CLIMACOOL®

A NIBE GROUP MEMBER

WATER-SOURCE MODULAR CHILLERS

INSTALLATION, OPERATION & MAINTENANCE MANUAL

Part#: C97B0004N03 | Revised: March 13, 2025

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

UW Models: 30-80 Tons

60Hz – R-454B

SHC on DEMAND® SIMULTANEOUS HEATING AND COOLING

CoolLogic Touch™

UW Models

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GENERAL DESCRIPTION

ClimaCool's Water-Source Modular Chillers, models UWC, UWH, UWT, UWU, & UWW are available in 30, 50, 70, and 80 tons. They can be configured in banks of 1 (one) to 12 (twelve) units (30-960 tons), and can satisfy future incremental growth needs by simply adding modules. These models are quiet, serviceable and extremely efficient systems that will provide years of reliable operation.

SAFETY

Throughout this manual warning, danger, caution and attention notices appear. Read these items carefully before attempting any installation, service or troubleshooting of the equipment. All labels on unit access panels must be observed.

DANGER: Indicates an immediate hazardous situation which, if not avoided, will result in death or serious injury.

WARNING: Indicates potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation or an unsafe practice which, if not avoided, could result in minor or moderate injury or product or property damage.

ATTENTION: Notification of installed, operation or maintenance information which is important, but not hazard related.

UW Models

Attentions, Cautions, and Warnings

⚠ WARNING

Do not use means to accelerate the defrosting process to clean, other than those recommended by the manufacturer.

Do not pierce or burn.

Be aware that refrigerants may not contain an odor.

⚠ WARNING

WATER AND REFRIGERANT SYSTEMS UNDER PRESSURE

- Isolate/Lockout source and relieve pressure BEFORE servicing equipment.
- Failure to relieve pressure may result in property damage, serious bodily injury or death!

⚠ WARNING

An unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

⚠ WARNING

Auxiliary devices which may be a POTENTIAL IGNITION SOURCE shall not be installed in the duct work. Examples of such POTENTIAL IGNITION SOURCES are hot surfaces with a temperature exceeding 1,292°F (700°C)

⚠ WARNING

An unventilated area where a water source heat pump is installed and surpasses a R-454B refrigerant charge of 62 oz (1.76 kg), shall be without continuously operating open flames (for example an operating gas appliance) or other POTENTIAL IGNITION SOURCES (for example, an operating electric heater, hot surfaces).

⚠ WARNING

Only auxiliary electric heaters approved by ClimaCool shall be installed in connecting ductwork. The installation of any other auxiliary devices is beyond ClimaCool's responsibility.

⚠ WARNING

For mechanical ventilation, the lower edge of the air extraction opening where air is exhausted from the room shall not be more than 3.94 inches (100 mm) above the floor. The location where the mechanical ventilation air extracted from the space is discharged shall be separated by a sufficient distance, but not less than 9.84 feet (3 m), from mechanical ventilation air intake openings, to prevent recirculation to the space.

⚠ WARNING

VERY HOT WATER!

⚠ WARNING

Disconnect power supply(ies) before servicing. Refer servicing to qualified service personnel. Electric shock hazard. May result in injury or death!

⚠ WARNING

All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants. If a compressor is removed from this unit, refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, refrigerant lines of the compressor must be sealed after it is removed.

⚠ WARNING

Children being supervised are NOT to play with the appliance.

⚠ WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

⚠ CAUTION

Unit to be serviced by qualified personnel only. Refrigerant system under pressure. Relieve pressure before using torch. Recover refrigerant and store or dispose of properly.

⚠ CAUTION

Single wall heat exchanger, not suitable for potable water connection.

⚠ CAUTION

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

⚠ CAUTION

Use only copper conductors for field installed wiring. Unit terminals are not designed to accept other types of conductors.

⚠ CAUTION

3-PHASE SCROLL COMPRESSOR UNIT

If this unit uses a 3-Phase Scroll Compressor, the following instructions must be followed:

- Unit power supply must be wired in the proper sequence to avoid damage to the 3-Phase Scroll Compressor;
- Scroll Compressors with incorrect rotation show the following characteristics:
  - High sound level;
  - High suction pressure and low discharge pressure;
  - Low current draw.

If any of the three above characteristics exist, swap two of the three supply wires at the disconnect and recheck compressor for incorrect rotation.

⚠ CAUTION

DO NOT store or install units in corrosive environments or in locations subject to temperature or humidity extremes (e.g., attics, garages, rooftops, etc.). Corrosive conditions and high temperature or humidity can significantly reduce performance, reliability, and service life. Always move and store units in an upright position. Tilting units on their sides will cause equipment damage.

⚠ CAUTION

CUT HAZARD - Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing heat pumps.

⚠ CAUTION

To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. The mechanical components and filters can quickly become clogged with construction dirt and debris, which may cause system damage and void product warranty.

Attentions, Cautions, and Warnings

UW Models

⚠ CAUTION

All three phase scroll compressors must have direction of rotation verified at startup. Verification is achieved by checking compressor Amp draw. Amp draw will be substantially lower compared to nameplate values. Additionally, reverse rotation results in an elevated sound level compared to correct rotation. Reverse rotation will result in compressor internal overload trip within several minutes. Verify compressor type before proceeding.

⚠ ATTENTION

To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state and federal proficiency requirements.

All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state and federal statues for the recovery and disposal of refrigerants.

If a compressor is removed from the unit, system refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, the refrigerant lines of the compressor must be sealed after it is removed.

⚠ 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.

⚠ ATTENTION

Confirm all panels and electrical covers are properly installed/sealed, including the condenser fan motor cover.

⚠ ATTENTION

Do not tamper with, modify, or defeat the functionality of the pressure relief valve in any way.

⚠ ATTENTION

Installations where direct sun may cause the module and bank control panels to reach temperatures above 104°F require a sunshade.

⚠ ATTENTION

Servicing shall be performed only as recommended by the manufacturer.

⚠ ATTENTION

REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS shall only be replaced with sensors specified by the appliance manufacturer.

⚠ ATTENTION

An unconditioned attic is not considered natural ventilation.

⚠ ATTENTION

This unit is equipped with electrically powered safety measures.
To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

⚠ ATTENTION

For Installation Only in Locations Not Accessible to the General Public.

⚠ NOTICE

Maximum external statics must be adhered to in order to maintain minimum CFM.

⚠ NOTICE

LEAK DETECTION SYSTEM installed. Unit must be powered except for service.

UW Models

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	1	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 = 30 Tons
50 = 50 Tons
70 = 70 Tons
80 = 80 Tons

REVISION LEVEL
A = Current

VOLTAGE - PHASE - FREQUENCY
H = 208/230-3-60[1]
F = 460-3-60
N = 575-3-60

COMPRESSOR
S = Standard
T = VFD Lead

WATER HEADER PIPE DIAMETER
6 = 6-inch[1]
8 = 8-inch

MODULE PASS THROUGH HEADERS
0 = No

REFRIGERANT DETECTION SENSOR
1 = Yes

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

SCCR
0 = 5 kAIC
1 = 65 kAIC[3]

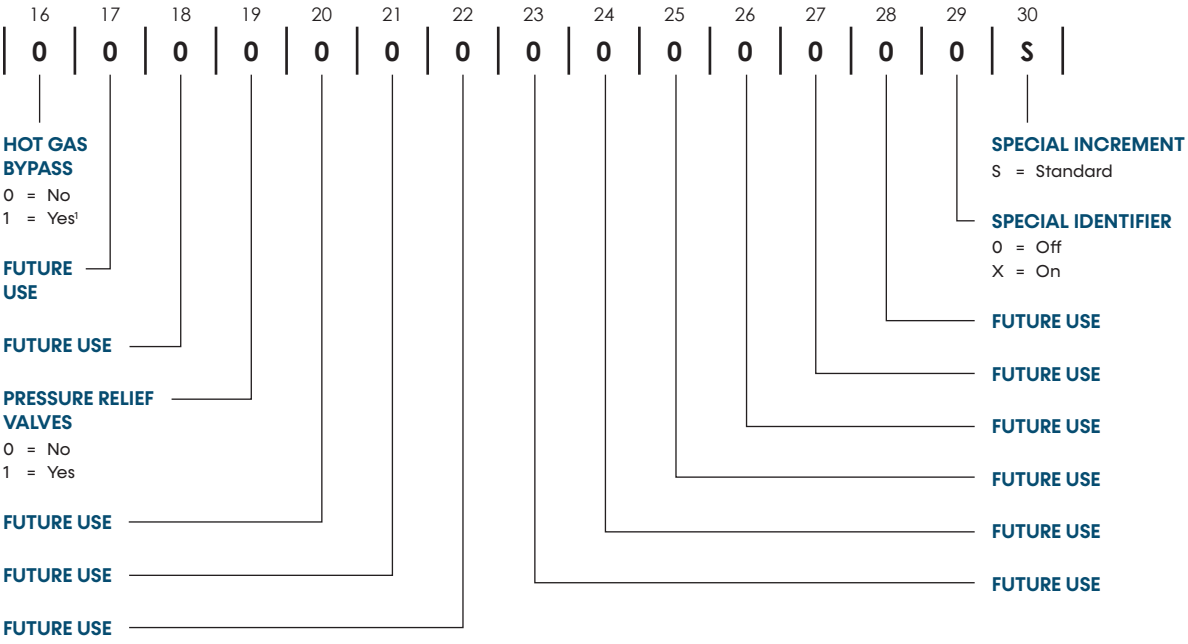
COMPRESSOR SOUND BLANKETS
0 = No
1 = Yes

1. Option not available for Size 80 modules
2. Option not available for SHC applications
3. Option not available in 575V-3P-60Hz

Continued on next page.

Model Nomenclature Digits 16-30

UW Models



1. Option not available on Heat Pumps or SHC Heat Pumps

UW Models

Physical Data
UWC, UWT, UWH – IP Units

Table 1: UW Series (Imperial Units)

Model UW	Chillers UWC				Heat Pumps UWT				Heat Recovery UWH			
	30	50	70	80	30	50	70	80	30	50	70	80
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
Total Refrigerant Charge R-454B (lbs)	27.8	48.2	59.4	80.0	27.8	48.2	59.4	80.0	27.8	48.2	59.4	80.0
Module Operating Weight w/Water (lbs)[2]	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)[3]	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)[4]	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)[4]	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. SHC = Simultaneous Heating and Cooling
2. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
3. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
4. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

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Physical Data
UWU, UWW – IP Units

Table Continued from Previous Page

Model UW	SHC[1] Heat Pumps UWU				SHC[1] Heat Recovery UWW			
	30	50	70	80	30	50	70	80
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
Total Refrigerant Charge R-454B (lbs)	27.8	48.2	59.4	80.0	27.8	48.2	59.4	80.0
Module Operating Weight w/Water (lbs)[2]	2,340	3,072	3,372	4,176	2,418	3,324	3,492	4,260
Module Shipping Weight (lbs)[3]	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)[4]	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)[4]	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.
2. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
3. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
4. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

UW Models

Physical Data
UWC, UWT, UWH – SI Units

Table 2: UW Series (Metric Units)

Model UW	Chillers UWC				Heat Pumps UWT				Heat Recovery UWH			
	30	50	70	80	30	50	70	80	30	50	70	80
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
Total Refrigerant Charge R-454B (kg)	12.59	21.86	26.93	36.29	12.59	21.86	26.93	36.29	12.59	21.86	26.93	36.29
Module Operating Weight w/Water (kg)[2]	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)[3]	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)[4]	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)[4]	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. SHC = Simultaneous Heating and Cooling.
2. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
3. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
4. 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

Physical Data UWU, UWW – SI Units

Table Continued from Previous Page

Model UW	SHC[1] Heat Pumps UWU				SHC[1] Heat Recovery UWW			
	30	50	70	80	30	50	70	80
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
Total Refrigerant Charge R-454B (kg)	12.59	21.86	26.93	36.29	12.59	21.86	26.93	36.29
Module Operating Weight w/Water (kg)[2]	1,061	1,393	1,530	1,894	1,094	1,508	1,584	1,932
Module Shipping Weight (kg)[3]	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)[4]	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)[4]	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.
2. Module operational weight includes water, compressor oil, and refrigerant charge. Multiply times the number of modules for a total system operational weight.
3. Unit shipping weight includes refrigerant charge, compressor oil and packaging.
4. Required to provide stable operation. Storage/buffer tanks may be utilized in return piping to meet the minimum volume requirements.

UW Models

Operating Limits

Table 3: Flow and Water Temperature Data – UW 4- & 6-Pipe Heat Pumps & Heat Recovery

Cooling Mode	30	50	70	80
Minimum Load Water Flow – gpm [m^3/min] [1]	21.0 [0.08]	35.0 [0.13]	45.0 [0.17]	59.0 [0.22]
Maximum Load Water Flow – gpm [m^3/min] [1]	149.0 [0.56]	235.0 [0.89]	296.0 [1.12]	375.0 [1.42]
Minimum Entering Evaporator Water Temperature – °F [°C]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]
Maximum Entering Evaporator Water Temperature – °F [°C]	88.0 [31.70]	88.0 [31.70]	88.0 [31.70]	88.0 [31.70]
Minimum Leaving Chilled Water Temperature (No Glycol) – °F [°C]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]
Minimum Leaving Chilled Water Temperature (with Glycol) – °F [°C]	20.0 [-6.67]	20.0 [-6.67]	20.0 [-6.67]	20.0 [-6.67]
Maximum Leaving Chilled Water Temperature – °F [°C]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]
Minimum Chilled Water Differential Temperature – °F [°C] [2]	5.0 [2.78]	5.0 [2.78]	6.0 [3.33]	6.0 [3.33]
Maximum Chilled Water Differential Temperature – °F [°C]	23.0 [12.78]	23.0 [12.78]	23.0 [12.78]	23.0 [12.78]
Minimum Source Water Flow – gpm [m^3/min] 1	24.2 [0.09]	37.7 [0.14]	48.5 [0.18]	61.6 [0.23]
Maximum Source Water Flow – gpm [m^3/min] 1	118.7 [0.45]	190.0 [0.72]	246.0 [0.937]	309.0 [1.17]
Minimum Leaving Source Water Temperature – °F [°C]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]
Maximum Leaving Source Water Temperature – °F [°C]	140.0 [60.00]	140.0 [60.00]	140.0 [60.00]	140.0 [60.00]
Minimum Source Water Differential Temperature – °F [°C] [2]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]
Maximum Source Water Differential Temperature – °F [°C]	30.0 [16.67]	30.0 [16.67]	30.0 [16.67]	30.0 [16.67]
Heating Mode	**30**	**50**	**70**	**80**
Minimum Load Water Flow – gpm [m^3/min] [1]	25.0 [0.095]	39.0 [0.15]	50.0 [0.19]	64.0 [0.24]
Maximum Load Water Flow – gpm [m^3/min] [1]	123.0 [0.47]	181.0 [0.69]	239.0 [0.91]	302.0 [1.14]
Minimum Entering Hot Water Temperature – °F [°C]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]
Minimum Leaving Hot Water Temperature – °F [°C]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]
Maximum Entering Hot Water Temperature – °F [°C]	130.0 [54.44]	130.0 [54.44]	130.0 [54.44]	130.0 [54.44]
Maximum Leaving Hot Water Temperature – °F [°C]	140.0 [60.00]	140.0 [60.00]	140.0 [60.00]	140.0 [60.00]
Minimum Hot Water Differential Temperature – °F [°C] [2]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]
Maximum Hot Water Differential Temperature – °F [°C]	30.0 [16.67]	30.0 [16.67]	30.0 [16.67]	30.0 [16.67]
Minimum Source Water Flow – gpm [m^3/min] 1	22.9 [0.09]	36.2 [0.14]	46.5 [0.18]	59.0 [0.22]
Maximum Source Water Flow – gpm [m^3/min] 1	208.0 [0.79]	227.0 [0.86]	294.0 [1.11]	373.0 [1.41]
Minimum Leaving Source Water Temperature – °F [°C] [2]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]
Maximum Leaving Source Water Temperature – °F [°C]	70.0 [21.11]	70.0 [21.11]	65.0 [18.33]	65.0 [18.33]
Minimum Source Water Differential Temperature – °F [°C]	5.0 [2.78]	5.0 [2.78]	6.0 [3.33]	6.0 [3.33]
Maximum Source Water Differential Temperature – °F [°C]	23.0 [12.78]	23.0 [12.78]	23.0 [12.78]	23.0 [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.

Operating Limits

UW Models

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

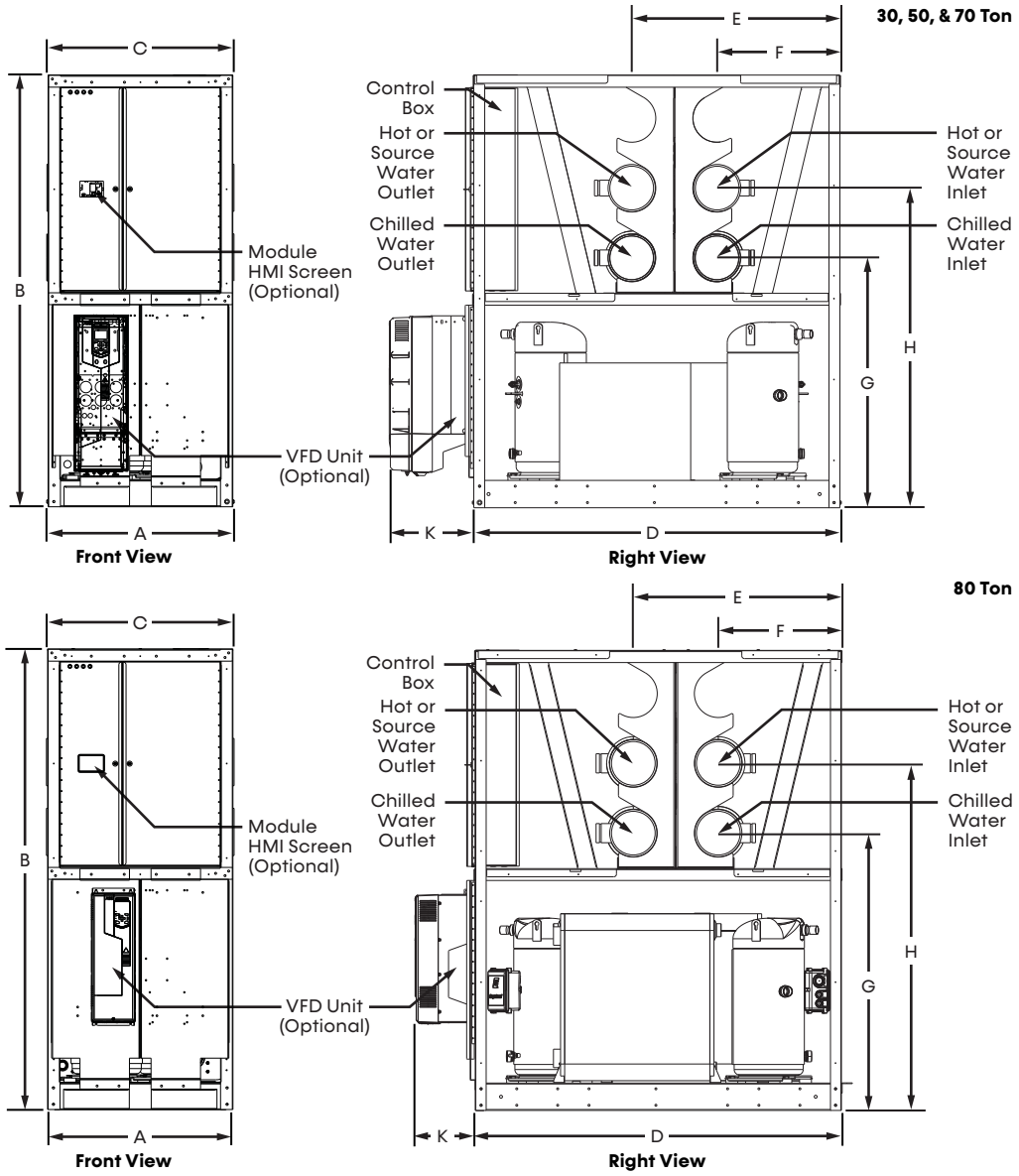
Evaporator	30	50	70	80
Minimum Chilled Water Flow – gpm [m³/min] [1]	21.5 [0.08]	35.1 [0.13]	45.0 [0.17]	59.2 [0.22]
Maximum Chilled Water Flow – gpm [m³/min] [1]	149.0 [0.56]	235.0 [0.89]	296.0 [1.12]	375.0 [1.42]
Minimum Entering Chilled Water Temperature – °F [°C]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]
Maximum Entering Chilled Water Temperature – °F [°C]	88.0 [31.7]	88.0 [31.7]	88.0 [31.7]	88.0 [31.7]
Minimum Leaving Chilled Water Temperature (No Glycol) – °F [°C]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]	40.0 [4.44]
Minimum Leaving Chilled Water Temperature (with Glycol) – °F [°C]	20.0 [-6.67]	20.0 [-6.67]	20.0 [-6.67]	20.0 [-6.67]
Maximum Leaving Chilled Water Temperature – °F [°C]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]
Minimum Chilled Water Differential Temperature – °F [°C] [2]	5.0 [2.78]	5.0 [2.78]	5.0 [2.78]	5.0 [2.78]
Maximum Chilled Water Differential Temperature – °F [°C]	23.0 [12.78]	23.0 [12.78]	23.0 [12.78]	23.0 [12.78]
Condenser	**30**	**50**	**70**	**80**
Minimum Source Water Flow – gpm [m³/min] [1]	24.2 [0.092]	37.7 [0.143]	48.5 [0.184]	61.6 [0.233]
Maximum Source Water Flow – gpm [m³/min] [1]	118.7 [0.45]	190.0 [0.72]	246.0 [0.937]	309.0 [1.17]
Minimum Entering Source Water Temperature – °F [°C]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]	45.0 [7.22]
Maximum Entering Source Water Temperature – °F [°C]	130.0 [54.44]	130.0 [54.44]	130.0 [54.44]	130.0 [54.44]
Minimum Leaving Source Water Temperature – °F [°C]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]	65.0 [18.33]
Maximum Leaving Source Water Temperature – °F [°C]	140.0 [60.0]	140.0 [60.0]	140.0 [60.0]	140.0 [60.0]
Minimum Source Water Differential Temperature – °F [°C] [2]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]	10.0 [5.56]
Maximum Source Water Differential Temperature – °F [°C]	30.0 [16.67]	30.0 [16.67]	30.0 [16.67]	30.0 [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.

