



COMPAX CHILLER/HEAT PUMP PRODUCT GUIDE

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Compax
Incorporated



Childrens Museum – Brooklyn, NY



BCI – Brantford, ON



Tulalip Casino & Resort – Marysville, WA

Vaudreuil-Dorion Arena – Montreal, QC



What is a Compax Chiller?



Series 1
3-7 tons



Series 2
8-12 tons



Series 3
14-30 tons



Series 4
40-60 tons



NASDAQ Building – NYC

It is a truly modular chiller/heat pump with superior heat exchangers. It features:

- ➡ High efficiency “Tube in Shell” exchangers
- ➡ A small footprint
- ➡ Up to 60 tons of cooling capacity per module
- ➡ 135°F hot water supply
- ➡ Geothermal applications
- ➡ 100% Front Serviceable
- ➡ Reversing or non-reversing

FMRP – Cambridge, ON



TRULY MODULAR

Compax units are truly modular. They can be installed an inch apart from each other. Each unit can be removed from the bank without service disruption to the other units.



RANGE OF OPERATION

Heating fluid to 135 °F (60 °C)
 Chilled fluid to 40 °F (4.4 °C)
 Geothermal
 source fluid from 30 °F to 70 °F
 (-1.1 °C to 21.1 °C)



SHELL & TUBE HEAT EXCHANGERS WITH ENHANCED BORE TUBES

Unlike most manufacturers, Compax does not utilize brazed plates or coaxial heat exchangers. Instead, we only use “tube in shell” heat exchangers. These highly efficient condensers have enhanced tubes which are much less prone to fouling than brazed plates.



100% FRONT SERVICEABLE

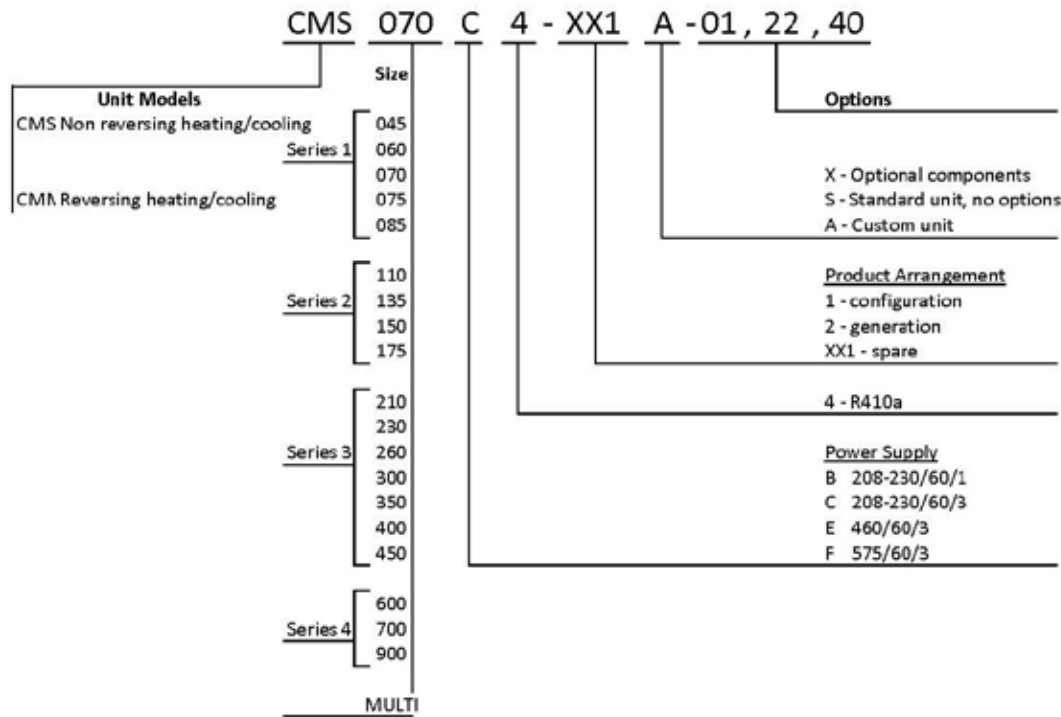
If they require servicing, our units can be serviced in place or pulled out without interrupting operations.



ASSEMBLY

Compax chillers can be assembled in banks on site. An optional factory made header assembly can be provided.

