Tranquility® 22 (TY) Compact Two Stage Series

Submittal Data

Models TYH/V024-060, 60Hz - HFC-410A

LC992

Rev.: January 24, 2023

CLIMATEMASTER®
A NIBE GROUP MEMBER

TY Compact Two Stage Series

THE TRANQUILITY® 22 (TY) COMPACT TWO STAGE SERIES

The TY comes with all the reliability features the ClimateMaster Tranquility® Series is known for. They include superb efficiency ratings, quiet operation and application flexibility. Tranquility TY units are available in vertical upflow and horizontal configurations in capacities of 24, 30, 36, 42, 48, and 60 Mbtuh. Other features include the next generation Copeland UltraTech™ two-stage scroll compressor, variable speed ECM fan motor, and digital communicating controls. It also has one of the industry's smallest footprints, making it suitable for installation in tight places and for replacement/retrofit projects.

Available in sizes 2 tons (7.0 kW) through 5 tons (17.6 kW) with multiple cabinet options (vertical upflow and horizontal) the Tranquility TY offers a wide range of units for most any installation. The Tranquility TY has an extended range refrigerant circuit, capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Standard features are many. Copeland UltraTech two-stage unloading scroll compressor, ECM variable fan, microprocessor controls, galvanized steel cabinet, insulated, non-corrosive polymer drain pan, and acoustic type fiber insulation are just some of the features of the innovative Tranquility TY Series.

ClimateMaster's exclusive double isolation compressor mounting system makes the Tranquility TY one of the quietest units on the market. Compressors are mounted on specially engineered sound tested EPDM grommets to a heavy gauge mounting plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration/sound attenuation. The easy access control box makes installing and maintaining the unit easier than any other water-source heat pump currently in production. Options such as coated air coil, DDC controls, and high efficiency MERV rated air filters allow customized design solutions.

iGate® 2 technology is the next generation in intelligent control by using two-way communication to provide a gateway into the system. The iGate 2 control system allows end-users and contractors to monitor the performance of the unit, custom tailor its operation, and diagnose any issues, right from the thermostat.

The Tranquility 22 (TY) Compact Two Stage 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

- iGate® 2 Communicating Controls Powered by DXM2.5
  - Multiple communication pathways,
    - Cloud-based connectivity via iGate 2 Wi-Fi communicating color touch screen thermostat for remote monitoring, access, and diagnosis. Including the new functionality for contractors/ building engineers to monitor and make mass changes on multi-unit systems
    - Connect directly to the system with use of a handheld service tool
  - Provides real-time unit operating conditions
  - Reduces start-up, commissioning, and service time by removing the need for hard tooling to take temperature measurements
  - Captures operating conditions in the event of a safety shutdown
- All sizes 024 (2 ton, 7.0 kW) through 060 (5 tons, 17.6 kW) exceed ASHRAE 90.1 efficiencies
- EarthPure® (HFC-410A) refrigerant
- Copeland UltraTech™ two-stage unloading scroll compressors
- Intelligent variable speed CV ECM fan motors for precise airflow control and soft start feature
- Part load operation significantly lowers annual operating costs
- Galvanized steel construction
- Insulated non-corrosive polymer drain pan
- Cabinet lined with acoustic type fiber insulation
- Unique double isolation compressor mounting with vibration isolation for quiet operation
- Insulated divider and separate compressor/air handler compartments
- TXV metering device
- Field convertible supply air arrangement (horizontal configurations only)
- Easy access swing out control box
- Eight Safeties Standard

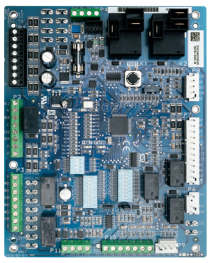
OPTIONS

- Extended range insulation for geothermal applications
- BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Tin-plated air coils for added protection from formicary corrosion
- Unit integrated power disconnect
- Easy to clean rust prohibitive stainless steel drain pans

ACCESSORIES

- Wi-Fi communicating color touch screen thermostat
- Wide variety of thermostat options to meet your application needs
- Various length braided hose kits with optional water valves, PT plugs, blowdown valve, flow limiting, and strainer options
- Externally mounted manual and motorized water valves
- 1” Merv 8 filter
- 2” Merv 8 or 13 filters
- Architecturally pleasing wall sensors for connection to DDC (MPC) controls
- Electric emergency duct heaters

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



Tranquility® 22 (TY) Compact Two Stage Series 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/ efficiency by precisely controlling smart components.

Monitor/Configure – Installers can configure from the myUplink PRO website, mobile app, iGate 2 Communicating AWC Thermostat, or diagnostic tool, including: 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.

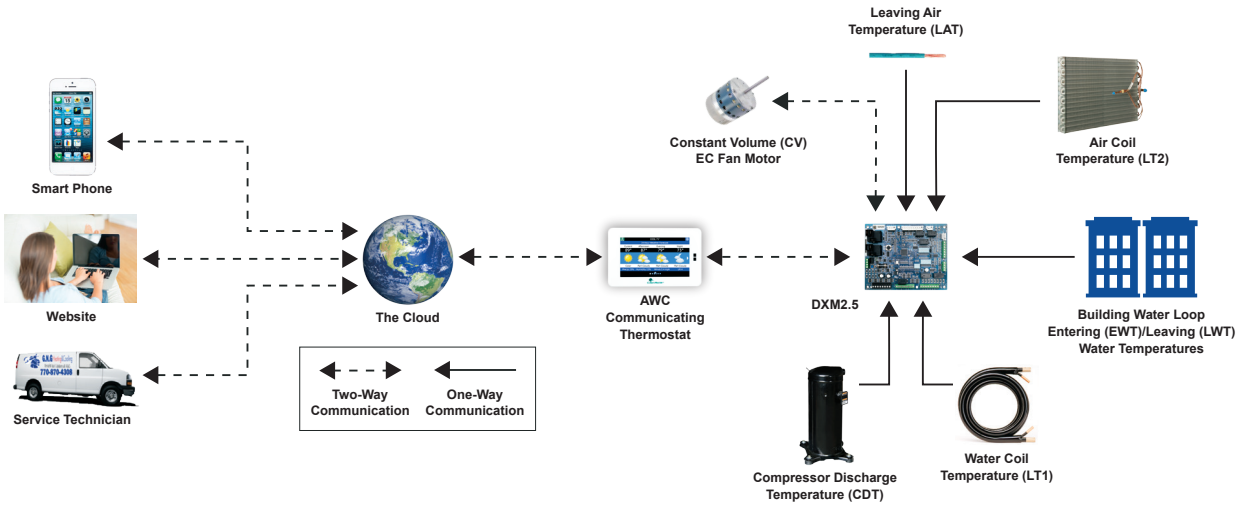
Precise Control – The new DXM2.5 board enables intelligent, 2-way communication between the DXM2.5 board and smart components like the communicating thermostat/diagnostic tool and constant volume (CV) EC fan motor. The advanced DXM2.5 board uses information received from the smart components and temperature sensors to precisely control operation of the variable speed CV EC fan motor 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 Communicating Thermostat, handheld service tool and the web portal/mobile app on the internet.

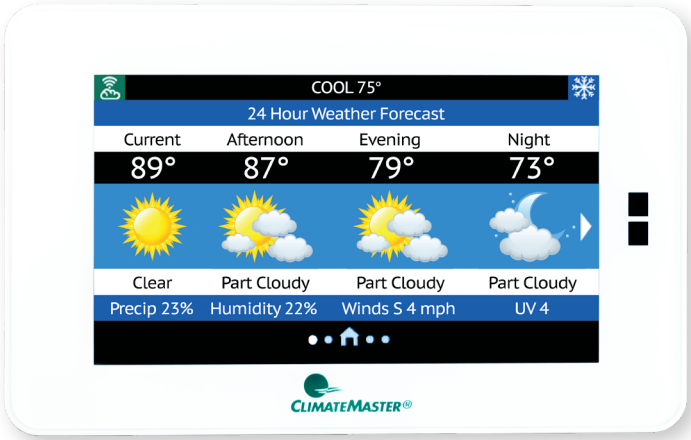
iGate 2 Thermostat Service Warnings notify the homeowner and contractor of a fault and displays fault descriptions by app notifications/email with possible causes. Additionally, the current system status can be viewed graphically on the web portal and mobile app.

In iGate 2 Service Mode, the service personnel can access fault description, possible causes and most importantly, the conditions (temp, flow, i/o conditions, configuration) at the time of the fault. Manual Operation mode allows the service personnel to manually command operation for any of the thermostat outputs, blower speed, to help troubleshoot specific components. This operation can either be conduct at the unit with a communicating thermostat/diagnostic tool or remotely with mobile app/website when the AWC Communicating 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 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

Touch Screen Interface
A brilliantly customizable touch screen monitor for simple control.

Seamless Integration
Between your iGate® 2 Communicating (AWC) Thermostat and Tranquility comfort system.

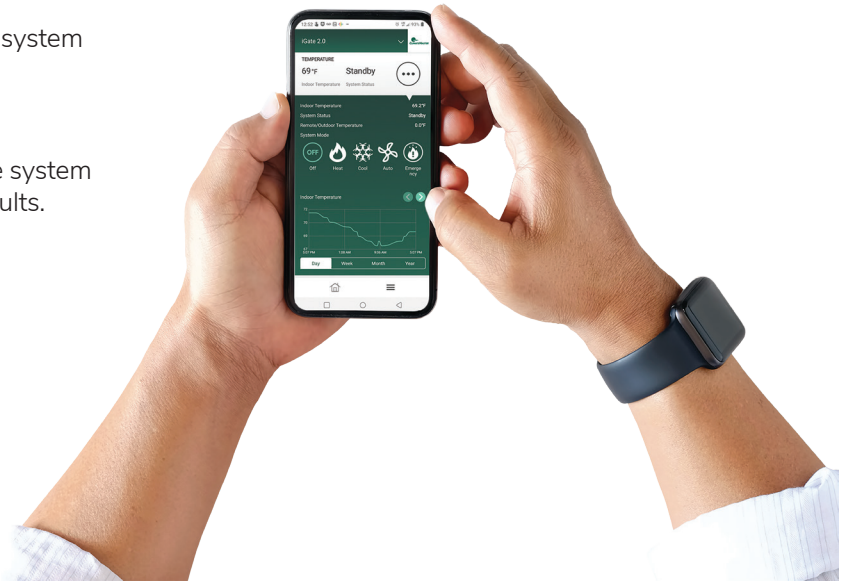
(Mobile) Remote System Control
Control temperature and schedule from anywhere in the world.

Early Fault Warnings
Alerts you and your contractor of potential system faults in the future.

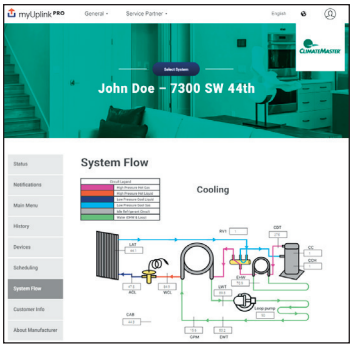
Remote Diagnostics
Enable the contractor to remotely diagnose system issues, adjust system settings, and reset faults.

Real-Time Operations Data & 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 diagnosis capabilities without the large expense of a building management system.



HVAC Professional | User Experience



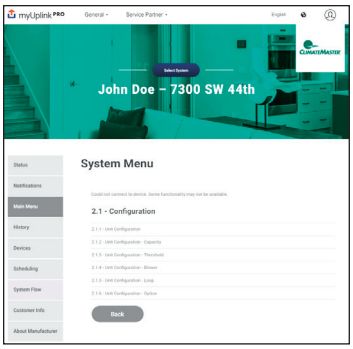
The iGate® 2 is more than just a smart thermostat for your residential or commercial customer, it's a business opportunity. Our new thermostat works with your customers' Tranquility comfort systems to provide the most efficient link between their system and your services. The customization of monitoring 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 diagnosis systems remotely
- Secure internet connection keeps homeowner information private
- Access thermostat(s) through Android and iPhone mobile apps

Homeowner | User Experience



The iGate® 2 combines a Wi-Fi thermostat and advanced unit controls to communicate the systems operation information to the cloud. From any internet connected device or smart phone, homeowners can control and monitor there systems from anywhere in the world. iGate 2 offers homeowners 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 diagnosis 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 interface
- Sleek, intuitive button control
- 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

The Intelligent Constant Volume (CV) ECM blower motor provides unmatched functionality that saves installing and service technicians time while also providing increased comfort levels to occupants.

CV ECM's are programed to maintain a constant CFM across a wide range of external static pressures (ESP). This functionality differs from traditional PSC or even Constant Torque (CT) ECM's. With traditional PSC and CT ECM fan motors, as ESP is increased CFM is reduced. To increase or decrease the speed of the fan motor requires a fan motor switch or a technician to wire into a different motor tap. CT ECM's provide increased efficiency over PSC motors but with no additional functionality. With a CV ECM, as changes in ESP occur the fan motor will adjust its speed to deliver the desired CFM (within its operating range). This ensures the system is delivering the airflow and capacity it was designed for.

A major benefit of the CV ECM over other fan motor types its ability to adjust airflow remotely through the iGate® 2 web portal/mobile app or directly at the unit with a communicating diagnostic service tool or thermostat. Airflow levels can be adjusted in increments of 25 CFM from the units minimum and maximum CFM range (see CV ECM configuration table for details). This functionality allows technicians to dial in airflow during start-up and commissioning via an easy to use service tool. During operation occupants may have a desire for airflow adjustments. Reducing CFM can reduce airflow sound levels and increase cooling dehumidification (latent capacity). Technicians can easily make these adjustments without making wiring changes reducing service time with minimal disruption to the occupants.

The fan motor operating modes include:

- First Stage Cooling (Y1 & O)
- Second Stage Cooling (Y1, Y2, & O)
- First Stage Heating (Y1)
- Second Stage Heating (Y1 & Y2)
- Fan (G with no Y1, Y2, or W)

Airflow Configuration Screen on Mobile App

The CV ECM motor includes **"soft start"** and **"ramp down"** features. The soft start feature gently increases the motors rpm at blower start up resulting quieter blower start cycles. Likewise, the ramp down feature allows the blower to slowly decrease rpm to a full stop resulting in a quieter end to each blower cycle. The ramp down feature (also known as the heating or cooling "Off Delay") also has the functionality to be field selected by the technician in the allowable range of 0 to 255 seconds.

Reference Calculations

HEATING

$$LWT = EWT - \frac{HE}{GPM \times Constant}$$

$$LAT = EAT + \frac{HC}{CFM \times 1.08}$$

COOLING

$$LWT = EWT + \frac{HR}{GPM \times Constant} \qquad LC = TC - SC$$

$$LAT\ (DB) = EAT\ (DB) - \frac{SC}{CFM \times 1.08} \qquad S/T = \frac{SC}{TC}$$

Constant = 500 for water, 485 for antifreeze

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

Airflow	Water Flow	Est 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
CDT	Compressor discharge temperature
CFM	Airflow, cubic feet per minute
COP	Coefficient of performance = BTUH output/BTUH input
CT ECM	Electronic commutated constant torque fan motor
CV ECM	Electronic commutated constant volume fan motor
DB	Dry bulb temperature, °F
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
HR	Total heat of rejection, BTUH
HWC	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
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

Step 1 Determine the actual heating and cooling loads at the desired dry bulb and wet bulb conditions.

