get Wet Transport motors to start</td>
<td>Grain level in dryer</td>
<td>Wet Transports will not start with dryer full</td>
<td>Lower grain level below fill switch</td>
</tr>
<tr>
<td></td>
<td>MAIN MENU-&gt; SET-UP-&gt; FILL &amp; EMPTY SETUP</td>
<td>WET BIN EMPTY SWITCH enabled</td>
<td>Wet bin is empty</td>
</tr>
<tr>
<td>Problem</td>
<td>Check</td>
<td>Cause</td>
<td>Solution</td>
</tr>
<tr>
<td>---------</td>
<td>-------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>Check Fill rotary switch operation</td>
<td>PLC thinks that dryer is full</td>
<td>Repair/replace faulty rotary switch</td>
<td></td>
</tr>
<tr>
<td>MAIN MENU-&gt; ALARMS</td>
<td>Alarm Present</td>
<td>Address any alarm problem in RED</td>
<td></td>
</tr>
<tr>
<td>Unable to get Dry Transport motors to start</td>
<td>MAIN MENU-&gt; SET-UP-&gt; FILL &amp; EMPTY SETUP</td>
<td>DRY BIN FULL SWITCH enabled</td>
<td>Dry bin is full</td>
</tr>
<tr>
<td>Presence of active alarm</td>
<td>DISCHARGE PLUGGED</td>
<td>Clear plugged discharge and reset alarm</td>
<td></td>
</tr>
</tbody>
</table>
5.2. HMI Troubleshooting Screens

The following screens are used primarily for troubleshooting:

- Alarms and Alarm Log
- Troubleshooting
- PLC Inputs Status
- PLC Outputs Status
- Temp Control Status
- Burner Control Status

**Figure 93. Alarms and Alarm Log Screens**

The Alarm Log shows alarm history. Both screens show time alarm went active and time alarm was reset (RTN).

**Figure 94. Troubleshooting Screen**
Figure 95. PLC Inputs Status Screen

Figure 96. PLC Outputs Status Screen

Figure 97. Temp Control Status Screen
Figure 98. Burner Control Status Screen

Figure 99. Blower VFD (Eaton) Screen

Figure 100. Fault Code (Eaton) Screen
Figure 101. Communications Screen
# 6. Specifications

## 6.1. Standard Model Specifications

Refer to the following table for specifications on standard NECO dryers. They are listed by model number as shown on the rating plate located on the front of the main control.

If the model number of your particular dryer is not shown below, contact your dealer.

<table>
<thead>
<tr>
<th>Model Number</th>
<th># of Tiers</th>
<th>Holding Capacity</th>
<th>Number of Burners and Blowers</th>
<th>TOTAL Blower Output (Max)</th>
<th>TOTAL Burner Output (Max)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Bushels (See Notes)</td>
<td>Metric Tons</td>
<td>Cubic ft/min</td>
<td>Cubic m/min</td>
</tr>
<tr>
<td>K600</td>
<td>4</td>
<td>579</td>
<td>15</td>
<td>1</td>
<td>21,500</td>
</tr>
<tr>
<td>K700</td>
<td>5</td>
<td>674</td>
<td>17</td>
<td>1</td>
<td>21,200</td>
</tr>
<tr>
<td>K800</td>
<td>6</td>
<td>770</td>
<td>19</td>
<td>1</td>
<td>27,500</td>
</tr>
<tr>
<td>K900</td>
<td>7</td>
<td>866</td>
<td>22</td>
<td>1</td>
<td>32,000</td>
</tr>
</tbody>
</table>

**Note**

1. Drying capacities represent NECO’s best estimate of attainable wet bushel capacities based on a combination of actual field results and computer analysis.
2. Capacities will vary depending on outside temperature, humidity, initial grain temperature, crop maturity and variety, cleanliness of the grain, test weight, operating temperature, drying vs. cooling zones, etc.
3. Hot grain discharged from the dryer will dry an additional 1.5% – 2% when properly cooled.
4. Average burner output MMBTU/hr is based on 155°F temperature rise. Ambient of 55°F and dryer operating temperature of 210°F.
5. Holding capacity values represent corn at 15.5% moisture content (56 lb/bushel).
7. Appendix

7.1. Manual Dryer Speed

Note
These speeds are recommended as a STARTING POINT only for input as manual metering roll speed until the DryerMaster system reaches full automatic. As grain drying factors change, speeds will need to change in order to maintain a correct and steady output grain moisture value.

Some factors to consider when drying grain are:

- The type of grain. Some varieties are moisture-resistant compared to others.
- The end usage of the grain - will it be used for seed, feed, commercial, or some other usage.
- The outside weather conditions - including temperature, humidity, and even wind.
- The moisture content of the incoming grain.
- The cleanliness of the incoming grain.
- The crop region.

Table 6. Speed Setting (DC Motor %)

<table>
<thead>
<tr>
<th>MODEL - RPM</th>
<th>MOISTURE CONTENT (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>K600-27 RPM</td>
<td>42%</td>
</tr>
<tr>
<td>K700-27 RPM</td>
<td>52%</td>
</tr>
<tr>
<td>K800-27 RPM</td>
<td>62%</td>
</tr>
<tr>
<td>K900-27 RPM</td>
<td>73%</td>
</tr>
</tbody>
</table>
7.2. Optional External Transport Configurations

Example 1: Wet 1 Auger and Dry 1 Air System

The following diagram shows an example of a one-wet and one-dry air system to be controlled and operated by the Commander system.

Note
Shown for example only. Individual configuration vary.

Figure 102. Wet 1 Auger and Dry 1 Air System

Note
The table information below is an example of the Fill/Empty Setup data inputs that would be required for the Wet/Dry type of layout shown above.