COMPAX NOMENCLATURE



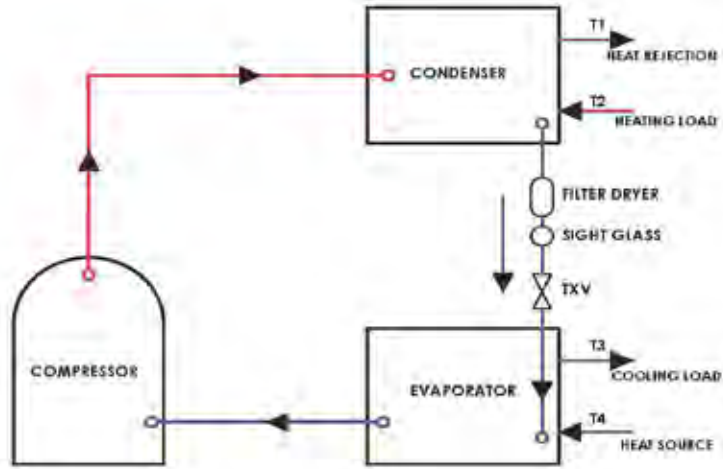
- Unit size refers to nominal heat of rejection (ie 900 = 900,000 BTU/H)
- Series 1 & 2 have single compressors
- Series 3 & 4 have dual compressors and dual circuits

TECHNICAL INFORMATION

- Standard range of operation: up to 135 °F hot water supply and 40 °F entering cold water.
- All units are complete with insulated metal, off white powder coated cabinets.
- All units operate with R410A refrigerant.
- All units are complete with a standalone microprocessor control with LCD display.
- All three phase units come with phase reversal and loss of phase protection.
- All 2 compressor units come with individual motor protection.
- Two compressor units have dual circuits as standard.
- CMS units have thermal expansion valves as standard (non-reversing).
- CMM units have electronic expansion valves (reversing).
- All units are programmed for heating and/or cooling operation.
- All units cycle based on heating or cooling setpoints. Setpoints are adjustable via display or via Modbus RTU.

CMS UNITS

Non reversing unit that can be controlled for cooling and heating. Control by EFT evap for cooling condenser for heating.



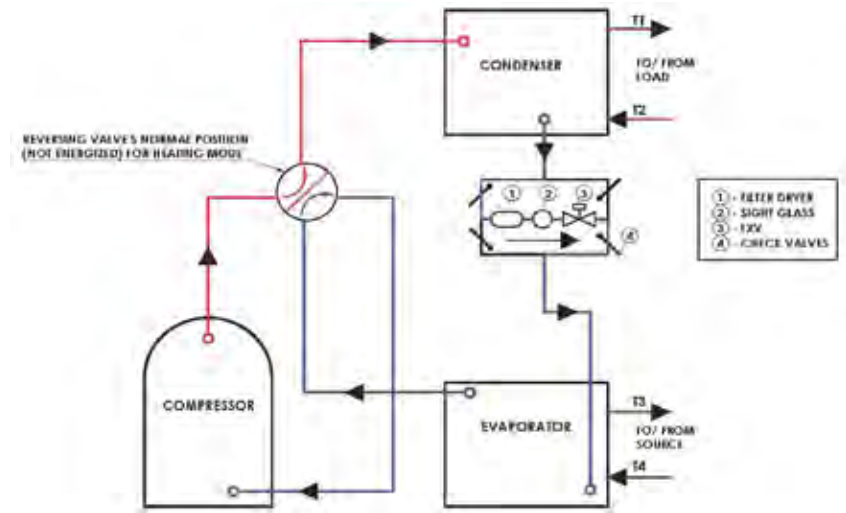
Springdale Professional Bldg, Brampton, ON



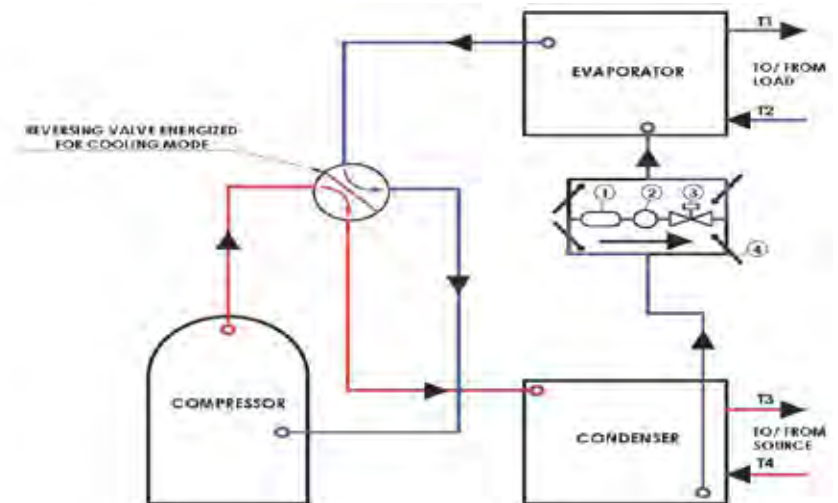
CMM UNITS

Reversing unit that can be controlled for cooling and heating. Control by EWT on load heat exchanger only.

