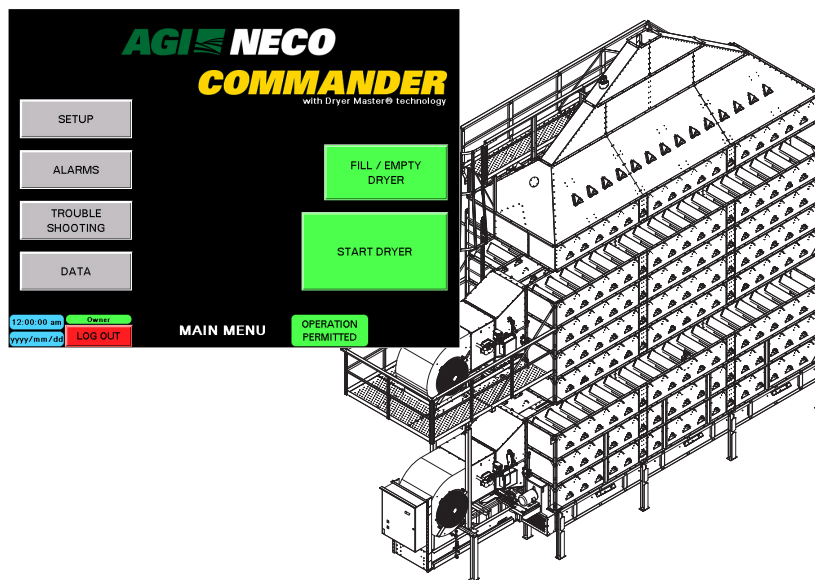


Continuous Mixed-Flow Grain Dryer

Grain Dryer Operator's Manual

This manual applies to the following models:

D1660, D1670, D1680, D1690, D16106, D16120, D16140, D16160
D24108, D24150, D24180, D24210, D24240, D24260, D24330, D24380
D32260, D32340, D232440, D32500



Read this manual before using product. Failure to follow instructions and safety precautions can result in serious injury, death, or property damage. Keep manual for future reference.

Part Number: 7713395 R3

Revised: March 2023

Original Instructions

CONTENTS

- 1. Introduction 5**
 - 1.1 Product Information 5
 - 1.2 Intended Use 6
 - 1.2.1 Misuse 6
- 2. Safety..... 7**
 - 2.1 Safety Alert Symbol and Signal Words..... 7
 - 2.2 General Safety Information..... 7
 - 2.3 Overhead Power Lines 7
 - 2.4 Grain Dryer Safety 8
 - 2.5 Gas Leak Hazards..... 9
 - 2.6 Guards Safety 9
 - 2.7 Drives and Lockout/Tagout Safety 9
 - 2.7.1 Electric Motor Safety..... 10
 - 2.8 Personal Protective Equipment..... 10
 - 2.9 Safety Equipment 11
 - 2.10 Safety Decals 11
 - 2.11 Decal Installation/Replacement..... 11
 - 2.12 Safety Decal Locations and Details 11
- 3. Features..... 18**
 - 3.1 Grain Cooling System (optional) 18
- 4. Operation 20**
 - 4.1 Operation Safety 20
 - 4.2 Equipment Pre-Check..... 21
 - 4.3 Commander Control Setup 23
 - 4.3.1 Before Logging In 23
 - 4.3.2 Logging In and Out 25
 - 4.3.3 Setting Up the Main Screen 29
 - 4.3.4 NECO Entered Setup Data..... 30
 - 4.3.5 Dealer or Customer Entered Setup Data 33
 - 4.4 Operation Overview 37
 - 4.4.1 Example A: Batch Drying 39
 - 4.4.2 Example B: Auto Drying 40
 - 4.4.3 Example C: Combined 41
 - 4.4.4 Plenum Door Safety Switch..... 42
 - 4.5 Fill/Empty Dryer 43
 - 4.6 Start Dryer 47
 - 4.6.1 Start Dryer Overview..... 47
 - 4.6.2 Completion of Dryer Setup 52
 - 4.6.3 Starting Batch Drying 53
 - 4.7 Batch Drying Mode..... 54
 - 4.7.1 Batch Drying Overview..... 54
 - 4.8 Auto Drying Mode 58
 - 4.8.1 Auto Drying Pre-Conditions 58
 - 4.8.2 Auto Drying Overview 59
 - 4.8.3 Slide Gate Adjustment 64
 - 4.8.4 Moisture Calibration 67

4.9 Data and Graphs Screens	68
4.9.1 Data Screen	68
4.9.2 Performance Data Graphs.....	69
4.10 Emergency Shutdown Procedure.....	71
5. Maintenance	73
5.1 Maintenance Safety	73
5.2 Maintenance Overview	73
5.3 Burner Gas Ports	74
5.4 Solenoid Valves	74
5.5 Lubrication.....	75
5.6 Motors	75
6. Troubleshooting.....	76
6.1 Solutions Table	76
6.2 HMI Troubleshooting Screens.....	80
7. Specifications	86
7.1 Standard Model Specifications	86
8. Appendix	88
8.1 Manual Dryer Speed.....	88
8.2 PLC and HMI Recorded Data Sheet.....	90
8.3 Updating the PLC and HMI Programs	91
8.4 Honeywell Burner Control Fault Codes.....	93
8.5 KS45 & TB45 Controller LEDs	95
8.6 Dryer Temperature Considerations	100
8.7 Grain Drying Tips	101
8.7.1 Specific Crops	101
8.7.2 Measuring Actual Seed Temperatures.....	105
9. Compliance.....	106
10. Limited Warranty.....	107

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 dryer parts or requesting service. Please record the product information in the table below for easy reference.

Local Dealer's Name and Address:	_____	Phone:	_____
	_____		_____
	_____		_____
Local Contractor's Name:	_____	Phone:	_____
Service Contractor's Name:	_____	Phone:	_____
Purchase Date:	_____	Installation Date:	_____
Model Number:	_____	Serial Number:	_____
Fuel Type:	_____	Number of Blowers:	_____
Wiring Diagram Drawing Number:	_____		

Figure 1. Dryer Rating Label — CE

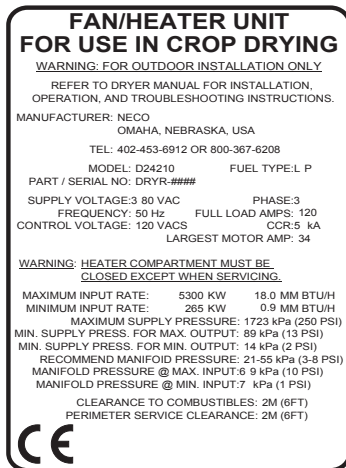


Figure 2. Dryer Rating Label — CSA

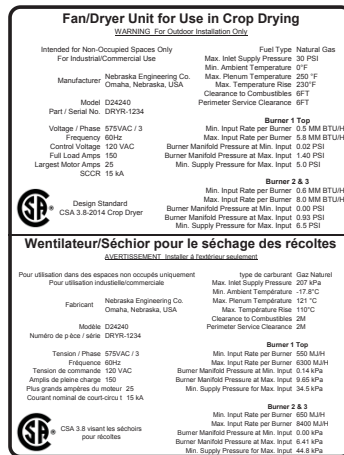
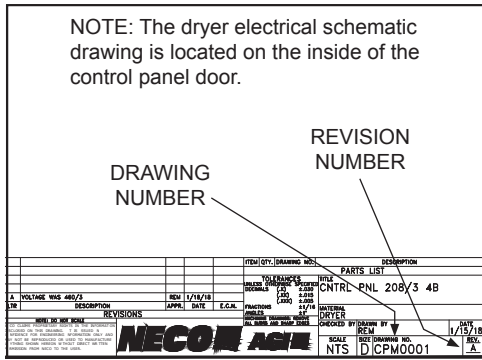


Figure 3. Dryer Rating Label — Domestic



Figure 4. Electrical Schematic Drawing



To register your grain dryer, scan the following QR code, or call AGI NECO at 402-453-6912. For SureTrack Dryer Manager registration, see the instructions included with the SureTrack gateway or call 855-835-5231.



1.2. Intended Use

The 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.

Intended use for the grain dryer

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

1.2.1 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

WARNING

- 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.
- Electrocuting can occur without direct contact.



2.4. Grain Dryer Safety

⚠ WARNING

- 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 contaminants, 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. Guards Safety

- ### **WARNING**
- Keep guards in place. Do not operate with guard removed.
 - Do not walk on, step on, or damage guards.
 - Lock out power before removing a guard.
 - Ensure all guards are replaced after performing maintenance.

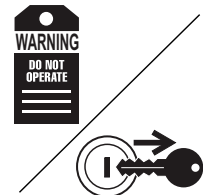
2.7. Drives and Lockout/Tagout Safety

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.

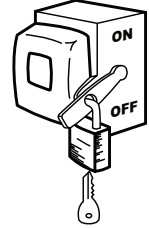


2.7.1 Electric Motor Safety

WARNING 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.

SERVICE DISCONNECT



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**



Wear safety glasses at all times to protect eyes from debris.

- **Steel-Toe Boots**



Wear steel-toe boots to protect feet from falling debris.

- **Coveralls**



Wear coveralls to protect skin.

- **Work Gloves**



Wear work gloves to protect your hands from sharp and rough edges.

- **Hard Hat**



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 decals 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

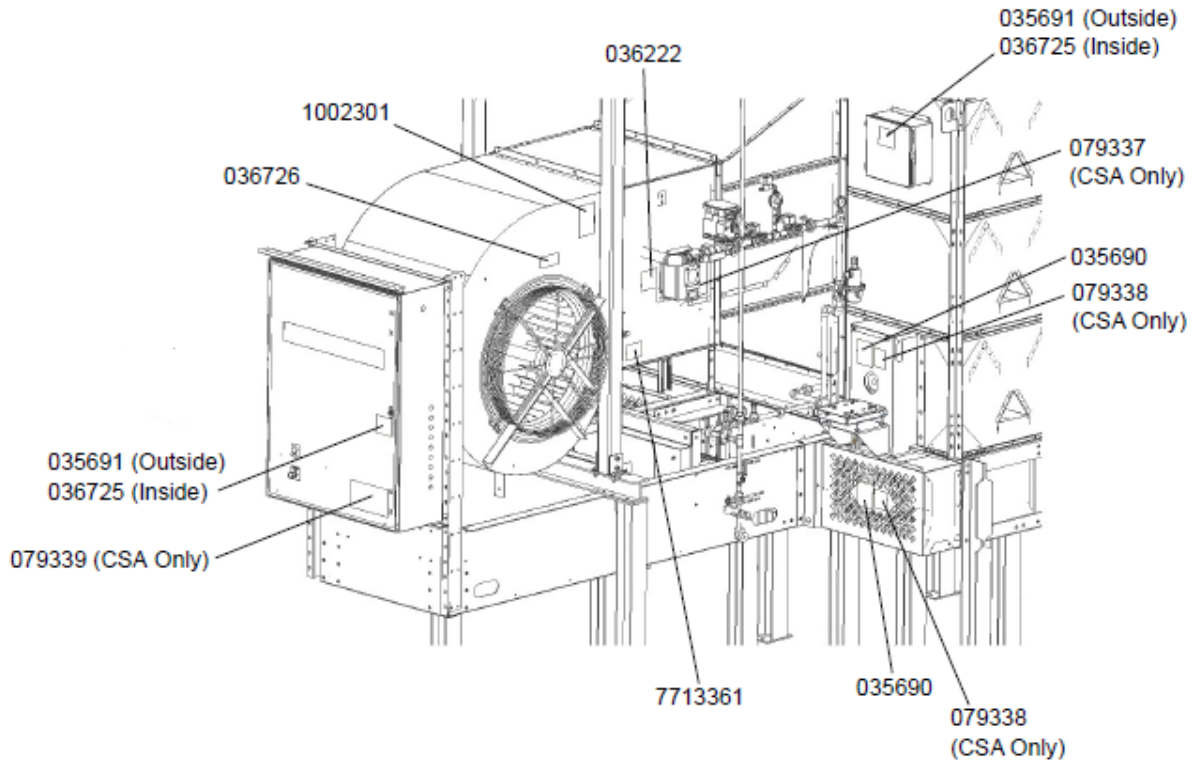


Figure 6. Front Right Dryer Safety Decal Locations

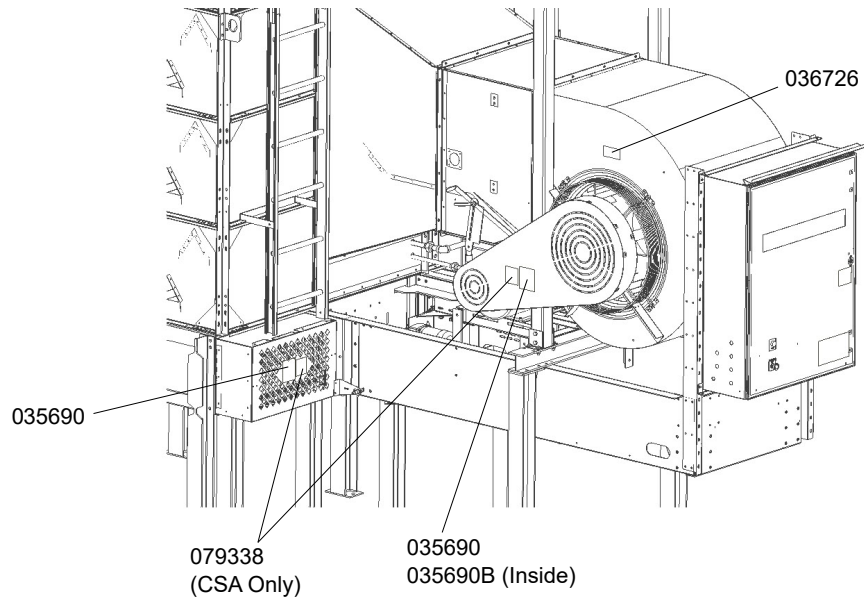


Figure 7. Drag Unload Safety Decal Locations

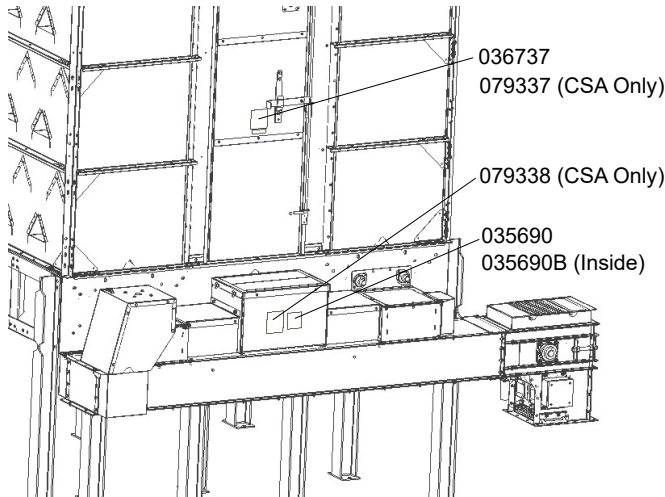


Figure 8. Auger Unload Safety Decal Locations

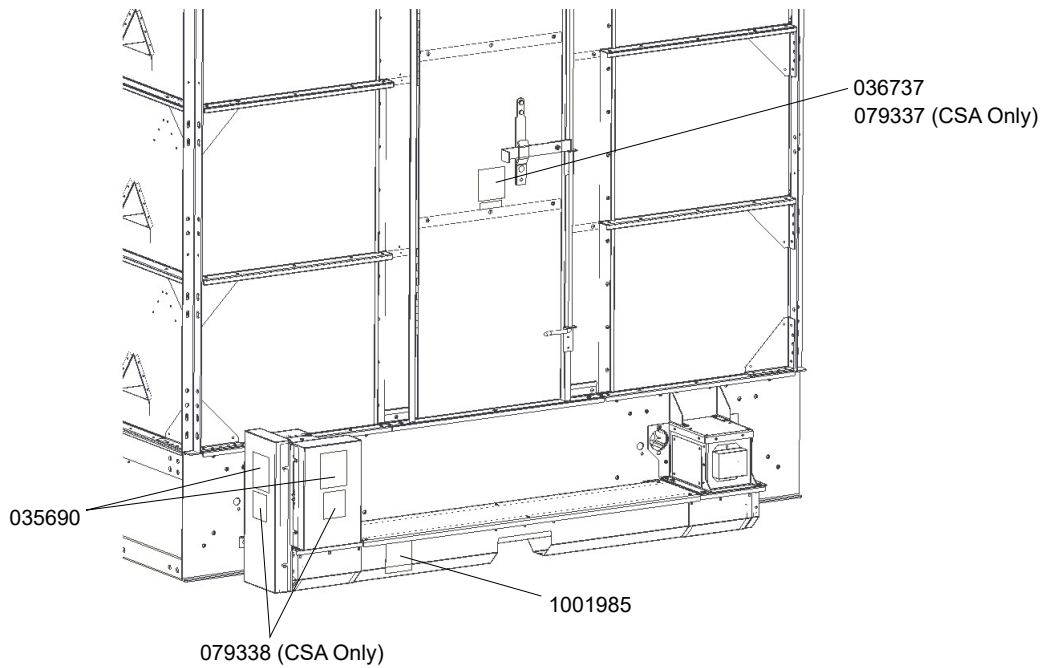


Figure 9. Door Safety Decal Locations

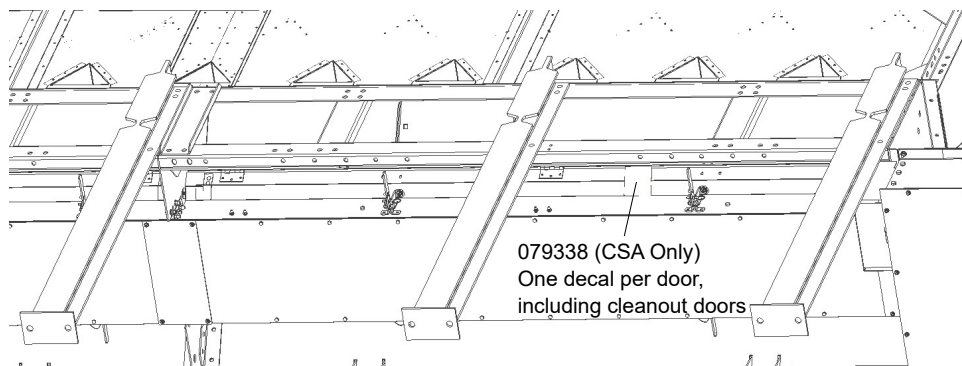


Table 1. Safety Decal Details — CSA
















<p style="text-align: center;">036726</p> <div style="border: 1px solid black; padding: 5px;">  <div style="display: inline-block; vertical-align: top; margin-left: 10px;"> <p>⚠ WARNING</p> <p>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.</p> </div> </div>	<p style="text-align: center;">035691</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">HIGH VOLTAGE</p> <p>To prevent serious injury or death, turn off and lock out power before servicing.</p> </div>	<p style="text-align: center;">036725</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ DANGER</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">HIGH VOLTAGE</p> <p>To prevent serious injury or death, turn off and lock out power before servicing.</p> </div>
<p style="text-align: center;">7713361</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #008000; color: white; margin: -5px -5px 5px -5px;">SAFETY INSTRUCTIONS</p> <p>For proper operation:</p> <ul style="list-style-type: none"> • 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. </div>	<p style="text-align: center;">036222</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">BURN HAZARD</p> <p>To prevent burns from high temperature flame:</p> <ul style="list-style-type: none"> • Keep door closed when operating. • Lock out power before opening inspection door. </div>	<p style="text-align: center;">035690</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">ENTANGLEMENT HAZARD</p> <p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> • 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. </div>
<p style="text-align: center;">036737</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ffff00;">⚠ CAUTION</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">DO NOT TOUCH!</p> <p>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.</p> </div>	<p style="text-align: center;">1001985</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center; background-color: #ff0000; color: white;">⚠ DANGER</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">ROTATING FLIGHTING HAZARD</p> <p>To prevent death or serious injury:</p> <ul style="list-style-type: none"> • KEEP AWAY from rotating auger flighting. • Shut off and lock out power before removing cover or servicing. </div>	<p style="text-align: center;">1002301</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;">⚠ WARNING</p> <div style="display: flex; justify-content: space-around;">   </div> <p>To prevent serious injury or death:</p> <ul style="list-style-type: none"> • 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. • Lock out power before performing maintenance. • If the manual, guards, or decals are missing or damaged, contact factory or representative for free replacements. </div>

Table 1 Safety Decal Details — CSA (continued)

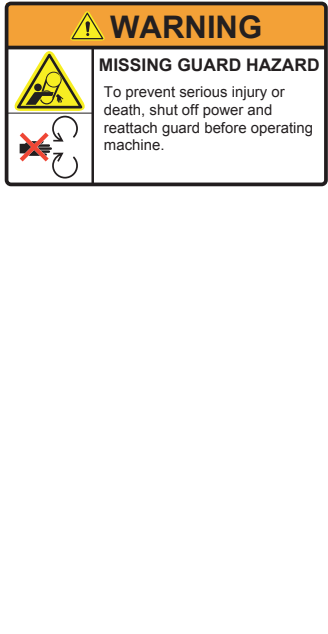
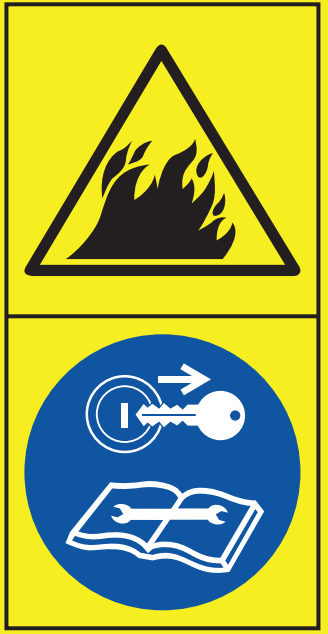
<p style="text-align: center;">079338</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> WARNING</p> <p>To avoid injury from moving parts, disconnect power to the equipment before (removing, opening) this (cover, door).</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> AVERTISSEMENT</p> <p>Pour éviter les blessures attribuables aux pièces mobiles débrancher l'appareil avant (de retirer, d'ouvrir) (ce couvercle, cette porte).</p> </div>	<p style="text-align: center;">079339</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> WARNING AVERTISSEMENT</p> <p>If the information in the manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.</p> <p>Si les informations données dans le mode d'emploi ne sont pas respectées à la lettre, un incendie ou une explosion pourrait survenir et entraîner des dommages matériels, des blessures ou la mort.</p> <ul style="list-style-type: none"> • DO NOT store or use gasoline or other flammable vapours and liquids in the vicinity of this or any other appliance. • Ne pas entreposer ni utiliser d'essence ou autres vapeurs ou liquides inflammables à proximité de cet appareil ou de tout autre appareil. <p>• WHAT TO DO IF YOU SMELL GAS</p> <ul style="list-style-type: none"> • DO NOT try to light any appliance. • DO NOT touch any electrical switch. • Immediately call your gas supplier, call the fire department. <p>• Quoi faire si vous sentez une odeur de gaz</p> <ul style="list-style-type: none"> • N'allumez aucun appareil ; • Éteindre toutes les flammes nues ; • Ne touchez à aucun interrupteur ; • Appelez immédiatement votre fournisseur de gaz. Suivez les instructions du fournisseur de gaz ; • Si vous ne pouvez rejoindre le fournisseur, appelez le service des incendies. <p>• Installation and service must be performed by a qualified installer, service agency or the gas supplier.</p> <p>• L'installation et les réparations doivent être confiées à un installateur ou un réparateur qualifié ou au fournisseur de gaz.</p> <p>FOR YOUR SAFETY - The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.</p> <p>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.</p> <p>Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.</p> <p>Une installation, un réglage, une modification, une réparation ou un entretien inadéquats peuvent entraîner des dommages matériels, des blessures ou la mort. Lire attentivement les instructions d'installation, de fonctionnement et d'entretien avant de procéder à l'installation ou à la réparation de cet appareil.</p> </div>		
<p style="text-align: center;">035690B</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> WARNING</p> <div style="display: flex; align-items: center;"> <div> <p>MISSING GUARD HAZARD</p> <p>To prevent serious injury or death, shut off power and reattach guard before operating machine.</p> </div> </div> </div>	<p style="text-align: center;">079337</p> <div style="border: 1px solid black; padding: 5px;"> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;"> <p style="text-align: center;"> WARNING</p> <p>This compartment must be closed except when servicing.</p> </td> <td style="width: 50%; padding: 5px;"> <p style="text-align: center;"> AVERTISSEMENT</p> <p>Ce compartiment doit être fermé sauf pendant une réparation.</p> </td> </tr> </table> </div>	<p style="text-align: center;"> WARNING</p> <p>This compartment must be closed except when servicing.</p>	<p style="text-align: center;"> AVERTISSEMENT</p> <p>Ce compartiment doit être fermé sauf pendant une réparation.</p>
<p style="text-align: center;"> WARNING</p> <p>This compartment must be closed except when servicing.</p>	<p style="text-align: center;"> AVERTISSEMENT</p> <p>Ce compartiment doit être fermé sauf pendant une réparation.</p>		

