

# TRANQUILITY<sup>®</sup> 16 COMPACT (TC) SERIES



**MODELS TCH/V 006-060  
60HZ - HFC-410A**

**INSTALLATION, OPERATION  
& MAINTENANCE**

**97B0075N07**

**Revised: January 24, 2023**



A **NIBE** GROUP MEMBER

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## Model Nomenclature – General Overview

1 2
3
4 5 6
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11
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15

TC
H
036
A
G
C
3
0
A
P
B
S

**S = STANDARD**

**MODEL TYPE**  
TC = TRANQUILITY COMPACT R410A

**CONFIGURATION**  
H = HORIZONTAL  
V = VERTICAL

**UNIT SIZE**

- 006 - E,G
- 009 - E,G
- 012 - E,G
- 015 - E,G
- 018 - E,G
- 024 - E,F,G,H
- 030 - E,F,G,H
- 036 - E,F,G,H
- 041 - F,G,H,N (TCV ONLY)
- 042 - F,G,H,N
- 048 - F,G,H,N
- 060 - F,G,H,N

**AVAILABLE VOLTAGES**

**REVISION LEVEL**  
A = CURRENT REVISION FOR ALL SIZES

**VOLTAGE**  
G = 208/230/60/1  
E = 265/60/1  
H = 208/230/60/3  
F = 460/60/3  
N = 575/60/3

**CONTROLS**  
C = CXM2  
D = DXM2.5  
N = CXM2 w/MPC  
P = DXM2.5 w/MPC

**w/DISCONNECT**

- A = CXM2
- B = DXM2.5
- R = CXM2 w/MPC
- S = DXM2.5 w/MPC

**SUPPLY AIR OPTIONS**

| Option         | Supply   | Configuration | Motor         |
|----------------|----------|---------------|---------------|
| T              | Top      | TCV           | PSC           |
| B              | Back     | TCH           | PSC           |
| S              | Straight | TCH           | PSC           |
| V <sup>1</sup> | Top      | TCV           | PSC Hi Static |
| Y <sup>1</sup> | Back     | TCH           | PSC Hi Static |
| Z <sup>1</sup> | Straight | TCH           | PSC Hi Static |
| K <sup>2</sup> | Top      | TCV           | CV ECM        |
| P <sup>2</sup> | Back     | TCH           | CV ECM        |
| W <sup>2</sup> | Straight | TCH           | CV ECM        |
| 1 <sup>2</sup> | Top      | TCV           | CT ECM        |
| 2 <sup>2</sup> | Back     | TCH           | CT ECM        |
| 3 <sup>2</sup> | Straight | TCH           | CT ECM        |

<sup>1</sup> Not available for sizes 006, 009, 012, 041  
<sup>2</sup> Not available for size 041  
<sup>3</sup> DXM2.5 Controls Required for CV ECM Fan Motors

**RETURN AIR OPTIONS**  
P = LEFT RETURN  
C = RIGHT RETURN  
S = LEFT RETURN S.S. DRAIN PAN  
T = RIGHT RETURN S.S. DRAIN PAN  
Q = FRONT RETURN S.S. DRAIN PAN and VERTICAL 009-030 AND 041 ONLY

**HEAT EXCHANGER OPTIONS**

| OPTION | COPPER WATER COIL | CUPRO-NICKEL WATER COIL | TIN PLATED AIR COIL | E-COATED ECON COIL | WATER SIDE ECONOMIZER |
|--------|-------------------|-------------------------|---------------------|--------------------|-----------------------|
| A      | YES               | NO                      | YES                 | N/A                | NO                    |
| C      | YES               | NO                      | NO                  | N/A                |                       |
| J      | NO                | YES                     | YES                 | N/A                |                       |
| N      | NO                | YES                     | NO                  | N/A                |                       |
| 1      | YES               | NO                      | YES                 | YES                | YES                   |
| 2      | YES               | NO                      | NO                  | NO                 |                       |
| 3      | YES               | NO                      | YES                 | YES                |                       |
| 4      | NO                | YES                     | NO                  | NO                 |                       |

**FUTURE USE**  
0 = NONE

**CABINET INSULATION**

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

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

## Tranquility® Compact (TC) Series

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### General Information

#### Safety

Warnings, cautions, and notices appear throughout this manual. Read these items carefully before attempting any installation, service, or troubleshooting of the equipment.

**DANGER:** Indicates an immediate hazardous situation, which if not avoided will result in death or serious injury. DANGER labels on unit access panels must be observed.

**WARNING:** Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

**CAUTION:** Indicates a potentially hazardous situation or an unsafe practice, which if not avoided could result in minor or moderate injury or product or property damage.

**NOTICE:** Notification of installation, operation, or maintenance information, which is important, but which is not hazard-related.

#### **WARNING!**

**WARNING!** The EarthPure® Application and Service Manual should be read and understood before attempting to service refrigerant circuits with HFC-410A.

#### **WARNING!**

**WARNING!** To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state, and federal proficiency requirements.

#### **CAUTION!**

**CAUTION!** To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. The mechanical components and filters can quickly become clogged with construction dirt and debris, which may cause system damage and void product warranty.

#### **WARNING!**

**WARNING!** The installation of water-source heat pumps and all associated components, parts, and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations.

#### **WARNING!**

**WARNING!** All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants. If a compressor is removed from this unit, refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, refrigerant lines of the compressor must be sealed after it is removed.

**Inspection** - Upon receipt of the equipment, carefully check the shipment against the bill of lading. Make sure all units have been received. Inspect the packaging of each unit, and inspect each unit for damage. Ensure that the carrier makes proper notation of any shortages or damage on all copies of the freight bill and completes a common carrier inspection report. Concealed damage not discovered during unloading must be reported to the carrier within 15 days of receipt of shipment. If not filed within 15 days, the freight company can deny the claim without recourse.

**Note: It is the responsibility of the purchaser to file all necessary claims with the carrier. Notify your equipment supplier of all damage within fifteen (15) days of shipment.**

**Storage** - Equipment should be stored in its original packaging in a clean, dry area. Store units in an upright position at all times. Stack units a maximum of 3 units high.

**Unit Protection** - Cover units on the job site with either the original packaging or an equivalent protective covering. Cap the open ends of pipes stored on the job site. In areas where painting, plastering, and/or spraying has not been completed, all due precautions must be taken to avoid physical damage to the units and contamination by foreign material. Physical damage and contamination may prevent proper start-up and may result in costly equipment clean-up.

## General Information, Cont'd.

Examine all pipes, fittings, and valves before installing any of the system components. Remove any dirt or debris found in or on these components.

**Pre-Installation** - Installation, Operation, and Maintenance instructions are provided with each unit. Horizontal equipment is designed for installation above false ceiling or in a ceiling plenum. Other unit configurations are typically installed in a mechanical room. The installation site chosen should include adequate service clearance around the unit. Before unit start-up, read all manuals and become familiar with the unit and its operation. Thoroughly check the system before operation.

### Prepare units for installation as follows:

1. Compare the electrical data on the unit nameplate with ordering and shipping information to verify that the correct unit has been shipped.
2. Keep the cabinet covered with the original packaging until installation is complete and all plastering, painting, etc. is finished.
3. Verify refrigerant tubing is free of kinks or dents and that it does not touch other unit components.
4. Inspect all electrical connections. Connections must be clean and tight at the terminals.
5. Remove any blower support packaging (water-to-air units only).
6. Some airflow patterns are field convertible (horizontal units only). Locate the airflow conversion section of this IOM.
7. Locate and verify any hot water generator (HWG), hanger, or other accessory kit located in the compressor section or blower section.

### CAUTION!

**CAUTION!** All three phase scroll compressors must have direction of rotation verified at start-up. Verification is achieved by checking compressor Amp draw. Amp draw will be substantially lower compared to nameplate values. Additionally, reverse rotation results in an elevated sound level compared to correct rotation. Reverse rotation will result in compressor internal overload trip within several minutes. Verify compressor type before proceeding.

### CAUTION!

**CAUTION!** DO NOT store or install units in corrosive environments or in locations subject to temperature or humidity extremes (e.g., attics, garages, rooftops, etc.). Corrosive conditions and high temperature or humidity can significantly reduce performance, reliability, and service life. Always move and store units in an upright position. Tilting units on their sides will cause equipment damage.

### CAUTION!

**CAUTION!** CUT HAZARD - Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing heat pumps.

# CLIMATEMASTER WATER-SOURCE HEAT PUMPS

## Tranquility® Compact (TC) Series

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### Physical Data

#### Tranquility® 16 (TC) Series (60 Hz)

| TC Series                         | 006    | 009   | 012   | 015      | 018      | 024      | 030      | 036                 | 041      | 042                 | 048                 | 060                 |
|-----------------------------------|--------|-------|-------|----------|----------|----------|----------|---------------------|----------|---------------------|---------------------|---------------------|
| Compressor (1 Each)               | Rotary |       |       |          |          | Scroll   |          |                     |          |                     |                     |                     |
| Factory Charge<br>HFC-410A (oz)   | 19     | 20    | 23    | 35       | 43       | 40       | 48       | 50                  | 70       | 70                  | 74                  | 82                  |
| <b>ECM Fan Motor &amp; Blower</b> |        |       |       |          |          |          |          |                     |          |                     |                     |                     |
| Blower Wheel Size<br>(Dia x w)    | 6x5    | 6x5   | 6x5   | 9x7      | 9x7      | 9x7      | 9x7      | 9x8                 | N/A      | 9x8                 | 10x10               | 12x10               |
| <b>PSC Fan Motor &amp; Blower</b> |        |       |       |          |          |          |          |                     |          |                     |                     |                     |
| Fan Motor Type/Speeds             | PSC/3  | PSC/3 | PSC-3 | PSC/3    | PSC/3    | PSC/3    | PSC/3    | PSC/3               | PSC/3    | PSC/3               | PSC/3               | PSC/3               |
| Blower Wheel Size<br>(Dia x w)    | 5x5    | 5x5   | 6x5   | 8x7      | 8x7      | 9x7      | 9x7      | 9x8                 | 9x8      | 9x8                 | 10x10               | 12x10               |
| <b>Water Connection Size</b>      |        |       |       |          |          |          |          |                     |          |                     |                     |                     |
| FPT                               | 1/2"   | 1/2"  | 1/2"  | 1/2"     | 1/2"     | 3/4"     | 3/4"     | 3/4"                | 3/4"     | 3/4"                | 1"                  | 1"                  |
| Coax Volume (gallons)             | 0.123  | 0.143 | 0.167 | 0.286    | 0.450    | 0.286    | 0.323    | 0.323               | 0.890    | 0.890               | 0.738               | 0.939               |
| <b>Vertical</b>                   |        |       |       |          |          |          |          |                     |          |                     |                     |                     |
| Air Coil Dimensions<br>(H x W)    | 10x15  | 10x15 | 10x15 | 20x17.25 | 20x17.25 | 20x17.25 | 20x17.25 | 24x21.75            | 20x17.25 | 24x21.76            | 24x28.25            | 24x28.25            |
| Filter Standard - 1"<br>Throwaway | 10x18  | 10x18 | 10x18 | 20x20    | 20x20    | 20x20    | 20x20    | 24x24               | 20x20    | 24x24               | 1-14x24,<br>1-18x24 | 1-14x24,<br>1-18x24 |
| Weight - Operating (lbs.)         | 103    | 105   | 114   | 153      | 158      | 189      | 197      | 203                 | 210      | 218                 | 263                 | 278                 |
| Weight - Packaged (lbs.)          | 113    | 115   | 124   | 158      | 163      | 194      | 202      | 209                 | 217      | 224                 | 270                 | 285                 |
| <b>Horizontal</b>                 |        |       |       |          |          |          |          |                     |          |                     |                     |                     |
| Air Coil Dimensions<br>(H x W)    | 10x15  | 10x15 | 10x15 | 16x22    | 16x22    | 16x22    | 16x22    | 20x25               | N/A      | 20x25               | 20x35               | 20x35               |
| Filter Standard - 1"<br>Throwaway | 10x18  | 10x18 | 10x18 | 16x25    | 16x25    | 18x25    | 18x25    | 20x28 or<br>2-20x14 | N/A      | 20x28 or<br>2-20x14 | 1-20x24,<br>1-20x14 | 1-20x24,<br>1-20x14 |
| Weight - Operating (lbs.)         | 103    | 105   | 114   | 153      | 158      | 174      | 182      | 203                 | N/A      | 218                 | 263                 | 278                 |
| Weight - Packaged (lbs.)          | 113    | 115   | 124   | 158      | 163      | 179      | 187      | 209                 | N/A      | 224                 | 270                 | 285                 |

**Notes:**

All units have TXV expansion device, and 1/2" & 3/4" electrical knockouts.  
 FPT = Female Pipe Thread  
 Condensate Drain Connection is rubber coupling that couples to 3/4" schedule 40/80 PVC.  
 575 volt fan motors are two speed.

| Unit Maximum Water Working Pressure | Max Pressure PSIG<br>[kPa] |
|-------------------------------------|----------------------------|
| Base Unit                           | 500 [3447]                 |
| WSE Option                          | 300 [2068]                 |

Use the lowest maximum pressure rating that applies to your unit.

## Horizontal Installation

### Horizontal Unit Location

Units are not designed for outdoor installation. Locate the unit in an INDOOR area that allows enough space for service personnel to perform typical maintenance or repairs without removing unit from the ceiling. Horizontal units are typically installed above a false ceiling or in a ceiling plenum. Never install units in areas subject to freezing or where humidity levels could cause cabinet condensation (such as unconditioned spaces subject to 100% outside air). Consideration should be given to access for easy removal of the filter and access panels. Provide sufficient room to make water, electrical, and duct connection(s).

If the unit is located in a confined space, such as a closet, provisions must be made for return air to freely enter the space by means of a louvered door, etc. Any access panel screws that would be difficult to remove after the unit is installed should be removed prior to setting the unit. Refer to Figure 3 for an illustration of a typical installation. Refer to unit submittal data or engineering design guide for dimensional data.

### Conform to the following guidelines when selecting unit location:

1. Provide a hinged access door in concealed-spline or plaster ceilings. Provide removable ceiling tiles in T-bar or lay-in ceilings. Refer to horizontal unit dimensions for specific series and model in unit submittal data. Size the access opening to accommodate the service technician during the removal or replacement of the compressor, control, or blower assembly.
2. Provide access to hanger brackets, water valves and fittings. Provide screwdriver clearance to access panels, discharge collars and all electrical connections.
3. DO NOT obstruct the space beneath the unit with piping, electrical cables and other items that prohibit future removal of components or the unit itself.
4. Use a manual portable jack/lift to lift and support the weight of the unit during installation and servicing.

The installation of water source heat pump units and all associated components, parts and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations.

### Mounting Horizontal Units

Horizontal units have 4 hanger brackets partially attached at the factory, one at each corner. Enclosed within the unit there is a hanger kit hardware bag containing vibration isolation grommets, washers, screws and a hanger installation instruction page. One additional screw from the hardware bag must be added to each hanger bracket before unit installation. Tighten each screw to 75 in-lbs (8.5 Nm). See Figure 1. Refer to the hanger installation instruction page contained in the hardware bag for details of final hanger bracket attachment and unit suspension. See Figure 1a.

Use four (4) field supplied threaded rods and factory provided vibration isolators to suspend the unit. Safely lift the unit into position supporting the bottom of the unit. Ensure the top of the unit is not in contact with any external objects. Connect the top end of the 4 all-thread rods, slide rods through the brackets and grommet then assemble washers and double nuts at each rod. Ensure that the unit is approximately level and that the threaded rod extends past the nuts.

Pitch the unit toward the drain as shown in Figure 2 to improve the condensate drainage. On small units (less than 2.5 tons/8.8kW) ensure that unit pitch does not cause condensate leaks inside the cabinet.

Figure 1: Hanger Bracket

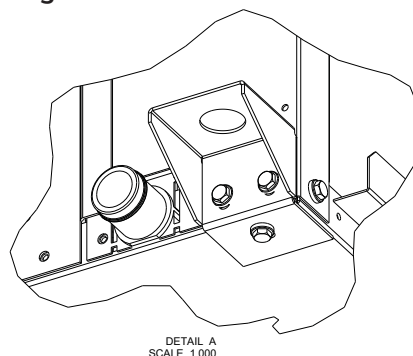
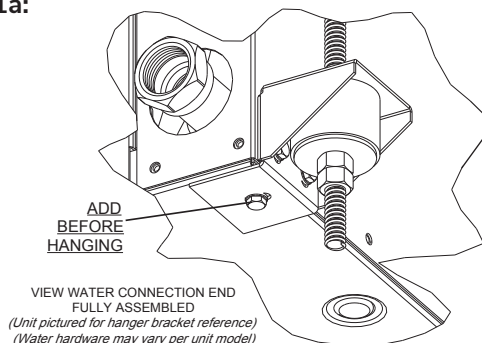


Figure 1a:



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Horizontal Installation, Cont'd.

Figure 2: Horizontal Unit Pitch

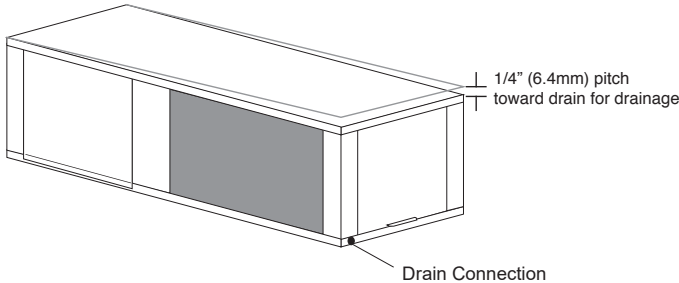
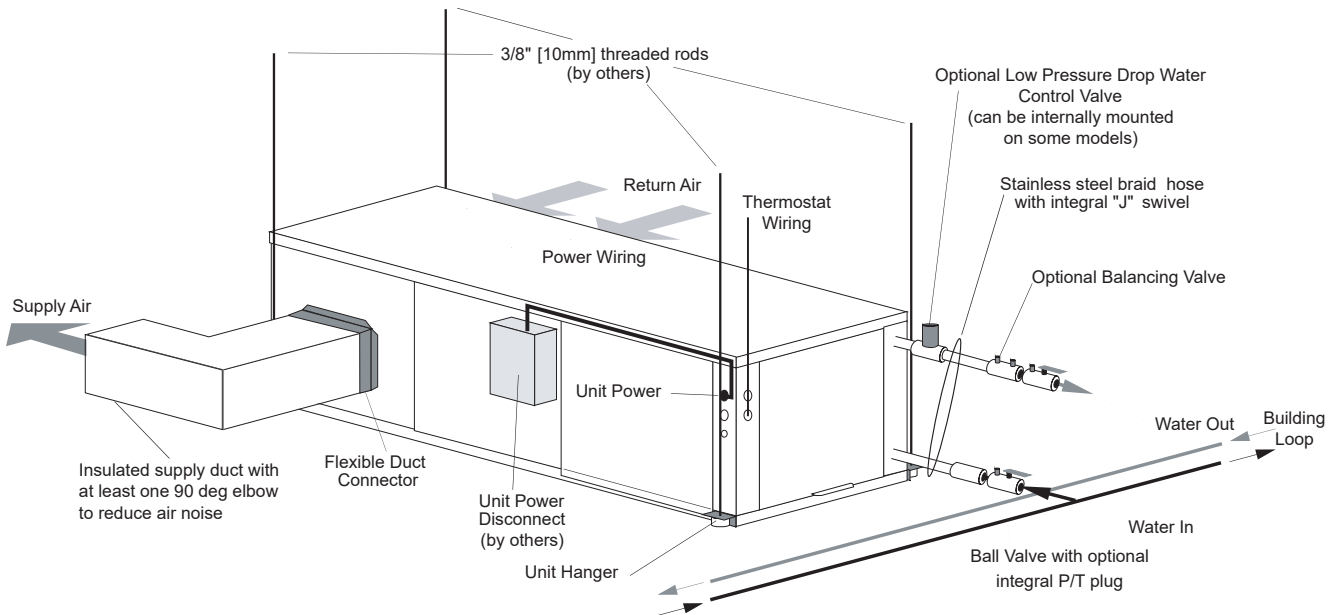


Figure 3: Typical Horizontal Unit Installation



**Air Coil** - To obtain maximum performance, the air coil should be cleaned before start-up. A 10% solution of dishwasher detergent and water is recommended for both sides of the coil. A thorough water rinse should follow. **UV based anti-bacterial systems may damage e-coated air coils.**

**Notice!** Installation Note - Ducted Return: Many horizontal WSHPs are installed in a return air ceiling plenum application (above ceiling). Vertical WSHPs are commonly installed in a mechanical room with free return (e.g. louvered door). Therefore, filter rails are the industry standard and are included on ClimateMaster commercial heat pumps for the purposes of holding the filter only. For ducted return applications, the filter rail must be removed and replaced with a duct flange or filter frame. Canvas or flexible connectors should also be used to minimize vibration between the unit and ductwork.



## Horizontal Installation – Field Conversion of Air Discharge

**Overview** - Horizontal units can be field converted between side (straight) and back (end) discharge using the instructions below.

**NOTE:** It is not possible to field convert return air between left or right return models due to the necessity of refrigeration copper piping changes.

**Preparation** - It is best to field convert the unit on the ground before hanging. If the unit is already hung it should be taken down for the field conversion.

### Side to Back Discharge Conversion

1. Place unit in well lit area. Remove the screws as shown in Figure 4 to free top panel and discharge panel.
2. Lift out the access panel and set aside. Lift and rotate the discharge panel to the other position as shown, being careful with the blower wiring.
3. Check blower wire routing and connections for tension or contact with sheet metal edges. Re-route if necessary.
4. Check refrigerant tubing for contact with other components.
5. Reinstall top panel and screws noting that the location for some screws will have changed.
6. Manually spin the fan wheel to ensure that the wheel is not rubbing or obstructed.
7. Replace access panels.

**Back to Side Discharge Conversion** - If the discharge is changed from back to side, use above instruction noting that illustrations will be reversed.

**Left vs. Right Return** - It is not possible to field convert return air between left or right return models due to the necessity of refrigeration copper piping changes. However, the conversion process of side to back or back to side discharge for either right or left return configuration is the same. In some cases, it may be possible to rotate the entire unit 180 degrees if the return air connection needs to be on the opposite side. **Note that rotating the unit will move the piping to the other end of the unit.**

Figure 4: Left Return Side to Back

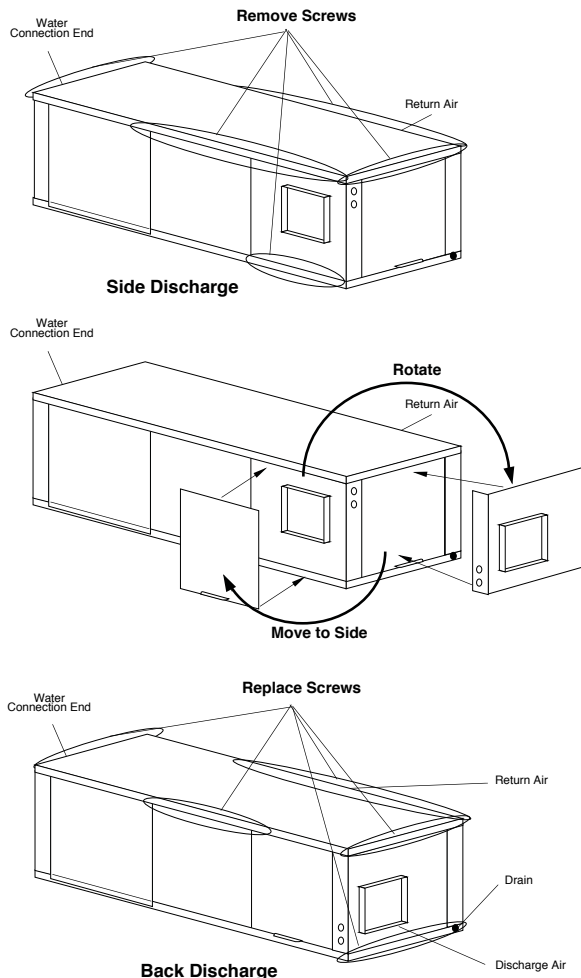
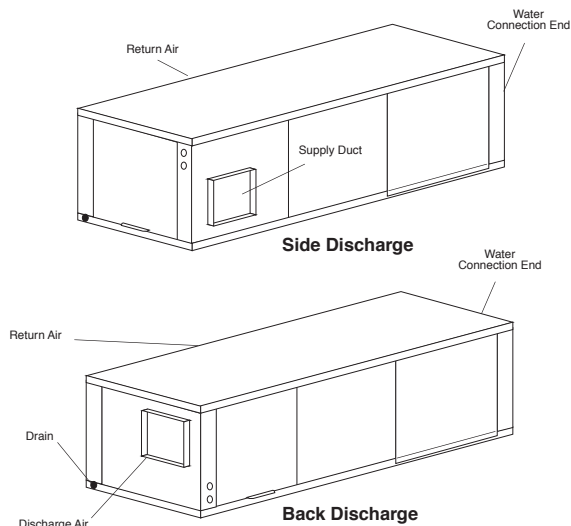


Figure 5: Right Return Side to Back



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Horizontal Installation, Cont'd.

**Condensate Piping - Horizontal Units** - A condensate drain line must be installed and pitched away for the unit to allow for proper drainage. This connection must meet all local plumbing/building codes.

Pitch the unit toward the drain as shown in Figure 2 to improve the condensate drainage. On small units (less than 2.5 tons/8.8 kW), ensure that unit pitch does not cause condensate leaks inside the cabinet.

Install condensate trap at each unit with the top of the trap positioned below the unit condensate drain connection as shown in Figure 6. Design the depth of the trap (water-seal) based upon the amount of ESP capability of the blower (where 2 inches [51mm] of ESP capability requires 2 inches [51mm] of trap depth). As a general rule, 1-1/2 inch [38mm] trap depth is the minimum.

Models with Water Side Economizer (Model Digit 12 is 1-4) Must trap WSE same as unit, can join together after vent.

Each unit must be installed with its own individual trap and connection to the condensate line (main) or riser. Provide a means to flush or blow out the condensate line. DO NOT install units with a common trap and/or vent.

Always vent the condensate line when dirt or air can collect in the line or a long horizontal drain line is required. Also vent when large units are working against higher external static pressure than other units connected to the same condensate main since this may cause poor drainage for all units on the line. **WHEN A VENT IS INSTALLED IN THE DRAIN LINE, IT MUST BE LOCATED AFTER THE TRAP IN THE DIRECTION OF THE CONDENSATE FLOW.**

**Polymer Drain Pans** - condensate drain connection is a rubber coupling that connects to 3/4" schedule 40/80 PVC. Use hose clamps to secure the pipe inside the coupling. If the connection is not secure, the connection may leak.

Instructions for coupling the condensate drain to the trap are included in the bag that includes the coupling and hose clamps.

**Stainless Steel Drain Pans** - condensate connection is female pipe thread. Field to provide condensate connection male adapter.

**Duct System Installation** - Proper duct sizing and design is critical to the performance of the unit. The duct system should be designed to allow adequate and even airflow through the unit during operation. Air flow through the unit **MUST** be at or above the minimum stated airflow for the unit to avoid equipment damage. Duct systems should be designed for quiet operation. Refer to Figure 3 for horizontal duct system details or Figure 8 for vertical duct system details. A flexible connector is recommended for both discharge and return air duct connections on metal duct systems to eliminate the transfer of vibration to the duct system. To maximize sound attenuation of the unit blower, the supply and return plenums should include internal fiberglass duct liner or be constructed from ductboard for the first few feet. Application of the unit to uninsulated ductwork in an unconditioned space is not recommended, as the unit's performance may be adversely affected.

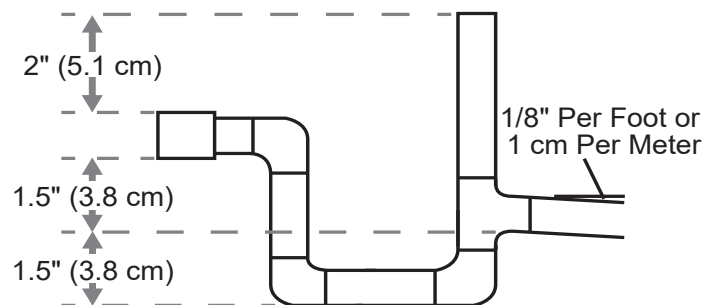
At least one 90° elbow should be included in the supply duct to reduce air noise. If air noise or excessive air flow is a problem, the blower speed can be changed. For airflow charts, consult submittal data for the series and model of the specific unit.

If the unit is connected to existing ductwork, a previous check should have been made to ensure that the ductwork has the capacity to handle the airflow required for the unit. If ducting is too small, as in the replacement of a heating only system, larger ductwork should be installed. All existing ductwork should be checked for leaks and repaired as necessary.

⚠ CAUTION! ⚠

CAUTION! Ensure condensate line is pitched toward drain 1/8 inch per ft [11 mm per m] of run.