CMM (heating)



CMM (cooling)



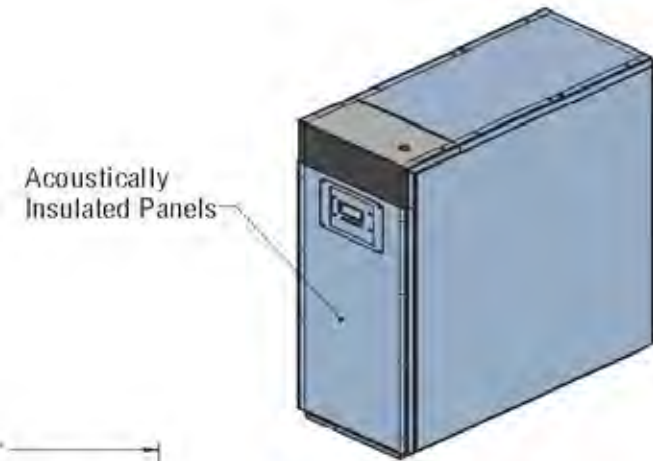
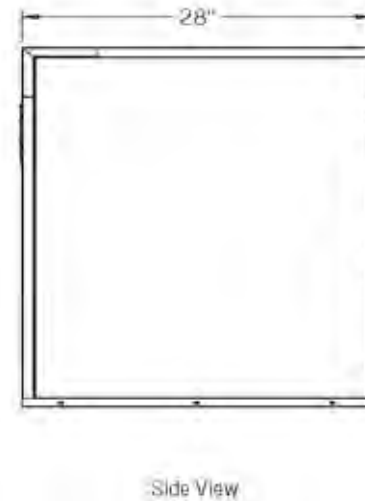
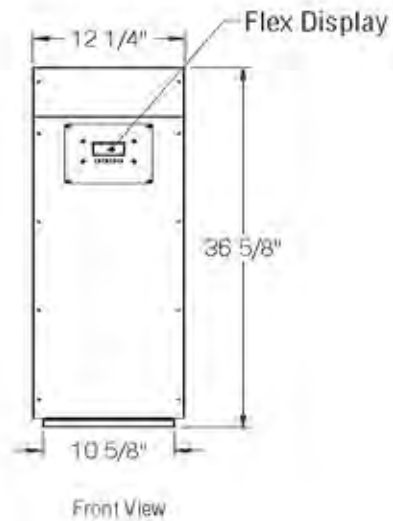
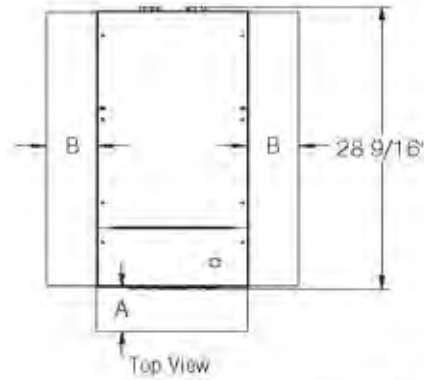
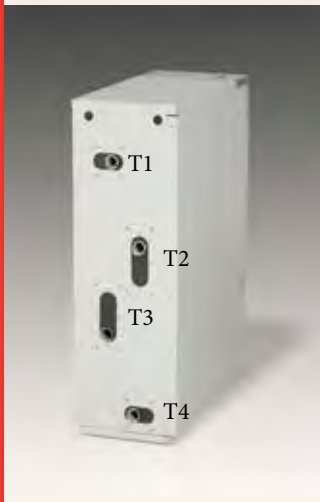
FEATURES (STANDARD OR OPTIONAL)	CMS	CMM
Baked enamel insulated cabinet	Standard	Standard
Scroll compressors	Standard	Standard
Shell and tube evap and condensers (tube are enhanced copper)	Standard	Standard
Shell and tube evap and condensers (CuproNickel tubes)	Optional	Optional
Single Power source for dual circuit units	Standard	Standard
Motor protectors on dual compressor units	Standard	Standard
Distribution block for power wiring available for Series 3 & 4 only	Standard	Standard
R410A refrigerant	Standard	Standard
Filter dryer	Standard	Standard
Sight glass	Standard	Standard
Pressure activated reversing valve	N/A	Optional
Electric reversing valve	N/A	Optional
Single direction refrigerant flow through expansion valves and filter drier	Standard	Standard
Front access for controls and refrigerant pressure access ports	Standard	Standard
Thermal TX valve	Standard	N/A
Electronic TX valve	Optional	Standard
Phase reversal protection (3 phase unit)	Standard	Standard
Phase loss protection (3 phase unit)	Standard	Standard
Dual compressor units – dual circuits (series 3 & 4 only)	Standard	Standard
Water flow switch	Optional	Optional
Pipe connections for Series 1 with threaded female pipe Series 2 and above with grooved mechanical (Victaulic or other) couplings included	Standard	Standard
Standalone electronic control system comes with: – Flex controller comes with LCD display – In and out temps display – Conditions and faults display – Modbus RS485 interconnect ability – Built in cooling temp controls – Built in heating temp controls	Standard	Standard
Extended range operation which extends the source heat exchanger entry operating temperature range	Optional	Optional
Electrically controlled flow valve on the fluid line on heat exchanger	Optional	Optional
Building system controller and sequencing panel	Optional	Optional
Low Source temperature operation changes low temperature safety cut-out to allow heating when the source is below freezing (0°C or 32°F)	Optional	Optional
12" Stainless steel braided hose connections	Optional	Optional

