CLIMATEMASTER®

A NIBE GROUP MEMBER

COMMERCIAL
TRANQUILITY® (ST) ROOFTOP SERIES

PRODUCT CATALOG

Part#: LC3021 | Revised: October 15, 2025

Models: ST 036-240
60 Hz - R-454B

PRELIMINARY

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THE TRANQUILITY (ST) ROOFTOP SERIES

The Tranquility (ST) Rooftop Series showcases superb efficiency ratings, quiet operation, and application flexibility that is synonymous with the ClimateMaster Tranquility family. The Tranquility ST surpasses ASHRAE 90.1 efficiency standards and utilizes R-454B low Global Warming Potential (GWP) refrigerant, setting a high standard for eco-friendly performance. Due to its innovative and environmentally-conscious design, the Tranquility ST qualifies for LEED® (Leadership in Energy and Environmental Design) points.

ClimateMaster's double isolation compressor mounting system makes the Tranquility ST one of the quietest rooftop units on the market. Compressors are mounted on specially engineered sound-tested EPDM grommets to a heavy-gauge mounting plate, which is further isolated from the cabinet base with rubber grommets for maximized vibration and sound attenuation. The easy access control box and large access panels make installing and maintaining the unit easier than other water-source heat pumps currently in production.

Available in sizes 3 tons (10.6 kW) through 20 tons (70.3 kW) with various outdoor air options, the Tranquility ST offers a wide range of units for most any installation. The Tranquility ST has an extended range refrigerant circuit, capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Standard features are many. Microprocessor controls, galvanized-steel cabinet, polyester powder-coat paint and TXV refrigerant metering device are just some of the features of the flexible Tranquility ST. All units are equipped with scroll compressors and high-efficiency EC plug fans.

The ability to handle outside air is one of the most attractive features of the Tranquility ST. Choices include manual fresh air damper, motorized fresh air damper, or modulating economizer with enthalpy controls. Options such as DDC controls, factory-installed water solenoid valves, and several filter choices allow customized design solutions.

iGate® 2 technology provides technicians an interface into the operation of the system in real time without the need for hard tooling. On board advanced controls communicate the key operating system temperatures allowing technicians to startup, commission, and service the equipment remotely by smart phone or website via the cloud. Communication can also be done at the unit via an AWC Thermostat or Wireless Service Tool. Not only does iGate 2 monitor current performance, it also allows the functionality to make system adjustments and captures operating conditions at time of fault. All this information is displayed in an easy to read format maximizing the usability of the experience.

ClimateMaster's patented ClimaDry® II Dehumidification option is an innovative means of providing modulating reheat without the complication of refrigeration controls. ClimaDry II is hot gas generated reheat, which utilizes one of the biggest advantages of a water-source heat pump (WSHP), the transfer of energy through the water piping system. ClimaDry II simply diverts condenser water through a water-to-air coil that is placed after the evaporator coil. ClimaDry II is the simplified leading reheat solution for commercial buildings.

The Tranquility ST Rooftop Series are designed to meet the challenges of today's HVAC demands with a high-efficiency, high-value solution. vFlow systems provide reduced water-pumping power compared to traditional fixed-speed pumping systems. They also protect the unit against extreme operating conditions, thus extending the life of the compressor and air coil. Since vFlow is built inside the unit, it also saves on installation time and makes for a very clean and compact installation. The Tranquility ST Series water-source heat pumps are designed to meet the challenges of today's HVAC demands with one of the most innovative products available on the market.

Features, Options, and Accessories

FEATURES

- Sizes 036 (3 ton, 10.55 kW) through 240 (20 ton, 70.34 kW)
- Exceeds ASHRAE 90.1 efficiency standards
- Environmentally friendly R-454B low-GWP refrigerant
- Refrigerant Detection System (RDS) (mandatory on sizes 048 through 240, optional for size 036)
- Dual refrigeration circuits (sizes 096 and larger)
- Galvanized-steel cabinet construction with polyester powder-coat paint
- Double-wall construction for access doors with stainless-steel hardware
- Unique double-isolation compressor mounting with vibration isolation for quieter operation
- TXV metering device
- Easy-to-clean, rust-prohibitive, stainless-steel drain pan
- CXM2 Communicating Controls (Sizes 096-240 only):
  - Multiple communication pathways for unit access and diagnosis:
    - Cloud-based remote monitoring via iGate 2 Communicating (AWC) Thermostat
    - Connect directly to the system with a Wireless Service Tool
  - Provides real-time unit operating conditions
  - Reduces startup, commissioning, and service time by providing key system temperatures electronically
  - Captures operating conditions in the event of a safety shutdown
- DXM2.5 Advanced Communicating Controls (Sizes 036-072, optional on sizes 096-240):
  - Includes all of the CXM2 features
  - 24V Accessory Relays
  - Variable-speed Pump Control
- High-efficiency EC plug fans
- Up to 2-inch (5.08 cm) ESP capability
- Slide-out blower assembly for quick servicing.
- Unit Performance Sentinel performance monitoring system
- Eight standard safety features

OPTIONS

- BACnet, Modbus and Johnson N2 compatibility options for Building Management Systems (BMS)
- Demand-controlled ventilation (DCV) with optional enthalpy economizer and optional CO_2 sensor.
- Two-way motorized water valves that prevent water flow through the unit when it is not in operation, increasing system pumping efficiency
- Internally mounted water pump for single-pipe systems
- ClimaDry II modulating reheat

ACCESSORIES

- Wi-Fi communicating (AWC) thermostat with color touchscreen
- Wide variety of thermostat options to meet your application needs
- Braided-hose kits in various lengths with optional water valve, PT plugs, blowdown valve, flow regulator, and strainer
- 2-inch Merv 8 filter
- 4-inch Merv 8 or 13 filters
- Aesthetically pleasing wall sensors for connection to BMS (MPC) controls

iGATE 2 COMMUNICATION – CLOUD CONNECTED, WEB-ENABLED INFORMATION GATEWAY TO MONITOR, CONTROL, AND DIAGNOSE YOUR SYSTEM

iGate 2 Communication – Cloud connected, web-enabled information gateway to monitor, control, and diagnose your system.

The Tranquility ST is equipped with industry-first, iGate 2 communication information gateway that allows users to interact with their water-source system in easy to read clear language.

Monitor/Configure – From the myUplink PRO website/mobile app paired with an AWC Thermostat or a Wireless Service Tool directly at the unit, installers can configure the following: Unit family, size, accessory configuration, and demand reduction (optional, to limit unit operation during peak times). Users can look up the current system status, temperature sensor readings, and operational status of the blower.

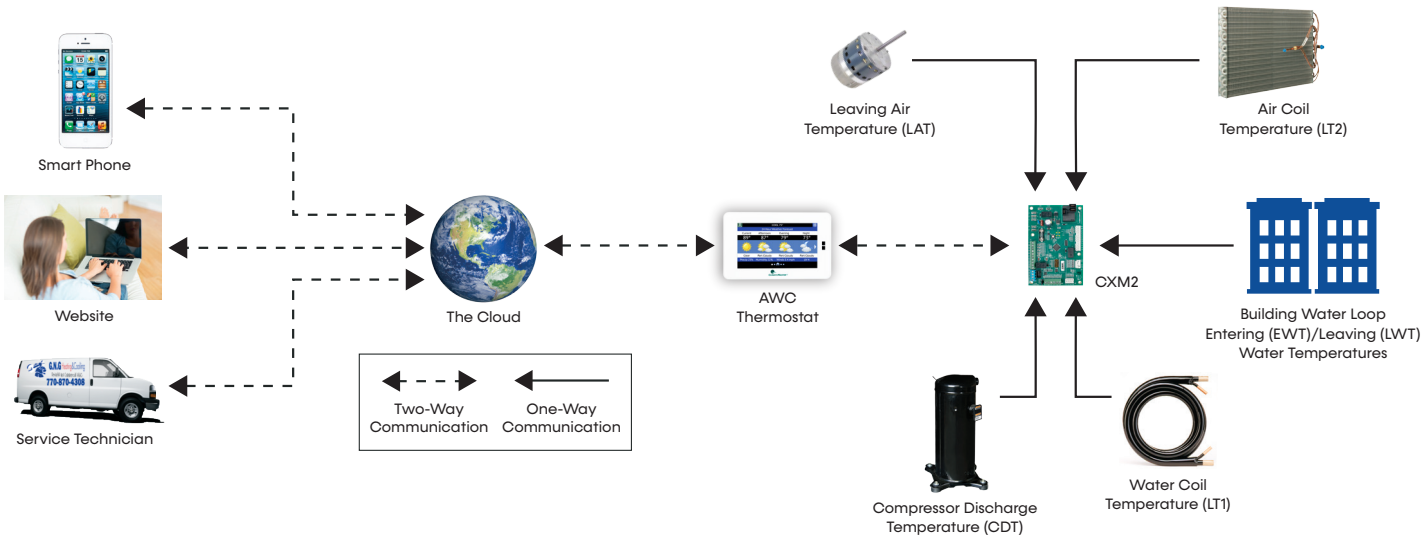
Precise Control – The new CXM2 enables intelligent, two-way communication between the CXM2 and smart components like the AWC Thermostat and Wireless Service Tool. CXM2 Communicating Controls uses information received from the temperature sensors to precisely control operation to deliver high efficiency, reliability and increased comfort.

Diagnostics – iGate 2 takes diagnosing water-source heat pump units to a next level of simplicity, by providing a dashboard of system and fault information, in clear language, on the AWC Thermostat, Wireless Service Tool, and the web portal/mobile app on the internet.

iGate 2 Service Warnings notify the homeowner and contractor of a fault and displays fault descriptions by app notifications/email with possible causes. Additionally, the current system status can be viewed graphically on the web portal and mobile app.

In iGate 2 Service Mode, service personnel can access fault descriptions, see possible causes, and most importantly, see the conditions (temp, flow, i/o conditions, configuration) at the time of the fault. Manual Operation mode enables service personnel to manually command operation for any of the thermostat outputs, blower speed, to help troubleshoot specific components. Manual Operation mode can be conducted at the unit with an AWC Thermostat using the mobile app, using the Wireless Service Tool, or remotely with mobile app/website when the AWC Thermostat controls are used.

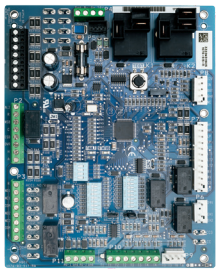
With an iGate 2 communicating system, users and contractors have a web-enabled gateway to system information never before available and exclusive to ClimateMaster products.



iGate 2 Communicating Controls Powered by DXM2.5 Advanced Communicating Controls

Models:
ST
036-240

iGATE 2 COMMUNICATION – CLOUD CONNECTED, WEB-ENABLED INFORMATION GATEWAY TO MONITOR, CONTROL, AND DIAGNOSE YOUR SYSTEM



The Tranquility ST is equipped with industry-first, iGate 2 communication information gateway that allows users to interact with their water-source system in easy to read clear language AND delivers improved reliability and efficiency by precisely controlling smart components.

Monitor/Configure: From the myUplink PRO website/ mobile app paired with an AWC Thermostat or a Wireless Service Tool directly at the unit, installers can configure the following: airflow, unit family, size, accessory configuration, and demand reduction (optional, to limit unit operation during peak times). Users can look up the current system status, temperature sensor readings, and operational status of the blower.

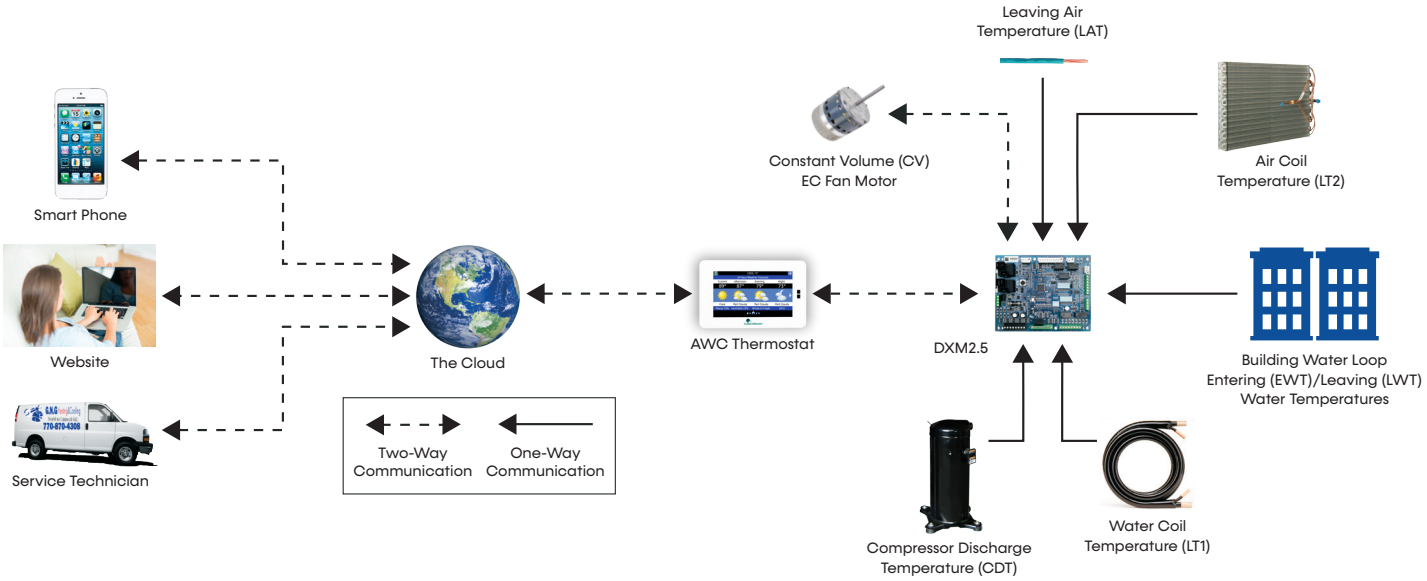
Precise Control: The DXM2.5 enables intelligent, two-way communication between the DXM2.5 and smart components like the AWC Thermostat, Wireless Service Tool, and constant volume CV EC blower motor. DXM2.5 Advanced Communicating Controls uses information received from the smart components and temperature sensors to precisely control operation of the variable speed CV EC fan to deliver higher efficiency, reliability and increased comfort.

Diagnostics: iGate 2 takes diagnosing water-source heat pump units to a next level of simplicity, by providing a dashboard of system and fault information, in clear language, on the AWC Thermostat, Wireless Service Tool, and the web portal/mobile app on the internet.

iGate 2 Service Warnings notify the homeowner and contractor of a fault and displays fault descriptions by app notifications and email with possible causes. Additionally, the current system status can be viewed graphically on the web portal and mobile app.

In iGate 2 Service Mode, service personnel can access fault descriptions, see possible causes, and most importantly, see the conditions (temp, flow, i/o conditions, configuration) at the time of the fault. Manual Operation mode enables service personnel to manually command operation for any of the thermostat outputs, blower speed, to help troubleshoot specific components. Manual Operation mode can be conducted at the unit with an AWC Thermostat using the mobile app, using the Wireless Service Tool, or remotely with mobile app/ website when the AWC Thermostat controls are used.

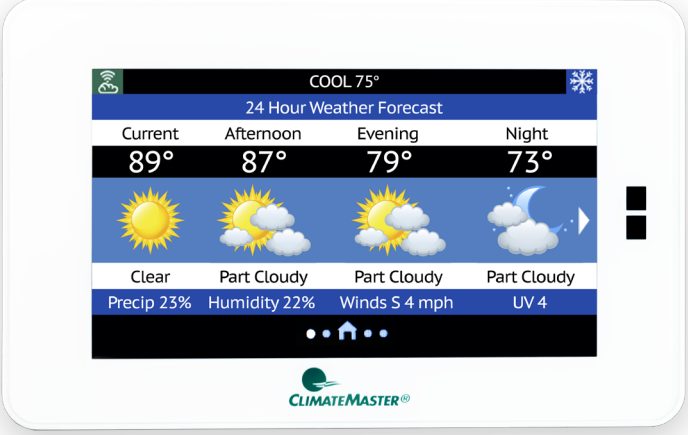
With an iGate 2 communicating system, users and contractors have a web-enabled gateway to system information never before available and exclusive to ClimateMaster products.



Communicating (AWC) Thermostat

Models:
ST
036-240

iGATE 2 COMMUNICATION – CLOUD CONNECTED, WEB-ENABLED INFORMATION GATEWAY TO MONITOR, CONTROL, AND DIAGNOSE YOUR SYSTEM



The iGate 2 Communicating (AWC) Thermostat is innovating the future of comfort technology, one building at a time. The inspired design of the touch screen interface allows you to see real-time data for the efficiency and health of your system, with early warnings for potential system faults. The cloud based information gateway allows technicians to remotely diagnose system issues before occupants even know there is a problem. Control and monitor the system in your home or business from anywhere in the world with an easy to use app on your phone.

Features with Efficiency in Mind

Touchscreen Interface
A brilliantly customizable touchscreen monitor for simple control.

Seamless Integration
Between your AWC Thermostat and comfort system.

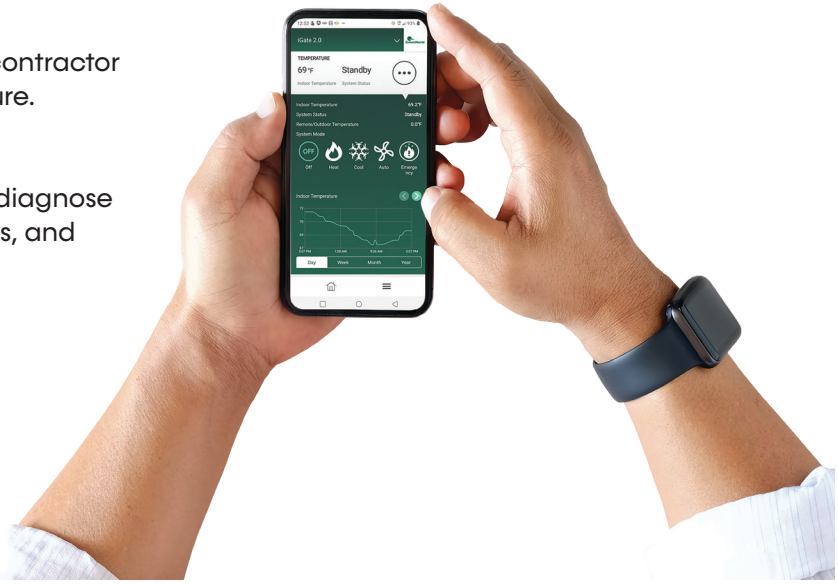
(Mobile) Remote System Control
Control temperature and schedule from anywhere in the world.

Early Fault Warnings
Alerts the building owner and the contractor of potential system faults in the future.

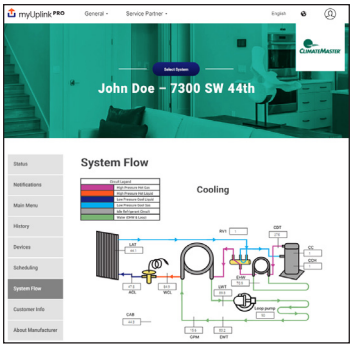
Remote Diagnostics
Enable the contractor to remotely diagnose system issues, adjust system settings, and reset faults.

Real-Time Operations Data and System Schematics
Access simply via the myUplink PRO Account and web portal to view system diagrams with current operating temperatures.

Revenue Stream
HVAC professionals can offer owners service contracts with remote monitoring and diagnostic capabilities without the large expense of a building management system.



HVAC Professional | User Experience



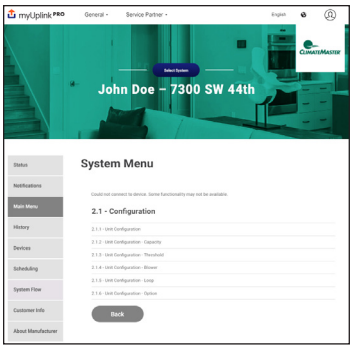
iGate 2 establishes a two-way link between the AWC Thermostat and the cloud, adding significant value for both residential and commercial customers. Our new thermostat works with your customers' Tranquility comfort systems to provide the most efficient link between their system and your services. The customizable monitoring from the myUplink PRO web portal or phone app account allows for continuous system monitoring, analysis, repair recognition, and early warnings for potential system faults that are sent to you and your customer.

myUplink PRO

Benefits

- Remote login from anywhere, anytime from any internet connected device
- View system fault history with possible root causes
- Information is available for contractors to troubleshoot and diagnose systems remotely
- Secure internet connection keeps homeowner information private
- Access thermostat(s) through Android and iPhone mobile apps

Homeowner | User Experience



iGate 2 advanced unit controls enable a two-way communication link for critical system information between the unit and the cloud. From any internet connected device or smart phone, building owners can control and monitor their systems from anywhere in the world. iGate 2 offers building owners peace of mind their systems are operating at peak performance with advanced operational performance issue notifications. HVAC professionals get notifications when systems are operating out of range. They can log in remotely to check system faults, review current operating conditions, and diagnose issues remotely. This gives the HVAC technician the upper hand when showing up to perform service, saving time which in turn, saves money.

myUplink

Benefits

- Communicates personal settings and reminders through the iGate 2 communication system
- Easy-to-use, full-color, high-resolution user interface
- Sleek, intuitive control panel
- Secure internet connection keeps your information private
- Contains unit model, serial number and your HVAC professionals contact information
- System monitoring automatically contacts HVAC system providers when service is needed

vFlow Internal Variable Water Flow Control

Models:
ST
036-240

vFLOW INTERNAL VARIABLE WATER FLOW

Industry-first, built-in vFlow replaces a traditionally inefficient, external component of the system (water circulation) with an ultra-high-efficient, variable-speed, internal water-flow system. This saves 70-80% on water circulation compared to traditional single-speed pump systems. Multi-unit installations are also much simpler with vFlow systems, as the units automatically adjust water flow across the system.

vFlow is enabled by iGate 2, which facilitates intelligent communication between the thermostat, unit control, sensors, and internal water pump/valve to make true variable water flow a reality.

vFLOW IS AVAILABLE IN TWO VARIATIONS:

1. **Low System Pressure Drop Modulating Valve:** High CV motorized valve for central pumping. (Standard unit).
2. **High Head Variable Pump:** Multi-/individual-unit pumping (optional).

vFLOW DELIVERS THREE MAIN BENEFITS:

1. Easier and quicker unit installation as the flow control is built in to the unit.
2. Superior reliability by varying the water flow to deliver more stable operation.
3. Increased cost savings by varying the flow (and pump watt consumption) to match the unit's mode of operation.

INTERNAL COMPONENTS

All Tranquility products can be installed more easily and compactly than their predecessors because vFlow components are internal to the unit. They also save installing contractors labor and time by eliminating the need for an external flow regulator or a bulky external pumping module.

VARIABLE FLOW

vFlow technology enables variable water flow through the unit, with the DXM2.5 adjusting the pump speed to maintain an installer-set loop ΔT. By controlling the water flow, the system is able to operate at its optimal capacity and efficiency. vFlow provides a lower flow rate for part load where units typically operate 80% of the time and a higher, more normal flow rate for full-load operation.

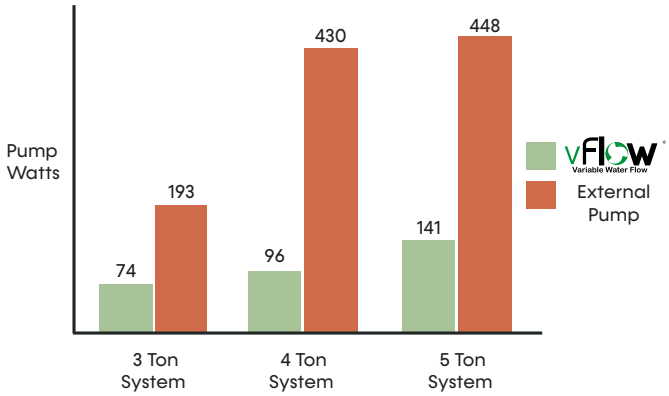
The variable-speed pump or motorized modulating valve delivers variable water flow, controlled by unit control, based on loop water ΔT.