Table 7. Fill/Empty Setup Data

<table>
<thead>
<tr>
<th>Wet 1 Transport (Closest To Dryer)</th>
<th>Motor Present</th>
<th>Run Continuous</th>
<th>Stop After Drying Stops</th>
<th>Start Delay Seconds</th>
<th>Stop Delay Seconds</th>
<th>Relay #</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level Auger</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>1</td>
<td>1</td>
<td>63CR</td>
</tr>
<tr>
<td>Unload Auger</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td>1</td>
<td>1</td>
<td>- -</td>
</tr>
<tr>
<td>Dry 1 Transport (Closest To Dryer)</td>
<td>Yes</td>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>62CR</td>
</tr>
</tbody>
</table>
7.3. Wiring External Transports

The customer is responsible for wiring any external transport equipment. The following schematics are for reference.

Figure 103. Wiring Connections for External Transports

<table>
<thead>
<tr>
<th>WET 1</th>
<th>STARTER (COIL) OVER</th>
<th>RUN SIGNAL TO STARTER COIL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OVERLOAD/Fault</td>
<td>RUN CONFIRMATION</td>
</tr>
<tr>
<td></td>
<td>24V</td>
<td></td>
</tr>
<tr>
<td>DRY 1</td>
<td>STARTER (COIL) OVER</td>
<td>RUN SIGNAL TO STARTER COIL</td>
</tr>
<tr>
<td></td>
<td>OVERLOAD/Fault</td>
<td>RUN CONFIRMATION</td>
</tr>
<tr>
<td></td>
<td>24V</td>
<td></td>
</tr>
</tbody>
</table>

**TRANSPORT CONNECTIONS**

1. 2 PAIRS OF WIRES ARE NEEDED FOR EACH REMOTE TRANSPORT DEVICE.
2. 2 WIRES FOR THE RUN SIGNAL (ROUTE POWER THROUGH THE RELAY TO THE STARTER COIL).
3. 2 WIRES FOR THE 24VDC RUN CONFIRMATION (C- LC MUST SEE A CHANGE OF STATE) AND THE 24VDC FAULT (INSTALL JUMPER IF UNAVAILABLE, COIL MUST NOT ENGAGE IF FAULT).
### 7.4. PLC and HMI Recorded Data Sheet

**SETUP TAB**

<table>
<thead>
<tr>
<th>Temp &amp; Volume Units:</th>
<th>Imperial</th>
<th>Metric</th>
</tr>
</thead>
</table>

**SETUP TAB - Dryer Configuration**

<table>
<thead>
<tr>
<th>Length:</th>
<th>12'</th>
<th>16'</th>
<th>24'</th>
</tr>
</thead>
</table>

- Gearmotor RPM: [ ] Yes [ ] No
- Level Auger: [ ] Yes [ ] No
- Number of Blowers: 1 [ ] 2 [ ]
- Number of Burners: 1 [ ] 2 [ ]
- Number of Tiers at Blower:
  - Blower #1:
    - 3 [ ] 4 [ ] 5 [ ]
  - Blower #2:
    - 3 [ ] 4 [ ] 5 [ ]
- Gas Type: Liquid Propane (LP) [ ] Natural Gas (NG) [ ]

**SETUP TAB - Fill & Empty Setup**

**Wet Transport 1**: [ ] Yes [ ] No

- Run Continuous: [ ] Yes [ ] No
- Stop After Drying Stops: [ ] Yes [ ] No
- Start Delay Seconds: [ ]
- Stop Delay Seconds: [ ]

- Level Auger: [ ] Yes [ ] No
- Run Continuous: [ ] Yes [ ] No
- Stop After Drying Stops: [ ] Yes [ ] No
- Start Delay Seconds: [ ]
- Stop Delay Seconds: [ ]

- Unload Auger: [ ] Yes [ ] No
- Run Continuous: [ ] Yes [ ] No
- Stop After Drying Stops: [ ] Yes [ ] No
- Start Delay Seconds: [ ]
- Stop Delay Seconds: [ ]

**Dry Transport 1**: [ ] Yes [ ] No

- Run Continuous: [ ] Yes [ ] No
- Stop After Drying Stops: [ ] Yes [ ] No
- Start Delay Seconds: [ ]
- Stop Delay Seconds: [ ]

**Wet Bin Empty Switch**: [ ] Yes [ ] No

**Dry Bin Full Switch**: [ ] Yes [ ] No

**Metering Roll Max Speed**: [ ]

**SETUP TAB - Timers Setup**

- Factory Defaults shown in ( )
- Auto Filling Delay (10 SEC):
- Max Run Time (5 MIN):
- Blower Start Delay (5 SEC):
- Burner Enable Delay (5 SEC):
- Enable Discharge (30 SEC):
- Metering Roll Start (3 MIN):
- Metering Roll Pause (60 SEC):
- Discharge Plugged Ignore (1 SEC):
- Dryer Cooling Time (5 MIN):

**MAIN MENU TAB - Trouble Shooting**

<table>
<thead>
<tr>
<th>Dealer Info:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

**MAIN MENU TAB - Trends**

<table>
<thead>
<tr>
<th>Discharge Rate Factor:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Throughput:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
</tr>
<tr>
<td>Hours:</td>
</tr>
</tbody>
</table>

**MAIN MENU TAB - Fill / Empty Dryer**

<table>
<thead>
<tr>
<th>Manual Metering Roll Setpoint:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Serial #:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLC &amp; HMI Version #:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
7.5. Updating the PLC and HMI Programs

In this Section:
- Program Update Instructions
- Installing the M241 PLC Firmware
- Installing the M241 PLC Software
- Installing the HMIGTO Screen Software

Program Update Instructions

Note
Updating the PLC and HMI programs results in the loss of certain setup configuration data. Settings on various screens will need to be manually re-entered. Make a copy of the Section 7.4 – PLC and HMI Record Sheet on page 76 to record the necessary data.

Note
It is best and easiest to take photos of each screen prior to updating the PLC and HMI programs.

- Update the PLC unit first. Then follow with the HMI update.
- In order to access and re-enter data, log in as: User = N e c o T e c h, Password = Neco11

Installing the M241 PLC Firmware

To install the Firmware:

Note
Firmware only needs to be installed if installing a PLC different to the one delivered with the machine, or if an update is unsuccessful.

