Air Turnover Systems

Commercial and Industrial Climate Control Systems

For Heating and Cooling Applications
Applied Air climate control systems are designed to satisfy the needs of both the owner and the specifying engineer. Standard models are available in 150 different sizes and arrangements, from 1,600 to 150,000 CFM. The gas-fired burners have capacities up to 14,086,000 BTUH. Whether units are located indoors or outdoors, mounted on the floor, roof, grade or suspended, and fueled with natural gas or propane, Applied Air has been satisfying the need since 1975.

All standard units include the necessary controls to provide years of trouble-free, low maintenance operation. Component parts are of the highest quality. Safety devices, meeting national and local standards, ensure fail safe protection in every Applied Air unit.

All Applied Air units are built with U.L. approved components, where applicable. Optional gas controls can be furnished to comply with FM & IRI. Compliance allows the owner to meet insurance underwriter’s requirements and assures the customer of equipment reliability and conformance to recognized standards.

State-of-the-art laser sighting equipment is used to align bearing mounts on shafts up to 14’ in length.
The Air Turnover principle eliminates air stratification in large open space buildings. It does this by recirculating the hot air which becomes trapped at the higher levels. The uniform room temperature improves comfort, conserves energy, eliminates thermal barriers, and eliminates the possibility of condensation forming on stored materials.

In the heating mode:
The Air Turnover System picks up the air at the floor, where it is the coolest, then heats and returns it to the space above. Innovative low velocity, low horsepower propeller fans gently turn over the room air 1 to 3 times each hour to maintain uniform temperatures from floor to ceiling throughout the building.

Cold air from open doors in shipping and receiving areas becomes less of a problem with an Air Turnover unit. Temperature recovery is almost instantaneous after the doors are closed.

In the cooling mode:
The Air Turnover System picks up air at the floor then cools and returns it to the space above. A comfort zone is created from the unit discharge down to the floor level. For buildings requiring cooling from floor to ceiling, extensions are available to get the unit discharge to required height. The centrifugal fans quietly move large volumes of air, turning over the air in the comfort zone 3.5 to 5 times each hour.

The Benefits and Features of Air Turnover Systems from Applied Air

- Fuel is conserved by utilizing heat normally trapped at the ceiling.
- Electrical operating costs can be reduced as much as 40% with low horsepower, high efficiency propeller fans.
- Quiet, warm weather ventilation is available with low power consumption.
- Condensation that might form on stored materials is eliminated.
- Moisture damage is minimized through constant air circulation and uniform room temperature.
- Installation cost is low because no duct distribution system is needed. The availability of large units also means fewer fuel and vent connections.
- Easy to reach controls and burner on floor mounted equipment simplify maintenance.
- Flame safeguard reliability provides safe operation. Electronic programming control monitors the firing sequence.
- Temperature recovery is rapid. The cold air effect from open shipping and receiving area doors is quickly overcome after doors are closed.
Air Turnover Heating Systems

Air Turnover systems are unique heating units designed for installation at floor level directly in the conditioned space of warehouses, manufacturing areas, shipping/receiving areas, and other large rooms with high ceilings. An Air Turnover system works by continuously circulating large volumes of room air at low velocity. Quiet, energy-efficient propeller fans turn over the room air 1 to 3 times each hour, thoroughly mixing the air to maintain a uniform temperature from floor to ceiling without drafts. Fuel is conserved by “reclaiming” heat that otherwise would be trapped at the ceiling. Continuously circulating air helps quickly overcome the cold air effect from open doors in the shipping and receiving area after the doors are closed. Unlike most indirect fired systems which replace exhaust air with warmed outside air, an Air Turnover system generally uses little if any outside air. As a result, operating costs are very low.

Applied Air offers three styles of heating-only Air Turnover systems:

- Straight gas fired (IFP)
- Non gas fired “slave” (IFS)
- Gas fired for small spaces (IFJ)
Air Turnover systems from Applied Air create uniform temperature throughout the conditioned space. The result is greater comfort for people in the room and significant savings on heating and cooling costs.

For Smaller Spaces
To meet the special needs of smaller warehouses and manufacturing areas, Applied Air offers the IFJ for heating only or heating/cooling applications. The IFJ provides all of the advantages of our larger Air Turnover systems in a more compact unit.

Induced Draft
Direct drive induced draft fan on IFP helps provide gas heating efficiency of up to 80%.

Control Cabinet
Fuses and power transformer are provided for single point electrical connection.
Air Turnover Cooling Systems

Air Turnover systems are also available that combine indirect fired gas heating and cooling. In cooling mode, these Air Turnover systems circulate room air to create a thermal barrier above the unit discharge. This thermal barrier acts as an insulating blanket between the hot roof above and the comfort zone below. Quiet, energy efficient centrifugal fans move large volumes of air, turning over room air 3.5 to 5 times each hour.

For buildings that require cooling from floor to ceiling, extensions are available that raise the unit discharge to the required height.

Applied Air offers two styles of heating/cooling Air Turnover systems:
- Gas fired with cooling coil (IFA)
- Gas fired with cooling coil for small spaces (IFJ)

High Velocity Grille
Air is discharged directly at high velocity. No ductwork is required so installed cost is lower.

Induced draft
Direct drive induced draft fan on IFA, helps provide gas heating efficiency of up to 80%.

Burner
Power burner with direct spark ignition, on-off, high-low-off, or modulating controls.

Control Cabinet
Provided with fuses and power transformer for single point electrical connection.

High Velocity Blowers
IFA and IFJ with cooling coils use centrifugal blowers for higher cooling coil static pressures.
The Air Turnover Concept

In a building with high ceilings, such as a warehouse or manufacturing facility, thermal barriers are established as warm air rises and gets trapped at the ceiling. The result, known as “air stratification,” creates layers of temperature in the space.

The temperature at the ceiling may be 25 degrees hotter than at the floor, and the heat trapped at the higher level is unusable. Since the desired building temperature must be maintained at a low level, the inevitable result is excessive heating bills.

Air stratification also creates problems in spaces that require cooling. Because cool air settles to the floor, higher levels remain too warm. When the temperature is not uniform from floor to ceiling, condensation can form causing moisture damage.

An Air Turnover system solves the air stratification problem by continuously circulating the air in the space. It picks up air at the floor, removing the coldest air layer supporting the thermal barrier. The air is heated or cooled, and returned quietly through a screened discharge plenum to create a uniform temperature – and a comfortable, more cost-effective conditioned space.

Key Benefits:

- Systems for heating only or heating/cooling
- All systems also provide quiet, warm weather ventilation
- Heating and cooling costs reduced up to 40%
- Quiet, draft-free operation with low power consumption
- No duct distribution system reduces installed cost
- Large and small units to meet every need
- Condensation and moisture damage eliminated
- Floor mounted controls and burner simplify maintenance

How Air Turnover Systems Work

In Heating Mode

For heating, the Air Turnover system picks up air at the floor (where it is coolest), then heats it and returns it to the space above. Room air turns over 1 to 3 times each hour. The result is a comfortable, uniform room temperature from floor to ceiling.

In Cooling Mode

For cooling, the Air Turnover system continuously recirculates large volumes of air to eliminate the room’s thermal barrier. The result is a “comfort zone” from the unit discharge down to the floor level. Extending the height of the discharge increases the height of the comfort zone. Air in the comfort zone turns over 3.5 to 5 times each hour.

Using the advanced computer simulation technique called “Computational Fluid Dynamics” (CFD), Applied Air can prove floor to ceiling temperature differences of only 2.49 degrees in a 24-foot high space with Air Turnover.