

Customer Connection for **BUSINESS**



Energy information to help you manage your operation

November 2021

Get the most from your rooftop units with retrofit controls

Retrofit controls for rooftop units (RTUs) have been available for more than a decade. Designed to improve RTU energy efficiency, these control kits can also solve humidity, noise, and short cycling issues. An RTU retrofit control kit:

- Reduces energy consumption by controlling fan speed and compressor capacity.
- Uses advanced economizer logic for better cooling and ventilation.
- Includes fault detection and diagnostics (FDD) that can help extend an RTU's life.

RTUs have an operational life of 15 to 20 years. So as energy codes advance and energy-saving techniques progress, older operating RTUs lag behind industry standards. The use of an RTU retrofit control kit can mitigate antiquated RTU controls—improving employee comfort and decreasing energy bills.

Several manufacturers offer RTU retrofit control kits. Review the table at right for information on two popular systems and talk with your HVAC contractor about the possibility of increasing your RTU's performance.

RTU orders may be delayed

Rooftop units, like many other consumer goods, are experiencing longer than expected lead times on orders. Timeframes for higher efficiency RTUs are longer than their lower efficiency counterparts. Analyzing your equipment as it nears the end of its service life will help you avoid delays.

If your business expects to purchase a new RTU, discuss these performance metrics with your HVAC contractor.

- **Seasonal Energy Efficiency Ratio (SEER):** Look for a SEER rating of 14 or higher.
- **Energy Efficiency Ratio (EER):** Look for an EER rating of 12 or higher.

While most RTUs currently in operation use natural gas for heating, more and more companies are opting for an electric heat pump RTU when replacing equipment. Heat pumps provide effective heating even when outdoor temperatures are 10°F or lower and save energy.

We offer significant rebates for heat pump installations. Contact one of our representatives about qualifications for incentives.

Use energy modeling to create an efficient building design

Designing a new building is an exciting time! Do you need more private offices or want open space for teamwork? What will the lobby look like? How will you design the production floor?

The vision stage of a project is your opportunity to consider how to make a new building's operating costs lower through energy-efficient design. With energy-modeling software, you can test small changes in your design to determine where your building's sweet spot is for energy performance. An efficient building could save you thousands of dollars year after year.

Contact us early in your new construction project and one of our representatives can link you to an energy-modeling consultant. In collaboration with you, your architect, and your design team, we'll discuss strategies to improve your building's efficiency and save you money.

Note: energy-modeling consultation can be arranged for all commercial customers. In Minnesota, through our energy efficiency program, this service is available at no cost.

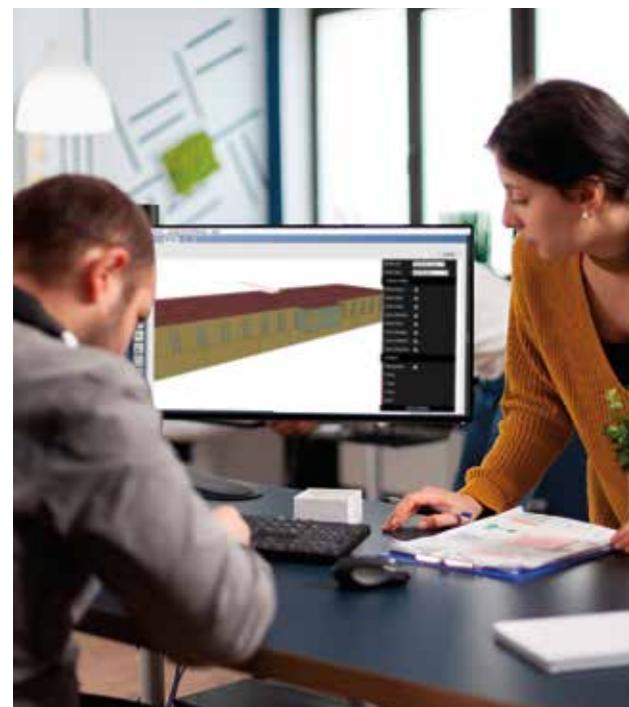
Comparing Catalyst and Digi-RTU retrofit controls

Two RTU retrofit control technologies that have shown positive results in field studies (including energy savings averaging 57 percent) are the Catalyst by Transformative Wave and the Digi-RTU by Bes-Tech. While they share standard features, each has unique offerings.

| Basic features | Catalyst | Digi-RTU |
|---|----------|----------|
| Evaporator fan control | X | X |
| Integrated economizer control | X | X |
| Demand-controlled ventilation | X | X |
| Fault detection and diagnostics (FDD) | X | X |
| Desirable features* | | |
| Remote monitoring | X | X |
| Remote control | X | X |
| Compressor control | | X |
| Condenser fan control | | X |
| Advanced features* | | |
| Advanced thermostat, economizer, and FDD controls | X | |
| Demand response capability | X | X |
| Web-enabled user interface | X | |
| Building automation system (BAS) integration | X | X |
| Stand-alone BAS | X | |

*Designated by U.S. Department of Energy. Source: E Source

Minnesota and South Dakota customers may qualify for a custom grant through our energy-efficiency programs. Contact one of our energy experts for further information.