ENERGY SAVINGS WITH WATER CIRCULATION CONTROL

Units with vFlow deliver greater operating cost savings by varying the water flow to match the unit's operation (ex: lower water flow when unit is in part-load operation). Lowering the flow results in lower energy consumption by the water pump (=greater cost savings) in vFlow units (whether internal or external pump).

In applications using vFlow with internal variable-speed electronically commuted (EC) pump, the EC pump uses fewer watts than a fixed-speed (PSC) pump even at full load. The EC pump excels in energy savings in part load, saving 70-80% watts compared to fixed-speed pumps (see chart). The EC pump can operate with independent flow rates for both heating and cooling operations allowing for more energy savings.

In loop applications, when the motorized modulating valve slows down the water flow during part-load operation, the external pump consumes fewer watts and saves more energy.



Reference Calculations

Heating	Cooling
$LWT = EWT - \frac{HE}{GPM \times Constant}$	$LWT = EWT + \frac{HR}{GPM \times Constant}$ $\quad LC = TC - SC$
$LAT = EAT + \frac{HC}{CFM \times 1.08}$	$LAT\ (DB) = EAT\ (DB) - \frac{SC}{CFM \times 1.08}$ $\quad S/T = \frac{SC}{TC}$

Constant = 500 for water, 485 for antifreeze

Conversion Table - to convert inch-pound (English) to S-I (Metric)

Airflow	Water Flow	External Static Pressure	Water Pressure Drop
Airflow (L/s) = CFM x 0.472	Water Flow (L/s) = GPM x 0.0631	ESP (Pa) = ESP (in of wg) x 249	PD (kPa) = PD (ft of hd) x 2.99

Legend and Glossary of Abbreviations

Abbreviations	Descriptions
Btuh	Btu (British Thermal Unit) per hour
BMS	Building Management System
CDT	Compressor discharge temperature
CFM	Airflow, cubic feet per minute
COP	Coefficient of performance = Btuh output/Btuh input
CT EC	Electronically commutated constant torque blower motor
CV EC	Electronically commutated constant volume blower motor
DB	Dry bulb temperature, °F
DT	Delta T
EAT	Entering air temperature
EER	Energy efficient ratio = Btuh output/Watt input
ESP	External static pressure, inches w.g.
EWT	Entering water temperature
FPT	Female pipe thread
GPM	Water flow in U.S., gallons per minute
HC	Air heating capacity, Btuh
HE	Total heat of extraction, Btuh
HGRH	Hot Gas Reheat

Abbreviations	Descriptions
HR	Total heat of rejection, Btuh
HWG	Hot water generator (desuperheater) capacity, MBtuh
kW	Total power unit input, kilowatts
LAT	Leaving air temperature, °F
LC	Latent cooling capacity, Btuh
LOC	Loss of charge
LWT	Leaving water temperature, °F
MBtuh	1,000 Btu per hour
MPT	Male pipe thread
MWV	Motorized water valve
PSC	Permanent split capacitor
RDS	Refrigerant Detection System
SC	Sensible cooling capacity, Btuh
S/T	Sensible to total cooling ratio
TC	Total cooling capacity, Btuh
TD or delta T	Temperature differential
VFD	Variable frequency drive
WB	Wet bulb temperature, °F
WPD	Waterside pressure drop, psi or feet of head
WSE	Waterside economizer

USE THE FOLLOWING SELECTION STEPS

1. Determine the actual heating and cooling loads at the desired dry bulb and wet bulb conditions.
2. Obtain the following design parameters: Entering water temperature, water flow rate in GPM, airflow in CFM, water flow pressure drop and design wet and dry bulb temperatures. Airflow CFM should be between 300 and 450 CFM per ton. Keep unit water pressure drop as close as possible to each other to make water balancing easier. See the appropriate tables and for the proper indicated water flow and water temperature.
3. Select a unit based on total and sensible cooling conditions. Select a unit which is closest to, but no larger than, the actual cooling load.
4. Enter tables at the design water flow and water temperature. Read the total and sensible cooling capacities

   NOTE: interpolation is permissible, extrapolation is not.
5. Read the heating capacity. If it exceeds the design criteria it is acceptable. It is quite normal for water-source heat pumps to be selected on cooling capacity only since the heating output is usually greater than the cooling capacity.
6. Determine the correction factors associated with the variable factors of dry bulb and wet bulb.

   Corrected Total Cooling =
   tabulated total cooling x wet bulb correction.

   Corrected Sensible Cooling =
   tabulated sensible cooling x wet/dry bulb correction.
7. Compare the corrected capacities to the load requirements. Normally if the capacities are within 10% of the loads, the equipment is acceptable. It is better to undersize than oversize, as undersizing improves humidity control, reduces sound levels, and extends the life of the equipment.
8. When completed, calculate water temperature rise and assess the selection. If the units selected are not within 10% of the load calculations, review what effect changing the GPM, water temperature, and air flow and air temperature have on the corrected capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure. Remember undersize slightly for best performance.

EXAMPLE EQUIPMENT SELECTION FOR COOLING

Step 1: Load Determination

Assume we have determined that the appropriate cooling load at the desired dry bulb 80°F and wet bulb 65°F conditions is as follows:

Total Cooling .....56,900 Btuh
Sensible Cooling .....49,400 Btuh
Entering Air Temp..... 80°F Dry Bulb / 65°F Wet Bulb

Step 2: Design Conditions

Similarly, we have also obtained the following design parameters:

Entering Water Temp .....90°F
Water Flow (Based upon 10°F rise in temp) ... 11 GPM
Airflow ..... 2,120 CFM

Steps 3, 4 & 5: HP Selection

After making our preliminary selection (ST05), we enter the tables at design water flow and water temperature and read Total Cooling, Sensible Cooling and Heat of Rejection capacities:

Total Cooling .....57,000 Btuh
Sensible Cooling .....45,000 Btuh
Heat of Rejection.....73,200 Btuh

Steps 6 and 7: Entering Airflow Corrections

Next, we determine our correction factors.

Corrected Values		Table		Ent Air		Airflow		Corrected
Corrected Total Cooling	=	57,000	x	0.969	x	1.004	=	55,454
Corrected Sensible Cooling	=	45,000	x	1.090	x	1.030	=	50,522
Corrected Heat of Rejection	=	73,200	x	1.006	x	1.006	=	71,798

Step 8: Water Temperature Rise Calculation and Assessment

Actual Temperature Rise .....13.1°F

When we compare the Corrected Total Cooling and Corrected Sensible Cooling figures with our load requirements stated in Step 1, we discover that our selection is within ±10% of our sensible load requirement. Furthermore, we see that our Corrected Total Cooling figure is slightly undersized as recommended, when compared to the actual indicated load.

Model Nomenclature

Models:
ST
036-240

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S	T	0	0	3	6	A	H	D	W	0	C	0	M	S

PRODUCT NAME
S = Tranquility

MODEL TYPE
T = Rooftop Series

AIR DAMPER OPTIONS
0 = None
1 = Motorized Fresh Air Damper
2 = Modulating Enthalpy Economizer[1]

SIZE
036 120
048 144
060 180
072 240
096

REVISION
A = Current

VOLTAGE
H = 208/230-3-60
F = 460-3-60
K = 208/230-3-60 with Refrigerant Detection System
L = 460-3-60 with Refrigerant Detection System

CONTROLS

Board	Power Termination	Standard	MPC	With GFI	
				Standard	MPC
CXM2[2]	Field Connected	C	N	-	-
	Disconnect	W	R	1	5
	Circuit Breaker	F	T	3	7
DXM2.5[2]	Field Connected	D	P	-	-
	Disconnect	B	S	2	6
	Circuit Breaker	G	U	4	8

SPECIAL OPTIONS
S = Standard

BLOWER MOTOR
M = Plug EC

EXTENDED OPTIONS
0 = None
F = Smoke Detector (Return)
G = Smoke Detector (Supply)

DRAIN PAN/HEAT EXCHANGER OPTIONS
C = Noncoated Air Coil
E = E-Coated Air Coil

WATER OPTIONS

Option	Coax Material	
	Copper	Cupro-nickel
None	0	Z
Modulating Valve	C	V
Internal Pump (Variable with Check Valve)	3	P
Internal Pump (Variable no Check Valve)	J	N
ClimaDry	D	H
Internal Secondary Pump (ISP)	7	S

CABINET

Model	MERV 8		MERV 13
	2"	4"	4"
Extended Range	H	Y	Q
Standard Range	W	Z	U

Notes:
1 The Modulating Enthalpy Economizer option is not compatible with the iGate 2 Communicating AWC Thermostat. The thermostat must be a standard heat pump thermostat or wall sensor.
2 Size 036-072 must use DXM2.5. Size 096-240 must use CXM2.
3 Only available on size 036-072.

Use ClimateMaster's selection software at https://ccgencompass.climatecontrolgroup.com/ to configure your Tranquility ST model.

Tested in Accordance with ARI/ASHRAE/ISO 13256-1 English (I-P) Units Part Load

Model	Motor Type	WSHP (Part Load)											
		Water-Loop Heat Pump				Ground-Water Heat Pump				Ground-Loop Heat Pump			
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 68°F		Heating 41°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
ST036	EC	26,100	16.4	31,900	5.5	30,300	28.0	25,300	4.6	29,200	22.6	22,900	3.9
ST048	EC	34,800	15.3	42,600	5.2	40,400	26.0	33,800	4.2	38,900	21.2	30,600	3.6
ST060	EC	43,500	17.7	53,300	5.5	50,500	30.0	42,300	4.5	48,700	24.2	38,300	3.9
ST072	EC	52,200	15.7	63,900	5.3	60,600	26.7	50,700	4.4	58,400	21.3	45,900	3.8
ST096	EC	48,000	14.0	58,700	4.4	54,300	20.6	47,600	3.9	50,400	15.6	38,400	3.3
ST120	EC	60,000	14.0	73,400	4.4	67,900	20.6	59,500	3.9	63,000	15.6	48,000	3.3
ST144	EC	72,000	14.0	88,100	4.5	81,400	20.0	71,400	4.0	75,600	15.2	57,700	3.3
ST180	EC	84,000	15.0	102,800	5.0	95,000	20.9	83,300	4.5	88,200	16.5	67,300	3.7
ST240	EC	120,000	14.0	146,900	4.8	135,800	20.0	119,100	4.2	126,000	15.0	96,100	3.4

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature.
- Heating capacities based upon 68°F DB, 59°F WB entering air temperature.
- Ground-Loop Heat Pump ratings based on 15% antifreeze solution.

Tested in Accordance with ARI/ASHRAE/ISO 13256-1 English (I-P) Units Full Load

Model	Motor Type	WSHP (Full Load)											
		Water-Loop Heat Pump				Ground-Water Heat Pump				Ground-Loop Heat Pump			
		Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Cooling 77°F		Heating 32°F	
		Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP	Capacity Btuh	EER Btuh/W	Capacity Btuh	COP
ST036	EC	36,000	15.0	44,000	5.1	40,400	22.1	35,700	4.6	37,800	16.4	28,800	3.7
ST048	EC	48,000	14.0	58,700	4.7	54,200	20.3	47,600	4.1	50,400	15.5	38,400	3.4
ST060	EC	60,000	16.2	73,400	5.1	67,900	23.7	59,500	4.5	63,000	17.9	48,000	3.7
ST072	EC	72,000	14.5	88,100	5.0	81,400	21.3	71,400	4.4	75,600	15.8	57,700	3.6
ST096	EC	96,000	14.0	117,500	4.4	108,600	20.6	95,200	3.9	100,800	15.6	76,900	3.3
ST120	EC	120,000	14.0	146,900	4.4	135,800	20.6	119,100	3.9	126,000	15.6	96,100	3.3
ST144	EC	144,000	14.0	176,300	4.5	162,900	20.0	142,900	4.0	151,200	15.2	115,400	3.3
ST180	EC	168,000	15.0	205,700	5.0	190,100	20.9	166,700	4.5	176,500	16.5	134,600	3.7
ST240	EC	240,000	14.0	293,900	4.8	271,600	20.0	238,200	4.2	252,100	15.0	192,300	3.4

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature.
- Heating capacities based upon 68°F DB, 59°F WB entering air temperature.
- Ground-Loop Heat Pump ratings based on 15% antifreeze solution.

Tested in Accordance with ARI/ASHRAE/ISO 13256-1 Metric (S-I) Units Part Load

Model	Motor Type	WSHP (Part Load)											
		Water-Loop Heat Pump				Ground-Water Heat Pump				Ground-Loop Heat Pump			
		Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Full Cooling 20°C		Full Heating 5°C	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kw	EER W/W	Capacity kW	COP
ST036	EC	7.65	4.8	9.35	5.5	8.88	8.2	7.42	4.6	8.56	6.6	6.71	3.9
ST048	EC	10.20	4.5	12.49	5.2	11.84	7.6	9.91	4.2	11.40	6.2	8.97	3.6
ST060	EC	12.75	5.2	15.62	5.5	14.80	8.8	12.40	4.5	14.27	7.1	11.23	3.9
ST072	EC	15.30	4.6	18.73	5.3	17.76	7.8	14.86	4.4	17.12	6.2	13.45	3.8
ST096	EC	14.07	4.1	17.20	4.4	15.91	6.0	13.95	3.9	14.77	4.6	11.25	3.3
ST120	EC	17.58	4.1	21.51	4.4	19.90	6.0	17.44	3.9	18.46	4.6	14.07	3.3
ST144	EC	21.10	4.1	25.82	4.5	23.86	5.9	20.93	4.0	22.16	4.5	16.91	3.3
ST180	EC	24.62	4.4	30.13	5.0	27.84	6.1	24.41	4.5	25.85	4.8	19.72	3.7
ST240	EC	35.17	4.1	43.05	4.8	39.80	5.9	34.91	4.2	36.93	4.4	28.17	3.4

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 20°C DB, 15°C WB entering air temperature.
- Heating capacities based upon 20°C DB, 15°C WB entering air temperature.
- Ground-Loop Heat Pump ratings based on 15% antifreeze solution.

Tested in Accordance with ARI/ASHRAE/ISO 13256-1 Metric (S-I) Units Full Load

Model	Motor Type	WSHP (Full Load)											
		Water-Loop Heat Pump				Ground-Water Heat Pump				Ground-Loop Heat Pump			
		Cooling 30°C		Heating 20°C		Cooling 15°C		Heating 10°C		Full Cooling 25°C		Full Heating 0°C	
		Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kw	EER W/W	Capacity kW	COP
ST036	EC	10.55	4.4	12.90	5.1	11.84	6.5	10.46	4.6	11.08	4.8	8.44	3.7
ST048	EC	14.07	4.1	17.20	4.7	15.89	5.9	13.95	4.1	14.77	4.5	11.25	3.4
ST060	EC	17.58	4.7	21.51	5.1	19.90	6.9	17.44	4.5	18.46	5.2	14.07	3.7
ST072	EC	21.10	4.2	25.82	5.0	23.86	6.2	20.93	4.4	22.16	4.6	16.91	3.6
ST096	EC	28.14	4.1	34.44	4.4	31.83	6.0	27.90	3.9	29.54	4.6	22.54	3.3
ST120	EC	35.17	4.1	43.05	4.4	39.80	6.0	34.91	3.9	36.93	4.6	28.17	3.3
ST144	EC	42.20	4.1	51.67	4.5	47.74	5.9	41.88	4.0	44.31	4.5	33.82	3.3
ST180	EC	49.24	4.4	60.29	5.0	55.72	6.1	48.86	4.5	51.73	4.8	39.45	3.7
ST240	EC	70.34	4.1	86.14	4.8	79.60	5.9	69.81	4.2	73.89	4.4	56.36	3.4

Notes:
- Where dual voltages are available ratings are based on the lower voltage setting.
- Cooling capacities based upon 27°C DB, 19°C WB entering air temperature.
- Heating capacities based upon 20°C DB, 15°C WB entering air temperature.
- Ground-Loop Heat Pump ratings based on 15% antifreeze solution.

For operation in the shaded area when water is used instead of an antifreeze solution, the LWT (Leaving Water Temperature) must be calculated. Flow must be maintained to a level such that the LWT is maintained above 40°F (4.4°C) when the JW3 jumper is not clipped (see example below). Otherwise, use appropriate levels of a proper antifreeze solution in systems with leaving water temperatures of 40°F (4.4°C) or below and clip the JW3 jumper. This is due to the potential of the refrigerant temperature being as low as 32°F (0°C) with 40°F (4.4°C) LWT, which may lead to a nuisance cutout due to the activation of the Low Temperature Protection. Never clip JW3 for standard-range equipment or systems without antifreeze.

F			HEATING - EAT 70			
	HR	EER	HC	kW	HE	CC
ecommended			13.811	1.57	8.620	2.6
0.88	33.152	34.3	16.294	1.61	10.977	3.0
0.85	32.536	35.1	17.072	1.62	11.719	3.1
0.84	32.080	35.0	17.505	1.62	12.132	3.2
0.97	33.404	31.2	19.704	1.65	14.238	3.5
0.91	33.325	33.4	20.733	1.66	15.225	3.7
0.88	33.167	34.2	21.303	1.67	15.773	3.7
1.09	33.039	27.1	23.145	1.69	17.547	4.0
1.00	33.335	29.9	24.408	1.71	18.764	4.2
.97	33.402	31.2	25.104	1.71	19.436	4.3
.4	32.271	22.8	26.551	1.73	20.833	4.5
	32.802	25.6	28.011	1.74	22.243	4.7
	33.022	27.0	28.805	1.75	23.010	
	.72	18.8	29.854	1.76	24.022	
		21.3	31.450	1.78		

Example:

At 50°F EWT (Entering Water Temperature) and 1.5 GPM/ton, a 3-ton unit has a HE of 22,500 Btuh. To calculate LWT, rearrange the formula for HE as follows:

HE = TD x GPM x 500, where HE = Heat of Extraction (Btuh); TD = temperature difference (EWT - LWT) and GPM = U.S. Gallons per Minute.

TD = HE / (GPM x 500)

TD = 22,500 / (4.5 x 500)

TD = 10°F

LWT = EWT - TD

LWT = 50 - 10 = 40°F

In this example, as long as the EWT does not fall below 50°F, the system will operate as designed. For EWTs below 50°F, higher flow rates will be required (open loop systems, for example, require at least 2 GPM/ton when EWT is below 50°F).

875 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	7.00	4.5	10.4	Operation Not Recommended					13.811	1.57	8.620	2.6
30	3.50	0.8	1.8	30.233	19.939	0.88	33.152	34.3	16.294	1.61	10.977	3.0
	5.25	1.9	4.4	29.729	19.944	0.85	32.536	35.1	17.072	1.62	11.719	3.1
	7.00	4.1	9.4	29.305	19.895	0.84	32.080	35.0	17.505	1.62	12.132	3.2
40	3.50	0.6	1.4	30.205	19.743	0.97	33.404	31.2	19.704	1.65	14.238	3.5
	5.25	1.6	3.7	30.323	19.892	0.91	33.325	33.4	20.733	1.66	15.225	3.7
	7.00	3.5	8.1	30.243	19.936	0.88	33.167	34.2	21.303	1.67	15.773	3.7
50	3.50	0.5	1.2	29.446	19.407	1.09	33.039	27.1	23.145	1.69	17.547	4.0
	5.25	1.2	2.9	30.012	19.640	1.00	33.335	29.9	24.408	1.71	18.764	4.2
	7.00	2.8	6.5	30.198	19.738	0.97	33.402	31.2	25.104	1.71	19.436	4.3
60	3.50	0.3	0.6	28.182	18.970	1.24	32.271	22.8	26.551	1.73	20.833	4.5
	5.25	0.9	2.0	29.044	19.262	1.14	32.802	25.6	28.011	1.74	22.243	4.7
	7.00	2.3	5.4	29.417	19.396	1.09	33.022	27.0	28.805	1.75	23.010	4.8
70	3.50	0.2	0.6	26.590	18.450	1.41	31.272	18.8	29.854	1.76	24.023	5.0
	5.25	0.7	1.6	27.617	18.785	1.30	31.917	21.3	31.450	1.78	25.564	5.2
	7.00	2.1	4.9	28.107	18.946	1.24	32.224	22.6	32.302	1.79	26.386	5.3
80	3.50	0.2	0.4	24.821	17.863	1.62	30.191	15.3	32.979	1.79	27.039	5.4
	5.25	0.6	1.4	25.906	18.225	1.49	30.848	17.3	34.627	1.81	28.625	5.6
	7.00	2.0	4.5	26.450	18.405	1.43	31.185	18.5	35.482	1.82	29.445	5.7
90	3.50	0.2	0.3	23.014	17.241	1.86	29.170	12.4	35.843	1.83	29.792	5.7
	5.25	0.5	1.2	24.066	17.606	1.72	29.751	14.0	37.433	1.85	31.310	5.9
	7.00	1.8	4.2	24.613	17.793	1.65	30.069	14.9	38.220	1.86	32.056	6.0
100	3.50	0.1	0.3	21.311	16.646	2.13	28.353	10.0	Operation Not Recommended			
	5.25	0.4	0.9	22.252	16.975	1.97	28.780	11.3				
	7.00	1.7	3.9	22.758	17.152	1.90	29.035	12.0				
110	3.50	0.1	0.2	19.869	16.177	2.43	27.909	8.2				
	5.25	0.4	0.8	20.622	16.413	2.26	28.097	9.1				
	7.00	1.7	3.8	21.046	16.555	2.18	28.248	9.7				
120	3.50	0.1	0.2	18.878	15.991	2.77	28.042	6.8				
	5.25	0.3	0.7	19.351	16.046	2.58	27.883	7.5				
	7.00	1.6	3.6	19.652	16.118	2.49	27.883	7.9				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

1200 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	9.00	6.3	14.6	Operation Not Recommended					22.913	2.16	15.780	3.1
30	4.50	1.2	2.8	41.210	28.346	1.67	46.745	24.6	25.381	2.21	18.074	3.4
	6.75	3.2	7.5	40.134	27.711	1.58	45.364	25.4	26.567	2.23	19.179	3.5
	9.00	5.7	13.2	39.318	27.246	1.54	44.405	25.6	27.229	2.25	19.796	3.6
40	4.50	1.0	2.2	41.530	28.637	1.81	47.526	22.9	29.534	2.29	21.946	3.8
	6.75	2.7	6.3	41.429	28.492	1.71	47.090	24.2	31.075	2.32	23.383	3.9
	9.00	4.9	11.3	41.139	28.302	1.66	46.643	24.7	31.932	2.34	24.182	4.0
50	4.50	0.7	1.6	40.806	28.425	1.96	47.307	20.8	33.887	2.38	26.006	4.2
	6.75	2.2	5.1	41.420	28.621	1.85	47.549	22.4	35.753	2.42	27.744	4.3
	9.00	4.0	9.3	41.549	28.635	1.80	47.503	23.1	36.781	2.44	28.701	4.4
60	4.50	0.4	0.9	39.357	27.872	2.14	46.429	18.4	38.280	2.47	30.095	4.5
	6.75	1.8	4.1	40.461	28.299	2.01	47.115	20.1	40.399	2.52	32.061	4.7
	9.00	3.5	8.1	40.899	28.458	1.95	47.355	21.0	41.544	2.54	33.122	4.8
70	4.50	0.3	0.8	37.423	27.088	2.33	45.149	16.0	42.556	2.57	34.058	4.9
	6.75	1.6	3.8	38.826	27.660	2.19	46.082	17.7	44.806	2.62	36.131	5.0
	9.00	3.3	7.6	39.469	27.916	2.12	46.501	18.6	45.985	2.65	37.212	5.1
80	4.50	0.3	0.6	35.196	26.162	2.56	43.679	13.7	46.548	2.67	37.728	5.1
	6.75	1.5	3.5	36.740	26.806	2.40	44.693	15.3	48.751	2.73	39.731	5.2
	9.00	3.2	7.3	37.498	27.119	2.33	45.199	16.1	49.844	2.76	40.715	5.3
90	4.50	0.2	0.5	32.848	25.177	2.83	42.214	11.6	50.061	2.77	40.909	5.3
	6.75	1.4	3.3	34.402	25.828	2.65	43.170	13.0	51.973	2.83	42.601	5.4
	9.00	3.0	7.0	35.198	26.162	2.56	43.680	13.7	52.826	2.87	43.336	5.4
100	4.50	0.2	0.4	30.546	24.232	3.14	40.947	9.7	Operation Not Recommended			
	6.75	1.3	3.1	31.999	24.823	2.94	41.721	10.9				
	9.00	2.9	6.6	32.768	25.143	2.84	42.166	11.5				
110	4.50	0.1	0.3	28.469	23.460	3.51	40.094	8.1				
	6.75	1.3	3.0	29.718	23.910	3.28	40.561	9.1				
	9.00	2.8	6.5	30.405	24.177	3.16	40.878	9.6				
120	4.50	0.1	0.3	26.829	23.047	3.95	39.915	6.8				
	6.75	1.2	2.8	27.763	23.243	3.68	39.928	7.6				
	9.00	2.7	6.3	28.314	23.409	3.55	40.050	8.0				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

