

HIGH EFFICIENCY
"FLEX" SERIES

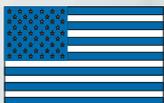
CLIMACOOL® FLEX SERIES

Water-Cooled Modular Chillers

30, 50 & 65 Ton



- Combine High Efficiency 30, 50 & 65 Ton Units For More Accurate Sizing And Performance.
- All Are "Refrigerant-Convertible" When Needed.



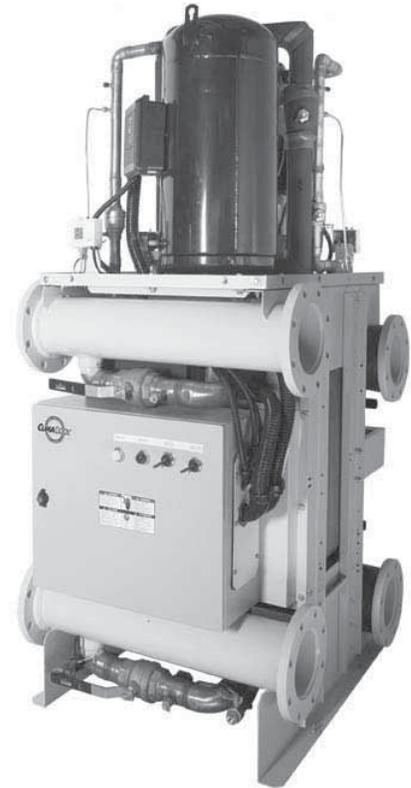
Made in the U.S.A.

CLIMA  **COOL**®
THE ULTIMATE CHILLER SOLUTION®

Global Leader in Cooling Versus Space.

ClimaCool Corp. works continually to improve its products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact ClimaCool for specific information on current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimaCool's opinion or commendation of its products.

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MODEL NUMBERS AND SPECIFICATIONS

<u>Model No.</u>	<u>Dimensions</u> <u>L x W x H (in.)</u>	<u>Voltage</u>	<u>Refrigerant</u> <u>Circuits</u>	<u>No. Of</u> <u>Compressors</u>	<u>Nominal</u> <u>Tons</u>
FLEX 30	41-7/8" x 29-1/2" x 77"*	208/230/3/60	2	2	30
FLEX 30	41-7/8" x 29-1/2" x 77"*	460/3/60	2	2	30
FLEX 30	41-7/8" x 29-1/2" x 77"*	575/3/60	2	2	30
FLEX 50	41-7/8" x 33-1/2" x 78 3/8"*	208/230/3/60	2	2	50
FLEX 50	41-7/8" x 33-1/2" x 78 3/8"*	460/3/60	2	2	50
FLEX 50	41-7/8" x 33-1/2" x 78 3/8"*	575/3/60	2	2	50
FLEX 65	43-5/8" x 33-1/2" x 78 3/8"*	208/230/3/60	2	2	65
FLEX 65	43-5/8" x 33-1/2" x 78 3/8"*	460/3/60	2	2	65
FLEX 65	43-5/8" x 33-1/2" x 78 3/8"*	575/3/60	2	2	65

* Dimensions with sound enclosures.

⚠ SAFETY WARNING ⚠

High voltage is used to operate this equipment. Failure to observe standard electrical safety procedures may result in serious injury. Only persons qualified and / or properly trained should attempt to install, operate and maintain this equipment. These chillers come fully charged with refrigerant. Installation, and start – up should be accomplished by technicians who are fully certified to handle refrigerants, as required by 40 CFR Part 82, subpart F of the Recycling and Emissions Reduction Act. Scroll compressors are used in this equipment. Phase verification is required for proper rotation direction. Incorrect rotation will result in elevated sound and internal overload trip failure.

The ClimaCool Features and Benefits

Features and Benefits

The ClimaCool® *FLEX* Series combines 30, 50 and 65 ton high efficiency units for accurate sizing and higher performance. The *FLEX* Series is designed to give you the flexibility to convert refrigerant R-22 to HFC (R-407C) at any time. *FLEX* offers "true operational modularity" which allows maintenance on any individual module without system shutdown. Scheduling for chiller shutdowns becomes a thing of the past.

Compact Advantages

The ClimaCool® modular chiller system's compact design allows for the highest cooling capacity for the maximum utilization of floor space.

The ClimaCool® modular chiller's compact size provides greater maneuverability in hallways and around tight corners where critical equipment and wiring may be located behind walls. With its slim width, each module can pass through a 34" wide opening. The modules can also ride in standard sized elevators and pass up or down standard stairways, helping to reduce installation costs and minimize mechanical room floor space requirements.

Modular Advantages

The ClimaCool® modular chiller system is designed so that modules can be field-coupled (linked side by side) to meet large project tonnage requirements. The floor occupied by a bank of ClimaCool® units is much less than that of conventional chillers for the same combined tonnage. The modular design also accommodates future expansions by allowing modules to be added in stages, precisely matched to your cooling requirements.

Equipment Access Advantages

The ClimaCool® modular chiller's small footprint design provides ample room for service and maintenance even in very tight mechanical rooms. All key components are conveniently located to facilitate routine maintenance.

Efficiency Advantages

The ClimaCool® modular chiller system includes our ClimaCom™ control system which offers intelligent control beyond conventional systems. This system can monitor numerous inputs or outputs, providing precise, optimal chiller control. Multiple stage unloading on each module, along with oversized heat exchangers, yields optimum performance at full or part load conditions. Precise control results in lower energy consumption and enhanced system operation. Modules can be unloaded as low as 4.7% on a 340 ton system.

Redundancy Advantages

Electrically, each module operates as an independent cooling system and can be individually isolated. This unique design provides "true operational redundancy" for uninterrupted cooling application, preventing total system shutdown.

Reliability Advantages

The rugged simplicity of the scroll compressor design has proven itself over and over again in a wide range of applications for more than a decade.

The proven, reliable scroll compressor provides the benefit of longer equipment life with reduced operating costs.



The ClimaCool Features and Benefits

Copeland Scroll Compressors
Durable Copeland Scroll compressors with built-in motor overload protection provide reliable operation.

Refrigerant Circuit Protection
High-pressure and low-pressure cutouts with manual reset.



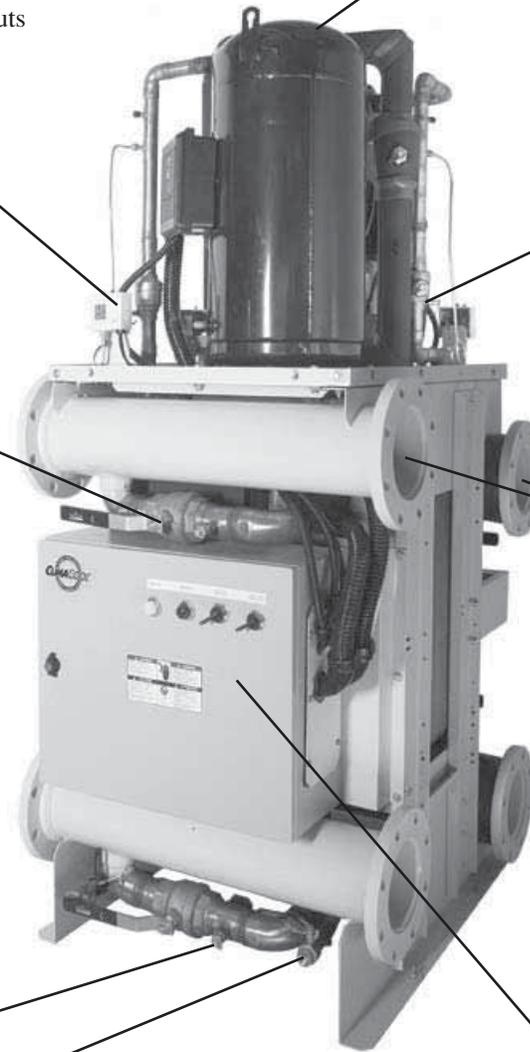
NEW Refrigerant-Convertible
Designed for easy conversion to HFC refrigerant (R-407C).

Water Side Isolation
Allows water side heat exchangers to be serviced while adjacent modules continue to deliver chilled water to the building load.

Hydronic Headers
Rugged hydronic headers constructed of Schedule 40 carbon steel piping with welded 285 PSI rated flanges. Built to deliver years of uninterrupted service.

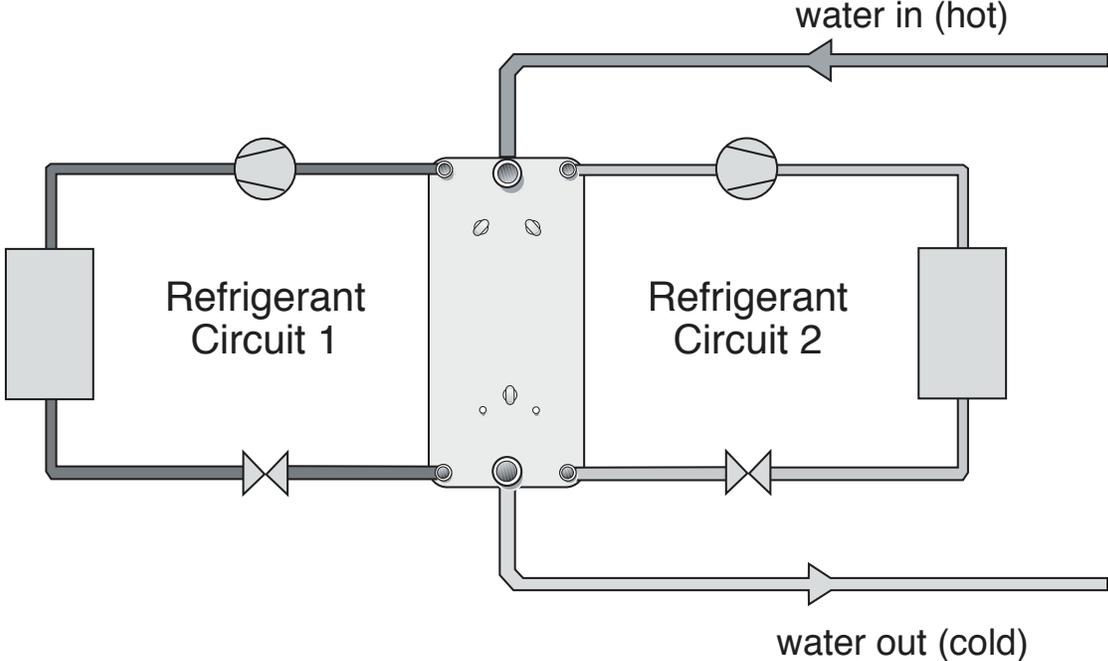
Petes Ports & Water Side Flush Connection
Permits backflushing or cleaning of heat exchangers at any time, without shutting down entire chiller system. Adjacent modules continue to deliver chilled water to the building load.

NEMA 4 Electrical Panel
Hinged and latched front access. Individual power connection for each module allows for the only "true operational redundancy" system. Each module can be serviced without interrupting chilled water supply to the building load.



The ClimaCool Features and Benefits

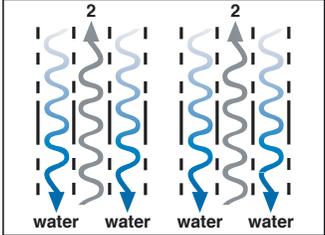
**Full Performance Every Time -
Even at Part Load.**



ClimaCool® modular chillers employ reliable and highly efficient brazed plate exchangers. These compact exchangers are true dual-circuit heat exchangers in which each water channel is flanked by two refrigerant circuits. This design gives maximum performance, even at part load.

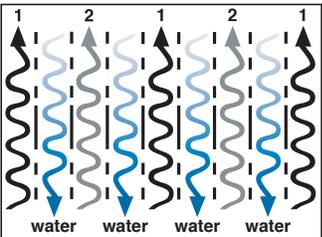
Refrigerant Circuit 2 Only

What happens if you cut out circuit 1? With the unique design, each water channel is still in contact with refrigerant circuit 2, so you get optimum heat transfer.



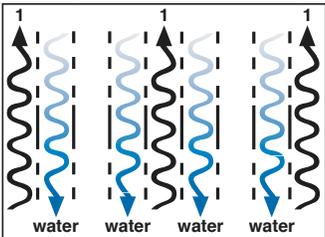
Refrigerant Circuits 1 and 2

Of course, you get full performance when you run dual circuit heat exchangers to full load, i.e. with both refrigerant circuits.



Refrigerant Circuit 1 Only

You get the same result if you run circuit 1 and cut out circuit 2. Optimum heat transfer... *even at half load!*



The ClimaCom™ Extended Digital Controller.

The ClimaCom™ Extended Digital Controller is the ideal digital control solution for modular chiller applications. As a stand-alone controller, the ClimaCom™ provides a real-time clock, extendable I/O and software programming to target a variety of applications. Individual point monitoring and control is available through the front panel LED display.

The ClimaCom™ also connects to the system over the N2 Bus, integrating its point and control information with the entire controller network. Preconfigured examples are available for common applications to use as a foundation for customizing to your particular facility. If the pre-configured examples don't cover your requirements, you can configure a totally customized process. In addition, points unused in the control scheme can be used in non-critical supervisory or control applications by the Network.

Features

- Stand-alone control provides system reliability.
- Network communications over N2 Bus provides facility-wide control efficiencies and cost effective sensor sharing.
- Fully integrated modular packaging allows you to purchase only needed parts.
- Graphical configuration via GX-9100 software tool allows easy connection of Flow Chart Modules to obtain desired control sequence .
- Built-in local status display makes it convenient and easy to use.
- Password and Trend Log features.

Options

- Analog Inputs
Sensor/Transmitter ranging, High/Low limits, Filter constants and Square root.
- Control Blocks
PID loops, Remote reset logic, Operation modes, Control limits, alarms and Sequencer/step control logic.
- Digital Inputs
Source points for logic functions and pulse counters.
- Logic Blocks
AND-OR-NOT, State change detect, Set and reset of parameters.



ClimaCom™ 

- BACNET communication interface.
- Calculation Blocks
Averaging, minimum or maximum select, enthalpy, wet bulb and dew point, input selector, arithmetic calculator, compare logic, line segment function, timer functions, run-time counter, totalizer and integrator.
- Analog Outputs
High/Low ranging.
- Digital Outputs (DX Controller)
Incremental with or without feedback, Duration adjust type, ON/OFF logic, including pulse.
- Digital Outputs (XT Modules)
ON/OFF logic, including pulse.
- Time Schedule Blocks
Yearly holiday calendar, Start/Stop times for days of week and holidays, Optimal Start/Stop modules (2 modules available).
- LONWORKS Compatible
A LONWORKS Compatible ClimaCom™ controller version is available.

NOTE: A lower cost ClimaCool® Mini-Com™ controller is available for simple setpoint staging of up to 2 modules without communications or remote features.

ClimaCool Design Features

The ClimaCool® *FLEX* Series modular chiller is a **true** modular chiller system, designed to save equipment room space and provide "true operational redundancies". Modules fit through narrow openings, into elevators and into places where a unique solution is required. The unit can be taken into buildings and negotiate corners where conventional large chillers cannot go without additional demolition costs. *FLEX* offers "true operational modularity" which allows maintenance on any individual module without system shutdown. Scheduling for chiller shutdowns becomes a thing of the past.

The modules are simple to assemble and install and require a minimal amount of site work. They are extremely "user friendly" in installation, operation and maintenance respects. All models come with aesthetically pleasing enclosures for minimal noise transmission.

Modular Unit Design - *FLEX* Series

The *FLEX* Series modules are designed to be refrigerant-convertible. The system is to be comprised of individual chiller sections that are modular in design. Modules must be comprised of individual refrigerant circuits, compliant with ASHRAE 90.1 operating on either R-22 or R-407C. Each module is to be less than 34" in width to allow for maneuvering through narrow openings. Each module's length shall not exceed 43 5/8" to minimize the turn radius around corners and obstacles encountered while moving and placing the unit in the equipment room. Every module shall be capable of field coupling on site to meet the project capacity requirements.