UW Models

Dimensional Data and Drawings

4-Pipe Chillers UWC & Heat Pumps UWT



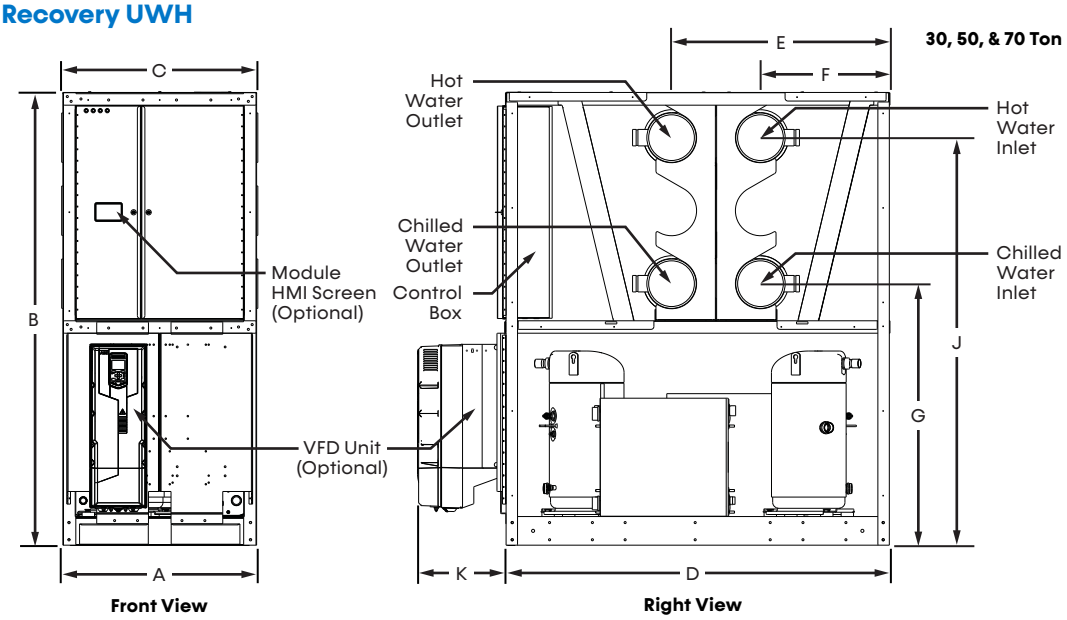
UWT & UWC with optional VFD	Voltage	A Outermost Bolt Width	B Base Pan to Top Panel	C Header Length	D Front Corner Post to Rear Corner Post	E Header Location	F Header Location	G Header Location	H Header Location	K Depth of VFD Unit[2]	Header Connection Size
030	208-3-60 460-3-60 575-3-60	33.83 [85.93]	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	460-3-60 575-3-60	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]

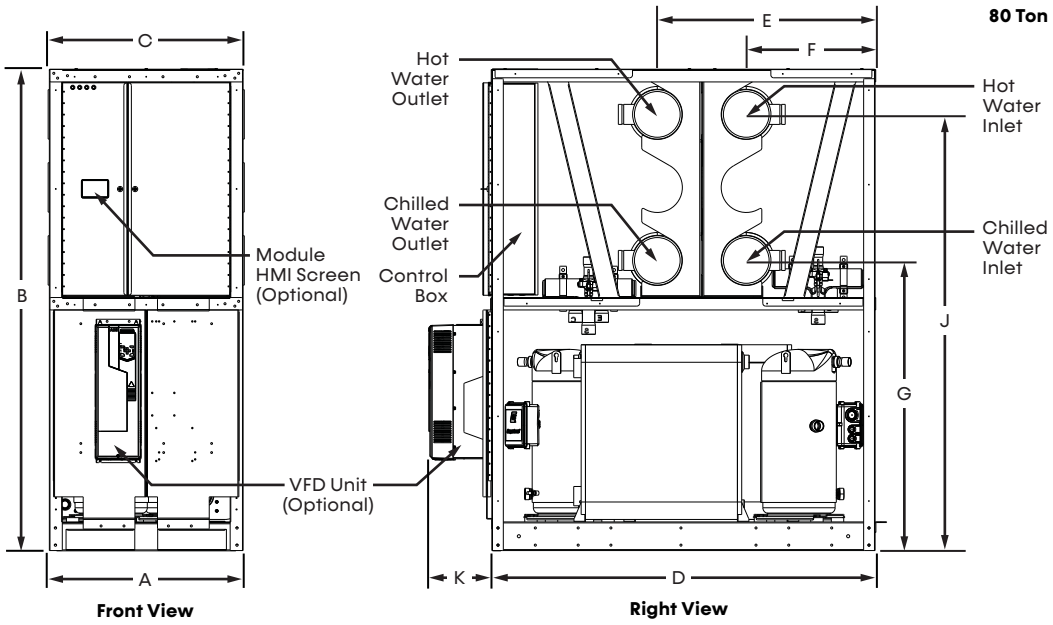
NOTES:
1. Dimensions shown in inches [centimeters].
2. Only present on units with VFD.

Dimensional Data and Drawings

UW Models

4-Pipe Heat Recovery UWH





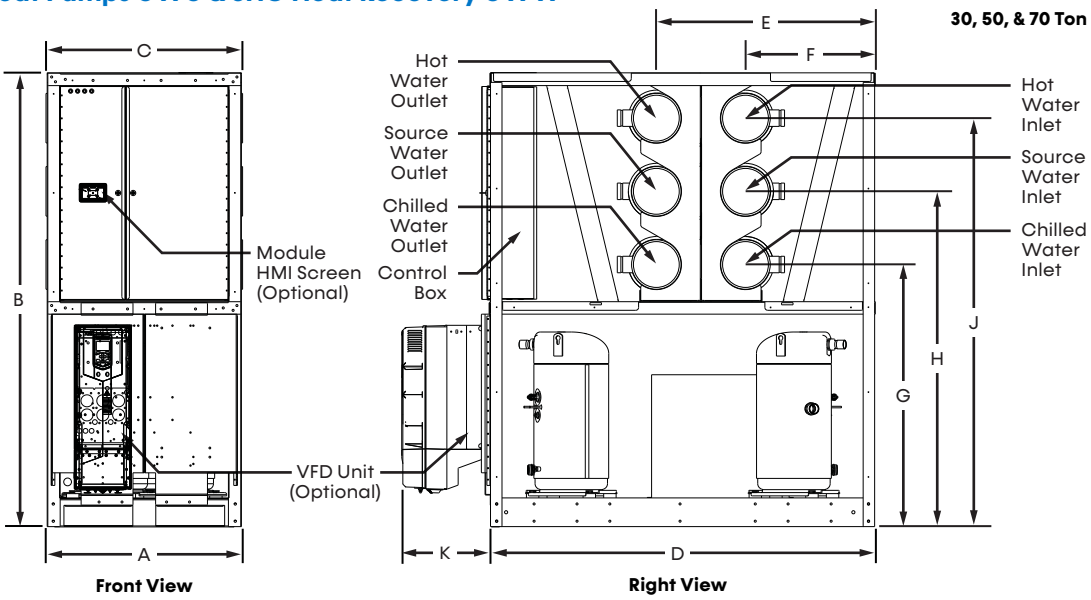
UWH with optional VFD	Voltage	A Outermost Bolt Width	B Base Pan to Top Panel	C Header Length	D Front Corner Post to Rear Corner Post	E Header Location	F Header Location	G Header Location	J Header Location	K Depth of VFD Unit[2]	Header Connection Size
030	208-3-60 460-3-60 575-3-60	33.83 [85.93]	79.05 [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	460-3-60 575-3-60	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]

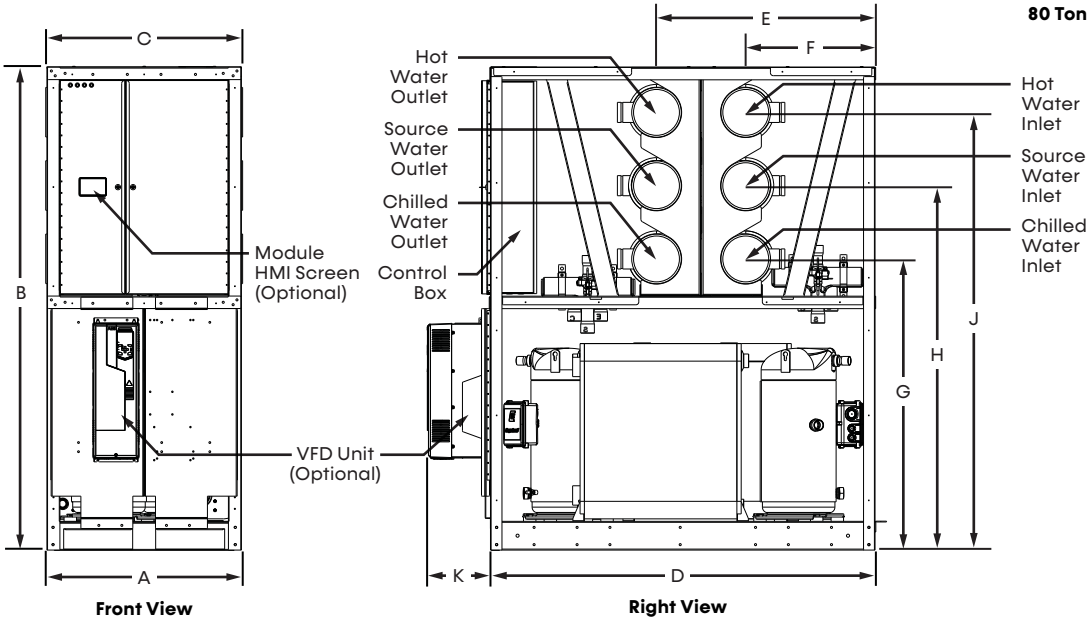
NOTES:
1. Dimensions shown in inches [centimeters].
2. Only present on units with VFD.

UW Models

Dimensional Data and Drawings

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





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	460-3-60 575-3-60	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.

Pre-Installation

UW Models

INSPECTION

Upon receipt of equipment, carefully check the shipment against the bill of lading and inspect each chiller for any damage incurred during shipment. Verify all components and loose parts immediately upon receipt. Note any damage on the bill of lading immediately and in the presence of the freight carrier's delivering agent. Report the damage to the freight carrier and file appropriate claim documents in accordance with International Chamber of Commerce (ICC) regulations. It is the responsibility of the recipient to contact ClimaCool Corp.

Thoroughly check for any visible damage of control panels, electrical and/or refrigeration components or broken copper lines. Be sure the nameplate voltage agrees with the site voltage. The carrier must make proper notation of any damages or shortages on all copies of the bill of lading and complete a common carrier inspection report prior to your final acceptance of the shipment.

NOTE: It is the responsibility of the purchaser to file all necessary claims with the carrier. In addition, please notify the ClimaCool Customer Service Department of all damage immediately at 1-800-299-9747, Option 1, or customersupport@climacoolcorp.com.

STORAGE

A suitable antifreeze solution will be required to store Modular Water-Cooled chillers in locations with ambient temperatures below 36°F (2.22°C).

Fill the chiller with at least 2 (two) gallons (7.6 L) of inhibited propylene glycol or other suitable inhibited antifreeze solution to prevent any residual water in the chiller from freezing.

HANDLING OF MODULES

Carefully remove the module's packaging. The chiller's steel base cutouts provide maneuverability by forklift or pallet jack into its final position. Verify that all header grooved couplings and mounting hardware kits are on site prior to connecting the modules.

RIGGING AND LIFTING

Each module should be lifted by using a fork lift. If it is necessary to utilize a crane for rigging or lifting, each module shall be lifted by using lifting straps and spreader bars using rigging points. Refer to Rigging and Lifting Procedures on next page.

WARRANTY

To ensure proper equipment longevity, design, performance, and reliability, all ClimaCool chillers must be installed, operated, and maintained per ClimaCool IO&M manuals. Water quality is of the utmost importance for the proper care and maintenance of your modular chiller system, and regular water treatment will increase your system's longevity. Failure to provide adequate filtration or treatment of evaporator water will void the ClimaCool module's warranty.

A factory-authorized technician is required to start up your ClimaCool chiller. Please contact the ClimaCool Technical Service Department to schedule startup at 1-800-299-9747, Option 3, or technicalsupport@climacoolcorp.com. A minimum of (two) 2-weeks' notice is required to schedule your factory startup.

⚠ 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.

⚠ WARNING

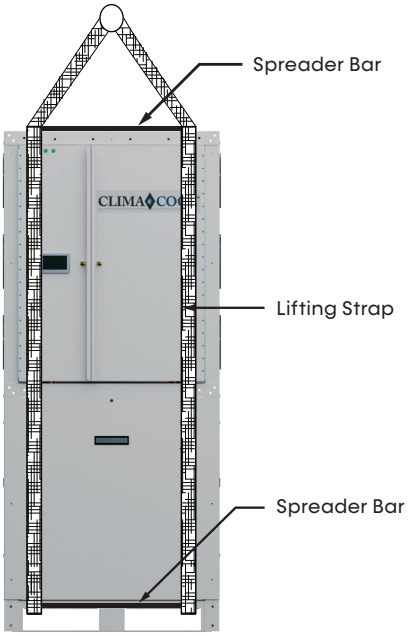
Equipment not accessible to General public.

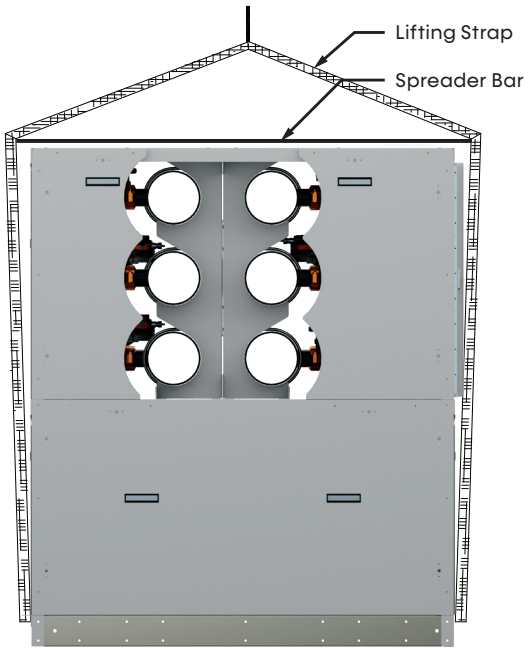
UW Models

Rigging and Lifting Procedures

RIGGING

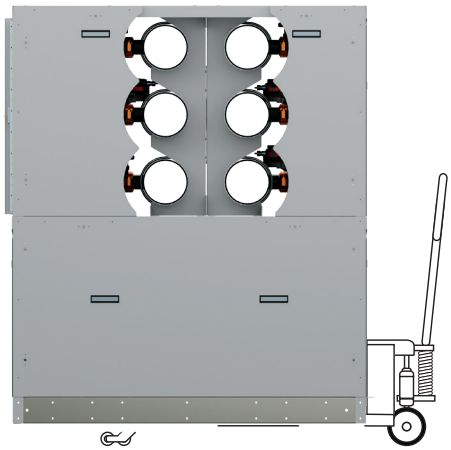
Each module should be lifted by using lift straps threaded through the steel base cutouts and the use of a spreader bar. **NOTE: If no spreader bar is used, damage to the unit may occur.**

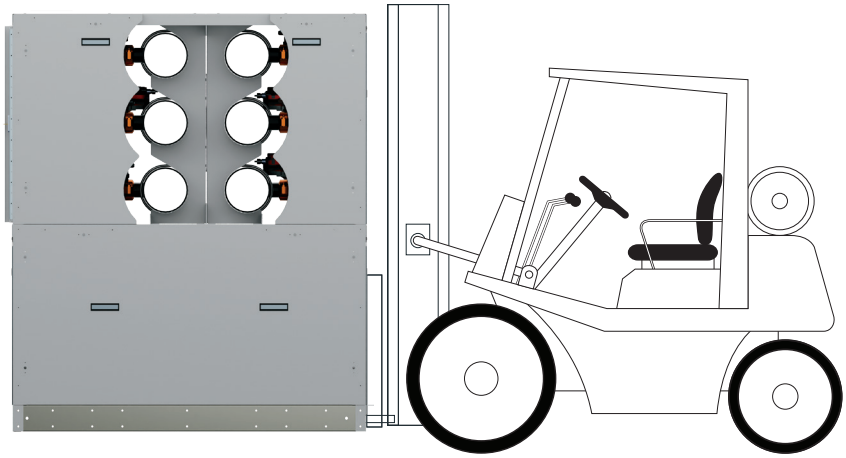




LIFTING AND TRANSPORTING MODULES

Pallet jacks or forklifts are required for lifting and transporting the module. Each module has base cutouts provided for ease of maneuverability. 60-inch forks are recommended to prevent damage to chiller base.

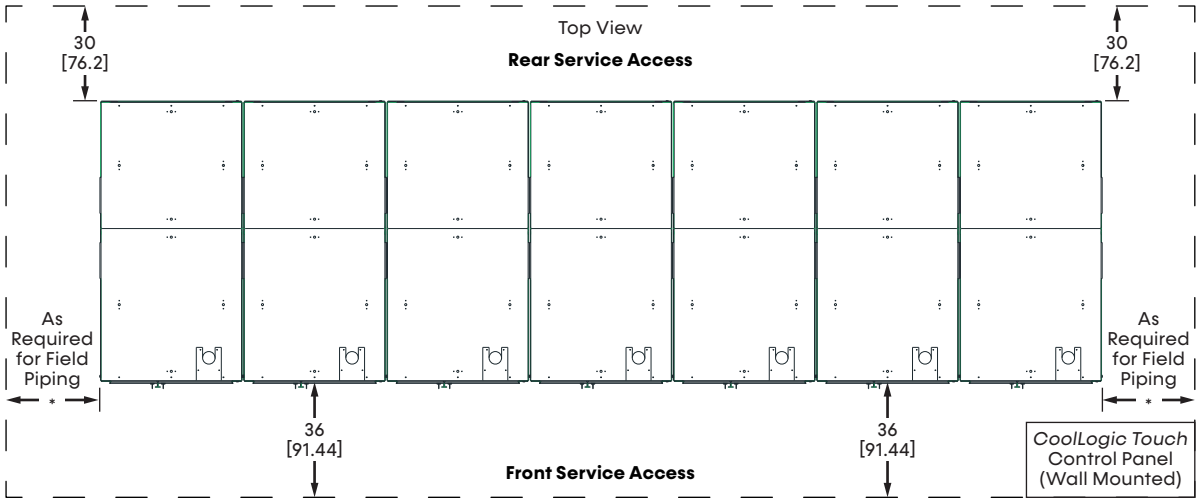




Recommended Service Clearances

UW Models

Figure 1: Recommended Service Clearance for Sizes 30/50/70/80



NOTE: Measurements are shown in inches and [centimeters].

NOTES:

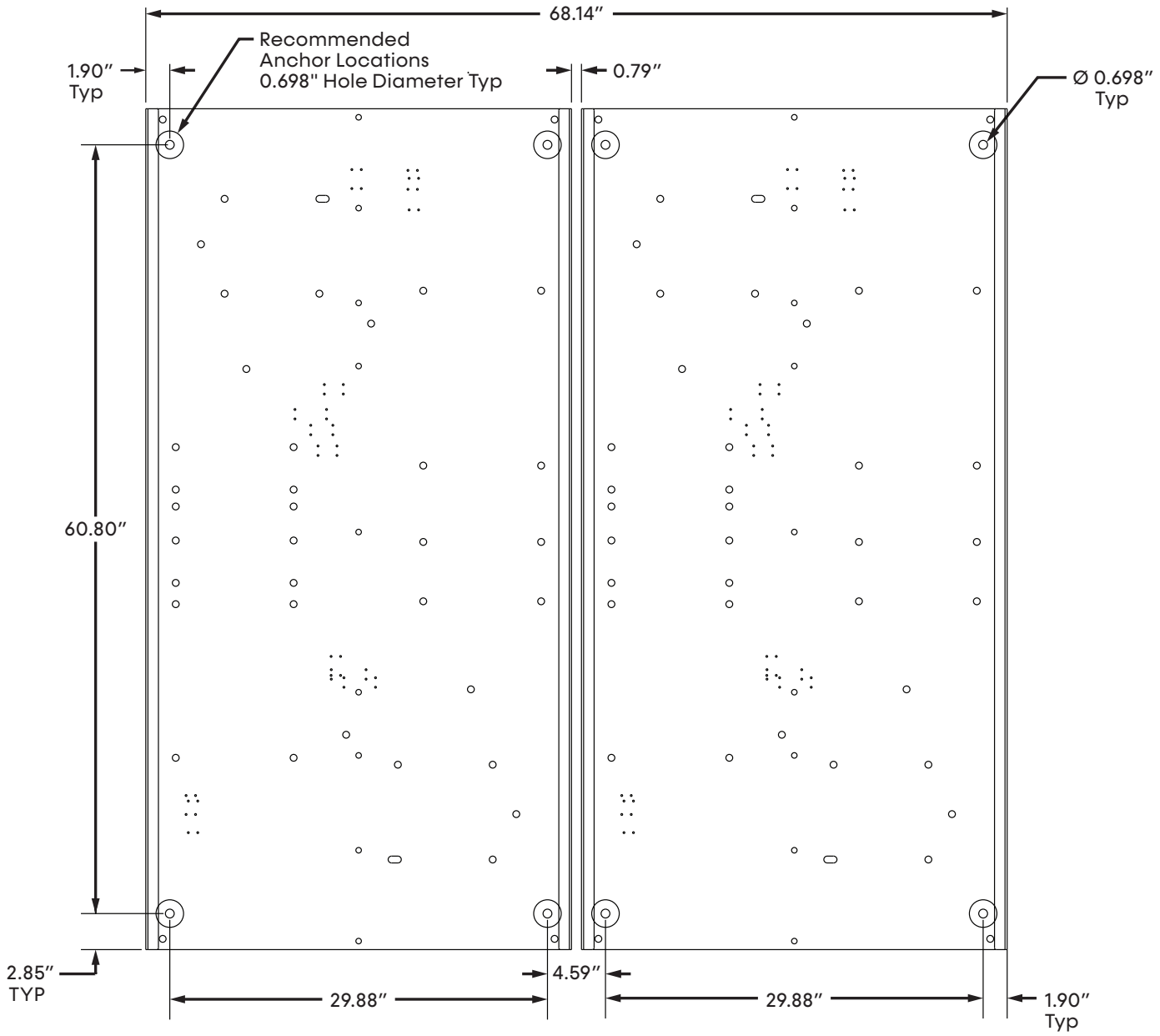
1. Allow 36-inch (91.44 cm) clearance for electrical panels and 30-inch (76.2 cm) clearance for rear service access to modules.
2. Allow a minimum of 18-inch (45.72 cm) height clearance for service for 30, 50, and 70 ton modules.
3. Local building or electrical codes may require additional clearance. Consult applicable codes.

UW Models

Mounting Rails and Vibration Isolation

ClimaCool recommends bolting the chiller to a concrete base or two (2) 4-inch (10.16 cm) base mounting rails using the six (6) bolt holes in each base pan. Due to the modules' low vibration, ClimaCool does not require the application of spring isolators or pads. Should isolators or pads be desired, install them in accordance with the images below.

Figure 2: UW Anchor Locations



Mounting Rails and Vibration Isolation

UW Models

Figure 4: Spring Vibration Isolators Option

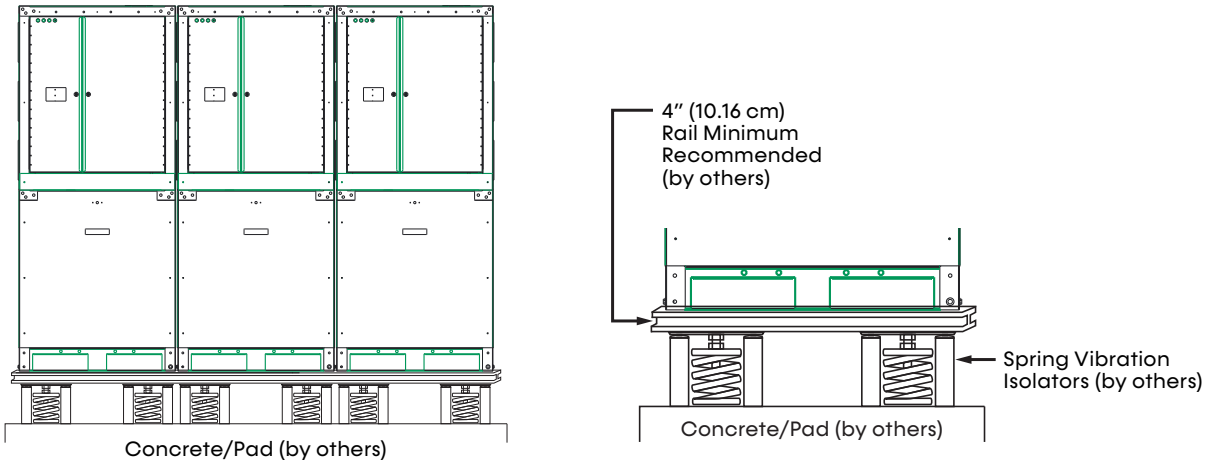
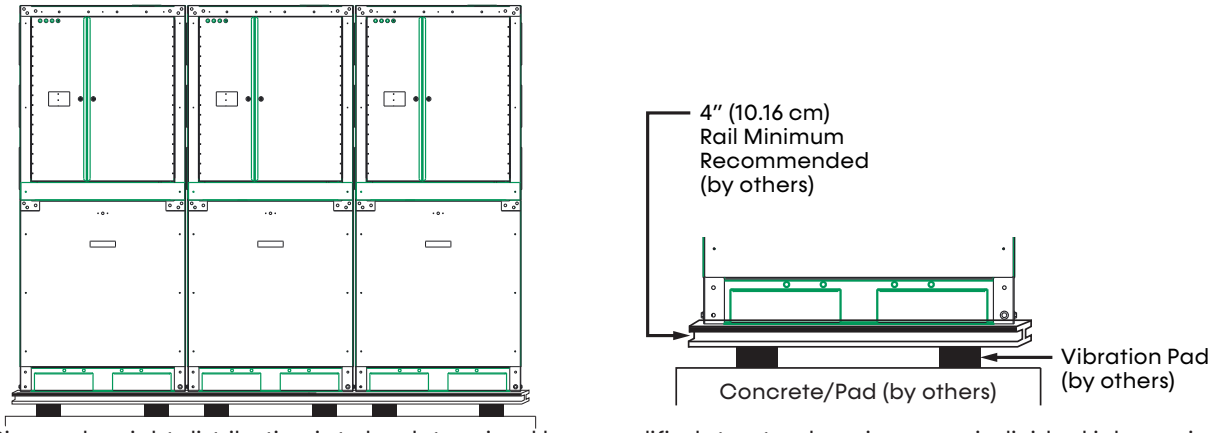


Figure 3: Vibration Isolation Pads Option



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

UW Models

Unit Installation

FOUNDATION FOR UNIT PLACEMENT

The minimum foundation requirement for the ClimaCool chiller is a level surface capable of bearing the combined operating weight of the modules.

DRAINING

When performing standard maintenance procedures such as flushing a heat exchanger, it is necessary to close off any relevant module sections. Each ClimaCool chiller module includes standard motorized water isolation valves for this purpose.