1. Turn off the power at 1CB.
2. Insert the SD card.
3. Turn on the power at 1CB; the SD light turns on for approximately two minutes.

Note
When the ERR light turns on, the loading is finished.

4. Turn off the power at 1CB, and remove the SD card.
5. Turn on the power at 1CB.

6. When the ETH (Ethernet) light turns on, and the ERR light blinks, the PLC is ready for a program.
Installing the M241 PLC Software

To install the M241 PLC Software:

1. Turn off the power at 1CB.
2. Insert the SDHC card.
3. Turn on the power.

**Note**
When **only** the SD and PWR lights are green the program is loaded.

4. Turn off the power at 1CB.
5. Remove the SD card.
6. Turn on the power at 1CB.
7. Check that the PWR, RUN, and ETH lights are on, and that the SL2 light is flashing; The M241 is ready for operations.
Installing the HMIGTO Screen Software

To install the HMIGTO software:

1. Power off the HMI.
2. Remove USB drive from dryer HMI.
3. Format USB drive to Fat32.
4. Replace the USB drive in the HMI.
5. Install the SD card with the new files.
6. Power on the HMI.

Note

Installation should begin automatically (~2 minutes).

7. When the installation is complete, remove the SD card, then press Restart.

Figure 110. HMIGTO Series
7.6. Main Control Box

Figure 111. Main Control Box

**WARNING**
Pushing the E-STOP button will turn OFF all outputs from the PLC. It does NOT shut off power into either Control Box. The Power ON lamp will remain lit on the Main Control front panel.
7.7. Honeywell Burner Control Fault Codes

The Honeywell burner control system displays system faults by illuminating the red Alarm LED, and turning the green Power LED on and off in patterns. The patterns consist of one or more fast, and one or more slow, flashes of the Power LED. These patterns are sometimes referred to as “blink codes”. The following table provides a description of the blink codes and their meanings.

Figure 112. Honeywell Burner Control Location and LEDs

Table 8. Power LED Fault Codes

<table>
<thead>
<tr>
<th>CODE (Fast-Slow)</th>
<th>FAULT DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Low AC line voltage</td>
</tr>
<tr>
<td>1-2</td>
<td>AC quality problem</td>
</tr>
<tr>
<td>2-1</td>
<td>Unexpected flame signal</td>
</tr>
<tr>
<td>2-2</td>
<td>Flame signal absent</td>
</tr>
<tr>
<td>2-3</td>
<td>Flame signal overrange</td>
</tr>
<tr>
<td>3-1</td>
<td>Running ILK switch problem</td>
</tr>
<tr>
<td>3-2</td>
<td>Running ILK switch in Standby</td>
</tr>
<tr>
<td>3-3</td>
<td>Valve proving fault</td>
</tr>
<tr>
<td>4-1</td>
<td>Purge card problem</td>
</tr>
<tr>
<td>4-2</td>
<td>Wiring problem/internal fault</td>
</tr>
<tr>
<td>4-3</td>
<td>Flame amplifier problem</td>
</tr>
</tbody>
</table>
### Table 8  Power LED Fault Codes (continued)

<table>
<thead>
<tr>
<th>CODE (Fast-Slow)</th>
<th>FAULT DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-4</td>
<td>Configuration jumper problem</td>
</tr>
<tr>
<td>5-1</td>
<td>PII fault (Normal state when turned off)</td>
</tr>
<tr>
<td>5-2</td>
<td>HFS/LFS fault</td>
</tr>
<tr>
<td>5-3</td>
<td>MOS/Start switch</td>
</tr>
<tr>
<td>6-1</td>
<td>Output drive failure</td>
</tr>
<tr>
<td>6-2</td>
<td>Internal fault</td>
</tr>
<tr>
<td>6-3</td>
<td>Device specific fault</td>
</tr>
<tr>
<td>6-4</td>
<td>Accessory fault</td>
</tr>
<tr>
<td>7-7</td>
<td>Unrecognized fault</td>
</tr>
</tbody>
</table>

### 7.8. KS45 & TB45 Controller LEDs

<table>
<thead>
<tr>
<th>Color</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Ok</td>
</tr>
<tr>
<td>Green, blinking</td>
<td>No Modbus communications</td>
</tr>
<tr>
<td>Red</td>
<td>Excessive Temperature or bad Thermocouple</td>
</tr>
<tr>
<td>Red, blinking</td>
<td>Internal fault, replace controller</td>
</tr>
</tbody>
</table>
Figure 113. Honeywell Modbus

Honeywell Modbus Mode LEDs

<table>
<thead>
<tr>
<th>LED Behavior</th>
<th>Pulse Period</th>
<th>Interval</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly ON with 1 blink (good)</td>
<td>50ms (OFF)</td>
<td>1 sec</td>
<td>Normal Operation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Both ControlBus and ModBus are active</td>
</tr>
<tr>
<td>Always OFF</td>
<td></td>
<td>OFF</td>
<td>No power or device failure</td>
</tr>
<tr>
<td>Always ON</td>
<td></td>
<td>ON</td>
<td>Modbus card failure</td>
</tr>
<tr>
<td>Mostly OFF with 1 flash</td>
<td>50ms (ON)</td>
<td>3.85 sec</td>
<td>ModBus is not active</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Check ModBus wiring</td>
</tr>
<tr>
<td>Mostly OFF with 2 pulses</td>
<td>2 x (200ms ON, 200ms OFF)</td>
<td>1.75 sec</td>
<td>Program CRC error</td>
</tr>
<tr>
<td>Most OFF with 3 pulses</td>
<td>3 x (200ms ON, 200ms OFF)</td>
<td>2.15 sec</td>
<td>No ControlBus signal from the burner controller</td>
</tr>
</tbody>
</table>
Honeywell Relay Module Blinking Power LED Indication

**Note**

A 5-1 blink code (Pre-Ignition Interlock) is a normal stand-by condition on NECO dryers with Commander & Commander Lite controls when not running.

