

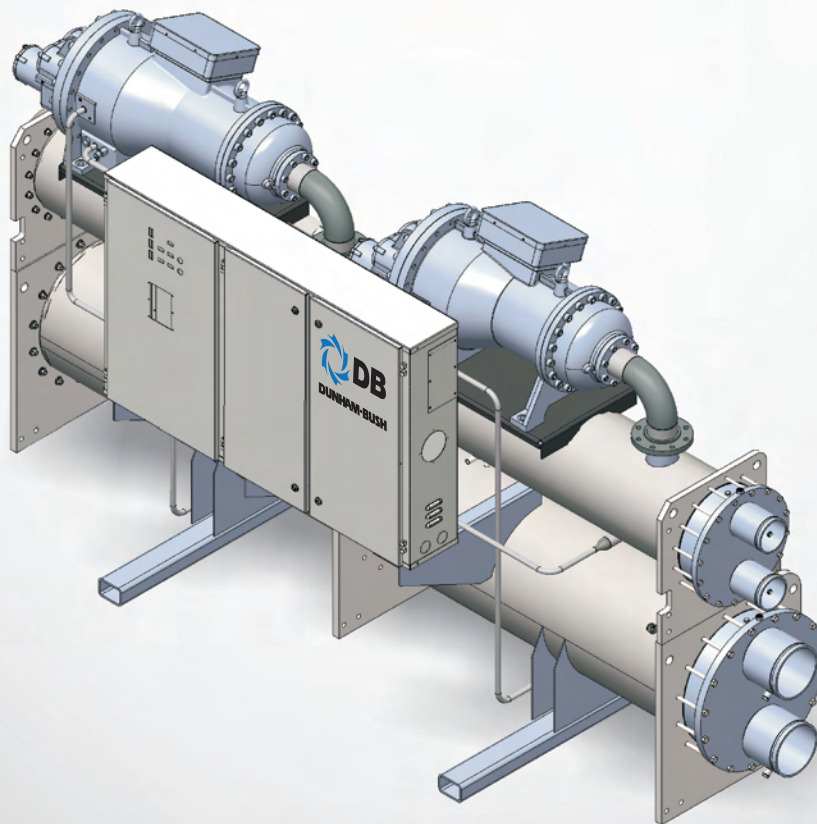
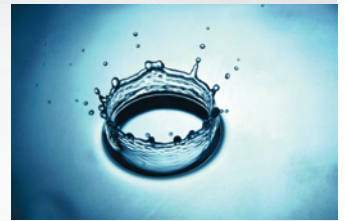


HYPERION

Water Cooled Screw Chillers

WCHX-A 50Hz

Cooling Capacity: 88 to 200 TR (310 to 703 kW)



ASHRAE
90.1
COMPLIANT

DUNHAM-BUSH®

Products that perform...By people who care

INTRODUCTION

For more than 100 years, Dunham-Bush has focused on innovative product development. Today, we provide a full portfolio of HVAC/R products from Fan Coil Units to large centrifugal chillers as well as many other innovative green solutions. Our commitment to innovation, matched with an aggressive attitude toward growth, makes Dunham-Bush a leader in global markets. Our product development is tailored to meet the specific needs of customers, building-by-building, country-by-country and region-by-region. No other HVAC/R manufacturer takes this approach to meeting your performance expectations.

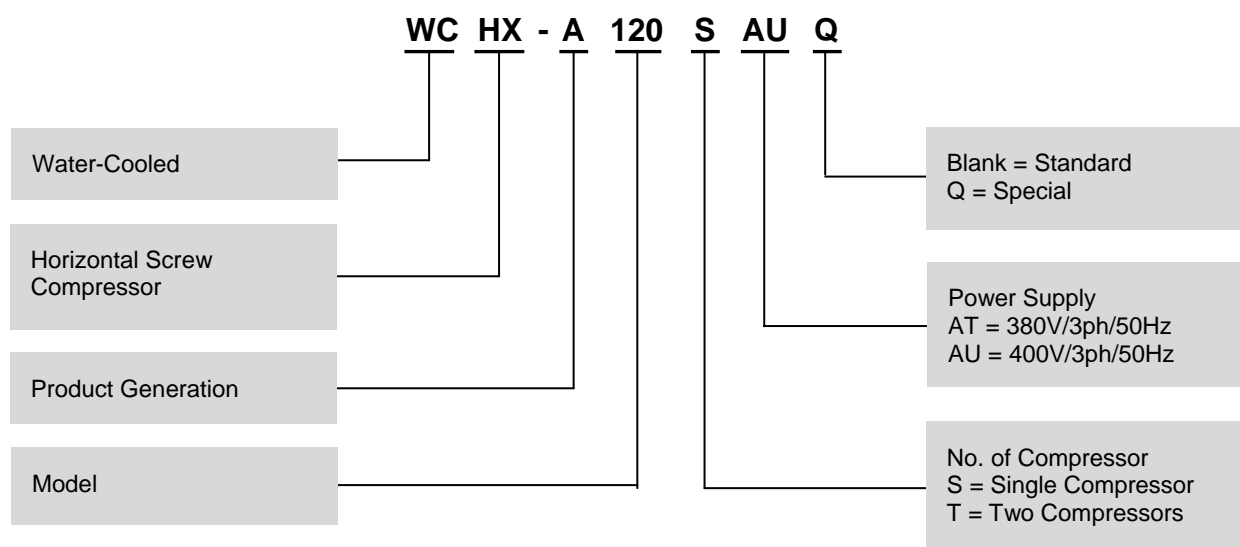
The Dunham-Bush name is synonymous worldwide with the Rotary Screw Compressor Chillers technology. With over 45 years of proven experience and track records in manufacturing and installation of Rotary Screw Compressors and chillers, thousands of our Chillers have clocked more than 100,000 operating hours without any compressor tear-out or overhaul! As a pioneer and industry leader in the Rotary Screw compressor technology for HVAC/R systems, Dunham-Bush now introduces the Water Cooled Rotary Screw Flooded Chillers with unsurpassed performance and reliability.

WCHX-A Water Cooled Screw Chillers, using environmentally sound R134a refrigerant. The entire product line features high energy efficiency, compact construction, installation ease, control flexibility, high reliability and advanced controller.

