

# Climate Control Technology for Yachts and Boats

Reverse Cycle Chillers and Chilled Water Air Handlers



**Marine**  
**Marvair**<sup>®</sup>  
AIRXCEL<sup>™</sup>, Inc.



# Reverse Cycle Chillers and Chilled Water Air Handlers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180

Chilled Water Air Handlers Models CWAH4-6-8-12-18-24-36



Marvair Marine's reverse cycle chillers and chilled water air handlers provide the ultimate in comfort demanded by the discriminating owner. Each of our models have been thoroughly tested and designed for ease of installation and service. With decades of experience in comfort cooling and heating around the globe, you can be assured of years of dependable operation in the demanding conditions of the marine environment with Marvair Marine chillers and air handlers.

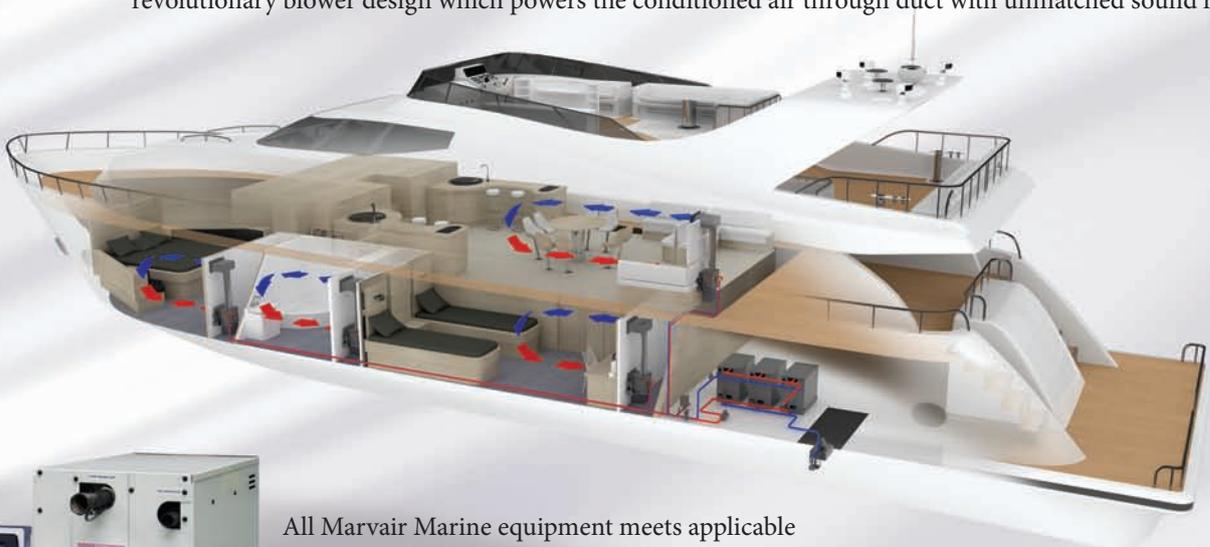
### A Marvair Marine First- an Interchangeable Control Board.

Marvair chillers, air handlers, self-contained units and split systems use the same control board. It is easily configured for our various displays/thermostats by simply moving jumpers on the board. The board automatically recognizes what display it is connected to - for a chiller, air handler, self-contained or split

system - and the appropriate icons are shown on the display. The common board reduces spare requirements since one board can be used for every Marvair unit on the boat. In a dual chiller application, either chiller can be designated as the first stage by simply moving a jumper on the board. Preset time delays and temperature settings automatically configure the two chillers. In cases where more than two chillers are required, multiple modules can be staged to meet the required load. Marvair Marine's unique microprocessor controller coordinates the operation of each module in addition to the seawater and loop pumps.

### Quiet Operation.

Decades of experience in the HVAC industry have provided the expertise and knowledge to build marine units that are unmatched for their quiet operation. In the chillers, a low vibration scroll compressor insures quiet operation as well as energy efficiency. Generous heat transfer surfaces in the sea water heat exchanger keep refrigerant pressures to a minimum to reduce compressor sound. The air handlers feature the Box Blower™, a revolutionary blower design which powers the conditioned air through duct with unmatched sound levels.



CHA60 chiller and control box

All Marvair Marine equipment meets applicable ABYC standards, US Coast Guard regulations, CE Directives and Air Conditioning Heating and Refrigeration Institute (AHRI) standards. All units are built to the requirements of UL standard 484. Marvair is an ISO 9001:2008 registered company.



## CHA Chillers

Marvair Marine chillers are built with capacities from 2 to 15 tons for operation on various power supplies and all use the universally acceptable R-410A refrigerant.

### Easy to Install and Simple to Service.

- Readily accessible power strip for the power and control wiring.
- All electrical boxes are in a separate enclosure and mounted remote from the chiller with a five foot, heavy duty, braided harness. (The five foot harness is standard, but custom sizes are available.) Note: because of the variety of control boxes and displays, the control box and chiller are ordered separately.
- Only access to the front of the unit is required to remove the front, top and left side panels of the chiller.
- The refrigerant valves and the flow switch can be accessed without removal of the manifolds.

Temperature sensors inserted into factory installed wells on the chilled water inlet line (return from the loop) and on the chilled water inlet line (supply to the loop) ensure accurate sensing of the water temperature. The temperature sensor on the inlet (return) turns the chiller on and off, depending on the water temperature. If the chiller is in the cooling mode and the water temperature is above the set point, the chiller will turn on to cool the loop water. In the heating mode, if the temperature is below the set point, the chiller will turn on to heat the loop water. The temperature sensor on the outlet line (supply to the loop), provides freeze and high temperature limit protection.

The ends of the sensor wires, the wells and the jacks on the control board are color coded to insure the correct connection of the sensors should they ever need to be replaced.

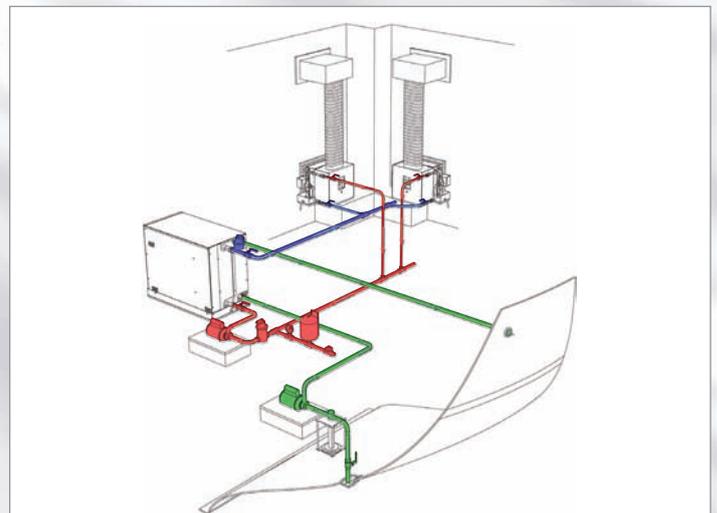
**Marine Grade Cabinets and Common Sizes.** The chillers are built in common cabinets to allow a smaller chiller to be easily upsized for boats going to tropical climates. (See chiller dimensional drawings for cabinet sizes.) The cabinets are constructed with stainless steel condensate/base pans with two condensate opening in each pan. Factory provided hold down clamps are included in the installation kit. Corrosion resistant, heavy gauge white aluminum is used for all exterior panels and eliminates the need for the builder to encase the chiller. The white finish enhances the appearance of engine rooms and makes it easy to identify leaks.