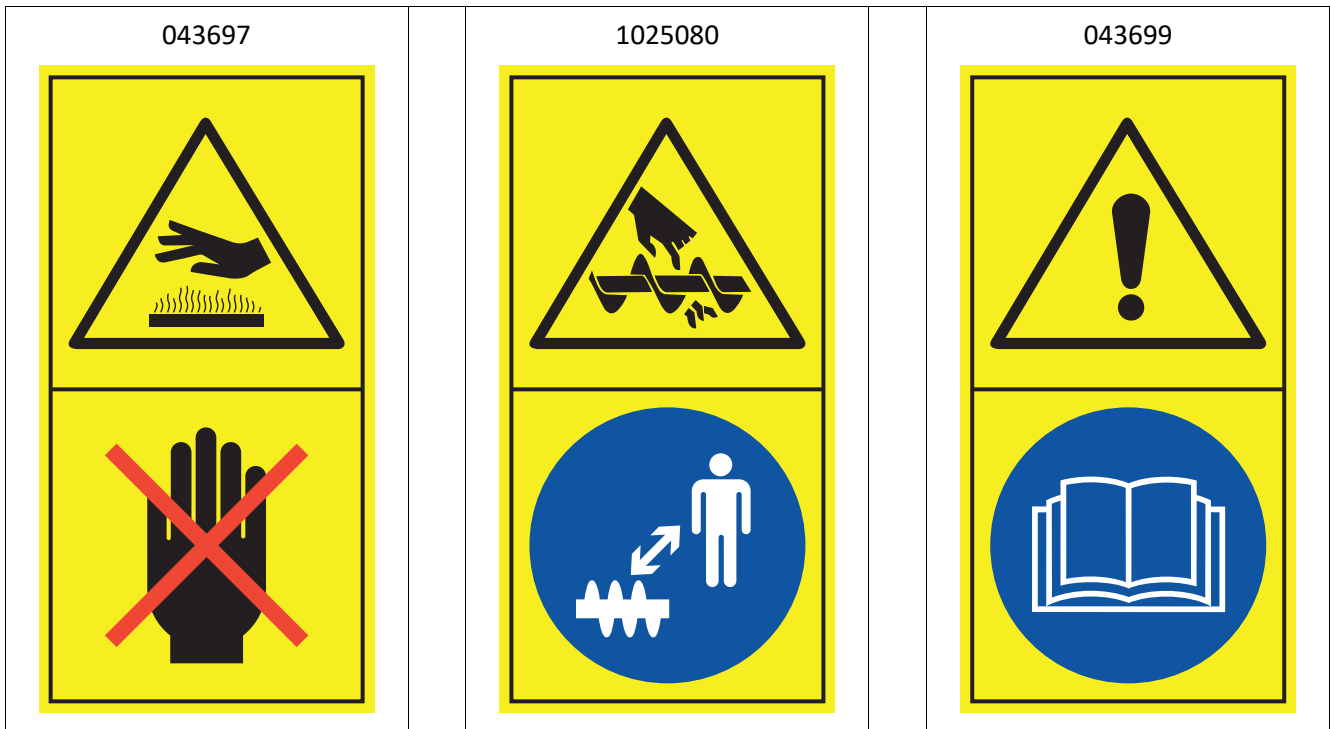
Note

The towing label is only used on certain models that can be safely towed.

<p style="text-align: center;">040220</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> DANGER</p> <div style="display: flex; align-items: center;"> </div> <p style="text-align: center;">ELECTROCUTION HAZARD</p> <p>To prevent death or serious injury when operating or moving, keep equipment away from overhead power lines and devices.</p> <p>This equipment is not insulated.</p> <p>Electrocution can occur without direct contact.</p> </div>
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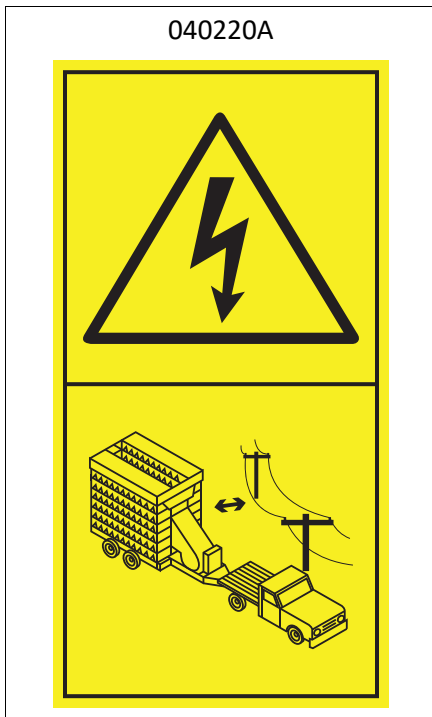
Table 2. Safety Decal Details — CE

<p style="text-align: center;">036726A</p> 	<p style="text-align: center;">043695</p> 	<p style="text-align: center;">035690A</p> <div style="border: 1px solid black; padding: 5px;"> <p style="text-align: center;"> WARNING</p> <p>MISSING GUARD HAZARD</p> <p>To prevent serious injury or death, shut off power and reattach guard before operating machine.</p> </div> 
<p style="text-align: center;">7713361</p> <div style="border: 1px solid black; padding: 5px;"> <p style="background-color: #006666; color: white; padding: 2px;">SAFETY INSTRUCTIONS</p> <p>For proper operation:</p> <ul style="list-style-type: none"> • 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. </div>	<p style="text-align: center;">043696</p> 	<p style="text-align: center;">035690A</p> 



Note

The towing label is only used on certain models that can be safely towed.



3. Features

Read this section to familiarize yourself with the basic component names and functions of the grain dryer.

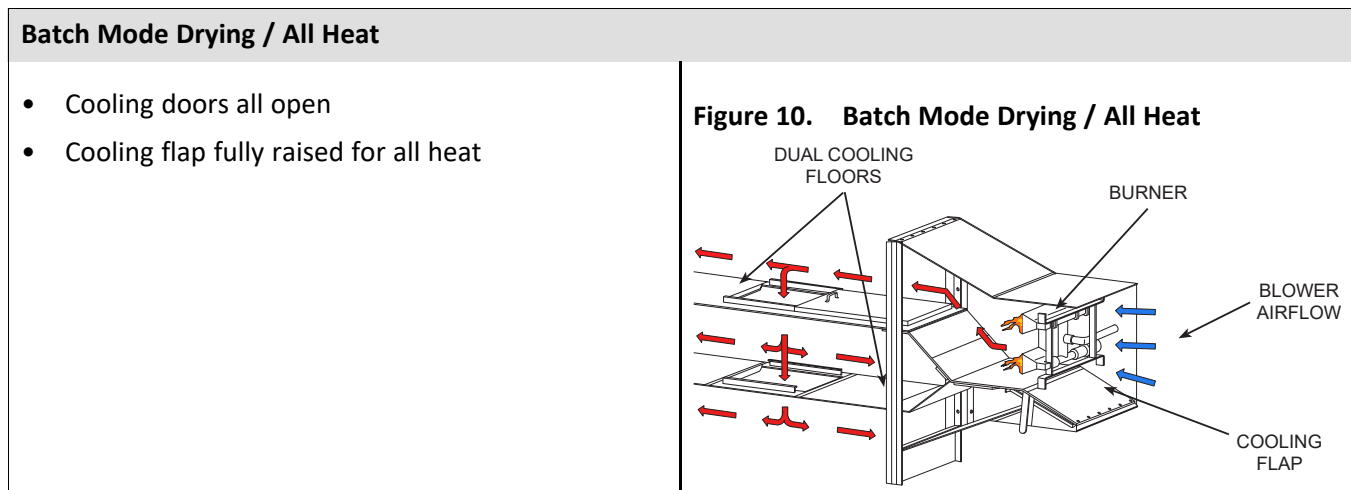
3.1. Grain Cooling System (optional)

In this Section:

- Overview of Batch Mode Drying/All Heat
- Overview of Continuous Mode Drying / with Cooling

Overview

- An optional grain cooling system with either one or two cooling floors can be supplied with the dryer. Each of the cooling floors has door openings spaced evenly along the length of the dryer. The operator has several grain cooling options from which to choose.
- The cooling floor(s) work in combination with a manually positioned cooling flap that can direct a portion of the blower system airflow. The cooling flap is in-line with the position of the exterior handle so that the operator can tell at a glance where the cooling flap is positioned. The handle position should be secured with the locking system.
- The cooling flap position determines the amount of cooling air that reaches the grain. Moving the handle down lowers the cooling flap and increases the cooling. To decrease the cooling, move the handle up. To shut off the cooling move the handle all the way up.

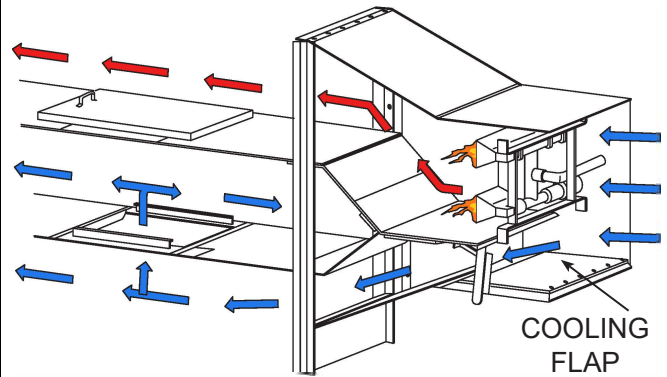


Continuous Mode Drying / with Cooling

- Cooling doors shut in the top cooling floor give two levels of cooling
- Cooling doors in the bottom cooling floor give one level of cooling
- Cooling flap shown closed for maximum cooling

Note

It is common to operate with the cooling flap only partially closed to achieve the desired level of cooling.

Figure 11. Continuous Mode Drying / with Cooling

4. 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.

4.1. Operation Safety

WARNING

- 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.

4.2. Equipment Pre-Check

Important

After completion of assembly and before each use, inspection of the dryer is mandatory. The dryer should be frequently checked and serviced for a trouble-free operation.

Figure 12. New dryer start-up checklist


		NEW DRYER START-UP CHECK LIST					
SERIAL# _____ MODEL# _____ CONTROL TYPE: PLC/SWITCHES _____ PROGRAM VERSION: PLC: HMI: _____			DATE _____ CUSTOMER _____ ADDRESS _____ PHONE # _____				
	COMMENTS						INITIALS
BELTS-TENSION AND ALIGNMENT							
CHAINS-TENSION AND ALIGNMENT							
OIL LEVEL IN GEARBOX							
METERING ROLLS CLEANED OUT							
UNLOAD DOORS CLOSED PROPERLY							
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							
DISCHARGE 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							
BLOWER BELT	SIZE:	QUANTITY:	WET 1	SIZE:	QUANTITY:		
UNLOAD BELT	SIZE:	QUANTITY:	WET 2	SIZE:	QUANTITY:		
LEVEL AUGER	SIZE:	QUANTITY:	DRY 1	SIZE:	QUANTITY:		
			DRY 2	SIZE:	QUANTITY:		
ADDITIONAL COMMENTS							

Figure 13. Pre-season checklist

AGI NECO		Pre-Season Checklist	
SERIAL# _____ MODEL# _____ CONTROL TYPE: PLC/SWITCHES _____ PROGRAM VERSION: PLC: _____ HMI: _____		DATE _____ CUSTOMER _____ ADDRESS _____ PHONE # _____	
	COMMENTS	INITIALS	
INSPECT FOR GAS LEAKS			
BELTS-CONDITION & TENSION			
DRIVE CHAINS-CONDITION & TENSION			
GEAR BOX OIL LEVEL & CONDITION			
CLEAN METERING ROLLS			
BEARINGS ON METERING ROLLS			
BEARINGS ON BLOWER			
BEARINGS ON AUGERS (UNLOAD AND FILL)			
GREASE ALL BEARINGS			
CLEAN BURNER			
CLEAN AIR SWITCH TUBE			
AIRSWITCH ADJUSTMENT (IF NEEDED)			
BACK DOOR SEAL			
THERMOCOUPLE WIRE			
CLEAN VAPORIZER TUBE FINS (LP)			
HIGH LIMIT/THERMOSTAT FUNCTION			
FULL DRYER SWITCH			
LOW DRYER SWITCH			
DISCHARGE PLUGGED SWITCH			
START DRYER AND TEST BURNER			
TEMPERATURE CONTROL			
TEST ALL LIGHTS ON CONTROL PANEL			
BELT INFORMATION--# OF BELTS & SIZES			
BLOWER BELT	SIZE:	QUANTITY:	WET 1 SIZE: QUANTITY:
UNLOAD BELT	SIZE:	QUANTITY:	WET 2 SIZE: QUANTITY:
LEVEL AUGER	SIZE:	QUANTITY:	DRY 1 SIZE: QUANTITY:
			DRY 2 SIZE: QUANTITY:
ADDITIONAL COMMENTS			

4.3. Commander Control Setup

4.3.1 Before Logging In

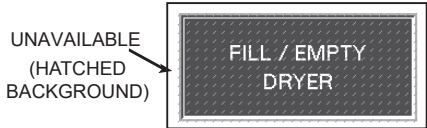
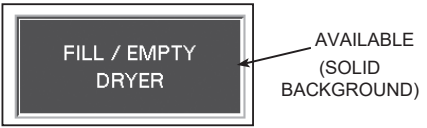

In this Section:

- Temporarily unavailable screens
- Before logging in: Buttons
- Before logging in: USB device
- Before Logging In: Main Screen
- Before Logging In: Version Compatibility

Note

Before logging in, the following controls are unavailable:

- Alarms
- Data
- Fill/Empty Dryer
- Go to Start Dryer

Before Logging In: Buttons	
<ul style="list-style-type: none"> • Active buttons are shaded solid. • Inactive buttons have hatched background pattern. • Some on-screen items are informational only. • Some on-screen items call up screens, sub-screens, or menus. 	<p>Figure 14. Inactive Screen</p>  <p>Figure 15. Active Screen</p> 
Before Logging In: USB Device	
<p>If a The USB device is connected. message appears, click X to clear the message; the Main Menu and Log In buttons display.</p>	<p>Figure 16. USB Device Message</p> 

Before Logging In: Main Screen

Before logging in, the following controls are available:

Setup

Opens the Setup screen. None of the controls on the Setup screen are available until logging in is complete. Click the **Main Menu** button on the **Setup** screen to return to the **Main Menu** screen.

Troubleshooting

Tap the **Troubleshooting** button. NECO and dealer contact information displays on the **Troubleshooting** screen.

The controls on the **Troubleshooting** screen are unavailable until logging in is complete. Tap the **Main Menu** button to return to the **Main Menu** screen.

Figure 17. Main Menu Screen

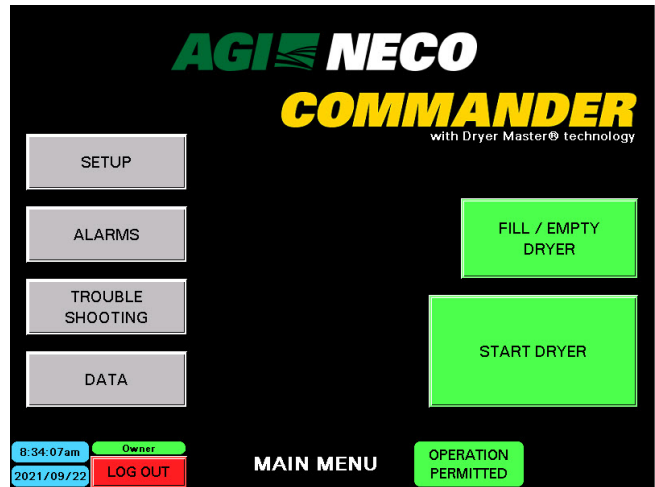
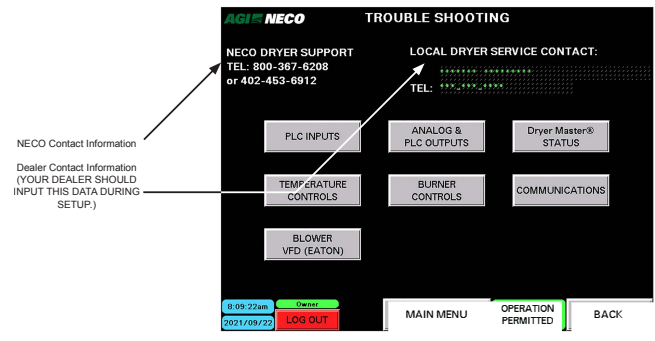


Figure 18. Main Menu Screen: Troubleshooting



Before Logging In: Version Compatibility

The HMI and PLC software version numbers display in the upper-right corner of the Setup screen. These numbers must be compatible.

Figure 19. Versions Compatible (Setup Screen)



4.3.2 Logging In and Out

In this Section:

- Accessing the **Log in to Operate** screen
- Entering Name and Password
- Completing the Log in procedure
- Main menu after Log in
- Verifying Setup information
- Logging out

Tap the **Log in to Operate** button; the **Log In** screen appears with the Name and Password fields.

Figure 20. Log In to Operate

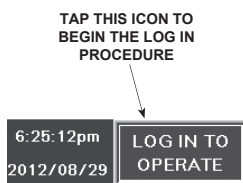
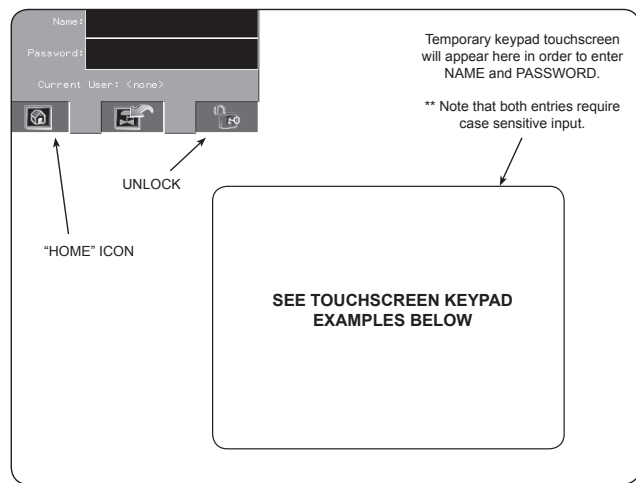


Figure 21. Log In Screen



Enter Name and Password

Note

Name and Password are case-sensitive.

Enter Name

1. Tap the **Name** field box; the alpha-numeric keypad appears.
2. Enter one of the following into the Name field:
 - For basic operations, enter: **USER** (case-sensitive).
 - To access **Setup** configuration, enter: **Owner** (case-sensitive)

Enter Password

1. Tap the **Password** field box; 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, a warning message displays. Tap **X** to re-start the Log In process.

Figure 22. The Alpha-numeric Keypad

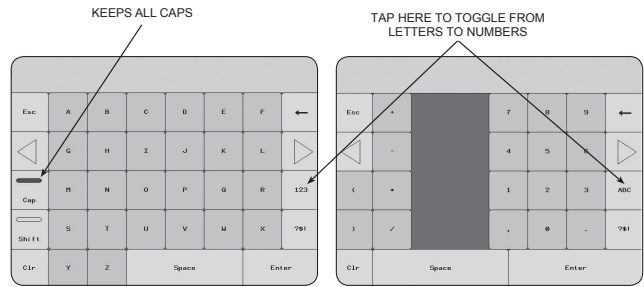
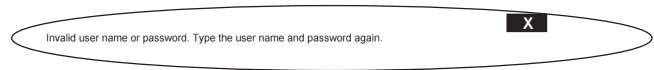


Figure 23. Invalid Entry



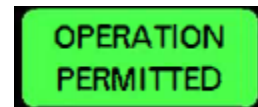
Complete the Log In Procedure

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.
 - 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.

Figure 24. Log Out Button



Figure 25. Operation Permitted Button



Main Menu — After Log In**Note**

A flashing **Set Up** button indicates the system configuration data must be restored. This may happen after installing new software, or replacing the PLC battery.

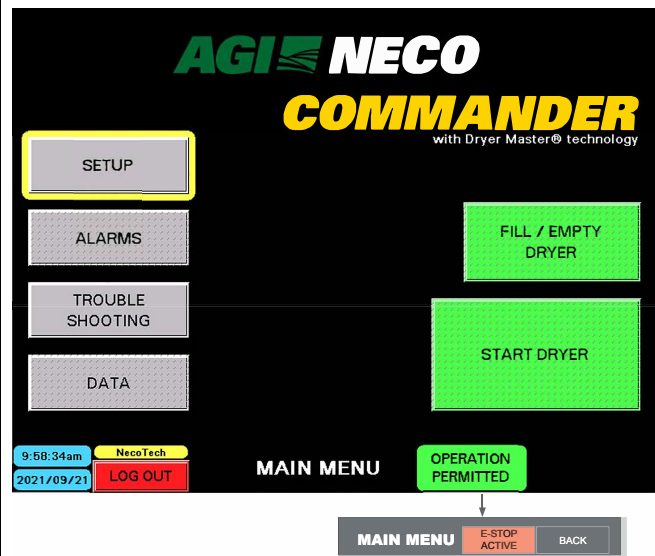
Depending on which screen is currently active, buttons and indicators may appear, or change status:

- 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 and screens are available:

- **Setup** Verifies or enters various setup parameters related to the dryer and auxiliary equipment.
- **Alarms** Views any current Alarm status.
- **Troubleshooting** Contact information for NECO or the local dealer is available for viewing.
- **Graphs** Generated for grain moisture, grain temperature, 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.

Figure 26. Main Menu Displaying E-STOP Active



Verification

Important

Before startup or operation, all Setup information must either be verified or entered.

The NECO factory enters some data 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. Logged in as **Owner**, go to **Setup** and complete the **Fill & Empty Setup** and **Timers Setup** requirements.

Note

After entering and verifying this Setup data, these screens 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.

2. If all **Setup** information has been entered and verified, see the [Section 4.2 – New Dryer Checklist on page 21](#) and [Section 4.2 – Pre-Season Checklist on page 21](#) as required. Go to [Section 4.4 – Operation on page 37](#) to determine how best to fill, start, and run the dryer.

