

Start Up Instructions for the Kiln, Page 1 of 2

1. Turn the **Main Breaker** at the right side of the panel on.
2. Press the orange **[Control Power On]** push button. It will light up when pressed.
3. If the alarm horn sounds, press the black **[Alarm Silence]** push button
4. Press the green push button to start each fan. The lamp on each push button will light.
 - **[Kiln Combustion Blower Start]**
 - **[Kiln P.O.C. Fan Start]**
 - **[Kiln Cooling Supply Fan Start]**
 - **[Kiln High Pressure Fan Start]**
 - **[Kiln Cooling Exhaust Fan Start]**
 - **[Kiln Crown Jet Nozzles Start]**
 - **[Dryer Recirculation Fan Start].**
5. Reset the **High Temperature Limit Controller**: Press the **[Reset]** button on the face of the controller.
6. When all the red **Alarm** lights turn off. The blue **Purging** lamp will light for about 3 minutes.
7. Turn the **Fire** switch for each zone to the **Low** position.
8. Check the **Controllers** for each zone:
 - Press the **[Man/Auto]** push button on each controller until there is a small **MAN** illuminated in the upper right corner of the display.
 - Press the **[Lower Display]** until **SP XXXX** is displayed. Use the **[▲]** and **[▼]** keys to set the setpoint close to the current kiln temperature.
 - Press the **[Man/Auto]** push button on each controller until there is a small **A** in the upper right hand corner of the display.
 - Press the **[Lower Display]** until **SP XXXX** is displayed. Adjust the setpoint to the operating setpoint. The kiln will automatically ramp from the current temperature to the operating temperature.
9. When the green **Purge Complete** lamp lights, go to the **Gas Train**. Open the **Main Gas Valve**: Move the handle all the way to the back, then **slowly** move it all the way forward.
10. Turn the **Burner** switch for each burner you wish to light to the **On** position.
11. Press the **[Ignition]** push button for each zone you wish to light. In a few seconds, each burner's **Flame** lamp will light.
 - If any burner fails to light, that burner's **Flame** lamp will not light, the alarm will sound until all burners in a zone have been lit once.
 - To **relight** a burner, open the middle two panel doors.
 - Find the gold **flame relay** for that burner.
 - Press the **[Reset]** bar on that flame relay.

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- **Repeat** until all burners are lit.
12. When all the burners in a zone are lit, turn that zone's **Fire** switch to the **High** position.
 13. Reset the Alarm by pressing the black **[Reset]** button.

Start Up Instructions for the Car Handling Equipment, Page 1 of 1

- 1 Turn on all four blue **Star Equipment** panels in the following order:
 - **Kiln Propeller Panel:**
 - 1) Turn **On** the **Disconnects**
 - 2) Turn the **Power** switch to the **On** position. The white **Power On** lamp will light.
 - 3) Pull out the red **[Stop]** push button.
 - 4) Press the green **[Start]** push button. The green **MCR On** lamp will light.
 - 5) Turn the **Power** switch on the **Pacesetter** panel to the **On** position. The instrument will light.
 - **Transfer Car 1:**
 - 1) Turn **On** the **Disconnects**
 - 2) Turn the **Power** switch to the **On** position. The white **Power On** lamp will light.
 - 3) Pull out the red **[Stop]** push button.
 - 4) Press the green **[Start]** push button. The green **MCR On** lamp will light.
 - **Return Track:**
 - 1) Pull out the **[Stop]** push button on all three pedestals.
 - 2) Go to the Star Panel near the cooling zone of the kiln.
 - 3) Turn the **Power** switch to the **On** position. The white **Power On** lamp will light.
 - 4) Press the green **[Start]** push button. The green **MCR On** lamp will light.
- 2 Refer to the Start-Up sheet of each separate piece of equipment.