Figure 6: Horizontal Condensate Connection



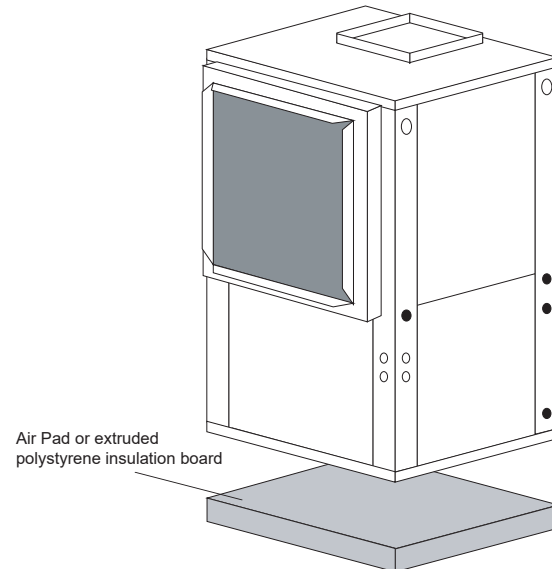
## Vertical Installation

**Vertical Unit Location** - Units are not designed for outdoor installation. Locate the unit in an INDOOR area that allows enough space for service personnel to perform typical maintenance or repairs without removing unit from the mechanical room/closet. Vertical units are typically installed in a mechanical room or closet. Never install units in areas subject to freezing or where humidity levels could cause cabinet condensation (such as unconditioned spaces subject to 100% outside air). Consideration should be given to access for easy removal of the filter and access panels. Provide sufficient room to make water, electrical, and duct connection(s).

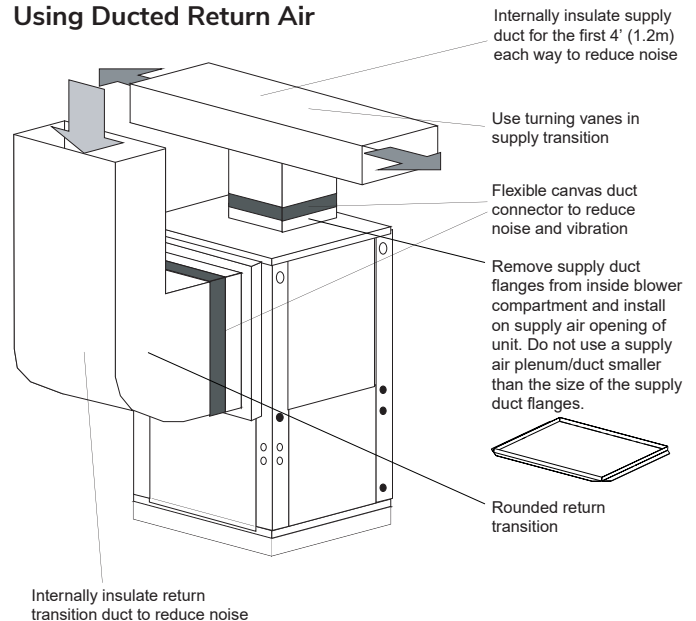
If the unit is located in a confined space, such as a closet, provisions must be made for return air to freely enter the space by means of a louvered door, etc. Any access panel screws that would be difficult to remove after the unit is installed should be removed prior to setting the unit. Refer to Figures 7 and 8 for typical installation illustrations. Refer to unit submittal data or engineering design guide for dimensional data.

1. Install the unit on a piece of rubber, neoprene or other mounting pad material for sound isolation. The pad should be at least 3/8" [10mm] to 1/2" [13mm] in thickness. Extend the pad beyond all four edges of the unit.
2. Provide adequate clearance for filter replacement and drain pan cleaning. Do not block filter access with piping, conduit or other materials. Refer to unit submittal data or engineering design guide for dimensional data.
3. Provide access for fan and fan motor maintenance and for servicing the compressor and coils without removing the unit.
4. Provide an unobstructed path to the unit within the closet or mechanical room. Space should be sufficient to allow removal of the unit, if necessary.
5. In limited side access installations, pre-removal of the control box side mounting screws will allow control box removal for future servicing.
6. Provide access to water valves and fittings and screwdriver access to the unit side panels, discharge collar and all electrical connections.

**Figure 7: Vertical Unit Mounting**



**Figure 8: Typical Vertical Unit Installation Using Ducted Return Air**



**Notice!** Installation Note - Ducted Return: Many horizontal WSHPs are installed in a return air ceiling plenum application (above ceiling). Vertical WSHPs are commonly installed in a mechanical room with free return (e.g. louvered door). Therefore, filter rails are the industry standard and are included on ClimateMaster commercial heat pumps for the purposes of holding the filter only. For ducted return applications, the filter rail must be removed and replaced with a duct flange or filter frame. Canvas or flexible connectors should also be used to minimize vibration between the unit and ductwork.

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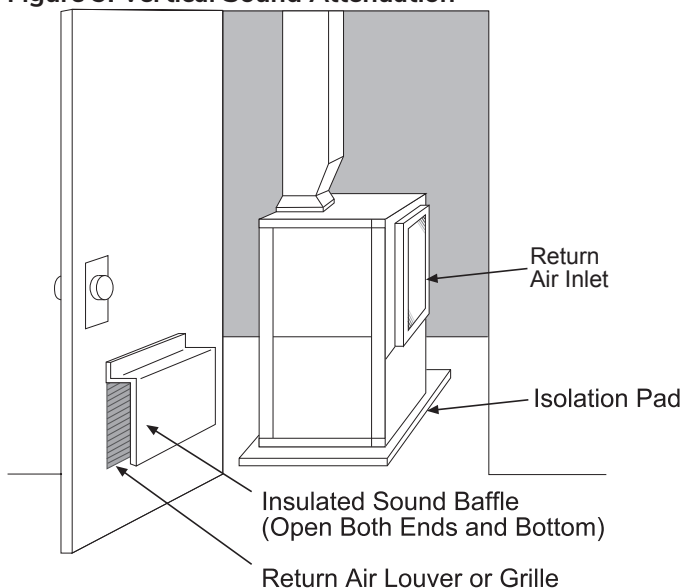
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## Vertical Installation, Cont'd.

**Sound Attenuation for Vertical Units** - Sound attenuation is achieved by enclosing the unit within a small mechanical room or a closet. Additional measures for sound control include the following:

1. Mount the unit so that the return air inlet is 90° to the return air grille. Refer to Figure 9. Install a sound baffle as illustrated to reduce line-of-sight sound transmitted through return air grilles.
2. Mount the unit on a rubber or neoprene isolation pad to minimize vibration transmission to the building structure.

**Figure 9: Vertical Sound Attenuation**



**Notice! Units with clear plastic drain lines should have regular maintenance (as required) to avoid buildup of debris, especially in new construction.**

**Condensate Piping for Vertical Units** - A condensate line must be installed and pitched away from the unit to allow for proper drainage. This connection must meet all local plumbing/building codes.

Install condensate trap at each unit with the top of the trap positioned below the unit condensate drain connection as shown in Figure 6. Design the depth of the trap (water-seal) based upon the amount of ESP capability of the blower (where 2 inches [51mm] of ESP capability requires 2 inches [51mm] of trap depth). As a general rule, 1-1/2 inch [38mm] trap depth is the minimum.

Always vent the condensate line when dirt or air can collect in the line or a long horizontal drain line is required. Also vent when large units are working against higher external static pressure than other units connected to the same condensate main since this may cause poor drainage for all units on the line. **WHEN A VENT IS INSTALLED IN THE DRAIN LINE, IT MUST BE LOCATED AFTER THE TRAP IN THE DIRECTION OF THE CONDENSATE FLOW.**

Each unit must be installed with its own individual vent (where necessary) and a means to flush or blow out the condensate drain line. Do not install units with a common trap and/or vent.

Condensate drain connection is a rubber coupling that couples to 3/4" schedule 40/80 PVC. Use hose clamps to secure the pipe inside the coupling. If the connection is not secure, the connection may leak.

Instructions for coupling the condensate drain to the trap are included in the bag that includes the coupling and hose clamps.

## Piping Installation

### Installation of Supply and Return Piping

Follow these piping guidelines.

1. Install a drain valve at the base of each supply and return riser to facilitate system flushing.
2. Install shut-off / balancing valves and unions at each unit to permit unit removal for servicing.
3. Place strainers at the inlet of each system circulating pump.
4. Select the proper hose length to allow slack between connection points. Hoses may vary in length by +2% to -4% under pressure.
5. Refer to Table 1. Do not exceed the minimum bend radius for the hose selected. Exceeding the minimum bend radius may cause the hose to collapse, which reduces water flow rate. Install an angle adapter to avoid sharp bends in the hose when the radius falls below the required minimum.

Insulation is not required on loop water piping except where the piping runs through unheated areas, outside the building or when the loop water temperature is below the minimum expected dew point of the pipe ambient conditions. Insulation is required if loop water temperature drops below the dew point (insulation is required for ground loop applications in most climates).

Pipe joint compound is not necessary when Teflon® thread tape is pre-applied to hose assemblies or when flared-end connections are used. If pipe joint compound is preferred, use compound only in small amounts on the external pipe threads of the fitting adapters. Prevent sealant from reaching the flared surfaces of the joint.

**Note: When antifreeze is used in the loop, ensure that it is compatible with the Teflon® tape or pipe joint compound that is applied.**

Maximum allowable torque for brass fittings is 30 ft-lbs [41 N-m]. If a torque wrench is not available, tighten finger-tight plus one quarter turn. Tighten steel fittings as necessary.

Models with Waterside Economizer Option (Model Digit 12 is 1-4) - Field fabricate water piping to connect WSE out to unit in. Allow room to remove front access panel and service unit. Insulate pipe. Hoses are not recommended due to high pressure drop.

Optional pressure-rated hose assemblies designed specifically for use with ClimateMaster units are available. Similar hoses can be obtained from alternate suppliers.

Supply and return hoses are fitted with swivel-joint fittings at one end to prevent kinking during installation. Refer to Figure 13 for an illustration of a typical supply/return hose kit. Adapters secure hose assemblies to the unit and risers. Install hose assemblies properly and check regularly to avoid system failure and reduced service life.

A backup wrench is required when tightening water connections on TC Series units to prevent water line damage.

**! WARNING! !**

**WARNING!** Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with HFC-410A refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing HFC-410A as system failures and property damage may result.

**! CAUTION! !**

**CAUTION!** Corrosive system water requires corrosion resistant fittings and hoses, and may require water treatment.

**! CAUTION! !**

**CAUTION!** Do not bend or kink supply lines or hoses.

**! CAUTION! !**

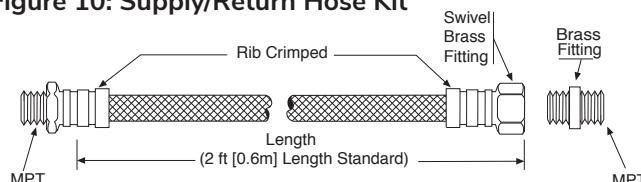
**CAUTION!** Piping must comply with all applicable codes.

Table 1: Metal Hose Minimum Bend Radii

| Hose Diameter   | Minimum Bend Radii |
|-----------------|--------------------|
| 1/2" [12.7mm]   | 2-1/2" [6.4cm]     |
| 3/4" [19.1mm]   | 4" [10.2cm]        |
| 1" [25.4mm]     | 5-1/2" [14cm]      |
| 1-1/4" [31.8mm] | 6-3/4" [17.1cm]    |

**NOTICE!** Do not allow hoses to rest against structural building components. Compressor vibration may be transmitted through the hoses to the structure, causing unnecessary noise complaints.

Figure 10: Supply/Return Hose Kit



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Water-Loop Heat Pump Applications

Commercial Water Loop Applications

Commercial systems typically include a number of units connected to a common piping system. Any unit plumbing maintenance work can introduce air into the piping system; therefore air elimination equipment is a major portion of the mechanical room plumbing. Consideration should be given to insulating the piping surfaces to avoid condensation. ClimateMaster recommends unit insulation any time the water temperature is expected to be below 60°F (15.6°C). Metal to plastic threaded joints should never be used due to their tendency to leak over time.

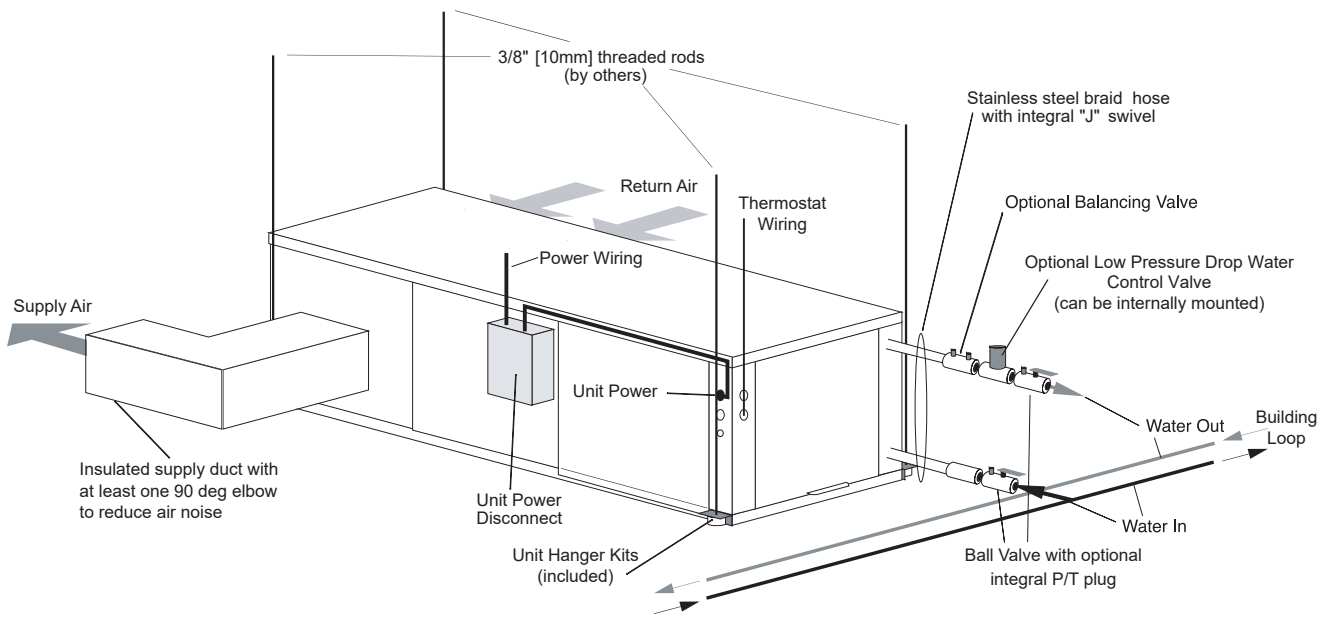
Teflon® tape thread sealant is recommended to minimize internal fouling of the heat exchanger. Do not over tighten connections and route piping so as not to interfere with service or maintenance access. Hose kits are available from ClimateMaster in different configurations as shown in Figure 11 for connection between the unit and the piping system. Depending upon selection, hose kits may include shut off valves, P/T plugs for performance measurement, high pressure stainless steel braided hose, “Y” type strainer with blow down valve, and/or “J” type

swivel connection. Balancing valves and an external low pressure drop solenoid valve for use in variable speed pumping systems may also be included in the hose kit.

The piping system should be flushed to remove dirt, piping chips, and other foreign material prior to operation (see “Piping System Cleaning and Flushing Procedures” in this manual). The flow rate is usually set between 2.25 and 3.5 gpm per ton [2.9 and 4.5 l/m per kW] of cooling capacity. ClimateMaster recommends 3 gpm per ton [3.9 l/m per kW] for most applications of water loop heat pumps. To ensure proper maintenance and servicing, P/T ports are imperative for temperature and flow verification, as well as performance checks.

Water loop heat pump (cooling tower/boiler) systems typically utilize a common loop, maintained between 60 - 90°F [16 - 32°C]. The use of a closed circuit evaporative cooling tower with a secondary heat exchanger between the tower and the water loop is recommended. If an open type cooling tower is used continuously, chemical treatment and filtering will be necessary.

Figure 11: Typical Water-Loop Application



Low Water Temperature Cutout Setting - CXM2 Control

When antifreeze is selected, the LT1 jumper (JW3) should be clipped to select the low temperature (antifreeze 10.0°F [-12.2°C]) setpoint and avoid nuisance faults (see “Low

Water Temperature Cutout Selection” in this manual).

**NOTE: Low water temperature operation requires extended range equipment.**

## Ground-Loop Heat Pump Applications

### ⚠ CAUTION! ⚠

**CAUTION!** The following instructions represent industry accepted installation practices for closed loop earth coupled heat pump systems. Instructions are provided to assist the contractor in installing trouble free ground loops. These instructions are recommendations only. State/provincial and local codes **MUST** be followed and installation **MUST** conform to **ALL** applicable codes. It is the responsibility of the installing contractor to determine and comply with **ALL** applicable codes and regulations.

### ⚠ CAUTION! ⚠

**CAUTION!** Ground loop applications require extended range equipment and optional refrigerant/water circuit insulation.

#### Pre-Installation

Prior to installation, locate and mark all existing underground utilities, piping, etc. Install loops for new construction before sidewalks, patios, driveways, and other construction has begun. During construction, accurately mark all ground loop piping on the plot plan as an aid in avoiding potential future damage to the installation.

#### Piping Installation

The typical closed loop ground source system is shown in Figure 11. All earth loop piping materials should be limited to polyethylene fusion only for in-ground sections of the loop. Galvanized or steel fittings should not be used at any time due to their tendency to corrode. All plastic to metal threaded fittings should be avoided due to their potential to leak in earth coupled applications. A flanged fitting should be substituted. P/T plugs should be used so that flow can be measured using the pressure drop of the unit heat exchanger.

Earth loop temperatures can range between 25 and 110°F [-4 to 43°C]. Flow rates between 2.25 and 3 gpm [2.41 to 3.23 l/m per kW] of cooling capacity is recommended in these applications.

Test individual horizontal loop circuits before backfilling. Test vertical U-bends and pond loop assemblies prior to installation. Pressures of at least 100 psi [689 kPa] should be used when testing. Do not exceed the pipe pressure rating. Test entire system when all loops are assembled.

#### Flushing the Earth Loop

Upon completion of system installation and testing, flush the system to remove all foreign objects and purge to remove all air.

#### Antifreeze

In areas where minimum entering loop temperatures drop below 40°F [5°C] or where piping will be routed through areas subject to freezing, antifreeze is required. Alcohols and glycols are commonly used as antifreeze; however your local sales office should be consulted to determine the antifreeze best suited to your area. Freeze protection should be maintained to 15°F [9°C] below the lowest expected entering loop temperature. For example, if 30°F [-1°C] is the minimum expected entering loop temperature, the leaving loop temperature would be 22 to 25°F [-6 to -4°C] and freeze protection should be at 15°F [-10°C].

Calculation is as follows:

$$30^{\circ}\text{F} - 15^{\circ}\text{F} = 15^{\circ}\text{F} \quad [-1^{\circ}\text{C} - 9^{\circ}\text{C} = -10^{\circ}\text{C}]$$

All alcohols should be premixed and pumped from a reservoir outside of the building when possible or introduced under the water level to prevent fumes. Calculate the total volume of fluid in the piping system. Then use the percentage by volume shown in Table 2 for the amount of antifreeze needed. Antifreeze concentration should be checked from a well mixed sample using a hydrometer to measure specific gravity.

#### Low Water Temperature Cutout Setting - CXM2 Control

When antifreeze is selected, the LT1 jumper (JW3) should be clipped to select the low temperature (antifreeze 10.0°F [-12.2°C]) setpoint and avoid nuisance faults (see “Low Water Temperature Cutout Selection” in this manual).

**NOTE: Low water temperature operation requires extended range equipment.**

Table 2: Antifreeze Percentages by Volume

| Type                                 | Minimum Temperature for Low Temperature Protection |               |               |               |
|--------------------------------------|--|---------------|---------------|---------------|
|                                      | 10°F [-12.2°C]                                     | 15°F [-9.4°C] | 20°F [-6.7°C] | 25°F [-3.9°C] |
| Methanol                             | 25%  | 21%           | 16%           | 10%           |
| 100% USP food grade Propylene Glycol | 38%  | 25%           | 22%           | 15%           |
| Ethanol*                             | 29%  | 25%           | 20%           | 14%           |

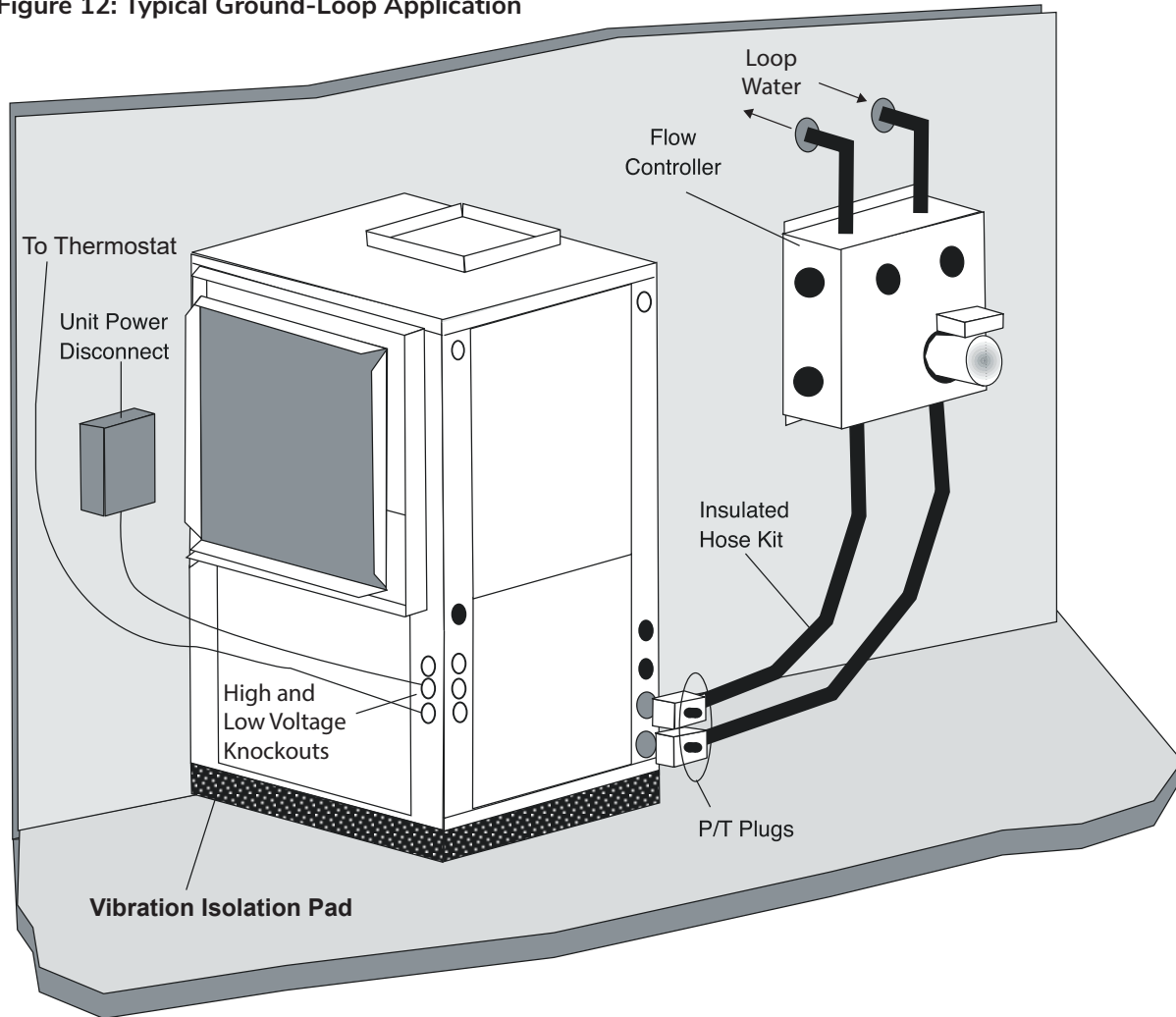
\* Must not be denatured with any petroleum based product

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Ground-Loop Heat Pump Applications, Cont'd.

Figure 12: Typical Ground-Loop Application





## Ground-Water Heat Pump Applications

**Open Loop - Ground Water Systems** - Typical open loop piping is shown in Figure 13. Shut off valves should be included for ease of servicing. Boiler drains or other valves should be “tee'd” into the lines to allow acid flushing of the heat exchanger. Shut off valves should be positioned to allow flow through the coax via the boiler drains without allowing flow into the piping system. P/T plugs should be used so that pressure drop and temperature can be measured. Supply and return water piping materials should be limited to copper, PE, or similar material. PVC or CPVC should never be used as they are incompatible with the POE oils used in HFC-410A products and piping system failure and property damage may result.

**Water Quality Requirements** - Table 3 should be consulted for water quality requirements. Scaling potential should be assessed using the pH/Calcium hardness method. If the pH <7.5 and the calcium hardness is less than 100 ppm, scaling potential is low. If this method yields numbers out of range of those listed, the Ryznar Stability and Langelier Saturation indices should be calculated. Use the appropriate scaling surface temperature for the application, 150°F [66°C] for direct use (well water/open loop); 90°F [32°F] for indirect use. A monitoring plan should be implemented in these probable scaling situations. Other water quality issues such as iron fouling, corrosion prevention and erosion and clogging should be referenced in Table 3.

### **WARNING!**

**WARNING!** Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with HFC-410A refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing HFC-410A as system failures and property damage may result.

Water quantity should be plentiful and of good quality. Consult table 3 for water quality guidelines. The unit can be ordered with either a copper or cupro-nickel water heat exchanger. Consult Table 3 for recommendations. Copper is recommended for closed loop systems and open loop ground water systems that are not high in mineral content or corrosiveness. In conditions anticipating heavy scale formation or in brackish water, a cupro-nickel heat exchanger is recommended. In ground water situations where scaling could be heavy or where biological growth such as iron bacteria will be present, an open loop system is not recommended. Heat exchanger coils may over time lose heat exchange capabilities due to build up of mineral deposits. Heat exchangers must only be serviced by a qualified technician, as acid and special pumping equipment is required. Desuperheater coils can likewise become scaled and possibly plugged. In areas with extremely hard water, the owner should be informed that the heat exchanger may require occasional acid flushing. In some cases, the desuperheater option should not be recommended due to hard water conditions and additional maintenance required.

**Expansion Tank and Pump** - Use a closed, bladder-type expansion tank to minimize mineral formation due to air exposure. The expansion tank should be sized to provide at least one minute continuous run time of the pump using its drawdown capacity rating to prevent pump short cycling. Discharge water from the unit is not contaminated in any manner and can be disposed of in various ways, depending on local building codes (e.g. recharge well, storm sewer, drain field, adjacent stream or pond, etc.). Most local codes forbid the use of sanitary sewer for disposal. Consult your local building and zoning department to assure compliance in your area.

**Water Control Valve** - Note the placement of the water control valve in Figure 13. Always maintain water pressure in the heat exchanger by placing the water control valve(s) on the discharge line to prevent mineral precipitation during the off-cycle. Pilot operated slow closing valves are recommended to reduce water hammer. If water hammer persists, a mini-expansion tank can be mounted on the piping to help absorb the excess hammer shock. Ensure that the total 'VA' draw of the valve can be supplied by the unit transformer. For instance, a slow closing valve can draw up to 35VA. This can overload smaller 50 VA transformers depending on the other controls in the circuit. A typical pilot operated solenoid valve draws approximately 15VA (see Figure 18). Note the special wiring diagrams for slow closing valves (Figures 18 & 19).

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Ground-Water Heat Pump Applications, Cont'd.

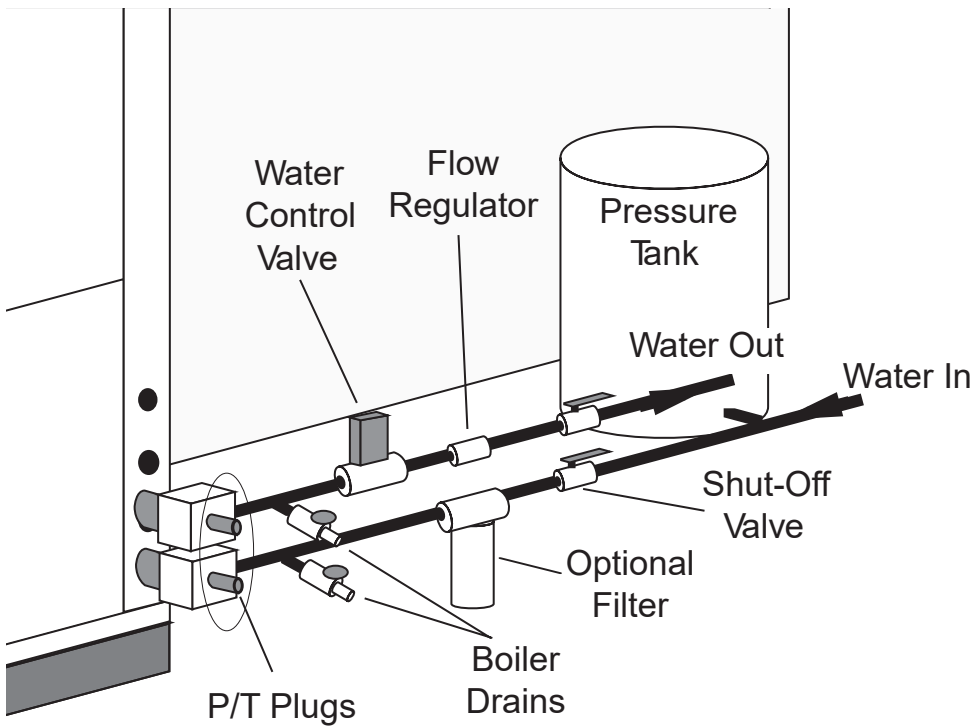
**Flow Regulation** - Flow regulation can be accomplished by two methods. One method of flow regulation involves simply adjusting the ball valve or water control valve on the discharge line. Measure the pressure drop through the unit heat exchanger, and determine flow rate from Tables 8a through 8e. Since the pressure is constantly varying, two pressure gauges may be needed. Adjust the valve until the desired flow of 1.5 to 2 gpm per ton [2.0 to 2.6 l/m per kW] is achieved. A second method of flow control requires a flow control device mounted on the outlet of the water control valve. The device is typically a brass fitting with an orifice of rubber or plastic material that is designed to allow a specified flow rate. On occasion, flow control devices may produce velocity noise that can be

reduced by applying some back pressure from the ball valve located on the discharge line. Slightly closing the valve will spread the pressure drop over both devices, lessening the velocity noise.