Figure 27. Fill and Empty Setup Screen

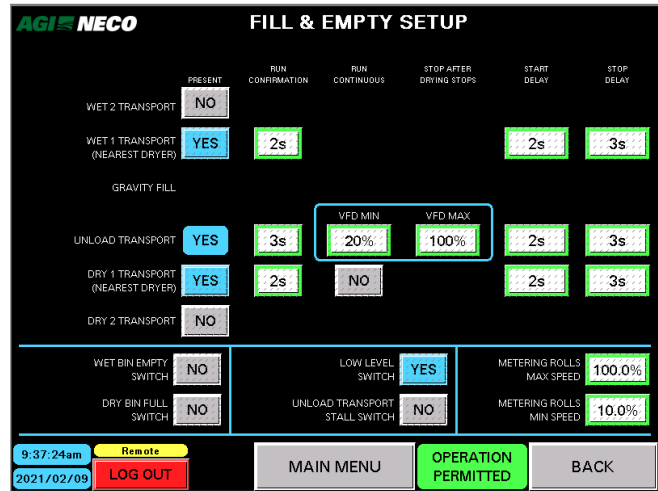
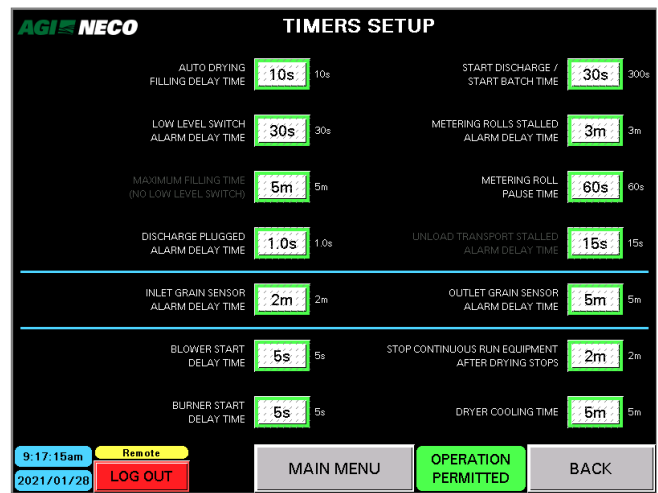


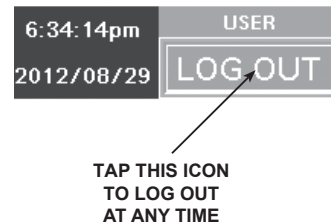
Figure 28. Timers Setup Screen



Logging Out

The **Log Out** button can be activated at any time during the drying process. On logging out, the existing process will continue. NECO recommends not leaving the dryer system completely unattended for an extended period of time, even with the Dryer Master in Auto mode. The moisture content should be regularly checked and calibrated.

Figure 29. Log Out Button



4.3.3 Setting Up the Main Screen

In this Section:

- Compatible Versions
- Security Setup button
- Initialize or Save button

Compatible Versions and Security Setup Button

Important

The current version of PLC and HMI software displays at the top-right corner of this main **Setup** screen. The two version numbers must match. If they match the **Versions Compatible** indicator appears. If they do not match, contact a dealer.

Some information has been entered and verified at the NECO factory and can not be edited or changed unless the user is logged in as an Owner.

Note

The **Security Setup button (H)** is not available if logged in as **User**. To activate the button and setup the quick login procedure, log in as **Owner** or **NecoTech**.

Figure 30. Setup Main Screen

Initialize or Save Configuration Button

Starting with the Version 50 installation, the various configuration data is periodically saved to the HMI’s USB data port.

In the event of a battery failure, the configuration and settings can be restored:

1. Tap the **Initialize** button.
2. Make the setup changes.
3. Click **Save Configuration** to save data after making setup changes and at the end of the season before turning power off.

Figure 31. Setup — Initialize

4.3.4 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.

Figure 32. Units of Measurement

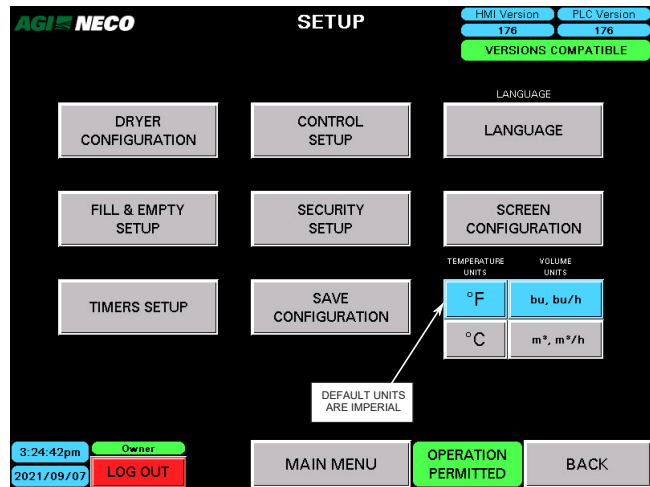
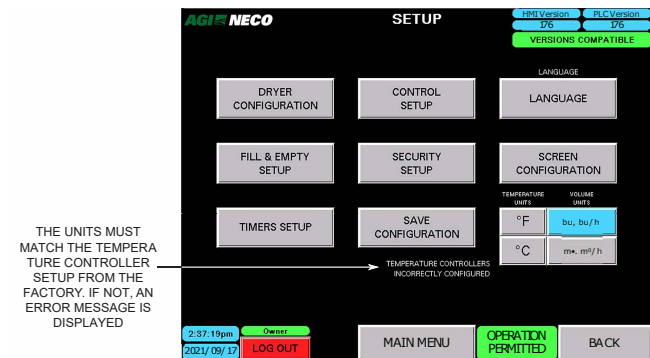


Figure 33. Units of Measurement



B. Dryer Configuration

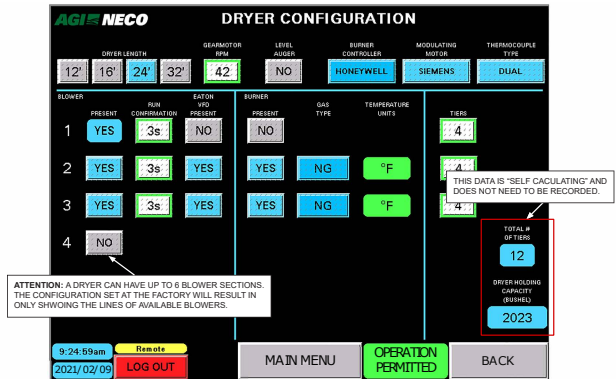
Dryer configuration information is entered at the NECO factory and provides the software with the as-built dryer configuration.

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.

Figure 34. Dryer Configuration Screen



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.

Figure 35. User Language Screen



D. Screen Configuration

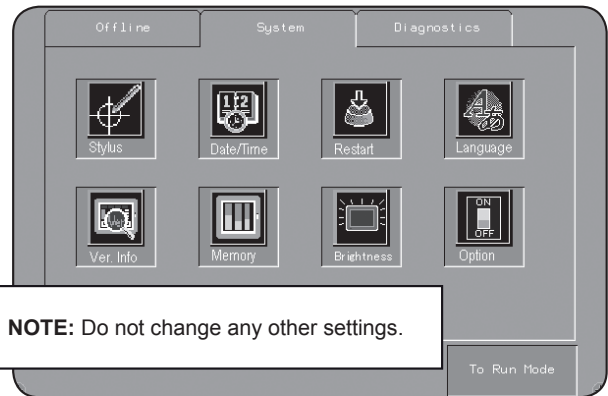
The following items can be changed with **Owner** login status:

- Brightness
- Date/Time
- Language (changes within the Schneider software screens only)

Table 3. Schneider Language Choices

Enter #	Language
0	English
2	French
3	German
4	Italian
5	Spanish
6	Chinese
7	Portuguese

Figure 36. Screen Configuration Screen



4.3.5 Dealer or Customer Entered Setup Data

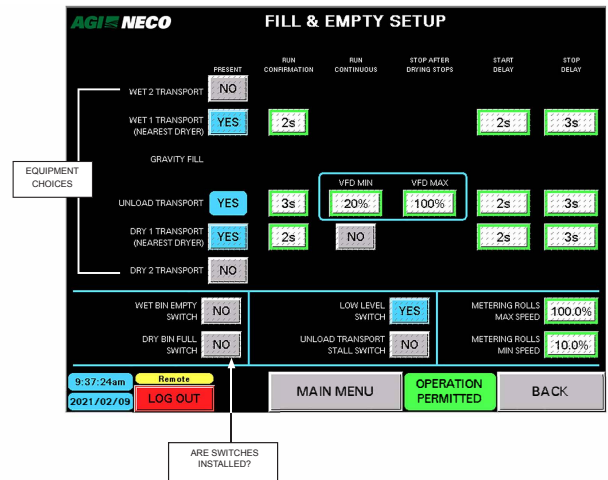
In this Section:

- Fill/Empty Setup
- Equipment Choices
- Metering Rolls Minimum and Maximum Speed
- Control Setup (overrides)
- Outlet Moisture Maximum and Minimum Alarm Setpoints
- Timers Setup
- Security Setup

E. Fill/Empty Setup

- This information is entered by the dealer. It provides the software with as-built dryer and auxiliary equipment information required for filling and emptying the dryer.
- The screen can be viewed by any login status, but only **Owner** login status can enter data or make changes.

Figure 37. Fill/Empty Dryer Setup Screen



Equipment Choices

The following are possible options 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.

Equipment to be Controlled

- WET 2 TRANSPORT (farthest from dryer)
- WET 1 TRANSPORT (closest to dryer)
- LEVEL AUGER (optional part of dryer)
- UNLOAD TRANSPORT (part of the dryer)
- DRY 1 TRANSPORT (closest to dryer)
- DRY 2 TRANSPORT (farthest from dryer)

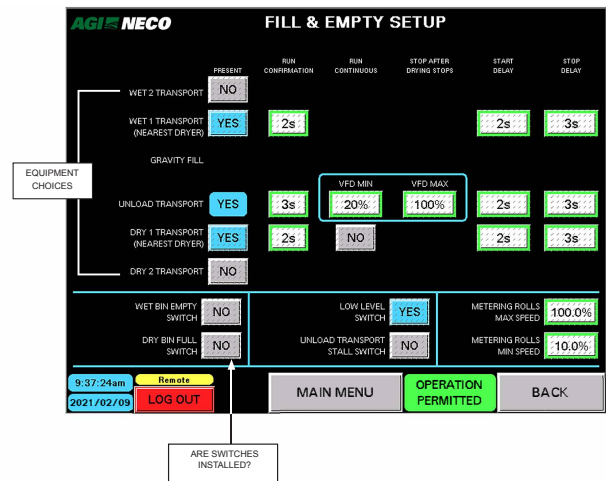
Switches to be Monitored

- WET BIN EMPTY SWITCH INSTALLED? Yes or No
- DRY BIN FULL SWITCH INSTALLED? Yes or No
- LOW LEVEL 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.

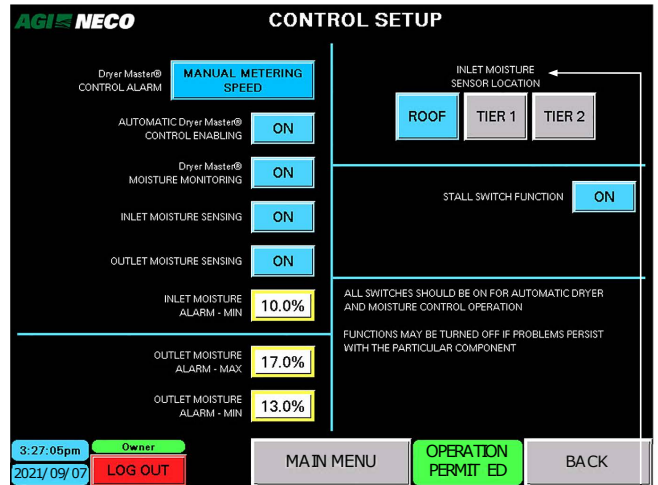
Figure 38. Fill/Empty Setup Screen: Equipment Choices



Control Setup (overrides)

- Allows the operator or technician to override switches.
- For fully automatic dryer and moisture control operation, all switches should be **On**. This causes the control to automatically proceed to the next stage, without pausing to wait for a screen control to be activated.
- If the **Dryer Master** system has an alarm, the default control status to proceed is to **Stop Drying**. If the screen control is toggled, the dryer will continue running at Manual Metering Roll Speed

Figure 39. Control Setup Screen



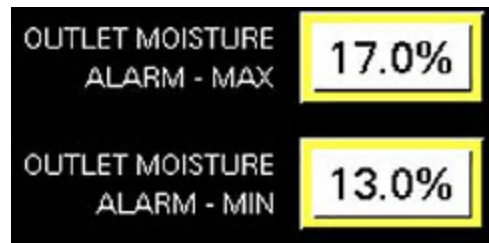
Outlet Moisture Maximum and Minimum Alarm Setpoints

- Outlet moisture readings outside of these limits trigger an alarm and shut down the dryer.
- These setpoints are also visible and editable when changing the target moisture. They can be set as close as 0.5% above and below target moisture.

Note

The narrower this window, the more likely the dryer is to shut down.

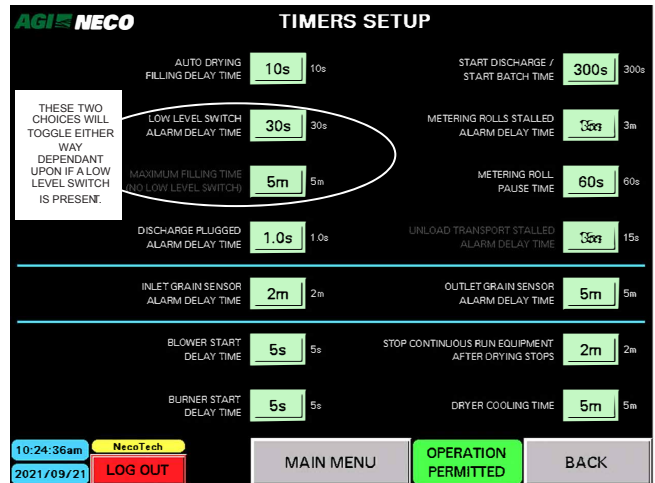
Figure 40. Outlet Moisture Alarm Max. and Min.



Timers Setup

- Default timer values are set by NECO as a starting point. The default data may require fine tuning for the 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 8.2 – PLC and HMI Recorded Data Sheets on page 90](#) to record this information.

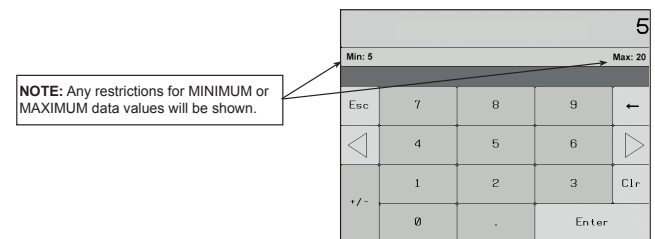
Figure 41. Timers Setup Screen



Enter or Edit Timer Data:

1. Tap the field (box) for the data to be changed. The on-screen numeric keypad appears.
2. Enter the required data.
3. Tap the **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.

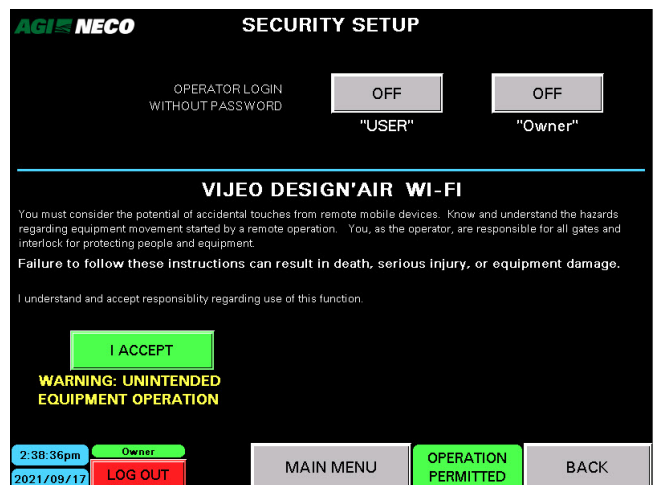
Figure 42. On-screen Numeric Keypad



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.

Figure 43. Security Setup 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.

Figure 44. Vijeo Design'Air Wifi Option



The image shows a black rectangular box with the text "VIJEO DESIGN'AIR WI-FI" in white, bold, uppercase letters.

4.4. Operation Overview

The NECO continuous dryer system is configured for different grain drying requirements by selecting the mode of operation, and customizing settings.

There are three main operating modes: **Batch Drying Mode**, **Auto Drying Mode**, and a **Combined Mode**.

Batch Drying Mode

- Generally used to start or end a drying cycle.
- Uses some, or all blowers and burners.
- Drying time manually set.

Auto Drying Mode

- Uses **Dryer Master** control to generate a drying model that meets the target moisture setpoint.
- Operation is fully automatic based on drying model.

Combined (Auto Mode followed by Batch Mode)

- Operation set to **Auto Mode** followed by **Batch Mode**.

The system also allows for different equipment configurations for controlling the movement of grain in and out of the system. After a drying cycle, grain can be directed to a dry bin storage, or directed to a wet bin to be recycled through the dryer.

Examples **A**, **B**, and **C** are the most common equipment configurations:

- **Example A: Batch Drying Mode** with output grain directed to dry bin grain storage after drying.
- **Example B: Auto Drying Mode** with output grain directed back to the wet bin to be recycled through the dryer.
- **Example C: Combined** with output grain directed to dry bin storage after drying.

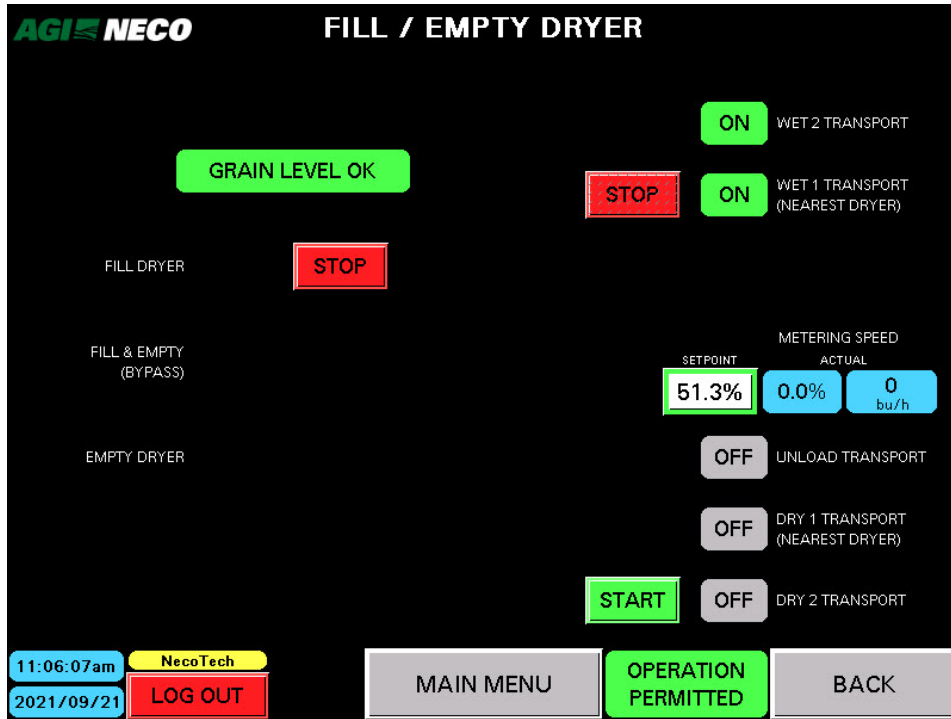
Overview of Operation Steps

Note

Both examples start by filling the dryer with wet grain using the Fill/Empty routine.

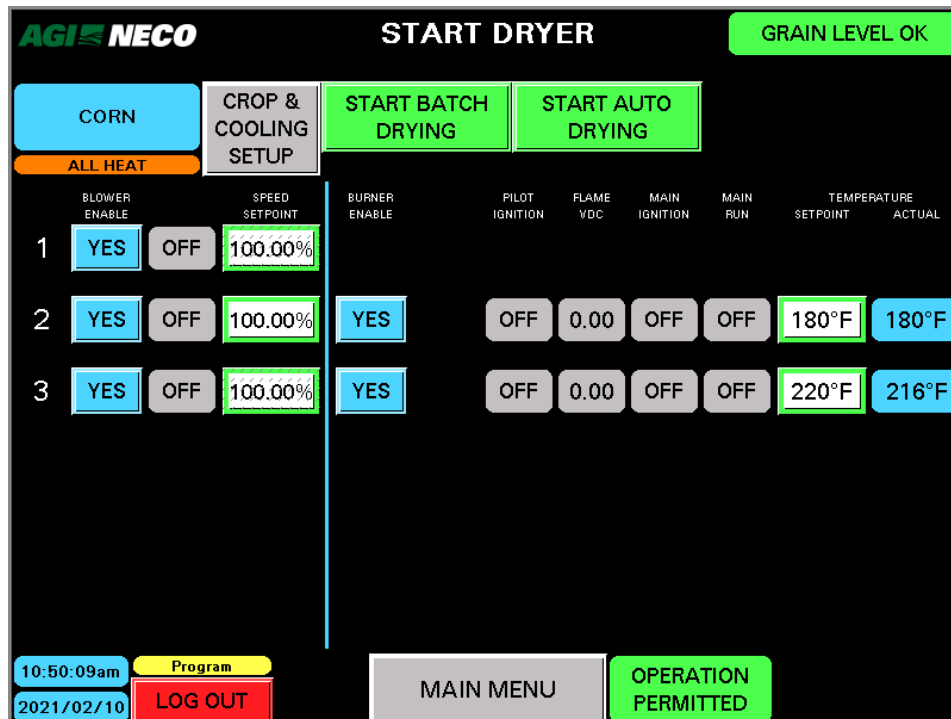
1. Configure the system:
 - Verify or edit the crop type. See [Section – Crop and Cooling Setup on page 47](#).
 - Designate cooling tiers. See [Section – Enable or Disable Blowers and Burners on page 49](#).
 - Set burner temperature. See [Section – Set Burner Temperature on page 51](#).
2. Fill the dryer with wet grain using the **Fill/Empty** routine. See [Section 4.5 – Fill/Empty Dryer on page 43](#) for more details.

Figure 45. The Fill/Empty Dryer Screen



- Once the dryer is filled above the low level switch and any continuous equipment is running, the **Start Auto Dryer** button displays.

Figure 46. Start Drying Screen



- Begin drying using either of the following optional modes:
 - Batch (all heat) Mode** (see [Section 4.7 – Batch Drying Mode on page 54](#))

- **Automatic Mode** (see [Section 4.8 – Auto Drying Mode on page 58](#))

4.4.1 Example A: Batch Drying

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

Batch Drying Example

1. Fill the dryer with wet grain.
2. Select **Batch Mode**.
3. Dry the grain until the required moisture content is reached.

Note

During the drying process, use the **Fill/Empty Bypass** to move the cooler, higher moisture grain 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.

Note

Dryer Master Moisture Controller collects data to set the drying model.

Figure 47. Batch Drying Screen

	BLOWER ENABLE	SPEED SETPOINT	BURNER ENABLE	LIQUID VALVES	PILOT IGNITION	FLAME YDC	MAIN IGNITION	MAIN RUN	TEMPERATURE SETPOINT	TEMPERATURE ACTUAL
1	YES	100.00%	NO						200°F	66°F
2	YES	100.00%	NO						180°F	67°F
3	YES	100.00%	NO						160°F	66°F

4.4.2 Example B: Auto Drying

In this example output grain is initially directed to wet bin grain storage after 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. 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.

Note

For dryers with multiple burners, start the drying process with higher temperatures in the lower sections and lower temperatures in the higher sections.

4. Go to the **Start Dryer** screen and begin drying using a manual metering roll speed.

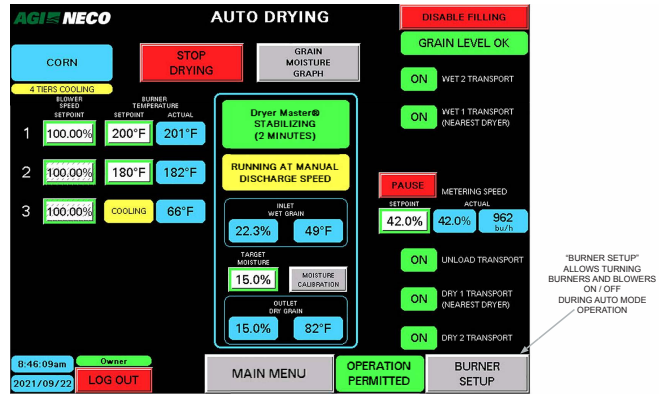
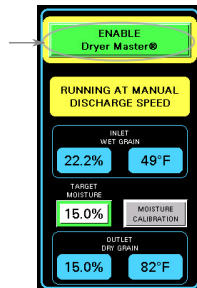
Note

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

5. 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. If applicable, the cooling floors can be adjusted to allow for cooling of grain before it exits the dryer. Burner temperatures may also need to be updated at this point.

Note

Once a drying model is developed, **Dryer Master** takes control of the metering rolls. If **Automatic Dryer Master Control Enabling** is set to **Off**, then the press **Enable Dryer Master** button at this point.