Start Up Instructions for the Kiln Propeller, Page 1 of 1

1. Check for a **Kiln Car** in front of the **Photo Eye** at the front of the **Kin**. If one is not there, use **Transfer Car 1** to put a kiln car at the entrance of the kiln.
2. Turn the **Kiln** switch to the **Man** position, and the **High Volume Pump** switch to the **Man** position.
3. Turn the **Cylinder 1** switch to the **REV** position, until the **strike bar** is against the **bottom limit switch** on the Cylinder 1 tower. Return the **Cylinder 1** switch to the **Auto** position.
4. Turn the **Cylinder 2** switch to the **FWD** position, until the **dog** is tight against the **rear** push point of the car at the front of the kiln. The **Strike Bar** should be not touching **any** limit switch on the cylinder 2 tower. Return the **Cylinder 2** switch to the **Auto** position.
5. Turn the **High Volume Pump** switch to the **Auto** position.
6. Turn the **Schedule Push** switch to the **Auto** position.
7. Turn and hold the **Reset Off Cycle** switch to the **Reset** position for **two seconds**. Then, turn the switch to **Cycle**.
8. Turn the **Kiln** switch to the **Auto** position.
9. Turn the **VFD** switch to the **On** position.
10. Press the **[Run]** key on the face of the **Pacesetter instrument**.
11. Press the **[Setpoint]** key on the face of the **Pacesetter instrument**. Type in the desired push rate in **Minutes per Car**, and press **[Enter]**.

Start Up Instructions for Transfer Car 1, Page 1 of 1

Transfer Car 1 is the transfer car at the **Entrance** of the kiln.

1. Turn the **Man Off Auto** switch to **Man**. Turn the **HPU** switch to **Man**. The Bell will ring for a few seconds, then the motor will start.
2. To start the transfer car in **Auto** mode, the car must be at the **Return Track**. If it is skip to step #6
3. Turn the **Car Mover** switch to the **Ret** position to retract the **Car Mover**.
4. Turn the **Lock** switch to the **Ret** position to retract the **V-Lock**.
5. Turn the **Travel** switch to the **Rev** position to drive the car **away from the river**, until the car is at the **Return Track**, and the green **Position** light turns on. To make the car move faster, press and hold the green **[Fast]** push button. Return the switch to **Auto** when the car is in position.
6. If there is a **Kiln Car** on the transfer car, press the **[Semi-Auto]** push button to automatically remove it.
7. Turn the **Lock** switch to the **Ext** position to extend the lock. Return the switch to the **Auto** position.
8. Turn the **Dogs** switch to the **On** position to change the dogs to the pull-on position. Return the switch to the **Auto** position.
9. Turn the **Car Mover** switch to the **Auto** position.
10. Turn the **HPU** switch to the **Auto** position.
11. Turn the **Kiln** and **Return Track** toggle switches to the **On** position. Turn the **Bypass Track** switch to the **Off** position.
12. Turn and hold the **Reset Off Cycle** to the **Cycle** position for **two seconds**, then turn the switch to **Cycle**.
13. The green **Auto** lamp will light

Start Up Instructions for Transfer Car 2, Page 1 of 1

Transfer car 2 is the transfer car at the **Exit** of the kiln.

1. Turn the **Man Off Auto** switch to **Man**. Turn the **HPU** switch to **Man**. The Bell will ring for a few seconds, then the motor will start.
2. To start the transfer car in **Auto** mode, the car must be at the **Kiln**. If it is skip to step #6
3. Turn the **Car Mover** switch to the **Ret** position to retract the **Car Mover**.
4. Turn the **Lock** switch to the **Ret** position to retract the **V-Lock**.
5. Turn the **Travel** switch to the **Fwd** position to drive the car **toward the river**, until the car is at the **Kiln**, and the green **Position** light turns on. To make the car move faster, press and hold the green **[Fast]** push button. Return the switch to **Auto** when the car is in position.
6. If there is a **Kiln Car** on the transfer car, press the **[Semi-Auto]** push button to automatically remove it.
7. Turn the **Lock** switch to the **Ext** position to extend the lock. Return the switch to the **Auto** position.
8. Turn the **Dogs** switch to the **On** position to change the dogs to the pull-on position. Return the switch to the **Auto** position.
9. Turn the **Car Mover** switch to the **Auto** position.
10. Turn the **HPU** switch to the **Auto** position.
11. Turn the **Kiln** and **Return Track** toggle switches to the **On** position. Turn the **Bypass Track** switch to the **Off** position.
12. Turn and hold the **Reset Off Cycle** to the **Cycle** position for **two seconds**, then turn the switch to **Cycle**.
13. The green **Auto** lamp will light

Start Up Instructions for the Return Track, Page 1 of 1

Car Mover 1: Car mover 1 moves a car up the return track from the **Exit** of the kiln to the **Unload** machine. Its controls are on a pedestal near the **Unload** machine.

