Installation

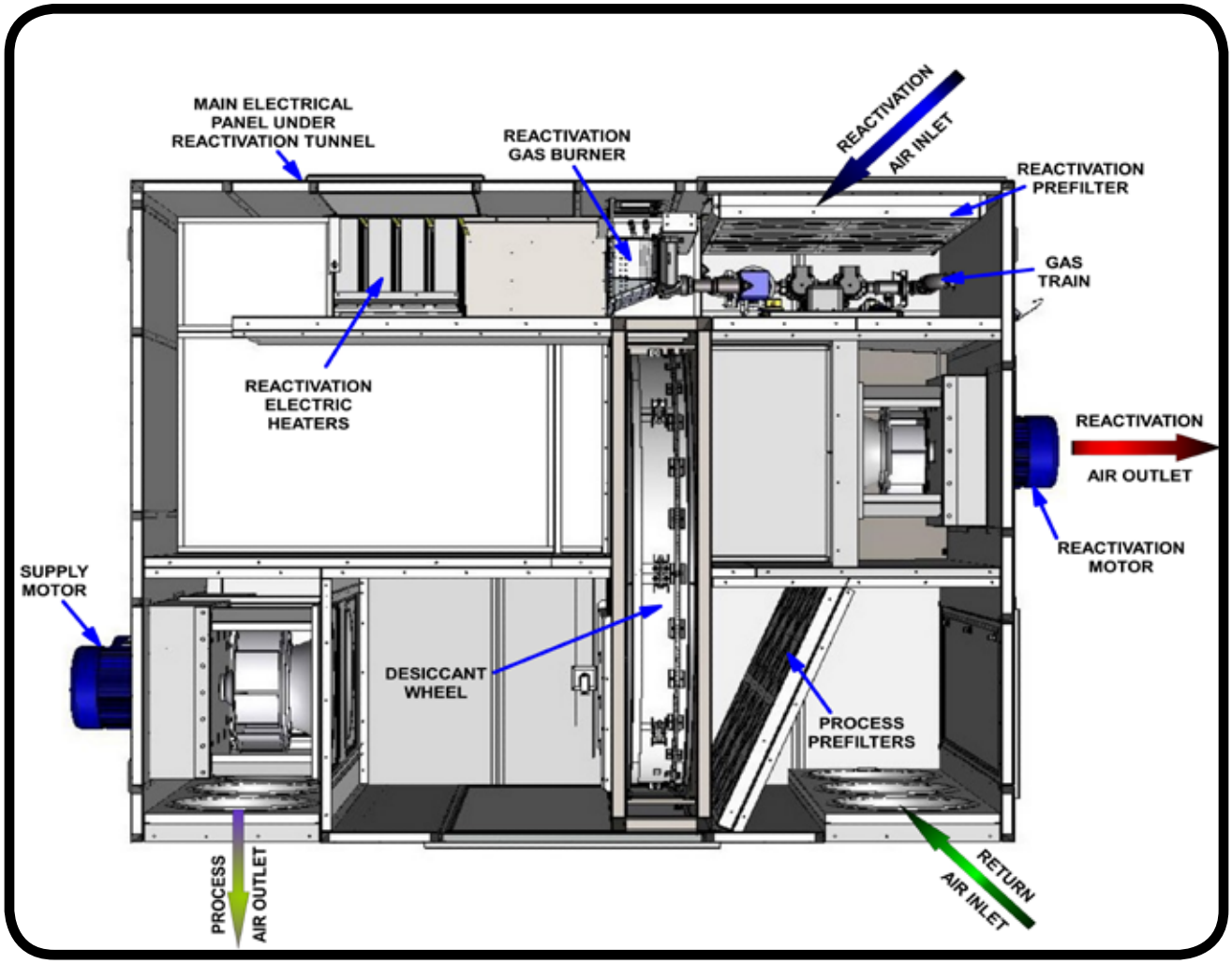
The following recommendations are not intended to supplant any requirements of federal, state, or local codes having jurisdiction. This equipment shall be installed and wired in accordance with regulations of the National Boards of Fire Underwriters, National Electric Code, and local governing bodies. In Canada, equipment should be installed in accordance with the applicable provincial regulations. Furthermore this document does not exempt the installer, designer, or user of this equipment from its correct application, nor from the safe and correct operation of this unit.