4.4.3 Example C: Combined

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

1. Repeat the **Batch Drying** process from **Example A**. For a dryer with multiple burners, it is advisable to start the drying process with higher temperatures in the lower sections and lower temperatures in the upper sections.
2. Once the grain reaches the target moisture, begin auto drying. Note that if present, discharge (dry) transports need to be started before auto drying can commence. At this point, temperatures can be reversed for multi-burner dryers (higher temperatures in the upper sections, lower temperatures in the lower sections).

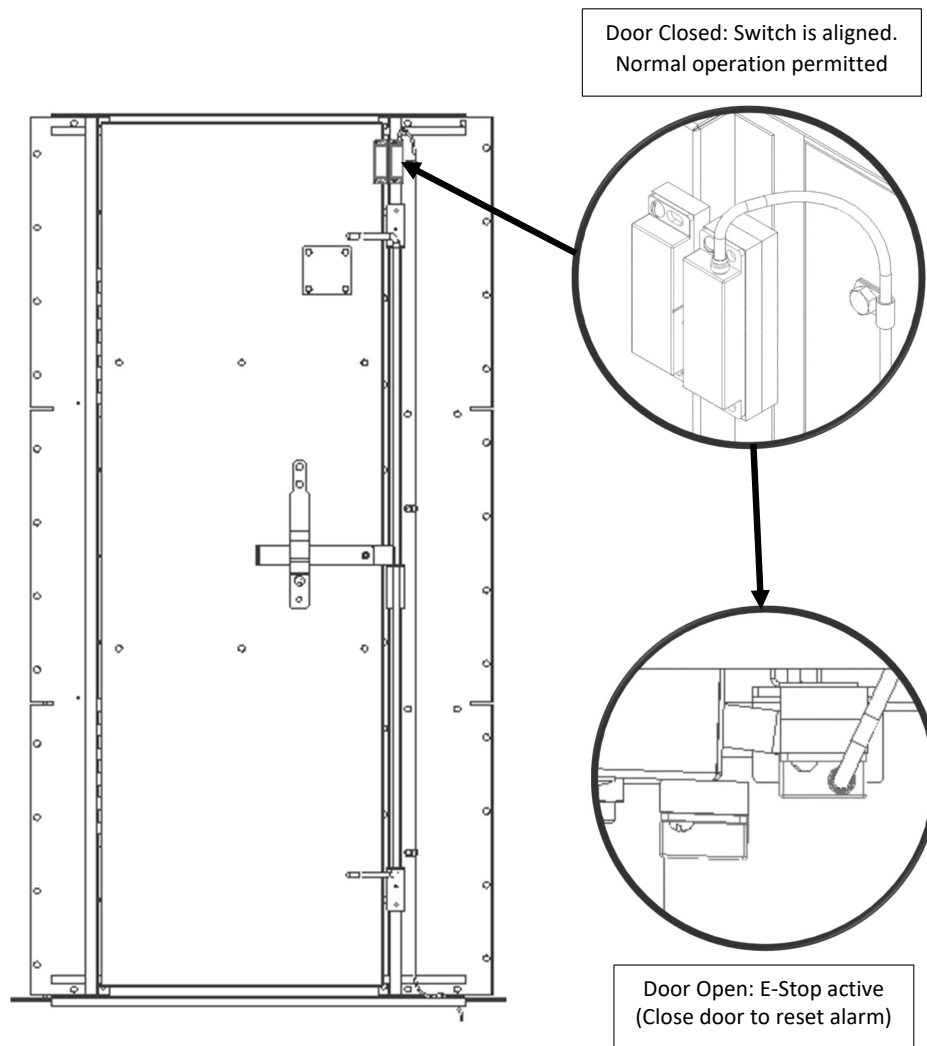
4.4.4 Plenum Door Safety Switch

WARNING Be sure to follow proper lockout/tagout procedures prior to 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.

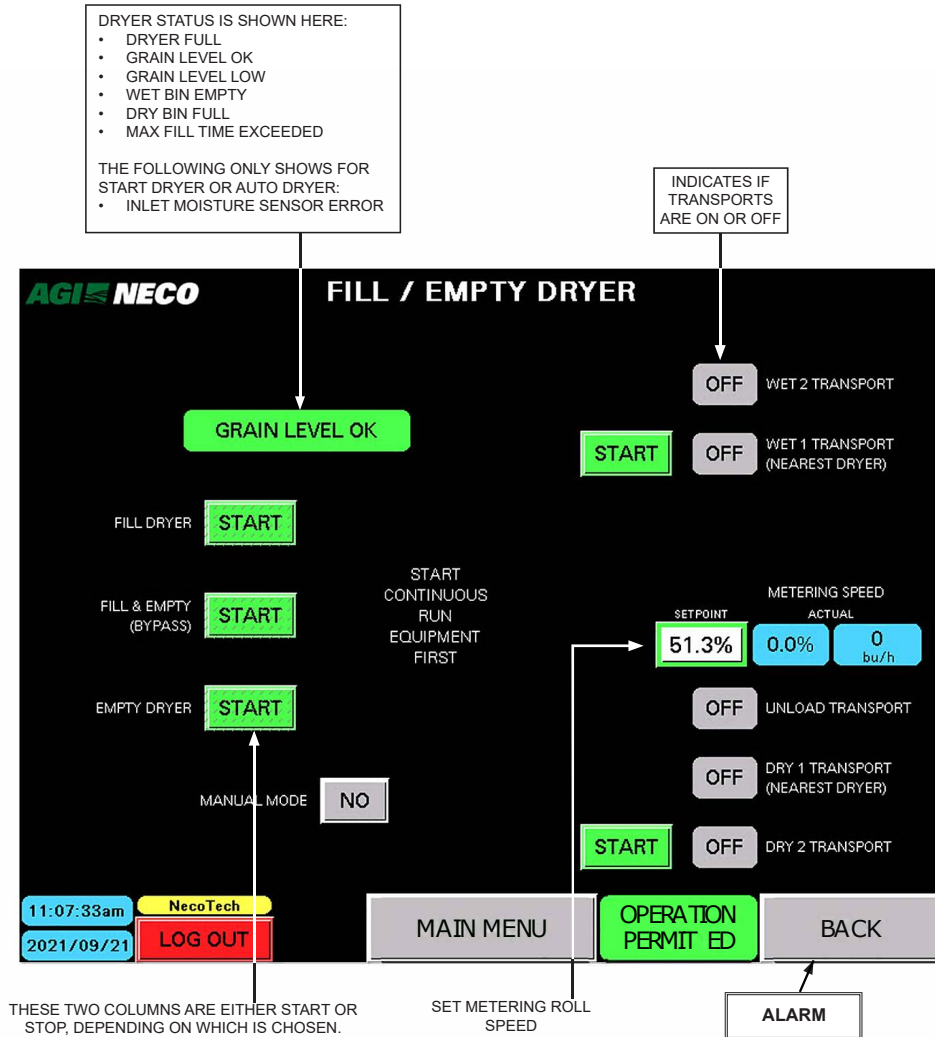


4.5. Fill/Empty Dryer

In this Section:

- Setting Manual Metering Roll Speed
- Filling the Dryer
- Emptying the Dryer
- Manual Mode

Figure 48. 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

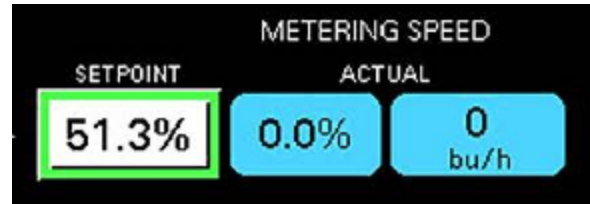
See [Section 8.1 – Manual Dryer Speed on page 88](#) for recommended metering roll speed starting point. This speed is used as the manual setpoint for Batch Mode drying and for initial Automatic Drying Mode until the **Dryer Master** gathers enough moisture data to take full automatic control.

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 2 (furthest from dryer)
- Wet Transport 1 (nearest to dryer)
- Level Auger
- Unload Auger
- Dry Transport 1 (nearest to dryer)
- Dry Transport 2 (furthest from dryer)

Figure 49. Manual Metering Roll Speed Buttons



Fill Dryer

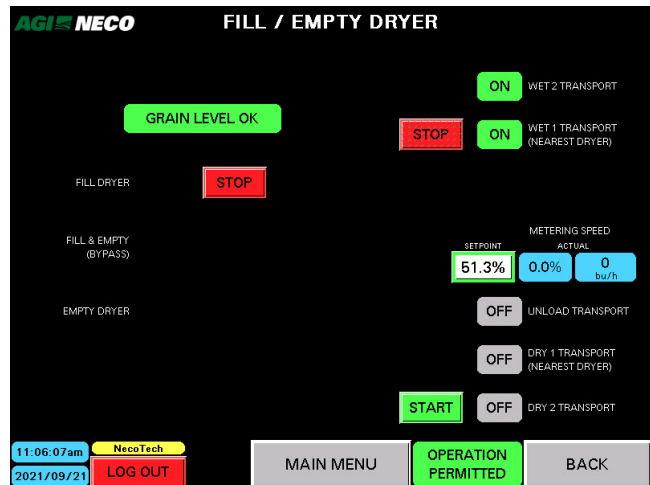
Used to initially fill the dryer with grain.

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

Note

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

Figure 50. Fill Dryer Screen

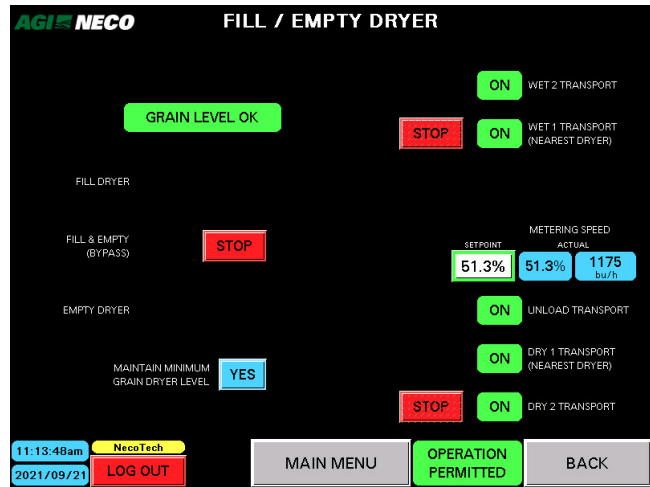


Fill and Empty (Bypass)

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

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

Figure 51. Fill and Empty (Bypass)

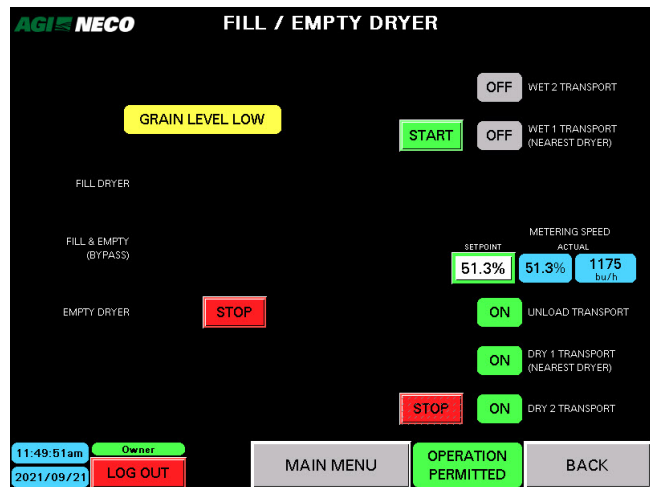


Empty Dryer

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 52. Empty Dryer Screen

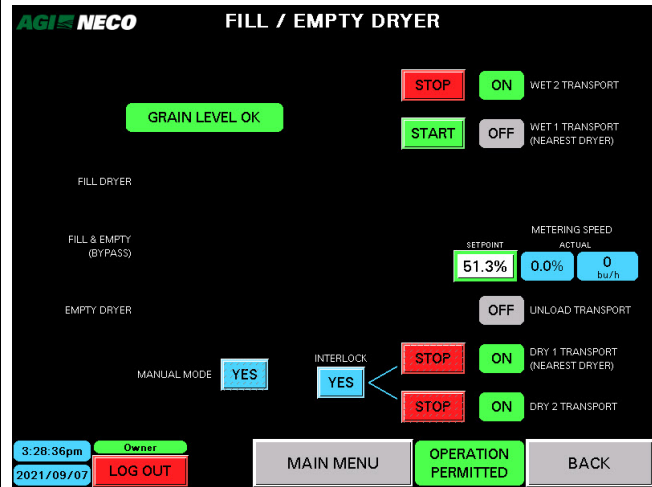


Manual Mode

Press the **Manual Mode** button to allow manual operation of the Wet 1, Wet 2 and Dry 1, Dry 2 transports when not drying.

- The external transports can be run manually without the need for additional external local/ auto switches.
- Both the Wet 1 & Wet 2 transports as well as Dry 1 & Dry 2 transports can be interlocked so that if one faults out the other will stop.

Figure 53. Manual Mode



4.6. Start Dryer

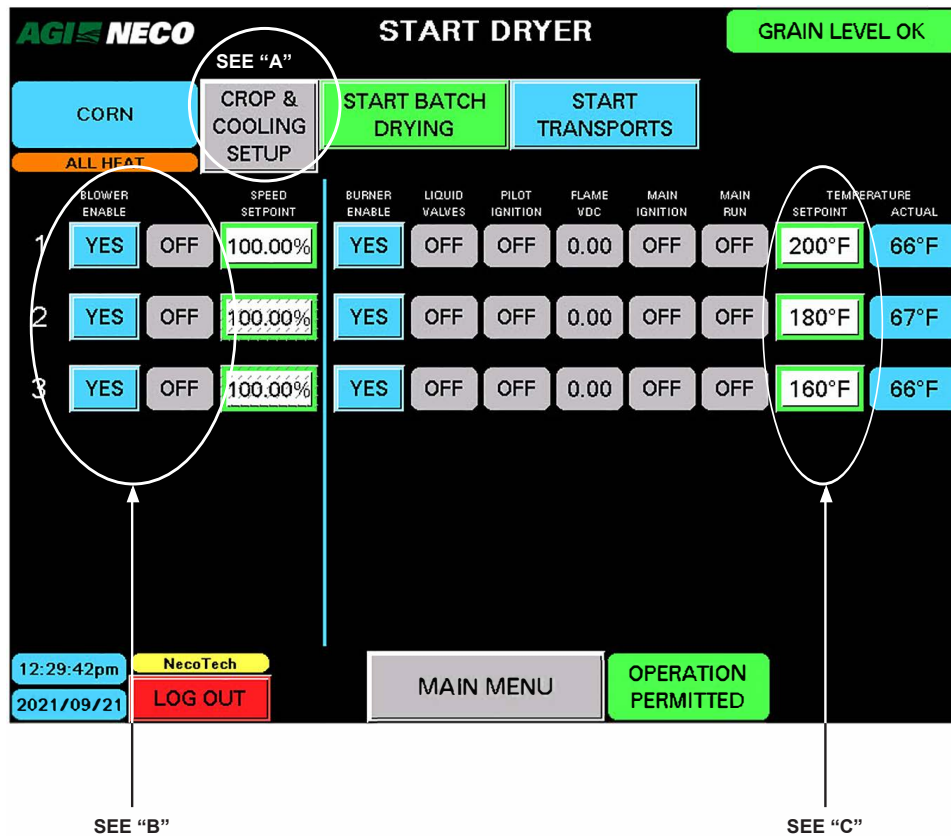
4.6.1 Start Dryer Overview

The Start Dryer main screen is used for setting necessary drying parameters and then activating either **Batch Mode**, **Auto Mode**, or a combined mode:

See the following sections A, B, and C to set parameters for the required drying mode.

- **A. Section – Crop and Cooling Setup on page 47** to change, add, or edit crops, and setup cooling tiers. The current crop and cooling tier layout are shown in the upper-left area of the screen, below the NECO logo.
- **B. Section – Enable or Disable Blowers and Burners on page 49** to enable or disable blower(s) and burner(s) for either **Batch Mode** or **Auto Mode**.
- **C. Section – Set Burner Temperature on page 51** to set burner temperature setpoints for either **Batch Mode** or **Auto Mode**.

Figure 54. Start Dryer – Main



A. Crop and Cooling Setup

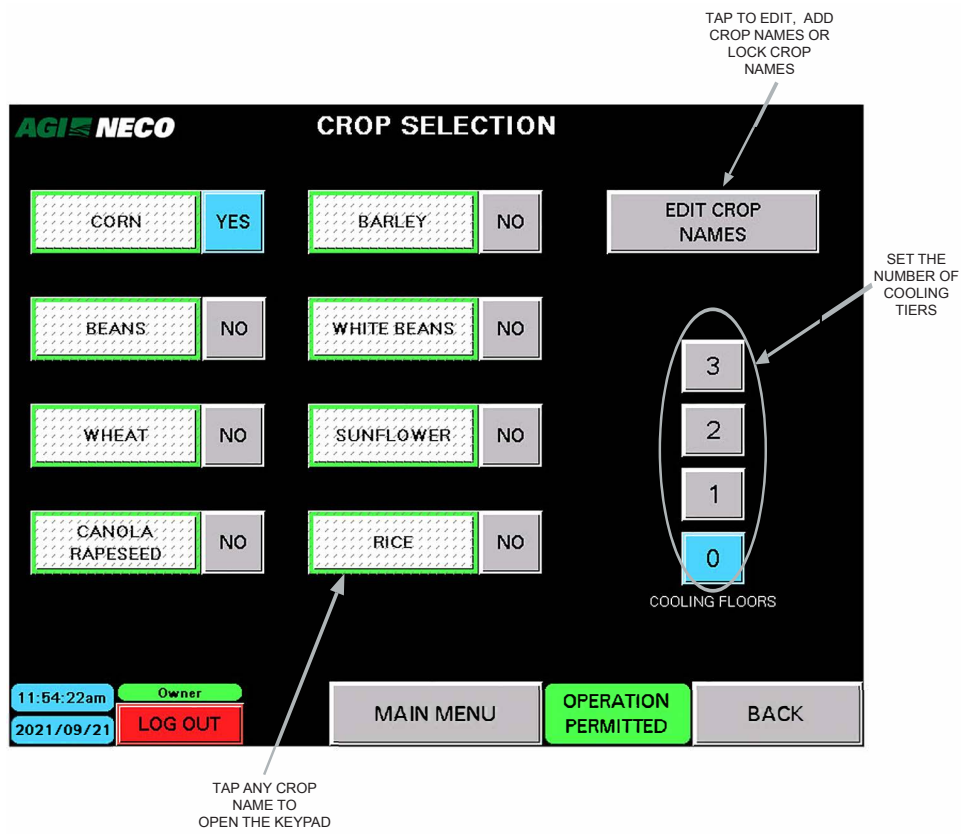
In this Section:

- Adding or editing crop names
- Selecting a different crop
- Setting cooling tiers (floors)

Select **Crop and Cooling Setup** to show the **Crop/Tier** screen. This screen displays **Yes** beside the current crop selection. The operator can:

- Select a different crop
- Set cooling tiers
- Edit or enter a crop name or description

Figure 55. Crop Selection Screen



A. Crop and Cooling Setup

To select a different crop:

1. Tap the **No** button next to the indicator for the new crop; **Yes** appears, and the screen automatically switches to the **Start Dryer - Main** screen.
2. Verify the current crop indication at the upper-left corner of the screen has changed to display the newly selected crop.
3. Make the required changes, using a maximum of 26 characters.

To set cooling tiers (floors):

Tap the button representing the correct number of cooling tiers.

To add or edit crop names:

1. Tap the **Edit Crop Names** button; the **Edit Crop Names** button changes to **Lock Crop Names**. The existing crop name buttons become available, allowing them to be selected.
2. Tap any crop name button to be changed. The alpha-numeric keypad appears. The current crop selection is shown at the top of the keypad.
3. Tap **Enter**.
4. Tap the **Lock Crop Names** button to lock in the changes. The button changes to display **Edit Crop Names** as before.
5. Tap the **Back** icon to return to the **Start Dryer - Main** screen.
6. Verify that the current crop icon at upper-left corner has changed to the newly selected crop.

Figure 56. Alpha-numeric Keypad

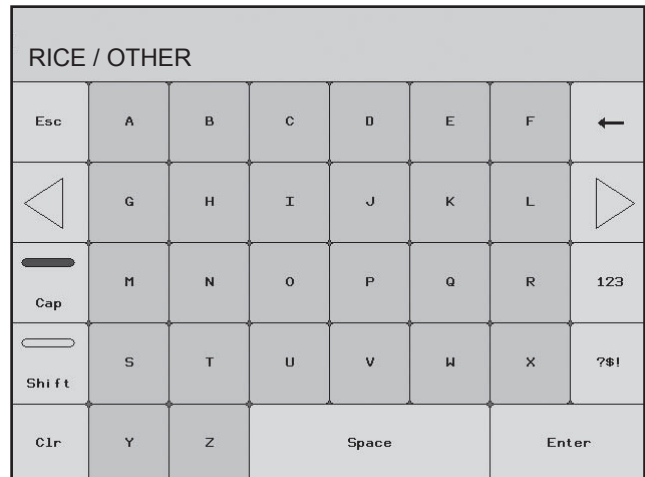
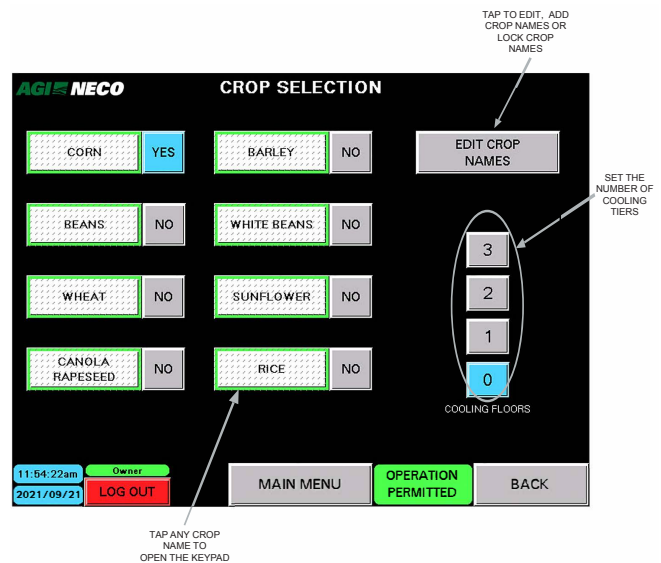


Figure 57. Edit Crop Names



B. Enable or Disable Blowers and Burners

In this Section:

- Overview of configuration
- Startup operation sequence
- Possible burner settings

Overview

- Dryer configuration is set at the factory. The screen only displays the actual blower/burner rows (number 1 to number 6) that are in this particular dryer configuration.
- The **Setup - Main** and **Batch Drying** screens utilize this layout and can show from 1 to 6 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

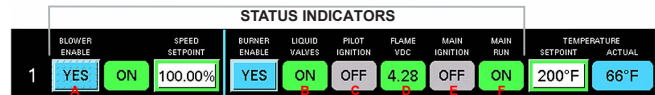
- The **On** or **Off** status indicators show the current status as either **Off** or **On**. When the indicator is **On**, it appears to be illuminated.

Startup Operation Sequence

A, B, C, D, and E in the following sequence refer to the reference letters in the associated figure:

- The blower turns **On** and the **Blower indicator** changes from **Off** to **On (A)**.
- The **Blower Start Delay Timer** 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 **Liquid Valve indicator** changes from **Off** to **On (B)**.
- When **Liquid Valve** goes **On**, the valve remains open and purges for a set time of 30 seconds. During this time the Blower is **On**, but the pilot valve and main valve (M1) remain closed.
- At the end of the purge period, the pilot valve and M1 valve opens. The spark generator energizes to light the pilot. The **Pilot Ignition indicator** changes from **Off** to **On (C)**.
- When the spark generator creates a pilot flame, the flame sensor voltage appears in the **Flame VDC indicator** field (**D**). If the voltage is 1.25 volts or less the pilot flame is not recognized and an error occurs.
- After a factory set 10-second period to verify pilot flame, the M2 valve opens.
- When M2 valve opens, a factory set 10–second delay begins.
- If the air switch does not detect blower operation, orther UV sensor does not verify the presence of burner flame, an error occurs. When the UV sensor does detect the burner flame, the main ignition indicator changes from **Off** to **On (E)**.
- On correct blower and burner detection the pilot valve closes and the main run indicator changes from **Off** to **On (F)**.

