

CENTRIFUGAL FAN & HEATER SAFETY SECTION

RECOGNIZE SAFETY ALERT SYMBOL



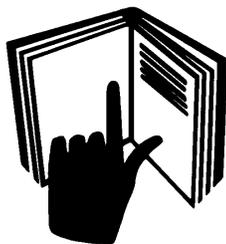
The American Society of Agricultural and Biological Engineers (ASABE) safety alert symbol means "ATTENTION! Be Alert! Your personal safety is involved."

This symbol draws your attention to important instructions concerning your personal safety. Read the messages carefully to avoid personal injury or death.

FOLLOW MACHINE SAFETY SIGNS & MESSAGES

Observe safe operating practices. Carefully read this manual and all safety signs on your equipment. Safety signs must be kept in good condition. Replace missing or damaged safety decals or shields free of charge by contacting Sukup Manufacturing Co. by mail at PO Box 677, Sheffield, Iowa 50475; by phone at 641-892-4222; or e-mail at info@sukup.com.

Learn how to use controls and operate equipment. Do not let anyone operate unit without thorough training of basic operating and safety procedures.



Make no unauthorized modifications to equipment. Modifications may endanger function and/or safety of unit. Periodically check all mechanical and electrical components. Keep unit in good working condition.

EMERGENCIES - KNOW WHAT TO DO

Have emergency numbers near your telephone:

Doctor: _____
Emergency Medical Squad: _____
Ambulance Service: _____
Hospital: _____
Fire Department: _____
911 Address: _____
Written Directions to Your Location: _____



WARNING: TO PREVENT EXPLOSION OR FIRE



- * Carefully review operator's manual.
 - * Clean under floor, as fines may cause a bin fire.
 - * Check for gas leaks, (spray soapy solution on piping and joints.)
 - * Run fan at least a half minute before starting heater.
 - * NEVER start heater if you smell gas or hear a hissing sound.
 - * NEVER run heater with inspection door open.
 - * Check fan blade, hub and shaft for cracks.
 - * Replace immediately if cracks are visible.
- Failure to heed these warnings may cause serious injury or death.



WARNING: KEEP CLEAR OF ALL MOVING PARTS

Keep people (ESPECIALLY YOUTH) away from equipment, particularly during operation.



Keep away from all moving parts. Entanglement can cause serious injury or death. Keep inlet guard in place and in good working condition.

If fan is wired for suction, outlet must be shielded to protect individual from moving parts.

Failure to follow the above precautions may cause serious injury or death.

CENTRIFUGAL FAN & HEATER SAFETY SECTION



CAUTION:

To avoid electrocution, all equipment must be properly wired and grounded according to electrical codes. Have unit wired by a qualified electrician.



Have your electrician install a main power disconnect switch capable of being locked only in the OFF position. Mark disconnect clearly as to the equipment it operates.

Always LOCK OFF main power disconnect switch whenever equipment is not in use or when servicing unit.



DANGER:

Never enter bin, unless all power is locked off and another person is present.

Rotating augers can kill or dismember!



NEVER clean out bin with augers running!

Flowing grain may trap and suffocate. If you enter a bin of flowing grain you can be completely submerged in grain in about 8 seconds.

Failure to heed these warnings may cause serious injury or death.



WARNING:

Heater must be electrically interlocked with fan. When this is not possible (example PTO or direct engine drive fan), an air switch kit needs to be added to heater. **NEVER** operate heater without airflow.

Failure to do so may cause serious injury or death.



CAUTION:

To avoid personal injury, frequently inspect all mechanical and electrical components. LOCK OFF all power whenever servicing equipment. For PTO driven units shut tractor off, disconnect PTO drive shaft, and remove ignition key from tractor. Repair and/or replace worn parts. Be sure all electrical wires are in good condition.



DANGER:

Disconnect electricity before inspecting or servicing. Lock out all power and have another person present. **Always** lock off all power and check with voltage meter before servicing.