1.0 Locating the Unit

The Climate By Design International. Mobile CDH-RC2-168 unit must be installed on a LEVEL surface and located so that there is enough clearance for opening the access doors and for all service clearances marked on the unit drawings.

Refer to the drawing below for an example of the airflow to and from the unit, but be sure to check the Unit Drawing for the proper airflow direction through the unit so that the unit may be positioned to accommodate necessary duct work. Also note from the Unit Drawing where approximate electrical and gas hookup points are located so that the proper connections can be made. At a minimum, all Mobile CDH-RC2-168 units are to be supported around the perimeter.

Be sure to locate the unit so that any unit air intakes are remote from any building exhaust fan outlets, gasoline storage facilities, or any other contaminants that could potentially



cause dangerous situations. The use and storage of gasoline or other flammable vapors and liquids in the vicinity of this unit is very hazardous.

On the direct fired gas reactivation CDH-RC2-168 series dehumidifier the gas is burning directly into the reactivation air stream being heated, therefore anything passing across the burner may be combusted. If this type CDH-RC2-168 series unit is used in a hazardous environment, insure that contaminants cannot enter the unit intake.

2.0 Clearance

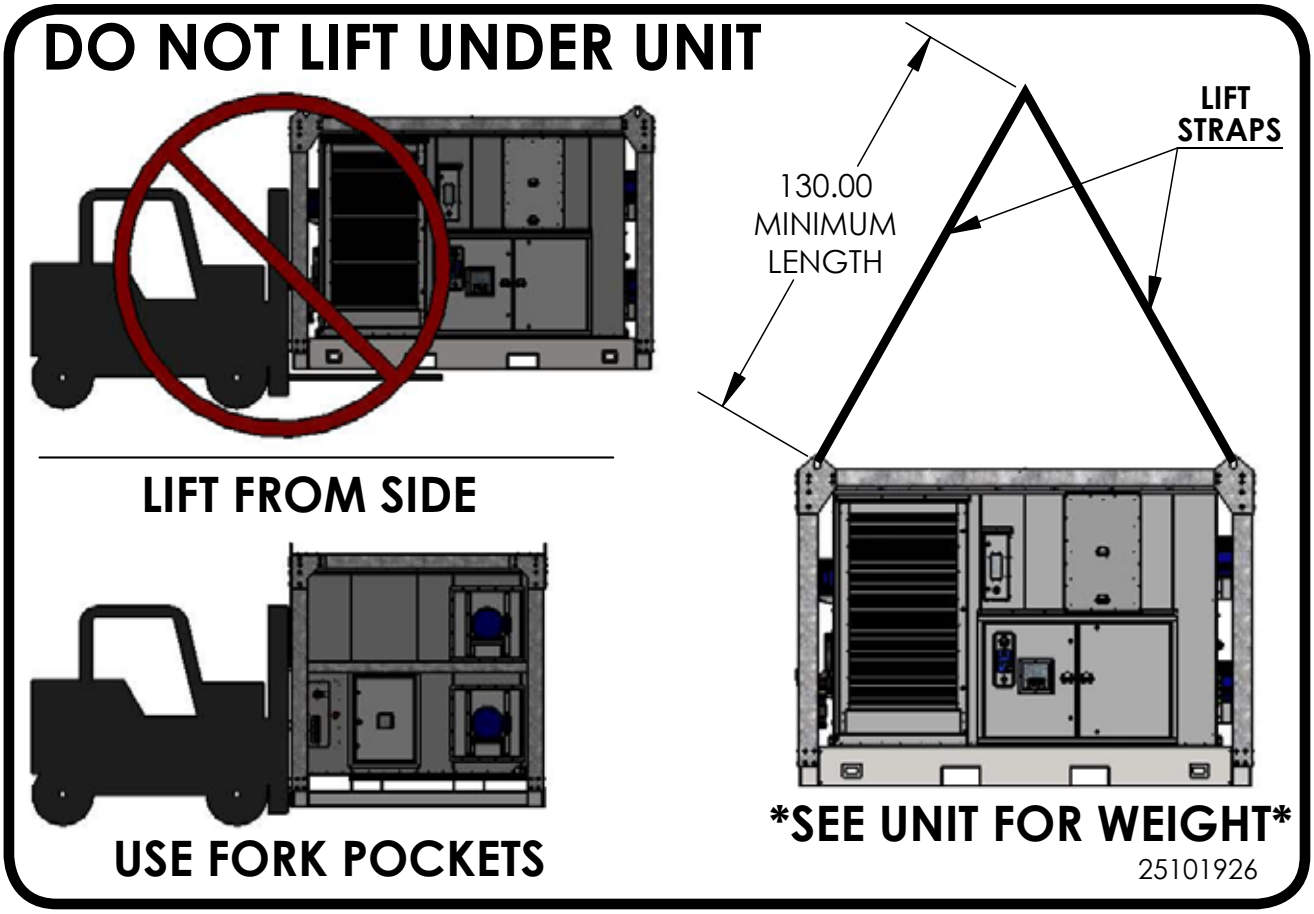
Except where required for service access, CDH-RC2-168 series units may be installed on top of combustible surfaces with 0" of clearance. A minimum of 6" (152 mm) clearance on other sides, and top is to be provided. (Will need extra clearance on top to access electrical panel.)

