



Multifamily Facility Management Services

REPLACEMENT OF HIGH EFFICIENT UNIT HEATERS

Description:

Unit heaters provide warm air for space heating by means of a furnace which is suspended above the floor or work area. Typical installations occur in warehouses, factories, public garages, auto repair facilities, and similar applications where large open spaces need to be heated.

Unit heaters in current service are typically gas-fired, gravity-vented units with standing pilots. Actual seasonal operating efficiencies for this type of equipment are in the range of 50% to 58%, depending on the application. (Note: since there is not a standard test procedure for estimating operating efficiency, most product literature only lists thermal efficiency which typically ranges from 74% to 78% and should not be confused with seasonal operating efficiency.)

Three replacement options with higher seasonal efficiencies are available:

1. the power vented unit heater,
2. the separated combustion unit heater, and
3. the condensing unit heater.

The power vented (also called power exhaust) system includes an exhaust blower for removing the combustion products from the heater, but still takes combustion air from the heated space. Since the power exhauster can be designed to pull the correct amount of combustion air into the unit for “ideal” combustion at maximal capacity, the steady state thermal efficiency of these units is high, in the range of 80% to 83%. Most of these units also incorporate pilot-less ignition systems. As a result, seasonal efficiency on power vented units heaters is expected to range from 79% to 83%, depending on the application. Costs for the power vented unit heater are about \$200 more than a standard atmospheric unit heater with a standing pilot. As a result, power vented unit heaters are a good replacement option in most applications whenever the existing unit heater is no longer functioning well. In some applications, it may even be worth considering an upgrade to a power vented unit when the existing unit heater is still functioning.

The separated combustion unit heaters are similar to the power vented units, except that they draw combustion air from outside of the building instead of from the heated space. This prevents dust, lint, dirt or other contaminants present in the heated space from entering the burners and combustion zone. In addition, separated combustion units are necessary for applications in buildings with negative pressure and are preferred for applications in buildings

with high humidity where indoor air quality is important. Steady state and seasonal efficiencies for these units are expected to be similar to standard power vented units. Costs for a separated combustion unit are at least \$500 more than the power vented unit. Therefore, a separated combustion unit heater is only recommended over a power vented unit in cases where it is required.

At least one manufacturer currently makes a unit heater based on condensing furnace technology. The unique feature of this unit is its high efficiency, which is achieved by condensing the moisture in the flue gas, thereby reclaiming the latent heat of vaporization. Estimated seasonal efficiencies for this type of unit range from 90% to 95%. However, the cost of these units is also much higher, about two times the cost of a standard atmospheric unit heater with a standing pilot. Nevertheless, a condensing unit heater will still be the most cost-effective equipment option in certain applications and should be considered.

Each type of unit heater can be purchased with either a fan or a blower to move air through the heat exchanger. The fan type is less expensive and is more compact. Fan units are classified as zero static pressure types and cannot be used with any kind of discharge device. By contrast, blower unit heaters are classified as high static pressure types and tend to be used in applications where duct work or discharge nozzles are required in conjunction with the heater. Examples might be for spot heating, for heating doorways, or for use with a short duct to provide heated air to a specific location or an enclosed space. Blower unit heaters are also quieter and can also be used when sound levels are an important consideration.

How to Implement:

Replacement unit heaters need to be installed by qualified, licensed heating contractors. Unit heater manufacturers recommend that the units be installed in such a way that air flow from the units wipes the wall without blowing directly on the wall. They also recommend that the heaters be spaced so that each one supports the air stream from another unit, assuring a good distribution of heated air. Units should be arranged so that they do not blow directly on workers. Deflector hoods and nozzles can be added to unit heaters for special applications, though some restrictions apply to their use.