Century®

# COMMERCIAL WATER SOURCE HEAT PUMPS

## Energy efficient Heating and Cooling for Commercial Applications

R454B

HEAT CONTROLLER

# COMMERCIAL WATER SOURCE HEAT PUMPS

## Energy-Saving Heating & Cooling Units for Replacements and New Construction

Century commercial water source heat pumps are ideal for improving the efficiency of older buildings and also as part of the design of sustainable structures. Because our water source systems use less energy, they lessen the economic and environmental impact of heating and cooling compared to HVAC systems powered solely by fossil fuels.

Multiple package models connected by a water loop are ideal for zoned heating and cooling in such facilities as schools, nursing homes, and condominiums—offering superior comfort and energy control throughout the building. Large capacity models are designed to condition single expansive spaces.

An extensive range of models, capacities and voltages means there's a model to meet the demands of designer, contractor and building owner—a great choice for new construction and retrofits, as well as replacements! With an innovative cabinet design, there are units to fit just about any existing location and multiple access panels make installation easy, even in tight spots.

### MB LARGE Series

6 to 25 tons, for large spaces such as gyms and commons areas; units can be used in water loop, ground water or ground loop installations, depending on the type of facility and the available land or source of water.

### MC COMPACT Series

.5 to 5 Tons, designed specifically for water loop, boiler/cooling tower applications, they provide effective zone control for comfort and efficiency; can also be used in ground loop installations.

### MD CONSOLE Series

.75 to 1.5 Tons, The Console MD Series provides a high efficiency WSHP ductless solution for spaces where individual, quiet control of the heating and cooling system is important.

### MH VERTICAL STACK Series

9 to 36 Tons, The MH Series vertical stack offers an innovative, labor-saving solution for spaces where individual, quiet control of the heating and cooling system is important.

## Glossary of Terms

**Water Loop**—Commercial water source installation in which a water loop connects all the individual, independently controlled units in the building, with excess heat energy rejected through a cooling tower and additional heat energy added by a boiler installed in the loop

**Ground Loop**—Geothermal system with heat transfer liquid permanently sealed in piping buried in the ground or submerged in a pond or lake (also called "Closed Loop")

**Ground Water**—Geothermal system in which water is pulled from an aquifer and used for heat transfer, then released to another well, a ditch or other water source (also called "Open Loop")

R454B

**R-454B**—The environmentally friendly refrigerant

**All Century WSHPs are rated in accordance with AHRI/ASHRAE/ISO 13256-1**

***Office buildings are among the many structures that can benefit from the independently controlled comfort and low operating costs of an interconnected water loop system.***

# LARGE CAPACITY COMMERCIAL
## MB SERIES

**Warranty–5 years on compressor, 1 year on parts**
(Some limitations apply; see printed warranty for details.)

These individual packaged units transfer heat via water loop systems for effective heating and cooling. Our largest capacity units, they feature belt drive blowers and reliable scroll compressors. Power and water connections can be made on either side, and discharge air is field convertible.

Because each unit operates independently of others, they can be zoned for maximum comfort. With their large capacity, this equipment meets the requirements of common areas, gymnasiums, cafeterias and other areas where individual comfort control of a large area is required, and is also ideal for multi-story structures.

The extended range option allows ground water and ground loop installations (requires extended range insulation package.)

Individual package units designed specifically for boiler/cooling tower applications, these highly efficient models allow for comfortable heating or cooling in separate zones at the same time. Each unit can be operated year 'round in heating or cooling mode, and each is independently controlled.

