Tranquility® 30 Digital (TE) Series

Submittal Data

Models TED/H/V 026-072 60Hz - HFC-410A

LC991

Rev.: Spetember 23, 2021

CLIMATEMASTER®

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TE Premier Efficiency Series

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TE Premier Efficiency Series

THE TRANQUILITY® 30 DIGITAL (TE) SERIES

As one of the highest efficiency water-source heat pumps on the planet, the Tranquility® 30 Digital Series raises the bar for water-source heat pump efficiencies, features and application flexibility. Not only does the Tranquility 30 Digital Series far exceed ASHRAE 90.1 efficiencies, but it also uses EarthPure® (HFC-410A) zero ozone depletion refrigerant, making it an extremely environmentally-friendly option. Tranquility 30 Digital is eligible for additional LEED® (Leadership in Energy and Environmental Design) points because of its "green" technology design.

Available in sizes 2 tons (7.0 kW) through 6 tons (19.3 kW) with multiple cabinet options (vertical upflow, vertical downflow and horizontal) the Tranquility 30 Digital offers a wide range of units for most installations. The Tranquility 30 Digital has an extended range refrigerant circuit, capable of ground loop (geothermal) applications as well as water loop (boiler-tower) applications. Some of the features of the innovative Tranquility 30 Digital include: Copeland UltraTech™ two-stage unloading scroll compressor, ECM variable communicating fan motor, communicating microprocessor controls, galvanized steel cabinet, polyester powder coat paint, stainless steel drain pan and foil-backed air handler insulation.

ClimateMaster's exclusive double isolation compressor mounting system makes the Tranquility 30 Digital 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. Multiple removable access panels and an easily accessible control box make installation and maintenance user friendly. Options such as DDC controls, internal variable speed pumps, modulating water valves, and high efficiency MERV rated air filters allow for customizable design solutions.

iGate® technology is the next generation in intelligent control by using two-way communication to provide a gateway into the system. The iGate 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 iGate communications hub is the DXM2 intelligent controller, which analyzes the status of sensors and smart components (which are also two-way communicating) to determine how best to operate the system for optimal comfort, efficiency and long-term reliability. All of this information is passed to the iGate thermostat (or diagnostic tool), where it can be displayed in plain English. And since communication is both ways, the iGate thermostat can also be used to configure and tailor the system without even touching the unit.

vFlow® is ClimateMaster's variable water flow technology. It represents a major advancement in geothermal system performance - made possible through the iGate system. vFlow not only builds the major water circulation components into the unit for a clean installation, it also intelligently varies the water flow to minimize pump energy consumption and improve system reliability.

The heart of vFlow is either a variable-speed pump (for ground loops) or modulating water valve (for ground water or central variable speed pumps) directly linked into the iGate system. Water flow is automatically varied based on changes in unit capacity level (stage) and source water temperature to maintain optimum system performance. vFlow® allows the use of direct return piping, while eliminating external two-way valves and automatic flow regulators - making vFlow® systems inherently self-balancing.

vFlow systems provide reduced water pumping power compared to traditional fixed-speed pumping systems. They also protect the unit against extreme operating conditions, thus extending the life of the compressor and air coil. Since vFlow is built inside the unit, it also saves on installation time and makes for a very clean and compact installation. The Tranquility 30 Digital 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.

UNIT FEATURES

- Sizes 026 (2 ton, 7.0 kW) through 072 (6 tons, 19.3 kW)
- EarthPure® (HFC-410A) refrigerant
- Copeland UltraTech™ two-stage unloading scroll compressors
- ECM variable speed communicating fan motor with soft start
- Exceeds ASHRAE 90.1 efficiencies
- Part load operation significantly lowers annual operating costs
- Galvanized steel construction with attractive black matte polyester powder coat paint
- Stainless steel drain pan
- Foil-backed insulation in air handler section
- Unique double isolation compressor mounting with vibration isolation for quiet operation
- Insulated divider and separate compressor/air handler compartments
- TXV metering device
- Available extended range (20°F to 120°F, -6.7°C to 48.9°C) operation
- Advanced Controls - iGate® communicating control provides advanced unit functionality and comprehensive configuration, monitoring and diagnostic capabilities through digital communication links with the variable-speed fan motor, variable-speed source pump (or modulating valve) and communicating thermostat or configuration/diagnostic tool.
  - 7 temperature sensor inputs for system protection and control
  - Anti-short cycle and over/under voltage protection
  - High pressure, loss of charge, and condensate overflow protection
  - LED fault and status indication at controller
  - Service tool port for optional setup and diagnostics at unit
- BACnet, Modbus and Johnson N2 compatibility options for DDC controls
- Field convertible discharge air arrangement for horizontal units
- Easy access control box
- Flush securely-mounted corner post water connections (no backup wrench required)
- Unit Performance Sentinel (UPS) monitoring system
- Eight Safeties Standard
- Wide variety of options including ultra quiet sound insulation, extended range insulation, return air filter frames, variable and fixed speed circulating pumps, modulating motorized valves, hot water generator, and cupro-nickel water coil

iGate® - Information gateway to monitor, control, and diagnose your system

Tranquility® 30 Digital is equipped with industry-first, iGate® – Information Gateway – 2-way communicating system. iGate allows users to interact with their geothermal system in plain English. It delivers improved reliability and efficiency by precisely controlling smart variable speed components. iGate makes Tranquility 30 Digital series the easiest geothermal products to install and service.

Monitor/Configure – Installers can configure Tranquility® 30 Digital units from the iGate® communicating thermostat or configuration/ diagnostic tool. This includes: Air flow, loop, water-flow option configuration, unit configuration, 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 and pump.

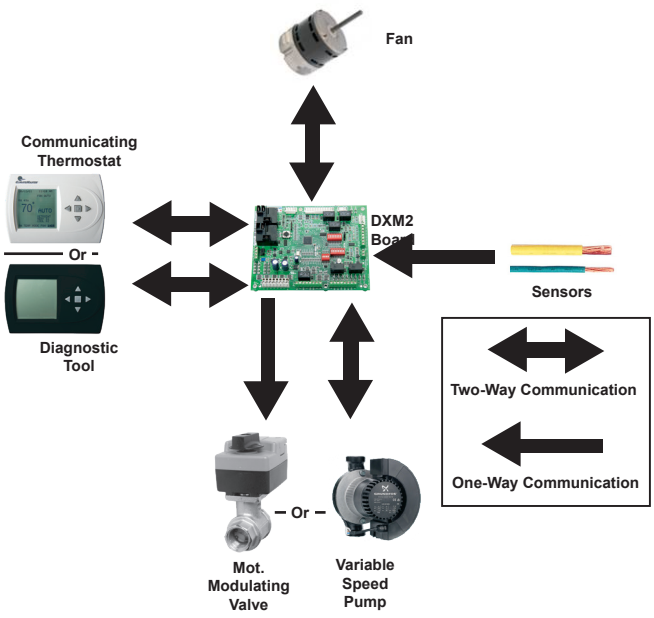
Precise Control – The new DXM2 board enables intelligent, 2-way communication between the DXM2 board and smart components like the communicating thermostat, fan motor, and water pump. The DXM2 board can also directly control the modulating valve and accepts various feedback/input (see figure). The Intelligent DXM2 board uses information received from the smart components/sensors to precisely control operation of the variable speed fan and variable speed water pump (or modulating valve) to deliver higher efficiency, reliability and increased comfort.

Diagnostics – iGate takes diagnosing geothermal units to the next level of simplicity, by providing a dashboard of system and fault information, in plain English, on the iGate thermostat/ service tool.

iGate Service Warning will alert the occupant of a fault and display dealer information (if programmed), fault description, possible causes, and current system status (temperature readings, fan RPM, and water flow status) which may be reported to service personnel.

In iGate 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, pump speed, or valve position from the thermostat to help troubleshoot specific components.

With the iGate communicating system, users and contractors have a gateway to system information thats never been available before now.



AIRFLOW SELECTION	CFM
HEAT STAGE 1	600
HEAT STAGE 2	750
AUXILIARY HEAT	850
EMERGENCY HEAT	850
COOL STAGE 1	525
COOL STAGE 2	700
COOL DEHUMID 1	425
COOL DEHUMID 2	550
CONTINUOUS FAN	350
HEAT OFF DELAY	60
COOL OFF DELAY	30

◀ PREVIOUS NEXT ▶

POSSIBLE FAULT CAUSES
LOW WATER COIL TEMP

LOW WATER TEMP - HTG
LOW WATER FLOW - HTG
LOW REFRIG CHARGE - HTG
INCORRECT LT1 SETTING
BAD LT1 THERMISTOR

◀ PREVIOUS

FAULT TEMPERATURE CONDITIONS
LT1 LOW WATER TEMP
HEAT 1 11:11 AM 11/14

LT1 TEMP	28.1
LT2 TEMP	97.3
HOT WATER EWT	121.5
COMP DISCHARGE	157.7
LEAVING AIR	92.7
LEAVING WATER	34.9
ENTERING WATER	42.1
CONTROL VOLTAGE	26.4

◀ PREVIOUS

vFlow® Internal Variable Water Flow Control

vFlow® Internal Variable Water Flow

Industry-first, built-in vFlow® provide an ultra-high-efficient, variable speed, internal water flow system. It saves installers time and labor by avoiding installing bulky external pumps, valves, or flow regulators. Multi-unit installations are also much simpler with vFlow systems, as the units automatically adjust water flow across the system.

vFlow is enabled by iGate®, which facilitates intelligent communication between the thermostat, DXM2 control, sensors, and internal water pump/valve to make true variable water flow a reality.

vFlow® is available in four variations:

1. Low System Pressure Drop Modulating Valve – High CV motorized valve for central pumping.
2. High System Pressure Drop Modulating Valve – Motorized valve for higher pressure water system such as water well pumps.
3. Standard Head Variable Pump – multi unit/central pumping.
4. High Head Variable Pump – multi/individual unit pumping.

vFlow® delivers three main benefits:

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

Internal components

Tranquility® 30 Digital can be installed more easily and compactly than its predecessors because water-flow components are internal to the unit. It also saves installing contractors labor and time by eliminating the need for an external flow regulator or a bulky external pumping module.

Variable flow

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

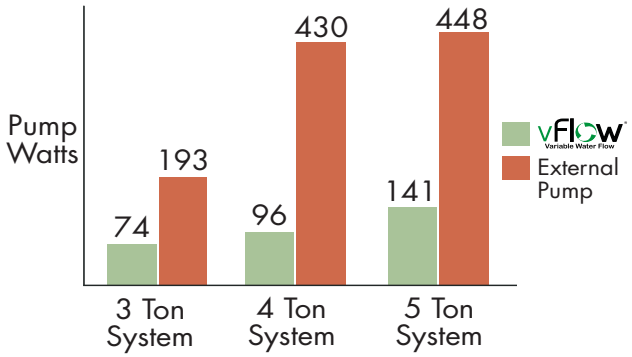
Variable speed pump or motorized modulating valve delivers variable water-flow, controlled by DXM2 control, based on loop water ΔT.

Energy Savings with water circulation control

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

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

In applications that use vFlow with a modulating valve, the motorized modulating valve slows down the water flow during part load operation. The external pump consumes fewer watts, thus saving more energy.



Reference Calculations

Heating

$$LWT = EWT - \frac{HE}{GPM \times 500}$$

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

Cooling

$$LWT = EWT + \frac{HR}{GPM \times 500}$$

$$LAT\ (DB) = EAT\ (DB) - \frac{SC}{CFM \times 1.08}$$

$$LC = TC - SC$$

$$S/T = \frac{SC}{TC}$$

Legend and Glossary of Abbreviations

BTUH = BTU(British Thermal Unit) per hour
CFM = airflow, cubic feet/minute
COP = coefficient of performance = BTUH output/BTUH input
DB = dry bulb temperature (°F)
EAT = entering air temperature, Fahrenheit (dry bulb/wet bulb)
EER = energy efficiency ratio = BTUH output/Watt input
MPT = male pipe thread
ESP = external static pressure (inches w.g.)
EWT = entering water temperature
GPM = water flow in U.S. gallons/minute
HE = total heat of extraction, BTUH
HC = air heating capacity, BTUH
HR = total heat of rejection, BTUH
HWC = hot water generator (desuperheater) capacity, Mbtuh
FPT = female pipe thread
KW = total power unit input, kilowatts
LAT = leaving air temperature, °F
LC = latent cooling capacity, BTUH
LWT = leaving water temperature, °F
MBTUH = 1000 BTU per hour
S/T = sensible to total cooling ratio
SC = sensible cooling capacity, BTUH
TC = total cooling capacity, BTUH
WB = wet bulb temperature (°F)
WPD = waterside pressure drop (psi & ft. of hd.)
MWV = Motorized Water Valve

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

Air Flow	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

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 .....22,100 BTUH
Sensible Cooling.....16,500 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.) .....6.0 GPM
Air Flow.....730 CFM

Steps 3, 4 & 5 HP Selection:

After making our preliminary selection (TEH026 - 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.....24,200 BTUH
Sensible Cooling.....16,300 BTUH
Heat of Rejection.....29,900 BTUH

Steps 6 & 7 Entering Air and Airflow Corrections:

Next, we determine our correction factors.

	Table		Ent Air		Air Flow		Corrected
Corrected Total Cooling =	24,200	x	0.975	x	0.978	=	23,076
Corrected Sens Cooling =	16,300	x	1.096	x	0.926	=	16,543
Corrected Heat of Reject =	29,900	x	0.979	x	0.978	=	28,628

Step 8 Water Temperature Rise Calculation and Assessment:

Actual Temperature Rise.....9.5°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.

TE Series Nomenclature

1 2	3	4 5 6	7	8	9	10	11	12	13	14	15
TE	V	026	B	G	D	1	0	B	L	T	S

SERIES
TE = Tranquility® 30 Digital

CONFIGURATION
V = Vertical Up
H = Horizontal
D = Downflow

UNIT SIZE
026 E,F,G,H
038 E,F,G,H
049 E,F,G,H
064 E,F,G,H
072 F,G,H

REVISION LEVEL
B = Current Revision

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

CONTROLS
D = DXM2
P = DXM2 w/MPC

B = DXM2
S = DXM2 w/MPC
} With Disconnect

CABINET

OPTION	RANGE	ULTRA QUIET	1" FILTER RACK	2" FILTER RACK	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

STANDARD
S = Standard

SUPPLY AIR FLOW & MOTOR CONFIGURATION

	Supply	Configuration	Motor
T	Top	TEV	ECM
B	Back	TEH	ECM
S	Straight	TEH	ECM
D	Down	TED	ECM

RETURN AIR FLOW CONFIGURATION
L = Left Return, Stainless Steel Drain Pan
R = Right Return, Stainless Steel Drain Pan

HEAT EXCHANGER OPTIONS

	Uncoated Copper Air Coil		Tin Plated Copper/Micro-Channel Aluminuum Air Coil	
	Copper	Cupro-Nickel	Copper	Cupro-Nickel
Standard	B	G	A	J
HWG (Coil Only)	T	V	U	W
ClimaDry®	E	P	D	F
ClimaDry® + HWG (Coil Only)	H	K	0	9

Sizes 026 to 049 always have an all-aluminum microchannel air coil.
Sizes 064 and 072 have an aluminum fin copper tube air coil with an option for tin plated copper tubes for added corrosion protection.
ClimaDry® reheat coil is not tin-plated

WATER CIRCUIT OPTIONS
0 = None
3 = Internal Pump Standard Head with Check Valve (Variable)
4 = Internal Pump High Head with Check Valve (Variable)
5 = Motorized Valve (Modulating) Closed Loop Applications, Low System Pressure Drop
6 = Motorized Valve (Modulating) Open Loop Applications, High System Pressure Drop
7 = Internal Secondary Pump - Single Speed
C = Internal Pump Standard Head Without Check Value (Variable)
D = Internal Pump High Head Without Check Value (Variable)

Note: Above model nomenclature is a general reference. Not all configurations are available on all models. Consult selection software for detailed information.

ClimaDry® Option Notes:
Unit minimum entering air temperature when in dehumidification or cooling mode is 65°F DB. Operation below this minimum may result in nuisance faults.
A thermostat with dehumidification mode or a thermostat and separate humidistat or dehumidistat is required for activation and control of ClimaDry®.

AHRI/ASHRAE/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
TE026 Part	19,200	19.8	23,600	7.0	22,000	34.1	19,000	5.8	20,800	28.0	16,800	5.0
TE026 Full	25,000	17.4	31,400	6.0	28,500	26.4	25,800	5.3	26,000	19.9	20,200	4.1
TE038 Part	27,400	20.1	32,600	6.5	30,700	34.4	27,300	5.5	29,700	29.6	23,800	4.8
TE038 Full	37,700	17.9	45,700	5.8	42,100	26.1	37,900	5.2	39,000	20.3	29,700	4.4
TE049 Part	36,300	18.8	42,200	6.1	41,800	32.9	34,800	5.0	39,100	27.4	29,800	4.4
TE049 Full	48,600	16.8	56,700	5.1	55,000	25.3	46,800	4.6	49,600	19.3	36,400	4.0
TE064 Part	46,300	18.7	54,700	6.0	53,100	32.4	44,000	5.0	51,200	26.7	38,100	4.4
TE064 Full	61,500	16.2	77,400	5.4	71,500	24.4	63,200	4.8	66,200	18.8	48,700	3.9
TE072 Part	53,000	16.8	64,600	5.2	60,800	28.6	53,200	4.5	58,100	23.2	46,000	3.9
TE072 Full	68,300	15.1	85,300	4.8	77,700	22.5	71,400	4.4	71,700	16.9	55,800	3.7

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

AHRI/ASHRAE/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 W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP	Capacity kW	EER W/W	Capacity kW	COP
TE026 Part	5.63	5.8	6.91	7.0	6.45	10	5.57	5.8	6.09	8.2	4.92	5.0
TE026 Full	7.32	5.1	9.20	6.0	8.35	7.7	7.56	5.3	7.62	5.8	5.92	4.1
TE038 Part	8.03	5.9	9.55	6.5	9.00	10.1	8.00	5.5	8.70	8.7	6.97	4.8
TE038 Full	11.05	5.2	13.39	5.8	12.34	7.7	11.10	5.2	11.43	5.9	8.70	4.4
TE049 Part	10.64	5.5	12.36	6.1	12.25	9.6	10.20	5.0	11.46	8.0	8.73	4.4
TE049 Full	14.24	4.9	16.61	5.1	16.11	7.4	13.71	4.6	14.53	5.7	10.67	4.0
TE064 Part	13.57	5.5	16.03	6.0	15.56	9.5	12.90	5.0	15.01	7.8	11.17	4.4
TE064 Full	18.02	4.7	22.68	5.4	20.96	7.2	18.52	4.8	19.40	5.5	14.27	3.9
TE072 Part	15.53	4.9	18.93	5.2	17.82	8.4	15.59	4.5	17.03	6.8	13.48	3.9
TE072 Full	20.02	4.4	25.00	4.8	22.77	6.6	20..93	4.4	21.01	5.0	16.35	3.7

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

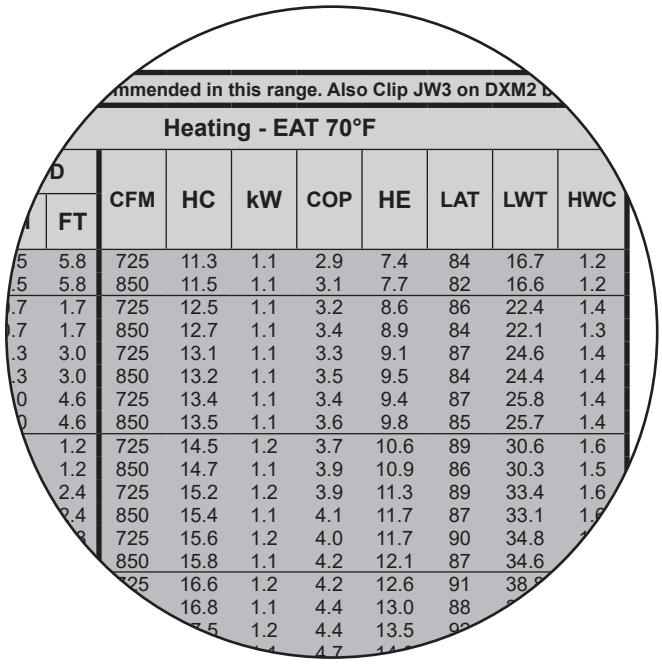
Performance Data – Selection Notes, vFlow® Models

Operation in Shaded Area: Closed Loop Application

For operation in the shaded area, appropriate levels of a proper antifreeze should be used in systems with leaving water temperatures of 40°F 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 systems without antifreeze.

Open Loop Application:

For operation in shaded area (below 40°F LWT) in open loop applications, ΔT (on DXM2) should be set such that the LWT (=EWT - ΔT) doesn't drop below 40°F. JW3 should NEVER be clipped for systems without antifreeze.



mmended in this range. Also Clip JW3 on DXM2 D

Heating - EAT 70°F

D / FT	CFM	HC	kW	COP	HE	LAT	LWT	HWC
5 5.8	725	11.3	1.1	2.9	7.4	84	16.7	1.2
.5 5.8	850	11.5	1.1	3.1	7.7	82	16.6	1.2
.7 1.7	725	12.5	1.1	3.2	8.6	86	22.4	1.4
.7 1.7	850	12.7	1.1	3.4	8.9	84	22.1	1.3
.3 3.0	725	13.1	1.1	3.3	9.1	87	24.6	1.4
.3 3.0	850	13.2	1.1	3.5	9.5	84	24.4	1.4
0 4.6	725	13.4	1.1	3.4	9.4	87	25.8	1.4
0 4.6	850	13.5	1.1	3.6	9.8	85	25.7	1.4
1.2	725	14.5	1.2	3.7	10.6	89	30.6	1.6
1.2	850	14.7	1.1	3.9	10.9	86	30.3	1.5
2.4	725	15.2	1.2	3.9	11.3	89	33.4	1.6
2.4	850	15.4	1.1	4.1	11.7	87	33.1	1.6
	725	15.6	1.2	4.0	11.7	90	34.8	
	850	15.8	1.1	4.2	12.1	87	34.6	
	25	16.6	1.2	4.2	12.6	91	38.6	
		16.8	1.1	4.4	13.0	88		
		17.5	1.2	4.4	13.5	92		
				4.7	14.2			

Performance Data Selection Notes - Models without vFlow®

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.

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.

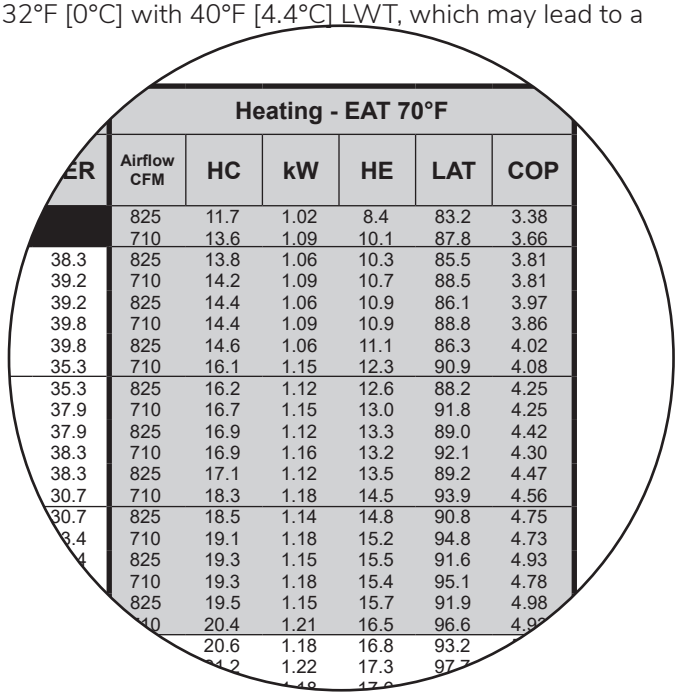
TD = HE / (GPM x 500)

TD = 22,500 / (4.5 x 500)

TD = 10°F

LWT = EWT - TD

LWT = 50 - 10 = 40°F



Heating - EAT 70°F

ER	Airflow CFM	HC	kW	HE	LAT	COP
	825	11.7	1.02	8.4	83.2	3.38
	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	4.9
		20.6	1.18	16.8	93.2	
		21.2	1.22	17.3	97.7	
				17.6		

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 – TE H/V/D 026 (Part Load), No vFlow®

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

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	4.5	1.2	2.9							11.7	1.20	7.6	82.7	2.9	1.2
30	2.3	0.5	1.1	23.6	15.6	0.61	25.6	38.8	0.7	13.2	1.18	9.2	84.3	3.3	1.3
	3.4	0.8	1.8	23.2	14.9	0.56	25.2	41.2	0.7	13.8	1.17	9.8	85.0	3.5	1.4
	4.5	1.1	2.6	22.9	14.5	0.55	24.8	41.9	0.7	14.1	1.16	10.2	85.4	3.6	1.4
40	2.3	0.4	1.0	23.5	15.3	0.68	25.8	34.4	0.8	15.4	1.15	11.5	86.7	3.9	1.5
	3.4	0.7	1.7	23.5	15.8	0.63	25.7	37.6	0.7	16.2	1.14	12.3	87.6	4.2	1.6
	4.5	1.1	2.5	23.5	15.9	0.60	25.6	39.2	0.7	16.6	1.13	12.8	88.1	4.3	1.6
50	2.3	0.4	1.0	22.9	15.9	0.77	25.5	29.6	1.1	17.7	1.12	13.8	89.2	4.6	1.7
	3.4	0.7	1.6	23.3	16.0	0.70	25.7	33.1	0.9	18.6	1.11	14.8	90.2	4.9	1.8
	4.5	1.0	2.3	23.5	16.0	0.67	25.8	34.9	0.8	19.1	1.11	15.4	90.8	5.1	1.8
60	2.3	0.4	1.0	21.9	15.5	0.88	24.9	24.9	1.5	19.9	1.10	16.2	91.7	5.3	1.9
	3.4	0.7	1.6	22.6	15.8	0.80	25.3	28.3	1.2	21.1	1.09	17.3	92.9	5.6	1.9
	4.5	1.0	2.3	22.9	15.9	0.76	25.5	30.0	1.1	21.7	1.09	18.0	93.6	5.8	2.0
70	2.3	0.4	1.0	20.7	15.0	1.00	24.1	20.7	2.0	22.2	1.09	18.5	94.2	6.0	2.0
	3.4	0.7	1.6	21.5	15.4	0.91	24.6	23.6	1.6	23.6	1.09	19.9	95.6	6.4	2.1
	4.5	1.0	2.2	21.9	15.6	0.87	24.9	25.2	1.4	24.3	1.09	20.6	96.4	6.6	2.2
80	2.3	0.4	1.0	19.3	14.3	1.14	23.2	16.9	2.6	24.6	1.09	20.9	96.8	6.6	2.2
	3.4	0.7	1.5	20.2	14.8	1.04	23.8	19.4	2.2	26.2	1.09	22.4	98.4	7.0	2.3
	4.5	0.9	2.2	20.7	15.0	1.00	24.1	20.8	2.0	27.1	1.10	23.3	99.4	7.2	2.3
90	2.3	0.4	1.0	17.8	13.6	1.30	22.2	13.7	3.4	27.1	1.10	23.3	99.4	7.2	2.3
	3.4	0.7	1.5	18.7	14.1	1.19	22.8	15.7	2.9	28.9	1.11	25.1	101.4	7.6	2.4
	4.5	0.9	2.2	19.2	14.3	1.14	23.1	16.9	2.7	29.9	1.12	26.1	102.5	7.8	2.5
100	2.3	0.4	1.0	16.3	13.0	1.48	21.4	11.1	4.3						
	3.4	0.7	1.5	17.2	13.4	1.36	21.9	12.6	3.8						
	4.5	0.9	2.1	17.7	13.6	1.31	22.2	13.6	3.5						
110	2.3	0.4	0.9	14.9	12.4	1.68	20.6	8.9	5.4						
	3.4	0.7	1.5	15.7	12.7	1.56	21.0	10.1	4.8						
	4.5	0.9	2.1	16.2	12.9	1.49	21.3	10.8	4.4						
120	2.3	0.4	0.9	13.7	12.1	1.91	20.2	7.2	6.6						
	3.4	0.6	1.4	14.4	12.3	1.77	20.4	8.1	5.9						
	4.5	0.9	2.0	14.7	12.4	1.71	20.6	8.6	5.5						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 026 (Full Load), No vFlow®