Failure to do so may cause serious injury or death.

Safety Decal Placement for Centrifugal Fans & Heaters

Safety decals and shields are mounted whenever possible at factory.

Yearly and prior to equipment use, please check that all decals are in place according to these drawings and in good legible condition. To order a replacement decal or shield free of charge, contact your dealer or **Sukup Manufacturing, Co. - P.O. Box 677 - Sheffield, IA, 50475**. Please specify computer number.

IMPORTANT! The following safety decals should be mounted on your equipment as shown below. If suggested locations are not clearly visible, place safety decals in a more suitable area. Never cover up any existing safety decals.

Make sure location area for decal is free from grease, oil and dirt. Remove backing from decal and place in proper position.

1. WARNING – Decal L0281 - Safe operation



2. WARNING – Decal L0165 – Disconnect electricity; Bleed gas



3. WARNING – Decal L0166 - Disconnect electricity; guards, shields in place; Check fan blade for tightness.



4. DANGER - Decal L0204

Do not operate with door removed.



5. WARNING - Decal L0284

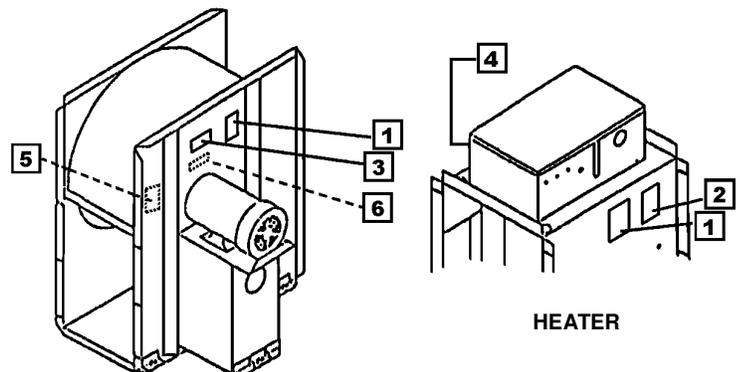
Keep away from all moving parts (on belt drive & PTO fans)



6. DANGER – Decal L0271 - Shield Missing (Inside - On belt drive and PTO fans)



The numbers on the drawings below refer to the location of the safety decals listed above.



SINGLE & DOUBLE INLET FANS

HEATER

SOLID STATE HEATER OPERATION

1. Heater power cord must be plugged into burner receptacle on fan for safe operation. This interlocks the fan with heater, assuring fan will be on before the heater. Never operate the heater without airflow.
2. After heater is switched on, a 45-second purge delay will occur. Then the red light on control panel will come on, indicating power to solenoid valves and ignition transformer. This 45-second purge delay allows the fan to blow out any gas that may be in the bin.
3. After the purge delay, the solenoids will open and ignition should occur.
4. If flame is not detected within 10 seconds, the solid state board will "lockout." The purpose of this is to prevent raw gas from entering the bin. The circuit is reset by turning the toggle switch off for 2 seconds. (The only time the red light goes off is if lockout occurs.)
5. Solenoid Valves are electrically operated shut-off valves, opening when energized. A sharp snap will be heard when valves open. (An arrow on solenoid body indicates direction of gas flow.)
6. Regulator delivers a constant pressure to the burner. Turn handle clockwise to increase pressure. (Regulator ports are marked to indicate direction of fuel flow.)
7. Spark Plug relieves high voltage energy necessary to ignite fuel.
8. Burner High Limit is located inside the burner housing. It trips upon excessive heat in burner. It is reset with pencil from inside electrical box.
9. Transition High Limit detects high temperature in transition. Manually reset by depressing red reset button.
10. Plenum Control regulates drying temperature (See Plenum Control section.)