## MB Horizontal/Vertical Large Series Performance Data

| Model | Water Loop Performance | | | | Shipping Wt. (lbs) |
|---|---|---|---|---|---|
| | Cooling @ 86°F EWT | | Heating @ 68°F EWT* | | |
| | BTUH | EER | BTUH | COP | |
| MB072 | Belt Drive | 71,000 | 14.1 | 92,300 | 626 |
| | Belt Drive with VFD | 72,000 | 14.5 | 91,400 | 684 |
| MB086 | Belt Drive | 101,000 | 15.3 | 122,800 | 738 |
| | Belt Drive with VFD | 101,700 | 15.5 | 123,000 | 1149 |
| MB120 | Belt Drive | 122,000 | 13.7 | 156,000 | 1244 |
| | Belt Drive with VFD | 124,000 | 13.9 | 156,000 | 1264 |

*EWT = Entering water temperature. See Engineering Guide for Ground Water/Ground Loop data.

## Available voltages:

All models are available in 208/230-3-60, 460-3-60, or 575-3-60. See the Engineering Design Guide or Price Book for a complete part number list. Available in front or back return, and front, back or top supply

## Features

- **New! Waterside Economizer**– On MBH072-MHBH120
- **Quiet Operation**–Insulated divider separates compressor and air handler compartments, and double isolated compressor mounting minimizes noise
- **Microprocessor Controls**–Provides reliability and ease in controlling temperature and operation
- **Performance Sentinel System**–Monitors the operation and signals a potential problem before a lockout occurs
- **Heavy Duty Compressors**–Copeland scroll compressors for efficiency and long life
- **Easy Installation**–Multiple access panels simplify installation, especially in tight spots; horizontal models include installed hanging brackets

# COMPACT COMMERCIAL
## MC SERIES

Individual MC Series units are connected by a water loop which allows heat transfer throughout the building. Excess heat energy is rejected through a cooling tower; additional heat energy is added by a boiler in the loop.

The innovative cabinet design means there are models to fit just about any existing location. Vertical and horizontal versions are available and can be ordered in a variety of configurations with options for supply air, return, and heat exchanger material. Horizontal units come with factory-installed hanger brackets and field-convertible discharge.

The MC Series is ideal for multi-story structures such as office buildings, as well as single story facilities such as nursing homes and schools.

**.5 to 5 Tons**

**Warranty–5 years on compressor, 1 year on parts**
(Some limitations apply; see printed warranty for details.)

## MC Horizontal/Vertical Compact Series Performance Data

| Model | Motor Type | Water Loop Performance | | | | Shipping Wt. (lbs) |
|---|---|---|---|---|---|---|
| | | Cooling @ 86°F EWT | | Heating @ 68°F EWT* | | |
| | | BTUH | EER | BTUH | COP | |
| MC006 | PSC | 5,900 | 13.4 | 8,400 | 4.8 | 113 |
| | EC | 6,100 | 15.0 | 8,300 | 5.1 | 113 |
| MC009 | PSC | 8,500 | 13.8 | 11,700 | 4.4 | 115 |
| | EC | 8,600 | 14.3 | 11,600 | 4.5 | 115 |
| MC012 | PSC | 10,500 | 12.7 | 14,400 | 4.5 | 124 |
| | EC | 10,700 | 13.4 | 14,400 | 4.6 | 124 |
| MC015 | PSC | 14,500 | 15.2 | 16,000 | 4.8 | 158 |
| | EC | 14,700 | 16.4 | 15,900 | 4.9 | 158 |
| MC018 | PSC | 17,900 | 14.3 | 21,500 | 4.9 | 163 |
| | EC | 18,000 | 15.0 | 21,500 | 5.1 | 163 |
| MC024 | PSC | 24,700 | 14.7 | 28,800 | 5.0 | 179 |
| | EC | 24,900 | 15.4 | 28,500 | 5.1 | 179 |
| MC030 | PSC | 28,800 | 13.7 | 35,400 | 4.6 | 187 |
| | EC | 29,200 | 14.5 | 35,000 | 4.8 | 187 |
| MC036 | PSC | 34,800 | 14.6 | 43,900 | 4.6 | 209 |
| | EC | 35,200 | 15.3 | 43,500 | 4.8 | 209 |
| MC042 | PSC | 41,100 | 14.0 | 49,500 | 4.6 | 224 |
| | EC | 41,800 | 15.2 | 48,500 | 4.9 | 224 |
| MC048 | PSC | 48,000 | 14.3 | 57,900 | 4.7 | 270 |
| | EC | 48,900 | 15.2 | 57,500 | 4.8 | 270 |
| MC060 | PSC | 59,400 | 13.2 | 70,000 | 4.4 | 285 |
| | EC | 60,200 | 14.7 | 68,000 | 4.7 | 285 |
| MC041 | PSC | 36,000 | 14.0 | 43,300 | 4.3 | 224 |