ASSEMBLING MODULES

ClimaCool recommends bolting the chiller to a concrete base or two (2) 4-inch (10.16 cm) base mounting rails using the bolt holes in the unit base. Although the compressors are installed on anti-vibration mountings, vibration-eliminating springs or pads under the base rails on which the chiller will rest can further isolate the chiller from the structure. One end of the modules should be chosen as the reference module and carefully located.

Field installed mounting accessories are provided for adjoining each module.

- **Header grooved coupling kits** contain four (4) mechanical grooved couplings per module for standard applications and six (6) for simultaneous heat pump applications.
- **Mounting hardware kit** contains necessary bolts, spacers, nuts and washers.
- **Header bank end cap kit** contains four (4) header bank end caps each for standard applications and six (6) each for simultaneous heat pump applications.

Field installing the mounting hardware kit will assist in aligning the modules in a bank and eliminate offset inconsistencies.

1. Inspect the pipe ends to ensure they are free from indentations, projections, roll marks, or other harmful surface defects such as loose paint, scale, dirt, chips, grease, and rust.
2. Inspect the grooved coupling gasket for defects.
3. Install gaskets on the pipe ends of one of the two modules to be mated. **Be sure the gasket is completely on the pipe so damage will not occur in the next step.**
4. Move the second module into position and line up the piping. Be sure to maintain piping alignment for any additional modules that may be added. When pipe ends are aligned, slide the gasket over the ends and center it between the grooves. No part of the gasket should protrude into the groove of either pipe end.
5. Place the coupling halves over the gasket and ensure that the coupling keys (the part that goes into the groove) are engaged in the grooves.
6. Insert the bolts and install nuts to hand tight. Ensure that the oval neck of the bolt engages into the bolt hole of the housing. **Tighten nuts alternately and equally until the bolt pads meet and make metal-to-metal contact.**
7. Tighten nuts by another ¼ to ½ turn to ensure the nuts and bolts are snug and secure; using a torque wrench is usually not required. **Uneven tightening of bolts may cause the gasket to be pinched resulting in immediate or delayed leaks.**

HEADER INSULATION

Chilled water piping is pre-insulated on each module at the factory with ¾-inch (1.91 cm) closed-cell insulation. **After bolting all modules together and leak testing, the installing contractor will need to insulate the entire coupling connection.**

⚠ WARNING

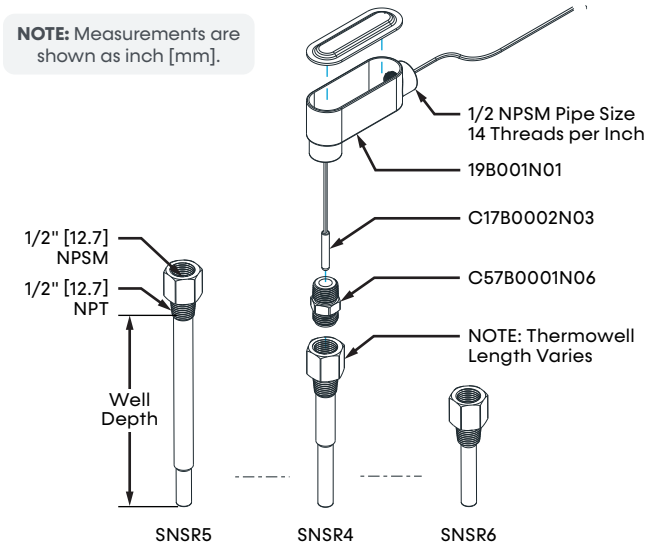
Equipment not accessible to General public.

As with any water system, it is important that the system be clean. The pipe work installer must remove weld scale, rust and contamination during pipe work fabrication. The system water piping must be flushed thoroughly with recommended alkaline flush or other chemicals that are compatible with 316 stainless steel prior to making connections to the ClimaCool chiller. There are certain necessary components that should always be installed in the chilled water system. All water piping must be installed in accordance with applicable codes and standards.

TEMPERATURE SENSOR AND WELLS

ClimaCool provides four (4) temperature sensors and wells with each four-pipe chiller system and six (6) with simultaneous heating & cooling six-pipe chiller systems configured by the CoolLogic Touch Control System. They must be field installed at least 36 inches (91.44 cm) but no more than 60 inches (152.40 cm) away from the bank and before the strainer on the chilled water inlet and chilled water outlet. **Note: Sensors must be fully inserted into the well to obtain proper readings, and the well must be installed so that it is fully immersed into the flowing water of the field piping. Use a slender, blunt instrument to gently push the sensor to the bottom of the sensor well. Double check that sensors are properly installed after all wiring runs have been completed.**

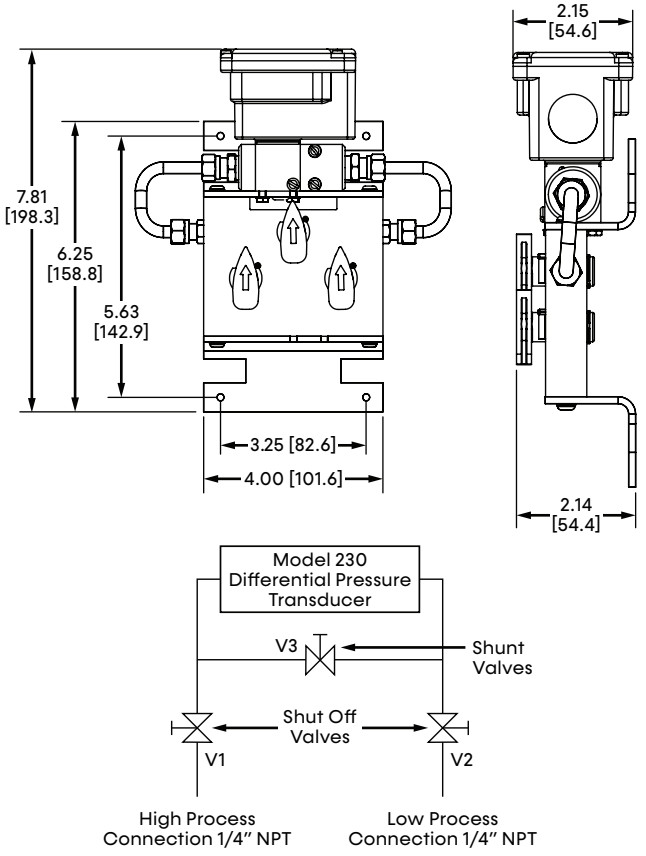
Figure 5: Temperature Sensor and Wells



PRESSURE DIFFERENTIAL FLOW SENSOR

It is imperative that minimum and maximum water flow rates, as defined in the Operating Limits, are not exceeded. A pressure differential flow sensor must be installed in the chilled water circuit to prevent the chiller from operating without sufficient water flow to the heat exchanger. Place downstream of the strainer on the outlet of a straight pipe, as close to the module as possible. Do not put in an elbow. When connecting the tubing to the differential pressure sensor, bleed any air from the tubing before tightening.

Figure 6: True Wet-to-Wet Differential Pressure Transducer: With 3-Valve Manifold Assembly



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.

UW Models

Water Piping

PRESSURE TAPS

The installing contractor must provide access ports for the ship loose DP Flow and Temperature sensors. UW 4-pipe models require 4-1/4 inch (10.80 cm) pressure taps and 6-pipe models require 6-1/4 inch (15.88 cm) taps. If a port is shared by the pressure differential flow sensor and the pressure gauge it will require two (2) 1/2 inch (1.27 cm) taps.

BANK WATER ISOLATION VALVES

It is recommended to provide bank water isolation valves for proper isolation and maintenance of the chiller, pump and strainer.

STRAINERS – MINIMUM 40 MESH SCREEN REQUIRED

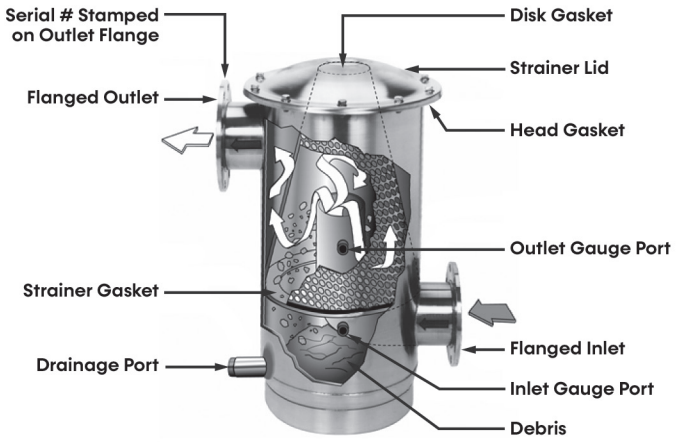
ClimaCool chillers utilize brazed plate heat exchangers which are extremely sensitive to debris. **Therefore, it is mandatory that all chilled water systems include a strainer with a minimum of 40 mesh screen for proper filtration.** The strainer must be installed as shown in the Water Piping Configurations and be in place at all times when the chiller is operating.

ClimaCool's warranty does not cover and does not apply to 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 supply.

Stainless Steel Strainer Option

UW Models

Figure 7: Stainless Steel Strainer



STRAINER INSTALLATION RECOMMENDATIONS

Follow the recommended guidelines below for strainer installation:

1. The Carbon Steel strainer should be placed on a firm, supporting surface. Failure to do so can cause stress on the weld joints. It is recommended that a concrete pad be poured under the base of the strainer. The weight of the CS strainer should not be supported by the main water lines connecting it.
2. The inlet and outlet connections should be securely fastened. The arrows depict flow direction (see figure to the left).
3. The back-mount pressure gauges should be installed in the gauge ports located on the front of the strainer body. These gauges will allow you to monitor the pressure differential across the strainer screen providing an indication when the strainer element is clogged and requires cleaning.
4. The CS strainer lid must be securely fastened according to the following torque specifications to ensure product safety and an adequate seal.

TORQUE SPECIFICATIONS

Clamped Lid Models: CS strainer models 3CS and 4CS have "over-center latch clamp" lid designs. The over-center clamp does not require adjustment when installing or removing the lid. The lock washer is set at the factory for proper clamp compression and normally requires no field adjustment. Minor tightening may be necessary over time. The lids are installed as follows:

1. Place the clamp around the strainer lid.
2. Latch the T-bolt with the receiver and push the latch handle towards the strainer body until the safety catch engages.

Bolted Lid Models: CS strainer models 6CS, 8CS and 10CS have "bolted" lid designs. Grade 5 zinc-plated bolts, nuts and washers are used to attach the lids to these strainers. See the table on the next page for proper lid bolt size and torque rating for each strainer. (Exercise care when tightening the lid bolts so as not to damage the strainer lid or housing).

It is important to follow the torque specifications as over-tightening may result in premature failure of the bolts. It is equally important to follow a star wheel torque pattern when tightening the lid bolts (see figure on the next page). The strainer lid may not be seated down completely after the first torque sequence. A second torque sequence should be adequate to seat the lid securely to the body.

Table 5: Bolt Size and Recommended Torque

Strainer	Bolt Size (inches)	Recommended Torque (ft. lbs.)
3 CS	5/16 - 18	60 - 80
4 CS	3/8 - 16	15 - 25
6 CS	1/2 - 13	45 - 55
8 CS	1/2 - 13	45 - 55
10 CS	5/8 - 11	80 - 100

UW Models

Stainless Steel Strainer Option

STRAINER OPERATION

Periodically, it will be necessary to flush out the debris that is collected and settled at the bottom of the strainer reservoir. CS-3 strainers must have a valve installed on the drainage port. The larger CS strainers (4CS, 6CS, 8CS and 10CS) are equipped with a flush port (or drainage port) extending inside the strainer. When it becomes time to clean the strainer, the flush port valve should be opened while the strainer is in operation (while pressurized and with water flowing). A thorough flushing of the strainer reservoir will depend upon the length of time the flush valve remains opened. This flush time will typically range from 15 to 60 seconds depending on the flow, inlet water pressure and the amount of debris collected by the strainer. As a general rule, the larger strainers will require higher inlet water pressures in order to achieve a complete flushing. For example, the 4CS model can be flushed with inlet water pressures as low as 15-20 psi, while the 6CS can be flushed with 30-35 psi. The 8CS and 10CS models should be flushed with inlet water pressures greater than 40 psi.

NOTE: When shutting down the chiller for extended periods of time, the strainer should be isolated and completely drained.

STRAINER ELEMENT CLEANING

If your strainer assembly is equipped with optional pressure gauges, you will be able to monitor the pressure differential between the inlet and outlet sides of the strainer. When this pressure differential reaches 5-10 psi the strainer element may require cleaning.

CAUTION: Prior to dismantling the strainer for cleaning, it is imperative that the strainer assembly is isolated and completely de-pressurized.

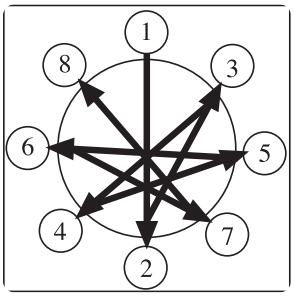
Follow the steps below when cleaning the CS strainer element:

Step 1. **For Bolted Lid Models:** Remove the top of the strainer by removing the Grade 5 Zinc plated bolts from the lid.

For Clamped Lid Models: Remove the top of the strainer by taking off the band-clamp assembly.*

Step 2. Lift the strainer element (conical screen) out of the strainer body.

Figure 8: Recommended Torquing Sequence



Step 3. Carefully scrub down the strainer element with a rigid nylon brush until all matter is loosened.

Do not use a steel brush.

Step 4. Wash the strainer element off with clean water. It is preferable to use a hose with a significant amount of water pressure.

Do not use a pressure washer.

Step 5. Wash all matter from the strainer gaskets and clean the inner-ring where the bottom of the strainer element rests.

Step 6. Make sure the U-shaped gasket is fitted securely to the bottom of the strainer element. Reposition the strainer element into the body of the strainer.

Step 7. Make sure the strainer head gasket is secure on top of the strainer body. On V-band models, O-rings should be seated completely in the body flange. Reposition the strainer lid back on the strainer body. **Tighten the lid securely either with the bolts or with the band-clamp.**

* For clamped models, opening and closing is achieved without adjusting the lock nut. It is tightened at the factory to the correct compression. (Minor tightening may be necessary if the gasket loses memory over time.) To open the clamp, depress the safety latch and pull the over-center lever outward. To close the clamp, make sure the T-bolt is seated in its receiver and push the over-center lever back toward the strainer housing. Be sure that the safety latch is engaged before putting the unit to use.

Stainless Steel Strainer Option

UW Models

Figure 9: Timer Based Valve Controller

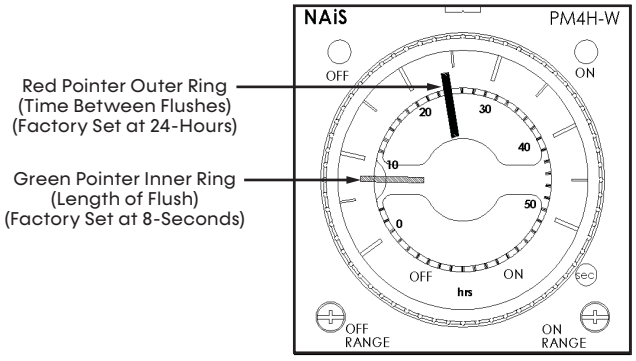


Figure 10: Electric Ball Valve

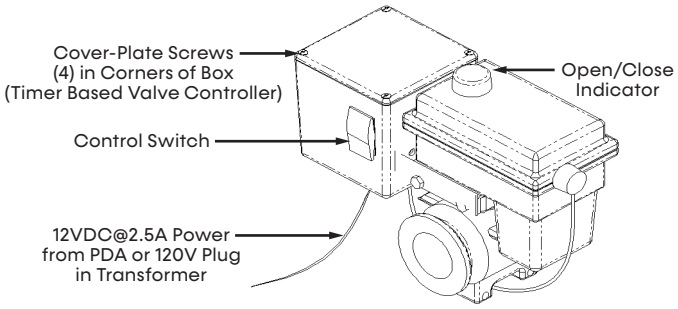
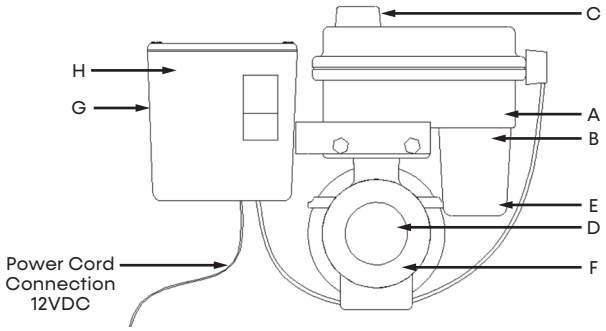


Figure 11: Valve Specifications



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

ATF OPERATION INSTRUCTIONS

Flush valve line must be piped to atmospheric pressure such as an open floor drain. The flush line should not undergo any changes in elevation and should be sloped downward in the direction of drainage. **Do not pipe the flush or drain line into a pressurized line.**

NOTE: The Automatic Timer Flush Package needs to be programmed when it is received by the end-user. The programming is simple and takes only a few moments. However, because every application has different parameters that affect the required frequency between flushes and the duration of the flush, the end-user must choose the controller's settings (refer to your specific strainer manual).

PROGRAMMING THE ATF CONTROLLER

1. Plug the transformer into a 120-VAC outlet.
2. Insert the 12-VDC plug coming from the transformer into the jack on the underside of the ATF box.
3. Test for power by pressing the manual flush side of the control switch (lower switch light should come on then the valve will start to open).
4. Adjust the "ON TIME" (Valve Open) by turning the inner timer ring with the GREEN POINTER clockwise to increase duration. The ON TIME RANGE is factory set at eight seconds (see *Timer Based Valve Controller* on previous page).
5. Adjust the "OFF TIME" (Valve Close) by turning the outer ring with the RED POINTER clockwise to increase duration. The OFF TIME RANGE is factory set at twenty-four (24) hours (see *Timer Based Valve Controller* on previous page).
6. Set the control switch to auto flush. The red off light on the timer will come on and the upper light on the switch will come on and stay on. During the flush cycle the on light on the timer and the lower switch light will come on.

UW Models

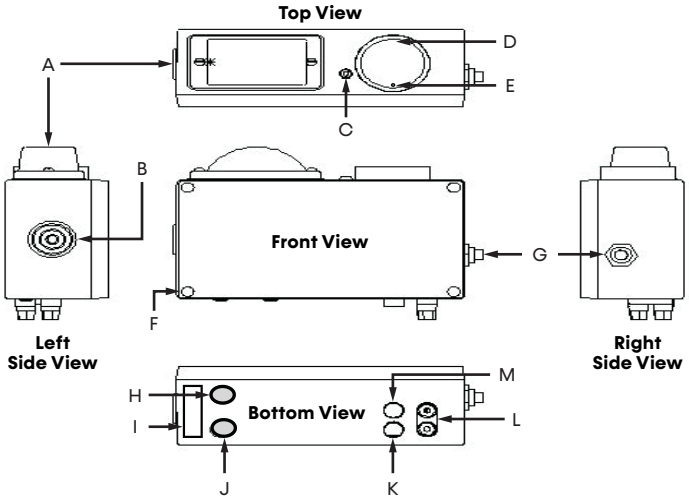
Stainless Steel Strainer Option

CONTROL SWITCH

Control switch flushing is initiated by pressing and holding down the manual control switch located on the front of the controller (see *Electric Ball Valve* on previous page). The manual flush control switch can also be used to conveniently drain the water out of the strainer before removing the conical screen element from the strainer housing. A yellow indicator arrow on top of the ATF valve will rotate in sync with the ball valve to show the valve position (open or closed). When the manual flush control switch is released, the valve will automatically close.

SAFETY FIRST! Keep fingers away from valve opening to avoid getting caught in the moving parts. The electric motor supplies a sufficient amount of power to cause personal injury. Take precaution when handling.

Figure 12: 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

ATF WATER RESISTANCE

The valve and controller are water-resistant, not water-proof. Do not install below ground level where the component can be submerged in water. Only remove the cover plate from the valve controller when setting or changing the flush settings. Keep the cover tightly sealed on the unit during normal operation.

PDA OPERATION INSTRUCTIONS

Remove the power supply and insert the connector end into the socket on the bottom of the PDA housing (see figure above) and plug the transformer into the power source. Standard systems are supplied with a 120V power supply to the primary of the transformer, with an output secondary of 12VDC. The pressure differential switch-gauge is factory set to 7-8 psi. The CS strainer operates at a pressure differential slightly less than 1 psi during maximum flow when the strainer screen is clean. By the time the differential pressure reaches 7-8 psi, the strainer element will be significantly clogged and require immediate removal and cleaning. To adjust the pressure differential switch-gauge setting, insert a 1⁄16-inch Allen wrench and rotate the differential set point contact to the desired location (see figure above). **NOTE: It is not recommended to set the differential switch-gauge higher than 10 psi. Disabling the alarm or increasing the alarm set point could result in damage to the strainer element and allow debris to pass into the system.**

When the differential set point is reached, both the audible and visual alarms will be triggered and will remain engaged until both the alarm condition is corrected and the alarm-reset button is pressed (if the alarm-reset button is pressed but the differential pressure is beyond the set point, the alarms will re-engage immediately). After the strainer is cleaned and put back in service, the differential pressure should return to 1 psi Electric Ball Valve.

Stainless Steel Strainer Option

PDA WATER RESISTANCE

The Pressure Differential Alarm Controller is water-resistant, not water proof. Do not install below ground level where the box can be submerged in water. **Do not remove** the cover plate from the PDA controller. Keep the cover tightly sealed on the module during normal operation.

AUXILIARY CONTACTS

The PDA option is equipped with a remote alarm feature. The remote alarm contacts are located at the two black and red banana clip posts (see *Pressure Differential Alarm* on previous page). The alarm can be set up in one of two ways:

1. A remote alarm signal of 12VDC can be sent to a central monitoring station.
2. A set of auxiliary contacts will indicate a "closed" condition when the alarm activates (Locate the "Auxiliary Contact Schematic" inside the PDA box by removing the four screws on the cover plate).

Table 6: Troubleshooting for ATF Package

Problem	Description	Solution
Valve is leaking past ball	Seals damaged or worn out	Install repair kit
	Valve is not stopping at proper closed position	Adjust limit switches
Valve stem leaks	Worn stem seals	On metal valves: tighten stem packing nut 1/2 turn. CAUTION! Over tightening stem nut could cause drag on motor and trip internal circuit breaker. May require repair kit or new valve.
Valve body leaks	Loose body bolts or excessive operation pressure	Check bolts and observe recommended pressure ratings
	Defective seals	Install repair kits or new valve
Valve hard to turn	Swollen seals or product buildup in valve chamber	Check valve for compatibility with product, may require valve cleaning or new valve
	Valve bolts too tight	Loosen bolts slightly
	Stem nut too tight	Loosen stem nut slightly

UW Models

WYE Strainer Option

The correct size of the WYE Strainer is determined by its job function, not by the size of the pipeline.

PRE INSTALLATION CHECKLIST

1. Ensure working conditions (pressure/temperature) are within the specified capacity of the product being installed. Please refer to the certified drawings to assist in determining these values.
2. Inspect all sealing surfaces to ensure gasket surfaces are free of defects (no nicks or cuts). The pipeline should also be checked for proper alignment. WYE strainers should never be utilized to realign an existing piping system.
3. Ensure that the pipeline's mating flanges are the same type as the WYE strainer being installed. Raised face flange ends cannot be mated to flat face flange ends.
4. Ensure strainer end-to-end length and installation gap are within a ¼-inch (0.64 cm) gap for gasket, and have sufficient clearance for easy opening of cover and screen removal.
5. If the WYE strainer is to be located on the discharge side of a pump, then a safety release valve must be installed between the WYE strainer and the pump.