1150 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	9.00	7.9	18.1	Operation Not Recommended					19.927	2.34	12.507	2.5
30	4.50	2.3	5.3	39.381	26.889	1.35	43.666	29.2	22.664	2.37	15.154	2.8
	6.75	4.2	9.8	38.565	26.043	1.28	42.630	30.1	23.704	2.38	16.163	2.9
	9.00	7.1	16.4	37.888	25.423	1.26	41.873	30.2	24.286	2.38	16.727	3.0
40	4.50	1.9	4.4	39.406	27.274	1.49	44.130	26.5	26.783	2.40	19.156	3.3
	6.75	3.5	8.1	39.518	27.097	1.39	43.922	28.5	28.165	2.41	20.502	3.4
	9.00	5.9	13.6	39.351	26.852	1.35	43.621	29.2	28.937	2.42	21.255	3.5
50	4.50	1.5	3.5	38.427	26.982	1.66	43.705	23.1	31.047	2.44	23.314	3.7
	6.75	2.7	6.3	39.203	27.243	1.54	44.081	25.5	32.761	2.45	24.987	3.9
	9.00	4.7	10.8	39.434	27.274	1.48	44.131	26.6	33.713	2.46	25.918	4.0
60	4.50	1.3	2.9	36.760	26.298	1.87	42.696	19.6	35.348	2.47	27.517	4.2
	6.75	2.1	4.9	37.975	26.802	1.72	43.445	22.0	37.349	2.48	29.476	4.4
	9.00	3.9	9.0	38.488	27.006	1.65	43.739	23.3	38.449	2.49	30.552	4.5
70	4.50	1.1	2.6	34.644	25.428	2.11	41.337	16.4	39.577	2.50	31.658	4.6
	6.75	1.9	4.5	36.108	26.026	1.95	42.281	18.6	41.788	2.51	33.824	4.9
	9.00	3.7	8.5	36.800	26.314	1.87	42.721	19.7	42.978	2.52	34.990	5.0
80	4.50	1.0	2.3	32.278	24.536	2.38	39.826	13.6	43.624	2.52	35.624	5.1
	6.75	1.9	4.3	33.835	25.111	2.20	40.817	15.4	45.927	2.54	37.880	5.3
	9.00	3.5	8.1	34.615	25.417	2.11	41.319	16.4	47.128	2.54	39.057	5.4
90	4.50	0.9	2.1	29.843	23.759	2.68	38.343	11.1	47.365	2.54	39.290	5.5
	6.75	1.8	4.1	31.364	24.224	2.49	39.257	12.6	49.598	2.56	41.478	5.7
	9.00	3.4	7.8	32.156	24.493	2.39	39.749	13.4	50.704	2.57	42.559	5.8
100	4.50	0.8	1.9	27.516	23.244	3.01	37.073	9.1	Operation Not Recommended			
	6.75	1.7	3.9	28.894	23.513	2.81	37.801	10.3				
	9.00	3.2	7.5	29.634	23.701	2.71	38.221	11.0				
110	4.50	0.8	1.8	25.494	23.184	3.38	36.222	7.5				
	6.75	1.6	3.7	26.625	23.150	3.16	36.655	8.4				
	9.00	3.1	7.3	27.259	23.209	3.05	36.947	8.9				
120	4.50	0.7	1.5	24.012	23.882	3.79	36.043	6.3				
	6.75	1.5	3.5	24.781	23.364	3.55	36.047	7.0				
	9.00	3.0	7.0	25.255	23.225	3.43	36.152	7.4				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

1600 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	12.00	12.6	29.1	Operation Not Recommended					31.335	3.18	20.909	2.9
30	6.00	3.3	7.6	52.909	35.058	2.36	60.643	22.4	34.746	3.28	24.013	3.1
	9.00	7.1	16.4	50.861	33.398	2.26	58.271	22.5	36.378	3.32	25.507	3.2
	12.00	11.4	26.4	49.416	32.326	2.22	56.702	22.2	37.284	3.34	26.339	3.3
40	6.00	2.7	6.2	53.883	36.264	2.54	62.211	21.2	40.365	3.42	29.176	3.5
	9.00	5.9	13.6	53.412	35.541	2.41	61.305	22.2	42.437	3.46	31.090	3.6
	12.00	9.7	22.4	52.801	34.961	2.35	60.508	22.4	43.585	3.49	32.152	3.7
50	6.00	2.1	4.8	53.149	36.438	2.76	62.189	19.3	46.150	3.55	34.529	3.8
	9.00	4.7	10.8	53.821	36.399	2.60	62.337	20.7	48.625	3.60	36.825	4.0
	12.00	8.0	18.4	53.877	36.212	2.53	62.153	21.3	49.984	3.63	38.088	4.0
60	6.00	1.5	3.5	51.275	35.922	3.01	61.135	17.0	51.933	3.67	39.897	4.1
	9.00	3.9	9.0	52.715	36.350	2.83	61.976	18.6	54.726	3.74	42.490	4.3
	12.00	7.0	16.1	53.256	36.453	2.74	62.235	19.4	56.237	3.77	43.890	4.4
70	6.00	1.4	3.2	48.667	34.960	3.29	59.448	14.8	57.549	3.80	45.106	4.4
	9.00	3.7	8.5	50.560	35.673	3.09	60.683	16.4	60.523	3.87	47.856	4.6
	12.00	6.6	15.3	51.418	35.970	2.99	61.223	17.2	62.088	3.90	49.298	4.7
80	6.00	1.3	3.0	45.645	33.744	3.60	57.451	12.7	62.818	3.92	49.970	4.7
	9.00	3.5	8.1	47.734	34.591	3.39	58.830	14.1	65.775	4.00	52.677	4.8
	12.00	6.4	14.7	48.762	34.997	3.28	59.511	14.9	67.264	4.04	54.029	4.9
90	6.00	1.2	2.8	42.492	32.459	3.95	55.429	10.8	67.536	4.05	54.275	4.9
	9.00	3.4	7.8	44.564	33.302	3.72	56.745	12.0	70.210	4.13	56.671	5.0
	12.00	6.2	14.2	45.637	33.741	3.61	57.445	12.7	71.455	4.18	57.764	5.0
100	6.00	1.2	2.7	39.482	31.302	4.33	53.667	9.1	Operation Not Recommended			
	9.00	3.2	7.5	41.357	32.008	4.08	54.738	10.1				
	12.00	6.0	13.8	42.370	32.410	3.96	55.354	10.7				
110	6.00	1.1	2.5	36.913	30.526	4.75	52.478	7.8				
	9.00	3.1	7.3	38.423	30.941	4.49	53.123	8.6				
	12.00	5.8	13.4	39.284	31.232	4.36	53.561	9.0				
120	6.00	1.0	2.4	35.145	30.493	5.22	52.245	6.7				
	9.00	3.0	7.0	36.096	30.399	4.93	52.247	7.3				
	12.00	5.7	13.1	36.715	30.486	4.79	52.412	7.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
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- Performance capacities shown in thousands of Btuh

1450 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	12.00	3.12	7.2	Operation Not Recommended					24.316	2.87	15.503	2.5
30	6.00	0.64	1.5	50.557	34.613	1.57	55.371	32.2	27.203	2.89	18.327	2.8
	9.00	1.37	3.2	50.244	34.270	1.50	54.838	33.6	28.236	2.90	19.336	2.9
	12.00	2.85	6.6	49.876	33.989	1.47	54.397	33.9	28.810	2.90	19.896	2.9
40	6.00	0.54	1.3	50.114	34.651	1.73	55.413	29.0	31.719	2.93	22.729	3.2
	9.00	1.22	2.8	50.523	34.680	1.61	55.471	31.4	33.148	2.94	24.121	3.3
	12.00	2.51	5.8	50.555	34.606	1.56	55.359	32.3	33.946	2.95	24.896	3.4
50	6.00	0.45	1.0	48.826	34.253	1.94	54.777	25.2	36.638	2.97	27.516	3.6
	9.00	1.06	2.5	49.786	34.567	1.79	55.275	27.9	38.489	2.99	29.319	3.8
	12.00	2.18	5.0	50.138	34.656	1.72	55.422	29.1	39.523	2.99	30.326	3.9
60	6.00	0.29	0.7	46.901	33.521	2.20	53.655	21.3	41.818	3.01	32.564	4.1
	9.00	0.91	2.1	48.256	34.046	2.02	54.455	23.9	44.093	3.03	34.785	4.3
	12.00	1.96	4.5	48.850	34.261	1.93	54.790	25.3	45.359	3.04	36.023	4.4
70	6.00	0.22	0.5	44.516	32.534	2.51	52.211	17.8	47.138	3.05	37.764	4.5
	9.00	0.85	2.0	46.126	33.207	2.30	53.188	20.1	49.805	3.07	40.380	4.8
	12.00	1.87	4.3	46.887	33.515	2.20	53.647	21.3	51.279	3.08	41.830	4.9
80	6.00	0.15	0.3	41.822	31.360	2.85	50.588	14.7	52.478	3.08	43.012	5.0
	9.00	0.80	1.9	43.567	32.126	2.63	51.636	16.6	55.475	3.09	45.974	5.3
	12.00	1.81	4.2	44.428	32.496	2.52	52.158	17.7	57.112	3.10	47.598	5.4
90	6.00	0.13	0.3	38.959	30.067	3.24	48.919	12.0	57.726	3.10	48.208	5.5
	9.00	0.79	1.8	40.737	30.875	3.00	49.946	13.6	60.955	3.10	51.435	5.8
	12.00	1.77	4.1	41.639	31.279	2.88	50.479	14.5	62.686	3.10	53.175	5.9
100	6.00	0.11	0.2	36.062	28.729	3.67	47.338	9.8	Operation Not Recommended			
	9.00	0.81	1.9	37.784	29.527	3.41	48.262	11.1				
	12.00	1.76	4.1	38.677	29.938	3.28	48.760	11.8				
110	6.00	0.09	0.2	33.267	27.433	4.14	45.979	8.0				
	9.00	0.77	1.8	34.858	28.169	3.87	46.728	9.0				
	12.00	1.71	3.9	35.699	28.560	3.73	47.150	9.6				
120	6.00	0.08	0.2	30.722	26.295	4.65	44.993	6.6				
	9.00	0.74	1.7	32.111	26.907	4.36	45.492	7.4				
	12.00	1.65	3.8	32.861	27.247	4.21	45.802	7.8				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
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- Performance capacities shown in thousands of Btuh

2000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	16.00	5.8	13.4	Operation Not Recommended					38.023	3.78	25.886	2.9
30	8.00	0.9	2.0	72.280	48.082	2.84	81.491	25.4	41.790	3.86	29.400	3.2
	12.00	2.8	6.6	71.471	47.544	2.74	80.360	26.1	43.441	3.90	30.948	3.3
	16.00	5.3	12.3	70.705	47.088	2.70	79.466	26.2	44.351	3.91	31.804	3.3
40	8.00	0.8	1.8	71.980	48.117	3.02	81.775	23.8	47.990	3.98	35.230	3.5
	12.00	2.5	5.8	72.350	48.169	2.89	81.711	25.1	50.139	4.02	37.257	3.7
	16.00	4.7	10.9	72.241	48.050	2.83	81.416	25.5	51.328	4.04	38.379	3.7
50	8.00	0.7	1.6	70.398	47.528	3.25	80.928	21.7	54.618	4.10	41.484	3.9
	12.00	2.2	5.0	71.644	48.004	3.08	81.632	23.3	57.293	4.14	44.005	4.1
	16.00	4.1	9.6	72.053	48.139	3.01	81.798	24.0	58.774	4.17	45.400	4.1
60	8.00	0.6	1.3	67.892	46.497	3.52	79.314	19.3	61.550	4.22	48.010	4.3
	12.00	2.0	4.5	69.743	47.264	3.32	80.519	21.0	64.753	4.28	51.014	4.4
	16.00	3.8	8.8	70.534	47.582	3.23	81.011	21.8	66.524	4.32	52.670	4.5
70	8.00	0.5	1.2	64.753	45.165	3.85	77.232	16.8	68.671	4.36	54.672	4.6
	12.00	1.9	4.3	66.975	46.111	3.62	78.706	18.5	72.380	4.45	58.113	4.8
	16.00	3.7	8.5	68.019	46.550	3.51	79.398	19.4	74.418	4.50	59.995	4.9
80	8.00	0.5	1.1	61.234	43.655	4.23	74.946	14.5	75.877	4.53	61.337	4.9
	12.00	1.8	4.2	63.626	44.682	3.97	76.490	16.0	80.035	4.65	65.135	5.0
	16.00	3.6	8.2	64.810	45.189	3.84	77.269	16.9	82.300	4.71	67.187	5.1
90	8.00	0.4	1.0	57.565	42.089	4.67	72.704	12.3	83.061	4.74	67.873	5.1
	12.00	1.8	4.1	59.956	43.107	4.38	74.144	13.7	87.581	4.89	71.911	5.3
	16.00	3.5	8.0	61.182	43.633	4.24	74.913	14.4	90.010	4.98	74.051	5.3
100	8.00	0.4	0.9	53.976	40.603	5.18	70.760	10.4	Operation Not Recommended			
	12.00	1.8	4.1	56.219	41.523	4.85	71.939	11.6				
	16.00	3.5	8.0	57.401	42.020	4.69	72.609	12.2				
110	8.00	0.4	0.8	50.712	39.370	5.76	69.387	8.8				
	12.00	1.7	3.9	52.668	40.088	5.39	70.148	9.8				
	16.00	3.4	7.8	53.733	40.506	5.22	70.641	10.3				
120	8.00	0.3	0.8	48.051	38.619	6.43	68.903	7.5				
	12.00	1.6	3.8	49.574	39.001	6.01	69.070	8.2				
	16.00	3.3	7.6	50.449	39.280	5.82	69.303	8.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

1750 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	13.00	3.15	7.3	Operation Not Recommended					30.601	3.53	19.147	2.5
30	6.50	0.76	1.8	59.401	40.521	1.96	65.758	30.3	34.493	3.60	22.840	2.8
	9.75	1.35	3.1	58.593	39.870	1.85	64.590	31.7	36.032	3.62	24.301	2.9
	13.00	2.85	6.6	57.779	39.280	1.81	63.657	31.9	36.891	3.63	25.116	3.0
40	6.50	0.54	1.2	58.937	40.410	2.19	66.030	26.9	40.495	3.69	28.538	3.2
	9.75	1.09	2.5	59.439	40.598	2.02	65.983	29.4	42.538	3.72	30.478	3.4
	13.00	2.20	5.1	59.371	40.490	1.95	65.690	30.5	43.679	3.74	31.562	3.4
50	6.50	0.36	0.8	57.121	39.457	2.48	65.163	23.0	46.771	3.79	34.498	3.6
	9.75	0.72	1.7	58.528	40.206	2.27	65.875	25.8	49.312	3.83	36.912	3.8
	13.00	1.60	3.7	59.019	40.450	2.17	66.053	27.2	50.726	3.85	38.255	3.9
60	6.50	0.21	0.5	54.412	37.971	2.83	63.585	19.2	53.161	3.88	40.568	4.0
	9.75	0.52	1.2	56.382	39.054	2.58	64.747	21.8	56.152	3.93	43.410	4.2
	13.00	1.25	2.9	57.251	39.527	2.46	65.235	23.2	57.801	3.96	44.977	4.3
70	6.50	0.18	0.4	51.170	36.191	3.23	61.634	15.9	59.515	3.98	46.605	4.4
	9.75	0.48	1.1	53.417	37.423	2.95	62.986	18.1	62.862	4.03	49.785	4.6
	13.00	1.14	2.6	54.504	38.022	2.82	63.640	19.3	64.677	4.06	51.510	4.7
80	6.50	0.14	0.3	47.708	34.325	3.67	59.608	13.0	65.679	4.08	52.462	4.7
	9.75	0.41	0.9	49.996	35.552	3.37	60.935	14.8	69.236	4.13	55.841	4.9
	13.00	1.07	2.5	51.164	36.187	3.23	61.630	15.8	71.116	4.16	57.628	5.0
90	6.50	0.11	0.2	44.324	32.581	4.16	57.800	10.7	71.490	4.17	57.982	5.0
	9.75	0.38	0.9	46.451	33.665	3.84	58.909	12.1	75.054	4.22	61.369	5.2
	13.00	1.04	2.4	47.584	34.260	3.69	59.538	12.9	76.865	4.25	63.089	5.3
100	6.50	0.08	0.2	41.332	31.195	4.69	56.522	8.8	Operation Not Recommended			
	9.75	0.33	0.8	43.116	31.995	4.35	57.231	9.9				
	13.00	0.95	2.2	44.112	32.476	4.19	57.696	10.5				
110	6.50	0.06	0.1	39.104	30.481	5.26	56.150	7.4				
	9.75	0.30	0.7	40.342	30.813	4.91	56.244	8.2				
	13.00	0.90	2.1	41.105	31.102	4.73	56.449	8.7				
120	6.50	0.04	0.1	38.120	30.906	5.88	57.176	6.5				
	9.75	0.28	0.6	38.538	30.478	5.50	56.352	7.0				
	13.00	0.86	2.0	38.955	30.464	5.31	56.176	7.3				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
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- Performance capacities shown in thousands of Btuh

2400 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	18.00	6.4	14.7	Operation Not Recommended					44.791	4.56	30.019	2.9
30	9.00	1.1	2.5	77.967	53.358	3.37	89.133	23.1	49.557	4.68	34.385	3.1
	13.50	3.2	7.4	75.475	51.571	3.24	86.193	23.3	51.725	4.73	36.381	3.2
	18.00	5.8	13.5	73.597	50.270	3.18	84.133	23.1	52.926	4.76	37.490	3.3
40	9.00	0.8	1.8	78.761	54.144	3.62	90.746	21.7	57.381	4.87	41.608	3.5
	13.50	2.5	5.8	78.547	53.817	3.45	89.953	22.8	60.178	4.93	44.201	3.6
	18.00	4.8	11.1	77.917	53.321	3.37	89.069	23.1	61.730	4.96	45.640	3.6
50	9.00	0.5	1.1	77.115	53.383	3.92	90.082	19.7	65.594	5.05	49.229	3.8
	13.50	1.8	4.2	78.468	54.044	3.71	90.737	21.2	69.017	5.12	52.408	3.9
	18.00	3.7	8.7	78.783	54.147	3.61	90.733	21.8	70.909	5.17	54.166	4.0
60	9.00	0.3	0.7	73.910	51.652	4.27	88.028	17.3	74.000	5.23	57.038	4.1
	13.50	1.5	3.4	76.236	52.918	4.02	89.548	19.0	77.994	5.32	60.746	4.3
	18.00	3.4	7.8	77.197	53.425	3.91	90.129	19.8	80.185	5.37	62.777	4.4
70	9.00	0.3	0.6	69.787	49.369	4.67	85.238	14.9	82.411	5.42	64.839	4.5
	13.50	1.3	3.1	72.606	50.932	4.39	87.148	16.5	86.871	5.53	68.961	4.6
	18.00	3.2	7.4	73.942	51.670	4.26	88.049	17.3	89.284	5.58	71.186	4.7
80	9.00	0.2	0.6	65.275	46.881	5.13	82.263	12.7	90.641	5.62	72.434	4.7
	13.50	1.3	2.9	68.195	48.487	4.83	84.170	14.1	95.402	5.74	76.798	4.9
	18.00	3.1	7.1	69.680	49.310	4.68	85.166	14.9	97.923	5.81	79.096	4.9
90	9.00	0.2	0.5	60.865	44.525	5.67	79.624	10.7	98.493	5.82	79.615	5.0
	13.50	1.2	2.7	63.560	45.951	5.33	81.191	11.9	103.325	5.97	83.980	5.1
	18.00	2.9	6.8	65.004	46.733	5.16	82.090	12.6	105.802	6.05	86.195	5.1
100	9.00	0.2	0.4	57.082	42.693	6.29	77.891	9.1	Operation Not Recommended			
	13.50	1.2	2.7	59.251	43.708	5.90	78.790	10.0				
	18.00	2.8	6.6	60.490	44.332	5.72	79.421	10.6				
110	9.00	0.1	0.3	54.561	41.911	7.01	77.768	7.8				
	13.50	1.1	2.6	55.860	42.211	6.57	77.599	8.5				
	18.00	2.8	6.4	56.733	42.546	6.36	77.785	8.9				
120	9.00	0.1	0.3	54.189	42.991	7.87	80.249	6.9				
	13.50	1.1	2.6	54.090	42.059	7.34	78.380	7.4				
	18.00	2.7	6.2	54.399	41.919	7.10	77.889	7.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

1600 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	24.00	12.3	28.4	Operation Not Recommended					32.733	3.51	20.989	2.7
30	12.00	2.9	6.7	56.146	37.433	2.51	64.549	22.3	35.596	3.56	23.697	2.9
	18.00	6.6	15.2	55.652	36.910	2.39	63.651	23.3	36.939	3.58	24.965	3.0
	24.00	11.0	25.4	55.225	36.535	2.34	63.038	23.6	37.686	3.59	25.670	3.1
40	12.00	2.3	5.3	56.064	37.676	2.70	65.088	20.8	40.515	3.64	28.338	3.3
	18.00	5.4	12.4	56.207	37.548	2.56	64.767	22.0	42.279	3.67	29.999	3.4
	24.00	9.2	21.2	56.109	37.381	2.50	64.456	22.5	43.255	3.69	30.918	3.4
50	12.00	1.6	3.8	55.197	37.457	2.92	64.951	18.9	45.781	3.74	33.292	3.6
	18.00	4.2	9.7	55.909	37.659	2.75	65.112	20.3	47.937	3.77	35.315	3.7
	24.00	7.3	16.9	56.112	37.673	2.68	65.066	21.0	49.119	3.80	36.424	3.8
60	12.00	1.1	2.7	53.641	36.860	3.18	64.266	16.9	51.172	3.84	38.345	3.9
	18.00	3.5	8.1	54.848	37.333	2.98	64.817	18.4	53.640	3.88	40.651	4.0
	24.00	6.6	15.1	55.322	37.499	2.89	64.993	19.1	54.972	3.91	41.892	4.1
70	12.00	1.0	2.4	51.475	35.945	3.49	63.145	14.7	56.475	3.94	43.291	4.2
	18.00	3.3	7.6	53.105	36.639	3.26	63.997	16.3	59.118	4.00	45.744	4.3
	24.00	6.2	14.4	53.815	36.931	3.15	64.351	17.1	60.504	4.03	47.027	4.4
80	12.00	1.0	2.2	48.763	34.751	3.86	61.684	12.6	61.467	4.05	47.915	4.4
	18.00	3.2	7.3	50.746	35.628	3.59	62.755	14.1	64.082	4.12	50.317	4.6
	24.00	6.0	13.8	51.658	36.025	3.46	63.243	14.9	65.389	4.15	51.510	4.6
90	12.00	0.9	2.0	45.560	33.294	4.31	59.969	10.6	65.898	4.16	51.972	4.6
	18.00	3.0	7.0	47.831	34.332	3.99	61.182	12.0	68.205	4.23	54.051	4.7
	24.00	5.8	13.4	48.912	34.817	3.84	61.765	12.7	69.259	4.27	54.986	4.8
100	12.00	0.8	1.9	41.913	31.572	4.83	58.079	8.7	Operation Not Recommended			
	18.00	2.9	6.7	44.415	32.761	4.47	59.367	9.9				
	24.00	5.6	13.0	45.630	33.326	4.30	60.006	10.6				
110	12.00	0.8	1.8	37.863	29.562	5.45	56.087	6.9				
	18.00	2.8	6.5	40.543	30.904	5.04	57.391	8.0				
	24.00	5.5	12.7	41.864	31.548	4.84	58.054	8.6				
120	18.00	2.7	6.3	36.258	28.731	5.70	55.333	6.4				
	24.00	5.3	12.4	37.660	29.458	5.48	55.991	6.9				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