Unit Construction

The unit frame design of each module utilizes a heavy gauge, painted cold roll steel frame for mounting compressors, individual condensers and evaporator circuits with front or rear service access. The frame is constructed using welded 6" carbon steel piping configured to give strength and stability to the hydronic section of the machine. Connection to the adjacent module is accomplished by using 285 PSI rated flanges on both water circuits, forming an extremely strong rigid header and minimizing stability problems during installation and operation. Refrigerant circuits are all pre-charged and factory run tested.

Module Isolation and Room Footprint Requirements

All service and maintenance isolation valves are contained within the module footprint dimensions (34" wide x 43 5/8" deep). Water isolation valves are recessed within the 6" header condenser and evaporator water piping dimensions front and rear to prevent valve damage and to minimize service clearances. All isolation valves are designed within the module footprint dimensions. Valves which extend beyond the main water header dimensions can result in an increase in the equipment room footprint or add to the service clearance dimensions. A motorized valve requires a 1 1/2" extension for variable primary flow.

Hydronic Design

The chilled water piping on each module is pre-insulated at the factory with 3/4" closed cell foam rubber. Insulation (3/4") on the chilled water header connection flanges is to be applied in the field by the installer, after the modules are bolted together on site. Each module is factory supplied with isolation valves on all water circuits to allow repair or maintenance without interrupting service of the entire system.

The ClimaCool® modular series chiller utilizes a water header system bolted in series to maintain constant and full flow to each of the exchangers while in operation. This design, combined with the full flow design of both heat exchangers allows for efficient operation at full and part load conditions. This provides optimal heat transfer at full and / or part load operating conditions. Service ports (2) 3/4" threaded ball valves are provided on the inlet and outlet of each plate heat exchanger, condenser and evaporator for maintenance back-flushing cleaning. Pete's ports are provided on all modules as standard.

Condenser – Water Cooled

The condenser for each module has a brazed plate heat exchanger (consisting of two refrigerant circuits with one waterside circuit); constructed with 316 stainless steel plates that are copper brazed, using total counter flow to increase module efficiency. Each module's condenser is designed in accordance with UL and/or ASME code for a 400 PSI refrigerant working pressure.

Evaporator

Each module has a brazed plate heat exchanger (consisting of two refrigerant circuits with one waterside circuit); constructed with 316 stainless steel plates that are copper brazed, and using a total counter flow to increase module efficiency. Each module's brazed plate heat exchanger has a single water circuit and is insulated with 3/4" closed cell foam rubber, having a "K" factor of 0.26 and UL and/or ASME coded for 400 PSI refrigerant working pressure.

Refrigerant Circuit - Refrigerant Flexible

The dual refrigerant circuits are designed to comply with ASHRAE 90.1 Efficiency Guidelines. Each circuit operates using HCFC R-22 as standard, and are readily convertible to HFC R-407C at any point during the lifetime of the product without any component changes. This requires no removal of existing refrigerant oil, only a refrigerant change on site.

Dual refrigerant circuits are pre-charged with R22 as standard, or with optional R407C, and factory run tested. If refrigerant R22 is specified, the chiller is designed to accept R407C at a later date in the field.

Each circuit consists of a factory tested scroll compressor, with high pressure switch, low pressure switch, pressure relief valve, discharge, suction, and liquid isolation valves, a liquid line drier, moisture indicator, externally equalized thermal valve (suitable for R22 and R407C), plus gauge port connections.

Compressors - Scroll

Each module contains two independent refrigerant circuits, each with its own compressor for redundancy. Each compressor is mounted with rubber isolation, compressor overload protection, high discharge pressure and low suction pressure cutouts.

Electrical

Each module is manufactured with its own individual electrical panel mounted to the unit frame and contained within the unit dimensions. Unit status indicators are mounted in full view on a right-hand hinged, swing out electrical power panel on the front of each module. All individual power panels are equipped with lockable door latch mechanisms. All modules are UL and CUL listed.

The power distribution system for each module contains:

- Main power distribution terminal
- Compressor motor contractors
- Motor overload protection per compressor
- Individual compressor motor fusing or breakers

Each individual module is equipped with a local manual "ON" / "OFF" compressor switch to allow service or repair to individual modules without interrupting service of the entire chiller. The use of individual power supply to each module allows the unit to produce chilled water while any one module is shut down.

Controls

Each chiller system can be equipped with a programmable ClimaCom™ microprocessor-based controller. The controller is programmed to duty-cycle the compressors based on equal run time, and staged accordingly based on leaving chilled water temperature. The controller is capable of communicating and becoming part of any facility management system with optional programming. The controller is capable of remote monitoring via an additional modem connection.

Control functions:

- Control of leaving chilled water temperature
- Compressor sequencing
- Compressor anti-short cycle
- Low temperature freeze protection
- High pressure control switch
- Low pressure control switch
- Alarms for high/low water temperature

NOTE: A lower cost ClimaCool® Mini-Com™ controller is available for simple setpoint, step-controlled staging of up to 2 modules without communications or remote features.

Run Tested

Each chiller module is given a complete operating charge of refrigerant. Modules are documented and run tested under load conditions.

Flange Blank Off Plates

Blank off plates are provided with nuts, bolts, gaskets and washers. Four are required per "bank" of modules. These are field installed on the last module and rated for 285 PSI operating pressure. Blank off plates are included and shipped with all modules.

ClimaCool Accessories and Optional Features

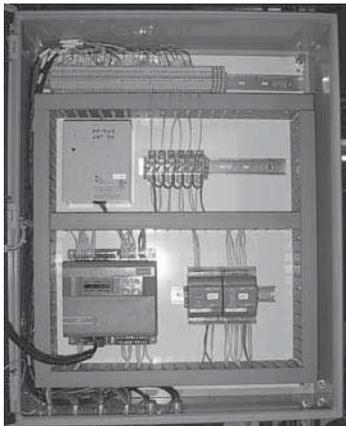
ClimaCom™ Controller

The ClimaCom™ Extended Digital Controller is a fully integrated modular chiller controller optimized for modular efficiency management and system reliability. ClimaCom™ is a required accessory. A lower cost Mini-Com™ controller is available for control of two or less modules - see Mini-Com™ controller option.



ClimaCom™ Control Panel Enclosure (NEMA 4)

Factory-assembled and field-installed, a ClimaCom™ control panel includes ClimaCom™ controller and extension/expansion modules as required. The unit requires 115V power supply and consists of a 115-24V stepdown transformer, circuit breaker, terminal strips, isolation relays and 115V service receptacle. The control panel is wall mounted in the equipment room. The LCD display is to be door mounted and ships separately.



ClimaCom™ LCD Display

This modern, easy-to-read display is designed for the operator or maintenance person who needs a convenient way to monitor and adjust chiller controller setpoints.



ClimaCom™ Control System - Specialized Programming

Specialized factory programming of your ClimaCom™ Control System is also available. Consult your local authorized ClimaCool® representative.

Mini-Com™ Controller Option

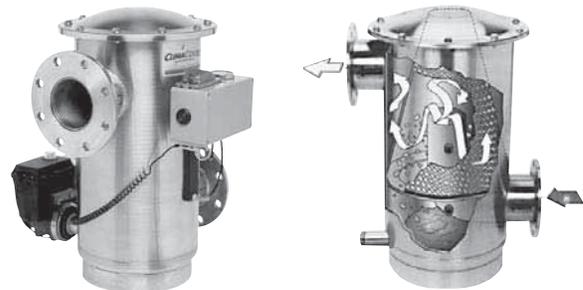
A lower cost ClimaCool® Mini-Com™ controller is available for simple setpoint staging of up to 2 modules without communications or remote features.

Compressor Extended Warranty

A 1-year compressor warranty (parts only) is standard. An additional 4-year compressor (parts only) warranty is optional.

ClimaCool® Strainer Package (CS Series)

The ClimaCool® CS Series Strainer Package is a high quality, filtration system that will reduce operating costs and prevent nuisance condenser problems. The field-installed strainer can be equipped with an optional automatic flush and alarm package.



ClimaCool® "Y" & Basket Strainers

Y-styled and Basket Strainers are also available from ClimaCool®. The ClimaCool® modular chiller selection program provides chiller selections and PSI drop data for both Y-styled, basket strainers and ClimaCool's CS Series stainless steel strainers (refer to Selection CD).

NOTE: A minimum 60 mesh strainer is required to protect both the condenser and evaporator hydronic circuits on all ClimaCool modular chiller systems.

ClimaCool® Warranty Information

Detailed warranty information is available on this equipment. Consult your authorized ClimaCool® representative, visit www.climacoolcorp.com, or see page 36 for a copy of the warranty certificate.

Field-Installed (by others)

Mounting Rails - Required

Minimum 4" steel rails (tubular or I-beam) are required for ease of installation (by others). Refer to Mounting Rail reference drawings on page 23 in this manual.

Vibration Isolators (Spring or Pads)

Due to the low vibration of the modules, ClimaCool® does not require the application of spring isolators or pads. However, should further isolation be desired, it can be achieved by installing vibration isolators. Refer to Vibration and Isolation configuration drawings on page 23 in this manual.

Differential Pressure Flow Switch - Required

A required safety device which prevents operation of chiller without sufficient water flow to evaporator and/or condenser. The flow switch or differential pressure switch is field installed prior to start-up of the chiller.

Supervision and Training

ClimaCool provides factory supervision and training as an extra cost option per installation of one or multiple chiller modules. This training is to provide general information about the installation and operating characteristics to the start-up contractor. Cost for the start-up service contractor is not ClimaCool's responsibility. Supervision and training for new service contractors is also available, contact ClimaCool for a quotation.

ClimaCool's supervision and training is not intended to take the place of the installation and start-up contractor. The start-up contractor is responsible for complete mechanical and electrical installation and adherence to all local and federal codes or regulations. Consult an authorized ClimaCool representative for a list of authorized start-up service contractors in your area.

ClimaCool Application Parameters

General Unit Application

The ClimaCool® *FLEX* Series modular chiller is *truly* a modular chiller system in operation, designed for ease of indoor installations. Less than 34 inches in width, each unit can negotiate standard size openings, narrow hallways and corners where conventional large tonnage chillers cannot. Modules are simple to install and assemble and can be field-coupled on site to meet large tonnage requirements. The modules are extremely user “friendly” and simple to operate and maintain. *FLEX* offers “true operational modularity” which allows maintenance on any individual module without system shutdown. Scheduling for chiller shutdowns becomes a thing of the past.

Unit Rigging

Each module has rigging points identified on page 21 of this manual. Depending on the length of the slings, a spreader bar may be required. The lifting arrangement should be checked to ensure that the slings are clear of all components and pipe work (For more information, see page 21 - Rigging and Lifting Procedures.) **Note: Due to component configuration, units ARE TOP HEAVY. Handle with extreme care.**

Foundation for Unit Placement

The minimum foundation requirement for the ClimaCool® chiller is a level surface which has been checked to ensure that it is capable of bearing the combined weight of the modules. Although the compressors are installed on anti-vibration mountings, further isolation of the chiller from the structure can be achieved by installing vibration-eliminating pads (refer to page 23 - Vibration and Isolation Options.) The use of 4-6” base rails is recommended for ease of installation.

Space and Location Requirements

ClimaCool® modules are virtually vibration-free and may generally be installed anywhere in the building. The path by which the modules are to be moved should be checked for obstructions. The space required for service access is the minimum amount of physical space required to access the serviceable parts (refer to drawing on page 22 - Service Clearance.) The suitability of this space to provide for safe working access must be assessed with a full knowledge of the plant room layout.

Units should be located with convenient access to a drain as there will be times when it is necessary to drain the units.

Clearances

Minimum distances are listed in the Service Clearance section on page 22 of this manual.

Electrical Connections

The power for all individual modules should be provided from a suitably protected supply. The electrical service can enter the individual units from either the top left or bottom left of the chiller and enter the unit’s control enclosure from its left side.

After the power wiring has been run, the control wires can enter the top right of the control panel to be connected. The wires should be carefully marked and installed in the terminals shown on the wiring diagram. Sensor wiring should not be run in the same conduit with the power wiring and should be laid out to prevent noise interference from other electrical loads. Proper grounding of the unit is mandatory.

A separate 115 volt power supply is required to power the ClimaCom control panel. Refer to the Power Distribution section on page 29 of this manual.

Control Circuit Power

The ClimaCom™ master control panel (remote-mounted) requires a 115 volt power supply and contains a 24V step down transformer with internal circuit breaker protection and a 115 volt outlet (for start-up and maintenance, laptop PC power supply only). Each module contains its own step down transformer and circuit breakers for internal 24V control circuit power.

Freeze Protection

ClimaCool® modular chillers are equipped with an anti-freeze protection thermostat on each module. Ethylene or Propylene Glycol can be added for additional protection. Do not use automotive grade anti-freeze solutions.

Water Flow Rates

It is imperative that minimum and maximum water flow rates are not exceeded. Minimum and maximum water flow rates are defined in the Physical Data tables of this manual. A flow switch or differential pressure switch is required to confirm flow in the chilled water and condenser circuits.

Chilled Water Temperature Limits

ClimaCool® *FLEX* Series modules are designed for a leaving water temperature range from 40°F to 55°F. All cataloged modules can operate safely in this range without the need of special controls or glycol additives. Leaving water temperatures below 40°F can result in evaporator suction temperatures below the freezing point of water. Therefore, we require a glycol solution additive that will protect the evaporator from freeze ups at lower operating suction temperatures. The full range of leaving chiller fluid using glycol is 20°F to 55°F on the Flex Series.

Condenser Water Temperature

The condensers are designed to operate most efficiently at lower entering water temperatures for lower power consumption. Operating lower than a recommended 60°F will negate efficiency and adversely affect system performance. The full range of entering condenser water is 60°F to 105°F.

Water Quality Parameters

Proper water treatment is a specialized industry. We recommend consulting an expert in this field to analyze the water for compliance with the water quality parameters listed in Table 1 below. The material used in the ClimaCool® chiller exposed to the water are type 316 stainless steel, pure copper, and carbon steel. Other materials may exist external to the ClimaCool® chiller. It is the users responsibility to ensure these materials are compatible with the treated water. Failure to provide proper water quality will void the ClimaCool® module's warranty.

It is further recommended to seek an experts advice to specify the appropriate water treatment required. Typical additives to hydronic systems include rust inhibitors, scaling preventative, antimicrobial growth agents, and algae preventatives. Anti-freeze solutions may also be required to lower the freezing point, based on the application.

Heavily-Contaminated Water

In such instances whereby the particulates in the water are excessive it is recommended to install an intermediate plate & frame heat exchanger to isolate the ClimaCool® chiller from the building water system.

Table 1 - Water Quality Parameters

WATER CONTAINING	CONCENTRATION
Sulphate	Less Than 200 ppm
pH	7.0 – 9.0
Chlorides	Less Than 200 ppm
Nitrate	Less Than 100 ppm
Iron	Less Than 4.5 mg/l
Ammonia	Less Than 2.0 mg/l
Manganese	Less Than 0.1 mg/l
Dissolved Solids	Less Than 1000 mg/l
CaCO3 Hardness	30 – 500 ppm
CaCO3 Alkalinity	30 – 500 ppm

Water Piping Practices

As with any water system, it is important that the system be clean. If care is taken during installation, the possibility of dirt related problems are avoided in future operation of the chiller. The pipe work installer must remove weld scale, rust and contamination during pipe work fabrication.

There are certain necessary components that should always be installed in both the chilled water and condenser water systems (see Water Piping Configurations on page 24 in this manual.) Isolation valves are required in the position shown to isolate the chiller for maintenance and also to allow isolation of the strainers for cleaning. It is also desirable and a good practice to have valves isolating the pumps.

Refer to the ClimaCool® modular chiller water piping configurations (Figs. 1 and 2 on page 24) for piping configurations on multiple modules. Before final piping connections are made to the chiller, all external water piping must be thoroughly flushed. Sufficient insulation should be installed and sealed to prevent condensation and reduce heat gain. Chilled water volume can be accommodated with the use of expansion tanks.

ClimaCool® Strainer

ClimaCool® requires quality strainers with a minimum of 60 mesh strainer screen to protect the chilled and condenser water sides of the system. The ClimaCool® Strainer Package (listed on page 8, Optional Features) meets all requirements and offers the convenience of an optional automatic flush timer and a high pressure alarm. "Y" and Basket Strainers are also available (listed on page 9, Optional Features). Installation of a strainer will:

- Increase efficiency
- Reduce abrasion and wear
- Ensure longer equipment life
- Provide greater return on your investment
- Filtration enhances the action of your water treatment program

For more information on the ClimaCool® strainer, consult your local authorized ClimaCool® representative.