950 CFM Nominal (Rated) Airflow Heating, 850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	6.0	1.9	4.4							16.8	1.68	11.0	86.3	2.9	1.5
30	3.0	0.7	1.6	30.6	19.4	1.03	34.1	29.7	0.8	18.5	1.64	12.9	88.0	3.3	1.8
	4.5	1.1	2.6	30.3	18.9	0.96	33.6	31.5	0.7	19.4	1.63	13.8	88.8	3.5	1.9
	6.0	1.8	4.0	29.9	18.6	0.93	33.1	32.2	0.7	19.8	1.62	14.3	89.3	3.6	1.9
40	3.0	0.6	1.5	30.4	19.3	1.12	34.2	27.0	1.1	21.3	1.61	15.8	90.7	3.9	2.1
	4.5	1.1	2.5	30.5	19.5	1.05	34.1	29.0	0.9	22.4	1.60	16.9	91.7	4.1	2.3
	6.0	1.6	3.8	30.6	19.6	1.02	34.0	30.1	0.8	23.0	1.59	17.5	92.3	4.2	2.3
50	3.0	0.6	1.4	29.6	19.4	1.23	33.8	24.1	1.5	24.1	1.59	18.7	93.5	4.5	2.5
	4.5	1.0	2.3	30.2	19.6	1.15	34.1	26.3	1.2	25.4	1.59	20.0	94.7	4.7	2.6
	6.0	1.6	3.6	30.4	19.6	1.11	34.2	27.4	1.1	26.2	1.59	20.7	95.4	4.8	2.7
60	3.0	0.6	1.3	28.4	18.9	1.35	33.0	21.1	1.9	27.1	1.59	21.6	96.3	5.0	2.8
	4.5	1.0	2.3	29.3	19.3	1.26	33.6	23.3	1.6	28.6	1.60	23.1	97.8	5.2	3.0
	6.0	1.5	3.5	29.7	19.4	1.22	33.8	24.4	1.4	29.4	1.61	24.0	98.6	5.4	3.1
70	3.0	0.6	1.3	26.9	18.3	1.48	32.0	18.2	2.4	30.1	1.61	24.6	99.2	5.5	3.2
	4.5	1.0	2.2	28.0	18.8	1.38	32.7	20.3	2.1	31.8	1.64	26.2	101.0	5.7	3.3
	6.0	1.5	3.4	28.5	19.0	1.33	33.1	21.4	1.9	32.8	1.66	27.2	101.9	5.8	3.4
80	3.0	0.6	1.3	25.2	17.5	1.64	30.8	15.4	3.0	33.1	1.66	27.5	102.2	5.8	3.5
	4.5	0.9	2.2	26.0	17.9	1.56	31.3	16.6	2.6	34.4	1.69	28.7	103.5	6.0	3.7
	6.0	1.4	3.3	26.7	18.2	1.50	31.8	17.7	2.4	35.6	1.72	29.8	104.7	6.1	3.8
90	3.0	0.6	1.3	23.5	16.7	1.81	29.7	12.9	3.7	36.3	1.74	30.4	105.3	6.1	3.8
	4.5	0.9	2.2	24.7	17.3	1.69	30.4	14.6	3.3	38.7	1.81	32.5	107.6	6.2	4.0
	6.0	1.4	3.2	25.3	17.5	1.63	30.9	15.5	3.0	40.0	1.86	33.6	108.9	6.3	4.1
100	3.0	0.6	1.3	21.7	15.9	2.02	28.6	10.7	4.5						
	4.5	0.9	2.1	22.9	16.4	1.88	29.3	12.1	4.0						
	6.0	1.4	3.2	23.5	16.7	1.82	29.7	12.9	3.7						
110	3.0	0.6	1.3	20.0	15.2	2.26	27.7	8.8	5.4						
	4.5	0.9	2.1	21.1	15.7	2.11	28.2	10.0	4.8						
	6.0	1.4	3.1	21.6	15.9	2.03	28.6	10.6	4.5						
120	3.0	0.5	1.2	18.5	14.7	2.55	27.2	7.3	6.4						
	4.5	0.9	2.0	19.4	15.0	2.37	27.5	8.2	5.8						
	6.0	1.3	3.1	19.9	15.2	2.28	27.7	8.7	5.5						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 038 (Part Load), No vFlow®

1,000 CFM Nominal (Rated) Airflow Heating, 1,000 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	6.0	2.5	5.7							17.2	1.58	11.8	85.9	3.2	1.7
30	3.0	0.9	2.1	33.3	21.3	0.84	36.2	39.8	0.9	19.1	1.58	13.7	87.7	3.6	1.8
	4.5	1.5	3.5	31.6	19.6	0.75	34.1	41.9	1.0	20.2	1.57	14.8	88.6	3.8	1.9
	6.0	2.2	5.1	30.2	18.5	0.72	32.7	42.0	1.1	20.7	1.57	15.4	89.2	3.9	2.0
40	3.0	0.8	1.9	33.8	22.2	0.96	37.1	35.2	0.9	22.2	1.57	16.9	90.5	4.1	2.1
	4.5	1.4	3.2	33.6	21.5	0.86	36.5	39.1	0.8	23.5	1.57	18.1	91.7	4.4	2.2
	6.0	2.0	4.7	33.0	20.9	0.81	35.8	40.6	0.9	24.1	1.57	18.8	92.3	4.5	2.3
50	3.0	0.8	1.8	33.0	22.2	1.10	36.7	29.9	1.1	25.3	1.57	19.9	93.3	4.7	2.4
	4.5	1.3	3.0	33.7	22.2	0.98	37.1	34.2	0.9	26.7	1.57	21.3	94.7	5.0	2.5
	6.0	1.9	4.4	33.8	22.2	0.93	37.0	36.3	0.9	27.5	1.57	22.1	95.4	5.1	2.6
60	3.0	0.8	1.8	31.4	21.6	1.26	35.7	24.9	1.5	28.3	1.58	22.9	96.1	5.3	2.6
	4.5	1.3	2.9	32.7	22.1	1.13	36.6	29.0	1.3	29.9	1.58	24.5	97.6	5.5	2.8
	6.0	1.8	4.2	33.2	22.2	1.07	36.9	31.1	1.2	30.8	1.58	25.4	98.5	5.7	2.8
70	3.0	1.2	2.7	29.4	20.7	1.44	34.3	20.4	2.2	31.3	1.59	25.9	98.9	5.8	2.9
	4.5	1.9	4.4	31.0	21.4	1.30	35.4	23.9	1.8	33.2	1.60	27.7	100.6	6.1	3.0
	6.0	2.9	6.6	31.7	21.7	1.23	35.9	25.9	1.6	34.2	1.60	28.7	101.6	6.3	3.1
80	3.0	1.2	2.7	27.1	19.7	1.64	32.7	16.6	3.0	34.3	1.60	28.9	101.7	6.3	3.1
	4.5	1.9	4.3	28.8	20.5	1.49	33.9	19.4	2.6	36.5	1.62	31.0	103.7	6.6	3.2
	6.0	2.8	6.5	29.7	20.9	1.41	34.5	21.0	2.3	37.8	1.63	32.2	104.9	6.8	3.3
90	3.0	1.2	2.7	24.9	18.7	1.87	31.3	13.3	4.1	37.5	1.63	32.0	104.7	6.8	3.3
	4.5	1.9	4.3	26.5	19.4	1.70	32.3	15.6	3.5	40.1	1.65	34.4	107.0	7.1	3.5
	6.0	2.8	6.3	27.3	19.8	1.62	32.9	16.9	3.2	41.5	1.67	35.8	108.4	7.3	3.6
100	3.0	1.2	2.7	22.9	17.8	2.13	30.1	10.8	5.3						
	4.5	1.8	4.2	24.2	18.4	1.94	30.9	12.5	4.7						
	6.0	2.7	6.3	25.0	18.7	1.86	31.3	13.5	4.4						
110	3.0	1.1	2.6	21.4	17.4	2.43	29.7	8.8	6.8						
	4.5	1.8	4.2	22.3	17.6	2.23	29.9	10.0	6.1						
	6.0	2.7	6.2	22.9	17.8	2.13	30.2	10.8	5.7						
120	3.0	1.1	2.5	20.8	17.9	2.80	30.4	7.4	8.6						
	4.5	1.7	4.0	21.1	17.5	2.55	29.8	8.3	7.7						
	6.0	2.6	6.0	21.4	17.4	2.44	29.7	8.8	7.3						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 038 (Full Load), No vFlow®

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

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	9.0	4.3	9.9							25.6	2.16	18.2	88.9	3.5	2.1
30	4.5	1.5	3.5	46.1	28.4	1.52	51.3	30.4	1.1	28.1	2.18	20.7	90.8	3.8	2.4
	6.8	2.6	6.0	45.9	27.8	1.41	50.7	32.6	0.9	29.5	2.19	22.0	91.8	3.9	2.5
	9.0	3.9	9.1	45.6	27.4	1.36	50.2	33.6	0.8	30.2	2.19	22.7	92.3	4.0	2.6
40	4.5	1.4	3.2	45.7	28.4	1.66	51.4	27.6	1.5	32.2	2.21	24.7	93.8	4.3	2.9
	6.8	2.4	5.5	46.1	28.5	1.55	51.4	29.8	1.2	33.8	2.23	26.2	95.0	4.4	3.1
	9.0	3.6	8.4	46.1	28.6	1.50	51.2	30.8	1.0	34.7	2.24	27.1	95.6	4.5	3.2
50	4.5	1.3	3.0	44.6	28.6	1.80	50.8	24.7	2.0	36.3	2.26	28.6	96.8	4.7	3.4
	6.8	2.2	5.1	45.5	28.7	1.69	51.3	26.9	1.6	38.2	2.29	30.3	98.2	4.9	3.6
	9.0	3.4	7.9	45.6	28.7	1.64	51.1	27.8	1.4	37.0	2.27	29.2	97.3	4.8	3.7
60	4.5	1.3	2.9	43.0	28.1	1.97	49.8	21.9	2.7	40.4	2.33	32.5	99.9	5.1	3.8
	6.8	2.1	4.9	44.3	28.5	1.84	50.6	24.0	2.2	42.5	2.37	34.4	101.4	5.3	4.1
	9.0	3.3	7.5	44.8	28.6	1.78	50.9	25.1	1.9	43.7	2.39	35.5	102.3	5.4	4.2
70	4.5	1.2	2.9	41.1	27.4	2.15	48.4	19.1	3.5	44.5	2.41	36.3	102.9	5.4	4.3
	6.8	2.1	4.8	42.6	27.9	2.02	49.4	21.1	2.9	46.9	2.47	38.5	104.7	5.6	4.6
	9.0	3.1	7.2	43.2	28.2	1.95	49.9	22.2	2.6	48.3	2.50	39.7	105.7	5.7	4.7
80	4.5	1.2	2.9	38.8	26.4	2.37	46.9	16.4	4.4	48.8	2.51	40.2	106.0	5.7	4.7
	6.8	2.0	4.7	40.5	27.1	2.21	48.0	18.3	3.7	51.5	2.59	42.7	108.1	5.8	5.0
	9.0	3.1	7.1	41.2	27.4	2.14	48.5	19.3	4.0	53.1	2.64	44.1	109.2	5.9	5.2
90	4.5	1.2	2.9	36.4	25.4	2.63	45.4	13.9	5.5	53.2	2.64	44.2	109.3	5.9	5.2
	6.8	2.0	4.6	38.1	26.1	2.45	46.4	15.6	4.7	56.3	2.75	47.0	111.6	6.0	5.5
	9.0	3.0	6.9	38.9	26.5	2.36	47.0	16.5	4.3	58.1	2.81	48.5	113.0	6.1	5.6
100	4.5	1.2	2.8	33.9	24.2	2.93	43.9	11.6	6.7						
	6.8	2.0	4.5	35.6	25.0	2.72	44.9	13.1	5.9						
	9.0	3.0	6.8	36.4	25.4	2.63	45.4	13.9	5.5						
110	4.5	1.2	2.8	31.4	23.0	3.29	42.6	9.5	8.0						
	6.8	1.9	4.5	33.0	23.8	3.05	43.4	10.8	7.1						
	9.0	2.9	6.7	33.8	24.2	2.94	43.9	11.5	6.7						
120	4.5	1.1	2.6	29.0	21.9	3.72	41.7	7.8	9.6						
	6.8	1.9	4.3	30.5	22.6	3.44	42.2	8.8	8.6						
	9.0	2.9	6.6	31.3	23.0	3.31	42.6	9.4	8.1						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 049 (Part Load), No vFlow®

1,350 CFM Nominal (Rated) Airflow Heating, 1,350 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	9.0	2.3	5.4							23.1	2.28	15.3	85.2	3.0	2.5
30	4.5	0.2	0.6	41.7	26.7	1.13	45.6	37.0	1.0	25.3	2.25	17.6	86.7	3.3	2.6
	6.8	1.2	2.8	40.3	24.2	1.04	43.8	38.6	1.1	26.3	2.24	18.6	87.3	3.4	2.6
	9.0	2.1	4.9	39.3	22.7	1.01	42.7	38.9	1.1	26.8	2.24	19.2	87.7	3.5	2.6
40	4.5	0.2	0.4	42.5	29.1	1.28	46.9	33.1	1.2	28.9	2.23	21.3	89.1	3.8	2.7
	6.8	1.1	2.5	42.1	27.6	1.17	46.2	35.9	1.0	30.2	2.23	22.6	89.9	4.0	2.7
	9.0	2.0	4.6	41.7	26.7	1.13	45.6	37.0	1.0	30.9	2.22	23.3	90.4	4.1	2.7
50	4.5	0.1	0.3	42.0	29.9	1.47	47.0	28.6	1.5	32.8	2.22	25.2	91.6	4.3	2.8
	6.8	1.0	2.3	42.1	29.9	1.46	47.0	28.8	1.2	34.4	2.23	26.8	92.7	4.5	2.9
	9.0	1.9	4.3	42.1	29.9	1.45	47.1	29.0	1.1	33.0	2.22	25.4	91.8	4.3	2.9
60	4.5	0.1	0.2	40.6	29.8	1.69	46.4	24.1	2.1	36.8	2.23	29.2	94.3	4.8	3.0
	6.8	1.0	2.2	41.7	30.0	1.53	46.9	27.2	1.7	38.7	2.24	31.1	95.6	5.1	3.1
	9.0	1.8	4.2	42.1	29.9	1.46	47.0	28.8	1.5	39.8	2.25	32.1	96.3	5.2	3.1
70	4.5	0.1	0.2	38.6	29.0	1.94	45.2	19.9	2.5	41.0	2.25	33.3	97.0	5.3	3.2
	6.8	0.9	2.1	40.0	29.6	1.76	46.1	22.7	2.1	43.2	2.26	35.5	98.5	5.6	3.3
	9.0	1.8	4.0	40.7	29.8	1.68	46.4	24.2	1.9	44.4	2.27	36.7	99.3	5.7	3.4
80	4.5	0.1	0.3	36.2	27.8	2.22	43.7	16.3	3.4	45.2	2.27	37.4	99.8	5.8	3.4
	6.8	0.9	2.1	37.8	28.6	2.03	44.7	18.6	2.9	46.0	2.28	38.3	100.4	5.9	3.6
	9.0	1.7	4.0	38.6	29.0	1.94	45.2	19.9	2.7	49.0	2.29	41.2	102.3	6.3	3.9
90	4.5	0.1	0.3	33.5	26.5	2.54	42.2	13.2	4.4	49.4	2.30	41.5	102.6	6.3	3.7
	6.8	0.9	2.1	35.2	27.3	2.33	43.2	15.1	3.9	52.1	2.31	44.2	104.4	6.6	3.9
	9.0	1.7	3.9	36.1	27.8	2.23	43.7	16.2	3.6	53.6	2.31	45.7	105.3	6.8	4.0
100	4.5	0.1	0.3	30.8	25.2	2.89	40.7	10.6	5.7						
	6.8	0.9	2.1	32.5	26.0	2.67	41.6	12.2	5.1						
	9.0	1.7	3.8	33.3	26.4	2.56	42.1	13.0	4.7						
110	4.5	0.1	0.2	28.2	24.2	3.30	39.5	8.6	7.2						
	6.8	0.9	2.0	29.7	24.7	3.05	40.1	9.7	6.5						
	9.0	1.6	3.7	30.5	25.1	2.93	40.5	10.4	6.1						
120	4.5	0.1	0.1	25.9	23.6	3.75	38.7	6.9	8.9						
	6.8	0.8	1.9	27.2	23.9	3.48	39.1	7.8	8.1						
	9.0	1.6	3.6	27.9	24.1	3.35	39.3	8.3	7.7						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 049 (Full Load), No vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,550 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	12.0	4.1	9.4							31.9	3.07	21.4	88.4	3.0	3.3
30	6.0	0.9	2.1	49.6	29.1	1.87	56.0	26.6	1.8	35.3	3.06	24.8	90.4	3.4	3.5
	9.0	2.1	4.9	44.9	25.0	1.70	50.7	26.3	1.9	36.8	3.06	26.3	91.2	3.5	3.5
	12.0	3.8	8.8	42.2	22.9	1.63	47.8	25.9	1.9	37.6	3.06	27.2	91.7	3.6	3.6
40	6.0	0.8	1.8	53.9	33.6	2.12	61.1	25.4	2.0	40.5	3.08	30.0	93.4	3.8	3.7
	9.0	2.0	4.6	51.6	31.0	1.96	58.3	26.3	1.8	42.3	3.11	31.7	94.4	4.0	3.8
	12.0	3.6	8.4	50.0	29.4	1.88	56.4	26.5	1.8	43.3	3.12	32.7	95.0	4.1	3.9
50	6.0	0.7	1.7	54.9	35.5	2.36	63.0	23.3	2.2	45.7	3.16	34.9	96.4	4.2	4.0
	9.0	1.9	4.3	54.9	35.5	2.35	62.9	23.4	2.1	47.9	3.20	37.0	97.6	4.4	4.1
	12.0	3.5	8.0	54.9	35.6	2.34	62.9	23.5	2.0	49.1	3.16	35.2	94.6	4.3	4.2
60	6.0	0.7	1.6	54.0	35.6	2.61	62.9	20.7	2.9	51.0	3.27	39.8	99.4	4.6	4.4
	9.0	1.8	4.2	54.8	35.6	2.44	63.1	22.5	2.5	53.5	3.33	42.1	100.9	4.7	4.5
	12.0	3.4	7.8	54.9	35.6	2.35	63.0	23.3	2.3	54.8	3.37	43.3	101.7	4.8	4.6
70	6.0	0.7	1.5	51.9	35.5	2.88	61.7	18.0	3.7	56.3	3.41	44.7	102.5	4.8	4.7
	9.0	1.8	4.0	53.5	36.0	2.69	62.7	19.9	3.1	59.1	3.49	47.2	104.1	5.0	5.0
	12.0	3.3	7.6	54.1	36.1	2.60	63.0	20.8	2.9	60.6	3.53	48.6	105.0	5.0	5.1
80	6.0	0.7	1.5	49.0	34.2	3.18	59.8	15.4	4.6	61.6	3.56	49.5	105.6	5.1	5.2
	9.0	1.7	4.0	51.0	35.1	2.97	61.1	17.2	3.9	62.6	3.59	50.3	104.1	5.1	5.5
	12.0	3.2	7.5	51.9	35.5	2.87	61.7	18.1	3.6	66.5	3.70	53.8	108.4	5.3	6.0
90	6.0	0.7	1.5	45.7	32.5	3.52	57.7	13.0	5.6	67.0	3.72	54.3	108.7	5.3	5.7
	9.0	1.7	3.9	47.9	33.6	3.29	59.1	14.6	4.9	70.5	3.81	57.5	110.7	5.4	6.0
	12.0	3.2	7.4	49.0	34.2	3.18	59.8	15.4	4.6	72.4	3.86	59.2	111.8	5.5	6.2
100	6.0	0.6	1.5	42.5	30.8	3.91	55.8	10.8	6.9						
	9.0	1.7	3.8	44.5	31.8	3.65	57.0	12.2	6.1						
	12.0	3.2	7.3	45.6	32.4	3.53	57.6	12.9	5.7						
110	6.0	0.6	1.4	39.5	29.3	4.38	54.5	9.0	8.4						
	9.0	1.6	3.7	41.3	30.2	4.09	55.2	10.1	7.4						
	12.0	3.1	7.2	42.2	30.6	3.94	55.7	10.7	7.0						
120	6.0	0.6	1.3	37.4	28.6	4.96	54.3	7.6	10.1						
	9.0	1.6	3.6	38.6	28.9	4.60	54.3	8.4	9.0						
	12.0	3.0	7.0	39.3	29.2	4.43	54.4	8.9	8.5						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 064 (Part Load), No vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,500 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	12.0	5.2	11.9							28.6	2.75	19.3	86.0	3.1	3.1
30	6.0	0.9	2.1	57.1	41.6	1.50	62.2	38.1	1.1	32.2	2.76	22.7	88.0	3.4	3.2
	9.0	2.5	5.7	56.9	42.3	1.45	61.8	39.2	1.0	33.6	2.77	24.1	88.8	3.6	3.2
	12.0	4.2	9.6	56.5	42.6	1.44	61.4	39.1	1.0	34.4	2.77	24.9	89.2	3.6	3.2
40	6.0	0.5	1.1	56.4	40.7	1.64	62.0	34.4	1.3	37.6	2.79	28.0	91.0	3.9	3.3
	9.0	1.9	4.4	57.0	41.3	1.54	62.3	37.1	1.1	39.4	2.80	29.8	92.0	4.1	3.4
	12.0	3.4	7.9	57.1	41.7	1.50	62.2	38.1	1.1	40.4	2.81	30.8	92.6	4.2	3.4
50	6.0	0.2	0.6	54.8	39.8	1.85	61.1	29.7	1.8	43.1	2.82	33.5	94.1	4.5	3.5
	9.0	1.5	3.5	56.0	40.4	1.70	61.8	33.0	1.5	45.3	2.84	35.7	95.4	4.7	3.5
	12.0	3.0	6.9	56.5	40.8	1.63	62.0	34.6	1.3	46.6	2.85	36.9	96.1	4.8	3.6
60	6.0	0.2	0.4	52.4	38.9	2.11	59.6	24.8	2.5	48.8	2.86	39.0	97.3	5.0	3.7
	9.0	1.4	3.2	54.1	39.5	1.93	60.6	28.1	2.0	51.4	2.89	41.5	98.8	5.2	3.8
	12.0	2.7	6.3	54.8	39.9	1.84	61.1	29.8	1.8	52.8	2.90	42.9	99.6	5.3	3.8
70	6.0	0.2	0.4	49.6	37.9	2.42	57.8	20.4	3.3	54.4	2.91	44.5	100.5	5.5	3.9
	9.0	1.3	3.0	51.5	38.6	2.21	59.0	23.3	2.7	57.3	2.94	47.3	102.1	5.7	4.1
	12.0	2.6	6.0	52.4	38.9	2.11	59.6	24.8	2.5	58.9	2.96	48.8	103.0	5.8	4.2
80	6.0	0.3	0.6	46.5	36.7	2.78	56.0	16.7	4.4	59.9	2.97	49.8	103.6	5.9	4.2
	9.0	1.3	3.1	48.5	37.5	2.55	57.2	19.0	3.7	63.1	3.00	52.9	105.3	6.2	4.4
	12.0	2.6	5.9	49.5	37.8	2.44	57.8	20.3	3.4	64.8	3.03	54.5	106.3	6.3	4.5
90	6.0	0.3	0.7	43.3	35.3	3.18	54.1	13.6	5.6	65.3	3.03	55.0	106.6	6.3	4.6
	9.0	1.4	3.2	45.2	36.2	2.93	55.2	15.4	4.8	68.7	3.08	58.2	108.4	6.5	4.8
	12.0	2.6	6.0	46.2	36.6	2.81	55.8	16.5	4.4	70.4	3.11	59.8	109.4	6.6	4.9
100	6.0	0.3	0.8	40.2	33.9	3.62	52.5	11.1	7.0						
	9.0	1.4	3.2	42.0	34.7	3.36	53.4	12.5	6.1						
	12.0	2.6	6.0	43.0	35.2	3.23	54.0	13.3	5.7						
110	6.0	0.3	0.6	37.4	32.4	4.09	51.3	9.1	8.7						
	9.0	1.3	3.1	38.9	33.2	3.81	52.0	10.2	7.7						
	12.0	2.5	5.8	39.8	33.7	3.68	52.3	10.8	7.2						
120	6.0	0.0	0.0	35.1	31.0	4.59	50.8	7.6	10.5						
	9.0	1.1	2.6	36.3	31.7	4.30	51.0	8.4	9.4						
	12.0	2.4	5.4	37.0	32.2	4.16	51.2	8.9	8.9						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 064 (Full Load), No vFlow®