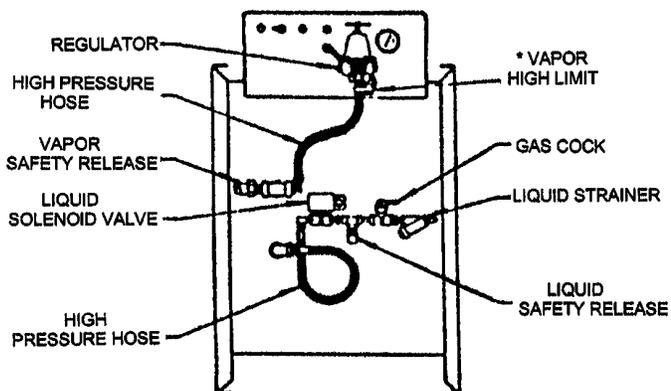
LIQUID HEATERS ONLY

1. Coiled vaporizer converts liquid propane into vapor propane by using heat from burner. Upper hose should be warmer than lower hose. **There should not be frost on regulator or on piping inside control box.** Loosen bolts in locking collars and slide vaporizer in for warmer operation. **Vapor high limit** shuts gas off if upper hose is too hot. Slide vaporizer out if very hot. Vapor high limit is open on temperature rise. Vapor high limit with red reset button must be manually reset if tripped. Vapor high limit without red reset button will reset automatically. Vaporizer must be adjusted before operating. Loosen bolts in locking collar and slide vaporizer out; approximately 8-9" downstream; 3-4" vane axial. Vaporizer pipe should be warm to the touch but not so hot you can't hold onto it. For more information on vaporizer installation, see pg. 32.

2. **V fuel strainers** filter fuel. Remove plug to clean screen.

3. **Pressure relief valves** bleed excessive pressure in piping.

***Note: Vapor high limit with auto reset is located as shown. Vapor high limit with manual reset is on pipe train in control box.**

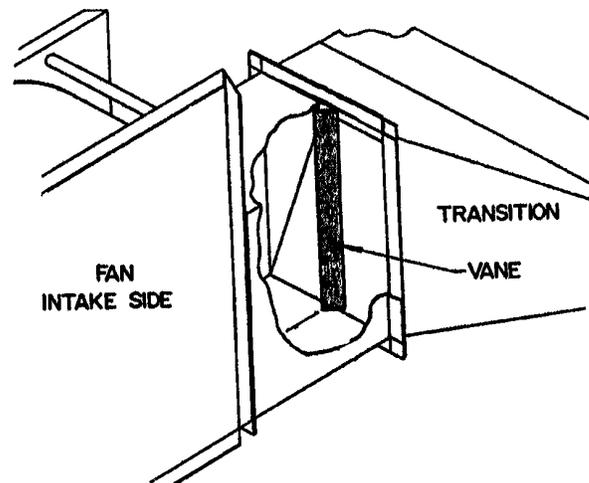


AIR DEFLECTING VANE ADJUSTMENT

The downstream heater is equipped with an air-deflecting vane. The purpose of this vane is to distribute heat evenly across the transition. The vane is factory-set so that the center of the vane is 1/2" to the right of the locking bolt. In many cases no further adjustment is necessary. However, due to differences in floor supports, angle of floor in relation to fan and heater, and multiple fan and heater installations, no two bins are exactly alike. This is why the temperature across the transition should be checked on each new installation and if needed the following adjustment made.

Procedure for vane adjustment:

1. Start the fan and heater. Allow the unit to operate until plenum chamber reaches desired temperature.
2. Using caution, use your hand to feel the temperature on top of the transition where the transition meets the bin wall.
3. If one side is distinctly warmer than the other, shut off the fan and heater. Open inspection door on the heater. Using a wrench, loosen the locking bolt and slide the vane approximately 1" toward the warmer side of the transition. Tighten the locking bolt, replace inspection door, and repeat steps 1 and 2.
4. Continue the above procedure until the temperature across the transition feels even.