ClimaCool Selection Procedures

The following information must be known in order to properly select a ClimaCool® modular chiller:

- System capacity
- Entering chilled water temperature
- Chilled water flow rate
- Leaving condenser temperature

If any three of the first four parameters are supplied, the missing parameter may be found by the following formula.

Sample Selection

GIVEN: Select a water cooled chiller to cool 691 GPM of water entering at 54°F and leaving at 44°F when supplied with 832 GPM of condenser water entering at 85°F and leaving at 95°F leaving.

Solution:

1. Chilled water range (CWTD) = 54°F to 44°F = 10°F
2. Condenser water range = 85°F to 95°F = 10°F
3. Capacity (tons) = (GPM x Chilled Water Range/24) = 691 x 10/24 = 288 tons.
4. Select the closest "project tons" value from the ClimaCool® *Quik Select* tables on page 16 and 17 which meets or exceeds the load of 288 tons. In this case, the closest match is a Project Tons of "290", delivering an actual capacity of 293 tons. This selection comprises a total of (4) 65-ton modules *PLUS* (1) 30-ton module.
5. Evaporator water pressure drop and condenser water pressure drop can be found on separate charts on page 13 of this manual. If not provided, flow rates can be determined from the following formulas:

$$\text{Chilled Water GPM} = \frac{(\text{Tons}) \times 24}{\text{Chilled Water delta T (°F)}}$$

$$\text{Condenser Water GPM} = \frac{(\text{Tons} + (0.285 \times \text{Compressor kW})) \times 24}{\text{Condenser Water delta T (°F)}}$$

Once the GPM is determined, it can be divided by the number of modules (weighted according to tonnage) to establish GPM per module.

NOTE: *Quik Select* Tables (page 16 and 17) are based on a maximum allowable water flow rate of 1000 GPM through each of the 6" main, water headers serving chiller and condenser sections. This results in a maximum of five FLEX 65 modules at the customary 10°F Chilled Water Range, and 10°F Condenser Water Range. Additional banks of modules can be selected for larger tonnage requirements. Also, the maximum number of modules which can be controlled by a single ClimaCom controller is seven. Additional controllers can be selected for projects requiring more than seven modules.

CHILLER PERFORMANCE WITH GLYCOLS

When analyzing performance data of chillers employing glycol and water solutions, first derive the chiller performance data (CAPACITY, KW, GPM & PRESSURE DROP) assuming pure

water flow through the chiller. Then you can apply adjustment factors to the performance data from the pure water case. These factors are found in Fig. AM-1 through Fig. AM-4 on page 14, and depend upon the type and percent of glycol used in the chiller circuit. Fig. AM-1 and Fig. AM-2 provide factors for propylene glycol. Fig. AM-3 and Fig. AM-4 are for ethylene glycol. The factors in all Fig's AM-1 through Fig. AM-4 are based on 10°F drop in fluid temperature through the chillers and 85°F entering condenser water (ECDW), and at 10°F rise through the condenser (CDTD). Fig. AM-5 is provided for solution freeze temps. of glycol concentrations. Fig. AM-6 provides adjustment factors for chiller temp. drops other than 10°F, all assuming a fouling factor of 0.0001 in the chiller.

Propylene Glycol Selection Example

(Select a FLEX 65 Module)

Determine CAPACITY, KW, GPM and Pressure Drop for a single

FLEX 65 module, given the following Inputs:

CWTD = 10°F

LCWT = 42°F

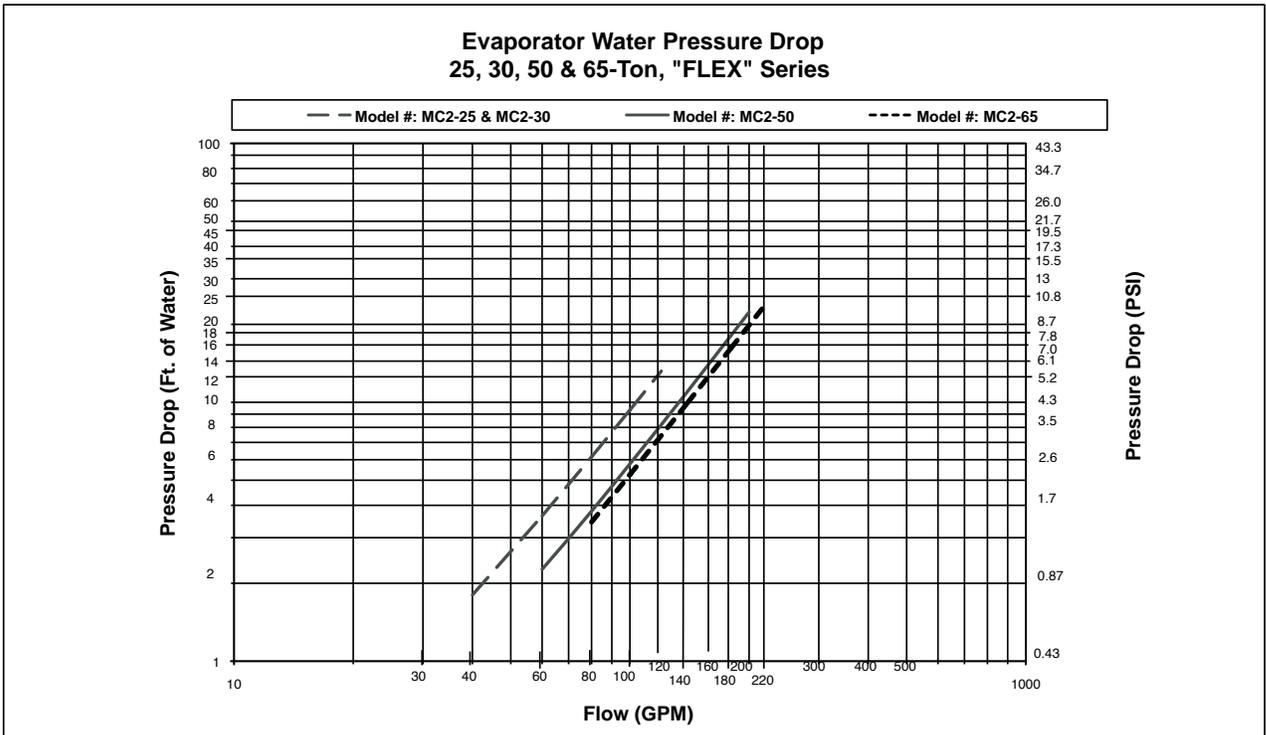
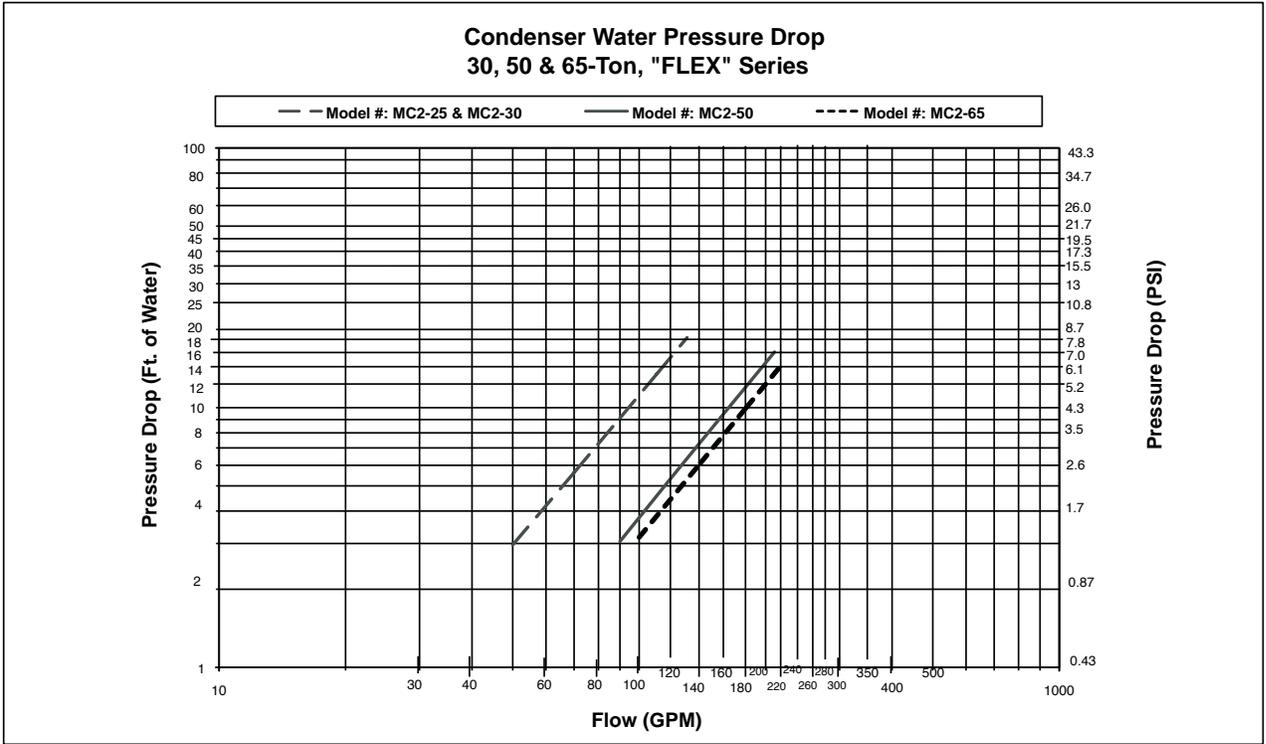
ECDW = 85°F

CDTD = 10°F.

30% Propylene Glycol/ 70% Water in Chiller

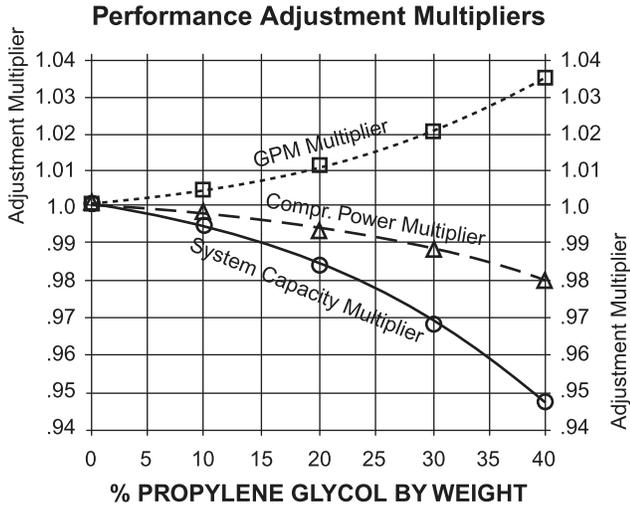
1. Assume a 10°F rise in the condenser, thus 95°F leaving condenser water.
2. From the Performance Data Table on page 18:
CAPACITY: 63 TONS; KW: 46.6
3. First find the chiller water flow and pressure drop for pure water as in the previous example.
GPM = (24)(63)/10 = 151.2 GPM
From page 13, bottom graph - right most curve, read pressure drop from mid. Curve as:
Pressure drop = 7.0 ft. of water
4. To convert performance data for pure water to data using 30% Propylene Glycol, record the adjustment multipliers from Fig. AM-1 & Fig. AM-2 on page 14:
CAPACITY factor: 0.97
KW factor: 0.988
GPM factor: 1.022
Pressure Drop factor: 1.20
5. Calculate chiller performance using 30% Propylene Glycol by multiplying the chiller performance data for pure water by the adjustment factors as follows:
CAPACITY: 63 x 0.97 = 61.1 TONS
KW: 46.6 x 0.988 = 46.04 KW
GPM: 151.2 x 1.022 = 154.5 GPM
Pressure Drop: 7.0 x 1.20 = 8.4 ft. of water

ClimaCool Pressure Drops



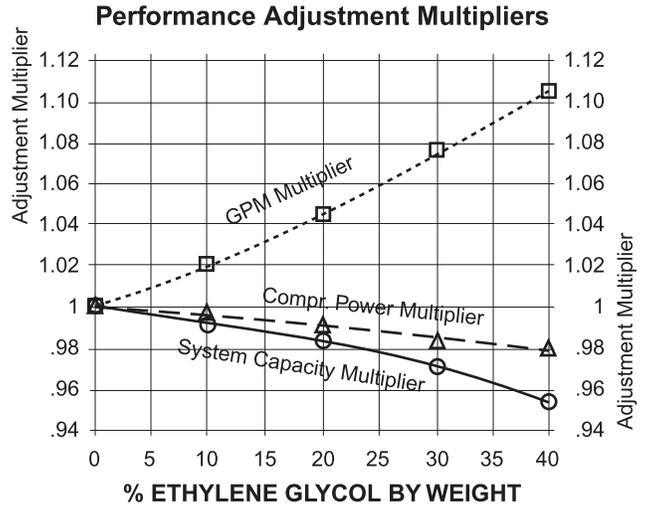
ClimaCool Glycol Performance Adjustment Factors

Fig. AM-1



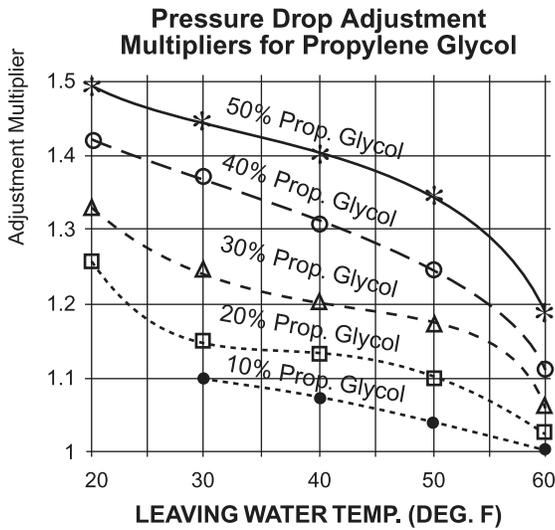
NOTE: Correction factors shown above are to be applied to Std. Product Data @ARI 550/590-1998; 44° F Leaving Chilled Water / 85° F Entering / 95° F Leaving Conditioned Water.

Fig. AM-3



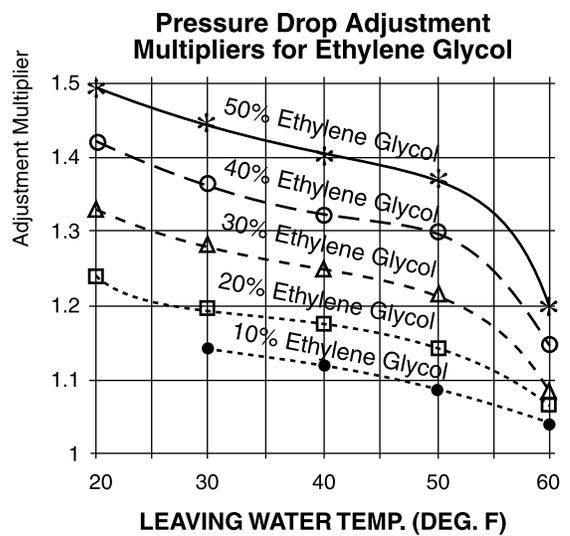
NOTE: Correction factors shown above are to be applied to Std. Product Data @ARI 550/590-1998; 44° F Leaving Chilled Water / 85° F Entering / 95° F Leaving Conditioned Water.

Fig. AM-2



NOTE: Correction factors shown above are to be applied to Std. Product Data chiller pressure drop curves for straight water.

Fig. AM-4



NOTE: Correction factors shown above are to be applied to Std. Product Data chiller pressure drop curves for straight water.