2,050 CFM Nominal (Rated) Airflow Heating, 1,850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	15.0	7.3	16.8							43.5	3.77	30.6	89.6	3.4	3.8
30	7.5	1.7	3.9	76.6	53.4	2.78	86.1	27.5	2.0	47.6	3.82	34.5	91.4	3.6	4.0
	11.3	3.7	8.6	76.2	54.0	2.67	85.3	28.5	1.8	49.9	3.86	36.7	92.5	3.8	4.1
	15.0	6.1	14.1	75.5	54.3	2.62	84.5	28.8	1.8	51.2	3.88	37.9	93.1	3.9	4.1
40	7.5	1.2	2.7	75.7	52.5	2.97	85.8	25.5	2.3	54.7	3.94	41.3	94.7	4.1	4.2
	11.3	3.0	7.0	76.5	53.2	2.82	86.1	27.1	2.1	57.6	3.99	44.0	96.0	4.2	4.4
	15.0	5.3	12.2	76.6	53.6	2.76	86.0	27.8	1.9	59.2	4.02	45.5	96.7	4.3	4.4
50	7.5	0.9	2.0	73.6	51.4	3.20	84.5	23.0	2.9	62.1	4.08	48.2	98.0	4.5	4.6
	11.3	2.6	6.0	75.3	52.2	3.02	85.6	25.0	2.5	65.5	4.15	51.3	99.5	4.6	4.7
	15.0	4.7	10.8	75.9	52.6	2.94	85.9	25.9	2.3	67.3	4.19	53.0	100.3	4.7	4.8
60	7.5	0.8	1.7	70.7	50.3	3.47	82.6	20.4	3.6	69.5	4.24	55.1	101.3	4.8	5.0
	11.3	2.4	5.4	73.0	51.1	3.26	84.1	22.4	3.1	73.4	4.33	58.6	103.1	5.0	5.2
	15.0	4.3	10.0	74.0	51.6	3.16	84.8	23.4	2.8	75.5	4.38	60.6	104.0	5.1	5.3
70	7.5	0.7	1.7	67.3	48.9	3.81	80.3	17.7	4.5	77.0	4.41	61.9	104.7	5.1	5.4
	11.3	2.3	5.2	69.8	49.9	3.56	82.0	19.6	3.8	81.3	4.52	65.9	106.6	5.3	5.7
	15.0	4.1	9.6	71.1	50.4	3.44	82.8	20.6	3.5	83.7	4.59	68.0	107.7	5.3	5.8
80	7.5	0.8	1.8	63.5	47.5	4.19	77.8	15.1	5.6	84.4	4.61	68.7	108.0	5.4	5.9
	11.3	2.2	5.2	66.2	48.5	3.91	79.6	16.9	4.8	89.1	4.74	73.0	110.2	5.5	6.2
	15.0	4.1	9.4	67.5	49.0	3.78	80.4	17.9	4.4	91.7	4.81	75.3	111.3	5.6	6.9
90	7.5	0.3	0.7	59.8	45.8	4.65	75.6	12.9	6.8	91.7	4.81	75.2	111.3	5.6	6.4
	11.3	1.4	3.2	62.3	47.0	4.33	77.1	14.4	6.0	96.7	4.96	79.7	113.6	5.7	6.9
	15.0	2.6	6.0	63.7	47.5	4.18	77.9	15.2	5.5	99.4	5.05	82.1	114.8	5.8	7.1
100	7.5	0.3	0.8	56.2	44.2	5.18	73.9	10.8	8.3						
	11.3	1.4	3.2	58.5	45.3	4.82	75.0	12.1	7.3						
	15.0	2.6	6.0	59.8	45.9	4.65	75.6	12.9	6.8						
110	7.5	0.3	0.6	53.1	42.6	5.80	72.9	9.2	10.0						
	11.3	1.3	3.1	55.0	43.6	5.39	73.4	10.2	8.9						
	15.0	2.5	5.8	56.1	44.2	5.19	73.8	10.8	8.3						
120	7.5	0.0	0.0	50.8	41.4	6.53	73.1	7.8	11.9						
	11.3	1.1	2.6	52.2	42.1	6.04	72.8	8.6	10.6						
	15.0	2.4	5.4	53.0	42.6	5.82	72.9	9.1	10.0						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 072 (Part Load), No vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,550 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	14.0	6.5	15.1							33.4	3.51	21.4	88.7	2.8	4.1
30	7.0	1.4	3.3	66.4	43.8	1.85	72.7	35.9	2.2	37.7	3.57	25.5	91.1	3.1	4.3
	10.5	3.3	7.6	66.7	44.2	1.75	72.7	38.1	2.2	39.3	3.59	27.0	92.0	3.2	4.3
	14.0	5.4	12.5	66.7	44.4	1.71	72.6	38.9	2.3	40.1	3.60	27.8	92.5	3.3	4.3
40	7.0	0.9	2.2	65.0	43.0	2.05	72.0	31.7	2.4	43.9	3.65	31.4	94.6	3.5	4.5
	10.5	2.6	6.1	66.0	43.6	1.91	72.5	34.6	2.2	45.8	3.68	33.3	95.7	3.7	4.5
	14.0	4.6	10.7	66.4	43.8	1.84	72.7	36.0	2.2	46.9	3.69	34.3	96.3	3.7	4.5
50	7.0	0.7	1.5	62.9	41.9	2.32	70.8	27.1	2.7	50.1	3.74	37.4	98.1	3.9	4.8
	10.5	2.2	5.1	64.4	42.7	2.13	71.7	30.2	2.5	52.5	3.77	39.6	99.4	4.1	4.9
	14.0	4.1	9.4	65.1	43.0	2.05	72.1	31.8	2.5	53.8	3.78	40.8	100.1	4.2	4.9
60	7.0	0.5	1.3	60.2	40.8	2.65	69.3	22.7	3.2	56.4	3.82	43.3	101.6	4.3	5.2
	10.5	2.0	4.6	62.1	41.6	2.42	70.4	25.6	2.9	59.1	3.86	46.0	103.1	4.5	5.3
	14.0	3.8	8.7	63.0	42.0	2.32	70.9	27.2	2.7	60.6	3.88	47.4	103.9	4.6	5.4
70	7.0	0.5	1.3	57.1	39.5	3.04	67.5	18.8	4.3	62.6	3.90	49.3	105.1	4.7	5.6
	10.5	1.9	4.5	59.2	40.3	2.78	68.7	21.3	3.7	65.8	3.95	52.3	106.8	4.9	5.8
	14.0	3.6	8.3	60.2	40.7	2.65	69.3	22.7	3.5	67.5	3.97	53.9	107.8	5.0	5.9
80	7.0	0.6	1.4	53.7	38.1	3.48	65.6	15.4	5.8	68.9	3.99	55.3	108.6	5.1	6.1
	10.5	1.9	4.5	55.9	39.0	3.19	66.8	17.5	5.0	72.4	4.05	58.6	110.5	5.2	6.3
	14.0	3.5	8.1	57.0	39.4	3.05	67.4	18.7	4.6	74.3	4.08	60.4	111.6	5.3	6.5
90	7.0	0.7	1.5	50.1	36.6	3.98	63.7	12.6	7.6	75.2	4.09	61.2	112.1	5.4	6.6
	10.5	2.0	4.5	52.3	37.5	3.67	64.8	14.3	6.7	79.1	4.15	64.9	114.3	5.6	7.0
	14.0	3.5	8.1	53.5	38.0	3.51	65.4	15.2	6.2	81.2	4.19	66.9	115.5	5.7	7.1
100	7.0	0.7	1.6	46.4	35.2	4.54	61.9	10.2	9.9						
	10.5	2.0	4.5	48.6	36.0	4.20	62.9	11.6	8.8						
	14.0	3.5	8.1	49.7	36.5	4.03	63.5	12.3	8.2						
110	7.0	0.6	1.4	42.9	33.8	5.15	60.4	8.3	12.6						
	10.5	1.9	4.4	44.9	34.6	4.78	61.2	9.4	11.3						
	14.0	3.5	8.0	46.0	35.0	4.61	61.7	10.0	10.7						
120	7.0	0.4	0.9	39.5	32.5	5.82	59.4	6.8	15.7						
	10.5	1.7	3.9	41.4	33.2	5.43	59.9	7.6	14.3						
	14.0	3.3	7.6	42.4	33.6	5.24	60.2	8.1	13.6						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 072 (Full Load), No vFlow®

2,050 CFM Nominal (Rated) Airflow Heating, 1,850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F						HEATING - EAT 70°F					
		PSI	FT	TC	SC	kW	HR	EER	HWC	HC	kW	HE	LAT	COP	HWC
20	17.0	8.9	20.6							47.3	4.52	31.9	91.3	3.1	4.1
30	8.5	2.2	5.1	83.8	53.9	3.15	94.6	26.6	2.2	52.4	4.63	36.6	93.6	3.3	4.3
	12.8	4.6	10.6	83.7	53.8	3.00	93.9	27.9	2.2	54.8	4.68	38.8	94.7	3.4	4.2
	17.0	7.6	17.6	83.3	53.5	2.94	93.3	28.3	2.3	56.1	4.71	40.1	95.3	3.5	4.2
40	8.5	1.6	3.8	82.7	53.5	3.39	94.3	24.4	2.4	60.3	4.80	43.9	97.2	3.7	4.4
	12.8	3.9	8.9	83.6	53.9	3.21	94.6	26.1	2.2	63.1	4.87	46.5	98.4	3.8	4.5
	17.0	6.7	15.5	83.8	53.9	3.13	94.5	26.8	2.2	64.6	4.90	47.9	99.1	3.9	4.5
50	8.5	1.3	3.0	80.5	52.6	3.67	93.0	21.9	2.8	67.9	4.99	50.9	100.6	4.0	4.7
	12.8	3.4	7.8	82.2	53.3	3.46	94.0	23.8	2.5	71.2	5.07	53.9	102.1	4.1	4.8
	17.0	6.0	13.9	82.9	53.6	3.36	94.3	24.7	2.5	72.9	5.11	55.5	102.9	4.2	4.9
60	8.5	1.2	2.7	77.4	51.4	4.01	91.1	19.3	3.3	75.5	5.18	57.9	104.0	4.3	5.1
	12.8	3.1	7.1	79.7	52.3	3.76	92.5	21.2	2.9	79.2	5.28	61.2	105.7	4.4	5.2
	17.0	5.6	13.0	80.7	52.7	3.64	93.1	22.2	2.8	81.2	5.33	63.0	106.6	4.5	5.3
70	8.5	1.1	2.6	73.7	49.8	4.42	88.7	16.7	4.5	83.2	5.38	64.8	107.5	4.5	5.5
	12.8	3.0	6.8	76.3	50.9	4.12	90.4	18.5	3.8	87.3	5.50	68.5	109.3	4.6	5.7
	17.0	5.4	12.4	77.6	51.5	3.99	91.2	19.5	3.5	89.5	5.57	70.5	110.3	4.7	5.8
80	8.5	1.2	2.7	69.5	48.1	4.89	86.2	14.2	6.0	90.9	5.61	71.7	110.9	4.7	6.0
	12.8	2.9	6.7	72.4	49.3	4.56	88.0	15.9	5.1	95.5	5.75	75.9	113.1	4.9	6.3
	17.0	5.2	12.1	73.8	49.9	4.40	88.8	16.8	4.7	98.1	5.83	78.2	114.2	4.9	6.4
90	8.5	1.2	2.8	65.2	46.2	5.45	83.8	12.0	7.9	98.8	5.85	78.8	114.5	4.9	6.5
	12.8	2.9	6.7	68.1	47.4	5.07	85.4	13.4	6.8	104.1	6.03	83.6	116.9	5.1	6.9
	17.0	5.2	12.0	69.6	48.1	4.88	86.3	14.2	6.3	107.1	6.12	86.2	118.3	5.1	7.1
100	8.5	1.2	2.8	60.9	44.3	6.09	81.6	10.0	10.2						
	12.8	2.9	6.7	63.7	45.5	5.66	83.0	11.2	9.0						
	17.0	5.2	12.0	65.1	46.2	5.46	83.8	11.9	8.4						
110	8.5	1.1	2.6	56.7	42.5	6.85	80.0	8.3	13.0						
	12.8	2.9	6.6	59.3	43.6	6.36	81.0	9.3	11.5						
	17.0	5.1	11.8	60.7	44.2	6.12	81.6	9.9	10.8						
120	8.5	0.9	2.1	52.9	41.0	7.72	79.2	6.8	16.2						
	12.8	2.7	6.2	55.2	41.9	7.16	79.6	7.7	14.6						
	17.0	5.0	11.5	56.4	42.4	6.90	80.0	8.2	13.8						

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 026 (Part Load), With vFlow®

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

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	1.0	0.2	0.3	23.0	16.0	0.75	25.6	30.7	70.0	1.0	4.5	1.2	2.9	11.7	1.20	7.6	2.9	82.7	16.6	1.2
	1.3	0.2	0.5	23.0	16.0	0.75	25.6	30.7	70.0	1.0	2.3	0.5	1.1	13.2	1.18	9.2	3.3	84.3	22.0	1.3
30	1.3	0.2	0.5	23.0	16.0	0.75	25.6	30.7	70.0	1.0	3.4	0.8	1.8	13.8	1.17	9.8	3.5	85.0	24.2	1.4
	1.3	0.2	0.5	23.0	16.0	0.75	25.6	30.7	70.0	1.0	4.5	1.1	2.6	14.1	1.16	10.2	3.6	85.4	25.5	1.4
	1.7	0.3	0.7	23.0	16.0	0.75	25.6	30.7	70.0	1.0	2.3	0.4	1.0	15.4	1.15	11.5	3.9	86.7	30.0	1.5
40	1.7	0.3	0.7	23.0	16.0	0.75	25.6	30.7	70.0	1.0	3.4	0.7	1.7	16.2	1.14	12.3	4.2	87.6	32.8	1.6
	1.7	0.3	0.7	23.0	16.0	0.75	25.6	30.7	70.0	1.0	4.5	1.1	2.5	16.6	1.13	12.8	4.3	88.1	34.3	1.6
	2.3	0.4	1.0	22.9	15.9	0.77	25.5	29.6	72.2	1.1	2.3	0.4	1.0	17.7	1.12	13.8	4.6	89.2	38.0	1.7
50	2.6	0.5	1.1	23.0	16.0	0.75	25.6	30.7	70.0	1.0	3.4	0.7	1.6	18.6	1.11	14.8	4.9	90.2	41.3	1.8
	2.6	0.5	1.1	23.0	16.0	0.75	25.6	30.7	70.0	1.0	4.5	1.0	2.3	19.1	1.11	15.4	5.1	90.8	43.2	1.8
	2.3	0.4	1.0	21.9	15.5	0.88	24.9	24.9	81.6	1.5	2.3	0.4	1.0	19.9	1.10	16.2	5.3	91.7	45.9	1.9
60	3.4	0.7	1.6	22.6	15.8	0.80	25.3	28.3	74.9	1.2	3.4	0.7	1.6	21.1	1.09	17.3	5.6	92.9	49.8	1.9
	4.5	1.0	2.3	22.9	15.9	0.76	25.5	30.0	71.3	1.1	4.5	1.0	2.3	21.7	1.09	18.0	5.8	93.6	52.0	2.0
	2.3	0.4	1.0	20.7	15.0	1.00	24.1	20.7	90.9	2.0	2.3	0.4	1.0	22.3	1.09	18.5	6.0	94.2	53.9	2.0
70	3.4	0.7	1.6	21.5	15.4	0.91	24.6	23.6	84.5	1.6	3.4	0.7	1.6	23.6	1.09	19.9	6.4	95.6	58.3	2.1
	4.5	1.0	2.2	21.9	15.6	0.87	24.9	25.2	81.1	1.4	4.5	1.0	2.2	24.3	1.09	20.6	6.6	96.4	60.8	2.2
	2.3	0.4	1.0	19.3	14.3	1.14	23.2	16.9	100.1	2.6	2.3	0.4	1.0	24.6	1.09	20.9	6.6	96.8	61.8	2.2
80	3.4	0.7	1.5	20.2	14.8	1.04	23.8	19.4	94.0	2.2	2.9	0.6	1.3	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	4.5	0.9	2.2	20.7	15.0	1.00	24.1	20.8	90.7	2.0	2.9	0.6	1.3	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	2.3	0.4	1.0	17.8	13.6	1.30	22.2	13.7	109.3	3.4	1.7	0.3	0.6	25.6	1.09	21.9	6.9	97.8	65.0	2.2
90	3.4	0.7	1.5	18.7	14.1	1.19	22.8	15.7	103.4	2.9	1.7	0.3	0.6	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	4.5	0.9	2.2	19.2	14.3	1.14	23.1	16.9	100.3	2.7	1.7	0.3	0.6	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	2.3	0.4	1.0	16.3	13.0	1.48	21.4	11.1	118.6	4.3	1.2	0.1	0.3	25.6	1.09	21.9	6.9	97.8	65.0	2.2
100	3.4	0.7	1.5	17.2	13.4	1.36	21.9	12.6	112.9	3.8	1.2	0.1	0.3	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	4.5	0.9	2.1	17.7	13.6	1.31	22.2	13.6	109.9	3.5	1.2	0.1	0.3	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	2.3	0.4	0.9	14.9	12.4	1.68	20.6	8.9	128.0	5.4	1.0	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2
110	3.4	0.7	1.5	15.7	12.7	1.56	21.0	10.1	122.4	4.8	1.0	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	4.5	0.9	2.1	16.2	12.9	1.49	21.3	10.8	119.5	4.4	1.0	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	2.3	0.4	0.9	13.7	12.1	1.91	20.2	7.2	137.6	6.6	0.8	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2
120	3.4	0.6	1.4	14.4	12.3	1.77	20.4	8.1	132.0	5.9	0.8	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2
	4.5	0.9	2.0	14.8	12.4	1.71	20.6	8.6	129.1	5.5	0.8	0.1	0.2	25.6	1.09	21.9	6.9	97.8	65.0	2.2

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 026 (Full Load), With vFlow®

950 CFM Nominal (Rated) Airflow Heating, 850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	1.4	0.3	0.6	29.8	19.5	1.20	33.9	24.8	70.0	1.4	6.0	1.9	4.4	16.8	1.68	11.0	2.9	86.3	16.3	1.5
30	1.7	0.3	0.7	29.8	19.5	1.20	33.9	24.8	70.0	1.4	3.0	0.7	1.6	18.5	1.64	12.9	3.3	88.0	21.4	1.8
	1.7	0.3	0.7	29.8	19.5	1.20	33.9	24.8	70.0	1.4	4.5	1.1	2.6	19.4	1.63	13.8	3.5	88.8	23.9	1.9
	1.7	0.3	0.7	29.8	19.5	1.20	33.9	24.8	70.0	1.4	6.0	1.8	4.0	19.8	1.62	14.3	3.6	89.3	25.2	1.9
40	2.3	0.4	1.0	29.8	19.5	1.20	33.9	24.8	70.0	1.4	3.0	0.6	1.5	21.3	1.61	15.8	3.9	90.7	29.5	2.1
	2.3	0.4	1.0	29.8	19.5	1.20	33.9	24.8	70.0	1.4	4.5	1.1	2.5	22.4	1.60	16.9	4.1	91.7	32.5	2.3
	2.3	0.4	1.0	29.8	19.5	1.20	33.9	24.8	70.0	1.4	6.0	1.6	3.8	23.0	1.59	17.5	4.2	92.3	34.2	2.3
50	3.0	0.6	1.4	29.6	19.4	1.23	33.8	24.1	72.5	1.5	3.0	0.6	1.4	24.1	1.59	18.7	4.5	93.5	37.5	2.5
	3.4	0.7	1.6	29.8	19.5	1.20	33.9	24.8	70.0	1.4	4.5	1.0	2.3	25.4	1.59	20.0	4.7	94.7	41.1	2.6
	3.4	0.7	1.6	29.8	19.5	1.20	33.9	24.8	70.0	1.4	6.0	1.6	3.6	26.2	1.59	20.7	4.8	95.4	43.1	2.7
60	3.0	0.6	1.3	28.4	18.9	1.35	33.0	21.1	82.0	1.9	3.0	0.6	1.3	27.1	1.59	21.6	5.0	96.3	45.6	2.8
	4.5	1.0	2.3	29.3	19.3	1.26	33.6	23.3	74.9	1.6	4.5	1.0	2.3	28.6	1.60	23.1	5.2	97.8	49.7	3.0
	6.0	1.5	3.5	29.7	19.4	1.22	33.8	24.4	71.3	1.4	6.0	1.5	3.5	29.4	1.61	24.0	5.4	98.6	52.0	3.1
70	3.0	0.6	1.3	26.9	18.3	1.48	32.0	18.2	91.3	2.4	3.0	0.6	1.3	30.1	1.61	24.6	5.5	99.2	53.6	3.2
	4.5	1.0	2.2	28.0	18.8	1.38	32.7	20.3	84.5	2.1	4.5	1.0	2.2	31.8	1.64	26.2	5.7	101.0	58.3	3.3
	6.0	1.5	3.4	28.5	19.0	1.33	33.1	21.4	81.0	1.9	6.0	1.5	3.4	32.8	1.66	27.2	5.8	101.9	60.9	3.4
80	3.0	0.6	1.3	25.2	17.5	1.64	30.8	15.4	100.5	3.0	3.0	0.6	1.3	33.1	1.66	27.5	5.8	102.2	61.7	3.5
	4.5	0.9	2.2	26.4	18.1	1.53	31.6	17.3	94.1	2.6	3.8	0.8	1.8	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	6.0	1.4	3.3	26.7	18.2	1.50	31.8	17.7	92.7	2.4	3.8	0.8	1.8	34.4	1.69	28.7	6.0	103.5	65.0	3.6
90	3.0	0.6	1.3	23.5	16.7	1.81	29.7	12.9	109.8	3.7	2.3	0.4	1.0	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	4.5	0.9	2.2	24.7	17.3	1.69	30.4	14.6	103.5	3.3	2.3	0.4	1.0	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	6.0	1.4	3.2	25.3	17.5	1.63	30.9	15.5	100.3	3.0	2.3	0.4	1.0	34.4	1.69	28.7	6.0	103.5	65.0	3.6
100	3.0	0.6	1.3	21.7	15.9	2.02	28.6	10.7	119.1	4.5	1.6	0.2	0.6	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	4.5	0.9	2.1	22.9	16.4	1.88	29.3	12.1	113.0	4.0	1.6	0.2	0.6	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	6.0	1.4	3.2	23.5	16.7	1.82	29.7	12.9	109.9	3.7	1.6	0.2	0.6	34.4	1.69	28.7	6.0	103.5	65.0	3.6
110	3.0	0.6	1.3	20.0	15.2	2.26	27.7	8.8	128.5	5.4	1.3	0.2	0.3	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	4.5	0.9	2.1	21.1	15.7	2.11	28.2	10.0	122.6	4.8	1.3	0.2	0.3	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	6.0	1.4	3.1	21.6	15.9	2.03	28.6	10.6	119.5	4.5	1.3	0.2	0.3	34.4	1.69	28.7	6.0	103.5	65.0	3.6
120	3.0	0.5	1.2	18.5	14.7	2.55	27.2	7.3	138.1	6.4	1.0	0.1	0.2	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	4.5	0.9	2.0	19.4	15.0	2.37	27.5	8.2	132.2	5.8	1.0	0.1	0.2	34.4	1.69	28.7	6.0	103.5	65.0	3.6
	6.0	1.3	3.1	19.9	15.2	2.28	27.7	8.7	129.2	5.5	1.0	0.1	0.2	34.4	1.69	28.7	6.0	103.5	65.0	3.6

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 038 (Part Load), With vFlow®

1,000 CFM Nominal (Rated) Airflow Heating, 1,000 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	1.5	0.4	1.0	33.5	22.2	1.03	37.0	32.4	70.0	1.2	6.0	2.5	5.7	17.2	1.58	11.8	3.2	85.9	16.1	1.7
30	1.8	0.5	1.1	33.5	22.2	1.03	37.0	32.4	70.0	1.3	3.0	0.9	2.1	19.1	1.58	13.7	3.6	87.7	20.8	1.8
	1.8	0.5	1.1	33.5	22.2	1.03	37.0	32.4	70.0	1.3	4.5	1.5	3.5	20.2	1.57	14.8	3.8	88.6	23.4	1.9
	1.8	0.5	1.1	33.5	22.2	1.03	37.0	32.4	70.0	1.3	6.0	2.2	5.1	20.7	1.57	15.4	3.9	89.2	24.9	2.0
40	2.5	0.7	1.5	33.5	22.2	1.03	37.0	32.4	70.0	1.2	3.0	0.8	1.9	22.2	1.57	16.9	4.1	90.5	28.7	2.1
	2.5	0.7	1.5	33.5	22.2	1.03	37.0	32.4	70.0	1.2	4.5	1.4	3.2	23.5	1.57	18.1	4.4	91.7	32.0	2.2
	2.5	0.7	1.5	33.5	22.2	1.03	37.0	32.4	70.0	1.2	6.0	2.0	4.7	24.1	1.57	18.8	4.5	92.3	33.7	2.3
50	3.0	0.8	1.8	33.0	22.2	1.10	36.7	29.9	74.5	1.4	3.0	0.8	1.8	25.3	1.57	19.9	4.7	93.3	36.7	2.4
	3.7	1.0	2.4	33.5	22.2	1.03	37.0	32.4	70.0	1.2	4.5	1.3	3.0	26.7	1.57	21.3	5.0	94.7	40.5	2.5
	3.7	1.0	2.4	33.5	22.2	1.03	37.0	32.4	70.0	1.2	6.0	1.9	4.4	27.5	1.57	22.1	5.1	95.4	42.6	2.6
60	3.0	0.8	1.8	31.4	21.6	1.26	35.7	24.9	83.8	2.0	3.0	0.8	1.8	28.3	1.58	22.9	5.3	96.1	44.7	2.6
	4.5	1.3	2.9	32.7	22.1	1.13	36.6	29.0	76.3	1.5	4.5	1.3	2.9	29.9	1.58	24.5	5.5	97.6	49.1	2.8
	6.0	1.8	4.2	33.2	22.2	1.07	36.9	31.1	72.3	1.3	6.0	1.8	4.2	30.8	1.58	25.4	5.7	98.5	51.5	2.8
70	3.0	0.8	1.8	29.4	20.7	1.44	34.3	20.4	92.8	2.7	3.0	0.8	1.8	31.3	1.59	25.9	5.8	98.9	52.8	2.9
	4.5	1.2	2.9	31.0	21.4	1.30	35.4	23.9	85.7	2.1	4.5	1.2	2.9	33.2	1.60	27.7	6.1	100.6	57.7	3.0
	6.0	1.8	4.1	31.7	21.7	1.23	35.9	25.9	82.0	1.9	6.0	1.8	4.1	34.2	1.60	28.7	6.3	101.6	60.4	3.1
80	3.0	0.8	1.9	27.1	19.7	1.64	32.7	16.6	101.8	3.7	3.0	0.8	1.9	34.3	1.60	28.9	6.3	101.7	60.8	3.1
	4.5	1.2	2.9	28.8	20.5	1.49	33.9	19.4	95.1	3.0	4.1	1.1	2.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	6.0	1.7	4.0	29.7	20.9	1.41	34.5	21.0	91.5	2.6	4.1	1.1	2.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
90	3.0	0.8	1.9	24.9	18.7	1.87	31.3	13.3	110.8	4.8	2.4	0.7	1.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	4.5	1.2	2.9	26.5	19.4	1.70	32.3	15.6	104.3	4.0	2.4	0.7	1.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	6.0	1.7	4.0	27.3	19.8	1.62	32.9	16.9	101.0	3.6	2.4	0.7	1.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
100	3.0	0.8	1.9	22.9	17.8	2.13	30.1	10.8	120.1	6.2	1.7	0.5	1.2	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	4.5	1.2	2.8	24.2	18.4	1.94	30.9	12.5	113.7	5.2	1.7	0.5	1.2	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	6.0	1.7	3.9	25.0	18.7	1.86	31.3	13.5	110.4	4.7	1.7	0.5	1.2	36.0	1.62	30.5	6.5	103.3	65.0	3.2
110	3.0	0.8	1.8	21.4	17.4	2.43	29.7	8.8	129.8	7.8	1.4	0.4	1.0	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	4.5	1.2	2.8	22.3	17.6	2.23	29.9	10.0	123.3	6.7	1.4	0.4	1.0	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	6.0	1.7	3.8	22.9	17.8	2.13	30.2	10.8	120.1	6.1	1.4	0.4	1.0	36.0	1.62	30.5	6.5	103.3	65.0	3.2
120	3.0	0.7	1.7	20.8	17.9	2.80	30.4	7.4	140.2	9.8	1.1	0.3	0.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	4.5	1.1	2.6	21.1	17.5	2.55	29.8	8.3	133.2	8.4	1.1	0.3	0.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2
	6.0	1.6	3.7	21.4	17.4	2.44	29.7	8.8	129.9	7.8	1.1	0.3	0.6	36.0	1.62	30.5	6.5	103.3	65.0	3.2

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 038 (Full Load), With vFlow®