1. Turn the **CM-1** switch to the **Rev** position until the green **Rear** lamp lights.
2. Turn the **CM-1** switch to the **Auto** position.
3. Turn the **Stop 1** switch to the **Down** position until the green **Down** lamp lights.
4. Turn the **Stop 1** switch to the **Auto** position.
5. When one of the two photo eyes at the rear of the return track have a car in front of them, the car mover will advance them to the **Unload** machine, when the machine is **ready**.

Car Mover 2: Car mover 2 moves the car from the **Unload** machine to the **Load** machine. Its controls are on a pedestal near the **Load** machine.

1. Turn the **CM-2** switch to the **Rev** position until the green **Rear** lamp lights.
2. Turn the **CM-2** switch to the **Auto** position.
3. Turn the **Stop 2** switch to the **Down** position until the green **Down** lamp lights.
4. Turn the **Stop 2** switch to the **Auto** position.
5. When the **Load** and **Unload** machines have completed their cycles, **CM-2** will advance the cars by one position.

Car Mover 3: Car mover 3 moves a car from in front of the **Load** machine to the head of the return track. Its controls are on a pedestal by **Transfer Car 1**.

1. Turn the **CM-3** switch to the **Rev** position until the green **Rear** lamp lights.
2. Turn the **CM-2** switch to the **Auto** position.
3. When **CM-2** deposits a car on the photo eye in front of the **Load** machine, **CM-3** will advance the car to **Transfer Car 1**.

Shut Down Instructions for the Kiln, Page 1 of 1

1. On each controller:
 - Press the **[Set-Up]** key until the display reads **Setup SP Ramp**.
 - Press the **[Function]** key until the display reads **XXX EU/Hr Down**.
 - Use the **[▲]** and **[▼]** keys to adjust this to the desired cool-down rate. For the longest kiln life, set this value to **100 or less**.
 - Press **[Lower Display]** to return to operating mode.
2. On each controller, press **[Lower Display]** until the display reads **SP XXXX**.
3. Use the **[▲]** and **[▼]** keys to adjust the setpoint to zero. The kiln will automatically ramp to this temperature from the current setpoint.
4. When the temperature in a zone stops dropping, turn the **Burners** switch for that zone to the **Low** position.
5. When all the **Burners** switches are in the **Low** position, turn the **Burners** switch for each zone to the **Off** position.
6. When the maximum temperature in the kiln is less than **1000°F** the **Star Pusher** can be turned **Off**. Press the red **[Stop]** button on the **Pacesetter**, and turn the **VFD** switch to the **Off** position.
7. When the maximum temperature in the kiln is less than **150°F**, press the red **[Stop]** push button for each of the fans on the kiln:
 - **[Preheat Exhaust Fan Stop]**
 - **[Combustion Blower Stop]**
 - **[Cooling Exhaust Fan Stop]**
 - **[Cooling Supply Fan Stop]**.
8. Press the red **[Control Power Off]** push button to remove power from the panel

Kiln Alarm Troubleshooting Guide, Page 1 of 8

If an alarm horn sounds, follow these steps:

1. **Press** the **[Alarm Silence]** push button to silence the alarm horn. The red light will stay on.
2. **Look** at the red lights on the panel or **Listen** to the squawks to find the cause of the alarm.
3. Find the **Alarm** in the list below. Follow the **Solutions** to clear the alarm.
4. When you think the alarm is clear, press the black **[Alarm Reset]** push button. If all the alarms are clear, the rotating, red light on top of the panel will go out.

Alarm	Alarm Actions	Solutions
Low Gas Pressure	Shuts off main gas valve	<ul style="list-style-type: none"> • Check that all valves in the incoming piping are open. • Check the gas strainer for blockage. • Check the switch for proper setpoint. • Check for the correct incoming gas pressure from your service provider. • Check the switch for proper function. • Check vent valve for proper function. • Check relief valve for proper function.
High Gas Pressure	Shuts off main gas valve	<ul style="list-style-type: none"> • Open the main gas valve more slowly. • Check the discharge pressure from the regulator, and adjust or repair as required. • Check the incoming pressure from your service provider. • Check the switch for proper function.
High Temperature Limit	Shuts off main gas valve	<ul style="list-style-type: none"> • Check to be sure that the instrument is not flashing the word Limit in the lower display. Press Reset on the instrument if it is. • Check Instrument Setpoint • Check other zone controllers for proper setpoint. • Check temperature control valves for proper function. • Check thermocouple for continuity. • Check instrument for proper function. Refer to <i>Honeywell UDC300L</i> manual.

