Optional Master Controller For Walk-ins

The Master Controller is a custom-designed part of a Master-Bilt refrigeration system which also contains either a remote condensing unit (B-Series or M-Series) or a multi-compressor system (MRS or DRS series) and one or more evaporator coils. Other components include an electric expansion valve, temperature sensors, an optional remote display and an optional remote data logging and control system.

The Master Controller system is highly efficient since it regulates an electric expansion valve in response to evaporator superheat and return air temperature. Featuring demand defrost technology, which provides up to 26% in energy savings depending on the application, the Controller offers the ultimate in convenience and energy efficiency.

The Master Controller is designed to significantly reduce installation and labor costs in many ways:

- *All the electrical components are pre-wired and tested at the factory*
- *No power wiring is required between evaporator coils and condensing units (a thermostat wire is required when reverse cycle defrost is used)*
- *The refrigeration system doesn't have to be "pulled down" to set the evaporator superheat*
- *The evaporator doesn't have to be wired or plumbed and the solenoid valve doesn't have to be wired*
- *No need to install a room thermostat or set a defrost schedule*

In some cases, the savings on the wiring installation alone can cover the cost of the Master Controller.

Mechanical Parts Eliminated

- Room thermostat
- Defrost timer
- Thermostatic expansion valve
- Defrost termination/fan delay thermostat
- Defrost heater contactor when the amp draw is less than 20A, single phase, 240VAC
- Evaporator fan contactor when the amp draw is less than 10A, single phase, 240VAC
- Liquid receiver if reverse cycle defrost is used (see p. 6)

Parts Added (Factory-mounted)

- Controller with two-digit LED and two pushbuttons on panel interface for setup
- Three solid state temperature sensors
- Electric expansion valve
- Pressure transducer
- 24V transformer
- Optional remote display panel with communication cable
- Liquid line solenoid valve for protection during power outages (if reverse cycle defrost is used, this valve isn't needed)
- External relay to control liquid line solenoid valve or compressor contactor

Room Temperature Information

- Room temperature range: -40°F to 80°F
- Medium temperature application is pre-set at 35°F cut-out room temperature with air defrost
- Low temperature application is pre-set at -10°F cut-out room temperature with demand defrost
- The cut-in temperature differential is 5°F by default
- The set points can be changed in field if needed

System Functions

- Contains pre-programmed settings for common industry applications
- Controls room temperature and defrost
- Electric expansion valve is modulated with evaporator superheat
- Three relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A)
- Digitally displays status data such as temperature and error codes
- Defrost is based either on a schedule like a conventional time clock or on demand defrost mode which defrosts only as needed. The factory preset is to demand defrost.
- Programmable settings
- Master/slave application for up to a total of six evaporators
- RS-485 port for remote display, setting and communication
- Operating voltage: 24V

Master Controller Interfaces

With the Master Controller, settings may be adjusted on the panel mounted directly to the evaporator. An optional remote panel is also available and can be located on a walk-in wall or door.