<table>
<thead>
<tr>
<th>Fault Code</th>
<th>System Failure</th>
<th>Recommended Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code 1-1</td>
<td>Low AC Line</td>
<td>1. Check the relay module and display module connections.</td>
</tr>
<tr>
<td>&quot;Low AC Line Voltage*&quot;</td>
<td>detected.</td>
<td>2. Reset and sequence the Relay Module.</td>
</tr>
<tr>
<td>Code 1-2</td>
<td>Excessive noise</td>
<td>3. Check the 7800 power supply and make sure that frequency and</td>
</tr>
<tr>
<td>&quot;AC Quality Problem*&quot;</td>
<td>or device running on slow, fast, or AC line dropout detected.</td>
<td>voltage meet specifications.</td>
</tr>
<tr>
<td>Code 2-1</td>
<td>Flame sensed</td>
<td>4. Check the backup power supply, as appropriate.</td>
</tr>
<tr>
<td>&quot;Unexpected Flame Signal*&quot;</td>
<td>when no flame is expected during STANDBY or PURGE.</td>
<td>5. Remove the flame amplifier and inspect its connections. Reseat the amplifier.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6. If the code reappears, replace the flame amplifier and/or the flame detector.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Fault Code</td>
<td>System Failure</td>
<td>Recommended Troubleshooting</td>
</tr>
<tr>
<td>------------</td>
<td>----------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Code 2-2</td>
<td>No-flame time present at the end of the Pilot Flame Establishing Period; lost during the Main Flame Establishing Period or during RUN.</td>
<td>1. Measure the flame signal. If one exists, verify that it meets specifications. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Inspect the main fuel valve(s) and valve connection(s). 4. Verify that the fuel pressure is sufficient to supply fuel to the combustion chamber. Inspect the connections to the fuel pressure switches. Make sure they are functioning properly. 5. Inspect the Airflow Switch and make sure that it is functioning properly. 6. Check the flame detector sighting position; reset and recycle. Measure the flame signal strength. Verify that it meets specifications. If not, refer to the flame detector and/or flame amplifier checkout procedures in the installation instructions. 7. Replace the flame amplifier and/or the flame detector, if necessary. 8. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 2-3</td>
<td>Flame signal value is too high to be valid.</td>
<td>1. Make sure the flame detector and flame amplifier are compatible. 2. Remove the flame amplifier and inspect its connections. Reset the flame amplifier. 3. Reset and sequence the relay module. 4. Check the flame detector sighting position; reset and recycle. Measure flame strength. Verify that it meets specifications. If not, refer to the flame detector and/or flame amplifier checkout procedures in the installation instructions. 5. If the code reappears, replace the flame amplifier and/or the flame detector. 6. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 3-1</td>
<td>Running or Lockout Interlock fault during Prepurge.</td>
<td>1. Check wiring; correct any errors. 2. Inspect the fan; make sure there is no air intake blockage and that it is supplying air. 3. Make sure the Lockout Interlock switches are functioning properly and the contacts are free from contaminants. 4. Reset and sequence the relay module to Prepurge (place the TEST/RUN Switch in the TEST position, if available). Measure the voltage between terminal 7 and G (ground); 120 Vac should be present. Switch TEST/RUN back to RUN. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 3-2</td>
<td>Lockout Interlock powered at improper point in sequence or On in Standby.</td>
<td>1. Check wiring to make sure that the Lockout Interlocks are connected properly between terminals 6 and 7. Correct any errors. 2. Reset and sequence the relay module. 3. If the fault persists, measure the voltage between terminal 6 and G (ground), then between terminal 7 and G. If there is 120 Vac at terminal 6 when the controller is off, the controller switch may be bad or is jumpered. 4. If steps 1 through 3 are correct and there is 120 Vac at terminal 7 when the controller is closed and the fault persists, check for a wobbled or jumpered Running Interlock or Airflow Switch. Correct any errors. 5. If steps 1 through 4 are correct and the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 3-3</td>
<td>VPS (Valve Proving Switch) in wrong state during VPS Test.</td>
<td>1. Check wiring, making sure upstream valve is connected to terminal 9 and downstream valve is connected to terminal 17. 2. Conduct Valve Seat leakage test using a manometer. 3. Reset and sequence the relay module; if fault repeats, test VPS (connected to terminal 16) is functioning properly; replace if necessary. 4. Reset and sequence the relay module. 5. If fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 4-1</td>
<td>No purge card or the purge card timing has changed from the original configuration.</td>
<td>1. Make sure the purge card is seated properly. 2. Inspect the purge card and the connector on the relay module for any damage or contaminants. 3. Reset and sequence the relay module. 4. If the fault code reappears, replace the purge card. 5. Reset and sequence the relay module. 6. If the fault code persists, replace the relay module.</td>
</tr>
</tbody>
</table>
| Code 4-2  | Pilot (ignition) valve terminal, main valve, ignition or Main Valve 2 was on when it should be off. | **WARNING**  
Electrical Shock Hazard; Fire or Explosion Hazard.  
Can cause severe injury, death or property damage.  
Remove system power and turn off power supply. 1. Remove system power and turn off fuel supply. 2. Check wiring; correct any errors. 3. Inspect Pilot Fuel Valve(s), both places, and connections. 4. Reset and sequence the relay module. 5. If the fault persists, replace the relay module. |
<table>
<thead>
<tr>
<th>Fault Code</th>
<th>System Failure</th>
<th>Recommended Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code 4-3</td>
<td>Flame not sensed, or sensed when it should be on or off</td>
<td>1. Check wiring; correct any errors.  2. Make sure the flame amplifier and flame detector are compatible.  3. Remove the flame amplifier and inspect the connections. Reseat the amplifier.  4. Reset and sequence the relay module.  5. If the code reappears, replace the flame amplifier and/or the flame detector.  6. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 4-4</td>
<td>Configuration Jumper Problem*</td>
<td>1. Inspect the jumper connections. Make sure the clipped jumpers were completely removed.  2. Reset and sequence the relay module.  3. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 5-1</td>
<td>Preignition Interlock</td>
<td>1. Check wiring and correct any errors.  2. Check Preignition Interlock switches to assure proper functioning.  3. Check fuel valve operation.  4. Reset and sequence the relay module; monitor the Preignition Interlock status.  5. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 5-2</td>
<td>Either High Fire Switch or Low Fire Switch failure.</td>
<td>1. Check wiring and correct any errors.  2. Reset and sequence the relay module.  3. Use manual motor potentiometer to drive the motor open and closed. Verify at motor switch that the end switches are operating properly. Use RUN/TEST switch if manual potentiometer is not available.  4. Reset and sequence the relay module.  5. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 5-3</td>
<td>Manual-Open Switch, Start Switch or Control On in the wrong operational state.</td>
<td>1. Check wiring and correct any errors.  2. Make sure that the Manual Open Valve Switch, Start Switch and Control are operating properly.  3. Start Switch held “On” too long.  4. Reset and sequence the relay module.  5. Reset and sequence the relay module. If the fault persists, replace the relay module (RM7838A1014; RM7838B1013 or RM7838C1004 only).</td>
</tr>
<tr>
<td>Code 6-1</td>
<td>Relay Module self-test failure.</td>
<td>1. Reset and sequence the relay module.  2. If fault reappears, remove power from the device, reapply power, then reset and sequence the relay module.  3. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 6-2</td>
<td>Relay Module Self-Test failure.</td>
<td>1. Reset and sequence the relay module.  2. If fault reappears, remove power from the device, reapply power, then reset and sequence the relay module.  3. If fault does not repeat on the next cycle, check for electrical noise being copied into the relay module through the external loads or possibly an electrical grounding issue.  4. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 6-3</td>
<td>Fault with special OEM input circuits.</td>
<td>1. Check wiring and operation of special OEM inputs.  2. Reset and sequence the relay module.  3. If fault reappears, remove power from the device, reapply power, then reset and sequence the relay module.  4. If the fault does not repeat on the next cycle, check for electrical noise being copied into the relay module through the external loads or possibly an electrical grounding issue.  5. If the fault persists, replace the relay module.</td>
</tr>
<tr>
<td>Code 6-4</td>
<td>Unused at this time.</td>
<td>—</td>
</tr>
<tr>
<td>Code 7-7</td>
<td>Unused at this time.</td>
<td>—</td>
</tr>
</tbody>
</table>
Fireye Lockout Codes Interpretation