Individual package units designed specifically for boiler/cooling tower applications, these highly efficient models allow for comfortable heating or cooling in separate zones at the same time. Each unit can be operated year 'round in heating or cooling mode, and each is independently controlled.

## Features

- **ECM Available**–On most models
- **Quiet Operation**–Sound absorbing glass fiber insulation, plus insulated divider to separate compressor and air handler compartments dampens sound
- **Performance Sentinel System**–Monitors the operation and signals a potential problem so maintenance can be scheduled before a lockout occurs
- **Heavy Duty Compressors**–Copeland scroll compressors on -024 and larger models; rotary compressors on -018 and smaller models
- **Compact Size**–With some of the smallest cabinet sizes in the industry, units are designed to be compatible with thousands of older water source heat pumps
- **Optional Extended Range Refrigerant Circuit**–Capable of ground loop as well as water loop installation for flexibility

**Available voltages**: 208/230-1-60, 208/230-3-60, 460-3-60, 575-3-60, 265-1-60, although all models are not available in all voltages. See MB Engineering Design Guide or Price Book for complete part number list.

All units available in right or left return.

# WATER SOURCE CONSOLE SERIES
## MD SERIES

The Console MD Series provides a high efficiency WSHP ductless solution for spaces where individual, quiet control of the heating and cooling system is important. MD Console Series units are especially ideal where space is limited, or when preserving the integrity of an existing structure. The MD Console Series exceeds ASHRAE 90.1 efficiencies, yet maintains small cabinet dimensions. Using EarthPure® (R454B) refrigerant, the MD Console Series not only protects the environment, it does so while delivering unprecedented comfort, efficiency, and reliability.

## ADVANTAGES OF THE CONSOLE MD SERIES

- Environmentally-friendly EarthPure® (HFC-454B) zero ozone depletion refrigerant
- Two-piece chassis/cabinet design
- Slope top with aluminum rigid bar supply air grille and aluminum control door
- TXV metering device
- Extended range (20 to 120°F, -6.7 to 48.9°C) operation
- Advanced digital auto change-over unit mounted control with temperature display, and speed selection
- Remote-mounted control available
- CXM2 Microprocessor controls
- Right or left-hand piping arrangement
- Front or bottom return air
- Unit Performance Sentinel performance monitoring system
- Eight safeties standard
- Wide variety of options including coated air coils and UltraQuiet construction

## UNIT SIZE

| Size | Model | W* | D* | H* |
|---|---|---|---|---|
| 09-15 | No Subbase | 48 | 12 | 21 |
| | 5" Subbase | 48 | 12 | 26 |
| | Extended Cabinet/No Subase | 54 | 12 | 21 |
| | Extended Cabinet/5" Subase | 54 | 12 | 26 |
| 18 | No Subbase | 54 | 12 | 21 |
| | 5" Subbase | 54 | 12 | 26 |
| | Extended Cabinet/No Subase | 60 | 12 | 21 |
| | Extended Cabinet/5" Subase | 60 | 12 | 26 |

*All dimensions shown in inches

Office buildings are among the many structures that can benefit from the independently controlled comfort and low operating costs of an interconnected water loop system.