Step 2 Obtain the following design parameters: Entering water temperature, water flow rate in GPM, air flow in CFM, water flow pressure drop and design wet and dry bulb temperatures. Air flow CFM should be between 300 and 450 CFM per ton. Unit water pressure drop should be kept as close as possible to each other to make water balancing easier. Go to the appropriate tables and find the proper indicated water flow and water temperature.

Step 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.

Step 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).

Step 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.

Step 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.

Step 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.

Step 8 When completed, calculate water temperature rise and assess the selection. If the units selected are not within 10% of the load calculations, then review what effect changing the GPM, water temperature and/or air flow and air temperature would have on the corrected capacities. If the desired capacity cannot be achieved, select the next larger or smaller unit and repeat the procedure. Remember, when in doubt, 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 ..... 22,000 BTUH
Sensible Cooling ..... 18,200 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.) ..... 4.5 GPM
Airflow ..... 600 CFM

Steps 3, 4 & 5 HP Selection:

After making our preliminary selection (TYH024 - Full Load), we enter the tables at design water flow and water temperature and read Total Cooling, Sens. Cooling and Heat of Rej. capacities:

Total Cooling ..... 22,500 BTUH
Sensible Cooling ..... 16,500 BTUH
Heat of Rejection ..... 28,800 BTUH

Steps 6 & 7 Entering Air and Airflow Corrections:

Next, we determine our correction factors.

		Table		Ent Air		Air Flow		Corrected
Corrected Total Cooling	=	22,500	x	0.976	x	0.967	=	21,235
Corrected Sens Cooling	=	16,500	x	0.919	x	1.089	=	16,513
Corrected Heat of Reject	=	28,800	x	0.969	x	0.972	=	27,126

Step 8 Water Temperature Rise Calculation and Assessment:

Actual Temperature Rise ..... 12.1°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 within 1,000 Btuh of the actual indicated load.

TY Series Nomenclature

1 2	3	4 5 6	7	8	9	10	11	12	13	14	15
TY	V	024	A	G	D	3	0	B	L	T	S

SERIES
TY = Tranquility® 22 Digital

CONFIGURATION
V = Vertical Up
H = Horizontal

UNIT SIZE
024
030
036
042
048
060

REVISION LEVEL
A = 030, 042, 048
B = 024, 036, 060

VOLTAGE
G = 208/230/60/1
E = 265/60/1
F = 460/60/3
H = 208/230/60/3

CONTROLS
D = DXM2.5
P = DXM2.5 w/MPC

w/DISCONNECT { B = DXM2.5 / S = DXM2.5 w/MPC

CABINET

OPTION	RANGE	ULTRA QUIET	1" FILTER RAIL	2" FILTER RAIL	1" FILTER FRAME	2" FILTER FRAME
1	EXTENDED RANGE	NO	YES	NO		
A			NO			YES
J			NO	YES	NO	
K			NO		YES	NO
2		YES	YES	NO		
C			NO			YES
L			NO	YES	NO	
M			NO		YES	NO
3	STANDARD RANGE	NO	YES	NO		
E			NO			YES
N			NO	YES	NO	
P			NO		YES	NO
4		YES	YES	NO		
G			NO			YES
R			NO	YES	NO	
S			NO		YES	NO

WATER CIRCUIT OPTIONS
0 = None

HEAT EXCHANGER OPTIONS

	Non-Coated Air Coil		Tin Plated Air Coil	
	Copper	Cupro-Nickel	Copper	Cupro-Nickel
Standard	B	G	A	J

RETURN AIR FLOW CONFIGURATION
P = Left Return
C = Right Return
S = Left Return, Stainless Steel Drain Pan
T = Right Return, Stainless Steel Drain Pan

SUPPLY AIR FLOW & MOTOR CONFIGURATION

	Supply	Configuration	Motor
T	Top	TYV	ECM
B	Back	TYH	ECM
S	Straight	TYH	ECM

STANDARD
S = Standard

Performance Data – AHRI/ASHRAE/ISO 13256-1

ASHRAE/AHRI/ISO 13256-1. English (I-P) Units

Model	Water Loop Heat Pump				Ground Water Heat Pump				Ground Loop Heat Pump			
	Cooling 86°F		Heating 68°F		Cooling 59°F		Heating 50°F		Full Cool 77°F Part Cool 68°F		Full Heat 32°F Part Heat 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
TY*024 Part	18,100	16.1	20,600	5.2	20,300	27.2	16,700	4.4	19,400	22.2	14,700	4.0
TY*024 Full	23,700	14.3	28,000	4.6	26,500	21.7	23,000	4.1	24,600	16.0	17,800	3.6
TY*030 Part	21,900	15.2	26,300	5.0	24,900	24.8	22,000	4.3	24,200	20.9	19,400	3.9
TY*030 Full	28,500	14.0	35,800	4.6	32,300	20.7	30,000	4.2	29,900	15.7	23,800	3.6
TY*036 Part	25,800	17.2	29,900	5.3	29,000	29.4	24,900	4.6	27,300	23.4	21,500	4.0
TY*036 Full	34,300	15.1	42,000	4.6	38,200	22.3	35,100	4.3	35,200	16.7	27,300	3.6
TY*042 Part	31,000	15.8	36,800	5.1	35,200	26.4	30,500	4.3	34,000	22.0	26,900	3.8
TY*042 Full	41,100	14.3	50,200	4.6	46,300	21.3	42,300	4.1	43,100	16.1	33,300	3.4
TY*048 Part	34,100	15.2	39,500	5.5	39,200	26.8	32,600	4.6	37,600	21.2	29,200	4.1
TY*048 Full	45,900	14.0	53,800	4.9	51,800	20.9	45,000	4.4	48,100	15.5	35,600	3.7
TY*060 Part	45,500	17.7	49,000	5.3	50,400	28.9	39,800	4.5	48,600	23.7	34,800	4.0
TY*060 Full	61,700	15.7	67,500	4.8	68,000	22.7	55,400	4.3	63,200	17.3	43,700	3.6

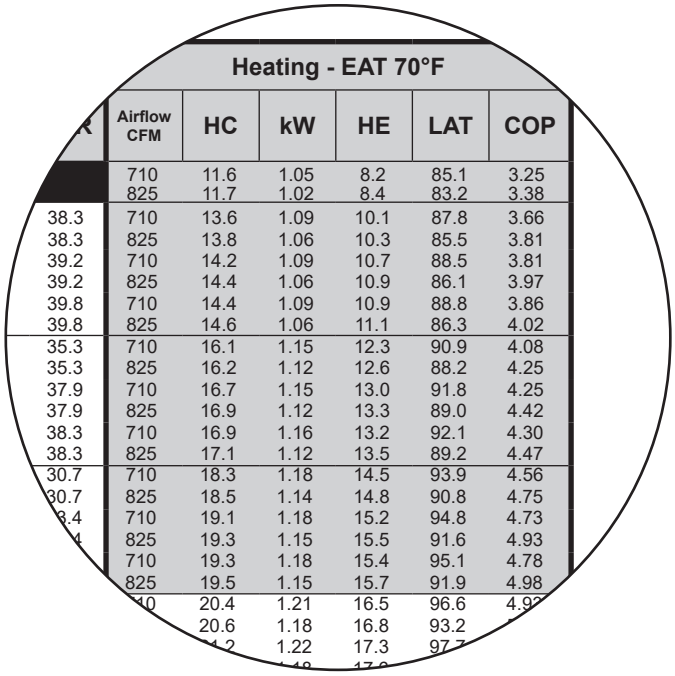
Cooling capacities based upon 80.6°F DB, 66.2°F WB entering air temperature
Heating capacities based upon 68°F DB, 59°F WB entering air temperature
Ground Loop Heat Pump ratings based on 15% antifreeze solution
All ratings based upon operation at lower voltage of dual voltage rated models
* Includes vertical and horizontal configurations

ASHRAE/AHRI/ISO 13256-1. Metric (S-I) Units

Model	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 Cool 25°C Part Cool 20°C		Full Heat 0°C Part Heat 5°C	
	Capacity kW	EER Btuh/W	Capacity kW	COP	Capacity kW	EER Btuh/W	Capacity kW	COP	Capacity kW	EER Btuh/W	Capacity kW	COP
TY*024 Part	5.30	4.7	6.04	5.2	5.95	8.0	4.89	4.4	5.68	6.5	4.31	4.0
TY*024 Full	6.94	4.2	8.20	4.6	7.76	6.4	6.74	4.1	7.21	4.7	5.22	3.6
TY*030 Part	6.42	4.5	7.71	5.0	7.30	7.3	6.45	4.3	7.09	6.1	5.69	3.9
TY*030 Full	8.35	4.1	10.49	4.6	9.47	6.1	8.79	4.2	8.76	4.6	6.98	3.6
TY*036 Part	7.56	5.0	8.76	5.3	8.50	8.6	7.30	4.6	8.00	6.9	6.30	4.0
TY*036 Full	10.05	4.4	12.31	4.6	11.19	6.5	10.28	4.3	10.31	4.9	8.00	3.6
TY*042 Part	9.09	4.6	10.79	5.1	10.32	7.7	8.94	4.3	9.96	6.4	7.88	3.8
TY*042 Full	12.05	4.2	14.71	4.6	13.57	6.2	12.40	4.1	12.63	4.7	9.76	3.4
TY*048 Part	9.99	4.5	11.58	5.5	11.49	7.9	9.55	4.6	11.02	6.2	8.56	4.1
TY*048 Full	13.45	4.1	15.77	4.9	15.18	6.1	13.19	4.4	14.10	4.5	10.43	3.7
TY*060 Part	13.3	5.2	14.36	5.1	14.77	8.5	11.66	4.3	14.24	6.9	10.20	3.9
TY*060 Full	18.1	4.6	19.78	4.5	19.93	6.7	16.24	4.0	18.52	5.1	12.80	3.5

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
All ratings based upon operation at lower voltage of dual voltage rated models

For operation in the shaded area when water is used in lieu 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, appropriate levels of a proper antifreeze solution should be used in systems with leaving water temperatures of 40°F [4.4°C] or below and the JW3 jumper should be clipped. 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. JW3 should never be clipped for standard range equipment or systems without antifreeze.



Heating - EAT 70°F						
R	Airflow CFM	HC	kW	HE	LAT	COP
	710	11.6	1.05	8.2	85.1	3.25
	825	11.7	1.02	8.4	83.2	3.38
38.3	710	13.6	1.09	10.1	87.8	3.66
38.3	825	13.8	1.06	10.3	85.5	3.81
39.2	710	14.2	1.09	10.7	88.5	3.81
39.2	825	14.4	1.06	10.9	86.1	3.97
39.8	710	14.4	1.09	10.9	88.8	3.86
39.8	825	14.6	1.06	11.1	86.3	4.02
35.3	710	16.1	1.15	12.3	90.9	4.08
35.3	825	16.2	1.12	12.6	88.2	4.25
37.9	710	16.7	1.15	13.0	91.8	4.25
37.9	825	16.9	1.12	13.3	89.0	4.42
38.3	710	16.9	1.16	13.2	92.1	4.30
38.3	825	17.1	1.12	13.5	89.2	4.47
30.7	710	18.3	1.18	14.5	93.9	4.56
30.7	825	18.5	1.14	14.8	90.8	4.75
8.4	710	19.1	1.18	15.2	94.8	4.73
4	825	19.3	1.15	15.5	91.6	4.93
	710	19.3	1.18	15.4	95.1	4.78
	825	19.5	1.15	15.7	91.9	4.98
	10	20.4	1.21	16.5	96.6	4.93
		20.6	1.18	16.8	93.2	
		21.2	1.22	17.3	97.7	

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).

Performance Data – TY H/V 024 (Part Load)

600 CFM Nominal (Rated) Airflow Cooling, 600 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	5.00	3.65	8.4						10.757	1.12	6.921	84.6	2.8
30	2.50	0.81	1.9	22.825	15.401	0.62	24.947	36.7	12.477	1.14	8.582	87.2	3.2
	3.80	1.82	4.2	22.992	15.408	0.58	24.962	39.8	13.070	1.15	9.154	88.1	3.3
	5.00	2.90	6.7	23.032	15.367	0.56	24.939	41.2	13.370	1.15	9.444	88.6	3.4
40	2.50	0.51	1.2	22.388	15.200	0.70	24.784	31.9	14.832	1.17	10.851	90.8	3.7
	3.80	1.39	3.2	22.710	15.358	0.65	24.913	35.2	15.570	1.18	11.559	92.0	3.9
	5.00	2.35	5.4	22.824	15.400	0.62	24.947	36.7	15.941	1.18	11.916	92.5	4.0
50	2.50	0.33	0.8	21.743	14.840	0.80	24.477	27.1	17.145	1.19	13.070	94.4	4.2
	3.80	1.10	2.6	22.201	15.097	0.73	24.699	30.3	18.009	1.20	13.898	95.7	4.4
	5.00	1.96	4.5	22.383	15.197	0.70	24.782	31.8	18.442	1.21	14.312	96.4	4.5
60	2.50	0.25	0.6	20.906	14.384	0.92	24.048	22.7	19.395	1.22	15.224	97.9	4.7
	3.80	0.94	2.2	21.484	14.695	0.84	24.346	25.6	20.363	1.23	16.151	99.4	4.8
	5.00	1.70	3.9	21.727	14.831	0.80	24.469	27.0	20.844	1.24	16.610	100.1	4.9
70	2.50	0.24	0.6	19.895	13.884	1.06	23.521	18.7	21.560	1.25	17.294	101.2	5.1
	3.80	0.85	2.0	20.575	14.214	0.97	23.876	21.3	22.604	1.26	18.293	102.8	5.2
	5.00	1.55	3.6	20.870	14.365	0.93	24.030	22.5	23.116	1.27	18.783	103.6	5.3
80	2.50	0.26	0.6	18.723	13.375	1.23	22.914	15.2	23.617	1.28	19.262	104.4	5.4
	3.80	0.83	1.9	19.489	13.700	1.12	23.309	17.4	24.704	1.29	20.302	106.0	5.6
	5.00	1.47	3.4	19.829	13.853	1.07	23.486	18.5	25.228	1.30	20.805	106.8	5.7
90	2.50	0.29	0.7	17.402	12.873	1.42	22.247	12.3	25.541	1.30	21.104	107.3	5.8
	3.80	0.83	1.9	18.238	13.183	1.30	22.667	14.1	26.631	1.31	22.151	109.0	5.9
	5.00	1.43	3.3	18.616	13.332	1.24	22.859	15.0	27.146	1.32	22.646	109.8	6.0
100	2.50	0.30	0.7	15.945	12.378	1.64	21.538	9.7	Operation Not Recommended				
	3.80	0.82	1.9	16.837	12.676	1.50	21.968	11.2					
	5.00	1.40	3.2	17.244	12.817	1.44	22.169	11.9					
110	2.50	0.26	0.6	14.360	11.865	1.89	20.803	7.6					
	3.80	0.78	1.8	15.296	12.167	1.74	21.232	8.8					
	5.00	1.36	3.1	15.726	12.306	1.67	21.434	9.4					
120	2.50	0.13	0.3	12.658	11.290	2.17	20.060	5.8					
	3.80	0.67	1.6	13.626	11.623	2.01	20.477	6.8					
	5.00	1.26	2.9	14.074	11.772	1.93	20.675	7.3					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 024 (Full Load)