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

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	2.0	0.7	1.5	45.0	28.6	1.76	51.0	25.5	70.0	1.8	9.0	4.3	9.9	25.6	2.16	18.2	3.5	88.9	15.9	2.1
30	2.5	0.7	1.7	45.0	28.6	1.76	51.0	25.5	70.0	1.8	4.5	1.5	3.5	28.1	2.18	20.7	3.8	90.8	20.8	2.4
	2.5	0.7	1.7	45.0	28.6	1.76	51.0	25.5	70.0	1.8	6.8	2.6	6.1	29.5	2.19	22.0	3.9	91.8	23.5	2.5
	2.5	0.7	1.7	45.0	28.6	1.76	51.0	25.5	70.0	1.8	9.0	3.9	9.1	30.2	2.19	22.7	4.0	92.3	25.0	2.6
40	3.4	1.0	2.2	45.0	28.6	1.76	51.0	25.5	70.0	1.8	4.5	1.4	3.2	32.2	2.21	24.7	4.3	93.8	29.0	2.9
	3.4	1.0	2.2	45.0	28.6	1.76	51.0	25.5	70.0	1.8	6.8	2.4	5.6	33.8	2.23	26.2	4.4	95.0	32.2	3.1
	3.4	1.0	2.2	45.0	28.6	1.76	51.0	25.5	70.0	1.8	9.0	3.6	8.4	34.7	2.24	27.1	4.5	95.6	34.0	3.2
50	4.5	1.3	3.0	44.6	28.6	1.80	50.8	24.7	72.6	2.0	4.5	1.3	3.0	36.3	2.26	28.6	4.7	96.8	37.3	3.4
	5.1	1.5	3.5	45.0	28.6	1.76	51.0	25.5	70.0	1.8	6.8	2.3	5.2	38.2	2.29	30.3	4.9	98.2	41.0	3.6
	5.1	1.5	3.5	45.0	28.6	1.76	51.0	25.5	70.0	1.8	9.0	3.4	7.9	39.2	2.31	31.3	5.0	98.9	43.0	3.7
60	4.5	1.3	2.9	43.0	28.1	1.97	49.8	21.9	82.1	2.7	4.5	1.3	2.9	40.4	2.33	32.5	5.1	99.9	45.6	3.8
	6.8	2.1	4.9	44.3	28.5	1.84	50.6	24.0	75.0	2.2	6.8	2.2	5.0	42.5	2.37	34.4	5.3	101.4	49.8	4.1
	9.0	3.3	7.5	44.8	28.6	1.78	50.9	25.1	71.3	1.9	9.0	3.3	7.5	43.7	2.39	35.5	5.4	102.3	52.1	4.2
70	4.5	1.2	2.9	41.1	27.4	2.15	48.4	19.1	91.5	3.5	4.5	1.2	2.9	44.5	2.41	36.3	5.4	102.9	53.9	4.3
	6.8	2.1	4.8	42.6	27.9	2.02	49.4	21.1	84.6	2.9	6.8	2.1	4.8	46.9	2.47	38.5	5.6	104.7	58.6	4.6
	9.0	3.1	7.2	43.2	28.2	1.95	49.9	22.2	81.1	2.6	9.0	3.1	7.2	48.3	2.50	39.8	5.7	105.7	61.2	4.7
80	4.5	1.2	2.9	38.8	26.4	2.37	46.9	16.4	100.9	4.4	4.5	1.2	2.9	48.8	2.51	40.2	5.7	106.0	62.1	4.7
	6.8	2.0	4.7	40.5	27.1	2.21	48.0	18.3	94.2	3.7	5.5	1.6	3.6	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	9.0	3.1	7.1	41.2	27.4	2.14	48.5	19.3	90.8	3.4	5.5	1.6	3.6	50.3	2.55	41.6	5.8	107.2	65.0	4.9
90	4.5	1.2	2.9	36.4	25.4	2.63	45.4	13.9	110.2	5.5	3.3	0.9	2.1	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	6.8	2.0	4.6	38.1	26.1	2.45	46.4	15.6	103.8	4.7	3.3	0.9	2.1	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	9.0	3.0	6.9	38.9	26.5	2.36	47.0	16.5	100.4	4.3	3.3	0.9	2.1	50.3	2.55	41.6	5.8	107.2	65.0	4.9
100	4.5	1.2	2.8	33.9	24.2	2.93	43.9	11.6	119.5	6.7	2.4	0.7	1.6	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	6.8	2.0	4.5	35.6	25.0	2.72	44.9	13.1	113.3	5.9	2.4	0.7	1.6	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	9.0	3.0	6.8	36.4	25.4	2.63	45.4	13.9	110.1	5.5	2.4	0.7	1.6	50.3	2.55	41.6	5.8	107.2	65.0	4.9
110	4.5	1.2	2.8	31.4	23.0	3.29	42.6	9.5	128.9	8.0	1.8	0.5	1.2	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	6.8	1.9	4.5	33.0	23.8	3.05	43.4	10.8	122.9	7.1	1.8	0.5	1.2	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	9.0	2.9	6.7	33.8	24.2	2.94	43.9	11.5	119.7	6.7	1.8	0.5	1.2	50.3	2.55	41.6	5.8	107.2	65.0	4.9
120	4.5	1.1	2.6	29.0	21.9	3.72	41.7	7.8	138.5	9.6	1.5	0.4	0.8	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	6.8	1.9	4.3	30.5	22.6	3.44	42.2	8.8	132.5	8.6	1.5	0.4	0.8	50.3	2.55	41.6	5.8	107.2	65.0	4.9
	9.0	2.9	6.6	31.3	23.0	3.31	42.6	9.4	129.5	8.1	1.5	0.4	0.8	50.3	2.55	41.6	5.8	107.2	65.0	4.9

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 049 (Part Load), With vFlow®

1,350 CFM Nominal (Rated) Airflow Heating, 1,350 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	1.9	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.5	9.0	2.3	5.4	23.1	2.28	15.3	3.0	85.2	16.6	2.5
30	2.4	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.4	4.5	0.2	0.6	25.3	2.25	17.6	3.3	86.7	22.2	2.6
	2.4	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.4	6.8	1.2	2.8	26.3	2.24	18.6	3.4	87.3	24.5	2.6
	2.4	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.4	9.0	2.1	4.9	26.8	2.24	19.2	3.5	87.7	25.7	2.6
40	3.1	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.5	4.5	0.2	0.4	28.9	2.23	21.3	3.8	89.1	30.5	2.7
	3.1	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.5	6.8	1.1	2.5	30.2	2.23	22.6	4.0	89.9	33.3	2.7
	3.1	0.1	0.1	42.1	29.9	1.45	47.1	29.0	70.0	1.5	9.0	2.0	4.6	30.9	2.22	23.3	4.1	90.4	34.8	2.7
50	4.5	0.1	0.3	42.0	30.0	1.47	47.0	28.6	70.9	1.5	4.5	0.1	0.3	32.8	2.22	25.2	4.3	91.6	38.8	2.8
	4.7	0.2	0.5	42.1	29.9	1.45	47.1	29.0	70.0	1.5	6.8	1.0	2.4	34.4	2.23	26.8	4.5	92.7	42.1	2.9
	4.7	0.2	0.5	42.1	29.9	1.45	47.1	29.0	70.0	1.5	9.0	1.9	4.3	35.3	2.23	27.7	4.6	93.3	43.9	2.9
60	4.5	0.1	0.2	40.6	29.8	1.69	46.4	24.1	80.6	2.1	4.5	0.1	0.2	36.8	2.23	29.2	4.8	94.3	47.0	3.0
	6.8	1.0	2.2	41.7	30.0	1.53	46.9	27.2	73.9	1.7	6.8	1.0	2.2	38.7	2.24	31.1	5.1	95.6	50.8	3.1
	9.0	1.8	4.2	42.1	29.9	1.46	47.0	28.8	70.5	1.5	9.0	1.8	4.2	39.8	2.25	32.1	5.2	96.3	52.9	3.1
70	4.5	0.1	0.2	38.6	29.0	1.94	45.2	19.9	90.1	2.8	4.5	0.1	0.2	41.0	2.25	33.3	5.3	97.0	55.2	3.2
	6.8	0.9	2.1	40.0	29.6	1.76	46.1	22.7	83.6	2.3	6.8	0.9	2.2	43.2	2.26	35.5	5.6	98.5	59.5	3.3
	9.0	1.8	4.0	40.7	29.8	1.68	46.4	24.2	80.3	2.1	9.0	1.8	4.0	44.4	2.27	36.7	5.7	99.3	61.9	3.4
80	4.5	0.1	0.3	36.2	27.8	2.22	43.7	16.3	99.4	3.8	4.5	0.1	0.3	45.2	2.27	37.4	5.8	99.8	63.4	3.4
	6.8	0.9	2.1	37.8	28.6	2.03	44.7	18.6	93.3	3.1	5.1	0.3	0.8	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	9.0	1.7	3.9	38.6	29.0	1.94	45.2	19.9	90.0	3.4	5.1	0.3	0.8	46.0	2.28	38.3	5.9	100.4	65.0	3.7
90	4.5	0.1	0.3	33.5	26.5	2.54	42.2	13.2	108.7	4.9	3.1	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	6.8	0.9	2.1	35.2	27.3	2.33	43.2	15.1	102.8	4.1	3.1	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	9.0	1.7	3.9	36.1	27.8	2.23	43.7	16.2	99.7	3.8	3.1	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
100	4.5	0.1	0.3	30.8	25.2	2.89	40.7	10.6	118.1	6.2	2.2	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	6.8	0.9	2.1	32.5	26.0	2.67	41.6	12.2	112.3	5.4	2.2	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	9.0	1.7	3.8	33.3	26.4	2.56	42.1	13.0	109.3	5.0	2.2	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
110	4.5	0.1	0.2	28.2	24.2	3.30	39.5	8.6	127.5	7.7	1.7	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	6.8	0.9	2.0	29.7	24.7	3.05	40.1	9.7	121.9	6.8	1.7	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	9.0	1.6	3.7	30.5	25.1	2.93	40.5	10.4	119.0	6.3	1.7	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
120	4.5	0.1	0.1	25.9	23.6	3.75	38.7	6.9	137.2	9.5	1.4	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	6.8	0.8	1.9	27.2	23.9	3.48	39.1	7.8	131.6	8.4	1.4	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5
	9.0	1.6	3.6	27.9	24.1	3.35	39.3	8.3	128.7	7.9	1.4	0.1	0.1	46.0	2.28	38.3	5.9	100.4	65.0	3.5

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 049 (Full Load), With vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,550 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	2.5	0.1	0.2	54.9	35.6	2.34	62.9	23.5	70.0	2.3	12.0	4.1	9.4	31.9	3.07	21.4	3.0	88.4	16.4	3.3
30	3.1	0.1	0.2	54.9	35.6	2.34	62.9	23.5	70.0	2.3	6.0	0.9	2.1	35.3	3.06	24.8	3.4	90.4	21.7	3.5
	3.1	0.1	0.2	54.9	35.6	2.34	62.9	23.5	70.0	2.3	9.0	2.1	4.9	36.8	3.06	26.3	3.5	91.2	24.1	3.5
	3.1	0.1	0.2	54.9	35.6	2.34	62.9	23.5	70.0	2.3	12.0	3.8	8.8	37.6	3.06	27.2	3.6	91.7	25.5	3.6
40	4.2	0.2	0.5	54.9	35.6	2.34	62.9	23.5	70.0	2.3	6.0	0.8	1.8	40.5	3.08	30.0	3.8	93.4	30.0	3.7
	4.2	0.2	0.5	54.9	35.6	2.34	62.9	23.5	70.0	2.3	9.0	2.0	4.6	42.3	3.11	31.7	4.0	94.4	32.9	3.8
	4.2	0.2	0.5	54.9	35.6	2.34	62.9	23.5	70.0	2.3	12.0	3.6	8.4	43.3	3.12	32.7	4.1	95.0	34.6	3.9
50	6.0	0.7	1.7	54.9	35.7	2.37	63.0	23.2	71.0	2.3	6.0	0.7	1.7	45.7	3.16	34.9	4.2	96.4	38.4	4.0
	6.3	0.8	1.9	54.9	35.6	2.34	62.9	23.5	70.0	2.3	9.0	1.9	4.3	47.9	3.20	37.0	4.4	97.6	41.8	4.1
	6.3	0.8	1.9	54.9	35.6	2.34	62.9	23.5	70.0	2.3	12.0	3.5	8.0	49.1	3.23	38.1	4.5	98.3	43.7	4.2
60	6.0	0.7	1.6	54.0	35.6	2.61	62.9	20.7	81.0	2.9	6.0	0.7	1.6	51.0	3.27	39.8	4.6	99.4	46.7	4.4
	9.0	1.8	4.2	54.8	35.6	2.44	63.1	22.5	74.0	2.5	9.0	1.8	4.2	53.5	3.33	42.1	4.7	100.9	50.6	4.5
	12.0	3.4	7.8	54.9	35.6	2.35	63.0	23.3	70.5	2.3	12.0	3.4	7.8	54.8	3.37	43.3	4.8	101.7	52.8	4.6
70	6.0	0.7	1.5	51.9	35.5	2.88	61.7	18.0	90.6	3.7	6.0	0.7	1.5	56.3	3.41	44.7	4.8	102.5	55.1	4.7
	9.0	1.8	4.0	53.5	36.0	2.69	62.7	19.9	83.9	3.1	9.0	1.8	4.0	59.1	3.49	47.2	5.0	104.1	59.5	5.0
	12.0	3.3	7.6	54.1	36.1	2.60	63.0	20.8	80.5	2.9	12.0	3.3	7.6	60.6	3.53	48.6	5.0	105.0	61.9	5.1
80	6.0	0.7	1.5	49.0	34.2	3.18	59.8	15.4	99.9	4.6	6.0	0.7	1.5	61.6	3.56	49.5	5.1	105.6	63.5	5.2
	9.0	1.7	4.0	51.0	35.1	2.97	61.1	17.2	93.6	3.9	6.7	0.9	2.1	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	12.0	3.2	7.5	51.9	35.5	2.87	61.7	18.1	90.3	3.6	6.7	0.9	2.1	62.6	3.59	50.3	5.1	106.1	65.0	5.3
90	6.0	0.7	1.5	45.7	32.5	3.52	57.7	13.0	109.2	4.9	4.0	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	9.0	1.7	3.9	47.9	33.6	3.29	59.1	14.6	103.1	4.6	4.0	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	12.0	3.2	7.4	49.0	34.2	3.18	59.8	15.4	100.0	5.7	4.0	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
100	6.0	0.6	1.5	42.5	30.8	3.91	55.8	10.8	118.6	6.0	2.9	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	9.0	1.7	3.8	44.5	31.8	3.65	57.0	12.2	112.7	5.7	2.9	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	12.0	3.2	7.3	45.6	32.4	3.53	57.6	12.9	109.6	7.0	2.9	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
110	6.0	0.6	1.4	39.5	29.3	4.38	54.5	9.0	128.2	7.4	2.2	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	9.0	1.6	3.7	41.3	30.2	4.09	55.2	10.1	122.3	7.0	2.2	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	12.0	3.1	7.2	42.2	30.6	3.94	55.7	10.7	119.3	8.4	2.2	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
120	6.0	0.6	1.3	37.4	28.6	4.96	54.3	7.6	138.1	9.0	1.8	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	9.0	1.6	3.6	38.6	28.9	4.60	54.3	8.4	132.1	8.5	1.8	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3
	12.0	3.0	7.0	39.3	29.2	4.43	54.4	8.9	129.1	8.5	1.8	0.1	0.2	62.6	3.59	50.3	5.1	106.1	65.0	5.3

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 064 (Part Load), With vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,500 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	2.4	0.1	0.1	54.8	39.9	1.84	61.1	29.9	70.0	1.8	12.0	5.2	11.9	28.6	2.75	19.3	3.1	84.0	16.8	3.1
30	3.1	0.1	0.1	54.8	39.9	1.84	61.1	29.9	70.0	1.8	6.0	0.9	2.1	32.2	2.76	22.7	3.4	86.0	22.4	3.2
	3.1	0.1	0.1	54.8	39.9	1.84	61.1	29.9	70.0	1.8	9.0	2.5	5.7	33.6	2.77	24.1	3.6	86.8	24.6	3.2
	3.1	0.1	0.1	54.8	39.9	1.84	61.1	29.9	70.0	1.8	12.0	4.1	9.6	34.4	2.77	24.9	3.6	87.2	25.8	3.2
40	4.1	0.1	0.2	54.8	39.9	1.84	61.1	29.9	70.0	1.8	6.0	0.5	1.1	37.6	2.79	28.0	3.9	89.0	30.7	3.3
	4.1	0.1	0.2	54.8	39.9	1.84	61.1	29.9	70.0	1.8	9.0	1.9	4.3	39.4	2.80	29.8	4.1	90.0	33.4	3.4
	4.1	0.1	0.2	54.8	39.9	1.84	61.1	29.9	70.0	1.8	12.0	3.4	7.9	40.4	2.81	30.8	4.2	90.6	34.9	3.4
50	6.0	0.2	0.6	54.8	39.8	1.85	61.1	29.7	70.4	1.8	6.0	0.2	0.6	43.1	2.82	33.5	4.5	92.1	38.8	3.5
	6.1	0.3	0.7	54.8	39.9	1.84	61.1	29.9	70.0	1.8	9.0	1.5	3.5	45.3	2.84	35.7	4.7	93.4	42.1	3.5
	6.1	0.3	0.7	54.8	39.9	1.84	61.1	29.9	70.0	1.8	12.0	3.0	6.9	46.6	2.85	36.9	4.8	94.1	43.9	3.6
60	6.0	0.2	0.4	52.4	38.9	2.11	59.6	24.8	79.9	2.5	6.0	0.2	0.4	48.8	2.86	39.0	5.0	95.3	47.0	3.7
	9.0	1.4	3.1	54.1	39.5	1.93	60.6	28.1	73.5	2.0	9.0	1.4	3.1	51.4	2.89	41.5	5.2	96.8	50.8	3.8
	12.0	2.7	6.3	54.8	39.9	1.84	61.1	29.8	70.2	1.8	12.0	2.7	6.3	52.8	2.90	42.9	5.3	97.6	52.8	3.8
70	6.0	0.2	0.4	49.6	37.9	2.42	57.8	20.4	89.3	3.3	6.0	0.2	0.4	54.4	2.91	44.5	5.5	98.5	55.2	3.9
	9.0	1.3	3.0	51.5	38.6	2.21	59.0	23.3	83.1	2.7	9.0	1.3	3.0	57.3	2.94	47.3	5.7	100.1	59.5	4.1
	12.0	2.6	6.0	52.4	38.9	2.11	59.6	24.8	79.9	2.5	12.0	2.6	6.0	58.9	2.96	48.8	5.8	101.0	61.9	4.2
80	6.0	0.2	0.6	46.5	36.7	2.78	56.0	16.7	98.7	4.4	6.0	0.2	0.6	59.9	2.97	49.8	5.9	101.6	63.4	4.2
	9.0	1.3	3.1	48.5	37.5	2.55	57.2	19.0	92.7	3.7	6.8	0.5	1.2	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	12.0	2.6	5.9	49.5	37.8	2.44	57.8	20.3	89.6	3.4	6.8	0.5	1.2	61.0	2.98	50.8	6.0	102.2	65.0	4.3
90	6.0	0.3	0.7	43.3	35.3	3.18	54.1	13.6	108.0	5.6	4.1	0.2	0.5	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	9.0	1.4	3.2	45.2	36.2	2.93	55.2	15.4	102.3	4.8	4.1	0.2	0.5	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	12.0	2.6	6.0	46.2	36.6	2.81	55.8	16.5	99.3	4.4	4.1	0.2	0.5	61.0	2.98	50.8	6.0	102.2	65.0	4.3
100	6.0	0.3	0.8	40.2	33.9	3.62	52.5	11.1	117.5	7.0	2.9	0.1	0.2	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	9.0	1.4	3.2	42.0	34.7	3.36	53.4	12.5	111.9	6.1	2.9	0.1	0.2	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	12.0	2.6	6.0	43.0	35.2	3.23	54.0	13.3	109.0	5.7	2.9	0.1	0.2	61.0	2.98	50.8	6.0	102.2	65.0	4.3
110	6.0	0.3	0.6	37.4	32.4	4.09	51.3	9.1	127.1	8.7	2.3	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	9.0	1.3	3.1	38.9	33.2	3.81	52.0	10.2	121.5	7.7	2.3	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	12.0	2.5	5.8	39.8	33.7	3.68	52.3	10.8	118.7	7.2	2.3	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3
120	6.0	0.0	0.0	35.1	31.0	4.59	50.8	7.6	136.9	10.5	1.8	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	9.0	1.1	2.6	36.3	31.7	4.30	51.0	8.4	131.3	9.4	1.8	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3
	12.0	2.3	5.4	37.0	32.2	4.16	51.2	8.9	128.5	8.9	1.8	0.1	0.1	61.0	2.98	50.8	6.0	102.2	65.0	4.3

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 064 (Full Load), With vFlow®

2,050 CFM Nominal (Rated) Airflow Heating, 1,850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	3.4	0.1	0.2	74.3	51.7	3.13	85.0	23.7	70.0	2.8	15.0	7.3	16.8	43.4	3.77	30.6	3.4	87.6	15.9	3.8
30	4.2	0.1	0.2	74.3	51.7	3.13	85.0	23.7	70.0	2.8	7.5	1.7	3.9	47.6	3.82	34.5	3.6	89.4	20.8	4.0
	4.2	0.1	0.1	74.3	51.7	3.13	85.0	23.7	70.0	2.8	11.3	3.7	8.6	49.9	3.86	36.7	3.8	90.5	23.5	4.1
	4.2	0.1	0.2	74.3	51.7	3.13	85.0	23.7	70.0	2.8	15.0	6.1	14.1	51.2	3.88	37.9	3.9	91.1	24.9	4.1
40	5.7	0.3	0.2	74.3	51.7	3.13	85.0	23.7	70.0	2.8	7.5	1.2	2.7	54.7	3.94	41.3	4.1	92.7	29.0	4.2
	5.7	0.3	0.8	74.3	51.7	3.13	85.0	23.7	70.0	2.8	11.3	3.0	7.0	57.6	3.99	44.0	4.2	94.0	32.2	4.4
	5.7	0.3	0.8	74.3	51.7	3.13	85.0	23.7	70.0	2.8	15.0	5.3	12.2	59.2	4.02	45.5	4.3	94.7	33.9	4.4
50	7.5	0.9	2.0	73.6	51.4	3.20	84.5	23.0	72.5	2.9	7.5	0.9	2.0	62.1	4.08	48.2	4.5	96.0	37.2	4.6
	8.5	1.3	3.0	74.3	51.7	3.13	85.0	23.7	70.0	2.8	11.3	2.6	6.0	65.5	4.15	51.3	4.6	97.5	40.9	4.7
	8.5	1.3	3.0	74.3	51.7	3.13	85.0	23.7	70.0	2.8	15.0	4.7	10.8	67.3	4.19	53.0	4.7	98.3	42.9	4.8
60	7.5	0.7	1.7	70.7	50.3	3.47	82.6	20.4	82.0	3.6	7.5	0.7	1.7	69.5	4.24	55.1	4.8	99.3	45.3	5.0
	11.3	2.4	5.4	73.0	51.1	3.26	84.1	22.4	75.0	3.1	11.3	2.4	5.4	73.4	4.33	58.6	5.0	101.1	49.6	5.2
	15.0	4.3	10.0	74.0	51.6	3.16	84.8	23.4	71.3	2.8	15.0	4.3	10.0	75.5	4.38	60.6	5.1	102.0	51.9	5.3
70	7.5	0.7	1.7	67.3	48.9	3.81	80.3	17.7	91.4	4.5	7.5	0.7	1.7	77.0	4.41	61.9	5.1	102.7	53.5	5.4
	11.3	2.3	5.2	69.8	49.9	3.56	82.0	19.6	84.6	3.8	11.3	2.3	5.2	81.3	4.52	65.9	5.3	104.6	58.3	5.7
	15.0	4.1	9.5	71.1	50.4	3.44	82.8	20.6	81.0	3.5	15.0	4.1	9.5	83.7	4.59	68.0	5.3	105.7	60.9	5.8
80	7.5	0.8	1.8	63.5	47.5	4.19	77.8	15.1	100.8	5.6	7.5	0.8	1.8	84.4	4.61	68.7	5.4	106.0	61.7	5.9
	11.3	2.2	5.2	66.2	48.5	3.91	79.6	16.9	94.1	4.8	9.5	1.5	3.6	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	15.0	4.1	9.4	67.5	49.0	3.78	80.4	17.9	90.7	4.4	9.5	1.5	3.6	87.3	4.69	71.3	5.5	107.4	65.0	6.1
90	7.5	0.8	2.0	59.8	45.8	4.65	75.6	12.9	110.2	6.8	5.7	0.2	0.5	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	11.3	2.3	5.2	62.3	47.0	4.33	77.1	14.4	103.7	5.9	5.7	0.2	0.5	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	15.0	4.0	9.3	63.7	47.5	4.18	77.9	15.2	100.4	5.5	5.7	0.2	0.5	87.3	4.69	71.3	5.5	107.4	65.0	6.1
100	7.5	0.9	2.0	56.2	44.2	5.18	73.9	10.8	119.7	8.3	4.1	0.1	0.2	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	11.3	2.3	5.2	58.5	45.3	4.82	75.0	12.1	113.3	7.3	4.1	0.1	0.2	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	15.0	4.0	9.3	59.8	45.9	4.65	75.6	12.9	110.1	6.8	4.1	0.1	0.2	87.3	4.69	71.3	5.5	107.4	65.0	6.1
110	7.5	0.8	1.8	53.1	42.6	5.80	72.9	9.2	129.4	10.0	3.2	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	11.3	2.2	5.1	55.0	43.6	5.39	73.4	10.2	123.1	8.8	3.2	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	15.0	4.0	9.2	56.1	44.2	5.19	73.8	10.8	119.8	8.3	3.2	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1
120	7.5	0.6	1.3	50.8	41.4	6.53	73.1	7.8	139.5	11.9	2.6	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	11.3	2.0	4.7	52.2	42.1	6.04	72.8	8.6	132.9	10.6	2.6	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1
	15.0	3.8	8.8	53.0	42.6	5.82	72.9	9.1	129.7	10.0	2.6	0.1	0.1	87.3	4.69	71.3	5.5	107.4	65.0	6.1

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Performance Data – TE H/V/D 072 (Part Load), With vFlow®