During an alarm condition, the Alarm LED is made to flash at approximately a twice per second rate. The remaining LED’s are illuminated as a coded sequence identifying the reason for the lockout. This remains true if power is removed and then restored in a locked out condition.

<table>
<thead>
<tr>
<th>LED DISPLAY READOUT</th>
<th>FAN</th>
<th>OPEN DAMPER</th>
<th>CLOSE DAMPER</th>
<th>AUTO</th>
<th>IGN</th>
<th>FLAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCKOUT MESSAGE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T13 FUEL VALVE END SWITCH OPEN</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-D LOW FIRE START OPEN</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-D LOW FIRE START OPEN - PTFI</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-D LOW FIRE START OPEN - MTFI</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-D CLOSED</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-8 CLOSED</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-8 HIGH PURGE CIRCUIT OPEN</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FALSE FLAME-STANDBY</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLAME FAIL PTFI</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLAME FAIL - MTFI</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLAME FAIL AUTO</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK OPEN - PREPURGE</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK OPEN - PURGE</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK OPEN-PTFI</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK OPEN-MTFI</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK CLOSED-STANDBY</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-P RUN INTLK OPEN-AUTO</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUEL VALVE STATE CHANGE</td>
<td></td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK FUSE</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK WIRING</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK SCANNER</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK PROGRAMMER</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK CHASSIS</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHECK EXPANSION MODULE</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7.9. HMI Wiring Connections

Important
The HMI must be connected to a customer-supplied 120 VAC, 400 to 600 VA uninterruptible power supply (UPS).

Figure 114. HMI Wiring Diagram (K Series)

Electrical Wiring from Main Control to HMI
1. Pull and connect the following wires from the main control terminals to the HMI terminals to the touch screen and emergency stop switch in the HMI. Refer to the schematic in the main control panel for connections.

Ethernet Cable from Main Control to HMI
1. Pull Cat 6 shielded Ethernet cable from the main control to the HMI. The maximum distance should be less than 300 feet.
2. Terminate each end of the Ethernet cable (if not already terminated).
3. Plug one end into the ethernet switch in the main control panel.
4. Plug the other end into the touch screen inside the HMI enclosure.
7.10. Dryer Master Moisture Sensor Circuit Board

The Dryer Master moisture sensor circuit board is factory set and should not need adjustment.

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**Figure 115. Dryer Master Enclosure**

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**Figure 116. Dryer Master Circuit Board and Connections**

The “J3” jumper should be always set to “STORE” position.
7.11. Dryer Temperature Considerations

**High-Limit Temperature Consideration**

**Fire Hazard**

- In cases where the grain has a lot of trash, or when drying high moisture grain (that is immature or frozen grain), drying at these temperatures may not be possible, as the risk of fire is increased.

- In cases where there is blockage in the machine due to trash, it is possible for this material to become subject to spontaneous combustion.

- Shut the blower(s) OFF immediately in ANY case where a person may see smoke coming from the machine.

- When the High Temperature Limit alarm is activated, the equipment will immediately shut down with NO cool-down period (blowers OFF).

- To avoid tripping the High Temperature Limit, ensure the High Limit Switch is set to 30°F (17°C) above the operating temperature at each burner.

**Cool-Down**

When stopping the machine the grain should be cooled down:

- **Manual Cool-Down**: Turn off burners, but leave blowers on for a period of 5 to 15 minutes.