750 CFM Nominal (Rated) Airflow Cooling, 750 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	6.00	4.80	11.1						15.583	1.48	10.517	87.2	3.1
30	3.00	1.18	2.7	29.725	19.717	1.10	33.481	27.0	17.490	1.53	12.257	89.5	3.3
	4.50	2.43	5.6	30.231	20.140	1.02	33.703	29.7	18.342	1.56	13.036	90.6	3.5
	6.00	3.93	9.1	30.470	20.355	0.97	33.783	31.4	18.811	1.57	13.464	91.2	3.5
40	3.00	0.83	1.9	28.965	19.167	1.20	33.075	24.0	20.432	1.61	14.948	93.2	3.7
	4.50	1.93	4.5	29.539	19.573	1.13	33.387	26.2	21.468	1.63	15.896	94.4	3.9
	6.00	3.27	7.6	29.807	19.782	1.09	33.521	27.4	22.035	1.65	16.415	95.1	3.9
50	3.00	0.61	1.4	28.086	18.640	1.31	32.570	21.4	23.355	1.68	17.622	96.8	4.1
	4.50	1.59	3.7	28.742	19.023	1.23	32.948	23.3	24.559	1.71	18.722	98.3	4.2
	6.00	2.79	6.5	29.049	19.223	1.19	33.122	24.3	25.215	1.73	19.320	99.1	4.3
60	3.00	0.50	1.2	27.062	18.135	1.45	31.994	18.7	26.232	1.75	20.246	100.3	4.4
	4.50	1.37	3.2	27.815	18.496	1.35	32.415	20.6	27.580	1.79	21.470	102.0	4.5
	6.00	2.46	5.7	28.168	18.685	1.30	32.617	21.6	28.307	1.81	22.128	102.9	4.6
70	3.00	0.46	1.1	25.868	17.644	1.61	31.375	16.0	29.033	1.83	22.783	103.8	4.6
	4.50	1.24	2.9	26.731	17.990	1.49	31.816	17.9	30.491	1.88	24.092	105.6	4.8
	6.00	2.24	5.2	27.136	18.168	1.44	32.035	18.9	31.268	1.90	24.786	106.5	4.8
80	3.00	0.46	1.1	24.477	17.148	1.83	30.736	13.3	31.727	1.91	25.194	107.1	4.9
	4.50	1.19	2.7	25.463	17.493	1.68	31.180	15.2	33.251	1.97	26.540	109.0	5.0
	6.00	2.10	4.9	25.928	17.667	1.61	31.404	16.2	34.050	2.00	27.239	109.9	5.0
90	3.00	0.48	1.1	22.862	16.612	2.12	30.105	10.8	34.278	2.01	27.437	110.2	5.0
	4.50	1.16	2.7	23.984	16.982	1.92	30.531	12.5	35.816	2.07	28.761	112.1	5.1
	6.00	2.03	4.7	24.515	17.160	1.83	30.752	13.4	36.604	2.10	29.427	113.1	5.1
100	3.00	0.49	1.1	20.994	15.983	2.49	29.505	8.4	Operation Not Recommended				
	4.50	1.15	2.7	22.265	16.414	2.24	29.899	10.0					
	6.00	1.98	4.6	22.869	16.614	2.12	30.107	10.8					
110	3.00	0.45	1.0	18.841	15.184	2.97	28.963	6.4					
	4.50	1.10	2.6	20.277	15.729	2.65	29.308	7.7					
	6.00	1.92	4.4	20.960	15.971	2.50	29.495	8.4					
120	3.00	0.33	0.8	16.369	14.104	3.56	28.507	4.6					
	4.50	1.01	2.3	17.989	14.834	3.16	28.788	5.7					
	6.00	1.83	4.2	18.760	15.152	2.99	28.946	6.3					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 030 (Part Load)

750 CFM Nominal (Rated) Airflow Cooling, 750 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	6.0	4.4	10.2						15.7	1.49	10.6	87.3	3.1
30	3.0	1.6	3.6	27.1	17.7	0.85	30.0	31.9	17.2	1.51	12.0	89.1	3.3
	4.5	2.5	5.8	27.3	17.7	0.79	30.0	34.5	17.8	1.52	12.6	89.9	3.4
	6.0	3.6	8.4	27.3	17.8	0.77	29.9	35.7	18.2	1.52	13.0	90.4	3.5
40	3.0	1.2	2.8	26.5	17.4	0.96	29.8	27.7	19.5	1.55	14.2	92.0	3.7
	4.5	2.0	4.7	26.9	17.6	0.88	30.0	30.5	20.3	1.56	14.9	92.9	3.8
	6.0	3.1	7.1	27.1	17.7	0.85	30.0	31.9	20.7	1.56	15.3	93.5	3.9
50	3.0	0.9	2.0	25.7	17.1	1.09	29.4	23.6	21.8	1.58	16.4	94.9	4.0
	4.5	1.6	3.6	26.3	17.3	1.00	29.7	26.3	22.7	1.60	17.3	96.0	4.2
	6.0	2.6	6.1	26.5	17.4	0.96	29.8	27.7	23.2	1.61	17.7	96.6	4.2
60	3.0	0.8	1.9	24.6	16.6	1.23	28.8	19.9	24.2	1.62	18.7	97.8	4.4
	4.5	1.5	3.4	25.3	16.9	1.14	29.2	22.3	25.2	1.64	19.6	99.1	4.5
	6.0	2.3	5.3	25.6	17.1	1.09	29.4	23.6	25.8	1.65	20.2	99.8	4.6
70	3.0	0.8	1.8	23.4	16.1	1.40	28.2	16.7	26.6	1.66	20.9	100.7	4.7
	4.5	1.4	3.2	24.2	16.4	1.29	28.6	18.7	27.7	1.68	22.0	102.2	4.8
	6.0	2.2	5.0	24.5	16.6	1.24	28.8	19.8	28.4	1.69	22.6	102.9	4.9
80	3.0	0.8	1.8	22.1	15.5	1.59	27.5	13.9	29.0	1.70	23.2	103.7	5.0
	4.5	1.4	3.2	22.9	15.9	1.47	27.9	15.5	30.2	1.72	24.4	105.3	5.2
	6.0	2.1	4.9	23.3	16.1	1.41	28.1	16.5	30.9	1.73	25.1	106.1	5.3
90	3.0	0.8	1.8	20.7	14.9	1.80	26.8	11.5	31.3	1.73	25.4	106.6	5.3
	4.5	1.4	3.2	21.5	15.3	1.67	27.2	12.9	32.8	1.75	26.8	108.3	5.5
	6.0	2.1	4.8	21.9	15.5	1.61	27.4	13.6	33.5	1.75	27.5	109.3	5.6
100	3.0	0.7	1.7	19.3	14.3	2.03	26.3	9.5	Operation Not Recommended				
	4.5	1.3	3.0	20.1	14.7	1.89	26.6	10.6					
	6.0	2.0	4.6	20.5	14.8	1.83	26.8	11.3					
110	3.0	0.7	1.5	18.0	13.7	2.29	25.8	7.9					
	4.5	1.2	2.8	18.8	14.0	2.14	26.1	8.8					
	6.0	1.9	4.4	19.2	14.2	2.06	26.2	9.3					
120	3.0	0.6	1.4										
	4.5	1.1	2.6	17.5	13.5	2.40	25.7	7.3					
	6.0	1.8	4.1	17.9	13.6	2.32	25.8	7.7					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 030 (Full Load)

900 CFM Nominal (Rated) Airflow Cooling, 900 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	7.5	5.8	13.5						21.8	1.93	15.2	89.2	3.3
30	3.8	2.0	4.7	35.3	21.8	1.40	40.1	25.3	23.5	1.99	16.7	90.9	3.5
	5.6	3.3	7.7	35.7	22.0	1.31	40.2	27.3	24.5	2.02	17.6	91.8	3.6
	7.5	4.9	11.4	35.8	22.0	1.27	40.1	28.3	25.0	2.03	18.0	92.3	3.6
40	3.8	1.6	3.7	34.5	21.5	1.53	39.7	22.6	26.6	2.08	19.5	93.8	3.7
	5.6	1.8	4.2	35.1	21.7	1.43	40.0	24.5	27.7	2.11	20.5	94.9	3.8
	7.5	1.8	4.2	35.4	21.8	1.39	40.1	25.5	28.3	2.13	21.0	95.5	3.9
50	3.8	1.2	2.8	33.5	21.0	1.67	39.2	20.0	29.7	2.17	22.3	96.9	4.0
	5.6	2.2	5.1	34.2	21.4	1.57	39.6	21.8	31.0	2.21	23.5	98.2	4.1
	7.5	3.5	8.1	34.6	21.5	1.52	39.8	22.8	31.7	2.23	24.1	98.9	4.2
60	3.8	1.2	2.7	32.1	20.5	1.84	38.4	17.5	32.9	2.27	25.1	100.0	4.2
	5.6	2.0	4.6	33.1	20.9	1.72	38.9	19.2	34.4	2.31	26.5	101.4	4.4
	7.5	3.3	7.6	33.5	21.1	1.67	39.2	20.1	35.2	2.34	27.2	102.2	4.4
70	3.8	1.1	2.5	30.7	19.9	2.03	37.6	15.1	36.0	2.36	28.0	103.0	4.5
	5.6	1.9	4.5	31.7	20.3	1.90	38.1	16.7	37.7	2.41	29.4	104.6	4.6
	7.5	3.1	7.2	32.2	20.5	1.83	38.4	17.6	38.6	2.44	30.2	105.5	4.6
80	3.8	1.1	2.5	29.0	19.2	2.24	36.7	13.0	39.2	2.46	30.8	106.1	4.7
	5.6	1.9	4.4	30.1	19.7	2.09	37.3	14.4	40.9	2.52	32.4	107.8	4.8
	7.5	3.0	7.0	30.7	19.9	2.02	37.6	15.1	41.9	2.55	33.2	108.7	4.8
90	3.8	1.1	2.5	27.3	18.5	2.49	35.8	11.0	42.2	2.56	33.5	109.1	4.8
	5.6	1.9	4.3	28.4	19.0	2.32	36.4	12.2	44.1	2.62	35.2	110.9	4.9
	7.5	2.9	6.8	29.0	19.2	2.25	36.7	12.9	45.1	2.66	36.0	111.8	5.0
100	3.8	1.0	2.3	25.6	17.7	2.77	35.0	9.2	Operation Not Recommended				
	5.6	1.8	4.1	26.7	18.2	2.59	35.5	10.3					
	7.5	2.8	6.5	27.2	18.4	2.50	35.8	10.9					
110	3.8	0.9	2.2	23.8	16.9	3.10	34.4	7.7					
	5.6	1.7	3.9	24.9	17.4	2.89	34.8	8.6					
	7.5	2.7	6.2	25.5	17.6	2.79	35.0	9.1					
120	3.8	0.9	2.0										
	5.6	1.6	3.7	23.1	16.5	3.24	34.2	7.1					
	7.5	2.6	6.0	23.7	16.8	3.13	34.4	7.6					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

950 CFM Nominal (Rated) Airflow Cooling, 950 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	8.00	4.08	9.4						16.886	1.65	11.250	84.4	3.0
30	4.00	0.53	1.2	31.006	21.641	0.84	33.877	36.8	19.155	1.67	13.461	86.6	3.4
	6.00	1.75	4.0	30.827	21.169	0.79	33.533	38.9	19.900	1.67	14.185	87.4	3.5
	8.00	3.29	7.6	30.672	20.865	0.77	33.307	39.7	20.302	1.68	14.576	87.7	3.5
40	4.00	0.23	0.5	30.914	22.051	0.95	34.146	32.6	22.296	1.70	16.511	89.7	3.9
	6.00	1.30	3.0	31.027	21.881	0.88	34.043	35.1	23.201	1.70	17.388	90.6	4.0
	8.00	2.70	6.2	31.024	21.736	0.86	33.944	36.3	23.689	1.71	17.860	91.0	4.1
50	4.00	0.07	0.2	30.373	22.016	1.08	34.055	28.1	25.404	1.73	19.518	92.7	4.3
	6.00	1.00	2.3	30.731	22.084	1.00	34.146	30.7	26.456	1.74	20.534	93.7	4.5
	8.00	2.27	5.3	30.860	22.071	0.97	34.153	32.0	27.022	1.74	21.080	94.3	4.5
60	4.00	0.06	0.1	29.464	21.653	1.24	33.686	23.8	28.459	1.76	22.466	95.7	4.7
	6.00	0.82	1.9	30.019	21.892	1.14	33.924	26.2	29.643	1.77	23.606	96.8	4.9
	8.00	1.99	4.6	30.258	21.979	1.10	34.015	27.5	30.276	1.78	24.214	97.4	5.0
70	4.00	0.05	0.1	28.257	21.070	1.42	33.113	19.9	31.444	1.79	25.338	98.6	5.1
	6.00	0.72	1.7	28.963	21.417	1.32	33.453	22.0	32.738	1.80	26.581	99.8	5.3
	8.00	1.81	4.2	29.289	21.572	1.27	33.606	23.2	33.425	1.81	27.242	100.5	5.4
80	4.00	0.04	0.1	26.813	20.355	1.64	32.401	16.4	34.337	1.82	28.117	101.4	5.5
	6.00	0.69	1.6	27.628	20.757	1.52	32.803	18.2	35.718	1.84	29.442	102.7	5.7
	8.00	1.72	4.0	28.019	20.952	1.46	32.996	19.2	36.446	1.85	30.139	103.4	5.8
90	4.00	0.09	0.2	25.188	19.581	1.88	31.614	13.4	37.121	1.86	30.786	104.1	5.9
	6.00	0.70	1.6	26.075	19.998	1.75	32.040	14.9	38.559	1.87	32.165	105.5	6.0
	8.00	1.68	3.9	26.510	20.208	1.68	32.253	15.8	39.310	1.88	32.884	106.2	6.1
100	4.00	0.13	0.3	23.435	18.804	2.16	30.809	10.8	Operation Not Recommended				
	6.00	0.71	1.6	24.360	19.206	2.01	31.226	12.1					
	8.00	1.67	3.9	24.822	19.413	1.94	31.441	12.8					
110	4.00	0.13	0.3	21.604	18.065	2.47	30.046	8.7					
	6.00	0.69	1.6	22.539	18.433	2.31	30.424	9.8					
	8.00	1.66	3.8	23.010	18.626	2.23	30.624	10.3					
120	4.00	0.05	0.1	19.746	17.397	2.82	29.384	7.0					
	6.00	0.63	1.5	20.665	17.717	2.65	29.695	7.8					
	8.00	1.62	3.7	21.133	17.888	2.56	29.866	8.3					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