3200 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	24.00	12.3	28.4	Operation Not Recommended					65.466	7.02	41.978	2.7
30	12.00	2.9	6.7	112.293	74.865	5.03	129.098	22.3	71.193	7.12	47.393	2.9
	18.00	6.6	15.2	111.303	73.821	4.78	127.303	23.3	73.879	7.16	49.930	3.0
	24.00	11.0	25.4	110.451	73.071	4.67	126.076	23.6	75.371	7.19	51.339	3.1
40	12.00	2.3	5.3	112.128	75.351	5.40	130.177	20.8	81.030	7.28	56.675	3.3
	18.00	5.4	12.4	112.415	75.096	5.12	129.533	22.0	84.557	7.34	59.998	3.4
	24.00	9.2	21.2	112.217	74.763	4.99	128.912	22.5	86.510	7.38	61.835	3.4
50	12.00	1.6	3.8	110.394	74.914	5.83	129.901	18.9	91.562	7.47	66.584	3.6
	18.00	4.2	9.7	111.818	75.318	5.50	130.224	20.3	95.873	7.55	70.630	3.7
	24.00	7.3	16.9	112.224	75.347	5.36	130.131	21.0	98.239	7.59	72.848	3.8
60	12.00	1.1	2.7	107.283	73.720	6.35	128.532	16.9	102.344	7.67	76.691	3.9
	18.00	3.5	8.1	109.697	74.665	5.96	129.635	18.4	107.280	7.77	81.302	4.0
	24.00	6.6	15.1	110.645	74.998	5.78	129.986	19.1	109.943	7.82	83.785	4.1
70	12.00	1.0	2.4	102.949	71.891	6.98	126.290	14.7	112.949	7.89	86.583	4.2
	18.00	3.3	7.6	106.209	73.278	6.52	127.995	16.3	118.235	8.00	91.489	4.3
	24.00	6.2	14.4	107.631	73.862	6.30	128.702	17.1	121.007	8.06	94.053	4.4
80	12.00	1.0	2.2	97.525	69.502	7.73	123.368	12.6	122.934	8.11	95.831	4.4
	18.00	3.2	7.3	101.491	71.257	7.18	125.509	14.1	128.163	8.23	100.634	4.6
	24.00	6.0	13.8	103.316	72.049	6.93	126.485	14.9	130.777	8.30	103.019	4.6
90	12.00	0.9	2.0	91.120	66.588	8.62	119.938	10.6	131.795	8.33	103.945	4.6
	18.00	3.0	7.0	95.663	68.664	7.99	122.364	12.0	136.410	8.47	108.103	4.7
	24.00	5.8	13.4	97.823	69.635	7.69	123.529	12.7	138.517	8.54	109.972	4.8
100	12.00	0.8	1.9	83.827	63.143	9.67	116.158	8.7	Operation Not Recommended			
	18.00	2.9	6.7	88.829	65.522	8.94	118.734	9.9				
	24.00	5.6	13.0	91.261	66.653	8.60	120.013	10.6				
110	12.00	0.8	1.8	75.727	59.123	10.90	112.174	6.9				
	18.00	2.8	6.5	81.085	61.808	10.08	114.782	8.0				
	24.00	5.5	12.7	83.729	63.096	9.68	116.108	8.6				
120	18.00	2.7	6.3	72.517	57.462	11.41	110.667	6.4				
	24.00	5.3	12.4	75.321	58.916	10.96	111.981	6.9				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

2000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	30.00	3.8	8.7	Operation Not Recommended					41.224	4.62	26.420	2.6
30	15.00	0.7	1.7	68.185	43.509	3.30	78.758	20.7	44.591	4.69	29.560	2.8
	22.50	1.6	3.7	68.029	42.426	3.16	78.177	21.5	46.269	4.72	31.124	2.9
	30.00	3.4	7.8	67.642	41.608	3.11	77.625	21.7	47.195	4.74	31.986	2.9
40	15.00	0.6	1.4	67.332	43.946	3.52	78.629	19.1	50.392	4.81	34.959	3.1
	22.50	1.2	2.8	68.087	43.695	3.34	78.807	20.4	52.536	4.86	36.951	3.2
	30.00	2.7	6.2	68.216	43.344	3.27	78.692	20.9	53.723	4.89	38.052	3.2
50	15.00	0.5	1.2	65.557	43.553	3.80	77.759	17.2	56.576	4.95	40.699	3.3
	22.50	0.8	1.8	66.996	43.919	3.58	78.486	18.7	59.213	5.01	43.141	3.5
	30.00	2.0	4.7	67.536	43.939	3.48	78.706	19.4	60.673	5.05	44.492	3.5
60	15.00	0.3	0.7	63.102	42.593	4.14	76.379	15.2	63.046	5.10	46.686	3.6
	22.50	0.5	1.2	65.022	43.365	3.88	77.466	16.8	66.185	5.18	49.584	3.7
	30.00	1.7	4.0	65.866	43.652	3.76	77.924	17.5	67.922	5.22	51.186	3.8
70	15.00	0.3	0.6	60.170	41.289	4.53	74.690	13.3	69.714	5.26	52.838	3.9
	22.50	0.5	1.1	62.392	42.285	4.23	75.970	14.7	73.345	5.35	56.179	4.0
	30.00	1.6	3.8	63.443	42.738	4.09	76.575	15.5	75.348	5.40	58.019	4.1
80	15.00	0.2	0.5	56.944	39.837	4.97	72.876	11.5	76.497	5.43	59.074	4.1
	22.50	0.4	1.0	59.312	40.900	4.64	74.200	12.8	80.588	5.54	62.825	4.3
	30.00	1.5	3.6	60.482	41.430	4.49	74.869	13.5	82.834	5.60	64.879	4.3
90	15.00	0.1	0.3	53.596	38.410	5.46	71.110	9.8	83.313	5.61	65.317	4.4
	22.50	0.4	0.9	55.974	39.411	5.11	72.348	11.0	87.813	5.73	69.423	4.5
	30.00	1.5	3.4	57.185	39.944	4.93	73.008	11.6	90.263	5.80	71.653	4.6
100	15.00	0.1	0.2	50.295	37.175	6.01	69.570	8.4	Operation Not Recommended			
	22.50	0.3	0.8	52.563	38.000	5.62	70.601	9.3				
	30.00	1.4	3.3	53.748	38.472	5.44	71.186	9.9				
110	15.00	0.1	0.2	47.220	36.305	6.62	68.449	7.1				
	22.50	0.3	0.7	49.266	36.844	6.20	69.152	7.9				
	30.00	1.4	3.2	50.363	37.198	6.00	69.599	8.4				
120	15.00	0.1	0.1	44.570	36.011	7.29	67.960	6.1				
	22.50	0.3	0.7	46.278	36.131	6.84	68.203	6.8				
	30.00	1.3	3.0	47.230	36.307	6.62	68.452	7.1				

- Interpolation is permissible; extrapolation is not.
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- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
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- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

4000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	30.00	3.8	8.7	Operation Not Recommended					82.449	9.23	52.839	2.6
30	15.00	0.7	1.7	136.369	87.018	6.59	157.516	20.7	89.181	9.37	59.119	2.8
	22.50	1.6	3.7	136.058	84.851	6.33	156.353	21.5	92.539	9.44	62.247	2.9
	30.00	3.4	7.8	135.283	83.216	6.23	155.250	21.7	94.391	9.48	63.972	2.9
40	15.00	0.6	1.4	134.664	87.891	7.05	157.259	19.1	100.785	9.62	69.918	3.1
	22.50	1.2	2.8	136.173	87.391	6.69	157.615	20.4	105.073	9.72	73.902	3.2
	30.00	2.7	6.2	136.433	86.689	6.53	157.384	20.9	107.445	9.77	76.104	3.2
50	15.00	0.5	1.2	131.114	87.106	7.61	155.518	17.2	113.152	9.90	81.397	3.3
	22.50	0.8	1.8	133.992	87.837	7.16	156.972	18.7	118.426	10.02	86.282	3.5
	30.00	2.0	4.7	135.071	87.878	6.97	157.412	19.4	121.347	10.09	88.985	3.5
60	15.00	0.3	0.7	126.204	85.185	8.28	152.758	15.2	126.093	10.20	93.373	3.6
	22.50	0.5	1.2	130.043	86.731	7.76	154.932	16.8	132.370	10.35	99.169	3.7
	30.00	1.7	4.0	131.731	87.304	7.52	155.848	17.5	135.843	10.44	102.373	3.8
70	15.00	0.3	0.6	120.340	82.578	9.05	149.381	13.3	139.428	10.52	105.676	3.9
	22.50	0.5	1.1	124.784	84.569	8.47	151.940	14.7	146.689	10.70	112.358	4.0
	30.00	1.6	3.8	126.886	85.475	8.19	153.149	15.5	150.695	10.81	116.039	4.1
80	15.00	0.2	0.5	113.889	79.674	9.93	145.751	11.5	152.993	10.86	118.148	4.1
	22.50	0.4	1.0	118.624	81.800	9.28	148.401	12.8	161.176	11.08	125.649	4.3
	30.00	1.5	3.6	120.964	82.860	8.97	149.739	13.5	165.667	11.20	129.758	4.3
90	15.00	0.1	0.3	107.192	76.820	10.92	142.219	9.8	166.626	11.22	130.634	4.4
	22.50	0.4	0.9	111.947	78.822	10.21	144.696	11.0	175.626	11.47	138.846	4.5
	30.00	1.5	3.4	114.371	79.887	9.87	146.016	11.6	180.526	11.60	143.305	4.6
100	15.00	0.1	0.2	100.590	74.349	12.02	139.141	8.4	Operation Not Recommended			
	22.50	0.3	0.8	105.125	76.000	11.25	141.202	9.3				
	30.00	1.4	3.3	107.496	76.944	10.87	142.372	9.9				
110	15.00	0.1	0.2	94.441	72.610	13.24	136.897	7.1				
	22.50	0.3	0.7	98.531	73.688	12.40	138.303	7.9				
	30.00	1.4	3.2	100.726	74.395	12.00	139.199	8.4				
120	15.00	0.1	0.1	89.140	72.021	14.59	135.920	6.1				
	22.50	0.3	0.7	92.557	72.261	13.67	136.407	6.8				
	30.00	1.3	3.0	94.461	72.614	13.23	136.903	7.1				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

2400 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	36.00	8.0	18.6	Operation Not Recommended					48.065	5.31	30.117	2.7
30	18.00	2.0	4.7	78.828	52.579	3.91	91.907	20.2	53.184	5.47	34.692	2.8
	27.00	4.4	10.2	78.619	52.941	3.76	91.189	20.9	55.291	5.53	36.595	2.9
	36.00	7.3	16.9	78.241	53.067	3.69	90.584	21.2	56.433	5.57	37.631	3.0
40	18.00	1.7	3.9	77.984	51.880	4.17	91.926	18.7	60.878	5.68	41.690	3.1
	27.00	3.8	8.8	78.703	52.385	3.99	92.029	19.7	63.425	5.74	44.031	3.2
	36.00	6.4	14.7	78.835	52.605	3.90	91.881	20.2	64.815	5.77	45.313	3.3
50	18.00	1.3	3.1	76.046	51.031	4.48	91.016	17.0	68.658	5.86	48.867	3.4
	27.00	3.2	7.3	77.494	51.635	4.26	91.733	18.2	71.722	5.93	51.708	3.5
	36.00	5.4	12.5	78.044	51.913	4.16	91.946	18.8	73.412	5.96	53.276	3.6
60	18.00	1.1	2.5	73.257	50.046	4.84	89.438	15.1	76.669	6.03	56.301	3.7
	27.00	2.7	6.3	75.248	50.735	4.59	90.579	16.4	80.361	6.11	59.726	3.9
	36.00	4.9	11.2	76.123	51.061	4.47	91.057	17.0	82.419	6.15	61.633	3.9
70	18.00	1.0	2.3	69.821	48.917	5.26	87.419	13.3	85.049	6.21	64.067	4.0
	27.00	2.6	6.0	72.189	49.691	4.97	88.813	14.5	89.507	6.31	68.178	4.2
	36.00	4.7	10.8	73.302	50.061	4.83	89.465	15.2	92.024	6.37	70.490	4.2
80	18.00	1.0	2.2	65.919	47.631	5.76	85.163	11.5	93.924	6.42	72.231	4.3
	27.00	2.5	5.8	68.519	48.491	5.42	86.658	12.6	99.319	6.56	77.149	4.4
	36.00	4.5	10.4	69.787	48.906	5.27	87.399	13.2	102.404	6.65	79.945	4.5
90	18.00	0.9	2.1	61.719	46.186	6.32	82.863	9.8	103.410	6.68	80.854	4.5
	27.00	2.4	5.5	64.422	47.125	5.95	84.324	10.8	109.940	6.87	86.718	4.7
	36.00	4.4	10.1	65.775	47.583	5.77	85.081	11.4	113.725	7.00	90.091	4.8
100	18.00	0.9	2.0	57.379	44.598	6.98	80.710	8.2	Operation Not Recommended			
	27.00	2.3	5.3	60.077	45.597	6.56	82.017	9.2				
	36.00	4.2	9.7	61.452	46.091	6.36	82.723	9.7				
110	18.00	0.8	1.9	53.060	42.912	7.73	78.903	6.9				
	27.00	2.2	5.2	55.658	43.939	7.26	79.942	7.7				
	36.00	4.1	9.5	57.000	44.454	7.04	80.536	8.1				
120												
	36.00	4.0	9.3	52.605	42.728	7.82	78.738	6.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
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- Performance capacities shown in thousands of Btuh

4800 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	36.00	8.0	18.6	Operation Not Recommended					96.130	10.63	60.235	2.7
30	18.00	2.0	4.7	157.655	105.159	7.82	183.813	20.2	106.368	10.95	69.385	2.8
	27.00	4.4	10.2	157.239	105.882	7.52	182.378	20.9	110.582	11.07	73.191	2.9
	36.00	7.3	16.9	156.482	106.135	7.38	181.168	21.2	112.866	11.13	75.263	3.0
40	18.00	1.7	3.9	155.968	103.761	8.34	183.853	18.7	121.756	11.36	83.381	3.1
	27.00	3.8	8.8	157.406	104.771	7.97	184.057	19.7	126.849	11.48	88.062	3.2
	36.00	6.4	14.7	157.670	105.209	7.80	183.762	20.2	129.629	11.55	90.625	3.3
50	18.00	1.3	3.1	152.092	102.062	8.95	182.032	17.0	137.316	11.72	97.734	3.4
	27.00	3.2	7.3	154.988	103.269	8.52	183.466	18.2	143.445	11.85	103.417	3.5
	36.00	5.4	12.5	156.088	103.827	8.32	183.893	18.8	146.823	11.92	106.552	3.6
60	18.00	1.1	2.5	146.513	100.091	9.68	178.877	15.1	153.339	12.06	112.602	3.7
	27.00	2.7	6.3	150.496	101.470	9.17	181.159	16.4	160.721	12.22	119.453	3.9
	36.00	4.9	11.2	152.247	102.121	8.93	182.115	17.0	164.837	12.31	123.267	3.9
70	18.00	1.0	2.3	139.641	97.833	10.53	174.838	13.3	170.098	12.42	128.134	4.0
	27.00	2.6	6.0	144.378	99.382	9.94	177.626	14.5	179.014	12.63	136.356	4.2
	36.00	4.7	10.8	146.603	100.122	9.67	178.929	15.2	184.048	12.75	140.980	4.2
80	18.00	1.0	2.2	131.839	95.262	11.51	170.326	11.5	187.849	12.84	144.463	4.3
	27.00	2.5	5.8	137.037	96.982	10.85	173.315	12.6	198.637	13.13	154.299	4.4
	36.00	4.5	10.4	139.574	97.811	10.53	174.799	13.2	204.809	13.30	159.891	4.5
90	18.00	0.9	2.1	123.438	92.372	12.65	165.725	9.8	206.820	13.36	161.708	4.5
	27.00	2.4	5.5	128.844	94.250	11.90	168.648	10.8	219.880	13.75	173.437	4.7
	36.00	4.4	10.1	131.550	95.165	11.55	170.162	11.4	227.451	13.99	180.181	4.8
100	18.00	0.9	2.0	114.758	89.196	13.95	161.420	8.2	Operation Not Recommended			
	27.00	2.3	5.3	120.154	91.195	13.12	164.033	9.2				
	36.00	4.2	9.7	122.903	92.182	12.72	165.446	9.7				
110	18.00	0.8	1.9	106.120	85.824	15.46	157.805	6.9				
	27.00	2.2	5.2	111.316	87.878	14.52	159.884	7.7				
	36.00	4.1	9.5	114.001	88.909	14.08	161.073	8.1				
120												
	36.00	4.0	9.3	105.210	85.457	15.63	157.476	6.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

3000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	45.00	11.5	26.5	Operation Not Recommended					56.006	5.10	38.603	3.2
30	22.50	2.8	6.6	92.882	66.607	4.116	106.926	22.6	60.969	5.21	43.205	3.4
	33.75	6.2	14.3	88.500	65.995	3.98	102.077	22.2	63.450	5.26	45.506	3.5
	45.00	10.3	23.9	85.885	65.551	3.93	99.294	21.9	64.842	5.29	46.796	3.6
40	22.50	2.3	5.3	96.831	67.115	4.41	111.868	22.0	69.974	5.40	51.554	3.8
	33.75	5.2	12.1	94.549	66.812	4.20	108.886	22.5	73.316	5.47	54.649	3.9
	45.00	8.9	20.5	92.943	66.614	4.12	106.995	22.6	75.174	5.51	56.369	4.0
50	22.50	1.8	4.1	97.931	67.424	4.78	114.245	20.5	79.766	5.61	60.616	4.2
	33.75	4.3	9.9	97.430	67.223	4.51	112.828	21.6	83.849	5.70	64.387	4.3
	45.00	7.4	17.2	96.750	67.102	4.40	111.750	22.0	86.084	5.75	66.448	4.4
60	22.50	1.3	3.1	96.891	67.568	5.23	114.743	18.5	89.719	5.84	69.796	4.5
	33.75	3.7	8.5	97.821	67.488	4.91	114.560	19.9	94.280	5.95	73.986	4.6
	45.00	6.7	15.4	97.932	67.411	4.76	114.167	20.6	96.701	6.01	76.204	4.7
70	22.50	1.2	2.9	94.238	67.407	5.76	113.880	16.4	99.229	6.07	78.514	4.8
	33.75	3.5	8.0	96.260	67.561	5.38	114.611	17.9	103.822	6.19	82.694	4.9
	45.00	6.4	14.7	97.006	67.567	5.20	114.756	18.6	106.128	6.26	84.780	5.0
80	22.50	1.2	2.7	90.385	66.762	6.35	112.066	14.2	107.621	6.30	86.124	5.0
	33.75	3.3	7.7	93.188	67.271	5.93	113.417	15.7	111.587	6.43	89.660	5.1
	45.00	6.2	14.2	94.414	67.426	5.73	113.953	16.5	113.352	6.49	91.207	5.1
90	22.50	1.1	2.5	85.678	65.484	7.03	109.650	12.2	114.045	6.52	91.806	5.1
	33.75	3.2	7.4	88.986	66.435	6.56	111.358	13.6	116.451	6.64	93.808	5.1
	45.00	6.0	13.8	90.545	66.796	6.33	112.146	14.3	117.125	6.69	94.292	5.1
100	22.50	1.0	2.4	80.418	63.485	7.77	106.942	10.3	Operation Not Recommended			
	33.75	3.1	7.2	83.992	64.907	7.26	108.776	11.6				
	45.00	5.8	13.4	85.749	65.507	7.02	109.687	12.2				
110	22.50	1.0	2.4	74.884	60.750	8.60	104.234	8.7				
	33.75	3.0	7.0	78.516	62.618	8.05	105.988	9.8				
	45.00	5.7	13.1	80.355	63.457	7.78	106.910	10.3				
120	33.75	2.9	6.8	72.859	59.585	8.92	103.307	8.2				
	45.00	5.6	12.8	74.676	60.635	8.63	104.137	8.6				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

6000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	45.00	11.5	26.5	Operation Not Recommended					112.013	10.20	77.206	3.2
30	22.50	2.8	6.6	185.765	133.214	8.232	213.851	22.6	121.939	10.41	86.409	3.4
	33.75	6.2	14.3	176.999	131.991	7.96	204.153	22.2	126.901	10.52	91.011	3.5
	45.00	10.3	23.9	171.771	131.103	7.86	198.587	21.9	129.684	10.58	93.592	3.6
40	22.50	2.3	5.3	193.662	134.229	8.81	223.737	22.0	139.949	10.80	103.107	3.8
	33.75	5.2	12.1	189.098	133.624	8.40	217.773	22.5	146.631	10.94	109.297	3.9
	45.00	8.9	20.5	185.886	133.229	8.24	213.990	22.6	150.349	11.02	112.738	4.0
50	22.50	1.8	4.1	195.862	134.848	9.56	228.489	20.5	159.532	11.23	121.232	4.2
	33.75	4.3	9.9	194.861	134.446	9.03	225.655	21.6	167.699	11.41	128.774	4.3
	45.00	7.4	17.2	193.500	134.204	8.79	223.499	22.0	172.168	11.51	132.896	4.4
60	22.50	1.3	3.1	193.783	135.137	10.46	229.486	18.5	179.439	11.68	139.592	4.5
	33.75	3.7	8.5	195.643	134.977	9.81	229.120	19.9	188.560	11.90	147.971	4.6
	45.00	6.7	15.4	195.863	134.821	9.52	228.334	20.6	193.402	12.01	152.408	4.7
70	22.50	1.2	2.9	188.476	134.814	11.51	227.759	16.4	198.457	12.14	157.028	4.8
	33.75	3.5	8.0	192.519	135.121	10.76	229.221	17.9	207.645	12.38	165.388	4.9
	45.00	6.4	14.7	194.011	135.133	10.40	229.512	18.6	212.256	12.51	169.559	5.0
80	22.50	1.2	2.7	180.770	133.524	12.71	224.132	14.2	215.243	12.60	172.249	5.0
	33.75	3.3	7.7	186.376	134.543	11.86	226.834	15.7	223.173	12.85	179.320	5.1
	45.00	6.2	14.2	188.828	134.853	11.45	227.907	16.5	226.704	12.98	182.414	5.1
90	22.50	1.1	2.5	171.356	130.968	14.05	219.300	12.2	228.090	13.04	183.613	5.1
	33.75	3.2	7.4	177.973	132.870	13.11	222.717	13.6	232.901	13.27	187.615	5.1
	45.00	6.0	13.8	181.089	133.593	12.66	224.292	14.3	234.251	13.38	188.585	5.1
100	22.50	1.0	2.4	160.835	126.969	15.55	213.884	10.3	Operation Not Recommended			
	33.75	3.1	7.2	167.984	129.815	14.53	217.551	11.6				
	45.00	5.8	13.4	171.499	131.015	14.03	219.375	12.2				
110	22.50	1.0	2.4	149.767	121.500	17.20	208.468	8.7				
	33.75	3.0	7.0	157.033	125.237	16.10	211.977	9.8				
	45.00	5.7	13.1	160.711	126.915	15.57	213.820	10.3				
120	33.75	2.9	6.8	145.718	119.171	17.85	206.615	8.2				
	45.00	5.6	12.8	149.353	121.270	17.27	208.275	8.6				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
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- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
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- Performance capacities shown in thousands of Btuh