1,650 CFM Nominal (Rated) Airflow Heating, 1,550 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	2.8	0.1	0.2	63.0	42.0	2.31	70.9	27.2	70.0	2.7	14.0	6.5	15.1	33.4	3.51	21.4	2.8	86.7	16.9	4.1
30	3.5	0.1	0.2	63.0	42.0	2.31	70.9	27.2	70.0	2.7	7.0	1.4	3.3	37.7	3.57	25.5	3.1	89.1	22.7	4.3
	3.5	0.1	0.2	63.0	42.0	2.31	70.9	27.2	70.0	2.7	10.5	3.3	7.6	39.3	3.59	27.0	3.2	90.0	24.9	4.3
	3.5	0.1	0.2	63.0	42.0	2.31	70.9	27.2	70.0	2.7	14.0	5.4	12.5	40.1	3.60	27.8	3.3	90.5	26.0	4.3
40	4.7	0.2	0.4	63.0	42.0	2.31	70.9	27.2	70.0	2.7	7.0	0.9	2.2	43.9	3.65	31.4	3.5	92.6	31.0	4.5
	4.7	0.2	0.4	63.0	42.0	2.31	70.9	27.2	70.0	2.7	10.5	2.6	6.1	45.8	3.68	33.3	3.7	93.7	33.7	4.5
	4.7	0.2	0.4	63.0	42.0	2.31	70.9	27.2	70.0	2.7	14.0	4.6	10.7	46.9	3.69	34.3	3.7	94.3	35.1	4.5
50	7.0	0.7	1.5	62.9	41.9	2.32	70.8	27.1	70.2	2.7	7.0	0.7	1.5	50.1	3.74	37.4	3.9	96.1	39.3	4.8
	7.1	0.7	1.6	63.0	42.0	2.31	70.9	27.2	70.0	2.7	10.5	2.2	5.1	52.5	3.77	39.6	4.1	97.4	42.5	4.9
	7.1	0.7	1.6	63.0	42.0	2.31	70.9	27.2	70.0	2.7	14.0	4.1	9.4	53.8	3.78	40.8	4.2	98.1	44.2	4.9
60	7.0	0.5	1.3	60.2	40.8	2.65	69.3	22.7	79.8	3.2	7.0	0.5	1.3	56.4	3.82	43.3	4.3	99.6	47.6	5.2
	10.5	2.0	4.6	62.1	41.6	2.42	70.4	25.6	73.4	2.9	10.5	2.0	4.6	59.1	3.86	46.0	4.5	101.1	51.2	5.3
	14.0	3.8	8.7	63.0	42.0	2.32	70.9	27.2	70.1	2.7	14.0	3.8	8.7	60.6	3.88	47.4	4.6	101.9	53.2	5.4
70	7.0	0.5	1.3	57.1	39.5	3.04	67.5	18.8	89.3	4.3	7.0	0.5	1.3	62.6	3.90	49.3	4.7	103.1	55.9	5.6
	10.5	1.9	4.5	59.2	40.3	2.78	68.7	21.3	83.1	3.7	10.5	1.9	4.5	65.8	3.95	52.3	4.9	104.8	60.0	5.8
	14.0	3.6	8.3	60.2	40.7	2.65	69.3	22.7	79.9	3.5	14.0	3.6	8.3	67.5	3.97	53.9	5.0	105.8	62.3	5.9
80	7.0	0.6	1.4	53.7	38.1	3.48	65.6	15.4	98.7	5.8	7.0	0.6	1.4	68.9	3.99	55.3	5.1	106.6	64.2	6.1
	10.5	1.9	4.5	55.9	39.0	3.19	66.8	17.5	92.7	5.0	7.4	0.8	1.8	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	14.0	3.5	8.1	57.0	39.4	3.05	67.4	18.7	89.6	4.6	7.4	0.8	1.8	69.5	4.00	55.8	5.1	106.9	65.0	6.1
90	7.0	0.7	1.5	50.1	36.6	3.98	63.7	12.6	108.2	7.6	4.5	0.3	0.6	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	10.5	2.0	4.5	52.3	37.5	3.67	64.8	14.3	102.3	6.7	4.5	0.3	0.6	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	14.0	3.5	8.1	53.5	38.0	3.51	65.4	15.2	99.3	6.2	4.5	0.3	0.6	69.5	4.00	55.8	5.1	106.9	65.0	6.1
100	7.0	0.7	1.6	46.4	35.2	4.54	61.9	10.2	117.7	9.9	3.2	0.2	0.4	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	10.5	2.0	4.5	48.6	36.0	4.20	62.9	11.6	112.0	8.8	3.2	0.2	0.4	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	14.0	3.5	8.1	49.7	36.5	4.03	63.5	12.3	109.1	8.2	3.2	0.2	0.4	69.5	4.00	55.8	5.1	106.9	65.0	6.1
110	7.0	0.6	1.4	42.9	33.8	5.15	60.4	8.3	127.3	12.6	2.5	0.1	0.2	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	10.5	1.9	4.4	44.9	34.6	4.78	61.2	9.4	121.7	11.3	2.5	0.1	0.2	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	14.0	3.5	8.0	46.0	35.0	4.61	61.7	10.0	118.8	10.7	2.5	0.1	0.2	69.5	4.00	55.8	5.1	106.9	65.0	6.1
120	7.0	0.4	0.9	39.5	32.5	5.82	59.4	6.8	137.0	15.7	2.0	0.1	0.1	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	10.5	1.7	3.9	41.4	33.2	5.43	59.9	7.6	131.4	14.3	2.0	0.1	0.1	69.5	4.00	55.8	5.1	106.9	65.0	6.1
	14.0	3.3	7.6	42.4	33.6	5.24	60.2	8.1	128.6	13.6	2.0	0.1	0.1	69.5	4.00	55.8	5.1	106.9	65.0	6.1

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Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
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Performance Data – TE H/V/D 072 (Full Load), With vFlow®

2,050 CFM Nominal (Rated) Airflow Heating, 1,850 CFM Nominal (Rated) Airflow Cooling

Performance capacities shown in thousands of Btuh

EWT °F	GPM	WPD		COOLING - EAT 80/67 °F							GPM	HEATING - EAT 70°F								
		PSI	FT	TC	SC	KW	HR	EER	LWT	HWC		PSI	FT	HC	KW	HE	COP	LAT	LWT	HWC
20	3.7	0.3	0.6	81.0	52.8	3.61	93.3	22.4	70.0	4.5	17.0	8.9	20.6	47.3	4.52	31.9	3.1	89.3	16.2	5.0
30	4.7	0.3	0.6	81.0	52.8	3.61	93.3	22.4	70.0	4.5	8.5	2.2	5.1	52.4	4.63	36.6	3.3	91.6	21.4	5.2
	4.7	0.3	0.6	81.0	52.8	3.61	93.3	22.4	70.0	4.5	12.8	4.6	10.6	54.8	4.68	38.8	3.4	92.7	23.9	5.4
	4.7	0.3	0.6	81.0	52.8	3.61	93.3	22.4	70.0	4.5	17.0	7.6	17.6	56.1	4.71	40.1	3.5	93.3	25.3	5.5
40	6.2	0.6	1.3	81.0	52.8	3.61	93.3	22.4	70.0	4.5	8.5	1.6	3.8	60.3	4.80	43.9	3.7	95.2	29.7	5.7
	6.2	0.6	1.3	81.0	52.8	3.61	93.3	22.4	70.0	4.5	12.8	3.9	8.9	63.1	4.87	46.5	3.8	96.4	32.7	5.9
	6.2	0.6	1.3	81.0	52.8	3.61	93.3	22.4	70.0	4.5	17.0	6.7	15.5	64.6	4.90	47.9	3.9	97.1	34.4	6.1
50	8.5	1.3	3.0	80.5	52.6	3.67	93.0	21.9	71.9	4.6	8.5	1.3	3.0	67.9	4.99	50.9	4.0	98.6	38.0	6.3
	9.3	1.7	3.9	81.0	52.8	3.61	93.3	22.4	70.0	4.5	12.8	3.4	7.8	71.2	5.07	53.9	4.1	100.1	41.5	6.6
	9.3	1.7	3.9	81.0	52.8	3.61	93.3	22.4	70.0	4.5	17.0	6.0	13.9	72.9	5.11	55.5	4.2	100.9	43.5	6.8
60	8.5	1.2	2.7	77.4	51.4	4.01	91.1	19.3	81.4	5.6	8.5	1.2	2.7	75.5	5.18	57.9	4.3	102.0	46.4	7.1
	12.8	3.1	7.1	79.7	52.3	3.76	92.5	21.2	74.5	4.8	12.8	3.1	7.1	79.2	5.28	61.2	4.4	103.7	50.4	7.4
	17.0	5.6	13.0	80.7	52.7	3.64	93.1	22.2	71.0	4.5	17.0	5.6	13.0	81.2	5.33	63.0	4.5	104.6	52.6	7.7
70	8.5	1.1	2.6	73.7	49.8	4.42	88.7	16.7	90.9	6.8	8.5	1.1	2.6	83.2	5.38	64.8	4.5	105.5	54.8	7.9
	12.8	3.0	6.8	76.3	50.9	4.12	90.4	18.5	84.2	5.9	12.8	3.0	6.8	87.3	5.50	68.5	4.6	107.3	59.3	8.4
	17.0	5.4	12.4	77.6	51.5	3.99	91.2	19.5	80.7	5.5	17.0	5.4	12.4	89.5	5.57	70.5	4.7	108.3	61.7	8.7
80	8.5	1.2	2.7	69.5	48.1	4.89	86.2	14.2	100.3	8.4	8.5	1.2	2.7	90.9	5.61	71.7	4.7	108.9	63.1	8.8
	12.8	2.9	6.7	72.4	49.3	4.56	88.0	15.9	93.8	7.3	9.8	1.6	3.8	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	17.0	5.2	12.1	73.8	49.9	4.40	88.8	16.8	90.5	6.7	9.8	1.6	3.8	92.6	5.66	73.3	4.8	109.7	65.0	9.2
90	8.5	1.2	2.8	65.2	46.2	5.45	83.8	12.0	109.7	10.3	5.9	0.3	0.6	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	12.8	2.9	6.7	68.1	47.4	5.07	85.4	13.4	103.4	9.0	5.9	0.3	0.6	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	17.0	5.2	12.0	69.6	48.1	4.88	86.3	14.2	100.1	8.4	5.9	0.3	0.6	92.6	5.66	73.3	4.8	109.7	65.0	9.2
100	8.5	1.2	2.8	60.9	44.3	6.09	81.6	10.0	119.2	12.5	4.2	0.1	0.2	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	12.8	2.9	6.7	63.7	45.5	5.66	83.0	11.2	113.0	11.0	4.2	0.1	0.2	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	17.0	5.2	12.0	65.1	46.2	5.46	83.8	11.9	109.9	10.3	4.2	0.1	0.2	92.6	5.66	73.3	4.8	109.7	65.0	9.2
110	8.5	1.1	2.6	56.7	42.5	6.85	80.0	8.3	128.8	15.0	3.3	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	12.8	2.9	6.6	59.3	43.6	6.36	81.0	9.3	122.7	13.4	3.3	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	17.0	5.1	11.8	60.7	44.2	6.12	81.6	9.9	119.6	12.6	3.3	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2
120	8.5	0.9	2.1	52.9	41.0	7.72	79.2	6.8	138.6	18.0	2.7	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	12.8	2.7	6.2	55.2	41.9	7.16	79.6	7.7	132.5	16.1	2.7	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2
	17.0	5.0	11.5	56.4	42.4	6.90	80.0	8.2	129.4	15.2	2.7	0.1	0.1	92.6	5.66	73.3	4.8	109.7	65.0	9.2

Interpolation is permissible, extrapolation is not. All performance data is based on the lower voltage of dual voltage units.
Performance stated is at the rated power supply, performance may vary as the power supply varies from the rated.
Table is with entering air of 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.
See performance correction tables for operating conditions other than those listed above. See performance data selection notes for operation in the shaded areas.
Operation below 40°F EWT is based on a 15% methanol antifreeze solution.
Operation below 60°F EWT requires optional extended range insulated water and refrigerant circuits to avoid condensation within the unit cabinet.

Airflow Correction Table

Airflow	Cooling				Heating		
% of Rated	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
60%	0.920	0.781	0.959	0.927	0.946	1.241	0.881
69%	0.942	0.832	0.964	0.946	0.960	1.163	0.915
75%	0.956	0.867	0.696	0.959	0.969	1.115	0.937
81%	0.969	0.901	0.975	0.970	0.978	1.076	0.956
88%	0.981	0.934	0.982	0.981	0.986	1.043	0.973
94%	0.991	0.967	0.990	0.991	0.993	1.018	0.988
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.007	1.033	1.011	1.008	1.006	0.990	1.010
113%	1.013	1.065	1.023	1.015	1.012	0.986	1.017
119%	1.018	1.098	1.036	1.021	1.017	0.983	1.024
125%	1.021	1.131	1.051	1.026	1.021	0.981	1.030
130%	1.023	1.159	1.063	1.030	1.024	0.979	1.034

Entering Air Correction Tables

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
40	1.084	0.732	1.161
45	1.073	0.764	1.140
50	1.060	0.802	1.117
55	1.046	0.846	1.090
60	1.031	0.893	1.061
65	1.016	0.945	1.031
68	1.006	0.978	1.013
70	1.000	1.000	1.000
75	0.984	1.058	0.968
80	0.968	1.117	0.936

ClimaDry Option Notes:
Unit minimum entering air temperature when in dehumidification or cooling mode is 65°F DB. Operation below this minimum may result in nuisance faults.

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

Cooling													
Entering Air WB°F	Total Capacity	Sensible Cooling Capacity Multiplier - Entering DB °F										Power	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95	100		
45	0.876	1.286	1.302	1.389	*	*	*	*	*	*	*	0.981	0.895
50	0.883	1.002	1.099	1.241	*	*	*	*	*	*	*	0.985	0.901
55	0.903	0.706	0.871	1.060	1.271	*	*	*	*	*	*	0.989	0.918
60	0.935		0.617	0.844	1.079	1.319	1.349	*	*	*	*	0.993	0.945
65	0.979			0.595	0.849	1.096	1.128	1.342	*	*	*	0.998	0.982
66.2	0.991			0.531	0.789	1.040	1.070	1.284	1.522	*	*	0.999	0.993
67	1.000			0.486	0.747	1.000	1.030	1.245	1.481	*	*	1.000	1.000
70	1.035				0.583	0.842	0.873	1.090	1.327	1.552	*	1.003	1.030
75	1.105					0.552	0.584	0.811	1.057	1.290	1.510	1.008	1.088

Airflow Correction Table

Airflow	Cooling				Heating		
% of Rated	Total Capacity	Sensible Capacity	Power	Heat of Rejection	Heating Capacity	Power	Heat of Extraction
60%	0.925	0.788	0.913	0.922	0.946	1.153	0.896
69%	0.946	0.829	0.926	0.942	0.959	1.107	0.924
75%	0.960	0.861	0.937	0.955	0.969	1.078	0.942
81%	0.972	0.895	0.950	0.968	0.977	1.053	0.959
88%	0.983	0.930	0.965	0.979	0.985	1.032	0.974
94%	0.992	0.965	0.982	0.990	0.993	1.014	0.988
100%	1.000	1.000	1.000	1.000	1.000	1.000	1.000
106%	1.007	1.033	1.020	1.009	1.006	0.989	1.011
113%	1.012	1.064	1.042	1.018	1.012	0.982	1.019
119%	1.016	1.092	1.066	1.025	1.018	0.979	1.027
125%	1.018	1.116	1.091	1.032	1.022	0.977	1.033
130%	1.019	1.132	1.112	1.037	1.026	0.975	1.038

Entering Air Correction Tables

Heating			
Entering Air DB°F	Heating Capacity	Power	Heat of Extraction
40	1.052	0.779	1.120
45	1.043	0.808	1.102
50	1.035	0.841	1.084
55	1.027	0.877	1.065
60	1.019	0.915	1.045
65	1.010	0.957	1.023
68	1.004	0.982	1.010
70	1.000	1.000	1.000
75	0.989	1.045	0.974
80	0.976	1.093	0.946

ClimaDry Option Notes:
Unit minimum entering air temperature when in dehumidification or cooling mode is 65°F DB. Operation below this minimum may result in nuisance faults.

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

Cooling												
Entering Air WB°F	Total Capacity	Sensible Cooling Capacity Multiplier - Entering DB °F									Power	Heat of Rejection
		60	65	70	75	80	80.6	85	90	95	100	
45	0.832	*	*	*	*	*	*	*	*	*	*	0.946	0.853
50	0.850	1.004	1.174	*	*	*	*	*	*	*	*	0.953	0.870
55	0.880	0.694	0.902	1.115	*	*	*	*	*	*	*	0.964	0.896
60	0.922		0.646	0.875	1.103	1.329	*	*	*	*	*	0.977	0.932
65	0.975			0.639	0.869	1.096	1.123	1.320	*	*	*	0.993	0.979
66.2	0.990			0.582	0.812	1.039	1.066	1.262	*	*	*	0.997	0.991
67	1.000			0.545	0.774	1.000	1.027	1.223	1.444	*	*	1.000	1.000
70	1.040				0.630	0.853	0.880	1.075	1.297	*	*	1.011	1.035
75	1.117					0.601	0.627	0.821	1.046	1.275	1.510	1.033	1.101

Correction Tables – Antifreeze and Water Pressure Drop Adder for Options

Antifreeze Correction Table

Antifreeze Type	Antifreeze %	Cooling EWT 90°F			Heating EWT 30°F		WPD Corr. Fct. EWT 30°F
		Total Cap	Sens Cap	Power	Htg Cap	Power	
Water	0	1.000	1.000	1.000	1.000	1.000	1.000
Propylene Glycol	5	0.995	0.995	1.003	0.989	0.997	1.070
	15	0.986	0.986	1.009	0.968	0.990	1.210
	25	0.978	0.978	1.014	0.947	0.983	1.360
Methanol	5	0.997	0.997	1.002	0.989	0.997	1.070
	15	0.990	0.990	1.007	0.968	0.990	1.160
	25	0.982	0.982	1.012	0.949	0.984	1.220
Ethanol	5	0.998	0.998	1.002	0.981	0.994	1.140
	15	0.994	0.994	1.005	0.944	0.983	1.300
	25	0.986	0.986	1.009	0.917	0.974	1.360
Ethylene Glycol	5	0.998	0.998	1.002	0.993	0.998	1.040
	15	0.994	0.994	1.004	0.980	0.994	1.120
	25	0.988	0.988	1.008	0.966	0.990	1.200

Modulating Valves for Closed Loop Applications, Low System Pressure Drop

Model	CV	Close Off	MOPD	WPD Adders		
				GPM	PSI	FT
026	4.7	200	30	3	0.41	0.94
	4.7	200	30	4.5	0.92	2.12
	4.7	200	30	6	1.63	3.76
038	7.4	200	30	4.5	0.37	0.85
	7.4	200	30	6.8	0.84	1.95
	7.4	200	30	9	1.48	3.42
049	10	200	30	6	0.36	0.83
	10	200	30	9	0.81	1.87
	10	200	30	12	1.44	3.33
064	19	200	30	7.5	0.16	0.36
	19	200	30	11.3	0.35	0.82
	19	200	30	15	0.62	1.44
072	19	200	30	8.5	0.20	0.46
	19	200	30	12.8	0.45	1.05
	19	200	30	17	0.80	1.85

Modulating Valves for Closed Loop Applications, High System Pressure Drop

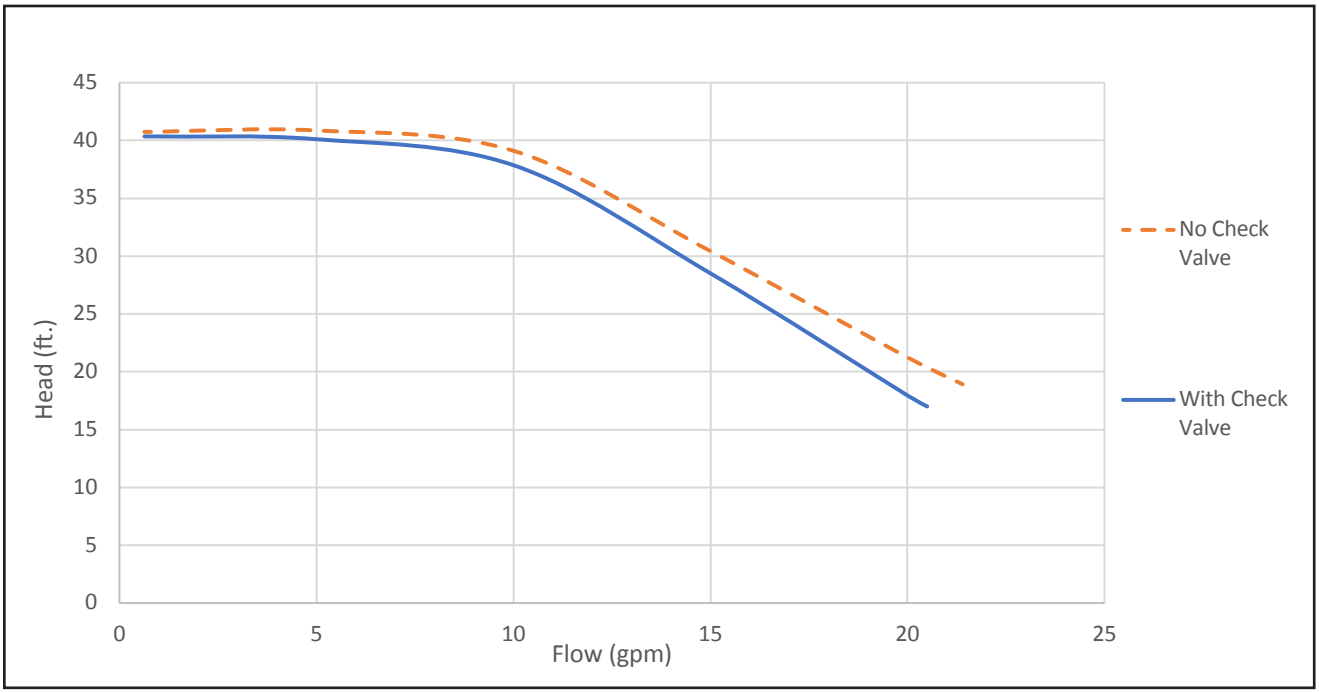
Model	CV	Close Off	MOPD	WPD Adders		
				GPM	PSI	FT
026	4.7	200	30	3	0.41	0.94
	4.7	200	30	4.5	0.92	2.12
	4.7	200	30	6	1.63	3.76
038	4.7	200	30	4.5	0.92	2.12
	4.7	200	30	6.8	2.09	4.84
	4.7	200	30	9	3.67	8.47
049	4.7	200	30	6	1.63	3.76
	4.7	200	30	9	3.67	8.47
	4.7	200	30	12	6.52	15.06
064	7.4	200	30	7.5	1.03	2.37
	7.4	200	30	11.3	2.33	5.39
	7.4	200	30	15	4.11	9.49
072	7.4	200	30	8.5	1.32	3.05
	7.4	200	30	12.8	2.99	6.91
	7.4	200	30	17	5.28	12.19

ClimaDry® Additional Pressure Drop (When Operating in Non-ClimaDry® Mode)

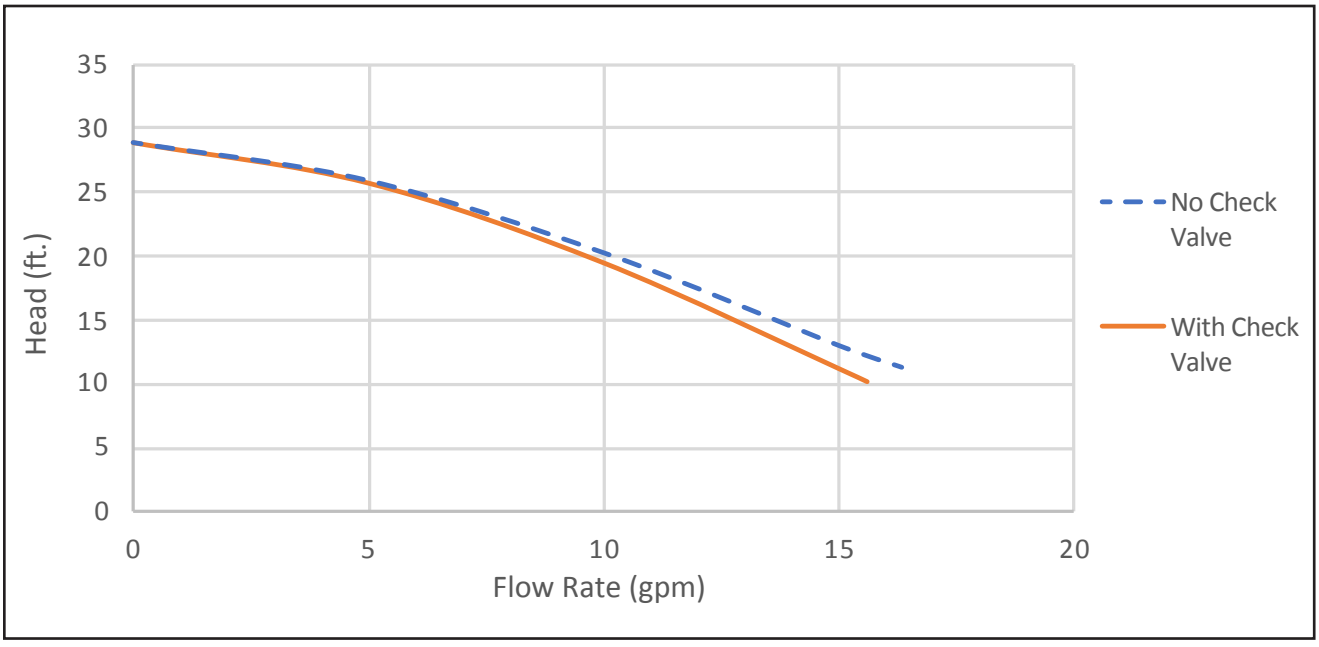
Model	WPD Adders (Part Load)			WPD Adders (Full Load)		
	GPM	PSI	FT	GPM	PSI	FT
026	3.5	1.200	2.771	4.0	1.567	3.620
	5.8	3.294	7.610	6.0	3.526	8.144
038	4.0	0.689	1.592	4.5	0.872	2.015
	6.0	1.551	3.583	6.8	1.992	4.602
049	5.5	1.303	3.011	6.0	1.551	3.583
	8.3	2.968	6.856	9.0	3.490	8.062
064	7.0	1.299	3.001	7.5	1.491	3.445
	10.5	2.923	6.752	11.3	3.385	7.820
072	7.5	1.491	3.445	8.5	1.915	4.425
	11.3	3.385	7.820	12.8	4.344	10.034

Variable Pump Performance

High Head Variable Pump Performance



Standard Head Variable Pump Performance



The ECM fan is controlled directly the DXM2 control board. It converts thermostat inputs and CFM settings to signals used by the ECM motor controller. To take full advantage of the ECM motor features, a communicating multi-stage thermostat should be used (ATC32U**).

The DXM2 control maintains a selectable operating airflow [CFM] for each heat pump operating mode. For each operating mode there are maximum and minimum airflow limits. See the ECM Blower Performance tables for the maximum, minimum, and default operating airflows.

Airflow levels are selected using the configuration menus of a communicating thermostat (ATC32U**) or diagnostic tool (ACDU**). The configuration menus allow the installer to independently select and adjust the operating airflow for each of the operating modes. Airflow can be selected in 25 CFM increments within the minimum and maximum limits shown in the ECM Blower Performance Table. The blower operating modes include:

- First Stage Cooling (Y1 & O)
- Second Stage Cooling (Y1, Y2, & O)
- First Stage Cooling in Dehumidification Mode (Y1, O, & Dehumid)
- Second Stage Cooling in Dehumidification Mode (Y1, Y2, O, & Dehumid)
- First Stage Heating (Y1)
- Second Stage Heating (Y1 & Y2)
- Third Stage (Auxiliary) Heating (Y1, Y2, & W)
- Emergency Heating (W with no Y1 or Y2)
- Fan (G with no Y1, Y2, or W)

It is highly recommended that ATC32U** or ACDU** be used to set dehumidification mode electronically. Dehumidification can NOT be selected when using a non-communicating thermostat with a vFlow® unit with Internal Flow Controller (pump). For dehumidification settings on other units using the non-communicating stat, refer to DXM2 AOM (part #97B0003N15).

The ECM motor includes “soft start” and “ramp down” features. The soft start feature is a gentle increase of motor rpm at blower start up. This creates a much quieter blower start cycle.

The ramp down feature allows the blower to slowly decrease rpm to a full stop at the end of each blower cycle. This creates a much quieter end to each blower cycle and adds overall unit efficiency.

The ramp down feature is eliminated during an ESD (Emergency Shut Down) situation. When the DXM2 ESD input is activated, the blower and all other control outputs are immediately de-activated.

The ramp down feature (also known as the heating or cooling “Off Delay”) is field selectable by the installer. The allowable range is 0 to 255 seconds.