**Note: When EWT is below 50°F [10°C], 2 gpm per ton (2.6 l/m per kW) is required.**

**Water Coil Low Temperature Limit Setting** - For all open loop systems the 30°F [-1.1°C] FP1 setting (factory setting-water) should be used to avoid freeze damage to the unit. See “Low Water Temperature Cutout Selection” in this manual for details on the low limit setting.

Figure 13: Typical Open Loop/Well Application



## Water Quality Requirements

**Table 3: Water Quality Requirements**

Clean water is essential to the performance and life span of water source heat pumps. Contaminants, chemicals, and minerals all have the potential to cause damage to the water heat exchanger if not treated properly. All closed water loop systems should undergo water quality testing and be maintained to the water quality requirements listed in this table.

| WATER QUALITY REQUIREMENTS            |  |                                  |                                |                           |   |                        |                        |
|---------------------------------------|--|----------------------------------|--------------------------------|---------------------------|---|------------------------|------------------------|
| For Closed-Loop and Open-Loop Systems |  |                                  |                                |                           |   |                        |                        |
|                                       | Description  | Symbol                           | Units                          | Heat Exchanger Type       |   |                        |                        |
|                                       |  |                                  |                                | Closed Loop Recirculating | Open Loop, Tower, Ground Source Well                            |                        |                        |
|                                       |  |                                  |                                | All Heat Exchanger Types  | COAXIAL HX Copper Tube in Tube                                  | COAXIAL HX Cupronickel | Brazed Plate HX 316 SS |
| Scaling Potential                     | pH - Chilled Water <85°F   |                                  |                                | 7.0 to 9.0                | 7.0 to 9.0  | 7.0 to 9.0             | 7.0 to 9.0             |
|                                       | pH - Heated Water >85°F  |                                  |                                | 8.0 to 10.0               | 8.0 to 10.0   | 8.0 to 10.0            | 8.0 to 10.0            |
|                                       | Alkalinity   | (HCO <sub>3</sub> <sup>-</sup> ) | ppm - CaCO <sub>3</sub> equiv. | 50 to 500                 | 50 to 500   | 50 to 500              | 50 to 500              |
|                                       | Calcium  | (Ca)                             | ppm                            | <100                      | <100  | <100                   | <100                   |
|                                       | Magnesium  | (Mg)                             | ppm                            | <100                      | <100  | <100                   | <100                   |
|                                       | Total Hardness   | (CaCO <sub>3</sub> )             | ppm - CaCO <sub>3</sub> equiv. | 30 to 150                 | 150 to 450  | 150 to 450             | 150 to 450             |
|                                       | Langelier Saturation Index   | LSI                              |                                | -0.5 to +0.5              | -0.5 to +0.5  | -0.5 to +0.5           | -0.5 to +0.5           |
| Ryznar Stability Index                | RSI  |                                  | 6.5 to 8.0                     | 6.5 to 8.0                | 6.5 to 8.0  | 6.5 to 8.0             |                        |
| Corrosion Prevention                  | Total Dissolved Solids   | (TDS)                            | ppm - CaCO <sub>3</sub> equiv. | <1000                     | <1000   | <1000                  | <1500                  |
|                                       | Sulfate  | (SO <sub>4</sub> <sup>2-</sup> ) | ppm                            | <200                      | <200  | <200                   | <200                   |
|                                       | Nitrate  | (NO <sub>3</sub> <sup>-</sup> )  | ppm                            | <100                      | <100  | <100                   | <100                   |
|                                       | Chlorine (free)  | (Cl)                             | ppm                            | <0.5                      | <0.5  | <0.5                   | <0.5                   |
|                                       | Chloride (water < 80°F)  | (Cl <sup>-</sup> )               | ppm                            | <20                       | <20   | <150                   | <150                   |
|                                       | Chloride (water > 120°F)   | (Cl <sup>-</sup> )               | ppm                            | <20                       | <20   | <125                   | <125                   |
|                                       | Hydrogen Sulfide <sup>a</sup>  | (H <sub>2</sub> S)               | ppb                            | <0.5                      | <0.5  | <0.5                   | <0.5                   |
|                                       | Carbon Dioxide   | (CO <sub>2</sub> )               | ppm                            | 0                         | <50   | 10 to 50               | 10 to 50               |
|                                       | Iron Oxide   | (Fe)                             | ppm                            | <1.0                      | <1.0  | <1.0                   | <0.2                   |
|                                       | Manganese  | (Mn)                             | ppm                            | < 0.4                     | <0.4  | <0.4                   | <0.4                   |
|                                       | Ammonia  | (NH <sub>3</sub> )               | ppm                            | <0.05                     | <0.1  | <0.1                   | <0.1                   |
|                                       | Chloramine   | (NH <sub>2</sub> CL)             | ppm                            | 0                         | 0   | 0                      | 0                      |
| Fouling & Biological                  | Iron Bacteria  |                                  | cells/mL                       | 0                         | 0   | 0                      | 0                      |
|                                       | Slime Forming Bacteria   |                                  | cells/mL                       | 0                         | 0   | 0                      | 0                      |
|                                       | Sulfate reducing bacteria  |                                  | cells/mL                       | 0                         | 0   | 0                      | 0                      |
|                                       | Suspended Solids <sup>b</sup>  | (TSS)                            | ppm                            | <10                       | <10   | <10                    | <10                    |
| Electrolysis All HX types             | Earth Ground Resistance <sup>x</sup>   |                                  | Ohms                           | 0                         | Consult NEC & local electrical codes for grounding requirements |                        |                        |
|                                       | Electrolysis Voltage <sup>d</sup>  |                                  | mV                             | <300                      | Measure voltage internal water loop to HP ground                |                        |                        |
|                                       | Leakage Current <sup>d</sup>   |                                  | mA                             | <15                       | Measure current in water loop pipe                              |                        |                        |
|                                       | Building Primary Electrical Ground to unit, must meet local diameter and penetration length requirements<br>Do not connect heat pump to steel pipe unless dissimilar materials are separated by using Di-electric unions. Galvanic corrosion of heat pump water pipe will occur. |                                  |                                |                           |   |                        |                        |

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## Water Quality Requirements, Cont'd.

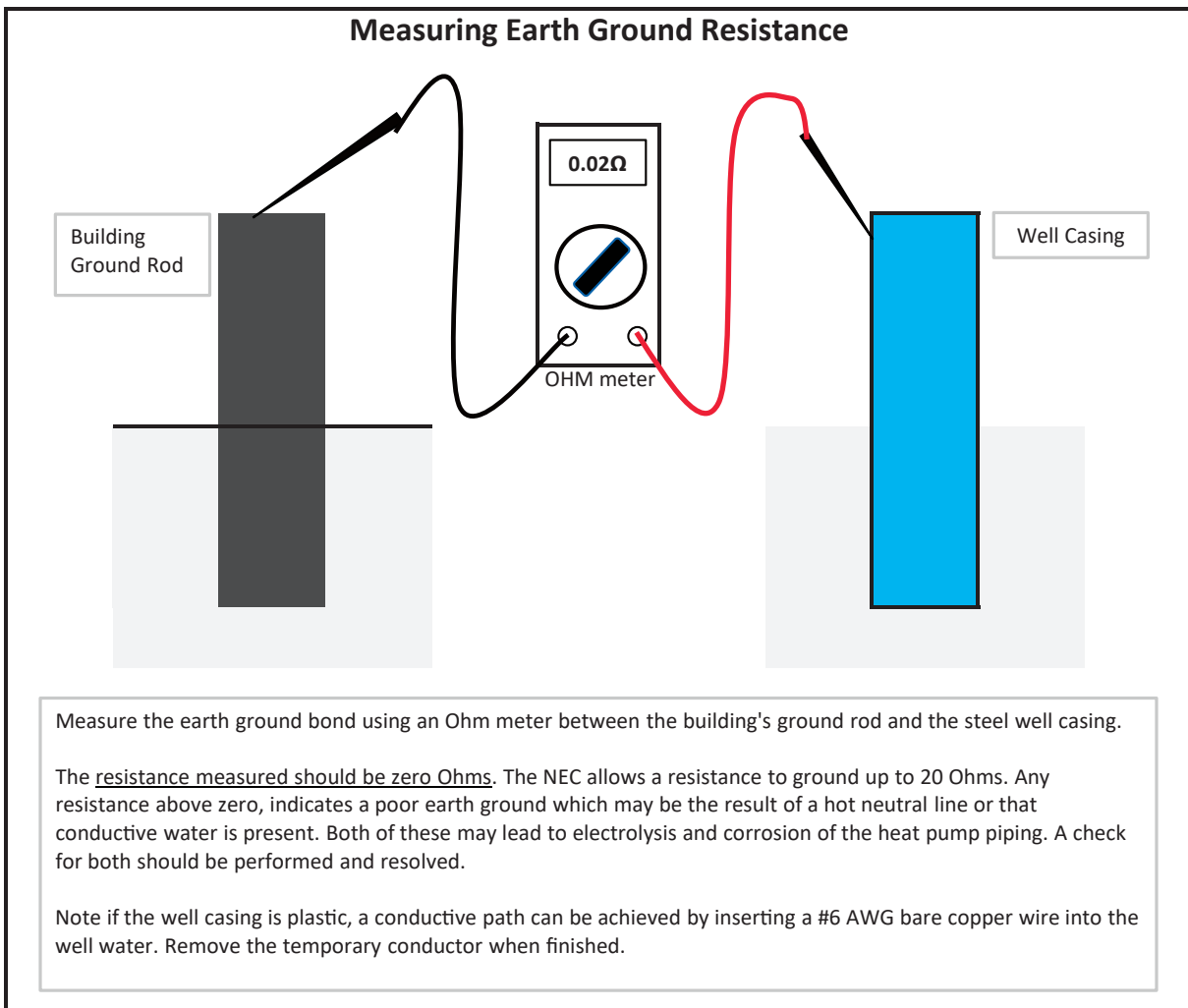
1. The ClimateMaster Water Quality Table provides water quality requirements for coaxial & brazed plate heat exchangers.
  2. The water must be evaluated by an independent testing facility comparing site samples against this Table. When water properties are outside of these parameters, the water must either be treated by a professional water treatment specialist to bring the water quality within the boundaries of this specification, or an external secondary heat exchanger must be used to isolate the heat pump water system from the unsuitable water. Failure to do so will void the warranty of the heat pump system and will limit liability for damage caused by leaks or system failure.
  3. Regular sampling, testing and treatment of the water is necessary to assure that the water quality remains within acceptable levels thereby allowing the heat pump to operate at optimum levels.
  4. If closed-loop systems are turned off for extended periods, water samples must be tested prior to operating the system.
  5. For optimal performance, it is recommended that the closed-loop piping systems are initially filled with de-ionized water.
  6. Well water with chemistry outside of these boundaries, and salt water or brackish water requires an external secondary heat exchanger. Surface/Pond water should not be used.
  7. If water temperature is expected to fall below 40°F, antifreeze is required. Refer to the heat pump IOM for the correct solution ratios to prevent freezing.
- α Hydrogen Sulfide has an odor of rotten eggs. If one detects this smell, a test for H2S must be performed. If H2S is detected above the limit indicated, remediation is necessary (Consult with your Water Testing/Treatment Professional) or a secondary heat exchanger is required using appropriate materials as recommended by the heat exchanger supplier.
  - β Suspended solids and particulates must be filtered to prevent fouling and failure of heat exchangers. Strainers or particulate filters must be installed to provide a maximum particle size of 600 micron (0.60 mm, 0.023 in.) using a 20 to 30 mesh screen size. When a loop is installed in areas with fine material such as sand or clay, further filtration is required to a maximum of 100 micron. Refer to the Strainer / Filter Sizing Chart to capture the particle sizes encountered on the site.
  - χ An electrical grounding system using a dedicated ground rod meeting NEC and Local Electrical codes must be installed. Building Ground must not be connected the WSHP piping system or other plumbing pipes.
  - δ Refer to IOM for instructions on measuring resistance and leakage currents within water loops.

**Do not use PVC pipe for water loop (compressor POE oil and glycols damage PVC) use of HDPE pipe is recommended.**

| Strainer / Filter Sizing |               |       |        |
|--------------------------|---------------|-------|--------|
| Mesh Size                | Particle Size |       |        |
|                          | Microns       | MM    | Inch   |
| 20                       | 840           | 0.840 | 0.0340 |
| 30                       | 533           | 0.533 | 0.0210 |
| 60                       | 250           | 0.250 | 0.0100 |
| 100                      | 149           | 0.149 | 0.0060 |
| 150                      | 100           | 0.100 | 0.0040 |
| 200                      | 74            | 0.074 | 0.0029 |

ppm = parts per million  
ppb = parts per billion

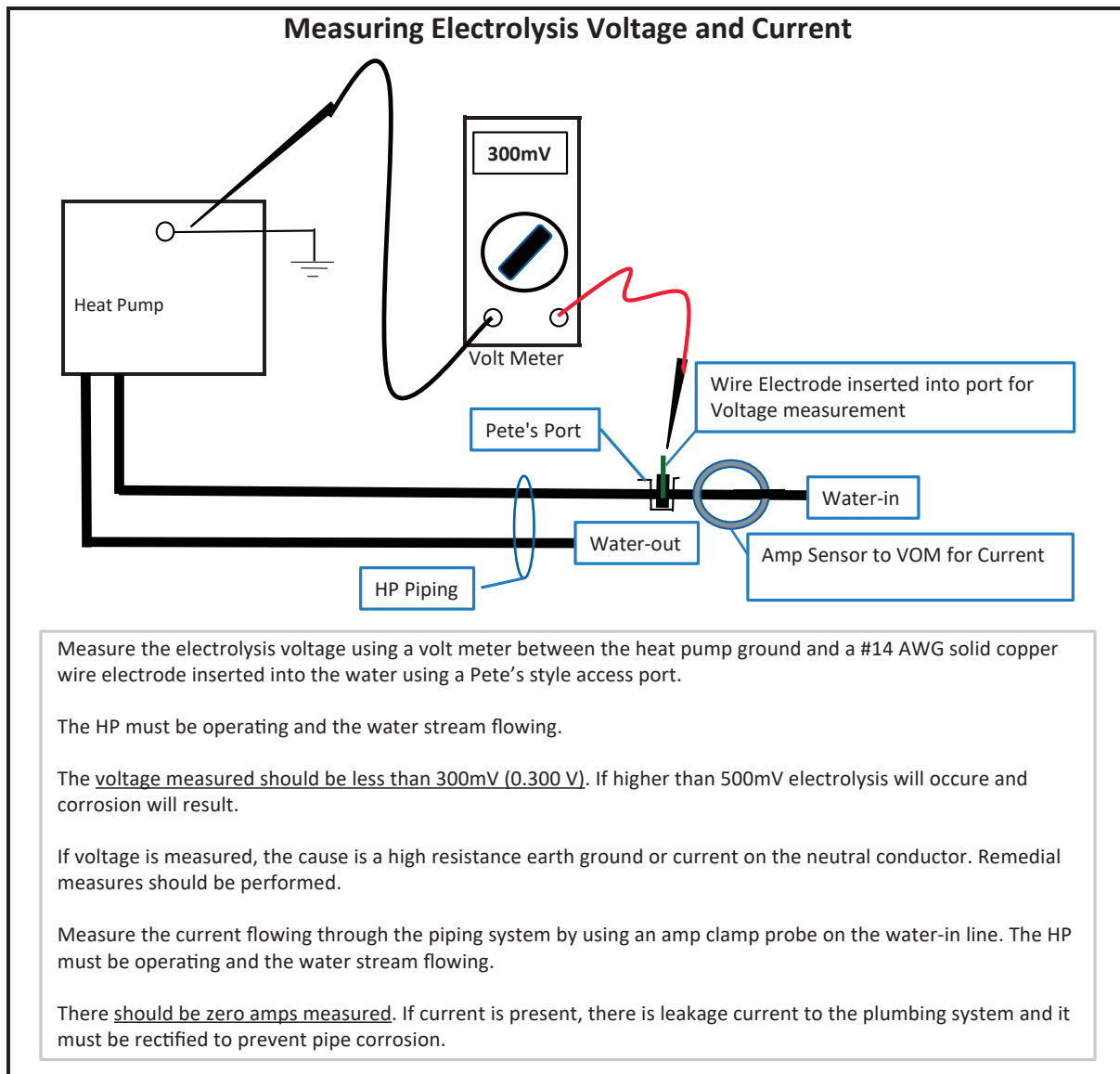
## Water Quality Requirements, Cont'd.



## Tranquility® Compact (TC) Series

Rev.: January 24, 2023

## Water Quality Requirements, Cont'd.



TC: Horizontal – Dimensional Data

| Horizontal Model |          | Overall Cabinet |               |              |
|------------------|----------|-----------------|---------------|--------------|
|                  |          | A Width         | B Length      | C Height     |
| 006 - 012        | in<br>cm | 19.1<br>48.5    | 34.1<br>86.6  | 11.1<br>28.2 |
| 015 - 018        | in<br>cm | 20.1<br>51.1    | 43.1<br>109.5 | 17.0<br>43.2 |
| 024 - 030        | in<br>cm | 20.1<br>51.1    | 43.1<br>109.5 | 18.3<br>46.5 |
| 036 - 042        | in<br>cm | 20.1<br>51.1    | 47.1<br>119.6 | 21.0<br>53.3 |
| 048 - 060        | in<br>cm | 24.1<br>61.2    | 54.1<br>137.4 | 21.0<br>53.3 |

| Horizontal Model |          | Electrical Knockouts |              |
|------------------|----------|----------------------|--------------|
|                  |          | J 1/2"               | K 3/4"       |
|                  |          | Low Voltage          | Power Supply |
| 006 - 012        | in<br>cm | 5.1<br>13.0          | 2.1<br>5.4   |
| 015 - 018        | in<br>cm | 9.9<br>25.2          | 6.9<br>17.5  |
| 024 - 030        | in<br>cm | 11.1<br>28.2         | 8.1<br>20.6  |
| 036 - 060        | in<br>cm | 13.9<br>35.3         | 10.9<br>27.7 |

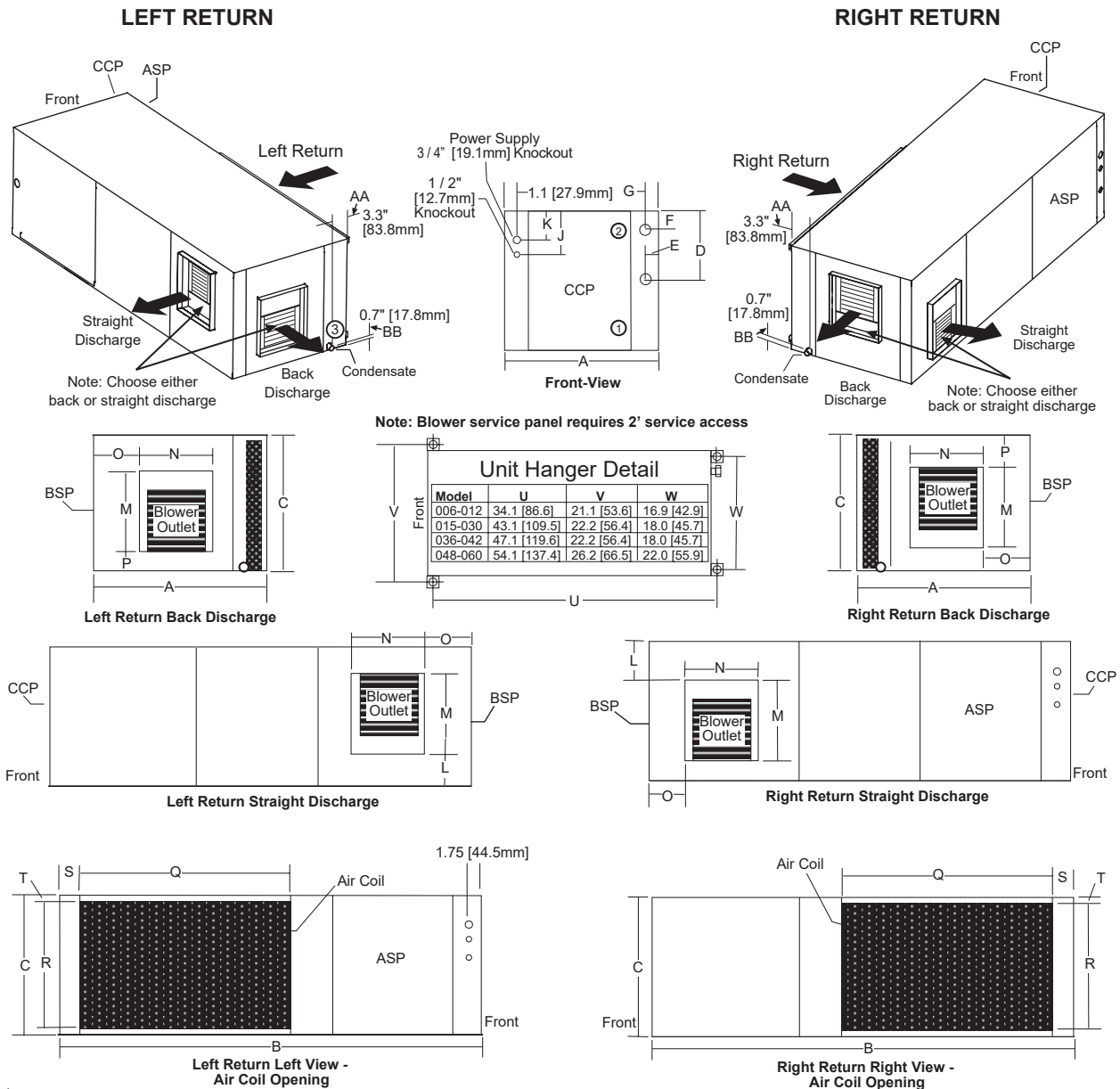
| Horizontal Model |          | Water Connections |            |             |            |            |            | Loop In/Out FPT |
|------------------|----------|-------------------|------------|-------------|------------|------------|------------|-----------------|
|                  |          | ①                 |            | ②           |            | ③          |            |                 |
|                  |          | Loop In D         | Loop In E  | Loop Out F  | Loop Out G | AA         | BB         |                 |
| 006 - 012        | in<br>cm | 5.6<br>14.2       | 1.1<br>2.7 | 1.6<br>4.1  | 1.1<br>2.7 | 3.3<br>8.4 | 0.7<br>1.8 | 1/2"            |
| 015              | in<br>cm | 15.1<br>38.4      | 1.4<br>3.4 | 3.2<br>8.1  | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 1/2"            |
| 018              | in<br>cm | 15.1<br>38.4      | 1.4<br>3.4 | 4.1<br>10.4 | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 1/2"            |
| 024              | in<br>cm | 16.4<br>41.7      | 1.4<br>3.4 | 4.4<br>11.3 | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 3/4"            |
| 030              | in<br>cm | 16.4<br>41.7      | 1.4<br>3.4 | 3.1<br>7.8  | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 3/4"            |
| 036              | in<br>cm | 19.1<br>48.5      | 1.4<br>3.4 | 5.3<br>13.4 | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 3/4"            |
| 042              | in<br>cm | 19.1<br>48.5      | 1.4<br>3.4 | 4.4<br>11.3 | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 3/4"            |
| 048              | in<br>cm | 19.1<br>48.5      | 1.4<br>3.4 | 4.4<br>11.1 | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 1"              |
| 060              | in<br>cm | 19.1<br>48.5      | 1.4<br>3.4 | 3.8<br>9.7  | 1.4<br>3.5 | 3.3<br>8.4 | 0.7<br>1.8 | 1"              |

| Horizontal Model |          | Discharge Connection<br>Duct Flange Installed (+/- 0.10 in, +/- 2.5mm) |                    |                   |             |            | Return Connection<br>Using Return Air Opening |                    |            |            |
|------------------|----------|--|--------------------|-------------------|-------------|------------|---|--------------------|------------|------------|
|                  |          | L  | M<br>Supply Height | N<br>Supply Width | O           | P          | Q<br>Return Width                             | R<br>Return Height | S          | T          |
| 006 - 012        | in<br>cm | 0.8<br>1.9   | 8.9<br>22.7        | 6.7<br>17.0       | 6.0<br>15.2 | 1.3<br>3.3 | 16.1<br>41.0                                  | 9.8<br>25.0        | 1.1<br>2.7 | 0.6<br>1.5 |
| 015 - 018        | in<br>cm | 2.6<br>6.6   | 13.3<br>33.8       | 9.9<br>25.1       | 4.1<br>10.5 | 1.3<br>3.3 | 23.0<br>58.4                                  | 15.0<br>38.1       | 1.1<br>2.8 | 1.0<br>2.5 |
| 024 - 030        | in<br>cm | 2.6<br>6.6   | 13.3<br>33.8       | 9.9<br>25.1       | 4.1<br>10.5 | 1.3<br>3.3 | 23.0<br>58.4                                  | 16.3<br>41.4       | 1.1<br>2.8 | 1.0<br>2.5 |
| 036 - 042        | in<br>cm | 2.5<br>6.3   | 16.1<br>40.9       | 11.0<br>27.9      | 3.0<br>7.7  | 2.5<br>6.4 | 25.9<br>65.8                                  | 19.0<br>48.3       | 1.1<br>2.8 | 1.0<br>2.5 |
| 048              | in<br>cm | 3.7<br>9.5   | 16.1<br>41.0       | 13.7<br>34.8      | 4.1<br>10.3 | 1.3<br>3.2 | 35.9<br>91.2                                  | 19.0<br>48.3       | 1.1<br>2.8 | 1.0<br>2.5 |
| 060              | in<br>cm | 1.7<br>4.4   | 18.1<br>46.0       | 13.7<br>34.8      | 4.1<br>10.3 | 1.3<br>3.2 | 35.9<br>91.2                                  | 19.0<br>48.3       | 1.1<br>2.8 | 1.0<br>2.5 |

## Tranquility® Compact (TC) Series

Rev.: January 24, 2023

### TC: Horizontal – Dimensional Data, Cont'd.



**Notes:**

1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate fitting on Polymer drain pan is rubber coupling that couples to 3/4" schedule 40/80 PVC, S.S. drain pan is 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.

**Legend:**

CCP = Control/Compressor Access Panel.  
 BSP = Blower Service Panel.  
 \*ASP = Additional Service Panel (not required).

**Note:**

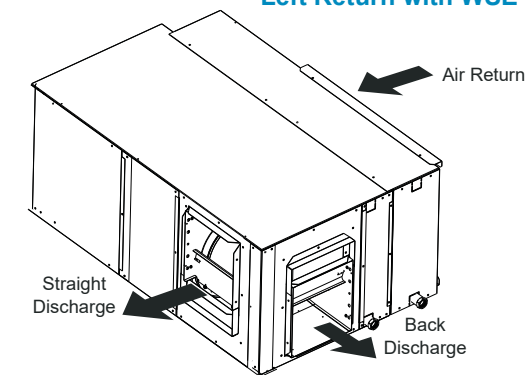
\*ASP are removable panels that provide additional access to the units interior. Clear access to ASP panels is not required and they are not to be used in place of the mandatory CCP and BSP panels.