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NOMENCLATURE



UNIT FEATURES

COMPRESSOR

- ✱ Semi-hermetic Rotary Twin Screw Compressor
- ✱ Suction gas-cooled compressor motor
- ✱ Multiple rotary screw compressors design for better reliability and redundancy
- ✱ External oil pump not required
- ✱ Optimized oil management
- ✱ Infinite variable capacity control with sliding valve mechanism

REFRIGERANT LIQUID LEVEL CONTROL

By using Electronic Expansion Valve (EEV), the refrigerant flow into evaporator can be control precisely. In such, the refrigerant liquid level in evaporator can be controlled at the optimum level to maximized heat transfer in the flooded type, shell-and-tube heat exchanger.



COMPACT FOOTPRINT

The revolutionary new WCHX-A compact water cooled screw chiller innovative, space-conscious design elements focused on convenience and serviceability into the smallest footprint available and helps the chiller fit in buildings where space is limited, making it ideal for retrofit projects.

Having one of the smallest footprints in its class allows the WCHX-A Series to occupy less space in cramped mechanical rooms and it can pass through in single access door

ECONOMIZER

- ✱ The economizer circuit consists of plate type heat exchanger, expansion valve and solenoid valve
- ✱ Refrigerant is sub-cooled at economizer before entering the evaporator; the flash refrigerant from economizer is fed into compressor at intermediate pressure.
- ✱ Cooling capacity is increased significantly with marginal increases in kW-input, thus, unit EER is improved

CONTROL PANEL

- ✱ Electrical enclosure fabricated by heavy gauge sheet steel with powder coated baked finishing.
- ✱ Single point power connection for all models

- ✱ Circuit breaker for each compressor motor
- ✱ Unit mounted reduced inrush starter for compressor
- ✱ Solid state motor protector module for compressors
- ✱ Step down transformer for control circuit
- ✱ Main power supply monitoring module provide protection on under or over voltage, phase reversal, phase losses and imbalance
- ✱ Unit mounted Remote/Off/Local (R/O/L) selector switch, an operation and servicing friendly feature
- ✱ Micro Vision controller– the state-of-art Dunham-Bush proactive advanced controller monitors the unit operation and maintains optimal operation of the unit. Micro vision, an intelligent controller that is able to operate the unit with optimum efficiency at off-design conditions. Micro vision adapts to any abnormal operating conditions and will execute preventive controls and actions for safety protections

MICRO VISION CONTROLLER

Micro Vision, an intelligent programmable direct digital controller designed specifically for the applications and precise control of Dunham-Bush Rotary Screw compressor chillers, WCHX-A.

The controller is equipped with a user friendly DBG5 graphical 4.3" color touch screen display with graphical resolution of 480 x 272 pixels, 65k color with LED backlight. DBG5 graphical display is designed with high quality images and advance interfacing by touch keys are available in a superior appearance.



BMS CONNECTIVITY, CHILLER PLANTROOM CONTROL

- ✱ DB Chiller Plant Manager, DB-CPM, a trustworthy and headache-free solution for building owners and users on chiller plant control and automation system
- ✱ DB-CPM's advanced controllers supervise equipments in chiller plant such as chillers, pumps, and variable frequency drives (VFD); and monitor field devices such as, flow meters, energy meters, digital power meters, sensors & transducers
- ✱ NetVisorPRO – Monitoring software of DB-CPM system provides graphical animations on system operation, temperature and energy trend graphs, historical data and alarm history logs

Chiller plantroom control and automation by Dunham-Bush DB-CPM provides owners a chiller system with stable and optimized performance in its operation.

OPTIONS AND ACCESSORIES

- ✱ **Compressor Isolation Valve (Suction & Discharge)** – For the ease of servicing
- ✱ **Evaporator and Condenser Flanged Connection** – Flanged connection is available on request
- ✱ **Marine Water Box** – Marine water box for condenser, for ease of condenser tube cleaning without interfere with field water piping
- ✱ **250 psig Evaporator and Condenser** – Evaporator and condenser vessels with 250 psig working pressure at water side is available to suite site installation
- ✱ **Double Insulation** – Evaporator with double thick 2" [50mm] closed cell insulation, for extra resistance to condensation
- ✱ **Hotgas Bypass** – To maintain unit operation below minimum unloaded capacity
- ✱ **Dual Mode Operation** – The unit with dual mode operation can deliver chilled fluid temperature down to 18°F [-7.8°C] during ice making mode. Units with Dual Mode Operation is used for Ice Thermal Storage System
- ✱ **ASME / JKKP Compliance** – Evaporator, condenser and desuperheater with ASME / JKKP approval is available on request
- ✱ **Extended Warranty Period for Compressors** – Extended compressor warranty is available on request

Electrical And Controls

- ✱ **Unit Mounted Main Disconnect Switch** – Non-fused disconnect switch with external lockable handle is furnished to isolate unit main incoming power supply for servicing.
- ✱ **Soft starter For Compressor Motors** – Solid State starter comes with bypass contactor to reduced mechanical stress and inrush current during compressor start-up
- ✱ **Ground Fault Interrupt (GFI)** – Provides equipment with ground fault protection
- ✱ **Ammeter / Voltmeter** – Analog ammeter and voltmeter with 3 phase selector switch for indication; located on the control panel
- ✱ **Refrigerant Leak Detector** – A refrigerant detection sensor module is connected to micro vision controller to monitor refrigerant concentration around the unit. Alarm is triggered and unit is shut down when the refrigerant concentration has exceeded the preset safety limit.

- ✱ **Chilled Water Reset / Demand Limiting** – Low level interfacing with Building Automation System (BAS). Chilled Water Reset allows controlled temperature setpoint to be reset by a 4-20mA signal from BAS; while Demand Limiting will limit the maximum current drawn by the compressors by 4-20mA signal from BAS.
- ✱ **Chilled Water Pump Control** – Primary chilled water pump is controlled by chiller's micro vision controller for enhanced safety operation
- ✱ **Condenser Water Pump Control** – Condenser water pump is controlled by chiller for enhanced stable operation
- ✱ **Complete Temperature Monitoring** – Entering evaporator water temperature sensor, leaving and entering condenser water temperature sensors can be included for complete temperature monitoring of the unit
- ✱ **IP54 Control Panel** – IP54 rated control panel can be supplied for harsh working environment
- ✱ **BMS Communication** – Various add-on communication cards provide BMS communication via common protocols: Modbus RTU RS485 / TCP/IP, LONworks FTT10, BACnet over IP / MSTP / PTP