Figure 13: WYE Strainer Straining Illustration

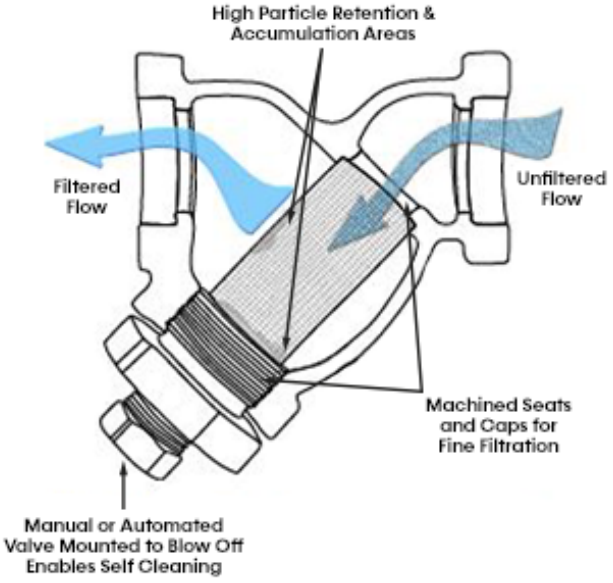


Figure 14: WYE Strainer - Flanged Ends

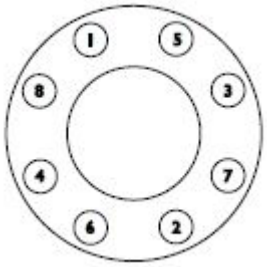
INSTALLATION PROCEDURE

1. Also, for maximum efficiency, install a differential pressure gauge at inlet and outlet connections or at the strainer gauge tap (if provided).
2. WYE strainers must be positioned in the pipeline ahead of the equipment requiring protection.
3. To provide for easier maintenance, the WYE strainer should be located where the drain plug can be removed. Additionally, ensure the drain is located at the lowest position when installed. **If installed in the vertical position, the WYE side of the strainer must be pointing downward.**
4. Ensure there is ample space at the WYE side of the strainer for screen removal.
5. Before placing the WYE strainer into place, support the existing pipeline with pipe supports near the inlet and outlet connections.
6. Place the WYE strainer into the pipeline ensuring that the flow arrow on the body of the WYE strainer is pointing in the direction of the pipeline flow. For large or heavy strainers, appropriate material handling equipment must be used.
7. Install a standard ANSI (⅛-inch-thick) flange gasket between the WYE strainer and pipeline flanges, on both sides. Install lubricated flange bolts and hand tighten. Flange bolts should then be tightened, using a star or crisscross pattern to evenly load the bolts, in accordance with established piping standards. This is illustrated below.

WYE Strainer Option

UW Models

Figure 15: Bolting Sequence Pattern



NOTE: Excessive bolt torque may damage flanges. Please refer to established flange bolt torques for guidelines.

OPERATION

Once proper installation has been successfully completed, start the system gradually, at start up as well as after shut down. This eliminates sudden shock to the strainer and other equipment in the line. This is extremely important for steam service.

STARTUP PROCEDURE

1. To remove all fluid from the strainer belly, a drip-leg can be installed or the piping can be placed at a ¼-inch (0.64 cm) slope. **NOTE: With piping systems that contain fluids other than water or when the working temperature is above 120°F (48.89°C), fluid must be drained to safe area, away from the operator.** Operators should always be fitted with appropriate equipment (goggles, gloves, vests etc.) when venting or servicing is performed.
2. Start the piping system by opening the outlet valve nearest the WYE strainer's outlet first. Then gradually open the inlet valve nearest the WYE strainer's inlet, approximately 25% of normal operational flow. It is important to start the system gradually to avoid displacing or damaging the WYE strainer.
3. Continue to open the inlet valve until the desired service flow has been reached.

MAINTENANCE

WYE strainers require little monitoring once they are properly installed. The pressure differential across the strainer should be checked periodically to determine if the screen needs to be cleaned or replaced. If the pressure differential goes unchecked and the screen becomes completely clogged, the screen will break and require replacing. Note: Strainer screens are not designed to withstand the same pressure ratings as the housings. If the screen becomes completely clogged, it will be exposed to the same pressure as the housing. In most cases, this will cause the screen to fail and potentially damage downstream equipment.

Regular maintenance involves:

- Timely cleaning or replacement of screen
- Periodically checking for leaks

During normal use, the screen will become clogged with foreign matter, causing the differential pressure to increase. Once the differential pressure has increased to an unacceptable value, typically by 5 psi to 10 psi, it is time to clean or replace the screen. It is not advisable to let the differential pressure increase by 20 psi. This may cause the screen to fail and possibly damage downstream equipment.

A convenient and safe way to determine when the screen needs to be replaced is to install pressure gauges on the inlet and outlet sides of the strainer. The maximum acceptable pressure drop across the strainer will indicate when the screen needs to be replaced. Screen size and construction determine the maximum pressure drop that a strainer screen can withstand.

UW Models

WYE Strainer Option

SCREEN REMOVAL/ CLEANING/REPLACEMENT

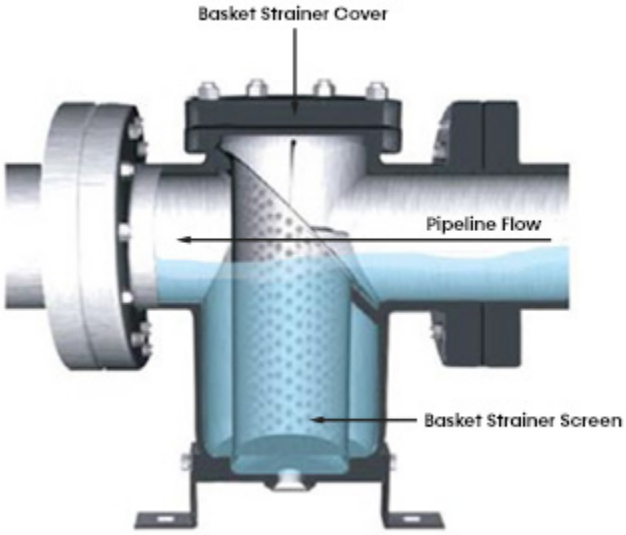
1. Isolate the strainer by closing the inlet and outlet valve connections on either side of the WYE strainer. Make sure valves are bubble tight.
2. Open vent to relieve pressure inside and drain fluid from the strainer.
3. Once pressure is relieved, remove the WYE side cap or cover.
4. Remove screen and clean. Do not permit screen to dry as it will be difficult to remove debris after it has hardened. Avoid banging or hitting the screen to remove stubborn debris.
5. Inspect screen and cover gasket for damage. If either is damaged, replace. Always ensure there is a spare gasket and screen on hand prior to maintenance.
6. Remove any debris or sludge from within the strainer.
7. Replace cleaned or new screen into its original position, ensuring it is squarely positioned on the screen.
8. Replace cover gasket and cap or cover. Tighten cap or cover to specified torque rating.

Basket Strainer Option

UW Models

The correct size of Basket Strainer is determined by its job function, not by the size of the pipeline.

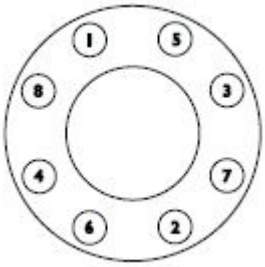
Figure 16: Installed Basket Strainer with Bolted Cover



INSTALLATION PROCEDURE

1. To provide for easier maintenance, the basket strainer should be located where the drain plug can be removed and where there is ample space above the basket strainer for screen removal.
2. Before placing the basket strainer into place, support the existing pipeline with pipe supports near the inlet and outlet connections of the basket strainer.
3. Place the basket strainer into the pipeline ensuring that the flow arrow on the body of the basket strainer is pointing in the direction of the pipeline flow. For large or heavy strainers, lift the basket strainer into place using slings positioned underneath the inlet and outlet connections.
4. Install a standard ANSI (⅛-inch-thick (0.3175 cm)) flange gasket between the basket strainer and pipeline flanges, on both sides. Install lubricated flange bolts and hand tighten. Flange bolts should then be tightened, using a star or crisscross pattern to evenly load the bolts, in accordance with established piping standards. This is illustrated in the figure below.

Figure 17: Bolting Sequence Pattern



NOTE: Excessive bolt torque may damage flanges. Please refer to established flange bolt torques for guidelines.

OPERATION

Once proper installation has been successfully completed, start the system gradually, at start up as well as after shut down. This eliminates sudden shock to the strainer and other equipment in the line. This is extremely important for steam service.

START-UP PROCEDURE

1. Remove air from the pipeline by opening the vent near the basket strainer. **NOTE: With piping systems that contain fluids other than water or when the working temperature is above 120°F (48.89°C), fluid must be drained to safe area, away from the operator.** Operators should always be fitted with appropriate equipment (goggles, gloves, vests etc.) when venting or servicing is performed.
2. Start the piping system by opening the outlet valve nearest the basket strainer's outlet first. Then gradually open the inlet valve nearest the basket strainer's inlet, approximately 25% of normal operational flow. It is important to start the system gradually to avoid displacing or damaging the basket strainer.
3. Continue to open the inlet valve until the desired service flow has been reached.

UW Models

Basket Strainer Option

MAINTENANCE

Basket strainers require little monitoring once they are properly installed. The pressure differential across the strainer should be checked periodically to determine if the screen needs to be cleaned or replaced. If the pressure differential goes unchecked and the screen becomes completely clogged, the screen will break and require replacing. **NOTE: Strainer screens are not designed to withstand the same pressure ratings as the housings.** If the basket becomes completely clogged, it will be exposed to the same pressure as the housing. In most cases, this will cause the basket to fail and potentially damage downstream equipment.

Regular maintenance involves:

- Periodically checking for leaks
- Timely cleaning or replacement of screen

During normal use, the basket will become clogged with foreign matter, causing the differential pressure to increase. Once the differential pressure has increased to an unacceptable value, typically by 5 psi to 10 psi, it is time to clean or replace the screen. It is not advisable to let the differential pressure increase by 20 psi. This may cause the screen to fail and possibly damage downstream equipment.

A convenient and safe way to determine when the screen needs to be replaced is to install pressure gauges on the inlet and outlet sides of the strainer. The maximum acceptable pressure drop across the strainer will indicate when the screen needs to be replaced. Screen size and construction determine the maximum pressure drop that a strainer screen can withstand. Please consult factory for exact pressure ratings.

STRAINER ELEMENT CLEANING

Before removing the cover of the basket strainer, the pressure inside the vessel must be reduced to atmospheric via suction or venting. Failure to do so may result in serious bodily injury.

1. Isolate the basket strainer by closing the inlet and outlet valve connections on either side of the basket strainer.
2. Open vent or drain plug to relieve pressure inside the basket strainer. Drain fluid up to screen seat level.
3. Once pressure is relieved, remove the cover.
4. Remove baskets and clean. Avoid banging or hitting the screen to remove stubborn debris.
5. Inspect basket and cover gasket for damage. If either is damaged, replace. Always ensure there is a spare gasket and basket on hand prior to maintenance.
6. Remove any debris or sludge from within the basket strainer.
7. Replace clean basket into its original position, ensuring it is squarely positioned on the screen seat.
8. Replace cover gasket and replace and tighten cover.

Chiller Header Bypass Kits

UW Models

CHILLER/HEATER SYSTEM WATER HEADER BYPASS

A bypass is required for any for any variable flow application per loop. The chiller-bank bypass must be piped in such a way that the temperature and pressure differential flow sensors are still sensing active flow. The purpose of the chiller/heater system bypass is to prevent deadheading of the pumps when all of the internal unit valves go closed as well as allow temperature and differential pressure sensors to sense active flow. The bypass should be sized for an absolute minimum of one module's worth of design flow. (Please refer to selection submittals for design flow rates).

Header bypass kits can be installed on either end of the bank for any return configuration. The same kit is used for all 3 loops and can be installed with the flex hose running above or below the headers. It is recommended to install the bypass for the Load/ Chilled Water headers (bottom set of pipes) with the flex hose above the headers so service access is not impeded.

Modules can be designated for fixed bypass for heating, cooling, however, this limits the number of modules remaining for that duty. Also, with a module acting as a bypass, increased wear of heat exchangers may be caused by abrasion from bypass flow.

Figure 18: Water Header Bypass Assembly

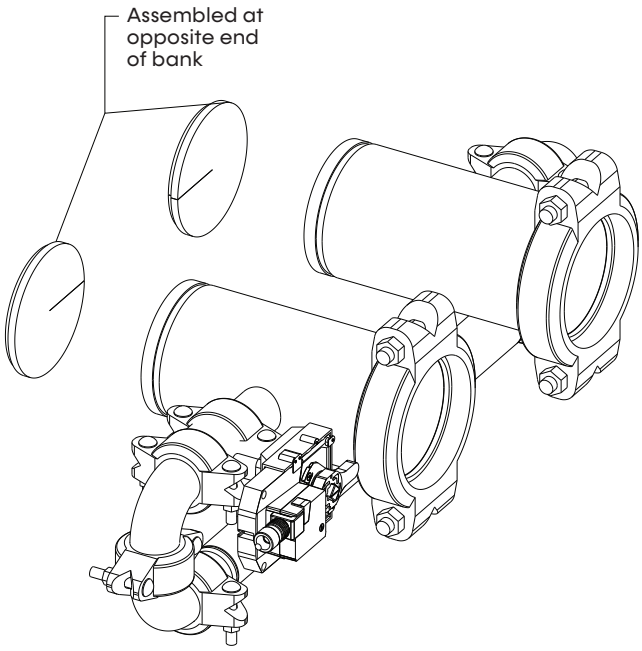
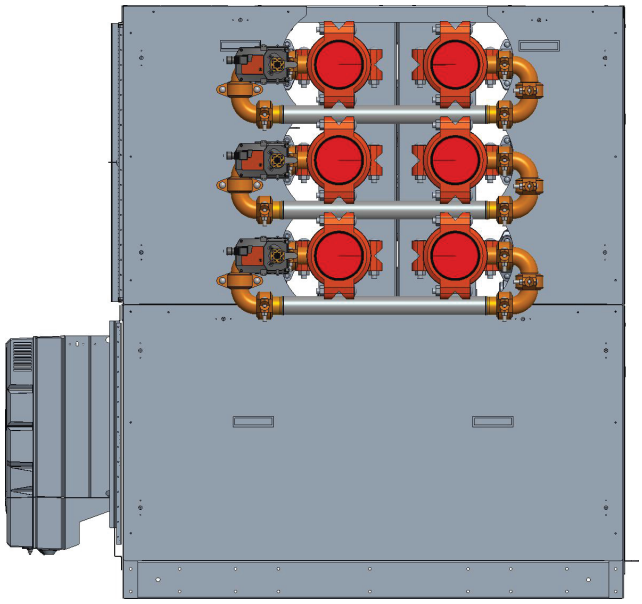


Figure 19: Water Header Bypass Arrangement



UW Models

Chiller Header Bypass Kits

6" Bypass Installation

1. Attach the 2" Flex hose (29B0010N05) to the NO.10 2-inch groove 90° elbow fitting (C29B0013N03) using a 2-inch groove coupling (C29B0015N04) on both ends of the water tube.
2. Connect both ends with the 2-inch groove 90° elbow fitting (C29B0013N03) (created as mentioned in point 1) using a 2-inch groove coupling (C29B0015N04).
3. Connect both ends of the assembly with a grooved reducing tee (29B046N07) using a 2-inch groove coupling (C29B0015N04).
4. Attach the MWV 2" grooved butterfly plug (C23B0006N62) to the left end of the grooved reducing tee (29B046N07) assembly and connect it with a 2-inch groove coupling (C29B0015N04) (created as mentioned in point 3).
5. Attach an 6-inch groove coupling (C29B0015N02) to the two reducing tees (29B046N07) facing the opposite end of the bank.
6. Attach the 6-inch end of the assembly you created using an 6-inch groove coupling (C29B0015N02) to the bank.
7. Attach an end cap (29B0047N02) to the 6-inch pipe at the opposite end of the bank using an 6-inch groove coupling (C29B0015N02)

Repeat the above steps for all headers.

8" Bypass Installation

1. Attach the 2" Fle x hose (29B0010N06) with NO.10 2-inch groove 90° elbow fitting (C29B0013N03) using a 2-inch groove coupling (C29B0015N04) on the right end of the water tube.
2. Attach MWV 2" GROOVED BUTTERFLY PLUG (C23B0006N62) to the left end of the water tube fittings assembly using a 2-inch groove coupling (C29B0015N04).
3. Connect the left end of the MWV 2" GROOVED BUTTERFLY PLUG (C23B0006N62) to the 2-inch groove 90° elbow fitting (C29B0013N03) using a 2-inch groove coupling (C29B0015N04) and connect both ends using a 2-inch groove coupling (C29B0015N04).
4. Connect both ends of the assembly (created as mentioned in point 3) with a grooved reducing tee (29B046N06) using both 2-inch groove 90° elbow fittings (C29B0013N03) and a 2-inch groove coupling (C29B0015N04).
5. Attach an 8-inch groove coupling (C29B0015N01) to the two reducing tee (29B046N06) facing the opposite end of the bank.
6. Attach the 8-inch end of the assembly you created using an 8-inch groove coupling (C29B0015N01) to the bank.
7. Attach an end cap (29B041N01) to the 8-inch pipe at the opposite end of the bank using an 8-inch groove coupling (C29B0015N01).

Repeat the above steps for all headers.

Water Piping Configurations

UW Models

Figure 20: 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 21: Field Piping Reverse Return – Preferred Piping Arrangement

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 chilled- and hot-water hydronic circuits.
5. Refer to *Dimensional Data and Drawings* for water header inlet/outlet dimensions.
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, 40-mesh strainer is required on each water loop. The 40-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 per bank with 6-inch (15.24 cm) headers is 1,100 gpm and 2,400 gpm per bank with 8-inch (20.32 cm) headers.
9. Bank-level bypass header kits are available and controlled for each water loop for all applications with motorized valves. System bypasses are provided and controlled by others.
10. Header bypass valve may be installed at either end of the bank.
11. For over twelve (12) modules, two (2) CoolLogic Touch control systems are required. Please consult the factory.

UW Models

Filling the Water System

It is imperative that the water systems are free from debris prior to initial operation. See *Water Quality Parameters* for a comprehensive list of precautions.

FILLING, PURGING AND LEAK TESTING THE SYSTEM

After the water systems have been properly installed, visually inspect all joints for tightness. If the chiller is to be installed in an existing system, the cleanliness of the existing system can be judged from the operating conditions of the present machines. It is good practice to flush and, ideally, to acid wash the existing system **before** connecting a new chiller.

The following method is recommended to fill and leak check the water system for modules **WITH** Water Isolation Valves:

1. Close all water isolation valves inside each module which isolate the individual heat exchangers.
2. Ensure that all drain valves are closed and that all water main isolation valves are opened.
3. The system should be filled with clean water sent through the strainers and the system checked for leaks.
4. Once the main water lines and the chiller headers are filled with clean water, purge and repeat the filling process at least three times.
5. All modules are equipped with ¾-inch fill and flush valves with lines that tee into the inlet and outlet connections into and out of each heat exchanger. Ensure these ¾-inch valves are **CLOSED**.
6. Open the water isolation valves inside each modular chiller and repeat the filling process, this time also checking for leaks inside each module.
7. Following the final filling and leak checking procedure, air should be purged from the system.

CLEANING THE SYSTEM

The following method is recommended to properly clean the water systems:

1. Before cleaning the system, install a temporary bypass line between the main supply and return water headers of both chilled and condenser water systems when possible. Open the main header bypass lines to divert the initial water flow around the module heat exchangers until you are confident the circulating water is mostly pure.
2. Provided main header bypass lines are installed, close all water isolation valves inside all modular chillers equipped with manual or automatic water isolation valves. If the modules are **NOT** equipped with water isolation valves, we recommend installing 3-way main header bypass valves so the initial water flow bypasses all module heat exchangers.
3. It is mandatory to run the pumps with the strainers in place (see Starting the Pumps section below for proper pump startup). All external hydronic branches should be open to all devices in the system.
4. Pressure drop across the strainer must be observed and as pressure change reaches 50% of the initial read, strainers must be isolated and cleaned.
5. Open all water isolation valves inside each module equipped with manual or automatic water isolation valves (see step 6 for modules **NOT** equipped with water valves). If bypass lines are not installed (described in step 1) it is recommended to drain out the initial fill of water to help flush out debris. Close off the main header bypass lines referred to in step 1 and open the flow to the main water headers. Repeat steps 3 and 4 until there is no more debris being collected by the strainers.
6. If bypass lines are not installed (described in step 1) and the modules are **NOT** equipped with water isolation valves, it is recommended to drain out the initial fill of water to help flush out debris. Remove and clean the strainers before refilling and purging the system again. Repeat steps 3 and 4 until there is no more debris being collected by the strainers.

Filling the Water System

STARTING THE PUMPS

Follow the manufacturer's recommendations when starting the pumps for the first time. The system should be checked for leaks and air purged with the pumps in operation. The pressure drop across the heat exchangers will give a good indication of flow through the system (see project selection print-out or contact local representative). This should be immediately checked against the expected pressure drop for the flow rate required. **If the pressure drop begins to fall and the flow rate is falling, this could indicate the need to clean the strainers.**

UW Models

Water Treatment & Temperature Requirements

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 7: 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
Chlorine (free)	Less than 0.5 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

Table 8: Water Temperature Requirements

Load Loops	Minimum LWT[4]	Maximum LWT[4]
Chilled Water	20°F [-6.67°C][1]	65°F [18.33°C]
Hot Water	65°F [18.33°C]	140°F [60.00°C]

NOTES:
1. Operating in water temperatures below 40°F (4.44°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 heat exchanger from freeze-ups.
4. LWT: Leaving Water Temperature.
5. The max leaving hot water temperature is limited to a 115°F rise over the leaving source water temperature.

⚠ 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.

⚠ CAUTION

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

Electrical Connections

UW Models

The power for all modules is taken from a suitable circuit breaker/fused disconnect power supply within the main panel. Proper grounding of the module is mandatory. **Before carrying out any electrical work, confirm that the main supply is isolated.** Knockout drawings are provided. **Do not drill into cabinet;** shavings can damage electronic components. The power for all individual modules shall be in compliance with all local and national codes.

COOLLOGIC TOUCH™ CONTROL SYSTEM WIRING

A separate 115 volt power supply is required to power the CoolLogic Touch Control System. Communication between the CoolLogic Touch Control System and chiller modules requires a shielded, twisted pair (STP) Cat 6 or higher Ethernet cable home run connection. **Control wiring cannot be installed in the same conduit as line voltage wiring or with wires that switch highly inductive loads such as contactor and relay coils.** All wiring shall be in compliance with all local and national codes.

FIELD CONNECTIONS BETWEEN COOLLOGIC TOUCH CONTROL SYSTEM AND MODULE CONTROLLER

- STP Cat 6 or higher Ethernet cable.
- Over 50 feet (15.24 meters), contact factory.

NOTE: Use the same polarity throughout the network segment.

⚠ CAUTION

Use only copper conductors for field installed wiring. Unit terminals are not designed to accept other types of conductors.

⚠ WARNING

Disconnect power supply(ies) before servicing. Refer servicing to qualified service personnel. Electric shock hazard. May result in injury or death!

⚠ ATTENTION

Installations where direct sun may cause the module and bank control panels to reach temperatures above 104°F require a sunshade.

FIELD CONNECTIONS TO THE COOLLOGIC TOUCH CONTROL SYSTEM

Field integration with CoolLogic Touch Control System is simplified by the use of the following minimum input devices:

- A remote start/stop input for scheduling.
- Differential pressure flow sensors for heating and cooling water flows.
- Chilled water inlet and outlet temperature sensors and wells.
- Heating water inlet and outlet temperature sensors and wells.

COOLLOGIC TOUCH™ CONTROL SYSTEM

Refer to separate CoolLogic Touch IOM for more details.

FIELD CONNECTIONS TO THE MODULES

The CoolLogic Touch Control System connects to the modules using STP Cat 6 or higher Ethernet cable. Refer to the Power Distribution drawing. All wiring shall be in compliance with all local and national codes.

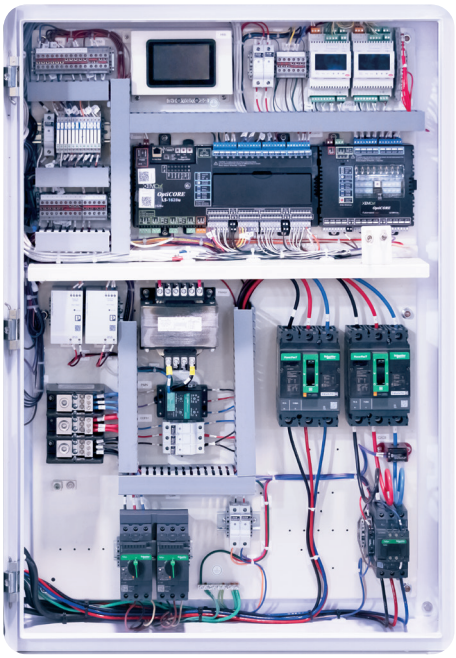
MODULE CONTROLLER

The module controller LS1628 directly senses the control parameters that govern the specific module's operation, such as evaporator and condenser leaving temperatures, suction and discharge temperatures and pressures.

UW Models

Electrical Connections

Figure 22: Module Control Panel



ELECTRICAL PHASE SEQUENCING

Proper clockwise rotation for scroll compressor motors is important to prevent damage to the compressors. ClimaCool recommends the use of a phase sequence indicating instrument following the manufacturers directions. An alternative is to "bump test" the compressors one at a time with pressure gauges attached to the high and low gauge ports of the compressors to check for proper rotation. Energize the compressor for a few seconds to ensure the discharge pressure gauge increases significantly. If the discharge pressure does not increase, proper rotation is reversed. Compressor rotation can be reversed by opening the main electrical disconnect and switching any two of the main power supply leads feeding that compressor's contactor.

