

## Loading a Sorbent Bag onto Injection Skid

1. Clear the portable stairs away from the injection skid and have fork lift operator place the new bulk bag under the hoist monorail. Remove the shrink –wrap or shipping covers from the bulk bag.
2. Enable the hoist via the power switch on front of control cabinet.
3. Lower the chain hoist and strong back lifting adapter over the bulk bag to allow attachment of four corner lifting loops.
4. After placing the four lifting loops onto the four arms of the strong back, initially lift the bulk bag till it is just clear of the pallet and confirm all four attachments points are secure and bearing weight, no twists or tears. While keeping the load suspend just off the pallet/ground traverse in as close to the injection skid frame as possible before making the vertical lift.

**\*\*\*\*\*Be alert and observant.....do not ever put your body or others between the bulk bag and injection skid frame or beneath the suspended load\*\*\*\*\***

Once the bulk bag is as close inside the frame as possible lift the bulk bag to a height that will clear the hopper. Once appropriate vertical clearance is achieved traverse the bulk bag over the hopper opening and gently lower the bulk bag to a position slightly higher than the hopper opening to allow for the bulk bag discharge spout to be accessed from the access door on the hopper.

5. Remove the empty pallet. Relocate the portable staircase in front of the access door. Open the hopper access door and pull the discharge spout of the bulk bag down through the hopper opening.
6. Most sorbent bags are equipped double layer bags and have an inner liner (clear plastic) and an outer bag (black woven plastic). Both must be opened and unrestricted for the bag to empty properly.

**Single layer bags.** With the bag spout cinch or tie in place, extend the spout of the bag down and over the hopper opening. Use the band clamp to secure the discharge spout of the bag to the hopper ring. Check that the spout is secure and then release and remove the bag cinch or tie. Manually massage or knead the spout of the bag to get product to start flowing into the hopper section.

**Double layer bags.** With the bag spout cinch or tie in place, extend the spout of the bag down and through the hopper opening. The clear plastic inner liner should pass inside the opening and the black woven outer bag should be pulled over the outside of the hopper ring and clamped in place. Check that the outer spout is secure and the inner liner is fully extended. Close the access door and then release and remove the bag cinch or tie. Manually massage or knead the spout of the bag to get product to start flowing into the hopper section.

## Removing an Empty Bag

When the sorbent bag is empty, care should be taken when removing the empty bag, as some sorbent will remain in the folds of the bag inner liner. The **Low Level** light should be illuminated indicating the sorbent is below the access door and that it can be safely opened.

1. Turn the air fluidization system off.
2. Open the hopper access door and tie off the discharge spout of the bulk bag, the attached cord, tape or Tie-wraps can be used to tie off the bag.

**Caution: The rotary valve below the access door is tied to the interlock safety switch on the access door and should not be capable of powering up with the door open, however, be careful not to have any items or body parts come in close contact with the rotary valve unless the system is completely powered down and locked out as it has the potential to cause harm to you and/or the system.**

3. Check to make sure the four (4) straps of the bulk bag are still secure to the lifting adapter
  4. Use the electric hoist to move the bulk bag to the end of the monorail.
  5. Lower the bulk bag to the ground and disconnect the four (4) straps from the lifting adapter.
  6. Load a new bulk bag utilizing the instructions above under heading "**Loading a Bulk Bag onto Injection Skid**".
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## Starting the System

