CLIMA COOL®

A NIBE GROUP MEMBER

WATER-SOURCE MODULAR CHILLERS

PRODUCT CATALOG

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Chillers, Heat Pumps, Heat Recovery, and SHC Heat Pumps & Heat Recovery

UW Models: 30-80 Tons | 60 Hz – R-454B

SHC on DEMAND® SIMULTANEOUS HEATING AND COOLING

CoolLogic Touch™

Table of Contents

WIDE VARIETY

of products and configurations to fulfill your application demands.

ClimaCool® is dedicated to providing flexible configurations to meet all your application needs, no compromises. These modular chillers are utilized in a wide variety of heating, cooling, and simultaneous heating and cooling applications in both commercial and industrial buildings. Whether the need is a dedicated chiller for off peak loads, comfort cooling, or a truly redundant simultaneous heating and cooling plant, the following fundamental design features are integral to providing a complete climate control solution.

No compromises!

Compact

Small footprint reduces installation cost and restrictions on placement.

CoolLogic Touch™ Bank Controller

The CoolLogic Touch Bank Controller provides complete system integration for ultimate chiller performance. It allows for control of modules via Ethernet cable and interfaces with native BACnet® communication. The CoolLogic Touch Bank Controller governs all top level events, timing and compressor staging and allows operator interface for all levels of setting and retrieving data. It maintains precise temperature control for cooling, heating, and simultaneous heating and cooling applications to ensure the highest building comfort for occupants.

ELECTRIC HEATING TO MEET YOUR BUILDINGS' DECARBONIZATION & ELECTRIFICATION REQUIREMENTS

Energy Efficient

All ClimaCool modules are designed to meet or exceed ASHRAE 90.1 minimum efficiency requirements.

Environmentally Friendly

A micro charge of low GWP R-454B refrigerant offers better efficiency and minimal performance derate. With a GWP of 466, it fits well within current requirements.

Expandable

Modular design allows for incremental system capacity to accommodate future growth.

Service Friendly

Design allows easy access to major components making the models fully serviceable and maintainable without removal of a module from the chiller bank or disassembly of headers.

Simple

Easy connect design simplifies installation, service and controls.

Sustainable

Based on application, ClimaCool chillers can help meet LEED® prerequisites and contribute significant system points toward LEED building certification.

True Redundancy

Separate module electrical feeds and dual independent refrigeration circuits provide true system redundancy.

LEED® CATEGORIES SATISFIED BY CLIMACOOL SYSTEMS:

Enhanced Commissioning and Measurement and Verification

CoolLogic Touch Bank Controller provides maximum flexibility with BAS interface.

Enhanced Refrigerant Management

Micro charge of chlorine-free and non-ozone depleting refrigerant.

Optimized Energy Performance

Meets or exceeds ASHRAE 90.1 minimum efficiency requirements.

Thermal Comfort

Precise required heating and cooling ensures the highest comfort for building occupants.

WATER-SOURCE CHILLER, MODEL UWC

Designed for major application flexibility and expandability to accommodate current and future needs. This system grows with the building requirements and offers a simple design for easy initial and future installation.

- **Tonnages:** 30, 50, 70, & 80
- **Configurations:** From 30–960 tons per bank
- **Voltages:** 208-230, 460, 575
- **Dimensions:**
  - 30, 50, 70 tons:
    - 34.4" w x 79.1" h x 68.7" d
    - (87.38 cm x 200.91 cm x 174.50 cm)
  - 80 tons:
    - 34.4" w x 84.0" h x 68.7" d
    - (87.38 cm x 213.36 cm x 174.50 cm)

WATER-SOURCE HEAT RECOVERY, MODEL UWH

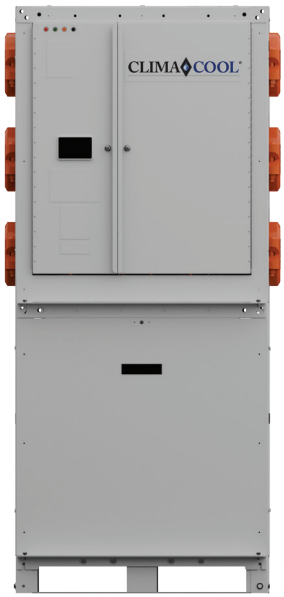
The high temperature heat recovery can be utilized for heating and cooling operations and is compatible with boiler/tower and geothermal systems. Heat recovery can provide hot water, while simultaneously producing chilled water. he UWH model is typically used for building efficiency upgrades dedicated to the constant base cooling & heating loads.

- **Tonnages:** 30, 50, 70, & 80
- **Configurations:** From 30–960 tons per bank
- **Voltages:** 208-230, 460, 575
- **Dimensions:**
  - 30, 50, 70 tons:
    - 34.4" w x 79.1" h x 68.7" d
    - (87.38 cm x 200.91 cm x 174.50 cm)
  - 80 tons:
    - 34.4" w x 84.0" h x 68.7" d
    - (87.38 cm x 213.36 cm x 174.50 cm)

WATER-SOURCE HEAT PUMP, MODEL UWT

Designed to provide a quiet, serviceable and extremely efficient system that will offer years of reliable operation. High efficiency design offers a minimum of 9.59 EER at full-load. Modules can be configured to provide project turn down and capacity requirements from 30–960 tons.

- **Tonnages:** 30, 50, 70, & 80
- **Configurations:** From 30–960 tons per bank
- **Voltages:** 208-230, 460, 575
- **Dimensions:**
  - 30, 50, 70 tons:
    - 34.4" w x 79.1" h x 68.7" d
    - (87.38 cm x 200.91 cm x 174.50 cm)
  - 80 tons:
    - 34.4" w x 84.0" h x 68.7" d
    - (87.38 cm x 213.36 cm x 174.50 cm)



SHC onDEMAND® SIMULTANEOUS HEATING AND COOLING

WATER-SOURCE SIMULTANEOUS HEATING & COOLING HEAT PUMP, MODEL UWU

Reduce energy consumption and the environmental impact of your heating and cooling equipment by harnessing energy that is already being produced but not used. The packaged water-cooled SHC onDEMAND® provides hot water, as high as 140°F (60°C), while offering a minimum cooling efficiency of 9.59 EER with typical heating efficiencies around 3.0 COP.

- **Tonnages:** 30, 50, 70, & 80
- **Configurations:** From 30–960 tons per bank
- **Voltages:** 208-230, 460, 575
- **Dimensions:**
  - 30, 50, 70 tons:
    - 34.4" w x 79.1" h x 68.7" d
    - (87.38 cm x 200.91 cm x 174.50 cm)
  - 80 tons:
    - 34.4" w x 84.0" h x 68.7" d
    - (87.38 cm x 213.36 cm x 174.50 cm)

SHC onDEMAND® SIMULTANEOUS HEATING AND COOLING

WATER-SOURCE SIMULTANEOUS HEATING & COOLING HEAT RECOVERY, MODEL UWW

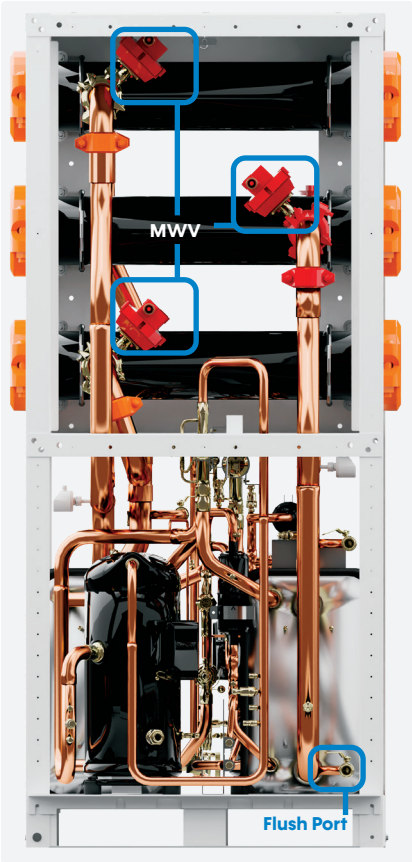
The SHC onDEMAND system eliminates the need to have separate equipment for heating, cooling, and heat recovery while saving installation costs, reducing the physical footprint and overall operating costs. Innovative engineering simplifies the simultaneous heating and cooling process, taking multitasking to a whole new level.

- **Tonnages:** 30, 50, 70, & 80
- **Configurations:** From 30–960 tons per bank
- **Voltages:** 208-230, 460, 575
- **Dimensions:**
  - 30, 50, 70 tons:
    - 34.4" w x 79.1" h x 68.7" d
    - (87.38 cm x 200.91 cm x 174.50 cm)
  - 80 tons:
    - 34.4" w x 84.0" h x 68.7" d
    - (87.38 cm x 213.36 cm x 174.50 cm)

WATER ISOLATION VALVES AND INDIVIDUAL HEAT EXCHANGER FLUSH PORTS

Factory installed, providing module isolation for maintenance and individual cleaning of evaporator and/or condenser heat exchangers. This is accomplished without increasing unit or bank dimensions. Individual heat exchangers can be backflushed/cleaned while adjacent modules continue normal operation. Motorized valves include 3/4-inch (19.05 mm) fill and flush valves.

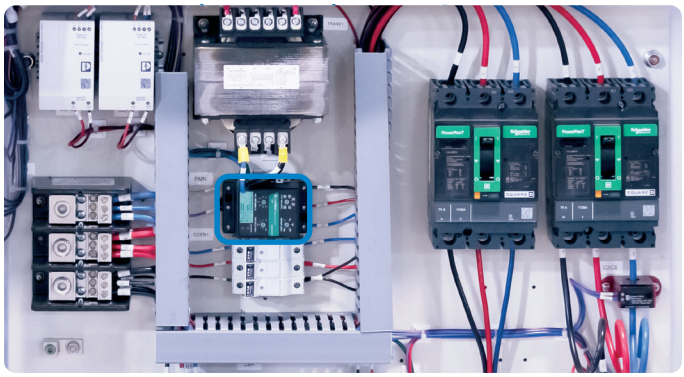
Figure 1: Motorized Valves and Flush Ports



VOLTAGE/PHASE MONITOR

Voltage/phase monitors are factory supplied with each unit. The voltage/phase monitor helps guard the chiller bank against voltage fluctuations, phase failure or phase reversal conditions which could void your warranty.

Figure 2: Unit Control Box



WATER HEADER BYPASS

A field installed water header bypass may be utilized to prevent deadheading the pump. The external bypass allows the chiller leaving water temperature sensor to monitor loop water temperature passing the chiller and reduces the wear on heat exchangers when they are not operating. The valve is controlled by the CoolLogic Touch controller and is always open when the modules are not in operation. The bypass valve closes when modules begin to stage on.

Figure 4: Water Header Bypass

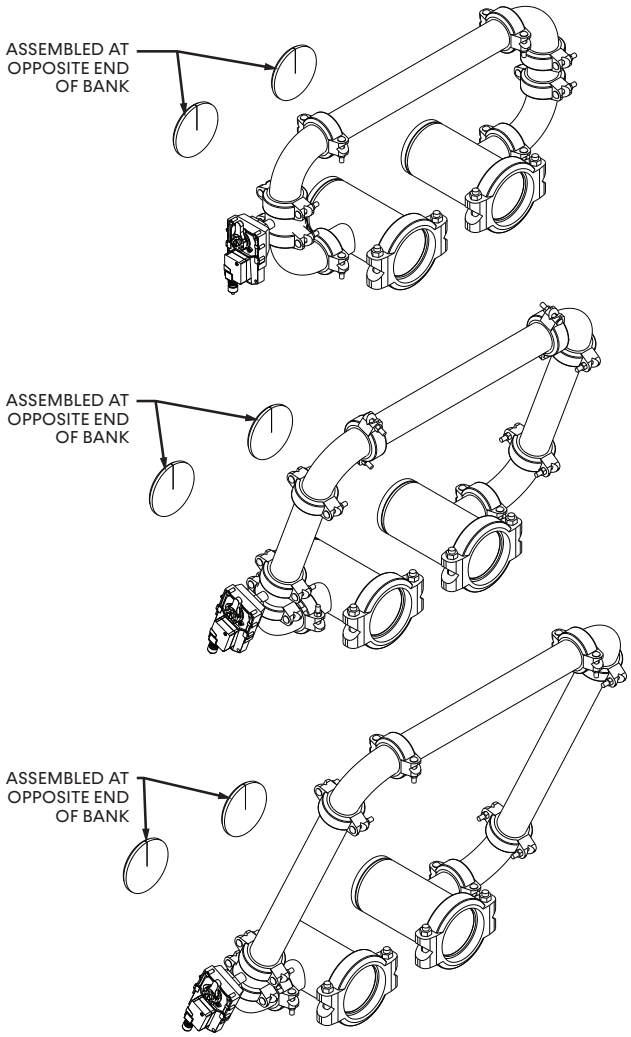


Figure 5: Bank with modules ON and header bypass CLOSED

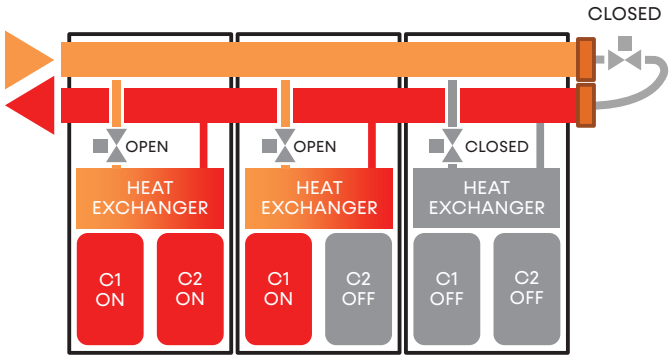
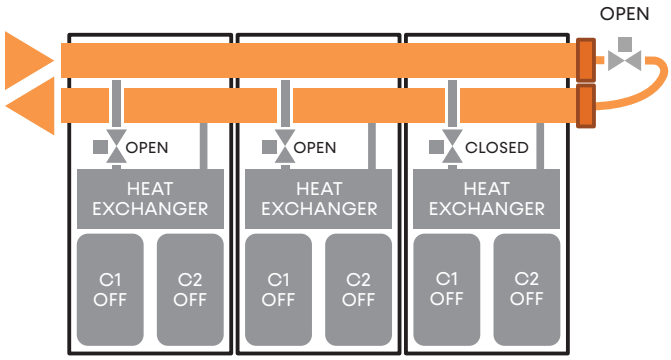


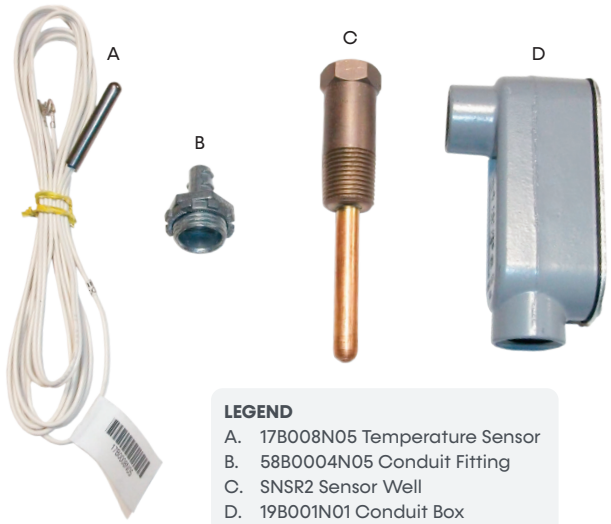
Figure 6: Bank with modules OFF and header bypass OPEN



TEMPERATURE SENSORS

Two temperature sensor kits shipped per water loop – one for the inlet stream and one for the outlet stream.