ClimaCool Glycol Performance Adjustment Factors

Fig. AM-5

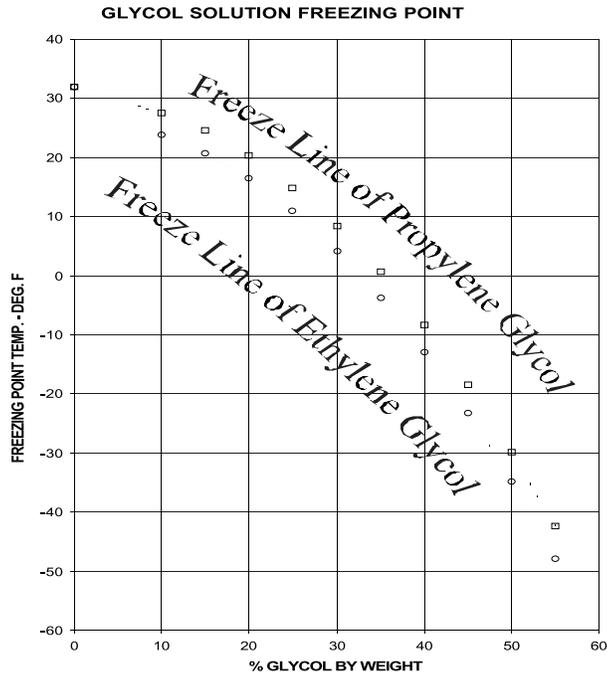
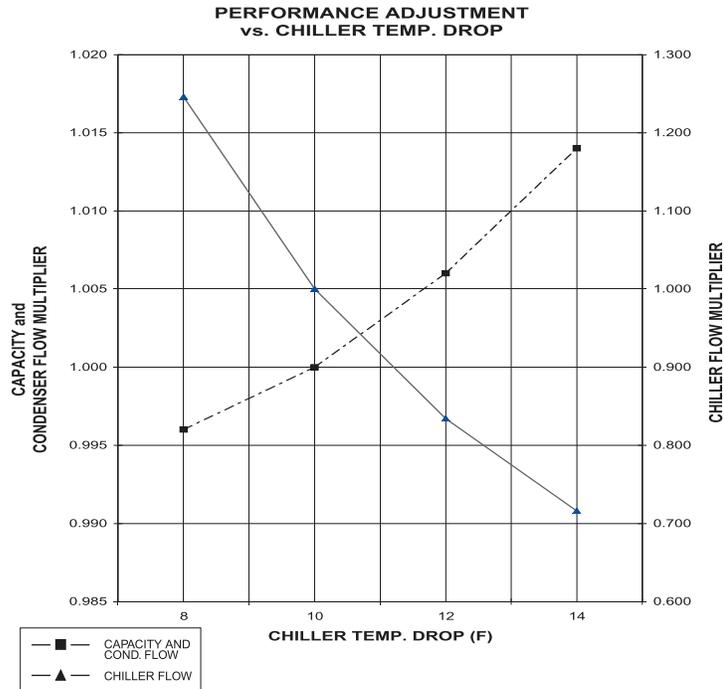


Fig. AM-6



ClimaCool Quik Select Table

Models 30, 50 & 65 - FLEX Series 208/230 Volt & 460 Volt

Project Tons	ClimaCool Modules			Total Modules Combined Performance Full Load Data@ 100% Operation					"IPLV" Part Load Efficiency			Electrical Data@ 460V-3ph-60hz				Electrical Data@ 208-230V-3ph-60hz				Combined Module Width ¹⁰	Total Oper. Weight Lbs.
	FLEX Models			Unit Tons	Unit kW	Unit Efficiency@Full Load			IPLV kW/ton	IPLV EER	IPLV COP	RLA ⁵	MCA ⁶	MOP ⁷	Discon. Switch Size ⁹	RLA ⁵	MCA ⁶	MOP ⁷	Discon. Switch Size ⁹	Width ¹⁰	Weight
	30	50	65			kW/ton	EER	COP													
	1	0	0	32.1	23.0	0.72	16.7	4.90	0.60	20.2	5.91	41.6	46.8	60	70	92	103.5	125	150	2'-5.5"	1825
40	0	1	0	51.4	36.9	0.72	16.7	4.90	0.60	19.9	5.82	64.4	72.4	100	100	142.3	160.1	225	225	2'-9.5"	2163
50	0	1	0	51.4	36.9	0.72	16.7	4.90	0.60	19.9	5.82	64.4	72.4	100	100	142.3	160.1	225	225	2'-9.5"	2163
60	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.95	82.8	93.2	125	125	183.1	206	250	300	2'-9.5"	2280
65	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.95	82.8	93.2	125	125	183.1	206	250	300	2'-9.5"	2280
70	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.96	82.8	93.2	125	125	183.1	206	250	300	2'-9.5"	2280
80	1	1	0	83	60	0.72	16.7	4.90	0.59	20.4	5.96	106	114	125	175	234	252	300	400	5'-3"	3988
90	1	0	1	97	70	0.72	16.7	4.90	0.59	20.4	5.99	124	135	175	200	275	298	350	450	5'-3"	4105
100	1	0	1	97	70	0.72	16.7	4.90	0.59	20.4	5.99	124	135	175	200	275	298	350	450	5'-3"	4105
110	0	1	1	117	84	0.72	16.7	4.90	0.59	20.5	6.01	147	158	175	225	325	348	400	500	5'-7"	4443
120	0	1	1	117	84	0.72	16.7	4.90	0.59	20.5	6.01	147	158	175	225	325	348	400	500	5'-7"	4443
130	0	0	2	131	94	0.72	16.7	4.90	0.58	20.7	6.08	166	176	200	250	366	389	450	600	5'-7"	4560
140	1	1	1	149	107	0.72	16.7	4.90	0.58	20.8	6.10	189	199	225	300	417	440	500	700	8'-0.5"	6268
150	1	1	1	149	107	0.72	16.7	4.90	0.58	20.8	6.10	189	199	225	300	417	440	500	700	8'-0.5"	6268
160	1	0	2	163	117	0.72	16.7	4.90	0.58	20.9	6.12	207	218	250	350	458	481	500	700	8'-0.5"	6385
170	0	2	1	168	121	0.72	16.7	4.90	0.58	20.8	6.11	212	222	250	350	468	491	500	700	8'-4.5"	6606
180	0	1	2	182	131	0.72	16.7	4.90	0.57	20.9	6.13	230	240	250	350	509	532	600	800	8'-4.5"	6723
190	0	0	3	196	140	0.72	16.7	4.90	0.57	21.0	6.16	248	259	300	400	549	572	600	1000	8'-4.5"	6840
200	0	0	3	196	140	0.72	16.7	4.90	0.57	21.0	6.16	248	259	300	400	549	572	600	1000	8'-4.5"	6840
210	1	1	2	214	154	0.72	16.7	4.90	0.57	21.1	6.17	272	282	300	450	601	623	700	1000	10'-10"	8548
220	1	0	3	228	163	0.72	16.7	4.90	0.57	21.1	6.20	290	300	350	450	641	664	700	1000	10'-10"	8665
230	1	0	3	228	163	0.72	16.7	4.90	0.57	21.1	6.20	290	300	350	450	641	664	700	1000	10'-10"	8665
240	0	1	3	247	177	0.72	16.7	4.90	0.57	21.0	6.17	313	323	350	500	692	715	800	1200	11'-2"	9003
250	0	1	3	247	177	0.72	16.7	4.90	0.57	21.0	6.17	313	323	350	500	692	715	800	1200	11'-2"	9003
260	0	0	4	261	187	0.72	16.7	4.90	0.57	21.1	6.19	331	342	350	500	733	755	800	1200	11'-2"	9120
270	1	2	2	265	190	0.72	16.7	4.90	0.57	21.0	6.14	336	346	350	600	743	766	800	1200	13'-7.5"	10711
280	1	1	3	279	200	0.72	16.7	4.90	0.57	21.2	6.20	354	365	400	600	784	807	1000	1200	13'-7.5"	10828
290	1	0	4	293	210	0.72	16.7	4.90	0.57	21.2	6.22	373	383	400	600	N/A	N/A	N/A	N/A	13'-7.5"	10945
300	0	2	3	299	214	0.72	16.7	4.90	0.57	21.1	6.18	377	388	400	600	N/A	N/A	N/A	N/A	13'-11.5"	11166
310	0	1	4	312	224	0.72	16.7	4.90	0.57	21.2	6.20	396	406	450	600	N/A	N/A	N/A	N/A	13'-11.5"	11283
320	0	0	5	326	234	0.72	16.7	4.90	0.57	21.2	6.22	414	424	450	700	N/A	N/A	N/A	N/A	13'-11.5"	11400
330	0	0	5	326	234	0.72	16.7	4.90	0.57	21.2	6.22	414	424	450	700	N/A	N/A	N/A	N/A	13'-11.5"	11400

NOTES:

- Unit tonnage rating conditions: 44°F leaving chilled water temperature, 85°F entering condenser water temperature, flow rates are 3 GPM per ton through the condenser with a fouling factor of .00025 and 2.4 GPM per ton through the evaporator with a .0001 fouling factor.
- Quick Select Table is based on a maximum of five modules. Multiple banks can be selected for additional project capacity.
- Ratings are based on R-22 with a 10°F drop in the evaporator and a 10°F rise in the condenser.
- "IPLV" integrated part load value is based on ARI Standard 550/590-1998.
- RLA. Rated Load Amps are calculated as per UL1995.
- MCA. Minimum Circuit Ampacity: 125% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent motors and/or electrical loads.
- MOP. Maximum Overcurrent Protection or Max.Fuse Sizing: Rounded down from 225% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent electrical loads.
- Disconnect Switch Sizing: Rounded down from 150% of the sum of 100% of the RLA (or FLA) of all concurrent motor loads plus any other concurrent electrical loads.
- MOP Fusing Device and Disconnect Switch Device supplied by others. These are recommended values for electrical power protection of combined modules selected.
- Combined module width does not include flange connection gaskets (1/8"), nor blank off plate flanges (1 1/2") each.

Models 30, 50 & 65 - FLEX Series 575 Volt

Project Tons	ClimaCool Modules			Total Modules Combined Performance Full Load Data@ 100% Operation					"IPLV" Part Load Efficiency			Electrical Data@ 575V-3ph-60hz				Combined Module Width ¹⁰	Total Oper. Weight Lbs.
	FLEX Models			Unit Tons	Unit kW	Unit Efficiency@Full Load			IPLV kW/ton	IPLV EER	IPLV COP	RLA ⁵	MCA ⁶	MOP ⁷	Discon. Switch Size ⁸		
	30	50	65			kW/ton	EER	COP									
30	1	0	0	32.1	23.0	0.72	16.7	4.90	0.60	20.2	5.91	33.3	37.4	50	50	2'-5.5"	1825
40	0	1	0	51.4	36.9	0.72	16.7	4.90	0.60	19.9	5.82	51.5	57.9	80	80	2'-9.5"	2163
50	0	1	0	51.4	36.9	0.72	16.7	4.90	0.60	19.9	5.82	51.5	57.9	80	80	2'-9.5"	2163
60	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.95	66.2	74.5	100	100	2'-9.5"	2280
65	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.95	66.2	74.5	100	100	2'-9.5"	2280
70	0	0	1	65.3	46.8	0.72	16.7	4.90	0.59	20.3	5.96	66.2	74.5	100	100	2'-9.5"	2280
80	1	1	0	83	60	0.72	16.7	4.90	0.59	20.4	5.96	85	91	110	150	5'-3"	3988
90	1	0	1	97	70	0.72	16.7	4.90	0.59	20.4	5.99	100	108	125	150	5'-3"	4105
100	1	0	1	97	70	0.72	16.7	4.90	0.59	20.4	5.99	100	108	125	150	5'-3"	4105
110	0	1	1	117	84	0.72	16.7	4.90	0.59	20.5	6.01	118	126	150	200	5'-7"	4443
120	0	1	1	117	84	0.72	16.7	4.90	0.59	20.5	6.01	118	126	150	200	5'-7"	4443
130	0	0	2	131	94	0.72	16.7	4.90	0.58	20.7	6.08	132	141	150	200	5'-7"	4560
140	1	1	1	149	107	0.72	16.7	4.90	0.58	20.8	6.10	151	159	175	250	8'-0.5"	6268
150	1	1	1	149	107	0.72	16.7	4.90	0.58	20.8	6.10	151	159	175	250	8'-0.5"	6268
160	1	0	2	163	117	0.72	16.7	4.90	0.58	20.9	6.12	166	174	200	250	8'-0.5"	6385
170	0	2	1	168	121	0.72	16.7	4.90	0.58	20.8	6.11	169	178	200	300	8'-4.5"	6606
180	0	1	2	182	131	0.72	16.7	4.90	0.57	20.9	6.13	184	192	225	300	8'-4.5"	6723
190	0	0	3	196	140	0.72	16.7	4.90	0.57	21.0	6.16	199	207	225	300	8'-4.5"	6840
200	0	0	3	196	140	0.72	16.7	4.90	0.57	21.0	6.16	199	207	225	300	8'-4.5"	6840
210	1	1	2	214	154	0.72	16.7	4.90	0.57	21.1	6.17	217	226	250	350	10'-10"	8548
220	1	0	3	228	163	0.72	16.7	4.90	0.57	21.1	6.20	232	240	250	350	10'-10"	8665
230	1	0	3	228	163	0.72	16.7	4.90	0.57	21.1	6.20	232	240	250	350	10'-10"	8665
240	0	1	3	247	177	0.72	16.7	4.90	0.57	21.0	6.17	250	259	300	400	11'-2"	9003
250	0	1	3	247	177	0.72	16.7	4.90	0.57	21.0	6.17	250	259	300	400	11'-2"	9003
260	0	0	4	261	187	0.72	16.7	4.90	0.57	21.1	6.19	265	273	300	400	11'-2"	9120
270	1	2	2	265	190	0.72	16.7	4.90	0.57	21.0	6.14	269	277	300	450	13'-7.5"	10711
280	1	1	3	279	200	0.72	16.7	4.90	0.57	21.2	6.20	284	292	300	450	13'-7.5"	10828
290	1	0	4	293	210	0.72	16.7	4.90	0.57	21.2	6.22	298	307	350	450	13'-7.5"	10945
300	0	2	3	299	214	0.72	16.7	4.90	0.57	21.1	6.18	302	310	350	500	13'-11.5"	11166
310	0	1	4	312	224	0.72	16.7	4.90	0.57	21.2	6.20	316	325	350	500	13'-11.5"	11283
320	0	0	5	326	234	0.72	16.7	4.90	0.57	21.2	6.22	331	340	350	500	13'-11.5"	11400
330	0	0	5	326	234	0.72	16.7	4.90	0.57	21.2	6.22	331	340	350	500	13'-11.5"	11400

NOTES:

- Unit tonnage rating conditions: 44°F leaving chilled water temperature, 85°F entering condenser water temperature, flow rates are 3 GPM per ton through the condenser with a fouling factor of .00025 and 2.4 GPM per ton through the evaporator with a .0001 fouling factor.
- Quick Select Table is based on a maximum of seven modules. Multiple banks can be selected for additional project capacity.
- Ratings are based on R-22 with a 10°F drop in the evaporator and a 10°F rise in the condenser.
- "IPLV" integrated part load value is based on ARI Standard 550/590-1998.
- RLA. Rated Load Amps are calculated as per UL1995.
- MCA. Minimum Circuit Ampacity: 125% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent motors and/or electrical loads.
- MOP. Maximum Overcurrent Protection or Max.Fuse Sizing: Rounded down from 225% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent electrical loads.
- Disconnect Switch Sizing: Rounded down from 150% of the sum of 100% of the RLA (or FLA) of all concurrent motor loads plus any other concurrent electrical loads.
- MOP Fusing Device and Disconnect Switch Device supplied by others. These are recommended values for electrical power protection of combined modules selected.
- Combined module width does not include flange connection gaskets (1/8"), nor blank off plate flanges (1 1/2") each.