PLENUM CONTROL

Thermostat Operation

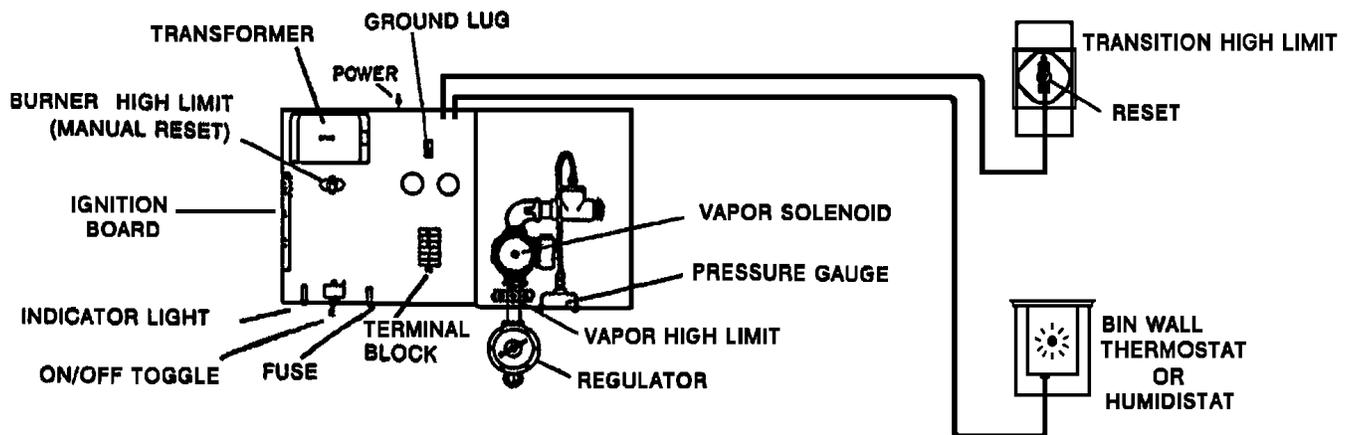
1. Open fuel supply valve (and gas cock on liquid models).
 2. Loosen regulator lock nut. Turn regulator handle counterclockwise to minimum setting.
 3. Set plenum thermostat at desired temperature.
 4. Start fan.
 5. Turn on heater. Wait for 45-second delay.
 6. Red light comes on.
 7. Adjust regulator until flame is on longer than off. Tighten lock nut.
 8. Check vaporizer (liquid models only). See page 19.
- Operator's troubleshooting guide starts on page 28.

SHUT-OFF PROCEDURE:

1. Close fuel supply valve. Wait for fuel to burn out of line.
2. Test flame detection device. Solid state board should lock out if flame probe is operating properly.
3. Turn off heater.
4. Turn off fan.

Solid State

THERMOSTAT OR HUMIDISTAT



(Humidistat Operation on following page)

HUMIDISTAT OPERATION

1. Open fuel supply valve (and gas cock on liquid models).
2. Loosen regulator lock nut. Turn regulator handle counterclockwise to minimum setting.
3. Set humidistat at lowest setting.
4. Start fan.
5. Turn on heater. Wait for 45-second delay.
6. When red light comes on, turn regulator handle clockwise until ignition occurs.
7. Adjust regulator to pressure between 2 and 4 psi. Pressure may be adjusted further if a smaller or larger temperature rise is desired. Tighten lock nut.
8. Check vaporizer (liquid models only). See page 19.
9. Adjust humidistat to desired relative humidity of the drying air. Heater will remain on if relative humidity of drying air is above this setting.

Operator's troubleshooting guide is found on page 28.

SHUT-OFF PROCEDURE

1. Close fuel supply valve. Wait for fuel to burn out of line. Close gas cock (on liquid models).
2. Test flame detection device. Solid state board should lock out if flame sensor is operating properly.
3. Turn off heater.
4. Turn off fan.