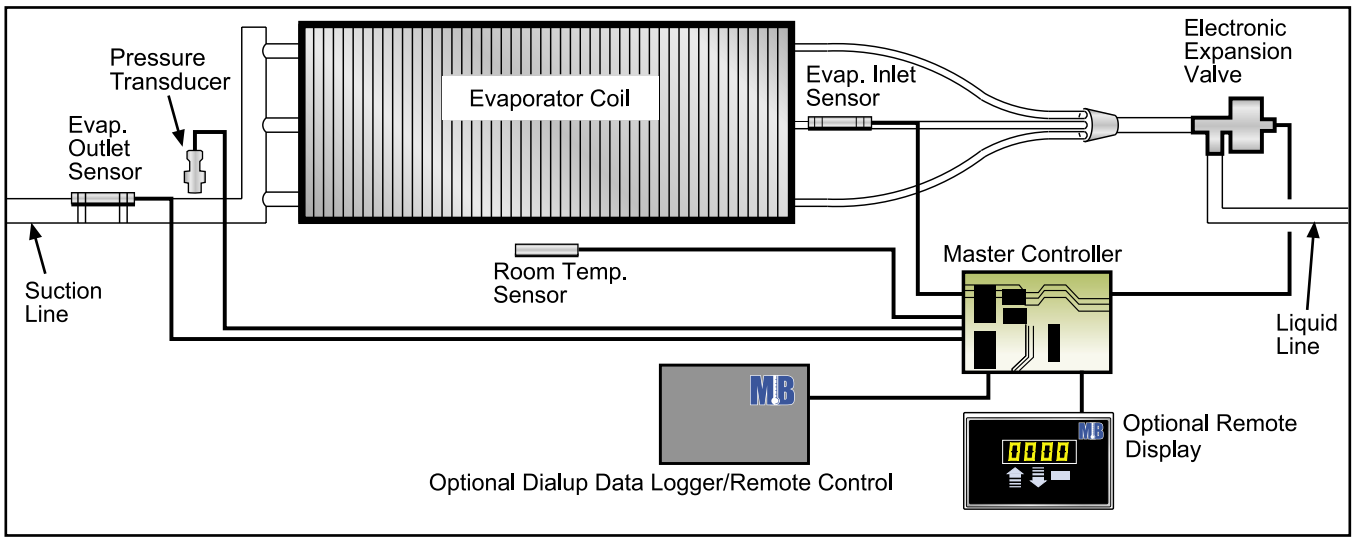
The user-friendly optional remote interface adds convenience by letting you adjust settings without having to enter the walk-in. All setting adjustments and diagnostics are controlled with the up/down keys and the enter key.

Both Master Controller interfaces feature two levels of access to system settings. The user level allows the adjusting of the room temperature set point while the technician's level opens access to all other temperature settings and operating parameters.

The Master Controller panel (shown above with housing removed) is mounted to the evaporator.

An optional remote panel (above) is also available.

Walk-in Master Controller System Diagram



Optional Master Controller For Walk-ins

Patented Process Reduces Defrost Energy Usage By Up To 80%

Reverse Cycle Defrost: Energy-Saving Innovation

Eliminate inefficient defrost methods with this patented* innovation from Master-Bilt.

The process involves a reverse cycle valve, an optional component on Master Controller systems only, which is added to the condensing unit.