ClimaCool Performance Data - 60 HZ

MODEL FLEX	LCWT °F	ENTERING CONDENSER WATER TEMPERATURE														
		65°F			75°F			85°F			95°F			105°F		
		TONS	kWi	EER	TONS	kWi	EER	TONS	kWi	EER	TONS	kWi	EER	TONS	kWi	EER
30	40	33.4	18.4	21.8	32.0	20.4	18.8	30.1	22.8	15.9	28.2	25.4	13.3	25.8	29.1	10.7
	42	34.4	18.5	22.3	33.0	20.5	19.3	31.1	22.9	16.3	29.2	25.5	13.7	26.8	29.2	11.0
	44	35.4	18.7	22.8	34.0	20.6	19.8	32.1	22.9	16.8	30.2	25.6	14.2	27.8	29.2	11.4
	46	36.4	18.8	23.3	35.0	20.7	20.3	33.1	23.0	17.3	31.1	25.6	14.6	28.8	29.3	11.8
	48	37.4	18.9	23.7	36.0	20.8	20.8	34.1	23.1	17.7	32.1	25.7	15.0	29.7	29.3	12.2
	50	38.5	19.0	24.2	37.0	20.9	21.3	35.1	23.1	18.2	33.1	25.8	15.4	30.7	29.4	12.6
50	40	53.4	30.8	20.8	50.8	33.2	18.4	48.0	36.2	15.9	45.4	39.9	13.7	42.1	44.9	11.2
	42	55.2	31.3	21.2	52.6	33.6	18.8	49.7	36.5	16.3	47.0	40.1	14.1	43.6	45.1	11.6
	44	56.9	31.7	21.5	54.3	34.0	19.2	51.4	36.8	16.7	48.6	40.4	14.5	45.2	45.3	12.0
	46	58.6	32.2	21.9	56.0	34.3	19.6	53.2	37.1	17.2	50.3	40.6	14.8	46.8	45.5	12.3
	48	60.4	32.6	22.2	57.8	34.7	20.0	54.9	37.5	17.6	51.9	40.9	15.2	48.3	45.7	12.7
	50	62.1	33.0	22.6	59.5	35.1	20.4	56.7	37.8	18.0	53.5	41.1	15.6	49.9	45.8	13.1
65	40	67.7	38.3	21.3	64.4	42.1	18.4	60.8	46.3	15.8	57.5	51.0	13.6	53.3	57.6	11.2
	42	69.9	38.5	21.9	66.6	42.4	18.9	63.0	46.6	16.3	59.6	51.3	14.0	55.3	57.8	11.5
	44	72.1	38.7	22.4	68.8	42.6	19.4	65.2	46.9	16.7	61.6	51.6	14.4	57.3	58.0	11.9
	46	74.3	38.9	23.0	71.0	42.9	19.8	67.4	47.1	17.2	63.7	51.9	14.8	59.3	58.3	12.2
	48	76.5	39.1	23.5	73.2	43.2	20.3	69.6	47.4	17.6	65.8	52.2	15.2	61.3	58.5	12.6
	50	78.7	39.2	24.1	75.4	43.4	20.8	71.8	47.7	18.1	67.9	52.4	15.5	63.2	58.7	13.0

NOTES:

1. Ratings are based on R-22 with a 10°F drop in the evaporator and a 10°F rise in the condenser.
2. kWi input is for compressors plus control circuit.
3. EER = Energy Efficiency ratio (Btu/watt-hour). Power inputs include compressors and control power.
4. Interpolation between points is permissible. Extrapolation is not permitted.
5. Consult a ClimaCool® representative for performance at temperatures outside of ranges shown.
6. LCWT. Leaving Chilled Water Temperature in degrees F.

Module and Compressors

Model FLEX		30	50	65
Capacity (Tons) ¹		32.1	51.4	65.2
Module Type		FLEX	FLEX	FLEX
Refrigerant Circuits (Quantity)		2	2	2
Compressor Type		Scroll	Scroll	Scroll
Compressor Quantity		2	2	2
Compressor Nominal Hp (Per Circuit)		15	25	32
Minimum Unloading ² (Tons / % Per Module)		15 / 50%	25 / 50%	32 / 50%
Refrigerant Charge (Per Circuit) R-22 (Lbs.)		17	24	29.5
Oil Charge (Per Circuit) (Oz.)		140	224	224
Module Overall Dimensions (Inches)	Length	41-7/8"	41-7/8"	43-5/8"
	Width	29-1/2"	33-1/2"	33-1/2"
	Height*	77"	78 3/8"	78 3/8"
	Height	72-7/8"	76-5/8"	76-5/8"
* Denotes unit with covers				
Module Operating Weight w/Water (Lbs.) ³		1825	2163	2280
Module Shipping Weight (Lbs.) ⁴		1669	1873	1990

Condenser

Model FLEX		30	50	65
Heat Exchanger (Type)		Brazed Plate	Brazed Plate	Brazed Plate
Independent Refrigerant Circuits (Quantity)		2	2	2
Water Storage Volume HX Only (Gals.)		3.42	6.65	7.92
Water Storage Volume HX Plus 6" Main Headers (Gals.)		11.27	16.12	17.41
Flow Rate (GPM) ⁵	Min.	60	100	120
	Max.	130	210	210
Pressure Drop (PSI. / Ft H ₂ O)		4.6 / 10.6	4.9 / 11.3	5.8 / 13.4
Maximum Design Working Pressure - Water Side (PSI.)		285	285	285
Condenser Water Connections Inlet/Outlet (Inches)		2"	2-1/2"	2-1/2"
Header Water Connections - Inlet/Outlet (Inches) ⁶		6"	6"	6"
Test Pressure Rating - Water/Fluid Header (PSI.)		450	450	450

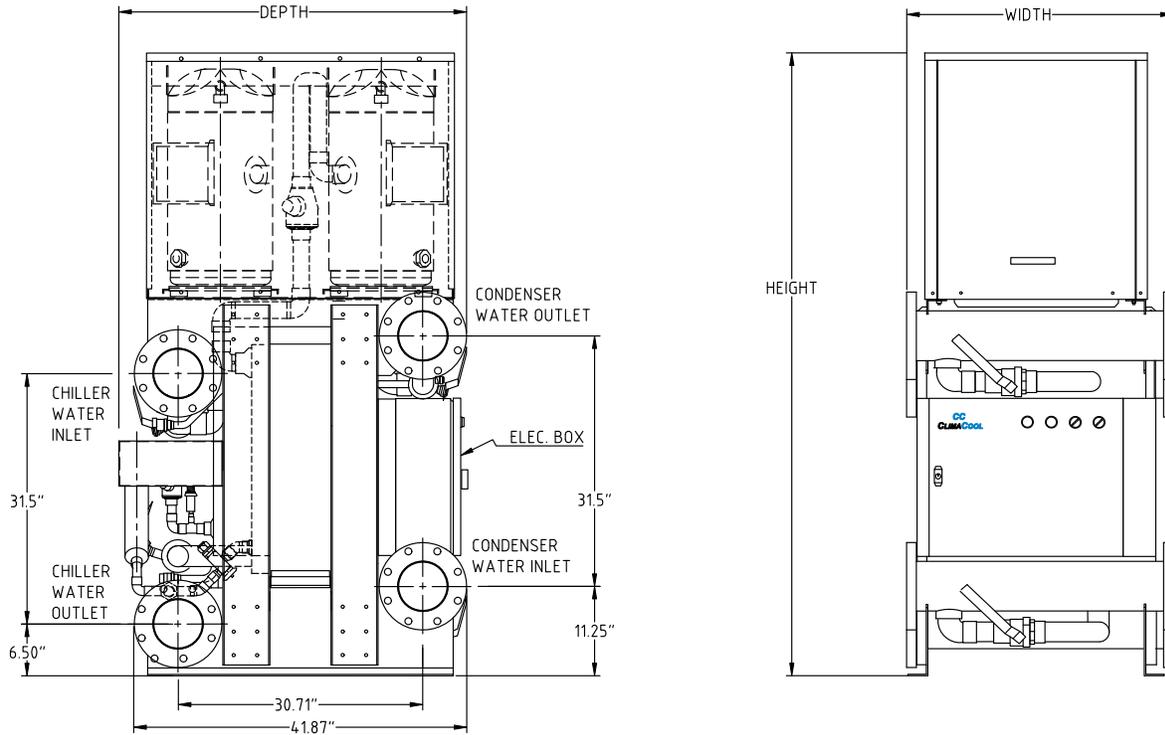
Evaporator

Model FLEX		30	50	65
Heat Exchanger (Type)		Brazed Plate	Brazed Plate	Brazed Plate
Independent Refrigerant Circuits (Quantity)		2	2	2
Water Storage Volume HX Only (Gals.)		3.42	6.65	7.92
Water Storage Volume HX Plus 6" Main Headers (Gals.)		11.27	16.12	17.41
Flow Rate (GPM) ⁵	Min.	50	80	90
	Max.	100	180	210
Pressure Drop (PSI. / Ft H ₂ O)		3.4 / 7.8	4.2 / 9.7	4.6 / 10.6
Maximum Design Working Pressure - Water Side (PSI.)		285	285	285
Evaporator Water Connections Inlet/Outlet (Inches)		2"	2-1/2"	2-1/2"
Evaporator Insulation Thickness (Inches)		3/4"	3/4"	3/4"
Header Water Connections - Inlet/Outlet (Inches) ⁶		6"	6"	6"
Test Pressure Rating - Water/Fluid Header (PSI.)		450	450	450
Insulation Thickness - Header (Inches)		3/4"	3/4"	3/4"

NOTES:

- Tonnage ratings conditions: 44°F leaving chilled water temperature, 85°F entering condenser water temperature, flow rates are 3 GPM per ton through the condenser with a fouling factor of .00025 and 2.4 GPM per ton through the evaporator with a .0001 fouling factor.
- Minimum chiller unloading percentage can be as low as 4.7% of total system. Calculate system unloading by dividing 1/2 of smallest module by total system tons.
- Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
- Unit shipping weight includes refrigerant charge, compressor oil, and shipping base skid.
- The minimum/maximum flow rates are based on a temperature differential of 7°F to 15°F through the evaporator and the condenser. The minimum allowable temperature differential for the FLEX 65 condenser is 9.5°F.
- Main header water / fluid connections are ASME, 6" full face flange, Class 150, eight bolt pattern.

ClimaCool Dimensional Data



Model FLEX	Voltage	Depth (inches)	Width (inches)	Height (inches)	Height (w/covers) (inches)	Weight ¹ (lbs.)	Oper. Weight ² (lbs.)
30	208/230/3/60	41-7/8	29-1/2	72-7/8	77	1,669	1,825
30	460/3/60	41-7/8	29-1/2	72-7/8	77	1,669	1,825
30	575/3/60	41-7/8	29-1/2	72-7/8	77	1,669	1,825
50	208/230/3/60	41-7/8	33-1/2	76-5/8	78-3/8	1,873	2,163
50	460/3/60	41-7/8	33-1/2	76-5/8	78-3/8	1,873	2,163
50	575/3/60	41-7/8	33-1/2	76-5/8	78-3/8	1,873	2,163
65	208/230/3/60	43-5/8	33-1/2	76-5/8	78-3/8	1,990	2,280
65	460/3/60	43-5/8	33-1/2	76-5/8	78-3/8	1,990	2,280
65	575/3/60	43-5/8	33-1/2	76-5/8	78-3/8	1,990	2,280

NOTES:

1. Unit shipping weight includes refrigerant charge, compressor oil, and shipping base skid. Add two inches to base dimensions for shipping skid.
2. Operational weight includes refrigerant charge, compressor oil and water.



• ISO-9001 Certified
• Meets NYC Fire Code



Rigging (Figures 1 and 2)

Each module should be lifted by using lift straps threaded through each top header tube.

A spreader bar should be utilized when rigging with sound attenuation covers in place.

Figure 1

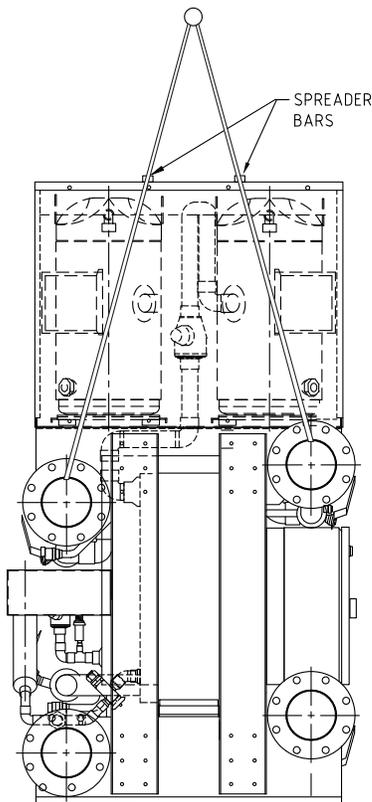
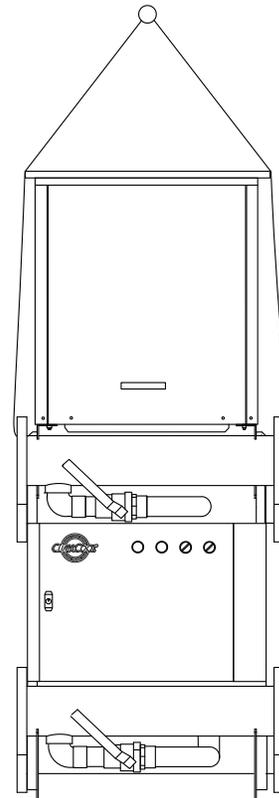


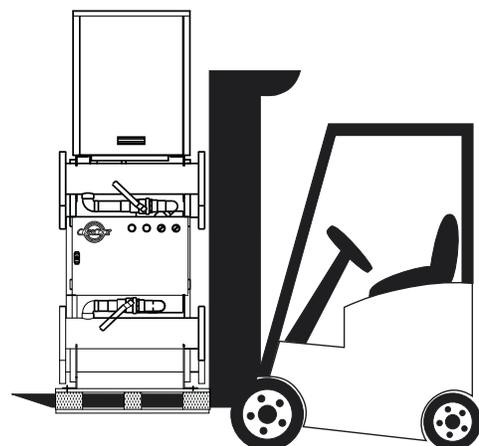
Figure 2



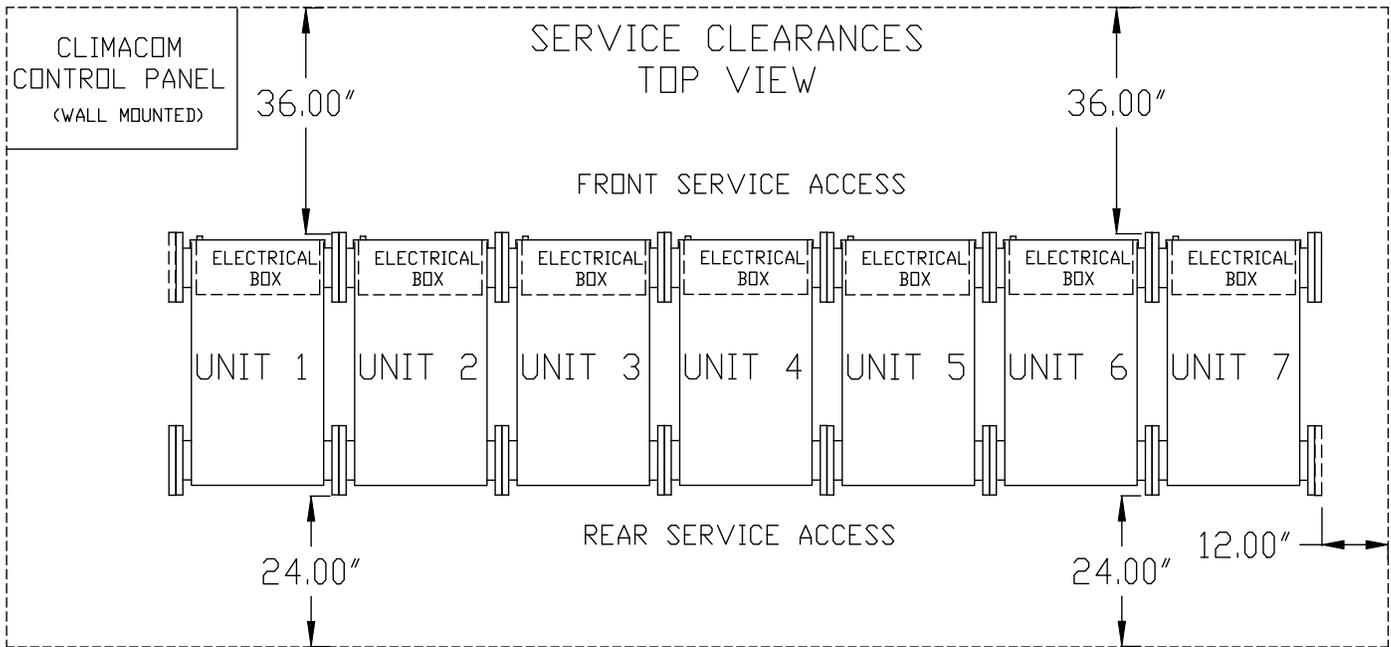
Lifting and Transporting Modules (Figure 3)

When lifting and transporting the module, it is very important to proceed as shown at right. Use of any other means for lifting and transporting may damage the module and void the warranty.