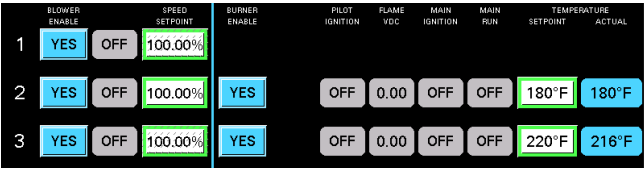
Figure 58. Status Indicators (A, B, C, D, E)



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 below 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.
- Row 3:** The blower is disabled, so none of the following status indicators (including the burner status) are visible.
- Row 4:** The blower is enabled, and this section is operating without a burner, so the blower status is visible but the burner and related status indicators (including temperature indications) are not visible.



C. Set Burner Temperature

In this Section:

- Burner setpoints
- Setting burner temperature

Note


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.

Set Burner Temperature

Note
The temperature setpoints can be modified at any time during the drying process.

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.

Figure 59. Setting Burner Temperature



4.6.2 Completion of Dryer Setup

Completion of Dryer Setup	
<p>On completion of the preceding steps (A, B and C), and prior to starting either Batch or Auto drying modes:</p> <ul style="list-style-type: none"> • 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. 	<p>Figure 60. Current Dryer Status</p> <p>The screenshot shows a control panel with a black background. At the top left, the text 'START DRYER' is displayed in white. Below this, there are two buttons: a green 'START BATCH DRYING' button and a blue 'START TRANSPORTS' button. In the top right corner, a green box contains the text 'DRYER FULL'. An arrow points from this box to a callout box below. The callout box has a white background and a black border, containing the text 'DRYER GRAIN STATUS IS SHOWN HERE:' followed by a bulleted list of five status conditions.</p>

4.6.3 Starting Batch Drying

To Start Batch Drying

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

1. Tap the **Start Batch Drying** button to proceed. Immediately, the blower and burner starting sequence begins.
2. The **Start Batch Timer** indicator only appears after all enabled burners are **On** as shown in the **Main Run Status** column.
3. 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**.

Figure 61. Starting Batch Drying

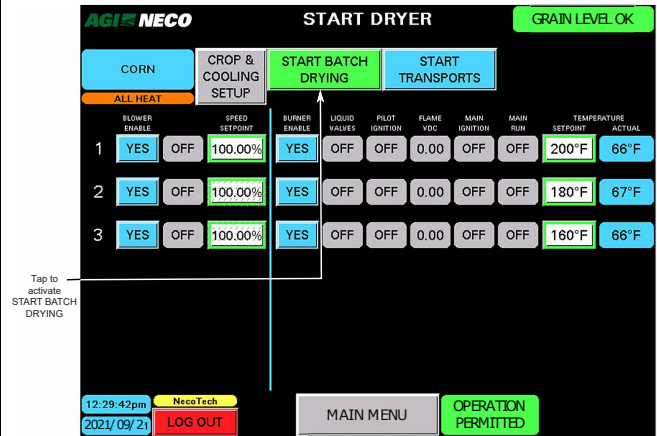
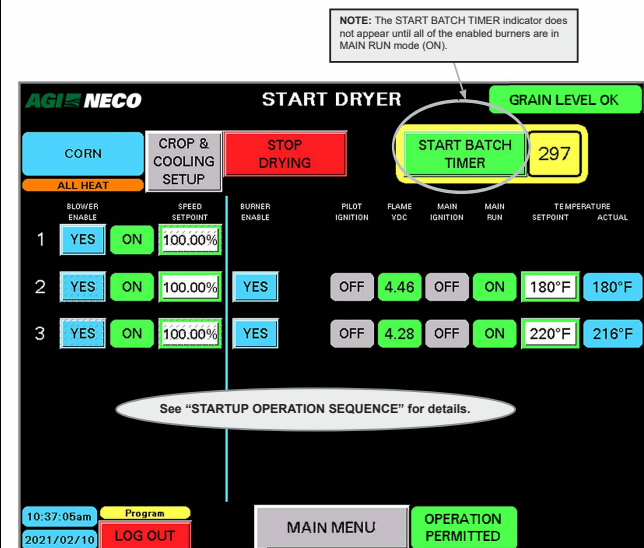


Figure 62. Start Batch Timer



4.7. Batch Drying Mode

4.7.1 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 A, B and C to set up and operate in **Batch Drying Mode**:

- [Section – A. Set Drying Time on page 54](#)

Note

Skip steps B and C if **Batch Drying Mode** is directly switched to **Auto Drying Mode**. However, before **Auto Drying Mode** can start, two conditions must be met. For details, see [Section 4.8 – Auto Drying Mode on page 58](#)

- [Section – B. Cooling on page 56](#)
- [Section – C. Restart on page 57](#)

Overview

- 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 – Enable or Disable Blowers and Burners on page 49](#) for a complete description of this sequence.

A. Set Drying Time

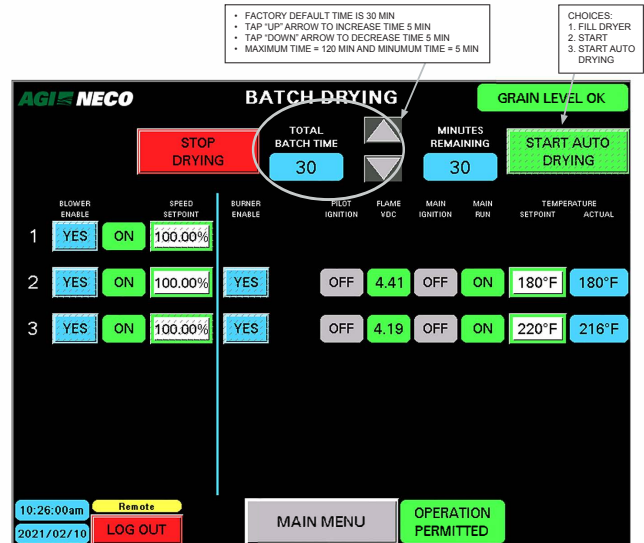
In this Section:

- Default batch drying time
- Setting total batch drying time
- Minutes remaining
- Switching to **Auto Drying Mode**
- Stopping drying

Total Batch Time

- Default total time = 30 minutes
- Tapping the **Up** button (▲) increases the total time by 5 minutes (to a maximum run time of 120 minutes).
- Tapping the **Down** button (▼) decreases the total time by 5 minutes (to a minimum run time of 5 minutes).
- 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.

Figure 63. Batch Drying Screen



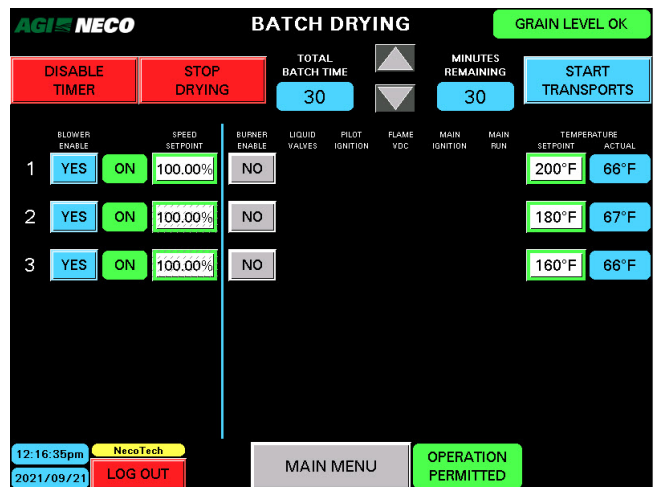
Minutes Remaining

- 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.

Figure 64. Batch Drying Mode Screen



Switch Directly 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 displays:

- Fill dryer
- Start
- Start auto drying

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

Stop Drying

To stop drying:

- Tap **Stop Drying** to stop the process and start **Cooling Mode**.

Figure 65. Stop Drying Button

	BLOWER ENABLE	BURNER ENABLE	LIQUID VALVES	PILOT IGNITION	FLAME VDC	MAIN IGNITION	MAIN RUN	TEMPERATURE SETPOINT	TEMPERATURE ACTUAL
1	YES	ON	ON	OFF	4.28	OFF	ON	217°F	217°F
2	YES	ON	ON	OFF	4.14	OFF	ON	207°F	207°F
3	YES	ON	ON	OFF	4.10	OFF	ON	186°F	187°F

B. Cooling

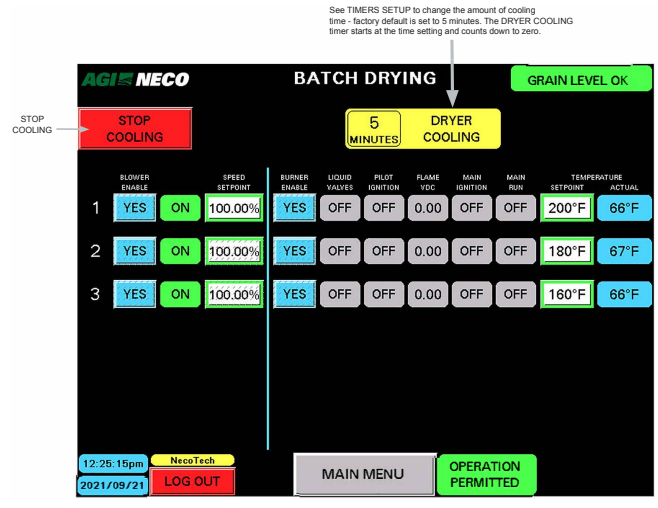
In this Section:

- Remaining cooling mode time
- Stopping cooling
- Starting batch drying

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.

Figure 66. Dryer Cooling

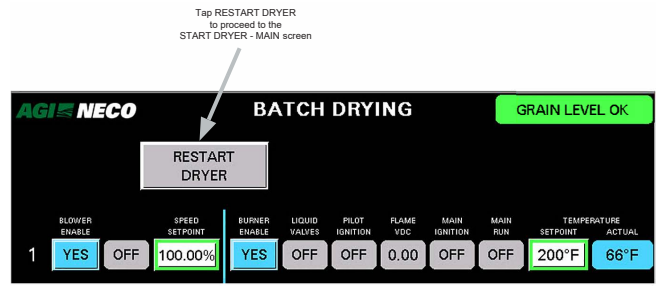


C. Restart

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**.

Figure 67. Restart Dryer Button



4.8. Auto Drying Mode

4.8.1 Auto Drying Pre-Conditions

Required Pre-conditions

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

1. The dryer status must display **Dryer Full** or **Dryer Level OK**. If neither of these display:
 - a. Tap the **Fill Dryer** button; the **Fill/Empty Dryer** screen appears.
 - b. Tap the **Start** button to fill the dryer. The dryer must fill past the level of the **Low level** sensor. When it does, the dryer status indicator displays **Dryer Level OK** or **Dryer Full**.
2. All required transports must be started prior to initiating **Auto Drying Mode**. If transports are enabled, but not running, the **Start Transports** indicator appears.
3. The **Fill/Empty Dryer** screen appears.

When the **Fill/Empty Dryer** screen displays:

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**.

Figure 68. Fill Dryer Button



Figure 69. Fill/Empty Dryer Screen

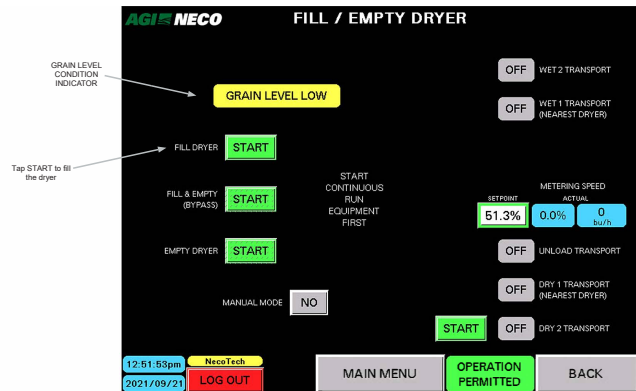


Figure 70. Start Transports Indicator/Button

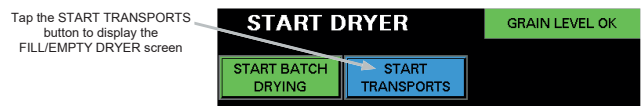
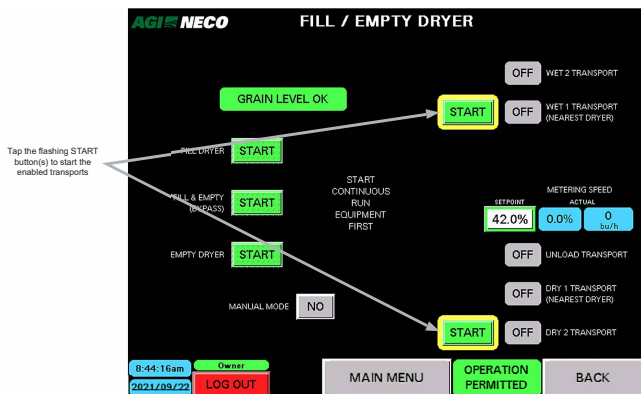


Figure 71. Transports Start Buttons



4.8.2 Auto Drying Overview

In this Section:

- Metering Roll Pause/Resume
- Burner Setup
- Change in Progress indicator

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

- [Section – A. Manual Speed on page 61](#): (Dryer Master collecting data) Burner setup is available
- [Section – B. Auto First Load on page 62](#): Burner setup is available
- [Section – C. Dryer Master Control on page 63](#): Burner setup is available
- [Section – D. Cooling on page 63](#)
- [Section – E. Restart on page 64](#)

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 example:

Figure 72. Metering Roll Resume Button

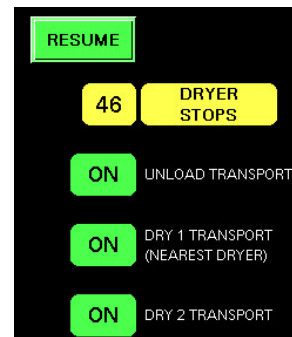
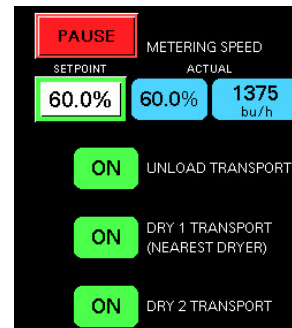


Figure 73. Metering Roll Pause Button

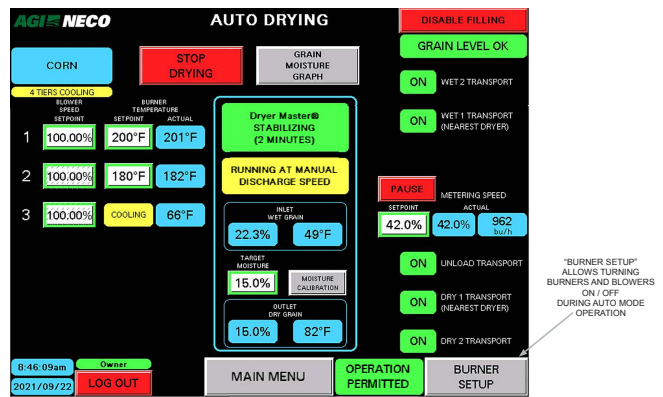


Burner Setup

Note

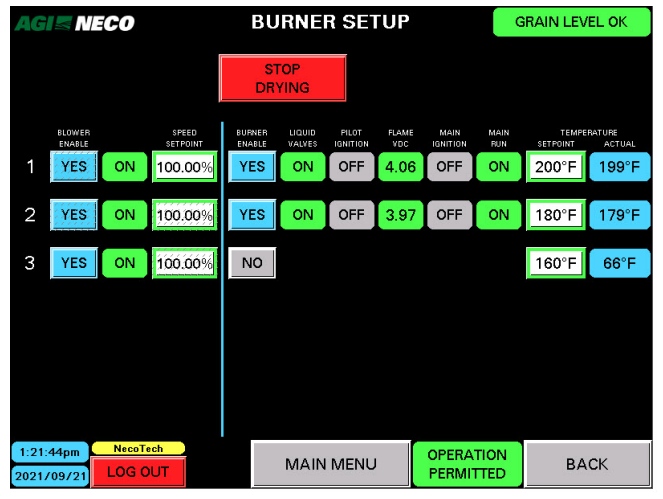
As the various operation stages occur, the display screen center panel area provides the operator with important status information. See the following example:

Figure 74. The Burner Setup Button on the Auto Drying Screen



The **Burner Setup** screen appears. Initially it shows the current status.

Figure 75. The Burner Setup screen



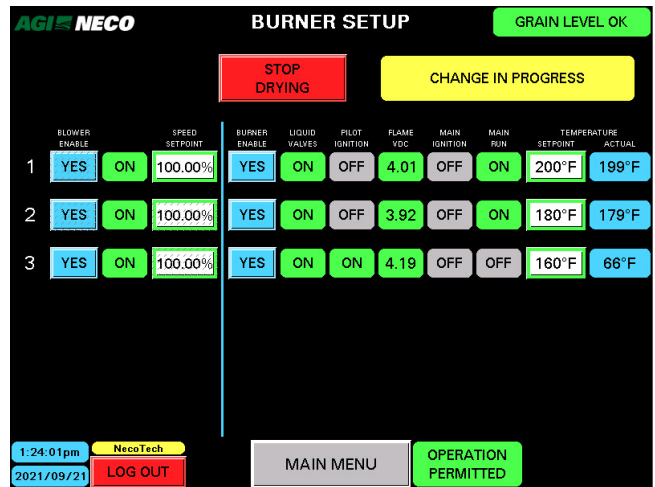
Change in Progress

Note

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

- As burner number 4 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**.

Figure 76. Example of Change in Progress

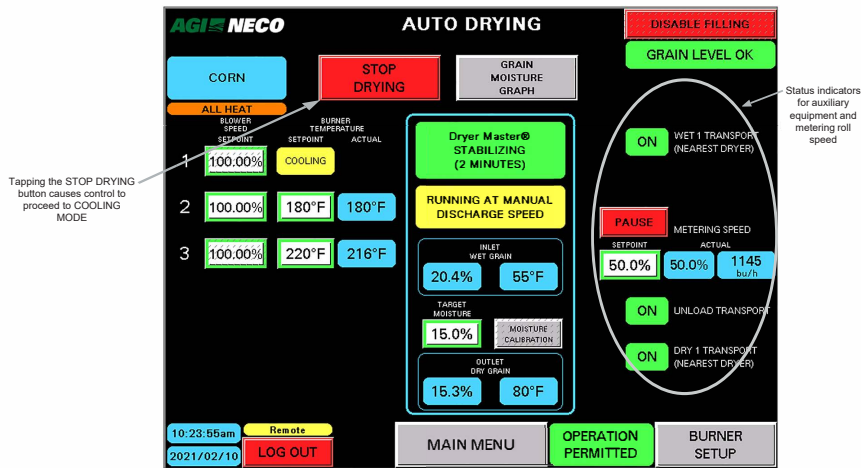


A. Manual Speed

In this Section:

- Manual Speed
- Automatic Dryer Master Control Enabling
- Enabling Automatic Moisture Control

Figure 77. Manual Speed Control



Manual Speed

The dryer runs at the manual metering roll speed entered until the **Dryer Master** gathers sufficient data. The manual speed can be dialed in and changed to come closer to target moisture.

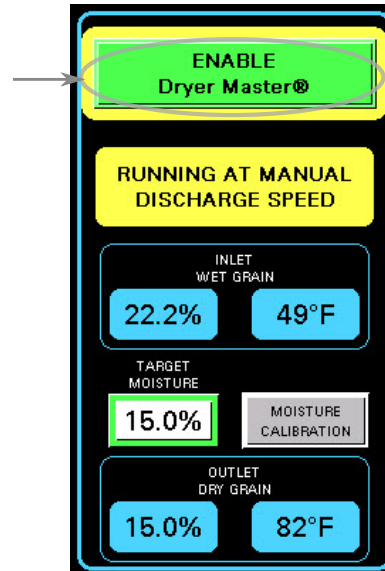
If **Automatic Dryer Master Control Enabling** is set to **Off**, as soon as the Dryer Master has gathered enough data, the **Enable Automatic Moisture Control** button (located with the main center panel) appears.

Tap **Enable Automatic Moisture Control** to proceed to **Auto First Load**.

Note

By default, **Automatic Dryer Master Control Enabling** is set to **On**, the control will proceed into **Auto First Load** automatically.

Figure 78. Control Setup Screen

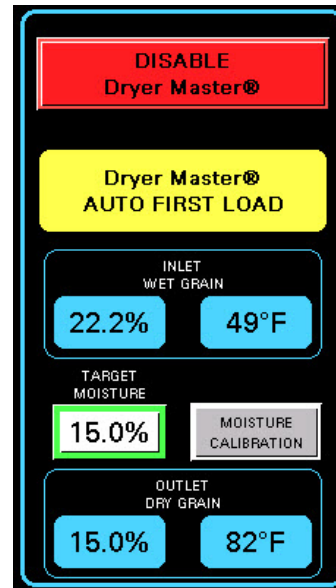


B. Auto First Load

Auto First Load

The **Dryer Master** control uses previous history to assist in building a current model, if possible. During **Auto First Load**, grain cycles through the dryer for enough time to gather completed current data. This time period varies, but can be up to one complete grain cycle. Once a current computer model of correct operation that will meet the target moisture setpoint is obtained, the control proceeds to full Dryer Master automatic operation.

Figure 79. Auto First Load Screen



C. Dryer Master Control

Dryer Master Control

- In **Dryer Master Controlling Mode** the Dryer Master controls the process and runs until **Stop Drying** is activated, or a low level sensor is activated.
- The operator should regularly check the grain moisture graph for abnormalities.
- Moisture calibration for the lower moisture sensor should be done a least every 2-3 hours.
- When changing the target moisture, a pop-up window appears that also shows the Minimum and Maximum alarm setpoints for the outlet grain.