Factory Supplied - Field Installed

- ✱ **Water Flow Switch** – Flow switch to be installed at evaporator and condenser outlet piping as safety interlock to evaporator and condenser water flow status. Three options are available: Weather tight flow switch with CE mark; NEMA 3R, and NEMA 4 rated flow switch
- ✱ **Rubber-In-Shear Isolators** – Designed for ease of installation. These one-piece molded rubber isolators are applicable for most installations.
- ✱ **Spring Isolators** – These housed spring assemblies have a neoprene friction pad at the bottom to prevent the passage of noise, and a spring locking levering bolt at the top. Neoprene inserts prevent contact between the steel upper and lower housings. Suitable for more critical application as compared to rubber-in-shear isolator.
- ✱ **DB-LAN Master Slave Sequencing Control (MSS)** Pre-programmed at factory; field supplied and installed inter-connection wiring between chillers to provide communication bus among chillers' controllers to enable Master-Slave Sequencing Control

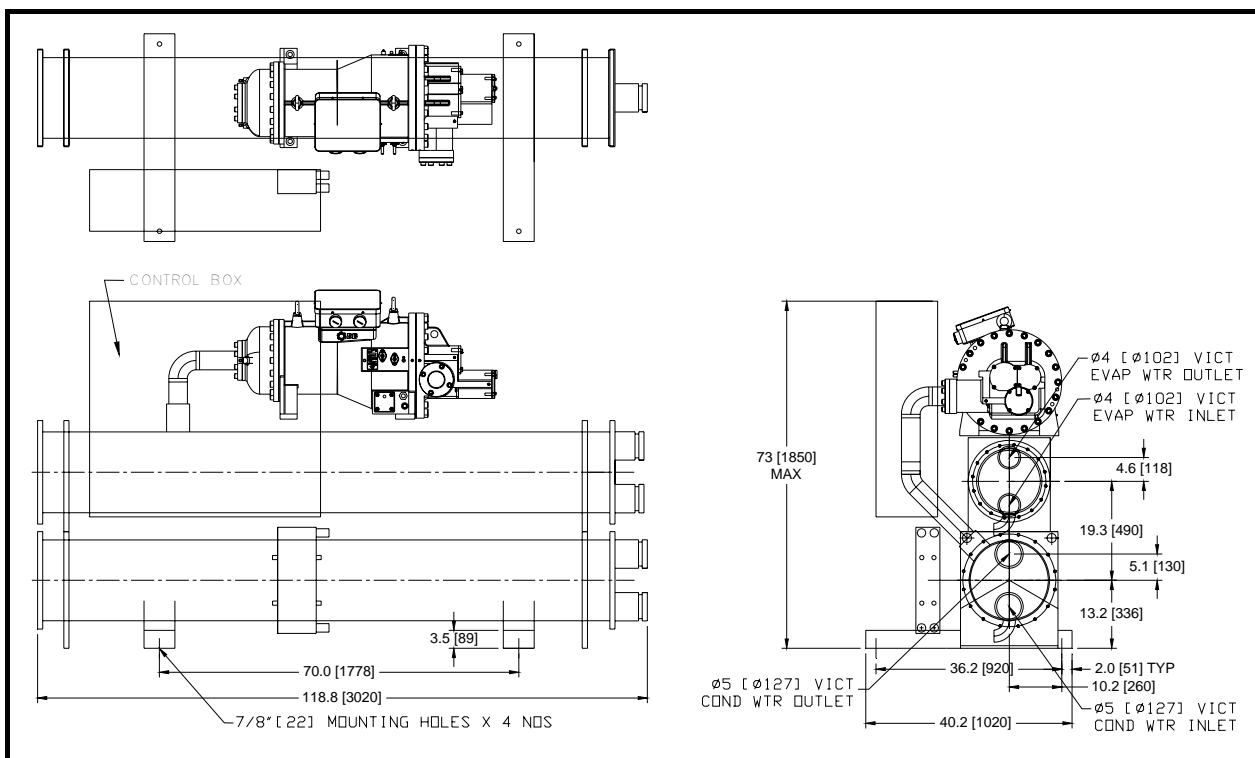
PHYSICAL SPECIFICATIONS

Model	Standard	90S	110S	120T	135T	150S	180S	180T	200T	200S
Nominal Capacity	TR [kW]	88.0 [309.5]	103.0 [362.3]	120.0 [422.0]	134.0 [471.3]	150.0 [527.6]	175.0 [615.5]	180.0 [633.1]	195.0 [685.8]	200.0 [703.4]
Energy efficiency	kW/TR	0.676	0.678	0.676	0.675	0.644	0.645	0.654	0.651	0.641
	COP	5.20	5.19	5.20	5.21	5.46	5.46	5.38	5.40	5.49
Min % Unit Capacity	%	25	25	12.5	12.5	25	25	12.5	12.5	25
Compressor										
Model (Qty)		1612 (1)	1616 (1)	1315 (2)	1315 (1) 1612 (1)	1912 (1)	1915 (1)	1612 (2)	1612 (1) 1616 (1)	1917 (1)
Nominal Power Input	kW	59.5	69.8	81.1	90.5	96.6	112.8	117.7	127	128.2
RLA (Each)		107	130	70	70 107	163	188	107 107	107 130	213
No. of Refrigerant Circuit		1	1	2	2	1	1	2	2	1
Evaporator										
Water Flow Rate	USgpm [m ³ /h]	209.9 [47.7]	245.7 [55.8]	286.3 [65.0]	319.7 [72.6]	357.8 [81.2]	417.5 [94.8]	429.4 [97.5]	465.2 [105.6]	477.1 [108.3]
Pressure Drop	psig [kPa]	4.7 [32.4]	4.7 [32.4]	6.0 [41.4]	6.0 [41.4]	7.3 [50.3]	7.7 [53.1]	8.7 [60.0]	9.2 [63.4]	7.9 [54.5]
Design Press. Water Side	psig [kPa]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]
Water Connection Size	Inch [mm]	4 [101.6]	5 [127.0]	5 [127.0]	5 [127.0]	5 [127.0]	5 [127.0]	5 [127.0]	5 [127.0]	5 [127.0]
Condenser										
Water Flow Rate	USgpm [m ³ /h]	252.0 [57.2]	295.1 [67.0]	343.6 [78.0]	383.7 [87.1]	426.3 [96.8]	497.4 [112.9]	512.7 [116.4]	555.1 [126.0]	567.9 [128.9]
Pressure Drop	psig [kPa]	6.2 [42.7]	5.7 [39.3]	5.1 [35.2]	4.7 [32.4]	7.3 [50.3]	5.7 [39.3]	9.9 [68.3]	9.1 [62.7]	6.1 [42.1]
Design Press. Water Side	psig [kPa]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]	150 [1034]
Water Connection Size	Inch [mm]	5 [127.0]	6 [152.4]	6 [152.4]	8 [203.2]	8 [203.2]	8 [203.2]	8 [203.2]	8 [203.2]	10 [254.0]
General										
Unit Length	Inch [mm]	118 8/9 [3020]	124 [3150]	126 7/9 [3220]	147 2/5 [3740]	124 2/5 [3160]	120 [3050]	156 [3960]	152 [3860]	121 1/4 [3080]
Unit Width	Inch [mm]	40 1/6 [1020]	40 5/9 [1030]	48 3/7 [1230]	51 1/6 [1300]	45 2/7 [1150]	44 7/8 [1140]	50 [1270]	53 1/2 [1360]	46 [1170]
Unit Height	Inch [mm]	72 5/6 [1850]	75 1/5 [1910]	74 [1880]	77 1/6 [1960]	81 1/9 [2060]	85 5/6 [2180]	79 1/7 [2010]	81 8/9 [2080]	88 1/5 [2240]
Unit Shipping Weight	lbs [kg]	4207 [1910]	4661 [2116]	5749 [2610]	6725 [3053]	5714 [2594]	6551 [2974]	7626 [3462]	8293 [3765]	7101 [3224]
Unit Operating Weight	lbs [kg]	4561 [2071]	5097 [2314]	6221 [2824]	7356 [3339]	6224 [2826]	7205 [3271]	8354 [3793]	9103 [4133]	7826 [3553]
R134a Charge (Approx)	lbs [kg]	233 [106]	273 [124]	318 [144]	355 [161]	397 [180]	463 [210]	476 [216]	516 [234]	529 [240]