Figure 7: Well Temperature Sensor Kit

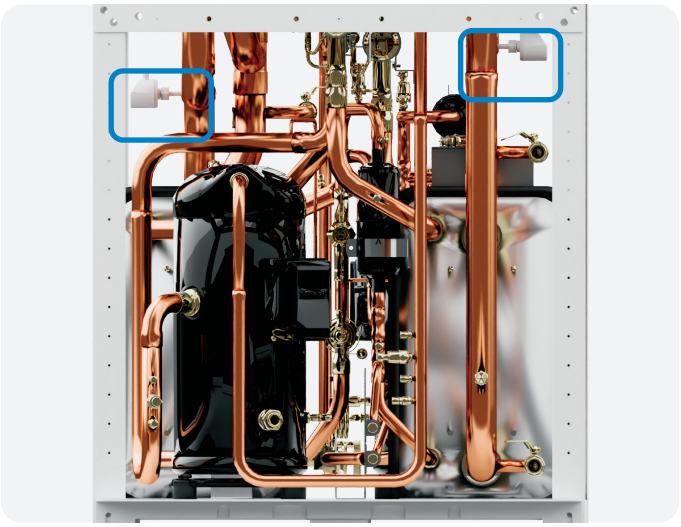


LEGEND
A. 17B008N05 Temperature Sensor
B. 58B0004N05 Conduit Fitting
C. SNSR2 Sensor Well
D. 19B001N01 Conduit Box

PRESSURE DIFFERENTIAL FLOW SENSOR

Field installed to prevent operation of the chiller without sufficient water flow to the evaporator and/or condenser.

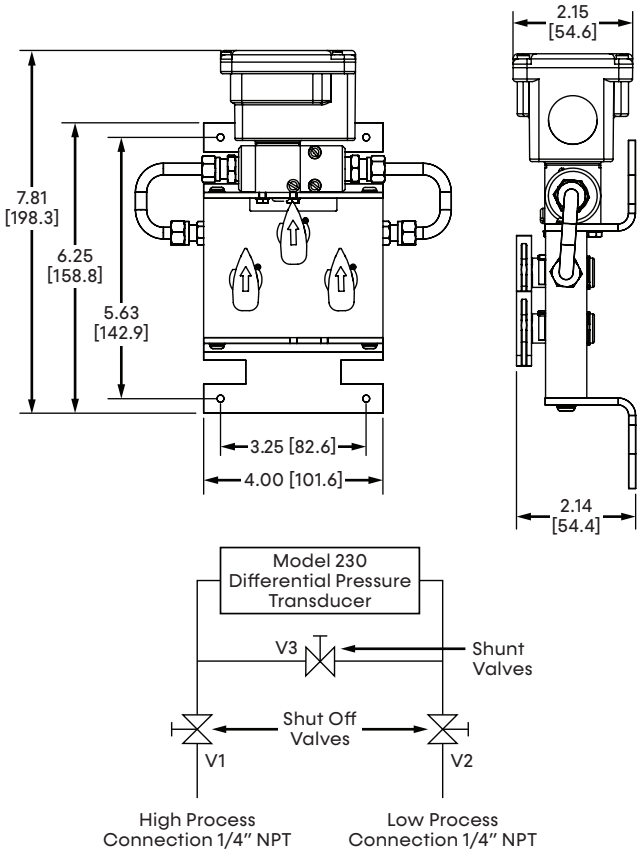
Figure 8: Flow Switches



DIFFERENTIAL PRESSURE TRANSDUCER

Field installed to prevent operation of the chiller without sufficient water flow to the evaporator and/or condenser.

Figure 9: True Wet-to-Wet Differential Pressure Transducer: With 3-Valve Manifold Assembly



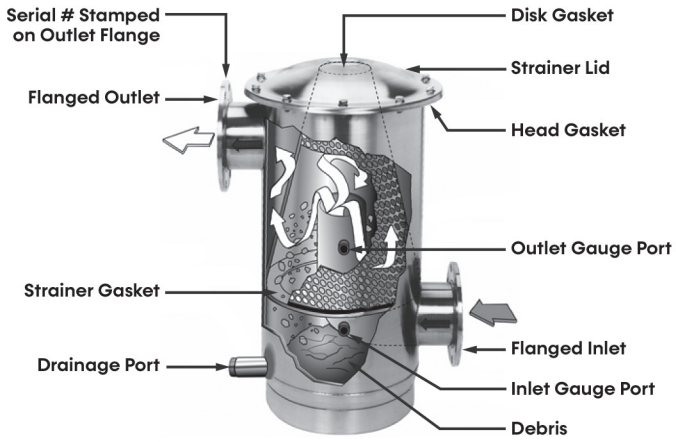
NOTE: Measurements are shown as inch [mm].

NOTE:
For differential pressure measurements at high line pressure (350 PSIG (2413.17 kPa) max), it is recommended that the pressure sensor be installed with a valve in each line, plus a shunt valve across the high and low (reference) pressure ports as shown.

Automatic CS Series Strainer Package

Field installed, high quality, low maintenance stainless steel filtration systems with 60 or 80 mesh stainless steel screens will reduce operating costs and prevent nuisance condenser issues. Strainer package can be equipped with optional pressure differential alarm and automatic time flush.

Figure 10: Stainless Steel Strainer



Automatic Timer Flush (ATF) Package Option

The ATF-EA-1.5 flush valve package provides an automatic method for flushing away the debris collected in the strainer's reservoir. The power supply and timer controls for the valve package are housed inside the ATF control box. The ATF controls can be pre-programmed to set the flushing duration and the time interval between flushes.

System Components

1. Timer based valve controller: sets the flush duration (length of the flush) and the flush interval (time between flushes).
2. Electric Ball Valve: designed for dirty water use.

Figure 11: Timer Based Valve Controller

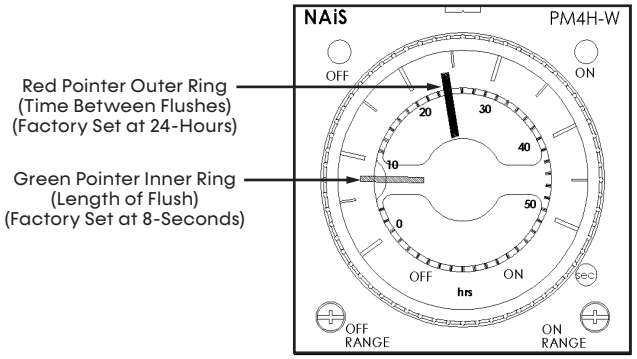


Figure 12: Electric Ball Valve

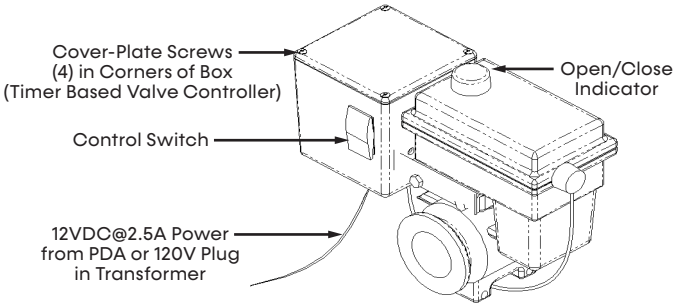
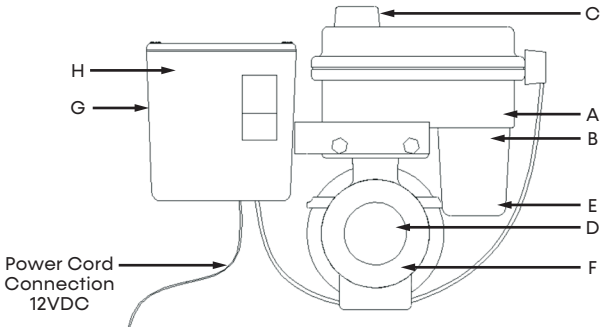


Figure 13: Valve Specifications



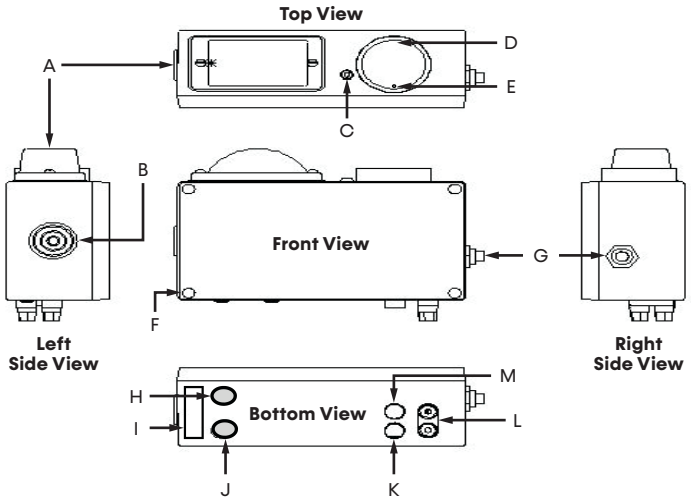
LEGEND

A. Water-resistant polypropylene motor case
B. High torque motors with perma-lub gears
C. Open and close indicator
D. Stainless steel ball valve and hardware
E. Auto reset circuit breaker
F. 90° bi-directional rotation
G. Controller case

Pressure Differential Alarm Package Option

The pressure differential alarm (PDA) option continually monitors and displays the strainer's inlet and outlet differential pressure. When the strainer element (conical strainer basket) becomes significantly clogged, the pressure differential switch-gauge will trigger an audible siren and a visual flashing alarm light. These alarms are intended to alert maintenance personnel that the strainer element must be removed and cleaned (see *Strainer Element Cleaning* section).

Figure 14: Pressure Differential Alarm (PDA) Option



LEGEND

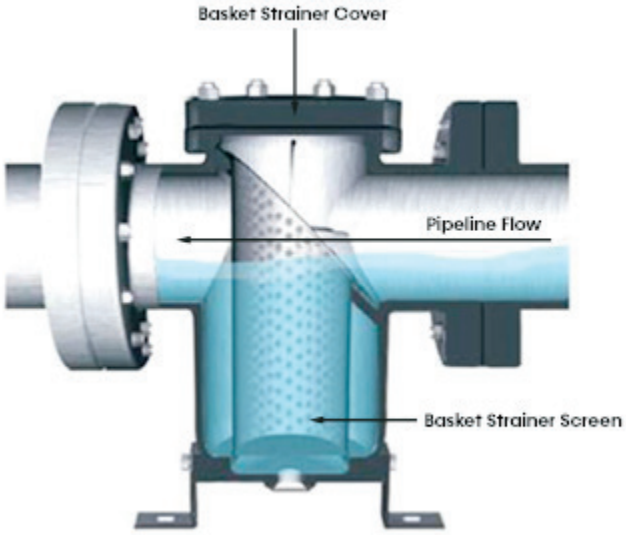
A. Visual Alarm
B. Audible Alarm
C. LED Power Indicator
D. Pressure Differential Switch-Gauge
E. Differential Setpoint Contact
F. Cover-Plate (4) in Corners of Box (DO NOT REMOVE)
G. Alarm Reset Button
H. Power to ATF
I. Cable Retainer
J. 110 Volt/12 Vold DC Wall Transformer
K. PSID Low
L. AUX Contacts (On or Off with Alarm Red & Black)
M. PSID High

Manual Strainers

Field installed to utilize Y-style and basket strainers of cast iron 200 psi or carbon 275 psi with 60 mesh stainless steel screens to increase efficiency and ensure long equipment life. All strainers are field installed external to the chiller bank for ease of service.

Figure 15: WYE Strainer - Flanged Ends

Figure 16: Installed Basket Strainer with Bolted Cover



Simultaneous Heating & Cooling (UWU)

Water-Source SHC models include six (6) headers and integral motorized valves for indexing module for heating or cooling operation.

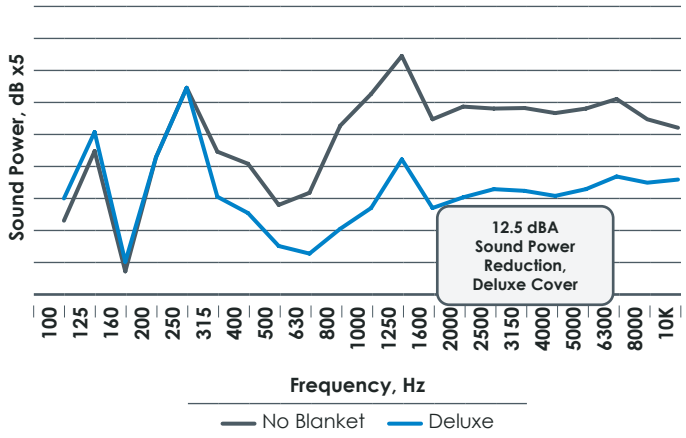
VFDs

Factory installed to allow unit operation below the minimum step of unloading to 45 Hz.

Sound Blankets

Reinforced vinyl envelope wrapped around a fiberglass blanket. Includes an extra layer of sound barrier material for additional noise absorption.

Table 1: Sound Reduction



ELECTRICAL

65 KA SCCR Electrical

The SCCR is the maximum short-circuit current an electrical component can safely withstand without causing a shock or fire hazard. ClimaCool module electrical panels have a default value of 5 KA SCCR. The SCCR for the control panel is determined the lowest SCCR value for any component or branch circuit. This option increases each electrical components' SCCR rating for the module's panel to 65 KA SCCR.

Bank Breaker Panel

The ship loose bank breaker panel (BBP) can be provided with 5 or 65 KA SCCR. The BBP is rated for outdoor install and includes a main disconnect shutoff with lock out tag out (LOTO) capabilities. Each branch contains circuit breakers for individual branch circuit protection. The BBP option also includes a single phase 120V transformer for the CoolLogic Touch.