PROPER VOLTAGE BALANCE

Occasionally, in three phase circuits, a voltage imbalance occurs between phases. It is not recommended to operate equipment when an imbalance greater than 2% occurs. This causes motors to run at high temperatures and may affect their longevity. The following example describes how to calculate the average voltage of the three phases to see if the imbalance is greater than 2%.

Example: Line 1 = 226V, Line 2 = 230V, Line 3 = 228V
The average is: (226+230+228)/3 = 228V

Next, [100(228-226)]/228 = 0.9%

The voltage imbalance of the three phase circuit is 0.9%. This is well under the 2% range.

⚠ CAUTION

Unit to be serviced by qualified personnel only. Refrigerant system under pressure. Relieve pressure before using torch. Recover refrigerant and store or dispose of properly.

⚠ CAUTION

3-PHASE SCROLL COMPRESSOR UNIT

If this unit uses a 3-Phase Scroll Compressor, the following instructions must be followed:

- Unit power supply must be wired in the proper sequence to avoid damage to the 3-Phase Scroll Compressor;
- Scroll Compressors with incorrect rotation show the following characteristics:
  - High sound level;
  - High suction pressure and low discharge pressure;
  - Low current draw.

If any of the three above characteristics exist, swap two of the three supply wires at the disconnect and recheck compressor for incorrect rotation.

⚠ ATTENTION

Installations where direct sun may cause the module and bank control panels to reach temperatures above 115°F require a sunshade.

Communications Wiring

AVOIDING NOISE

Avoid running communication wires or sensor input wires next to AC power wires or the controller's relay output wires. These can be sources of noise that can affect signal quality. Common sources of noise are:

- Spark igniters
- Radio transmitters
- Variable speed drives
- Electric motors (> 1hp)
- Transformers
- Large contactors, (i.e., motor starters)
- Relays
- Video display devices
- Lamp dimmers
- Fluorescent lights
- Induction heaters
- Generators
- Parallel runs with power lines
- Other electronic modules

STP CAT 6 ETHERNET CABLE

Shielded, twisted pair category 6 (STP Cat 6) Ethernet cable is a twisted-pair cable comprised of eight copper wires twisted into four pairs. Each pair is then shielded with aluminum foil or braided wire strands before being jacketed. The cable standard provides performance of up to 250 MHz and runs at 1 Gbps up to 328 ft. (100 m) in length. If the length of the cable is 121 ft. (37 m) or less, then the speed increases to 10 Gbps.

This cable is commonly connected using punch-down blocks and modular connectors. Cable shielding reduces interference (both electromagnetic and radio frequency) and improves signal quality.

Category 6 is currently defined in ISO/IEC 11801, IEC 61156, and EN 50173. These documents specify performance characteristics and test requirements for frequencies up to 250 MHz.

The cable is available in both stranded- and solid-conductor forms. The stranded form is more flexible and withstands more bending without breaking. In situations where a cable is repeatedly flexed or connected and disconnected, choose a stranded cable. For horizontal cable runs not subject to repeated movement, or for outdoor applications, use STP Cat 6 CMP solid-copper conductor cable with individual shielding applied to each of the four wired pairs. The category and type of cable can be identified by the printing on the jacket.

The Category 6 specification requires conductors to be pure copper.

CHARACTERISTICS OF STP CAT 6

The use of balanced lines helps preserve a high signal-to-noise ratio despite interference from both external sources and crosstalk from other pairs.

Table 9: Electrical Characteristics for a Commercially Available Cat 6 UTP Cable Product

Property	Nominal	Tolerance	Unit
Characteristic Impedance, 1-250 MHz	100	± 15	Ω
Characteristic Impedance @ 250 MHz	100	± 5	Ω
DC Loop Resistance	≤ 0.05		Ω/m
Propagation Speed Relative to the Speed of Light	0.69		1
Propagation Delay	4.60		ns/m
Delay Skew < 100 MHz	< 0.45		ns/m
Capacitance @ 100 Hz	56		pF/m
Max Tensile Load, During Installation	110		N
Wire Diameter (24 AWG; 0.205 mm^2)	0.51		mm
Operating Temperature	-20 to +70		°C
Maximum DC Operating Voltage (PoE uses max 57 V)	90		V

UW Models

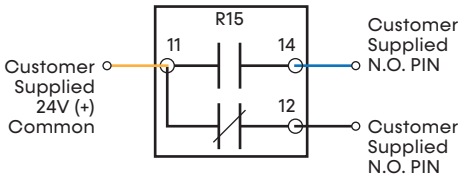
Electrical: Low Voltage Wiring - RDS Installation

REFRIGERANT DETECTION SYSTEM (RDS)

The function, operation, and required servicing measures for the Refrigerant Detection System (RDS) include the following:

- The RDS monitors the status of the refrigerant sensor in the unit. If refrigerant is detected above the maximum threshold, the unit control disables the compressors and enables a pilot relay (R15). This relay can be used to open external dampers and/or activate external mechanical ventilation. The relay and Normally Open (NO) and Normally Closed (NC) contacts can control a signal with a maximum of 6A at 250VAC or at 30VDC.

Figure 23: RDS Mitigation Fan Relay



R15 Data Info:
Input Voltage Rating: 24 VAC / 12 VDC, max 28 VAC / 14 VDC
Contact Rating: 6A, 250 VAC / 30 VDC

Electrical: Low Voltage Wiring - RDS Installation

MINIMUM INSTALLATION AREA

Minimum mechanical room area where customer supplied ventilation must be installed:

Required minimum room area A_{min} an RDS per UL 60335-2-40 4th ed, GG.7DV (212)

Model	Charge oz (kg)	h_{rel} in (m)	Minimum Installation Area ft² (m²) [A_{min}]			
			Floor	Window	Wall	Ceiling
UW*30	444.00 (12.59)	3.00 (0.076)	1526.0 (141.7)	851.0 (79.0)	488.0 (45.3)	402.0 (37.4)
UW*50	772.00 (21.89)	3.00 (0.076)	2653.0 (246.5)	1479.0 (137.4)	848.0 (78.8)	699.0 (65.0)
UW*70	950.00 (26.93)	3.00 (0.076)	3265.0 (303.3)	1820.0 (169.1)	1044.0 (97.0)	861.0 (79.9)
UW*80	1280.00 (36.29)	3.00 (0.076)	4399.0 (408.6)	2452.0 (227.8)	1407.0 (130.7)	1159.0 (107.7)

Required minimum airflow per UL 60335-2-40 4th ed, GG.5DV (212)

Model	Charge oz (kg)	Minimum CFM [Q_{min}] ft³/min (m³/h)
UW*30	444 (12.59)	750.89 (1275.73)
UW*50	772 (21.89)	1305.61 (2218.16)
UW*70	950 (26.93)	1606.64 (2729.60)
UW*80	1280 (36.29)	2164.74 (3677.77)

When the openings for connected rooms or natural ventilation are required, the following conditions shall be applied:

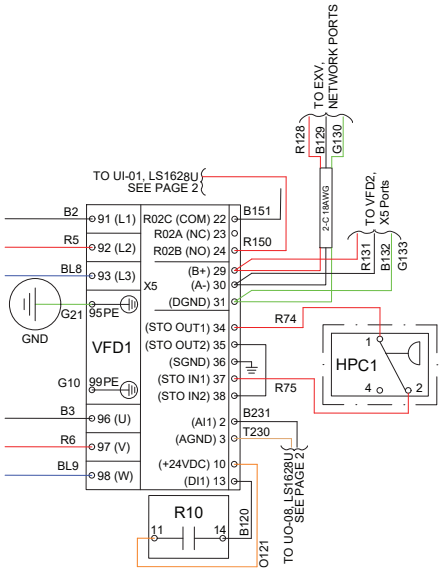
- The area of any openings above 11.8 inches (300 mm) from the floor shall not be considered in determining compliance with Anv_{min}.
- At least 50% of the required opening area Anv_{min} shall be below 7.8 inches (200 mm) from the floor.
- The bottom of the lowest openings shall not be higher than the point of release when the unit is installed and not more than 3.9 inches (100 mm) from the floor.
- Openings are permanent openings which cannot be closed.
- For openings extending to the floor, the height shall not be less than 0.78 inch (20 mm) above the surface of the floor covering.
- A second higher opening shall be provided. The total size of the second opening shall not be less than 50% of minimum opening area for Anv_{min} and shall be at least 3.3 ft (1.5 m) above the floor.

UW Models

Electrical: VFD STO Function

OPTIONAL VFD INSTALLATION WITH STO FUNCTION

The optional VFD installation on the lead compressor circuit has wiring details as shown below:

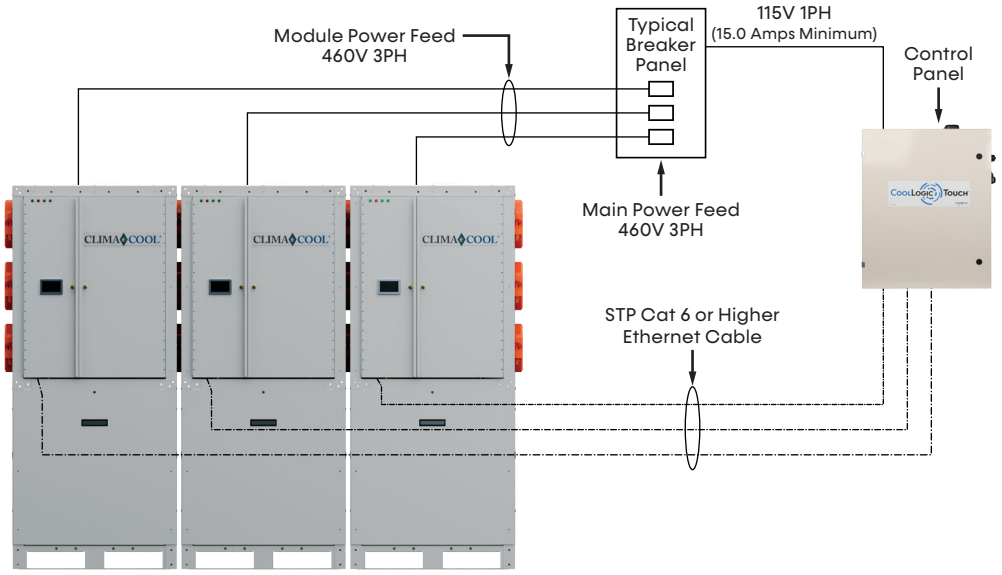


In the unlikely event that the HPC1 (head pressure control cut-out switch, manual reset) is tripped, the VFD is temporarily placed in a lock-out state (STO, "Safe Torque Off"). To recover from such an STO event, it is necessary that the HPC1 control is reset by depressing the red button switch on the control, and you will need to clear the VFD alarm using the VFD user keypad.

Power Distribution Drawing

UW Models

Figure 24: Power Distribution Drawing



NOTES:

1. Communication wiring is home run set up with STP Cat 6 or higher Ethernet cable.
2. ClimaCool Standard Bank Package includes ship-loose items: 1–CoolLogic Touch Control System per bank and 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.
7. All voltages available, 460V used as example only.

UW Models

Electrical Data - No Lead VFD

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)
UWCS30	208/230V-3PH-60Hz	100.4	112.7	150
	460V-3PH-60HZ	49.1	55.1	70
	575V-3PH-60Hz	39.3	44.1	60
UWHS30 UWWS30	208/230V-3PH-60Hz	100.4	112.7	150
	460V-3PH-60HZ	49.1	55.1	70
	575V-3PH-60Hz	39.3	44.1	60
UWTS30 UWUS30	208/230V-3PH-60Hz	100.4	112.7	150
	460V-3PH-60HZ	49.1	55.1	70
	575V-3PH-60Hz	39.3	44.1	60
UWCS50	208/230V-3PH-60Hz	151.2	169.8	225
	460V-3PH-60HZ	78.8	88.4	125
	575V-3PH-60Hz	57.7	64.8	90
UWHS50 UWWS50	208/230V-3PH-60Hz	151.2	169.8	225
	460V-3PH-60HZ	78.8	88.4	125
	575V-3PH-60Hz	57.7	64.8	90
UWTS50 UWUS50	208/230V-3PH-60Hz	151.2	169.8	225
	460V-3PH-60HZ	78.8	88.4	125
	575V-3PH-60Hz	57.7	64.8	90
UWCS70	208/230V-3PH-60Hz	208.0	233.7	300
	460V-3PH-60HZ	97.1	109.1	150
	575V-3PH-60Hz	87.1	97.8	125
UWHS70 UWWS70	208/230V-3PH-60Hz	208.0	233.7	300
	460V-3PH-60HZ	97.1	109.1	150
	575V-3PH-60Hz	87.1	97.8	125
UWTS70 UWUS70	208/230V-3PH-60Hz	208.0	233.7	300
	460V-3PH-60HZ	97.1	109.1	150
	575V-3PH-60Hz	87.1	97.8	125
UWCS80	460V-3PH-60HZ	136.1	153.0	200
	575V-3PH-60Hz	91.3	102.6	125
UWHS80 UWWS80	460V-3PH-60HZ	136.1	153.0	200
	575V-3PH-60Hz	91.3	102.6	125
UWTS80 UWUS80	460V-3PH-60HZ	136.1	153.0	200
	575V-3PH-60Hz	91.3	102.6	125

Notes:
1. RLA - Rated Load Amps are calculated as per UL 60335-2-40
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. Max Breaker Size is equivalent to MOP.
5. MOP Device or Recommended Fusing Device (Disconnect Switch) for Module Power Wiring supplied by others. These are recommended values for electrical power protection of modules selected.

Electrical Data - With Lead VFD

UW Models

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)
UWCS30	208/230V-3PH-60Hz	110.4	125.2	175
	460V-3PH-60HZ	52.1	58.8	80
	575V-3PH-60Hz	42.1	47.6	60
UWHS30 UWWS30	208/230V-3PH-60Hz	139.4	161.4	225
	460V-3PH-60HZ	69.1	80.1	110
	575V-3PH-60Hz	52.1	60.1	90
UWTS30 UWUS30	208/230V-3PH-60Hz	139.4	161.4	225
	460V-3PH-60HZ	69.1	80.1	110
	575V-3PH-60Hz	52.1	60.1	90
UWCS50	208/230V-3PH-60Hz	151.6	170.3	225
	460V-3PH-60HZ	73.9	83.6	110
	575V-3PH-60Hz	61.3	69.3	100
UWHS50 UWWS50	208/230V-3PH-60Hz	219.8	255.5	350
	460V-3PH-60HZ	104.9	121.1	175
	575V-3PH-60Hz	70.3	80.5	110
UWTS50 UWUS50	208/230V-3PH-60Hz	219.8	255.5	350
	460V-3PH-60HZ	104.9	121.1	175
	575V-3PH-60Hz	70.3	80.5	110
UWCS70	208/230V-3PH-60Hz	193.2	218.9	300
	460V-3PH-60HZ	93.1	105.1	150
	575V-3PH-60Hz	85.0	95.7	125
UWHS70 UWWS70	208/230V-3PH-60Hz	248.2	283.9	400
	460V-3PH-60HZ	114.1	130.3	175
	575V-3PH-60Hz	96.0	109.0	150
UWTS70 UWUS70	208/230V-3PH-60Hz	248.2	283.9	400
	460V-3PH-60HZ	114.1	130.3	175
	575V-3PH-60Hz	96.0	109.0	150
UWCS80	460V-3PH-60HZ	133.6	150.5	200
	575V-3PH-60Hz	98.1	111.1	150
UWHS80 UWWS80	460V-3PH-60HZ	164.6	188.6	250
	575V-3PH-60Hz	123.1	142.3	200
UWTS80 UWUS80	460V-3PH-60HZ	164.6	188.6	250
	575V-3PH-60Hz	123.1	142.3	200

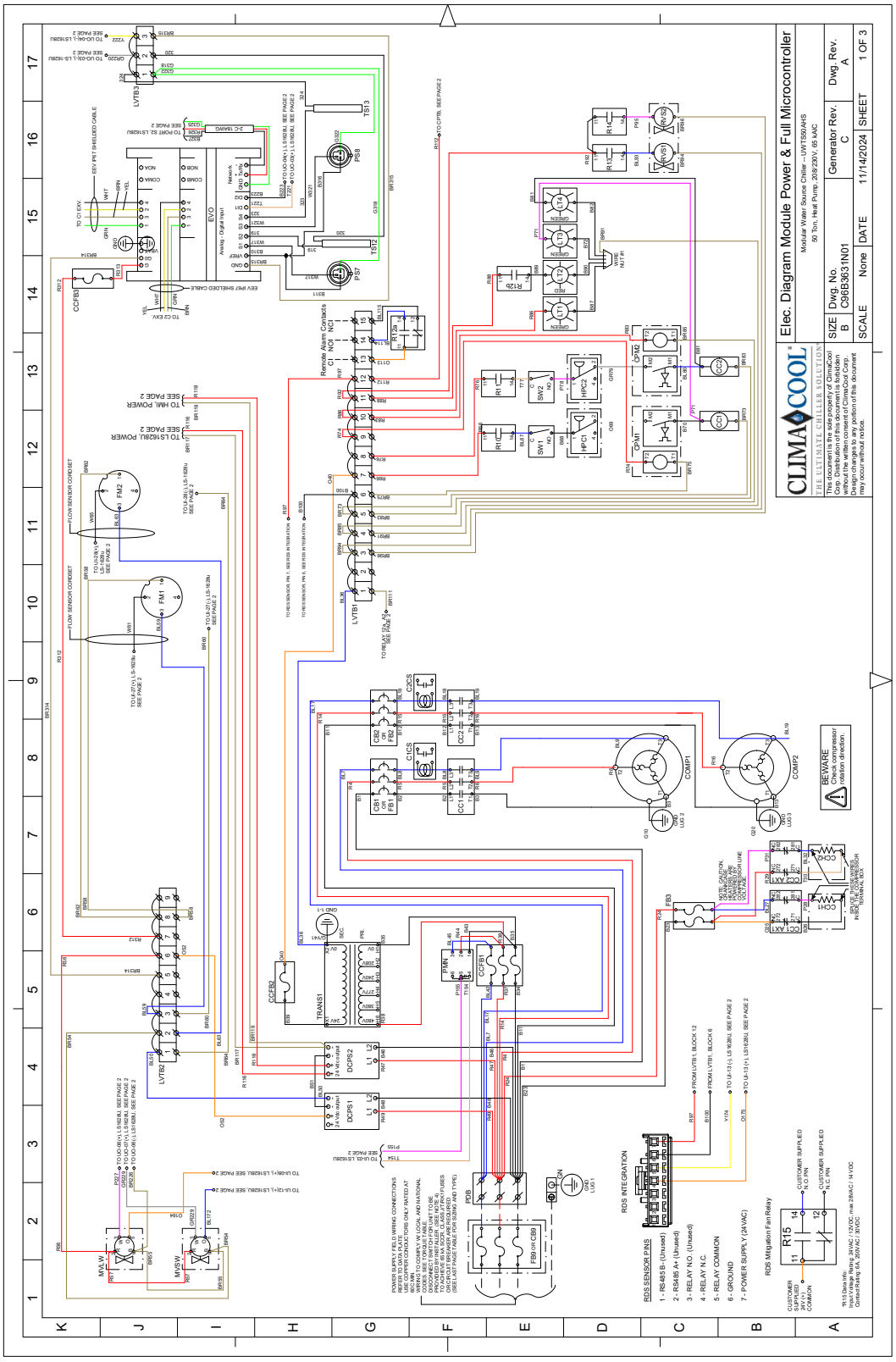
Notes:

1. RLA - Rated Load Amps are calculated as per UL 60335-2-40
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. Max Breaker Size is equivalent to MOP.
5. MOP Device or Recommended Fusing Device (Disconnect Switch) for Module Power Wiring supplied by others. These are recommended values for electrical power protection of modules selected.

UW Models

Example Wiring Diagrams

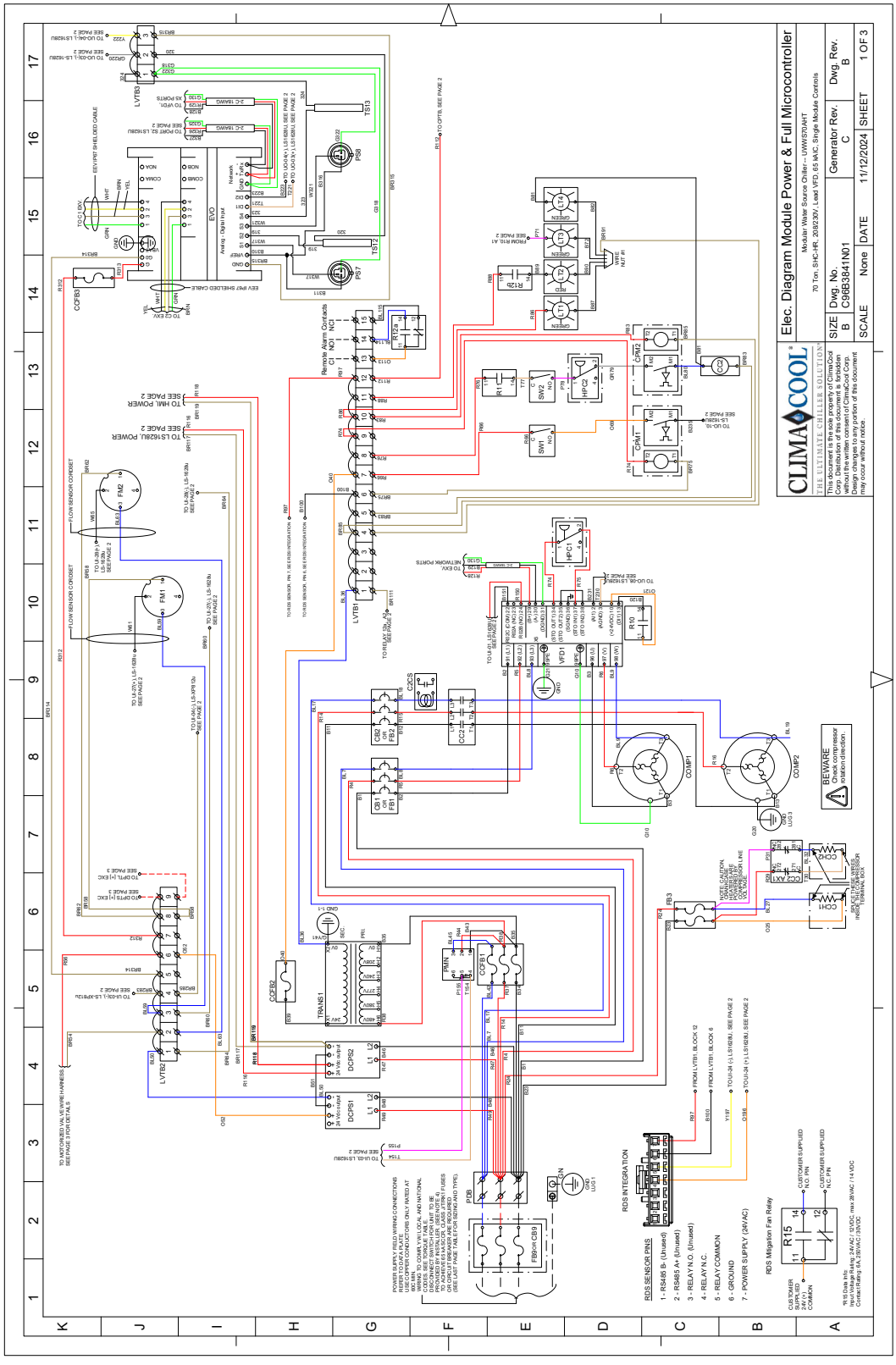
UWT, Heat Pumps, 208/230V-3PH



Example Wiring Diagrams

UW Models

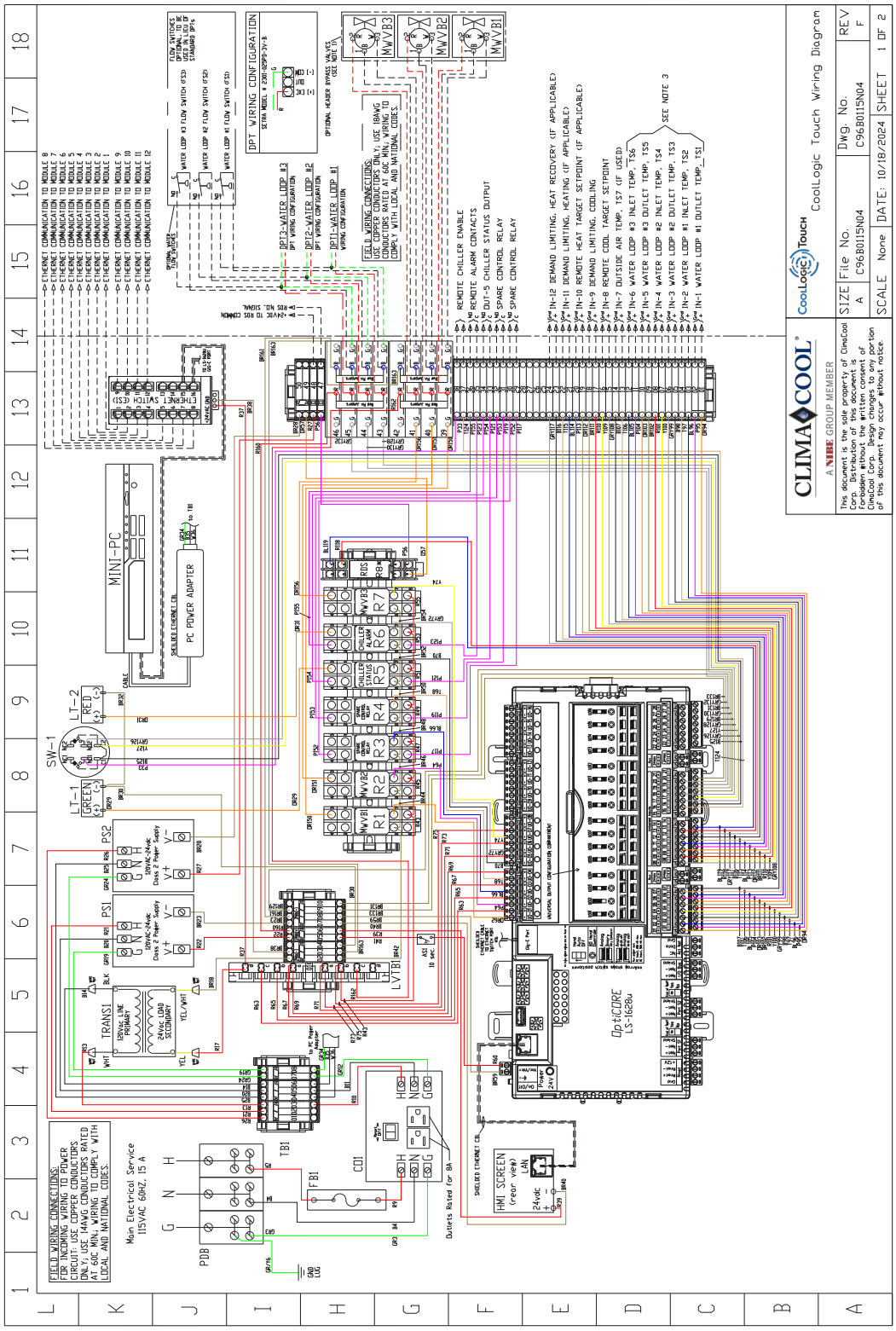
UWW SHC Heat Recovery with Lead VFD & KAIC, 208/230V-3PH



UW Models

Example Wiring Diagrams

CoolLogic Touch



Pre-Startup

All startups must be performed by ClimaCool factory trained personnel. Prior to chiller startup, there are certain essential checks which must be completed. Failure to carry out these checks could result in damage to the chiller voiding the modules warranty.