The unit should be located so that prevailing winds do not blow into the unit inlet. The reactivation fresh air inlet hood is not designed for extreme weather conditions. If the application is critical, other provisions must be made to protect the unit inlet from driving winds.

3.0 Handling the Equipment

Before handling the unit by the cage be sure that the cage bolts have been touqued to the proper torque per the cage drawing in this O&M.

The CDH-RC2-168 unit is designed for handling by a lift truck and is lifted from the bottom through the holes in the base in a fashion that holds it level and keeps it from tipping, falling or twisting. The other method would be to lift from the top as shown below. It is the user's responsibility to verify that the handling equipment has the ability to safely handle the unit.



When lifting with a forklift make sure that the forks extend completely through the units lifting holes. Forks which do not reach to the other side the unit could cause it to tip resulting in unsafe conditions or damage to the unit.

4.0 Preparing Unit for Use

Be sure to look for shipping brackets or other packaging that should be removed prior to using the unit. It is the user's responsibility to remove protective coverings and shipping supports. All such items should be removed prior to unit startup.

5.0 Assembling the Unit

Any pieces not shipped attached to the basic unit when shipped must be installed at the job site, using assembly hardware provided with the unit. The determination of the general arrangement of the assembly can be made by referencing the unit drawing.

6.0 Electrical Connections

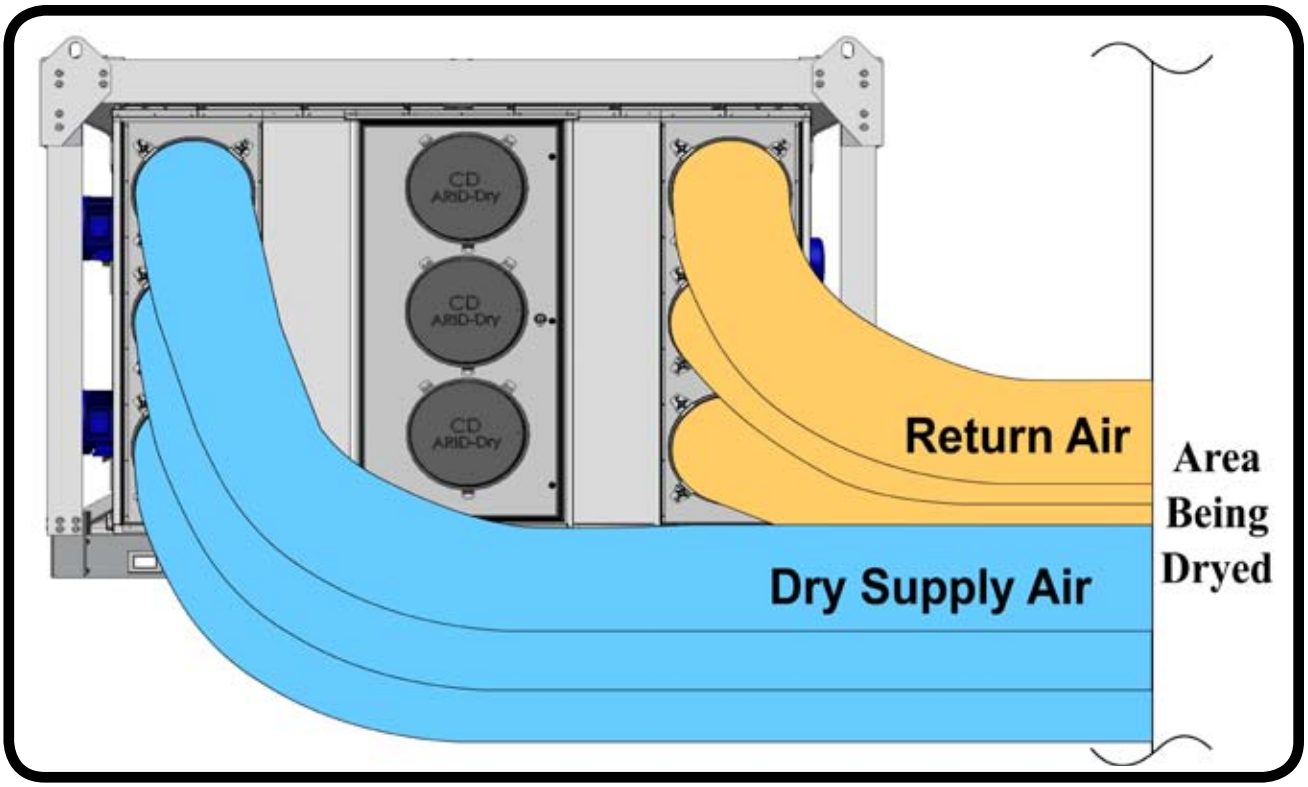
All wiring must comply with all applicable local, state, provincial, and national electric codes. Visually inspect nameplate on the unit prior to running power to the unit. Check voltage to insure that the voltage option ordered is the voltage received.

Comply with unit nameplate data when sizing power wiring to the unit.

Check the supply voltage before energizing the unit. Maximum variation should not exceed +/-10%. Phase voltage imbalance must not exceed 2%.

7.0 Duct Connections

Connect supply and return ducts as shown in the drawing below. Insure that duct opening(s) to building or equipment being dried is adequately flashed and sealed to prevent moisture leakage.