- **Automatic Cool-Down**: The system has five possible grain level monitors. Certain conditions can result in the equipment automatically shutting down. Most of these conditions include a cool-down period. A few conditions, such as High Limit Temperature, that are reached provide a shut-down with NO cool-down period.
7.12. Grain Drying Tips

7.12.1 Specific Crops

DRIYING SUGGESTIONS
FOR SPECIFIC GRAINS / SITUATIONS IN YOUR
AGI® NECO DRYER

**CORN**

DIFFICULTY: 

DRIYING TEMP: 210°F (100°C)

NOTES:
Corn is probably the easiest of the grains to dry in the NECO dryer. Corn will handle quite high temperatures and is generally dried at 210°F.

Known issues with corn can be a crop that has experienced a difficult growing season and is immature or stressed. These kernels will be more difficult to dry and capacities through the dryer will be reduced. Certain hybrids that are designed to be drought or moisture resistant will have thicker seed coats and smaller attachment points that make the drying process more difficult. Capacities will be markedly reduced.

CONCERNS:
Bees’ wings or red dogs will be present during drying and worse with high moisture corn. Cleanup in and around the dryer as often as necessary.

Very wet bees’ wings can build up on the upper sections of the dryer causing several issues. Accumulations near the inlet moisture sensor can cause faulty readings of the inlet moisture.

Very high moisture corn will generate large amounts of steam exiting the dryer. Buildup of ice on the fan blades can occur on very cold days causing over ramping of the blower motors and dryer shutdowns.

**WHITE CORN / FOOD GRADE**

DIFFICULTY: 

DRIYING TEMP: 130-160°F (54-60°C)

NOTES:
Grains that are highly susceptible to stress cracking are well suited to the NECO dryer. Similar to corn, white corn dries well. Slow cooling is the most critical factor with these grains to avoid stress cracking.

Reduce burner temperatures to 130-140°F (54-60°C) and slow the rate of cooling. With multiple burner dryers, the upper temperatures may be able to run slightly hotter. Stagger the temperatures to slowly reduce kernel temps as the grain progresses through the dryer.

CONCERNS:
Bees’ wings or “white” dogs will be present during drying and worse with high moisture corn. Cleanup in and around the dryer as often as necessary.

On very warm days use as many cooling floors as possible or run the dryer with reduced temperatures in an All-Heat mode and slow cool in the bin with properly sized aeration fans.

CAUTION - on extremely cold days, the outside cooling air will likely be too cool. The kernels will shrink too quickly and stress cracks will form. Consider slow cooling in the bin. If using the entire bottom section for cooling, run this burner at a low temperature like 80-90°F (27-32°C).

NOTES TO THE READER:
The information presented here should be considered suggestions only and do not constitute any guarantee of drying performance in your dryer.

The NECO Continuous Flow Grain Dryer is one of the most flexible and robust dryers on the market, but keep in mind that every crop, hybrid, and drying condition is different and vary from season to season. Every drying situation is unique and careful evaluation and planning should be given to each situation.

WARNING:
High temperature grain dryers utilize many moving parts and fuel trains supplying combustible fuel to the burners. It is critical to work safely around the dryer and keep an eye on changing conditions. Dryers and the area around them should be kept clean. Dryers and their supporting equipment should be properly maintained at all times.

All power to the dryer must be locked-out and tagged-out before any work is performed. Even without power, extreme caution should be exercised when working inside of the dryer.

For any questions, please call the NECO factory at 402-453-6912 or send an email to service@necodryers.com.
WHEAT

DIFFICULTY: OOOOO
DRYING TEMP: 190°F (82°C) or lower

NOTES:
Wheat should be dried at slightly lower temperatures than corn – perhaps 180°F (82°C) to achieve highest quality.

Wheat will dry quite easily and sometimes will move through the dryer so quickly that the unload will have problems keeping up.

CONCERNS:
If wheat gets above 28% moisture – watch the quality closely. It may need to run in two passes. Too high of temperatures used on very high moisture wheat can damage the quality.

High moisture wheat that is full of debris can be "sluggish" as it moves through the dryer. Perform periodic inspections to make sure grain columns are moving.

BARLEY / OATS

DIFFICULTY: OOOOO
DRYING TEMP: 160-170°F (71-77°C)

NOTES:
Barley and oats run well in a NEO dryer but bearded barley especially can hang up in the dryer. Reduce burner temperatures to 160-170°F (71-77°C).

Check regularly to make sure the grain is moving through the dryer. Look in each of the lower ducts for grain movement. There might be bridging that is keeping the column from moving freely.

CONCERNS:
If working on the outside of the dryer - blockages in the upper ducts can be removed while the dryer is running. If the blockage seems to be in the bottom duct, stop the unload and lockout the machine before trying to work with the metering rolls. If you need to access the ducts inside the dryer, stop the dryer and lockout the machine.

As incoming barley or oats gets dryer, it can get quite light and fail to engage the fill switch to shut down the filling equipment. Lower the adjustable height rotary switch into the grain or consider adding paddle extensions to better engage the grain mass.

If the incoming grain contains large amounts of chaff, consider pre-cleaning or view the section on Special Harvest Situations – EXCESS CHAFF.

SOYBEANS

DIFFICULTY: OOOOO
DRYING TEMP: 140-145°F (60-63°C)

NOTES:
Reduce drying temperatures to 140-145°F (60-63°C). If having problems with seed coat cracking, use slow cooling techniques (see WHITE CORN). Oilseed crops should not be left unattended while drying.

CONCERNS:
The plenum area can get a buildup of “fuzz” that needs to be cleaned each day. Soybeans can be quite “trashy”. Bean pods can build up in corners of the dryer causing blockages and “hot spots”.

This lighter material (seed pods) can build up in the dryer to the outside ends of the dryer at the very top (viewed from inside the plenum top section). Every couple of days – turn off the fill equipment until the grain level falls below the low dryer switch. Refill the dryer and continue drying. This will help “flush” some of this material through the dryer. If in doubt, it is a best practice to simply empty the dryer to remove the excess material, refill the dryer, and resume drying.