4000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	60.00	10.2	23.5	Operation Not Recommended					78.263	7.97	51.064	2.9
30	30.00	2.7	6.3	126.072	90.445	6.325	147.439	19.9	84.574	8.13	56.837	3.0
	45.00	5.6	13.0	120.569	85.596	5.85	140.337	20.6	87.399	8.20	59.436	3.1
	60.00	9.2	21.4	117.106	82.607	5.62	136.081	20.8	88.968	8.23	60.882	3.2
40	30.00	2.3	5.3	130.201	94.348	7.00	153.837	18.6	95.788	8.38	67.186	3.3
	45.00	4.8	11.2	127.963	92.166	6.55	150.098	19.5	99.666	8.47	70.778	3.5
	60.00	8.0	18.4	126.117	90.486	6.33	147.500	19.9	101.821	8.51	72.776	3.5
50	30.00	1.8	4.3	130.269	94.970	7.62	156.024	17.1	108.380	8.65	78.860	3.7
	45.00	4.0	9.3	130.586	94.825	7.19	154.876	18.2	113.346	8.76	83.468	3.8
	60.00	6.7	15.5	130.134	94.274	6.97	153.694	18.7	116.098	8.81	86.022	3.9
60	30.00	1.5	3.5	127.503	93.457	8.25	155.372	15.5	121.833	8.94	91.341	4.0
	45.00	3.5	8.2	129.694	94.698	7.81	156.076	16.6	127.838	9.07	96.906	4.1
	60.00	6.2	14.2	130.342	94.998	7.59	155.991	17.2	131.144	9.14	99.967	4.2
70	30.00	1.5	3.3	122.772	90.648	8.91	152.869	13.8	135.692	9.24	104.173	4.3
	45.00	3.4	7.9	126.233	92.704	8.45	154.766	14.9	142.587	9.39	110.537	4.4
	60.00	5.9	13.7	127.682	93.563	8.22	155.451	15.5	146.337	9.48	113.989	4.5
80	30.00	1.4	3.2	116.752	87.184	9.63	149.291	12.1	149.528	9.56	116.923	4.6
	45.00	3.3	7.6	120.966	89.589	9.13	151.813	13.2	157.050	9.74	123.814	4.7
	60.00	5.7	13.2	122.936	90.745	8.89	152.964	13.8	161.059	9.84	127.470	4.8
90	30.00	1.4	3.1	110.009	83.585	10.45	145.309	10.5	162.909	9.89	129.154	4.8
	45.00	3.2	7.3	114.542	85.967	9.90	147.968	11.6	170.668	10.11	136.175	4.9
	60.00	5.6	12.9	116.787	87.204	9.63	149.313	12.1	174.670	10.23	139.767	5.0
100	30.00	1.3	3.0	103.068	80.312	11.39	141.554	9.0	Operation Not Recommended			
	45.00	3.1	7.2	107.549	82.366	10.77	143.921	10.0				
	60.00	5.5	12.6	109.856	83.508	10.47	145.221	10.5				
110	30.00	1.3	2.9	96.454	77.836	12.50	138.681	7.7				
	45.00	3.0	7.0	100.554	79.276	11.78	140.352	8.5				
	60.00	5.4	12.4	102.740	80.172	11.44	141.391	9.0				
120	45.00	3.0	6.9	94.141	77.217	12.98	137.969	7.3				
	60.00	5.3	12.2	96.036	77.712	12.58	138.538	7.7				

- Interpolation is permissible; extrapolation is not.
- All entering air conditions are 80°F (26.6°C) DB and 67°F (19.4°C) WB in cooling, and 70°F (21°C) DB in heating.
- AHRI/ISO certified conditions are 80.6°F (27°C) DB and 66.2°F (19°C) WB in cooling and 68°F (20°C) DB in heating.
- Table does not reflect fan or pump power corrections for AHRI/ISO conditions.
- All performance is based upon the lower voltage of dual voltage rated units.
- Performance stated is at the rated power supply; performance may vary as the power supply varies from the rated.
- Operation below 40°F (4.4°C) EWT is based upon 15% methanol antifreeze solution.
- Operation below 60°F (15.5°C) EWT requires optional insulated water/refrigerant circuit.
- See performance correction tables for operating conditions other than those listed above.
- See Performance Data Selection Notes for operation in the shaded areas.
- For quiet operation and long term reliability, it is recommended that systems be designed to avoid continuous operation in the outlined areas.
- Performance capacities shown in thousands of Btuh

8000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
20	60.00	10.2	23.5	Operation Not Recommended					156.527	15.94	102.128	2.9
30	30.00	2.7	6.3	252.145	180.891	12.651	294.878	19.9	169.149	16.26	113.674	3.0
	45.00	5.6	13.0	241.138	171.192	11.70	280.675	20.6	174.797	16.39	118.871	3.1
	60.00	9.2	21.4	234.211	165.213	11.24	272.162	20.8	177.936	16.46	121.765	3.2
40	30.00	2.3	5.3	260.403	188.695	13.99	307.674	18.6	191.576	16.77	134.372	3.3
	45.00	4.8	11.2	255.926	184.332	13.11	300.195	19.5	199.332	16.93	141.556	3.5
	60.00	8.0	18.4	252.235	180.972	12.66	295.000	19.9	203.642	17.03	145.551	3.5
50	30.00	1.8	4.3	260.538	189.940	15.25	312.047	17.1	216.761	17.30	157.720	3.7
	45.00	4.0	9.3	261.172	189.649	14.38	309.752	18.2	226.692	17.51	166.936	3.8
	60.00	6.7	15.5	260.268	188.549	13.95	307.388	18.7	232.197	17.63	172.044	3.9
60	30.00	1.5	3.5	255.005	186.914	16.50	310.745	15.5	243.666	17.87	182.683	4.0
	45.00	3.5	8.2	259.387	189.397	15.62	312.152	16.6	255.675	18.13	193.812	4.1
	60.00	6.2	14.2	260.684	189.996	15.19	311.981	17.2	262.288	18.27	199.934	4.2
70	30.00	1.5	3.3	245.545	181.296	17.82	305.738	13.8	271.383	18.48	208.345	4.3
	45.00	3.4	7.9	252.467	185.409	16.89	309.532	14.9	285.174	18.79	221.073	4.4
	60.00	5.9	13.7	255.364	187.125	16.44	310.902	15.5	292.673	18.96	227.979	4.5
80	30.00	1.4	3.2	233.503	174.368	19.27	298.583	12.1	299.055	19.11	233.845	4.6
	45.00	3.3	7.6	241.933	179.178	18.26	303.626	13.2	314.101	19.48	247.629	4.7
	60.00	5.7	13.2	245.873	181.489	17.78	305.927	13.8	322.117	19.69	254.941	4.8
90	30.00	1.4	3.1	220.018	167.170	20.90	290.618	10.5	325.818	19.79	258.308	4.8
	45.00	3.2	7.3	229.084	171.934	19.79	295.936	11.6	341.335	20.22	272.349	4.9
	60.00	5.6	12.9	233.574	174.407	19.26	298.625	12.1	349.340	20.46	279.534	5.0
100	30.00	1.3	3.0	206.136	160.625	22.79	283.109	9.0	Operation Not Recommended			
	45.00	3.1	7.2	215.098	164.733	21.54	287.843	10.0				
	60.00	5.5	12.6	219.712	167.015	20.94	290.442	10.5				
110	30.00	1.3	2.9	192.909	155.673	25.00	277.363	7.7				
	45.00	3.0	7.0	201.109	158.553	23.56	280.704	8.5				
	60.00	5.4	12.4	205.479	160.343	22.89	282.783	9.0				
120	45.00	3.0	6.9	188.282	154.433	25.95	275.938	7.3				
	60.00	5.3	12.2	192.072	155.424	25.16	277.075	7.6				

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- Performance capacities shown in thousands of Btuh

Cooling Corrections

Entering Air Correction Table Cooling											
Ent Air WB °F	Total Clg Cap	Sens Clg Cap Multipliers- Entering DB F								Power	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95	
50.0	0.7267	0.8845									0.9756	0.7757
55.0	0.8009	0.6901	0.8885	0.8448							0.9817	0.8366
60.0	0.8795		0.6885	0.8869	1.0871						0.9886	0.9015
65.0	0.9769			0.6839	0.8824	1.0835	1.1066	1.2837			0.9966	0.9724
66.2	0.9658			0.6357	0.8330	1.0341	1.0579	1.2352			0.9986	0.9721
67.0	1.0000			0.6039	0.8001	1.0000	1.0239	1.2020			1.0000	1.0000
70.0	1.0438				0.6772	0.8753	0.8994	1.0764	1.2779		1.0052	1.0440
75.0	1.1443					0.6828	0.6828	0.8662	1.0671	1.2694	1.0135	1.1185

- Sensible Capacity equals Total Capacity.
- AHRI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6°F DB/ 66.2°F WB, and Heating - 68°F DB/ 59°F WB entering air temperature.
- Entering DB temperature range is based on operating limits, not on commision limits.
- Cooling air corrections based on rated airflow.

Heating Corrections

Full EAT Heating Corrections			
Ent Air DB °F	Heating Capacity	Power	Heat of Extraction
50	1.028	0.828	1.082
55	1.019	0.870	1.061
60	1.012	0.902	1.041
65	1.001	0.951	1.017
68	0.994	0.980	1.003
70	1.000	1.000	1.000
75	0.976	1.043	0.957
80	0.965	1.096	0.928

- Heating air corrections based on rated airflow.

Airflow Correction Table

Full Airflow Corrections							
Airflow	Heating			Cooling			
% of Rated	Heating Capacity	Heating Power	Heat of Extraction	Total Capacity	Sensible Capacity	Power	Heat of Rejection
75	0.934	1.039	0.937	0.943	0.847	0.953	0.945
81	0.948	1.025	0.951	0.955	0.884	0.964	0.957
88	0.963	1.010	0.966	0.968	0.920	0.976	0.970
94	0.981	1.005	0.983	0.984	0.960	0.988	0.985
100	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106	0.998	0.989	0.994	1.009	1.030	1.013	1.010
113	0.996	0.977	0.988	1.017	1.060	1.026	1.019
119	1.004	0.979	0.994	1.024	1.085	1.042	1.028
125	1.011	0.981	1.001	1.031	1.110	1.058	1.037

- Cooling and heating air corrections based on rated airflow.

Coil Conversions

Wet Coil to Dry Coil Conversion Table		
Air Coil Face Velocity FPM	Required BHP Multiplier	Required RPM Multiplier
200	0.956	0.997
250	0.973	0.997
300	0.978	0.997
350	0.981	0.997
400	0.987	0.996
450	0.993	0.996
500	1.069	0.994

ClimaDry II ESP Loss

Coil Face Velocity FPM	ST036 and 048 inches of Water	ST060 and 072 inches of Water	ST096 inches of Water	ST120 and 144 inches of Water	ST168 and 240 inches of Water
175	-	-	-	-	-
200	0.17	0.17	-	-	0.15
225	0.18	0.18	-	-	0.16
250	0.20	0.20	0.19	-	0.18
275	0.21	0.21	0.20	0.20	0.19
300	0.22	0.23	0.22	0.22	0.21
325	0.23	0.24	0.23	0.23	0.22
350	0.25	0.26	0.24	0.25	0.24
375	0.26	0.27	0.25	0.27	0.25
400	0.27	0.29	0.27	0.28	0.26
425	-	0.30	0.28	0.30	0.28
450	-	0.31	0.29	0.32	0.29
475	-	-	-	0.33	0.31
500	-	-	-	0.35	0.32
525	-	-	-	0.37	-
550	-	-	-	0.38	-
575	-	-	-	0.40	-

Antifreeze Type	Antifreeze %	Cooling			Heating		WPD Corr. Fct. EWT 30°F
		Total Cap	Sensible Cap	Power (Watts)	Total Cap	Power (Watts)	
Water	0	1.000	1.000	1.000			
Propylene Glycol	5	0.995	0.995	1.003	0.989	0.997	1.070
	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
Methanol	5	0.997	0.997	1.002	0.989	0.997	1.070
	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.140
	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
Ethylene Glycol	5	0.998	0.998	1.002	0.993	0.998	1.040
	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

ST 2-Way Motorized Valve Data

Model	Size	Type	CV	MOPD
ST036	3/4"-sweat	24V, Spring Return, Normally Closed	5	25
ST048	3/4"-sweat		5	25
ST060	1"-sweat		8	20
ST072	1-1/4"-FPT		19	150
ST096	1-1/2"-FPT		37	150
ST120	1-1/2"-FPT		37	150
ST144	1-1/2"-FPT		37	150
ST180	2"-FPT		57	150
ST240	2"-FPT		57	150

ST 2-Way Motorized Valve Data

Model	Size	Type	CV	MOPD
ST036	3/4"- FPT	24V, Spring Return, Normally Closed	10	30
ST048	3/4"- FPT		10	30
ST060	1"- FPT		19	30
ST072	1-1/4"- FPT		25	50

ST 3-Way Motorized Valve Data

Model	Size	Type	CV AB ro A	CV AB to B	MOPD
ST036	3/4"- FPT	24V, Spring Return, Normally Closed	7.4	5.2	150
ST048	3/4"- FPT		7.4	5.2	150
ST060	1"- FPT		10	7.0	150
ST072	1"- FPT		10	7.0	150
ST096	1-1/2"-FPT		29	20.3	150
ST120	1-1/2"-FPT		29	20.3	150
ST144	1-1/2"-FPT		29	20.3	150
ST180	1-1/2"-FPT		29	20.3	150
ST240	2"-FPT		68	47.6	150

ClimaDry II Pressure Drop Adder

Model	GPM	Motorized Water Valve Option			ClimaDry II	
		CV	PSI	FT	PSI	FT
ST036	4.50	5	0.8	1.8	0.87	2.00
	6.75	5	1.8	4.2	1.99	4.60
	9.00	5	3.2	7.4		
ST048	6.00	5	1.4	3.3	1.55	3.60
	9.00	5	3.2	7.4	3.49	8.10
	12.00	5	5.8	13.4		
ST060	8.00	8	1.0	2.3	1.70	3.90
	12.00	8	2.3	5.3	3.82	8.80
	16.00	8	4.0	9.2		
ST072	9.00	25	0.4	0.8	2.15	5.00
	13.50	25	0.5	1.2	4.83	11.20
	18.00	25	0.7	1.7		
ST096	12.00	41	0.3	0.7	1.04	2.40
	18.00	41	0.4	1.0	2.35	5.40
	24.00	41	0.6	1.4		
ST120	15.00	41	0.4	0.8	1.63	3.80
	22.50	41	0.5	1.3	3.67	8.50
	30.00	41	0.7	1.7		
ST144	18.00	41	0.4	1.0	2.35	5.40
	27.00	41	0.7	1.5	5.28	12.20
	36.00	41	0.9	2.0		
ST168	21.00	57	0.4	0.9	2.73	6.30
	31.50	57	0.6	1.3	6.14	14.20
	42.00	57	0.7	1.7		
ST240	30.00	57	0.5	1.2	2.89	6.70
	45.00	57	0.8	1.8	6.50	15.00
	60.00	57	1.1	2.4		

Blower Performance

Model	Rated CFM	Min CFM	Motor Type	CFM	External Static Pressure (in. wg)									
					0.2	0.4	0.6	0.8	1	1.2	1.4	1.5	1.8	2
ST036	1,200	900	Plug EC	Min CFM	900	900	900	900	900	900	900	900		
				Rated CFM	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200		
				Max CFM	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500		
ST048	1,600	1,200		Min CFM	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200		
				Rated CFM	1,600	1,600	1,600	1,600	1,600	1,600	1,600	1,600		
				Max CFM	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000		
ST060	2,000	1,500		Min CFM	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500		
				Rated CFM	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000		
				Max CFM	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500		
ST072	2,400	1,800		Min CFM	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800		
				Rated CFM	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400		
				Max CFM	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000		
ST096	3,200	2,400		Min CFM	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
				Rated CFM	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200
				Max CFM	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
ST120	4,000	3,000		Min CFM	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
				Rated CFM	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000
				Max CFM	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
ST144	4,800	3,600		Min CFM	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
				Rated CFM	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800	4,800
				Max CFM	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
ST180	6,000	4,500		Min CFM	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500
				Rated CFM	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
				Max CFM	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500	7,500
ST240	8,000	6,000		Min CFM	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
				Rated CFM	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000	8,000
				Max CFM	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

- Blower performance data is based on the lowest nameplate voltage setting.
- Blower performance is based on a wet coil with clean 1-inch filter.
- Blower performance is based on operating conditions of 80°F DB and 67°F WB.
- CFM Tolerance is ±7%
- Cells in grey - option not available
- The maximum allowable altitude of installation for this product is 6,561 ft (2,000 m).

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor		Total Unit FLA	Min. Circuit Amp	MOP	Fuse/ HACR Amp
				QTY	RLA	LRA	QTY	FLA				
ST036	H,K	208/230-3-60	187/252	1	9.9	82.0	1	4.8	14.6	17.1	27.0	25
	F,L	460-3-60	432/504	1	4.8	44.3	1	3.0	7.8	9.0	13.8	15
ST048	H,K	208/230-3-60	187/252	1	11.9	112.0	1	4.8	16.7	19.7	31.6	30
	F,L	460-3-60	432/504	1	6.8	61.8	1	3.0	9.8	11.5	18.3	15
ST060	H,K	208/230-3-60	187/252	1	14.0	150.0	1	4.7	18.7	22.2	36.2	35
	F,L	460-3-60	432/504	1	6.3	58.0	1	3.6	9.9	11.5	17.9	15
ST072	H,K	208/230-3-60	187/252	1	18.9	162.3	1	4.7	23.6	28.4	47.3	45
	F,L	460-3-60	432/504	1	9.1	70.8	1	3.6	12.7	15.0	24.1	20
ST096	H,K	208/230-3-60	187/252	2	12.8	120.4	2	4.8	35.1	38.3	51.2	50
	F,L	460-3-60	432/504	2	6.0	49.4	2	3.0	18.1	19.6	25.6	25
ST120	H,K	208/230-3-60	187/252	2	16.0	156.4	2	7.2	46.4	50.4	66.4	60
	F,L	460-3-60	432/504	2	7.1	69.0	2	5.9	25.9	27.7	34.7	30
ST144	H,K	208/230-3-60	187/252	2	21.2	156.5	2	7.2	56.6	61.9	83.1	80
	F,L	460-3-60	432/504	2	9.1	74.8	2	5.9	30.0	32.3	41.4	40
ST180	H,K	208/230-3-60	187/252	2	24.4	200.0	3	4.7	63.0	69.1	93.6	90
	F,L	460-3-60	432/504	1	11.9	103.0	3	3.6	34.5	37.4	49.3	45
ST240	H,K	208/230-3-60	187/252	2	28.5	255.0	3	7.2	78.5	85.6	114.2	110
	F,L	460-3-60	432/504	2	13.5	123.0	3	5.9	44.6	48.0	61.5	60

Notes:
- All units rated for SCCR RMS SYM at 5 kA and 600 max volts.
- Wire length based on one way measurement with 2% voltage drop.
- Wire size based on 60°C copper conductor.

Electrical Data
Standard with Variable-Speed Pump

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor		Pump	Total Unit FLA	Min. Circuit Amp	MOP	Fuse/ HACR Amp
				QTY	RLA	LRA	QTY	FLA	Variable				
ST036	H,K	208/230-3-60	187/252	1	9.9	82.0	1	4.8	1.44	16.1	18.5	28.4	25
	F,L	460-3-60	432/504	1	4.8	44.3	1	3.0	1.44	9.2	10.4	15.3	15
ST048	H,K	208/230-3-60	187/252	1	11.9	112.0	1	4.8	1.44	18.1	21.1	33.0	30
	F,L	460-3-60	432/504	1	6.8	61.8	1	3.0	1.44	11.2	12.9	19.7	15
ST060	H,K	208/230-3-60	187/252	1	14.0	150.0	1	4.7	1.44	20.1	23.6	37.6	35
	F,L	460-3-60	432/504	1	6.3	58.0	1	3.6	1.44	11.4	13.0	19.3	15
ST072	H,K	208/230-3-60	187/252	1	18.9	162.3	1	4.7	1.44	25.1	29.8	48.7	45
	F,L	460-3-60	432/504	1	9.1	70.8	1	3.6	1.44	14.1	16.4	25.5	25

Notes:
- All units rated for SCCR RMS SYM at 5 kA and 600 max volts.
- Wire length based on one way measurement with 2% voltage drop.
- Wire size based on 60°C copper conductor.

Electrical Data
Standard with ISP or ClimaDry II

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor		Pump	Total Unit FLA	Min. Circuit Amp	MOP	Fuse/ HACR Amp
				QTY	RLA	LRA	QTY	FLA	ISP or ClimaDryII				
ST036	H,K	208/230-3-60	187/252	1	9.9	82.0	1	4.8	1.18	15.8	18.3	28.1	25
	F,L	460-3-60	432/504	1	4.8	44.3	1	3.0	1.36	9.2	10.4	15.2	15
ST048	H,K	208/230-3-60	187/252	1	11.9	112.0	1	4.8	1.18	17.9	20.8	32.8	30
	F,L	460-3-60	432/504	1	6.8	61.8	1	3.0	1.36	11.2	12.9	19.6	15
ST060	H,K	208/230-3-60	187/252	1	14.0	150.0	1	4.7	1.18	19.9	23.4	37.4	35
	F,L	460-3-60	432/504	1	6.3	58.0	1	3.6	1.36	11.3	12.9	19.2	15
ST072	H,K	208/230-3-60	187/252	1	18.9	162.3	1	4.7	1.18	24.8	29.5	48.5	45
	F,L	460-3-60	432/504	1	9.1	70.8	1	3.6	1.36	14.0	16.3	25.4	25
ST096	H,K	208/230-3-60	187/252	2	12.8	120.4	2	4.8	1.10	36.2	39.4	52.3	50
	F,L	460-3-60	432/504	2	6.0	49.4	2	3.0	0.55	18.6	20.1	26.1	25
ST120	H,K	208/230-3-60	187/252	2	16.0	156.4	2	7.2	1.10	47.5	51.5	67.5	60
	F,L	460-3-60	432/504	2	7.1	69.0	2	5.9	0.55	26.5	28.2	35.3	35
ST144	H,K	208/230-3-60	187/252	2	21.2	156.5	2	7.2	1.10	57.7	63.0	84.2	80
	F,L	460-3-60	432/504	2	9.1	74.8	2	5.9	0.55	30.6	32.8	41.9	40
ST180	H,K	208/230-3-60	187/252	2	24.4	200.0	3	4.7	1.96	65.0	71.1	95.5	90
	F,L	460-3-60	432/504	1	11.9	103.0	3	3.6	0.98	35.4	38.4	50.3	50
ST240	H,K	208/230-3-60	187/252	2	28.5	255.0	3	7.2	1.96	80.5	87.6	116.1	110
	F,L	460-3-60	432/504	2	13.5	123.0	3	5.9	0.98	45.6	49.0	62.4	60

Notes:
- All units rated for SCCR RMS SYM at 5 kA and 600 Max Volts.
- Wire length based on one way measurement with 2% voltage drop.
- Wire size based on 60°C copper conductor.
- Units can include either the Internal Secondary Pump (ISP) or ClimaDry II option.