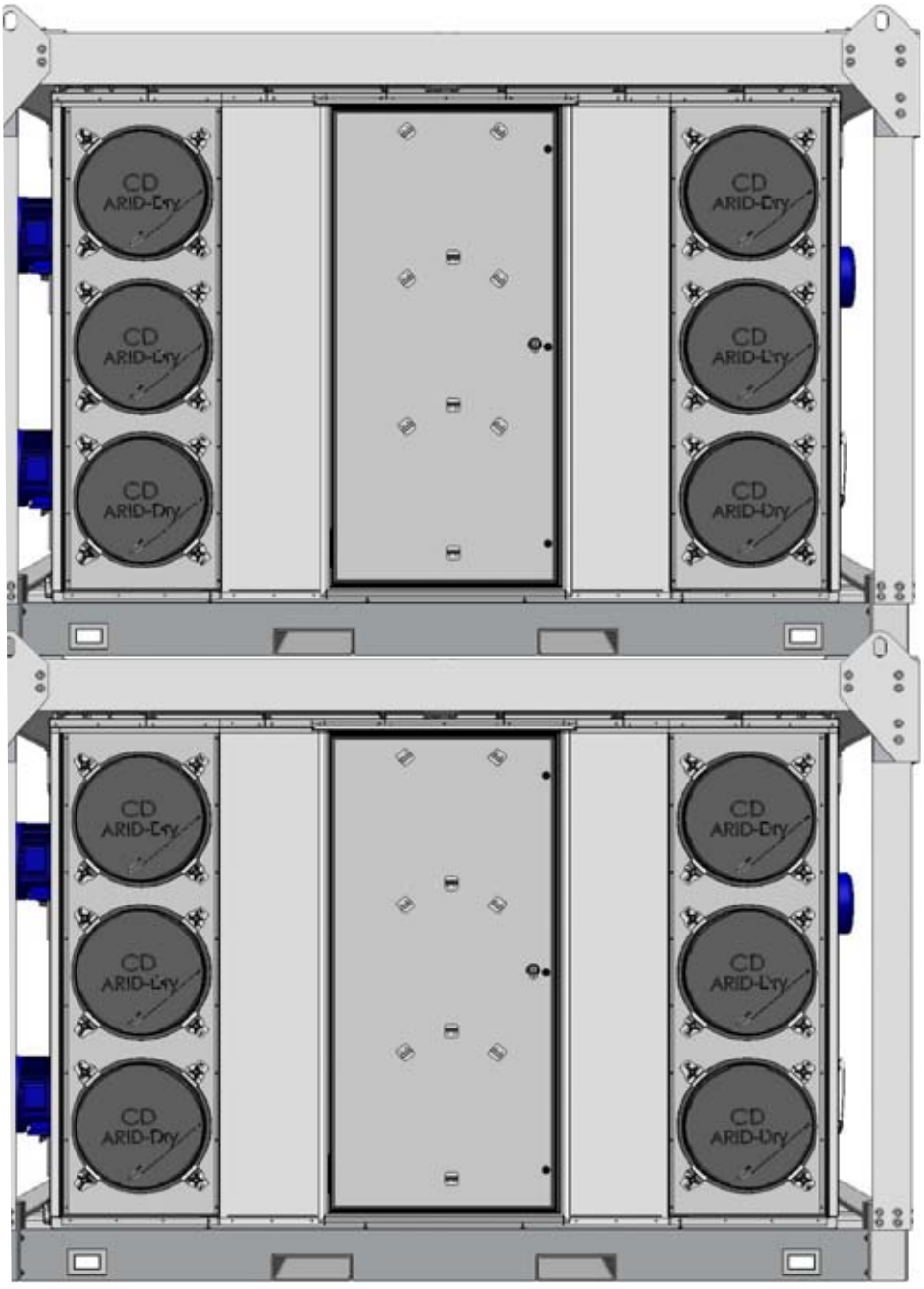
If unit is to be used in a harsh or very dirty environment, it may be better to pull the return air from outdoors rather than pull the contaminated air through the unit. Doing so may damage the rotor.

Insure that duct opening(s) to building or equipment being dried is adequately flashed and sealed to prevent moisture leakage.

8.0 Stacking of Units

When stacking the unit one on top of the other care should be taken to make sure to align the units to fit within the Brackets designed to keep the unit in line. Proper way of stacking units is shown above. **Only** units with the Optional protective cages can be stacked on top of one another due to the layout of the protective cage.

Maximum stacking height is 2 units.



9.0 Transportation of Units

When transporting the units Please make sure to properly secure the unit with tie down straps to prevent movement during transit.

10. Unit Shut Down Can Result From But not Limited To:

A) High Reactivation Discharge Temperature.

B) Supply Fan Failure to Prove.

C) Failure to Prove Rotation of Desiccant otor.

D) Low Reactivation Outlet Temperature.

E) High Reactivation Heating Element Inlet Temperature.

These can result from plugged filters, motor failure, blocked inlets and outlets or tripped motor protectors or fuses.

Startup

11. Special Tools Required

- Ammeter, Amprobe or Equal
- Ohm Meter / Volt Meter
- Manometer 0 to 6”(152mm) W.C.
- Temperature Gage (450° F/232° C)

12. Precautions Before Attempting Startup of the Dehumidifier

Perform the Pre-Start Inspection, Including but not necessarily limited to:

A) Measure supply voltage and make sure it agrees with the unit nameplate.

B) Check all electrical connections in the main control panel for tightness.

C) Check to see that all fuses are installed, and are of correct value.

D) Make sure all fuel connections are tight and that all joints have been properly sealed. Use soap test for assurance.

E) Verify that the supply gas line to the dehumidifier was blown clean prior to connection to the dehumidifier. Purge gas lines of air. Close Manual gas valves before supplying main gas pressure.