### Rugged Components

- Scroll compressor with suction line accumulator, filter drier, and high and low refrigerant pressure switches. The switches are brazed in the refrigerant line to eliminate the leaks and nuisance trips common with screwed on switches.
- Coaxial tube-in-tube heat exchanger is constructed of corrosion resistant cupro-nickel water tubing and copper refrigerant tubing. The cupro-nickel water tubing provides the ultimate resistance to salt water corrosion and the copper refrigerant tubing maximizes heat transfer.



- The flat plate heat exchanger for the loop water is constructed of stainless steel.
- Easily accessible, paddle type flow switch in the chilled water line senses water flow and will not allow the compressor to operate if water flow is not sufficient.



# Reverse Cycle Chillers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180



### Innovative Displays.

The display for the chiller is on a cable (up to 50 ft. /15.2 m) to allow mounting for easy viewing and access- not buried inside the electrical box. Readily understandable icons are used to show the operational status.

### Configurable Control Board.

The control board is easy to set up for operation with a single or two chillers. For a two chiller installation, either chiller can be selected as the second stage unit by simply moving a jumper on the board. Preset time

delays and temperature settings automatically configure the chiller as the second stage unit.

For equal run time between the two chillers, an internal time clock on the board records run time of the chiller. By simply moving the jumper on each board, your service dealer can swap the first and second stage units. In cases where more than two chillers are required, multiple modules can be staged to meet the required load. Marvair Marine's

unique

microprocessor controller coordinates the operation of each module in addition to the seawater and loop pumps.

## Specification

### CHA Chiller Model Identification

CH	A	●●	RC	●	●
CH - Chiller	A = R410-A Refrigerant	Normal Capacity 24 = 24,000 BTUH 36 = 36,000 BTUH 48 = 48,000 BTUH 60 = 60,000 BTUH 72 = 72,000 BTUH 90 = 90,000 BTUH 102 = 102,000 BTUH 120 = 120,000 BTUH 150 = 150,000 BTUH 180 = 180,000 BTUH	System Type RC = Reverse Cycle	Normal Voltage A = 208/230V, 1ø, 60Hz C = 208.230V3ø, 60Hz F = 220V, 1ø, 50Hz W = 220/240V, 1ø, 50Hz E = 380V, 3ø, 50 Hz	Controls S = Single Unit M = Multiple Units

### CHA Chillers Minimum Seawater Flow

Model	Gallons/Minute	Litres/Minute
CHA24	8.5	32.2
CHA36	12.6	48.6
CHA48	17	65.5
CHA60	21	81
CHA72	25.5	98.3
CHA90	32	123.4
CHA102	36	138.8
CHA120	42.5	163.8
CHA150	54.5	210.1
CHA180	63.75	245.8

### CHA Chillers Minimum Loop Water Flow

Model	Gallons/Minute	Litres/Minute
CHA24	6	22.7
CHA36	9	34.1
CHA48	12	45.4
CHA60	15	56.8
CHA72	18	68.1
CHA90	22.5	85.2
CHA102	25.5	96.5
CHA120	30	113.6
CHA150	37.5	141.9
CHA180	45	170.3

# Reverse Cycle Chillers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180

## Chiller Electrical Characteristics - CHA chillers (50 Hz)

CHILLER MODEL	Nominal Capacity (BTUH)	Nominal Tonnage	No. of Compressors	Volts	Hz	Phase	Nominal Cooling Amps <sup>1</sup>	MCA <sup>2</sup>	MFS <sup>3</sup>	LRA <sup>4</sup>	Soft Start Amps <sup>5</sup>
CHA24RCW	24,000	2	1	220-240	50	1	6.1	13.6	20	60.0	17
CHA36RCW	36,000	3	1	220-240	50	1	9.8	20.0	35	87.0	24
CHA48RCW	48,000	4	1	220-240	50	1	13.0	26.4	45	136.0	38
CHA60RCW	60,000	5	1	220-240	50	1	17.2	30.6	50	153.0	43
CHA24RCE	24,000	2	1	380	50	3	2.7	6.4	10	28.0	3.0
CHA36RCE	36,000	3	1	380	50	3	3.8	7.4	10	44.0	4.0
CHA48RCE	48,000	4	1	380	50	3	4.7	9.7	15	51.5	5.0
CHA60RCE	60,000	5	1	380	50	3	6.8	13.2	20	74.0	7.0
CHA72RCE	72,000	6	1	380	50	3	7.2	11.2	20	74.0	7.5
CHA90RCE	90,000	7.5	1	380	50	3	9.5	18.4	30	95.0	10.0
CHA102RCE	102,000	8.5	1	380	50	3	10.9	20.8	35	111.0	11.0
CHA120RCE	120,000	10	1	380	50	3	12.5	22.4	40	118.0	13.0
CHA150RCE	150,000	12.5	1	380	50	3	15.9	27.2	45	140.0	16.0
CHA180RCE	180,000	15	1	380	50	3	20.5	31.2	55	173.0	21.0

## Chiller Electrical Characteristics - CHA chillers (60 Hz)

CHILLER MODEL	Nominal Capacity (BTUH)	Nominal Tonnage	No. of Compressors	Volts	Hz	Phase	Nominal Cooling Amps <sup>1</sup>	MCA <sup>2</sup>	MFS <sup>3</sup>	LRA <sup>4</sup>	Soft Start Amps <sup>5</sup>
CHA24RCA	24,000	2	1	208/230	60	1	6.1	16.8	30	58.3	16
CHA36RCA	36,000	3	1	208/230	60	1	9.1	20.8	35	79.0	22
CHA48RCA	48,000	4	1	208/230	60	1	12.6	27.2	45	117.0	33
CHA60RCA	60,000	5	1	208/230	60	1	15.4	32.8	50	134.0	37
CHA24RCC	24,000	2	1	208/230	60	3	4.9	9.7	15	55.0	5.0
CHA36RCC	36,000	3	1	208/230	60	3	7.1	13.0	20	73.0	7.0
CHA48RCC	48,000	4	1	208/230	60	3	8.0	17.1	30	83.1	8.0
CHA60RCC	60,000	5	1	208/230	60	3	10.5	19.5	35	110.0	11.0
CHA72RCC	72,000	6	1	208/230	60	3	12.2	25.6	45	155.0	12.0
CHA90RCC	90,000	7.5	1	208/230	60	3	14.0	28.0	50	149.0	14.0
CHA102RCC	102,000	8.5	1	208/230	60	3	19.5	29.0	50	164.0	20.0
CHA120RCC	120,000	10	1	208/230	60	3	22.6	37.6	60	225.0	23.0
CHA150RCC	150,000	12.5	1	208/230	60	3	25.5	43.2	75	239.0	26.0
CHA180RCC	180,000	15	1	208/230	60	3	34.7	64.0	115	300.0	35.0
CHA24RCD	24,000	2	1	460	60	3	2.4	5.0	10	22.4	3.0
CHA36RCD	36,000	3	1	460	60	3	3.5	7.2	10	38.0	4.0
CHA48RCD	48,000	4	1	460	60	3	4.2	7.8	10	41.0	4.5
CHA60RCD	60,000	5	1	460	60	3	4.9	9.7	15	52.0	5.0
CHA72RCD	72,000	6	1	460	60	3	6.3	12.0	20	75.0	6.5
CHA90RCD	90,000	7.5	1	460	60	3	7.3	11.2	20	74.0	7.5
CHA102RCD	102,000	8.5	1	460	60	3	9.8	18.4	30	95.0	10.0
CHA120RCD	120,000	10	1	460	60	3	11.3	20.8	35	114.0	11.5
CHA150RCD	150,000	12.5	1	460	60	3	12.7	22.4	40	125.0	13.0
CHA180RCD	180,000	15	1	460	60	3	16.4	28.8	50	150.0	16.5

<sup>1</sup> Nominal cooling amps at 45°F (7.2°C) evaporating temperature and 100°F (37.8°C) condensing temperature as per the ABYC guidelines. Amp draw will vary with conditions and will be higher in the heating mode.