Leafy material can be pulled into the blowers and ignited at the burner. On very windy days, watch for this issue. Consider drying on a different day.

SORGHUM / MILLET

DIFFICULTY: OOOOO
DRYING TEMP: 130-140°F (54-60°C)

NOTES:
Sorghum or milo dries relatively well if caution is used. Reduce drying temperatures to 130-140°F (54-60°C).

CONCERNS:
Sorghum can be quite “trashy” with chaff and debris. Buildup in the corners of the dryer can cause blockages and “hot spots”.

This lighter material can build up in the dryer to the outside ends of the dryer at the very top (viewed from inside the plenum top section). Every couple of days – turn off the fill equipment until the grain level falls below the low dryer switch. Refill the dryer and continue drying. This will help “flush” some of this material through the dryer. If in doubt, it is a best practice to simply empty the dryer to remove the excess material, refill the dryer, and resume drying.

Leafy material can be pulled into the blowers and ignited at the burner. On very windy days, watch for this issue. Consider drying on a different day.

If coming off the field very wet, too much heat in the upper sections can cause auto-ignition problems. Very wet sorghum as been known to auto-ignite in the grain carts. Reduce heat to the upper section and make sure the grain is getting plenty of air – especially in the wet bin.
CONTINUOUS MIXED-FLOW GRAIN DRYER – GRAIN DRYER

7. APPENDIX

EDIBLE BEANS

DIFFICULTY: 
DRYING TEMP: 120-130°F (49-55°C)

NOTES:
The NECO mixed flow dryer is well suited for the gentle drying required with edible beans. Reduce temperatures to 120-130°F (49-55°C) to keep seed coat from cracking or discoloring. At this point the handling of the product needs to be considered.

CONCERNS:
Augers should be slowed down with a pulley change or VFD to keep them running as full as possible. Smaller VFDs can be installed in the main cabinet. Larger VFDs should be installed in a secondary cabinet to reduce electrical noise to components in the main cabinet.

If having problems with seed coat cracking, use slow cooling techniques (see WHITE CORN).

Consider purchasing poly float for even better results – or consider the option of a drag unload with VFD. Some customers have installed after market belt conveyors.

RAPE / CANOLA

DIFFICULTY: 
DRYING TEMP: 130-140°F (54-60°C)

NOTES:
Rape seed or canola will dry relatively trouble free – but special conditions apply. Reduce burner temperatures to 130-140°F (54-60°C). Rape seed should not be dried unattended due to its oil content. Rape has numerous varieties. Those with very high oil content should NOT be dried unattended.

CONCERNS:
Material can fly out of the ducts at the top corners for the dryer. These ducts may need to be partially blocked with duct cover (7735095). Contact the NECO factory to determine if a Small Grains Kit might be applicable to your situation. Or the air can be slowed slightly with a pulley change or even a VFD on the blower motor – but anytime the airflow is reduced, the operator should check to make sure they are still achieving good flame quality. If using a VFD, install the equipment in a secondary cabinet to reduce electrical noise to components in the main cabinet.

If the rape seed gets above 24% - watch quality closely. It may need to run in two passes. If the rape seed or canola has excess chaff – see the section on Special Harvest Situations – EXCESS CHAFF.

RICE

DIFFICULTY: 
DRYING TEMP: 115-125°F (46-52°C) NIGHT
105-115°F (41-46°C) DAY

NOTES:
Rice can be quite difficult to dry. Most operators will bring rice to the dryer around 19-22% moisture. The dryer should be set to run in all heat (without cooling). Drying temperatures should be set at 115-125°F (46-52°C) in the nighttime and 105-115°F (41-46°C) in the daytime hours.

CONCERNS:
Rice can only be brought down approximately 3-4 points in moisture at a time. More than this and the kernel may shrink too quickly causing internal stress cracking. Some customers have reported success removing 7 points in one pass but complete drying data was not available.

Partially dried rice should be stored in bins with fan aeration and left at least 24 hours to temper. At that point, a decision can be made to leave it in aeration or bring it back through the dryer for a second pass. Rice can also see some moisture rebound in the bin. Final moisture should be brought to 12.5-13.0%. If rice is already less than 18%, consider an air-only pass.

Rice hybrids can be caustic and produce significant upset. Watch very closely the leveling augers if equipped and discharge auger wood bearings. Wood bearings may need to be rotated after only a short while.

SUNFLOWER

DIFFICULTY: 
DRYING TEMP: 120-130°F (49-55°C)

NOTES:
Sunflowers present the greatest challenge in a high temperature dryer. Because it is an oil seed with a large surface area, it could ignite if subjected to high temperatures for long periods of time. Reduce drying temperature to 120-130°F (49-55°C). Sunflower seeds should NEVER be dried unattended.

CONCERNS:
Sunflowers can be one of the dirtiest crops. The plenum area can get a buildup of “fuzz” that needs to be cleaned each day. Lighter material can build up in the dryer to the outside ends of the dryer at the very top (viewed from inside the plenum top section). Every couple of days – turn off the filling equipment until the grain level falls below the low dryer switch. Refill the dryer and continue drying. This will help “flush” some of this material through the dryer.

If in doubt, it is a best practice to simply empty the dryer to remove the excess material, refill the dryer, and resume drying.

(See CONCERNS continued on next page)
7. APPENDIX

APPENDIX CONTINUOUS MIXED-FLOW GRAIN DRYER – GRAIN DRYER

SUNFLOWER

DIFFICULTY:

DRYING TEMP:
120-130°F (49-55°C)

CONCERNS (CONTINUED):
The seeds can start lifting out of the ducts as they get dryer at the bottom. It may be necessary to restrict the airflow by blocking ducts with duct cover (7715095). Contact the NECO factory to determine if a Small Grains Kit might be applicable to your situation. Or the air can be slowed slightly with a pulley change or even a VFD on the blower motor—but anytime the airflow is reduced, the operator should check to make sure they are still achieving good flame quality. If using a VFD, install the equipment in a secondary cabinet to reduce electrical noise to components in the main cabinet.