TCH with Left Hand Waterside Economizer – Dimensional Data

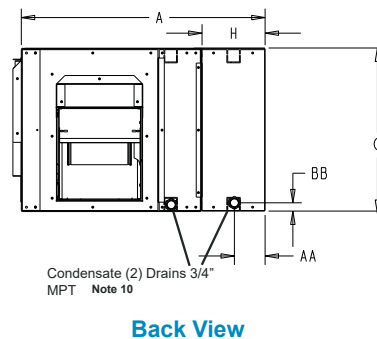
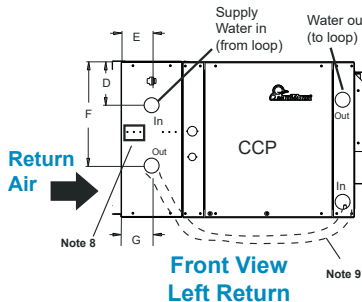
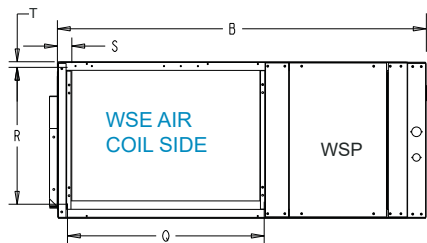
| Horizontal Model |    | Overall Cabinet |          |          | WSE H Width | Left WSE Connections |     |      |     |                |     | Return Connection Using Return Air Opening |                |                 |     |     |
|------------------|----|-----------------|----------|----------|-------------|----------------------|-----|------|-----|----------------|-----|--|----------------|-----------------|-----|-----|
|                  |    | A Width         | B Length | C Height |             | In                   |     | Out  |     | Cond. 3/4" MPT |     | Water In/Out FPT                           | Q Return Width | R Return Height | S   | T   |
|                  |    |                 |          |          |             | D                    | E   | F    | G   | AA             | BB  |  |                |                 |     |     |
| 006-012          | in | 26.1            | 34.1     | 11.0     | 7.1         | 4.7                  | 3.5 | 8.0  | 3.5 | 3.5            | 0.8 | 1/2"                                       | 16.1           | 10.0            | 1.5 | 0.3 |
|                  | cm | 66.3            | 86.6     | 27.9     | 18.0        | 11.9                 | 8.9 | 20.3 | 8.9 | 8.9            | 2.0 |  | 40.9           | 25.4            | 3.8 | 0.8 |
| 015-018          | in | 27.2            | 43.1     | 17.0     | 7.1         | 5.3                  | 3.5 | 11.5 | 3.5 | 3.5            | 0.8 | 1/2"                                       | 23.0           | 16.0            | 1.5 | 0.3 |
|                  | cm | 69.1            | 109.5    | 43.2     | 18.0        | 13.5                 | 8.9 | 29.2 | 8.9 | 8.9            | 2.0 |  | 58.4           | 40.6            | 3.8 | 0.8 |
| 024-030          | in | 27.2            | 43.1     | 18.2     | 7.1         | 5.1                  | 3.5 | 21.1 | 3.5 | 3.5            | 0.8 | 3/4"                                       | 22.9           | 16.0            | 1.5 | 0.3 |
|                  | cm | 69.1            | 109.5    | 46.2     | 18.0        | 13.0                 | 8.9 | 53.6 | 8.9 | 8.9            | 2.0 |  | 58.2           | 40.6            | 3.8 | 0.8 |
| 036-042          | in | 27.2            | 47.1     | 21.0     | 7.1         | 6.5                  | 3.5 | 14.0 | 3.5 | 3.5            | 0.8 | 3/4"                                       | 26.0           | 20.0            | 1.5 | 0.3 |
|                  | cm | 69.1            | 119.6    | 53.3     | 18.0        | 16.5                 | 8.9 | 35.6 | 8.9 | 8.9            | 2.0 |  | 66.0           | 50.8            | 3.8 | 0.8 |
| 048-060          | in | 31.6            | 54.1     | 21.0     | 7.5         | 5.0                  | 1.3 | 15.9 | 1.3 | 3.5            | 0.8 | 3/4"                                       | 36.0           | 20.0            | 1.5 | 0.3 |
|                  | cm | 80.3            | 137.4    | 53.3     | 19.1        | 12.7                 | 3.3 | 40.4 | 3.3 | 8.9            | 2.0 |  | 91.4           | 50.8            | 3.8 | 0.8 |

Left Return with WSE



Unit Hanger Detail

| Model   | U            | V           | W           |
|---------|--------------|-------------|-------------|
| 006-012 | 34.1 [86.6]  | 21.1 [53.6] | 16.9 [42.9] |
| 015-030 | 43.1 [109.5] | 22.2 [56.4] | 18.0 [45.7] |
| 036-042 | 47.1 [119.6] | 22.2 [56.4] | 18.0 [45.7] |
| 048-060 | 54.1 [137.4] | 26.2 [66.5] | 22.0 [55.9] |



Notes:

- 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.
- Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.
- Discharge flange and hanger brackets are factory installed.
- Condensate drains are 3/4" MPT.
- Blower service panel requires 2' service access.
- Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
- Filters same size as standard unit.
- Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect molex.
- WSE to unit piping to be field fabricated, Run below or in front. Must leave room to remove front access panel (CCP) to service unit.
- External trap and vent both drains before joining.
- Refer to Discharge Air connection dimensions.

Tranquility® Compact (TC) Series

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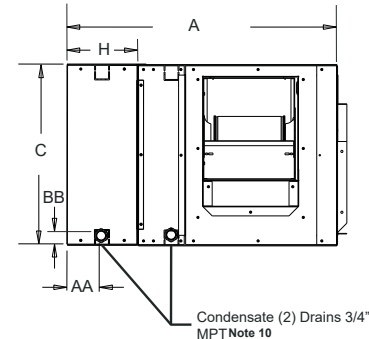
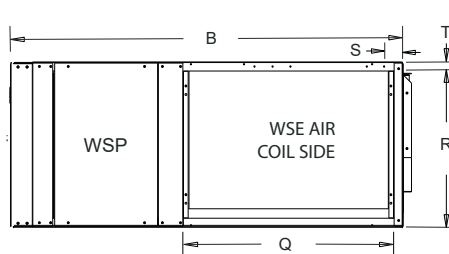
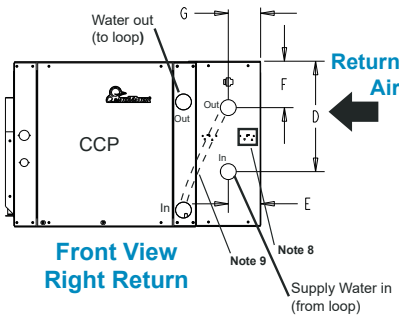
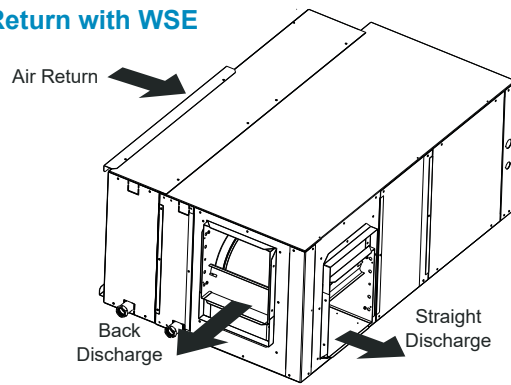
TCH with Right Hand Waterside Economizer – Dimensional Data

| Horizontal Model |    | Overall Cabinet |             |             | WSE<br>H Width | Left WSE Connections |     |      |     |                |     | Return Connection Using Return Air Opening |                   |                    |     |     |
|------------------|----|-----------------|-------------|-------------|----------------|----------------------|-----|------|-----|----------------|-----|--|-------------------|--------------------|-----|-----|
|                  |    | A<br>Width      | B<br>Length | C<br>Height |                | In                   |     | Out  |     | Cond. 3/4" MPT |     | Water In/Out<br>FPT                        | Q<br>Return Width | R<br>Return Height | S   | T   |
|                  |    |                 |             |             |                | D                    | E   | F    | G   | AA             | BB  |  |                   |                    |     |     |
| 006-012          | in | 26.1            | 34.1        | 11.0        | 7.1            | 8.0                  | 3.5 | 4.7  | 3.5 | 3.5            | 0.8 | 1/2"                                       | 16.1              | 10.0               | 1.5 | 0.3 |
|                  | cm | 66.3            | 86.6        | 27.9        | 18.0           | 20.3                 | 8.9 | 11.9 | 8.9 | 8.9            | 2.0 |  | 40.9              | 25.4               | 3.8 | 0.8 |
| 015-018          | in | 27.2            | 43.1        | 17.0        | 7.1            | 11.5                 | 3.5 | 5.3  | 3.5 | 3.5            | 0.8 | 1/2"                                       | 23.0              | 16.0               | 1.5 | 0.3 |
|                  | cm | 69.1            | 109.5       | 43.2        | 18.0           | 29.2                 | 8.9 | 13.5 | 8.9 | 8.9            | 2.0 |  | 58.4              | 40.6               | 3.8 | 0.8 |
| 024-030          | in | 27.2            | 43.1        | 18.2        | 7.1            | 21.1                 | 3.5 | 5.1  | 3.5 | 3.5            | 0.8 | 3/4"                                       | 22.9              | 16.0               | 1.5 | 0.3 |
|                  | cm | 69.1            | 109.5       | 46.2        | 18.0           | 53.6                 | 8.9 | 13.0 | 8.9 | 8.9            | 2.0 |  | 58.2              | 40.6               | 3.8 | 0.8 |
| 036-042          | in | 27.2            | 47.1        | 21.0        | 7.1            | 14.0                 | 3.5 | 6.5  | 3.5 | 3.5            | 0.8 | 3/4"                                       | 26.0              | 20.0               | 1.5 | 0.3 |
|                  | cm | 69.1            | 119.6       | 53.3        | 18.0           | 35.6                 | 8.9 | 16.5 | 8.9 | 8.9            | 2.0 |  | 66.0              | 50.8               | 3.8 | 0.8 |
| 048-060          | in | 31.6            | 54.1        | 21.0        | 7.5            | 15.9                 | 1.3 | 5.0  | 1.3 | 3.5            | 0.8 | 3/4"                                       | 36.0              | 20.0               | 1.5 | 0.3 |
|                  | cm | 80.3            | 137.4       | 53.3        | 19.1           | 40.4                 | 3.3 | 12.7 | 3.3 | 8.9            | 2.0 |  | 91.4              | 50.8               | 3.8 | 0.8 |

**Unit Hanger Detail**

| Model   | U            | V           | W           |
|---------|--------------|-------------|-------------|
| 006-012 | 34.1 [86.6]  | 21.1 [53.6] | 16.9 [42.9] |
| 015-030 | 43.1 [109.5] | 22.2 [56.4] | 18.0 [45.7] |
| 036-042 | 47.1 [119.6] | 22.2 [56.4] | 18.0 [45.7] |
| 048-060 | 54.1 [137.4] | 26.2 [66.5] | 22.0 [55.9] |

Right Return with WSE

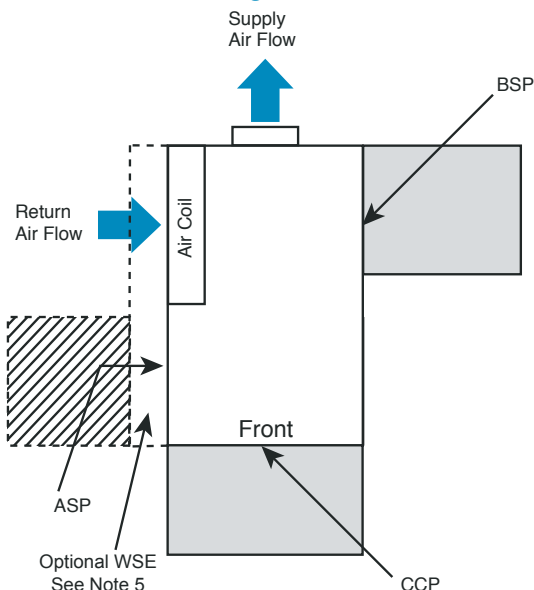


Notes:

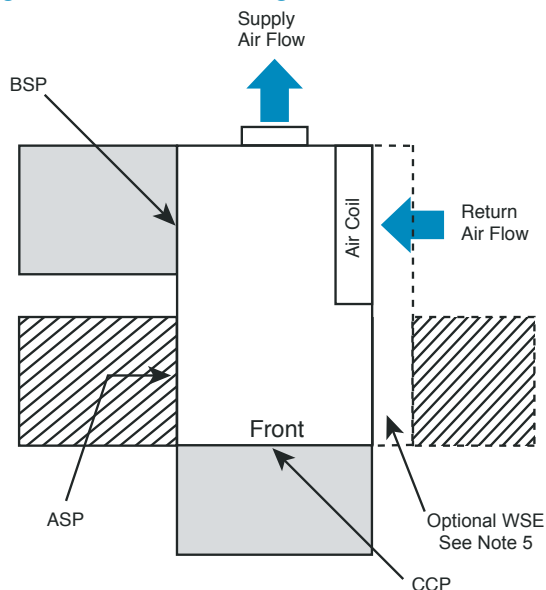
1. While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
2. Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.
3. Discharge flange and hanger brackets are factory installed.
4. Condensate drains are 3/4" MPT.
5. Blower service panel requires 2' service access.
6. Blower service access is through back panel on straight discharge units or through panel opposite air coil on back discharge units.
7. Filters same size as standard unit.
8. Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect moxex.
9. WSE to unit piping to be field fabricated. Run below or in front. Must leave room to remove front access panel (CCP) to service unit.
10. External trap and vent both drains before joining.
11. Refer to Discharge Air connection dimensions.

## TC: Horizontal Service Access

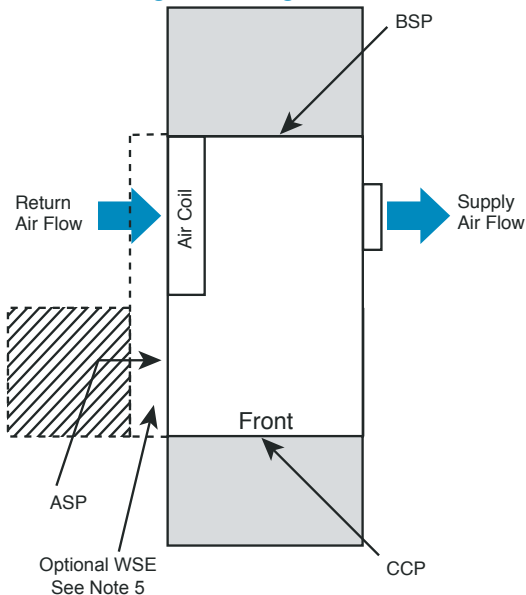
**Left Return Back Discharge**



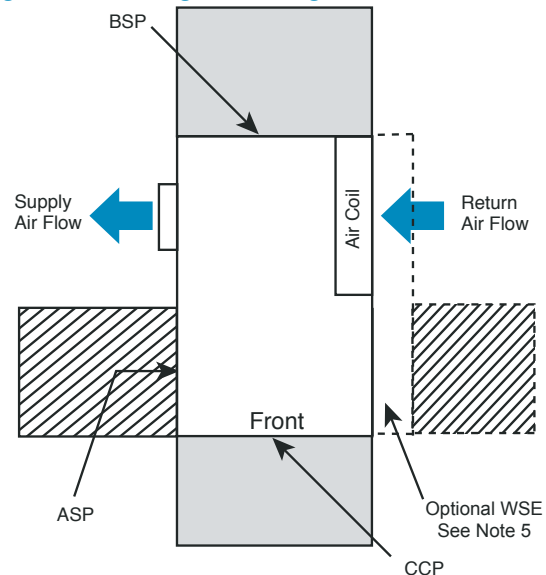
**Right Return Back Discharge**



**Left Return Straight Discharge**





**Right Return Straight Discharge**



**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.
5. Units with WSE must have access to water valve through side access panel.

-  = mandatory 2' service access
-  = (optional) additional 2' service access

**Legend:**

- CCP = Control/Compressor Access Panel
- BSP = Blower Service Panel
- ASP = Additional Service Panel (not required)
- WSE = Waterside Economizer

## Tranquility® Compact (TC) Series

Rev.: January 24, 2023

### TC: Vertical Upflow – Dimensional Data

| Vertical Upflow Model |    | Overall Cabinet |         |          |
|-----------------------|----|-----------------|---------|----------|
|                       |    | A Width         | B Depth | C Height |
| 006 - 012             | in | 19.1            | 19.1    | 22.0     |
|                       | cm | 48.5            | 48.5    | 55.9     |
| 015 - 030, 041        | in | 21.5            | 21.5    | 40.0     |
|                       | cm | 54.6            | 54.6    | 101.6    |
| 036 - 042             | in | 21.5            | 26.0    | 45.0     |
|                       | cm | 54.6            | 66.0    | 114.3    |
| 048 - 060             | in | 24.0            | 32.5    | 46.0     |
|                       | cm | 61.0            | 82.6    | 116.8    |

| Vertical Model |    | Electrical Knockouts |              |
|----------------|----|----------------------|--------------|
|                |    | J 1/2"               | K 3/4"       |
|                |    | Low Voltage          | Power Supply |
| 006 - 012      | in | 5.9                  | 8.9          |
|                | cm | 14.9                 | 22.5         |
| 015 - 060      | in | 7.1                  | 10.1         |
|                | cm | 18.1                 | 25.7         |
| 041            | in | 7.1                  | 11.1         |
|                | cm | 18.0                 | 28.2         |

| Vertical Upflow Model |    | Water Connections - Standard Units |           |            |            |      |     |                 |
|-----------------------|----|------------------------------------|-----------|------------|------------|------|-----|-----------------|
|                       |    | ①                                  |           | ②          |            | ③    |     | Loop In/Out FPT |
|                       |    | Loop In D                          | Loop In E | Loop Out F | Loop Out G | H    | I   |                 |
| 006 - 012             | in | 1.5                                | 1.5       | 9.5        | 1.5        | 11.7 | 1.4 | 1/2"            |
|                       | cm | 3.8                                | 3.8       | 24.1       | 3.8        | 29.7 | 3.6 |                 |
| 015                   | in | 1.9                                | 1.4       | 13.8       | 1.4        | 19.7 | 1.4 | 1/2"            |
|                       | cm | 4.8                                | 3.6       | 35.1       | 3.6        | 50.0 | 3.6 |                 |
| 018                   | in | 1.9                                | 1.4       | 13.8       | 1.4        | 19.7 | 1.4 | 1/2"            |
|                       | cm | 4.8                                | 3.6       | 35.1       | 3.6        | 50.0 | 3.6 |                 |
| 024                   | in | 1.9                                | 1.4       | 13.8       | 1.4        | 19.7 | 1.4 | 3/4"            |
|                       | cm | 4.8                                | 3.6       | 35.1       | 3.6        | 50.0 | 3.6 |                 |
| 030                   | in | 1.9                                | 1.4       | 15.2       | 1.4        | 19.7 | 1.4 | 3/4"            |
|                       | cm | 4.8                                | 3.6       | 38.6       | 3.6        | 50.0 | 3.6 |                 |
| 036                   | in | 1.9                                | 1.4       | 15.2       | 1.4        | 20.6 | 1.4 | 3/4"            |
|                       | cm | 4.8                                | 3.6       | 38.6       | 3.6        | 52.3 | 3.6 |                 |
| 041                   | in | 3.6                                | 2.3       | 14.0       | 2.3        | 18.3 | 2.3 | 3/4"            |
|                       | cm | 4.8                                | 5.8       | 35.6       | 5.8        | 46.5 | 5.8 |                 |
| 042                   | in | 1.9                                | 1.4       | 16.6       | 1.4        | 20.6 | 1.4 | 3/4"            |
|                       | cm | 4.8                                | 3.6       | 42.0       | 3.6        | 52.3 | 3.6 |                 |
| 048                   | in | 2.0                                | 1.4       | 16.9       | 1.4        | 21.6 | 1.4 | 1"              |
|                       | cm | 5.1                                | 3.6       | 42.9       | 3.6        | 54.9 | 3.6 |                 |
| 060                   | in | 2.0                                | 1.4       | 17.4       | 1.4        | 21.6 | 1.4 | 1"              |
|                       | cm | 5.1                                | 3.6       | 44.2       | 3.6        | 54.9 | 3.6 |                 |

**Notes:**

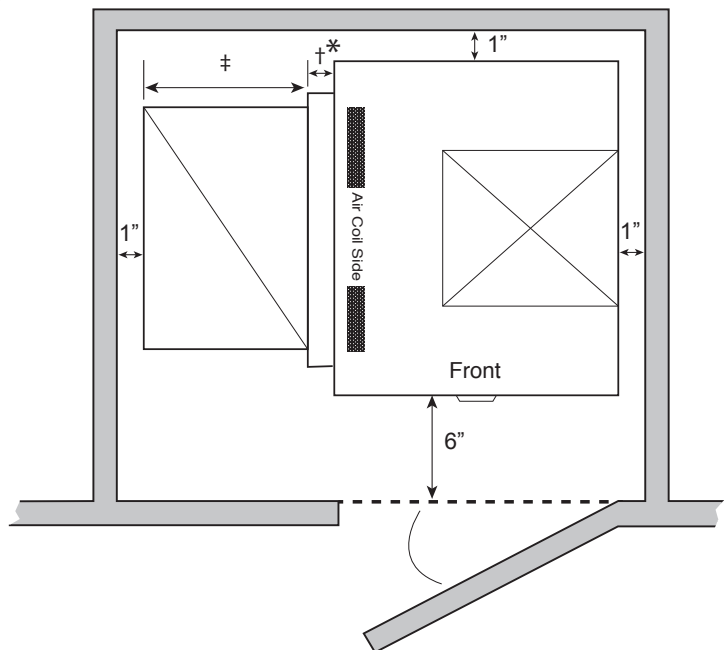
- While clear access to all removable panels is not required, installer should take care to comply with all building codes and allow adequate clearance for future field service.
- Front & Side access is preferred for service access. However, all components may be serviced from the front access panel if side access is not available. (Except on TCV 009-030 and 041 with front return) Units with the front return require left side access for the fan.
- Discharge flange is field installed.
- Condensate fitting on Polymer drain pan is rubber coupling that couples to 3/4" schedule 40/80 PVC, S.S. drain pan is 3/4" MPT.
- Units are shipped with air filter rails that are not suitable for supporting return air ductwork. An air filter frame with duct mounting collar is available as an accessory, see the ClimateMaster Accessory Submittal set for further information on this frame.

**Legend:**

- CCP = Control/Compressor Access Panel
- BSP = Blower Service Panel
- ASP = Alternative Service Panel

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

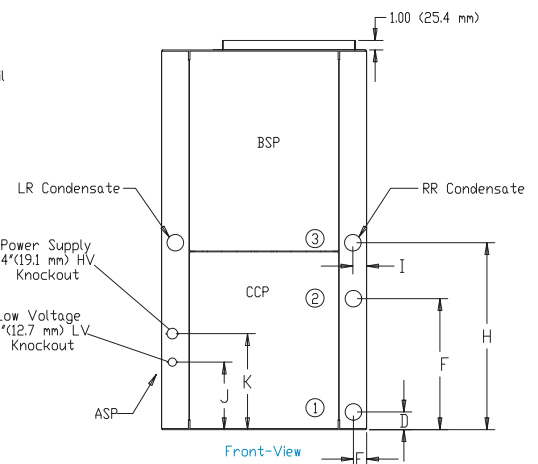
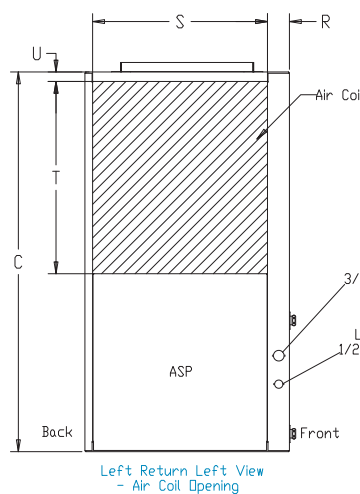
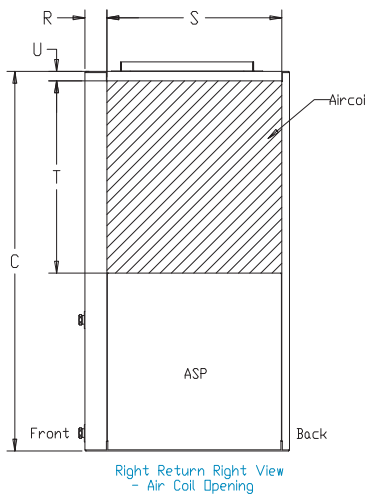
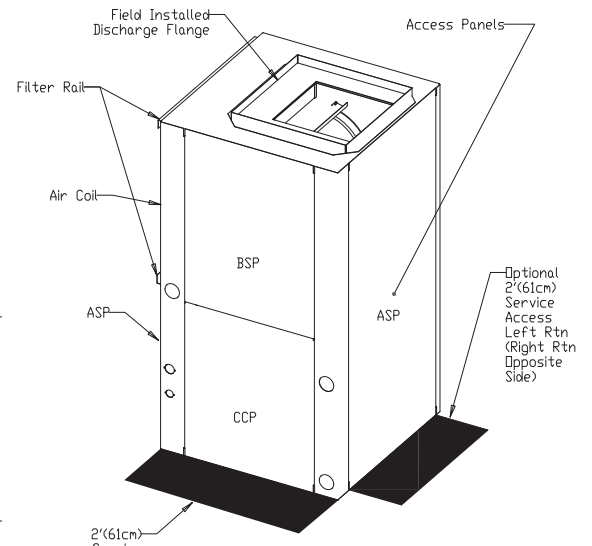
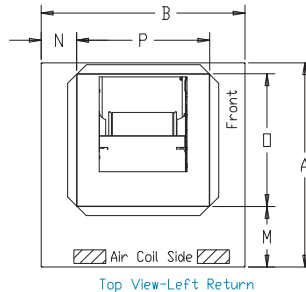
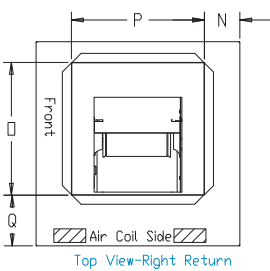
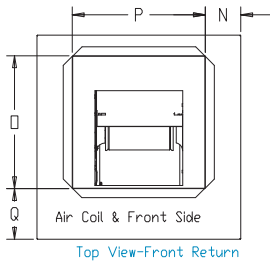
\* Field installed accessories (hoses, air cleaners, etc.) and factory WSE option will require additional space. Top supply air is shown, the same clearances apply to bottom supply air units.



TCV: Vertical Upflow – Dimensional Data, Cont'd.

| Vertical Model |          | Discharge Connection<br>Duct Flange Installed (+/- 0.10 in, +/- 2.5mm) |             |                   |                   |             | Return Connection<br>Using Return Air Opening |                   |                    |              |
|----------------|----------|--|-------------|-------------------|-------------------|-------------|---|-------------------|--------------------|--------------|
|                |          | M  | N           | O<br>Supply Width | P<br>Supply Depth | Q           | R   | S<br>Return Depth | T<br>Return Height | U            |
|                |          | 006 - 012  | in<br>cm    | 8.9<br>22.7       | 5.1<br>12.9       | 9.0<br>22.9 | 9.0<br>22.9                                   | 5.5<br>14.0       | 2.1<br>5.3         | 16.2<br>41.1 |
| 015 - 018      | in<br>cm | 6.4<br>16.1  | 3.8<br>9.5  | 14.0<br>35.6      | 14.0<br>35.6      | 5.3<br>13.6 | 2.3<br>5.8                                    | 18.3<br>46.5      | 20.9<br>53.1       | 0.7<br>1.9   |
| 024 - 030      | in<br>cm | 6.4<br>16.3  | 5.0<br>12.7 | 14.0<br>35.6      | 14.0<br>35.6      | 5.8<br>14.7 | 2.0<br>5.1                                    | 18.5<br>47.0      | 19.3<br>49.0       | 0.9<br>2.3   |
| 036 - 042      | in<br>cm | 6.4<br>16.1  | 3.8<br>9.5  | 14.0<br>35.6      | 14.0<br>35.6      | 5.1<br>13.1 | 2.3<br>5.8                                    | 22.8<br>57.9      | 23.9<br>60.7       | 0.7<br>1.9   |
| 048 - 060      | in<br>cm | 6.9<br>17.4  | 7.3<br>18.4 | 16.0<br>40.6      | 18.0<br>45.7      | 5.1<br>13.1 | 2.3<br>5.8                                    | 29.3<br>74.4      | 22.5<br>57.0       | 0.7<br>1.9   |

Front Return - N = 4.8 in (12.2 cm), Q = 6.4 in (16.3 cm).  
 Right Return - N = 3.8 in (9.7 cm), Q = 5.5 in (14.0 cm).  
 Left Return - M = 6.4 in (16.3 cm), N = 2.8 in (7.1 cm).



Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.