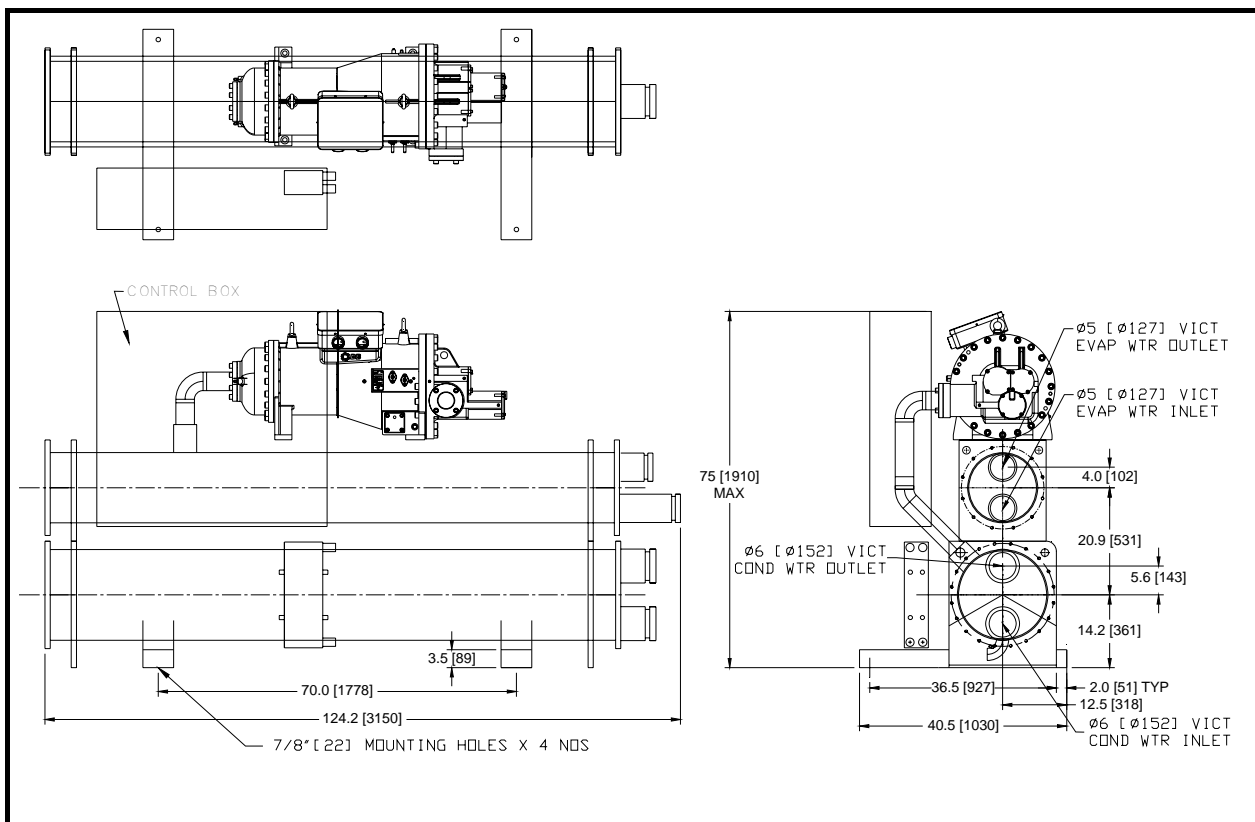
- Notes:
- The units are rated in accordance with AHRI Standard 550/590. The above data are rated with following conditions:
Chilled Water Inlet/Outlet Temperature 54/44°F [12.2/6.7°C]; Cooling Water Inlet Temperature 85°F [29.4°C]; Cooling Water Flow Rate 3USgpm/ton [0.054 l/s.kW]; Evaporator fouling factor 0.0001hr.ft².°F/Btu [0.000018 m².°C/W]; condenser fouling factor 0.00025hr.ft².°F/Btu [0.0000144 m².°C/W]; 2-pass evaporator and condenser.
 - To consult nearest Dunham-Bush sales office for computer selections other than above operating conditions.