<sup>2</sup> MCA= Minimum Circuit Ampacity (Wire Sizing Amps)

<sup>3</sup> MFS=Maximum Fuse Size

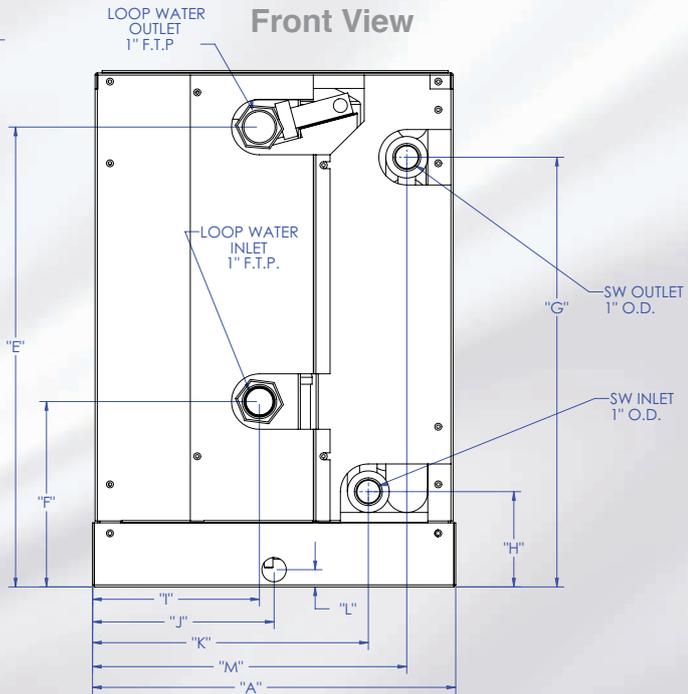
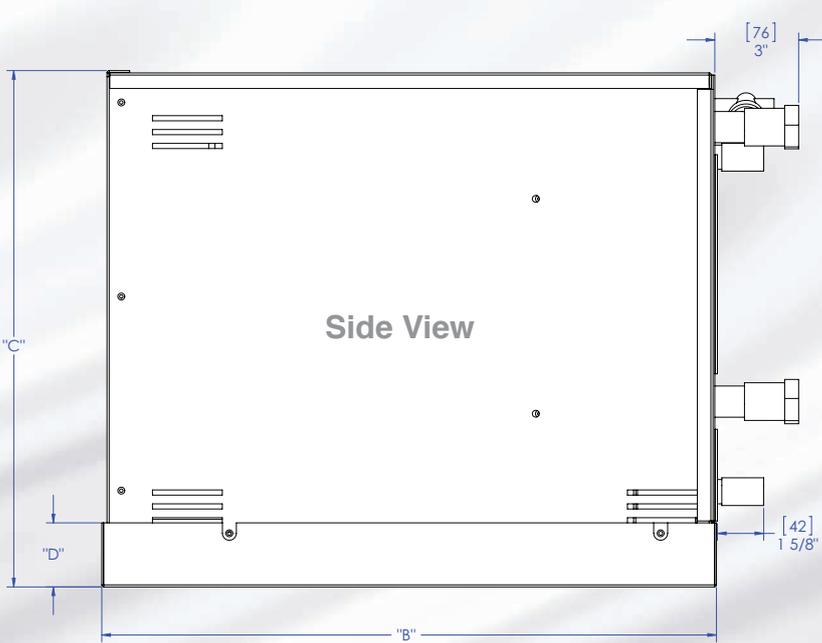
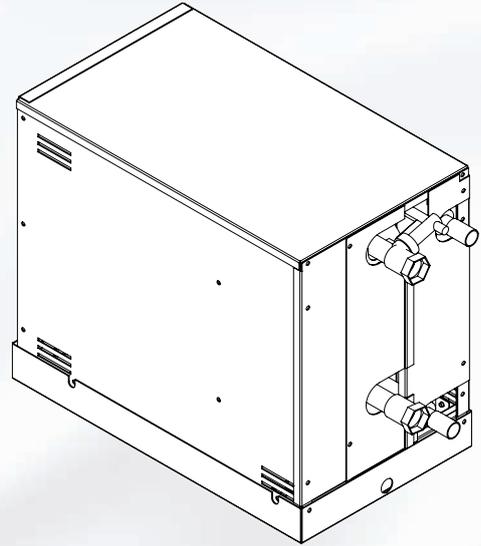
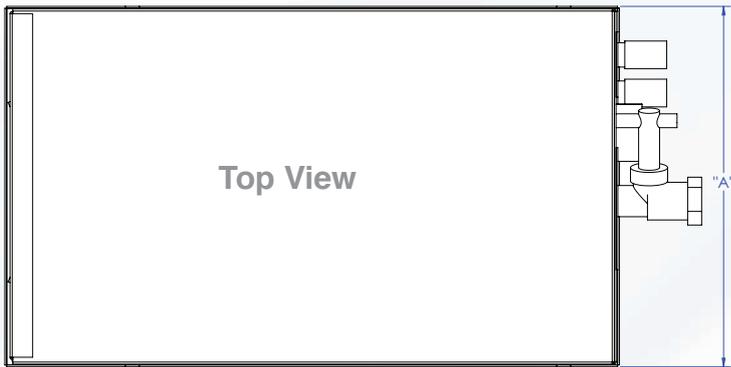
<sup>4</sup> LRA = Locked Rotor Amps

<sup>5</sup> SoftStart Amps= Approximate starting amps with Soft Start device on 1ø chillers and VFD on 3ø chillers. Amps will vary with conditions and will be higher in the heating mode.