Airflow Configuration Screen on Communicating Thermostat

AIRFLOW SELECTION	CFM
HEAT STAGE 1	600
HEAT STAGE 2	750
AUXILIARY HEAT	850
EMERGENCY HEAT	850
COOL STAGE 1	525
COOL STAGE 2	700
COOL DEHUMID 1	425
COOL DEHUMID 2	550
CONTINUOUS FAN	350
HEAT OFF DELAY	60
COOL OFF DELAY	30
◀ PREVIOUS	NEXT ▶

Standard Unit (ECM)

Airflow in CFM with wet coil and clean air filter

Model	Max ESP (in wg)	Fan Motor (hp)	Range	Cooling Mode		Dehumid Mode		Heating Mode		Fan Only Mode
				Stg 2	Stg 1	Stg 2	Stg 1	Stg 2	Stg 1	
026	1.0	1/2	Default	700	525	550	425	750	600	350
			Maximum	1000	800	800	600	1000	850	1000
			Minimum	600	450	550	400	600	450	300
038	0.9	1/2	Default	1050	800	850	650	1100	850	550
			Maximum	1500	1100	1200	900	1500	1100	1500
			Minimum	900	600	825	550	900	600	450
049	1.0	1	Default	1400	1050	1100	850	1500	1150	700
			Maximum	2000	1500	1600	1200	2000	1500	2000
			Minimum	1200	900	1100	825	1200	900	600
064	0.7	1	Default	1750	1300	1400	1050	1875	1450	875
			Maximum	2300	1900	2000	1500	2300	1900	2300
			Minimum	1500	1100	1375	1000	1500	1100	750
072	0.7	1	Default	1900	1450	1650	1250	2000	1650	950
			Maximum	2300	2200	2000	1800	2300	2200	2300
			Minimum	1800	1350	1650	1250	1800	1350	900

Airflow is controlled within +/- 5% up to Max ESP shown with wet coil and standard 1" fiberglass filter.
ClimaDry® equipped units are factory set to operate in stage 2 airflow.

TRANQUILITY® 30 DIGITAL (TE) SERIES WITH CLIMADRY®

All Tranquility® 30 Digital (TE) units have an ECM fan motor. The small amount of additional pressure drop of the ClimaDry® coil causes the ECM motor to slightly increase RPM to overcome the added pressure drop and maintain selected CFM up to the maximum ESP.

ClimaDry® Modulating Reheat

ClimateMaster's patented ClimaDry® Dehumidification is an innovative means of providing modulating reheat without the complication of refrigeration controls. ClimaDry is hot gas generated reheat, which utilizes one of the biggest advantages of a Water-Source Heat Pump (WSHP), the transfer of energy through the water piping system. ClimaDry simply diverts condenser water through a water-to-air coil that is placed after the evaporator coil. If condenser water is not warm enough, the internal "run-around" loop increases the water temperature with each pass through the condenser coil (see figure 1, below).

ClimaDry® Benefits

ClimaDry® is like no other reheat option on the market. Proportional reheat is controlled to the desired leaving air temperature setpoint (factory setpoint of 72°F, 22°C), no matter what the water loop temperature is. Since dehumidification operation will occur under less than full load cooling conditions a good percentage of the time, it is important to have a reheat function that provides 100% reheat in the spring and fall when the water loop is cool. Competitors without ClimaDry® typically use an on/off (non-modulating) refrigeration based reheat circuit, typically referred to as "Hot gas reheat" (HGR). HGR needs higher condensing temperatures to work well, typically 85°F [29°C] entering water temperature (EWT).

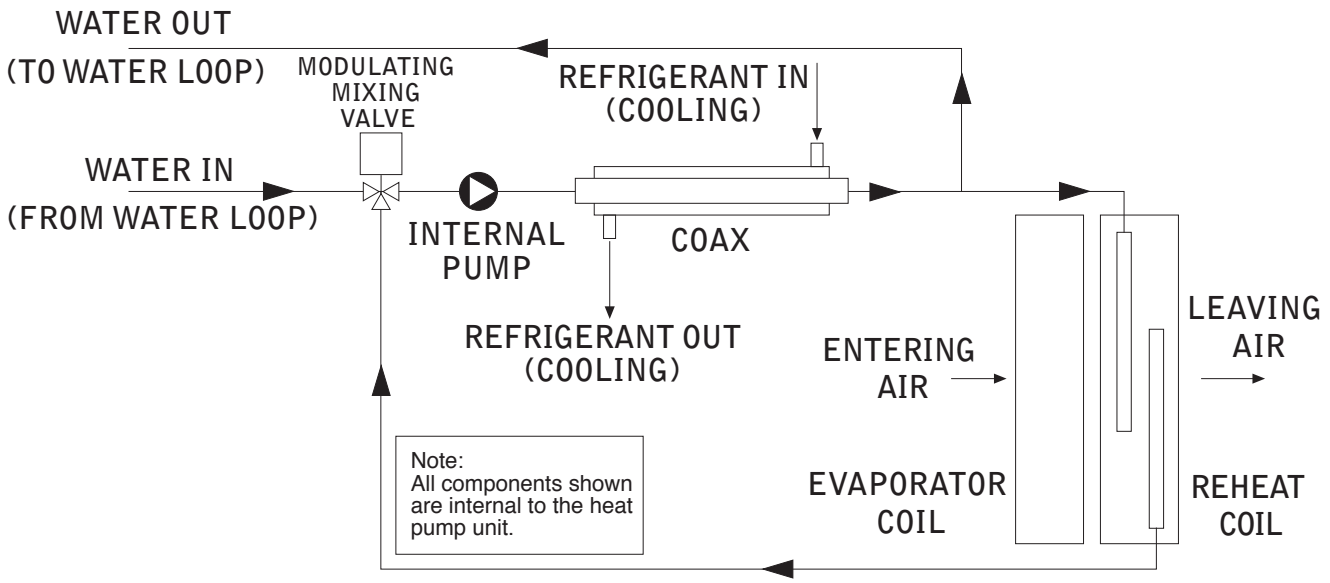
With HGR, cooler water temperatures produce cooler supply air temperatures, which could overcool the space, requiring additional space heating from another source or a special auto-change-over relay to allow the unit to switch back and forth between reheat and heating. Rarely does HGR provide 100% reheat, like ClimaDry. ClimaDry has a simple and easy to troubleshoot refrigerant circuit. No switching valves or hard to diagnose leaky check valves are utilized. No unusual refrigerant pressures occur during the reheat mode. The ClimaDry refrigerant circuit is like every other ClimateMaster unit (without reheat), so everything the technician already knows applies to troubleshooting the ClimaDry refrigeration circuit. Plus, the water loop portion of the ClimaDry option is easy to understand and diagnose.

ClimaDry® Applications

ClimaDry® can be applied to a number of common applications, such as:

- Classrooms.
- Condominiums.
- Apartments.
- Computer rooms.
- Spaces with high latent loads like auditoriums, theaters, convention centers, etc.
- Most applications where humidity is a problem. (Note: ClimaDry® is not for use in high fraction outdoor air applications or in applications with corrosive atmospheres, such as pool rooms.)

Figure 1: ClimaDry® Schematic



ClimaDry® – Benefits and Application

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

The moisture removal capability of the heat pump is determined by the unit's latent capacity rating. Latent capacity equals Total capacity minus Sensible capacity. Using unit performance data from submittals (climatemaster.com) select the correct model, use your maximum entering water temperature (EWT) and flow rate to select TC and SC. For example, at 80° F [26.7° C] EWT and 6.8 GPM, the moisture removal capability (latent capacity) of a ClimateMaster unit is 11.8 Mbtuh [3.5 kW] as shown below.

Dividing the latent capacity by 1,069 BTU/LB of water vapor at 80° F DB and 67° F WB [26.7° C DB and 19.4° C WB] moist air enthalpy, converts the amount of moisture removal to pounds per hour (multiply pounds per hour by 0.4536 to obtain kg/hr). Calculations are shown below.

Most ClimateMaster water source heat pumps have a sensible-to-total (S/T) ratio of 0.72 to 0.82. Therefore, approximately, 25% of the cooling capacity is dedicated to latent cooling capacity (moisture removal). When selecting a unit with ClimaDry, the space sensible and latent loads should be calculated. If the unit will be used for space cooling, a unit with at least enough capacity to satisfy the building sensible load should be selected. If the latent cooling load is not satisfied by the selection, a larger unit with enough latent capacity will be required. If the unit will be used for dehumidification purposes only, the latent capacity is the only consideration necessary. In this case, sensible load is immaterial.

LC = TC - SC = 37.2 - 25.4 = 11.8 Mbtuh

11,800 Btuh ÷ 1069 = 11.0 lbs/hr

Example Performance

EWT °F	GPM	WPD		Cooling - EAT 80/67°F							Heating - EAT 70°F					
		PSI	FT	Airflow CFM	TC	SC	Sens/ Total Ratio	kW	HR	EER	Airflow CFM	HC	kW	HE	LAT	COP
70	4.5	1.1	2.5	1080	37.8	25.7	0.68	2.22	45.3	17.0	1080	44.0	2.71	34.8	107.7	4.75
	4.5	1.1	2.5	1250	38.7	28.2	0.73	2.32	46.6	16.7	1250	44.8	2.60	36.0	103.2	5.05
	6.8	2.9	6.7	1080	39.1	26.2	0.67	2.08	46.1	18.8	1080	46.4	2.79	36.9	109.8	4.88
	6.8	2.9	6.7	1250	40.0	28.8	0.72	2.17	47.4	18.4	1250	47.3	2.67	38.2	105.0	5.19
80	4.5	1.0	2.3	1080	35.8	24.8	0.69	2.44	44.2	14.7	1080	48.3	2.84	38.6	111.4	4.98
	4.5	1.0	2.3	1250	36.7	27.2	0.74	2.55	45.4	14.4	1250	49.2	2.73	39.9	106.5	5.29
	6.8	2.8	6.6	1080	37.2	25.4	0.68	2.29	45.0	16.3	1080	51.1	2.93	41.1	113.8	5.10
	6.8	2.8	6.6	1250	38.0	27.9	0.73	2.39	46.2	15.9	1250	52.1	2.81	42.5	108.6	5.43
85	4.5	1.0	2.2	1080	34.8	24.3	0.70	2.57	43.6	13.6	1080	50.5	2.92	40.6	113.3	5.08
	4.5	1.0	2.2	1250	35.6	26.7	0.75	2.68	44.8	13.3	1250	51.5	2.80	41.9	108.1	5.40
	6.8	2.8	6.4	1080	36.2	25.0	0.69	2.40	44.4	15.0	1080	53.5	3.02	43.2	115.9	5.20
	6.8	2.8	6.4	1250	37.0	27.4	0.74	2.51	45.6	14.7	1250	54.5	2.89	44.7	110.4	5.53
90	4.5	0.9	2.1	1080	33.8	23.9	0.71	2.70	43.0	12.5	1080	52.7	2.99	42.5	115.2	5.17
	4.5	0.9	2.1	1250	34.6	26.2	0.76	2.81	44.2	12.3	1250	53.7	2.86	44.0	109.8	5.50
	6.8	2.7	6.2	1080	35.1	24.5	0.70	2.52	43.8	13.9	1080	55.9	3.10	45.3	117.9	5.29
	6.8	2.7	6.2	1250	36.0	26.9	0.75	2.63	45.0	13.7	1250	57.0	2.97	46.9	112.2	5.62

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

ClimaDry® Sequence of Operation

A heat pump equipped with ClimaDry® can operate in three modes; cooling, cooling with reheat (dehumidification), and heating. The cooling/heating modes are like any other ClimateMaster WSHP. The reversing valve ("O" signal) is energized in cooling, along with the compressor contactor(s) and blower relay. In the heating mode the reversing valve is de-energized. Almost any thermostat will activate the heat pump in heating or cooling modes. The DXM2 microprocessor board, which is required with the ClimaDry option, will accept either heat pump (Y,O) thermostats or non-heat pump (Y,W) thermostats. The reheat mode requires either a separate humidistat/ dehumidistat or a thermostat that has an integrated dehumidification function for activation. The DXM2 board is configured to work with either a humidistat or dehumidistat input to terminal "H". Upon receiving an "H" input, the DXM2 board will activate the cooling mode and engage reheat.There are four operational inputs for single stage units and six operational inputs for dual stage units:

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

Fan Only: A (G) call from the thermostat to the (G) terminal of the DXM2 control board will bring the unit on in fan only mode. 1st Stage Heating: A simultaneous call from (G) and (Y1) to the (G) and (Y1) terminals of the DXM2 control board will bring the unit on in 1st Stage Heating.

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

2nd Stage Cooling: A simultaneous call from (G), (Y1), and (O) to the (G), (Y1), (O/W2) terminals of the DXM2 control board will bring the unit on in 1st Stage Cooling.

Table 2: Humidistat/Dehumidistat Logic and DXM2 (2.1, 2.2., 2.3) DIP Settings

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

Table 3: ClimaDry® Operating Modes

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

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

1st Stage Heating: A simultaneous call from (G) and (Y1) to the (G) and (Y1) terminals of the DXM2 control board will bring the unit on in 1st stage Heating.

2nd Stage Heating: A simultaneous call from (G), (Y1), and (Y2) to the (G), (Y1), and (Y2) terminals of the DXM2 control board will bring the unit on in 2nd Stage Heating. When the call is satisfied at the thermostat the unit will continue to run in 1st Stage Heating until the call is removed or satisfied, shutting down the unit. **NOTE: Not all units have two-stage heating functionality.**

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

Note: Care must be taken when using a humidistat to operate ClimaDry®. When the DIP switch on the DXM2 controller is set for 'humidistat' it reverses the control logic so that an "open" control circuit initiates a ClimaDry run cycle. If a humidistat is not connected, or if a manual switch on the humidistat is set to "off", ClimaDry will see the open circuit and call for dehumidification.

ClimaDry® Component Functions

The ClimaDry® option consists of the following components:
Motorized Valve/Proportional Controller
Supply Air Sensor
Loop Pump
Hydronic Coil
Low Air Temperature Safety

The Proportional Controller operates on 24 VAC power supply and automatically adjusts the water valve based upon the Supply Air Sensor. The Supply Air Sensor senses supply air temperature at the blower inlet providing the input signal necessary for the proportional control to drive the motorized valve during the reheat mode of operation. The Motorized Valve is a proportional actuator/three-way valve combination used to divert the condenser water from the coax to the hydronic reheat coil during the reheat mode of operation. The proportional controller signals the motorized valve based on the supply air temperature of the supply air sensor.

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

ClimaDry® Application Considerations

The reheat coil adds a small amount of resistance to the air stream. Consult the submittal data or the Installation/Operation/Maintenance (I.O.M.) manual for the specific heat pump to review blower tables.

Unlike most hot gas reheat options, the ClimaDry® option will operate over a wide range of EWTs. Special flow regulation (water regulating valve) is not required for low EWT conditions.

Unit mimimum entering air temperature while in the dehumidification, cooling, or continuous fan modes is **65°F DB/55°F WB**. Operation below this minimum may result in nuisance faults.

Water-source heat pumps with ClimaDry should not be used as make-up air units. These applications should use equipment specifically designed for make-up air.

Physical Data

Model	026	038	049	064	072
Compressor (1 Each)	**Two-Stage Scroll**				
Factory Charge (HFC-410A) (oz) [kg]	44 [1.25]	52 [1.47]	69 [1.96]	142 [4.03]	140 [3.97]
ECM Fan Motor & Blower					
Fan Motor (hp) [W]	1/2 [373]	1/2 [373]	1 [746]	1 [746]	1 [746]
Blower Wheel Size (dia x w) - (in) [mm]	9 x 7 [229 x 178]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]	11 x 10 [279 x 254]
Water Connection Size					
FPT (in)	3/4	3/4	1	1	1
HWG Connection Size					
FPT (in)	1/2	1/2	1/2	1/2	1/2
Coax Volume					
Volume (US Gallons) [liters]	0.76 [2.88]	0.92 [3.48]	1.24 [4.69]	1.56 [5.91]	1.56 [5.91]
Vertical Upflow/Downflow					
Air Coil Dimensions (h x w) - (in) [mm]	28 x 20 [711 x 508]	28 x 25 [711 x 635]	32 x 25 [813 x 635]	36 x 25 [914 x 635]	36 x 25 [914 x 635]
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	1 - 28 x 24 [711 x 610]	1 - 28 x 30 [712 x 762]	2 - 16 x 30 [406 x 762]	1 - 16 x 30 [406 x 762] 1 - 20 x 30 [508 x 762]	1 - 16 x 30 [406 x 762] 1 - 20 x 30 [508 x 762]
Weight - Operating, (lbs) [kg]	298 [135]	359 [163]	448 [203]	475 [215]	475 [215]
Weight - Packaged, (lbs) [kg]	308 [140]	369 [167]	458 [208]	485 [220]	485 [220]
Weight - ClimaDry, (lbs) [kg]	38 [17]	41 [19]	44 [20]	49 [22]	49 [22]
Horizontal					
Air Coil Dimensions (h x w) - (in) [mm]	18 x 31 [457 x 787]	20 x 35 [508 x 889]	20 x 40 [508 x 1016]	20 x 45 [508 x 1143]	20 x 45 [508 x 1143]
Standard Filter - 1" [25.4mm] Throwaway, qty (in) [mm]	2 - 18 x 18 [457 x 457]	1 - 12 x 20 [305 x 508] 1 - 20 x 25 [508 x 635]	1 - 18 x 20 [457 x 508] 1 - 20 x 24 [508 x 610]	2 - 20 x 24 [508 x 610]	2 - 20 x 24 [508 x 610]
Weight - Operating, (lbs) [kg]	298 [135]	359 [163]	448 [203]	475 [215]	475 [215]
Weight - Packaged, (lbs) [kg]	308 [140]	369 [167]	458 [208]	485 [220]	485 [220]
Weight - ClimaDry (lbs) [kg]	38 [17]	41 [19]	44 [20]	49 [22]	49 [22]

Notes: All units have TXV expansion device and 1/2" & 3/4" electrical knockouts.

Unit Maximum Working Water Pressure	
Options	Max Pressure PSIG [kPa]
Base Unit	500 [3447]
Unit with Internal Modulation Water Valve Option	300 [2,068]
Unit with Internal Water Pump Option	145 [999]
Unit with ClimaDry	145 [999]

TE Horizontal – Dimensional Data

Horizontal Model		Overall Cabinet		
		*A Width	B Length	C Height
026	in	22.4	62.2	19.3
	cm	56.8	158.0	48.9
038	in	25.4	71.2	21.3
	cm	64.5	180.8	54.0
049	in	25.4	76.2	21.3
	cm	64.5	193.5	54.0
064 & 072	in	25.4	81.2	21.3
	cm	64.5	206.2	54.0

*Does not include air filter supports. Add 2" (5.1cm) when a 1" (25.4mm) filter is used, add 3" (7.6cm) when a 2" (50.8mm) filter is used.

Horizontal Model		Water Connections						
		1	2	3	4	5		
		Loop In D	Loop Out E	HWG In F	HWG Out G	Cond. H	Water Loop FPT	HWG FPT
026	in	3.9	8.4	13.9	16.9	3.5	3/4"	1/2"
	cm	9.9	21.3	35.2	42.9	8.9		
038	in	3.9	8.4	15.6	18.9	3.4	3/4"	1/2"
	cm	9.9	21.3	39.7	47.9	8.6		
049	in	3.9	8.4	15.6	18.9	3.4	1"	1/2"
	cm	9.9	21.3	39.7	47.9	8.6		
064 & 072	in	3.9	8.4	15.6	18.9	3.4	1"	1/2"
	cm	9.9	21.3	39.7	47.9	8.6		

Water Connections - Units with ClimaDry®	
1	2
Loop In D	Loop Out E
2.1	10.0
5.2	25.4
6.01	13.1
15.1	33.4
6.01	13.1
15.1	33.4
6.01	13.1
15.1	33.4

Horizontal Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
026	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
038	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
049	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
064 & 072	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9

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. Horizontal units shipped with filter bracket only. This bracket should be removed for return duct connection
3. Discharge flange and hanger brackets are factory installed.
4. Condensate is 3/4" FPT.
5. CCP and BSP 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.

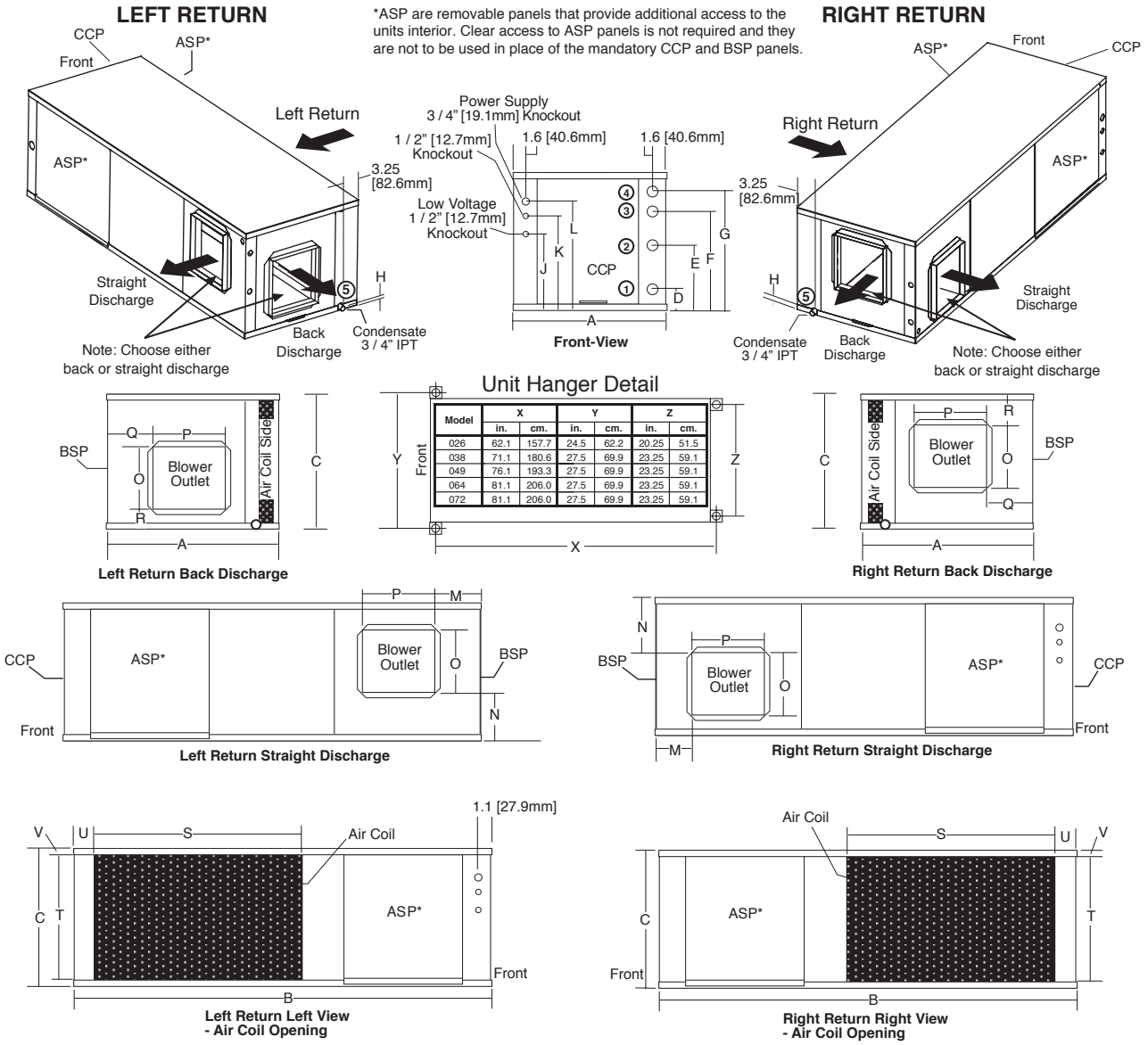
Legend:

CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = (Optional) Additional Service Panel

TE Horizontal – Dimensional Data

Horizontal Model		Discharge Connection Duct Flange Installed						Return Connection Using Return Air Opening				Return Connection Using Optional Air Filter Frame			
		M	N	O Supply Height	P Supply Width	Q	R	S Return Width	T Return Height	U	V	S Return Width	T Return Height	U	V
026	in	3.6	2.0	15.5	12.5	3.6	2.0	32.1	17.3	2.3	1.0	33.8	16.2	2.3	1.7
	cm	9.3	5.1	39.4	31.8	9.2	5.2	81.5	43.9	5.8	2.5	85.8	41.0	5.8	4.3
038	in	3.1	1.2	19.0	17.5	3.1	1.0	36.1	19.3	2.3	1.0	34.8	18.2	3.1	1.7
	cm	7.9	3.1	48.3	44.5	7.9	2.6	91.7	49.0	5.7	2.5	88.3	46.1	7.8	4.3
049	in	3.1	1.2	19.0	17.5	3.1	1.0	41.1	19.3	2.3	1.0	39.8	18.2	3.1	1.7
	cm	7.9	3.1	48.3	44.5	7.9	2.6	104.4	49.0	5.7	2.5	101.0	46.1	7.8	4.3
064 & 072	in	3.1	1.2	19.0	17.5	3.1	1.0	46.1	19.3	2.3	1.0	44.8	18.2	3.1	1.7
	cm	7.9	3.1	48.3	44.5	7.9	2.6	117.1	49.0	5.7	2.5	113.7	46.1	7.8	4.3

All dimensions are +/- 0.20 in, (+/-5.1 mm).