Figure 17: Bank Breaker Panel

Model Nomenclature Digits 1-15

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
U	W	T	S	3	0	A	F	S	6	0	0	S	0	0

PRODUCT LINE
U = Ultimate Chiller

SOURCE
W = Water

APPLICATION
C = Cooling Only
H = Heat Recovery
T = Heat Pump
U = SHC Heat Pump
W = SHC Heat Recovery

OPTIONS
S = Standard

TONNAGE
30
50
70
80

REV LEVEL
A

VOLTAGE
H = 208V
F = 460V
N = 575V

COMPRESSOR
S = Standard
T = VFD Lead

COMPRESSOR SOUND BLANKETS
0 = No
1 = Yes

SCCR
0 = 5 kAIC
1 = 65 kAIC

CONTROL OPTIONS
S = Standard
1 = Single Module Controls
2 = Auto Stand Alone
3 = Module HMI Only

BRINE
0 = No
1 = Yes

MODULE PASS THROUGH HEADERS[1]
0 = No

WATER HEADER PIPE DIAMETER
6 = 6 inches
8 = 8 inches

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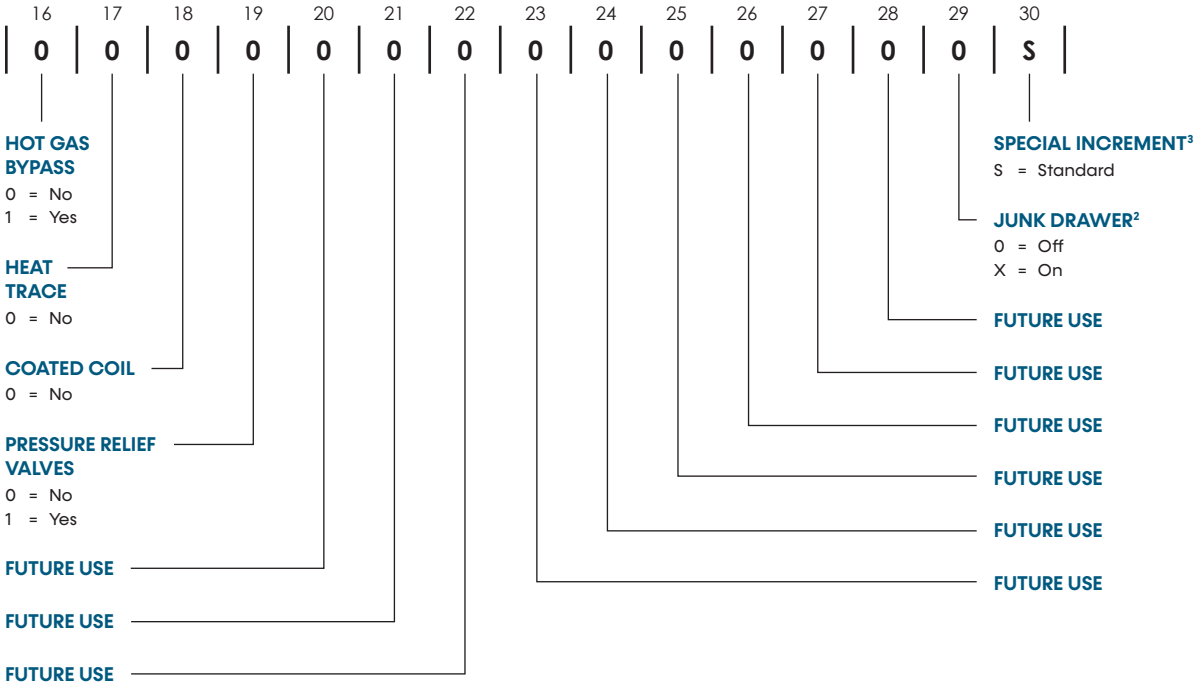
1. This option will be required if the module is intended to be banked with SHC units.

Model Nomenclature Digits 16-30



1. This option will be required if the module is intended to be banked with SHC units.
2. Digit 29 is used to indicate a unit special that does not fall into any other model key digits (ie, paint color).

Table 2: UW Series (Imperial Units)

Model UW	Chiller				Heat Pump				Heat Recovery			
	30	50	70	80	30	50	70	80	30	50	70	80
Capacity (tons)[1]	30.86	48.12	60.82	76.75	30.33	47.58	60.68	71.31	30.33	47.26	59.82	71.31
EER (Cooling Mode)[1]	16.110	16.480	15.990	15.997	15.830	16.295	15.940	15.890	15.830	16.190	15.730	15.890
COP (Heating Mode)[2]	NA	NA	NA	NA	3.42	3.68	3.48	3.62	5.60	6.00	6.13	6.24
Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Compressor Type	Scroll				Scroll				Scroll			
Compressor Quantity	2	2	2	2	2	2	2	2	2	2	2	2
Compressor Nominal Hp (per circuit)	15	25	30	40	15	25	30	40	15	25	30	40
Refrigerant Charge R-454B (lbs)	26.2	48.2	52.2	80.0	26.2	48.2	52.2	80.0	26.2	48.2	52.2	80.0
Module Operating Weight w/Water (lbs)[3]	2,274	2,886	3,018	3,690	2,274	2,886	3,018	3,690	2,274	2,886	3,018	3,690
Module Shipping Weight (lbs)[4]	1,650	2,502	2,634	3,132	1,650	2,502	2,634	3,132	1,650	2,502	2,634	3,132
Condenser	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (gals per HX)	4.80	7.35	9.30	18.00	4.80	7.30	9.00	18.00	4.80	7.35	9.30	18.00
Water Storage Volume HX and Module Piping & Headers (gals per HX)	22.1	25.9	27.6	37.4	22.1	25.9	27.6	37.4	22.1	25.9	27.6	37.4
Min. System Volume (gal)[5]	180	300	420	480	180	300	420	480	180	300	420	480
Max. Design Working Pressure - Water Side (psi)	300	300	300	300	300	300	300	300	300	300	300	300
Header Water Connections - Inlet/Outlet (in.)	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	6 or 8	8
Evaporator	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (gal per HX)	4.10	6.20	7.90	15.25	4.80	7.30	9.00	18.00	4.10	6.20	7.90	15.25
Water Storage Volume HX and Module Piping & Headers (gal per HX)	21.6	24.6	26.2	35.0	22.1	25.9	27.6	37.4	21.6	24.6	26.2	35.0
Min. System Volume (gal)[5]	180	300	420	480	180	300	420	480	180	300	420	480
Max. Design Working Pressure - Water Side (psi)	300	300	300	300	300	300	300	300	300	300	300	300
Header Water Connections - Inlet/Outlet (in.)	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	8

NOTES:

1. Tonnage and EER ratings conditions: 44°F leaving chilled water temperature, 85°F entering and 94.3°F leaving condenser water temperature with a fouling factor of 0.00025 hr-ft²-°F/Btu and 2.4 gpm per ton through the evaporator with a 0.0001 hr-ft²-°F/Btu fouling factor.
2. COP Heating and Heat Recovery modes rating conditions: 65°F entering source water with the same gpm at cooling conditions noted above and 120/140°F hot water.
3. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
4. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
5. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

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Model UW	SHC[1] Heat Pump				SHC[1] Heat Recovery			
	30	50	70	80	30	50	70	80
Capacity (tons)[2]	30.33	47.58	60.68	71.31	30.33	47.26	59.82	71.31
EER (Cooling Mode)[2]	15.830	16.295	15.940	15.890	15.830	16.190	15.730	15.890
COP (Heating Mode)[3]	3.42	3.68	3.48	3.45	5.60	6.00	6.13	6.24
Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Compressor Type	Scroll				Scroll			
Compressor Quantity	2	2	2	2	2	2	2	2
Compressor Nominal Hp (per circuit)	15	25	30	40	15	25	30	40
Refrigerant Charge R-454B (lbs)	26.2	48.2	52.2	80.0	26.2	48.2	52.2	80.0
Module Operating Weight w/Water (lbs)[5]	2,340	3,072	3,372	4,176	2,418	3,324	3,492	4,260
Module Shipping Weight (lbs)[6]	1,956	2,700	3,000	3,576	2,034	3,952	3,120	3,660
Condenser	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (gals per HX)	4.8	7.3	9.0	18.0	4.8	7.3	9.0	18.0
Water Storage Volume HX and Module Piping & Headers (gals per HX)	22.1	25.9	27.6	45.0	22.1	25.9	27.6	45.0
Min. System Volume (gal)[7]	180	300	420	480	180	300	420	480
Max. Design Working Pressure - Water Side (psi)	300	300	300	300	300	300	300	300
Header Water Connections - Inlet/Outlet (in.)	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	6 or 8	8
Evaporator	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (gal per HX)	4.80	7.30	9.00	18.00	4.80	7.30	9.00	15.25
Water Storage Volume HX and Module Piping & Headers (gal per HX)	22.1	25.9	27.6	45.0	22.6	25.6	27.2	36.0
Min. System Volume (gal)[7]	180	300	420	480	180	300	420	480
Max. Design Working Pressure - Water Side (psi)	300	300	300	300	300	300	300	300
Header Water Connections - Inlet/Outlet (in.)	6 or 8	6 or 8	6 or 8	8	6 or 8	6 or 8	6 or 8	8

NOTES:
1. SHC = Simultaneous Heating and Cooling Heat Pump.
2. Tonnage and EER ratings conditions: 44°F leaving chilled water temperature, 85°F entering and 94.3°F leaving condenser water temperature with a fouling factor of 0.00025 hr-ft²-°F/Btu and 2.4 gpm per ton through the evaporator with a 0.0001 hr-ft²-°F/Btu fouling factor.
3. COP Heating Mode rating conditions: 65°F entering source water with the same gpm at cooling conditions noted above and 120/140°F hot water.
4. Heat Recovery mode rating conditions: 44°F leaving chilled water with the same gpm at cooling conditions noted above and 100/120°F hot water.
5. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
6. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
7. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

Table 3: UW Series (Metric Units)

Model UW	Chiller				Heat Pump				Heat Recovery			
	30	50	70	80	30	50	70	80	30	50	70	80
Capacity (kW)[1]	108.53	169.23	213.89	269.92	106.67	167.33	213.40	250.77	106.67	166.21	210.38	250.77
EER (Cooling Mode)[1]	16.110	16.480	15.990	15.997	15.830	16.300	15.940	15.890	15.830	16.190	15.730	15.890
COP (Heating Mode)[2]	NA	NA	NA	NA	3.42	3.68	3.48	3.62	5.60	6.00	6.13	6.24
Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Compressor Type	Scroll				Scroll				Scroll			
Compressor Quantity	2	2	2	2	2	2	2	2	2	2	2	2
Compressor Nominal kW (per circuit)	11.19	18.65	22.38	29.84	11.19	18.65	22.38	29.84	11.19	18.65	22.38	29.84
Refrigerant Charge R-454B (kg)	11.88	21.86	23.67	36.29	11.88	21.86	23.67	36.29	11.88	21.86	23.67	36.29
Module Operating Weight w/Water (kg)[3]	1,031	1,309	1,369	1,674	1,031	1,309	1,369	1,674	1,031	1,309	1,369	1,674
Module Shipping Weight (kg)[4]	748	1,135	1,195	1,421	748	1,135	1,195	1,421	748	1,135	1,195	1,421
Condenser	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (L per HX)	18.17	27.82	35.20	68.14	18.17	27.63	34.07	68.14	18.06	27.82	35.20	68.14
Water Storage Volume HX and Module Piping & Headers (L per HX)	83.66	98.04	104.48	141.57	83.66	98.04	104.48	141.57	83.66	98.04	104.48	141.57
Min. System Volume (L)[5]	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00
Max. Design Working Pressure - Water Side (kPa)	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43	2,068.43
Header Water Connections - Inlet/Outlet (cm)	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32
Evaporator	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (L per HX)	15.52	23.47	29.90	57.73	18.17	27.63	34.07	68.14	15.52	23.47	29.90	57.73
Water Storage Volume HX and Module Piping & Headers (L per HX)	81.76	93.12	99.18	132.49	83.66	98.04	104.48	141.57	81.76	93.12	99.18	132.49
Min. System Volume (L)[5]	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00
Max. Design Working Pressure - Water Side (kPa)	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50	2068.50
Header Water Connections - Inlet/Outlet (cm)	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32

NOTES:

1. Tonnage and EER ratings conditions: 6.67°C leaving chilled water temperature, 29.44°C entering and 34.61°C leaving condenser water temperature with a fouling factor of 0.044 m²·K/kW and 0.06 L/s per ton through the evaporator with a 0.0176 m²·K/kW fouling factor.
2. COP Heating and Heat Recovery modes rating conditions: 65°C entering source water with the same L/s at cooling conditions noted above and 48.89/60°C hot water.
3. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
4. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
5. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