Tranquility (ST) Series IP Units

ST Series	036	048	060	072	096	120	144	180	240
Number of Circuits	1				2				
Factory Charge R-454B - (oz.) per circuit	54	71	102	113	92	102	111	182	255
Refrigerant Leak Detection System	O	R	R	R	R	R	R	R	R
Number of Sensors	2	2	2	2	2	2	2	2	2
Blower Motor	EC								
Blower Motor Quantity	1				2				3
Standard Motor (hp)	2.5								
Blower	Backward Curved EC								
Number of Blowers	1				2				3
Blower Diameter (in.)	11.02		13.98		11.02	13.98			
Water Connection	Standard FPT								
Source FPT (in.)	3/4		1	1-1/4	1-1/2			2	
Coax Volume									
System Water Volume (US gal.)	0.61	0.77	1.11	1.30	1.69	2.29	2.68	3.83	4.77
Condensate Connection Size									
Source FPT (in.)	1								
Internal Secondary Pump	Direct Drive Impeller								
Number of Pumps	1								
Standard Motor (hp)	1/6				1/2			3/4	1-1/2
Connection Size (in.)	3/4		1		1-1/2				2
General Data									
Filter Standard - 2" MERV 8 (qty.) (in.)	(QTY.4) 16 x 20				(QTY.6) 16 x 20			(QTY.8) 16 x 20 (QTY.2) 20 x 20	
Weight - Operating (lbs.)	735	785	835	880	1080	1125	1175	1870	1960
Weight - Packaged (lbs.)	750	800	850	900	1100	1150	1200	1900	2000

- All units have TXV expansion device and ½-inch and ¾-inch electrical knockouts.
- FPT = Female Pipe Thread
- O = Optional, R = Required

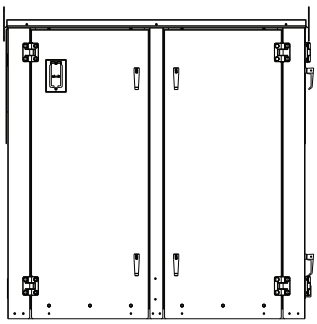
Tranquility (ST) Series SI Units

ST Series	036	048	060	072	096	120	144	180	240
Number of Circuits	1				2				
Factory Charge R-454B - (kg) per circuit	1.81	2.02	2.90	3.21	2.61	2.90	3.15	5.17	7.24
Refrigerant Leak Detection System	O	R	R	R	R	R	R	R	R
Number of Sensors	2	2	2	2	2	2	2	2	2
Blower Motor	EC								
Blower Motor Quantity	1				2				3
Standard Motor (kw)	1.87								
Blower	Backward Curved EC								
Number of Blowers	1				2				3
Blower Diameter (mm)	280		355		280	355			
Water Connection	Standard FPT								
Source FPT (mm)	19.05		25.4	31.75	38.1			50.8	
Coax Volume									
System Water Volume (L)	2.29	2.90	4.21	4.93	6.49	8.69	10.13	14.50	18.04
Condensate Connection Size									
Source FPT (mm)	25.4								
Internal Secondary Pump	Direct Drive Impeller								
Number of Pumps	1								
Standard Motor (kw)	0.124				0.373			0.556	1.120
Connection Size (cm)	1.91		2.54		3.81				5.08
General Data									
Filter Standard - 50.8 mm MERV 8 (qty.) (cm)	(QTY.4) 406 x 508				(QTY.6) 406 x 508			(QTY.8) 406 x 508 (QTY.2) 508 x 508	
Weight - Operating (kg)	333	356	379	399	490	510	534	850	889
Weight - Packaged (kg)	340	363	386	408	499	522	546	863	907

- All units have TXV expansion device and 1.27 cm and 1.91 cm electrical knockouts.
- FPT = Female Pipe Thread
- O = Optional, R = Required

Model	Outdoor Air Opening	Water In/Out (IPT)	Condensate
ST036	12.57" x 30.00"	3/4"	1"
ST048	12.57" x 30.00"	3/4"	1"
ST060	12.57" x 30.00"	1"	1"
ST072	12.57" x 30.00"	1-1/4"	1"

FRONT



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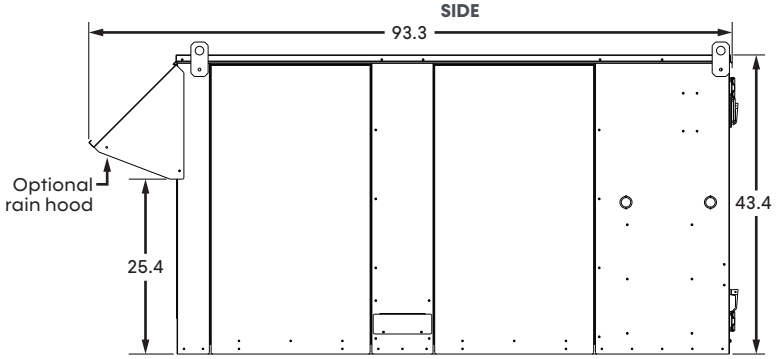
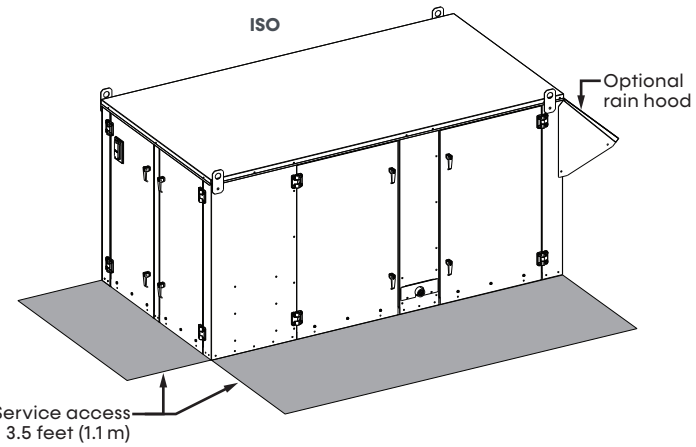


NOTES

The rain hood is included only if the Motorized Fresh Air Damper or Modulating Enthalpy Economizer is selected in digit 3 of the model nomenclature.

ISO



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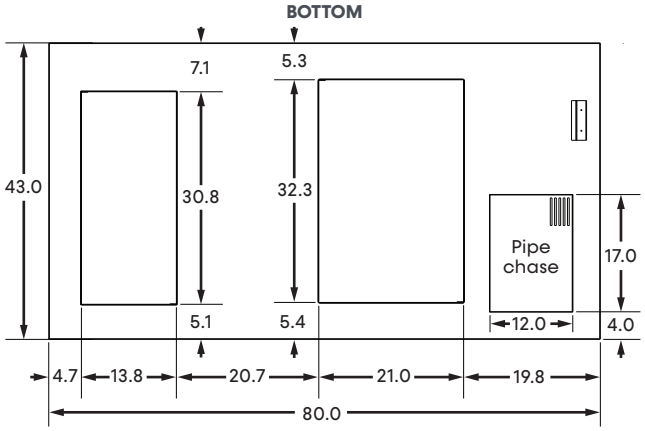
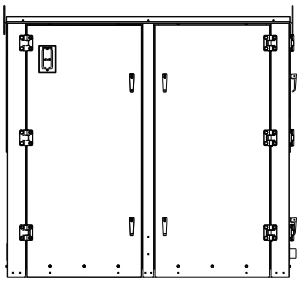


Model	Outdoor Air Opening	Water In/Out (IPT)	Condensate
ST096	18.95" x 36.00"	1-1/2"	1"
ST120	18.95" x 36.00"	1-1/2"	1"
ST144	18.95" x 36.00"	1-1/2"	1"

FRONT



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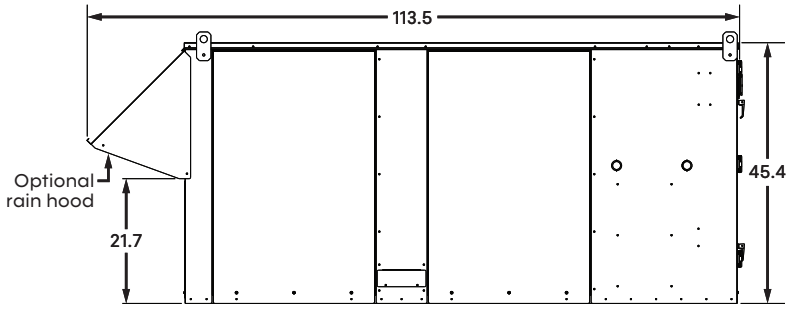
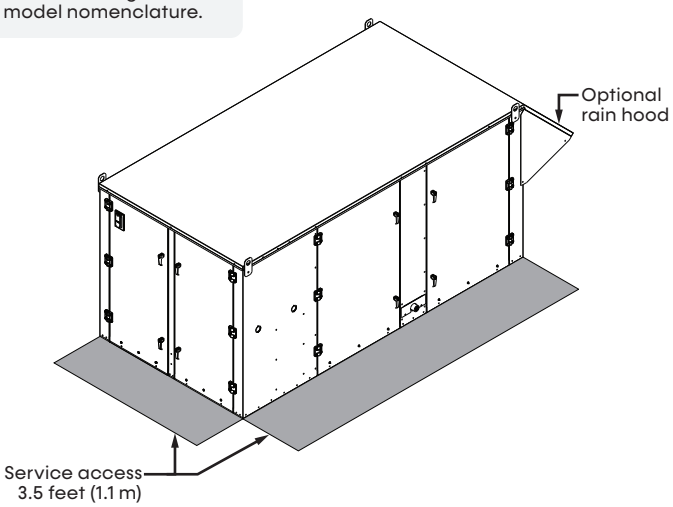


NOTES

The rain hood is included only if the Motorized Fresh Air Damper or Modulating Enthalpy Economizer is selected in digit 3 of the model nomenclature.

ISO



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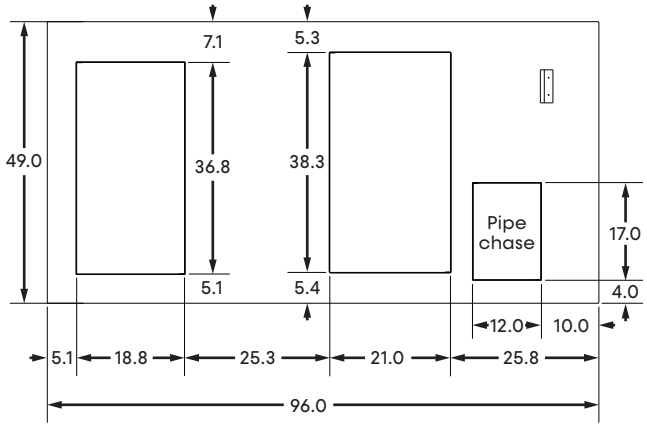
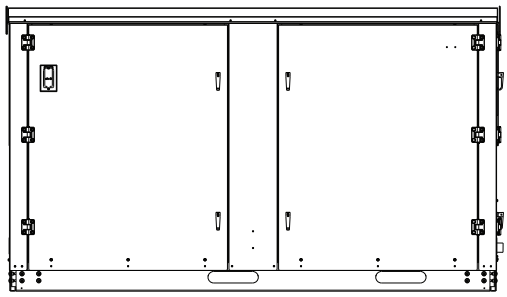


Model	Outdoor Air Opening	Water In/Out (IPT)	Condensate
ST180	18.95" x 74.00"	2"	1"
ST240	18.95" x 74.20"	2"	1"

FRONT



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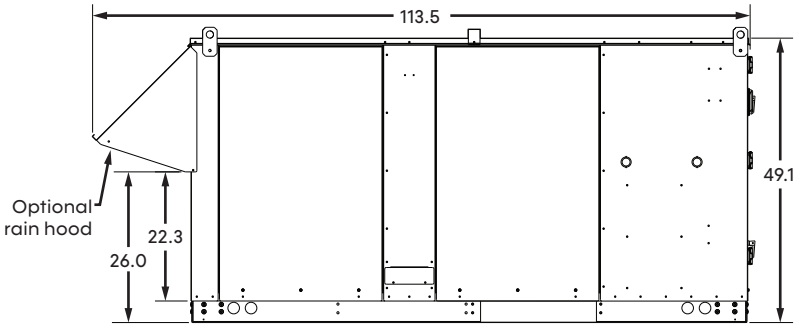
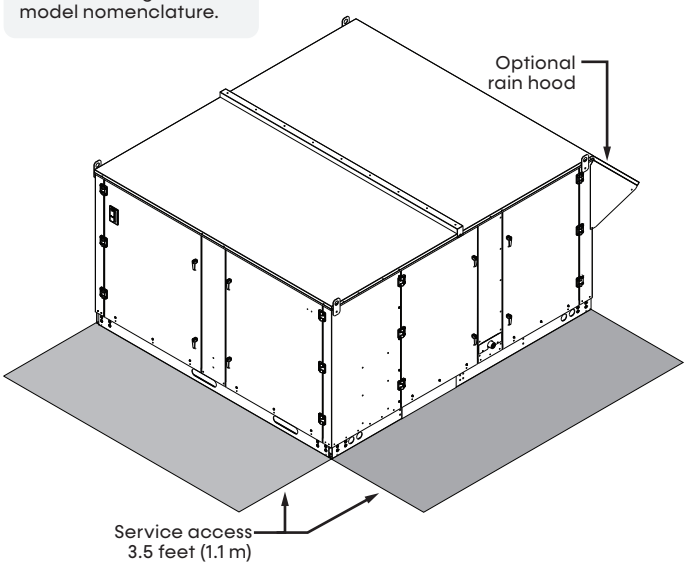


NOTES

The rain hood is included only if the Motorized Fresh Air Damper or Modulating Enthalpy Economizer is selected in digit 3 of the model nomenclature.

ISO



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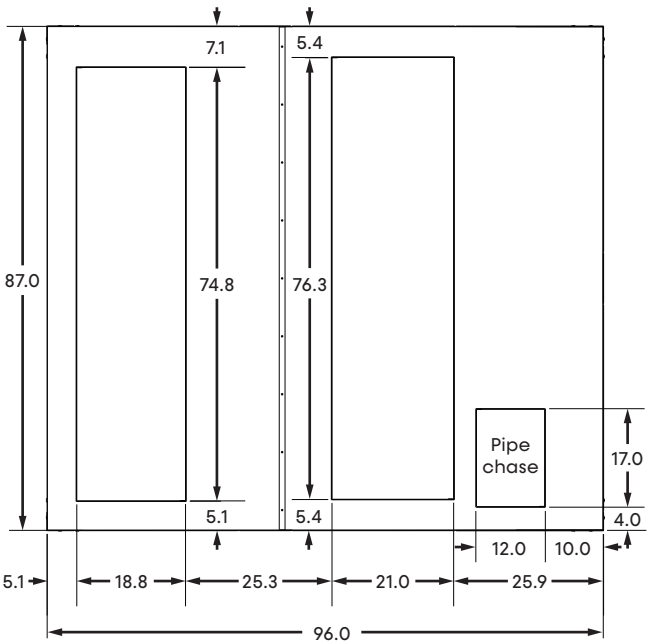
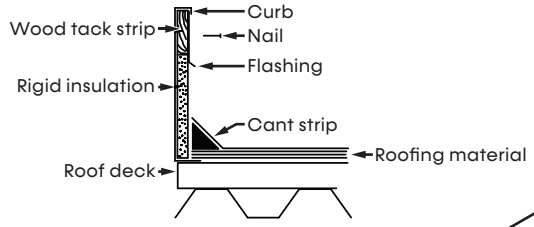


Models	A	B	C	D	E	F
036, 048, 060, 072	72.25"	18.00"	35.25"	72.25"	35.25"	14.00" or 24.00"
096, 120, 144	82.25"	21.00"	41.25"	82.25"	41.25"	14.00" or 24.00"
180, 240	82.25"	21.00"	78.88"	82.25"	78.88"	14.00" or 24.00"

ROOFING DETAIL

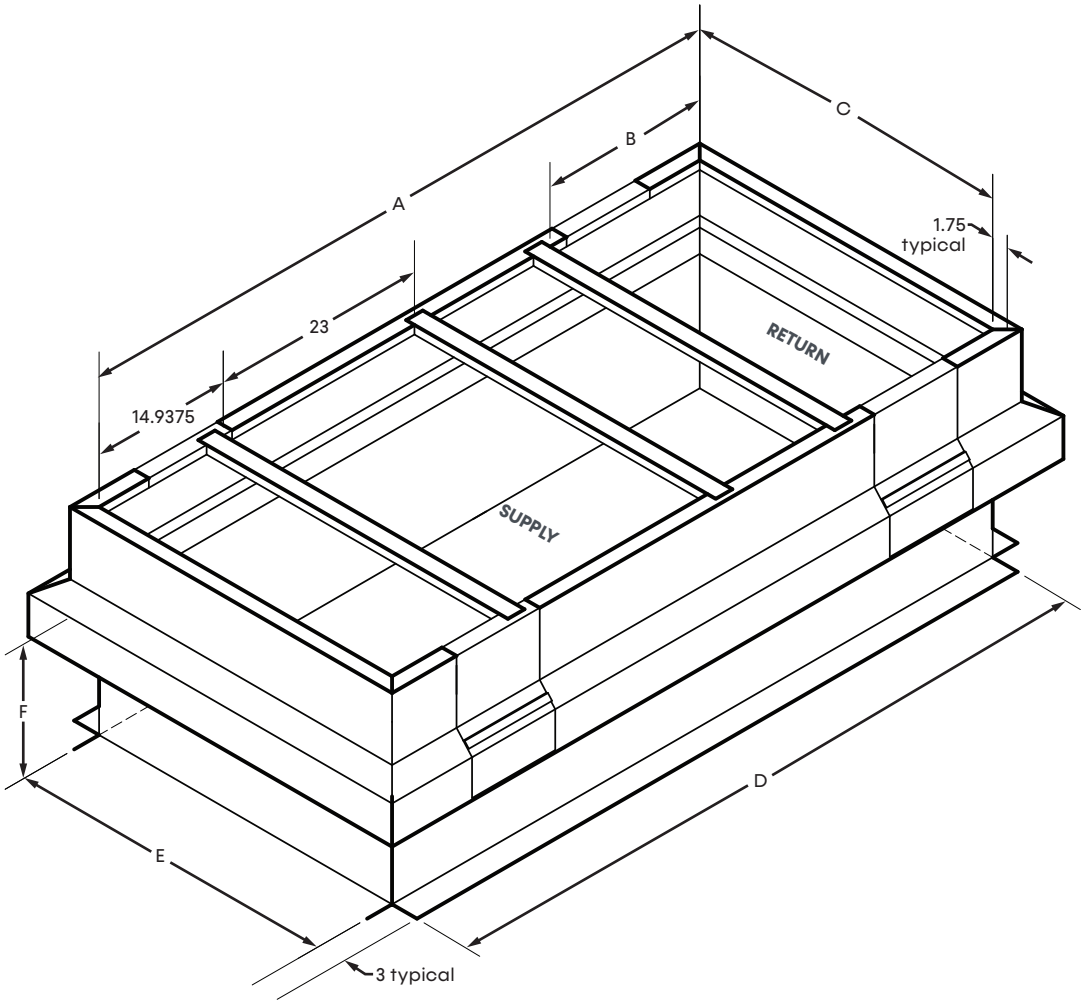


NOTES

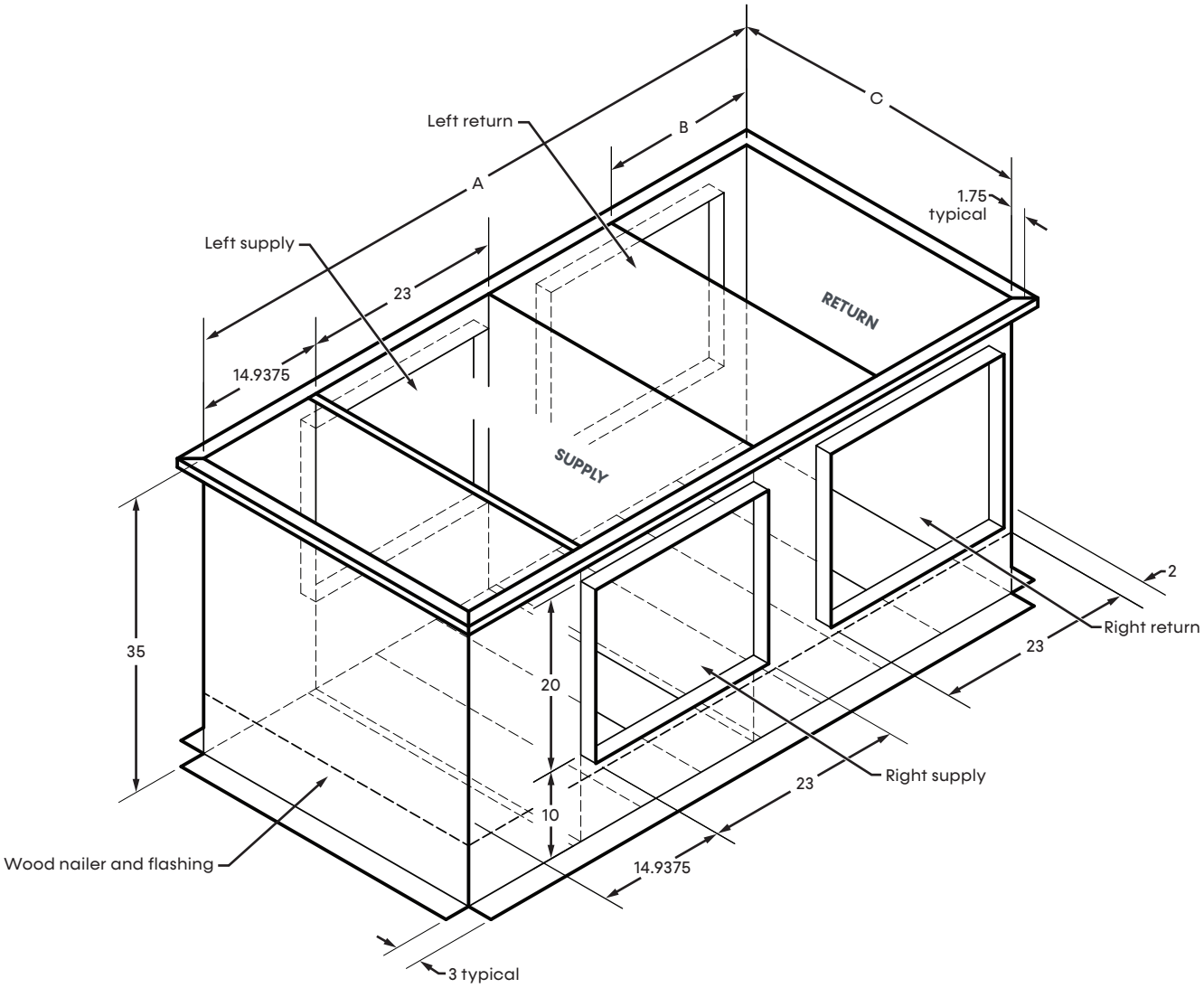
Cant strip, nails, flashing, rigid insulation, roof deck, and roofing materials are field provided.