ELECTRICAL

It is imperative to turn off the main electrical power supply and follow proper lock-out/tag-out procedures prior to servicing any of the chiller's electrical components. The following procedures can be performed only after the electrical power is confirmed to be off:

1. The installation must be inspected and approved by the respective agent and be in compliance with all local and national electrical codes.
2. Check and tighten as required all electrical terminal connections on each module. Utilize any lock-out/tag-out procedures required for your project location when performing this operation. If no procedure exists take all precautions necessary to prevent the power from being turned on. A systematic tightening of all terminals inside the electrical control panel on each module should be carried out. This will include the compressor motor terminals, which would require removal of the compressor terminal cover. Check connections at each safety and every termination in the panel.
3. Verify that a separate 115 volt power supply is used to power the CoolLogic Touch Control System. Field connections are a home run STP Cat 6 or higher Ethernet cable connection.
4. All field connections should be checked for tightness.
5. Check all fuses for proper sizing as indicated on the chiller data plate and/or the electrical diagram on the inside door of the electrical panel.
6. Verify proper operation of the **mandatory** field installed pressure differential flow sensor.
7. Verify proper installation of the mandatory factory provided field installed voltage/ phase monitor.
8. **Confirm all panels and electrical covers are properly installed/sealed, including the condenser fan motor cover.**
9. **Check that all cabling (inside and outside of electrical panel) is not subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. These effects should also consider continual vibration from such sources as the compressors.**

REFRIGERATION

1. Refrigerant piping and components should be inspected for damage.
2. Place refrigerant gauges on the discharge and suction access ports of each refrigerant circuit to ensure a refrigerant charge is present. Leave the gauges on for compressor rotation check.
3. Confirm the settings on all pressure switches.

UW Models

Pre-Startup

WATER SYSTEM

1. Confirm installation of the mandatory field installed chilled water strainer with minimum of 40-mesh screen.
2. Confirm that leak testing has been carried out.
3. Confirm that the system is clean.
4. Confirm that necessary water treatment systems are in place with the heat exchanger water systems.
5. Confirm the chilled water circulating pumps are operational and water is flowing through the exchanger.
6. Shut the entering water valve and blow out some water from the lower flush port to check for particles or coloration from suspended particles. Record the pressure differential across the chiller heat exchanger measured at the pete's ports at each module.
7. Confirm correct water flow rates through the heat exchanger. Acquire the design parameters for the chiller bank from the ClimaCool Selection Program data (available from your local representative). Compare the measured differential pressures from step 5 above with the predicted flow rates to ensure proper correlation to the flow results.
8. Verify proper installation of the mandatory factory provided field installed pressure differential flow sensor, temperature sensors and wells (sensors should be fully inserted in the well and the well must be installed such that it is fully immersed into the flowing water of the field piping) and verify calibration of sensors read through CoolLogic Touch Control System.

⚠ WARNING

Disconnect power supply(ies) before servicing. Refer servicing to qualified service personnel. Electric shock hazard. May result in injury or death!

⚠ WARNING

Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with R-454B refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing R-454B as system failures and property damage may result.

⚠ CAUTION

Unit to be serviced by qualified personnel only. Refrigerant system under pressure. Relieve pressure before using torch. Recover refrigerant and store or dispose of properly.

⚠ CAUTION

3-PHASE SCROLL COMPRESSOR UNIT

If this unit uses a 3-Phase Scroll Compressor, the following instructions must be followed:

- Unit power supply must be wired in the proper sequence to avoid damage to the 3-Phase Scroll Compressor;
- Scroll Compressors with incorrect rotation show the following characteristics:
  - High sound level;
  - High suction pressure and low discharge pressure;
  - Low current draw.

If any of the three above characteristics exist, swap two of the three supply wires at the disconnect and recheck compressor for incorrect rotation.

Model: UW

Pre-Startup Checklist
Water-Source Modular Chillers

CLIMACOOL® A NIBE GROUP MEMBER

E-mail: technicalsupport@climacoolcorp.com • Phone: 800.299.9747, Option 2, then Option 3

Project Name: **Date:**

Address/Phone:

		YES	NO
1.	Are modules connected properly per Codes and Installation Manual? (Installation, Operation & Maintenance (IOM) Manual is available at www.climacoolcorp.com.)	☐	☐
2.	Is there a minimum of 40-mesh strainer on the inlet water of each loop? (three (3) for SHC units; two (2) for all others) (Fill the chiller with water, passing through–at minimum–40-mesh strainers.)	☐	☐
3.	Is condenser water system filled and flushed? See "Filling the Water System" in IOM.	☐	☐
4.	Is chilled water system filled, flushed and all air purged from system? (Air must be purged from system prior to startup. See "Filling the Water System" in IOM.)	☐	☐
5.	Is source water system (6-pipe only) filled, flushed and all air purged from system? (Air must be purged from system prior to startup. See "Filling the Water System" in IOM.)	☐	☐
6.	Are all pumps tested and operational?	☐	☐
7.	Is required GPM/Pressure Differential supplied to the chilled water side? See project specifications or selection and performance sheets available from ClimaCool Sales Rep.	☐	☐
8.	Is required GPM/Pressure Differential being supplied to the condenser? See project specifications or selection and performance sheets available from ClimaCool Sales Rep.	☐	☐
9.	Is required GPM/Pressure Differential being supplied to the source loop (6-pipe only)? See project specifications or selection and performance sheets available from ClimaCool Sales Rep.	☐	☐
10.	Are the pressure differential flow sensors properly installed and wired to the CoolLogic Touch™ Control System?	☐	☐
11.	Have all chiller coupling connections been leak tested?	☐	☐
12.	Is water presently circulating through chiller?	☐	☐
13.	Have temperature sensors been installed?	☐	☐
14.	Does the power supply match the chiller nameplate?	☐	☐
15.	Are power and communication wiring complete to each module?	☐	☐
16.	Do wiring and devices match the approved electrical submittal drawings?	☐	☐
17.	Is required load available to run multiple compressors at startup?	☐	☐
18.	Is control functional to maintain condenser water temperature? Includes maintaining "minimum" inlet temperature. See "Operational Limitations" in ClimaCool IOM.	☐	☐
19.	Is a water header bypass installed at the chiller? *(Check One)* ☐ ClimaCool provided ☐ Field Provided ☐ Smart Bypass (4-pipe only)		
20.	Glycol Added? If Yes, Glycol % _____	☐	☐

If you checked "No" to any question above, provide the line reference number and the date of scheduled completion below. Please note **all conditions must be complete prior to the start-up date:**

* This form must be completed and submitted to ClimaCool Corp. **three (3) weeks** prior to final scheduling of any Startup.
NOTE: If any of the above items are not complete at time of startup, back charges will be assessed for additional costs.

Contractor Name:

Address:

(Authorized Signature)

Phone: **Date:**

UW Models

Mechanical Startup

All startups must be performed by ClimaCool factory trained personnel.

STARTUP DOCUMENTATION

All startup paperwork and documentation must be submitted to ClimaCool. Future warranty claims cannot be processed without a completed Startup and Warranty Registration form on file.

WATER TESTING

Extract three (3) water samples from each water side, evaporator/chilled for a cooling only application or evaporator/chilled and hot water/condenser for Simultaneous Heating and Cooling application using the bottles provided (three bags; each bag containing three bottles) from the Water Sample test kit. **Confirm that the sample bottles are filled to the top leaving no air in the bottles.** All the sample bottles must have labels completed per instructions included with the bottles. Ship the bottles immediately to the appropriate water testing laboratory per the instructions.

MECHANICAL STARTUP

1. Review all items are complete from the Pre-Startup Checklist.
2. Cross reference model number with submittal sheet to verify that the units are the correct model type and voltage requirements.
3. Confirm all panels and electrical covers are properly installed/sealed.
4. Inspect all refrigerant piping for oil leaks which may have occurred during shipment which might indicate a refrigerant leak. Check the high-pressure cutout setting of the pressure controls. The setting should be 585 psig for all UW models.
5. Use refrigerant gauge set suitable for the high pressure R-454B, and hook up to the suction and discharge ports of each module's compressor stages separately. Bump start the compressors by depressing the contactor manually. Bump the compressor only for 1-2 seconds to ensure the correct rotation of the scroll compressors (indicated by a rising highside pressure and a falling suction pressure).
6. Check for proper line- or high-voltage values at each module-input power block, and the 24VAC low-voltage values for correctness (± 10% of nominal values).
7. Tighten every screw and lug connection inside the *CoolLogic Touch* Control System and inside each module control panel high-voltage section. Check auxiliary contacts on contactors and ensure #1 auxiliary is wired on the #1 contactor. Open up the compressor junction box located on the front of each compressor and verify main electrical terminal lug tightness and the low-voltage wires on protection module.
8. Confirm the jumper locations for all control systems and module controllers as shown on the wiring diagrams provided on the inside electrical door panels.
9. Verify that EXV controller is wired to the LS1628.
10. Verify motorized water-isolation valves auxiliary-switch dial settings, to ensure they close near:
    - 30% for evaporator/chilled water valves for cooling-only units and hot-water/condenser valves for Simultaneous Heating and Cooling units.
11. Power up each module control panel, turn OFF the two toggle switches located on the inside bottom of the low-voltage side of the module electrical panel. Refer to separate CoolLogic Touch IOM for more details.
12. Verify that evaporator header inlets (hot-water side if simultaneous application) include strainer assemblies equipped with 40-mesh screens.

Controller Startup

UW Models

CONTROL SYSTEM STARTUP

1. Verify the communication with the STP Cat 6 or higher Ethernet home run cabling is wired to each unit to and from the CoolLogic Touch Control System. Verify the cable's outer jacket is not stripped more than one inch. If so, the wires may have become untwisted, causing signal reflections.
2. Verify Controller hand/off/auto switches and I/O dip switches per wiring diagram.
3. Verify the location and wiring connections of all main header temperature sensors (should be a minimum of 36 inches but no more than 60 inches from the chiller bank). Confirm that all sensors are **fully inserted** into their sensor wells and wired back to the correct terminals in the bank control panel.
4. Verify the location and ports for all water differential pressure sensors used for flow detection (+) port piped to the inlet headers and the (–) ports piped to the outlet headers).
   - Verify the correct wiring using the +5 VDC power supply to the differential sensor inputs.
   - Verify the correct output wiring from the differential sensors back to the control system universal input (UI) channels 8 and 11. Confirm inputs 8 and 11 jumpers are set to 'volts'.

     Note: The differential sensor ports should not be piped to a location which includes strainer pressure drops.
5. For Variable Flow applications, confirm that the main water pumps are driven by VFD's, and that all VFD's are controlling the pump speeds to produce a nominal differential pressure drop across the chiller bank headers, per project design temperatures and approved submittal. precisely at the differential pressure sensor locations in step 6.

   Nominal differential pressure ranges are from 1 to 8 psid.
6. For Constant Flow Cooling applications, set modules to CV Cooling and confirm that valves travel to 100% open. Confirm that the main water pumps produce a nominal differential pressure drop across the chiller bank headers, per project design temperatures and approved submittal.
7. To activate Auto Stand Alone mode,
   a. On the Home page select *Service*
   b. Enter the provided unlock code to the Unlock Code field of the service page then select *Auto Stand Alone Mode*
   c. In the *Enable Auto Stand Alone Mode Function* dropdown list, select *ON.*

   Note: Auto Stand Alone mode and setpoints are automatically derived from the CoolLogic panel.

   During Auto Stand Alone mode, active mode and setpoints can be temporarily overridden at the module level. These selections transition to Bank settings when the Bank exits Auto Stand Alone mode.
8. Verify proper communications from each module back to the control system using the "status" menu, then indexing down to the desired compressor data screen.
9. Verify that module-status parameters such as temperatures and pressures coincide with actual readings.
10. Power-up the bank control panel and verify settings per the Controls Quick-start guide.

COOLLOGIC TOUCH™ CONTROL SYSTEM

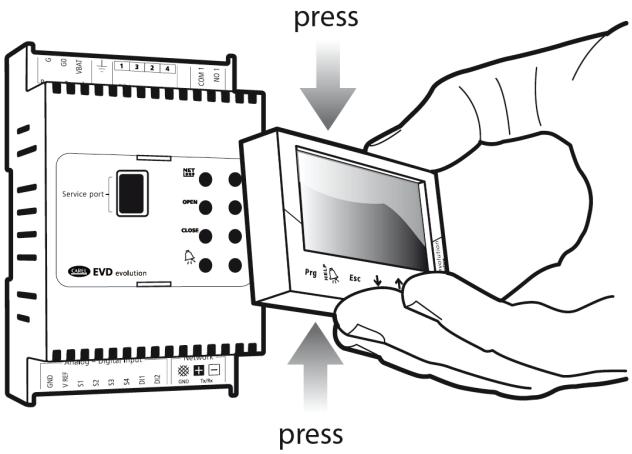
Refer to separate CoolLogic Touch IOM for Quick Start Guide and more details.

UW Models

Electronic Expansion Valves Startup

INSTALLATION

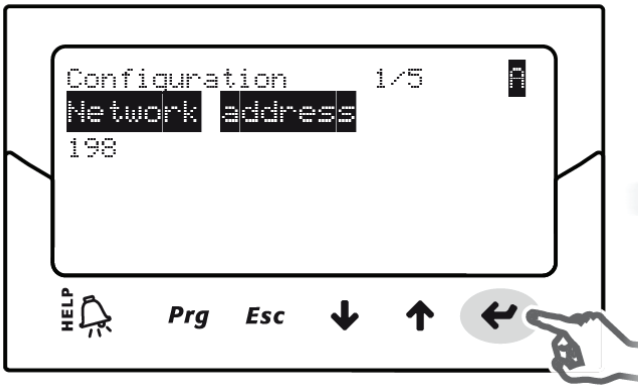
1. Remove EXV controller face plate.
2. Install EVO display.
   a. Remove the cover, pressing on the fastening points.
   b. Fit the display board, as shown.
   c. The display will come on, and if the controller is being commissioned, the guided configuration procedure will start.



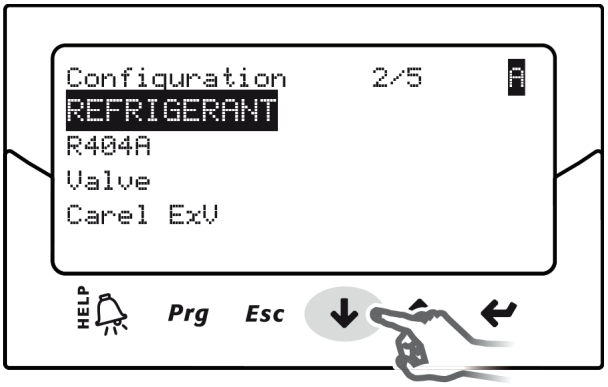
3. Power EXV controller with 24VDC.

COMMISSIONING

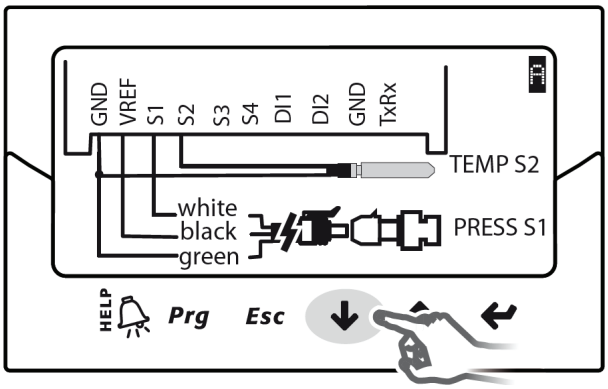
1. After fitting the display, Navigate to *CONFIGURATION* 1/5 screen, enter Network Address as *198*
   a. Press *ENTER* to move to the value of the parameter.
   b. Use the *UP/DOWN* arrows to modify the value.
   c. Press Enter again to confirm the value.



2. Press *UP/DOWN* to move to the between parameters for Driver A, indicated by the letter at the top right.



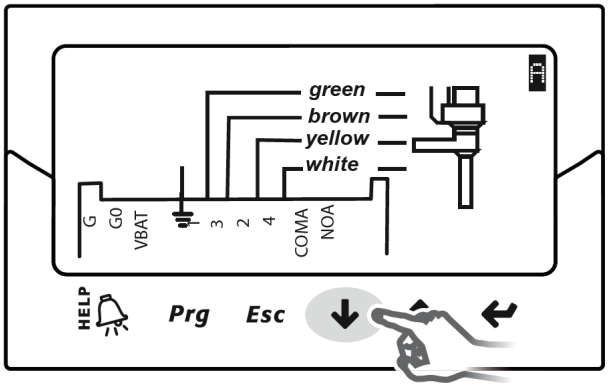
3. Navigate to *CONFIGURATION* 2/5 screen, change *Refrigerant Type* to *R454B*
   a. The type of refrigerant is essential for calculating the superheat. In addition, it is used to calculate the evaporation and condensing temperature based on the reading of the pressure probe.
4. Navigate to *CONFIGURATION* 3/5 screen, change *Probe S1 Sensor Type* to 0 to 17.3 Barg.
5. Continue in the *CONFIGURATION* 3/5 screen, change *Main Regulation* to Air conditioner/ chiller with variable cooling capacity.
6. Repeat steps 2, 3, 4, 5 to modify the values of the parameters for Driver A: refrigerant, valve, pressure probe S1, main control;
7. Check that the probe electrical connections are correct for Driver A;



Electronic Expansion Valves Startup

UW Models

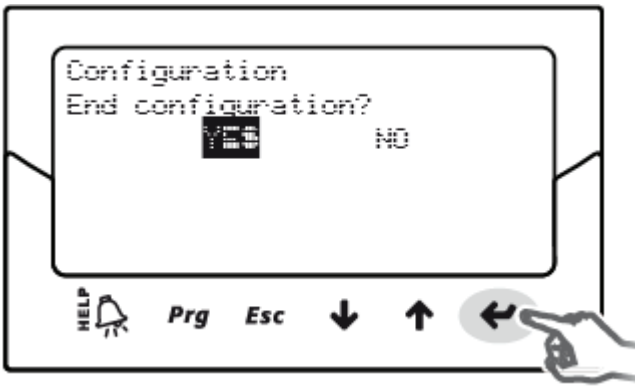
8. Check that the electrical connections are correct for Valve A



9. Repeat steps for Driver B;

   a. Press the *HELP* and *ENTER* buttons together. Switching when programming the parameters displays the parameters for driver A and driver B on the same screen.

10. When prompted to *END CONFIGURATION,* Enter *YES*

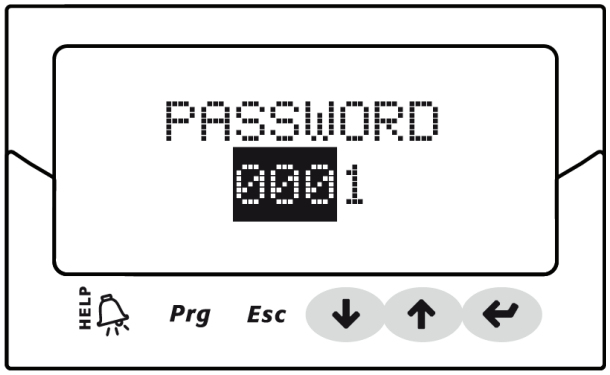


This completes the initial setup (required for new controllers never powered up); further setup is required.

11. Using the navigation arrows, complete the detailed setup as follows:

   a. Hit the *PROGRAM* key

   b. When prompted, enter the default password of *0066*



12. Set *Power Supply Mode* to *24VDC*

Parameter/Description	Def.	Min.	Max.	UOM
SPECIAL				
Power supply mode	0	0	1	-

0 = 24VAC
1 = 24VDC

13. Select network settings and set protocol configuration to *NONE, 2 STOP BITS, 19200 bps* (option 2)

Parameter	Description			Def.
SPECIAL				
Set Configuration	Parity	Bit Stop	Baud Rate (bps)	
0	none	2	4800	
1	none	2	9600	
2	none	2	19200	X
4	none	1	4800	
5	none	1	9600	
6	none	1	19200	
16	even	2	4800	
17	even	2	9600	
18	even	2	19200	
20	even	1	4800	
21	even	1	9600	
22	even	1	19200	
24	odd	2	4800	
25	odd	2	9600	
26	odd	2	19200	
28	odd	1	4800	
29	odd	1	9600	
30	odd	1	19200	

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Startup and Warranty Registration
Water-Source Modular Chillers

Model: UW

Sign date and E-mail to: technicalsupport@climacoolcorp.com • For any questions, call 800.299.9747, Option 2, then Option 3

NOTE: Please fill out this form and include the required screenshots for each module in the bank.

Project Name:
Address:
City/State/Zip:
Startup Date:

Ambient Temp:
Contractor Name:
Address:
City/State/Zip:
Phone No.:

Module

Model No.:
Serial No.:
Chiller No.: Bank No.:

Compressor

Model No.:
Serial No. 1:
Serial No. 2:

Water Samples Taken: (Mark "X")

Cooling Loop: ☐ Yes
Heating Loop: ☐ Yes ☐ N/A
Source Loop: ☐ Yes ☐ N/A
Glycol Added: ☐ Yes ☐ No If Yes: Glycol %:

Bank Water Pressure Entering/Leaving

Cooling: / Δ P
Heating: / Δ P
Source: / Δ P

"Flow devices" shut off chiller below 40% of flow for Cool Loop & 25% for Heat Loop: (if used) ☐ Yes

NOTE: Failure to collect and send water samples from each loop will void any promise of warranty.
For initial MANDATORY water samples, bottles are provided. Follow instructions on label and mail the same day sample is taken.