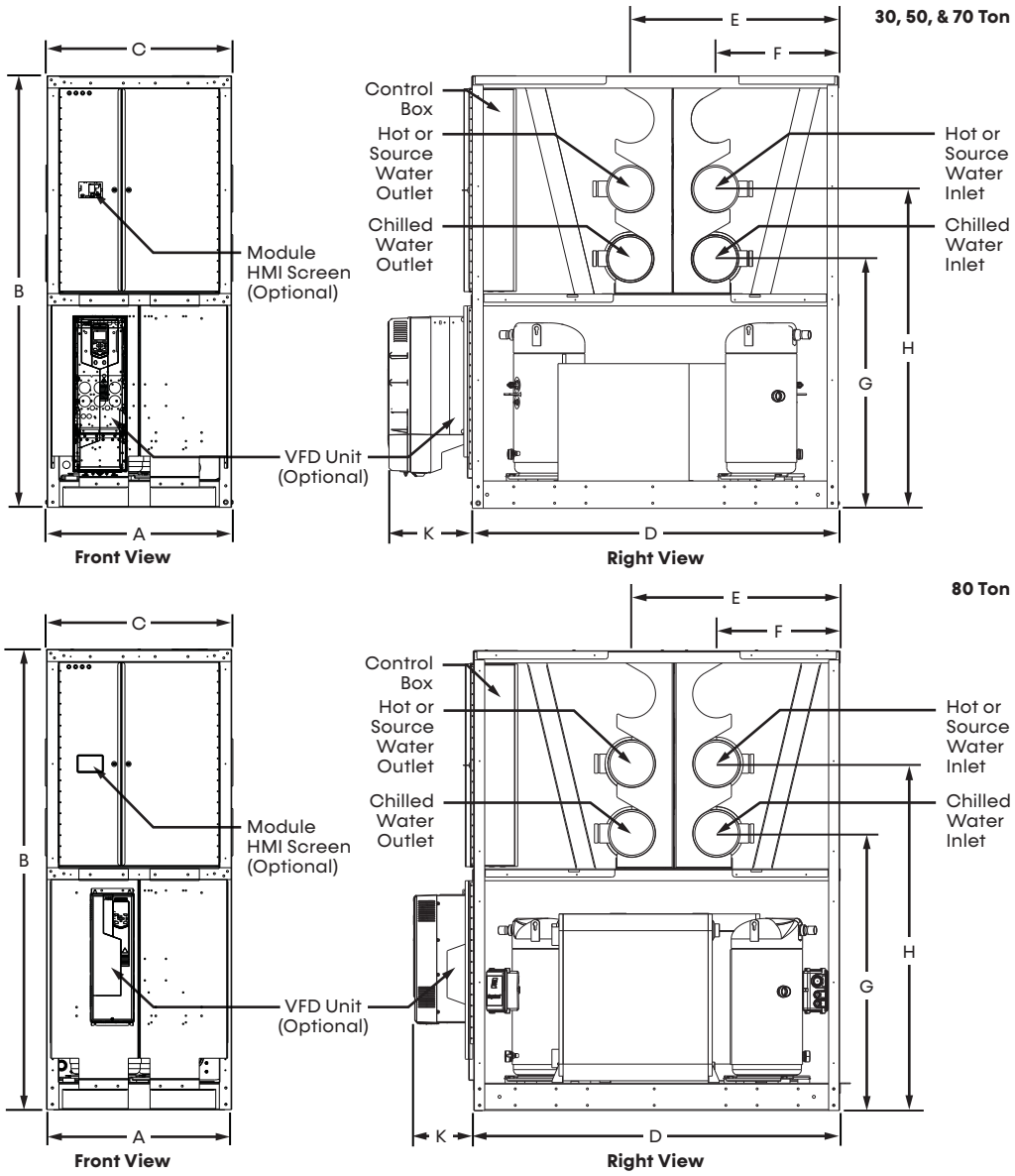
Table Continued on Next Page

Table Continued from Previous Page

Model UW	SHC[1] Heat Pump				SHC[1] Heat Recovery			
	30	50	70	80	30	50	70	80
Capacity (kW)[2]	106.67	167.33	213.40	250.77	106.67	166.21	210.38	250.77
EER (Cooling Mode)[2]	15.830	16.295	15.940	15.89	15.830	16.190	15.730	15.890
COP (Heating Mode)[3]	3.42	3.68	3.48	3.45	5.60	6.00	6.13	6.24
Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Compressor Type	Scroll				Scroll			
Compressor Quantity	2	2	2	2	2	2	2	2
Compressor Nominal kW (per circuit)	11.19	18.65	22.38	29.84	11.19	18.65	22.38	29.84
Refrigerant Charge R-454B (kg)	11.88	21.86	23.67	36.29	11.88	21.86	23.67	36.29
Module Operating Weight w/Water (kg)[5]	1,061	1,393	1,530	1,894	1,094	1,508	1,584	1,932
Module Shipping Weight (kg)[6]	887	1,225	1,361	1,622	923	1,339	1,415	1,660
Condenser	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (L per HX)	18.17	27.63	34.07	68.14	18.06	27.82	35.20	68.14
Water Storage Volume HX and Module Piping & Headers (L per HX)	83.66	98.04	104.48	170.34	83.66	98.04	104.48	136.28
Min. System Volume (L)[7]	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00
Max. Design Working Pressure - Water Side (kPa)	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5
Header Water Connections - Inlet/Outlet (cm)	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32
Evaporator	**30**	**50**	**70**	**80**	**30**	**50**	**70**	**80**
Heat Exchanger (type)	Brazed Plate				Brazed Plate			
Independent Refrigerant Circuits (quantity)	2	2	2	2	2	2	2	2
Water Storage Volume HX Only (L per HX)	18.17	27.63	34.07	68.14	15.52	23.47	29.90	57.73
Water Storage Volume HX and Module Piping & Headers (L per HX)	83.66	98.04	104.48	170.34	85.55	96.91	104.48	136.28
Min. System Volume (L)[7]	681.37	1,135.62	1,589.87	1,817.00	681.37	1,135.62	1,589.87	1,817.00
Max. Design Working Pressure - Water Side (kPa)	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5	2068.5
Header Water Connections - Inlet/Outlet (cm)	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32	15.24 or 20.32	15.24 or 20.32	15.24 or 20.32	20.32

NOTES:
1. SHC = Simultaneous Heating and Cooling Heat Pump.
2. Tonnage and EER ratings conditions: 6.67°C leaving chilled water temperature, 29.44°C entering and 34.61°C leaving condenser water temperature with a fouling factor of 0.044 m²·K/kW and 0.06 L/s per ton through the evaporator with a 0.0176 m²·K/kW fouling factor.
3. COP Heating Mode rating conditions: 65°C entering source water with the same L/s at cooling conditions noted above and 48.89/60°C hot water.
4. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
5. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
6. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

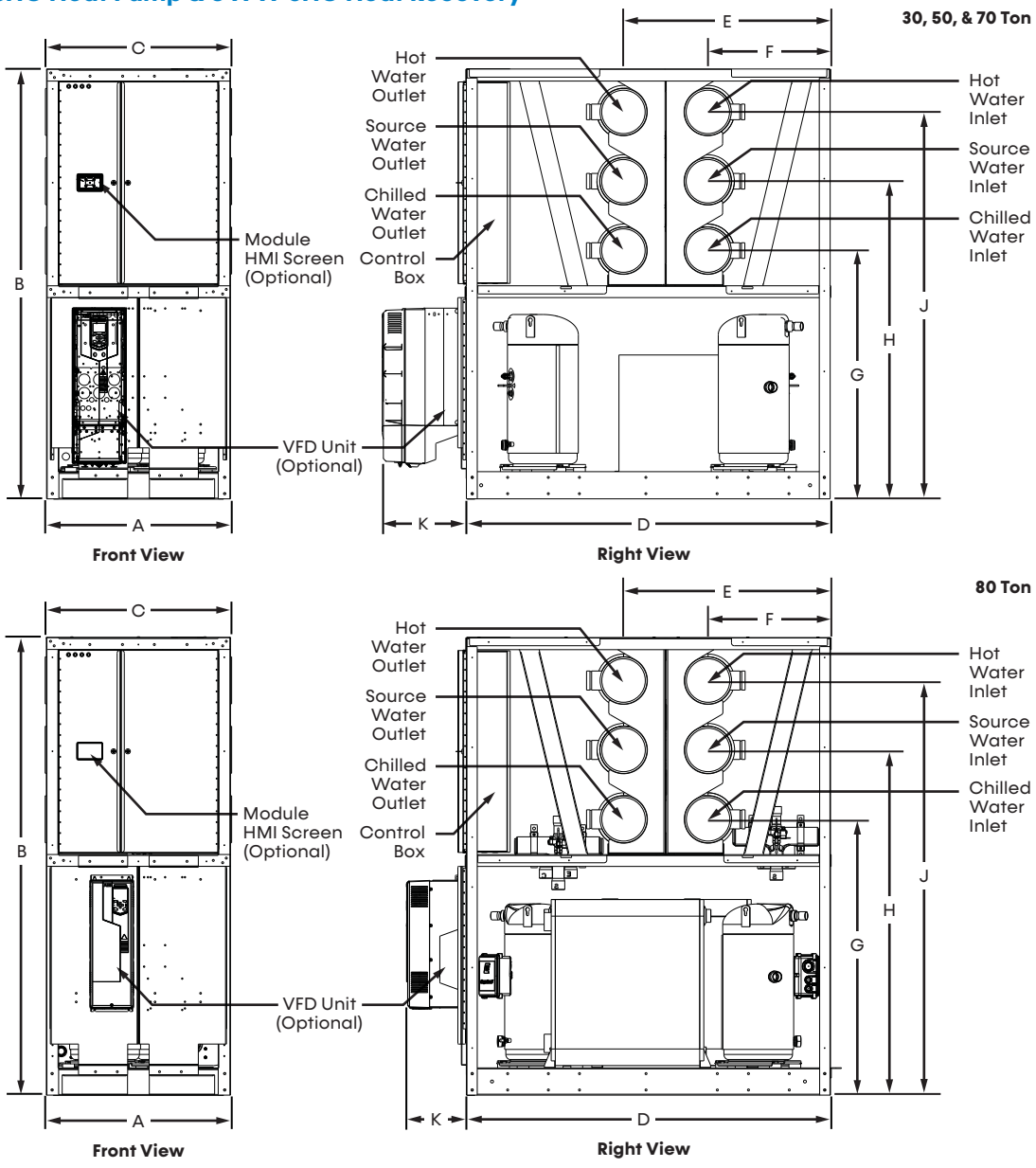
4-Pipe UWT Heat Pump & UWC Chiller



Model UWT & UWC with optional VFD	Voltage	A Outermost Bolt Width	B Base Pan to Top Panel	C Header Length	D Front Corner Post to Rear Corner Post	E Header Location	F Header Location	G Header Location	H Header Location	K Depth of VFD Unit[2]	Header Connection Size
030	208-3-60 460-3-60 575-3-60	33.83 [85.93]	79.05 [200.79]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	45.66 [115.98]	58.41 [148.36]	15.45 [39.12]	6.00 or 8.00 [15.27 or 20.32]
050											
070											
080		33.83 [85.93]	84.05 [200.79]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	50.66 [115.98]	63.41 [148.36]	15.44 [39.12]	8.00 [20.32]

NOTES:
1. Dimensions shown in inches [centimeters].
2. Only present on units with VFD.

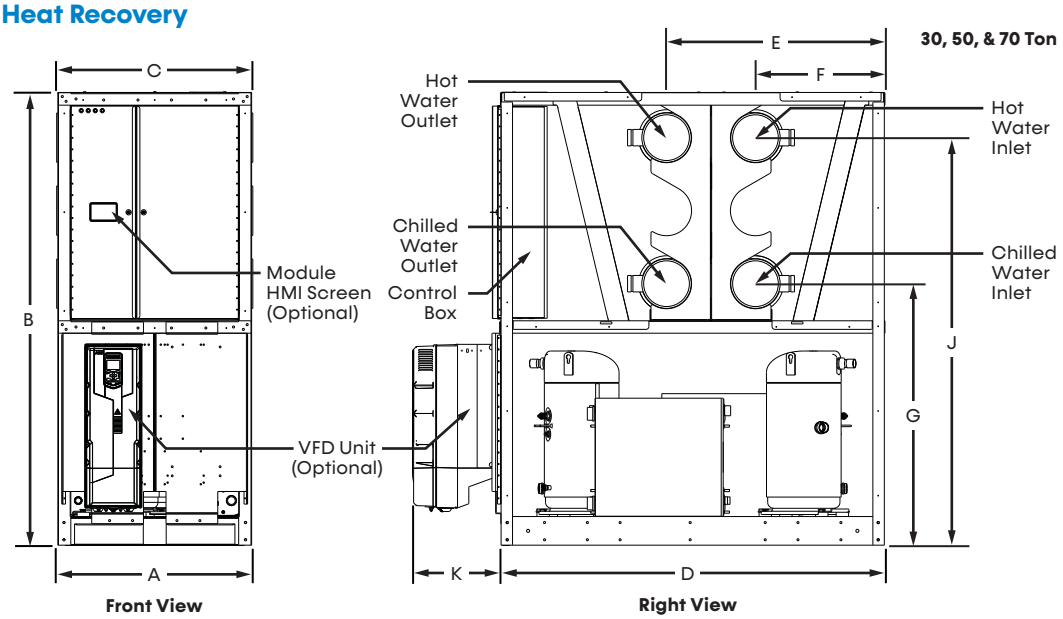
6-Pipe UWU SHC Heat Pump & UWW SHC Heat Recovery

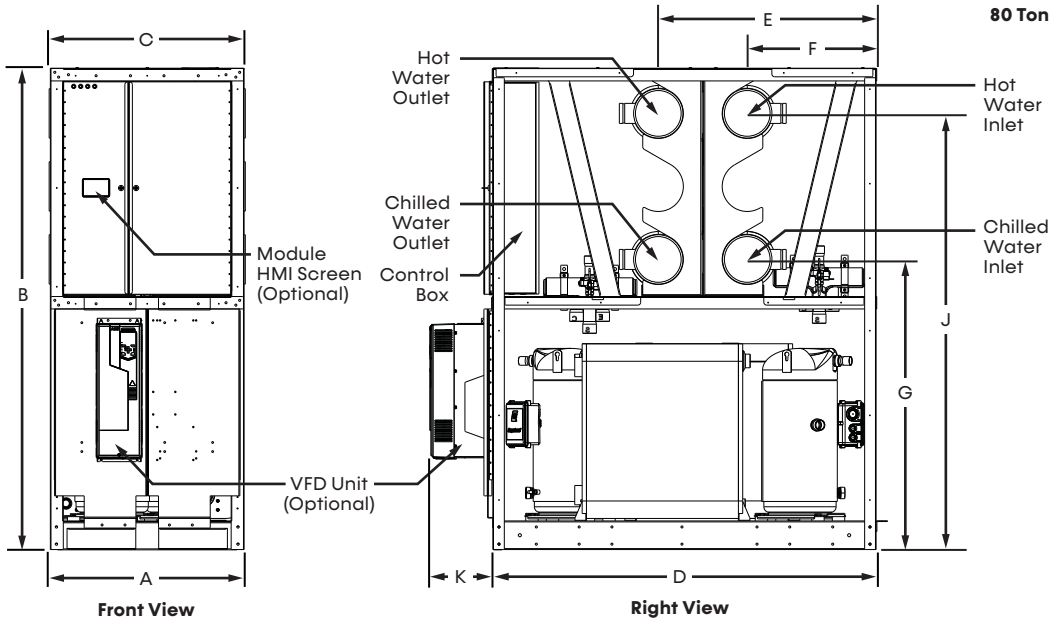


Model UWU & UWW with optional VFD	Voltage	A Outermost Bolt Width	B Base Pan to Top Panel	C Header Length	D Front Corner Post to Rear Corner Post	E Header Location	F Header Location	G Header Location	H Header Location	J Header Location	K Depth of VFD Unit[2]	Header Connection Size
030	208-3-60 460-3-60 575-3-60	33.83 [85.93]	79.05 [200.79]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	45.66 [115.98]	58.41 [148.36]	71.16 [183.29]	15.45 [39.12]	6.00 or 8.00 [15.27 or 20.32]
050												
070												
080		33.83 [85.93]	84.05 [213.49]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	50.66 [115.98]	63.41 [148.36]	76.16 [193.45]	15.44 [39.12]	8.00 [20.32]

NOTES:
1. Dimensions shown in inches [centimeters].
2. Only present on units with VFD.