1,150 CFM Nominal (Rated) Airflow Cooling, 1,150 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	9.00	4.97	11.5						24.931	2.31	17.044	88.0	3.2
30	4.50	0.79	1.8	41.039	27.311	1.55	46.314	26.5	27.340	2.36	19.303	90.0	3.4
	6.80	2.34	5.4	40.992	26.970	1.46	45.963	28.1	28.540	2.38	20.424	90.9	3.5
	9.00	4.10	9.5	40.878	26.733	1.42	45.710	28.9	29.167	2.39	21.008	91.4	3.6
40	4.50	0.45	1.1	40.682	27.464	1.69	46.433	24.1	31.266	2.43	22.958	93.1	3.8
	6.80	1.84	4.2	40.981	27.396	1.59	46.394	25.8	32.709	2.47	24.292	94.3	3.9
	9.00	3.44	7.9	41.042	27.301	1.54	46.304	26.6	33.461	2.48	24.986	94.9	3.9
50	4.50	0.25	0.6	39.889	27.291	1.84	46.184	21.6	35.222	2.53	26.603	96.3	4.1
	6.80	1.48	3.4	40.485	27.443	1.73	46.392	23.4	36.897	2.57	28.132	97.6	4.2
	9.00	2.95	6.8	40.700	27.465	1.68	46.435	24.2	37.767	2.59	28.923	98.3	4.3
60	4.50	0.15	0.4	38.728	26.867	2.03	45.656	19.1	39.178	2.63	30.200	99.5	4.4
	6.80	1.26	2.9	39.569	27.185	1.90	46.047	20.8	41.065	2.69	31.896	101.0	4.5
	9.00	2.62	6.0	39.915	27.300	1.84	46.194	21.7	42.040	2.72	32.766	101.8	4.5
70	4.50	0.13	0.3	37.253	26.255	2.25	44.928	16.6	43.101	2.75	33.709	102.6	4.6
	6.80	1.13	2.6	38.292	26.691	2.10	45.443	18.3	45.172	2.82	35.535	104.3	4.7
	9.00	2.40	5.6	38.747	26.875	2.03	45.665	19.1	46.232	2.86	36.461	105.1	4.7
80	4.50	0.15	0.4	35.513	25.504	2.51	44.072	14.2	46.958	2.89	37.091	105.7	4.8
	6.80	1.07	2.5	36.708	26.021	2.33	44.657	15.8	49.174	2.98	38.998	107.5	4.8
	9.00	2.28	5.3	37.250	26.254	2.25	44.926	16.6	50.297	3.03	39.953	108.4	4.9
90	4.50	0.19	0.4	33.552	24.657	2.81	43.156	11.9	50.712	3.05	40.303	108.7	4.9
	6.80	1.06	2.5	34.864	25.224	2.61	43.762	13.4	53.026	3.16	42.232	110.6	4.9
	9.00	2.23	5.2	35.473	25.487	2.51	44.053	14.1	54.185	3.23	43.180	111.5	4.9
100	4.50	0.22	0.5	31.411	23.741	3.18	42.247	9.9	Operation Not Recommended				
	6.80	1.06	2.5	32.808	24.337	2.94	42.828	11.2					
	9.00	2.21	5.1	33.466	24.619	2.83	43.118	11.8					
110	4.50	0.21	0.5	29.128	22.779	3.60	41.412	8.1					
	6.80	1.05	2.4	30.581	23.390	3.33	41.926	9.2					
	9.00	2.20	5.1	31.272	23.682	3.20	42.192	9.8					
120	4.50	0.14	0.3										
	6.80	0.99	2.3	28.227	22.402	3.78	41.126	7.5					
	9.00	2.18	5.0	28.938	22.699	3.64	41.349	8.0					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

1,100 CFM Nominal (Rated) Airflow Cooling, 1,100 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	7.5	5.1	11.9						19.8	2.09	12.7	84.6	2.8
30	3.8	1.6	3.6	38.1	28.2	1.15	42.0	33.1	22.1	2.12	14.9	86.6	3.1
	5.6	2.8	6.4	38.3	27.9	1.06	41.9	36.3	23.1	2.13	15.8	87.4	3.2
	7.5	4.3	10.0	38.3	27.6	1.02	41.8	37.6	23.7	2.14	16.4	87.9	3.2
40	3.8	1.2	2.9	37.4	28.2	1.31	41.8	28.6	25.6	2.16	18.3	89.5	3.5
	5.6	1.6	3.7	38.0	28.3	1.19	42.0	32.0	26.8	2.17	19.4	90.5	3.6
	7.5	1.6	3.7	38.1	28.2	1.13	42.0	33.7	27.5	2.18	20.1	91.1	3.7
50	3.8	1.0	2.4	36.3	27.8	1.49	41.4	24.3	29.1	2.19	21.6	92.5	3.9
	5.6	2.0	4.5	37.1	28.1	1.35	41.7	27.5	30.5	2.20	23.0	93.6	4.1
	7.5	3.1	7.2	37.5	28.2	1.29	41.9	29.2	31.3	2.21	23.8	94.3	4.2
60	3.8	1.0	2.3	34.8	27.1	1.71	40.7	20.4	32.5	2.22	25.0	95.3	4.3
	5.6	1.8	4.2	35.9	27.6	1.55	41.2	23.2	34.1	2.23	26.5	96.7	4.5
	7.5	3.0	6.9	36.4	27.9	1.47	41.4	24.7	35.0	2.24	27.3	97.4	4.6
70	3.8	0.9	2.1	33.1	26.3	1.95	39.8	16.9	35.9	2.25	28.2	98.1	4.7
	5.6	1.7	4.0	34.4	26.9	1.78	40.4	19.3	37.6	2.26	29.9	99.6	4.9
	7.5	2.8	6.5	35.0	27.2	1.69	40.7	20.7	38.6	2.27	30.8	100.4	5.0
80	3.8	0.9	2.1	31.1	25.4	2.22	38.7	14.0	39.1	2.27	31.4	100.9	5.1
	5.6	1.7	3.9	32.5	26.0	2.03	39.5	16.0	41.0	2.28	33.2	102.4	5.3
	7.5	2.7	6.3	33.2	26.4	1.94	39.8	17.1	41.9	2.29	34.1	103.2	5.4
90	3.8	0.9	2.0	29.0	24.5	2.51	37.6	11.5	42.2	2.29	34.4	103.4	5.4
	5.6	1.6	3.8	30.5	25.1	2.31	38.4	13.2	44.1	2.30	36.2	105.0	5.6
	7.5	2.6	6.1	31.2	25.4	2.21	38.8	14.1	45.1	2.31	37.2	105.9	5.7
100	3.8	0.9	2.0	26.8	23.6	2.83	36.4	9.5	Operation Not Recommended				
	5.6	1.6	3.6	28.3	24.2	2.62	37.2	10.8					
	7.5	2.6	5.9	29.0	24.5	2.51	37.6	11.5					
110	3.8	0.8	1.9	24.5	22.7	3.16	35.3	7.7					
	5.6	1.5	3.5	26.0	23.3	2.94	36.0	8.8					
	7.5	2.5	5.7	26.7	23.5	2.84	36.4	9.4					
120	3.8	0.8	1.8										
	5.6	1.5	3.4	23.6	22.4	3.29	34.8	7.2					
	7.5	2.4	5.5	24.3	22.7	3.18	35.2	7.6					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 042 (Full Load)

1,300 CFM Nominal (Rated) Airflow Cooling, 1,300 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	10.5	8.3	19.3						29.6	2.83	19.9	89.0	3.1
30	5.3	2.5	5.8	50.4	36.7	1.94	57.0	25.9	32.4	2.89	22.5	91.0	3.3
	7.9	4.7	10.8	51.1	37.2	1.83	57.3	28.0	33.7	2.93	23.7	92.0	3.4
	10.5	7.2	16.7	51.3	37.3	1.77	57.4	29.0	34.4	2.94	24.4	92.5	3.4
40	5.3	2.1	4.8	49.2	35.9	2.12	56.4	23.2	36.9	3.00	26.6	94.2	3.6
	7.9	2.2	5.1	50.1	36.5	1.99	56.9	25.2	38.5	3.04	28.1	95.3	3.7
	10.5	2.2	5.1	50.5	36.8	1.93	57.1	26.2	39.3	3.06	28.9	95.9	3.8
50	5.3	1.8	4.1	47.8	35.0	2.32	55.7	20.6	41.3	3.11	30.7	97.4	3.9
	7.9	3.4	7.9	48.8	35.7	2.17	56.2	22.5	43.2	3.15	32.4	98.7	4.0
	10.5	5.4	12.5	49.3	36.0	2.11	56.5	23.4	44.1	3.18	33.3	99.4	4.1
60	5.3	1.7	3.9	46.1	34.1	2.55	54.7	18.1	45.8	3.22	34.8	100.5	4.2
	7.9	3.2	7.5	47.3	34.8	2.38	55.4	19.8	47.8	3.27	36.6	102.0	4.3
	10.5	5.2	11.9	47.9	35.1	2.31	55.7	20.7	48.9	3.30	37.6	102.8	4.3
70	5.3	1.6	3.6	44.1	33.1	2.81	53.7	15.7	50.1	3.33	38.8	103.6	4.4
	7.9	3.1	7.1	45.5	33.8	2.62	54.4	17.3	52.4	3.39	40.8	105.2	4.5
	10.5	4.9	11.3	46.1	34.1	2.54	54.8	18.2	53.5	3.42	41.9	106.0	4.6
80	5.3	1.5	3.5	42.0	32.2	3.10	52.6	13.5	54.4	3.45	42.6	106.7	4.6
	7.9	3.0	6.9	43.5	32.8	2.90	53.3	15.0	56.8	3.52	44.8	108.3	4.7
	10.5	4.8	11.0	44.2	33.1	2.80	53.7	15.8	58.0	3.55	45.9	109.2	4.8
90	5.3	1.5	3.4	39.6	31.3	3.44	51.4	11.5	58.5	3.57	46.4	109.6	4.8
	7.9	2.9	6.6	41.2	31.8	3.21	52.2	12.8	61.0	3.65	48.6	111.4	4.9
	10.5	4.7	10.7	42.0	32.2	3.10	52.6	13.5	62.3	3.69	49.7	112.3	5.0
100	5.3	1.4	3.3	37.1	30.4	3.82	50.2	9.7	Operation Not Recommended				
	7.9	2.8	6.4	38.8	31.0	3.57	51.0	10.9					
	10.5	4.5	10.4	39.6	31.2	3.45	51.4	11.5					
110	5.3	1.4	3.2	34.5	29.6	4.26	49.0	8.1					
	7.9	2.7	6.2	36.2	30.1	3.98	49.7	9.1					
	10.5	4.4	10.1	37.0	30.4	3.84	50.1	9.6					
120	5.3	1.3	3.1										
	7.9	2.6	6.0	33.4	29.3	4.44	48.5	7.5					
	10.5	4.2	9.8	34.3	29.6	4.29	48.9	8.0					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

1,250 CFM Nominal (Rated) Airflow Cooling, 1,250 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	9.0	5.0	11.5						23.1	2.18	15.6	85.0	3.1
30	4.5	1.4	3.3	41.6	28.3	1.37	46.3	30.4	25.3	2.20	17.8	86.7	3.4
	6.8	2.7	6.3	42.0	28.2	1.28	46.3	32.7	26.3	2.20	18.8	87.4	3.5
	9.0	4.3	9.9	42.0	28.0	1.25	46.3	33.6	26.8	2.21	19.3	87.8	3.6
40	4.5	1.1	2.6	40.8	28.2	1.54	46.1	26.6	28.8	2.22	21.3	89.3	3.8
	6.8	1.3	2.9	41.4	28.3	1.42	46.3	29.3	30.0	2.22	22.4	90.2	4.0
	9.0	1.3	2.9	41.7	28.3	1.37	46.3	30.5	30.7	2.23	23.1	90.7	4.0
50	4.5	1.1	2.5	39.9	27.8	1.72	45.7	23.3	32.4	2.24	24.8	92.0	4.3
	6.8	2.1	4.9	40.8	28.2	1.57	46.1	26.0	33.8	2.24	26.2	93.0	4.4
	9.0	3.4	7.9	41.2	28.3	1.50	46.3	27.4	34.6	2.25	26.9	93.6	4.5
60	4.5	1.0	2.3	38.3	27.2	1.98	45.1	19.4	36.1	2.25	28.4	94.6	4.7
	6.8	2.0	4.6	39.4	27.6	1.79	45.5	22.0	37.7	2.26	30.0	95.8	4.9
	9.0	3.2	7.5	39.9	27.9	1.71	45.8	23.3	38.5	2.26	30.8	96.5	5.0
70	4.5	0.9	2.0	36.5	26.3	2.28	44.2	16.0	39.7	2.27	31.9	97.3	5.1
	6.8	1.8	4.2	37.7	26.9	2.07	44.8	18.2	41.4	2.28	33.7	98.6	5.3
	9.0	3.0	6.9	38.3	27.2	1.97	45.1	19.4	42.4	2.28	34.6	99.3	5.4
80	4.5	0.9	2.0	34.4	25.4	2.63	43.3	13.1	43.2	2.28	35.4	99.9	5.5
	6.8	1.8	4.0	35.8	26.0	2.40	43.9	14.9	45.1	2.29	37.3	101.3	5.8
	9.0	2.9	6.7	36.4	26.3	2.29	44.2	15.9	46.5	2.41	38.3	102.4	5.7
90	4.5	0.8	1.8	32.1	24.5	3.01	42.4	10.7	47.0	2.41	38.8	102.7	5.7
	6.8	1.7	3.9	33.6	25.1	2.76	43.0	12.2	49.0	2.42	40.8	104.2	5.9
	9.0	2.8	6.5	34.3	25.4	2.64	43.3	13.0	50.0	2.42	41.8	105.0	6.1
100	4.5	0.8	1.8	29.7	23.5	3.42	41.4	8.7	Operation Not Recommended				
	6.8	1.6	3.7	31.2	24.1	3.16	42.0	9.9					
	9.0	2.7	6.1	32.0	24.4	3.03	42.3	10.5					
110	4.5	0.7	1.7	27.3	22.6	3.86	40.5	7.1					
	6.8	1.5	3.5	28.8	23.2	3.59	41.0	8.0					
	9.0	2.6	5.9	29.5	23.4	3.46	41.3	8.5					
120	4.5	0.7	1.7	24.8	21.8	4.32	39.5	5.8					
	6.8	1.5	3.5	26.3	22.3	4.04	40.1	6.5					
	9.0	2.5	5.9	27.0	22.5	3.90	40.4	6.9					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 048 (Full Load)