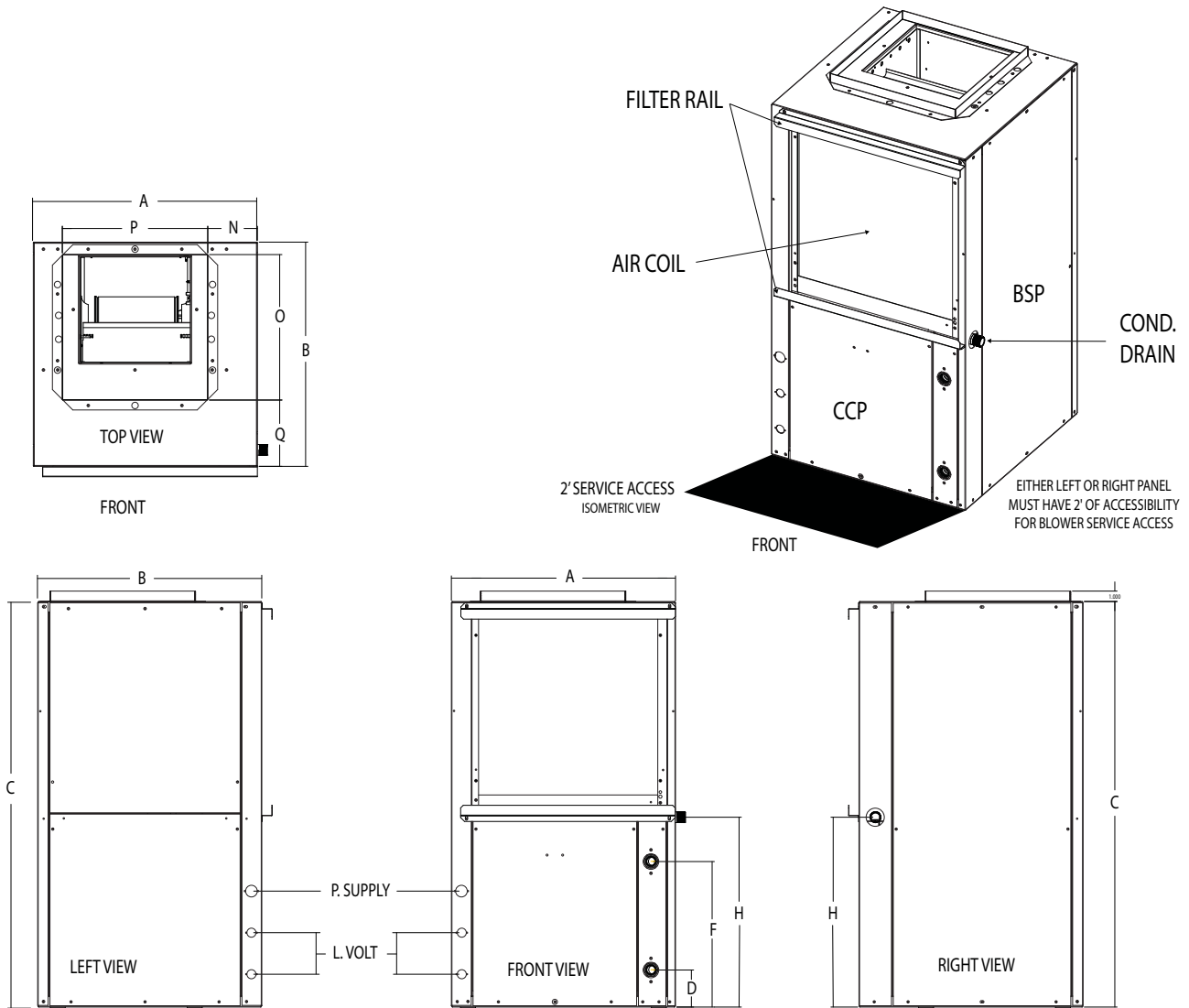
Tranquility® Compact (TC) Series

Rev.: January 24, 2023

TC: Front Return Vertical Upflow – Dimensional Data

| Vertical Model |    | Overall Cabinet |         |          | Water Connection - Front Return Units |             |               | Top Discharge Connection Duct Flange Installed (+/- 0.10 in, +/- 2.5mm) |                |                |      |
|----------------|----|-----------------|---------|----------|---------------------------------------|-------------|---------------|---|----------------|----------------|------|
|                |    | A Width         | B Depth | C Height | D Water In                            | F Water Out | H Cond. Drain | N   | O Supply Width | P Supply Depth | Q    |
| 009 - 012      | in | 19.1            | 19.0    | 22.0     | 1.6                                   | 9.6         | 11.5          | 5.1   | 9.0            | 9.0            | 6.0  |
|                | cm | 48.5            | 48.3    | 55.9     | 4.1                                   | 24.4        | 29.2          | 12.9  | 22.9           | 22.9           | 15.2 |
| 015 - 018      | in | 21.6            | 21.5    | 40.0     | 1.9                                   | 13.8        | 19.7          | 3.8   | 14.0           | 14.0           | 5.4  |
|                | cm | 54.9            | 54.6    | 101.6    | 4.8                                   | 35.1        | 50.0          | 9.5   | 35.6           | 35.6           | 13.7 |
| 024            | in | 21.6            | 21.5    | 40.0     | 1.9                                   | 13.8        | 19.7          | 3.8   | 14.0           | 14.0           | 5.4  |
|                | cm | 54.9            | 54.6    | 101.6    | 4.8                                   | 35.1        | 50.0          | 12.7  | 35.6           | 35.6           | 14.7 |
| 030            | in | 21.6            | 21.5    | 40.0     | 1.9                                   | 15.2        | 19.7          | 3.8   | 14.0           | 14.0           | 5.4  |
|                | cm | 54.9            | 54.6    | 101.6    | 4.8                                   | 38.6        | 50.0          | 12.7  | 35.6           | 35.6           | 14.7 |
| 041            | in | 21.6            | 21.6    | 39.0     | 3.6                                   | 14.0        | 18.3          | 4.8   | 14.0           | 14.0           | 6.4  |
|                | cm | 54.9            | 54.9    | 99.1     | 9.1                                   | 35.6        | 46.5          | 9.5   | 35.6           | 35.6           | 13.0 |

\* For Air Coil and Filter Dimensions see the physical data table.  
See electrical knockout table for details on low and high voltage power connection dimensions.

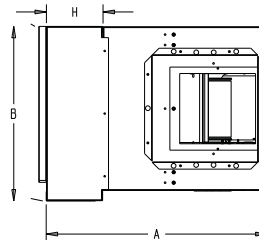
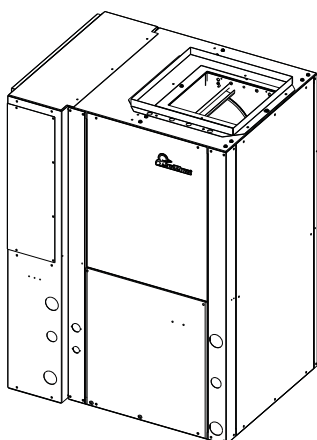


Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.

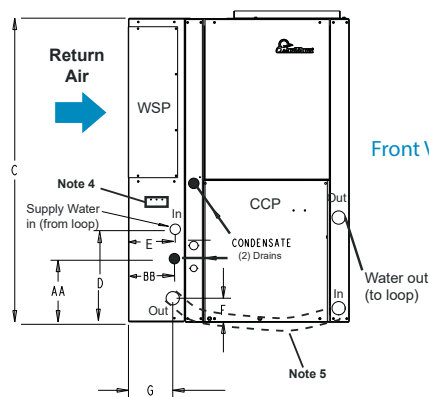
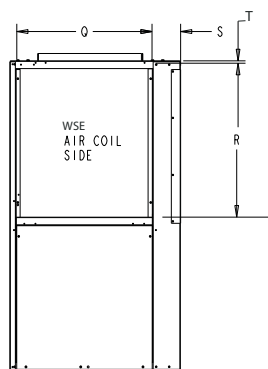
## TCV with Left Hand Waterside Economizer – Dimensional Data

| Vertical Model | Overall Cabinet |             |             | WSE   | WSE Connections |      |      |     |      |                | Return Connection Using Return Air Opening |                  |                   |                    |      |     |
|----------------|-----------------|-------------|-------------|-------|-----------------|------|------|-----|------|----------------|--|------------------|-------------------|--------------------|------|-----|
|                | A<br>Width      | B<br>Length | C<br>Height |       | H<br>Width      | In   |      | Out |      | Cond. 3/4" MPT |  | Water In/Out FPT | Q<br>Return Width | R<br>Return Height | S    | T   |
|                |                 |             |             |       |                 | D    | E    | F   | G    | AA             | BB   |                  |                   |                    |      |     |
| 006-012        | in              | 26.1        | 21.2        | 22.0  | 7.1             | 8.1  | 5.5  | 2.1 | 5.5  | 5.1            | 5.5  | 1/2"             | 16.1              | 10.0               | 4.2  | 0.4 |
|                | cm              | 66.3        | 53.8        | 55.9  | 18.0            | 20.6 | 14.0 | 5.3 | 14.0 | 13.0           | 14.0                                       |                  | 40.9              | 25.4               | 10.7 | 1.0 |
| 015-030        | in              | 29.0        | 24.7        | 40.0  | 7.4             | 11.6 | 6.0  | 2.6 | 6.0  | 7.1            | 6.0  | 3/4"             | 18.1              | 20.0               | 3.8  | 0.3 |
|                | cm              | 73.7        | 62.7        | 101.6 | 18.8            | 29.5 | 15.2 | 6.6 | 15.2 | 18.0           | 15.2                                       |                  | 46.0              | 50.8               | 9.7  | 0.8 |
| 036-042        | in              | 29.0        | 28.7        | 45.0  | 7.4             | 12.1 | 6.0  | 2.6 | 6.0  | 7.1            | 6.0  | 3/4"             | 22.7              | 24.0               | 4.6  | 0.1 |
|                | cm              | 73.7        | 72.9        | 114.3 | 18.8            | 29.5 | 15.2 | 6.6 | 15.2 | 18.0           | 15.2                                       |                  | 57.7              | 61.0               | 11.7 | 0.3 |
| 048-060        | in              | 31.2        | 37.2        | 46.0  | 7.0             | 12.1 | 5.8  | 3.1 | 5.8  | 7.1            | 5.8  | 3/4"             | 29.3              | 24.0               | 5.0  | 0.1 |
|                | cm              | 79.2        | 94.5        | 116.8 | 17.8            | 30.7 | 14.7 | 7.9 | 14.7 | 18.0           | 14.7                                       |                  | 74.4              | 61.0               | 12.7 | 0.3 |

### Left Return with WSE



Top View



Front View Left Return

### Notes:

- Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.
- WSE condensate drain is 3/4" FPT, Unit condensate drain is 3/4" MPT. Externally trap and vent both drains before joining.
- Filters same size as standard unit.
- Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect molex.
- WSE to unit piping to be field fabricated, run below or in front. Must leave room to remove front access panel (CCP) to service unit.
- Refer to Discharge Air connection dimensions.

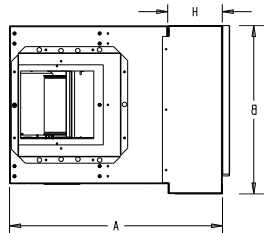
Tranquility® Compact (TC) Series

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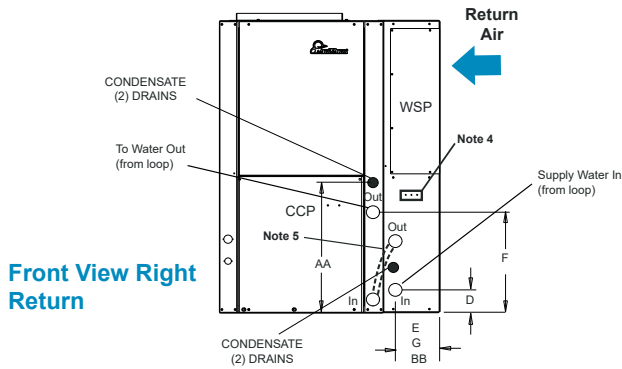
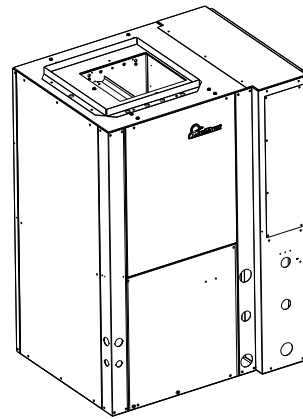
TCV with Right Hand Waterside Economizer – Dimensional Data

| Vertical Model |    | Overall Cabinet |             |             | WSE  | WSE Connections |      |      |      |      |                | Return Connection Using Return Air Opening |                  |                   |                    |     |
|----------------|----|-----------------|-------------|-------------|------|-----------------|------|------|------|------|----------------|--|------------------|-------------------|--------------------|-----|
|                |    | A<br>Width      | B<br>Length | C<br>Height |      | H<br>Width      | In   |      | Out  |      | Cond. 3/4" MPT |  | Water In/Out FPT | Q<br>Return Width | R<br>Return Height | S   |
|                |    |                 |             |             | D    |                 | E    | F    | G    | AA   | BB             |  |                  |                   |                    |     |
| 006-012        | in | 26.1            | 21.2        | 22.0        | 7.1  | 2.1             | 5.5  | 8.1  | 5.5  | 5.1  | 5.5            | 1/2"                                       | 16.1             | 10.0              | 4.2                | 0.4 |
|                | cm | 66.3            | 53.8        | 55.9        | 18.0 | 5.3             | 14.0 | 20.6 | 14.0 | 13.0 | 14.0           |  | 40.9             | 25.4              | 10.7               | 1.0 |
| 015-030        | in | 29.0            | 24.7        | 40.0        | 7.4  | 2.6             | 6.0  | 11.6 | 6.0  | 7.1  | 6.0            | 3/4"                                       | 18.1             | 20.0              | 3.8                | 0.3 |
|                | cm | 73.7            | 62.7        | 101.6       | 18.8 | 6.6             | 15.2 | 29.5 | 15.2 | 18.0 | 15.2           |  | 46.0             | 50.8              | 9.7                | 0.8 |
| 036-042        | in | 29.0            | 28.7        | 45.0        | 7.4  | 2.6             | 6.0  | 12.1 | 6.0  | 7.1  | 6.0            | 3/4"                                       | 22.7             | 24.0              | 4.6                | 0.1 |
|                | cm | 73.7            | 72.9        | 114.3       | 18.8 | 6.6             | 15.2 | 29.5 | 15.2 | 18.0 | 15.2           |  | 57.7             | 61.0              | 11.7               | 0.3 |
| 048-060        | in | 31.2            | 37.2        | 46.0        | 7.0  | 3.1             | 5.8  | 12.1 | 5.8  | 7.1  | 5.8            | 3/4"                                       | 29.3             | 24.0              | 5.0                | 0.1 |
|                | cm | 79.2            | 94.5        | 116.8       | 17.8 | 7.9             | 14.7 | 30.7 | 14.7 | 18.0 | 14.7           |  | 74.4             | 61.0              | 12.7               | 0.3 |

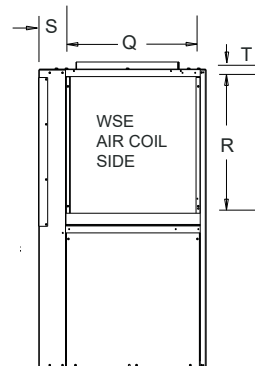
Right Return with WSE



Top View



Front View Right Return



Notes:

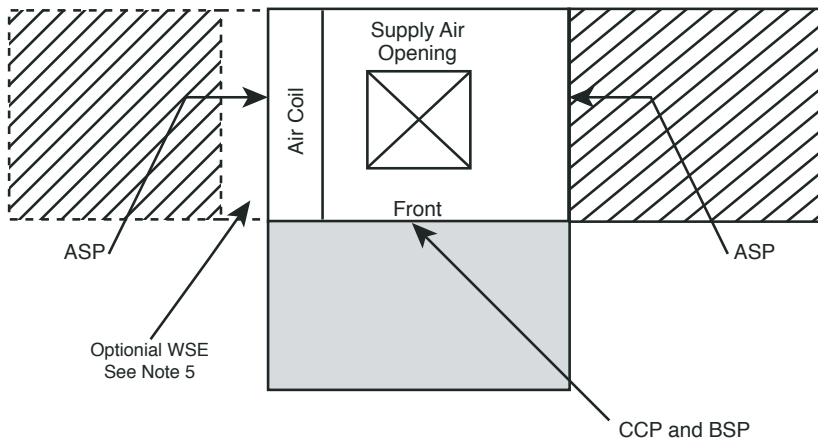
- Units are shipped with either filter rails or filter frames depending on unit model. Air filter rails are not suitable for supporting return air duct. Air filter frames are provided with a duct mounting collar for connection to return air duct.
- WSE condensate drain is 3/4" FPT. Unit condensate drain is 3/4" MPT. Externally trap and vent both drains before joining.
- Filters same size as standard unit.
- Factory supplied controller (aquastat) is shipped inside unit. Open waterside economizer panel (WSP), remove, slide onto dinrail, and connect molex.
- WSE to unit piping to be field fabricated below or in front. Must leave room to remove front access panel (CCP) to service unit.
- Refer to Discharge Air connection dimensions.



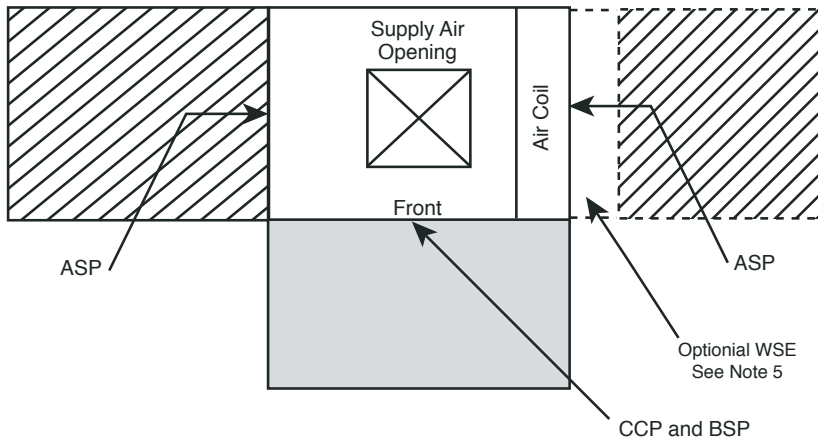
## TC: Vertical Service Access

### 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, units without WSE option 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. Front return units (not shown) require front access for controls/compressor and left side access for blower.
5. Units with WSE Must have access to water valve through side access panel.

-  = mandatory 2' service access
-  = (optional) additional 2' service access

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

Tranquility® Compact (TC) Series

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Electrical Data: Standard Unit

Table 4: Electrical Data - Standard Units

| MODEL | VOLTAGE CODE | RATED VOLTAGE    | VOLTAGE MIN/MAX | COMPRESSOR |      |       | FAN MOTOR FLA | TOTAL UNIT FLA | MIN CIRCUIT AMP | MAX FUSE/HACR | SCCR kA rms symmetrical | SCCR Volts Maximum |
|-------|--------------|------------------|-----------------|------------|------|-------|---------------|----------------|-----------------|---------------|-------------------------|--------------------|
|       |              |                  |                 | QTY        | RLA  | LRA   |               |                |                 |               |                         |                    |
| 006   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 2.6  | 17.7  | 0.3           | 2.9            | 3.6             | 15            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 2.6  | 13.5  | 0.4           | 3.0            | 3.6             | 15            | 5                       | 600                |
| 009   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 3.7  | 22    | 0.8           | 4.5            | 5.5             | 15            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 3.4  | 17.5  | 0.8           | 4.2            | 5.1             | 15            | 5                       | 600                |
| 012   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 5.6  | 32.5  | 0.8           | 6.4            | 7.8             | 15            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 4.2  | 31.5  | 0.8           | 5.0            | 6.1             | 15            | 5                       | 600                |
| 015   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 5.6  | 29.0  | 0.9           | 6.5            | 7.9             | 15            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 5.0  | 28.0  | 0.7           | 5.7            | 7.0             | 15            | 5                       | 600                |
| 018   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 7.4  | 33.0  | 0.9           | 8.3            | 10.2            | 15            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 6.0  | 28.0  | 0.7           | 6.7            | 8.2             | 15            | 5                       | 600                |
| 024   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 12.8 | 58.3  | 1.5           | 14.3           | 17.5            | 30            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 9.6  | 54.0  | 1.2           | 10.8           | 13.2            | 20            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 3.6  | 28.0  | 1.4           | 5.0            | 5.9             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 7.7  | 55.4  | 1.5           | 9.2            | 11.1            | 15            | 5                       | 600                |
| 030   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 14.1 | 73.0  | 2.7           | 16.8           | 20.3            | 30            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 11.2 | 60.0  | 2.9           | 14.1           | 16.9            | 25            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 4.2  | 28.0  | 1.6           | 5.8            | 6.9             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 8.9  | 58.0  | 2.7           | 11.6           | 13.8            | 20            | 5                       | 600                |
| 036   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 16.7 | 79.0  | 2.7           | 19.4           | 23.5            | 40            | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5   | 1          | 13.5 | 72.0  | 2.0           | 15.5           | 18.9            | 30            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 5.8  | 38.0  | 1.2           | 7.0            | 8.5             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 10.4 | 73.0  | 2.7           | 13.1           | 15.7            | 25            | 5                       | 600                |
| 041*  | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 17.9 | 112.0 | 2.7           | 20.6           | 25.1            | 40            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 6.0  | 44.0  | 1.6           | 7.6            | 9.1             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 13.2 | 88.0  | 2.7           | 15.9           | 19.2            | 30            | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5   | 1          | 4.2  | 30.0  | 1.4           | 5.6            | 6.7             | 15            | 5                       | 600                |
| 042   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 17.9 | 112.0 | 2.7           | 20.6           | 25.1            | 40            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 6.0  | 44.0  | 1.6           | 7.6            | 9.1             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 13.5 | 88.0  | 2.7           | 16.2           | 19.6            | 30            | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5   | 1          | 4.9  | 34.0  | 1.4           | 6.3            | 7.5             | 15            | 5                       | 600                |
| 048   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 21.8 | 117.0 | 3.3           | 25.1           | 30.6            | 50            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 6.2  | 41.0  | 1.7           | 7.9            | 9.5             | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 13.7 | 83.1  | 3.3           | 17.0           | 20.4            | 30            | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5   | 1          | 4.8  | 33.0  | 1.4           | 6.2            | 7.4             | 15            | 5                       | 600                |
| 060   | G            | 208-230 / 60 / 1 | 187.2 / 253     | 1          | 26.3 | 134.0 | 4.8           | 31.1           | 37.7            | 60            | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506       | 1          | 7.8  | 52.0  | 2.4           | 10.2           | 12.2            | 15            | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253     | 1          | 15.6 | 110.0 | 4.8           | 20.4           | 24.3            | 40            | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5   | 1          | 5.8  | 38.9  | 1.8           | 7.6            | 9.1             | 15            | 5                       | 600                |

\* 460 volt units require a neutral connection.  
 All "F" voltage units with Constant Volume (CV) ECM require a four wire power supply with neutral.  
 Motors are 265 volt and are wired between one hot leg and neutral.  
 All fuses Class RK-5

### Electrical Data: High Static Blower

| MODEL | VOLTAGE CODE | RATED VOLTAGE    | VOLTAGE MIN/ MAX | COMPRESSOR |      |       | FAN MOTOR FLA | TOTAL UNIT FLA | MIN CIRCUIT AMP | MAX FUSE/ HACR | SCCR kA rms symmetrical | SCCR Volts Maximum |
|-------|--------------|------------------|------------------|------------|------|-------|---------------|----------------|-----------------|----------------|-------------------------|--------------------|
|       |              |                  |                  | QTY        | RLA  | LRA   |               |                |                 |                |                         |                    |
| 015   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 5.6  | 29.0  | 0.9           | 6.5            | 7.9             | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 5.0  | 28.0  | 0.7           | 5.7            | 7.0             | 15             | 5                       | 600                |
| 018   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 7.4  | 33.0  | 0.9           | 8.3            | 10.2            | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 6.0  | 28.0  | 0.7           | 6.7            | 8.2             | 15             | 5                       | 600                |
| 024   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 12.8 | 58.3  | 2.7           | 15.5           | 18.7            | 30             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 9.6  | 54.0  | 2.9           | 12.5           | 14.9            | 20             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 3.6  | 28.0  | 1.6           | 5.2            | 6.1             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 7.7  | 55.4  | 2.7           | 10.4           | 12.3            | 20             | 5                       | 600                |
| 030   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 14.1 | 73.0  | 2.7           | 16.8           | 20.3            | 30             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 11.2 | 60.0  | 2.9           | 14.1           | 16.9            | 25             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 4.2  | 28.0  | 1.6           | 5.8            | 6.9             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 8.9  | 58.0  | 2.7           | 11.6           | 13.8            | 20             | 5                       | 600                |
| 036   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 16.7 | 79.0  | 2.7           | 19.4           | 23.6            | 40             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 13.5 | 72.0  | 2.9           | 16.4           | 19.8            | 30             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 5.8  | 38.0  | 1.6           | 7.4            | 8.9             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 10.4 | 73.0  | 2.7           | 13.1           | 15.7            | 25             | 5                       | 600                |
| 042   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 17.9 | 112.0 | 2.7           | 20.6           | 25.1            | 40             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 6.0  | 44.0  | 1.6           | 7.6            | 9.1             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.5 | 88.0  | 2.7           | 16.2           | 19.6            | 30             | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5    | 1          | 4.9  | 34.0  | 1.4           | 6.3            | 7.5             | 15             | 5                       | 600                |
| 048   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 21.8 | 117.0 | 4.8           | 26.6           | 32.1            | 50             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 6.2  | 41.0  | 2.4           | 8.6            | 10.2            | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.7 | 83.1  | 4.8           | 18.5           | 21.9            | 35             | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5    | 1          | 4.8  | 33.0  | 1.8           | 6.6            | 7.8             | 15             | 5                       | 600                |
| 060   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 26.3 | 134.0 | 5.7           | 32.0           | 38.6            | 60             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 7.8  | 52.0  | 2.5           | 10.3           | 12.3            | 20             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 15.6 | 110.0 | 5.7           | 21.3           | 25.2            | 40             | 5                       | 600                |
|       | N            | 575 / 60 / 3     | 517.5 / 632.5    | 1          | 5.8  | 38.9  | 1.9           | 7.7            | 9.2             | 15             | 5                       | 600                |

\* 460 volt units require a neutral connection.  
 All "F" voltage units with Constant Volume (CV) ECM require a four wire power supply with neutral.  
 Motors are 265 volt and are wired between one hot leg and neutral.  
 All fuses Class RK-5

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Electrical Data: Constant Torque (CT) ECM

| MODEL | VOLTAGE CODE | RATED VOLTAGE    | VOLTAGE MIN/ MAX | COMPRESSOR |      |       | FAN MOTOR FLA | TOTAL UNIT FLA | MIN CIRCUIT AMP | MAX FUSE/ HACR | SCCR kA rms symmetrical | SCCR Volts Maximum |
|-------|--------------|------------------|------------------|------------|------|-------|---------------|----------------|-----------------|----------------|-------------------------|--------------------|
|       |              |                  |                  | QTY        | RLA  | LRA   |               |                |                 |                |                         |                    |
| 006   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 2.6  | 17.7  | 2.3           | 4.9            | 5.6             | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 2.6  | 13.5  | 2.3           | 4.9            | 5.6             | 15             | 5                       | 600                |
| 009   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 3.7  | 22.2  | 2.3           | 6.0            | 6.9             | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 3.4  | 18.8  | 2.3           | 5.7            | 6.6             | 15             | 5                       | 600                |
| 012   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 5.6  | 32.5  | 2.3           | 7.9            | 9.3             | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 4.2  | 31.5  | 2.3           | 6.5            | 7.6             | 15             | 5                       | 600                |
| 015   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 5.6  | 29.0  | 2.6           | 8.2            | 9.6             | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 5.0  | 28.0  | 1.9           | 6.9            | 8.2             | 15             | 5                       | 600                |
| 018   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 7.4  | 33.0  | 2.6           | 10.0           | 11.9            | 15             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 6.0  | 28.0  | 1.9           | 7.9            | 9.4             | 15             | 5                       | 600                |
| 024   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 12.8 | 58.3  | 3.9           | 16.7           | 19.9            | 30             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 9.6  | 54.0  | 3.2           | 12.8           | 15.2            | 20             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 3.6  | 28.0  | 1.1           | 4.7            | 5.6             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 7.7  | 55.4  | 3.9           | 11.6           | 13.5            | 20             | 5                       | 600                |
| 030   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 14.1 | 73.0  | 3.9           | 18.0           | 21.5            | 35             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 11.2 | 60.0  | 3.2           | 14.4           | 17.2            | 25             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 4.2  | 28.0  | 1.1           | 5.3            | 6.4             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 8.9  | 58.0  | 3.9           | 12.8           | 15.0            | 20             | 5                       | 600                |
| 036   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 16.7 | 79.0  | 6.0           | 22.7           | 26.9            | 40             | 5                       | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 13.5 | 72.0  | 3.9           | 17.4           | 20.8            | 30             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 5.8  | 38.0  | 1.5           | 7.3            | 8.8             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 10.4 | 73.0  | 6.0           | 16.4           | 19.0            | 25             | 5                       | 600                |
| 042   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 17.9 | 112.0 | 6.0           | 23.9           | 28.4            | 45             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 6.0  | 44.0  | 1.5           | 7.5            | 9.0             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.5 | 88.0  | 6.0           | 19.5           | 22.9            | 35             | 5                       | 600                |
| 048   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 21.8 | 117.0 | 7.5           | 29.3           | 34.8            | 50             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 6.2  | 41.0  | 2.1           | 8.3            | 9.9             | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.7 | 83.1  | 7.5           | 21.2           | 24.6            | 35             | 5                       | 600                |
| 060   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 26.3 | 134.0 | 7.5           | 33.8           | 40.4            | 60             | 5                       | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 7.8  | 52.0  | 2.1           | 9.9            | 11.9            | 15             | 5                       | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 15.6 | 110.0 | 7.5           | 23.1           | 27.0            | 40             | 5                       | 600                |