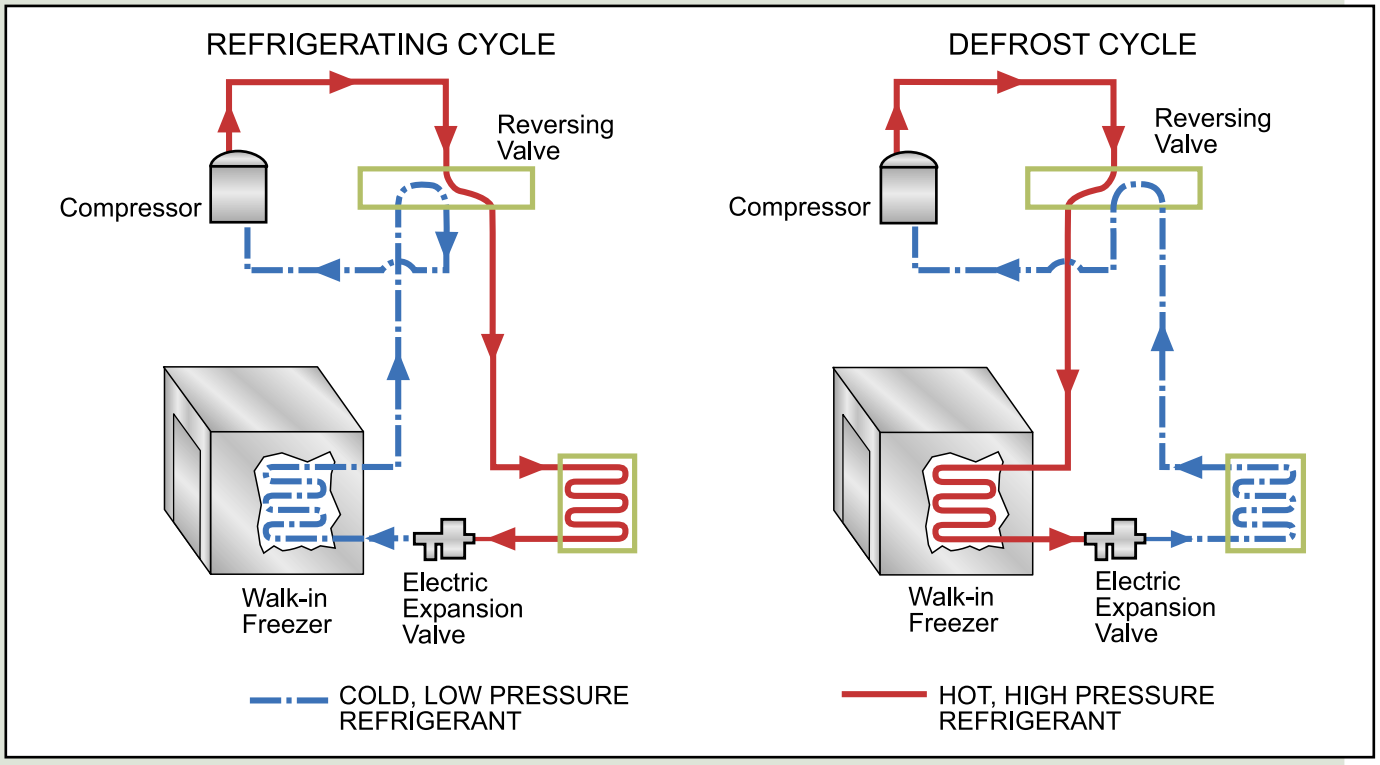
The valve's primary function is to reverse the direction of refrigerant flow during defrost. When the Master Controller's demand defrost determines a defrost is necessary, the reverse cycle valve is activated and the high temperature refrigerant flow is reversed. The refrigerant flows back through the evaporator coil heating it along its entire length and completely eliminates frost buildup. Only a certain amount of the coil is heated by traditional defrost heaters, leaving ice deposits which weaken the evaporator's performance.

Reverse cycle technology offers several significant advantages. First of all, the process uses less energy than electric defrost heaters. **Reverse cycle reduces defrost energy usage by up to 80%.** This savings plus that gained from the demand defrost feature and elimination of head pressure control valves dramatically reduces electrical bills.

Reverse cycle eliminates not only the need for defrost heaters and head pressure control valves, but also check valves and expansion valves at the condenser. With reverse cycle, liquid receivers are also unneeded on most condensing units. Removing these components reduces the cost of the evaporator itself and saves on installation and wiring.