Models	A	B	C	D	E	F
036, 048, 060, 072	72.25"	18.00"	35.25"	72.25"	35.25"	14.00" or 24.00"
096, 120, 144	82.25"	21.00"	41.25"	82.25"	41.25"	14.00" or 24.00"
180, 240	82.25"	21.00"	78.88"	82.25"	78.88"	14.00" or 24.00"

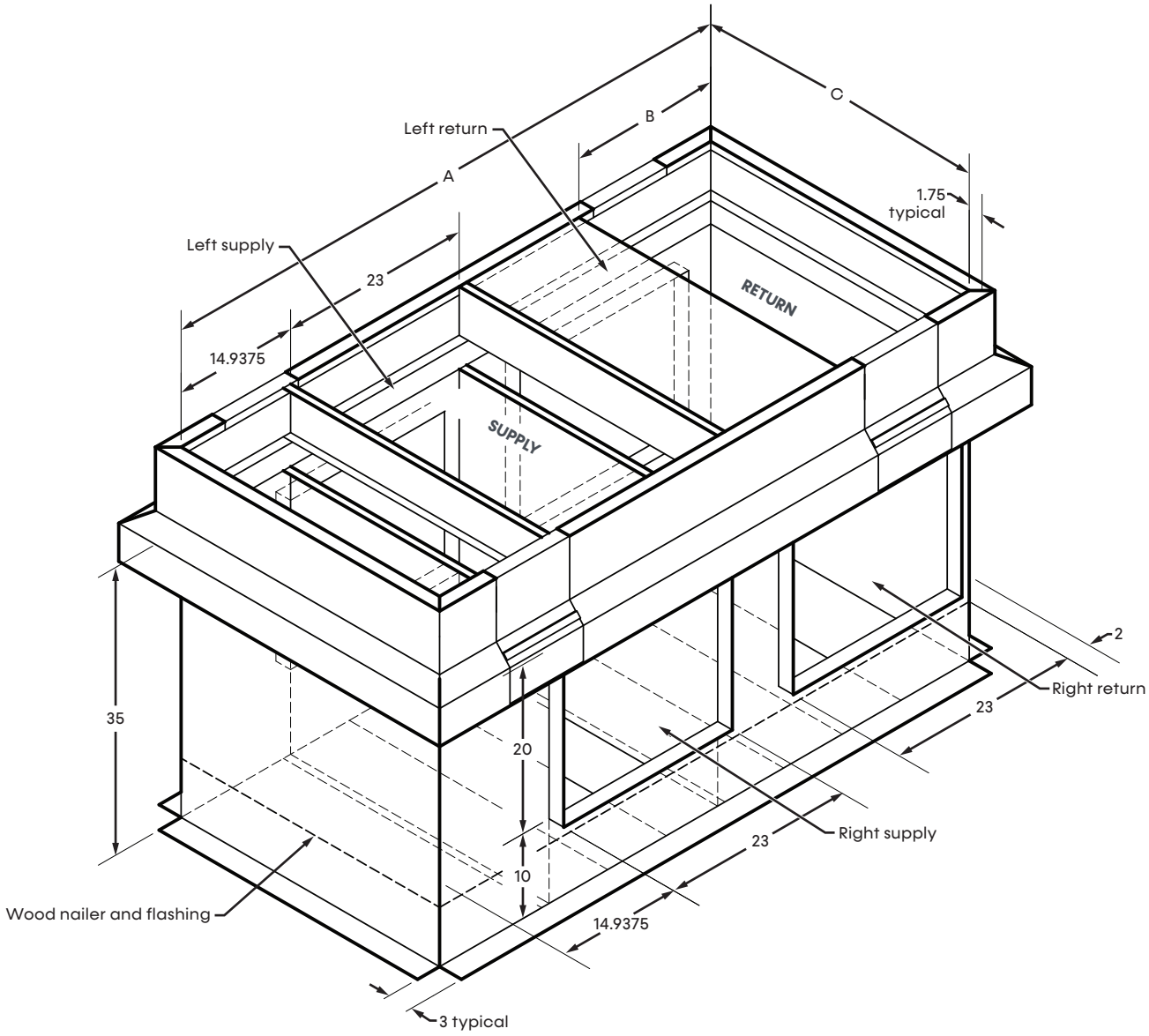
Notes:
- The finish height is 12.5" taller than the base curb height.



Models	A	B	C
036, 048, 060, 072	72.25"	18.00"	35.25"
096, 120, 144	82.25"	21.00"	41.25"
180, 240	82.25"	21.00"	78.88"



Models	A	B	C
036, 048, 060, 072	72.25"	18.00"	35.25"
096, 120, 144	82.25"	21.00"	41.25"
180, 240	82.25"	21.00"	78.88"



Corner Weights (lb)

Model	Total	Left-Front[1]	Right-Front[1]	Left-Back[1]	Right-Back[1]	Roof Curb
ST036	735.00	184.00	259.00	108.50	183.50	83.00
ST048	785.00	196.00	276.00	117.00	196.00	83.00
ST060	835.00	208.50	293.50	124.50	208.50	83.00
ST072	880.00	224.00	298.00	134.00	224.00	83.00
ST096	1080.00	292.00	380.00	193.00	215.00	94.00
ST120	1125.00	303.50	395.50	202.00	224.00	94.00
ST144	1175.00	320.00	406.00	212.50	236.50	94.00
ST180	1870.00	501.00	667.00	326.00	376.00	128.00
ST240	1960.00	530.00	690.00	350.00	390.00	128.00

1. Front is control box end.

Corner Weights (kg)

Model	Total	Left-Front[1]	Right-Front[1]	Left-Back[1]	Right-Back[1]	Roof Curb
ST036	333.39	83.46	117.48	49.21	83.23	37.65
ST048	356.07	88.90	125.19	53.07	88.90	37.65
ST060	378.75	94.57	133.13	56.47	94.57	37.65
ST072	399.16	101.60	135.17	60.78	101.60	37.65
ST096	489.88	132.45	172.37	87.54	97.52	42.64
ST120	510.29	137.67	179.40	91.63	101.60	42.64
ST144	532.97	145.15	184.16	96.39	107.27	42.64
ST180	802.86	217.27	282.59	142.88	160.12	58.06
ST240	889.04	240.40	312.98	158.76	176.90	58.06

1. Front is control box end.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
S	T	0	0	3	6	A	H	D	W	0	C	0	M	S

CLIMADRY II REQUIREMENTS

- The ClimaDry II option (Digit 11 - D or H) must be ordered with original equipment.
  - DXM2.5 is required.
  - 460V configurations require 4-wire power supply with neutral.
  - Not available for configurations with internal water valve or flow regulator options. Check the unit submittal for limitations and specific requirements.
- Antifreeze is required to protect the reheat coil in low ambient conditions. ASHRAE minimums for the region shall be considered during the calculation of the antifreeze solution.
- ClimaDry II is not recommended for applications with poor water quality. For more information, see the water quality guidelines in the unit's IOM.
- The maximum working water pressure is 145 PSIG.
- The thermostat must be one of the following:
  - A thermostat with dehumidification mode (ATP32U04 or similar)
  - A thermostat and separate humidistat or dehumidistat controller. See the **Humidistat/ Dehumidistat Logic and DXM2.5 (2.1, 2.2., 2.3) DIP Settings** table more information.
- Units must have minimum entering air temperature of 65°F DB/55°F WB while in Cooling, Continuous Fan, or Dehumidification modes. Minimum entering air temperature while operating in Heating mode (not Continuous Fan) is the minimum entering air temperature for the standard model in the Heating mode. Operating below these minimum entering air temperatures may result in nuisance faults.

WATER OPTIONS

Option	Coax Material	
	Copper	Cupro-nickel
None	0	Z
Modulating Valve	C	V
Internal Pump (Variable with Check Valve)	3	P
Internal Pump (Variable no Check Valve)	J	N
ClimaDry	D	H
Internal Secondary Pump (ISP)	7	S

CLIMADRY II MODULATING REHEAT OPTION

ClimateMaster's patented ClimaDry II Dehumidification option is an innovative means of providing modulating reheat without the complication of refrigeration controls. ClimaDry II is hot gas generated reheat, which utilizes one of the biggest advantages of a water-source heat pump, the transfer of energy through the water piping system. ClimaDry II simply diverts condenser water through a water-to-air coil that is placed after the evaporator coil. If condenser water is not warm enough, the internal "run-around" loop increases the water temperature with each pass through the condenser coil. See the **ClimaDry II Schematic** for additional details.

CLIMADRY II BENEFITS

ClimaDry II is like no other reheat option on the market. Proportional reheat is controlled to the desired leaving air temperature set point (factory set point of 72°F, 22°C), no matter what the water loop temperature is. Since dehumidification operation occurs under less than full-load cooling conditions a good percentage of the time, it is important to have a reheat function that provides 100% reheat in the spring and fall when the water loop is cool. Supply air temperature is field adjustable to ± 3°F (± 1.7°C) for even greater flexibility with the optional potentiometer. It is recommended that the ClimaDry II supply air temperature is set to match the space cooling setpoint so that ClimaDry II does not impact room temperature.

ClimaDry II works at a wide range of water temperatures to provide the perfect amount of dehumidification and reheat.

An additional advantage is that the ClimaDry II refrigerant circuit is like every other ClimateMaster unit (without reheat), so technician's existing knowledge is easily applied to troubleshooting the ClimaDry II refrigeration circuit. Plus, the water loop portion of the ClimaDry II option is easy to understand and diagnose.

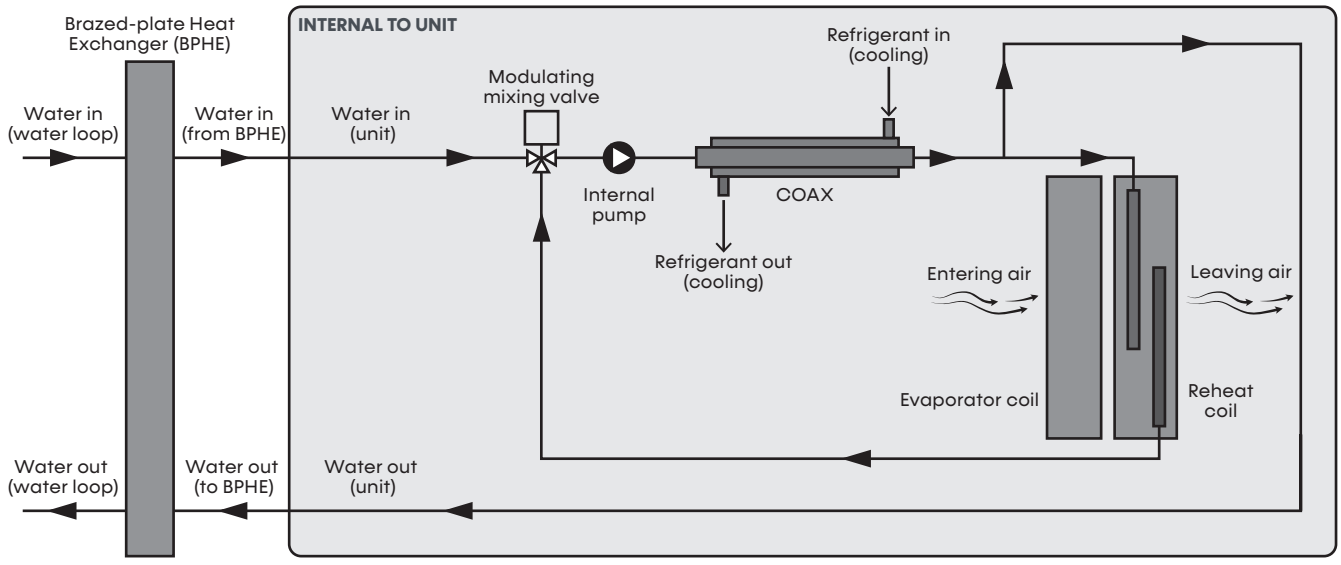
CLIMADRY II APPLICATIONS

You can apply ClimaDry II to a number of common applications, such as:

- Classrooms
- Condominiums
- Apartments
- Computer rooms
- Spaces with high latent loads like auditoriums, theaters, convention centers, etc
- Most applications where humidity is a problem

NOTE: ClimaDry II is not for use in high fraction outdoor air applications or in applications with corrosive atmospheres, such as pool rooms.

Figure 1: ClimaDry II Schematic



With the ClimaDry II option, return air from the space is cooled by the air-to-refrigerant (evaporator) coil, and then reheated by the water-to-air (reheat) coil to dehumidify the air, but maintain the same space temperature (thus operating as a dehumidifier).

The moisture removal capability of the heat pump is determined by the unit's latent capacity rating. Latent Capacity equals Total Capacity minus Sensible Capacity. Using unit performance data from the product catalog, find the correct model then use the maximum entering water temperature (EWT) and flow rate to select TC and SC. For example, at 80°F (26.7°C) EWT and 15 GPM, the moisture removal capability (latent capacity) of an ST120 is 34.2 MBtuh as shown as shown below.

Divide the latent capacity by 1,069 Btu/lb of water vapor at 80°F DB and 67°F WB (26.7°C DB and 19.4°C WB) moist air enthalpy, converts the amount of moisture removal to pounds per hour (multiply pounds per hour by 0.4536 to obtain kg/hr).

Most ClimateMaster heat pumps have a sensible-to-total (S/T) ratio of 0.72 to 0.82 with approximately 25% of the cooling capacity dedicated to latent cooling capacity (moisture removal). When configuring a unit with ClimaDry II, calculate the space's sensible and latent loads. If the unit is used for space cooling, select a unit with enough capacity to satisfy the building sensible load. If the latent cooling load is not satisfied by the selection, a larger unit with enough latent capacity is required. If the unit is used for dehumidification purposes only, latent capacity is the only consideration necessary. In this case, sensible load is immaterial.

Example Calculation

4000 CFM Rated Airflow

EWT °F	WATER/BRINE			COOLING - EAT 80/67 °F					HEATING - EAT 70°F			
	FLOW GPM	WPD		TC	SC	kW	HR	EER	HC	kW	HE	COP
		PSI	FT									
70	15.00	0.3	0.6	120.340	82.578	9.05	149.381	13.3	139.428	10.52	105.676	3.9
	22.50	0.5	1.1	124.784	84.569	8.47	151.940	14.7	146.689	10.70	112.358	4.0
	30.00	1.6	3.8	126.886	85.475	8.19	153.149	15.5	150.695	10.81	116.039	4.1
80	15.00	0.2	0.5	113.889	79.674	9.93	145.751	11.5	152.993	10.86	118.148	4.1
	22.50	0.4	1.0	118.624	81.800	9.28	148.401	12.8	161.176	11.08	125.649	4.3
	30.00	1.5	3.6	120.964	82.860	8.97	149.739	13.5	165.667	11.20	129.758	4.3
90	15.00	0.1	0.3	107.192	76.820	10.92	142.219	9.8	166.626	11.22	130.634	4.4
	22.50	0.4	0.9	111.947	78.822	10.21	144.696	11.0	175.626	11.47	138.846	4.5
	30.00	1.5	3.4	114.371	79.887	9.87	146.016	11.6	180.526	11.60	143.305	4.6

LC = TC - SC = 113.9 - 79.7 = 34.2 MBtuh

34,200 Btuh ÷ 1,069 = 32.0 lbs/hr (14.5 kg/hr)

Divide the latent capacity by 1,069 Btu/lb. of water vapor at 80°F DB and 67°F WB (26.7°C DB and 19.4°C WB) moist air enthalpy, which converts the amount of moisture removal to pounds per hour (multiply pounds per hour by 0.4536 to obtain kg/hr).

A heat pump equipped with ClimaDry II can operate in three modes; Cooling, Cooling with Reheat (dehumidification), and Heating. The Cooling/Heating modes are like any other ClimateMaster unit. The reversing valve (O signal) is energized in cooling, along with the compressor contactor(s) and blower relay. In the heating mode the reversing valve is de-energized. Most thermostats can activate the heat pump in Heating or Cooling modes. The DXM2.5 accepts either heat pump (Y,O) thermostats or non-heat pump (Y,W) thermostats. The Reheat mode requires either a separate humidistat/dehumidistat or a thermostat that has an integrated dehumidification function for activation. The DXM2.5 is configured to work with either a humidistat or dehumidistat input to terminal "H" (DIP switch settings for the DXM2.5 are shown below in table 2). Upon receiving an "H" input, the DXM2.5 activates the Cooling mode and engages reheat. The **Humidistat/Dehumidistat Logic and DXM2.5 (2.1, 2.2., 2.3) DIP Settings** and **ClimaDry II Operating Modes** tables show the relationship between thermostat input signals and unit operation.

Table 1: Humidistat/Dehumidistat Logic and DXM2.5 (2.1, 2.2., 2.3) DIP Settings

Sensor	2.1	2.2	2.3	Logic	Reheat (ON)–H	Reheat (OFF)–H
Humidistat	OFF	OFF	OFF	Reverse	0VAC	24VAC
Dehumidistat	OFF	ON	OFF	Standard	24VAC	0VAC

Table 2: ClimaDry II Operating Modes

Mode	Input					Output				
	O	G	Y1	Y2[3]	H	O	G	Y1	Y2[3]	Reheat
No Demand	ON/OFF	OFF	OFF	OFF	OFF	ON/OFF	OFF	OFF	OFF	OFF
Fan Only	ON/OFF	ON	OFF	OFF	OFF	ON/OFF	ON	OFF	OFF	OFF
Cooling 1st Stage	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF	OFF
Cooling 2nd Stage	ON	ON	ON	ON	OFF	ON	ON	ON	ON	OFF
Cooling and Dehumidistat[1]	ON	ON	ON	ON/OFF	ON	ON	ON	ON	ON/OFF	OFF
Dehumidistat Only	ON/OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
Heating 1st Stage	OFF	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
Heating 2nd Stage	OFF	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF
Heating and Dehumidistat[2]	OFF	ON	ON	ON/OFF	ON	OFF	ON	ON	ON/OFF	OFF

1. Cooling input takes priority over dehumidify input.
2. DXM2.5 is programmed to ignore the H demand when the unit is in heating mode.
3. N/A for single stage units; Full load operation for dual capacity units.
4. ON/OFF = Either ON or OFF.

There are four operational inputs for single-stage units and six operational inputs for two-stage units:

NOTE: Not all units have two-stage cooling functionality.

- Fan Only
- 1st Stage Cooling
- 2nd Stage Cooling
- 1st Stage Heating
- 2nd Stage Heating
- Reheat Mode

Fan Only: A (G) call from the thermostat to the (G) terminal of the DXM2.5 activates the unit on in Fan Only mode.

1st Stage Cooling: A simultaneous call from (G), (Y1), and (O) to the (G), (Y1), (O/W2) terminals of the DXM2.5 activates the unit in 1st Stage Cooling.

2nd Stage Cooling: A simultaneous call from (G), (Y1), (Y2), and (O) to the (G), (Y1), (Y2), and (O/W2) terminals of the DXM2.5 activates the unit in 2nd Stage Cooling. When the call is satisfied at the thermostat, the unit continues to run in 1st Stage Cooling until the 1st Stage Cooling call is removed or satisfied, shutting down the unit.

1st Stage Heating: A simultaneous call from (G) and (Y1) to the (G) and (Y1) terminals of the DXM2.5 activates the unit in 1st Stage Heating.

2nd Stage Heating: A simultaneous call from (G), (Y1), and (Y2) to the (G), (Y1), and (Y2) terminals of the DXM2.5 activates the unit in 2nd Stage Heating. When the call is satisfied at the thermostat the unit continues to run in 1st Stage Heating until the call is removed or satisfied, shutting down the unit.

Reheat Mode: A call from the Humidistat/Dehumidistat to the (H) terminal of the DXM2.5 activates the unit in Reheat mode if there is no call for cooling at the thermostat. When the Humidistat/Dehumidification call is removed or satisfied, the unit shuts down. **NOTE: Cooling always overrides Reheat Mode. In the Cooling mode, the unit cools and dehumidifies. If the cooling thermostat is satisfied but there is still a call for dehumidification, the unit continues to operate in Reheat mode.**

NOTE: Take care when using a humidistat to operate ClimaDry II. When the DIP switch on the DXM2.5 is set for humidistat, it reverses the control logic so that an "open" control circuit initiates a ClimaDry II run cycle. If a humidistat is not connected or if a manual switch on the humidistat is set to "off", ClimaDry II detects the open circuit and calls for dehumidification.

COMPONENT FUNCTIONS

ClimaDry II consists of the following components:

- Motorized Valve/Proportional Controller
- Supply Air Sensor
- Loop Pump
- Hydronic Coil
- Low Pressure Switch

The proportional controller operates on 24VAC power supply and automatically adjusts the water valve based upon the Supply Air sensor. The Supply Air sensor detects supply air temperature at the blower inlet providing the input signal necessary for the proportional control to drive the motorized valve during the reheat mode of operation.

The motorized valve is a proportional actuator/ three-way valve combination used to divert the condenser water from the coax to the hydronic reheat coil during the reheat mode of operation. The proportional controller signals the motorized valve based on the supply air temperature of the supply air sensor.

The loop pump circulates condenser water through the hydronic reheat coil during the reheat mode of operation. In this application, the loop pump is only energized during the reheat mode of operation. The hydronic coil is utilized during the reheat mode of operation to reheat the air to the setpoint of the proportional controller. Condenser water is diverted by the motorized valve and pumped through the hydronic coil by the loop pump in proportion to the control setpoint. The amount of reheating is dependent on the setpoint and how far from setpoint the supply air temperature is. The factory setpoint is 72°F (22°C), generally considered neutral air.

APPLICATION CONSIDERATIONS

The reheat coil adds a small amount of resistance to the air stream. In some cases the high static option may be required for applications with higher static ductwork. Consult the product catalog or the IOM for the specific heat pump to review blower tables.

Unlike most hot gas reheat options, the ClimaDry II option operates over a wide range of EWTs. A special flow regulation (water regulating valve) is not required for low EWT conditions.

Units with ClimaDry II must have an antifreeze solution to protect the coil in low ambient conditions. ASHRAE minimums for the region shall be considered during the calculation of the antifreeze solution.

In applications where antifreeze is not specified, use a secondary heat exchanger to isolate the unit from the water loop, resulting in less antifreeze being required with the ST secondary brazed-plate heat exchanger. See the **ClimaDry II Schematic** for details about the heat exchanger connections.

NOTE: Do not use water-source heat pumps with ClimaDry II as make-up air units. Use equipment specifically designed for make-up air for these applications.

Minimum area and CFM requirements for the conditioned space

Model (ST)	048	060	072	096	120	144	180	240
Charge [oz]	63.00	90.00	99.75	81.00	90.00	97.50	144.00	255.00
TA_{min} ft^2 (m^2)	3.23 (0.30)	4.61 (0.43)	5.11 (0.47)	4.15 (0.39)	4.61 (0.43)	5.00 (0.46)	7.38 (0.69)	11.53 (1.07)
Q_{min} ft^3/min (m^2/min)	107 (3.02)	152 (4.31)	169 (4.78)	137 (3.88)	152 (4.31)	165 (4.67)	244 (6.90)	381 (10.78)

TA_{min} = Minimum conditioned area for venting leaked refrigerant

Q_{min} = Minimum ventilation flow rate for conditioned space if space is less than TA_{min}

GENERAL

Furnish and install ClimateMaster Tranquility (ST) Rooftop Series water-source heat pumps, as indicated on the plans. Equipment shall be completely assembled, piped and internally wired. Capacities and characteristics as listed in the schedule and the specifications that follow.

Units shall be supplied completely factory built capable of operating over an entering water temperature range from 20° to 120°F (-6.7° to 43.3°C) as standard. Equivalent units from other manufacturers may be proposed provided approval to bid is given 10 days prior to bid closing. All equipment listed in this section must be rated and certified in accordance with Air-Conditioning, Heating and Refrigeration Institute / International Standards Organization (AHRI / ISO 13256-1). All equipment must be tested, investigated, and determined to comply with the requirements of the standards for Heating and Cooling Equipment UL 60335-2-40 4th Edition, UL 60335-1 6th Edition for the United States and Can/CSA C22.2 No. 60335-2-40:22, CAN/CSA C22.2 No 60335-1:16 for Canada, by Intertek Testing Laboratories (ETL). The units shall have AHRI / ISO and ETL-US-C labels.

