

# HEAT RECOVERY CHILLERS

## What is a heat recovery chiller?

Heat recovery chillers are a type of HVAC system that can simultaneously provide heating and cooling to a building by recovering waste heat from the cooling process and using it to produce hot water for space heating, domestic hot water, or other process requirements, thereby offsetting heating energy. Typical leaving condenser water temperature range from 90°F up to 140°F. Lower leaving condenser water temperature up to 120°F can be used for VAV reheat, radiant floor heat, pool heating, and pre-heating domestic hot water. Higher leaving condenser water temperature up to 140°F can be used for domestic hot water, laundry, and other process application. Leaving condenser water temperature must be higher than heating loop return water temperature to recover heat.

During cooling only operation, the chiller produces a controlled source of chilled water leaving the evaporator while dissipating heat through the condenser to the environment. When there is a simultaneous need for chilled water and hot water, these chillers have the capability to operate in heat recovery mode.

## What would qualify a project for this measure?

- Waste heat from the chiller is used as a heat source for some other end use.
- Equipment can produce heating and cooling effects simultaneously.

## What are the benefits?

- Heat recovery captures energy that would have been wasted during the cooling process. The recovered heat can be redirected for various heating needs, which saves energy while maintaining design conditions.
- Heat recovery chiller can achieve COPs of up to 7.0 when in heat recovery mode.
- Reduce carbon emissions.
- May reduce the size of primary heating equipment.
- Flexible sizes available for small or large commercial applications.

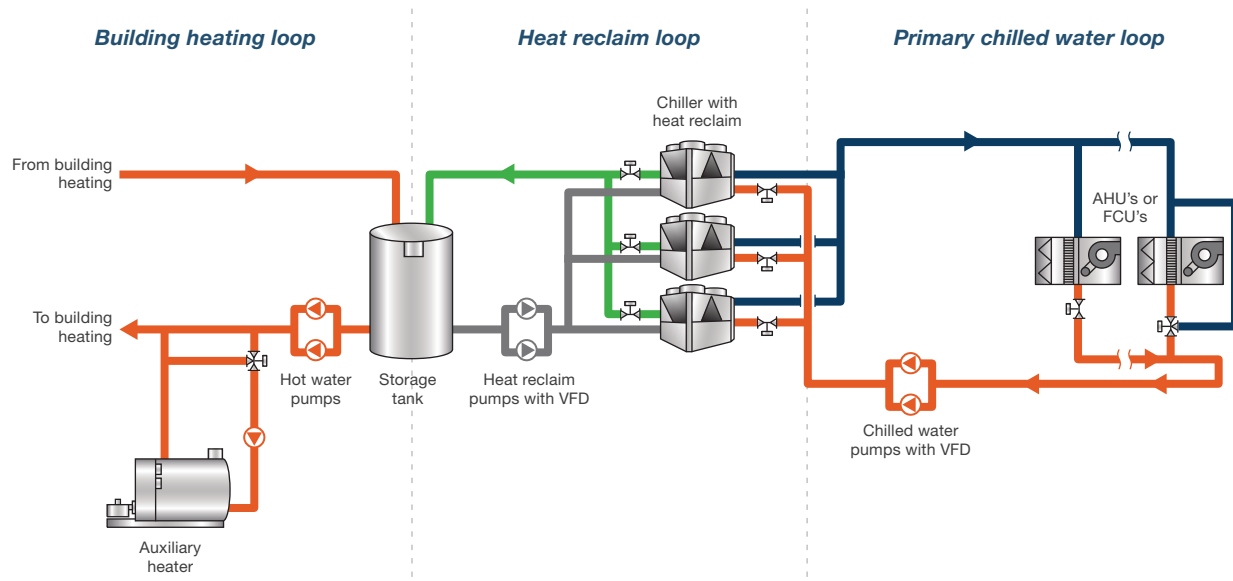
## What are the challenges/constraints, if any?

- Additional components and piping may be needed.
- Potential higher upfront cost.
- Higher condenser leaving water temperature typically decreases the cooling efficiency of the chiller.
- Increased peak electric demand.
- Additional controls may be required.

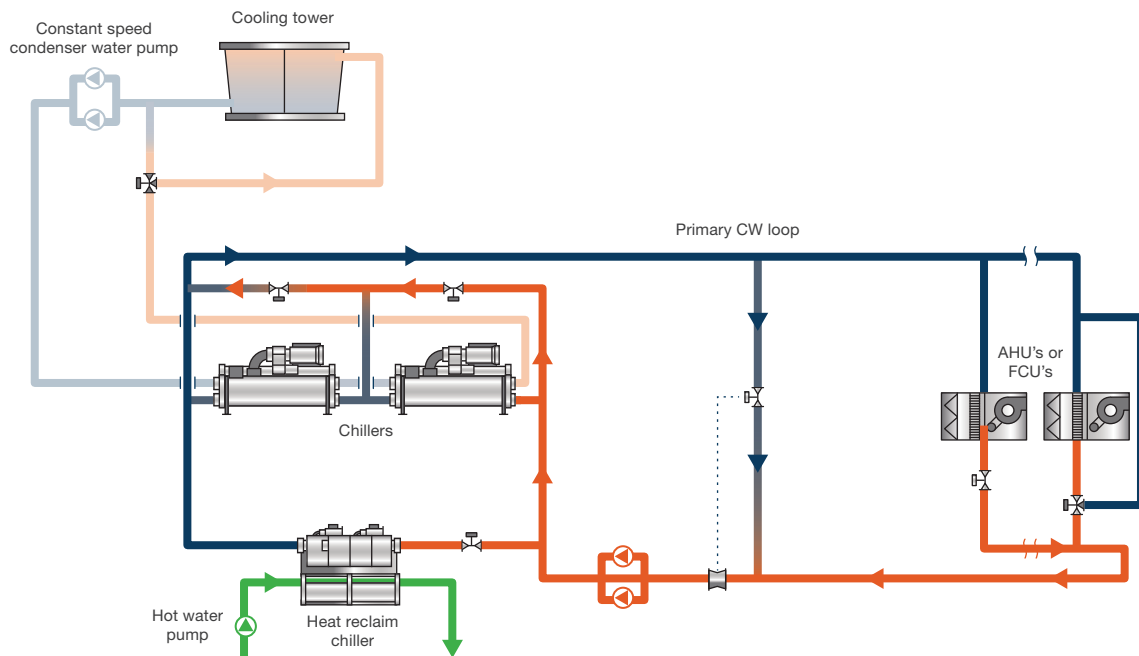
## When to consider a heat recovery chiller?

- There is a significant simultaneous heating and cooling load.
- Hot water loop temperatures between 59°F and 131°F.
- Mechanical space available for chiller.

## Multiple chiller system with heat reclaim for building heating\*



## Series counterflow chilled water system with heat recovery chiller\*



\*Diagrams provided by Carrier