SERIES ONE

045-085 (3 to 7 tons)
Single compressor



NV Heathorn, San Leandro, CA



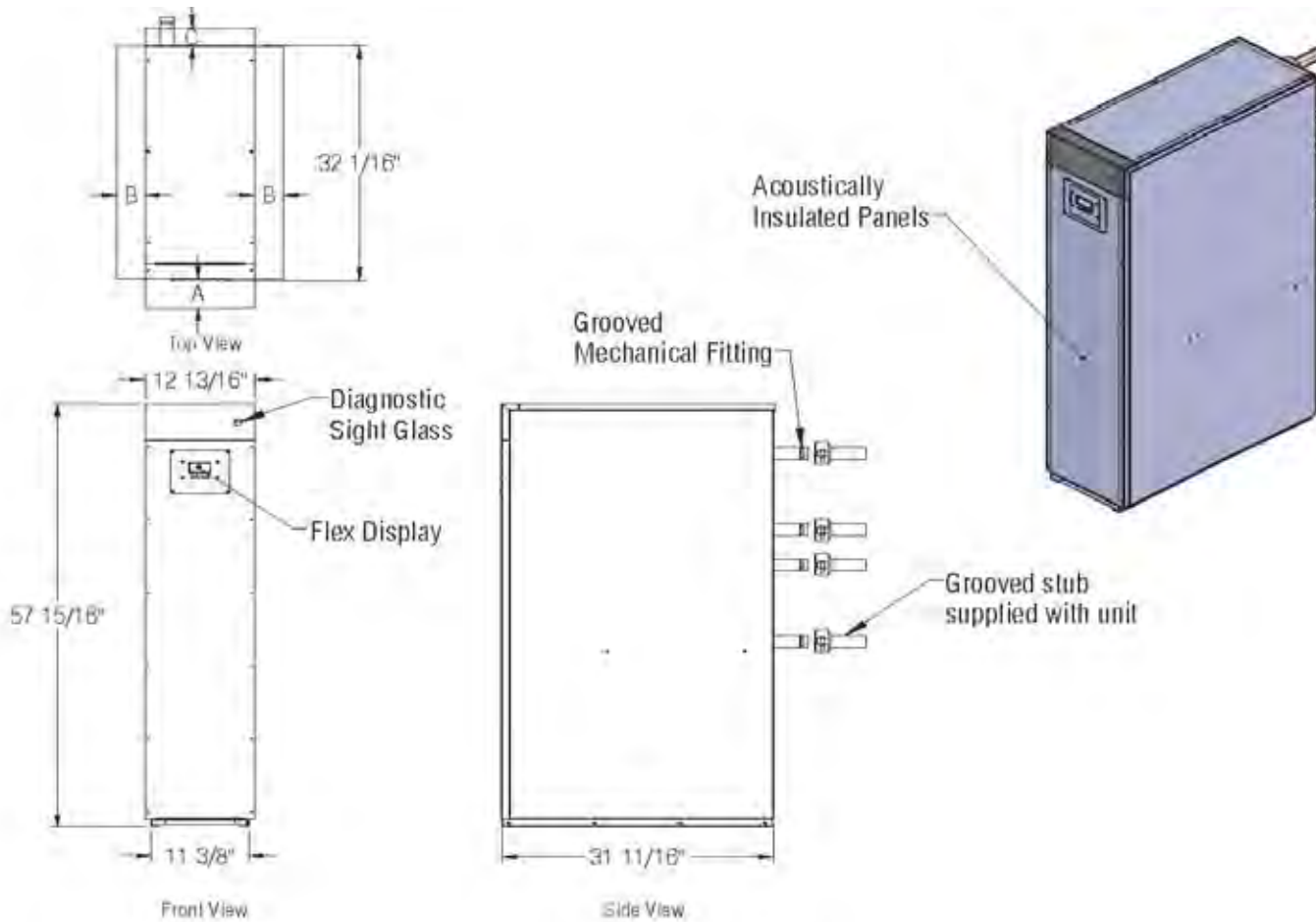


Demaray Hall, Seattle University, Seattle

SERIES TWO

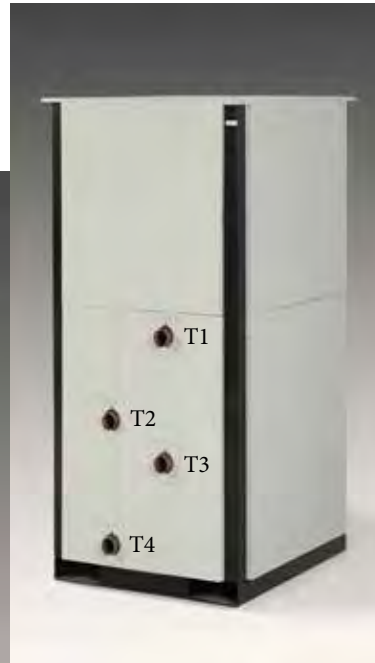
110-175 (8 to 12 tons)
Single compressor

