

POWER

- DO NOT exceed 80% rated duty of breaker (amps).
- 120v maximum heater output is 1500-1800w.
- 3-phase power works for single phase heaters (load balancing recommended).
- 1-phase power DOES NOT work for 3-phase heaters.
- NEVER use higher voltage than what the heater or control is rated for.
- POWER DE-RATION: happens when you apply a lower voltage to a higher voltage heater. This results in potentially much lower element temps and fan speeds.

CALC'S & FACTORS

- 1 watt = 3.4 BTU
- 1000 watts = 1 kW (kilowatt)
- Comfort Heat = 1 watt per cubic ft. in a well insulated residential/commercial space to maintain 70F inside at 0F outside.
- Watts/voltage = amps.

CONTROLS

Thermostats: single or double pole. Single cuts 1 leg of power 120/277V, double pole cuts 2 legs of power 208/240V. Comfort wall stats max. at 75F. Floor warming stats max. around 105F.

Contactor Relay Panel: used to "chain" together multiple heaters and accepts a control signal from a t-stat.

SCR Controller: modulates heaters with very high turndown and accuracy. Like a "dimmer" for a heater.

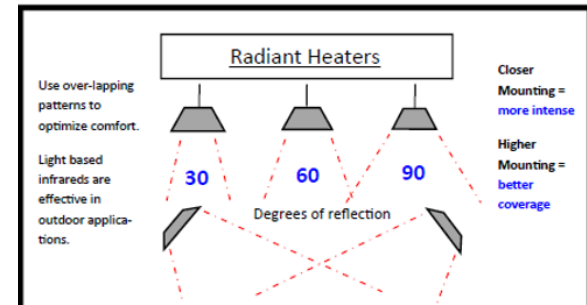
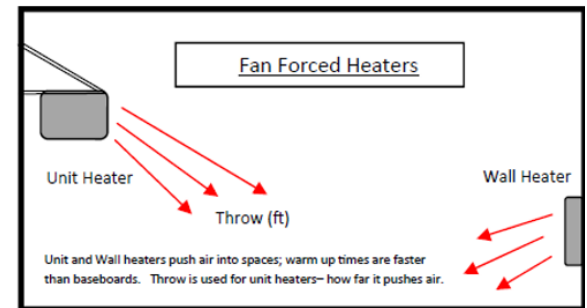
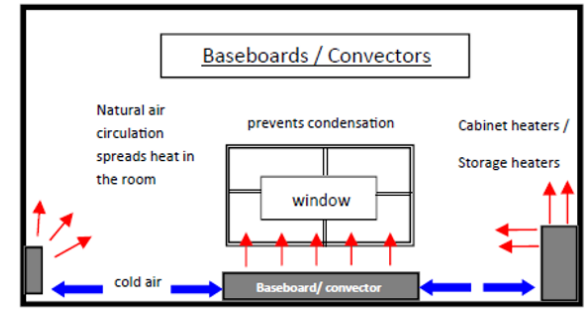
HEATING TYPES

CONVECTION HEATING: heating a space through warming air (most common). Baseboards, wall htrs, unit htrs, etc. Some use fans; some do not.

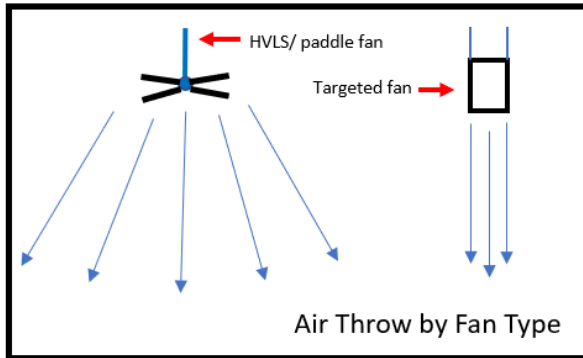
RADIANT/INFRARED HEATING: heating objects with infrared waves, and indirectly heating air.

- Long wave (SRP gas tube) travels longest distances and is the most comfortable. Most affected by windy conditions.
- Medium wave (Infratech/Bromic) not as bright as short wave elements, good balance of heat & comfort. Minimum 4kW outside.
- Short wave (Qmark/Berko) brightest light, best option for heating outdoors, most intense feeling heat, travels shortest distances.
- ALWAYS consider minimum mounting clearances when designing a layout!
- Ceiling Panels work to a maximum of about 11-12'H and heats an area the dimension of the panel.

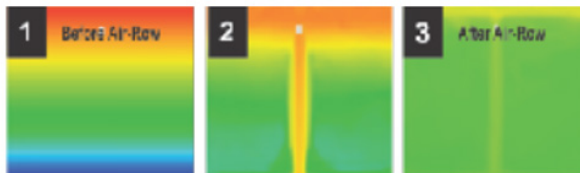
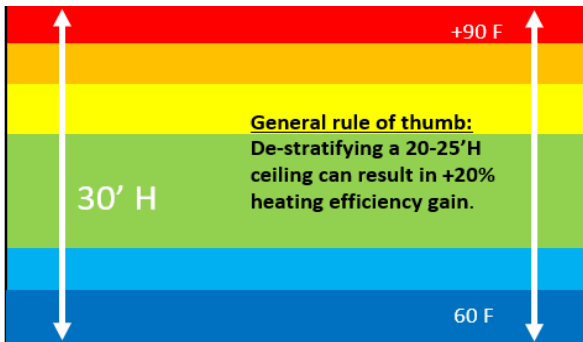
*Radiant heating is most successful and comfortable when you hit the target from multiple sides.



AIR DE-STRATIFICATION TIPS



Cold dense air pushes warmer air upward and forms layers of very warm air trapped at the ceiling. There is big energy savings in recovering that warm air, along with making the space more comfortable, less condensation issues or mold/mildew growth.



Thermal Imaging Before and After Air-Row Fans

De-stratifying air is one of the easiest and most effective ways to recover warm air, gain efficiency, and make interior conditions more comfortable. Stratification happens in EVERY interior space; it's simply caused by warm air rising.

CALC'S & FACTORS

- TO OBTAIN CUBIC FEET – multiply the room's length X width X height
- CFM (cubic ft. per minute) = total cubic ft. divided by 60.

GRID CEILING SOLUTION

Air Row's LA-248 is the only drop ceiling de-stratification fan solution on the market. This fan is a 2' x 2' grid ceiling drop in, 120V, and can throw air up to 40'; 3-spd, 27 watts on high speed.



ENVIRA-NORTH
SYSTEMS LIMITED

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- VSD is a Variable Speed Drive that modulates the fan speed based on a set point. It saves energy and helps optimize comfort.

DE-STRAT TYPES

COMMERCIAL PADDLE FAN (Weaver, Marley, Hunter): Simple and low-cost, effective up to heights of 15-16'.

- Pros: low cost, customers understand equip.
- Cons: limited effectiveness; obstructions, & height.

HVLS FANS (Envira North): high-volume, low-speed large paddle fans move huge volumes of air and are fantastic for open areas. Range from 7' dia. to 27' dia.

- Pros: move A LOT of air, VSD controls make them energy efficient.
- Cons: highest cost equipment. Air spread so big it gets deflected off obstructions below, becoming less effective. Space limitations.

TARGETED FANS (Air Row, Envira North): discharge air in a concise column to avoid obstructions and get air down to ground level.

- Pros: excellent at getting air from ceiling to floor, compact, and easy to install; very efficient.
- Cons: noisy if there are multiple fans running on high speed; moves less air vs. HVLS per fan.

WEAVER AIR
PRODUCTS, LLC