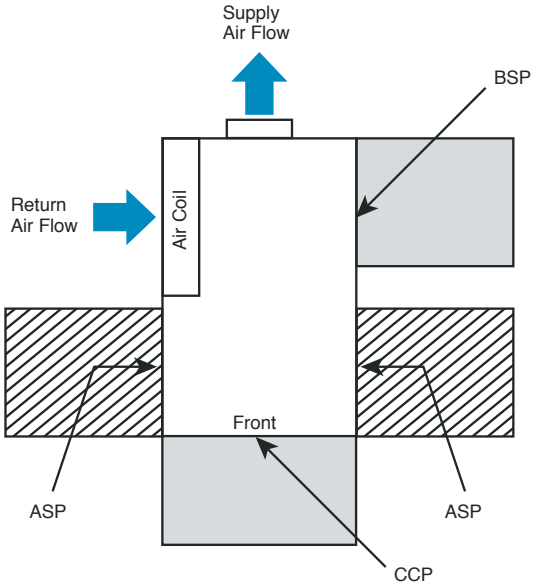


Filter Rails Removed

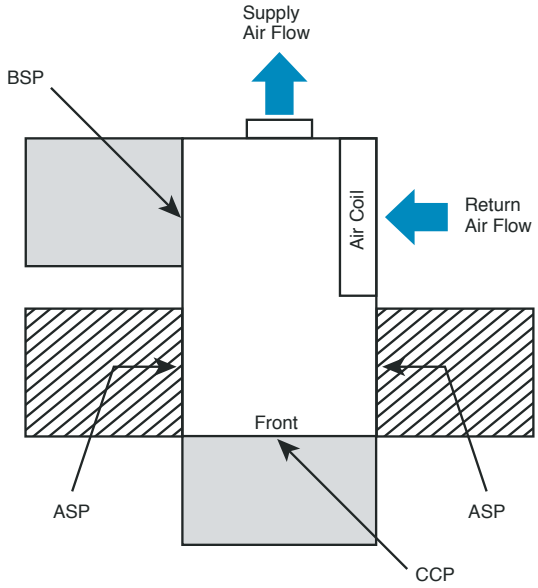
See Aff ---- for accessory air filter frame with duct collar

TE Horizontal – Service Access

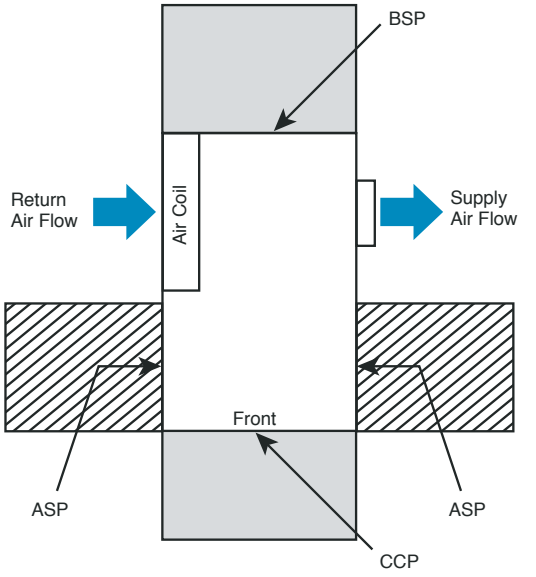
Left Return Back Discharge



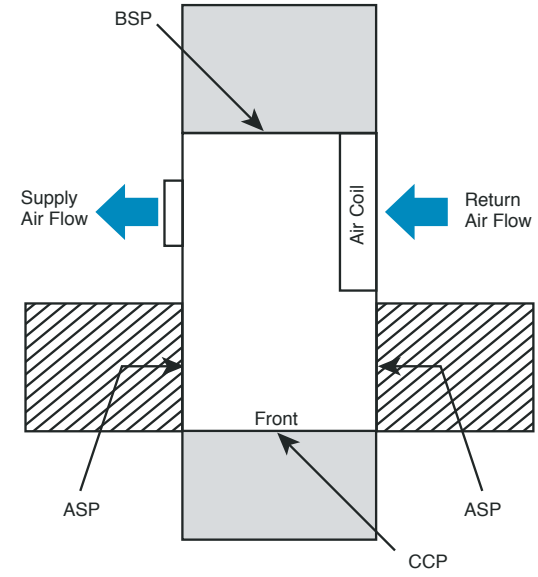
Right Return Back Discharge



Left Return Straight Discharge



Right Return Straight Discharge



= mandatory 2′ service access

= (optional) additional 2′ service access

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. CCP and BSP requires 2' service access.
3. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
4. ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

Legend:

CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = (Optional) Additional Service Panel

TE Vertical Upflow – Dimensional Data

Vertical Upflow Model		Overall Cabinet		
		*A Width	B Depth	C Height
026	in	22.4	25.6	48.5
	cm	56.8	65.1	123.2
038	in	25.4	30.6	50.5
	cm	64.5	77.8	128.3
049	in	25.4	30.6	54.5
	cm	64.5	77.8	138.4
064 & 072	in	25.4	30.6	58.5
	cm	64.5	77.8	148.6

*Does not include air filter supports. Add 2" (5.1cm) when a 1" (25.4mm) filter is used, add 3" (7.6cm) when a 2" (50.8mm) filter is used.

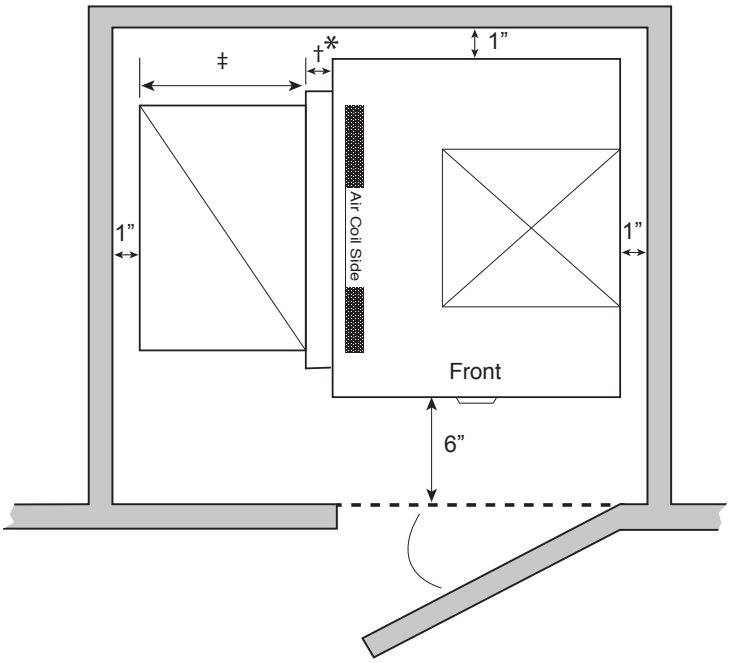
Vertical Upflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
026	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
038	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
049	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
064 & 072	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9

Vertical Upflow Model		Water Connections						
		1	2	3	4	5		
		Loop In D	Loop Out E	HWG In F	HWG Out G	Cond. H	Water Loop FPT	HWG FPT
026	in	3.9	8.4	13.9	16.9	6.3	3/4"	1/2"
	cm	9.9	21.3	35.2	42.9	16.0		
038	in	3.9	8.4	15.6	18.9	6.3	3/4"	1/2"
	cm	9.9	21.3	39.7	47.9	16.0		
049	in	3.9	8.4	15.6	18.9	6.3	1"	1/2"
	cm	9.9	21.3	39.7	47.9	16.0		
064 & 072	in	3.9	8.4	15.6	18.9	6.3	1"	1/2"
	cm	9.9	21.3	39.7	47.9	16.0		

Water Connections - Units with ClimaDry®	
1	2
Loop In D	Loop Out E
2.1	10.0
5.2	25.4
6.0	13.1
15.1	33.4
6.0	13.1
15.1	33.4
6.0	13.1
15.1	33.4

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.



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 is 3/4" FPT PVC and is switchable from front to side.

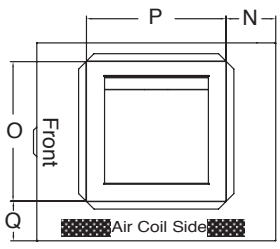
Legend:

CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = (optional) Additional Service Panel

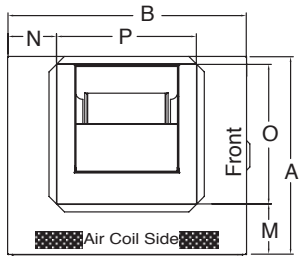
TE Vertical Upflow – Dimensional Data

Vertical Upflow Model		Discharge Connection Duct Flange Installed					Return Connection Using Return Air Opening				Return Connection Using Optional Air Filter Frame			
		M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U	R	S Return Depth	T Return Height	U
026	in	7.2	5.8	14.0	14.0	4.9	2.3	21.1	27.7	1.0	1.7	22.2	26.2	1.7
	cm	18.3	14.8	35.6	35.6	12.4	5.8	53.6	70.4	2.5	4.3	56.4	66.5	4.3
038	in	6.4	6.3	18.0	18.0	5.3	2.3	26.1	27.7	1.0	1.7	27.2	26.2	1.7
	cm	16.1	16.0	45.7	45.7	13.5	5.8	66.3	70.4	2.5	4.3	69.1	66.5	4.3
049	in	6.4	6.3	18.0	18.0	5.3	2.3	26.1	31.7	1.0	1.7	27.2	30.2	1.7
	cm	16.1	16.0	45.7	45.7	13.5	5.8	66.3	80.5	2.5	4.3	69.1	76.7	4.3
064 & 072	in	6.4	6.3	18.0	18.0	5.3	2.3	26.1	35.7	1.0	1.7	27.2	34.2	1.7
	cm	16.1	16.0	45.7	45.7	13.5	5.8	66.3	90.7	2.5	4.3	69.1	86.9	4.3

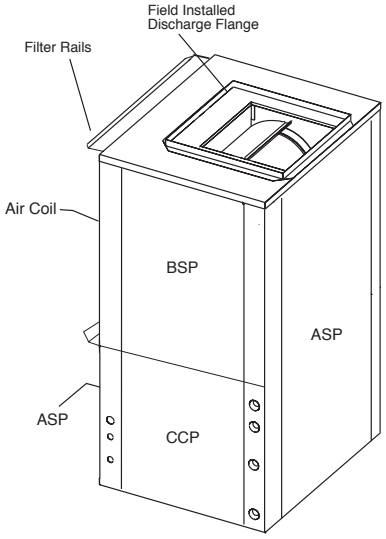
All dimensions are +/- 0.20 in, (+/-5.1 mm).



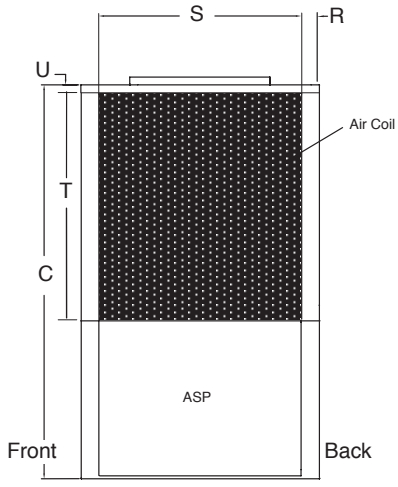
Top View-Right Return



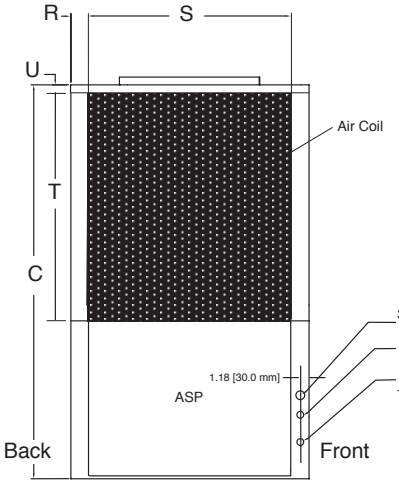
Top View-Left Return



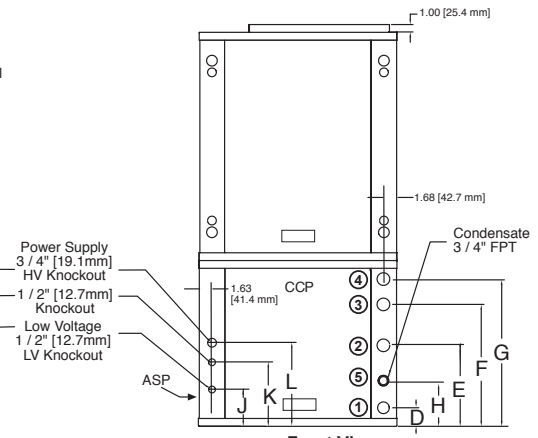
Isometric (Left Return) View



Right Return Right View - Air Coil Opening



Left Return Left View - Air Coil Opening



Front View Both Left and Right Hand Return

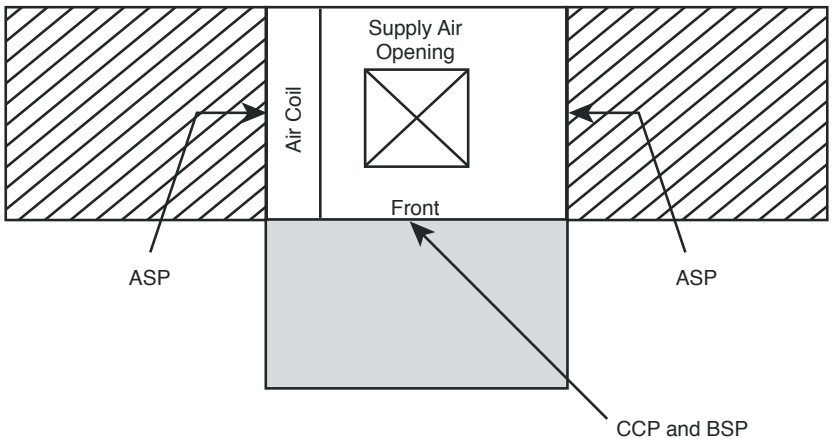
*ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

Filter Rails Removed

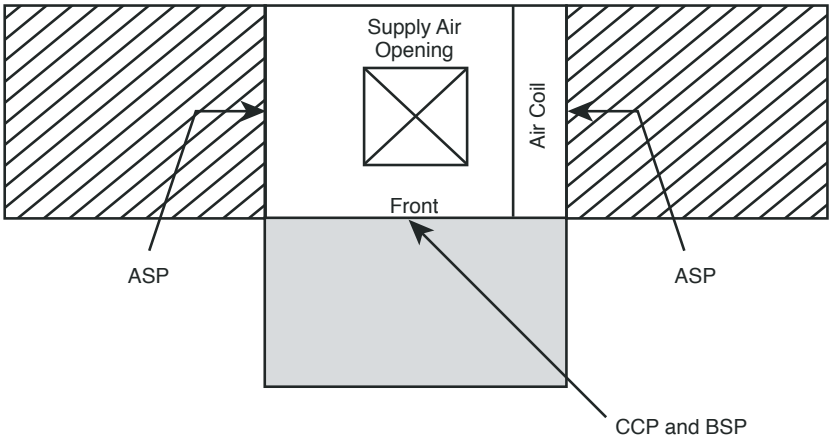
See Aff ---- for accessory air filter frame with duct collar

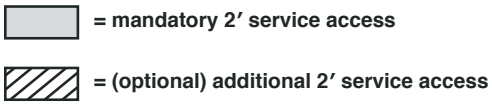
Vertical Units

Left Return



Right Return





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. ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.
4. Top supply air is shown, the same clearances apply to bottom supply air units.

Legend:

CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = (optional) Additional Service Panel

TE Vertical Downflow – Dimensional Data

Vertical Downflow Model		Overall Cabinet		
		*A Width	B Depth	C Height
026	in	22.4	25.6	52.5
	cm	56.8	65.1	133.4
038	in	25.4	30.6	54.5
	cm	64.5	77.8	138.4
049	in	25.4	30.6	58.5
	cm	64.5	77.8	148.6
064 & 072	in	25.4	30.6	62.5
	cm	64.5	77.8	158.8

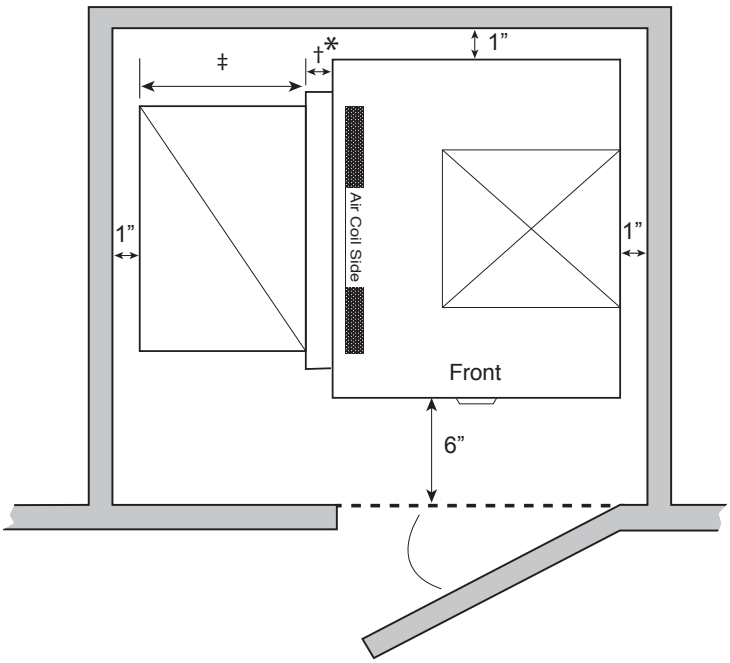
*Does not include air filter supports. Add 2" (5.1cm) when a 1" (25.4mm) filter is used, add 3" (7.6cm) when a 2" (50.8mm) filter is used.

Vertical Downflow Model		Electrical Knockouts		
		J 1/2"	K 1/2"	L 3/4"
		Low Voltage	External Pump	Power Supply
026	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
038	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
049	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9
064 & 072	in	3.6	6.1	8.6
	cm	9.2	15.6	21.9

Vertical Downflow Model		Water Connections						
		1	2	3	4	5		
		Loop In D	Loop Out E	HWG In F	HWG Out G	Cond. H	Water Loop FPT	HWG FPT
026	in	15.4	10.9	5.4	2.4	4.7	3/4"	1/2"
	cm	39.1	27.7	13.7	6.1	11.9		
038	in	17.4	12.9	5.7	2.4	4.7	3/4"	1/2"
	cm	44.2	32.8	14.5	6.1	11.9		
049	in	17.4	12.9	5.7	2.4	4.7	1"	1/2"
	cm	44.2	32.8	14.5	6.1	11.9		
064 & 072	in	17.4	12.9	5.7	2.4	4.7	1"	1/2"
	cm	44.2	32.8	14.5	6.1	11.9		

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.



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 of a standard unit if side access is not available.
3. Condensate is 3/4" FPT PVC and is switchable from front to side.
4. Top supply air is shown, the same clearances apply to bottom supply air units.

Legend:

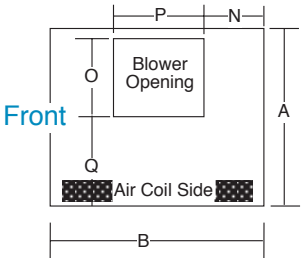
CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = (optional) Additional Service Panel

TE Vertical Downflow – Dimensional Data

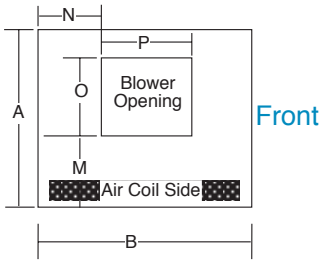
Vertical Downflow Model		Discharge Connection Duct Flange Installed					Return Connection Using Return Air Opening				Return Connection Using Optional Air Filter Frame			
		M	N	O Supply Width	P Supply Depth	Q	R	S Return Depth	T Return Height	U	R	S Return Depth	T Return Height	U
026	in	6.7	8.4	10.1	9.1	10.8	2.2	21.1	27.7	21.2	1.7	22.2	26.2	21.9
	cm	17.1	21.4	25.7	23.0	27.4	5.6	53.6	70.4	53.8	4.3	56.4	66.5	55.6
038	in	7.2	9.0	13.4	12.9	10.4	2.2	26.1	27.7	23.2	1.7	27.2	26.2	23.9
	cm	18.3	22.9	34.0	32.7	26.5	5.6	66.3	70.4	58.9	4.3	69.1	66.5	60.7
049	in	7.2	9.0	13.4	12.9	10.4	2.2	26.1	31.7	23.2	1.7	27.2	30.2	23.9
	cm	18.3	22.9	34.0	32.7	26.5	5.6	66.3	80.5	58.9	4.3	69.1	76.7	60.7
064 & 072	in	7.2	9.0	13.4	12.9	10.4	2.2	26.1	35.7	23.2	1.7	27.2	34.2	23.9
	cm	18.3	22.9	34.0	32.7	26.5	5.6	66.3	90.7	58.9	4.3	69.1	86.9	60.7

All dimensions are +/- 0.20 in, (+/-5.1 mm).

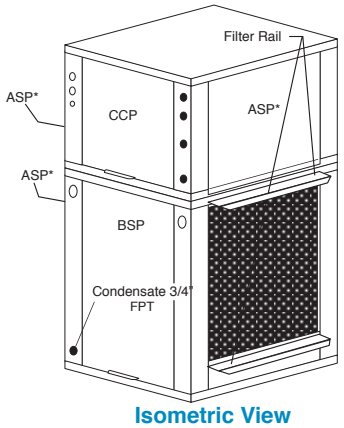
Legend:
CCP = Control/Compressor Access Panel
BSP = Blower Service Panel
ASP = Additional Service Panel (not required)



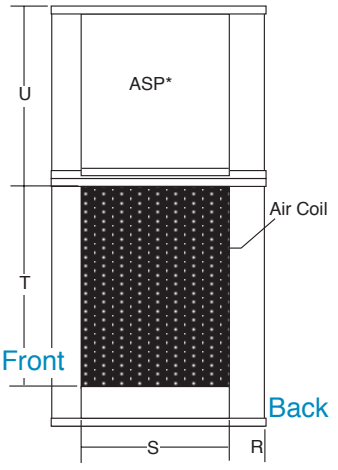
Right Return Discharge Floor Foot Print



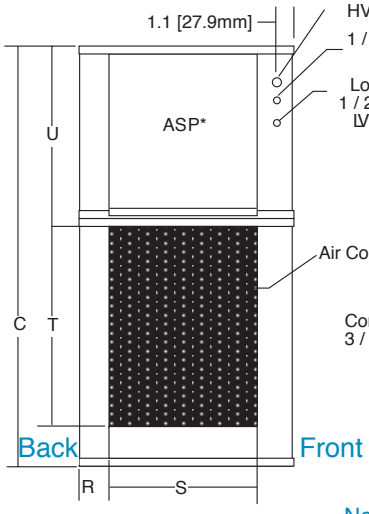
Left Return Discharge Floor Foot Print



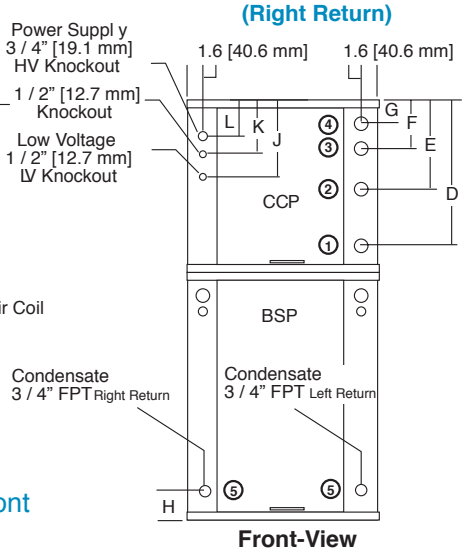
Isometric View (Right Return)



Right Return Right View - Air Coil Opening



Left Return Left View - Air Coil Opening



Front-View

Filter Rails Removed
See Aff ---- for accessory air filter frame with duct collar

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. Condensate is 3/4" FPT PVC.
4. ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.

Corner Weights for TE Series Horizontal Units

Model		Total	Left-Front*	Right-Front*	Left-Back*+	Right-Back*+
026	Lbs	298	88	75	78	57
	kg	135	40	34	35	26
038	Lbs	359	115	82	92	70
	kg	163	52	37	42	32
049	Lbs	448	156	100	106	86
	kg	203	71	45	48	39
064	Lbs	475	196	78	85	116
	kg	215	89	35	39	53
072	Lbs	475	196	78	85	116
	kg	215	89	35	39	53

*Front is control box end.
+ Weights shown are for units with left hand return air. Reverse these for a right hand return air unit.

Standard Units

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Fan Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
				RLA	LRA	Qty				
026	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
038	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
049	G	208/230/60/1	197/252	21.2	104.0	1	6.9	28.1	33.4	50
	E	265/60/1	239/292	16.0	109.7	1	6.0	22.0	26.0	40
	H	208/230/60/3	197/252	14.0	83.1	1	6.9	20.9	24.4	35
	*F	*460/60/3	414/506	6.4	41.0	1	6.0	12.4	14.0	20
064	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
072	G	208/230/60/1	197/252	29.7	179.2	1	6.9	36.6	44.0	70
	H	208/230/60/3	197/252	17.6	136.0	1	6.9	24.5	28.9	45
	*F	*460/60/3	414/506	8.5	66.1	1	6.0	14.5	16.6	25

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 with ECM motors require a four wire power supply with neutral. ECM motor is rated 265 vac and is wired between one hot leg and neutral.**

Unit with Secondary Pump or ClimaDry®

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Internal Pump FLA	Fan Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
				RLA	LRA	Qty					
026	G	208/230/60/1	197/252	11.7	58.3	1	0.8	3.9	16.4	19.3	30
	E	265/60/1	239/292	9.1	54.0	1	0.7	3.2	13.0	15.3	20
	H	208/230/60/3	197/252	6.5	55.4	1	0.8	3.9	11.2	12.8	15
	*F	*460/60/3	414/506	3.5	28.0	1	0.7	3.2	7.4	8.3	15
038	G	208/230/60/1	197/252	15.3	83.0	1	0.8	3.9	20.0	23.8	35
	E	265/60/1	239/292	13.0	72.0	1	0.7	3.2	16.9	20.2	30
	H	208/230/60/3	197/252	11.6	73.0	1	0.8	3.9	16.3	19.2	30
	*F	*460/60/3	414/506	5.7	38.0	1	0.7	3.2	9.6	11.0	15
049	G	208/230/60/1	197/252	21.2	104.0	1	0.8	6.9	28.9	34.2	50
	E	265/60/1	239/292	16.0	109.7	1	0.7	6.0	22.7	26.7	40
	H	208/230/60/3	197/252	14.0	83.1	1	0.8	6.9	21.7	25.2	35
	*F	*460/60/3	414/506	6.4	41.0	1	0.7	6.0	13.1	14.7	20
064	G	208/230/60/1	197/252	27.1	152.9	1	1.1	6.9	35.1	41.8	60
	E	265/60/1	239/292	22.4	130.0	1	1.1	6.0	29.5	35.1	50
	H	208/230/60/3	197/252	16.5	110.0	1	1.1	6.9	24.5	28.6	45
	*F	*460/60/3	414/506	7.2	52.0	1	1.1	6.0	14.3	16.1	20
072	G	208/230/60/1	197/252	29.7	179.2	1	1.1	6.9	37.7	45.1	70
	H	208/230/60/3	197/252	17.6	136.0	1	1.1	6.9	25.6	30.0	45
	*F	*460/60/3	414/506	8.5	66.1	1	1.1	6.0	15.6	17.7	25

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 with ECM motors/internal secondary circulators require a four wire power supply with neutral. ECM motors/ClimaDry pump/internal secondary circulators are rated 265 vac and are wired between one hot leg and neutral.**

Units with Variable Pump High Head

Model	Voltage Code	Voltage	Min/ Max Voltage	Compressor			Pump FLA	Fan Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
				RLA	LRA	Qty					
026	G	208/230/60/1	197/252	11.7	58.3	1	1.44	3.9	17.0	20.0	30
	E	265/60/1	239/292	9.1	54.0	1	1.25	3.2	13.6	15.8	25
	H	208/230/60/3	197/252	6.5	55.4	1	1.44	3.9	11.8	13.5	20
	*F	*460/60/3	414/506	3.5	28.0	1	1.25	3.2	8.0	8.8	15
038	G	208/230/60/1	197/252	15.3	83.0	1	1.44	3.9	20.6	24.5	40
	E	265/60/1	239/292	13.0	72.0	1	1.25	3.2	17.5	20.7	30
	H	208/230/60/3	197/252	11.6	73.0	1	1.44	3.9	16.9	19.8	30
	*F	*460/60/3	414/506	5.7	38.0	1	1.25	3.2	10.2	11.6	15
049	G	208/230/60/1	197/252	21.2	104.0	1	1.44	6.9	29.5	34.8	50
	E	265/60/1	239/292	16.0	109.7	1	1.25	6.0	23.3	27.3	40
	H	208/230/60/3	197/252	14.0	83.1	1	1.44	6.9	22.3	25.8	40
	*F	*460/60/3	414/506	6.4	41.0	1	1.25	6.0	13.7	15.3	20
064	G	208/230/60/1	197/252	27.1	152.9	1	1.44	6.9	35.4	42.2	60
	E	265/60/1	239/292	22.4	130.0	1	1.25	6.0	29.7	35.3	50
	H	208/230/60/3	197/252	16.5	110.0	1	1.44	6.9	24.8	29.0	45
	*F	*460/60/3	414/506	7.2	52.0	1	1.25	6.0	14.5	16.3	20
072	G	208/230/60/1	197/252	29.7	179.2	1	1.44	6.9	38.0	45.5	70
	H	208/230/60/3	197/252	17.6	136.0	1	1.44	6.9	25.9	30.3	45
	*F	*460/60/3	414/506	8.5	66.1	1	1.25	6.0	15.8	17.9	25