4-Pipe UWH Heat Recovery

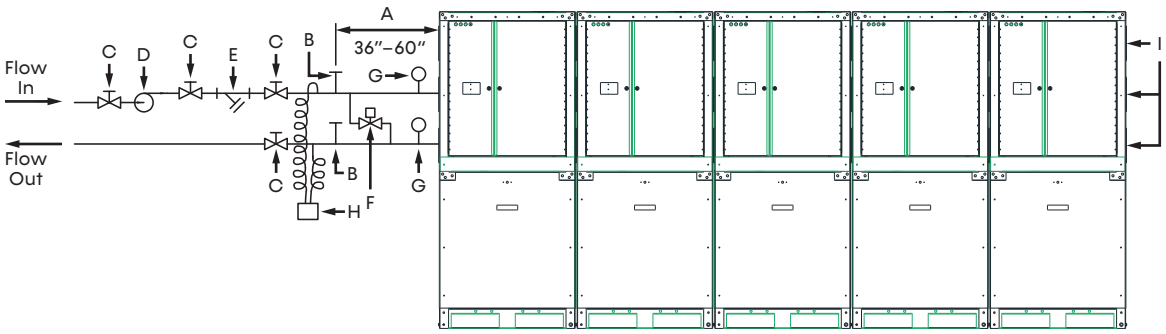




Model UWH with optional VFD	Voltage	A Outermost Bolt Width	B Base Pan to Top Panel	C Header Length	D Front Corner Post to Rear Corner Post	E Header Location	F Header Location	G Header Location	J Header Location	K Depth of VFD Unit[2]	Header Connection Size
030	208-3-60 460-3-60 575-3-60	33.83 [85.93]	79.05 [200.79]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	45.66 [115.98]	71.16 [183.29]	15.45 [39.12]	6.00 or 8.00 [15.27 or 20.32]
050											
070											
080		33.83 [85.93]	84.05 [200.79]	34.25 [86.00]	66.92 [169.98]	38.03 [96.60]	22.50 [57.15]	50.66 [115.98]	76.16 [193.45]	15.44 [39.12]	8.00 [20.32]

NOTES:
1. Dimensions shown in inches [centimeters].
2. Only present on units with VFD.

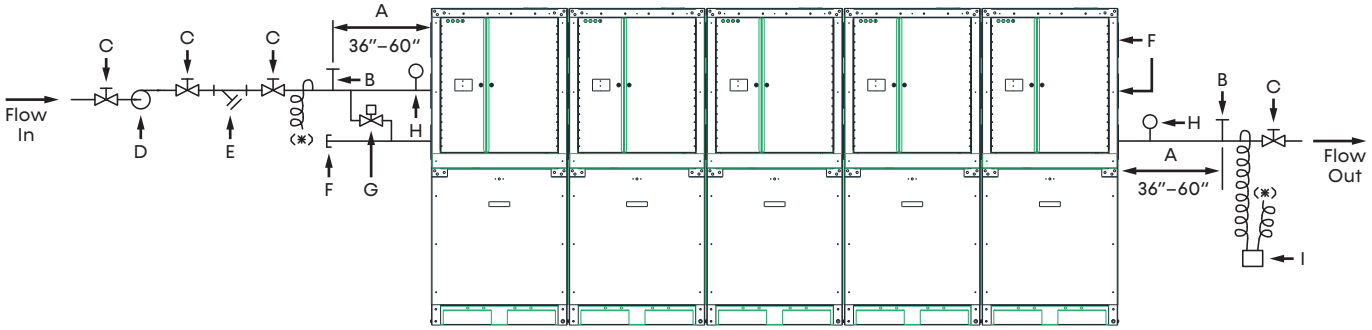
Figure 18: Field Piping Direct Return – 1 to 5 Modules



LEGEND

A. Sensor Location
B. Temp Sensor Well
C. Isolation Valve
D. Pump
E. Strainer
F. Header Bypass Valve
G. Pressure Taps with Shut-Off Valves & Gauges (Optional)
H. Pressure Differential Flow Sensor
I. End Caps

Figure 19: Field Piping Reverse Return – Preferred for 1-5 modules, required for 6 or more modules.



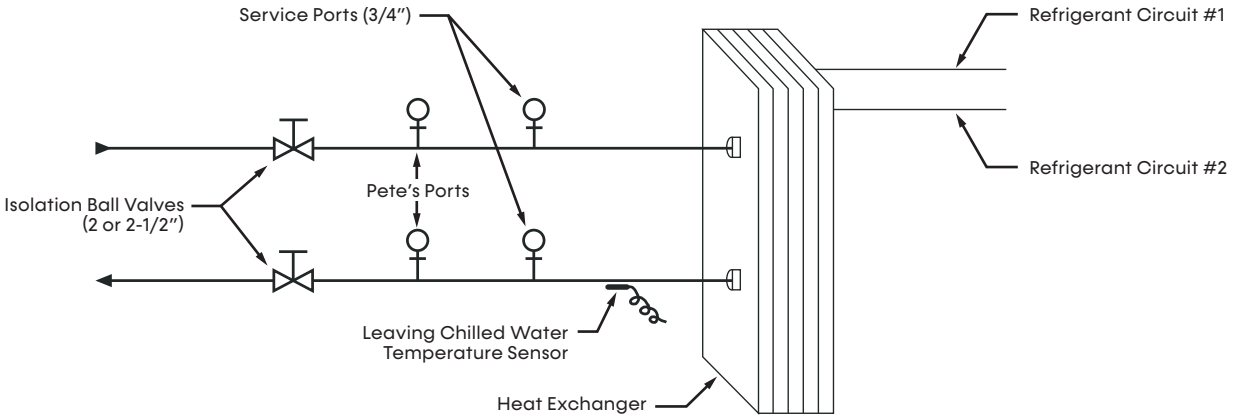
LEGEND

A. Sensor Location
B. Temp Sensor Well
C. Isolation Valve
D. Pump
E. Strainer
F. End Caps
G. Header Bypass Valve
H. Pressure Taps with Shut-Off Valves & Gauges (Optional)
I. Pressure Differential Flow Sensor

NOTES:

1. The above are required piping for proper water regulation and distribution through ClimaCool modular chillers.
2. ClimaCool Standard Bank Package includes shipped loose items to be installed in the field: strainer, temp sensors and wells, DP proof of flow sensors, bypass header kit, end caps and couplings for all water loops. The shown pump, isolation valves, and pressure taps with shut off valves and gauges are provided by others/NOT included.
3. Module order and incoming/outgoing water flow, as shown above, can be set up as either a left-to-right or right-to-left configuration.
4. Source Hydronic Circuit shown. Piping configurations are identical for the chilled water hydronic circuit.
5. For source, hot and chilled water inlet/outlet location dimensions, refer to *Dimensional Data and Drawings*.
6. The differential flow sensor provided as part of the ClimaCool Bank Package is a required proof of flow safety device on all water loops. Install the DP Sensor between the strainer and the entering side of the chiller as well as before the first water take off on the leaving side of the chiller. This sensor is NOT for pump control. The BAS should provide their own DP for VFD/pump control.
7. A minimum first pass, 60 mesh strainer is required on each water loop. The 60 mesh strainer must be installed at time of start-up for valid warranty commencement. Installing dual strainers per water loop avoids bank shut down and is recommended for better redundancy.
8. Maximum water flow rates for systems for 6-inch headers in 1 bank is 1100 gpm and 8-inch headers in 1 bank is 2400 gpm.
9. Bypass header kits are provided & controlled for each water loop for all applications with motorized valves/ VPF (Variable Flow). System bypasses are provided and controlled by others.
10. Header bypass valve may be installed at either end of bank.
11. For over twelve (12) modules, two (2) CoolLogic Touch panels are required. Please consult the factory.

Figure 20: Chilled Water Circuit



NOTE: The figure above depicts hydronic piping in each ClimaCool chiller module and is shown with water isolation valves.

WHAT IS WATER HAMMER?

Water hammer is a phenomenon that can occur in fluid systems with long pipes. Water hammer is a rapid change of pressure caused by a rapid change in velocity. If the flow has been abruptly shut off downstream, the pressure in the entire system is raised very quickly.

What Causes Water Hammer?

Any action that can cause a rapid change in the velocity of the flow can set off a water hammer, such as closing a downstream valve, pump stoppage, etc. Typically, for short lengths of pipe (below 500 feet) downstream valves that are closed within 1/10 of a second can generate water hammer.

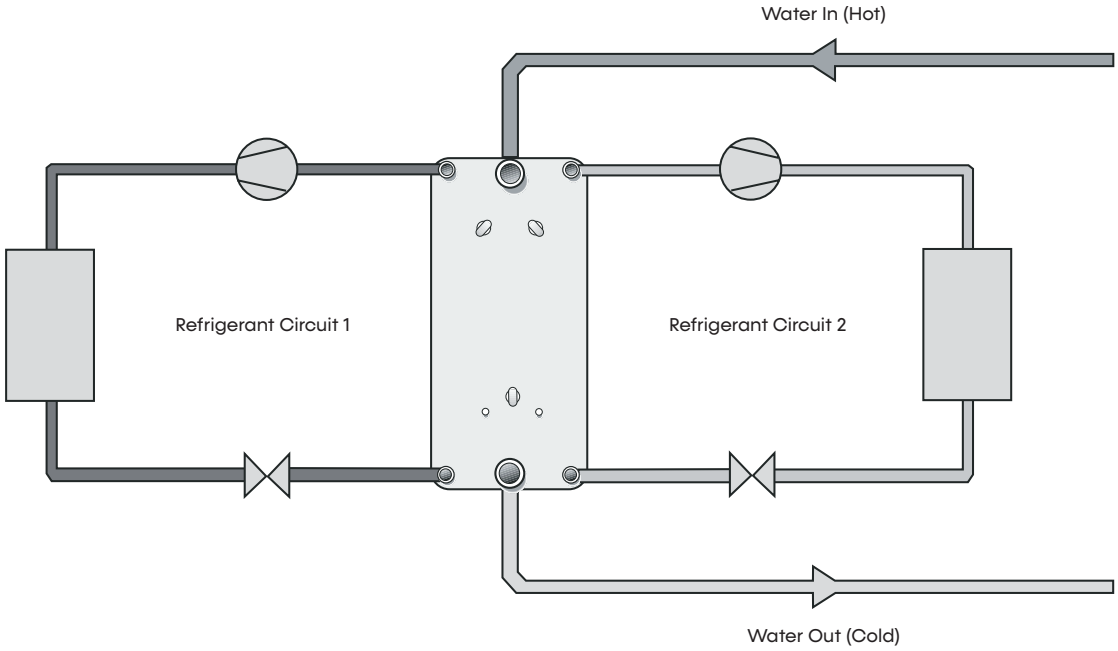
What Can Water Hammer Do?

Pressure spikes from water hammer can raise fluid pressures to dangerously high values. These pressure spikes can cause serious damage to valves, pipes, strainers, joints, etc. The CS strainer is rated to an absolute maximum pressure of 150 psi for bolted lid models, and 125 psi for clamped lid models. A water hammer pressure spike that raises the pressure higher than the maximum rated pressure may result in strainer damage, voiding the manufacturer's warranty.

What Can I Do to Prevent Water Hammer?

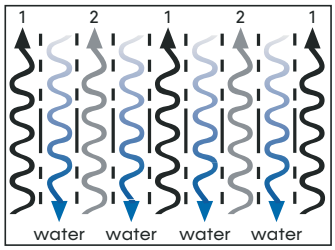
There are certain precautions that can be taken to prevent or decrease the effect of water hammer. The addition of a surge tank or accumulator fitted with a suitable pressure relief valve strategically located within the water system may provide adequate protection against the effects from water hammer. Careful attention should be given to the design and control strategy for valves and pumps so their actions do not invite a water hammer.

ClimaCool modular chillers employ reliable and highly efficient brazed plate heat 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.



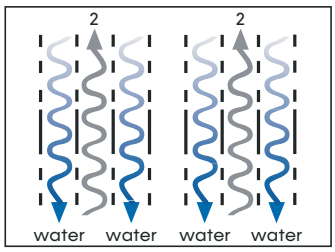
Coil design provides optimum performance in both Full and Partial Load.

Figure 21: Refrigerant Circuits 1 and 2



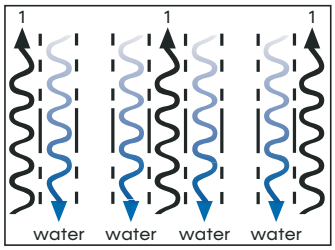
Of course, full performance is attained when the dual-circuit heat exchangers are run to full-load (i.e. with both refrigerant circuits).

Figure 22: Refrigerant Circuit 2 Only



If circuit 1 is cut, the unique design allows each water channel to remain in contact with refrigerant circuit 2, providing optimum heat transfer.

Figure 23: Refrigerant Circuit 1 Only



The same results are achieved if circuit 1 is ran and circuit 2 cut out; optimum heat transfer, even at part-load.

Water quality is of the utmost importance for the proper care and maintenance of the modular chiller system. Proper water treatment is a specialized industry and it is recommended to consult an expert in this field to analyze the water for compliance with the water quality parameters listed. The materials 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 user's responsibility to ensure these materials are compatible with the treated water. Regular treatment of the water will increase longevity of your system. **Failure to provide adequate filtration or treatment of brazed-plate heat exchanger water will void the ClimaCool module's warranty.**

HEAVILY CONTAMINATED WATER

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

Table 4: Water Quality Parameters

Water Containing	Concentration
Ammonia	Less than 2.0 mg/l
$CaCO_3$ Alkalinity	30 - 500 mg/l
$CaCO_3$ Hardness	30 - 500 mg/l
Chlorides	Less than 200 mg/l
Dissolved Solids	Less than 1000 mg/l
Iron	Less than 5.0 mg/l
Manganese	Less than 0.4 mg/l
Nitrate	Less than 100 mg/l
pH	7.0 - 9.0
Sulphate	Less than 200 mg/l

⚠ CAUTION

Excessive chlorine, undissolved solids and other improper water conditions **WILL DAMAGE** the internal heat exchanger and **WILL VOID YOUR WARRANTY!**

Table 5: Water Temperature Requirements

Load Loops	Minimum LWT[4]	Maximum LWT[4]
Chilled Water	20°F [-6.67°C][1]	62°F [16.67°C]
Hot Water	75°F [2.39°C]	135°F [60.00°C] (at 40°F [4.44°C] ambient or above)

NOTES:

1. Operating in ambient temperatures below 36°F (2.2°F) requires a suitable antifreeze solution.
2. All modules can operate in this range without the need of special controls.
3. A glycol solution additive is required at a lower operating suction temperatures in order to protect the evaporator from freeze-ups.
4. LWT: Leaving Water Temperature.
5. **When the chiller is exposed to lower ambient temperatures of 36°F (2.2 °C) or below, freeze-up protection is required using inhibited ethylene or propylene glycol. 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 are not covered by ClimaCool warranty.**
6. The max LHWT will be limited in heating mode as the outdoor ambient falls.