# Reverse Cycle Chillers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180

## Dimensional Data Two and Three Ton Chiller Models CHA24/CHA36



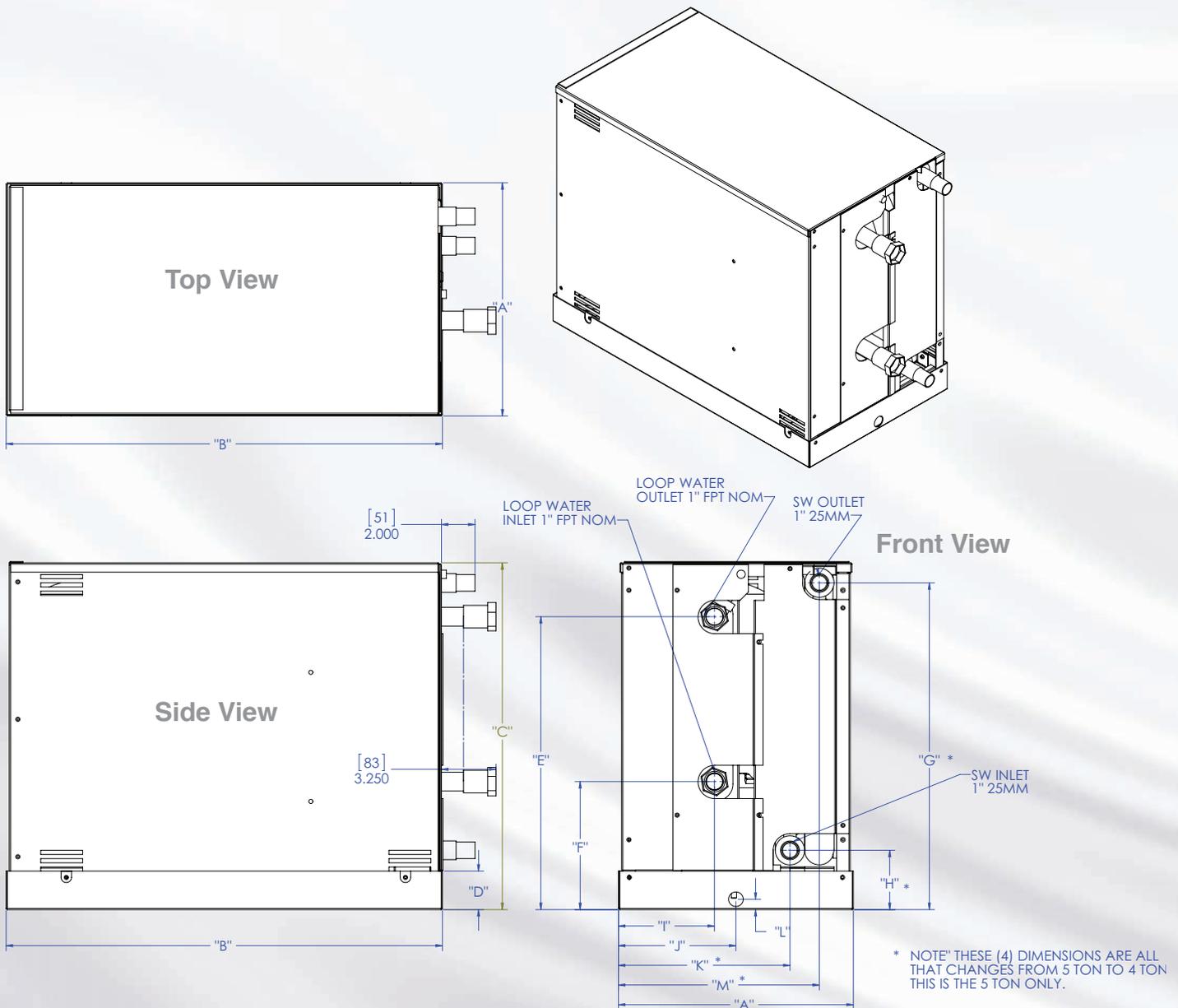
CHA24	A	B	C	D	E	F	G	H	I	J	K	L	M
Inches	13	22	18-5/8	2-1/4	16-5/8	6-5/8	14-5/8	4-1/4	6	6-1/2	10-1/4	5/8	11-3/8
MM	330	559	473	59	421	170	373	109	152	165	260	16	289

CHA36	A	B	C	D	E	F	G	H	I	J	K	L	M
Inches	13	22	18-5/8	2-1/4	16-5/8	6-5/8	15-1/2	3-3/8	6	6-1/2	9-7/8	5/8	11-3/8
MM	330	559	473	59	421	170	394	87	152	165	251	16	289

# Reverse Cycle Chillers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180

## Dimensional Data Four and Five Ton Chiller Models CHA48/CHA60



CHA48	A	B	C	D	E	F	G	H	I	J	K	L	M
Inches	14	26	20-7/8	2-1/4	17-5/8	7-5/8	17-1/2	3-5/8	5-3/4	7	10-5/8	5/8	12-1/8
MM	351	660	529	59	447	195	445	93	146	178	271	16	309

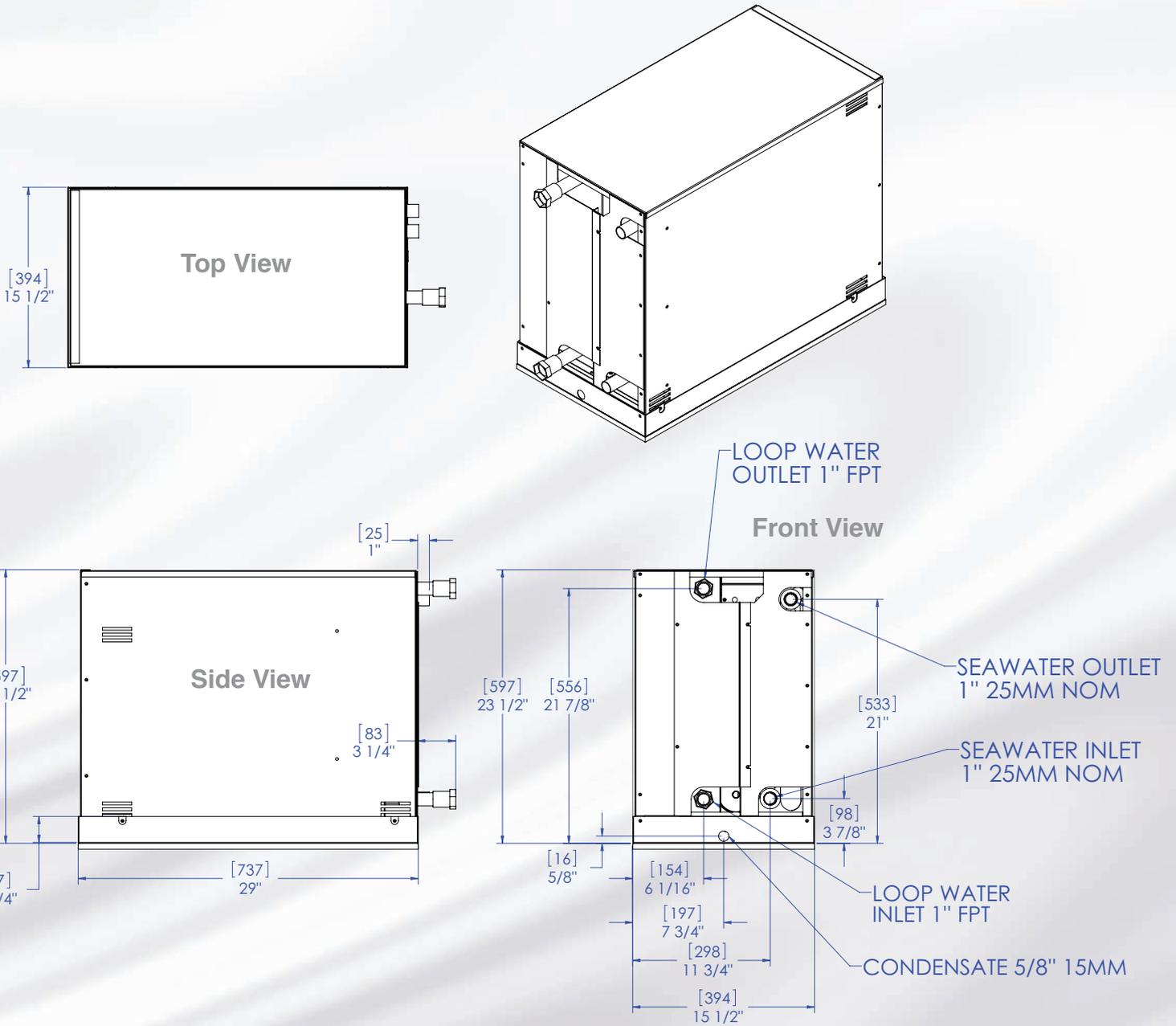
  

CHA60	A	B	C	D	E	F	G	H	I	J	K	L	M
Inches	14	26	20-7/8	2-1/4	17-5/8	7-5/8	19-5/8	3-1/2	5-3/4	7	10-1/4	5/8	12
MM	351	660	529	59	447	195	498	90	146	178	260	16	304