Figure 80. Control Setup Screen

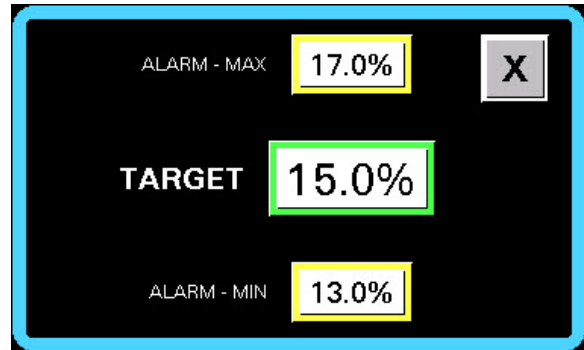
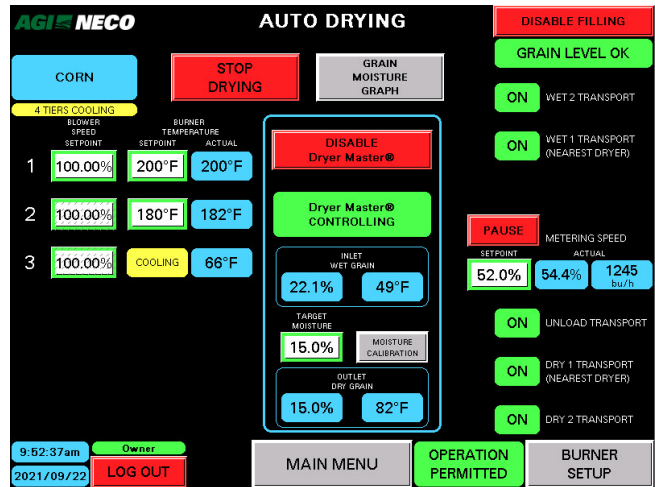


Figure 81. Dryer Master Controlling

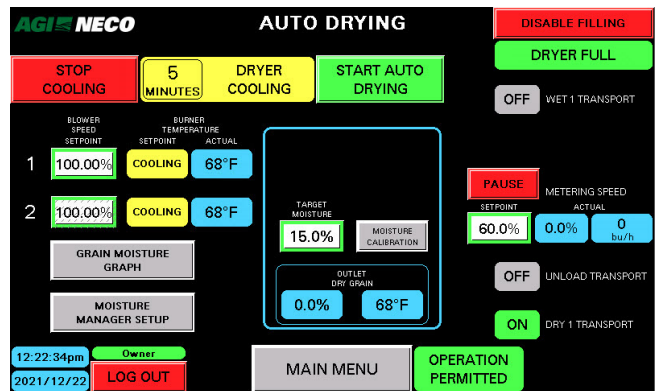


D. Cooling

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 82. Cooling

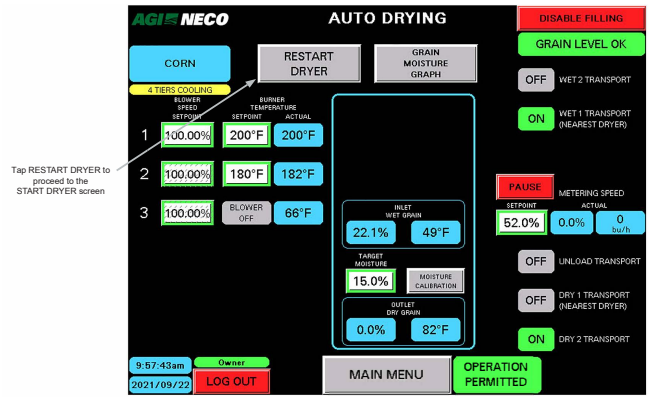


E. Restart

Restart

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

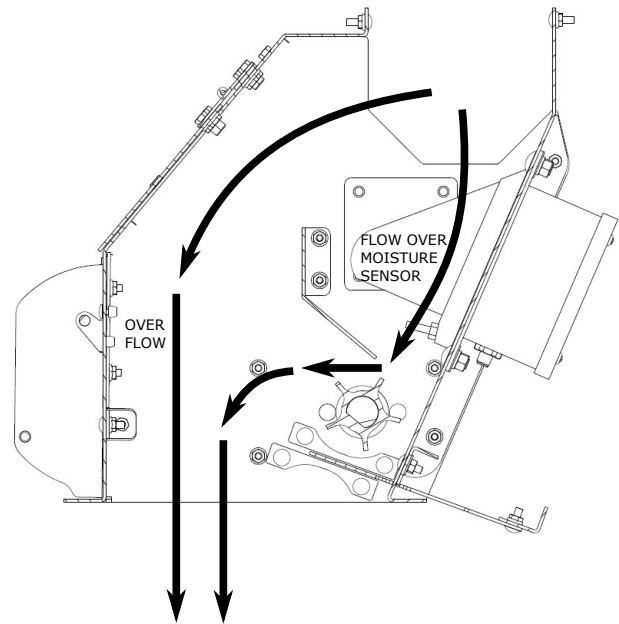
Figure 83. Auto Drying Screen with Restart Button



4.8.3 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.



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.

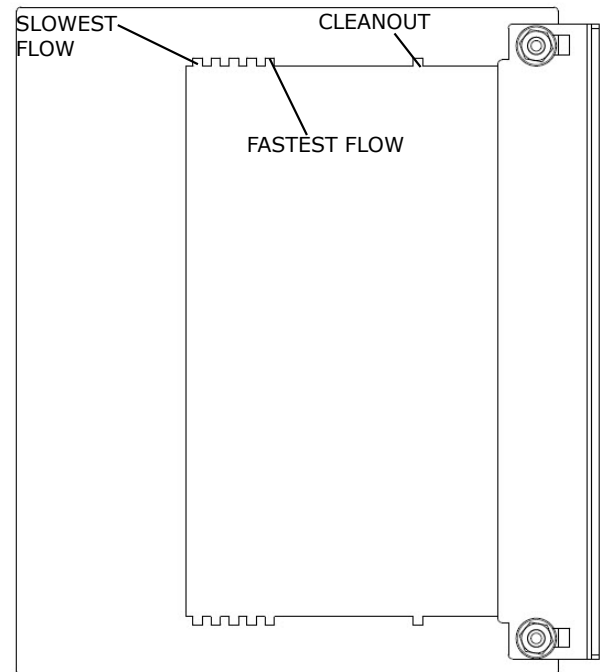
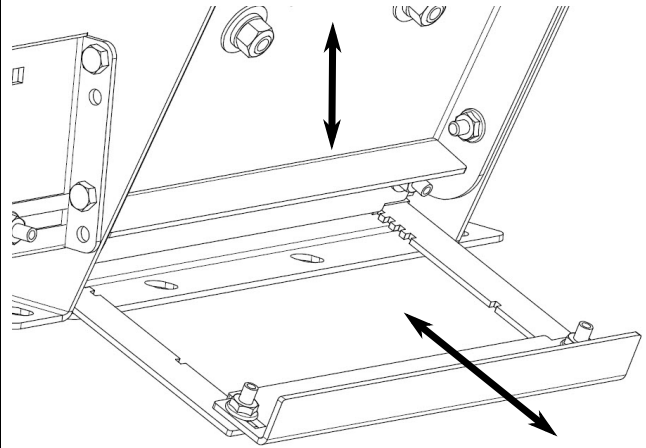
To adjust the slide gate position:

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.

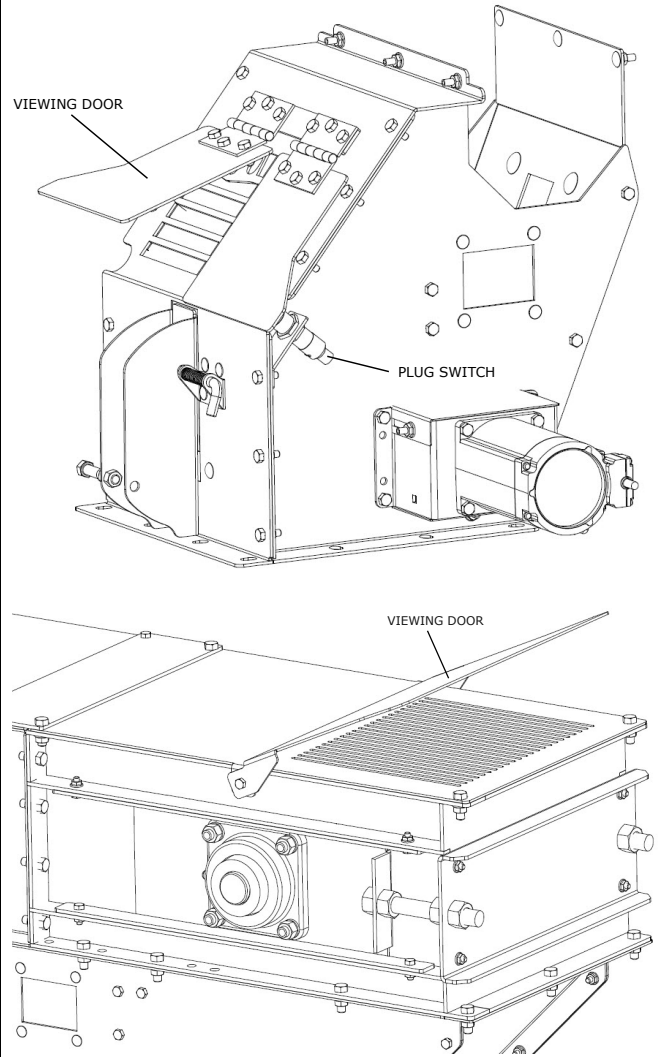
During normal operation, grain should cover the fin of the outlet moisture sensor at all times, and a steady flow of grain should be observed through the viewing window on the side of the discharge chute. If the drying rate is low enough that grain does not consistently keep the chute full enough to 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.



4.8.4 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.

Moisture Calibration

To calibrate moisture levels:

1. Start the **Inlet Sensor** calibration routine by tapping its associated **Initiate** button.
2. Start the **Outlet Sensor** calibration routine by tapping its associated **Initiate** button, or by pressing the **Sample** button located at the rear of the dryer, near the grain exit chute.

Note
On starting the calibration routine for either sensor, the **Sampling** indicator displays.

3. 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 **Done** indicator appears.
4. Have the samples tested for actual grain moisture content.
5. Average the values for the actual grain moisture content.
6. Enter the calculated average for the actual grain moisture content using the **Sample Test Moisture** button.
7. Tap **Done**.

Note
In the example here, the **Current Reading Value** was originally 21.6. The **Sample Test Moisture** average of the measured values was 24.5. Since 24.5—21.6 is more than 1.0, the new **Current Reading** moved closer to the **Sample Test Moisture Value** by 0.5 (from 21.6 to 22.1).

Figure 84. Moisture Calibration Screen

The screenshot shows the 'MOISTURE CALIBRATION' screen. It features two rows of sensor data. The first row is for the 'INLET SENSOR' with a 'CURRENT READING' of 21.6% and a 'SAMPLE TEST MOISTURE' of 21.6%. The second row is for the 'OUTLET SENSOR' with a 'CURRENT READING' of 15.0% and a 'SAMPLE TEST MOISTURE' of 15.0%. Each row has an 'INITIATE' button. At the bottom, there is a status bar with '9:23:57am', '2021/09/22', 'Owner', 'LOG OUT', 'MAIN MENU', 'OPERATION PERMITTED', and 'BACK'.

Figure 85. Sampling in Progress

The screenshot shows the 'MOISTURE CALIBRATION' screen during sampling. The 'CURRENT READING' for the 'INLET SENSOR' is 21.6% and the 'SAMPLE TEST MOISTURE' is 21.6%. A yellow 'SAMPLING' indicator is present next to the 'SAMPLE TEST MOISTURE' value. The 'INITIATE' button is still visible for the outlet sensor.

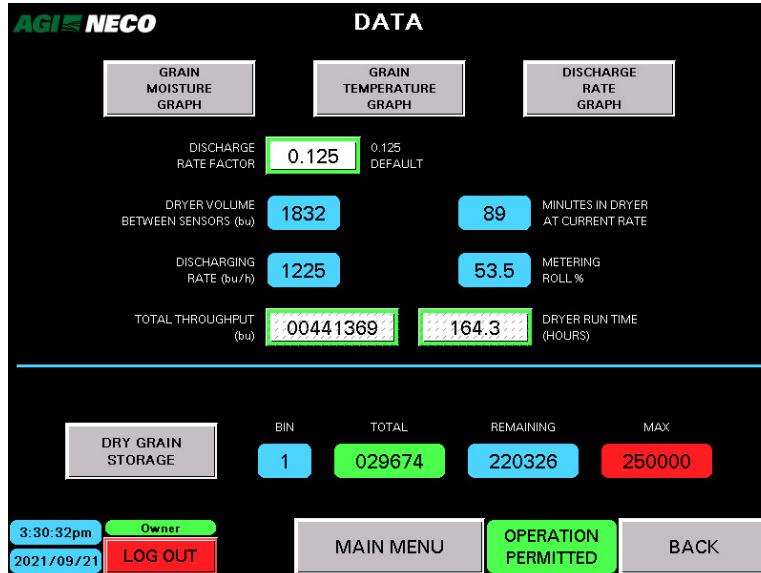
Figure 86. Current Reading Updated after Entering Sample Test Moisture Average

The screenshot shows the 'MOISTURE CALIBRATION' screen after updating. The 'CURRENT READING' for the 'INLET SENSOR' is updated to 22.1% and the 'SAMPLE TEST MOISTURE' is 24.5%. A 'DONE' button is visible next to the 'SAMPLE TEST MOISTURE' value. The 'INITIATE' button is still visible for the outlet sensor.

4.9. Data and Graphs Screens

4.9.1 Data Screen

Figure 87. Data Screen



The Data screen displays the following information:

Item	Description
Dryer Volume Between Sensors	Bushels or cubic meters.
Minutes in Dryer at Current Rate	Minutes required for grain to move from the inlet sensor to the outlet sensor at the current discharging rate.
Discharge Rate Factor	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Grain Bin volume counters. Select the desired grain bin counter.

Figure 88. Dry Grain Storage Screen

AGI NECO		DRY GRAIN STORAGE							
BIN	TOTAL	REMAINING	MAX	BIN	TOTAL	REMAINING	MAX		
1	029827	220173	250000	9	000000	999999	999999		
2	245000	005000	250000	10	000000	999999	999999		
3	150000	000000	150000	11	000000	999999	999999		
4	000000	150000	150000	12	000000	999999	999999		
5	000000	045000	045000	13	000000	999999	999999		
6	000000	045000	045000	14	000000	999999	999999		
7	000000	999999	999999	15	000000	999999	999999		
8	000000	999999	999999	16	000000	999999	999999		
3:31:36pm		Owner		MAIN MENU		OPERATION PERMITTED		BACK	
2021/09/21		LOG OUT							

4.9.2 Performance Data Graphs

In this Section:

- Grain Moisture graph
- Temperature graph
- Discharge Rate graph
- 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.

Figure 89. Grain Moisture

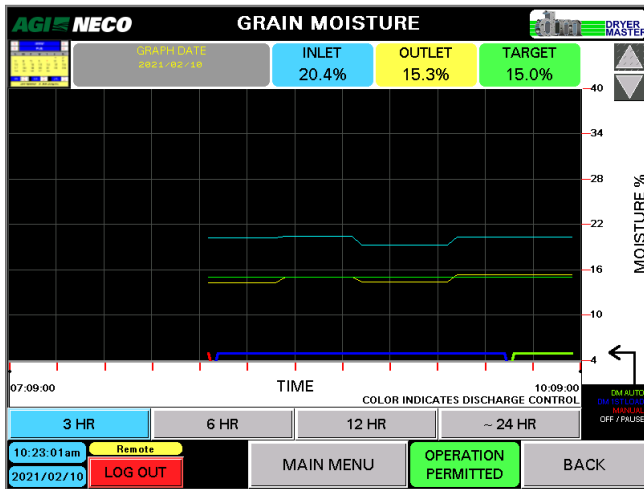


Figure 90. Temperature

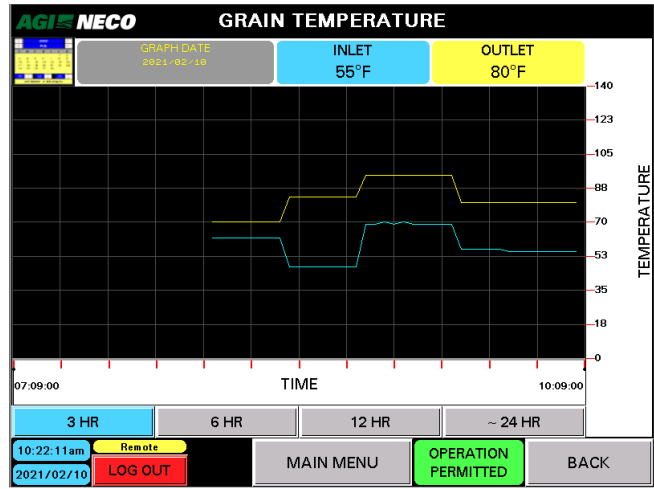
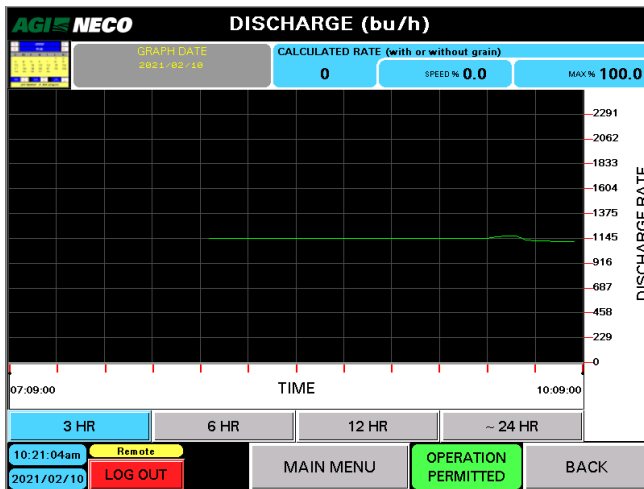


Figure 91. Discharge Rate



Note

All graphs capture a data point every three minutes.

4.10. Emergency Shutdown Procedure

1. Push the E-STOP button.



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 92. Emergency Door Closed

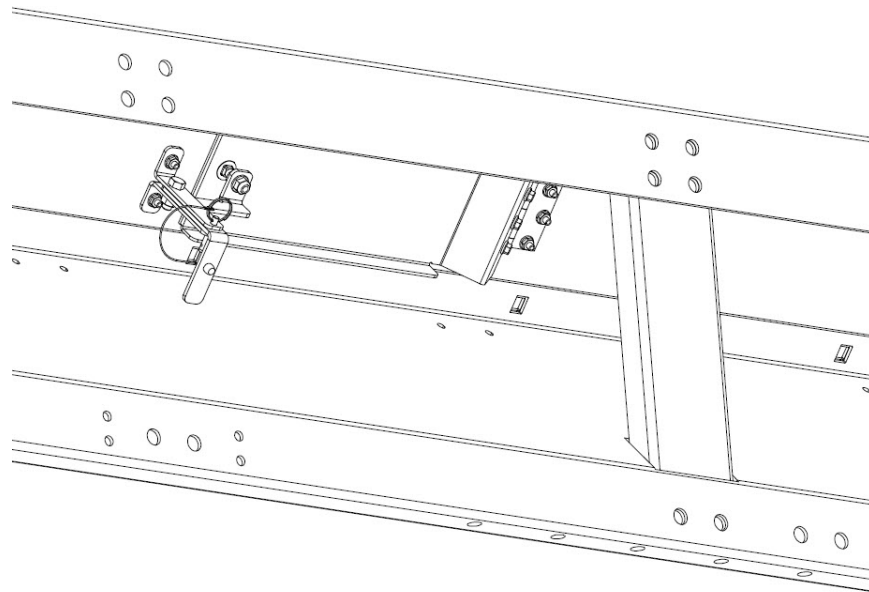
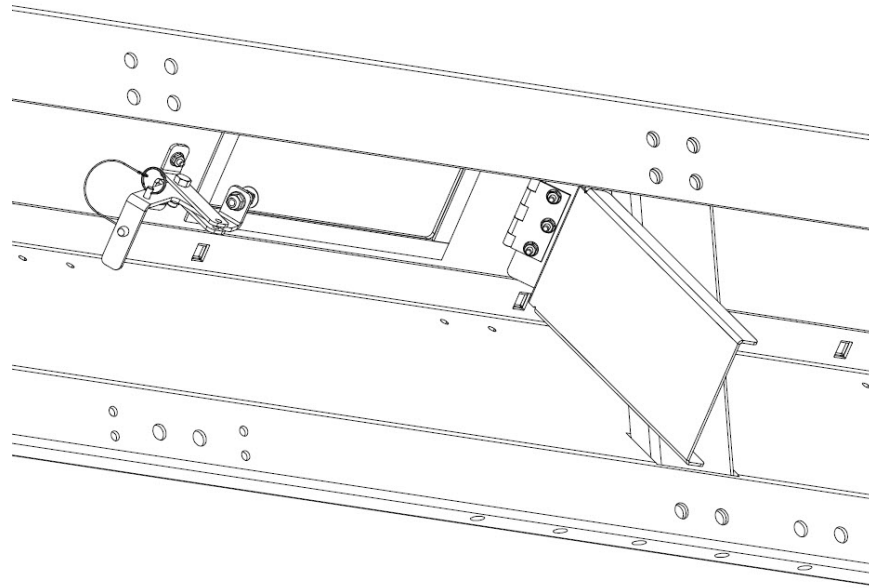


Figure 93. Emergency Door Open

- 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.

5. 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.

5.1. 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.



5.2. 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 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 4.2 – Equipment Pre-Check on page 21](#) 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 5.3 – Burner Gas Ports on page 74](#).
- 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.

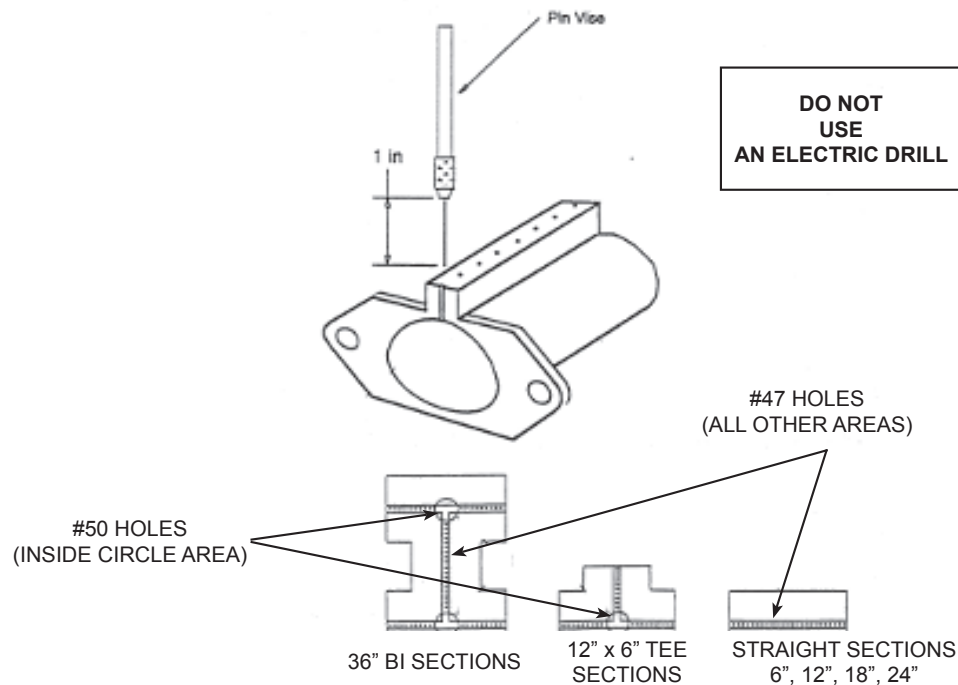
End-of-season equipment shutdown:

- 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.

5.3. 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:

Figure 94. Burner Gas Port Checking/Cleaning



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.

5.4. 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.

5.5. Lubrication

Important

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

PART DESCRIPTION	LUBRICATION PRODUCT	PER TIME PERIOD OF USAGE
Blower Drive Motor	Mfg Recommendation	Mfg Recommendation
Cross Auger Gearbox	80/90 Gear Oil 1/2 Full	Check Weekly
Fan Shaft Bearings	Mfg Recommendation	80 Hours
Cross Auger Bearings	Mfg Recommendation	100 Hours
Roller Chains	Le 451/452 Almasol	Annually

5.6. 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.

6. Troubleshooting

6.1. 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

Problem	Check	Cause	Solution
Temperature control communication error	If other temperature controls are visible	Incorrect address of the temperature controller	Re-address temperature controller
	If other temperature controllers are not visible	Damaged Modbus communication wires	Starting at the front of the PLC, trace Modbus communication cables to the lowest burner box
		Loose connection at gray communication tee connector	Tighten connection
		If problem persists contact dealer	
Temperature displays_***	Front of KS45 inside burner box displays FAIL on top display	Damaged thermocouple	Repair twisted end of thermocouple or replace whole wire
Unable to reach set point temperature	MAIN MENU-> TROUBLESHOOTING-> TEMPERATURE CONTROLS	If mod motor position is at 100% there is a fuel delivery problem	Turn fuel regulated pressure at individual burner up.
			CAUTION: DO NOT EXCEED 6 PSI for NG .10 PSI for LP
Actual temperature exceeds set point	MAIN MENU-> TROUBLESHOOTING-> TEMPERATURE CONTROLS	If mod motor position is at 0% there is a fuel delivery problem	Turn fuel regulated pressure down, trouble lighting may occur if operating pressures are turned below 1 PSI
Unsteady temperature control (high and low)	MAIN MENU-> TROUBLESHOOTING-> TEMPERATURE CONTROLS	Unsteady mod motor position	Turn fuel regulated pressure down, trouble lighting may occur if operating pressures are turned below 1 PSI
	Thermocouple location and condition	Location inside the dryer too close or too far away from burner	Thermocouple should be located three tiers from the floor and five air ducts back from the burner unless otherwise instructed by NECO
		Thermocouple corrosion	Cut and strip and tightly re-twist 3/4" of thermocouple wire
	Natural gas applications	Too high of a ramp rate	Troubleshooting-> temperature controls set ramp rate to 125

Problem	Check	Cause	Solution
Limits exceeded before plenum temperature is reached	Check set point of high limit switch	High limit switch set too low	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
	Check location of thermocouple in relation to the high limit bulb	Thermocouple and high limit switch bulb are too far apart	Thermocouple twisted pair should be within inches of high limit bulb without touching anything conductive

Honeywell Burner Control

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

Moisture Controls

Problem	Check	Cause	Solution
Moisture drift on outlet sensor	Blockage in discharge chute	Debris bridging over outlet sensor blocking grain flow	Clean out discharge chute around sensor
	Can sensor be seen through flow of grain	Insufficient grain flow over sensor	Adjust gate in discharge chute to restrict flow of grain
INLET MOISTURE SENSOR ERROR	Make sure that the Inlet Sensor is completely covered in grain	Incorrect timer settings on filling equipment allowing sensor to become uncovered	Adjust timer settings on the filling equipment to ensure sensor coverage.