▶ All wiring terminations in module panel, safeties, and compressors tightened: ☐ Yes
▶ Rotation of scroll compressor is correct: ☐ Yes

Voltage/Ground

Phase-Phase: L1-L2: L2-L3: L1-L3:
Fan Amps: L1: L2: L3:
Fan Amps: L1: L2: L3:

Transformer: L1: L2: L3: 24V:
Fan Amps: L1: L2: L3:
Fan Amps: L1: L2: L3:

Compressor Circuit #1

Amperage: L1: L2: L3:
Sight Glass Oil Level:

Compressor Circuit #2

Amperage: L1: L2: L3:
Sight Glass Oil Level:

▶ Verify Safety Setting Limits:

☐ **Low Temperature:** ☐ **High Pressure:** ☐ **Low Pressure:**

Insert a USB drive into the USB port on the back of the touchscreen.
Go to the screens noted on this page and press the camera icon to take screenshots of each screen.
Submit the screenshots with your startup form.

System Screenshots[1]

Home: ☐
System Setup: ☐
Cool & Heat Setpoints: ☐
Controller Configuration: ☐
Module Configuration: ☐

NOTES:
1. All System Screenshots are required.
2. Provide screenshots from each module in the bank.

Module Screenshots[2]

Module 1	☐	Module 2	☐
Module 3	☐	Module 4	☐
Module 5	☐	Module 6	☐
Module 7	☐	Module 8	☐
Module 9	☐	Module 10	☐
Module 11	☐	Module 12	☐

Rep Signature: Print Name:
E-Signature: ☐ Check Box (Authorized Signature)

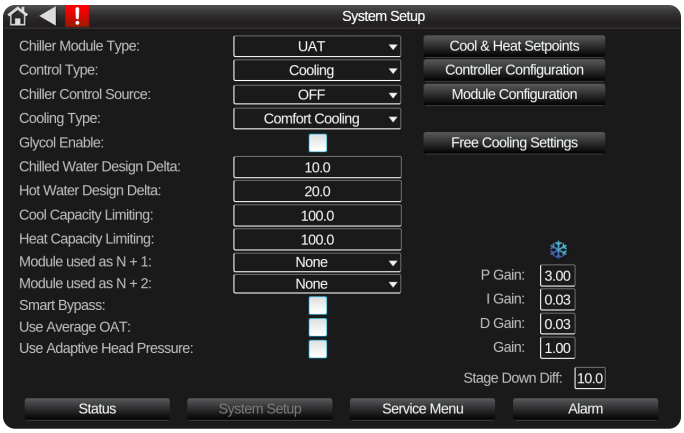
Startup and Warranty Registration

UW Models

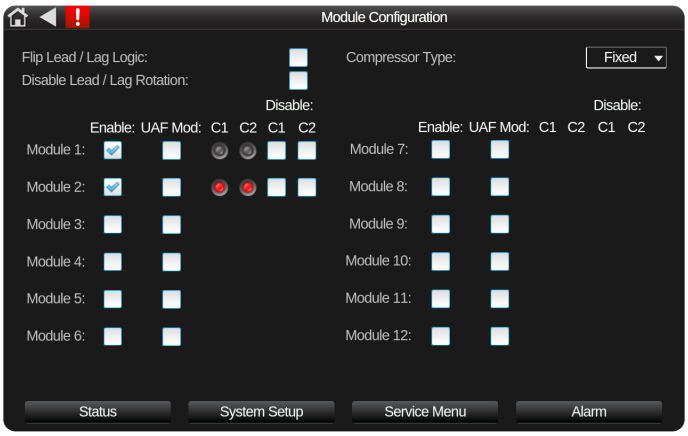
TAKING SCREENSHOTS ON THE COOLLOGIC TOUCH

Insert a USB drive into the USB port on the back of the touchscreen. Go to the screens displayed on this page and press the Camera icon to take screenshots of each screen. Submit the screenshots with your startup form.

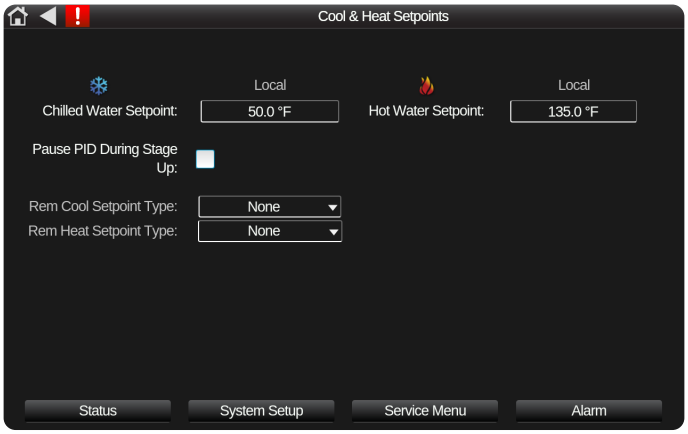
System Setup



Module Configuration

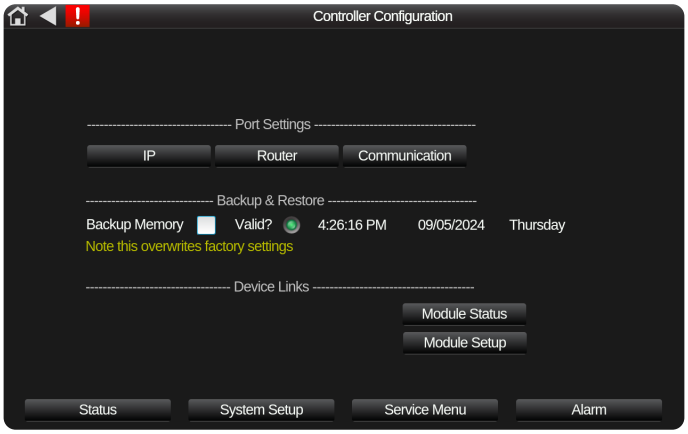


Cool & Heat Setpoints

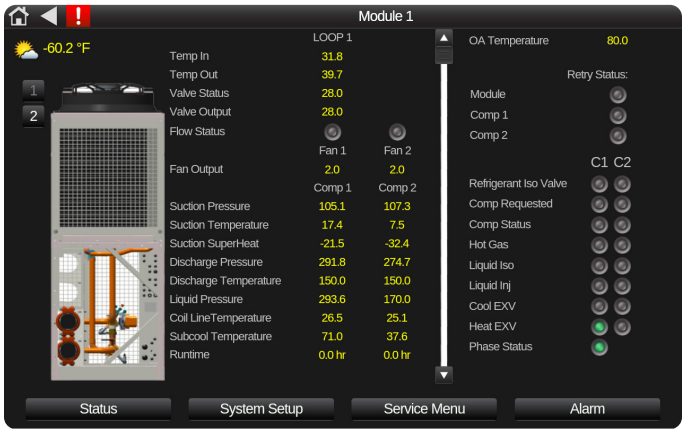


Home Screen

Controller Configuration



Module Screen



NOTE: Provide a screenshot of each module in the bank.

UW Models

Operation and Maintenance

PRESSURE AND TEMPERATURE LOG

A log of temperatures and pressures should be taken regularly. Periodically conduct a visual inspection of the chiller to identify problems before they reach the point of failure. As with any mechanical system, it is necessary to conduct a series of checks to the ClimaCool chiller to confirm correct operation.

MAINTAINING A DAILY LOG

Date							
Chilled No.							
Technician							
	Sun.	**Mon.**	**Tue.**	**Wed.**	**Thur.**	**Fri.**	**Sat.**
Chilled Water Entering Temperature							
Chilled Water Leaving Temperature							
Chilled Water Pressure Drop							
Faults: Note by Module Number							

DAILY

- A daily operational log should be kept.
- Perform visual inspection.
- Record entering and leaving chilled water temperatures and pressures.
- Note any problems that may exist and immediately plan for further investigation. If repair is necessary, schedule for earliest possible date.
- Properly document all data taken.

WEEKLY

- Review daily log from previous week.
- Perform visual inspection.
- Properly document all data taken.
- Note any problems that may exist. Immediately plan for further investigation. If repair is necessary, schedule for earliest possible date.

QUARTERLY

Check controller operating parameters and setpoints.

- Check temperature drop/rise on heat exchanger.*
- Check compressor oil level.
- Check compressor oil color.
- Check water flow rates and pressure drops across heat exchanger.
- Clean condenser coil with vacuum and soft brush (to protect coil fins) and to prevent dirt accumulation.
- Check all electrical connections for tightness.
- Properly document all data taken.

* The temperature drop/rise on a fully loaded (both compressors) heat exchanger is generally 10°F (-12.22°C). If only one compressor is running the temperature drop/rise will be approximately 5°F (-15°C). Some projects are designed to have a higher or lower temperature drop on the evaporator depending on application. Consult the bank performance sheet for your specific project for these values. If the temperature drop/rise is greater than the design, your heat exchanger may need to be back flushed or the strainer may need to be cleaned.

Visually inspect inner and outer condenser coil slab and remove surface loaded fibers as needed. Use a vacuum cleaner. If a vacuum cleaner is not available, a soft non metallic brush may be used. In either case, brush in the direct of the fin as they can be easily bent over and damaged.

A periodic clean water rinse is very beneficial for coils applied in coastal or industrial environments. It is very important the water rinse is made with a low velocity stream to avoid damage to the coil fins. **Use only environmentally sound coil cleaners. Avoid the use of: coil brighteners, high pressure washers and poor water quality for cleaning.**

⚠ WARNING

WATER AND REFRIGERANT SYSTEMS UNDER PRESSURE

- Isolate/Lockout source and relieve pressure BEFORE servicing equipment.
- Failure to relieve pressure may result in property damage, serious bodily injury or death!

⚠ WARNING

VERY HOT WATER!

WINTER SHUTDOWN: AT THE END OF THE COOLING SEASON

Drain the fluid from the cooler, hydronic package (if installed) and internal piping.

Fill the cooler and hydronic package with a sufficient amount of antifreeze solution to prevent any residual water in the cooler and hydronic package/piping from freezing. It is the facility's responsibility to maintain the working-fluid freeze-point adequately below the lowest water temperatures for freeze protection during off-state.

At the beginning of the next cooling season, refill the cooler and add the recommended inhibitor.

ANNUAL

- Back flush all heat exchangers. If fouling is suspected, use only ClimaCool recommended de-scalers (see *Chemical Clean In Place Washing* section).
- Remove and clean all waterside strainers.
- Manually operate all waterside isolation valves, if provided, on each module.
- Check all electrical connections for tightness.
- Perform leak check on all refrigerant circuits.
- Check all header piping couplings for tightness.
- Check oil level and color on each compressor.
- Check and test all refrigerant safeties for proper operation.
- Check all peripheral systems for proper operation.
- Check and test CoolLogic Touch Control System.
- Verify setpoints, sensors and general control configuration.
- Properly document all data taken.

⚠ WARNING

WATER AND REFRIGERANT SYSTEMS UNDER PRESSURE

- Isolate/Lockout source and relieve pressure BEFORE servicing equipment.
- Failure to relieve pressure may result in property damage, serious bodily injury or death!

⚠ WARNING

VERY HOT WATER!

UW Models

Heat Exchangers

DRAINING

When performing standard maintenance procedures such as flushing a heat exchanger, it will be necessary to close off a section of a module. This can easily be done if factory mounted water isolation valves are provided. Access to a floor drain is helpful when performing standard maintenance procedures.

BACK FLUSHING

It may become evident from the recorded weekly log data that the performance of the chiller is gradually degrading. This could be due to a buildup of debris or sludge obstructing the free passage of flow through the heat exchangers. This debris can be removed by a back washing process which involves the introduction of a forced violent backwards flow through the heat exchanger using a carefully formulated flushing solution. To be effective, this back flow should be slightly higher than the normal flow, and in the opposite direction. The difficulties and practicality of this method depends on the back wash pumping system itself. Another method is to back flush each heat exchanger using city water as opposed to system water. The back washing procedure is accomplished by isolating each individual heat exchanger and introducing the city water using a connection hose to the ¾-inch (1.91 cm) service port to flow in an opposite direction from the normal heat exchanger flow direction. On the opposite ¾-inch service port, connect a drain hose continuing back flow until all debris is removed. **WARNING: Water valves must be re-opened after flushing is complete.**

⚠ WARNING

WATER VALVES MUST BE REOPENED AFTER FLUSHING IS COMPLETE

CHEMICAL CLEAN IN PLACE WASHING WITH WATER ISOLATION VALVES

Chemical Clean in place washing will typically provide the best debris removal, even from severely clogged heat exchangers. It is only necessary to mechanically and electrically isolate one chiller module at a time. The rest of the chiller modules can continue to operate to satisfy the cooling load required. The cleaning tank, pump and pump strainer should be arranged in the manner shown on the next page. The flow of the cleaning is arranged in the opposite flow to the normal operational direction. Connection points are provided using the ¾-inch (1.91 cm) service ports at each heat exchanger. The cleaning solution used can be either a detergent or hot water to remove particles and simple cleaning. If correct water treatment has been implemented, this should provide adequate cleaning for most situations. The solution can be pumped through the heat exchangers and allowed to "soak" for a time and then pumped again.

If it is required to remove carbonates, then an acidic wash is recommended. A 2% solution of phosphoric or sulfamic acids in pure water are generally acceptable. These acid solutions should only be allowed to circulate within the heat exchanger for 10 to 15 minutes, followed by a thorough pure water flush for 10 to 15 minutes. Hydrochloric or sulfuric acids must not be used. In any case, consult the chemical supplier to establish the correct formulation and handling process. The materials, which will be exposed to the wash, are stated in the *Water Treatment* section and *Water Parameter* chart.

Once the washing is complete, the solution should be flushed out completely by pumping clean, fresh water through the chiller. To achieve a reasonable level of dilution, it may be required to change the water several times. After cleaning, the water quality and water treatment should be confirmed.

Figure 25: City Water Cleaning Arrangement

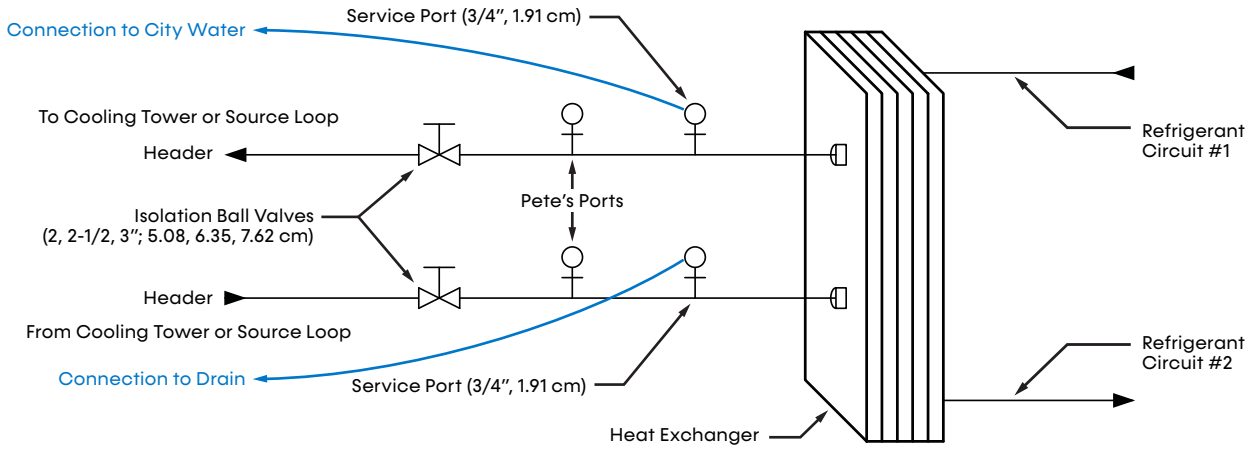
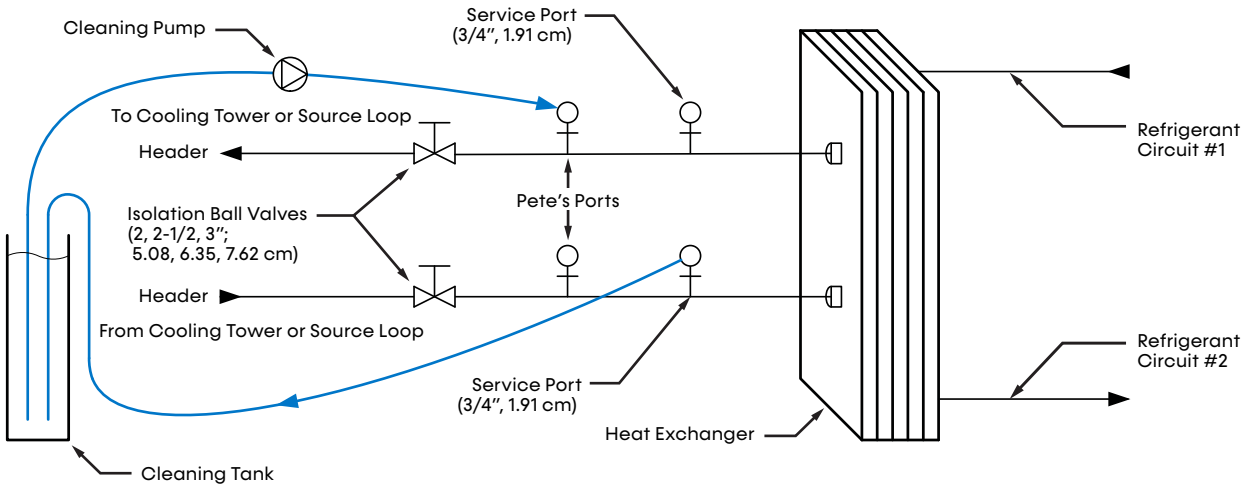


Figure 26: In Place Cleaning Arrangement



NOTES:

1. When back flushing, be sure to flush in opposite direction of flow.
2. Be sure to open all manual valves before unit is put back into operation.

UW Models

Troubleshooting Guide

⚠ WARNING

The troubleshooting guidelines recommended in this section could result in exposure to electrical safety hazards. Please refer to the safety warnings provided in this manual. Failure to follow all of the recommended safety warnings provided could result in death or serious injury. When possible, disconnect all electrical power including remote disconnects before servicing. Follow proper lockout/tagout procedures. Only a qualified, licensed electrician or persons trained to handle live electrical components should be allowed to work with energized electrical components.

⚠ WARNING

Disconnect power supply(ies) before servicing. Refer servicing to qualified service personnel. Electric shock hazard. May result in injury or death!

⚠ CAUTION

Unit to be serviced by qualified personnel only. Refrigerant system under pressure. Relieve pressure before using torch. Recover refrigerant and store or dispose of properly.

Issue	Possible Cause
Compressor high discharge temperature alarm	Discharge Temp > 250 psi and compressor output is ON
Local flow alarm	Both valves fully open, module flow is OFF and a compressor has been requested
Load high leaving water temperature alarm	In heat mode if leaving temp > 90°F, otherwise if temp > 144°F
High suction pressure software shutdown	Suction pressure > 185 psi, Motorized Water Valve is > minimum position , and compressor output is ON
Low discharge pressure software shutdown	Discharge pressure < 200 psi and compressor output is ON
Compressor no-run alarm	Compressor input status is OFF and compressor output status is ON
Issue	
Compressor Low Suction Pressure Alarm: Suction Pressure < 89 psi	
Possible Cause	**Solution**
Main chilled water valve closed or restricted	Open valve to full open position.
Module chilled water isolation valves, if provided, closed or restricted	Open valves to full open position.
Low refrigerant volume	Check for leaks – add refrigerant.
No load on water chiller	Check water pump operation.
Restriction in liquid line	Plugged liquid line drier – replace liquid line drier.
Inoperable EEV	Repair the expansion valve.
Low water flow through the cooler	Check water flow through the cooler.
Chilled water temperature too cold	Raise water temperature setpoint.
Fouled brazed plate heat exchanger	Clean-in-place heat exchanger as described in IOM.
Faulty suction pressure transducer	Verify transducer calibration using a calibrated manifold gauge and replace if defective.
Wrong suction pressure cutout setpoint	Verify suction pressure cutout setpoint to be set equal to the corresponding leaving chilled solution freeze temperature equivalent pressure on a PT chart. (i.e. If the solution freeze point is 32°F, the equivalent pressure setpoint will be 101 psig).
Improper chilled water circulation	Use an ample sized cleanable strainer in the chilled water circuit; make certain the strainer is clean to ensure full flow of chilled water (strainer screen must be 40-mesh minimum).
Faulty suction pressure transducer	Verify transducer calibration using a calibrated manifold gauge and replace if defective.
Wrong suction pressure cutout setpoint	Verify suction pressure cutout setpoint to be set equal to the corresponding leaving chilled solution freeze temperature equivalent pressure on a PT chart. (i.e. If the solution freeze point is 32°F, the equivalent pressure setpoint will be 101 psig.).
Low discharge pressure	Raise and control discharge pressure within design limits.

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Issue	
Compressor High Discharge Pressure Alarm: Discharge pressure > 575 psi	
Possible Cause	**Solution**
Improper condenser water circulation	Use an ample sized cleanable strainer in the condenser water circuit; make certain the strainer is clean to ensure full flow of condenser water (strainer must be 40 mesh minimum). It may sometimes be necessary to treat water to prevent formation of deposits.
Insufficient water flow through the condenser	Check water flow through condenser against design requirements.
Fouled brazed plate heat exchanger	Clean-in-place heat exchanger as described in IOM.
Main condenser water valve closed or restricted	Open valves to full open position.
Module condenser water isolation valves closed or restricted	Open valves to full open position.
Water regulating valve incorrectly set or defective	Reset or replace valve.
Defective high pressure switch	Replace high pressure switch.
Compressor discharge valve partially closed	Open valve to full open position.
Non-condensable gases in hydronic system	Recover non-condensable gases from bleed valve on condenser or at bleed valve of the building condenser water system.
Condenser water temperature high	Check water supply temperature against requirements; if cooling tower is used, check spray nozzles on cooling tower.
Overcharge of refrigeration	Recover refrigerant from system while in operation until the first sign of bubbles are shown in the sight glass. Add back refrigerant just until bubbles clear.
Issue	
Module Lockout: Unlock code does not match factory lock code	
Possible Cause	**Solution**
Incorrect unlock code	Contact factory to verify unlock code
Issue	
Phase Loss Alarm: Chiller Requested and Phase Status is OFF	
Possible Cause	**Solution**
No signal from phase loss monitor	Check power wiring and fuses.
Phase loss monitor not operational	Replace Phase loss monitor.
Issue	
Communication Loss Alarm: Module Communication Lost from CoolLogic for > 2 minutes and 30 seconds	
Possible Cause	**Solution**
Incorrect network configuration	Verify device instance, home network selected, and network number used on both CoolLogic Touch and module controllers.
No power to the CoolLogic Touch controller	Verify power and power wiring to the CoolLogic Touch controller.
Incorrect wiring	Verify ethernet connection between Gig-E port on both module and CoolLogic Touch controllers.
Bad ethernet switch	Replace ethernet switch.
No power to the ethernet switch	Verify power and power wiring to the ethernet switch.
Issue	
EEV Communication Loss Alarm: EEV Communication Status is OFF	
Possible Cause	**Solution**
No power to the controller	Verify power and power wiring to the controller.
Incorrect wiring	Verify ethernet connection between the S2 port on the module and network on the Controller.
Incorrect network configuration	Verify and update network address
Issue	
Invalid OAT Out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad OAT Sensor	Replace sensor.
Incorrect wiring to OAT sensor	Verify sensor wiring.

Table continued on next page.

Troubleshooting Guide

Table continued from previous page.

Issue	
Invalid Compressor Discharge Temperature Out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad discharge temp sensor	Replace sensor.
Incorrect wiring to discharge temp sensor	Verify sensor wiring.
Issue	
Invalid Compressor Suction Temperature Out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad suction temp sensor	Replace sensor.
Incorrect wiring to the suction temp sensor	Verify sensor wiring.
Issue	
Invalid Air Coil Line Temperature out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad air coil line temp sensor	Replace sensor.
Incorrect wiring to the air coil line temp sensor	Verify sensor wiring.
Issue	
Invalid Liquid Line Temperature out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad air coil line temp sensor	Replace sensor.
Incorrect wiring to the air coil line temp sensor	Verify sensor wiring.
Issue	
Invalid Loop Entering Water Temperature out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad loop entering water temp sensor	Replace Sensor
Incorrect wiring to the loop entering water temp sensor	Verify sensor wiring
Issue	
Invalid Compressor Suction Pressure out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad suction pressure sensor	Replace sensor.
Incorrect wiring to suction pressure sensor	Verify sensor wiring.
Issue	
Invalid Loop Leaving Water Temperature out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad loop leaving water temp sensor	Replace sensor.
Incorrect wiring to the loop leaving water temp sensor	Verify sensor wiring.
Issue	
Invalid Compressor Discharge Pressure out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad discharge pressure sensor	Replace sensor.
Incorrect wiring to discharge pressure sensor	Verify sensor wiring.
Issue	
Invalid Compressor Liquid Pressure out of Range Alarm: Sensor is reading a value outside of its operating range, while operating inside range	
Possible Cause	**Solution**
Bad liquid pressure sensor	Replace sensor.
Incorrect wiring to liquid pressure sensor	Verify sensor wiring.