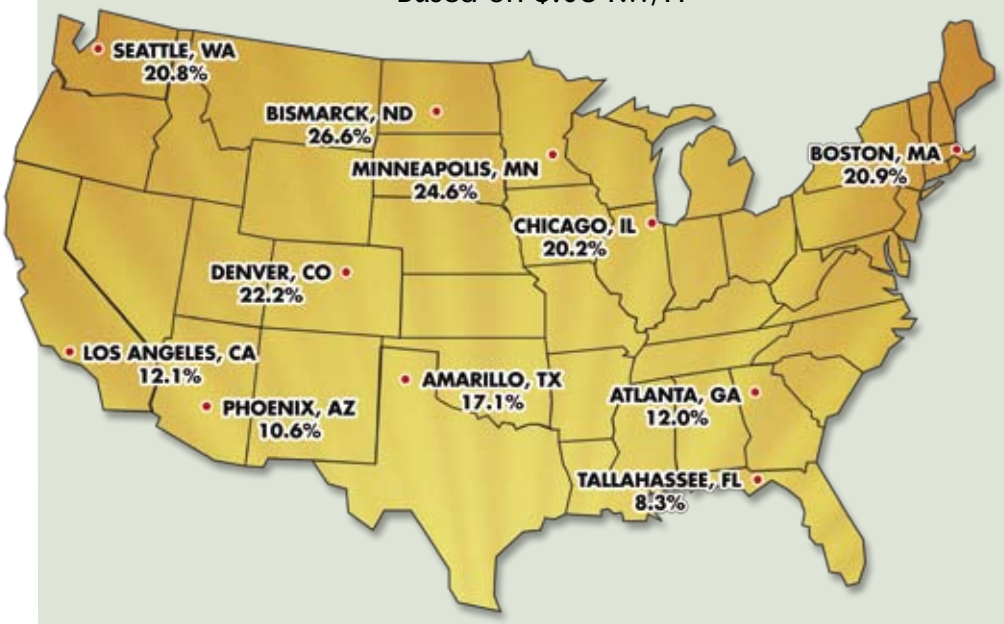
Defrost time is also greatly lessened. The average time using defrost heaters is 20-30 minutes. Reverse cycle performs a completely "clean" defrost in 3-5 minutes. Because the defrost is so rapid, there's no noticeable increase in freezer temperature and the product temperature rise is also significantly less.

*U.S. patent no. 7,073,344



Estimated Annual Energy Savings

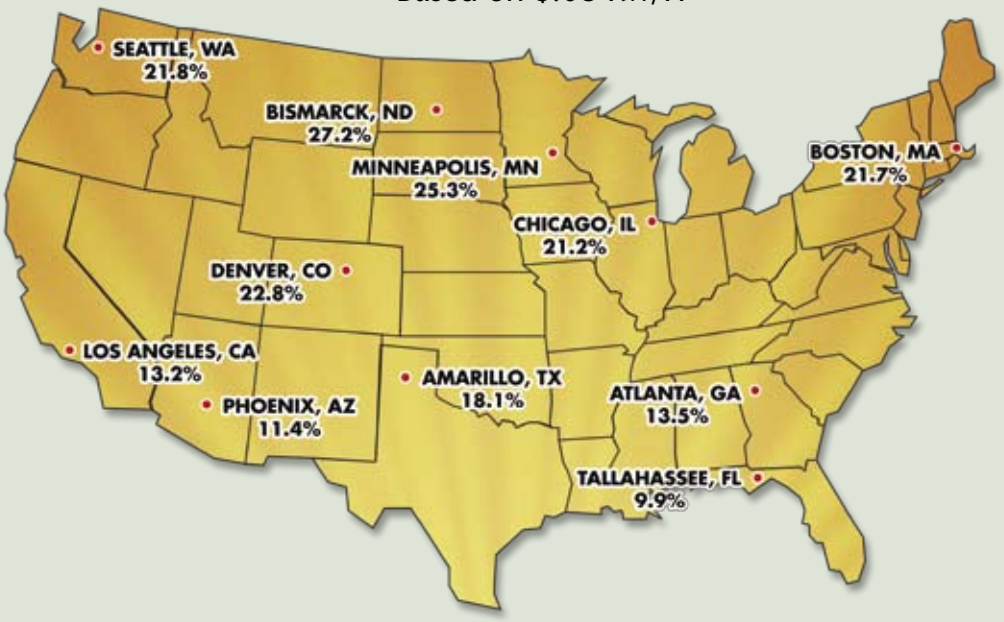
Master Controller Only
Based on $.08 Kw/H



Kitchen Innovations
2007
AWARD
NATIONAL RESTAURANT ASSOCIATION
RESTAURANT, HOTEL-MOTEL SHOW

The Master Controller with reverse cycle defrost is a unique combination and was named the winner of a Kitchen Innovations 2007 Award presented by the National Restaurant Association Restaurant, Hotel-Motel Show.

Master Controller With Reverse Cycle Defrost
Based on $.08 Kw/H



For the latest product information and specifications go to www.master-bilt.com/products/products.htm.

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Due to continuous product enhancements, we reserve the right to change specifications without notice.