Starting the Dryer in AUTO

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

General Operation

Problem	Check	Cause	Solution
CHANGE BATTERY	Battery in PLC is low, if not replaced DRYER CONFIGURATION can be lost	Battery in PLC should be replaced approx. every 3 years	Replace 1/2 AA battery in the bottom of the PLC in the main control panel
DRYER CONFIGURATION is lost.	CHANGE BATTERY displayed in lower right corner of HMI screen when powered up	Battery died in PLC during time of non use	Contact dealer to replace battery and re-configure dryer
E-STOP ACTIVE	Both E-STOP switches must be released	One switch is active	Activate and release each switch
	E-STOP Relay inside main control panel normally	If E-STOP button activated the relay displays	Repair or replace the E-STOP button or repair circuit
	Supply-green	Supply-green	If only one K1 or K2 on check wiring of switch
	K1 -green	K1 -off	
	K2 -green	K2 -off	
	Reset -off	Reset -off	
Unable to get Wet or Dry motors to start	MAIN MENU-> SET UP-> FILL & EMPTY SETUP	Review FILL & EMPTY SETUP page	Turn on necessary options
	MAIN MENU-> TROUBLESHOOTING-> PLC INPUTS	Review PLC INPUT STATUS, blinking icons indicate configuration/wiring errors	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
	MAIN MENU-> ALARMS	Alarm Present	Address any alarm problem in RED
Unable to get Wet Transport motors to start	Grain level in dryer	Wet Transports will not start with dryer full	Lower grain level below fill switch
	MAIN MENU-> SET-UP-> FILL & EMPTY SETUP	WET BIN EMPTY SWITCH enabled	Wet bin is empty

Problem	Check	Cause	Solution
	Check Fill rotary switch operation	PLC thinks that dryer is full	Repair/replace faulty rotary switch
	MAIN MENU-> ALARMS	Alarm Present	Address any alarm problem in RED
Unable to get Dry Transport motors to start	MAIN MENU-> SET-UP-> FILL & EMPTY SETUP	DRY BIN FULL SWITCH enabled	Dry bin is full
	Presence of active alarm	DISCHARGE PLUGGED	Clear plugged discharge and reset alarm

6.2. HMI Troubleshooting Screens

The following screens are used primarily for troubleshooting:

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

Figure 95. 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 96. Troubleshooting Screen

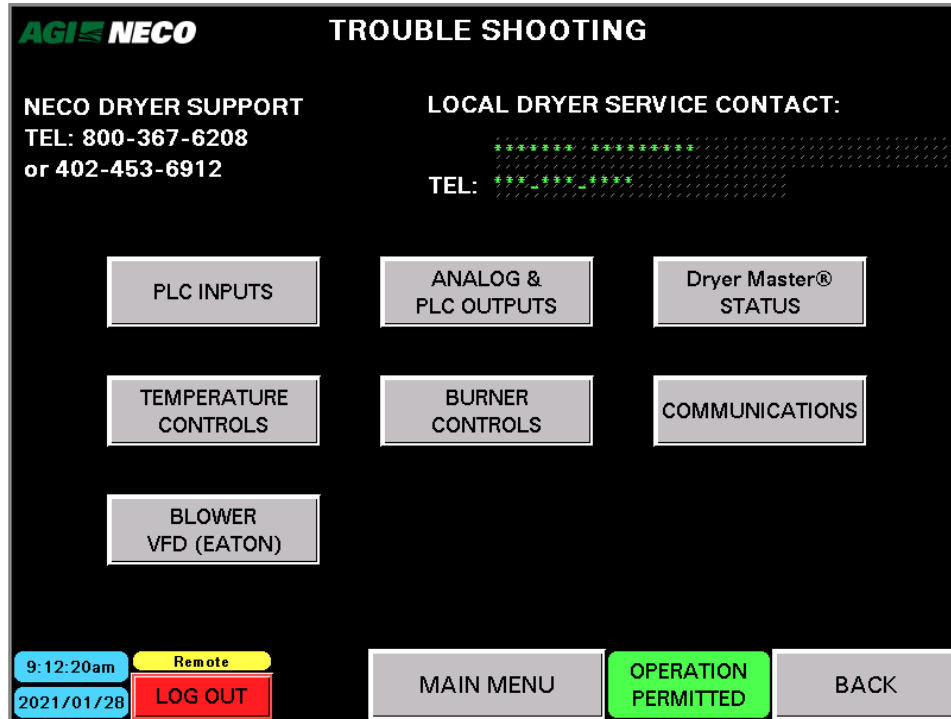


Figure 97. PLC Inputs Screen

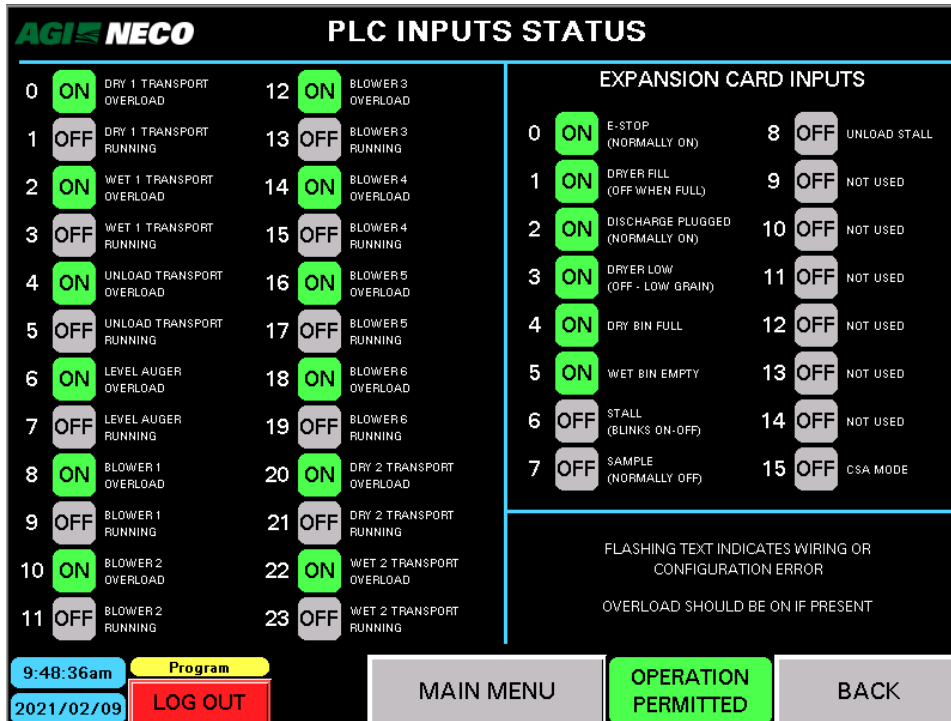


Figure 98. PLC Outputs Status Screen

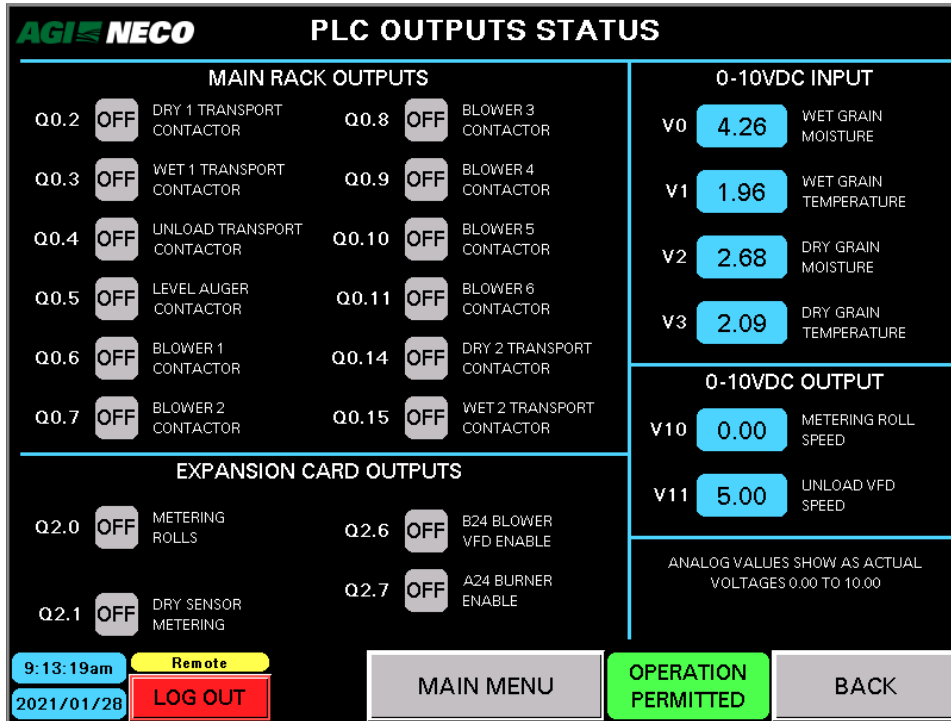


Figure 99. Dryer Master Status Screen

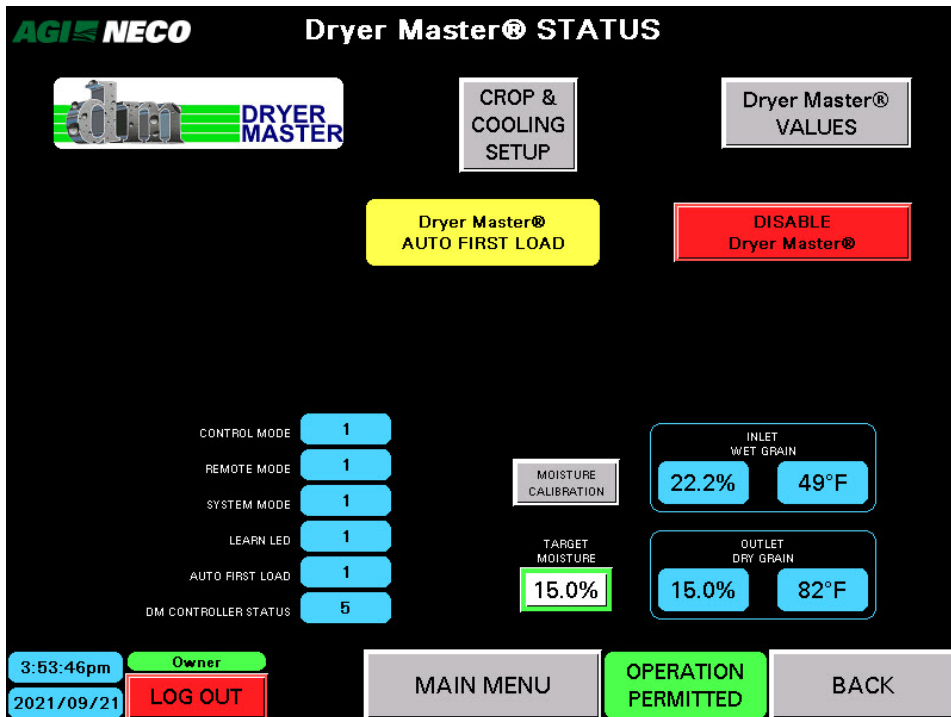


Figure 100. Dryer Master Values Screen

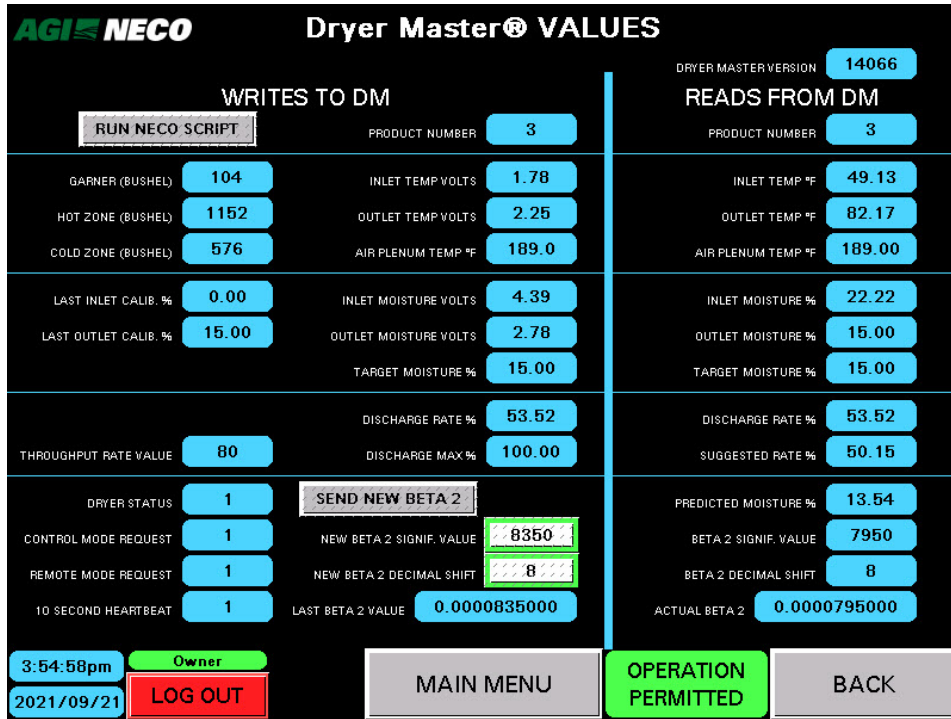


Figure 101. Temp Control Status Screen

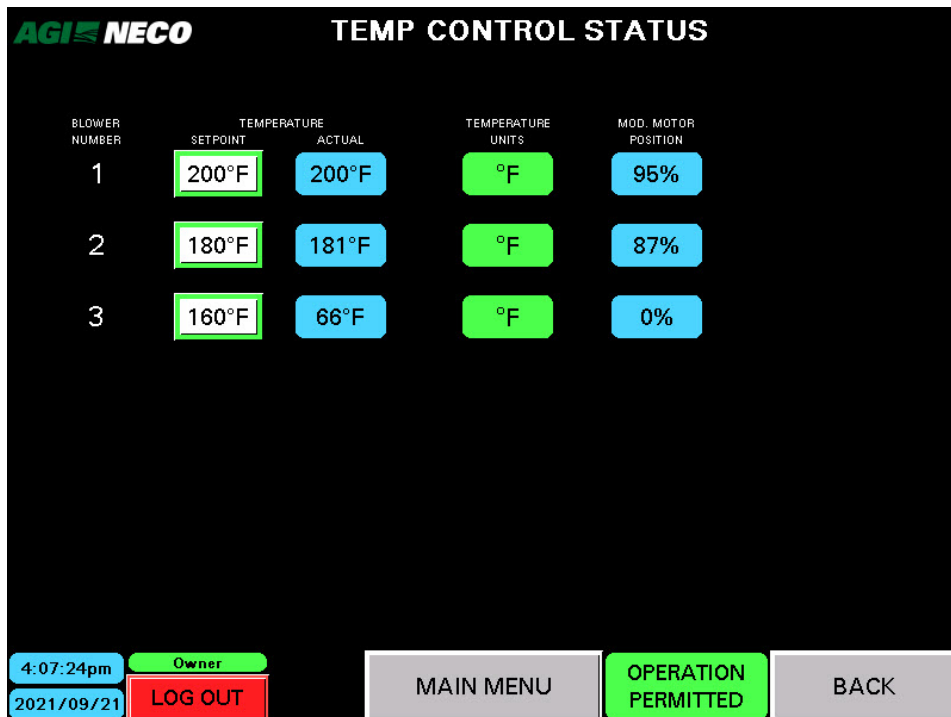


Figure 102. Burner Control Screen

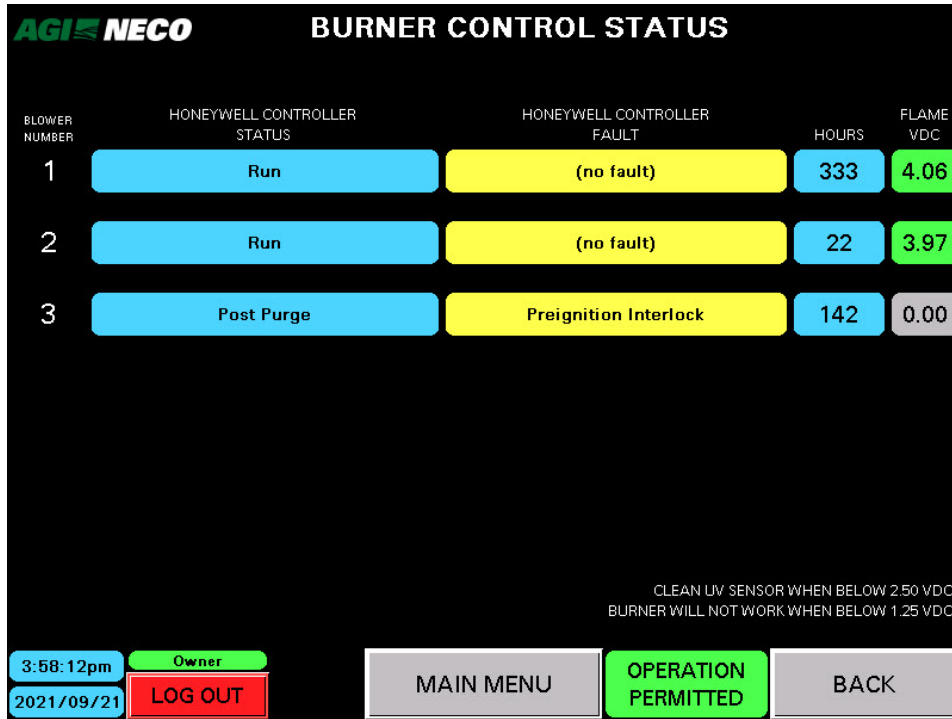


Figure 103. Blower VFD (Eaton) Screen

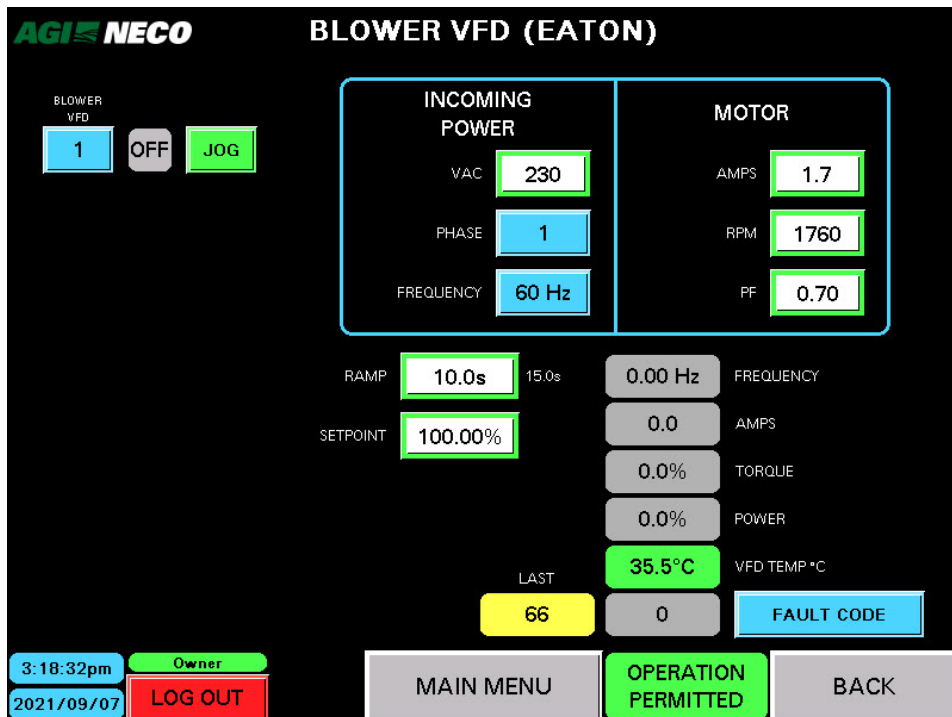


Figure 104. Fault Code (Eaton) Screen

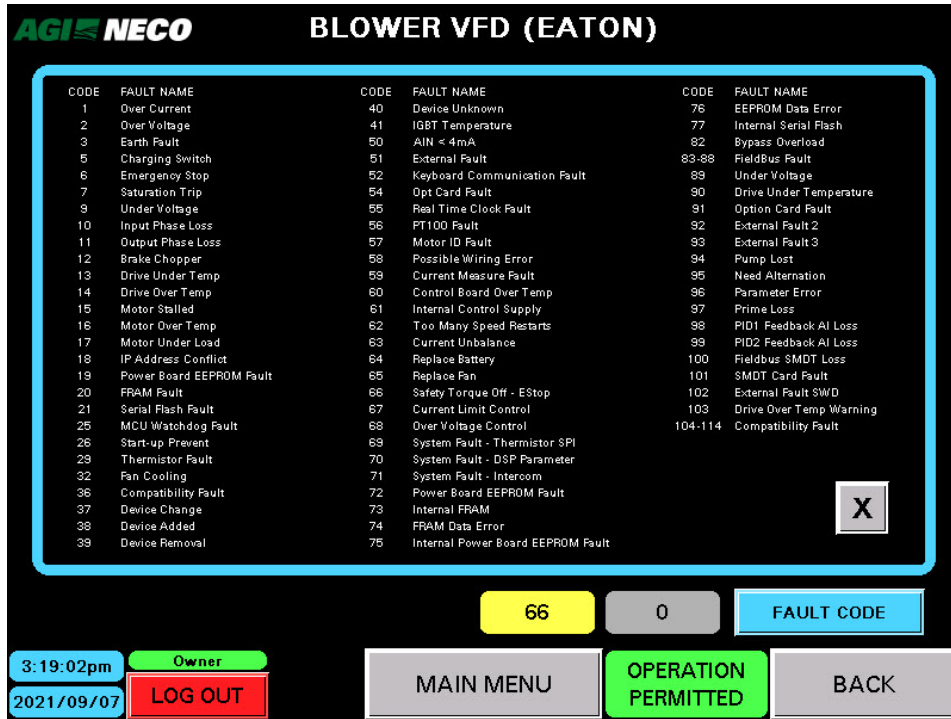
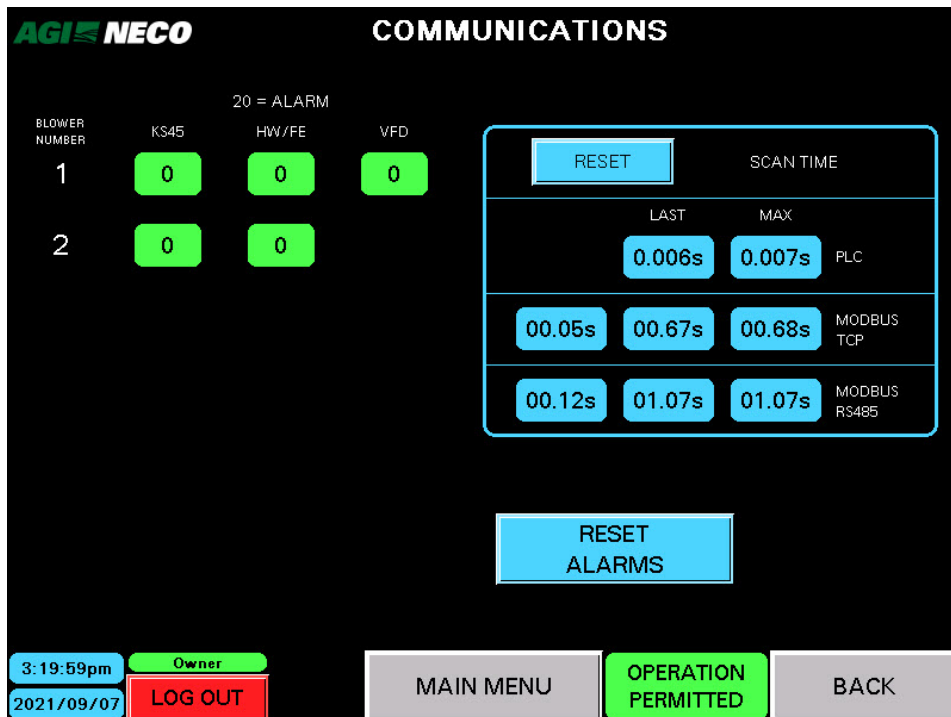


Figure 105. Communications Screen



7. Specifications

7.1. 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.