\* 460 volt units require a neutral connection.  
 All "F" voltage units with Constant Volume (CV) ECM require a four wire power supply with neutral.  
 Motors are 265 volt and are wired between one hot leg and neutral.  
 All fuses Class RK-5

### Electrical Data: Constant Volume (CV) ECM

| MODEL | VOLTAGE CODE | RATED VOLTAGE    | VOLTAGE MIN/ MAX | COMPRESSOR |      |       | FAN MOTOR FLA | TOTAL UNIT FLA | MIN CIRCUIT AMP | MAX FUSE/ HACR | SCCR kA rms symetrical | SCCR Volts Maximum |
|-------|--------------|------------------|------------------|------------|------|-------|---------------|----------------|-----------------|----------------|------------------------|--------------------|
|       |              |                  |                  | QTY        | RLA  | LRA   |               |                |                 |                |                        |                    |
| 006   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 2.6  | 17.7  | 1.5           | 4.1            | 4.8             | 15             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 2.6  | 13.5  | 1.4           | 4.0            | 4.7             | 15             | 5                      | 600                |
| 009   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 3.7  | 22.2  | 1.5           | 5.2            | 6.1             | 15             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 3.4  | 18.8  | 1.4           | 4.8            | 5.7             | 15             | 5                      | 600                |
| 012   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 5.6  | 32.5  | 2.6           | 8.2            | 9.6             | 15             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 4.2  | 31.5  | 2.5           | 6.7            | 7.8             | 15             | 5                      | 600                |
| 015   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 5.6  | 29.0  | 2.6           | 8.2            | 9.6             | 15             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 5.0  | 28.0  | 2.4           | 7.4            | 8.7             | 15             | 5                      | 600                |
| 018   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 7.4  | 33.0  | 2.6           | 10.0           | 11.9            | 15             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 6.0  | 28.0  | 2.4           | 8.4            | 9.9             | 15             | 5                      | 600                |
| 024   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 12.8 | 58.3  | 3.9           | 16.7           | 19.9            | 30             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 9.6  | 54.0  | 3.2           | 12.8           | 15.2            | 20             | 5                      | 600                |
|       | *F           | 460 / 60 / 3     | 414 / 506        | 1          | 3.6  | 28.0  | 3.2           | 6.8            | 7.7             | 15             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 7.7  | 55.4  | 3.9           | 11.6           | 13.5            | 20             | 5                      | 600                |
| 030   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 14.1 | 73.0  | 3.9           | 18.0           | 21.5            | 35             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 11.2 | 60.0  | 3.2           | 14.4           | 17.2            | 25             | 5                      | 600                |
|       | *F           | 460 / 60 / 3     | 414 / 506        | 1          | 4.2  | 28.0  | 3.2           | 7.4            | 8.5             | 15             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 8.9  | 58.0  | 3.9           | 12.8           | 15.0            | 20             | 5                      | 600                |
| 036   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 16.7 | 79.0  | 6.0           | 22.7           | 26.9            | 40             | 5                      | 600                |
|       | E            | 265 / 60 / 1     | 238.5 / 291.5    | 1          | 13.5 | 72.0  | 4.8           | 18.3           | 21.7            | 35             | 5                      | 600                |
|       | *F           | 460 / 60 / 3     | 414 / 506        | 1          | 5.8  | 38.0  | 4.8           | 10.6           | 12.1            | 15             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 10.4 | 73.0  | 6.0           | 16.4           | 19.0            | 25             | 5                      | 600                |
| 042   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 17.9 | 112.0 | 6.0           | 23.9           | 28.4            | 45             | 5                      | 600                |
|       | F            | 460 / 60 / 3     | 414 / 506        | 1          | 6.0  | 44.0  | 4.8           | 10.8           | 12.3            | 15             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.5 | 88.0  | 6.0           | 19.5           | 22.9            | 35             | 5                      | 600                |
| 048   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 21.8 | 117.0 | 7.5           | 29.3           | 34.8            | 50             | 5                      | 600                |
|       | *F           | 460 / 60 / 3     | 414 / 506        | 1          | 6.2  | 41.0  | 6.2           | 12.4           | 14.0            | 15             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 13.7 | 83.1  | 7.5           | 21.2           | 24.6            | 35             | 5                      | 600                |
| 060   | G            | 208-230 / 60 / 1 | 187.2 / 253      | 1          | 26.3 | 134.0 | 7.5           | 33.8           | 40.4            | 60             | 5                      | 600                |
|       | *F           | 460 / 60 / 3     | 414 / 506        | 1          | 7.8  | 52.0  | 6.0           | 13.8           | 15.8            | 20             | 5                      | 600                |
|       | H            | 208-230 / 60 / 3 | 187.2 / 253      | 1          | 15.6 | 110.0 | 7.5           | 23.1           | 27.0            | 40             | 5                      | 600                |

\* 460 volt units require a neutral connection.  
 All "F" voltage units with Constant Volume (CV) ECM require a four wire power supply with neutral.  
 Motors are 265 volt and are wired between one hot leg and neutral.  
 All fuses Class RK-5

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Electrical: Line Voltage

**⚠ WARNING! ⚠**

**WARNING!** Disconnect electrical power source to prevent injury or death from electrical shock.

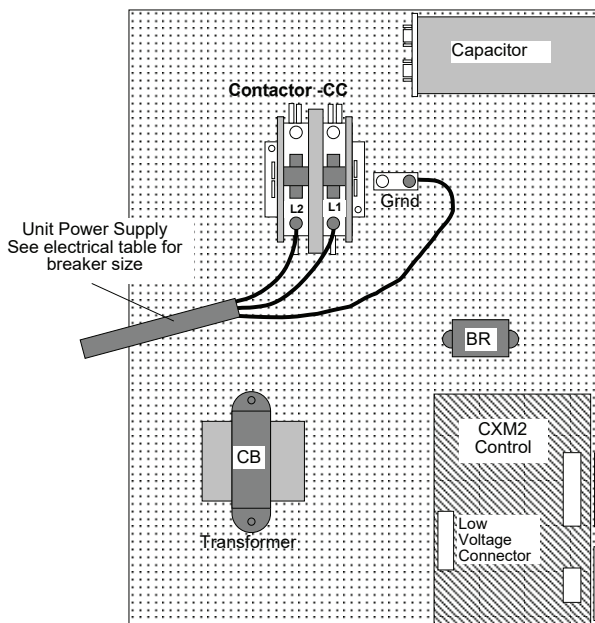
**⚠ CAUTION! ⚠**

**CAUTION!** Use only copper conductors for field installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

**Electrical - Line Voltage** - All field installed wiring, including electrical ground, must comply with the National Electrical Code as well as all applicable local codes. Refer to the unit electrical data for fuse sizes. Consult wiring diagram for field connections that must be made by the installing (or electrical) contractor. All final electrical connections must be made with a length of flexible conduit to minimize vibration and sound transmission to the building.

**General Line Voltage Wiring** - Be sure the available power is the same voltage and phase shown on the unit serial plate. Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

**Figure 14: Single Phase Line Voltage Field Wiring. Three phase wiring is similar except that all three power wires are directly connected to the contactor.**



**Note:** 460V units with Constant Volume (CV) ECM motor require a neutral wire.

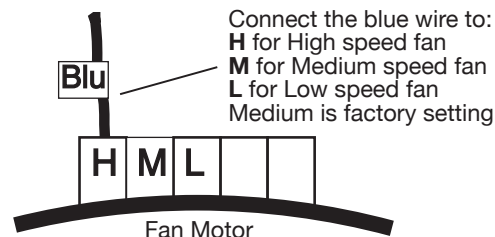
**Power Connection** - Line voltage connection is made by connecting the incoming line voltage wires to the “L” side of the contractor as shown in Figure 14. Consult electrical data tables for correct fuse size.

**Transformer** - All 208/230 voltage units are factory wired for 208 volt. If supply voltage is 230 volt, installer must rewire transformer. See wire diagram for connections.

**Blower Speed Selection** – Units with PSC Motor - PSC (Permanent Split Capacitor) blower fan speed can be changed by moving the blue wire on the fan motor terminal block to the desired speed as shown in Figure 15. Most ClimateMaster units are shipped on the medium speed tap. Consult submittal data or engineering design guide for specific unit airflow tables. Typical unit design delivers rated airflow at nominal static (0.15 in. w.g. [37Pa]) on medium speed and rated airflow at a higher static (0.4 to 0.5 in. w.g. [100 to 125 Pa]) on high speed for applications where higher static is required. Low speed will deliver approximately 85% of rated airflow at 0.10 in. w.g. [25 Pa]. An optional high static blower is available on some models.

**Special Note for AHRI Testing:** To achieve rated airflow for AHRI testing purposes on all PSC products, it is necessary to change the fan speed to “HI” speed. When the heat pump has experienced less than 100 operational hours and the coil has not had sufficient time to be “seasoned”, it is necessary to clean the coil with a mild surfactant such as Calgon to remove the oils left by manufacturing processes and enable the condensate to properly “sheet” off of the coil.

**Figure 15: PSC Motor Speed Selection**



## Electrical: Power & Low Voltage Wiring

### ELECTRICAL - LOW VOLTAGE WIRING

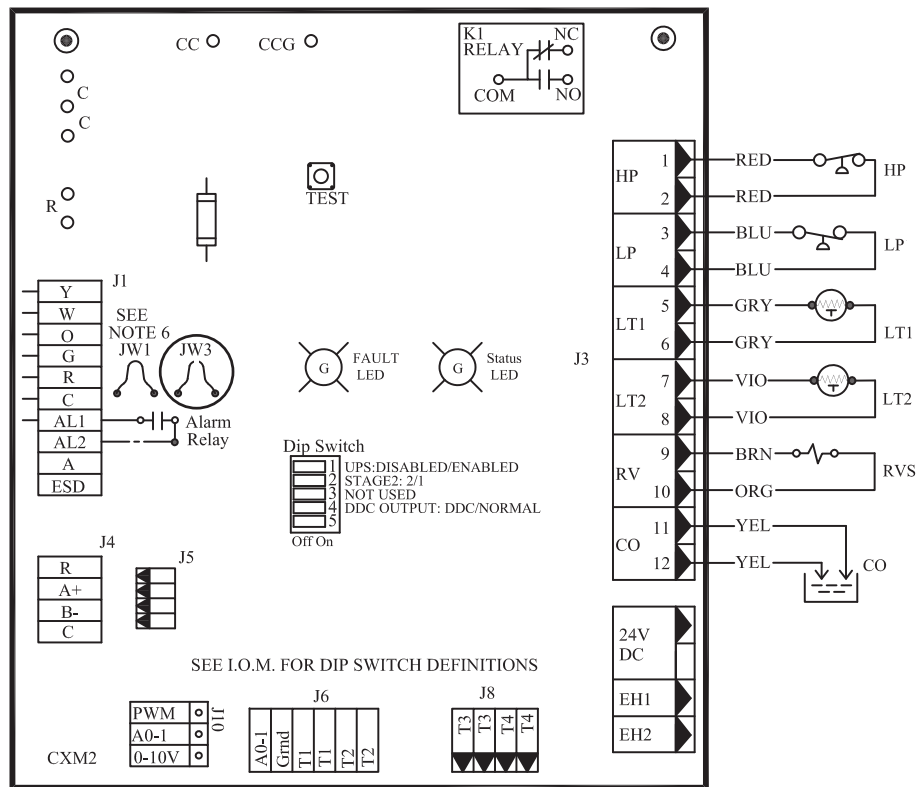
**Thermostat Connections** - The thermostat should be wired directly to the CXM2 or DXM2.5 board. See “Electrical – Thermostat” for specific terminal connections. Review the appropriate AOM (Application, Operation and Maintenance) manual for units with DDC controls.

**Low Water Temperature Cutout Selection** - The CXM2/DXM2.5 control allows the field selection of low water (or water-antifreeze solution) temperature limit by clipping jumper JW3, which changes the sensing temperature associated with thermistor LT1. Note that the LT1 thermistor is located on the refrigerant line between the coaxial heat exchanger and expansion device (TXV). Therefore, LT1 is sensing refrigerant temperature, not water temperature, which is a better indication of how water flow rate/temperature is affecting the refrigeration circuit.

The factory setting for LT1 is for systems using water (30°F [-1.1°C] refrigerant temperature). In low water temperature (extended range) applications with antifreeze (most ground loops), jumper JW3 should be clipped as shown in Figure 16 to change the setting to 10°F [-12.2°C] refrigerant temperature, a more suitable temperature when using an antifreeze solution. All ClimateMaster units operating with entering water temperatures below 60°F [15.6°C] must include the optional water/refrigerant circuit insulation package to prevent internal condensation.

**Models with Waterside Economizer** - Assemble controller to DIN rail connect molex connector. Factory settings are 45°F (7.2°C), valve opens, closes at 55°F (12.8°C), and 5 minute short cycle delay. Settings are adjustable.

Figure 16: LT1 Limit Setting



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Electrical: Low Voltage Wiring

Accessory Connections

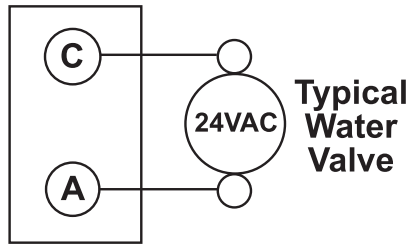
A terminal paralleling the compressor contactor coil has been provided on the CXM2/DXM2.5 control. Terminal “A” is designed to control accessory devices, such as water valves. Note: This terminal should be used only with 24 Volt signals and not line voltage. Terminal “A” is energized with the compressor contactor. See Figure 17 or the specific unit wiring diagram for details.

Low Voltage VA Ratings

| Component                        | VA      |
|----------------------------------|---------|
| Typical Blower Relay             | 6 - 7   |
| Typical Reversing Valve Solenoid | 4 - 6   |
| 30A Compressor Contactor         | 6 - 9   |
| Subtotal                         | 16 - 22 |
| + CXM2 board (5 - 9 VA)*         | 21 - 31 |
| Remaing VA for Accessories       | 19 - 29 |
|                                  |         |
| + DXM2.5 board (8 - 12 VA)*      | 24 - 34 |
| Remaing VA for Accessories       | 41 - 51 |

\*Standard transformer for CXM2 board is 50VA. Optional DXM2.5 board and/or DDC controls include 75VA transformer.

Figure 17: Accessory Wiring Terminal Strip



**Water Solenoid Valves** - An external solenoid valve(s) should be used on ground water installations to shut off flow to the unit when the compressor is not operating. A slow closing valve may be required to help reduce water hammer. Figure 18 shows typical wiring for a 24VAC external solenoid valve. Figures 18 and 19 illustrate typical slow closing water control valve wiring for Taco 500 series (ClimateMaster P/N AVM) and Taco SBV series valves. Slow closing valves take approximately 60 seconds to open (very little water will flow before 45 seconds). Once fully open, an end switch allows the compressor to be energized. Only relay or triac based electronic thermostats should be used with slow closing valves. When wired as shown, the slow closing valve will operate properly with the following notations:

1. The valve will remain open during a unit lockout.
2. The valve will draw approximately 25-35 VA through the “Y” signal of the thermostat.

**Note: This valve can overheat the anticipator of an electromechanical thermostat. Therefore, only relay or triac based thermostats should be used.**

Figure 18: Accessory Motorized Water Valve - Typical Wiring Example #1

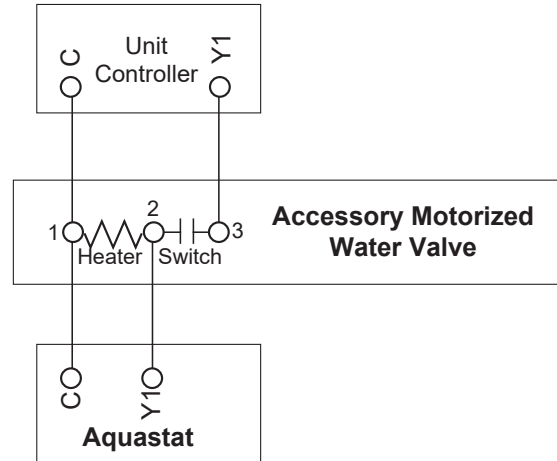
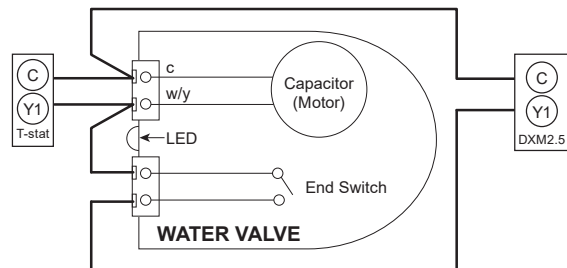


Figure 19: Accessory Motorized Water Valve - Typical Wiring Example #2

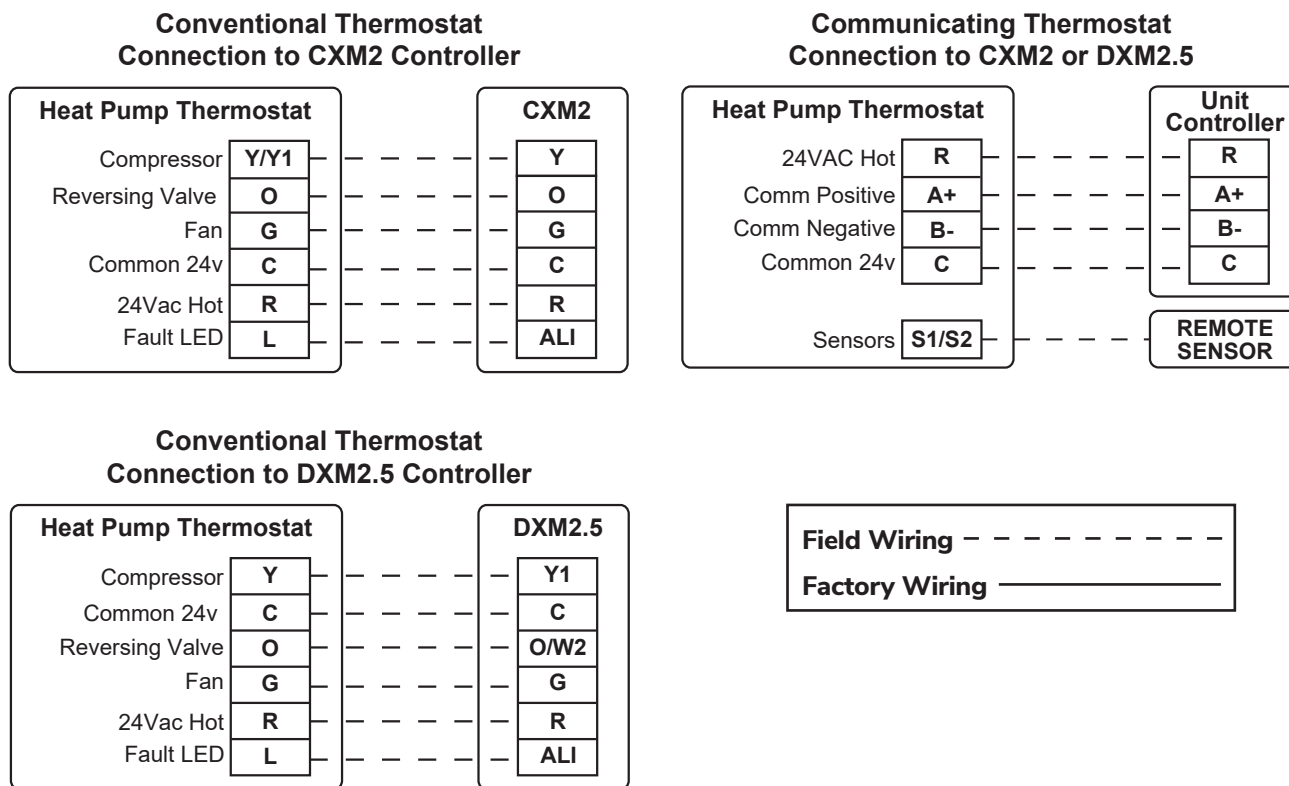




## Electrical: Thermostat Wiring

**Thermostat Installation** - The thermostat should be located on an interior wall in a larger room, away from supply duct drafts. DO NOT locate the thermostat in areas subject to sunlight, drafts or on external walls. The wire access hole behind the thermostat may in certain cases need to be sealed to prevent erroneous temperature measurement. Position the thermostat back plate against the wall so that it appears level and so the thermostat wires protrude through the middle of the back plate. Mark the position of the back plate mounting holes and drill holes with a 3/16" (5mm) bit. Install supplied anchors and secure plate to the wall. Thermostat wire must be 18 AWG wire. Representative thermostat wiring is shown in Figure 20 however, actual wiring connections should be determined from the thermostat IOM and or unit wiring diagram. Practically any heat pump thermostat will work with water source heat pump units, provided it has the correct number of heating and cooling stages.

Figure 20: Units with PSC Fan



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Blower Performance Data – TC006

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |      |      |      |      |
| 225       | 150     | PSC                 | Low                 | CFM                               | 210  | 190  | 160  |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 260  | 240  | 210  |      |      |      |      |      |      |      |      | 190  |      |      |
|           |         |                     | High                | CFM                               | 310  | 290  | 270  |      |      |      |      |      |      |      |      | 230  | 180  |      |
| 225       | 150     | Constant Torque ECM | 1                   | RPM                               | 944  | 1028 | 1114 | 1206 | 1297 |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 22   | 24   | 25   | 28   | 30   |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 225  | 207  | 187  | 169  | 150  |      |      |      |      |      |      |      |      |      |
|           |         |                     | 2                   | RPM                               |      |      |      | 1201 | 1280 | 1362 | 1441 | 1523 | 1608 | 1694 |      |      |      |      |
|           |         |                     |                     | Power (W)                         |      |      |      | 34   | 37   | 39   | 42   | 44   | 48   | 51   |      |      |      |      |
|           |         |                     |                     | CFM                               |      |      |      | 233  | 217  | 201  | 185  | 173  | 164  | 150  |      |      |      |      |
|           |         |                     | 3                   | RPM                               |      |      |      |      |      |      | 1324 | 1400 | 1476 | 1551 | 1628 | 1709 | 1786 |      |
|           |         |                     |                     | Power (W)                         |      |      |      |      |      |      | 43   | 45   | 48   | 51   | 54   | 58   | 61   |      |
|           |         |                     |                     | CFM                               |      |      |      |      |      |      | 241  | 227  | 212  | 200  | 188  | 179  | 168  |      |
|           |         |                     | 4                   | RPM                               |      |      |      |      |      |      |      |      |      | 1516 | 1588 | 1658 | 1730 | 1799 |
|           |         |                     |                     | Power (W)                         |      |      |      |      |      |      |      |      |      | 55   | 58   | 61   | 65   | 67   |
|           |         |                     |                     | CFM                               |      |      |      |      |      |      |      |      |      | 240  | 227  | 216  | 205  | 193  |
| 225       | 150     | Constant Volume ECM | Minimum CFM         | RPM                               | 763  | 933  | 1078 | 1201 | 1314 | 1417 | 1519 | 1615 | 1712 |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 16   | 21   | 27   | 40   | 36   | 41   | 46   | 52   | 59   |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  | 150  |      |      |      |      |      |
|           |         |                     | Default CFM         | RPM                               | 983  | 1102 | 1211 | 1319 | 1419 | 1516 | 1610 | 1708 | 1783 | 1817 |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 29   | 35   | 41   | 47   | 53   | 60   | 67   | 76   | 81   | 77   |      |      |      |      |
|           |         |                     |                     | CFM                               | 225  | 225  | 225  | 225  | 225  | 225  | 225  | 225  | 225  | 225  |      | 255  |      |      |
|           |         |                     | Maximum CFM         | RPM                               | 1053 | 1162 | 1265 | 1366 | 1462 | 1553 | 1648 | 1733 | 1802 | 1817 |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 35   | 41   | 47   | 53   | 60   | 67   | 76   | 84   | 88   | 78   |      |      |      |      |
|           |         |                     |                     | CFM                               | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  | 250  |      | 250  |      |      |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

### Blower Performance Data – TC009

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |
| 325       | 225     | PSC                 | Low                 | CFM                               | 340  | 322  | 300  | 260  |      |      |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 390  | 360  | 320  | 290  | 260  |      |      |      |      |      |
|           |         |                     | High                | CFM                               | 410  | 380  | 350  | 320  | 280  |      |      |      |      |      |
| 325       | 225     | Constant Torque ECM | 1                   | RPM                               | 1137 | 1203 | 1266 | 1344 | 1413 |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 40   | 42   | 44   | 47   | 49   |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 294  | 278  | 259  | 245  | 230  |      |      |      |      |      |
|           |         |                     | 2                   | RPM                               | 1361 | 1413 | 1464 | 1503 | 1577 | 1640 | 1700 | 1751 | 1803 | 1831 |
|           |         |                     |                     | Power (W)                         | 67   | 70   | 73   | 74   | 79   | 82   | 85   | 88   | 90   | 85   |
|           |         |                     |                     | CFM                               | 370  | 357  | 343  | 326  | 318  | 302  | 291  | 278  | 265  | 235  |
|           |         |                     | 3                   | RPM                               |      |      | 1538 | 1589 | 1642 | 1695 | 1749 | 1812 | 1829 | 1847 |
|           |         |                     |                     | Power (W)                         |      |      | 86   | 88   | 91   | 95   | 98   | 101  | 96   | 90   |
|           |         |                     |                     | CFM                               |      |      | 370  | 358  | 346  | 334  | 322  | 307  | 280  | 247  |
|           |         |                     | 4                   | RPM                               |      |      |      |      |      |      | 1835 | 1853 | 1869 | 1875 |
|           |         |                     |                     | Power (W)                         |      |      |      |      |      |      | 120  | 113  | 107  | 102  |
|           |         |                     |                     | CFM                               |      |      |      |      |      |      | 340  | 309  | 276  | 234  |
| 325       | 225     | Constant Volume ECM | Minimum CFM         | RPM                               | 929  | 1083 | 1210 | 1324 | 1432 | 1529 | 1595 | 1723 | 1792 |      |
|           |         |                     |                     | Power (W)                         | 25   | 32   | 39   | 45   | 53   | 60   | 66   | 78   | 83   |      |
|           |         |                     |                     | CFM                               | 225  | 225  | 225  | 225  | 225  | 225  | 225  | 225  | 225  |      |
|           |         |                     | Default CFM         | RPM                               | 1209 | 1326 | 1430 | 1535 | 1635 | 1732 | 1792 | 1801 | 1811 |      |
|           |         |                     |                     | Power (W)                         | 49   | 58   | 67   | 77   | 88   | 100  | 105  | 95   | 88   |      |
|           |         |                     |                     | CFM                               | 325  | 325  | 325  | 325  | 325  | 325  | 325  | 325  | 325  |      |
|           |         |                     | Maximum CFM         | RPM                               | 1691 | 1753 | 1765 | 1769 | 1778 | 1784 | 1793 | 1803 | 1813 |      |
|           |         |                     |                     | Power (W)                         | 126  | 134  | 131  | 125  | 119  | 118  | 105  | 98   | 90   |      |
|           |         |                     |                     | CFM                               | 375  | 375  | 375  | 375  | 375  | 375  | 375  | 375  | 375  |      |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Tranquility® Compact (TC) Series

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Blower Performance Data – TC012