1,500 CFM Nominal (Rated) Airflow Cooling, 1,500 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	FLOW GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	12.0	7.6	17.5						32.4	2.88	22.6	88.0	3.3
30	6.0	2.2	5.2	55.7	36.8	2.32	63.6	24.0	35.2	2.93	25.1	89.6	3.5
	9.0	4.3	9.9	56.2	36.8	2.21	63.7	25.4	36.5	2.96	26.4	90.5	3.6
	12.0	6.7	15.6	56.3	36.7	2.17	63.7	26.0	37.2	2.97	27.0	90.9	3.7
40	6.0	1.9	4.4	54.5	36.4	2.51	63.1	21.8	39.7	3.02	29.4	92.5	3.9
	9.0	3.8	8.7	55.4	36.7	2.37	63.5	23.4	41.4	3.05	30.9	93.5	4.0
	12.0	6.1	14.0	55.7	36.8	2.31	63.6	24.1	42.3	3.07	31.8	94.0	4.0
50	6.0	1.7	4.0	53.0	35.6	2.58	61.8	20.5	44.6	3.12	33.9	95.4	4.2
	9.0	3.4	7.9	53.8	36.0	2.43	62.1	22.2	46.5	3.16	35.7	96.6	4.3
	12.0	5.5	12.7	54.1	36.1	2.36	62.2	22.9	47.6	3.18	36.7	97.3	4.4
60	6.0	1.6	3.7	51.3	34.9	2.86	61.0	17.9	49.5	3.22	38.5	98.5	4.5
	9.0	3.2	7.5	52.5	35.4	2.66	61.6	19.7	51.8	3.26	40.7	99.9	4.7
	12.0	5.3	12.2	53.0	35.6	2.57	61.8	20.6	53.0	3.29	41.8	100.7	4.7
70	6.0	1.4	3.3	49.1	34.0	3.21	60.0	15.3	54.6	3.32	43.2	101.6	4.8
	9.0	3.0	6.9	50.6	34.7	2.96	60.7	17.1	57.2	3.38	45.6	103.2	5.0
	12.0	4.9	11.3	51.3	34.9	2.85	61.0	18.0	58.6	3.41	46.9	104.1	5.0
80	6.0	1.4	3.3	46.5	33.0	3.62	58.9	12.8	59.7	3.44	47.9	104.7	5.1
	9.0	2.9	6.7	48.2	33.7	3.34	59.6	14.4	62.5	3.50	50.5	106.5	5.2
	12.0	4.8	11.1	49.1	34.0	3.21	60.0	15.3	64.5	3.69	51.9	107.7	5.1
90	6.0	1.3	3.1	43.8	31.9	4.11	57.8	10.7	65.2	3.71	52.5	108.2	5.2
	9.0	2.8	6.5	45.6	32.6	3.79	58.5	12.0	68.2	3.79	55.3	110.0	5.3
	12.0	4.7	10.9	46.5	33.0	3.63	58.9	12.8	69.9	3.83	56.8	111.0	5.3
100	6.0	1.3	3.0	41.0	30.7	4.67	57.0	8.8	Operation Not Recommended				
	9.0	2.7	6.1	42.8	31.5	4.31	57.5	9.9					
	12.0	4.5	10.4	43.7	31.8	4.13	57.8	10.6					
110	6.0	1.2	2.8	38.3	29.5	5.32	56.5	7.2					
	9.0	2.6	5.9	40.0	30.3	4.90	56.7	8.2					
	12.0	4.4	10.1	40.9	30.6	4.70	56.9	8.7					
120	6.0	1.2	2.8										
	9.0	2.6	5.9										
	12.0	4.3	10.0	38.2	29.5	5.36	56.4	7.1					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 060 (Part Load)

1,600 CFM Nominal (Rated) Airflow Cooling, 1,600 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	12.00	5.99	13.9						27.446	2.69	18.269	83.8	3.0
30	6.00	1.21	2.8	53.953	36.470	1.50	59.063	36.0	30.406	2.72	21.112	85.6	3.3
	9.00	3.08	7.1	54.171	36.396	1.39	58.916	39.0	31.494	2.74	22.158	86.2	3.4
	12.00	5.40	12.5	54.207	36.294	1.34	58.785	40.4	32.088	2.74	22.729	86.5	3.4
40	6.00	1.01	2.3	53.244	36.294	1.69	58.998	31.6	34.933	2.77	25.465	88.2	3.7
	9.00	2.76	6.4	53.760	36.445	1.56	59.080	34.5	36.328	2.79	26.809	89.0	3.8
	12.00	4.93	11.4	53.945	36.469	1.50	59.065	36.0	37.090	2.80	27.543	89.4	3.9
50	6.00	0.90	2.1	52.085	35.842	1.91	58.599	27.3	39.677	2.83	30.035	90.9	4.1
	9.00	2.53	5.9	52.894	36.165	1.76	58.897	30.1	41.379	2.84	31.676	91.9	4.3
	12.00	4.59	10.6	53.228	36.288	1.69	58.994	31.5	42.307	2.85	32.570	92.4	4.3
60	6.00	0.83	1.9	50.478	35.183	2.17	57.886	23.2	44.536	2.88	34.720	93.7	4.5
	9.00	2.38	5.5	51.571	35.631	2.00	58.383	25.8	46.523	2.90	36.637	94.9	4.7
	12.00	4.34	10.0	52.052	35.829	1.91	58.586	27.2	47.600	2.91	37.676	95.5	4.8
70	6.00	0.80	1.9	48.427	34.366	2.48	56.876	19.6	49.409	2.93	39.421	96.5	4.9
	9.00	2.28	5.3	49.790	34.905	2.28	57.555	21.9	51.638	2.95	41.571	97.8	5.1
	12.00	4.16	9.6	50.412	35.156	2.18	57.855	23.1	52.834	2.96	42.725	98.5	5.2
80	6.00	0.78	1.8	45.933	33.414	2.83	55.586	16.2	54.199	2.98	44.041	99.3	5.3
	9.00	2.21	5.1	47.548	34.026	2.60	56.427	18.3	56.600	3.00	46.358	100.7	5.5
	12.00	4.03	9.3	48.306	34.318	2.49	56.815	19.4	57.870	3.01	47.583	101.4	5.6
90	6.00	0.76	1.8	42.999	32.323	3.23	54.030	13.3	58.802	3.02	48.483	102.0	5.7
	9.00	2.16	5.0	44.845	33.008	2.98	55.011	15.1	61.281	3.05	50.873	103.4	5.9
	12.00	3.94	9.1	45.727	33.337	2.86	55.477	16.0	62.564	3.06	52.111	104.1	6.0
100	6.00	0.70	1.6	39.625	31.053	3.69	52.222	10.7	Operation Not Recommended				
	9.00	2.09	4.8	41.677	31.830	3.41	53.322	12.2					
	12.00	3.86	8.9	42.674	32.202	3.28	53.856	13.0					
110	6.00	0.59	1.4	35.813	29.527	4.21	50.175	8.5					
	9.00	2.00	4.6	38.043	30.435	3.91	51.372	9.7					
	12.00	3.77	8.7	39.140	30.865	3.76	51.961	10.4					
120	6.00	0.42	1.0	31.562	27.626	4.79	47.903	6.6					
	9.00	1.85	4.3	33.939	28.720	4.46	49.172	7.6					
	12.00	3.65	8.4	35.121	29.234	4.30	49.805	8.2					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Performance Data – TY H/V 060 (Full Load)

1,900 CFM Nominal (Rated) Airflow Cooling, 1,900 CFM Nominal (Rated) Airflow Heating

Performance capacities shown in thousands of Btuh

WATER / BRINE				COOLING - EAT 80/67°F					HEATING - EAT 68°F				
EWT °F	Flow GPM	PD PSI	PD FT	TC	SC	kW	HR	EER	HC	kW	HE	LAT	COP
20	Operation Not Recommended												
	14.00	7.87	18.2						39.923	3.66	27.450	87.4	3.2
30	7.00	1.78	4.1	72.270	47.419	2.77	81.735	26.1	43.047	3.72	30.354	88.9	3.4
	10.50	4.19	9.7	72.938	47.600	2.61	81.831	28.0	44.693	3.76	31.881	89.7	3.5
	14.00	7.16	16.5	73.202	47.632	2.52	81.810	29.0	45.602	3.77	32.724	90.2	3.5
40	7.00	1.55	3.6	71.114	46.985	3.00	81.351	23.7	48.647	3.84	35.544	91.7	3.7
	10.50	3.80	8.8	72.043	47.341	2.82	81.675	25.5	50.757	3.89	37.496	92.7	3.8
	14.00	6.60	15.2	72.431	47.471	2.74	81.771	26.5	51.924	3.91	38.574	93.2	3.9
50	7.00	1.39	3.2	69.593	46.360	3.25	80.688	21.4	54.670	3.98	41.107	94.6	4.0
	10.50	3.51	8.1	70.803	46.859	3.05	81.225	23.2	57.253	4.04	43.485	95.8	4.2
	14.00	6.17	14.3	71.327	47.070	2.96	81.433	24.1	58.677	4.07	44.793	96.5	4.2
60	7.00	1.30	3.0	67.674	45.576	3.54	79.762	19.1	60.966	4.12	46.894	97.6	4.3
	10.50	3.31	7.6	69.181	46.191	3.32	80.495	20.9	63.999	4.20	49.670	99.1	4.5
	14.00	5.85	13.5	69.853	46.468	3.21	80.808	21.8	65.661	4.24	51.188	99.9	4.5
70	7.00	1.25	2.9	65.327	44.647	3.89	78.587	16.8	67.394	4.29	52.767	100.8	4.6
	10.50	3.17	7.3	67.144	45.363	3.62	79.499	18.5	70.823	4.38	55.882	102.4	4.7
	14.00	5.61	13.0	67.971	45.696	3.50	79.909	19.4	72.684	4.43	57.568	103.3	4.8
80	7.00	1.21	2.8	62.523	43.575	4.29	77.176	14.6	73.819	4.46	58.593	103.9	4.8
	10.50	3.08	7.1	64.657	44.388	3.98	78.250	16.2	77.554	4.57	61.954	105.7	5.0
	14.00	5.45	12.6	65.645	44.771	3.84	78.747	17.1	79.553	4.63	63.743	106.7	5.0
90	7.00	1.18	2.7	59.233	42.338	4.78	75.542	12.4	80.106	4.65	64.236	106.9	5.0
	10.50	3.00	6.9	61.687	43.260	4.42	76.758	14.0	84.019	4.78	67.711	108.9	5.2
	14.00	5.33	12.3	62.839	43.694	4.25	77.335	14.8	86.069	4.85	69.516	109.8	5.2
100	7.00	1.12	2.6	55.428	40.889	5.35	73.697	10.4	Operation Not Recommended				
	10.50	2.93	6.8	58.201	41.949	4.93	75.036	11.8					
	14.00	5.23	12.1	59.518	42.445	4.74	75.683	12.6					
110	7.00	1.02	2.4	51.083	39.153	6.03	71.651	8.5					
	10.50	2.84	6.6	54.166	40.396	5.55	73.096	9.8					
	14.00	5.14	11.9	55.649	40.974	5.32	73.802	10.5					
120	7.00	0.85	2.0	46.169	37.019	6.81	69.417	6.8					
	10.50	2.71	6.3	49.553	38.511	6.27	70.947	7.9					
	14.00	5.03	11.6	51.195	39.200	6.01	71.703	8.5					

Interpolation is permissible; extrapolation is not.
All entering air conditions are 80°F DB and 67°F WB in cooling, and 70°F DB in heating.
AHRI/ISO certified conditions are 80.6°F DB and 66.2°F WB in cooling and 68°F 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 EWT is based upon a 15% methanol antifreeze solution.
Operation below 60°F 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. If operation in the shaded area is required please refer to the TE or TZ product family.

Part Load Performance Data – Correction Tables

Airflow Correction Table

Airflow	Heating			Cooling				
% of Rated	Heating Capacity	Power	Heat of Extraction	Total Capacity	Sensible Capacity	S/T	Power	Heat of Rejection
80	0.979	1.035	0.965	0.980	0.917	0.936	0.955	0.975
85	0.984	1.021	0.975	0.986	0.939	0.953	0.964	0.982
90	0.990	1.011	0.984	0.992	0.961	0.969	0.975	0.988
95	0.995	1.004	0.993	0.996	0.981	0.985	0.986	0.994
100	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
105	1.006	1.002	1.007	1.003	1.017	1.014	1.016	1.005
110	1.011	1.006	1.012	1.004	1.031	1.027	1.033	1.010

Entering Air Correction Table

EAT Heating Corrections			
Ent Air DB ºF	Heating Capacity	Power	Heat of Extraction
50	1.023	0.773	1.084
55	1.021	0.827	1.068
60	1.016	0.882	1.049
65	1.009	0.940	1.026
70	1.000	1.000	1.000
75	0.989	1.063	0.971
80	0.978	1.128	0.941

* = Sensible capacity equals total capacity
AHRI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6°F DB/66.2°F WB, 1 and Heating - 68°F DB/59°F WB entering air temperature

Cooling											
Ent Air WB ºF	Total Capacity	Sensible Cooling Capacity Multipliers - Entering DB ºF								Power	Heat of Rejection
		65	70	75	80	85	90	95	100		
45	0.628	*	*	*	*	*	*	*	*	1.010	0.698
50	0.712	*	*	*	*	*	*	*	*	1.008	0.767
55	0.797	1.026	*		*	*	*	*	*	1.006	0.835
60	0.882	0.669	0.894	1.111	*	*	*	*	*	1.003	0.904
65	0.966		0.693	0.890	1.092	1.298	*	*	*	1.001	0.973
67	1.000		0.640	0.810	1.000	1.202	*	*	*	1.000	1.000
70	1.051			0.706	0.862	1.060	1.298	*	*	0.999	1.041
75	1.135				0.633	0.860	1.087	1.314	1.541	0.996	1.110

Full Load Performance Data – Correction Tables

Airflow Correction Table

Airflow	Heating			Cooling				
% of Rated	Heating Capacity	Power	Heat of Extraction	Total Capacity	Sensible Capacity	S/T	Power	Heat of Rejection
80	0.983	1.040	0.967	0.976	0.919	0.941	0.939	0.969
85	0.987	1.018	0.978	0.984	0.941	0.957	0.953	0.977
90	0.991	1.004	0.988	0.990	0.962	0.972	0.968	0.986
95	0.996	0.998	0.995	0.996	0.982	0.986	0.983	0.993
100	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
105	1.005	1.010	1.003	1.003	1.017	1.014	1.018	1.006
110	1.009	1.028	1.004	1.005	1.032	1.027	1.036	1.012

Entering Air Correction Table

EAT Heating Corrections			
Ent Air DB ºF	Heating Capacity	Power	Heat of Extraction
50	1.030	0.808	1.092
55	1.026	0.858	1.073
60	1.020	0.905	1.052
65	1.011	0.951	1.027
70	1.000	1.000	1.000
75	0.989	1.054	0.971
80	0.978	1.114	0.940

* = Sensible capacity equals total capacity
AHRI/ISO/ASHRAE 13256-1 uses entering air conditions of Cooling - 80.6°F DB/66.2°F WB, 1 and Heating - 68°F DB/59°F WB entering air temperature

Cooling											
Ent Air WB ºF	Total Capacity	Sensible Cooling Capacity Multipliers - Entering DB ºF								Power	Heat of Rejection
		65	70	75	80	85	90	95	100		
45	0.638	*	*	*	*	*	*	*	*	0.914	0.694
50	0.720	*	*	*	*	*	*	*	*	0.934	0.763
55	0.803	1.044	*	*	*	*	*	*	*	0.953	0.833
60	0.885	0.751	0.927	1.114	*	*	*	*	*	0.973	0.903
65	0.967		0.693	0.886	1.089	1.300	*	*	*	0.992	0.972
67	1.000		0.607	0.798	1.000	1.211	1.432	*	*	1.000	1.000
70	1.049			0.669	0.866	1.076	1.299	*	*	1.012	1.042
75	1.132				0.644	0.848	1.077	1.329	1.605	1.031	1.111