⚠ ATTENTION

This chiller is configured for brine duty with a minimum LWT of 20°F (6.7 C).

It is the facility's responsibility to maintain the brine freeze-point adequately below the lowest water and ambient temperatures that the chiller will see.

Table 6: Flow and Water Temperature Data – UW 4- & 6-Pipe Heat Pump & Heat Recovery

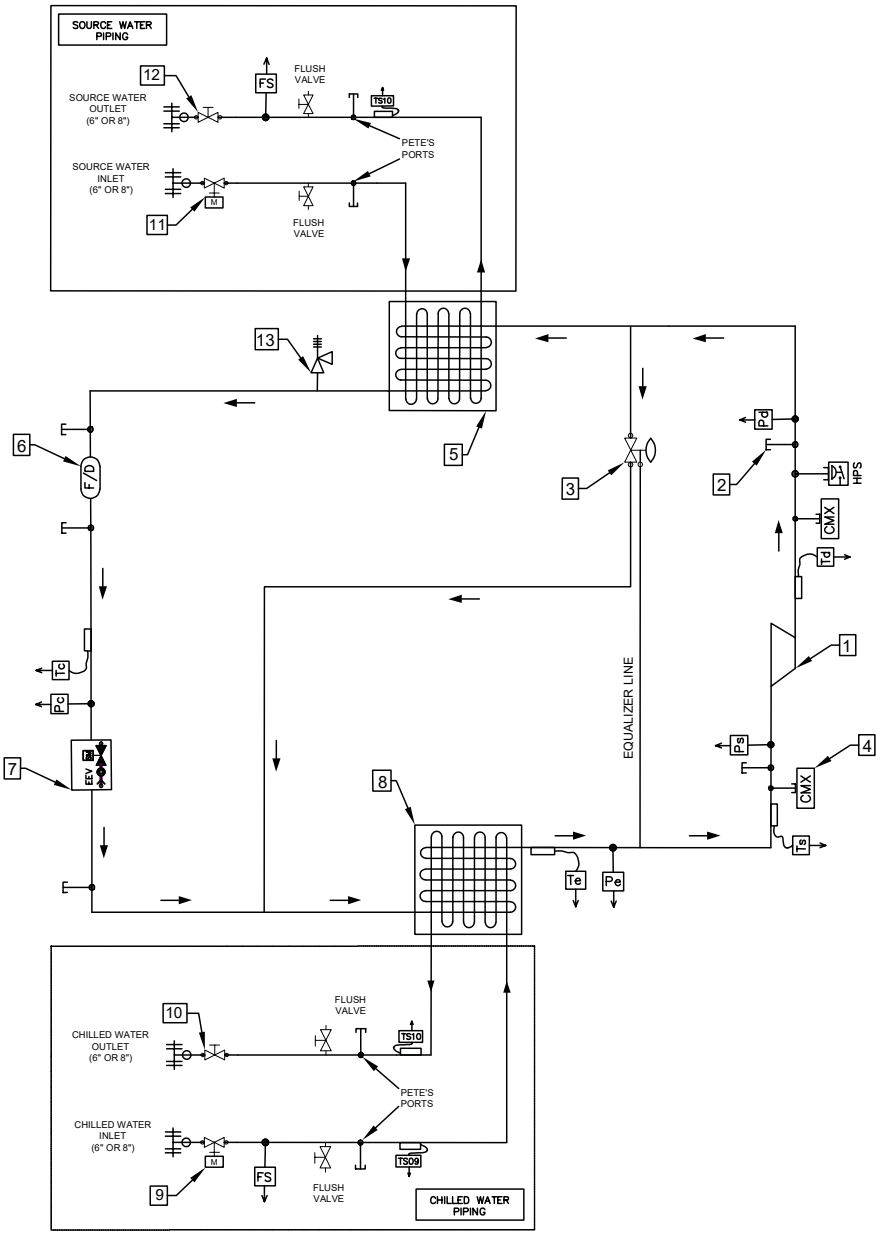
Cooling Mode	30	50	70	80
Minimum Load Water Flow – gpm [m3/min] [1]	31 [0.12]	48 [0.18]	61 [0.23]	65 [0.25]
Maximum Load Water Flow – gpm [m3/min] [1]	140 [0.53]	220 [0.83]	234 [0.87]	256 [0.97]
Minimum Entering Evaporator Water Temperature – °F [°C]	45 [7.22]	45 [7.22]	45 [7.22]	45 [7.22]
Maximum Entering Evaporator Water Temperature – °F [°C]	85 [29.44]	85 [29.44]	85 [29.44]	85 [29.44]
Minimum Leaving Chilled Water Temperature (No Glycol) – °F [°C]	40 [4.44]	40 [4.44]	40 [4.44]	40 [4.44]
Minimum Leaving Chilled Water Temperature (with Glycol) – °F [°C]	20 [-6.67]	20 [-6.67]	20 [-6.67]	20 [-6.67]
Maximum Leaving Chilled Water Temperature – °F [°C]	65 [18.33]	65 [18.33]	65 [18.33]	65 [18.33]
Minimum Chilled Water Differential Temperature – °F [°C] [2]	5 [2.78]	5 [2.78]	6 [3.33]	6 [3.33]
Maximum Chilled Water Differential Temperature – °F [°C]	23 [12.78]	23 [12.78]	23 [12.78]	23 [12.78]
Minimum Leaving Source Water Temperature – °F [°C]	65 [18.33]	65 [18.33]	65 [18.33]	65 [18.33]
Maximum Leaving Source Water Temperature – °F [°C]	140 [60.0]	140 [60.0]	140 [60.0]	140 [60.0]
Minimum Source Water Differential Temperature – °F [°C] [2]	10 [5.56]	10 [5.56]	10 [5.56]	10 [5.56]
Maximum Source Water Differential Temperature – °F [°C]	30 [16.67]	30 [16.67]	30 [16.67]	30 [16.67]
Heating Mode	**30**	**50**	**70**	**80**
Minimum Load Water Flow – gpm [m3/min] [1]	29 [0.11]	45 [0.17]	57 [0.22]	73 [0.28]
Maximum Load Water Flow – gpm [m3/min] [1]	158 [0.60]	245 [0.93]	315 [1.19]	333 [1.26]
Minimum Entering Hot Water Temperature – °F [°C]	45 [7.22]	45 [7.22]	45 [7.22]	45 [7.22]
Minimum Leaving Hot Water Temperature – °F [°C]	65 [18.33]	65 [18.33]	65 [18.33]	65 [18.33]
Maximum Entering Hot Water Temperature – °F [°C]	130 [54.44]	130 [54.44]	130 [54.44]	130 [54.44]
Maximum Leaving Hot Water Temperature – °F [°C]	140 [60.0]	140 [60.0]	140 [60.0]	140 [60.0]
Minimum Hot Water Differential Temperature – °F [°C] [2]	10 [5.56]	10 [5.56]	10 [5.56]	10 [5.56]
Maximum Hot Water Differential Temperature – °F [°C]	30 [16.67]	30 [16.67]	30 [16.67]	30 [16.67]
Minimum Leaving Source Water Temperature – °F [°C] [2]	40 [4.44]	40 [4.44]	40 [4.44]	40 [4.44]
Maximum Leaving Source Water Temperature – °F [°C]	70 [21.11]	70 [21.11]	65 [18.33]	65 [18.33]
Minimum Source Water Differential Temperature – °F [°C]	5 [2.78]	5 [2.78]	6 [3.33]	6 [3.33]
Maximum Source Water Differential Temperature – °F [°C]	23 [12.78]	23 [12.78]	23 [12.78]	23 [12.78]

NOTES:
1. Minimum flows are based on maximum ΔT's and Maximum flows are based on minimum ΔT's.
2. Minimum ΔT's are based on minimum ΔP's (0.5 PSI)
3. Water temperatures below 40°F (4.44°C) require a suitable antifreeze solution.
4. If project operating parameters are needed outside of the above values, please contact your local sales representative.

Table 7: Flow and Water Temperature Data – UW 4-Pipe Chiller

Evaporator	30	50	70	80
Minimum Chilled Water Flow – gpm [m3/min] [1]	30 [0.11]	47 [0.18]	60 [0.23]	78 [0.30]
Maximum Chilled Water Flow – gpm [m3/min] [1]	121 [0.46]	192 [0.73]	244 [0.92]	307 [1.16]
Minimum Entering Chilled Water Temperature – °F [°C]	45 [7.22]	45 [7.22]	45 [7.22]	45 [7.22]
Maximum Entering Chilled Water Temperature – °F [°C]	85 [29.44]	85 [29.44]	85 [29.44]	85 [29.44]
Minimum Leaving Chilled Water Temperature (No Glycol) – °F [°C]	40 [4.44]	40 [4.44]	40 [4.44]	40 [4.44]
Minimum Leaving Chilled Water Temperature (with Glycol) – °F [°C]	20 [-6.67]	20 [-6.67]	20 [-6.67]	20 [-6.67]
Maximum Leaving Chilled Water Temperature – °F [°C]	65 [18.33]	65 [18.33]	65 [18.33]	65 [18.33]
Minimum Chilled Water Differential Temperature – °F [°C] [2]	5 [2.78]	5 [2.78]	5 [2.78]	5 [2.78]
Maximum Chilled Water Differential Temperature – °F [°C]	23 [12.78]	23 [12.78]	23 [12.78]	23 [12.78]
Condenser	**30**	**50**	**70**	**80**
Minimum Source Water Flow – gpm [m3/min] [1]	31 [0.12]	48 [0.18]	61 [0.23]	77 [0.29]
Maximum Source Water Flow – gpm [m3/min] [1]	137 [0.52]	215 [0.81]	235 [1.19]	344 [1.30]
Minimum Entering Source Water Temperature – °F [°C]	45 [7.22]	45 [7.22]	45 [7.22]	45 [7.22]
Maximum Entering Source Water Temperature – °F [°C]	130 [54.44]	130 [54.44]	130 [54.44]	130 [54.44]
Minimum Leaving Source Water Temperature – °F [°C]	65 [18.33]	65 [18.33]	65 [18.33]	65 [18.33]
Maximum Leaving Source Water Temperature – °F [°C]	115 [46.11]	115 [46.11]	115 [46.11]	115 [46.11]
Minimum Source Water Differential Temperature – °F [°C] [2]	10 [5.56]	10 [5.56]	10 [5.56]	10 [5.56]
Maximum Source Water Differential Temperature – °F [°C]	30 [16.67]	30 [16.67]	30 [16.67]	30 [16.67]

5. Minimum flows are based on maximum ΔT's and Maximum flows are based on minimum ΔT's.
6. Minimum ΔT's are based on minimum ΔP's (0.5 PSI)
7. Water temperatures below 40°F (4.44°C) require a suitable antifreeze solution.
8. If project operating parameters are needed outside of the above values, please contact your local sales representative.



COMPONENT LEGEND

1. COMPRESSOR
2. PRESSURE ACCESS FITTING
3. HOT GAS BYPASS VALVE (IF USED)
4. COREMAX VALVE
5. BRAZED PLATE HEAT EXCHANGER - SOURCE
6. FILTER DRIER
7. ELECTRONIC EXPANSION VALVE
8. BRAZED PLATE HEAT EXCHANGER - LOAD
9. MOTORIZED CHILLER WATER INLET VALVE
10. CHILLER WATER OUTLET VALVE
11. MOTORIZED CONDENSER WATER INLET VALVE
12. CONDENSER WATER OUTLET VALVE
13. PRESSURE RELIEF VALVE

ABBREVIATIONS

PRESSURE TRANSDUCER

Pe = ELECTRONIC EXPANSION VALVE
Ps = SUCTION
Pd = DISCHARGE
Pc = COOLING

TEMPERATURE SENSOR

Te = ELECTRONIC EXPANSION VALVE
Ts = SUCTION
Td = DISCHARGE
Tc = COOLING

TS09 = INLET
TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH

← = COOLING

CLIMACOOL®

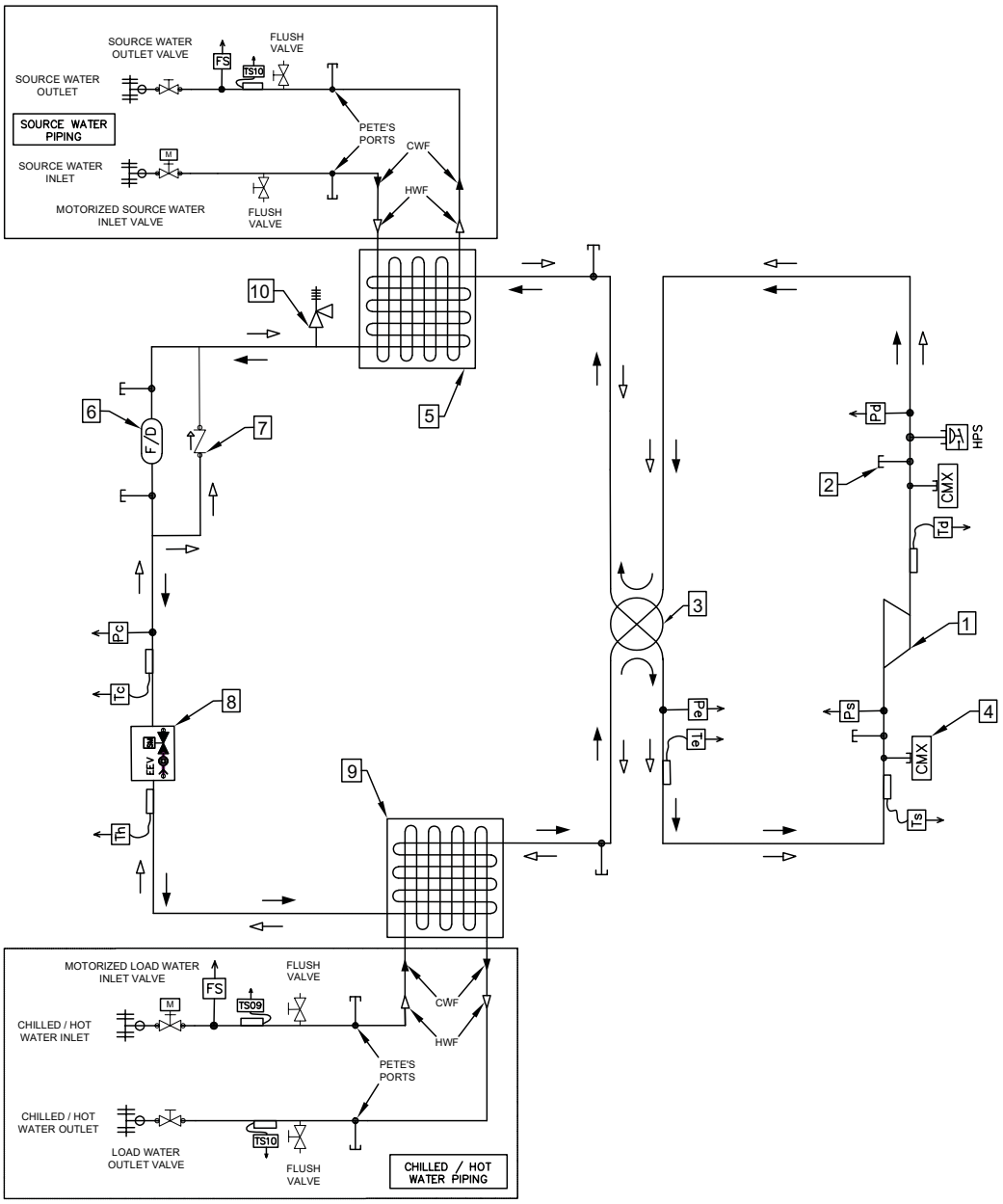
TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: PACKAGED WATER COOLED MODULAR COOLING ONLY (4-PIPE) CLIMACOOL MODEL # UWC (030/050/070/085)

SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

REVISION BY: EA
DATE: JUN-2024
SHEET: 1 OF 1

REV: B



COMPONENT LEGEND

1. COMPRESSOR
2. PRESSURE ACCESS FITTING
3. REVERSING VALVE
4. COREMAX VALVE
5. BRAZED PLATE HEAT EXCHANGER - SOURCE
6. FILTER DRIER
7. CHECK VALVE
8. ELECTRONIC EXPANSION VALVE
9. BRAZED PLATE HEAT EXCHANGER - LOAD
10. PRESSURE RELIEF VALVE

ABBREVIATIONS

PRESSURE TRANSDUCER

Pe = ELECTRONIC EXPANSION VALVE
Ps = SUCTION
Pd = DISCHARGE
Pc = COOLING

TEMPERATURE SENSOR

Te = ELECTRONIC EXPANSION VALVE
Ts = SUCTION
Td = DISCHARGE
Tc = COOLING
Th = HEATING

TS09 = INLET
TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH
CWF = CHILLED WATER FLOW
HWF = HOT WATER FLOW

= HEATING
= COOLING

CLIMACOOL®

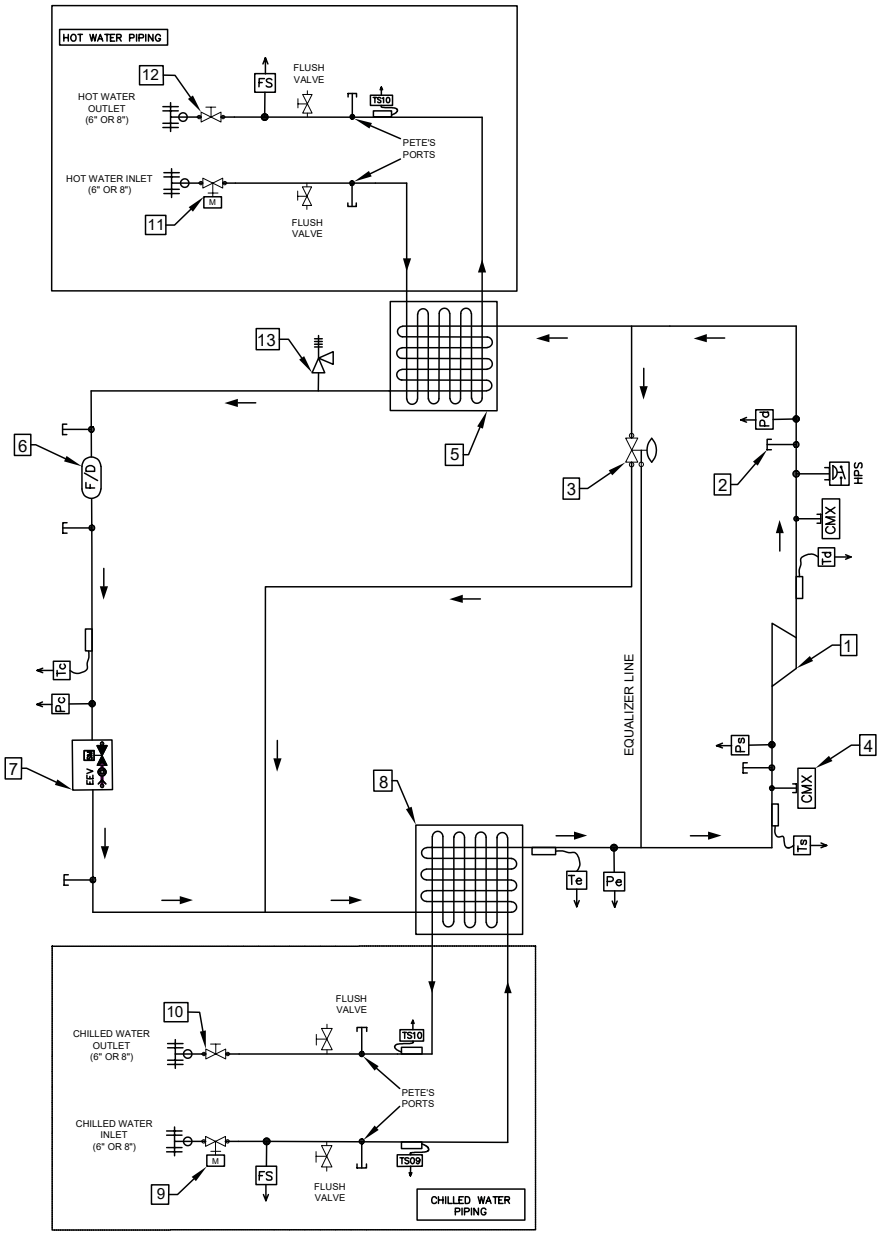
TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: PACKAGED WATER COOLED MODULAR HEAT PUMP CHILLER (4-PIPE) CLIMACOOL MODEL UWT(030/050/070/080)-HP

SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

REVISION BY: EA
DATE: AUG-2024
SHEET: 1 OF 1

REV: C



COMPONENT LEGEND

1. COMPRESSOR
2. PRESSURE ACCESS FITTING
3. HOT GAS BYPASS VALVE (IF USED)
4. COREMAX VALVE
5. BRAZED PLATE HEAT EXCHANGER - SOURCE
6. FILTER DRIER
7. ELECTRONIC EXPANSION VALVE
8. BRAZED PLATE HEAT EXCHANGER - LOAD
9. MOTORIZED CHILLER WATER INLET VALVE
10. CHILLER WATER OUTLET VALVE
11. MOTORIZED CONDENSER WATER INLET VALVE
12. CONDENSER WATER OUTLET VALVE
13. PRESSURE RELIEF VALVE

ABBREVIATIONS

PRESSURE TRANSDUCER

Pe = ELECTRONIC EXPANSION VALVE
Ps = SUCTION
Pd = DISCHARGE
Pc = COOLING

TEMPERATURE SENSOR

Te = ELECTRONIC EXPANSION VALVE
Ts = SUCTION
Td = DISCHARGE
Tc = COOLING

TS09 = INLET
TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH

← = COOLING

CLIMACOOL®

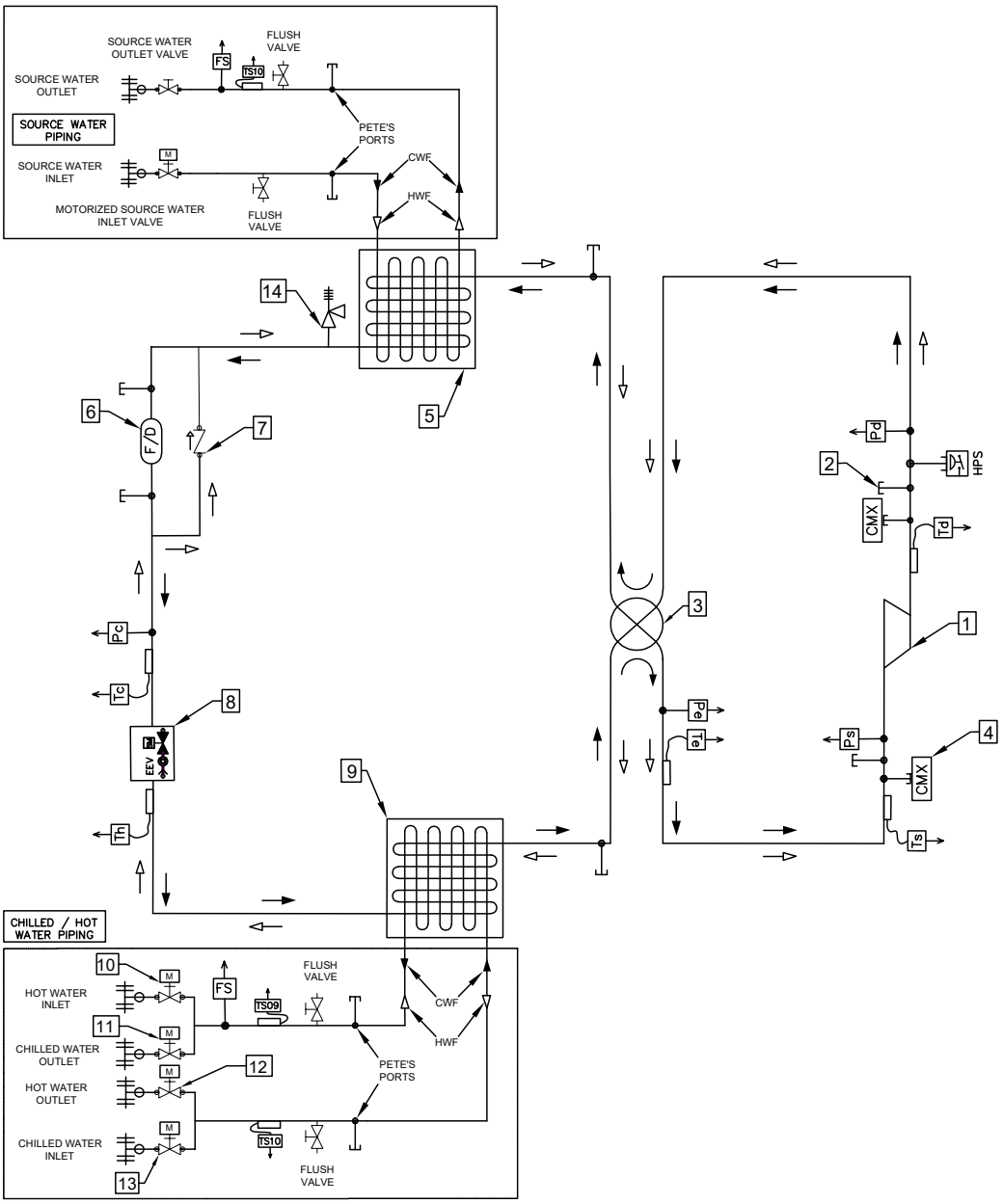
TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: PACKAGED WATER COOLED MODULAR HEAT RECOVERY (4-PIPE) CLIMACOOL MODEL # UWH (030/050/070/085) - HR

SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

REVISION BY: EA
DATE: JUN-2024
SHEET: 1 OF 1

REV: B



COMPONENT LEGEND

1. COMPRESSOR
2. PRESSURE ACCESS FITTING
3. REVERSING VALVE
4. COREMAX VALVE
5. BRAZED PLATE HEAT EXCHANGER - SOURCE
6. FILTER DRIER
7. CHECK VALVE
8. ELECTRONIC EXPANSION VALVE
9. BRAZED PLATE HEAT EXCHANGER - LOAD
10. MOTORIZED HOT WATER INLET VALVE
11. MOTORIZED CHILLED WATER OUTLET VALVE
12. MOTORIZED HOT WATER OUTLET VALVE
13. MOTORIZED CHILLED WATER INLET VALVE
14. PRESSURE RELIEF VALVE

ABBREVIATIONS

PRESSURE TRANSDUCER

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Td = DISCHARGE
Tc = COOLING
Th = HEATING
TS09 = INLET
TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH
CWF = CHILLED WATER FLOW
HWF = HOT WATER FLOW
= HEATING
= COOLING