All units shall pass a factory acceptance test. The quality control system shall automatically perform factory acceptance test via computer. A detailed report card from the factory acceptance test shall ship with each unit.

NOTE: If unit fails the factory acceptance test, it shall not be allowed to ship. Unit serial number shall be recorded by factory acceptance test and furnished on report card for ease of unit warranty status.

BASIC CONSTRUCTION

Units shall be designed for outdoor installation and usage and shall be ETL or UL tested to withstand UL rain test standards.

All exterior and other painted surfaces shall be constructed of galvanized steel finished with both sides having powder paint coated surfaces. This corrosion protection system shall meet the stringent 1,000-hour salt spray test per ASTM B117.

Roof shall be constructed of a single piece of steel as described above (except on largest of unit sizes in which case shall be a maximum of two pieces joined by a standing seam construction). All roof edges shall overlap sides of unit and have a 45° lip extending away from unit sides so that rainwater drippage shall not fall on top of access doors.

Access to filters, indoor blower, electrical controls, compressor compartment, and damper section shall be provided by double wall construction for access doors and noncorrosive hardware.

The compressor and electrical control compartment shall be isolated from the system air streams.

Bottom base pan of entire unit shall have no penetrations by bolts or screws. All base pan edges and any openings shall contain one-inch upturns at all edges and shall be sealed with silicone caulking to prevent water from dripping through base pan.

All interior surfaces shall be lined with 1-inch thick (25 mm), 1-½ lb/ft^3 (24 kg/m^3) acoustic-type fiberglass insulation. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the airstream. All air-handling compartments shall utilize foil-faced insulation for ease of cleaning.

Standard cabinet panel insulation must meet NFPA 90A requirements, air erosion and mold growth limits of UL-181, stringent fungal resistance test per ASTM-C1071 and ASTM G21, and shall meet zero level bacteria growth per ASTM G22. **Unit insulation must meet these stringent requirements or unit(s) will not be accepted.**

Entire unit base shall be insulated on the underneath side to provide condensation protection and noise attenuation. The unit shall be furnished with 2-inch (50 mm) filter rails and one set 2-inch (50.8 mm) throwaway filters. Filter rails shall be field convertible without the need for additional parts to accept 4-inch (101.6 mm) filters.

FAN AND MOTOR ASSEMBLY

The blower assembly shall come with an aluminum, backwards-curved centrifugal impeller and a galvanized inlet cone. The motorized impeller is statically and dynamically balanced according to DIN ISO 21940-11 at least with quality level G6.3.

The motor shall be an EC external-rotor design with sealed, long-term, lubricated ball bearings and is made of die-cast aluminum. The motor shall be at least IP54 with class F insulation. The motor shall exceed IE5 class efficiency per IEC 60034-30-2. The motor shall be three-phase with internal over/under voltage and over-temperature detection as well as locked-rotor monitoring.

The fan and motor assembly must be capable of overcoming the external static pressures, up to and including as shown in the unit submittal. Airflow/ Static pressure rating of the unit shall be based on a wet coil with a clean filter in place. Fan and motor assembly shall be mounted on an easily-removable, slide-out assembly with safety stop for easy access and maintenance; motor shall be factory wired with wire of sufficient length to allow fan/motor assembly to be removed from unit and be placed on roof of unit for servicing.

REFRIGERANT CIRCUIT

All units shall contain an R-454B sealed refrigerant circuit including a high-efficiency scroll compressor (dual-scroll compressors for units larger than 7 tons/ 24.6 kW) designed for heat pump operation, a thermostatic expansion valve for refrigerant metering, an enhanced corrugated aluminum lanced fin and rifled copper tube refrigerant-to-air heat exchanger, reversing valve, coaxial (tube-in-tube) refrigerant-to-water heat exchanger, and safety controls including a high pressure switch, low pressure (loss of charge) switch, water coil low temperature sensor, and air coil low temperature sensor. Access fittings shall be factory installed on high and low pressure refrigerant lines to facilitate field service. Activation of any safety device shall prevent compressor operation via a microprocessor lockout circuit. The lockout circuit shall be reset at the thermostat or at the contractor supplied disconnect switch. Units that cannot be reset at the thermostat shall not be acceptable.

The two-stage scroll compressor (036-072) or two single-stage scroll compressors (096-240) will be mounted on external grommets specifically selected for maximized vibration attenuation. Compressor(s) shall be mounted on a double-isolation compressor deck, to further reduce vibration transmission to unit base. Compressor(s) shall have thermal overload protection and be located in an insulated compartment away from air stream to minimize sound transmission.

Refrigerant-to-air heat exchangers shall utilize enhanced corrugated lanced aluminum fins and rifled copper tube construction rated to withstand 650 PSIG (4,481 kPa) refrigerant working pressure. Refrigerant-to-water heat exchangers shall be of copper inner water tube that is deeply fluted, and steel refrigerant outer tube co-axial design, rated to withstand 650 PSIG (4,481 kPa) working refrigerant pressure and 300 PSIG (2,068 kPa) working water pressure. The refrigerant-to-water heat exchanger shall be "electro-coated" with a low-cure cathodic epoxy material a minimum of 0.4-mils-thick (0.4 – 1.5 mils range) on all surfaces. The black-colored coating shall provide a minimum of 1,000 hours salt-spray protection per ASTM B117-97 on all external steel and copper tubing. The material shall be formulated without the inclusion of any heavy metals and shall exhibit a pencil hardness of 2H (ASTM D3363-92A), crosshatch adhesion of 4B-5B (ASTM D3359-95), and impact resistance of 160 in-lbs (184 kg-cm) direct (ASTM D2794-93).

Refrigerant metering shall be accomplished by thermostatic expansion valve only. Expansion valves shall be dual port balanced type with external equalizer for optimum refrigerant metering. Units shall be designed and tested for operating ranges of entering water temperatures from 20° to 120°F (-6.7° to 48.9°C). Reversing valve shall be four-way solenoid activated refrigerant valve, which shall default to heating mode should the solenoid fail to function. If the reversing valve solenoid defaults to cooling mode, an additional low temperature thermostat must be provided to prevent over-cooling an already cold room.

Option: **The unit will be supplied with internally factory mounted two-way water valve with end switch for variable speed pumping requirements. A factory-mounted or field-installed high pressure switch (included with factory-mounted water valve) shall be installed in the water piping to disable compressor operation in the event water pressures build due to water freezing in the piping system.**

Option: **vFlow - The unit will be supplied with internally factory mounted modulating water valve with ΔT control. The factory built-in valve shall modulate water flow through unit based on a field adjustable water temperature difference between the entering and leaving water. The valve shall automatically adjust for operating mode, source water temperature and variations in external head pressure. The valve will also act as a shut-off valve to prevent water flow through the unit when the unit is not activated and will have a minimum position capability.**

Option: **The unit will be supplied with cupro-nickel coaxial water to refrigerant heat exchanger.**

Option: **The Refrigerant Detection System (RDS) package shall consist of the RDS module and sensors to be strategically placed within the cabinet. In the event of a refrigerant leak, the RDS disables compressor operation and the unit blower runs to disperse any concentration of leaked refrigerant in compliance with UL 60335-2-40 safety standards for flammable refrigerants. (Optional for size 036, mandatory for sizes 048-240).**

Option: **Unit shall include ClimaDry II reheat option. Only modulating reheat that will adjust capacity based upon supply air temperature to provide "neutral" (72°F, 22.2°C) constant air temperature will be accepted. "Neutral" supply air temperature shall be provided regardless of entering loop water temperatures or refrigerant condensing pressures. Control of reheat must be accomplished via a humidistat or dehumidistat contact closure. Refrigerant circuit must be AHRI certified. Approved equal manufacturers may provide pre-engineered integrated modulating hot gas reheat within the unit cabinet. Any design costs and costs of field installed items shall be borne by mechanical contractor. Refrigerant circuits that are not AHRI certified when the reheat option is applied will not be accepted. (See ClimaDry II submittal for application details and unit availability.)**

Option: **The unit will be supplied with internally mounted secondary pump for primary/secondary applications, including one-pipe systems.**

DRAIN PAN

The drain pan shall be constructed of 304 stainless steel. This corrosion protection system shall meet the stringent 1,000-hour salt spray test per ASTM B117. Drain pan shall be fully insulated. Drain outlet shall be located at pan as to allow complete and unobstructed drainage of condensate. Drain pan outlet side field selectable/convertible. Drain outlet shall be connected from pan directly to FPT fitting. **No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted.**

ELECTRICAL

A control box shall be located within the unit compressor compartment and shall contain a 75VA transformer with load side circuit breaker protection, 24V-activated, three-pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. Reversing valve and fan motor wiring shall be routed through this electronic controller. Units shall be name-plated for use with time delay fuses or HACR circuit breakers. Unit controls shall be 24 Volt and provide heating or cooling as required by the remote thermostat/sensor. Two compressor units shall have a solid-state time delay relay and random start to prevent both compressors from starting simultaneously.

Option: Disconnect Switch, Non-Fused

Option: Disconnect Switch, Non-Fused and unpowered 115 VAC GFI convenience outlet (separate 115 VAC circuit required by others).

Option: Circuit Breaker

Option: Circuit Breaker and unpowered 115 VAC GFI convenience outlet (separate 115 VAC circuit required by others).

OUTDOOR AIR

The unit shall be supplied as standard with no outdoor air provisions (100% return air).

Option: Manual outside air damper with rain hood and bird screen sized for a maximum capacity of 20% of the total unit air volume for outside air volume.

Option: Two-position motorized outside air damper (opens outside air damper upon compressor contactor activation).

Option: Fully modulating enthalpy controlled economizer, supplied with large diameter ABS gear driven outdoor air and return air dampers. Solid-state economizer logic module shall be Honeywell W7220 series with Honeywell M7215 actuator. The economizer package shall also be supplied with gravity relief damper.

Option: Optional demand control ventilation when optional CO_2 sensor is added to economizer.

ENHANCED SOLID STATE CONTROL SYSTEM (CXM2)

Unit sizes 096 through 240 shall have a solid-state control system. Units utilizing electro-mechanical control shall not be acceptable. The control system microprocessor board shall be specifically designed to protect against building electrical system noise contamination, EMI, and RFI interference. The control system shall interface with a heat pump type thermostat. The control system shall have the following features:

a. Anti-short cycle time delay on compressor operation.
b. Random start on power up mode.
c. Low-voltage protection.
d. High-voltage protection.
e. Unit shutdown on high or low refrigerant pressures.
f. Unit shutdown on low water temperature.
g. Option to reset unit at thermostat or disconnect.
h. Automatic intelligent reset. Unit shall automatically reset the unit 5 minutes after trip if the fault has cleared. If a fault occurs 3 times sequentially without thermostat meeting temperature, then lockout requiring manual reset will occur.
i. Ability to defeat time delays for servicing.
j. The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
k. 24V output to cycle a motorized water valve or other device with compressor contactor.
l. Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.
m. Water coil low temperature sensing (selectable for water or antifreeze).
n. Air coil low temperature sensing.

o. Minimized reversing valve operation (Unit control logic shall only switch the reversing valve when cooling is demanded for the first time. The reversing valve shall be held in this position until the first call for heating, ensuring quiet operation and increased valve life).

p. Emergency shutdown contacts.

q. Entering and leaving water temperature sensing.

r. Leaving air temperature sensing.

s. Compressor discharge temperature sensing.

NOTE: Units not providing the 7 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air-coil low temperature cut-out, and water-coil low temperature cut-out will not be accepted.

When CXM2 is connected to the AWC Thermostat via the myUplink Pro website/mobile app or the Wireless Service Tool directly at the unit, the installer/service technician can; check DIP switch S2 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults. When the AWC99U01 communicating thermostat is used this same functionality can be viewed and adjusted remotely in the web portal or mobile app. Systems not providing remote access, diagnosis, and adjustment functionality will not be accepted.

ENHANCED SOLID STATE CONTROL SYSTEM (DXM2.5)

This control system is a communicating controller for use on unit sizes 036 through 072 only.

DXM2.5 shall have the above-mentioned features of the CXM2 control system along with the following expanded features:

a. Removable thermostat connector.

b. Night setback control.

c. Random start on return from night setback.

d. Override temperature control with two-hour timer for room occupant to override setback temperature at the thermostat.

e. Dry contact night setback output for digital night-setback thermostats.

f. Ability to work with heat pump or heat/cool (Y, W) type thermostats.

g. Ability to work with heat pump thermostats using O or B reversing valve control.

h. Boilerless system heat control at low loop water temperature.

i. Ability to allow up to three units to be controlled by one thermostat.

j. Relay to operate an external damper.

k. Relay to start system pump.

l. 75 VA control transformer. Control transformer shall have load side short circuit and overload protection via a built-in circuit breaker.

NOTE: Units not providing the 7 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air-coil low temperature cut-out, and water coil low temperature cut-out, will not be accepted.

When DXM2.5 is connected to the AWC Thermostat via the myUplink Pro website/mobile app or the Wireless Service Tool directly at the unit,, the installer/service technician can; check and set CFM; check DIP switch S1, S2, and S3 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures - water coil (LT1), air coil (LT2), compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults. When the AWC99U01 communicating thermostat is used this same functionality can be viewed and adjusted remotely with the only portal or mobile app. Systems not providing remote access, diagnosis, and adjustment functionality will not be accepted.

DIGITAL NIGHT SETBACK WITH PUMP RESTART (DXM2.5 W/ ATP32U03C/04C, AWC99U01)

The unit will be provided with a Digital Night Setback feature using an accessory relay on the DXM2.5 controller with an ATP32U03C/04C or AWC99U01 thermostat and an external, field-provided time clock. The external time clock will initiate and terminate the night setback period. The thermostat will have a night setback override feature with a programmable override time period. An additional accessory relay on the unit DXM2.5 controller will energize the building loop pump control for the duration of the override period.

Note: This feature requires additional low voltage wiring. Consult Application Drawings for details.

REMOTE SERVICE SENTINEL (CXM2/DXM2.5)

Solid-state control system shall communicate with thermostat to display (at a compatible thermostat) the unit status, fault status, and specific fault condition, as well as retrieve previously stored fault that caused unit shutdown. The Remote Service Sentinel allows building maintenance personnel or service personnel to diagnose unit from the wall thermostat. The control board shall provide a signal to the thermostat fault light, indicating a lockout. Upon cycling the G (fan) input 3 times within a 60 second time period, the fault light shall display the specific code as indicated by a sequence of flashes. A detailed flashing code shall be provided at the thermostat LED to display unit status and specific fault status such as over/under voltage fault, high pressure fault, low pressure fault, low water temperature fault, etc. Units that do not provide this remote service sentinel shall not be acceptable.

Option: MPC (Multiple Protocol Control) Interface System.

Units shall have all the features listed above and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a two-wire twisted pair shielded cable. The following points must be available at a central or remote computer location:

Units shall have all the features listed above (either CXM2 or DXM2.5) and the control board will be supplied with a Multiple Protocol interface board. Available protocols are BACnet MS/TP, Modbus, or Johnson Controls N2. The choice of protocol shall be field selectable/changeable via the use of a simple selector switch. Protocol selection shall not require any additional programming or special external hardware or software tools. This will permit all units to be daisy chain connected by a two-wire twisted-pair shielded cable. The following points must be available at a central or remote computer location:

a. Space temperature
b. Leaving water temperature
c. Discharge air temperature
d. Command of space temperature setpoint
e. Cooling status
f. Heating status
g. Low temperature sensor alarm
h. Low pressure sensor alarm
i. High-pressure switch alarm
j. Hi/low-voltage alarm
k. Fan "ON/AUTO" position of space thermostat as specified above
l. Unoccupied/occupied command
m. Cooling command

n. Heating command
o. Fan "ON/AUTO" command
p. Fault reset command
q. Itemized fault code revealing reason for specific shutdown fault (any one of 7)

This option also provides the upgraded 75VA control transformer with load-side, short-circuit and overload protection via a built-in circuit breaker.

WARRANTY

ClimateMaster shall warranty equipment for a period of 12 months from startup or 18 months from shipping (which ever occurs first).

Option: Extended 4-year compressor warranty covers compressor for a total of 5 years.

Option: Extended 4-year refrigeration circuit warranty covers coils, reversing valve, expansion valve and compressor for a total of 5 years.

Option: Extended 4-year control board warranty covers the factory-supplied controls for a total of 5 years.

THERMOSTATS

The thermostat shall be a ClimateMaster mechanical- or electronic-type thermostat as selected below with the described features:

a. **Thermostat (Communicating) (AWC99U01)** An electronic communicating web-enabled touchscreen thermostat shall be provided. The thermostat shall offer three stages of heating and two stages of cooling with precise temperature control and have a four-wire connection to the unit. The thermostat shall be capable of manual or automatic change-over operation and shall operate in standard or programmable mode. An integrated humidity-control feature shall be included to control a humidifier and/or a dehumidifier. The thermostat shall include a utility demand-reduction feature to be initiated by an independent time program or an external input. The thermostat shall provide access to via the web portal or mobile application to include temperature adjustment, schedule adjustment including occupied/unoccupied, entering-water temperature, leaving-water temperature, water-coil temperature, air-coil temperature, leaving-air temperature, and compressor-discharge temperature. A graphical system layout to be provided with real-time operating mode information of the temperature sensors for easy diagnostics. The thermostat shall display system faults with probable cause and troubleshooting guidance. The system shall provide in clear language last five faults, time of faults, operating temps at time of fault, and possible reasons for the fault. The thermostat shall provide access for immediate manual control of all outputs via the web portal/mobile application for rapid troubleshooting.

b. **Single-Stage Digital Auto or Manual Changeover (ATA11U01)**
Thermostat shall be a single-stage, digital, auto- or manual-changeover with HEAT-OFF-COOL-AUTO system switch and fan ON-AUTO switch. Thermostat shall have an LCD display with temperature and setpoint(s) in °F or °C. The Thermostat shall provide permanent memory of setpoint(s) without batteries. A fault LED shall be provided to display specific fault condition. Thermostat shall provide temperature display offset for custom applications.

c. **Multi-stage Manual Changeover Programmable 5/2 Day (ATP21W02)**
Thermostat shall be 5-day/2-day programmable (with up to four setpoints per day), multi-stage (2H/1C), manual changeover with HEAT-OFF-COOL-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have an LCD display with temperature, setpoint(s), mode, and status indication. The temperature indication shall be selectable for °F or °C. The thermostat shall provide permanent memory of setpoint(s) without batteries. Thermostat shall provide convenient override feature to temporarily change setpoint.

d. **Multi-stage Automatic or Manual Changeover Programmable 7 Day (ATP32U03C)**
Thermostat shall be 7-day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have a blue backlit dot-matrix LCD display with temperature, setpoints, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12- or 24-hour clock. Fault identification shall be provided (when used with ClimateMaster CXM2 or DXM2.5 controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating-setpoint range limit, cooling-setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

e. **Multistage Automatic or Manual Changeover Programmable 7-Day with Humidity Control (ATP32U04C)**
Thermostat shall be 7-day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier. Thermostat shall have a blue backlit dot-matrix LCD display with temperature, relative humidity, setpoints, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided (when used with ClimateMaster CXM2 or DXM2.5 controls) to simplify troubleshooting by providing specific unit fault at the thermostat with red backlit LCD during unit lockout. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating-setpoint range limit, cooling-setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring options and for setup of servicing contractor name and contact information. Thermostat shall allow the use of an accessory remote and/or outdoor temperature sensor (AST008). Thermostat navigation shall be accomplished via five buttons (up/down/right/left/select) with menu-driven selections for ease of use and programming.

f. **CM100 - Multi-stage Automatic or Manual Changeover digital thermostat (ATA32V01)**
Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have a green backlit LED display with temperature, setpoints, mode, and status indication via a green (cooling) or red(heating) LED. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12- or 24-hour clock. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating-setpoint range limit, cooling-setpoint range limit, temperature display offset, keypad lockout, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide an installer setup for configuring. Thermostat navigation shall be accomplished via four buttons (Mode/fan/down/up) with menu-driven selections for ease of use and programming.

g. **CM300 – Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V02C)**
Commercial version shall be 7-day programmable with 4 occupied/unoccupied periods per day with up to 4-hour override. Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings, Wi-Fi, pre-occupancy purge-fan option, night time control of display backlight, bi-color LED indicates a heating or cooling demand, keypad lock, title 24 compliant, openADR2.0b certified with Skyport web portal.

h. **CM500 – Color Touchscreen Display, Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V03C)**
Thermostat shall have color resistive-touchscreen display with space temperature, relative humidity, setpoints, mode, status indication and local weather (if connected to Wi-Fi). Commercial version shall be 7-day programmable with 4 occupied/unoccupied periods per day with up to 4-hour override. Multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings, Wi-Fi, pre-occupancy purge-fan option, customizable screen saver and background displays, indicator on display indicates a heating or cooling demand, set-point lock, title 24 compliant, openADR2.0b certified with Skyport web portal. Capable of being monitored by 3rd-party software. Compatible with AST014 Wi-Fi remote sensor. Configurator mobile app or web portal for easy setup. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12- or 24-hour clock. The thermostat shall provide permanent memory of setpoints without batteries. Thermostat shall provide heating-setpoint range limit, cooling-setpoint range limit, temperature display offset, dead-band range setting, and inter-stage differential settings. Thermostat shall provide progressive recovery to anticipate time required to bring space temperature to the next programmed event. Thermostat shall provide access to a web portal and mobile app for installer setup for configuring options. Thermostat shall have menu-driven selections for ease of use and programming.

WIRELESS SERVICE TOOL

Allows installation and service personnel to access the configuration and service modes of the unit control.

a. Configure the airflow, pump, or modulating valve operation etc.

b. Diagnose by viewing fault history and operating conditions at the time of fault and manually operating the unit.

DDC SENSORS

ClimateMaster wall-mounted DDC sensor to monitor room temperature and interfaces with optional interface system described above. Several types as described below:

a. Sensor only with no display (MPC).

b. Sensor with setpoint adjustment and override (MPC only).

c. Sensor with setpoint adjustment and override, LCD display, status/fault indication (MPC).

ROOF CURBS

A 14-inch high (356 mm) knockdown roof curb for flat roofs is available as standard in down-discharge configuration. Other curbs are available by special request.

Option: A 24-inch-high (610 mm) knockdown roof curb for flat roofs with downward discharge configuration.

⚠ NOTICE

This product specification document is furnished as a means to copy and paste ClimateMaster product information into project specification. It is not intended to be a complete list of product requirements. This document is an excerpt from the product submittal and must not be used without consulting the complete product submittal. For complete product installation and application requirements, please consult the complete product submittal. ClimateMaster is not responsible for misuse of this document or a failure to adequately review specific requirements in the product catalog.

Date	Section	Description
10/15/25	Table of Contents	Added subsections
	Electrical Data	Updated all tables and added a table for Standard units with ISP and ClimaDry II
	Dimensional Data	Updated dimensional drawings
	ClimaDry II	Added section
	All	Updated organization, figure references, and table references
	Engineering Specifications	Added ClimaDry II and Internal Secondary Pump (ISP) options
02/20/25	All	• Removed Neutral Connection requirement and related notices and warnings. • Updated references to a "diagnostic tool" to the "Wireless Service Tool"
01/16/25	All	Updated naming conventions for CXM2, DXM2.5, and AWC Thermostat
	Blower Performance Data	Added note concerning maximum allowable altitude of installation
	Equipment Specs	• Updated Unit Maximum Water Working Pressure • Removed mention of non-applicable condensate overflow protection.
08/01/24	All	Corrected size offerings
05/14/24	All	First Published

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