Building design programs can measure the cost and benefit of energy-efficient design changes for your building project.

Breakeven point, balance point, or both?



Air-source heat pumps work not by producing the heat that you need to keep warm through the winter but by extracting energy from the outside air and moving it into your space, using refrigerant as the medium of heat exchange.

For effectiveness, there needs to be enough heat energy available. As the temperature drops outside not only does your space take more energy to keep warm, but there's less heat energy available in the outside air. An air-source heat pump's efficiency will decline the lower the outdoor air temperature drops as it uses more energy to extract the available heat.

The point at which the extractable heat energy is too low for a heat pump to adequately heat your home is called the **balance point**.

Along with the balance point, which may be -10°F or lower for some cold-climate heat pumps, the price you're paying for electricity or alternate fuel(s) is a factor to determine the best economic point to switch over the system. This is called the **breakeven point**.

The table below will help you find the breakeven point of your system. Find the price per kilowatt-hour that your system is served. Then find the price paid for your backup fuel. Natural gas is on the top line and propane along the bottom.

| | | Natural gas rate, \$/therm, (furnaces and boilers) | | | | | | | | | | | | | | |
|------------------------------|--------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | \$0.60 | \$0.65 | \$0.70 | \$0.75 | \$0.80 | \$0.85 | \$0.90 | \$1.00 | \$1.15 | \$1.33 | \$1.50 | \$2.00 | \$2.50 | \$2.75 | |
| Electric rate, \$/kWh (ASHP) | \$0.04 | 10° | 10° | 5° | -5° | -10° | -10° | -10° | -10° | -10° | -10° | -10° | -10° | -10° | -10° | |
| | \$0.05 | 25° | 20° | 15° | 10° | 5° | 0° | -5° | -10° | -10° | -10° | -10° | -10° | -10° | -10° | |
| | \$0.06 | 35° | 30° | 25° | 20° | 15° | 15° | 10° | 0° | -10° | -10° | -10° | -10° | -10° | -10° | |
| | \$0.07 | 45° | 40° | 35° | 30° | 25° | 25° | 20° | 10° | 0° | -10° | -10° | -10° | -10° | -10° | |
| | \$0.08 | 50° | 45° | 40° | 40° | 35° | 30° | 25° | 20° | 10° | 0° | -10° | -10° | -10° | -10° | |
| | \$0.09 | 60° | 55° | 50° | 45° | 40° | 40° | 35° | 30° | 20° | 10° | 0° | -10° | -10° | -10° | |
| | \$0.10 | 60° | 60° | 55° | 50° | 50° | 45° | 40° | 35° | 25° | 15° | 10° | -10° | -10° | -10° | |
| | \$0.11 | 60° | 60° | 60° | 60° | 55° | 50° | 45° | 40° | 30° | 25° | 15° | -5° | -10° | -10° | |
| | \$0.12 | 60° | 60° | 60° | 60° | 60° | 55° | 50° | 45° | 35° | 30° | 20° | 0° | -10° | -10° | |
| | \$0.13 | 60° | 60° | 60° | 60° | 60° | 60° | 55° | 50° | 40° | 35° | 25° | 5° | -10° | -10° | |
| | \$0.14 | 60° | 60° | 60° | 60° | 60° | 60° | 60° | 55° | 45° | 35° | 30° | 10° | -5° | -10° | |
| | | | | | | | | | | | | \$1.22 | \$1.37 | \$1.83 | \$2.29 | \$2.52 |

Source: mnashp.org

Propane rate, \$/gallon, (furnaces and boilers)

Work with your installer to ensure the switchover point is set properly to take advantage of the economic value offered by a cold-climate heat pump.



Protect employees from electrical hazards

Many on-the-job electrical injuries are a result of improperly maintained electrical equipment, faulty wiring, and the use of electrical equipment near water. Share these tips with your team to help prevent injuries.

- Look for overloaded outlets and shift loads.
- Never plug together extension cords.
- Keep three feet of clearance from electrical panels.
- Unplug appliances for cleaning or servicing.
- Watch for warning signs, such as excessive heat, sparks, smoke, or odd noises, which indicate equipment is faulty and should be removed from use.
- Place a guard over exposed electrical components or wires.
- Do not use electrical equipment or appliances with wet hands or near water.

A team of energy experts is available to help you



Roger Garton
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Jamestown and Oakes, ND areas



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If you have a project to discuss, call one of our representatives at 800-493-3299.

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