CLIMACOOL®

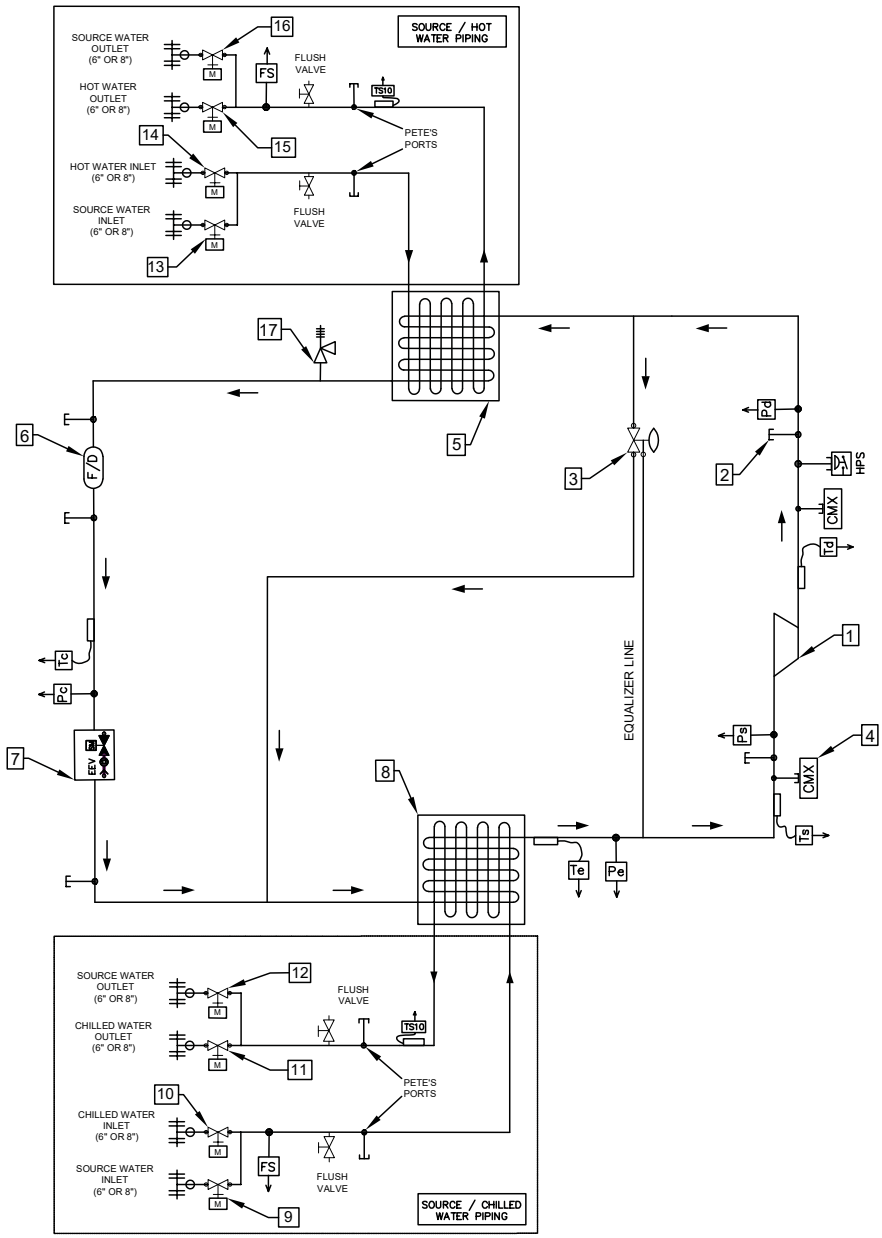
TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: PACKAGED WATER COOLED MODULAR SHC HEAT PUMP CHILLER (6-PIPE) CLIMACOOL MODEL UWU(030/050/070/080)-SHC HP

SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

REVISION BY: EA
DATE: AUG-2024
SHEET: 1 OF 1

REV: C



COMPONENT LEGEND

1. COMPRESSOR
2. PRESSURE ACCESS FITTING
3. HOT GAS BYPASS VALVE (IF USED)
4. COREMAX VALVE
5. BRAZED PLATE HEAT EXCHANGER - SOURCE
6. FILTER DRIER
7. ELECTRONIC EXPANSION VALVE
8. BRAZED PLATE HEAT EXCHANGER - LOAD
9. MOTORIZED SOURCE WATER INLET VALVE
10. MOTORIZED CHILLER WATER INLET VALVE
11. MOTORIZED CHILLER WATER OUTLET VALVE
12. MOTORIZED SOURCE WATER OUTLET VALVE
13. MOTORIZED SOURCE WATER INLET VALVE
14. MOTORIZED HOT WATER INLET VALVE
15. MOTORIZED HOT WATER OUTLET VALVE
16. MOTORIZED SOURCE WATER OUTLET VALVE
17. PRESSURE RELIEF VALVE

ABBREVIATIONS

PRESSURE TRANSDUCER

Pe = ELECTRONIC EXPANSION VALVE
Ps = SUCTION
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Pc = COOLING

TEMPERATURE SENSOR

Te = ELECTRONIC EXPANSION VALVE
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Td = DISCHARGE
Tc = COOLING

TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH

← = COOLING

CLIMACOOL®

TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: PACKAGED WATER COOLED MODULAR SHC HEAT RECOVERY CHILLER (6-PIPE) CLIMACOOL MODEL # UWW (030/050/070/080) - SHC HR

SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

REVISION BY: EA
DATE: AUG-2024
SHEET: 1 OF 1

REV: C

GENERAL

Factory-assembled and wired water cooled water chiller. Chiller consists of two compressors, one evaporator and one condenser, safety and operational controls. The modular water cooled package chiller shall incorporate one or more modules with two independent refrigerant circuits. Modules shall be capable of independent operation powered by a field installed fused disconnect switch (or equivalent circuit breaker) supplied by others, so that any one module can be shut down for repair without interrupting the remaining chiller modules in operation.

BASIC CONSTRUCTION

The frame design shall consist of heavy gauge galvanized steel with 3 mil powder-coat paint finish baked at 350°F (176.67°C) for resilience in transport and installation and service access panels made of 18 gauge sheet metal with powder coat paint finish and quick release half turn latches. The module must have a low center of gravity, detachable schedule 40 carbon steel pipe water headers, designed to connect to adjacent modules through the use of 300 PSI rated grooved couplings, base with cutouts for forklifts or pallet jacks and the frame must be designed to fit through a standard 36-inch doorway. Each module has sound attenuation panels to ensure quiet operation

REFRIGERATION CIRCUIT

Each independent circuit shall consist of a scroll compressor, crankcase heater, and thermostatic expansion valve for refrigerant metering, sight glass, filter drier, solenoid valve, high and low pressure controls and safety controls. The modular chiller bank must be able to produce chilled water even in the event of a failure of one or more refrigerant circuits.

EVAPORATOR AND CONDENSER

Each evaporator and condenser shall be dual-circuited, brazed plate heat exchangers constructed of stainless steel; UL Listed and Labeled. The evaporator and condenser heat exchangers shall be mounted to eliminate the effects of migration of refrigerant to the cold evaporation with consequent liquid slugging on startup. The evaporator and condenser shall each be mounted on two layers of noise-attenuating rubber isolation pads which also act as a thermal barrier. The evaporator and condenser shall be wrapped with ¾-inch closed cell insulated blanket. The closed cell insulation shall be provided on suction side refrigerant tubing including refrigerant-to-chiller heat exchanger to prevent condensation.

COMPRESSORS

Each module shall contain two scroll compressors independently circuited for redundancy. Each compressor shall be mounted with rubber isolated compressor mounts to the module base and each shall include compressor overload protection, high discharge pressure and low suction pressure cutouts.

MODULE CONTROLLERS

Module Controllers shall be provided for individual control as well as system integration. The control shall consist of a Cat 5e or higher Ethernet cable connected via home run back to the bank control panel. The packaged water source chiller control panel shall be a NEMA Type 1 enclosure including: power distribution block, compressor fusing, contactors, finger safe control fusing, transformer, isolation relays, status and alarm relay, 32-bit microprocessor bank controller with built in native Building Automation System (BAS) communication protocols, (BACnet), status indicating lights showing:

1. Compressor operation (on/off),
2. Unit alarm status,
3. Power on, two toggle switches to disable each individual compressor during start-up or troubleshooting.

COOLLOGIC TOUCH BANK CONTROLLER

The CoolLogic Touch Bank Controller shall be fully compatible with the Building Automation System via native BACnet communication. The microprocessor-based bank controller shall schedule the various compressors. A compressor run-time equalization sequence ensures an even distribution of compressor run time. A load limit control shall be available to limit the number of compressors that may be energized simultaneously. The CoolLogic Touch Bank Controller shall monitor and report the following for each refrigeration circuit in each module:

- Discharge pressure and temperature faults
- Suction pressure and temperature faults
- Compressor winding high temperature fault
- Low evaporator leaving chilled water temperature fault

The Bank Controller shall monitor and report the following system parameters for the chiller system:

- Chilled, hot, and source water entering and leaving temperature
- Evaporator and condenser water flow availability

Any module failure condition shall cause a system-fault indication at the Bank Controller and a shutdown of that compressor circuit by transferring the load requirements to the next available module. In the case of a "system fault," the entire chiller will be shut down. When any fault occurs, the Bank Controller shall record conditions at the time of fault and store the data for recall. This information shall be capable of recall through the Bank Controller interface and be displayed on the 10-inch (254 mm) touch-screen display. A history of faults shall be maintained, including the date and time of each fault (up to the last 100 occurrences). The Bank Controller monitors voltage/phase failure as well as internal leaving chilled-water reset control, which will ensure that the parallel evaporators are operated above the freezing point for part-load operation.

FACTORY TESTING

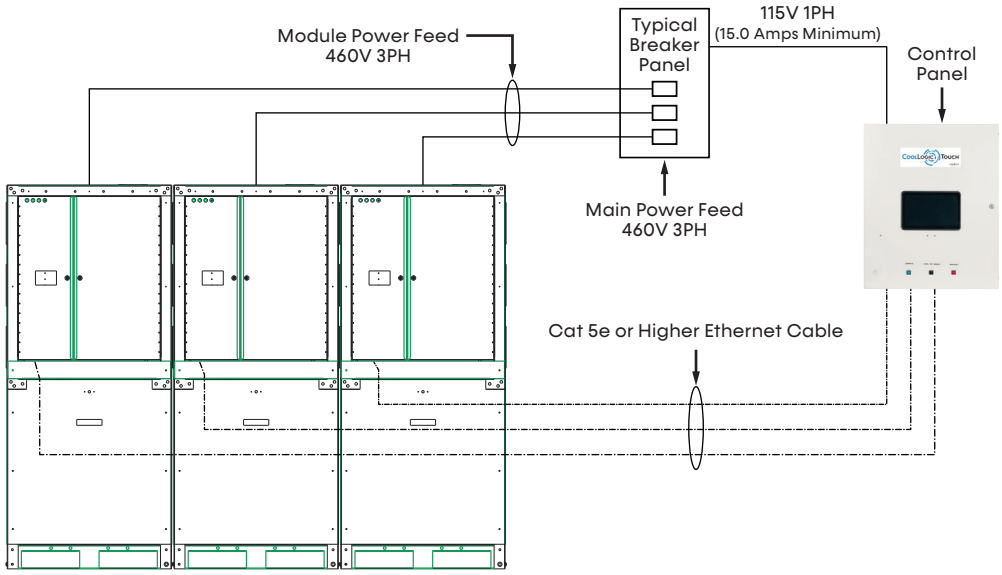
Each module is run tested before shipment. Run tests consist of checking the unit for refrigerant and water leaks, verifying pressures, temperature sensors, MWV, subcooling and superheat ranges, as well as each compressor's voltage, rotation, and amps.

Voltage Limitations		
The following voltage limitations are absolute and operation beyond these limitations may cause serious damage to the compressor.		
Nominal Voltage	**Minimum Voltage**	**Maximum Voltage**
208/230-3-60	187	253
460-3-60	414	506
575-3-60	518	632

ClimaCool Base Model	Voltage	Power Wiring per Module				
		Rated Load Amps	Min. Circuit Amps (MCA)	Max Fuse Size (MOP)	Max Breaker Size	Disconnect Switch Size
UWCS30	208/230V-3PH-60Hz	105.1	117.7	125	150	150
	460V-3PH-60HZ	49.1	55.0	60	70	100
	575V-3PH-60Hz	36.6	41.0	45	50	60
UWHS30 UWWS30	208/230V-3PH-60Hz	131.3	147.2	175	200	200
	460V-3PH-60HZ	61.4	68.8	80	90	100
	575V-3PH-60Hz	45.7	51.4	60	70	60
UWTS30 UWUS30	208/230V-3PH-60Hz	131.3	147.2	175	200	200
	460V-3PH-60HZ	61.4	68.8	80	90	100
	575V-3PH-60Hz	45.7	51.4	60	70	60
UWCS50	208/230V-3PH-60Hz	139.8	157.2	175	200	200
	460V-3PH-60HZ	69.9	78.4	90	110	100
	575V-3PH-60Hz	55.9	62.7	70	80	100
UWHS50 UWWS50	208/230V-3PH-60Hz	170.4	191.6	225	250	400
	460V-3PH-60HZ	85.2	95.6	110	125	200
	575V-3PH-60Hz	68.2	76.5	90	100	100
UWTS50 UWUS50	208/230V-3PH-60Hz	170.4	191.6	225	250	400
	460V-3PH-60HZ	85.2	95.6	110	125	200
	575V-3PH-60Hz	68.2	76.5	90	100	100
UWCS70	208/230V-3PH-60Hz	170.6	191.9	225	250	400
	460V-3PH-60HZ	86.3	96.8	110	125	200
	575V-3PH-60Hz	67.3	75.5	90	100	100
UWHS70 UWWS70	208/230V-3PH-60Hz	211.1	237.4	250	300	400
	460V-3PH-60HZ	106.7	119.8	125	150	200
	575V-3PH-60Hz	83.3	93.5	110	125	200
UWTS70 UWUS70	208/230V-3PH-60Hz	211.1	237.4	250	300	400
	460V-3PH-60HZ	106.7	119.8	125	150	200
	575V-3PH-60Hz	83.3	93.5	110	125	200
UWCS80	460V-3PH-60HZ	108.4	121.6	125	150	200
	575V-3PH-60Hz	87.5	98.2	110	125	200
UWHS80 UWWS80	460V-3PH-60HZ	134.2	150.7	175	200	200
	575V-3PH-60Hz	108.3	121.7	125	175	200
UWTS380 UWUS380	460V-3PH-60HZ	134.2	150.7	175	200	200
	575V-3PH-60Hz	108.3	121.7	125	175	200

Notes:
1. RLA - Rated Load Amps are calculated as per UL1995.
2. MCA - Minimum Circuit Ampacity is: 125% of the RLA of the largest compressor motor plus 100% of the RLA of all other concurrent motors and/or electrical loads.
3. MOP - Maximum Overcurrent Protection or Max. Fuse Size is rounded down from: 225% of the RLA of the largest compressor motor plus 100% of the RLA 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 of all other concurrent electrical loads.
5. LRA - Locked Rotor Amps are instantaneous starting amperage per compressor.
6. Module internal wiring is per NEC.
7. MOP Device or Recommended Fusing Device for Module Power Wiring supplied by others. These are recommended values for electrical power protection of modules selected.
8. Disconnect Switch for Module Power Wiring supplied by others. These are recommended values for electrical power protection of modules selected.

Figure 24: Power Distribution Drawing



NOTES:

1. Communication wiring is home run set up with Cat5e or higher Ethernet cable.
2. ClimaCool Standard Bank Package includes ship loose items: 1–CoolLogic Touch Bank Controller per bank, 2–temperature sensors and wells, 1–DP proof of flow sensor and 1–bypass header kit for each water loop. These items are to be installed, powered, and control wired in the field by others.
3. The shown Breaker Panel may be purchased through ClimaCool Corp, but is typically provided by the project electrical contractor.
4. Breaker panel represents field power supply and is to be installed by others. Not provided as part of the ClimaCool modular chiller system.
5. Control wiring by others.
6. Disconnects are NOT Included.

Date	Section	Description
9/1/24	Created	

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