Antifreeze Correction Table

EWT	Antifreeze Type	Antifreeze %	Cooling			Heating		WPD
			Total Cap	Sensible Cap	Watts	Total Cap	Watts	
90	Water	0%	1	1	1	1	1	1
	Ethanol	5%	0.998	0.998	1.002	0.996	0.999	1.025
		10%	0.996	0.996	1.003	0.991	0.997	1.048
		15%	0.994	0.994	1.005	0.987	0.996	1.098
		20%	0.991	0.991	1.006	0.982	0.994	1.142
		25%	0.986	0.986	1.009	0.972	0.991	1.207
		30%	0.981	0.981	1.012	0.962	0.988	1.265
		35%	0.977	0.977	1.015	0.953	0.985	1.312
		40%	0.972	0.972	1.018	0.943	0.982	1.37
		45%	0.966	0.966	1.023	0.931	0.978	1.431
		50%	0.959	0.959	1.027	0.918	0.974	1.494
	Ethylene Glycol	5%	0.998	0.998	1.002	0.996	0.999	1.021
		10%	0.996	0.996	1.003	0.991	0.997	1.04
		15%	0.994	0.994	1.004	0.987	0.996	1.079
		20%	0.991	0.991	1.005	0.982	0.995	1.114
		25%	0.988	0.988	1.008	0.976	0.993	1.146
		30%	0.985	0.985	1.01	0.969	0.99	1.175
		35%	0.982	0.982	1.012	0.963	0.988	1.208
		40%	0.979	0.979	1.014	0.956	0.986	1.243
		45%	0.976	0.976	1.016	0.95	0.984	1.278
		50%	0.972	0.972	1.018	0.943	0.982	1.314
	Methanol	5%	0.997	0.997	1.002	0.993	0.998	1.039
		10%	0.993	0.993	1.004	0.986	0.996	1.075
		15%	0.99	0.99	1.007	0.979	0.994	1.116
		20%	0.986	0.986	1.009	0.972	0.991	1.154
		25%	0.982	0.982	1.012	0.964	0.989	1.189
		30%	0.978	0.978	1.014	0.955	0.986	1.221
		35%	0.974	0.974	1.017	0.947	0.984	1.267
		40%	0.97	0.97	1.02	0.939	0.981	1.31
		45%	0.966	0.966	1.023	0.93	0.978	1.353
		50%	0.961	0.961	1.026	0.92	0.975	1.398
	Propylene Glycol	5%	0.995	0.995	1.003	0.99	0.997	1.065
		10%	0.99	0.99	1.006	0.98	0.994	1.119
		15%	0.986	0.986	1.009	0.971	0.991	1.152
		20%	0.981	0.981	1.012	0.962	0.988	1.182
		25%	0.978	0.978	1.014	0.956	0.986	1.227
		30%	0.975	0.975	1.016	0.95	0.984	1.267
		35%	0.972	0.972	1.018	0.944	0.982	1.312
		40%	0.969	0.969	1.02	0.938	0.98	1.356
		45%	0.965	0.965	1.023	0.929	0.977	1.402
		50%	0.96	0.96	1.026	0.919	0.974	1.45

Table Continued on Next Page

Antifreeze Correction Table

Table Continued from Previous Page

EWT	Antifreeze Type	Antifreeze %	Cooling			Heating		WPD
			Total Cap	Sensible Cap	Watts	Total Cap	Watts	
30	Water	0%	1	1	1	1	1	1
	Ethanol	5%	0.991	0.991	1.006	0.981	0.994	1.14
		10%	0.981	0.981	1.012	0.961	0.988	1.242
		15%	0.973	0.973	1.018	0.944	0.983	1.295
		20%	0.964	0.964	1.024	0.927	0.977	1.343
		25%	0.959	0.959	1.028	0.917	0.974	1.363
		30%	0.954	0.954	1.031	0.907	0.97	1.383
		35%	0.949	0.949	1.035	0.897	0.967	1.468
		40%	0.944	0.944	1.038	0.887	0.964	1.523
		45%	0.94	0.94	1.041	0.88	0.962	1.58
		50%	0.936	0.936	1.043	0.872	0.959	1.639
	Ethylene Glycol	5%	0.997	0.997	1.002	0.993	0.998	1.04
		10%	0.993	0.993	1.004	0.986	0.996	1.075
		15%	0.99	0.99	1.006	0.98	0.994	1.122
		20%	0.987	0.987	1.008	0.973	0.992	1.163
		25%	0.983	0.983	1.011	0.966	0.99	1.195
		30%	0.979	0.979	1.013	0.958	0.987	1.225
		35%	0.976	0.976	1.016	0.951	0.985	1.279
		40%	0.972	0.972	1.018	0.943	0.982	1.324
		45%	0.969	0.969	1.021	0.937	0.98	1.371
		50%	0.966	0.966	1.023	0.93	0.978	1.419
	Methanol	5%	0.995	0.995	1.004	0.989	0.997	1.069
		10%	0.989	0.989	1.007	0.978	0.993	1.127
		15%	0.984	0.984	1.011	0.968	0.99	1.164
		20%	0.979	0.979	1.014	0.957	0.986	1.197
		25%	0.975	0.975	1.017	0.949	0.984	1.216
		30%	0.971	0.971	1.019	0.941	0.981	1.235
		35%	0.967	0.967	1.022	0.933	0.979	1.286
		40%	0.963	0.963	1.025	0.924	0.976	1.323
		45%	0.959	0.959	1.028	0.917	0.974	1.36
		50%	0.955	0.955	1.03	0.91	0.971	1.399
	Propylene Glycol	5%	0.995	0.995	1.004	0.989	0.997	1.071
		10%	0.989	0.989	1.007	0.978	0.993	1.13
		15%	0.985	0.985	1.01	0.968	0.99	1.206
		20%	0.98	0.98	1.013	0.958	0.987	1.27
		25%	0.974	0.974	1.017	0.947	0.983	1.359
		30%	0.968	0.968	1.021	0.935	0.979	1.433
		35%	0.963	0.963	1.025	0.924	0.976	1.522
		40%	0.957	0.957	1.029	0.913	0.972	1.614
		45%	0.949	0.949	1.034	0.898	0.967	1.712
		50%	0.941	0.941	1.039	0.882	0.962	1.816

Blower Performance Data

Model	Max ESP (in wg)	Fan Motor (hp)	Range	Cooling Mode		Dehumid Mode		Heating Mode		Fan Only Mode	Aux Emerg Mode
				Stg 2	Stg 1	Stg 2	Stg 1	Stg 2	Stg 1		
024	0.75	1/2	Default	750	575	650	500	750	575	350	750
			Maximum	850	650	800	600	850	850	850	850
			Minimum	600	450	600	450	600	450	300	650
030	0.5	1/2	Default	950	650	800	575	950	650	450	950
			Maximum	1100	750	1000	700	1100	1100	1100	1100
			Minimum	750	525	750	525	750	525	375	750
036	0.6	1/2	Default	1125	750	975	650	1125	750	525	1125
			Maximum	1250	950	1200	800	1250	1250	1250	1250
			Minimum	900	600	900	600	900	600	450	900
042	0.6	3/4	Default	1300	925	1125	825	1300	925	600	1300
			Maximum	1475	1100	1400	1000	1475	1475	1475	1475
			Minimum	1050	750	1050	750	1050	750	525	1050
048	0.75	3/4	Default	1500	1125	1300	975	1500	1125	700	1500
			Maximum	1700	1300	1600	1200	1700	1700	1700	1700
			Minimum	1200	900	1200	900	1200	900	600	1350
060	0.75	1	Default	1875	1500	1625	1300	1875	1500	875	1875
			Maximum	2100	1700	2000	1600	2100	2100	2100	2100
			Minimum	1500	1200	1500	1200	1500	1200	750	1500

Airflow is controlled within 5% up to the Max ESP shown with wet coil.
Performance shown is with wet coil and factory air filters.

Physical Data

Model	024	030	036	042	048	060
Compressor (1 Each)	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Factory Charge HFC-410A (oz)	49	48	48	70	80	80
ECM Fan Motor & Blower						
Fan Motor (hp) [W]	1/2	1/2	1/2	3/4	3/4	1
Blower Wheel Size (dia x w) - (in) [mm]	9X7	9X7	9X8	9X8	10X10	11X10
Water Connection Size						
FPT (in)	3/4"	3/4"	3/4"	3/4"	1"	1"
Coax Volume (gallons)	0.323	0.323	0.738	0.89	0.738	0.939
Vertical Upflow						
Air Coil Dimensions (h x w) - (in) [mm]	20 X 17.25	20 X 17.25	24 X 21.75	24 X 21.75	24x28.25	24x28.25
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	20x20	20x20	24x24	24x24	1-14x24 1-18x24	1-14x24 1-18x24
Weight - Operating, (lbs) [kg]	189	197	203	218	263	278
Weight - Packaged, (lbs) [kg]	194	202	209	224	270	285
Horizontal						
Air Coil Dimensions (h x w) - (in) [mm]	16 X 22	16 X 22	20 X 25	20 X 25	20 X 35	20 X 35
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	18x25	18x25	2-14x20	2-14x20	1-20x24 1-14x20	1-20x24 1-14x20
Weight - Operating, (lbs) [kg]	174	182	203	218	263	278
Weight - Packaged, (lbs) [kg]	179	187	209	224	270	285

Notes:
All units have TXV expansion device and 1/2” & 3/4” electrical knockouts.
Condensate drain connection is rubber coupling that couples to 3/4” schedule 50/80 PVC.

Unit Maximum Water Working Pressure	
Options	Max Pressure PSIG [kPa]
Base Unit	500 [3,447]

TY – Horizontal Dimensional Data

Horizontal Model		Overall Cabinet		
		A Width	B Length	C Height
024 - 030	in	20.1	43.1	18.3
	cm	51.1	109.5	46.5
036 - 042	in	20.1	47.1	21.0
	cm	51.1	119.6	53.3
048 - 060	in	24.1	54.1	21.0
	cm	61.2	137.4	53.3

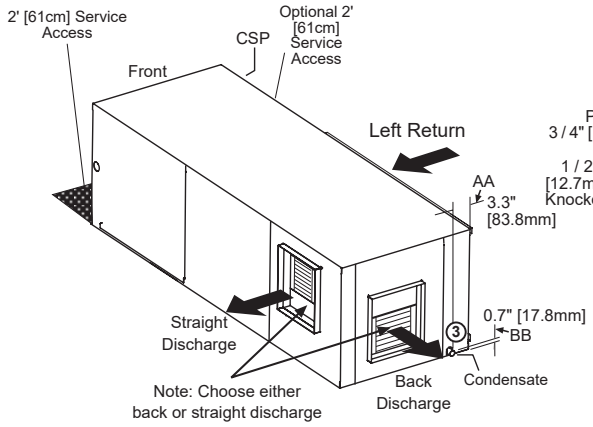
Horizontal Model		Electrical Knockouts	
		J 1/2"	K 3/4"
		Low Voltage	Power Supply
024 - 030	in	9.1	6.1
	cm	25.2	15.6
036 - 060	in	13.9	10.9
	cm	35.3	27.7

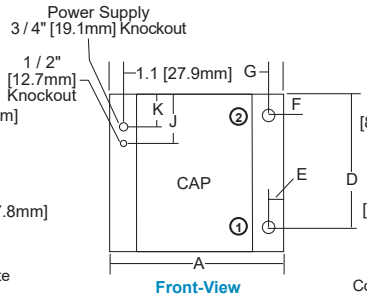
Horizontal Model		Water Connections						
		①		②		③		Loop In/Out FPT
		Loop In D	Loop In E	Loop Out F	Loop Out G	AA	BB	
024	in	16.4	1.4	4.4	1.4	3.3	0.7	3/4"
	cm	41.7	3.4	11.3	3.5	8.4	1.8	
030	in	16.4	1.4	3.1	1.4	3.3	0.7	3/4"
	cm	41.7	3.4	7.8	3.5	8.4	1.8	
036	in	19.1	1.4	5.3	1.4	3.3	0.7	3/4"
	cm	48.5	3.4	13.4	3.5	8.4	1.8	
042	in	19.1	1.4	4.4	1.4	3.3	0.7	3/4"
	cm	48.5	3.4	11.3	3.5	8.4	1.8	
048	in	19.1	1.4	4.4	1.4	3.3	0.7	1"
	cm	48.5	3.4	11.1	3.5	8.4	1.8	
060	in	19.1	1.4	3.8	1.4	3.3	0.7	1"
	cm	48.5	3.4	9.7	3.5	8.4	1.8	

Horizontal Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		L	M Supply Height	N Supply Width	O	P	Q Return Width	R Return Height	S	T
024 - 030	in	2.6	13.3	9.9	4.1	1.3	23.0	16.3	1.1	1.0
	cm	6.6	33.8	25.1	10.5	3.3	58.4	41.4	2.8	2.5
036 - 042	in	2.5	16.1	11.0	3.0	2.5	25.9	19.0	1.1	1.0
	cm	6.3	40.9	27.9	7.7	6.4	65.8	48.3	2.8	2.5
048	in	3.7	16.1	13.7	4.1	1.3	35.9	19.0	1.1	1.0
	cm	9.5	41.0	34.8	10.3	3.2	91.2	48.3	2.8	2.5
060	in	1.7	18.1	13.7	4.1	1.3	35.9	19.0	1.1	1.0
	cm	4.4	46.0	34.8	10.3	3.2	91.2	48.3	2.8	2.5

TY – Horizontal Dimensional Data

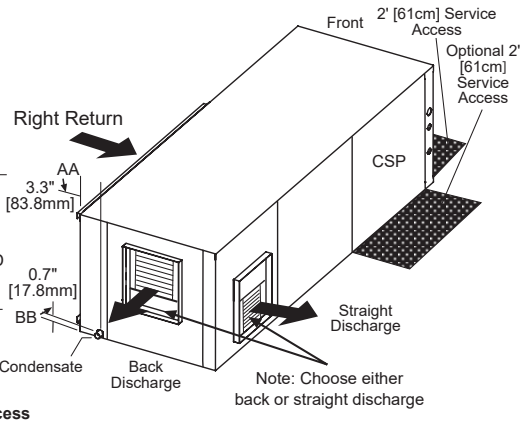
LEFT RETURN



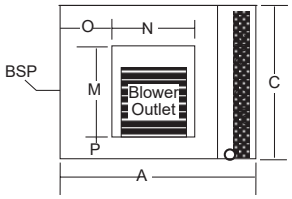


Front-View

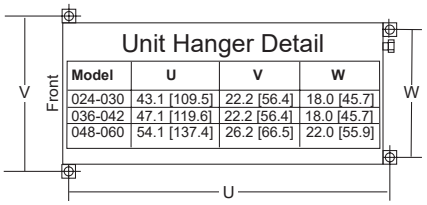
RIGHT RETURN

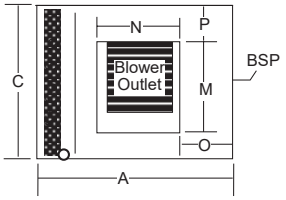


Note: Blower service panel requires 2' service access

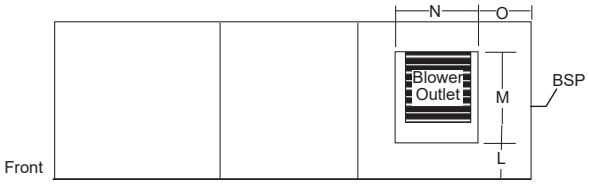


Left Return Back Discharge

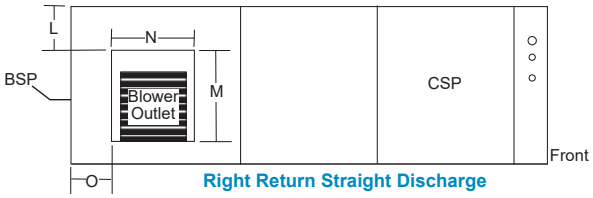




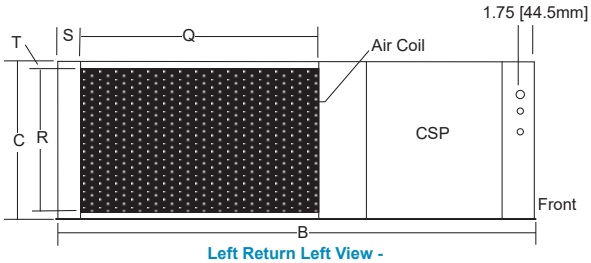
Right Return Back Discharge



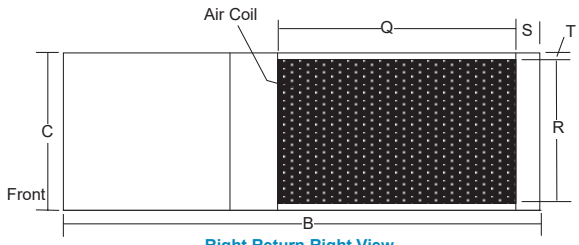
Left Return Straight Discharge



Right Return Straight Discharge



Left Return Left View - Air Coil Opening



Right Return Right View - Air Coil Opening

Notes:

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units shipped with filter rails. These rails should be removed for return duct connection. See Aff---- for accessory air filter frame with duct collar.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate connection for polymer drain pan rubber is coupling that couples to ¾" schedule 40/80 PVC, S.S. drain pan is 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units

Legend:

CAP = Control Access Panel
BSP = Blower Service Panel
CSP = Compressor Access Panel

TY – Vertical Upflow Dimensional Data

Vertical Upflow Model		Overall Cabinet		
		A Width	B Depth	C Height
024 - 030	in	21.5	21.5	40.0
	cm	54.6	54.6	101.6
036 - 042	in	21.5	26.0	45.0
	cm	54.6	66.0	114.3
048 - 060	in	24.0	32.5	46.0
	cm	61.0	82.6	116.8

Vertical Upflow Model		Water Connections - Standard Units						
		①		②		③		
		Loop In D	Loop In E	Loop Out F	Loop Out G	H	I	Loop In/Out FPT
024	in	1.9	1.4	13.8	1.4	19.7	1.4	3/4"
	cm	4.8	3.6	35.1	3.6	50.0	3.6	
030	in	1.9	1.4	15.2	1.4	19.7	1.4	3/4"
	cm	4.8	3.6	38.6	3.6	50.0	3.6	
036	in	1.9	1.4	15.7	1.4	20.6	1.4	3/4"
	cm	4.8	3.6	39.9	3.6	52.3	3.6	
042	in	1.9	1.4	16.6	1.4	20.6	1.4	3/4"
	cm	4.8	3.6	42.0	3.6	52.3	3.6	
048	in	1.9	1.4	16.6	1.4	21.6	1.4	1"
	cm	4.8	3.6	42.2	3.6	54.9	3.6	
060	in	1.9	1.4	17.2	1.4	21.6	1.4	1"
	cm	4.8	3.6	43.7	3.6	54.9	3.6	

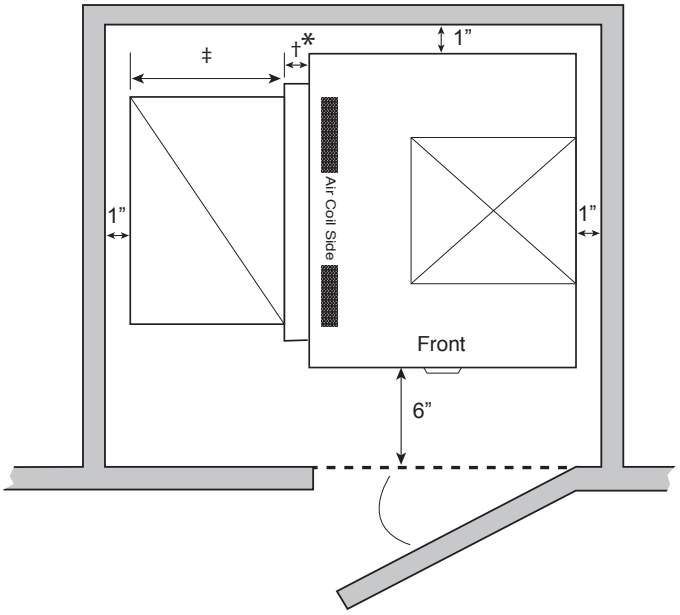
Vertical Model		Electrical Knockouts	
		J 1/2"	K 3/4"
		Low Voltage	Power Supply
024 - 060	in	7.1	10.1
	cm	18.1	25.7

Notes:
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available.
3. Discharge flange is field installed.
4. Condensate connection for polymer drain pan is rubber coupling that couples to ¾" schedule 40/80 PVC, S.S. drain pan is 3/4" MPT.
5. Units come standard with air filter rails. For duct connections, optional filter frames should be ordered. See product options decoder for details. Filter rails can be converted in the field with an accessory air filter frame kit. Please see the accessory submittal for details.

Legend:
CAP = Control Access Panel
BSP = Blower Service Panel
CSP = Compressor Access Panel
ASP = Alternative Service Panel

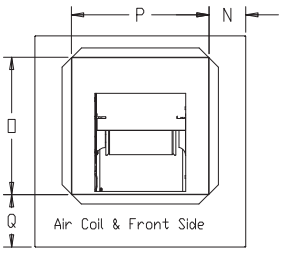
Recommended Minimum Installation Clearances for Vertical Units*	
1"	Back of unit
	Side opposite return air
6"	Front if hard piped
Return Air Side	
1"	Ducted return - ‡ *Add for duct width - † Add 2" for 1" filter frame/rail or 3" for 2" filter frame/rail
	Free (open) return - calculate required dimension for a maximum velocity of 600 fpm

*Field installed accessories (hoses, air cleaners, etc.) and factory WSE option will require additional space. Top supply air is shown, the same clearances apply to bottom supply air units.

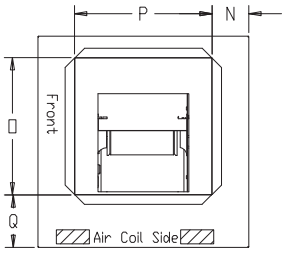


TY – Vertical Upflow Dimensional Data

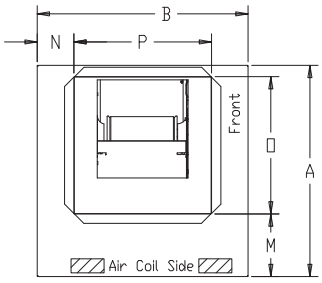
Vertical Model		Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm)					Return Connection Using Return Air Opening			
		M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U
024 - 030	in	6.4	5.0	14.0	14.0	5.8	2.0	18.5	19.3	0.9
	cm	16.3	12.7	35.6	35.6	14.7	5.1	47.0	49.0	2.3
036 - 042	in	6.4	3.8	14.0	14.0	5.1	2.3	22.8	23.9	0.7
	cm	16.1	9.5	35.6	35.6	13.1	5.8	57.9	60.7	1.9
048 - 060	in	6.9	7.3	16.0	18.0	5.1	2.3	29.3	22.5	0.7
	cm	17.4	18.4	40.6	45.7	13.1	5.8	74.4	57.0	1.9



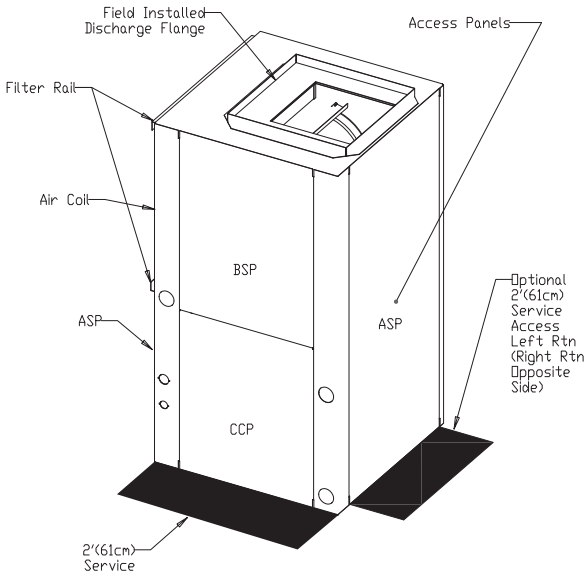
Top View-Front Return

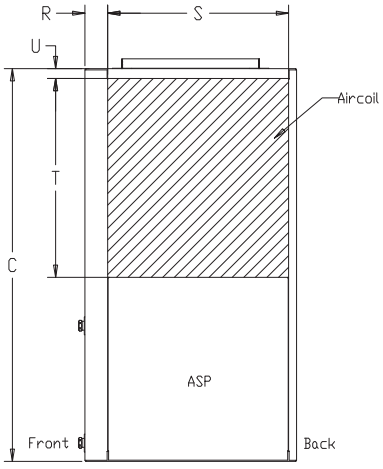


Top View-Right Return

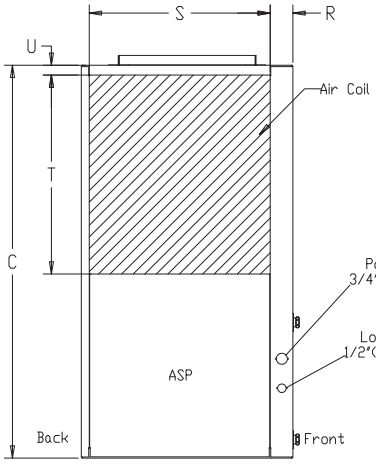


Top View-Left Return

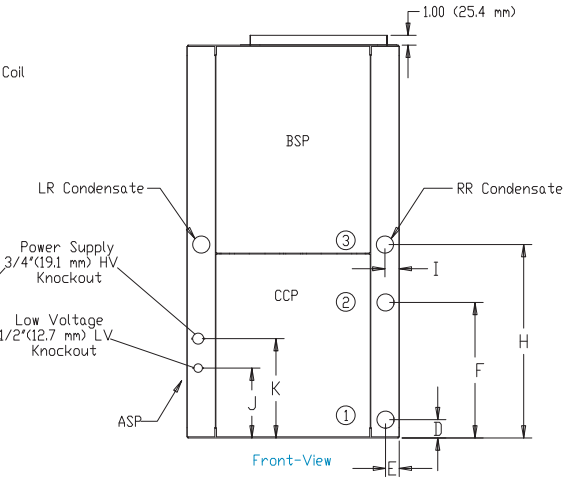




Right Return Right View - Air Coil Opening



Left Return Left View - Air Coil Opening



Front-View

Units come standard with air filter rails. For duct connections, optional filter frames should be ordered. See product options decoder for details. Filter rails can be converted in the field with an accessory air filter frame kit. Please see the accessory submittal for details.

Corner Weights for TY Series Horizontal Units

Model		Total	Left-Front*	Right-Front*	Left-Back	Right-Back
TYH024	lbs	174	62	40	39	33
	kg	79	28	18	18	15
TYH030	lbs	182	67	41	40	34
	kg	83	30	19	18	15
TYH036	lbs	203	75	47	44	37
	kg	92	34	21	20	17
TYH042	lbs	218	81	50	48	39
	kg	99	37	23	22	18
TYH048	lbs	263	98	60	58	47
	kg	119	44	27	26	21
TYH060	lbs	303	103	64	61	75
	kg	137	47	29	28	34

*Front is control box end.

Standard Units

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Fan Motor	Total Unit	Min Circ	Max Fuse/ HACR
				RLA	LRA	Qty	FLA	FLA	Amp	
024	G	208/230/60/1	197/252	11.7	58.3	1	3.9	15.6	18.5	30
	E	265/60/1	239/292	9.1	54.0	1	3.2	12.3	14.6	20
	H	208/230/60/3	197/252	6.5	55.4	1	3.9	10.4	12.0	15
	F*	460/60/3*	414/506	3.5	28.0	1	3.2	6.7	7.6	15
030	G	208/230/60/1	197/252	13.1	73.0	1	3.9	17.0	20.3	30
	E	265/60/1	239/292	10.2	60.0	1	3.2	13.4	16.0	25
	H	208/230/60/3	197/252	8.7	58.0	1	3.9	12.6	14.8	20
	F*	460/60/3*	414/506	4.3	28.0	1	3.2	7.5	8.6	15
036	G	208/230/60/1	197/252	15.3	83.0	1	3.9	19.2	23.0	35
	E	265/60/1	239/292	13.0	72.0	1	3.2	16.2	19.5	30
	H	208/230/60/3	197/252	11.6	73.0	1	3.9	15.5	18.4	30
	F*	460/60/3*	414/506	5.7	38.0	1	3.2	8.9	10.3	15
042	G	208/230/60/1	197/252	17.9	96.0	1	5.2	23.1	27.6	45
	H	208/230/60/3	197/252	14.2	88.0	1	5.2	19.4	23.0	35
	F*	460/60/3*	414/506	6.2	44.0	1	4.7	10.9	12.5	15
048	G	208/230/60/1	197/252	21.2	104.0	1	5.2	26.4	31.7	50
	E	265/60/1	239/292	16.0	109.7	1	4.7	20.7	24.7	40
	H	208/230/60/3	197/252	14.0	83.1	1	5.2	19.2	22.7	35
	F*	460/60/3*	414/506	6.4	41.0	1	4.7	11.1	12.7	15
060	G	208/230/60/1	197/252	27.1	152.9	1	6.9	34.0	40.8	60
	E	265/60/1	239/292	22.4	130.0	1	6.0	28.4	34.0	50
	H	208/230/60/3	197/252	16.5	110.0	1	6.9	23.4	27.5	40
	F*	460/60/3*	414/506	7.2	52.0	1	6.0	13.2	15.0	20

Wire length based on one way measurement with 2% voltage drop
Wire size based on 60°C copper conductor
All fuses Class RK-5

*** NEUTRAL CONNECTION REQUIRED! All F Voltage (460 vac) units require a four wire power supply with neutral.**
ECM motor is rated 265 vac and is wired between one hot leg and neutral.

TY Series Wiring Diagram Matrix

All current diagrams can be located online at climatemaster.com.
Click 'Commercial Professional'.

1. Click 'Products' in the main navigation
2. Select 'Small Packaged Units'
3. Select the TY product series
4. Click the Wire Diagrams tab in the middle of the page
5. Select your voltage and controls

Unit Controller	Fan Motor	208v/1 - 265v/1	208v/3	460v/3
		TY024 - 060	TY024 - 060	TY024 - 060
DXM2.5	CV ECM	96B0231N11	96B0232N21	96B0232N31
Auxiliary WD for MPC		96B0147N14		

Tranquility® 22 (TY) Series 60Hz
Engineering Specifications – Page 1

General:

Furnish and install ClimateMaster Tranquility® "TY" 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 48.9°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-1995 for the United States and CAN/CSA-C22.2 NO.236 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 the 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 will be recorded by factory acceptance test and furnished on report card for ease of unit warranty status.)**

Basic Construction:

Horizontal units shall have one of the following air flow arrangements: Left Inlet/Straight (Right) Discharge; Right Inlet/Straight (Left) Discharge; Left Inlet/Back Discharge; or Right Inlet/Back Discharge as shown on the plans. Units must have the ability to be field convertible from straight to back or back to straight discharge with no additional parts or unit structure modification. Horizontal units will have factory installed hanger brackets with rubber isolation grommets packaged separately.