F) Measure the supply gas pressure and make sure it agrees with the unit nameplate. (Gas pressure over that specified in the nameplate can result in damage to components.)

G) Check unit supply air outlet, and supply blower inlets for obstructions.

H) Check filters for cleanliness, clean or replace if dirty or damaged.

I) Inspect desiccant rotor and seals for damage, or binding.

J) Check inside unit for general cleanliness, close and secure access doors.

13. Typical Sequence of Operation

WARNING: To minimize exposure to electrical and mechanical hazards when servicing this unit, the unit Main Disconnect Switch should be placed in the OFF position and power to the unit shut off.

1) With the correct power supplied to the unit and the Main Disconnect Switch in the **ON** position and with the Continuous-Off-Auto-Blower Only selector switch in the **OFF** position, the DDC Controller is powered and the sensors are activated. The unit is in standby.

NOTE: On units that include the VAV option, the electrical cabinet temperature is controlled by the air conditioner with electric heater. The electrical cabinet temperature is sensed by a temperature sensor mounted near the variable frequency drives. The DDC controller will not start the VFD until the temperature inside the cabinet is above 14°F for 10 min.

2) **Continuous Mode:** With the Continuous-Off-Auto-Blower Only selector switch in the Continuous position and with all safety circuits normal, the supply fan is energized. The reactivation process will cycle as described below.

3) **Supply Fan Speed Potentiometer:** Air volume can be adjusted via supply fan speed potentiometer. Adjust the supply fan speed potentiometer until desired air volume has been achieved.

4) **Auto Mode:** With the Continuous-Off-Auto-Blower Only selector switch in the Auto position and with all safety circuits normal, the unit will remain in standby until a call for dehumidification occurs. With a call for dehumidification the supply fan is energized.

5) **Blower Only Mode:** With the Continuous-Off-Auto-Blower Only selector switch in the Blower Only position and with all safety circuits normal, the supply fan is energized. The reactivation process will remain off.

6) **Hi-Limit Pressure Transmitter:** Hi-Limit Pressure set-point is set in DDC controller at 14.2”W.C. This is associated with a maximum air flow of 18,000 CFM.

Intermittent DH with RH Humidistat: The space air humidity is controlled via the DDC Controller. The space air humidity is sensed by the (optional) shipped loose space humidistat. When the sensed humidity exceeds the humidistat set-point the DDC controller enables a call for dehumidification energizing the supply fan and reactivation circuit, including reactivation fan, DH rotor, and reactivation heat. The supply fan and reactivation process will run continuously if the Continuous Run jumper plug is installed.

Intermittent DH with Space or Return Air Dew Point and Temp Transmitter: The space or return air dew point is controlled via the DDC Controller. The space or return air dew point is sensed by the (optional) shipped loose dew point transmitter. When the sensed dew point exceeds the set-point by 2° the DDC controller enables a call for dehumidification energizing the supply fan and reactivation circuit, including reactivation fan, DH rotor, and reactivation heat. The set-point is adjustable via the DDC user interface.

Note: Humidistat or DP Transmitter control is selected via the DDC user interface.

Optional Discharge Dew Point Transmitter: For monitoring purposes only.

7) Reactivation burner ignition and flame management on gas fired units are controlled via a dedicated flame safeguard system and proven via flame rectification. Pre-ignition interlocks include reactivation airflow differential pressure proving switch, and manual reset high temperature limit switch.

8) **Reactivation energy is controlled via DDC controller as follows:**

Desiccant reactivation inlet temperature

is maintained at optimum temperature for maximum dehumidification performance irrespective of outdoor temperature or filter loading.

As moisture load decreases, reactivation outlet temperature rises, and DDC controller resets reactivation inlet temperature down as required to limit reactivation outlet temperature.

Fail-Safe Mode: In order to preserve limited performance, in the event of a sensor failure, the DDC controller will deliver reactivation heat modulation rate signal as follows:

With a failed desiccant reactivation inlet sensor the reactivation heat, on a gas reactivation unit, is modulated to 50%. On an electric reactivation unit heater capacity will be limited to 50%. "Other Faults" light on the unit will illuminate. The DDC user interface will also indicate an alarm.