COMPAX SERIES TWO

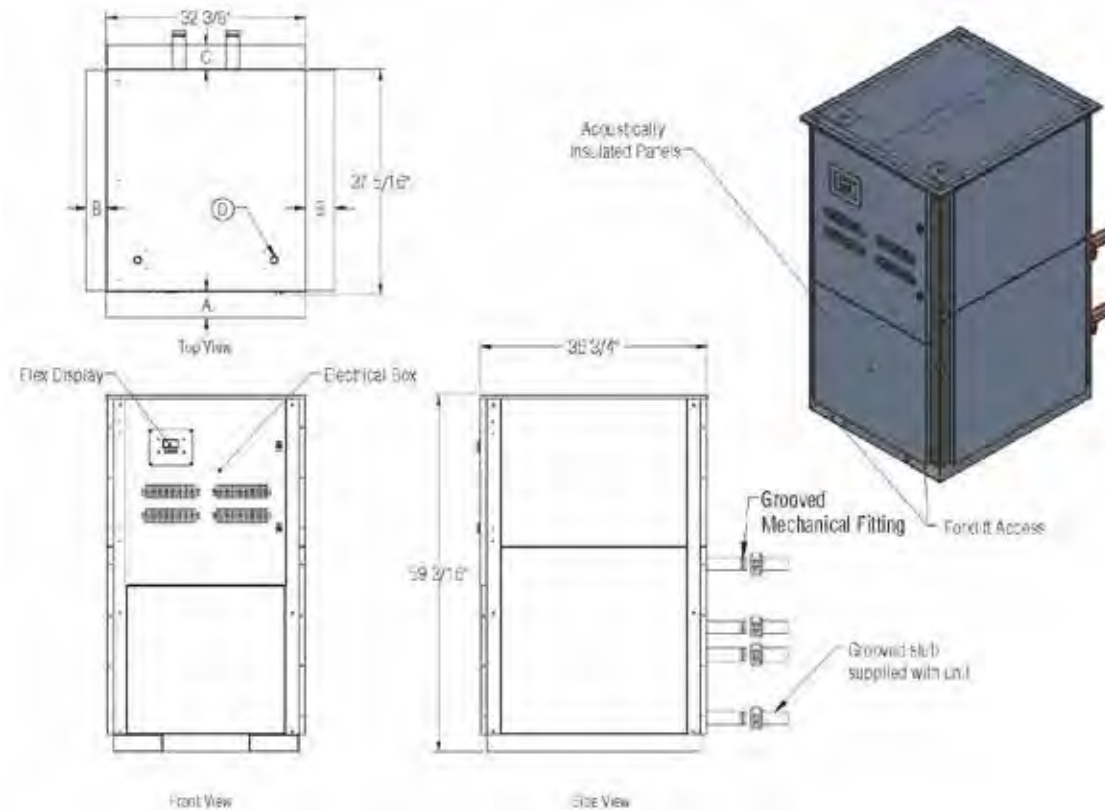


SERIES THREE

210-450 (14 to 30 tons)
Dual compressor



Polyvalente Des Baies, Montreal, QC





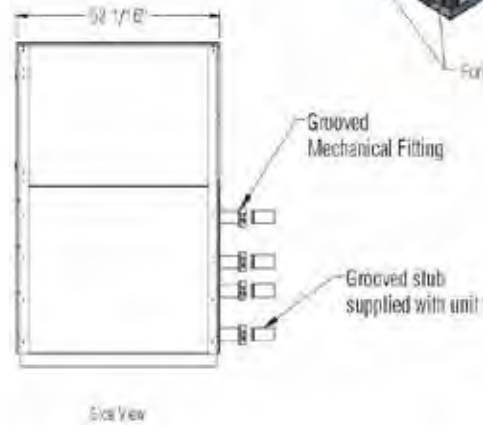
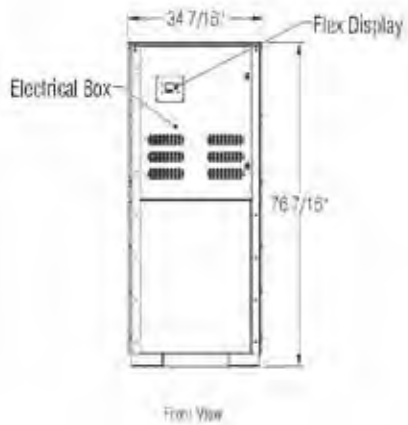
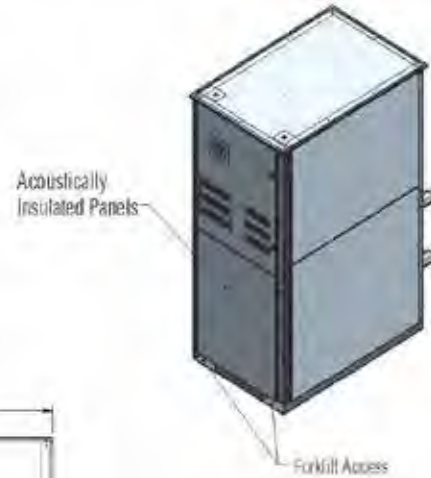
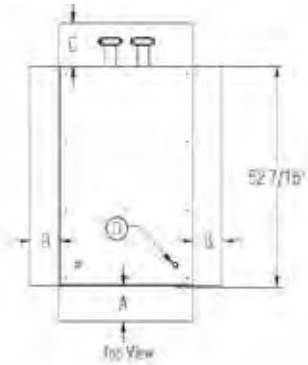
Sunova Main, Winnipeg, MB