**Warranty–5 years on compressor, 1 year on parts**
(Some limitations apply; see printed warranty for details.)

**.75 to 1.5 Tons**

## PHYSICAL DATA

| Model | 09 | 12 | 15 | 18 |
|---|---|---|---|---|
| Number of Refrigerant Circuits | 1 | | | |
| Factory Charge R-454B (oz) [kg] | 18 [0.51] | 22 [0.62] | 26 [0.74] | 27 [0.77] |
| Refrigerant Leak Detection System | Optional | | | |
| Refrigerant Leak Detection Sensors | 1 | | | |
| **Water Connection Size** | | | | |
| O.D. Sweat (in) [mm] | 5/8 [15.9] | | | 7/8 [22.2] |
| Optional FPT Fittings (in) | 1/2 [12.7] | | | 3/4 [19.1] |
| Optional MPT Fittings (in) | 1/2 [12.7] | | | 3/4 [19.1] |
| **Condensate Connection Size** | | | | |
| I.D. Vinyl Hose (In) [mm] | 5/8 [15.9] | | | |
| **Filter Size** | | | | |
| Bottom Return (in) | 1 - 10 x 30 x 1 | | | 1 - 10 x 36 x 1 |
| Front Return (In) | 1 - 7 x 29.5 x 1/8 | | | 1 - 7 x 35.5 x 1/8 |
| **Unit Weight** | | | | |
| Weight - Operating (lbs) [kg] | 184 [83.5] | 187 [84.8] | 199 [90.3] | 224 [101.6] |
| Weight - Packaged (lbs) [kg] | 211 [95.7] | 214 [97.1] | 226 [102.5] | 251 [113.9] |

FPT = Female Pipe Thread, MPT = Male Pipe Thread

# VERTICAL STACK SERIES
## MH SERIES

9 to 36 Tons

**Warranty–5 years on compressor, 1 year on parts**
(Some limitations apply; see printed warranty for details.)

The MH Series vertical stack offers an innovative, labor-saving solution for spaces where individual, quiet control of the heating and cooling system is important. Using R454B refrigerant, the MH Series vertical stack not only protects the environment, it does so while delivering unprecedented comfort, efficiency, and reliability.

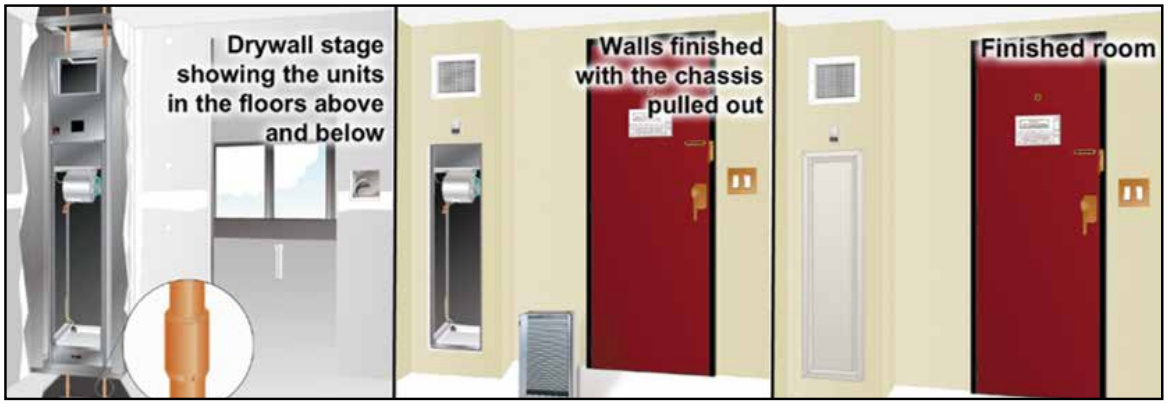
## STANDARD FEATURES

- 009 (3/4 ton) through 036 (3 tons)
- 208/230 1ph or 265 1ph voltage
- 1" Filters
- Removable chassis
- Double isolation compressor mounting
- PSC fan motor
- Cabinet can slide over riser ball valve
- Communicating CXM2 controls
- Eight standard safeties
- Tin plated coils
- Coaxial heat exchanger
- Field configuration of multiple discharge air and riser knock outs