# Reverse Cycle Chillers

Chilled CHA24-36-48-60-72-90-102-120-150-180

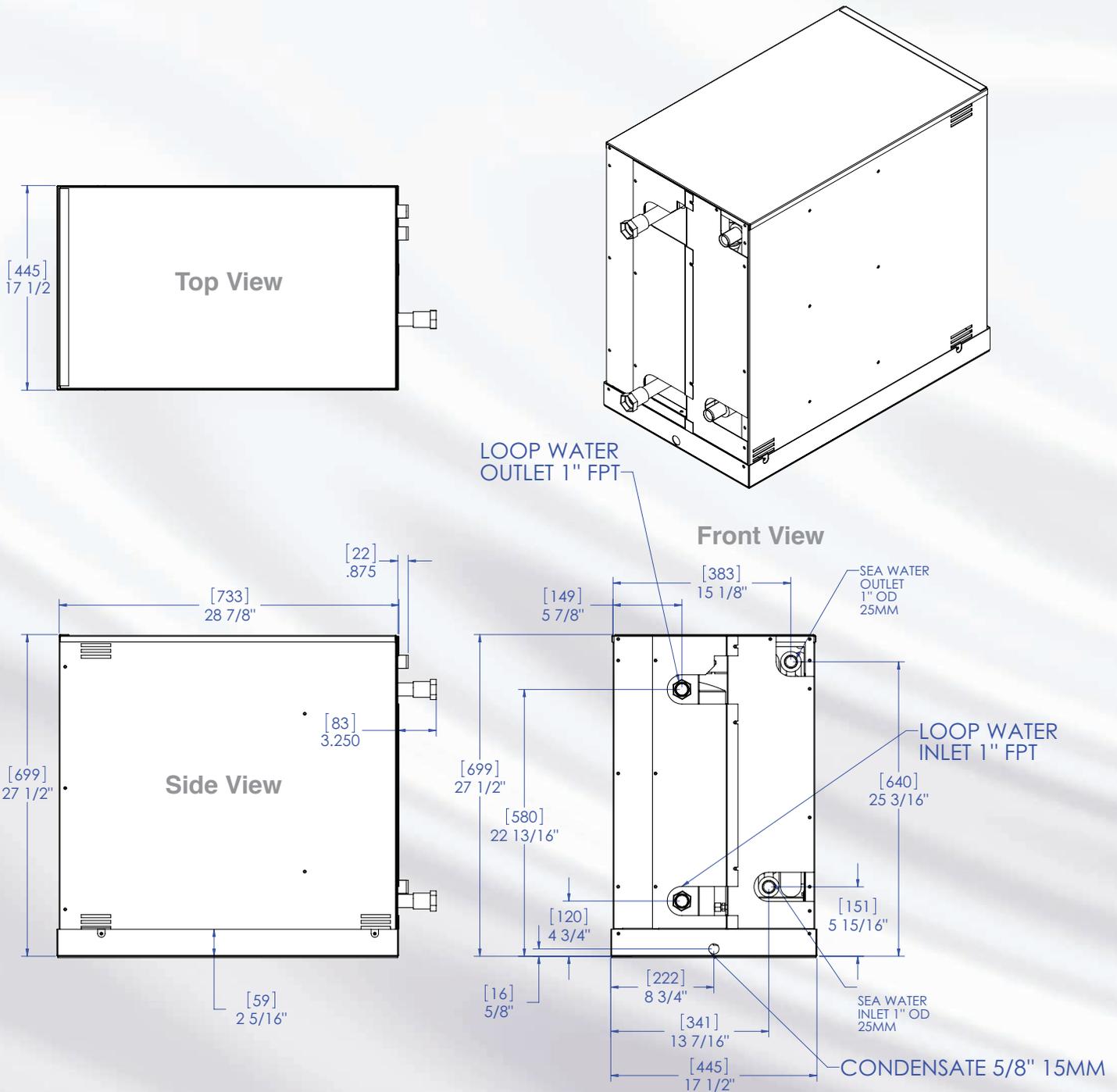
## Dimensional Data Chiller Models CHA72



# Reverse Cycle Chillers

Chiller Models CHA24-36-48-60-72-90-102-120-150-180

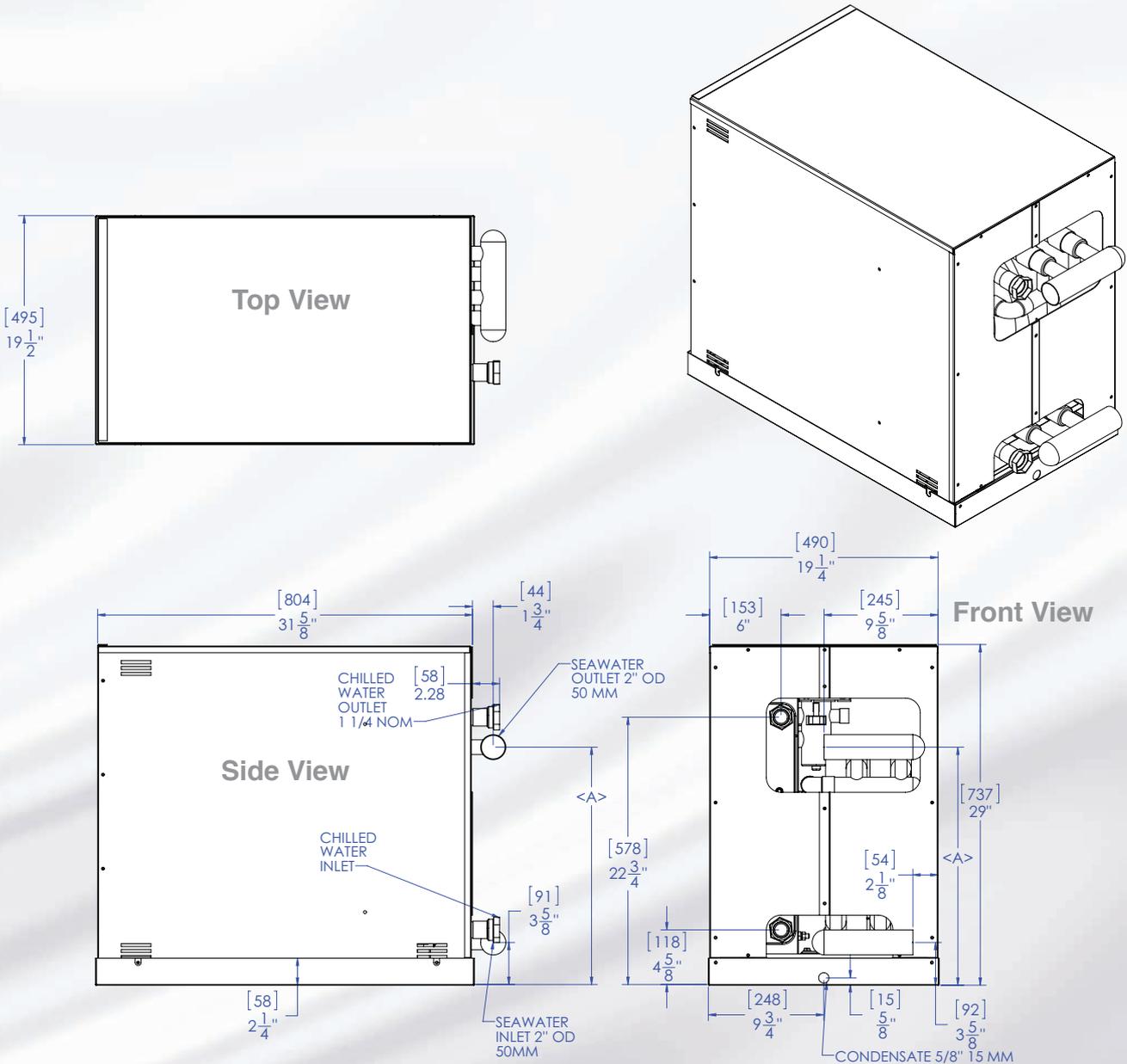
## Dimensional Data Chiller Models CHA90