SERIES FOUR

600-900 (40 to 60 tons)
Dual compressor

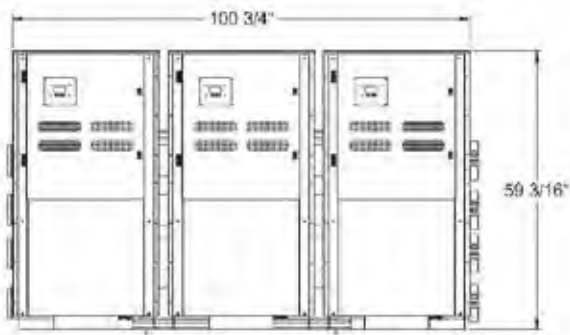


COMPAX SERIES FOUR

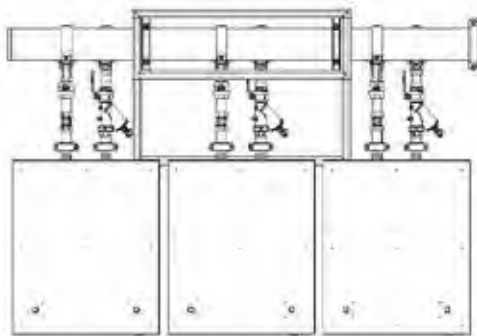
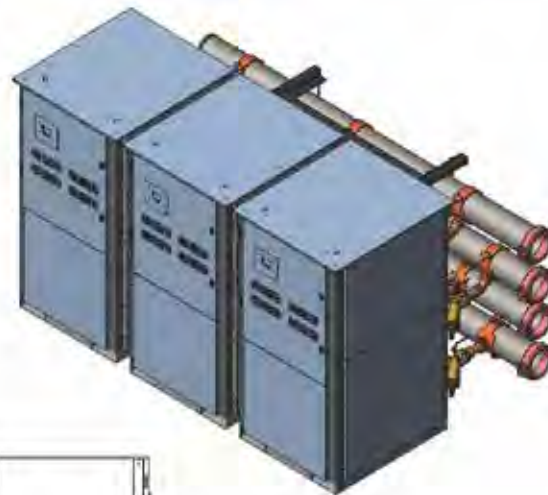


MULTI PAK ASSEMBLY

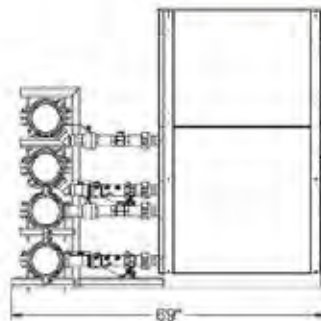
Multiple units can be assembled on site easily and quickly to operate as a bank of chillers. As an option, a factory made header assembly can be provided for field assembly.



FRONT VIEW



TOP VIEW



SIDE VIEW

PRE-PIPED PACKAGE ASSEMBLY

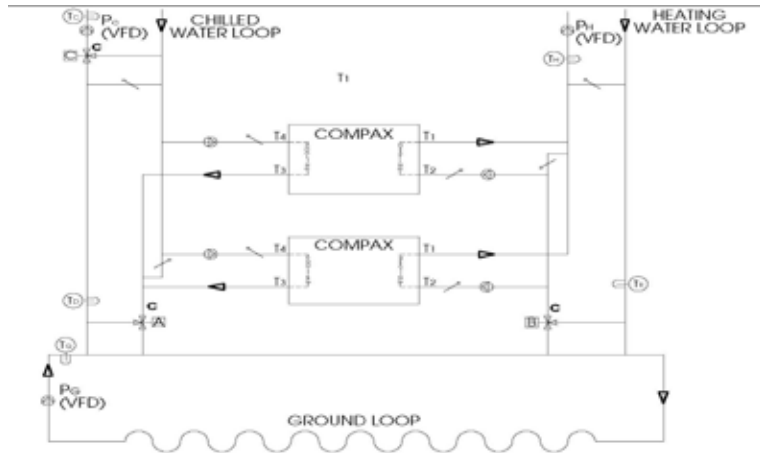
Compax units can be pre-piped at the factory and shipped pre-assembled.

Up to 8 modules (Series 1-2)

Up to 5 modules (Series 3).