DIMENSIONAL DATA

WCHX-A 90S



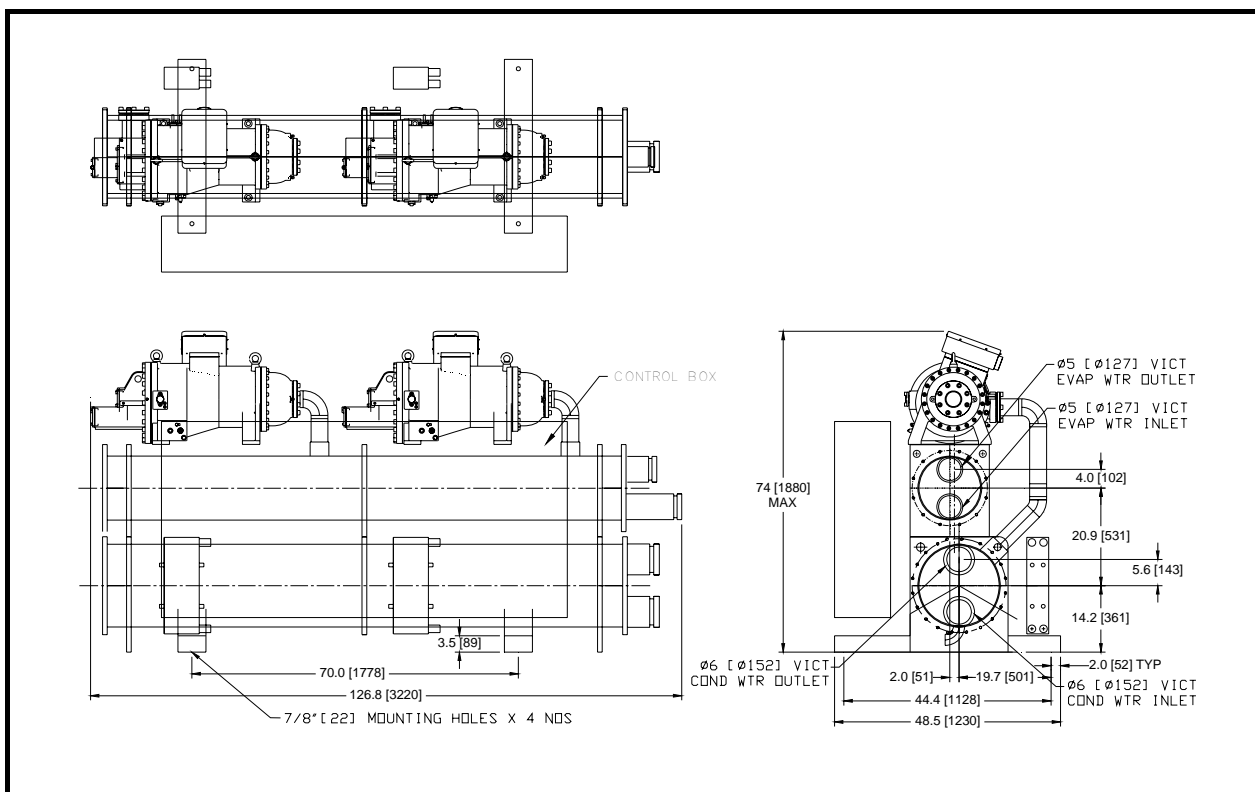
WCHX-A 110S



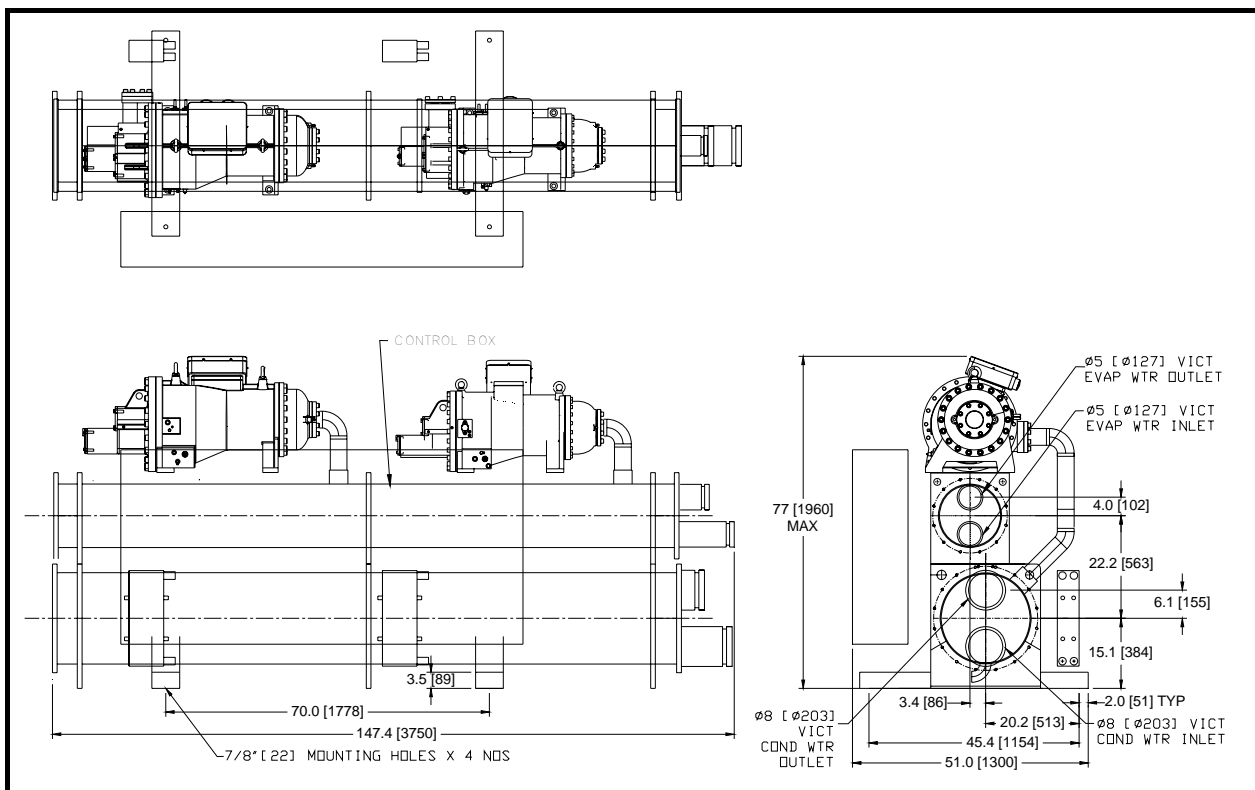
Note: All dimensions are in inches[mm].