MODULATING VALVE OPERATION

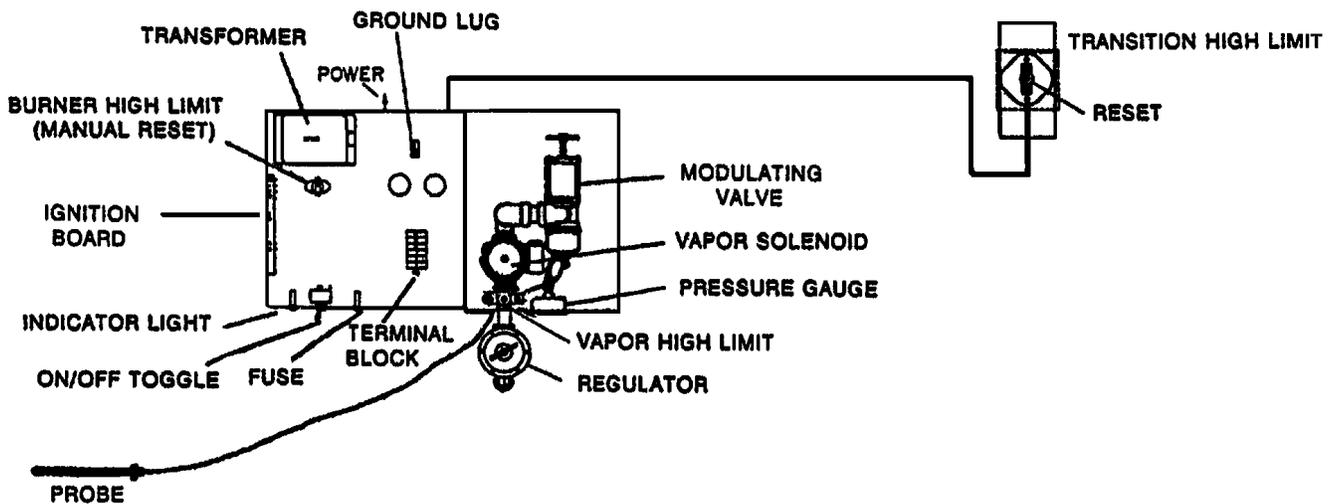
1. Open fuel supply valve (and gas cock on liquid models).
2. Turn modulating valve counterclockwise to minimum setting. **Never adjust regulator** (factory-set at 15 psi).
3. Start fan.
4. Turn on heater. Wait for 45-second delay.
5. Red light comes on.
6. Adjust modulating valve until dial thermometer in bin stabilizes at desired drying temperature.
7. Check vaporizer (liquid models only). See page 19.

Operator's troubleshooting guide starts on page 28.

SHUT-OFF PROCEDURE:

1. Close fuel supply valve. Wait for fuel to burn out of line.
2. Test flame detection device. Solid state board should lock out if flame sensor is operating properly.
3. Turn off heater.
4. Turn off fan.

SOLID STATE MODULATING VALVE



HIGH-LOW OPERATION

1. Open fuel supply valve (and gas cock on liquid models).
2. Loosen regulator lock nut. Turn regulator handle counterclockwise to minimum setting.
3. Set high-low thermostat at desired drying temperature
4. Start fan.
5. Turn on heater. Wait for 45-second delay.
6. Red light comes on. Turn regulator handle clockwise until ignition occurs.
7. Adjust regulator until heater cycles evenly between high and low flame (watch pressure gauge). If flame cycles off, regulator is set too high. If flame does not cycle from high to low, regulator is set too low. Tighten regulator locknut.
8. Check vaporizer (liquid models only). See page 19.

Operator's troubleshooting guide starts on page 28.

SHUT-OFF PROCEDURE:

1. Close fuel supply valve. Wait for fuel to burn out of line.
2. Test flame detection device. Solid-state board should lock out if flame sensor is operating properly.
3. Turn off heater.
4. Turn off fan.

SOLID STATE HI-LO