⚠ CAUTION



ClimaCool Service Clearances



Recommended Clearances

1. Allow 36" clearance for electrical panels. 24" clearance for rear service access to modules.
2. Allow a minimum of 18" height clearance for service.
3. Local building or electrical codes may require additional clearance. Consult applicable codes.

Modular Chiller Bank Dimensions - w/Connection Flange Gaskets and Blank Off Plates

Model FLEX	Dimensions											
	Width (ft./inches)			Depth			Height (w/o panels)			Height (w/ panels)		
	30	50	65	30	50	65	30	50	65	30	50	65
1 module	2' 7-1/8"	2' 11-1/8"	2' 11-1/8"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
2 modules	5' 3/4"	5' 8-3/4"	5' 8-3/4"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
3 modules	7' 6-3/8"	8' 6-3/8"	8' 6-3/8"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
4 modules	10' 0"	11' 4"	11' 4"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
5 modules	12' 5-5/8"	14' 1-5/8"	14' 1-5/8"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
6 modules	15' 7/8"	17' 7/8"	17' 7/8"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"
7 modules	17' 6-1/2"	19' 10-1/2"	19' 10-1/2"	41-7/8"	41-7/8"	43-5/8"	72-7/8"	76-3/4"	76-3/4"	77"	78-3/8"	78-3/8"

NOTES:

1. Modular chiller bank width dimensions above include (1/8") between modules, plus (1-1/2") for required blank off plate flanges when piping for a direct return (Refer to page 24 - Water Piping Configuration - Figure 1). Example: (5) FLEX 65 modules 167-1/2" width + 1-1/2" (Blank off plates) + 5 x 1/8" (flange connection gaskets) = 169-5/8" (14' 1-5/8").
2. When piping 1 to 5 or more than 5 modules, use reverse return (Refer to page 24 - Water Piping Configuration - Figure 2). Example: (7) FLEX 30 modules 206-1/2" width + 1-1/2" (Blank off plates left) + 1-1/2" (Blank off plates right) + 8 x 1/8" (flange connection gaskets) = 210-1/2" (17' 6-1/2").

Due to the low vibration of the modules, ClimaCool® does not require the application of spring isolators or pads. Should isolators or pads be desired, install in accordance with Figs. 1 and 2.

Figure 1 - Spring Vibration Isolators Option

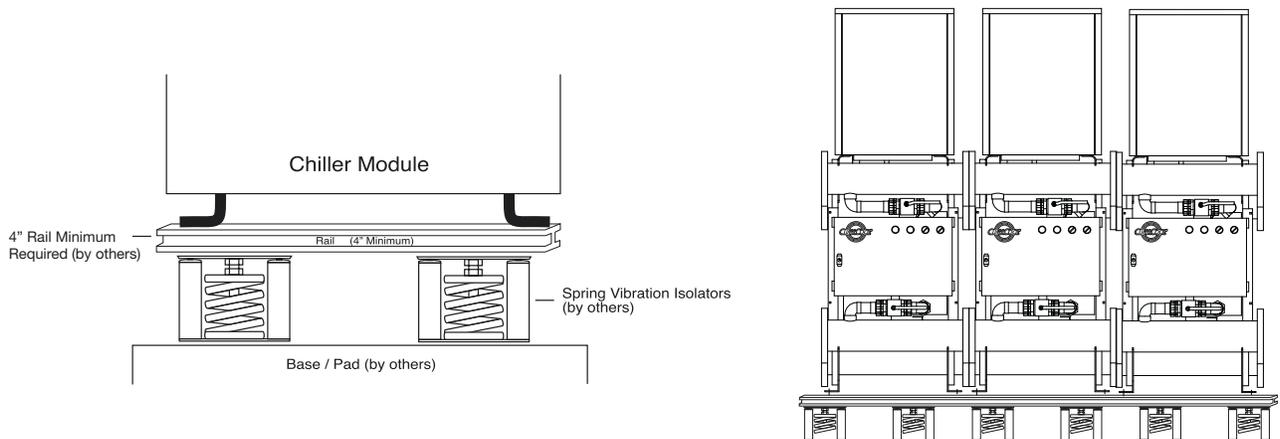
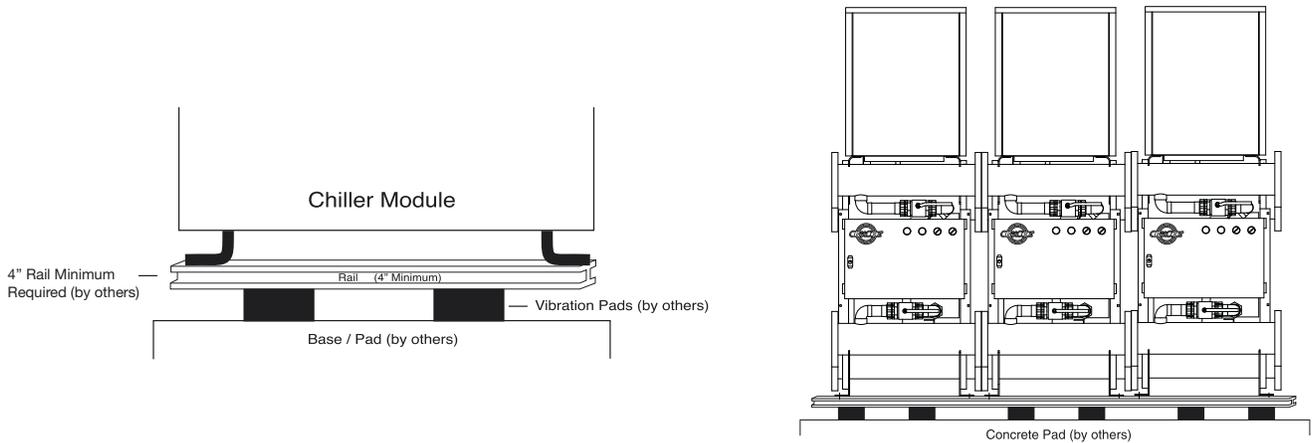


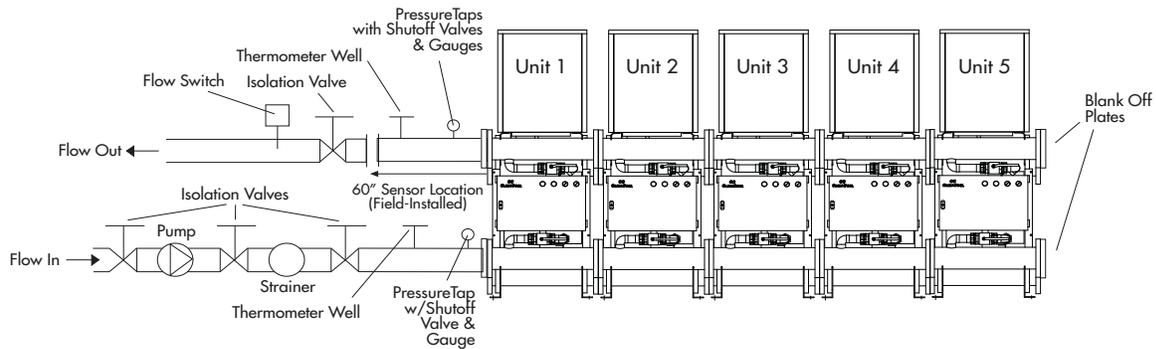
Figure 2 - Vibration Isolation Pads Option



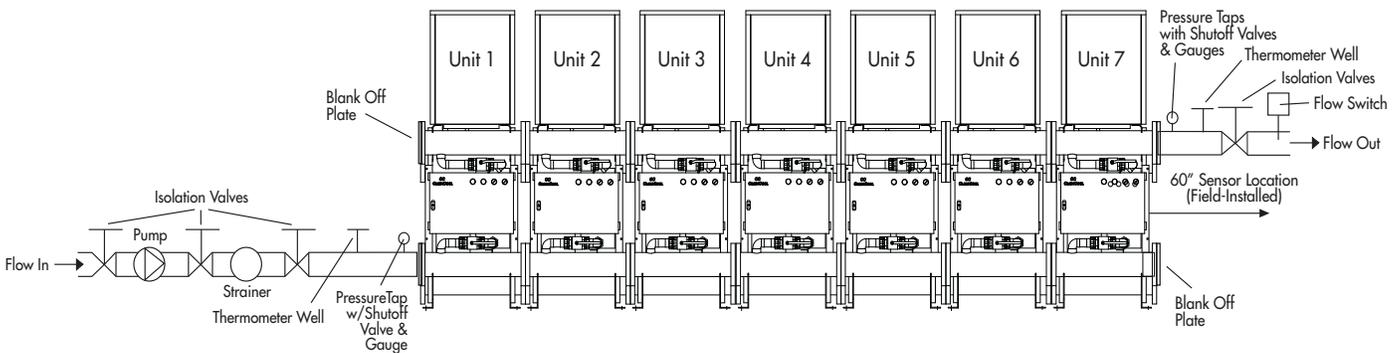
NOTE: Size and weight distribution is to be determined by a qualified structural engineer per individual job requirements.

ClimaCool Water Piping Configurations

Field Piping Direct Return - 1 to 5 Modules (Figure 1)



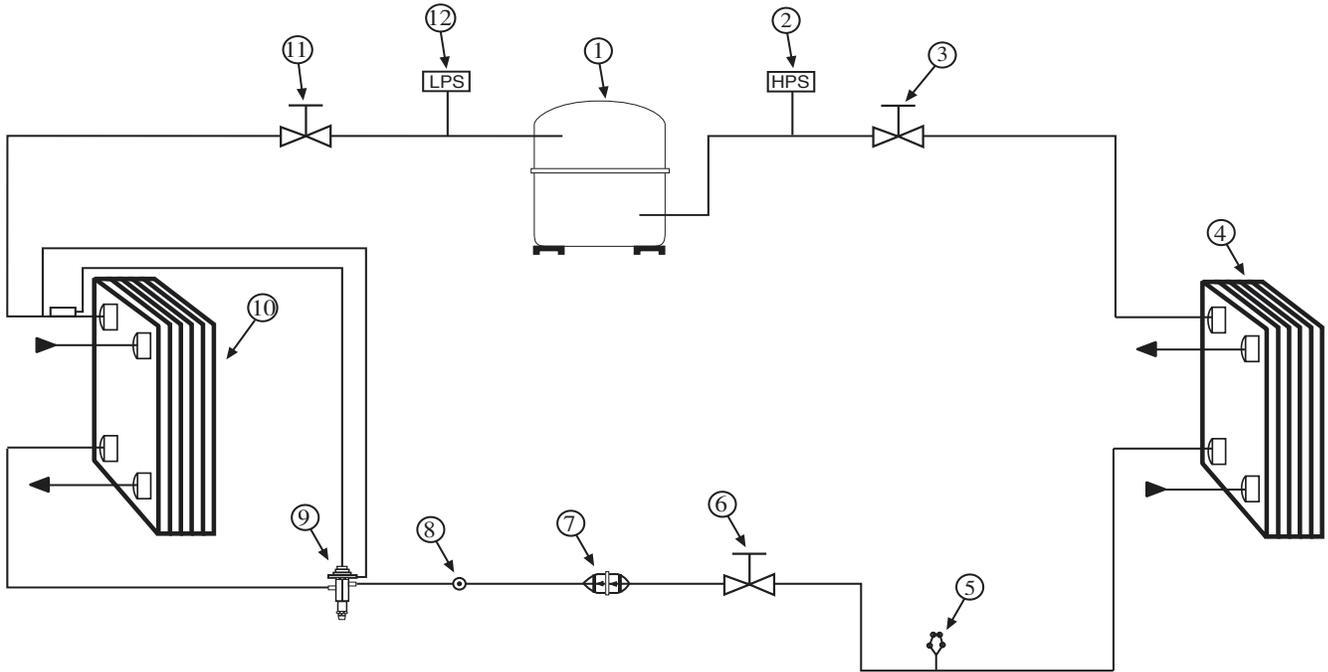
Field Piping Reverse Return - (Preferred 1 to 5 modules) Required for 6 to 7 Modules (Figure 2)



NOTES:

1. Figures 1 and 2 are required piping for proper water regulation and distribution through ClimaCool® modular chillers.
2. Module order and incoming/outgoing water flow as shown in both Figure 1 and 2 can be set up as either a left-to-right or right-to-left configuration.
3. Condenser Hydronic Circuit shown. Piping configurations are similar for the chilled water hydronic circuit.
4. For condenser and chilled water (evaporator) inlet/outlet location dimensions, refer to page 20 - Module Dimensional Data.
5. A differential pressure flow switch is a required safety device for ClimaCool® modular chillers on the chilled and condenser water circuits.
6. Maximum water flow rates for both evaporator and condenser water header systems in one bank of modules is 1000 GPM.

ClimaCool Refrigeration Circuit



Reference Legend

- | | |
|---------------------------------|------------------------------|
| 1 - Compressor | 7 - Filter Drier |
| 2 - High Pressure Switch | 8 - Moisture Indicator |
| 3 - Discharge Isolation Valve | 9 - Thermal Valve |
| 4 - Condenser | 10 - Evaporator |
| 5 - Pressure Relief Valve | 11 - Suction Isolation Valve |
| 6 - Liquid Line Isolation Valve | 12 - Low Pressure Switch |

Refrigerant (per circuit)

Model	R-22 Quantity (lbs.)	
	FLEX	Quantity (lbs.)
	Circuit #1	Circuit #2
30	17	17
50	24	24
65	33.5	33.5

Model	R-407C Quantity (lbs.)	
	FLEX	Quantity (lbs.)
	Circuit #1	Circuit #2
30	16.5	16.5
50	23	23
65	32.5	32.5

NOTES: Modules are all pre-charged at factory and ready for field connections. FLEX Modules are refrigerant flexible.

ClimaCool® Module Hydronic Configuration

Figure 1 - Condenser Hydronic Circuit

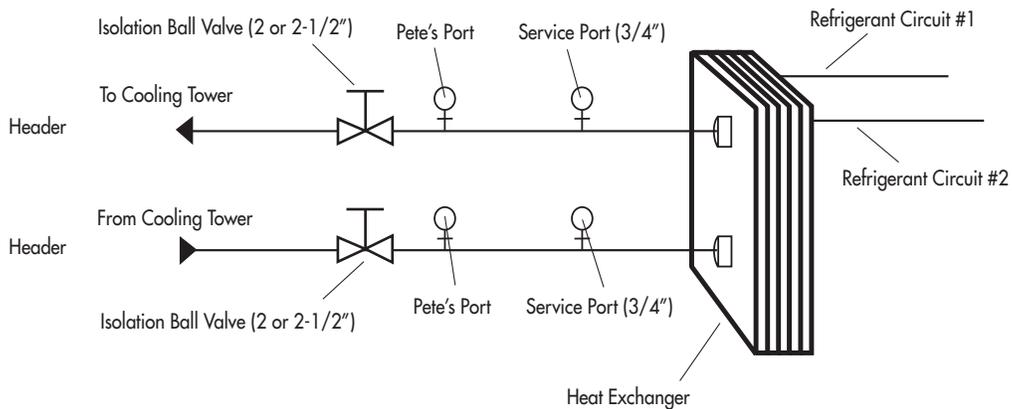
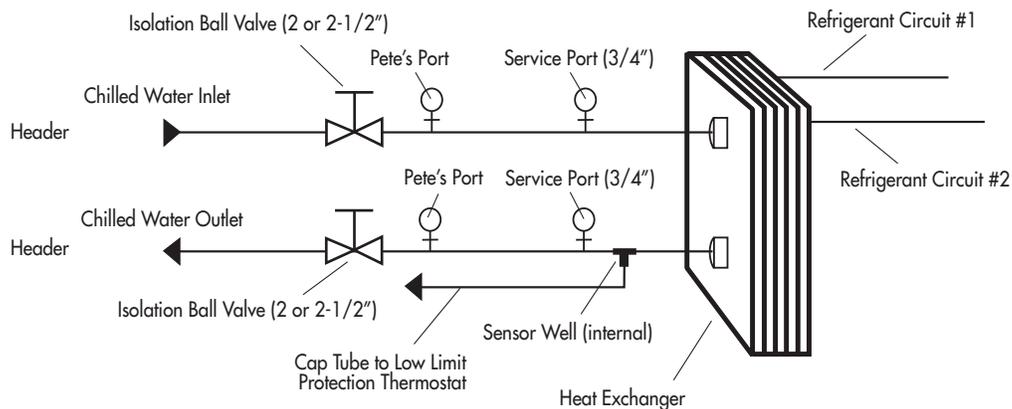


Figure 2 - Chilled Water Circuit



NOTE: Figures 1 and 2 depict hydronic piping in each ClimaCool® chiller module.