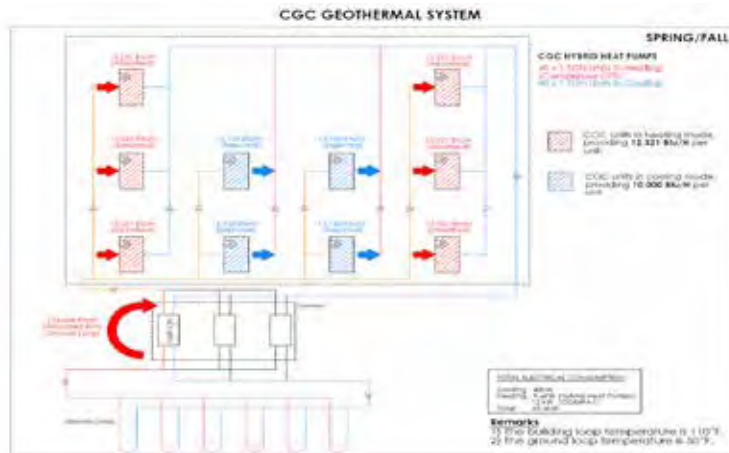
(Header ships separately)

4 PIPE GEOTHERMAL



Fort Sill, Oklahoma City, OK

GEOTHERMAL



CHILLER MODE & HEAT RECOVERY MODE

Model	Cooling	Heating
CGC018	27,947	52,339
CGC024	33,141	36,908
CGC030	37,471	44,200

Load		Solve	
Normal Flow USgpm	64.0	64.0	64.0
Adjusted Flow USgpm	61.0	64.0	64.0
Pressure Drop ft	31.8	31.2	31.2

Capacity	Flow
Cooling Capacity	254,000
Heating Capacity	118,710

CONTROLS

INTERNAL:

- Compax Flex controller with LCD display is standard.
- Display provides entering and leaving fluid temperatures, alarms status, input/output status, and setpoint adjustment.
- Flow and pressure control options are available.

EXTERNAL:

- Flex controller is complete with RS485 communications capability (Modbus RTU).
- Compax units can operate as stand alone units or be staged via DDC using Modbus RTU from a BMS or an optional factory supplied sequencing panel.
- If there is no BAS, then an optional Building system controls and sequencing panels are available to control units and monitor your loop system.



Controls/Circuit board



Electronic expansion valve and controller

(Standard on CMM but optional on CMS)

GENERAL DATA

- All units are complete with insulated, off white powder coated, metal cabinets.
- All units utilize scroll compressors with R410A refrigerant.
- All units are complete with a standalone microprocessor control system with LCD display.
- All three phase units come with phase reversal and loss of phase protection module.
- All dual compressor units come with individual motor protection.
- Two compressor units have dual circuits as standard.
- CMS units have thermal expansion valves as standard (non-reversing).
- CMM units have electronic expansion valves (reversing) as standard.
- All units are programmed for heating and/or cooling operation.
- All unit cycles are based on heating or cooling set points. Set points are adjustable via display or Modbus RTU.

ADDITIONAL OPTIONS AVAILABLE

- Extend compressor only warranty
- Extend compressor and refrigerant component warranty
- Extended electronic control board warranty
- Two stage cooling
(standard for 210 and up, optional only to 045to 085)
- Electronic expansion valve (CMS only)
- Low source temperature (anti-freeze required)
- Crankcase heaters (standard for Series 3 & 4)
- Mounted third party controllers
(may change overall dimensions)
- Water flow switches both circuits
- CuNi condenser/load heat exchanger
- CuNi evaporator/source heat exchanger
- 12" hose connection
- Wet 24V AC output for pump or valve control
- Demand flow valve control on condenser/load circuit
- Demand flow valve control on evaporator/source circuit
- Flow control valve on condenser/load circuit
(Extended Range Control)
- Flow control valve on evaporator/source circuit
(Extended Range control)
- Combine options 42 & 44 condenser/load circuit
- Combine options 43 & 45 condenser/load circuit
- Building System Control and Sequencing panels
 - Basic panel with or without web enabled connectivity
 - Custom panel with or without web enabled connectivity



Condenser



Fixed scroll compressor

COMPAX FLUID TO FLUID HEAT PUMP/ CHILLER GUIDE SPECIFICATIONS

1 GENERAL SPECIFICATIONS

1. Furnish and install Compax fluid to fluid heat pump/chiller units as indicated on the plans with capacities and characteristics as listed in the schedules.
2. Cabinets shall be 18ga. galvanized satin coat steel with a baked powder coat finish. Heavy gauge base with integral welded steel frame shall support the major components. Cabinet shall be internally insulated with ½” acoustical insulation for improved thermal and acoustic performance. All cabinet panels shall be removable for service access to all internal components.
3. Compressors shall be hermetically sealed, high efficiency scroll type with integral overload protection. Compressor shall be designed for low temperature operation. The system shall incorporate tube in shell heat exchangers, thermostatic expansion valves, and microprocessor controls. Brazed plated units must provide unit mounted strainers.

2 HEAT EXCHANGERS

1. Refrigerant to fluid heat exchangers shall be tube-in-shell type with non clogging enhanced tubes on the water side. The heat exchangers can be used as evaporator or condenser as required. Both heat exchangers feature copper tubes for the fluid and steel shells for refrigerant.
2. Both heat exchangers are insulated to prevent condensation and heat loss on reversing models. On non-reversing models only evaporators are insulated.
3. Heat exchangers shall be designed for working pressures of 600 psi on the refrigerant side, and 300 psi on the water side.