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |  |  |  |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|--|--|--|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |  |  |  |
| 380       | 300     | PSC                 | Low                 | CFM                               | 360  | 350  | 320  | 310  |      |      |      |      |      |  |  |  |
|           |         |                     | Medium              | CFM                               | 420  | 400  | 380  | 360  | 340  |      |      |      |      |  |  |  |
|           |         |                     | High                | CFM                               | 470  | 450  | 430  | 400  | 380  | 320  |      |      |      |  |  |  |
| 380       | 300     | Constant Torque ECM | 1                   | RPM                               | 1338 | 1385 | 1436 | 1491 | 1551 |      |      |      |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 64   | 66   | 69   | 71   | 75   |      |      |      |      |  |  |  |
|           |         |                     |                     | CFM                               | 358  | 345  | 332  | 319  | 305  |      |      |      |      |  |  |  |
|           |         |                     | 2                   | RPM                               | 1477 | 1517 | 1561 | 1612 | 1660 | 1711 | 1769 | 1819 |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 86   | 88   | 91   | 94   | 97   | 100  | 103  | 104  |      |  |  |  |
|           |         |                     |                     | CFM                               | 400  | 388  | 377  | 365  | 354  | 342  | 328  | 309  |      |  |  |  |
|           |         |                     | 3                   | RPM                               | 1632 | 1672 | 1709 | 1747 | 1785 | 1820 | 1835 | 1856 |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 116  | 119  | 122  | 124  | 126  | 126  | 121  | 114  |      |  |  |  |
|           |         |                     |                     | CFM                               | 449  | 437  | 427  | 414  | 401  | 385  | 359  | 327  |      |  |  |  |
|           |         |                     | 4                   | RPM                               | 1698 | 1729 | 1765 | 1798 | 1821 | 1836 | 1842 | 1843 |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 131  | 133  | 135  | 137  | 135  | 130  | 123  | 110  |      |  |  |  |
|           |         |                     |                     | CFM                               | 467  | 456  | 444  | 433  | 414  | 390  | 361  | 318  |      |  |  |  |
| 380       | 300     | Constant Volume ECM | Minimum CFM         | RPM                               | 1258 | 1368 | 1464 | 1555 | 1635 | 1718 | 1793 | 1830 |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 55   | 64   | 73   | 81   | 90   | 99   | 107  | 106  |      |  |  |  |
|           |         |                     |                     | CFM                               | 300  | 300  | 300  | 300  | 300  | 300  | 300  | 300  |      |  |  |  |
|           |         |                     | Default CFM         | RPM                               | 1598 | 1672 | 1743 | 1813 | 1831 | 1845 | 1859 | 1875 |      |  |  |  |
|           |         |                     |                     | Power (W)                         | 105  | 115  | 125  | 135  | 132  | 127  | 123  | 118  |      |  |  |  |
|           |         |                     |                     | CFM                               | 380  | 380  | 380  | 380  | 380  | 380  | 380  | 380  |      |  |  |  |
|           |         |                     | Maximum CFM         | RPM                               | 1798 | 1823 | 1834 | 1844 | 1858 | 1872 | 1886 | 1901 | 1920 |  |  |  |
|           |         |                     |                     | Power (W)                         | 147  | 149  | 146  | 143  | 139  | 134  | 130  | 126  | 120  |  |  |  |
|           |         |                     |                     | CFM                               | 415  | 415  | 415  | 415  | 415  | 415  | 415  | 415  | 415  |  |  |  |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Blower Performance Data – TC015

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |     |     |     |     |     |      |      |      |      |      |     |     |     |     |     |
|-----------|---------|---------------------|---------------------|-----------------------------------|-----|-----|-----|-----|-----|------|------|------|------|------|-----|-----|-----|-----|-----|
|           |         |                     |                     | 0.1                               | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7  | 0.8  | 0.9  | 1.0  |      |     |     |     |     |     |
| 525       | 375     | PSC                 | Low                 | CFM                               | 503 | 490 | 479 | 439 |     |      |      |      |      |      |     |     |     |     |     |
|           |         |                     | Medium              | CFM                               | 595 | 575 | 562 | 510 | 451 |      |      |      |      |      |     |     |     |     |     |
|           |         |                     | High                | CFM                               |     |     |     | 581 | 510 | 386  |      |      |      |      |     |     |     |     |     |
| 525       | 375     | PSC - High Static   | Low                 | CFM                               | 462 | 456 | 443 | 425 | 385 |      |      |      |      |      |     |     |     |     |     |
|           |         |                     | Medium              | CFM                               | 546 | 539 | 531 | 513 | 481 | 414  |      |      |      |      |     |     |     |     |     |
|           |         |                     | High                | CFM                               |     |     |     |     |     | 547  | 426  |      |      |      |     |     |     |     |     |
| 525       | 375     | Constant Torque ECM | 1                   | RPM                               | 655 | 614 | 701 | 770 | 851 | 937  |      |      |      |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 67  | 55  | 62  | 68  | 75  | 82   |      |      |      |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 648 | 588 | 542 | 493 | 441 | 378  |      |      |      |      |     |     |     |     |     |
|           |         |                     | 2                   | RPM                               | 655 | 720 | 799 | 863 | 946 | 1021 | 1078 |      |      |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 67  | 74  | 81  | 87  | 95  | 102  | 108  |      |      |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 648 | 608 | 557 | 514 | 460 | 402  | 354  |      |      |      |     |     |     |     |     |
|           |         |                     | 3                   | RPM                               | 687 | 744 | 822 | 883 | 950 | 1032 | 1098 | 1150 |      |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 79  | 86  | 94  | 101 | 107 | 117  | 124  | 130  |      |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 695 | 659 | 611 | 570 | 526 | 475  | 422  | 377  |      |      |     |     |     |     |     |
|           |         |                     | 4                   | RPM                               | 716 | 771 | 844 | 906 | 965 | 1037 | 1110 | 1170 | 1219 |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 92  | 98  | 107 | 114 | 121 | 129  | 138  | 145  | 151  |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 737 | 705 | 661 | 622 | 582 | 534  | 482  | 438  | 396  |      |     |     |     |     |     |
|           |         |                     | 5                   | RPM                               | 763 | 790 | 851 | 924 | 978 | 1039 | 1113 | 1175 | 1233 | 1281 |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 106 | 110 | 117 | 126 | 133 | 141  | 151  | 159  | 165  | 172  |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 745 | 745 | 708 | 662 | 626 | 585  | 535  | 488  | 444  | 402  |     |     |     |     |     |
| 525       | 375     | Constant Volume ECM | Minimum CFM         | RPM                               |     | 617 | 741 | 848 | 945 | 1028 | 1103 | 1171 |      |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         |     | 36  | 52  | 68  | 84  | 99   | 114  | 129  |      |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               |     | 375 | 375 | 375 | 375 | 375  | 375  | 375  | 375  |      |     |     |     |     |     |
|           |         |                     | Default CFM         | RPM                               |     | 661 | 767 | 859 | 944 | 1028 | 1107 | 1179 | 1247 |      |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         |     | 55  | 74  | 90  | 108 | 127  | 147  | 166  | 186  |      |     |     |     |     |     |
|           |         |                     |                     | CFM                               |     | 525 | 525 | 525 | 525 | 525  | 525  | 525  | 525  | 525  |     |     |     |     |     |
|           |         |                     | Maximum CFM         | RPM                               | 586 | 695 | 795 | 882 | 963 | 1038 | 1111 | 1180 | 1248 | 1312 |     |     |     |     |     |
|           |         |                     |                     | Power (W)                         | 54  | 73  | 93  | 112 | 132 | 152  | 173  | 194  | 216  | 238  |     |     |     |     |     |
|           |         |                     |                     | CFM                               | 625 | 625 | 625 | 625 | 625 | 625  | 625  | 625  | 625  | 625  | 625 | 625 | 625 | 625 | 625 |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Blower Performance Data – TC018

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |  |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|--|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |  |
| 600       | 450     | PSC                 | Low                 | CFM                               | 524  | 509  | 493  | 451  |      |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               | 611  | 588  | 564  | 514  |      |      |      |      |      |      |  |
|           |         |                     | High                | CFM                               | 704  | 668  | 643  | 617  | 504  |      |      |      |      |      |  |
| 600       | 450     | PSC - High Static   | Low                 | CFM                               | 461  |      |      |      |      |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               | 553  | 543  | 533  | 506  | 468  |      |      |      |      |      |  |
|           |         |                     | High                | CFM                               | 670  | 661  | 645  | 628  | 587  | 534  |      |      |      |      |  |
| 600       | 450     | Constant Torque ECM | 1                   | RPM                               | 693  | 763  | 837  | 882  |      |      |      |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 73   | 78   | 85   | 90   |      |      |      |      |      |      |  |
|           |         |                     |                     | CFM                               | 600  | 558  | 518  | 491  |      |      |      |      |      |      |  |
|           |         |                     | 2                   | RPM                               | 745  | 801  | 873  | 904  | 966  | 1031 | 1098 |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 92   | 99   | 107  | 109  | 116  | 123  | 131  |      |      |      |  |
|           |         |                     |                     | CFM                               | 676  | 641  | 599  | 570  | 536  | 498  | 452  |      |      |      |  |
|           |         |                     | 3                   | RPM                               | 782  | 831  | 890  | 958  | 992  | 1048 | 1106 | 1171 | 1223 |      |  |
|           |         |                     |                     | Power (W)                         | 112  | 118  | 126  | 135  | 140  | 147  | 155  | 163  | 170  |      |  |
|           |         |                     |                     | CFM                               | 741  | 713  | 677  | 640  | 619  | 586  | 554  | 512  | 471  |      |  |
|           |         |                     | 4                   | RPM                               | 833  | 875  | 924  | 986  | 1046 | 1072 | 1124 | 1177 | 1236 | 1290 |  |
|           |         |                     |                     | Power (W)                         | 138  | 144  | 152  | 161  | 170  | 174  | 181  | 190  | 199  | 207  |  |
|           |         |                     |                     | CFM                               | 802  | 780  | 751  | 714  | 680  | 662  | 633  | 603  | 567  | 529  |  |
|           |         |                     | 5                   | RPM                               | 895  | 924  | 968  | 1016 | 1078 | 1133 | 1151 | 1199 | 1249 | 1302 |  |
|           |         |                     |                     | Power (W)                         | 170  | 175  | 182  | 190  | 201  | 210  | 214  | 222  | 231  | 240  |  |
|           |         |                     |                     | CFM                               | 854  | 848  | 820  | 791  | 754  | 724  | 711  | 683  | 655  | 625  |  |
| 600       | 450     | Constant Volume ECM | Minimum CFM         | RPM                               |      |      |      |      | 1096 | 1179 | 1275 | 1361 |      |      |  |
|           |         |                     |                     | Power (W)                         |      |      |      |      | 111  | 132  | 157  | 180  |      |      |  |
|           |         |                     |                     | CFM                               |      |      |      |      | 450  | 450  | 450  | 450  |      |      |  |
|           |         |                     | Default CFM         | RPM                               | 847  | 918  | 971  | 1095 | 1208 | 1297 | 1360 | 1418 | 1467 |      |  |
|           |         |                     |                     | Power (W)                         | 85   | 101  | 113  | 145  | 178  | 206  | 228  | 248  | 266  |      |  |
|           |         |                     |                     | CFM                               | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  |      |  |
|           |         |                     | Maximum CFM         | RPM                               | 1036 | 1080 | 1131 | 1172 | 1213 | 1317 | 1406 | 1494 |      |      |  |
|           |         |                     |                     | Power (W)                         | 157  | 171  | 186  | 200  | 214  | 251  | 286  | 323  |      |      |  |
|           |         |                     |                     | CFM                               | 750  | 750  | 750  | 750  | 750  | 750  | 750  | 750  |      |      |  |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Blower Performance Data – TC024

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |      |  |  |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|--|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |      |  |  |
| 850       | 600     | PSC                 | Low                 | CFM                               | 760  | 741  | 722  | 694  | 665  | 618  |      |      |      |      |      |  |  |
|           |         |                     | Medium              | CFM                               | 941  | 912  | 874  | 836  | 789  | 732  | 665  |      |      |      |      |  |  |
|           |         |                     | High                | CFM                               |      |      |      |      | 950  | 884  | 827  | 732  | 656  |      |      |  |  |
| 850       | 600     | PSC - High Static   | Low                 | CFM                               |      |      |      | 979  | 931  | 884  | 827  | 751  | 675  |      |      |  |  |
|           |         |                     | Medium              | CFM                               |      |      |      |      | 988  | 922  | 846  | 713  |      |      |      |  |  |
|           |         |                     | High                | CFM                               |      |      |      |      |      | 979  | 903  | 798  | 665  |      |      |  |  |
| 800       | 600     | Constant Torque ECM | 1                   | RPM                               | 817  | 865  | 915  | 973  |      |      |      |      |      |      |      |  |  |
|           |         |                     |                     | Power (W)                         | 116  | 122  | 128  | 135  |      |      |      |      |      |      |      |  |  |
|           |         |                     |                     | CFM                               | 755  | 728  | 695  | 653  |      |      |      |      |      |      |      |  |  |
|           |         |                     | 2                   | RPM                               | 877  | 920  | 966  | 1012 | 1070 | 1142 | 1198 |      |      |      |      |  |  |
|           |         |                     |                     | Power (W)                         | 146  | 152  | 159  | 166  | 174  | 185  | 193  |      |      |      |      |  |  |
|           |         |                     |                     | CFM                               | 836  | 810  | 782  | 750  | 708  | 657  | 616  |      |      |      |      |  |  |
|           |         |                     | 3                   | RPM                               | 938  | 974  | 1017 | 1057 | 1102 | 1158 | 1227 | 1283 | 1323 | 1355 |      |  |  |
|           |         |                     |                     | Power (W)                         | 181  | 187  | 194  | 201  | 209  | 218  | 230  | 239  | 246  | 252  |      |  |  |
|           |         |                     |                     | CFM                               | 910  | 887  | 861  | 834  | 804  | 762  | 714  | 674  | 642  | 619  |      |  |  |
|           |         |                     | 4                   | RPM                               | 1015 | 1048 | 1084 | 1121 | 1159 | 1199 | 1244 | 1309 | 1369 | 1412 |      |  |  |
|           |         |                     |                     | Power (W)                         | 232  | 240  | 247  | 254  | 262  | 270  | 278  | 291  | 303  | 312  |      |  |  |
|           |         |                     |                     | CFM                               | 996  | 975  | 952  | 929  | 904  | 876  | 845  | 798  | 755  | 725  |      |  |  |
|           |         |                     | 5                   | RPM                               |      |      |      |      |      | 1219 | 1255 | 1293 | 1331 | 1384 | 1446 |  |  |
|           |         |                     |                     | Power (W)                         |      |      |      |      |      | 323  | 331  | 340  | 348  | 361  | 374  |  |  |
|           |         |                     |                     | CFM                               |      |      |      |      |      | 999  | 975  | 951  | 923  | 884  | 840  |  |  |
| 800       | 600     | Constant Volume ECM | Minimum CFM         | RPM                               | 706  | 788  | 867  | 941  | 1013 | 1080 | 1143 | 1203 | 1259 | 1311 |      |  |  |
|           |         |                     |                     | Power (W)                         | 71   | 89   | 107  | 124  | 141  | 159  | 177  | 195  | 213  | 230  |      |  |  |
|           |         |                     |                     | CFM                               | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  | 600  |  |  |
|           |         |                     | Default CFM         | RPM                               | 882  | 943  | 1002 | 1059 | 1114 | 1168 | 1220 | 1271 | 1319 | 1366 |      |  |  |
|           |         |                     |                     | Power (W)                         | 145  | 165  | 185  | 205  | 225  | 245  | 266  | 285  | 306  | 326  |      |  |  |
|           |         |                     |                     | CFM                               | 800  | 800  | 800  | 800  | 800  | 800  | 800  | 800  | 800  | 800  | 800  |  |  |
|           |         |                     | Maximum CFM         | RPM                               | 1077 | 1122 | 1162 | 1200 | 1233 | 1263 | 1288 | 1310 | 1329 | 1343 |      |  |  |
|           |         |                     |                     | Power (W)                         | 284  | 300  | 315  | 332  | 351  | 364  | 379  | 396  | 412  | 428  |      |  |  |
|           |         |                     |                     | CFM                               | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |  |  |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Blower Performance Data – TC030

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |      |  |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|--|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |      |  |
| 1000      | 750     | PSC                 | Low                 | CFM                               | 1017 | 979  | 931  | 884  | 827  | 751  |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               | 1140 | 1093 | 1036 | 988  | 922  | 846  |      |      |      |      |      |  |
|           |         |                     | High                | CFM                               |      |      |      | 1102 | 1045 | 979  | 903  | 798  |      |      |      |  |
| 1000      | 750     | PSC - High Static   | Low                 | CFM                               | 979  | 941  | 912  | 865  | 798  |      |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               |      |      |      | 1074 | 979  | 884  | 779  |      |      |      |      |  |
|           |         |                     | High                | CFM                               |      |      |      |      | 1102 | 988  | 874  | 760  |      |      |      |  |
| 1000      | 750     | Constant Torque ECM | 1                   | RPM                               | 880  | 925  | 994  | 1049 | 1101 |      |      |      |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 158  | 165  | 176  | 184  | 192  |      |      |      |      |      |      |  |
|           |         |                     |                     | CFM                               | 904  | 873  | 832  | 796  | 763  |      |      |      |      |      |      |  |
|           |         |                     | 2                   | RPM                               | 956  | 998  | 1038 | 1105 | 1156 | 1203 | 1248 | 1295 | 1344 |      |      |  |
|           |         |                     |                     | Power (W)                         | 211  | 219  | 227  | 240  | 250  | 258  | 267  | 276  | 285  |      |      |  |
|           |         |                     |                     | CFM                               | 1020 | 992  | 965  | 927  | 894  | 864  | 835  | 805  | 771  |      |      |  |
|           |         |                     | 3                   | RPM                               | 1034 | 1072 | 1110 | 1145 | 1209 | 1250 | 1303 | 1346 | 1387 | 1422 |      |  |
|           |         |                     |                     | Power (W)                         | 280  | 289  | 298  | 306  | 321  | 330  | 342  | 351  | 361  | 368  |      |  |
|           |         |                     |                     | CFM                               | 1139 | 1113 | 1089 | 1064 | 1027 | 999  | 966  | 937  | 910  | 879  |      |  |
|           |         |                     | 4                   | RPM                               | 1095 | 1130 | 1166 | 1201 | 1237 | 1299 | 1337 | 1387 | 1428 | 1465 |      |  |
|           |         |                     |                     | Power (W)                         | 336  | 346  | 355  | 364  | 374  | 389  | 399  | 413  | 423  | 430  |      |  |
|           |         |                     |                     | CFM                               | 1216 | 1193 | 1168 | 1146 | 1123 | 1086 | 1062 | 1028 | 1002 | 975  |      |  |
|           |         |                     | 5                   | RPM                               |      |      |      |      | 1268 | 1301 | 1333 | 1394 | 1426 | 1473 | 1491 |  |
|           |         |                     |                     | Power (W)                         |      |      |      |      | 452  | 462  | 471  | 490  | 499  | 508  | 478  |  |
|           |         |                     |                     | CFM                               |      |      |      |      | 1250 | 1229 | 1208 | 1173 | 1151 | 1112 | 1036 |  |
| 1000      | 750     | Constant Volume ECM | Minimum CFM         | RPM                               | 872  | 928  | 990  | 1046 | 1096 | 1143 | 1192 | 1238 | 1282 | 1327 |      |  |
|           |         |                     |                     | Power (W)                         | 71   | 89   | 108  | 127  | 145  | 162  | 181  | 199  | 217  | 235  |      |  |
|           |         |                     |                     | CFM                               | 750  | 750  | 750  | 750  | 750  | 750  | 750  | 750  | 750  | 750  | 750  |  |
|           |         |                     | Default CFM         | RPM                               | 1131 | 1177 | 1218 | 1252 | 1295 | 1337 | 1381 | 1415 |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 251  | 274  | 296  | 315  | 337  | 362  | 387  | 407  |      |      |      |  |
|           |         |                     |                     | CFM                               | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |      |      |      |  |
|           |         |                     | Maximum CFM         | RPM                               | 1260 | 1299 | 1334 | 1373 | 1403 |      |      |      |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 388  | 410  | 431  | 453  | 471  |      |      |      |      |      |      |  |
|           |         |                     |                     | CFM                               | 1150 | 1150 | 1150 | 1150 | 1150 |      |      |      |      |      |      |  |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.



Blower Performance Data – TC036

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |  |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|--|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |  |
| 1150      | 900     | PSC                 | Low                 | CFM                               | 970  | 960  | 951  | 941  | 902  |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               | 1106 | 1096 | 1086 | 1067 | 1009 | 912  |      |      |      |      |  |
|           |         |                     | High                | CFM                               | 1436 | 1387 | 1329 | 1280 | 1174 | 1077 | 931  |      |      |      |  |
| 1150      | 900     | PSC - High Static   | Low                 | CFM                               | 980  | 970  | 960  | 931  | 902  |      |      |      |      |      |  |
|           |         |                     | Medium              | CFM                               | 1300 | 1280 | 1261 | 1222 | 1193 | 1116 | 1038 |      |      |      |  |
|           |         |                     | High                | CFM                               |      |      |      |      | 1484 | 1426 | 1358 | 1251 | 1135 | 931  |  |
| 1150      | 900     | Constant Torque ECM | 1                   | RPM                               | 842  | 891  | 945  |      |      |      |      |      |      |      |  |
|           |         |                     |                     | Power (W)                         | 166  | 175  | 184  |      |      |      |      |      |      |      |  |
|           |         |                     |                     | CFM                               | 974  | 941  | 904  |      |      |      |      |      |      |      |  |
|           |         |                     | 2                   | RPM                               | 936  | 983  | 1028 | 1075 | 1125 | 1167 | 1203 | 1241 |      |      |  |
|           |         |                     |                     | Power (W)                         | 241  | 251  | 261  | 272  | 282  | 292  | 299  | 307  |      |      |  |
|           |         |                     |                     | CFM                               | 1132 | 1103 | 1074 | 1041 | 1005 | 973  | 944  | 916  |      |      |  |
|           |         |                     | 3                   | RPM                               | 988  | 1032 | 1076 | 1117 | 1160 | 1205 | 1246 | 1282 | 1315 | 1354 |  |
|           |         |                     |                     | Power (W)                         | 294  | 304  | 316  | 326  | 337  | 349  | 359  | 367  | 375  | 385  |  |
|           |         |                     |                     | CFM                               | 1271 | 1242 | 1214 | 1185 | 1153 | 1118 | 1083 | 1056 | 1029 | 999  |  |
|           |         |                     | 4                   | RPM                               | 1056 | 1090 | 1130 | 1170 | 1208 | 1250 | 1292 | 1332 | 1370 | 1403 |  |
|           |         |                     |                     | Power (W)                         | 376  | 387  | 399  | 409  | 421  | 433  | 446  | 457  | 468  | 478  |  |
|           |         |                     |                     | CFM                               | 1403 | 1377 | 1351 | 1324 | 1295 | 1268 | 1233 | 1201 | 1169 | 1143 |  |
|           |         |                     | 5                   | RPM                               |      |      | 1193 | 1228 | 1265 | 1295 | 1323 | 1358 | 1392 | 1419 |  |
|           |         |                     |                     | Power (W)                         |      |      | 499  | 510  | 523  | 524  | 521  | 519  | 516  | 514  |  |
|           |         |                     |                     | CFM                               |      |      | 1485 | 1460 | 1434 | 1396 | 1347 | 1295 | 1240 | 1194 |  |
| 1150      | 900     | Constant Volume ECM | Minimum CFM         | RPM                               | 682  | 788  | 898  | 976  | 1043 | 1107 | 1170 | 1230 | 1297 | 1371 |  |
|           |         |                     |                     | Power (W)                         | 105  | 132  | 164  | 188  | 211  | 233  | 257  | 280  | 307  | 339  |  |
|           |         |                     |                     | CFM                               | 900  | 900  | 900  | 900  | 900  | 900  | 900  | 900  | 900  | 900  |  |
|           |         |                     | Default CFM         | RPM                               | 830  | 895  | 961  | 1054 | 1145 | 1209 | 1267 | 1321 | 1371 | 1419 |  |
|           |         |                     |                     | Power (W)                         | 205  | 232  | 261  | 303  | 349  | 382  | 415  | 446  | 475  | 505  |  |
|           |         |                     |                     | CFM                               | 1150 | 1150 | 1150 | 1150 | 1150 | 1150 | 1150 | 1150 | 1150 | 1150 |  |
|           |         |                     | Maximum CFM         | RPM                               | 1042 | 1040 | 1095 | 1149 | 1199 | 1273 | 1355 | 1420 | 1459 | 1493 |  |
|           |         |                     |                     | Power (W)                         | 406  | 403  | 438  | 474  | 511  | 564  | 629  | 680  | 692  | 691  |  |
|           |         |                     |                     | CFM                               | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |  |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Blower Performance Data – TC041

| Rated CFM | Min CFM | Motor Type | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |     |     |     |     |     |  |
|-----------|---------|------------|---------------------|-----------------------------------|------|------|------|------|-----|-----|-----|-----|-----|--|
|           |         |            |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |  |
| 1125      | 845     | PSC        | Low                 | CFM                               | 1008 | 971  |      |      |     |     |     |     |     |  |
|           |         |            | Medium              | CFM                               | 1142 | 1090 | 1023 |      |     |     |     |     |     |  |
|           |         |            | High                | CFM                               | 1269 | 1198 | 1114 | 1018 |     |     |     |     |     |  |

Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 Units factory shipped on medium speed. Other speeds require field selection.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Blower Performance Data – TC042

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |      |      |      |      |      |      |
| 1400      | 1050    | PSC                 | Low                 | CFM                               | 1074 | 1064 |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 1368 | 1321 | 1273 | 1207 | 1131 | 1064 |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | High                | CFM                               | 1501 | 1444 | 1378 | 1302 | 1226 | 1131 |      |      |      |      |      |      |      |      |      |      |
| 1400      | 1050    | PSC - High Static   | Low                 | CFM                               |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 1302 | 1283 | 1254 | 1235 | 1188 | 1121 |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | High                | CFM                               |      | 1473 | 1444 | 1397 | 1378 | 1311 | 1178 |      |      |      |      |      |      |      |      |      |
| 1400      | 1050    | Constant Torque ECM | 1                   | RPM                               | 916  | 957  | 1004 | 1065 |      |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 238  | 248  | 259  | 272  |      |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1186 | 1152 | 1113 | 1056 |      |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     | 2                   | RPM                               | 1013 | 1050 | 1084 | 1128 | 1179 | 1227 | 1279 | 1317 | 1356 | 1400 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 331  | 369  | 352  | 365  | 381  | 396  | 411  | 423  | 437  | 446  |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1345 | 1317 | 1283 | 1251 | 1215 | 1181 | 1150 | 1124 | 1094 | 1050 |      |      |      |      |      |      |
|           |         |                     | 3                   | RPM                               | 1108 | 1142 | 1178 | 1207 | 1247 | 1293 | 1336 | 1382 | 1426 | 1462 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 448  | 461  | 474  | 486  | 501  | 518  | 534  | 551  | 568  | 581  |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1507 | 1482 | 1455 | 1427 | 1396 | 1365 | 1331 | 1296 | 1276 | 1246 |      |      |      |      |      |      |
|           |         |                     | 4                   | RPM                               | 1200 | 1231 | 1263 | 1292 | 1321 | 1356 | 1397 | 1440 | 1479 | 1505 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 582  | 595  | 609  | 622  | 635  | 651  | 669  | 688  | 706  | 681  |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1641 | 1623 | 1601 | 1577 | 1548 | 1519 | 1488 | 1455 | 1423 | 1355 |      |      |      |      |      |      |
|           |         |                     | 5                   | RPM                               |      |      | 1317 | 1372 | 1392 | 1412 | 1436 | 1469 | 1500 | 1504 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         |      |      |      | 756  | 775  | 776  | 774  | 772  | 768  | 765  | 679  |      |      |      |      |      |
|           |         |                     |                     | CFM                               |      |      | 1743 | 1717 | 1688 | 1645 | 1596 | 1541 | 1490 | 1352 |      |      |      |      |      |      |
| 1400      | 1050    | Constant Volume ECM | Minimum CFM         | RPM                               | 786  | 855  | 920  | 985  | 1059 | 1125 | 1186 | 1240 | 1292 | 1346 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 154  | 177  | 200  | 224  | 252  | 280  | 306  | 331  | 355  | 383  |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 | 1050 |
|           |         |                     | Default CFM         | RPM                               | 997  | 1042 | 1094 | 1145 | 1193 | 1241 | 1292 | 1345 | 1400 | 1451 |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 334  | 359  | 390  | 421  | 453  | 484  | 517  | 555  | 595  | 636  |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 |
|           |         |                     | Maximum CFM         | RPM                               | 1224 | 1245 | 1282 | 1305 | 1327 |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 658  | 674  | 703  | 700  | 697  |      |      |      |      |      |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1750 | 1750 | 1750 | 1750 | 1750 |      |      |      |      |      |      |      |      |      |      |      |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Tranquility® Compact (TC) Series