ClimaCool Electrical Data - 60 HZ

Model FLEX	Voltage	Power Wiring - per Module				Internal Wiring - per Compressor			
		RLA ¹	MCA ²	MOP ^{3,8}	Rec. Fuse ^{4,8}	RLA ¹	MCA ²	LRA ⁵	Fuse Size ⁴
30	208-230/3/60	92	103	125	125	46	58	425	70
30	460/3/60	42	47	60	60	21	26	187	35
30	575/3/60	33	37	50	45	17	21	148	30
50	208-230/3/60	142	160	225	200	71	89	500	110
50	460/3/60	64	72	100	90	32	40	250	50
50	575/3/60	51	58	80	70	26	32	198	40
65	208-230/3/60	183	206	250	250	92	115	600	150
65	460/3/60	83	93	125	110	41	52	310	70
65	575/3/60	66	75	100	90	33	41	255	60

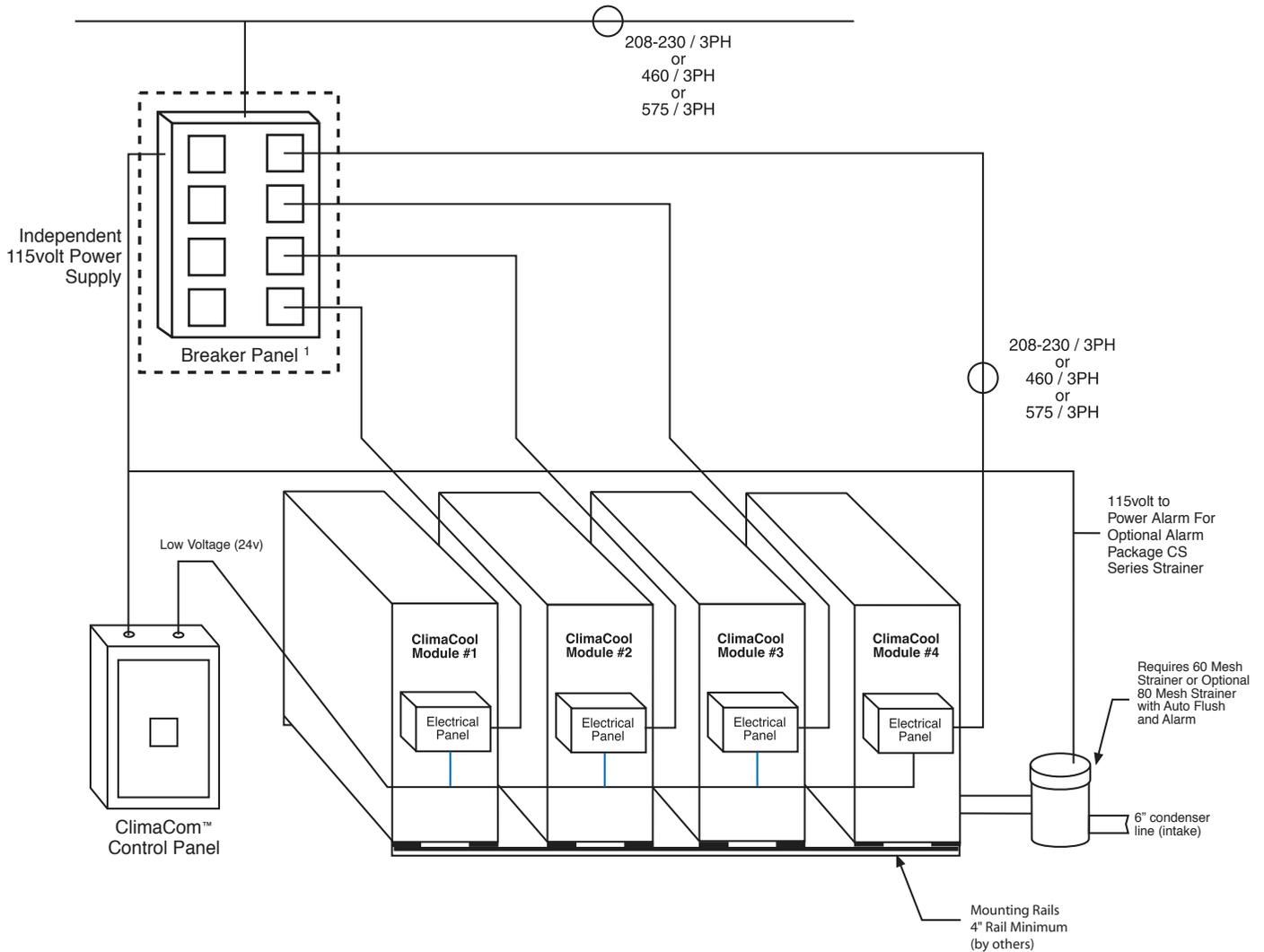
NOTES:

1. RLA. Rated Load Amps are calculated as per UL1995.
2. MCA. Minimum Circuit Ampacity: 125% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent motors and/or electrical loads.
3. MOP. Maximum Overcurrent Protection or Max.Fuse Sizing: Rounded down from 225% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent electrical loads.
4. Recommended (Dual Element) Fuse Sizing: Rounded up from 150% of the RLA of the largest compressor motor plus 100% of the RLA (or FLA) of all other concurrent electrical loads.
5. Locked Rotor Amps are instantaneous starting amperage per compressor.
6. Module internal wiring is per NEC.
7. Voltage Tolerance Range:
 208-230V / 60Hz: Min. 187V Max. 253V
 460V / 60Hz: Min. 414V Max. 506V
 575V / 60Hz: Min. 518V Max. 632V
8. MOP Device or Recommended Fusing Device for Module Power Wiring supplied by others.
 These are recommended values for electrical power protection of modules selected.

LEGEND:

- RLA - Rated Load Amps
- LRA - Locked Rotor Amps
- MCA - Minimum Circuit Amps
- MOPD - Maximum Overcurrent Protection Device

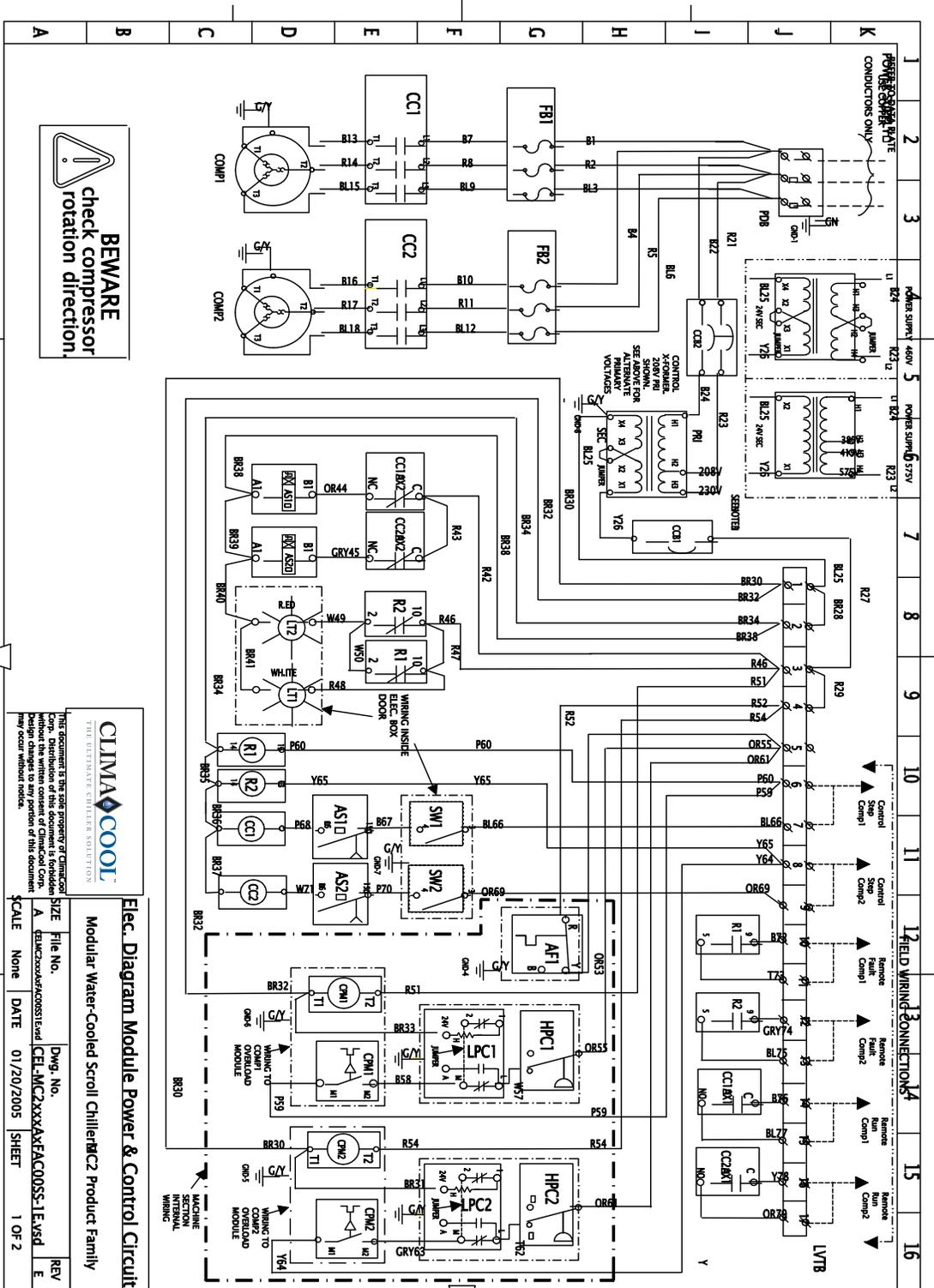
ClimaCool Power Distribution



NOTES:

1. Breaker panel represents field power supply and is to be installed by others. Not provided as part of ClimaCool® modular chiller system.
2. Breaker panels can be supplied for skid mount pump/tank packages or new construction projects as options. Consult your local ClimaCool® representative.
3. Control wiring is by others.

Power / Control Circuit - FLEX Series



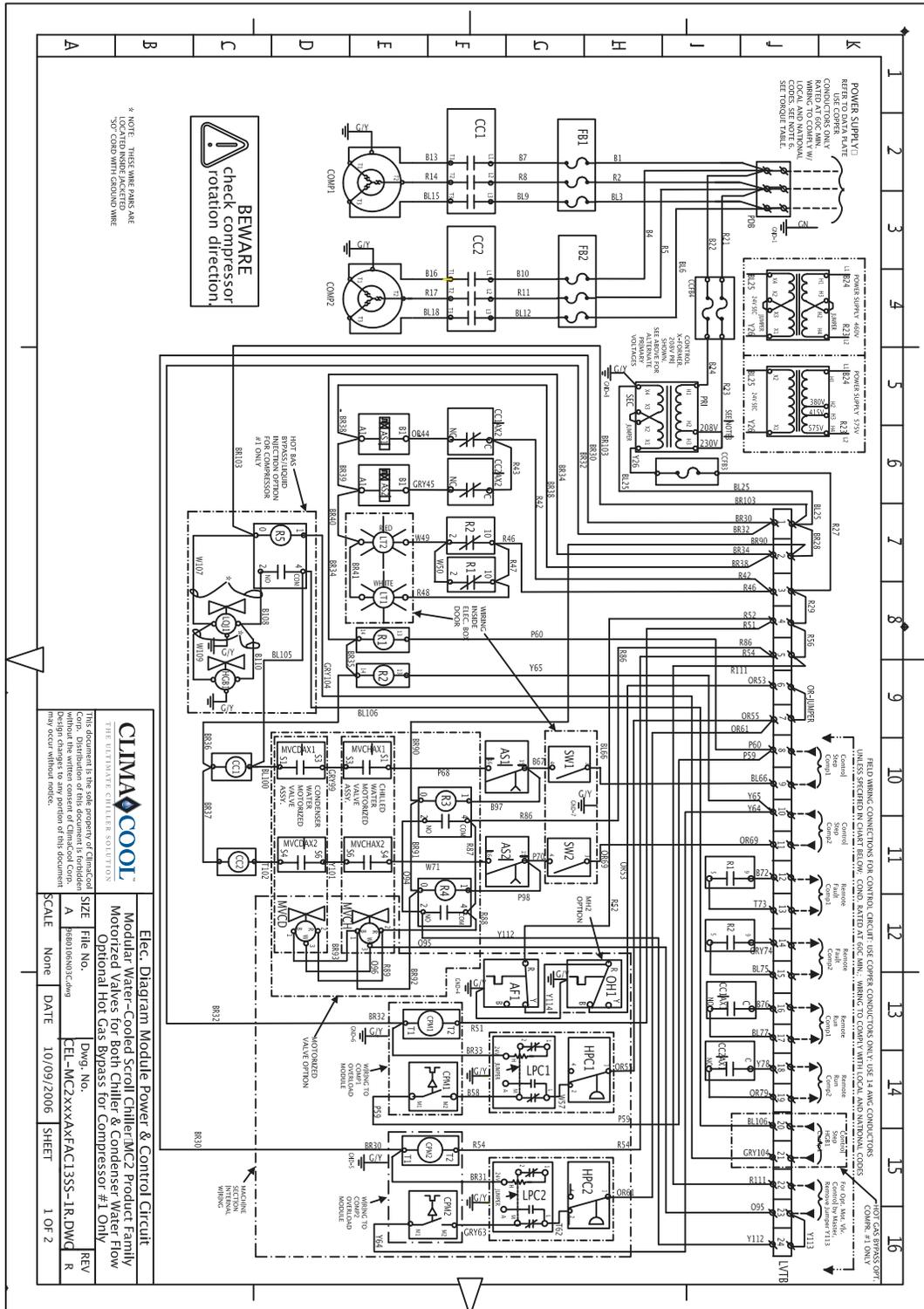
BEWARE
check compressor
rotation direction.

CLIMACOOL
THE ULTIMATE CHILLER SOLUTION

Elec. Diagram Module Power & Control Circuit
Modular Water-Cooled Scroll Chiller/CFC Product Family

File No. _____
Dwg. No. _____
SCALE None DATE 01/20/2005 SHEET 1 OF 2

Motorized Valve Option and Hot Gas By-Pass Option



General

Furnish and install where shown on the plans water cooled chiller modules having a total capacity of _____ tons when cooling _____ GPM of chilled water/glycol solution from _____ °F to _____ °F. The glycol type for the chiller solution is (ethylene)/(propylene)/(water-only) *circle one*, at a glycol solution percentage of _____ %. The chiller capacity rating shall be based on a _____ °F drop through the evaporator with a chiller flow rate of _____ GPM/ton. The water cooled chiller modules have a condenser flow rate of _____ GPM of water/glycol solution, with a temperature rise from _____ °F to _____ °F. The glycol type for the condenser solution is (ethylene)/(propylene)/(water-only) *circle one*, at a glycol solution percentage of _____ %. The condenser rating shall be based on a _____ °F rise through the condenser with a flow rate of _____ GPM/ton.

Modular Unit Design

The *FLEX* Series modules must be designed to be refrigerant-convertible. The system is to be comprised of individual chiller sections that are modular in design. Modules must be comprised of individual refrigerant circuits, compliant with ASHRAE 90.1 operating on either R-22 or R-407C. Each module is to be less than 34" in width to allow for maneuvering through narrow openings. Each module's length shall not exceed 43 5/8" to minimize the turn radius around corners and obstacles encountered while moving and placing the unit in the equipment room. Every module shall be capable of field coupling on site to meet the project capacity requirements.