## UNIT SIZE

| Model | W* | D* | H** |
|---|---|---|---|
| 09 - 12 | 17.0 | 17.0 | 88.0 |
| 15 - 18 | 19.25 | 19.0 | 88.0 |
| 24 - 36 | 24.0 | 24.0 | 88.0 |

| CONTROLS AND MOTORS | | | | |
|---|---|---|---|---|
| MOTOR | PSC | EC CT | EC CV | N/A |
| 24V Controls | - | - | - | A |
| Electro-mechanical Controls | - | - | - | B |
| Line Voltage Controls | - | - | - | C |
| CXM2 Controls | D | F | - | - |
| DXM2 Controls | E | G | J | - |



# ADVANCED DESIGN

*All Century water source heat pumps are designed for reliable, quiet operation and long life*

## Dependable

- State-of-the-art, solid state microprocessor controls feature easy-to-understand diagnostics and monitor key system points
- Heavy duty compressor is rated for heat pump use; larger models have dual compressors
- Performance monitoring system signals a potential problem, much like a car's "check engine" light, so service can be scheduled
- Limited number of moving parts means less wear and long life expectancy
- Coated air coil prolongs equipment life in most environments and improves efficiency

## Installation Flexibility

- Models are available in multiple voltages and with numerous options to meet building design requirements
- Numerous options are available to customize the equipment to the installation location
- Compact models take up little room, maximizing usable space in the building and making them ideal for tight spaces or retrofit applications; they also utilize a compact ductwork system

## Quiet Operation

- Dual spring and grommet isolation mounting system for the compressor reduces vibration
- Flexible torsion motor mounting further reduces vibration and related sound
- Compressor and air handler compartments in package models are separated by an insulated divider and the blower housing is covered in noise suppression material
- Discharge muffler reduces inherent compressor pulse noise

## Easy Servicing

- Components can be accessed from multiple sides to simplify service and maintenance
- Removable blower inlet rings allow easy access to the fan and motor for maintenance
- Safety features protect the unit:
  High pressure and loss of refrigerant charge; condensate overflow; freeze protection for coaxial heat exchanger and air coil; fault lock-out enables emergency heat and prevents compressor operation; anti-short cycle protects the compressor

## WHAT DO WE MEAN BY 'ENERGY EFFICIENCY'?

In recent years, the HVAC industry has made significant advances in the energy efficiency of heating and cooling systems. You can judge efficiencies yourself by comparing some industry standards.Cooling efficiency is measured by an Energy Efficiency Ratio (EER). This is a ratio of total cooling capacity to electrical energy output. The higher the number, the more efficient the equipment. Our water source units have EER ratings as high as 15.5 (water loop installation), a substantial improvement over efficiency of other types of commercial cooling equipment. On the heating side, efficiency is shown by a Coefficient of Performance (COP), which indicates the ratio of total heating capacity to electrical energy output. As with EERs, the higher the number, the more efficient the equipment. Again, water source systems rate significantly higher than comparable gas or electric heating equipment.

"This product complies with all California product labeling laws including, but not limited to, the Safe Drinking Water and Toxic Enforcement Act of 1986, more commonly known as Proposition 65."

Due to ongoing product improvements, specifications and dimensions are subject to change and correction without notice or incurring obligations. Determining the application and suitability for use of any product is the responsibility of the installer. Additionally, the installer is responsible for verifying dimensional data on the actual product prior to beginning any installation preparations.

Third party incentive and rebate programs have precise requirements as to product performance and certification. All products meet applicable regulations in effect on date of manufacture; however, certifications are not necessarily granted for the life of a product. Therefore, it is the responsibility of the applicant to determine whether a specific model qualifies for these incentive/rebate programs.

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