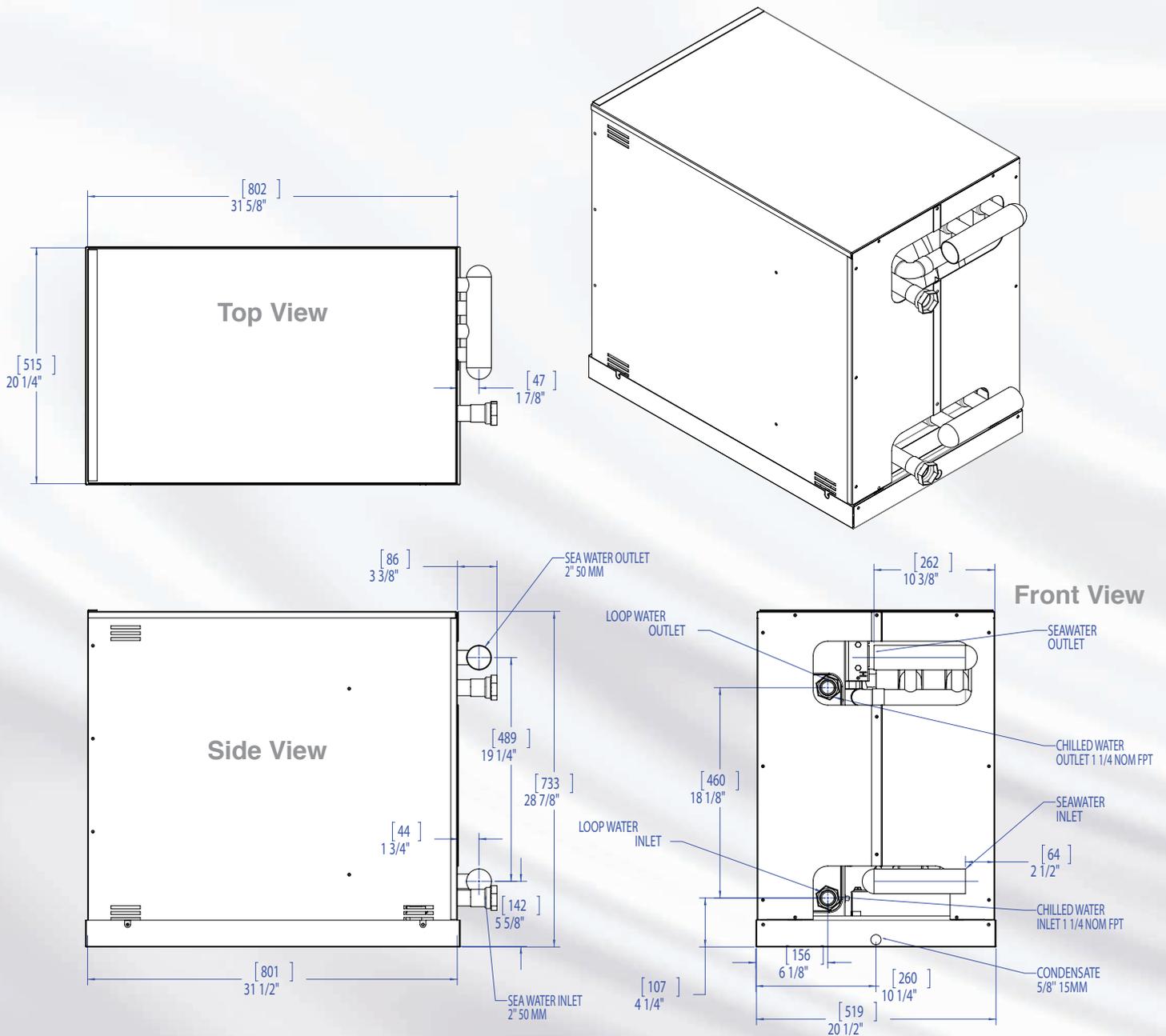
# Reverse Cycle Chillers

Chilled CHA24-36-48-60-72-90-102-120-150-180

## Dimensional Data Chiller Models CHA102, CHA120, and CHA150

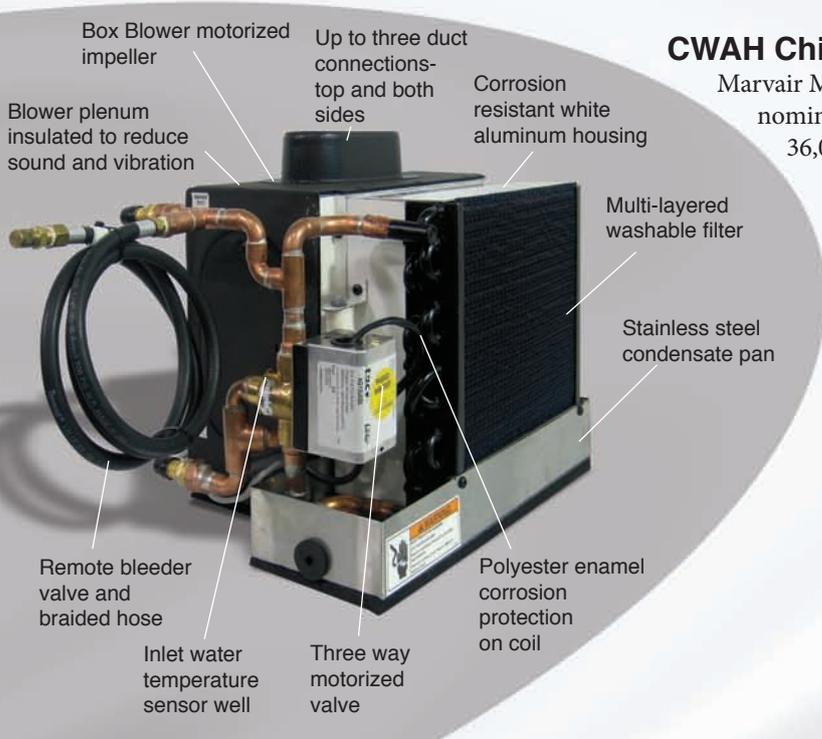


## Dimensional Data Chiller Models CHA180



# Chilled Water Air Handlers

Chilled Water Air Handlers Models CWAH4-6-8-12-18-24-36



## CWAH Chilled Water Air Handlers

Marvair Marine's chilled water air handlers are built in seven sizes with nominal capacities of 4,000; 6,000; 9,000; 12,000; 18,000; 24,000 and 36,000 BTUH's. All units feature the following:

### Unique Multiport Box Blower

- Allows up to three duct connections.
- Oval hose ring easily fits round flex duct.
- Eliminates need for expensive "Y" & "T" adapters and rotating of the blower.
- Compact, high static motorized impeller moves the conditioned air quietly and efficiently through duct.
- Blower speed can be adjusted without expensive electronics.
- Blowers in communal areas can be easily wired together, but controlled at different speeds.
- Exceptionally low amp draw.