Unit Construction

The frame design of each module shall utilize a painted, heavy gauge, cold rolled steel frame for mounting the compressors, condenser and evaporator. The frame must allow for front or rear service access of the heat exchangers. The unit shall be constructed using welded 6" carbon steel pipe configured to give strength and stability to the hydronic section of the machine. Connection to the adjacent module is accomplished by using 285 PSI rated flanges on both condenser and chiller water circuits. The main headers must form an extremely strong rigid structure to minimize stability problems during installation and operation.

Module Isolation and Room Footprint Requirements

All service and maintenance isolation valves must be contained within the module footprint dimensions (34" wide x 43 5/8" deep). All water isolation valves must be recessed within the 6" header condenser and evaporator water pip-

ing dimensions front and rear to prevent valve damage and to minimize service clearances. All isolation valves must be contained within the module dimensions. Valves which extend beyond the main water header dimensions must be approved by the project engineer if they cause an increase in the equipment room footprint or add to the service clearance dimensions. A motorized valve requires a 1 1/2" extension for variable primary flow.

Electrical Cabinet Dimensional Parameters

The electrical cabinet construction must be recessed within the module footprint dimensions (34" wide x 43 5/8" deep). The electrical control cabinet must be recessed within the 6" header flanges of the condenser water piping, top and bottom to prevent damage and to minimize service clearances. The electrical cabinet construction must allow for electrical access without removal of any sound attenuation covers.

Hydronic Design

Each chiller shall utilize a water header system of modules bolted in series to maintain constant and full flow to each of the heat exchangers while in operation. Each module shall be factory supplied with isolation valves on all water circuits to allow repair or maintenance of the heat exchangers without interrupting operation of the entire system. The chilled water piping on each module shall be pre-insulated at the factory with 3/4" closed cell foam rubber. Insulation on the chilled water header connection flanges is to be applied in the field by the installer, once the modules are bolted together on site. Service ports (2) 3/4" threaded ball valves, shall be provided on the inlet and outlet of each plate heat exchanger, condenser and evaporator for maintenance back flush and cleaning. Pete's ports shall be provided on all modules as standard.

Modular Chiller *FLEX* CS Strainer

The *FLEX* CS strainer shall be designed for a flow of _____ GPM, with a maximum pressure loss during maximum flow of 1 PSI. Strainer shall be provided with 80-mesh/178-micron filter element, conical in shape and vertical in orientation. Pressure construction of the strainer housing, flanges, nipples, and screens shall be of type 304 or optional 316 stainless steel. Strainers shall be provided with 1/4" gauge ports on the inlet and outlet side of screen and with debris flush port integral to the operation of the strainer. Strainer housing shall be rated for 125 PSI (clamp lids) or 150 PSI (bolted lid). The filter/strainer shall be installed on the condenser and chilled water inlets of each bank of chillers.

Modular Chiller "Y" or Basket Strainers

The FLEX module strainers shall be designed for a flow of ___GPM, with a design pressure loss during maximum flow of 1.5 PSI. Strainers shall be provided with a minimum 60 mesh / 234 micron screens for system protection. Pressure construction of the strainer housing, flanges and nipples shall all be carbon steel. Strainer housing shall be rated for either 200 PSI or 285 PSI. The strainers shall be installed on the condenser water and chilled water inlets for each bank of chillers.

Pressure Differential Alarm Package (CS Series only)

Each Strainer shall be equipped with a Pressure Differential Alarm (PDA) and Automatic Timer Flush. The PDA is constructed of a fiberglass NEMA 4X enclosure, consisting of a pressure differential switch, gauge, flashing, and audible alarm signals. The controller shall be capable of remote monitoring via two additional auxiliary contacts. Adjustable differential pressure switch, ranging from 1-15 PSI, factory set @ 7 PSI.

PDA to provide following functions:

- Continuously monitor the inlet and outlet system pressure differential. When the filter screen becomes dirty, a gauge-switch will trigger an audible siren and a visual flashing alarm.
- Alarms shall be designed to alert maintenance personnel that the strainer screen needs to be removed from the strainer housing for cleaning.

Automatic Flush System Feature (CS Series only)

The automatic flush valve shall be constructed with a 1-1/2" stainless steel motorized ball valve with an open/close indicator. The controller is to be equipped with a programmable time-based controller along with a manual control switch.

Automatic Flush Strainer & Timer Functions (CS Series only):

- Design shall insure particulates which fall down to the debris reservoir are automatically flushed.
- Timer control for the valve package is to be housed inside a watertight control box, attached to the valve.
- Design shall permit end-user to simply dial in the flush frequency and flush duration of the valve.

- The valve shall also be equipped with a manual flush control switch that can be used to manually flush the strainer or drain the strainer before removing the screen.

Condenser – Water Cooled

Each module will have a dual circuit brazed plate heat exchanger. The heat exchanger will be designed and constructed in accordance with UL and/or ASME codes. It shall be constructed with copper brazed 316 stainless steel plates. The condenser shall have two refrigerant circuits, one water-side circuit and shall incorporate a counter flow heat transfer pattern to increase heat transfer efficiency. The condenser will have a refrigerant design side working pressure of 400 PSI and a water side design working pressure of 285 PSI. In order to ensure proper flow protection, a strainer with a minimum of 60 mesh screen must be installed prior to the condenser in the field.

Evaporator

Each module's evaporator will be a dual circuit brazed plate heat exchanger. The evaporator shall be designed and constructed in accordance with UL and/or ASME codes. It shall be constructed with copper brazed 316 stainless steel plates. The heat exchanger shall have two refrigerant circuits, one waterside circuit and shall incorporate a counter flow heat transfer pattern to increase heat transfer efficiency. The evaporator will have a refrigerant design side working pressure of 400 PSI, a water side design working pressure of 285 PSI and shall be insulated with 3/4" closed cell foam rubber having a "K" factor of 0.26. In order to ensure proper flow and protection, a minimum of a 60 mesh strainer must be installed prior to the chiller water evaporator in the field.

Compressors

Each module shall contain two independent refrigerant circuits, each with its own scroll compressor for redundancy. Each compressor shall be mounted with rubber isolation, each shall include compressor overload protection, high discharge pressure and low suction pressure cutouts.

Refrigerant Circuits - Refrigerant Flexible

The dual refrigerant circuits must be designed to comply with ASHRAE 90.1 Efficiency Guidelines. Each circuit operates using HCFC R-22 as standard, and must be readily convertible to HFC R407C at any point during the lifetime of the product without any component changes.

This requires no removal of existing refrigerant oil, only a refrigerant change on site.

The dual refrigerant circuits shall be pre-charged with R22 as standard, or with optional R407C, and factory run tested. Refer to the project chiller equipment schedule for the selected refrigerant. If refrigerant R22 is specified, the chiller must have the ability to accept R407C at a later date in the field.

Each circuit shall consist of a factory tested scroll compressor, with high pressure switch, low pressure switch, pressure relief valve, discharge, suction, and liquid isolation valves, a liquid line drier, moisture indicator, externally equalized thermal valve (suitable for R22 and R407C), plus gauge port connections.

Electrical

Each module is to be manufactured with its own control electrical panel mounted to the unit frame and contained within the unit dimensions. Unit status indicators such as compressor power on, and alarm indicators are to be mounted in full view on the front of each module. All individual power panels shall be equipped with a lockable door latch mechanism per module. Modules shall have UL and CUL listing.

The power distribution system for each module shall contain:

- Main power distribution terminal
- Compressor motor contactors
- Motor overload protection per compressor
- Individual compressor motor fusing or breakers

Each individual module shall be equipped with a local manual “ON” / “OFF” compressor switch to allow service or repair to individual modules without interrupting service of the entire chiller. The use of individual power supply to each module shall allow the unit to produce chilled water while any one module is shut down for repair or service.

Controls

Each chiller system shall be equipped with a programmable microprocessor controller. The controller must be programmed to duty-cycle the compressors based on equal run time, and staged based on leaving chilled water temperature. The controller must be capable of communicating and becoming part of any facility management system with optional programming. The controller shall be capable of remote monitoring via an additional modem connection.

Control functions:

- Control of leaving chilled water temperature
- Compressor sequencing
- Compressor anti-short cycle
- Low temperature freeze protection
- High pressure control switch
- Low pressure control switch
- Alarms for high/low water temperature

Run Test

Each chiller module shall be pre-charged with refrigerant at the factory. Each system shall be given a documented factory run test with water circulated through each module under load conditions.

Installation

Per the project drawings, the installing contractor shall connect each module together with the hardware provided, and insulate connection points on the chilled water side flange connections in the field. Two 4” to 6” rails (provided by others) are required for ease of installation. A level floor and base rails are minimum requirements. A main building breaker panel with individual circuit breakers is required to feed each module. Alternatively, separate fused disconnect switches can be provided (by others) to feed each module.

Operation and Maintenance - Redundancy

Each modular chiller shall be designed so that any major component on an individual module can be serviced without having to shut down the entire system. Every module shall be equipped with (4) factory-installed isolation valves, (2) isolating the condenser exchanger and (2) isolating the evaporator exchanger. Independent electrical service to each module shall permit any module within a bank of chillers to be shut down for service, while the remaining modules continue to operate.

Codes and Standards Reference

- ARI 550/590-1998 - Standard for Water Chilling Packages using the Vapor Compression Cycle.
- ANSI/ASHRAE 90.1 - Energy Efficient Design of New Buildings.
- ANSI/ASHRAE STANDARD 15-1992 - Safety Code for Mechanical Refrigeration.
- ANSI/UL 1995 - Central Cooling Air Conditioners.
- UL 984 - Safety Standards for Hermetic Motor Compressors.
- ARI STANDARD 575-87 - Method of Measuring Machinery Sound Within Equipment Rooms.

Warranty Certificate



THE ULTIMATE CHILLER SOLUTION®

CLIMACOOL CORPORATION

LIMITED EXPRESS WARRANTY/LIMITATION OF REMEDIES AND LIABILITY

WARRANTY DISCLAIMER

It is expressly understood that unless a statement is specifically identified as a warranty, statements made by ClimaCool Corp., an Oklahoma corporation ("CC"), or its representatives, relating to CC's products, whether oral, written or contained in any quote, sales literature, catalog or any agreement, are not express warranties and do not form a part of the basis of the bargain, but are merely CC's opinion or commendation of CC's products. **EXCEPT AS SPECIFICALLY SET FORTH HEREIN, THERE IS NO EXPRESS WARRANTY AS TO ANY OF CC'S PRODUCTS. CC MAKES NO WARRANTY AGAINST LATENT DEFECTS. CC MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.**

GRANT OF LIMITED EXPRESS WARRANTY

CC warrants CC's products purchased and retained in the United States of America and Canada to be free from defects in material workmanship under normal use and maintenance only as follows: (a) All modular chillers built or sold by CC for twelve (12) months from date of unit start-up or eighteen (18) months from date of shipment (from CC's warehouse), whichever comes first and (b) Repair and replacement parts, which are not supplied under warranty, for ninety (90) days from date of shipment (from CC's warehouse). All parts must be returned to CC's warehouse in Oklahoma City, Oklahoma, freight prepaid, no later than sixty (60) days after the date of the failure of the part. If CC determines the part to be defective and within CC's Limited Express Warranty, CC shall, when such part has been either replaced or repaired, return such to a CC recognized dealer, contractor or service organization, FOB, CC's warehouse, Oklahoma City, Oklahoma, freight prepaid. The warranty on any part repaired or replaced under warranty expires at the end of the original warranty period.

This warranty does not cover and does not apply to: (1) Fuses, refrigerant, fluids, oil; (2) Products relocated after initial installation; (3) Any portion or component of the system that is not supplied by CC, regardless of the cause of the failure of such portion or component; (4) Products on which the module identification tags or labels have been removed or defaced; (5) Products on which payment to CC is or has been in default; (6) Products which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance (including, without limitation, defects or damages caused by voltage surges, inadequate voltage conditions, phase imbalance, any form of electrical disturbances, inadequate or improper electrical circuit installation or protection, failure to perform common maintenance, etc.); or are caused by accident, misuse or abuse, fire, flood, alteration or misapplication of the product; (7) Products which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Products subjected to corrosion or abrasion; (9) Mold, fungus or bacteria damage; (10) Products manufactured or supplied by others; (11) Products which have been subjected to misuse, negligence or accidents; (12) Products which have been operated in a manner contrary to CC's printed instructions; or (13) Products which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of CC's product(s). Products which have defects or damages due to freezing of the water supply, an inadequate or interrupted water supply, corrosives or abrasives in the water supply, or improper or inadequate filtration or treatment of the water or air supply.

CC is not responsible for: (1) The costs of any fluids, refrigerant or other system components, or associated labor to repair or replace the same, which is incurred as a result of a defective part covered by CC's Limited Express Warranty; (2) The costs of labor, refrigerant, materials of service incurred in removal of the defective part, or in obtaining and replacing the new or repaired part; or, (3) Transportation costs of the defective part from the installation site to CC or of the return of any part not covered by CC's Limited Express Warranty.

Limitation: This Limited Express Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such warranty, including without limitation any express warranties or any implied warranties of fitness for particular purpose and merchantability shall be limited to the duration of the Limited Express Warranty.

LIMITATION OF REMEDIES

In the event of a breach of the Limited Express Warranty, CC will only be obligated at CC's option to repair the failed part, module or to furnish a new or rebuilt part or module in exchange for the part or module which has failed. If, after written notice to CC's Head Office in Oklahoma City, Oklahoma of each defect, malfunction or other failure and a reasonable number of attempts by CC to correct the defect, malfunction or other failure and the remedy fails or its essential purpose, CC shall refund the purchase price paid to CC in exchange for the return of the sold good(s). Said refund shall be the maximum liability of CC. **THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER AGAINST CC FOR THE BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR CC'S OWN NEGLIGENCE OR IN STRICT LIABILITY.**

LIMITATION OF LIABILITY

CC shall have no liability for any damages if manufacturer's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to, any war, civil unrest, government restrictions or restraints, strikes or work stoppages, fire, flood, accident, shortage of transportation, fuel, material, or labor, acts of God or any other reason beyond the sole control of CC. **CC EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR CC'S OWN NEGLIGENCE OR AS STRICT LIABILITY.**

OBTAINING WARRANTY PERFORMANCE

Normally, the contractor or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any CC recognized contractor or service organization. If assistance is required in obtaining warranty performance, write:
ClimaCool Corp. P.O. Box 2055 Oklahoma City, Oklahoma 73102 (405)745-3185 e-mail: Claims@climacoolcorp.com

NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusion of consequential or incidental damages, so the foregoing exclusion and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state and from Canadian province to Canadian province. Please refer to the CC Installation, Operation and Maintenance manual for operating and maintenance instructions.

Modular, Flexible Design

The ClimaCool® modular chiller system is designed so that modules can be easily connected as needed to meet large project tonnage requirements and save space.

Most Space Efficient

The ClimaCool® modular chiller's space-saver footprint design leaves ample room for cooling equipment, even in very tight mechanical rooms.

Superior Redundancy

Modular isolation provides unparalleled redundancy. This design redundancy prevents total system shutdown for all cooling applications.

Easy Installation Access

The ClimaCool® modular chiller system's compact design allows for easy access to equipment rooms and saves space.

Highly Reliable

ClimaCool®'s industrial strength frame supports rugged hydronic headers constructed of carbon steel pipe with 285 PSI rated flanges. All models include Copeland Scroll® compressors, proven reliable over a wide range of applications.



ClimaCool Corp.
7300 S.W. 44th Street
Oklahoma City, OK 73179
405-745-3185
405-745-2072 (Fax)
www.climacoolcorp.com

ClimaCool® works continually to improve its products. As a result, the design and specifications of each product at the time for order may be changed without notice and may not be as described herein. Please contact ClimaCool®'s Customer Service Department at (405) 745-3185 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimaCool®'s opinion or commendation of its products. For the most current version of this document please visit www.climacoolcorp.com.

The management system governing the manufacture of ClimaCool®'s products is ISO 9001:2000 certified.