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Alarm	Alarm Actions	Solutions
Low Combustion Air Flow	Shuts off main gas valve	<ul style="list-style-type: none"> • Check and clean filter. • Check copper tubing to pressure switch for obstruction. • Check fan motor starter overload. Reset overload. • Reset tripped circuit breaker. • Check fan fuses for failure. Replace fuses. • Check fan motor for failure. Repair motor. • Check flexible sleeves for damage. Repair sleeves. • Check fan for damage. Repair fan. • Check pressure switch for failure. Replace switch
Low POC Exhaust Fan Air Flow	Shuts off main gas valve	<ul style="list-style-type: none"> • Check kiln pressure controller for proper tuning and function • Check copper tubing to pressure switch for obstruction. • Check the motor drive VFD for proper function. Refer to the <i>Allen Bradley 1336 VFD</i> manual. • Check fan belt for failure. Replace belt. • Check fan circuit breaker for trip. Reset breaker. • Check fan motor for failure. Repair motor. • Check fan impeller for damage. Repair fan. • Check pressure switch for failure. Replace switch.

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Alarm	Alarm Actions	Solutions
Low Cooling Supply Fan Air Flow	Prevents initial start-up. Afterwards, Alarm Only	<ul style="list-style-type: none"> • Check Dryer and Cooling Air temperature controllers for proper tuning and function • Check copper tubing to pressure switch for obstruction.
Low Cooling Exhaust Fan Air Flow		<ul style="list-style-type: none"> • Check the motor drive VFD for proper function. Refer to the <i>Allen Bradley 1336 VFD manual</i>. • Check fan belt for failure. Replace belt. • Check fan circuit breaker for failure. Reset breaker. • Check fan motor for failure. Repair motor. • Check fan impeller for damage. Repair fan. • Check pressure switch for failure. Replace switch.
Low Kiln High Pressure Fan Air Flow	Prevents initial start-up. Afterwards, Alarm Only	<ul style="list-style-type: none"> • Check and clean filter. • Check copper tubing to pressure switch for obstruction. • Check fan motor starter overload. Reset overload.
Low Crown Jet Air Flow		<ul style="list-style-type: none"> • Reset tripped circuit breaker. • Check fan fuses for failure. Replace fuses. • Check fan motor for failure. Repair motor. • Check flexible sleeves for damage. Repair sleeves. • Check fan for damage. Repair fan. • Check pressure switch for failure. Replace switch
Low Dryer Recirculation Fan Air Flow	Prevents initial start-up. Afterwards, Alarm Only	<ul style="list-style-type: none"> • Check Dryer and Air temperature controller for proper tuning and function • Check piping to pressure switch for obstruction. • Check for tripped overload. Reset overload. • Check fan belt for failure. Replace belt. • Check fan circuit breaker for failure. Reset breaker. • Check fan motor for failure. Repair motor. • Check fan impeller for damage. Repair fan. • Check pressure switch for failure. Replace switch.

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Alarm	Alarm Actions	Solutions
Flame Failure	Prevents zone from going to high fire until all burners in the zone are lit. Afterwards, Alarm Only	<ul style="list-style-type: none"> • Reset flame relay. • Check valves in gas line to be sure they are open. • Check UV scanner heat blocking lens and bulb for cleanliness. Clean. • Check UV scanner for function. Replace scanner. • Check impulse pressure in the zone. Clean impulse filter. • Check function of the solenoid valve. • Check function of the spark igniter. • Check function of the flame relay.
Zone will not achieve temp (no alarm)	No alarm.	<ul style="list-style-type: none"> • Check setpoint • Check for Auto mode. • Check for Fire switch in the High position. • Check to be sure that all burners are lit. • Check combustion air filter. • Check impulse line filter. • Check valve motor and linkage. • Check burner settings. • Check for proper kiln draft.