3 REFRIGERANT CIRCUIT

1. Refrigerant circuit shall be constructed in accordance with design requirements for R410A refrigerant. Circuit shall include in addition to the basic components, a sight glass, balanced port thermal expansion valve(s) and a filter dryer.
2. Safety devices shall include a high and low pressure cut-out, loss of charge disable, high and low fluid temperature shutdown and high discharge gas temperature protection.
3. Reversing valve on the CMM unit shall be a four way, spool type valve with electric or pressure activated pilot. The valve shall be fully serviceable. Sealed bodied valves are not acceptable.
4. The complete circuit shall be pressure tested for leaks with a helium Mass Spectrometer, fully evacuated and factory charged to the prescribed level. Following, the unit shall undergo a 30 minute run test during which time performance characteristics shall be recorded.

4 CONTROLS

1. Microprocessor based control systems and all controlled components shall operate on 24 volt AC power. Controller shall be able to communicate with Modbus RTU to building Automation systems. BACnet MSTP and other open communication protocols are possible via gateway.

2. The microprocessor controller shall have the following features:
 - Built-in temperature control for heating or cooling mode
 - Anti-recycle protection
 - Intelligent lockout protection of low or high refrigerant pressure
 - Built-in alarm system for controlling fluid temperatures
 - Compressor shutdown on low fluid flow
3. An alpha-numerical LCD display module provides information on:
 - Entry and exit fluid temperatures for both heat exchangers
 - The current heating and cooling set points
 - The status of control inputs in the unit
 - Current and previous alarm status
 - The current network address and operating state of the Compax unit
4. The control inputs are:
 - Supply and return temperature for both heat exchangers
 - Compressor discharge gas temperature
 - Heating and cooling call
 - Flow status
 - High and low pressure switch
 - Auxiliary alarm contact
5. The control outputs are:
 - System lockout relay
 - Heat exchanger isolation valve interlock
 - Compressor's 1 and 2
 - Reversing valve (where applicable)
 - Heat exchanger pump interlock



U of Washington, Seattle, WA

5 WARRANTY

The manufacturer's limited warranty states that its products are free from defects in parts and factory workmanship for a period of 12 months from start-up date or 18 months from shipping date. A 5 year warranty option is provided for the compressor and refrigeration circuit (parts only).

6 OPTIONS

1. Tag Unit: Provides tagging of units per schedule.
2. Extended 5 year compressor warranty: Extends compressor warranty 48 months on parts only. Freight extra and no labour.
3. Extended 5 year refrigerant circuit warranty: Extends refrigerant cycle component warranty 48 months on parts only. Freight extra and no labour.

4. Extended electronic control board warranty: Extends electronic control board warranty 12 months.
5. Two stage cooling: Incorporates two-step compressors for dual capacity operation on certain models only (units 045 to 075).
6. Electronic expansion valve: Provides an electronically controlled expansion valve on CMS units – 1 for 1 circuit and 2 for 2 circuit units.
7. Extended range operation: Extends the source heat exchanger entry operating temperature range by providing a condenser head pressure control and /or evaporator pressure control.
8. Crankcase Heater: Provides a crankcase heater for the compressor to prevent mixing of refrigerant with compressor oil on an off cycle (units 045 to 175).
9. Low source temperature: Changes low temperature safety cut-out to allow heating when source is below freezing (0°C or 32°F). This option must have source fluid freeze protection to 20°F or lower.
10. Unit set-up for 230–240 Volt power supply: Tap transformers to 230 – 240 Volt power supply (small units 045 to 085 only).
11. Mounted 3rd Party DDC Controllers: Mounts and wires third party controller and sensors, control box included where required. This controller is in addition to native controllers and components that are already be installed.
12. Flow switches both circuits: Provides 2 flow switches to prevent loss of flow in fluid line. Shipped loose, installed by others.
13. Unit mounted BACnet gateway: Provides unit mounted BACnet gateway and BAS connection points. Display is ordered separately.
14. Controls integration with Building Automation Systems (BAS): Provide assistance integrating CGC provided Modbus to BACnet or TCP/IP with BAS. Includes custom programming of BAS points. Does not include site visits.
15. Hose connections: Provides 12” flexible hose connections for attaching unit’s fluid lines to building loop.
16. ON/OFF control valve: Provides an electrically controlled shutoff valve on fluid line of either one of the heat exchangers. Shipped loose, installed by others.
17. Cupro–Nickel heat exchanger: in lieu of copper available on both source and load heat exchanger.
18. Wet 24V AC output for pump or valve control: Allows for pumps or valves rated at 10 VA or less to be connected to the unit control board.
19. Flow control valve: Provides an electrically controlled flow valve on fluid line of either one of the heat exchangers.
20. Combined options: A combination of the ON/OFF control valve and the flow control valve on either one of the heat exchangers.



CGC Group Manufacturing Facility in Fergus, Ontario, Canada (Solar PV panels on roof)

www.compaxchiller.com



CGC Group Corporate Office: 1-150 Britannia Rd East, Mississauga, Ontario, Canada, L4Z 2A4
Tel:1-888-220-5551