Vertical Units shall have one of the following air flow arrangements: Left Return/Top Discharge, Right Return/Top Discharge, as shown on the plans.

If units with these arrangements are not used, the contractor is responsible for any extra costs incurred by other trades. All units (horizontal and vertical) must have multiple access panels for serviceability of compressor compartment. **Units having only one access panel to compressor/heat exchangers/expansion device/refrigerant piping shall not be acceptable.**

Compressor section interior surfaces shall be lined with 1/2 inch (12.7mm) thick, 1-1/2 lb/ft3 (24 kg/m3) acoustic type glass fiber insulation. Air handling section interior surfaces shall be lined with 1/2 in (12.7mm) thick, 1-1/2 lb/ft3 (24 kg/m3) foil-faced fiber insulation for ease of cleaning. Insulation placement shall be designed in a manner that will eliminate any exposed edges to prevent the introduction of glass fibers into the air stream. **Units without foil-faced insulation in the air handling section will not be accepted.**

The heat pump cabinets shall be fabricated from heavy gauge galvanized steel.

Standard insulation must meet NFPA Fire Hazard Classification requirements 25/50 per ASTM E84, UL 723, CAN/ULC S102-M88 and 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.**

All horizontal units to have factory installed 1 inch (25.4 mm) discharge air duct collars, 1 inch (25.4 mm) filter rails with 1 inch (25.4 mm) filters factory installed, and factory installed unit-mounting brackets. Vertical units to have field installed discharge air duct collar, shipped loose and 1 inch (25.4 mm) filter rails with 1 inch (25.4 mm) filters factory installed. **If units with these factory-installed provisions are not used, the contractor is responsible for any extra costs to field install these provisions, and/or the extra costs for his sub-contractor to install these provisions.**

All units must have an insulated panel separating the fan compartment from the compressor compartment. **Units with the compressor in the air stream are not acceptable.** Units shall have a factory installed 1 inch (25.4 mm) wide filter bracket for filter removal from either side. Units shall have a 1 inch (25.4 mm) thick throwaway type glass fiber filter. **The contractor shall purchase one spare set of filters and replace factory shipped filters on completion of start-up.** Filters shall be standard sizes. **If units utilize non-standard filter sizes then the contractor shall provide 12 spare filters for each unit.**

Cabinets shall have separate holes and knockouts for entrance of line voltage and low voltage control wiring. All factory-installed wiring passing through factory knockouts and openings shall be protected from sheet metal edges at openings by plastic ferrules. Supply and return water connections shall be copper FPT fittings. All water connections and electrical knockouts must be in the compressor compartment corner post as to not interfere with the serviceability of unit. Contractor shall be responsible for any extra costs involved in the installation of units that do not have this feature. Contractor must ensure that units can be easily removed for servicing and coordinate locations of electrical conduit and lights with the electrical contractor.

Option: The unit will be supplied with optional field or factory installed 2 inch air filter rails (typically used for free return installation) or 1 inch or 2 inch air filter frames with filter access door and return air duct flanges (typically used for ducted return installation). A corresponding 1 inch or 2 inch throwaway type glass fiber filter will ship with the factory installed filter rails or frame.

Option: The contractor shall install 1 inch or 2 inch MERV rated pleated media disposable air filters on all units.

Option: UltraQuiet package shall consist of high technology sound attenuating material that is strategically applied to the compressor and air handling compartment casings and fan scroll in addition to the standard ClimaQuiet system design, to further dampen and attenuate sound transmissions.

Option: The unit shall be supplied with extended range insulation option, which adds closed cell insulation to internal water lines, and provides insulation on suction side refrigeration tubing including refrigerant to water heat exchanger.

Fan and Motor Assembly:

Blower shall have inlet rings to allow removal of wheel and motor from one side without removing housing. Units shall have a direct-drive centrifugal fan. The fan motor shall be an ECM variable speed ball bearing type motor. The ECM fan motor shall provide soft starting, maintain constant CFM over its static operating range and provide airflow adjustment in 25 CFM increments via its control board. The fan motor shall be isolated from the housing by rubber grommets. The motor shall be permanently lubricated and have thermal overload protection. A special dehumidification mode shall be provided to allow lower airflows in cooling for better dehumidification. The dehumidification mode may be constant or automatic (humidistat controlled). Airflow/Static pressure rating of the unit shall be based on a wet coil and a clean filter in place. **Ratings based on a dry coil, and/or no air filter, shall NOT be acceptable.**

Refrigerant Circuit:

All units shall contain an EarthPure® (HFC-410A) sealed refrigerant circuit including a high efficiency two-stage scroll compressor 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 switch (loss of charge), 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.**

Hermetic compressors shall be internally sprung. The compressor shall have a dual level vibration isolation system. The compressor will be mounted on specially engineered sound-tested EPDM vibration isolation grommets to a large heavy gauge compressor mounting plate, which is then isolated from the cabinet base with rubber grommets for maximized vibration attenuation. All units shall include a discharge muffler to further enhance sound attenuation. Compressor shall have thermal overload protection. Compressor shall 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 625 PSIG (4309 kPa) refrigerant working pressure. Refrigerant to water heat exchangers shall be of copper inner water tube and steel refrigerant outer tube design, rated to withstand 625 PSIG (4309 kPa) working refrigerant pressure and 500 PSIG (3445 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 types 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 a cupro-nickel coaxial water to refrigerant heat exchanger.

Option: The refrigerant to air heat exchanger shall be tin-plated.

Drain Pan:

The drain pan shall be constructed of corrosion resistant polymer material. Drain outlet shall be connected from pan using provided polymer coupling and clamps that meet UL 2043 as required for discrete products by the IMC and UMC when located in a plenum. If steel material is used for drain pan it shall be fully insulated on all sides and must meet the stringent 1,000 hour salt spray test per ASTM B117. Drain outlet shall be located at pan as to allow unobstructed drainage of condensate. Drain outlet shall be connected from pan directly to plumbing via a rubber coupling that couples to ¾ inch schedule 40/80 PVC fitting. **No hidden internal tubing extensions from pan outlet extending to unit casing (that can create drainage problems) will be accepted.** The unit as standard will be supplied with solid-state electronic condensate overflow protection. **Mechanical float switches will NOT be accepted.**

Option: The drain pan shall be constructed of 304 stainless steel and drain connection will be 3/4" MPT. The stainless steel drain pan shall be fully insulated on all sides.

Electrical:

A control box shall be located within the unit compressor compartment and shall contain a 75 VA transformer, 24 volt activated, 2 or 3 pole compressor contactor, terminal block for thermostat wiring and solid-state controller for complete unit operation. The control box on sizes 015 through 060 shall have a door to protect the internal components. The entire control box shall be capable of rotating out of the unit to allow access to the components behind the control box. Low voltage wires shall enter the box through a hole in the lower left side and high voltage wires shall enter the box through a hole in the upper left side. 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.

Option: Disconnect Switch, Non-Fused, classified as motor disconnect

Solid State Control System (DXM2.5):

Units 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 have the following features:

- Anti-short cycle time delay on compressor operation.
- Random start on power up mode.
- Low voltage protection.
- High voltage protection.
- Unit shutdown on high or low refrigerant pressures.
- Unit shutdown on low water temperature.
- Condensate overflow electronic protection.
- Option to reset unit at thermostat or disconnect.
- 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.
- Ability to defeat time delays for servicing.
- Light emitting diode (LED) on circuit board to indicate high pressure, low pressure, low voltage, high voltage, low water/air temperature cut-out, condensate overflow, and control voltage status.
- The low-pressure switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- 24V output to cycle a motorized water valve or other device with compressor contactor.
- Unit Performance Sentinel (UPS). The UPS warns when the heat pump is running inefficiently.
- Water coil low temperature sensing (selectable for water or antifreeze).
- Air coil low temperature sensing.
- Removable thermostat connector.
- Night setback control.
- Random start on return from night setback.
- 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.).
- Override temperature control with 2-hour timer for room occupant to override setback temperature at the thermostat.
- Dry contact night setback output for digital night setback thermostats.
- Ability to work with heat pump (Y, O) or heat/cool (Y, W) type thermostats.
- Ability to work with heat pump thermostats using O or B reversing valve control.
- Emergency shutdown contacts.
- Boilerless system heat control at low loop water temperature.
- Ability to allow up to 3 units to be controlled by one thermostat.
- Relay to operate an external damper.
- Ability to automatically change fan speed from multi-stage thermostat.
- Relay to start system pump.
- 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 8 safety protections of anti-short cycle, low voltage, high voltage, high refrigerant pressure, low pressure (loss of charge), air coil low temperature cut-out, water coil low temperature cut-out, and condensate overflow protections will not be accepted.

NOTE: To achieve full benefit of the two-stage compressor and ECM fan, a 2 Heat/2 Cool thermostat (or a 3 Heat/2 Cool thermostat when electric backup heat is required) should be employed.

When DXM2.5 is connected to AWC99U01 communicating thermostat or handheld service tool, the installer/service technician can; check and set CFM and 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.**

This control system coupled with a multi-stage thermostat will better dehumidify room air by automatically running the heat pump's fan at lower speed on the first stage of cooling thereby implementing low sensible heat ratio cooling. On the need for higher cooling performance the system will activate the second stage of cooling and automatically switch the fan to the higher fan speed setting. This system may be further enhanced with a humidistat. **Units not having automatic low sensible heat ratio cooling will not be accepted; as an alternate a hot gas reheat coil may be provided with control system for automatic activation.**

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:

Solid state control system shall communicate with thermostat to display (at the 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, condensate overflow 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 2-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. condensate overflow alarm
k. hi/low voltage alarm
l. fan "ON/AUTO" position of space thermostat as specified above
m. unoccupied/occupied command
n. cooling command
o. heating command
p. fan "ON/AUTO" command
q. fault reset command
r. itemized fault code revealing reason for specific shutdown fault (any one of 7)

Warranty:

ClimateMaster shall warranty equipment for a period of 12 months from start up 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 DXM2.5 control board for a total of 5 years.

FIELD INSTALLED OPTIONS

Hose Kits:

All units shall be connected with hoses. The hoses shall be 2 feet (61 cm) long, braided stainless steel; fire rated hoses complete with adapters. Only fire rated hoses will be accepted.

Valves:

The following valves are available and will be shipped loose:

a. Ball valve; bronze material, standard port full flow design, FPT connections.
b. Ball valve with memory stop and PT port.
c. "Y" strainer with blowdown valve; bronze material, FPT connections.
d. Motorized water valve; slow acting, 24v, FPT connections.

Hose Kit Assemblies:

The following assemblies ship with the valves already assembled to the hose described:

a. Supply and return hoses having ball valve with PT port.
b. Supply hose having ball valve with PT port; return hose having automatic flow regulator valve with PT ports, and ball valve.
c. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having automatic flow regulator with PT ports, and ball valve.
d. Supply hose having "Y" strainer with blowdown valve, and ball valve with PT port; return hose having ball valve with PT port.

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. CM500 – Color Touchscreen Display, Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V03C/R)

Thermostat shall have color resistive touchscreen display with space temperature, relative humidity, setpoints, mode, status indication and local weather (if connected to Wi-Fi). Residential version shall be 7 day programmable with up to 4 setpoints per day. 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. Compatible with condensate overflow warning systems – lockout compressor with message on the display. 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.

c. CM300 – Multi-stage, Automatic or Manual Changeover, 7-day Programmable with Wi-Fi and Humidity Control (AVB32V02C/R)

Residential version shall be 7 day programmable with up to 4 setpoints per day. 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. Compatible with condensate overflow warning systems – lockout compressor with message on.

d. 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.

e. Multi-stage Digital Automatic Changeover (ATA22U01)
Thermostat shall be multi-stage (2H/2C), manual or automatic changeover with HEAT-OFF-COOL-AUTO-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. A fault LED shall be provided to indicate specific fault condition(s). Thermostat shall provide temperature display offset for custom applications. Thermostat shall allow unit to provide better dehumidification by automatically using lower fan speed on stage 1 cooling (higher latent cooling) as main cooling mode, and automatically shifting to high speed fan on stage 2 cooling.

f. Multi-stage Automatic or Manual Changeover Programmable 7 Day (ATP32U03)
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 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.

g. Multi-stage Automatic or Manual Changeover Programmable 7 Day with Humidity Control (ATP32U04)
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. Installer configuration mode shall allow thermostat to operate with ECM fan dehumidification mode via settings changes. 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 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.

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).

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 submittal.

SUBMITTAL DATA - I-P UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ Btuh

EER: _____

Heating Capacity: _____ Btuh

COP: _____

Ambient Air Temp: _____ °F

Entering Water Temp (Clg): _____ °F

Entering Air Temp (Clg): _____ °F

Entering Water Temp (Htg): _____ °F

Entering Air Temp (Htg): _____ °F

Airflow: _____ CFM

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (lb)

ELECTRICAL DATA

Power Supply: _____ Volts

_____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

SUBMITTAL DATA - S-I UNITS

Unit Designation: _____

Job Name: _____

Architect: _____

Engineer: _____

Contractor: _____

PERFORMANCE DATA

Cooling Capacity: _____ kW

EER: _____

Heating Capacity: _____ kW

COP: _____

Ambient Air Temp: _____ °C

Entering Water Temp (Clg): _____ °C

Entering Air Temp (Clg): _____ °C

Entering Water Temp (Htg): _____ °C

Entering Air Temp (Htg): _____ °C

Airflow: _____ l/s

Fan Speed or Motor/RPM/Turns: _____

Operating Weight: _____ (kg)

ELECTRICAL DATA

Power Supply: _____ Volts

_____ Phase _____ Hz

Minimum Circuit Ampacity: _____

Maximum Overcurrent Protection: _____

Notes

Revision History

Date:	Item:	Action:
01/24/23	All	Transitioned from DXM2 to DXM2.5 unit controls. Introduced new communicating Wi-Fi color touch screen iGate 2 thermostat
09/23/21	All	Removed LON option, discontinued
08/25/21	Engineering Specs	Added drain pan insulation text
07/08/21	Introduced Polymer Drain Pans. Discontinued Painted Galvanized Pans. Increased the height of vertical sizes 015 and 018. Removed all wiring diagrams.	Updated
1/28/20	TOC, Physical Data	Update, Size 060 updated
11/27/18	Electrical service disconnect	Added
11/15/16	Document Design Update	Updated
06/22/16	All	Updated Cabinet Description
03/14/16	Page 42	Run test text edit
02/25/16	Table page: 12-13,16-17, 22-23	Updated Performance tables sizes 024,036,060
07/31/15	Unit Features and Engineering Specifications	Edit Compressor Mount Text
06/09/15	Decoder - Page 10; Text - Page 35	Updated
01/30/15	Table - Page 29	Updated
12/17/14	Table - Page 29	Updated
09/30/14	Text Edit - Page 44	Updated
06/13/14	Page 43	Changed Text - “rack” to “rails”
04/17/14	Page 42	Update text re. water pressure switch
03/24/14	Page 33	Top view - Front return removed
11/07/13	AHRI Table	Updated to sizes 024 and 036
02/26/13	AHRI Table	Size 060 Updated
11/26/12	AHRI / ISO Tables Wiring Diagrams	Updated Size 060 Data Updated
09/27/12	Recommended Minimum Installation Clearances for Vertical Units *	Added
07/30/12	AHRI/ISO Tables	Updated
06/01/12	First Published	

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