With failed reactivation outlet sensor, desiccant reactivation inlet is maintained at 260°. "Other Faults Alarm" light on the unit will illuminate. The DDC user interface will also indicate an alarm.

With diminished reactivation airflow (I.e. dirty filters) desiccant reactivation inlet temperature is limited in order to prevent rotor overheat.

Adequate reactivation energy is proven via reactivation outlet temperature. If the reactivation outlet temperature fails to achieve or falls below 85° over a 15 minute period the "React Low Temp" light on the unit will illuminate. The DDC user interface will also indicate an alarm.

9) **Unit or reactivation shutdown occurs via the following:**

Desiccant rotor rotation is proven via magnetic proximity switch input to the DDC controller. If rotation is not detected within programmed time, unit shut-down occurs. If the unit is in "Continuous" mode the supply fan will continue to run. The "Rotation Alarm" light on the unit will illuminate." The DDC user interface will also indicate an alarm.

On 3-Phase units a 3-Phase power monitor is connected to the External Faults input. If input power phasing, voltage or balance is incorrect the "Phase Correct" light on the unit will NOT be illuminated. If correct it will illuminate. Unit will not start. To correct, disconnect the power supply to the unit and reverse two of the three power cords supplying the unit.

Flame failure via flame safeguard relay causes unit shut-down in the event of failure to ignite or maintain pilot flame. If the unit is designed for continuous supply operation the supply fan will continue to run. The "React Flame Failure" light on the unit will illuminate. The DDC user interface will also indicate an alarm.

This unit is equipped with a reactivation burner gas train High Gas Pressure Switch. When the pressure sensed above the high pressure switch settings the switch will open disabling the burner, rotor, and reactivation fan. If the unit is in a mode that has continuous supply operation the supply fan will continue to run. The "React Flame Failure" light on the unit will illuminate. The DDC user interface will also indicate an alarm. This switch requires manual reset.

Reactivation inlet temperature exceeding the high limit set-point results in a high limit fault and unit shut down. If the unit is in "Continuous" mode the supply fan will continue to run. To reset the High Limit Stat, turn the Main Disconnect Switch OFF

and allow the unit to cool. Turn the Main Disconnect Switch ON. The “RIT High Temp Alarm” light on the unit will illuminate. The DDC user interface will also indicate an alarm.
There is an over temp roll out snap disc limit switch located above the gas burner. Over temp on this switch results in a “Flame Failure” alarm and unit shut down. If the unit is in “Continuous” mode the supply fan will continue to run. The “General Alarm” light on the unit will illuminate and the DDC user interface will indicate a “Flame Failure.”

Additional temperature limits are programmed into the reactivation rate controller. If the reactivation inlet temperature sensed by the inlet RTD reaches 350° or the reactivation outlet RTD senses a temperature greater than 200° the reactivation process is de-energized. The “Other Fault” light on the unit will illuminate and the “RIT Limit Exceeded” or ROT Limit Exceeded” will be indicated on the DDC user interface. Unit shut-down occurs. If the unit is in “Continuous” mode the supply fan will continue to run.

An additional safety is programmed into the reactivation rate controller that will de-energize the reactivation process if the reactivation inlet temperature exceeds 320° and the reactivation energy modulation is at 0%. The “Other Faults” light on the unit will illuminate and the DDC user interface will indicate a “Possible React Airflow Restriction Alarm.” Unit shut-down occurs. If the unit is in “Continuous” mode the supply fan will continue to run.

Failure of the supply fan to energize within 60 seconds of the run command, or loss of supply proof during operation, results in a supply fan fault and unit shut-down. The “Other Faults” light on the unit will illuminate. The DDC user interface will also indicate an alarm.

Failure to sense reactivation airflow within 60 seconds of the reactivation enable command or loss of reactivation air flow during operation results in a react fan fault and unit shut-down. If the unit is in “Continuous” mode the supply fan will continue to run. The “Other Faults” light on the unit will illuminate. The DDC user interface will also indicate an alarm.

After corrective action is taken, the controller fault condition may be reset by cycling the “Continuous-Off-Auto” selector switch to the Off position, or cycling unit power.