### Rugged Construction Ensures Years of Dependable Operation

- Water coil and hairpins are dipped, not sprayed, in a polyester enamel to maximize the life of the coil while preserving heat transfer.
- Stainless steel condensate pan with high sides and two condensate openings prevents water from overflowing the sides.
- Superior corrosion resistant aluminum coil and blower housing.
- Blower plenum is completely enclosed in sound absorb-insulation to minimize sound and vibration.
- Multi-layered washable air filter.

### Innovative Design Reduces Installation Time and Materials

- Remote air bleed valve is constructed of braided hose integral relief valve.
- Three way motorized valve with factory installed water sensor well.
- Remotely mounted electrical box allows placement in confined spaces.

### Display and Control Board

- Same electronic control board, cables and sensors as used in chiller and DX systems. Keeps spare parts to a minimum.
- Easy to understand icons on display show operational status. Ideal for global use.



*Box Blower™, a revolutionary blower design which powers the conditioned air through duct with unmatched sound levels.*



*The venturi ring provides a smooth transition of the air into the impeller, increasing air flow by up to 20% and reducing sound levels.*

## Chilled Water Air Handlers

Chilled Water Air Handlers Models CWAH4-6-8-12-18-24-36

### Specification

#### Chilled Water Air Handlers Model Identification

<b>CWAH</b>	<b>Nominal Capacity</b>	<b>Electrical Rating</b>
Chilled Water	04 = 4,000 BTUH	Normal Voltage
Air Handler	06 = 6,000 BTUH	A = 208/230V, 1ø, 60Hz
	09 = 9,000 BTUH	B = 115V, 60Hz
	12 = 12,000 BTUH	F = 200-220V, 1ø, 50Hz
	18 = 18,000 BTUH	W = 220/240V, 1ø, 50Hz
	24 = 24,000 BTUH	
	36 = 36,000 BTUH	

#### Performance and Electrical Data

Model Number	Capacity (BTUH/Kcal/h)	Voltage @ 50 - 60Hz., 1ø	FLA <sup>1</sup> (60 Hz)	MCA <sup>2</sup> (60 Hz)	MFS <sup>3</sup> (60 Hz)	FLA <sup>1</sup> (50 Hz)	MCA <sup>2</sup> (50 Hz)	MFS <sup>3</sup> (50 Hz)	Air Flow CFM <sup>4</sup>	Air Flow M <sup>3</sup> /Hr <sup>5</sup>
CWAH04	4,000/1,000	230	0.22	0.3	5.0	0.22	0.3	5.0	150	225
CWAH06	6,000/1,510	230	0.25	0.3	5.0	0.24	0.3	5.0	250	425
CWAH09	9,000/2,270	230	0.25	0.3	5.0	0.24	0.3	5.0	300	510
CWAH12	12,000/3,025	230	0.50	0.6	5.0	0.41	0.5	5.0	361	612
CWAH18	18,000/4,540	230	0.50	0.6	5.0	0.41	0.5	5.0	400	680
CWAH24	24,000/6,050	230	0.86	1.1	5.0	0.86	1.1	5.0	700	1,189
CWAH36	36,000/9,070	230	1.00	1.2	5.0	.82	1.0	5.0	800	1,360

<sup>1</sup> FLA=Full Load Amps

<sup>2</sup> MCA= Minimum Circuit Ampacity (Wire Sizing Amps)

<sup>3</sup> MFS=Maximum Fuse Size

For information on 115 volt chilled water air handlers, please contact the factory.

#### Air and Water Connections

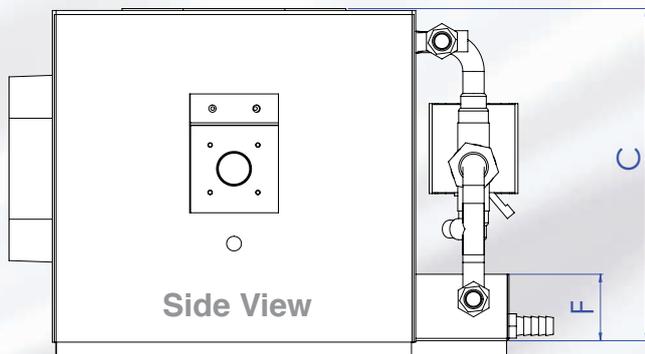
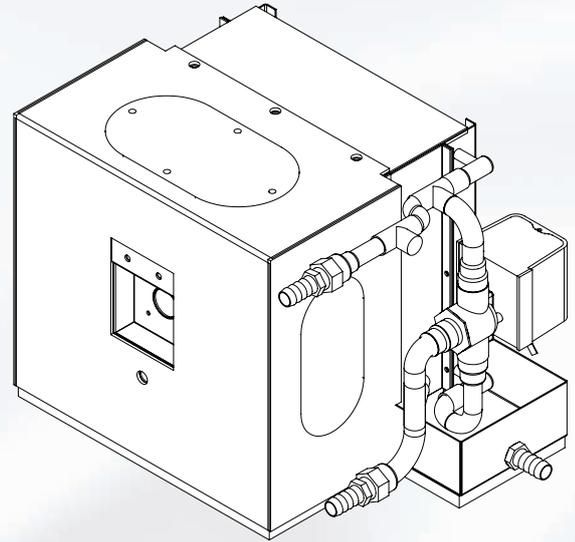
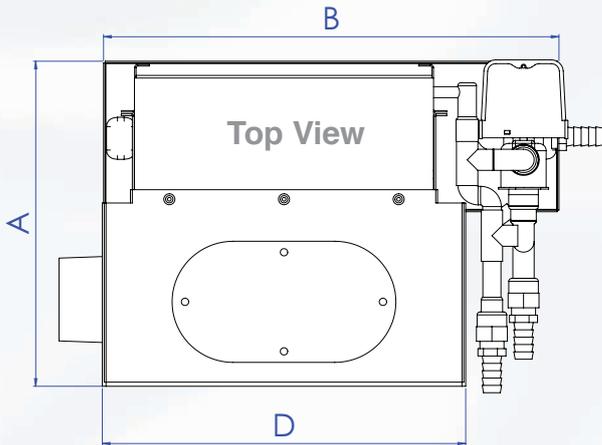
Model No.	Supply Air Duct Diameter inches/mm	Return Air Inlet inches <sup>2</sup> /mm <sup>2</sup>	Water Connections	Condensate Drain	Net Weight Lbs/Kg
CWAH04	4/102	70/450	5/8" Hose Barb	5/8" Hose Barb	20/9.1
CWAH06	5/127	70/450	5/8" Hose Barb	5/8" Hose Barb	20/9.1
CWAH09	6/152	98/630	5/8" Hose Barb	5/8" Hose Barb	21/9.6
CWAH12	6/152	130/840	5/8" Hose Barb	5/8" Hose Barb	23/10.5
CWAH18	7/178	200/1,290	5/8" Hose Barb	5/8" Hose Barb	24/10.9
CWAH24	8/203	240/1,550	5/8" Hose Barb	5/8" Hose Barb	40/18.2
CWAH36	7/178	400/2,580	5/8" Hose Barb	5/8" Hose Barb	50/22