DIMENSIONAL DATA

WCHX-A 120T



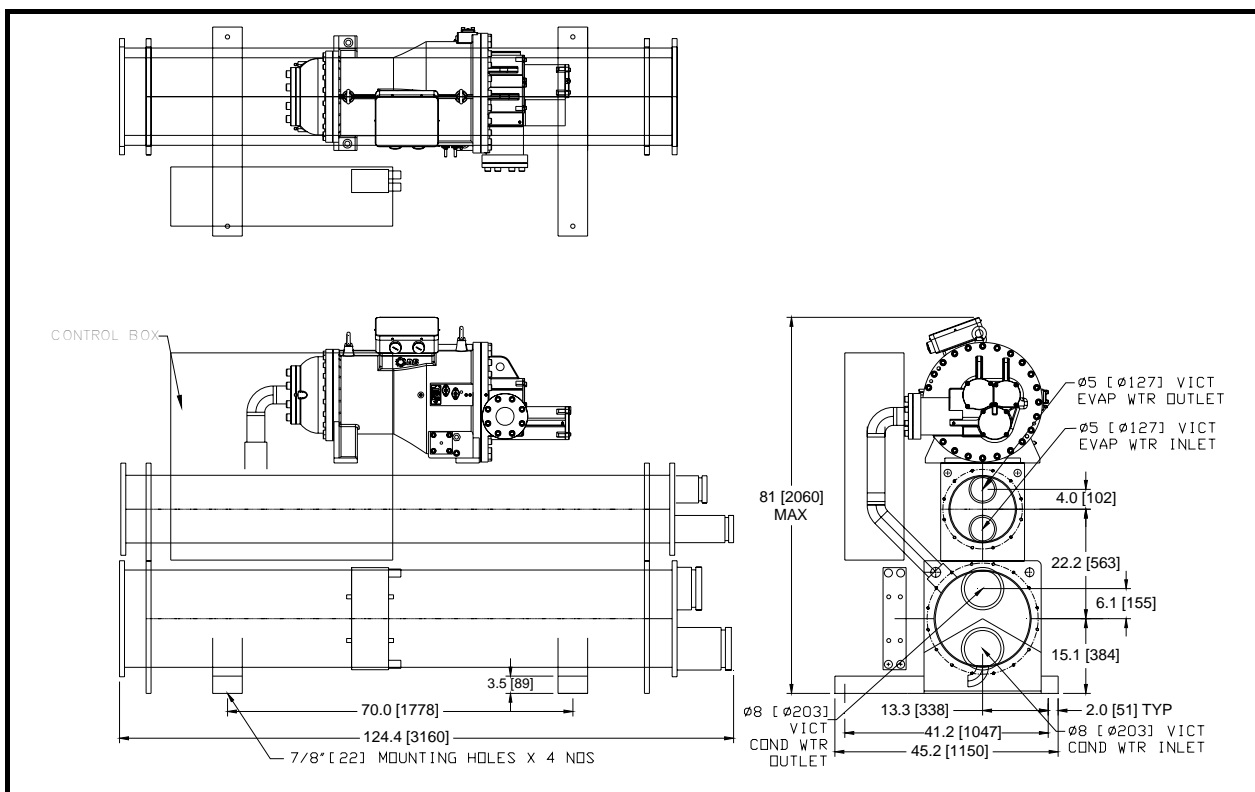
WCHX-A 135T



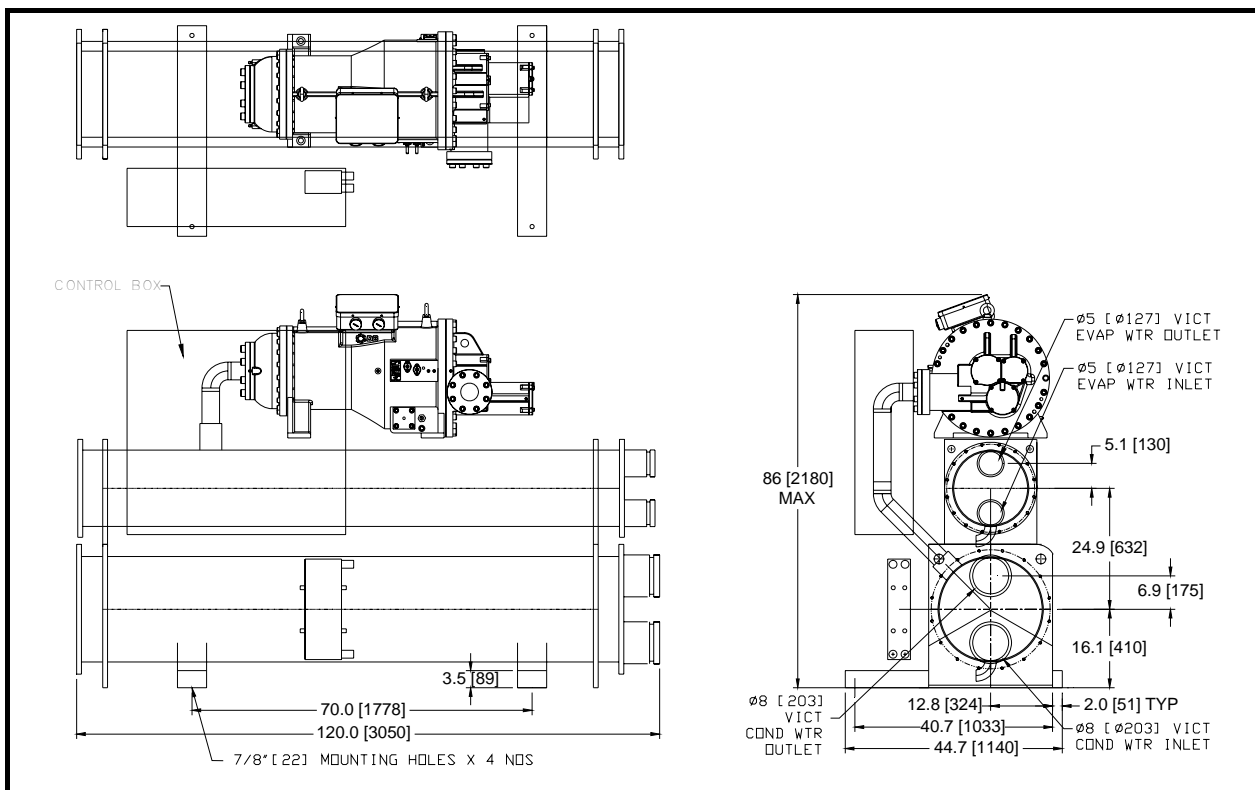
Note: All dimensions are in inches[mm].

