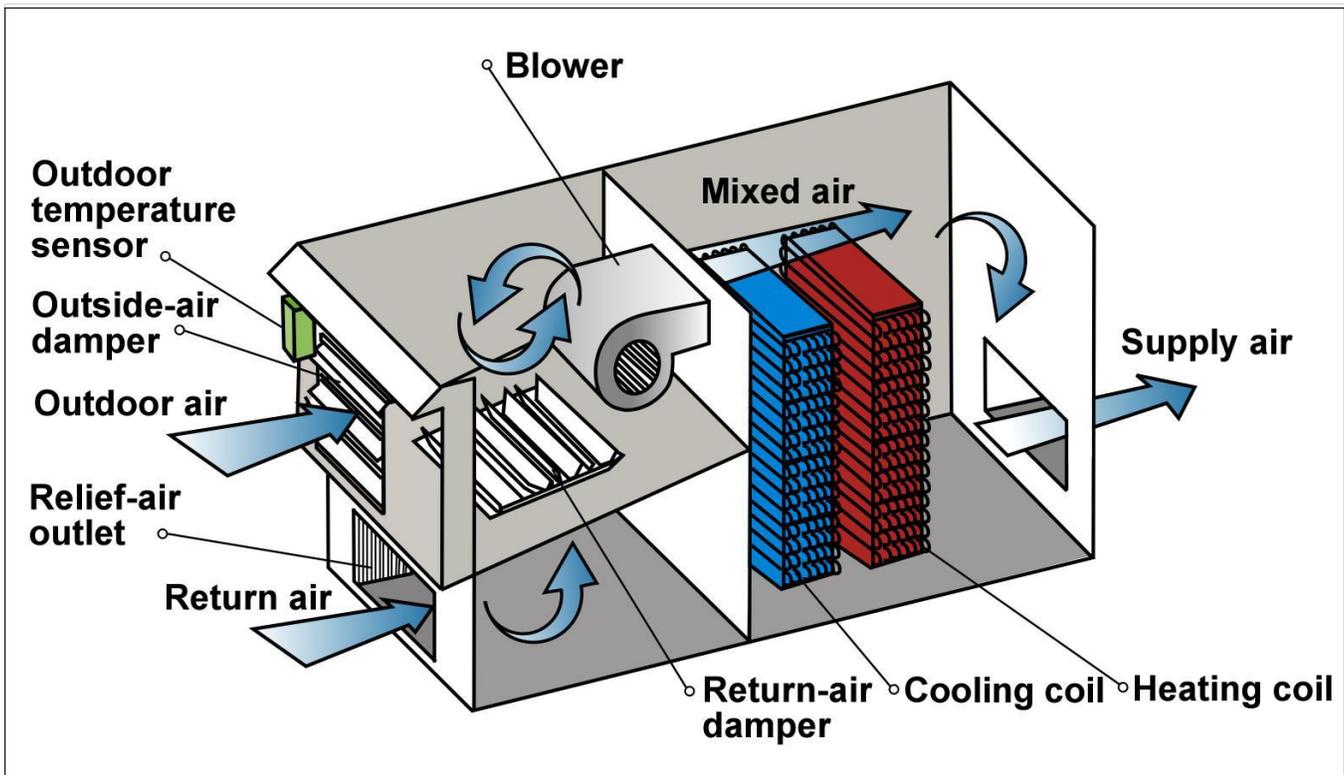




Economizer Requirements in IECC 2009 - Code Notes

The 2009 International Energy Conservation Code® (IECC) requires cooling systems in commercial buildings to have economizers, depending on climate zone and cooling system capacity. Economizers save cooling system energy by using outdoor air to cool a building when outdoor conditions are favorable. This is accomplished with sensors and controls that increase the percentage of outside air that is brought inside when the outside air temperature, or enthalpy, is low enough to help meet the building's cooling load. If the enthalpy is low enough to meet the entire cooling load, the controls should prevent mechanical cooling operation.



In the 2009 IECC, an integrated air economizer is required for all cooling systems with cooling capacity exceeding 54,000 BTU/h. Economizers are not required in Climate Zones 1A, 1B, 2A, 7, and 8. These climate zones represent extremely hot and humid or cold areas, where the first cost of economizers would not be offset by energy cost savings.

IECC 2009 provides the following exemptions to economizer requirements:

1. Economizers are not required in certain climate zones if the cooling equipment efficiency exceeds minimum requirements as follows: by 10 percent in Zone 2B; by 15 percent in Zone 3B; or by 20 percent in Zone 4B. In these climates and beyond these efficiency thresholds, the increased efficiency of the cooling offsets the potential energy savings of the economizers.
2. Economizers are not required for cooling systems with air or evaporatively cooled condensers, and serving spaces with open-case refrigeration. The excess latent load imposed on open-case refrigeration offsets, or negates, the energy savings from the excess outdoor air.
3. Economizers are not required for cooling systems with air or evaporatively cooled condensers when the outside air pollutants require unusual outside air filtration to meet the minimum outdoor air-ventilation and air-quality requirements of Section 403.3 of the International Mechanical Code®. The added cost of expensive gas-phase filtration systems would reduce the lifecycle cost effectiveness of economizer systems.



4. Economizer requirements do not apply if the cooling system includes a water economizer that provides 100 percent of the expected cooling load at outside air temperatures of 50°F dry bulb/45°F wet bulb and below.

Plan Review

If the building is located in a climate zone requiring economizers, and the cooling system capacity is greater than that specified in Table 503.3.1(1), do the following:

1. Verify that the plans require installation of an economizer.
2. If an economizer is not shown in the plans, verify that the proposed equipment meets the higher efficiency requirement (EER and IPLV, as applicable), per Table 503.3.1(2).
3. If an economizer is not shown in the plans and the equipment efficiency does not meet the high-efficiency requirement mentioned in item 2, then check for the presence of open-case refrigeration or a documented need for an unusual air filtration requirement. This exception is applicable only for systems with air or evaporatively cooled condensers.
4. Verify that the system provides a relief-air outlet to prevent overpressurizing the building, and that the relief-air outlet is located to avoid recirculation.

Field Inspection

If an economizer is required and provided, then verify the following items:

1. economizer controls are installed on each cooling system
2. the return-air damper, outdoor-air damper, and relief-air damper are installed as per the approved plans.

Code Citations*

IECC 2009, 503.3.1. Economizers

Supply air economizers shall be provided on each cooling system as shown in Table 503.3.1(1).

Economizers shall be capable of providing 100-percent outdoor air, even if additional mechanical cooling is required to meet the cooling load of the building. Systems shall provide a means to relieve excess outdoor air during economizer operation to prevent overpressurizing the building. The relief air outlet shall be located to avoid recirculation into the building. Where a single room or space is supplied by multiple air systems, the aggregate capacity of those systems shall be used in applying this requirement.

Exceptions:

1. Where cooling equipment is covered by the minimum efficiency requirements of Table 503.2.3(1) or 503.2.3(2) and meets or exceeds the minimum cooling efficiency requirement (EER) by the percentages shown in Table 503.3.1(2).
2. Systems with air or evaporatively cooled condensers and which serve spaces with open case refrigeration or that require filtration equipment in order to meet the minimum ventilation requirements of Chapter 4 of the *International Mechanical Code*.

References

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