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Alarm	Alarm Actions	Solutions
Pusher High Pressure	Push Stops. One Squawk at pusher panel.	<ul style="list-style-type: none"> • Check for a wreck in the kiln. • Check for any obstructions on the kiln car track, or in the pusher dog track. • Check for damage to the pusher cylinder, or pusher cylinder hydraulic tubing. • Solenoid failure. • Little valve at solenoid discharge closed. • Tower limit switch failure - cylinder at full forward or reverse limit. • Increase pressure setpoint slightly (at management station). Check car wheels of car that exits the kiln when the pressure drops off. Lube all car wheels. <p style="text-align: center;">WATCH KILN CAREFULLY!!!!</p> <ul style="list-style-type: none"> • Check pressure transmitter for proper function. • Alarm not reset.
Kiln Exit Safety	Push Stops. Two Squawks at pusher panel.	<ul style="list-style-type: none"> • Transfer car 2 not in Auto mode. Put TC-2 in Auto. • Transfer car is stuck in its cycle. • Transfer car not at kiln exit. • Transfer car VFD fault. Press red [0] button on faulted VFD. • HPU overload failure on TC-2. Reset overload. • Sensor failure at exit end of kiln, or on transfer car. • Wiring problem.

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Alarm	Alarm Actions	Solutions
Too Many Attempts to Start Pusher VFD.	Push Doesn't Start. Three Squawks at pusher panel.	<ul style="list-style-type: none"> • Disconnect turned off. • VFD switch turned off. • Pacesetter turned off. • Problem with the schedule pump, or the schedule pump motor. • VFD faulted. Press red [0] key on schedule pump VFD. • Problem with VFD. Refer to Allen Bradley 1305 manual. • Alarm not reset.
Car delayed getting to the kiln.	Push Stops. Four Squawks at the Pusher Panel.	<ul style="list-style-type: none"> • No cars at the head of the return track. • Loader or Unloader fault. • Car Mover Fault. • Communication fault between the Loader or Unloader and the PLC. • Transfer car 1 not in Auto mode. Put TC-1 in Auto. • Transfer car is stuck in its cycle. • Transfer car not at kiln entrance. • Transfer car VFD fault. Press red [0] button on faulted VFD. • HPU overload failure on TC-1. Reset overload. • Sensor failure at entrance of kiln, or on transfer car. • Wiring problem.
Pacesetter Alarm	Push Stops. Five Squawks at pusher panel	<ul style="list-style-type: none"> • Refer to Star Pacesetter manual.
Hydraulic Fluid Low Level or High Temperature	High Volume Pump will not run. Six Squawks at pusher panel.	<ul style="list-style-type: none"> • Hydraulic fluid temperature is too high. • Hydraulic fluid level is too low. • Sensor failure. • Alarm not reset.

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Alarm	Alarm Actions	Solutions
Pusher Not Scheduling	No Alarm.	<ul style="list-style-type: none"> • Pusher out of sequence. Restart the pusher in auto mode. • Pacesetter setpoint incorrect. • Dog not tight against car being pushed. • High Volume Pump switch not in Auto Mode. • Small valve at the exit of the solenoid valve closed. • Solenoid failure. • Schedule pump belt failure. • Schedule pump motor failure. • No hydraulic fluid in reservoir • Problem with quick take-up cycle. • Problem with PLC. • Problem with cylinder. • Someone increased pusher high pressure alarm above the relief valve setting on the schedule or quick take up pumps. See Star manual for more details.
Car Mover Fault	Fault lamp on the appropriate pedestal lights	<ul style="list-style-type: none"> • VFD over current fault. Press red [0] button on the appropriate VFD in the small panel by the cooling zone of the kiln. • Debris in the car mover track or the kiln car rail. • Stops jammed in the up position. • Other VFD fault. Refer to Allen Bradley 1305 VFD manual. • Motor or Gear Reducer failure.
Transfer Car over traveled	Transfer Car Alarm Squawks fast	<ul style="list-style-type: none"> • Turn the Travel switch to travel towards the kiln, and turn and hold the Reset switch to clear the fault. • Counter prox problem. • Position photoeye problem. • Missing or Dirty reflector.

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Alarm	Alarm Actions	Solutions
Transfer Car Cycle Timeout	Transfer Car Alarm on Continuously	<ul style="list-style-type: none"> • Transfer car is stuck. Put in Man mode, and complete current operation manually. For instance if stuck while lock is extending, align car better, and extend lock. Return the car to Auto mode, and it will complete its cycle. • Solenoid failure. • Cylinder failure. • VFD fault: Press the red [0] key on the VFD to reset the fault or refer to Allen Bradley VFD manual.
Transfer Car Travel Obstruction	Transfer Car Alarm on Continuously	<ul style="list-style-type: none"> • Obstruction in the transfer car pit. • Reflector is damaged or dirty. • Photo eye or reflector out of alignment. • Photo eye is damaged or dirty.