DIMENSIONAL DATA

WCHX-A 150S



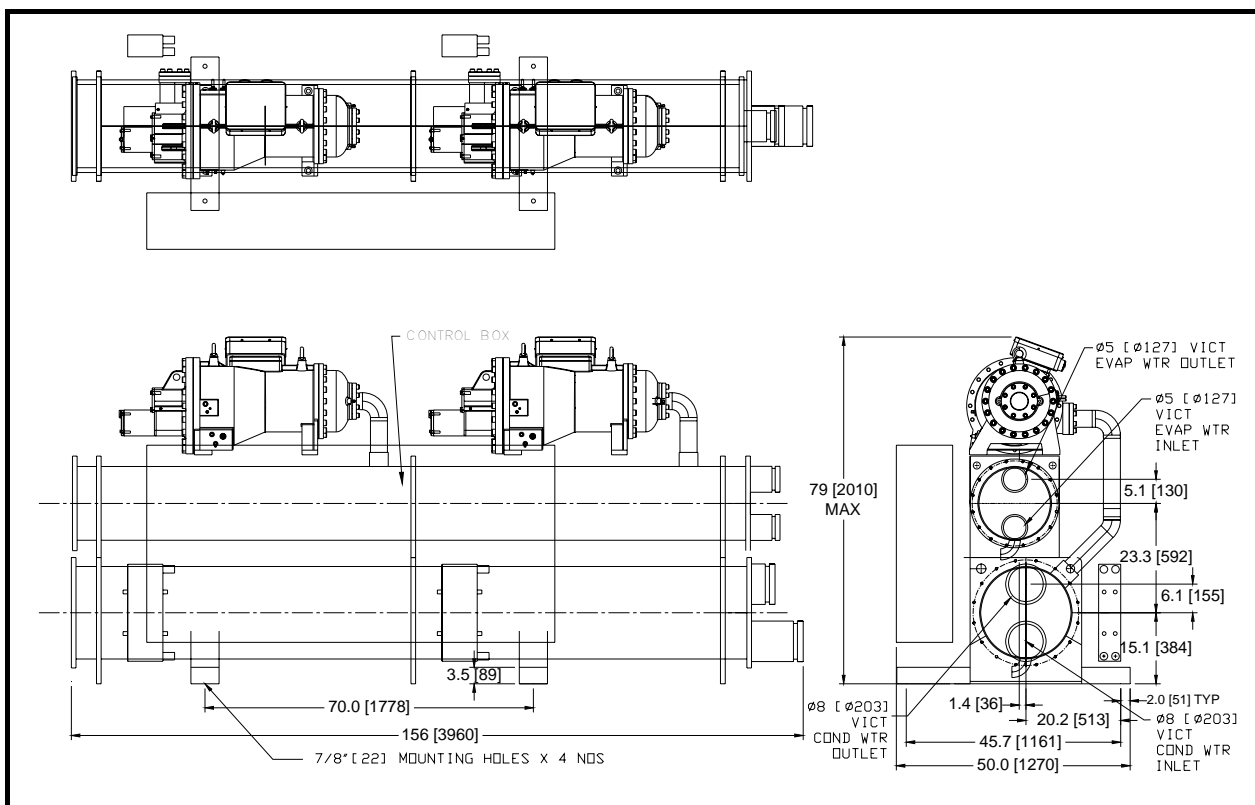
WCHX-A 180S



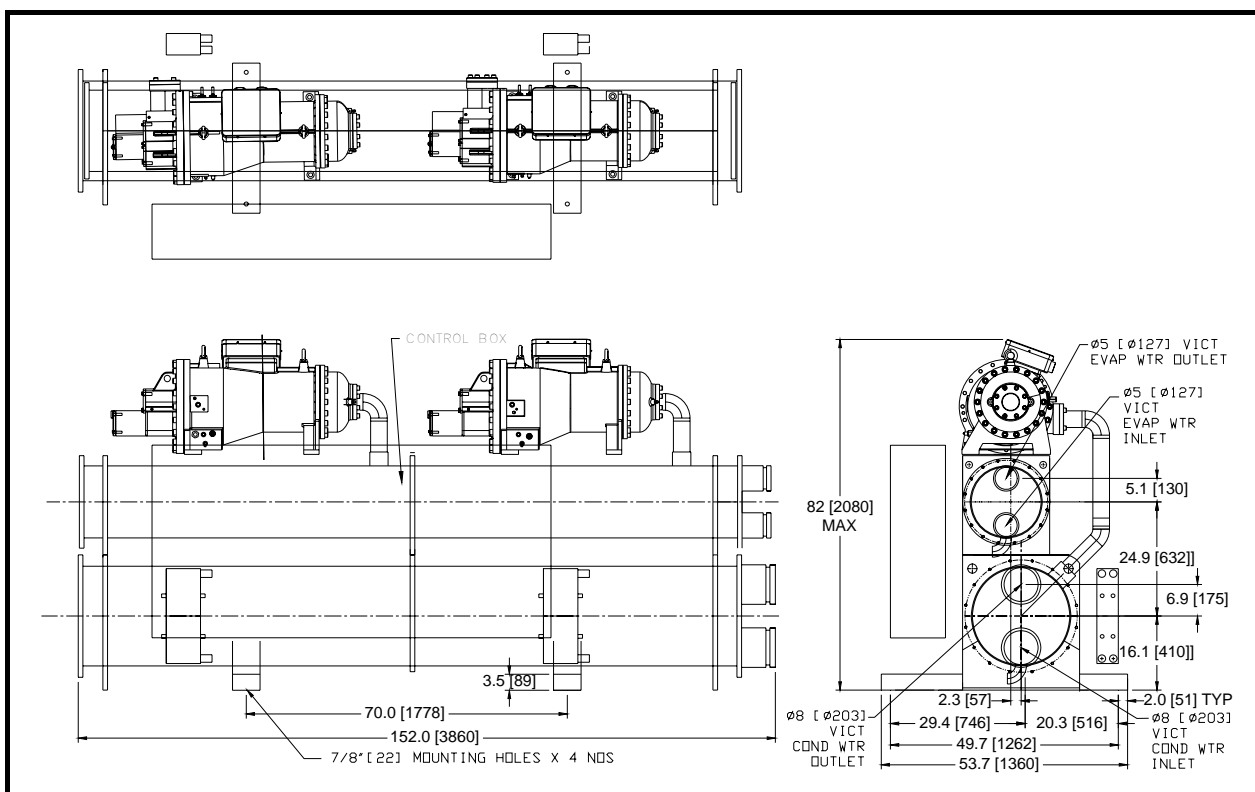
Note: All dimensions are in inches[mm].