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Issue	
Refrigerant Detection System	
Possible Cause	**Solution**
Refrigerant Leak	Check refrigerant charge. If the charge is low, identify and repair the leak.
Faulty RDS Sensor	Check refrigerant charge. If the charge is not low, replace the RDS sensor.

UW Models

General Information - Servicing

WORK PROCEDURE

Work shall be undertaken under a controlled procedure to minimize the risk of a flammable gas or vapor being present while the work is being performed.

GENERAL WORK AREA

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

Check for presence of refrigerant - The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

Presence of fire extinguisher - If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

No ignition sources - No person carrying out work in relation to a REFRIGERATION SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing, and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

Ventilated area - Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

CHECKS TO REFRIGERATION EQUIPMENT

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant-containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigerant piping or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

CHECKS TO ELECTRICAL DEVICES

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- Capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That no live electrical components and wiring are exposed while charging, recovering, or purging the system;
- That there is continuity of earth bonding.

Refrigerant Recovery, Evacuation, and Charging

UW Models

RECOVERY AND EVACUATION

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations;
- Recover;
- Purge the circuit with Nitrogen;
- Evacuate;
- Continuously flush or purge with inert gas when using flame to open circuit; and
- Open the circuit.

The refrigerant charge shall be recovered into the proper recovery cylinders. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

CHARGING PROCEDURES

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with Nitrogen to 300 psi. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

LEAK DETECTION

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine may react with the refrigerant and corrode the copper pipe-work. **NOTE: Examples of leak detection fluids are: bubble method or fluorescent method agents.**

If a leak is suspected, all naked flames shall be removed/extinguished. If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated (by means of shut-off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to the section, "Recovery and Evacuation" above.

UW Models

Refrigerant Recovery, Evacuation, and Charging

DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a. Become familiar with the equipment and its operation.

b. Isolate system electrically.

c. Before attempting the procedure, ensure that:

   – Mechanical handling equipment is available, if required, for handling refrigerant cylinders;

   – All personal protective equipment is available and being used correctly;

   – The recovery process is supervised at all times by a competent person;

d. Pump down refrigerant system, if possible.

e. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.

f. Make sure that cylinder is situated on the scales before recovery takes place.

g. Start the recovery machine and operate in accordance with instructions.

h. Do not overfill cylinders (no more than 80% volume liquid charge).

i. Do not exceed the maximum working pressure of the cylinder, even temporarily.

j. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.

k. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

Labeling

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating that the equipment contains FLAMMABLE REFRIGERANTS.

RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

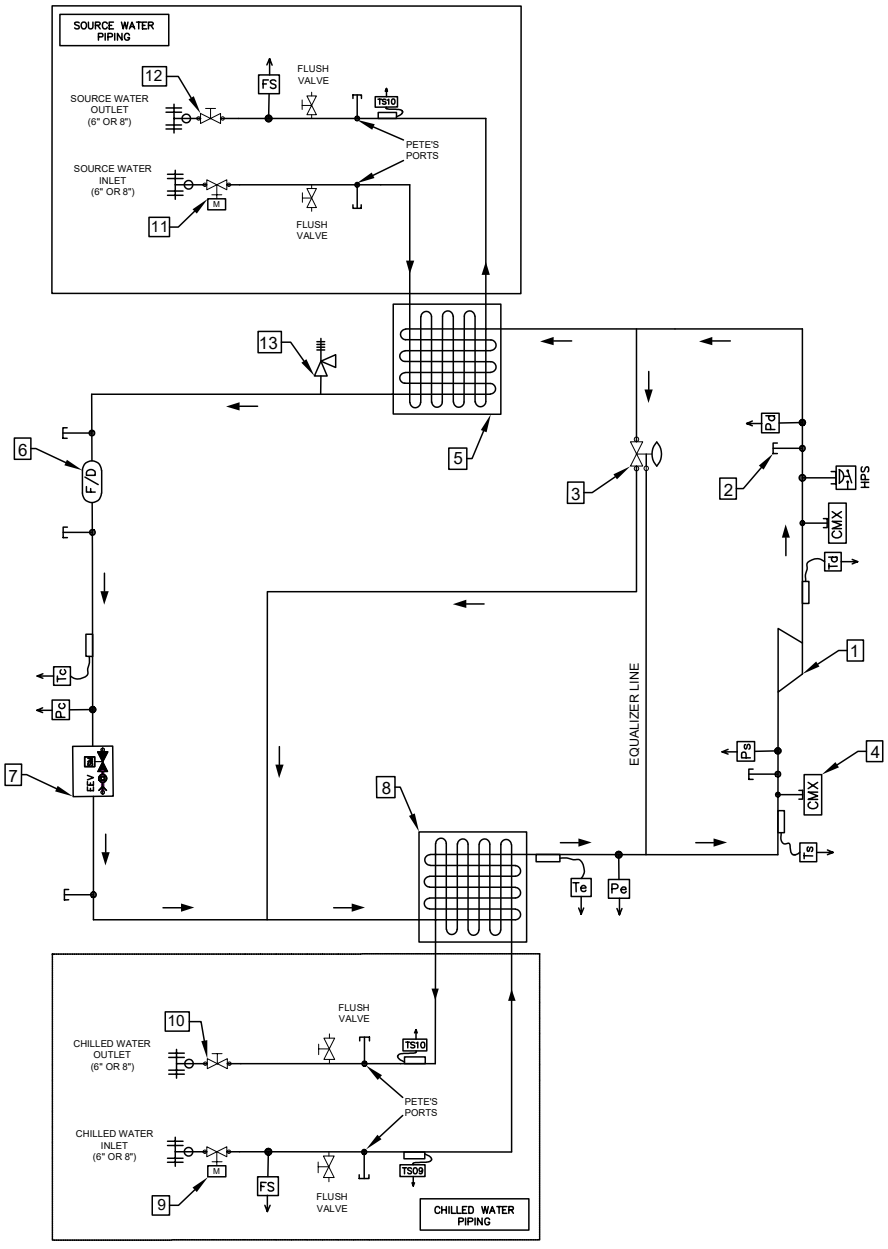
The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Refrigeration Circuit Diagrams Chillers UWC

UW Models



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

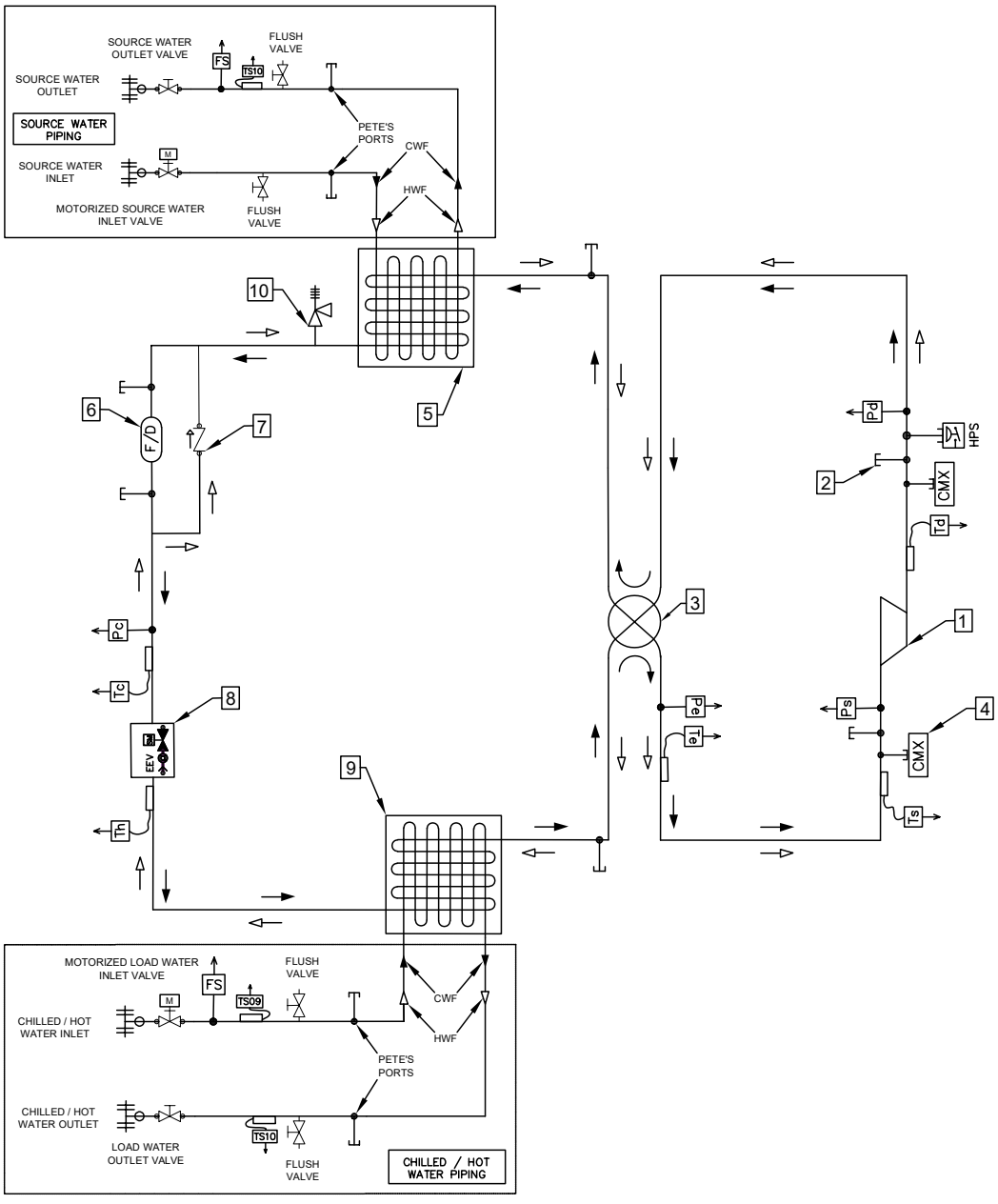
SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

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

REV: B

UW Models

Refrigeration Circuit Diagram
Heat Pumps UWT



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

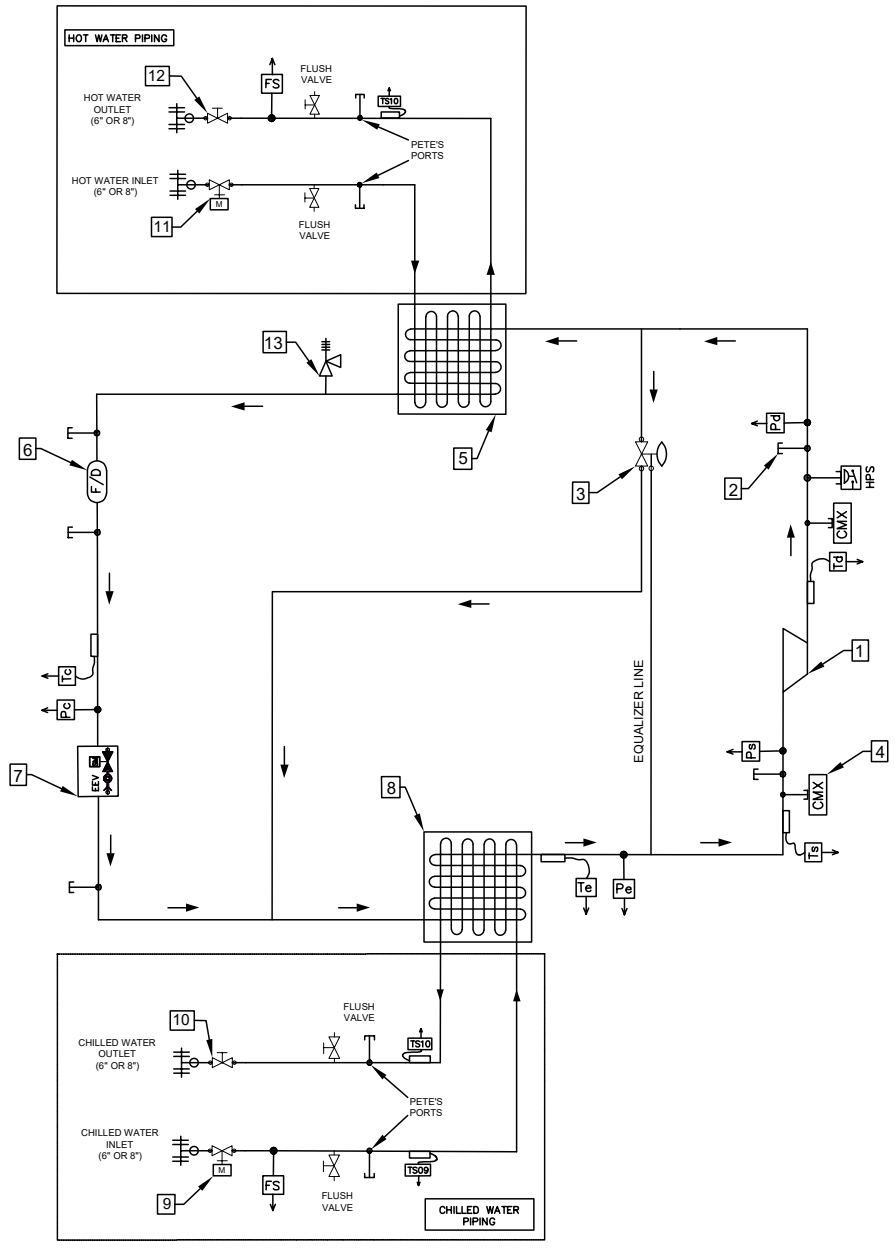
SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

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

REV: C

Refrigeration Circuit Diagrams
Heat Recovery UWH

UW Models



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

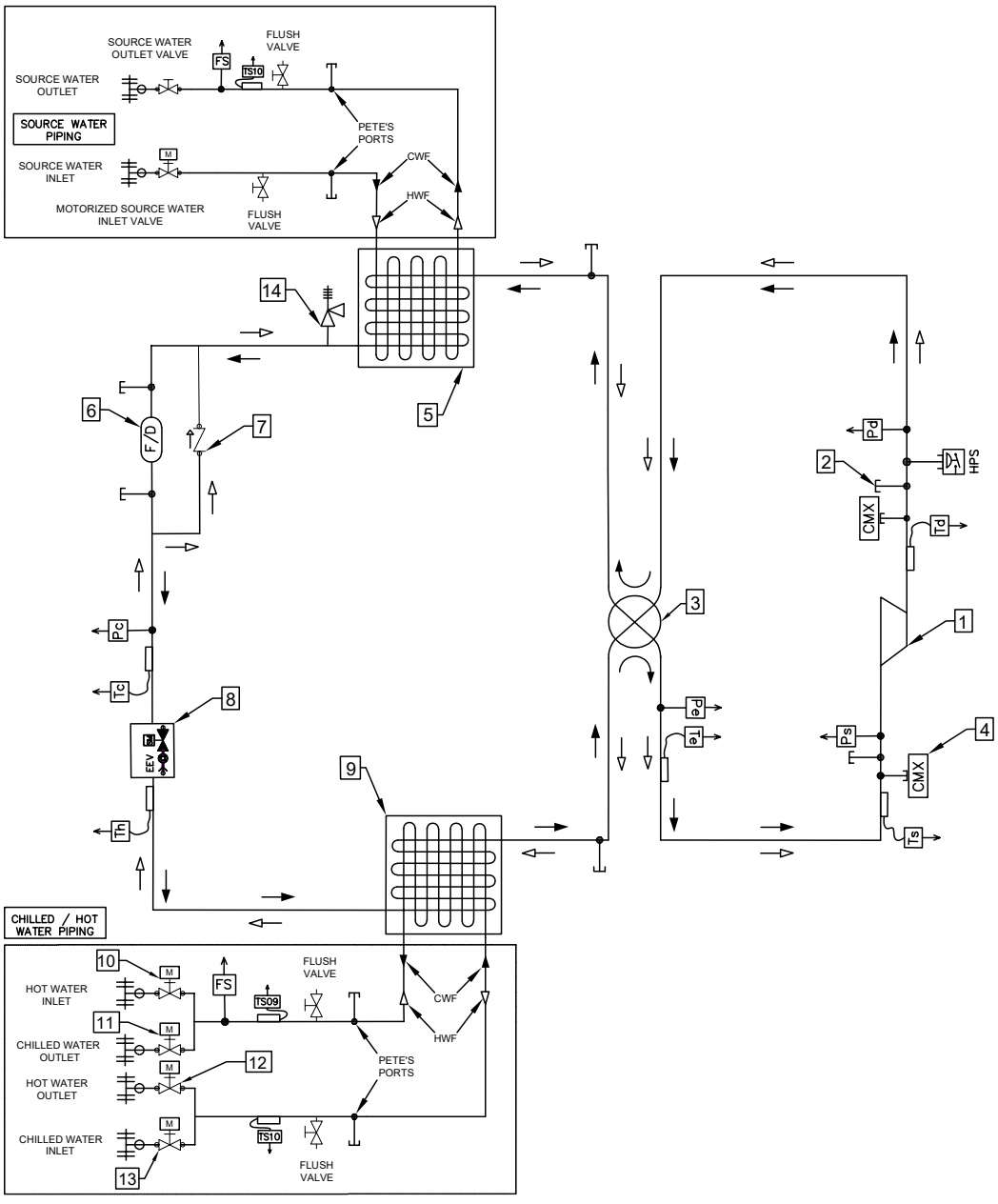
SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

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

REV: B

UW Models

Refrigeration Circuit Diagrams
SHC Heat Pumps UWU



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

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

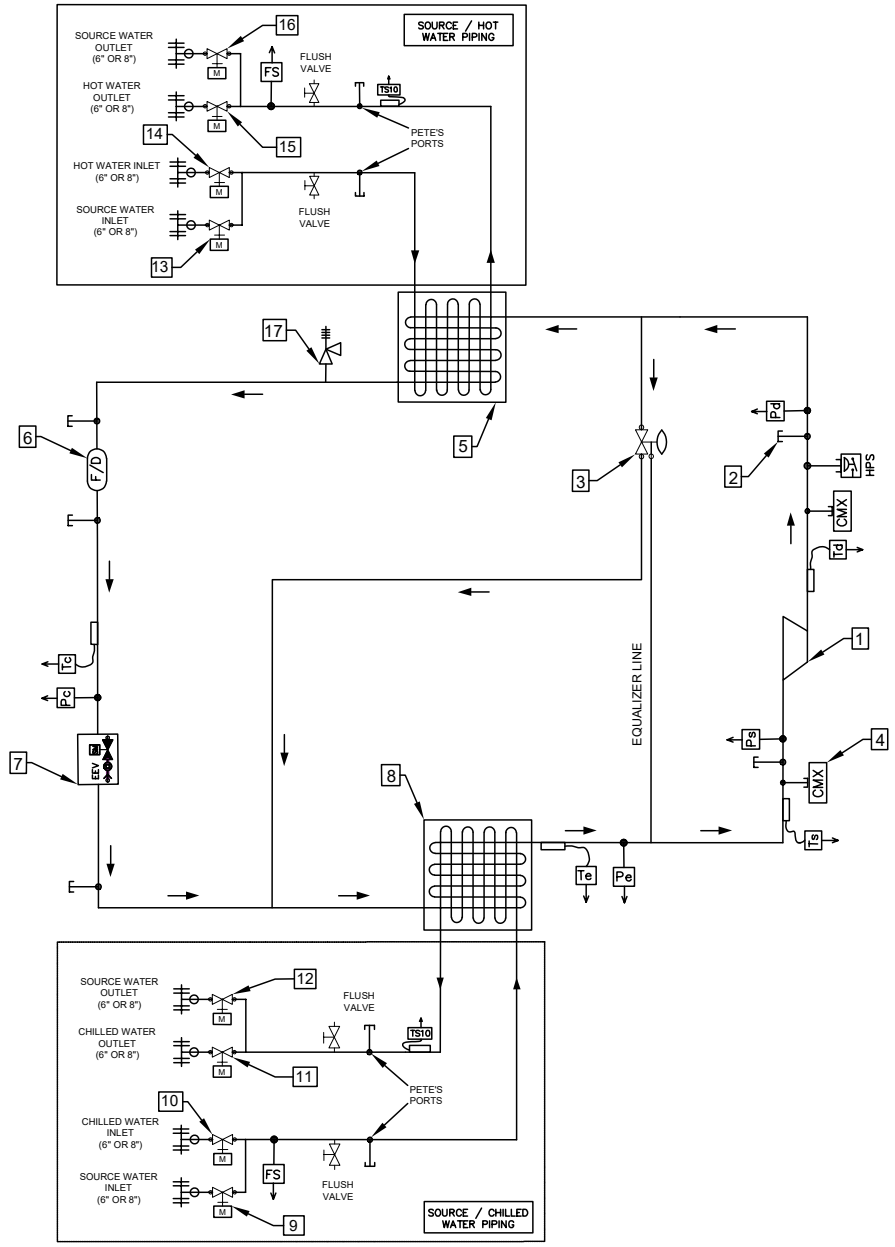
SIZE: A
SCALE: -
DRAWN BY: CCC-ENG

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

REV: C

Refrigeration Circuit Diagrams
SHC Heat Recovery UWW

UW Models



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
Pd = DISCHARGE
Pc = COOLING

TEMPERATURE SENSOR

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

TS10 = OUTLET

OTHERS

HPS = HIGH PRESSURE SWITCH
FS = FLOW SWITCH

← = COOLING

CLIMACOOL®

TITLE: REFRIGERATION CIRCUIT DIAGRAM (CIRCUIT #1 SHOWN)

DESCRIPTION: 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

CLIMACOOL®

A NIBE GROUP MEMBER

CLIMACOOL CORPORATION
LIMITED EXPRESS WARRANTY/LIMITATION OF REMEDIES AND LIABILITY WITH EXTENDED COMPRESSOR WARRANTY

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 and workmanship under normal use and maintenance only as follows:

FOR MODULAR CHILLERS: (a) All modular chillers built or sold by CC for twelve (12) months from the date of unit start-up or eighteen (18) months from date of shipment (from CC's warehouse), whichever comes first; and (b) Any repair and replacement parts, which are not supplied under warranty, for ninety (90) days from date of shipment (from CC's warehouse) and (c) If such extended warranty is purchased, the compressors in all modular chillers built or sold by CC shall extend for sixty (60) months from the 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, F.O.B. 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 units 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 or chemicals; (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; (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 products; (14) 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: (15) Products which are defects caused by overfiring, use of incorrect fuel, or improper burn or control adjustments; or (16) Products which have incomplete or inadequate combustion.
CC is not responsible for: (1) The costs of any fluids, refrigerant or other system components, or the 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 or 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 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 any 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 this Limited Express Warranty, CC will only be obligated at CC's option to repair the failed part or 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 of 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 AGAINST CC FOR 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 CC'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, allocation, shortages 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. • 15 South Virginia Ave. • Oklahoma City, Oklahoma 73106 • (405) 815-3000 • e-mail: customersupport@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 to state and from Canadian province to Canadian province.

Please refer to the CC Installation, Operation and Maintenance Manual for operating and maintenance instructions.

Revised: 04-27-22

Notes

UW Models

Revision History

Date	Section	Action
03/13/25	Electrical Data	Updated table structure and notes. Updated data for UWC with Lead VFD modules.
02/28/25	Electrical: Low Voltage Wiring - RDS Installation	Updated functional description of RDS control board.
02/10/25	All	Added RDS installation, Minimum Installation Area, VFD STO Function, Servicing, and Refrigeration Circuit Diagrams pages. Removed Wiring Diagram Maritix Tables. Updated requirements for Cat 5e to shielded, twisted pair (STP) Cat 6. Updated requirement for 60-mesh strainers to 40-mesh strainers. Added warning in applicable sections concerning no public access to equipment.
	Attentions, Cautions, and Warnings	Added Warnings to support the RDS and R-454B refrigerant.
	Model Nomenclature	Added RDS offerings. Removed unused offerings. Updated Notes.
	Physical Data	Updated data for sizes 30 and 70 tons. Updated Notes. Removed Capacity, EER, and COP data.
	Operating Limits	Updated data
	Chiller Header Bypass Kits	Updated Header Bypass kit design and accompanying graphics and installation instructions.
	Water Piping Configurations	Updated applicability of Field Piping Reverse Return configuration
	Water Treatment & Temperature Requirements	Added Chlorine Water Quality Parameters
	Electrical Connections	Added Disconnect information
	Communications Wiring	Updated communication requirements and supplemental information from Cat 5e to STP Cat 6
	Electrical Data	Updated data. Added new table for units with Lead VFD
	Example Wiring Diagrams	Updated wiring diagrams
	Pre-Startup.	Added step 9 to Electrical Pre-Startup procedures. Added Polyolester Warning
	Refrigerant Recovery, Evacuation, and Charging	Added Leak detection and Labeling sections
	Troubleshooting Guide	Added section for resolution of Refrigerant Detection System issues
	Heat Exchangers	Added Warning concerning flushing procedure
10/07/24	Pre-startup Checklist	Updated checklist items

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