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).

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

Table 5. Standard Model Specifications

Model Number	Number of Tiers	Holding Capacity		Number of Burners and Blowers	TOTAL Blower Output (Max)		TOTAL Burner Output (Max)	
		Bushels (See Notes)	Metric Tonnes		cubic ft/min	cubic m/min	MMBTU /hr	kWH
D1660	4	579	15	1	21,500	609	6	1,758
D1670	5	674	17	1	23,500	665	6	1,758
D1680	6	770	19	1	27,500	778	6	1,758
D1690	7	866	22	1	32,000	905	6	1,758
D16106	8	962	24	2	36,600	1,035	12	3,517
D16120	10	1,155	29	2	47,000	1,330	12	3,517
D16140	12	1,347	34	2	55,000	1,556	12	3,517
D16160	14	1,539	39	3	65,300	1,847	18	5,275
D16180	16	1,731	44	3	78,500	2,221	18	5,275
D24108	6	1,155	29	2	41,200	1,165	12	3,517
D24150	8	1,443	36	2	55,000	1,556	12	3,517
D24180	10	1,732	44	2	62,000	1,754	15	4,396
D24210	12	2,020	51	3	82,500	2,334	18	5,275
D24240	14	2,309	58	3	89,500	2,532	21	6,154
D24260	16	2,597	66	4	110,000	3,113	24	7,034
D24330	20	3,174	80	5	137,500	3,891	30	8,792
D24380	24	3,750	95	6	165,000	4,669	36	10,551
D32260	12	2,693	68	3	108,000	3,056	27	7,913

Table 5 Standard Model Specifications (continued)

Model Number	Number of Tiers	Holding Capacity		Number of Burners and Blowers	TOTAL Blower Output (Max)		TOTAL Burner Output (Max)	
		Bushels (See Notes)	Metric Tonnes		cubic ft/min	cubic m/min	MMBTU /hr	kWH
D32340	16	3,463	88	4	144,000	4,075	36	10,551
D32440	20	4,232	107	5	182,000	5,150	45	13,188
D32500	24	5,001	127	6	216,000	6,112	54	15,826

8. Appendix

8.1. Manual Dryer Speed

Note

These speeds are recommended as a starting point only for input as manual metering roll speed until the Dryer Master 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 Settings (DC Motor %)

MODEL - RPM	MOISTURE CONTENT (%)						
	3	5	7	9	11	13	15
D1240 - 27 RPM	42%	25%	18%	14%	12%	10%	9%
D1250 - 27 RPM	52%	32%	23%	18%	15%	13%	11%
D1260 - 27 RPM	63%	38%	27%	21%	18%	15%	13%
D1660 - 27 RPM	42%	26%	19%	15%	13%	10%	9%
D1670 - 27 RPM	52%	32%	23%	18%	15%	12%	11%
D1680 - 27 RPM	62%	38%	27%	21%	17%	15%	13%
D1690 - 27 RPM	73%	44%	32%	25%	20%	17%	15%
D16106 - 42 RPM	53%	32%	23%	18%	15%	13%	11%
D16120 - 42 RPM	67%	40%	29%	22%	18%	16%	14%
D16140 - 42 RPM	80%	48%	34%	27%	22%	19%	16%
D16160 - 62 RPM	63%	38%	27%	21%	17%	15%	13%
D24108 - 27 RPM	62%	38%	27%	21%	17%	15%	13%
D24150 - 27 RPM	53%	32%	23%	18%	15%	12%	11%
D24180 - 42 RPM	67%	40%	29%	22%	18%	16%	14%
D24210 - 42 RPM	80%	48%	34%	27%	22%	19%	16%
D24240 - 62 RPM	63%	38%	27%	21%	17%	15%	13%
D24260 - 62 RPM	72%	43%	31%	24%	20%	17%	15%
D24330 - 83 RPM	68%	41%	29%	23%	19%	16%	14%
D24380 - 83 RPM	81%	49%	35%	27%	22%	19%	16%

Table 6 Speed Settings (DC Motor %) (continued)

MODEL - RPM	MOISTURE CONTENT (%)						
	3	5	7	9	11	13	15
D32260 - 62 RPM	54%	32%	23%	18%	15%	13%	11%
D32340 - 62 RPM	72%	43%	31%	24%	20%	17%	15%
D32440 - 92 RPM	61%	36%	26%	20%	17%	14%	12%
D32500 - 92 RPM	73%	44%	31%	24%	20%	17%	15%

8.2. PLC and HMI Recorded Data Sheet

(Circle choice or Enter data)

SETUP TAB

Temp & Volume Units: Imperial Metric

SETUP TAB - Dryer Configuration

Length: 12' 16' 24' 32'

Gearmotor RPM:

Level Auger: Yes No

Number of Blowers: 1 2 3 4 5 6

Number of Burners: 1 2 3 4 5 6

Number of Tiers at Blower:					
Blower #1	Blower #2	Blower #3	Blower #4	Blower #5	Blower #6
3 4 5	3 4 5	3 4 5	3 4 5	3 4 5	3 4 5

Gas Type: Liquid Propane (LP) or Natural Gas (NG)

SETUP TAB - Fill & Empty Setup

Wet Transport 2: Yes No

Run Continuous: Yes No

Stop After Drying Stops: Yes No

Start Delay Seconds:

Stop Delay Seconds:

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:

Dry Transport 2: 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

Low Level Switch: Yes No

Metering Roll Max Speed:

SETUP TAB - Timers Setup

Factory Defaults shown in ()

Auto Filling Delay (10 SEC):

Low Level Ignore (30 SEC):

Max Run Time (5 MIN):

Blower Start Delay (5 SEC):

Burner Enable Delay (5 SEC):

Enable Discharge (30 SEC):

Metering Roll Stall (3 MIN):

Metering Roll Pause (60 SEC):

Discharge Plugged Ignore (1 SEC):

Dryer Cooling Time (5 MIN):

SETUP TAB - Control Setup (Overrides)

Inlet Grain Moisture Alarm Setpoint:

MAIN MENU TAB - Trouble Shooting

Dealer Info:

TROUBLE SHOOTING - Temperature Control

Ramp Deg/Min

1

2

3

4

5

6

MAIN MENU TAB - Trends

Discharge Rate Factor:

Throughput:

Total Throughput:

Hours:

MAIN MENU TAB - Fill / Empty Dryer

Manual Metering Roll Setpoint:

Serial #:

PLC & HMI Version #:

8.3. 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 8.2 – PLC and HMI Record Sheet on page 90](#) 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**.

Figure 106. Lights When Power Turned Back On

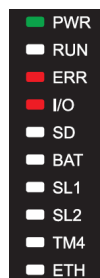
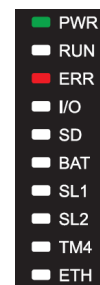
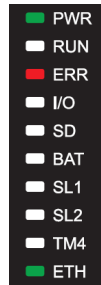


Figure 107. PWR and ERR Lights On



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

Figure 108. Lights Indicating Ready to 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.

Figure 109. Lights When Power Turned On

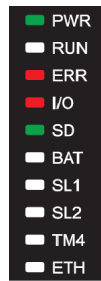
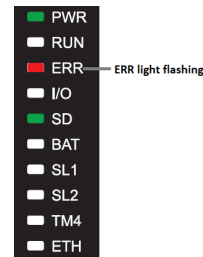
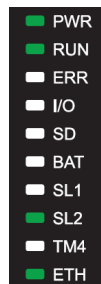


Figure 110. Lights On When Program is Finished Loading



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.

Figure 111. Lights Indicating M241 Ready for Use



Installing the HMIGTO Screen Software

To install the HMIGTO software:

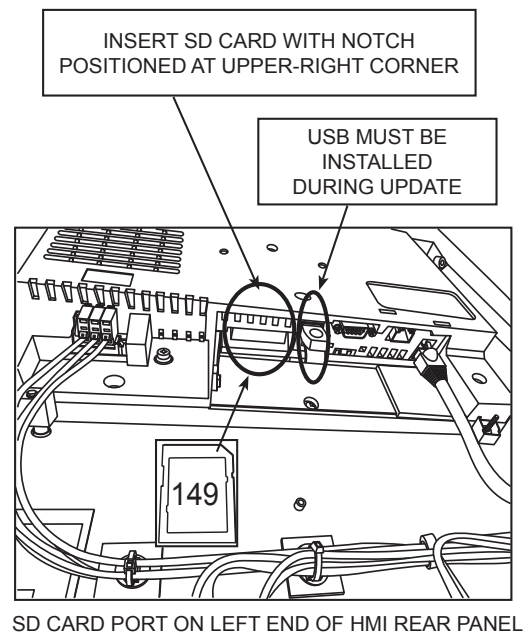
1. Power off the **HMI**.
2. Remove **USB drive** from **dryer HMI**.
3. Format **USB drive** to **Fat32**.
4. Replace the **USB drive** in the **HMI**.
5. Install the **SD card** with the new files.
6. Power on the **HMI**.

Note

Installation should begin automatically (~2 minutes).

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

Figure 112. HMIGTO Series



8.4. 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 113. Honeywell Burner Control Location and LEDs

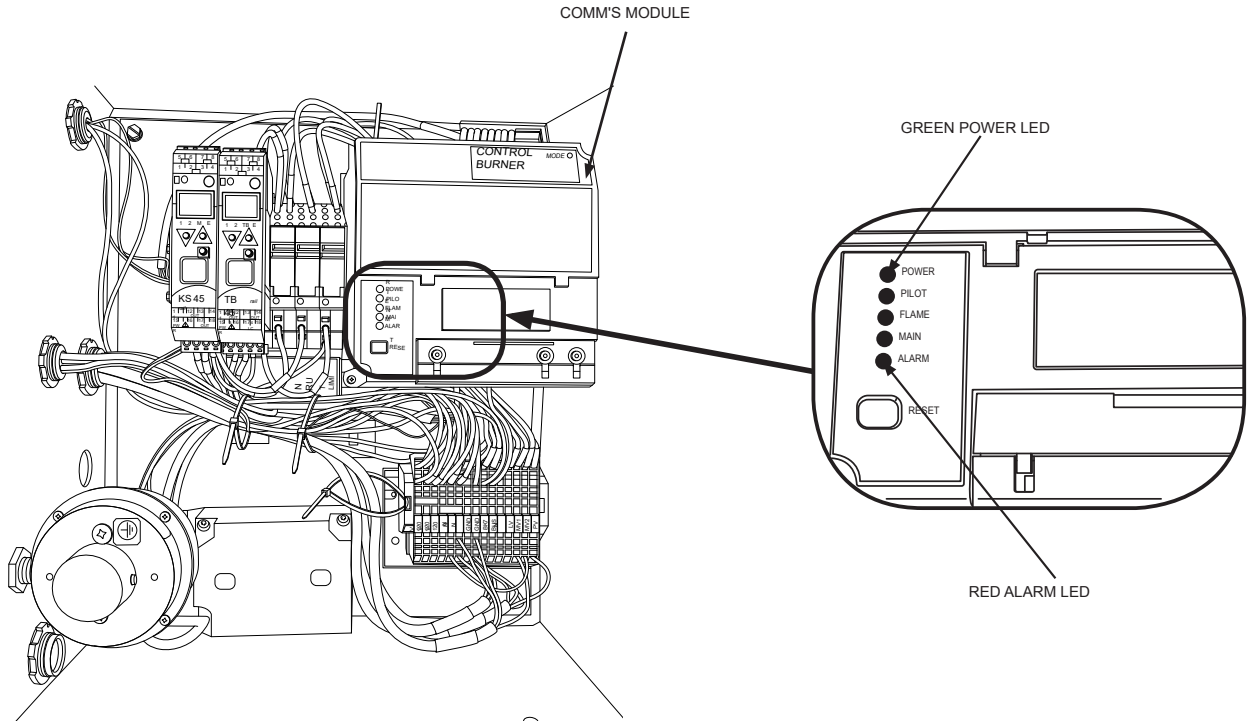


Table 7. Power LED Fault Codes

CODE (Fast-Slow)	FAULT DESCRIPTION
1-1	Low AC line voltage
1-2	AC quality problem
2-1	Unexpected flame signal
2-2	Flame signal absent
2-3	Flame signal overrange
3-1	Running ILK switch problem
3-2	Running ILK switch in Standby
3-3	Valve proving fault
4-1	Purge card problem
4-2	Wiring problem/internal fault
4-3	Flame amplifier problem
4-4	Configuration jumper problem
5-1	PII fault (Normal state when turned off)
5-2	HFS/LFS fault
5-3	MOS/Start switch
6-1	Output drive failure

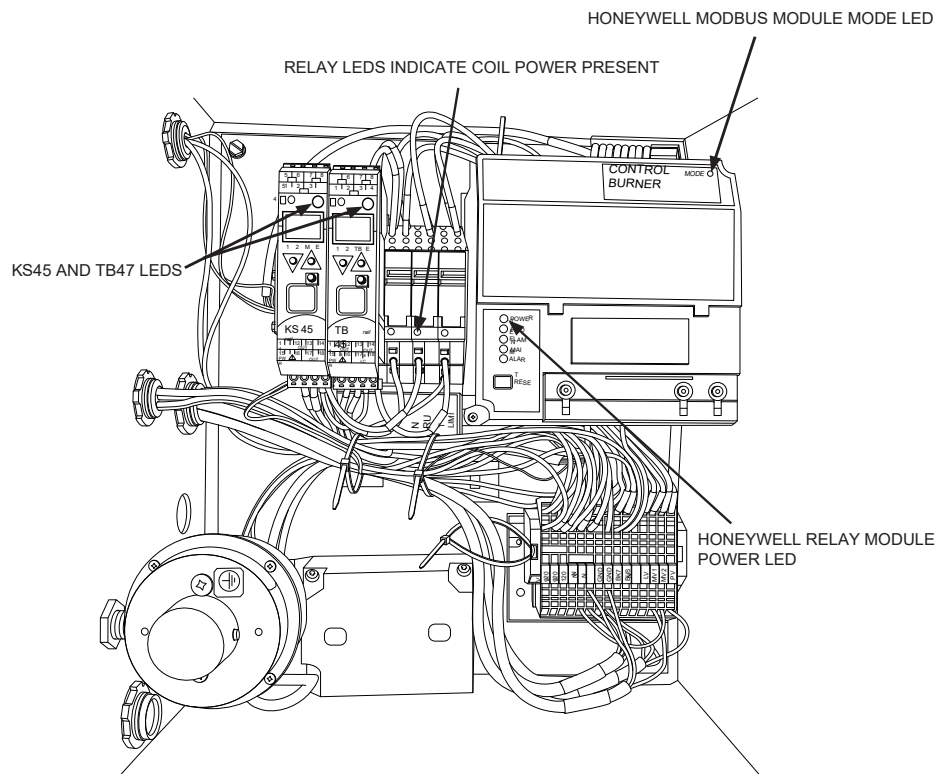
Table 7 Power LED Fault Codes (continued)

CODE (Fast-Slow)	FAULT DESCRIPTION
6-2	Internal fault
6-3	Device specific fault
6-4	Accessory fault
7-7	Unrecognized fault

8.5. KS45 & TB45 Controller LEDs

Table 8. KS45 and TB45 Controller LED Warnings

Color	Meaning
Green	Ok
Green, blinking	No Modbus communications
Red	Excessive temperature or bad thermocouple
Red, blinking	Internal fault, replace controller



Honeywell Modbus Mode LEDs

LED Behavior	Pulse Period	Interval	Meaning
Mostly ON with 1 blink (good)	50ms (OFF)	1 sec	Normal Operation Both ControlBus and ModBus are active
Always OFF		OFF	No power or device failure
Always ON		ON	Modbus card failure
Mostly OFF with 1 flash	50ms (ON)	3.85 sec	ModBus is not active Check ModBus wiring
Mostly OFF with 2 pulses	2 x (200ms ON, 200ms OFF)	1.75 sec	Program CRC error
Most OFF with 3 pulses	3 x (200ms ON, 200ms OFF)	2.15 sec	No ControlBus signal from the burner controller

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.







Fault Code	System Failure	Recommended Troubleshooting
Code 1-1 *Low AC Line Voltage*	Low AC Line detected.	<ol style="list-style-type: none"> 1. Check the relay module and display module connections. 2. Reset and sequence the Relay Module. 3. Check the 7800 power supply and make sure that frequency and voltage meet specifications. 4. Check the backup power supply, as appropriate.
Code 1-2 *AC Quality Problem*	Excessive noise or device running on slow, fast, or AC line dropout detected.	
Code 2-1 *Unexpected Flame Signal*	Flame sensed when no flame is expected during STANDBY or PURGE.	<ol style="list-style-type: none"> 1. Check that flame is not present in the combustion chamber; correct any errors. 2. Make sure that the flame amplifier and flame detector are compatible. 3. Check the wiring and correct any errors. 4. Remove the flame amplifier and inspect its connections. Reseat the amplifier. 5. Reset and sequence the relay module. 6. If the code reappears, replace the flame amplifier and/or the flame detector. 7. If the fault persists, replace the relay module.

Fault Code	System Failure	Recommended Troubleshooting
Code 2-2 *Flame Signal Absent*	No-flame time present at the end of the Pilot Flame Establishing Period; lost during the Main Flame Establishing Period or during RUN.	<ol style="list-style-type: none"> 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 check-out 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.
Code 2-3 *Flame Signal Overrange*	Flame signal value is too high to be valid.	<ol style="list-style-type: none"> 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.
Code 3-1 *Running/ Interlock Switch Problem*	Running or Lockout Interlock fault during Prepurge.	<ol style="list-style-type: none"> 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.
Code 3-2 *Running/ Interlock On During Standby*	Lockout Interlock powered at improper point in sequence or On in Standby.	<ol style="list-style-type: none"> 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 welded 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.
Code 3-3 *VPS in Improper State*	VPS (Valve Proving Switch) in wrong state during VPS Test.	<ol style="list-style-type: none"> 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.
Code 4-1 *Purge Card Problem*	No purge card or the purge card timing has changed from the original configuration.	<ol style="list-style-type: none"> 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.
Code 4-2 *Wiring Problem/ Internal Fault*	Pilot (ignition) valve terminal, main valve, ignition or Main Valve 2 was on when it should be off.	<p>⚠ WARNING Electrical Shock Hazard; Fire or Explosion Hazard. Can cause severe injury, death or property damage. Remove system power and turn off power supply.</p> <ol style="list-style-type: none"> 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.

Fault Code	System Failure	Recommended Troubleshooting
Code 4-3 *Flame Amplifier Problem*	Flame not sensed, or sensed when it should be on or off.	<ol style="list-style-type: none"> 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.
Code 4-4 *Configuration Jumper Problem*	The configuration jumpers differ from the sample taken at startup.	<ol style="list-style-type: none"> 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.
Code 5-1 *Preignition Interlock*	Preignition Interlock fault.	<ol style="list-style-type: none"> 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.
Code 5-2 *High Fire Sw. or Low Fire Sw.*	Either High Fire Switch or Low Fire Switch failure.	<ol style="list-style-type: none"> 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.
Code 5-3 *Man-Open Sw.; Start Sw. or Control On*	Man-Open Switch, Start Switch or Control On in the wrong operational state.	<ol style="list-style-type: none"> 1. Check wiring and correct any errors. 2. Make sure that the Manual Open Valve Switch, Start Switch and Control are operating properly. 3. Stat 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).
Code 6-1 *Internal Faults*	Relay Module self-test failure.	<ol style="list-style-type: none"> 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.
Code 6-2 *Internal Faults*	Relay Module Self-Test failure.	<ol style="list-style-type: none"> 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.
Code 6-3 *Device Specific*	Fault with special OEM input circuits.	<ol style="list-style-type: none"> 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.
Code 6-4 *Accessory Fault*	Unused at this time.	—
Code 7-7 *Unused*	Unused at this time.	—

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.

LED DISPLAY READOUT ● = ON							
LOCKOUT MESSAGE	FAN	OPEN DAMPER	CLOSE DAMPER	AUTO	IGN	FLAME	
							
T13 FUEL VALVE END SWITCH OPEN					●	●	
M-D LOW FIRE START OPEN				●		●	
M-D LOW FIRE START OPEN - PTFI	●			●		●	
M-D LOW FIRE START OPEN - MTFI	●	●		●		●	
M-D CLOSED			●		●		
M-8 CLOSED			●			●	
M-8 HIGH PURGE CIRCUIT OPEN				●			
FALSE FLAME-STANDBY				●	●		
FLAME FAIL PTFI	●			●	●	●	
FLAME FAIL - MTFI	●	●		●	●	●	
FLAME FAIL AUTO				●	●	●	
3-P RUN INTLK OPEN - PREPURGE	●		●			●	
3-P RUN INTLK OPEN - PURGE	●		●		●		
3-P RUN INTLK OPEN-PTFI	●		●				
3-P RUN INTLK OPEN-MTFI	●	●	●				
3-P RUN INTLK CLOSED-STANDBY						●	
3-P RUN INTLK OPEN-AUTO			●				
FUEL VALVE STATE CHANGE					●		
CHECK FUSE			●	●	●		
CHECK WIRING			●	●		●	
CHECK SCANNER			●		●	●	
CHECK PROGRAMMER			●	●			
CHECK CHASSIS		●					
CHECK EXPANSION MODULE			●	●	●	●	

8.6. Dryer Temperature Considerations

High-Limit Temperature Consideration

 **WARNING** 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.

8.7. Grain Drying Tips

8.7.1 Specific Crops

DRYING SUGGESTIONS
FOR SPECIFIC GRAINS / SITUATIONS IN YOUR
AGI≡NECO DRYER



AGI≡NECO

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.

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CORN

DIFFICULTY:
●○○○○

DRYING 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 buildup 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 overamping of the blower motors and dryer shutdowns.



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WHITE CORN / FOOD GRADE

DIFFICULTY:
●●○○○

DRYING TEMP:
130-140°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).




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WHEAT

DIFFICULTY:
●●○○○

DRYING TEMP:
180°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 unloads 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.

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BARLEY / OATS

DIFFICULTY:
●●○○○

DRYING TEMP:
160-170°F (71-77°C)



NOTES:
Barley and oats run well in a NECO 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.

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SOYBEANS

DIFFICULTY:
●●●○○

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.

AGI≡NECO

SORGHUM / MILLET

DIFFICULTY:
●●●○○

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.

AGI≡NECO

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

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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 (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.


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.

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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 wear. 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.

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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)

AGI≡NECO

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 402-453-6912 or send an email to service@necodryers.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 over 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 buildup 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.





8.7.2 *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.

9. 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: **D1660CE, D1670CE, D1680CE, D1690CE, D16106CE, D16120CE,
D16140CE, D16160CE
D24108CE, D24150CE, D24180CE, D24210CE, D24240CE,
D24260CE, D24330CE, D24380CE
D32260CE, D32340CE, D32440CE, D32500CE**

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

Omaha, NE USA

10. 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.






NECO is an AGI Brand.

AGI is a leading provider of equipment solutions for agriculture bulk commodities including seed, fertilizer, grain, and feed systems with a growing platform in providing equipment and solutions for food processing facilities. AGI has manufacturing facilities in Canada, the United States, the United Kingdom, Brazil, South Africa, India and Italy and distributes its products globally.



9364 N. 45th St. Omaha, Nebraska, USA 68152

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If you have any comments or questions on this manual, or find an error, email us at comments@aggrowth.com.
Please include the part number listed on the cover page in your message.