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 with ECM motors/internal pumps require a four wire power supply with neutral. ECM motors/internal pumps are rated 265 vac and are wired between one hot leg and neutral.**

Unit with Variable Pump Standard Head

Model	Voltage Code	Voltage	Min/Max Voltage	Compressor			Pump FLA	Fan Motor FLA	Total Unit FLA	Min Circ Amp	Max Fuse/ HACR
				RLA	LRA	Qty					
026	G	208/230/60/1	197/252	11.7	58.3	1	0.7	3.9	16.3	19.2	30
	E	265/60/1	239/292	9.1	54.0	1	0.6	3.2	12.9	15.2	20
	H	208/230/60/3	197/252	6.5	55.4	1	0.7	3.9	11.1	12.7	15
	*F	*460/60/3	414/506	3.5	28.0	1	0.6	3.2	7.3	8.2	15
038	G	208/230/60/1	197/252	15.3	83.0	1	0.7	3.9	19.9	23.7	35
	E	265/60/1	239/292	13.0	72.0	1	0.6	3.2	16.8	20.1	30
	H	208/230/60/3	197/252	11.6	73.0	1	0.7	3.9	16.2	19.1	30
	*F	*460/60/3	414/506	5.7	38.0	1	0.6	3.2	9.5	10.9	15
049	G	208/230/60/1	197/252	21.2	104.0	1	0.7	6.9	28.8	34.1	50
	E	265/60/1	239/292	16.0	109.7	1	0.6	6.0	22.6	26.6	40
	H	208/230/60/3	197/252	14.0	83.1	1	0.7	6.9	21.6	25.1	35
	*F	*460/60/3	414/506	6.4	41.0	1	0.6	6.0	13.0	14.6	20
064	G	208/230/60/1	197/252	27.1	152.9	1	0.7	6.9	34.7	41.5	60
	E	265/60/1	239/292	22.4	130.0	1	0.6	6.0	29.0	34.6	50
	H	208/230/60/3	197/252	16.5	110.0	1	0.7	6.9	24.1	28.2	40
	*F	*460/60/3	414/506	7.2	52.0	1	0.6	6.0	13.8	15.6	20
072	G	208/230/60/1	197/252	29.7	179.2	1	0.7	6.9	37.3	44.7	70
	H	208/230/60/3	197/252	17.6	136.0	1	0.7	6.9	25.2	29.6	45
	*F	*460/60/3	414/506	8.5	66.1	1	0.6	6.0	15.1	17.2	25

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 with ECM motors/internal pumps require a four wire power supply with neutral. ECM motors/internal pumps are rated 265 vac and are wired between one hot leg and neutral.**

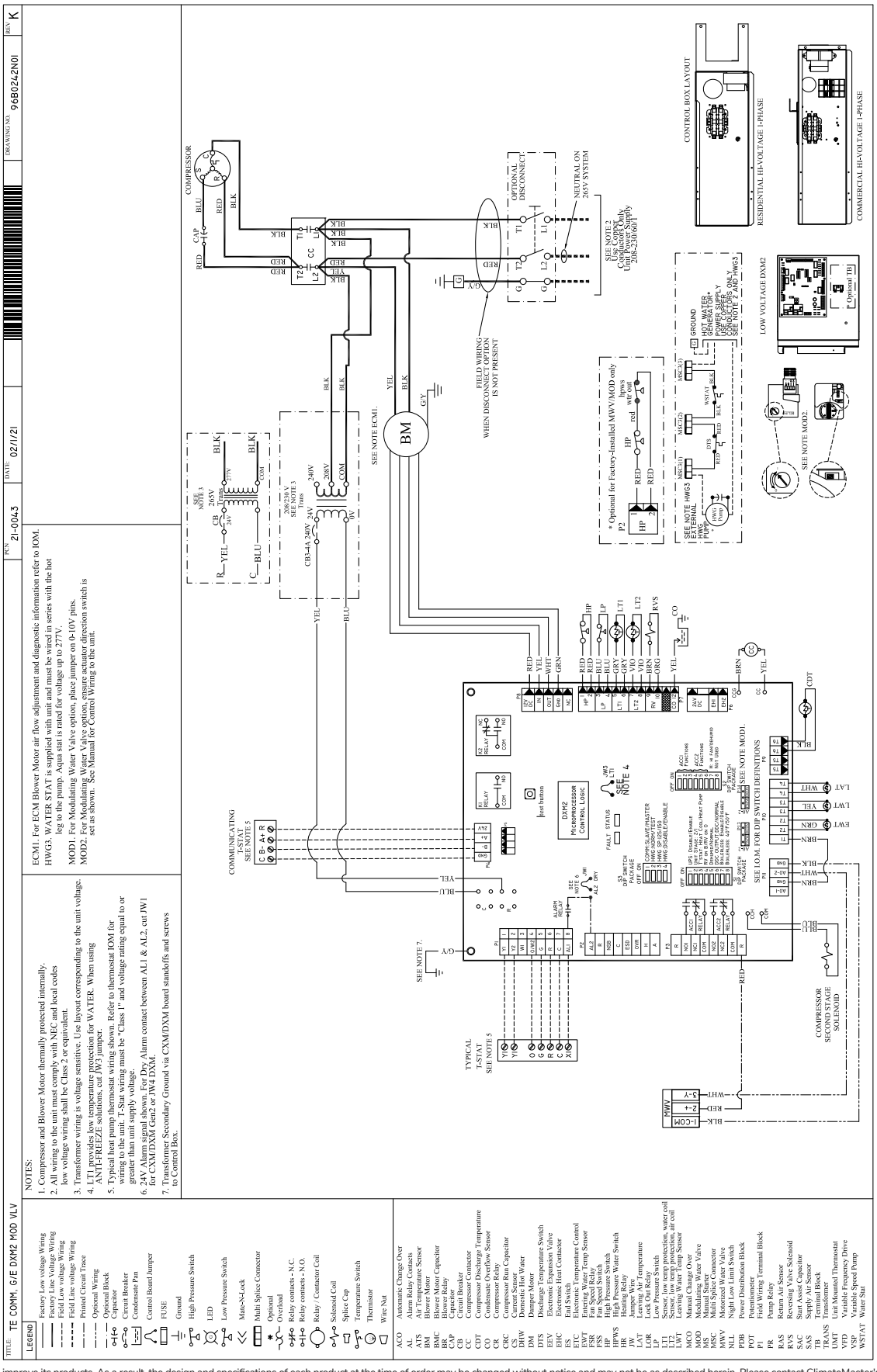
TE Series Wiring Diagram Matrix

All current diagrams can be located online at climatemaster.com. Click 'Commercial Professional' (go to 'Resources/literature/wiring diagrams' in the upper right), use part numbers below to lookup wiring diagrams

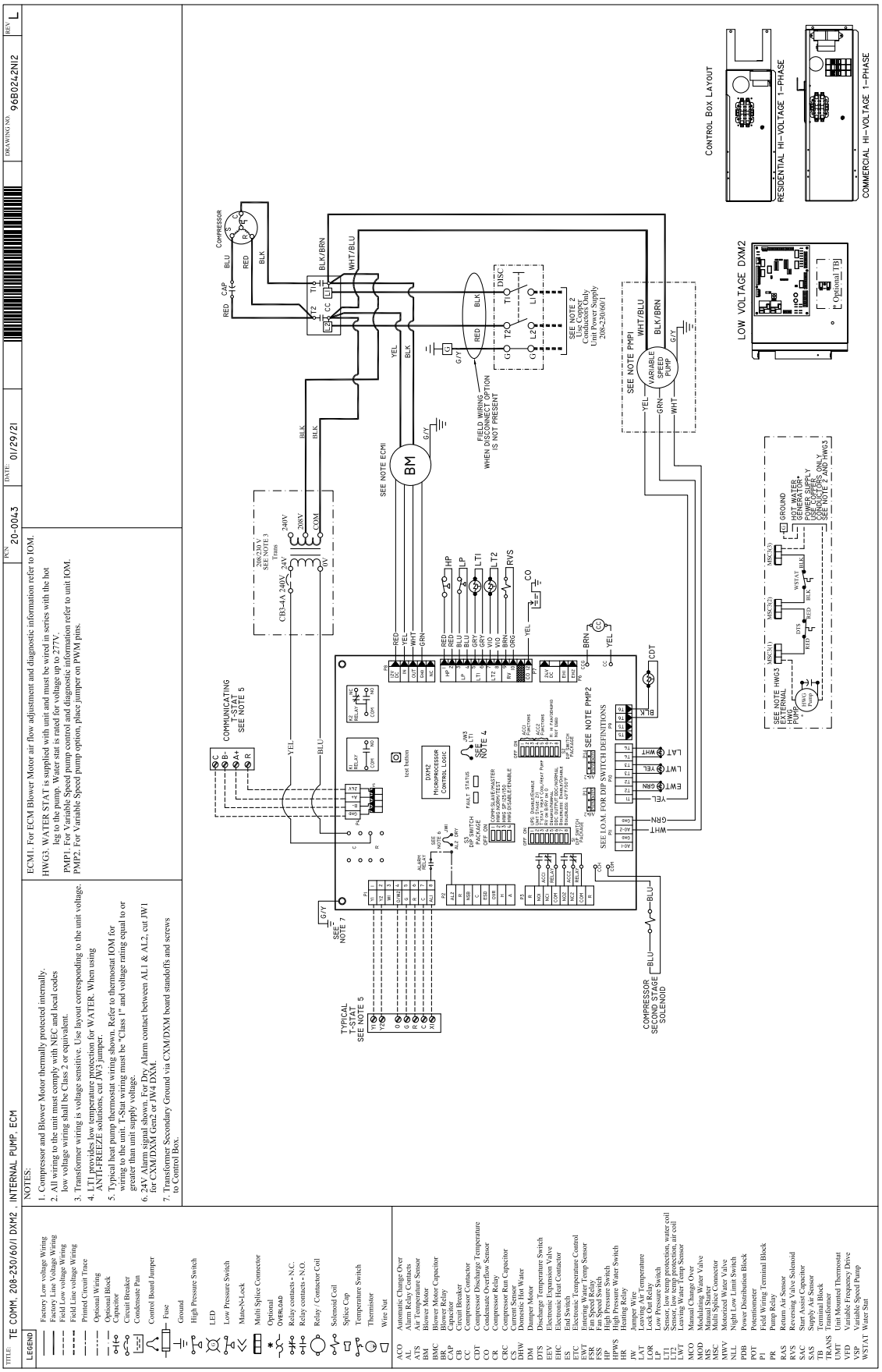
Model	Refrigerant	Wiring Diagram Part Number	Electrical (Voltage Code)	Control	DDC	Unit Options
TE Series	EarthPure® HFC-410A	96B0242N01	(G) 208-230/60/1 (E) 265/60/1	DXM2	-	MOD VALVE
		96B0242N03			MPC	MOD VALVE
		96B0242N05*			-	INTERNAL SECONDARY PUMP*
		96B0242N07*			MPC	INTERNAL SECONDARY PUMP*
		96B0242N08			-	CLIMADRY®
		96B0242N20			MPC	CLIMADRY®
		96B0242N09			-	VARIABLE PUMP (265 Volt)
		96B0242N12			-	VARIABLE PUMP (208-230 Volt)
TE Series	EarthPure® HFC-410A	96B0243N01	(H) 208-230/60/3	DXM2	-	MOD VALVE
		96B0243N03			MPC	MOD VALVE
		96B0243N05*			-	INTERNAL SECONDARY PUMP*
		96B0243N07*			MPC	INTERNAL SECONDARY PUMP*
		96B0243N08			-	CLIMADRY®
		96B0243N12			MPC	CLIMADRY®
		96B0243N09			-	VARIABLE PUMP
TE Series	EarthPure® HFC-410A	96B0244N01	(F) 460/60/3	DXM2	-	MOD VALVE
		96B0244N03			MPC	MOD VALVE
		96B0244N05*			-	INTERNAL SECONDARY PUMP*
		96B0244N07*			MPC	INTERNAL SECONDARY PUMP*
		96B0244N08			-	CLIMADRY®
		96B0244N11			MPC	CLIMADRY®
		96B0244N09			-	VARIABLE PUMP

* A base unit utilizes the same WD as a unit with an Internal Secondary Pump.

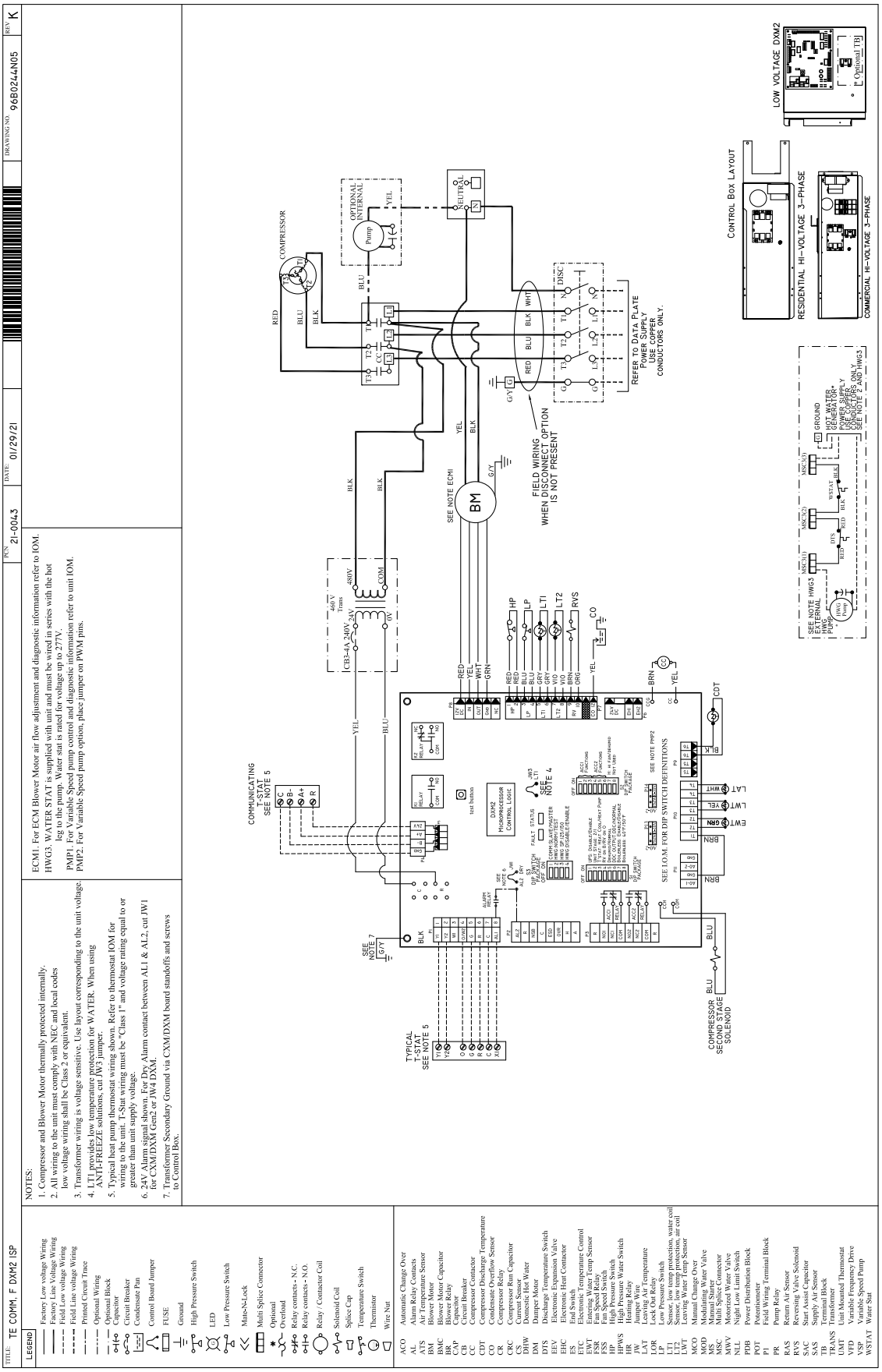
Typical Wiring Diagram – Single Phase TE Units with Modulating Water Valve



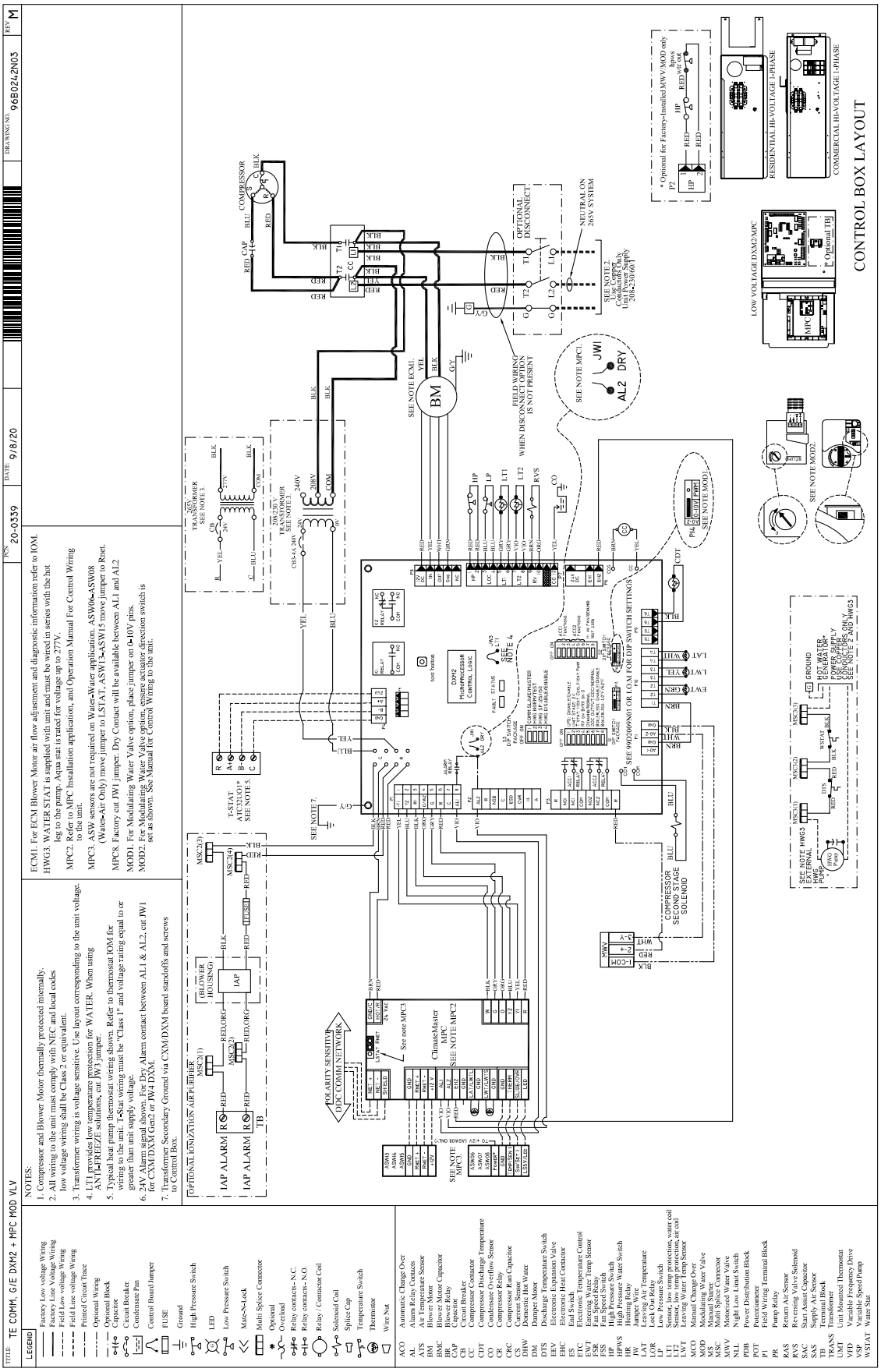
Typical Wiring Diagram – Single Phase 208/230V TE Units with Variable Pump



Typical Wiring Diagram – Three Phase 460V TE Units with DXM2 Controller



Typical Wiring Diagram – Single Phase TE Units with MWV and MPC Controller



Tranquility® 30 (TE) Series 60 Hz
Engineering Specifications – Page 1

General:

Furnish and install ClimateMaster Tranquility® "TE" 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, Left Return/Bottom Discharge, Right Return/Bottom 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 a minimum of three 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 (12.7 mm) 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 inch (12.7 mm) 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 pumps shall be fabricated from heavy gauge galvanized steel with powder coat paint finish. Both sides of the steel shall be painted for added protection.

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, and shall be securely mounted flush to the cabinet corner post allowing for connection to a flexible hose without the use of a back-up wrench. Water connections that protrude through the cabinet or require the use of a backup wrench shall not be allowed. 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 will be supplied with internally factory mounted modulating water valve with ΔT control. The factory built-in valve shall modulate water flow through unit based on a field adjustable water temperature difference between the entering and leaving water. For two-stage units, the modulating valve will automatically reduce the water flow through the unit during part load operation to maintain the configured temperature difference. The valve shall automatically adjust for operating mode, stage of capacity, source water temperature and variations in external head pressure. The valve will also act as a shut-off valve to prevent water flow through the unit when the unit is not activated and will have a minimum position capability. Externally mounted modulating water valves will not be accepted.

Option: The unit will be supplied with internally factory mounted variable speed water circulating pump with internal check valve. The variable speed pump shall modulate water flow through the unit based on a field adjustable temperature difference between the entering and leaving water. For two-stage units, the modulating valve will automatically reduce the water flow through the unit during part load operation to maintain the configured temperature difference. The variable speed

pump shall automatically adjust for operating mode, stage of capacity, source water temperature, and variations in external head pressure. Externally mounted circulating pumps will not be accepted.

Option: The unit will be supplied with internally mounted secondary pump for primary/secondary applications, including one-pipe systems. Externally mounted secondary pump will not be accepted.

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.

Option: Unit shall include ClimaDry® reheat option. Only modulating reheat that will adjust capacity based upon supply air temperature to provide "neutral" (72° F, 22.2° C) constant air temperature will be accepted. "Neutral" supply air temperature shall be provided regardless of entering loop water temperatures (above 55° F, 12.8° C) or refrigerant condensing pressures. Control of reheat must be accomplished via a humidistat or dehumidistat contact closure. Refrigerant circuit must be AHRI certified. Approved equal manufacturers may provide pre-engineered integrated modulating hot gas reheat within the unit cabinet, or the installing contractor in conjunction with the "approved equal" unit manufacturer can provide for approval (during the submittal phase) an engineered system consisting of: a duct mounted hot water coil, small circulating pump, modulating control valve, and associated piping using the discharge condenser water off of the unit as the heating medium. All design costs and costs of field installed items including additional power wiring to pump, and control wiring to and from pump and control valve to unit shall be borne by mechanical contractor. Refrigerant circuits that are not AHRI certified when the reheat option is applied will not be accepted.

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 or all aluminum micro channel 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 or all aluminum microchannel 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 unit shall be supplied with a hot water generator (desuperheater).

Drain Pan:

The drain pan shall be constructed of 304 Stainless Steel to inhibit corrosion. This corrosion protection system shall meet the stringent 1,000 hour salt spray test per ASTM B117. If plastic type material is used, it must be HDPE (High Density Polyethylene) to avoid thermal cycling shock stress failure over the lifetime of the unit. Drain pan shall be fully insulated. Drain outlet shall be located at pan as to allow unobstructed drainage of condensate. Drain outlet for horizontal units shall be connected from pan directly to MPT 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.**

Vertical units shall be furnished with a PVC FPT condensate drain connection and an internal factory installed condensate trap. If units without an internal trap are 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.

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. 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):

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 (loss of charge).
- 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 (loss of charge), low voltage, high voltage, low water/air temperature cut-out, condensate overflow, and control voltage status.
- The low-pressure (loss of charge) switch shall not be monitored for the first 120 seconds after a compressor start command to prevent nuisance safety trips.
- 24 V 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 multistage 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.

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.**

When DXM2 is connected to either ACDU service tool or ATC32U03C thermostat the installer/service technician can; check and set CFM; check dip switch S1, S2, and S3 settings; run operation modes manually; check all physical inputs from thermostat and refrigerant pressure switches status, (Y1, Y2, W, O, G, H, ESD, NSB, OR, HP switch, and LOC switch); current or at time of fault the following temperatures -LT1, LT2, compressor discharge, leaving air, leaving water, entering water and control voltage; record last five faults, list possible reasons, and clear faults.

Digital Night Setback with Pump Restart (with ATP32U03C, ATP32U04C, and ACT32U03C):

The unit will be provided with a Digital Night Setback feature using an accessory relay on the DXM2 controller 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 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 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, 24 V, 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) (ATC32U03C)

An electronic communicating LCD 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 have a comprehensive installation setup menu to include configuration of the unit CFM for each mode of operation and configuration of the water flow rate through the unit, including variation of the water flow rate based on the stage of unit operation.

The thermostat shall display system faults with probable cause and troubleshooting guidance. Comprehensive service diagnostics menus shall display, system inputs, system outputs, configuration settings, Geo source inlet and outlet temperatures, compressor discharge line temperature, liquid line temperature, leaving air temperature, and entering potable water temperature (on units equipped with a Hot Water Generator). The thermostat shall allow for immediate manual control of all DXM2 outputs at the thermostat 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 (ATP32U03C)
Thermostat shall be 7-day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Thermostat shall have a blue backlit dot matrix LCD display with temperature, setpoints, mode, and status indication. The temperature indication shall be selectable for °F or °C. Time display shall be selectable for 12 or 24 hour clock. Fault identification shall be provided 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 (AST008C). 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 (ATP32U04C)
Thermostat shall be 7-day programmable (with up to 4 setpoints per day), multi-stage (3H/2C), automatic or manual changeover with HEAT-OFF-COOL-AUTO-EM HEAT system settings and fan ON-AUTO settings. Separate dehumidification and humidification setpoints shall be configurable for discreet outputs to a dehumidification option and/or an external humidifier. 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 (AST008C). 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).

Accessory: Hand Held Communication/Diagnostic Service Tool ACDU02C

- Allows installation and service personnel to access the configuration and service modes of the DXM2 control board without installing the ATC32U02C communicating thermostat.
- Configure the airflow, pump, or modulating valve operation etc.
- Diagnose by viewing fault history and operating conditions at the time of fault and manually operating the unit.

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.

Performance Sheet

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: _____

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: _____

Notes

Revision History

Date:	Item:	Action:
09/24/21	All	Removed LON Controls
04/13/20	All	Updated format
02/12/20	Pages 4-72	Updated
07/25/19	Pages 66, 68, 69	Updated ATC32U02C thermostat to ATC32U03C
01/30/19	Page 36, 54	Updated variable pump data
11/7/18	Decoder	Updated water circuit options
07/14/17	ClimaDry	Added
06/7/17	Dimension H Page 43	Updated
05/03/17	Vertical Upflow Models Dimensional Drawing	Updated
05/03/17	Vertical Upflow Models Water Connections Table	Updated
11/1/16	Update Design Document	Updated
03/12/16	Page 57 and 58	Update run test and vflow text
11/09/15	Unit Features and Engineering Specifications - Page 58	Update UltraQuiet Option Description
07/31/15	Unit Features and Engineering Specifications	Edit Compressor Mount Text
07/09/15	WPD - Page 16, 17, 18	Updated
01/30/15	Table edit - Page 39	Updated
11/21/14	Text edit - Page 7	Updated
10/20/14	TE026 Full Load Data	Updated
09/30/14	Decoder - Page 10; Text Edit - Page 59	Updated
09/10/14	Added Performance Data Selection Notes - Page 12 Updated Performance Data Notes - Pages 13-32	Added/Updated
07/28/14	Created	

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