DIMENSIONAL DATA

WCHX-A 180T



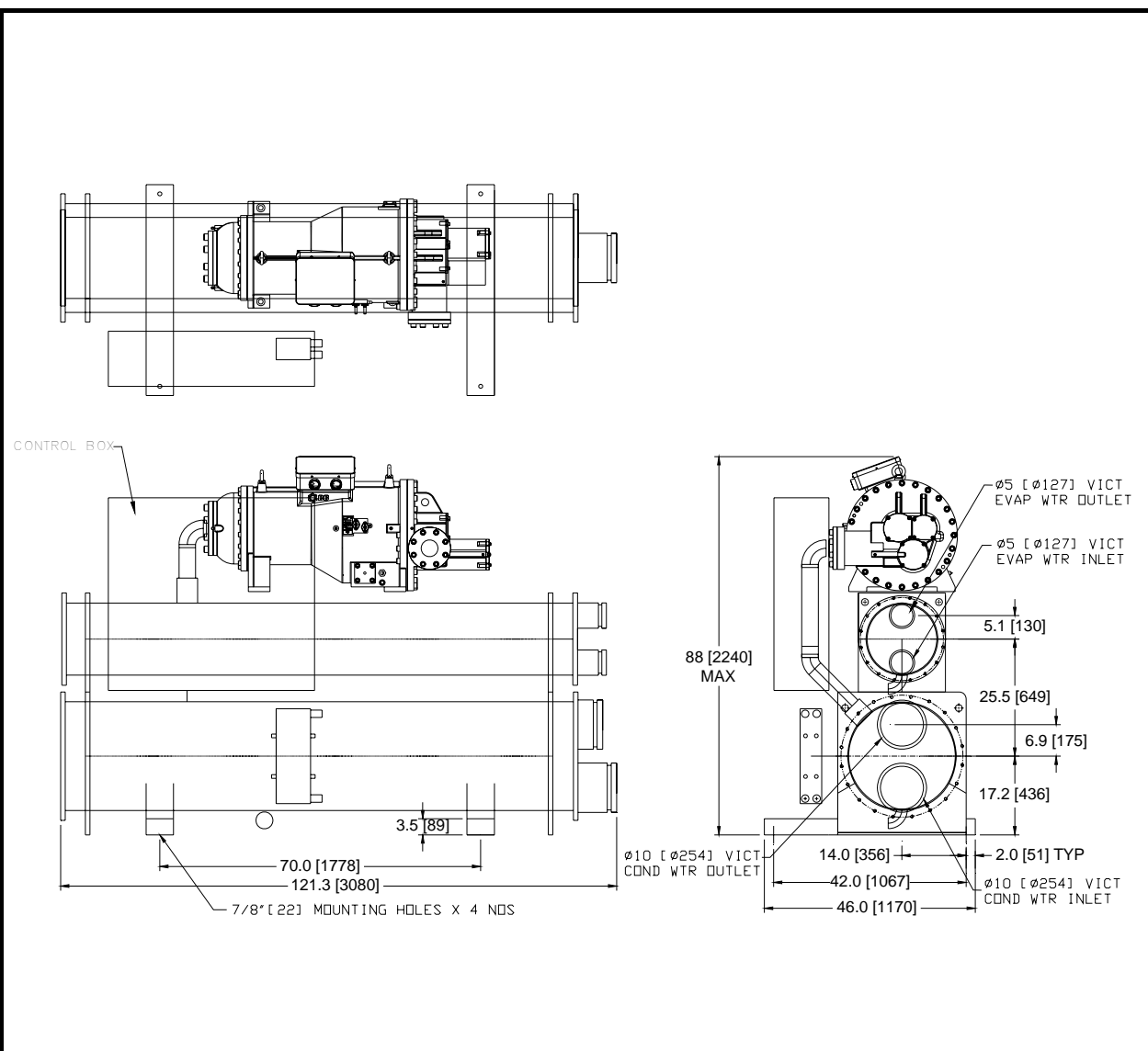
WCHX-A 200T



Note: All dimensions are in inches[mm].

DIMENSIONAL DATA

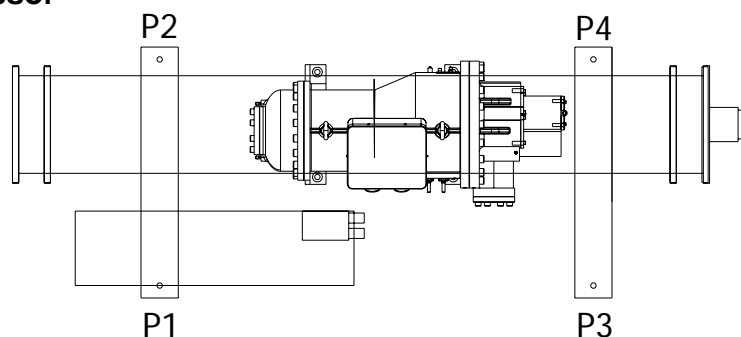
WCHX-A 200S



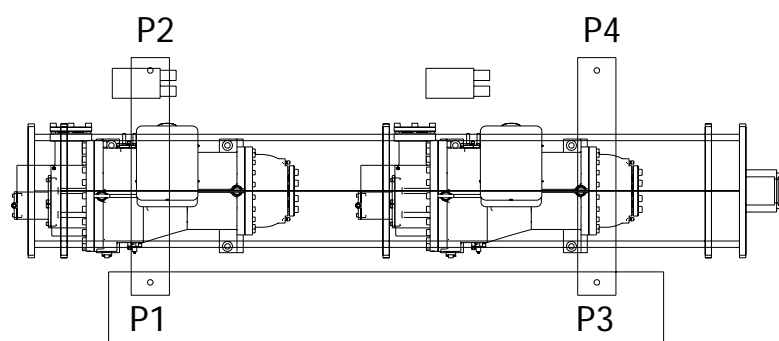
Note: All dimensions are in inches[mm].

FLOOR LOADING DIAGRAM

Single Compressor



Two Compressors



POINT LOAD DATA

Model WCHX-A	P1	P2	P3	P4	Operating Weight
	Lbs [kg]	Lbs [kg]	Lbs [kg]	Lbs [kg]	Lbs [kg]
90S	826 [374]	1288 [584]	801 [363]	1651 [749]	4561 [2071]
110S	1014 [460]	1741 [790]	798 [362]	1548 [702]	5097 [2314]
120T	1529 [693]	1792 [813]	1250 [567]	1656 [751]	6221 [2824]
135T	1718 [779]	1874 [850]	1708 [775]	2063 [936]	7356 [3339]
150S	1195 [542]	1892 [858]	1140 [517]	2003 [908]	6224 [2826]
180S	1406 [638]	2389 [1083]	1195 [542]	2223 [1008]	7205 [3271]
180T	1892 [858]	2232 [1012]	1857 [842]	2382 [1080]	8354 [3793]
200T	2218 [1006]	2338 [1060]	2118 [961]	2439 [1106]	9103 [4133]
200S	1521 [690]	2434 [1104]	1427 [647]	2452 [1112]	7826 [3553]

Notes: 1.) Refer to dimensional drawings for location of mounting points.
2.) Unit must be lowered onto mounting springs in a level fashion or spring damage may occur.



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MS-04107A-0516