# Chilled Water Air Handlers

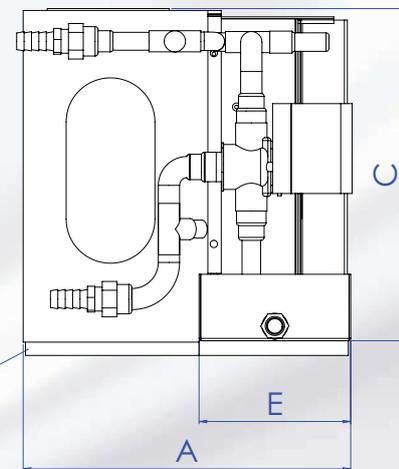
Chilled Water Air Handlers Models CWAH4-6-8-12-18-24-36

## Dimensional Data

### Chilled Water Air Handlers Models CWAH04 - 24



### Front View



INSULATION PAD

CWAH04	A	B	C	D	E	F
Inches	11	14-3/8	11-3/8	11-1/4	5	2-1/4
MM	279	365	288	286	127	58

CWAH06	A	B	C	D	E	F
Inches	11	15-3/8	11-1/4	12	5	2-1/4
MM	279	391	286	306	127	58

CWAH09	A	B	C	D	E	F
Inches	10-7/8	16-7/8	13-1/8	11-3/4	5	2-1/4
MM	275	429	333	299	127	58

CWAH12	A	B	C	D	E	F
Inches	10-3/8	17-3/8	13-1/4	12-3/8	5	2-1/4
MM	265	441	330	255	127	58

CWAH18	A	B	C	D	E	F
Inches	11-3/4	17-7/8	13-1/4	12-3/8	5	2-1/4
MM	299	454	336	314	127	58

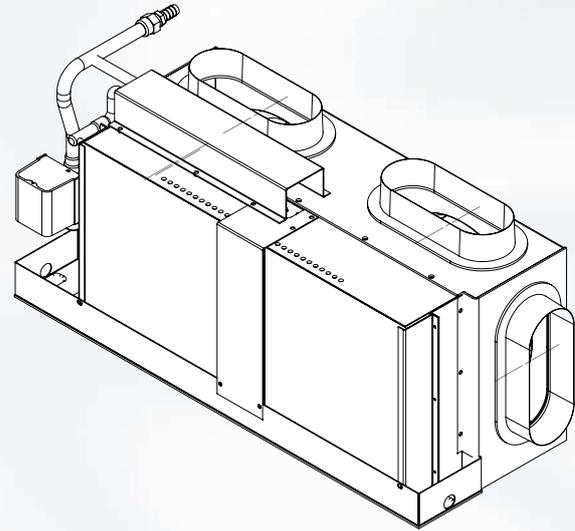
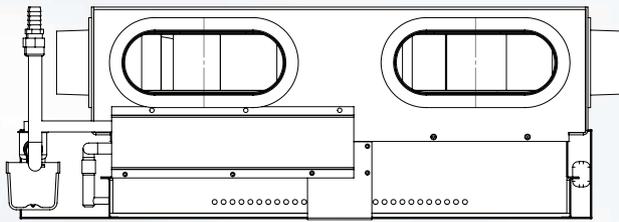
CWAH24	A	B	C	D	E	F
Inches	13-3/4	23-1/8	17	14-7/8	5	2-1/4
MM	349	587	430	377	127	58

# Chilled Water Air Handlers

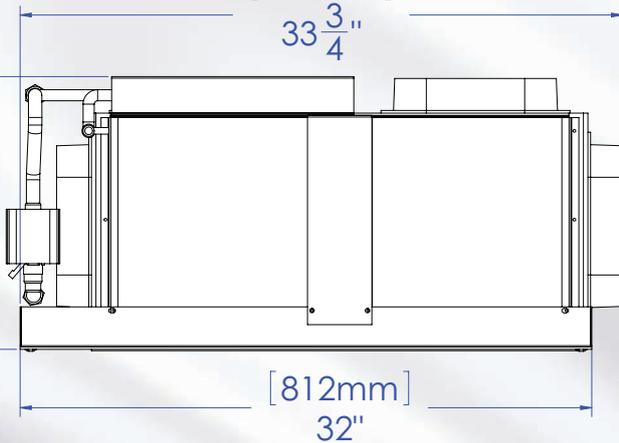
Chilled Water Air Handlers Models CWAH36

## Dimensional Data Chilled Water Air Handlers Model CWAH36

Top View



[856mm]  
33 <sup>3</sup>/<sub>4</sub>"



[390mm]  
15 <sup>3</sup>/<sub>8</sub>"

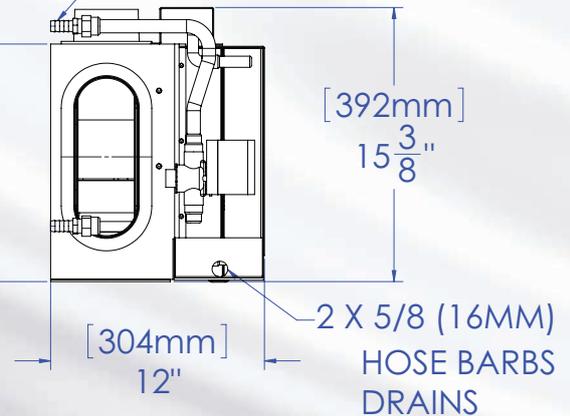
[812mm]  
32"

Side View

2 x 5/8 (16mm) Hose Barbs

[340mm]  
13 <sup>3</sup>/<sub>8</sub>"

[392mm]  
15 <sup>3</sup>/<sub>8</sub>"



[304mm]  
12"

2 X 5/8 (16MM)  
HOSE BARBS  
DRAINS

Front View

# Marvair Marine Offers a Wide Range of Equipment

for the Complete Chilled Water Installation



Fig. 1



Fig. 2



Fig. 3



Fig. 3



Fig. 8



Fig. 4



Fig. 5



Fig. 6



Fig. 7

- Duct heaters for air handlers. (Fig. 1)
- Heater barrels for chillers. (Fig. 2)
- Displays and controllers. (Fig. 3)
- Duct accessories – grilles, transitions and adapters. (Fig. 4)
- Plumbing – valves, pump manifolds. (Fig. 5)
- Complete chiller packages on racks. (Fig. 6)
- Fresh air make-up units. (Fig. 7)
- Compressor soft start modules. (Fig. 8)



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As part of the Marvair continuous improvement program, specifications are subject to change without notice. Please visit the Marvair marine website at [www.marvairmarine.com](http://www.marvairmarine.com) for the latest versions of all literature. A complete warranty statement can be found in each product's Installation or Owner's manual, on the website or by contacting Marvair.

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