On very windy days, make sure floating material is not being pulled back into the blower inlets. If possible, stop drying until calmer conditions are met.

As a last note – sunflowers have one of the highest moisture-rebound rates. It might be necessary to dry to a couple points under the desired setpoint before putting into the bins.

SPECIALTY CROPS

OTHER SPECIALTY CROPS:
The NECO dryer has been used to dry many other specialty crops including radish seed, mustard seed, sesame seed, grass seed, grape seed, chickpeas and even some nuts - like hazelnuts. Drying data was not available in all instances.

Use caution and start slowly until you have learned the best techniques to use in your instance.

Begin at a lower temperature and work your way up to a point where you are comfortable.

Always remember the crop needs to be free flowing, relatively clean of debris and foreign material.

Always maintain a clean dryer and a clean working area around the dryer.

For any questions, please call the NECO factory at 402-453-6932 or send an email to service@necedorysers.com.

HARVEST SITUATIONS

SPECIAL HARVEST SITUATIONS:

EXCESS BULK MATERIAL
During difficult harvest seasons, it is very common to speed up the combines to shorten the harvest. This often results in excess corn cobs, stalks, leafy material and the like. This situation can be common with certain types of harvest machines – no matter the speed.

Keep in mind any dryer is designed to dry free flowing grains and not bulky material (cobs, stalks, leaves) that may bridge. Material that is not free flowing may plug up a dryer and restrict the free movement of the grain.

Material that is hung up in the dryer will eventually dry to the point it becomes a hazard. If the grain is full of this material - regularly inspect random sections of the dryer to ensure the grain is free flowing. If in doubt – it is a best practice to empty the dryer and inspect for the presence of this material. Clean the dryer, refill the dryer and resume drying.

Consider putting grain with excess bulky material through a scalper or pre-cleaner before bringing it to the dryer. The grain will flow better, the potential for bridging will be reduced, and you will not be paying to dry the bulk material.

HARVEST SITUATIONS

SPECIAL HARVEST SITUATIONS:

EXCESS CHAFF
Crops that come to the dryer with an excess amount of chaff will cause similar hazards.

Chaff is lighter than grain and will “float” on top of the flowing grain – remaining somewhat stationary and accumulating over time. This can happen anywhere in the dryer.

A tell-tale sign of excess chaff would be the buildup in the heat ducts where the constant flow of air will push it to the sidewall of the dryer. Over time this material will over dry and become a hazard. If the grain is full of this material - regularly inspect random sections of the dryer to ensure there is no build-up of chaff in the heat ducts. If in doubt – it is a best practice to empty the dryer to remove this material. Clean the dryer, refill the dryer and resume drying.

It might be possible to stop drying and simply run the unloads for 15-20 minutes to see if this material will be drawn into the mass of flowing grain. Recheck for the excess chaff condition and if in doubt - empty the dryer completely, refill the dryer and resume drying.

Consider putting material with excess chaff through a pre-cleaner prior to bringing it to the dryer. The grain will flow better, the potential for hot spots will be reduced, and you will not be paying to dry chaff.
7.12.2 *Measuring Actual Seed Temperatures*

**Note**
Putting a thermometer directly in the dryer only gives the temperature of the air between the kernels and not the correct temperature of the actual kernels.

When operating in batch mode:

- To determine correct kernel temperature, take a sample from a duct at the lower part of the heating section.
- Put into an insulated (covered) container, with a thermometer directly in the grain.
- After 10 minutes record the temperature reading.
8. Compliance

Declaration of Conformity
Konformitätserklärung

Nebraska Engineering Company (NECO)
a Division of Ag Growth International (AGI)
9364 North 45th Street
Omaha, NE 68152 USA
Phone: 402-453-6912

Continuous Flow Grain Dryer, 380V 3PH 50Hz

Models: K600CE, K700CE, K800CE, K900CE

Conforms to applicable requirements of directive 2006/42/EC
In Übereinstimmung mit der Richtlinie des Rates 2006/42/EC

Omaha, NE USA
# 9. Limited Warranty

For a period of one (1) year after shipment of goods by the Buyer to the Buyer’s customer, NECO will supply, free of charge, FOB per NECO’s factory located in Omaha, Nebraska, replacement parts for any parts that NECO identifies to be defective due to workmanship or material.

- This limited warranty does not extend to parts that wear due to normal operation and need to be replaced periodically.
- Goods not manufactured by NECO carry only their manufacturer’s warranty.
- This undertaking is in lieu of all other warranties, expressed or implied, including merchantability and fitness for a particular purpose.
- You must obtain a “Return Authority” form NECO prior to returning any defective goods. Those defective goods must be returned, freight-prepaid, to the NECO factory in Omaha, NE. See the back cover of this manual for complete address information.
- NECO reserves the right to make changes or improvements to products and goods without incurring any obligation with respect to previously manufactured products.
- Failure to follow the instructions contained in this manual, as well as the existence of any of the conditions listed below, will cause this Limited Warranty to be null and void:
  1. Improper assembly.
  2. Improper installation, including power and wiring.
  3. Unauthorized alteration of the product or components therein.
  4. Operation of the unit when repairs are needed.
  5. Use of unauthorized parts.
  6. Operation by children or uninstructed personnel.
  7. Processing of materials that are abrasive, that do not flow freely, or that are otherwise unsuited for processing in farm equipment.
  8. Misuse of the equipment or any of its components.
  9. Damage due to negligence, abuse, or accidents.

## LIMITATION OF LIABILITY

- Buyer agrees that in no event shall NECO have liability for direct damages in excess of the contract price of the goods for which the claim is made.
- Buyer further agrees that in no event shall NECO have liability for loss of use, loss of profits, or for any indirect, incidental, or consequential damages on any claim of any kind.