1. Turn the **Control Power** on. Press the alarm reset button. Follow directions on how to load a sorbent bag.
2. Turn the conveying **Blower** on. Once the blower is running, position the alarm trip levels on the photohelic gauge. The upper limit should be 9-12 psig and the lower limit approximately 5-6 psig. If the conveying blower were to trip or fail the low pressure will shut the feed system off.
3. Turn the **Feeder** power on at the control panel. The KCM feeder controller (black control panel on lower left) should power up. If not press the Alarm Reset button and confirm that the blower and eductor alarms are clear.
4. At the KCM controller, confirm that the controller is set to "GRAV" or Gravimetric mode. Enter the desired feed set point by pressing the "New SP" key and then entering the feedrate in lbs/hour followed by the enter key. Additional display parameters are accessible by using the down arrow button in the lower left of the key pad. The "Home" key or "ESC" key will return you back to the top of the Home page.
5. The "TOT" or Totalizer key in the top row of the key pad is used to reset the cumulative totalizer which can be used to track total pounds of sorbent injected. The cumulative value is viewable by pressing the down arrow key to scroll down the home screen.
6. To start the feeder press the "RUN" button on the right had side of the key pad. The current set point "SP" value, mass feed being achieved "MF" value and net weight on the gravimetric feeder unit are displayed on the top of the home screen. By scrolling down via the down arrow, the Motor RPM, Screw RPM, Feed Factor "FF" and Total Weight fed "TOTAL" are viewable.
7. As the net weight of the gravimetric unit decreases it will reach a minimum level "MIN REFILL" and the controller will automatically initiate a refill cycle. During this time the feeder locks in the RPM setting and signals to open the butterfly valve and start the rotary valve allowing sorbent to drop into the feeder bin. When the maximum refill weight "MAX REFILL" is achieved the controller will stop the rotary valve, close the butterfly, and switch itself back into gravimetric mode after a short dwell period.
8. Feeder controller alarms are indicated by a red "Alarm" notice. To view the alarm condition press the "ALARM" key on the right side of the panel. Pressing the "ALARM" a second time will acknowledge the alarm (color will change to yellow) and pressing the "ALARM" key a third time will clear the alarm if the cause of the alarm has subsided.
9. When the bulk bag is empty, the "LOW LEVEL" alarm on the panel will indicate. The empty bag can be removed and replaced with the next sorbent bag, "see Removing and Empty Bag". The system will continue to run when this alarm is on using the sorbent material in the intermediate hopper during the time between bag changes. Press the "ALARM RESET" panel button once the new bag has been loaded to clear the LOW LEVEL alarm.

## Trouble Shooting

**Alarms, upon powering up the panel you must reset the system by pressing and releasing the “Reset” button. Once a panel alarm is cleared you have to reset the system. If in doubt, press and release the reset button!**

### ***Low-level Light is on:***

- The sorbent level in the hopper is below the low level sensor
  - a. **If bag is full and carbon is feeding:** Manually pulse the fluidizer or massage the bag bottom manually or with the aid of the powered hoist. Then press the reset button on the front of the control cabinet to see if the alarm state will clear. Repeat as necessary.
  - b. **If bag is full and carbon is not feeding:** Manually pulse the fluidizer or massage the bag bottom manually or with the aid of the powered hoist. Then press the reset button on the front of the control cabinet to see if the alarm state will clear. Repeat as necessary.
  - c. **Otherwise:** the sorbent has run out and the bag needs to be replaced

### ***Low-Level light will not turn on and the bag is empty and the sorbent is below the sensor:***

- Check the level detector, foreign obstruction may be wrapped around the probe or sorbent material may be caked to the probe. Clean off any build up or foreign material.

### ***Fan Pressure Low light is on:***

- The fan is off or there is an air leak between the blower and the eductor.
- If the fan is not running attempt to restart; if restart fails or blower trips again have the blower package inspected by an electrician.
- If there is an air leak between the blower and the pressure tap, check to make sure the pressure relief valve has not been opened.
- If the pressure relief valve is venting adjust the blower VFD power setting downward.
- If the blower is running and system operation appears unaffected adjust the photohelic trip set point.

### ***Eductor Vacuum Low/High light is on:***

- If vacuum is high there could be a plug in the eductor, the carbon injection line or lances, inspect the eductor throat, lances and conveying lines.
- If vacuum is low there is a problem between the blower and eductor or the air intake above the feeder is plugged.

### **Sorbent Feed**

- Besides the above problems the conveying line can become plugged, in which case turn off the feeder switch with the blower still running. Locate the plug and shake/beat the hose to loosen up large clumps

### **PERT (on KCM Controller Display)**

- The “PERT” indicator on the KCM controller for the gravimetric feeder indicates that there is a perturbation in the weight reading of the scale. This can be due to wind gusts, excessive vibration, or personnel bumping the feeder section of the skid. The automatic feeder control is temporarily suspended and the last RPM value is held until stable weight readings are achieved.