Rev.: January 24, 2023

Blower Performance Data – TC048

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |      |      |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|
|           |         |                     |                     |                                   | 0.1  | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |      |
| 1600      | 1200    | PSC                 | Low                 | CFM                               | 1644 | 1606 | 1568 | 1492 | 1378 | 1264 |      |      |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 1805 | 1767 | 1682 | 1625 | 1520 | 1340 |      |      |      |      |      |      |
|           |         |                     | High                | CFM                               |      | 1881 | 1815 | 1710 | 1596 | 1416 | 1216 | 1216 |      |      |      |      |
| 1600      | 1200    | PSC - High Static   | Low                 | CFM                               | 1748 | 1720 | 1691 | 1644 | 1587 | 1520 | 1435 | 1311 |      |      |      |      |
|           |         |                     | Medium              | CFM                               | 1938 | 1891 | 1843 | 1796 | 1739 | 1691 | 1625 | 1539 | 1416 | 1254 |      |      |
|           |         |                     | High                | CFM                               |      |      |      | 1957 | 1910 | 1862 | 1786 | 1701 | 1577 | 1435 |      |      |
| 1500      | 1200    | Constant Torque ECM | 1                   | RPM                               | 767  | 811  | 848  | 886  | 935  |      |      |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 225  | 237  | 247  | 257  | 270  |      |      |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1397 | 1349 | 1304 | 1259 | 1202 |      |      |      |      |      |      |      |
|           |         |                     | 2                   | RPM                               | 826  | 869  | 905  | 940  | 979  | 1026 | 1073 |      |      |      |      |      |
|           |         |                     |                     | Power (W)                         | 287  | 300  | 312  | 322  | 334  | 349  | 363  |      |      |      |      |      |
|           |         |                     |                     | CFM                               | 1527 | 1484 | 1441 | 1398 | 1351 | 1294 | 1240 |      |      |      |      |      |
|           |         |                     | 3                   | RPM                               | 881  | 925  | 960  | 993  | 1027 | 1064 | 1108 | 1150 | 1214 |      |      |      |
|           |         |                     |                     | Power (W)                         | 358  | 374  | 387  | 398  | 410  | 423  | 439  | 454  | 473  |      |      |      |
|           |         |                     |                     | CFM                               | 1660 | 1619 | 1577 | 1537 | 1494 | 1452 | 1399 | 1349 | 1254 |      |      |      |
|           |         |                     | 4                   | RPM                               | 959  | 997  | 1034 | 1064 | 1093 | 1124 | 1157 | 1195 | 1206 |      |      |      |
|           |         |                     |                     | Power (W)                         | 474  | 491  | 507  | 521  | 533  | 546  | 560  | 576  | 511  |      |      |      |
|           |         |                     |                     | CFM                               | 1837 | 1795 | 1760 | 1722 | 1685 | 1647 | 1608 | 1560 | 1382 |      |      |      |
|           |         |                     | 5                   | RPM                               |      |      | 1078 | 1113 | 1145 | 1174 | 1200 | 1213 | 1200 |      |      |      |
|           |         |                     |                     | Power (W)                         |      |      | 649  | 667  | 684  | 698  | 714  | 695  | 588  |      |      |      |
|           |         |                     |                     | CFM                               |      |      | 1993 | 1956 | 1919 | 1886 | 1854 | 1784 | 1588 |      |      |      |
| 1500      | 1200    | Constant Volume ECM | Minimum CFM         | RPM                               | 703  | 766  | 827  | 886  | 943  | 998  | 1051 | 1102 | 1150 | 1196 |      |      |
|           |         |                     |                     | Power (W)                         | 174  | 205  | 237  | 269  | 302  | 336  | 371  | 407  | 444  | 482  |      |      |
|           |         |                     |                     | CFM                               | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |      |
|           |         |                     | Default CFM         | RPM                               | 833  | 884  | 932  | 986  | 1043 | 1089 | 1137 | 1191 | 1242 | 1293 |      |      |
|           |         |                     |                     | Power (W)                         | 287  | 329  | 369  | 412  | 455  | 495  | 536  | 578  | 620  | 662  |      |      |
|           |         |                     |                     | CFM                               | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |
|           |         |                     | Maximum CFM         | RPM                               | 993  | 1038 | 1082 | 1129 | 1178 | 1220 | 1264 | 1311 | 1357 | 1402 |      |      |
|           |         |                     |                     | Power (W)                         | 562  | 616  | 669  | 724  | 781  | 832  | 885  | 940  | 994  | 1048 |      |      |
|           |         |                     |                     | CFM                               | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

Blower Performance Data – TC060

| Rated CFM | Min CFM | Motor Type          | Motor Speed Setting | External Static Pressure (in. wg) |      |      |      |      |      |      |      |      |      |      |  |      |      |
|-----------|---------|---------------------|---------------------|-----------------------------------|------|------|------|------|------|------|------|------|------|------|--|------|------|
|           |         |                     |                     | 0.1                               | 0.2  | 0.3  | 0.4  | 0.5  | 0.6  | 0.7  | 0.8  | 0.9  | 1.0  |      |  |      |      |
| 1950      | 1500    | PSC                 | Low                 | CFM                               | 1803 | 1774 | 1744 | 1695 | 1637 | 1568 |      |      |      |      |  |      |      |
|           |         |                     | Medium              | CFM                               | 1999 | 1950 | 1901 | 1852 | 1793 | 1744 |      |      |      |      |  | 1676 | 1588 |
|           |         |                     | High                | CFM                               |      | 1881 | 1815 | 1710 | 1596 | 1416 |      |      |      |      |  | 1216 | 1216 |
| 1950      | 1500    | PSC - High Static   | Low                 | CFM                               | 1882 | 1872 | 1852 | 1842 | 1813 | 1793 | 1764 | 1715 | 1666 | 1588 |  |      |      |
|           |         |                     | Medium              | CFM                               | 2107 | 2097 | 2038 | 1999 | 1980 | 1940 | 1891 | 1842 | 1460 | 1715 |  |      |      |
|           |         |                     | High                | CFM                               | 2342 | 2323 | 2293 | 2254 | 2195 | 2156 | 2087 | 2019 | 1940 | 1852 |  |      |      |
| 1950      | 1500    | Constant Torque ECM | 1                   | RPM                               | 768  | 797  | 830  | 863  |      |      |      |      |      |      |  |      |      |
|           |         |                     |                     | Power (W)                         | 342  | 354  | 366  | 380  |      |      |      |      |      |      |  |      |      |
|           |         |                     |                     | CFM                               | 1685 | 1640 | 1593 | 1545 |      |      |      |      |      |      |  |      |      |
|           |         |                     | 2                   | RPM                               | 836  | 867  | 895  | 922  | 955  | 989  | 1020 | 1048 | 1081 |      |  |      |      |
|           |         |                     |                     | Power (W)                         | 460  | 476  | 489  | 501  | 518  | 533  | 548  | 561  | 577  |      |  |      |      |
|           |         |                     |                     | CFM                               | 1879 | 1833 | 1795 | 1754 | 1705 | 1657 | 1608 | 1563 | 1514 |      |  |      |      |
|           |         |                     | 3                   | RPM                               | 923  | 953  | 974  | 1000 | 1025 | 1052 | 1079 | 1109 | 1137 |      |  |      |      |
|           |         |                     |                     | Power (W)                         | 648  | 666  | 678  | 694  | 708  | 724  | 740  | 757  | 773  |      |  |      |      |
|           |         |                     |                     | CFM                               | 2113 | 2069 | 2039 | 1998 | 1963 | 1925 | 1885 | 1840 | 1795 |      |  |      |      |
|           |         |                     | 4                   | RPM                               | 972  | 994  | 1020 | 1041 | 1066 | 1090 | 1114 | 1144 | 1170 |      |  |      |      |
|           |         |                     |                     | Power (W)                         | 771  | 785  | 803  | 817  | 832  | 848  | 864  | 883  | 900  |      |  |      |      |
|           |         |                     |                     | CFM                               | 2235 | 2198 | 2163 | 2130 | 2094 | 2061 | 2019 | 1977 | 1939 |      |  |      |      |
|           |         |                     | 5                   | RPM                               | 1003 | 1025 | 1050 | 1074 | 1099 | 1122 | 1147 | 1166 | 1194 | 1209 |  |      |      |
|           |         |                     |                     | Power (W)                         | 866  | 881  | 899  | 916  | 934  | 951  | 970  | 977  | 973  | 969  |  |      |      |
|           |         |                     |                     | CFM                               | 2322 | 2290 | 2253 | 2219 | 2188 | 2152 | 2120 | 2083 | 2013 | 1940 |  |      |      |
| 1950      | 1500    | Constant Volume ECM | Minimum CFM         | RPM                               | 705  | 773  | 836  | 894  | 949  | 998  | 1044 | 1085 | 1121 | 1153 |  |      |      |
|           |         |                     |                     | Power (W)                         | 246  | 301  | 354  | 405  | 453  | 500  | 544  | 587  | 627  | 665  |  |      |      |
|           |         |                     |                     | CFM                               | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 | 1500 |  |      |      |
|           |         |                     | Default CFM         | RPM                               | 852  | 899  | 949  | 992  | 1031 | 1085 | 1136 | 1179 | 1225 | 1272 |  |      |      |
|           |         |                     |                     | Power (W)                         | 501  | 562  | 629  | 683  | 731  | 804  | 871  | 926  | 986  | 1047 |  |      |      |
|           |         |                     |                     | CFM                               | 1950 | 1950 | 1950 | 1950 | 1950 | 1950 | 1950 | 1950 | 1950 | 1950 |  |      |      |
|           |         |                     | Maximum CFM         | RPM                               | 995  | 1020 | 1044 | 1069 | 1094 |      |      |      |      |      |  |      |      |
|           |         |                     |                     | Power (W)                         | 885  | 896  | 901  | 916  | 937  |      |      |      |      |      |  |      |      |
|           |         |                     |                     | CFM                               | 2200 | 2200 | 2200 | 2200 | 2200 |      |      |      |      |      |  |      |      |

See ECM control section for details on setting airflow.  
 Airflow is controlled within 5% up to the Max ESP shown with wet coil.  
 Do not select Dehumidification mode if HP CFM is on setting 1.  
 Black areas denote ESP where operation is not recommended.  
 PSC: Units factory shipped on medium speed. Other speeds require field selection.  
 CT ECM: Units factory shipped on Speed Tap 2 for Fan-Only and Speed Tap 3 for Heating/Cooling.  
 All airflow is rated and shown above at the lower voltage if unit is dual voltage rated, e.g. 208V for 208-230V units.  
 Only two speed PSC fan (H & M) available on 575V units.  
 Performance stated is at the rated power supply. Performance may vary as the power supply varies from the rated.  
 All data is shown wet coil with clean 1" filter.  
 All data is ran at 80 °F DB and 67 °F WB.  
 CFM Tolerance is 7%.  
 RPM/Watt Tolerance 10%.

## Tranquility® Compact (TC) Series

Rev.: January 24, 2023

## Constant Volume (CV) ECM

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

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

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

The fan motor operating modes include:

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

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



**Airflow Configuration Screen on Mobile App**

## Constant Torque (CT) ECM

### The Constant Torque (CT) ECM blower

**motor** combines high efficient airflow movement with simplistic operation.

The CT ECM is designed to maintain a fixed RPM. The delivered unit airflow will depend on the total static applied on the system (ductwork, grilles, etc.). This is similar to the operation of a PSC motor and differs from the CV ECM motor which will adjust RPM to deliver a constant CFM. Also, like a traditional PSC blower motor, the CT ECM blower motor has 4-5 Speed Taps depending on unit size (see blower tables for details). The blower comes factory wired into two speed taps. To adjust speeds in the field a technician manually changes the electrical connection either at the fan motor or connecting wire harness (varies by size).

The blower offers a “soft start” feature. Soft start gently increases the blower motors rpm resulting in quieter operation during start up cycles. The blower does not include a “ramp down” feature like the CV ECM motor. When the fan call is removed the blower will immediately shut down. If the ramp down feature is required please select a CV ECM blower.

The CT ECM blower is not a communicating component and does not contain the high functionality like the CV ECM blower does. It offers an entry level ECM option for applications seeking high efficiency with simplistic functionality. Constant Volume (CV) and Constant Torque (CT) styles of ECM blower motors are both equally efficient in their operation. The difference between the two motors is in their operational functionality.



Speed Taps 1-5



Tranquility® Compact (TC) Series

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## Wiring Diagram Matrix

All current diagrams can be located online at [climatemaster.com](http://climatemaster.com).

Click 'Commercial Professional'.

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

| Unit Controller      | Fan Motor | Water Side Economizer | 208v/1 - 265v/1 |            | 208v/3     | 460v/3     | 575v/3  |  |
|----------------------|-----------|-----------------------|-----------------|------------|------------|------------|---------|--|
|                      |           |                       | 006-012         | 015-060    | 024-060    | 024-060    | 041-060 |  |
| CXM2                 | PSC       | None                  | 96B0514N11      |            | 96B0514N21 | 96B0514N31 |         |  |
|                      |           | WSE                   | 96B0515N11      |            | 96B0515N21 | 96B0515N31 |         |  |
|                      | CT ECM    | None                  | 96B0514N12      |            | 96B0514N22 | 96B0514N32 |         |  |
|                      |           | WSE                   | 96B0515N12      |            | 96B0515N22 | 96B0515N32 |         |  |
| DXM2.5               | PSC       | None                  | 96B0521N11      |            | 96B0521N21 | 96B0521N31 |         |  |
|                      |           | WSE                   | 96B0476N11      |            | 96B0476N21 | 96B0476N31 |         |  |
|                      | CT ECM    | None                  | 96B0527N11      |            | 96B0527N21 | 96B0527N31 |         |  |
|                      |           | WSE                   | 96B0478N11      |            | 96B0478N21 | 96B0478N31 |         |  |
|                      | CV ECM    | None                  | 96B0523N01      | 96B0523N11 | 96B0523N21 | 96B0523N31 |         |  |
|                      |           | WSE                   | 96B0477N01      | 96B0477N11 | 96B0477N21 | 96B0477N31 |         |  |
| Auxiliary WD for MPC |           |                       | 96B0147N14      |            |            |            |         |  |



## DIP Setting Table

### DIP Setting Table - 99D0061N01

Note: Shade indicates DIP switch location

|  |    |   |     |  |   |     |    |   |     |    |   |
|--|----|---|-----|--|---|-----|----|---|-----|----|---|
| TC DIGIT 9 = D, B + DXM2.5 WSE<br>TC DIGIT 12 = 1,2,3,4 + DXM2.5 WSE |    |   |     | TC DIGIT 9 = P, S + DXM2.5 WSE + MPC<br>TC DIGIT 12 = 1,2,3,4 + DXM2.5 WSE + MPC |   |     |    |   |     |    |   |
| OFF  | ON | 1 | OFF | ON   | 1 | OFF | ON | 1 | OFF | ON | 1 |
|  | ■  |   | ■   |  |   |     | ■  |   | ■   |    |   |
| ■  |    | 2 | ■   |  | 2 | ■   |    | 2 | ■   |    | 2 |
|  | ■  | 3 |     | ■  | 3 |     | ■  | 3 |     | ■  | 3 |
| ■  |    | 4 | ■   |  | 4 | ■   |    | 4 | ■   |    | 4 |
|  | ■  | 5 |     | ■  | 5 |     | ■  | 5 |     | ■  | 5 |
| ■  |    | 6 | ■   |  | 6 | ■   |    | 6 | ■   |    | 6 |
|  | ■  | 7 |     | ■  | 7 |     | ■  | 7 |     | ■  | 7 |
| ■  |    | 8 | ■   |  | 8 | ■   |    | 8 | ■   |    | 8 |
| S1   |    |   | S2  |  |   | S1  |    |   | S2  |    |   |

## Tranquility® Compact (TC) Series

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### Controls – CXM2 and DXM2.5



#### **CXM2 Controls**

For detailed controller information, see the CXM2 Application, Operation, and Maintenance (AOM) manual (part # 97B0137N01). To confirm the controller type of your particular unit, refer to digit 9 on the unit model number and the unit nomenclature diagram found on page 3 of this manual.



#### **DXM2.5 Controls**

For detailed controller information, see the DXM2.5 Application, Operation, and Maintenance (AOM) manual (part # 97B0142N01). To confirm the controller type of your particular unit, refer to digit 9 on the unit model number and the unit nomenclature diagram found on page 3 of this manual.

## Operating and Commissioning Limits

### Operating Limits

Environment – Units are designed for indoor installation only. Never install units in areas subject to freezing or where humidity levels could cause cabinet condensation (such as unconditioned spaces subject to 100% outside air).

Power Supply – A voltage variation of +/- 10% of nameplate utilization voltage is acceptable.

Determination of operating limits is dependent primarily upon three factors: 1) return air temperature. 2) water temperature, and 3) ambient temperature. When any one of these factors is at minimum or maximum levels, the other two factors should be at normal levels to ensure proper unit operation. Extreme variations in temperature and humidity and/or corrosive water or air will adversely affect unit performance, reliability, and service life. Consult Table 7 for operating limits.

### Commissioning Limits

Consult Table 8 for the particular model. Starting conditions vary depending upon model and are based upon the following notes:

#### Notes:

1. Conditions in Table 8 are not normal or continuous operating conditions. Minimum/maximum limits are start-up conditions to bring the building space up to occupancy temperatures. Units are not designed to operate under these conditions on a regular basis.
2. Voltage utilization range complies with AHRI Standard 110.

Table 7: Operating Limits

| Operating Limits          | TC  |                      |
|---------------------------|---|----------------------|
|                           | Cooling                                       | Heating              |
| <b>Air Limits</b>         |   |                      |
| Min. ambient air, DB      | 45°F [7°C]                                    | 39°F [4°C]           |
| Rated ambient air, DB     | 80.6°F [27°C]                                 | 68°F [20°C]          |
| Max. ambient air, DB      | 130°F [54.4°C]                                | 85°F [29°C]          |
| Min. entering air, DB/WB  | *65/50°F [18/10°C]                            | 45°F [7.2°C]         |
| Rated entering air, DB/WB | 80.6/66.2°F [27/19°C]                         | 68°F [20°C]          |
| Max. entering air, DB/WB  | 95/75°F [35/24°C]                             | 80°F [27°C]          |
| <b>Water Limits</b>       |   |                      |
| Min. entering water       | 30°F [-1°C]                                   | 20°F [-6.7°C]        |
| Normal entering water     | 50-110°F [10-43°C]                            | 30-70°F [-1 to 21°C] |
| Max. entering water       | 120°F [49°C]                                  | 90°F [32°C]          |
| <b>Normal Water Flow</b>  | 1.5 to 3.0 gpm/ton<br>[1.6 to 3.2 l/m per kW] |                      |

Table 8: Commissioning Limits

| Commissioning Limits      | Cooling                                       | Heating              |
|---------------------------|---|----------------------|
| <b>Air Limits</b>         |   |                      |
| Min. ambient air, DB      | 45°F [7°C]                                    | 39°F [4°C]           |
| Rated ambient air, DB     | 80.6°F [27°C]                                 | 68°F [20°C]          |
| Max. ambient air, DB      | 130°F [54.4°C]                                | 85°F [29°C]          |
| Min. entering air, DB/WB  | 50/45°F [10/7°C]                              | 40°F [4.5°C]         |
| Rated entering air, DB/WB | 80.6/66.2°F [27/19°C]                         | 68°F [20°C]          |
| Max. entering air, DB/WB  | 110/83°F [43/28°C]                            | 80°F [27°C]          |
| <b>Water Limits</b>       |   |                      |
| Min. entering water       | 30°F [-1°C]                                   | 20°F [-6.7°C]        |
| Normal entering water     | 50-110°F [10-43°C]                            | 30-70°F [-1 to 21°C] |
| Max. entering water       | 120°F [49°C]                                  | 90°F [32°C]          |
| <b>Normal Water Flow</b>  | 1.5 to 3.0 gpm/ton<br>[1.6 to 3.2 l/m per kW] |                      |

## Tranquility® Compact (TC) Series

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## Piping System Cleaning and Flushing

### Piping System Cleaning and Flushing

Cleaning and flushing the WLHP piping system is the single most important step to ensure proper start-up and continued efficient operation of the system.

Follow the instructions below to properly clean and flush the system:

1. Ensure that electrical power to the unit is disconnected.
2. Install the system with the supply hose connected directly to the return riser valve. Use a single length of flexible hose.
3. Fill the system with water. DO NOT allow system to overflow. Bleed all air from the system. Pressurize and check the system for leaks and repair as appropriate.  
Models with Waterside Economizer also manually open economizer valve and coil air vents (2) to bleed air from coil.
4. Verify that all strainers are in place (ClimateMaster recommends a strainer with a #20 stainless steel wire mesh). Start the pumps, and systematically check each vent to ensure that all air is bled from the system.
5. Verify that make-up water is available. Adjust make-up water as required to replace the air which was bled from the system. Check and adjust the water/air level in the expansion tank.
6. Set the boiler to raise the loop temperature to approximately 86°F [30°C]. Open a drain at the lowest point in the system. Adjust the make-up water replacement rate to equal the rate of bleed.
7. Refill the system and add trisodium phosphate in a proportion of approximately one pound per 150 gallons (.8 kg per 1000 l) of water (or other equivalent approved cleaning agent) Reset the boiler to raise the loop temperature to 100°F [38°C]. Circulate the solution for a minimum of 8 to 24 hours. At the end of this period, shut off the circulating pump and drain the solution. Repeat system cleaning if desired.
8. When the cleaning process is complete, remove the short-circuited hoses. Reconnect the hoses to the proper supply, and return the connections to each of the units. Refill the system and bleed off all air.

9. Test the system pH with litmus paper. The system water should be in the range of pH 6.0 - 8.5 (see table 3). Add chemicals, as appropriate to maintain neutral pH levels.
10. When the system is successfully cleaned, flushed, refilled and bled, check the main system panels, safety cutouts and alarms. Set the controls to properly maintain loop temperatures.

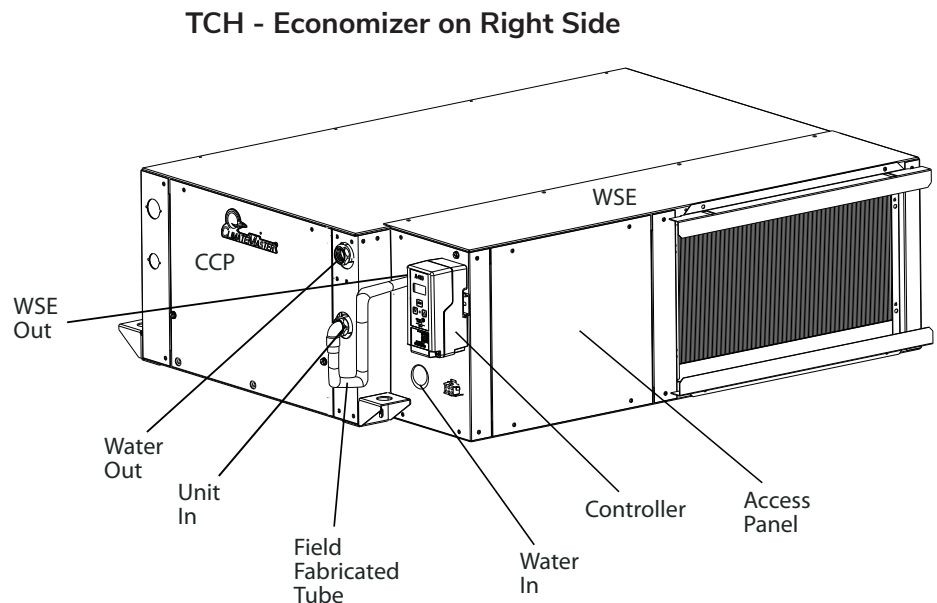
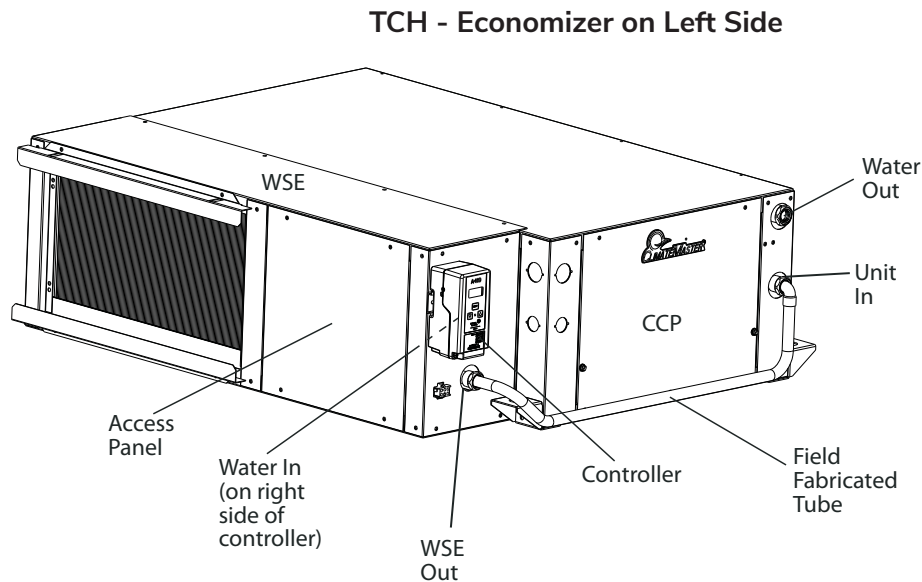
### CAUTION!

**CAUTION!** DO NOT use “Stop Leak” or similar chemical agent in this system. Addition of chemicals of this type to the loop water will foul the heat exchanger and inhibit unit operation.

**Note:** The manufacturer strongly recommends all piping connections, both internal and external to the unit, be pressure tested by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. Test pressure may not exceed the maximum allowable pressure for the unit and all components within the water system. The manufacturer will not be responsible or liable for damages from water leaks due to inadequate or lack of a pressurized leak test, or damages caused by exceeding the maximum pressure rating during installation.

## TC with Waterside Economizer Option

Figure 21:



**Notes:**

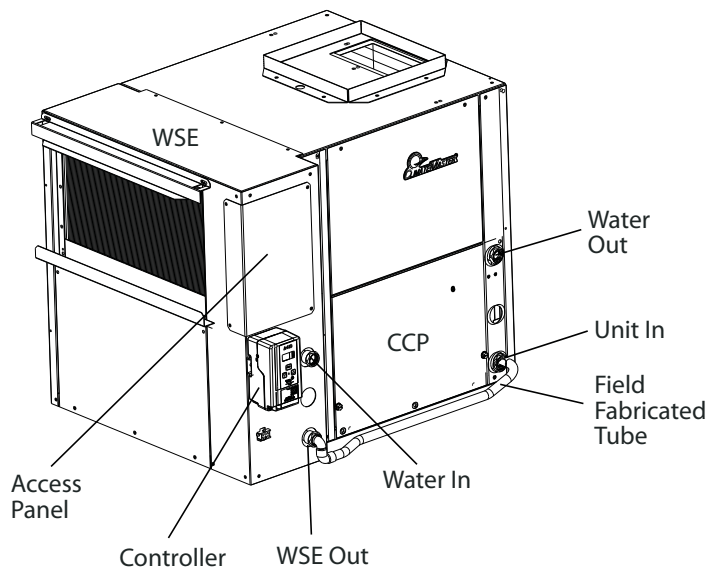
1. Field to fabricate tube and connect from WSE - OUT to Unit - IN. Do not block compressor/control box service panel (CCP). Hoses are not recommended.
2. Access panel for access to 3 way valve and air bleed vents (2) at top of WSE coil headers. For vertical units and 1 at the top and 1 at the bottom for horizontal units.
3. All units require two external drain traps. The two drains may be connected after the vents.
4. Controllers are shipped inside, remove, slide on DIN rail, and connect molex.

## Tranquility® Compact (TC) Series

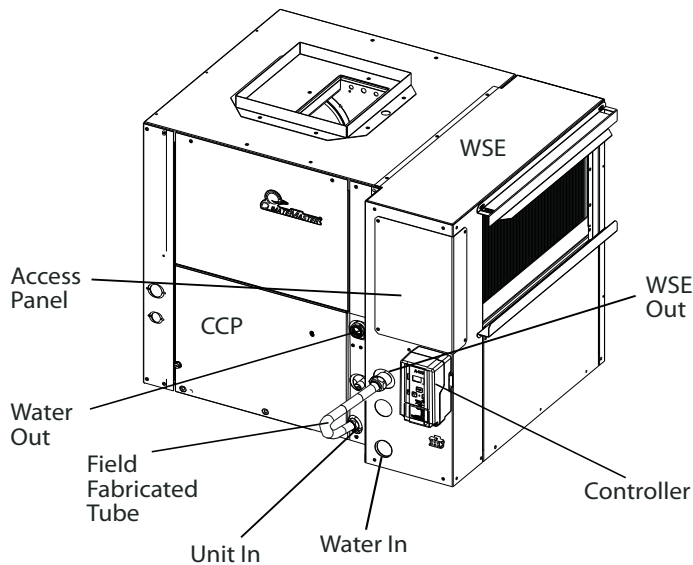
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### TC with Waterside Economizer Option, Cont'd.

TCV - Economizer on Left Side



TCV - Economizer on Right Side



#### Notes:

1. Field to fabricate tube and connect from WSE - OUT to Unit - IN. Do not block compressor/control box service panel (CCP). Hoses are not recommended.
2. Access panel for access to 3 way valve and air bleed vents (2) at top of WSE coil headers. For vertical units and 1 at the top and 1 at the bottom for horizontal units.
3. All units require two external drain traps. Can connect 2 drains after vents.
4. Controllers are shipped inside, remove, slide on DIN rail, and connect molex.

## Unit and System Checkout

### **WARNING!**

**WARNING!** Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with HFC-410A refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing HFC-410A as system failures and property damage may result.

### Unit and System Checkout

BEFORE POWERING SYSTEM, please check the following:

#### UNIT CHECKOUT

- ❑ Balancing/shutoff valves: Ensure that all isolation valves are open and water control valves are wired.
- ❑ Line voltage and wiring: Verify that voltage is within an acceptable range for the unit and wiring and fuses/breakers are properly sized. Verify that low voltage wiring is complete.
- ❑ Unit control transformer: Ensure that transformer has the properly selected voltage tap.
- ❑ Entering water and air: Ensure that entering water and air temperatures are within operating limits of Table 8a-b.
- ❑ Low water temperature cutout: Verify that low water temperature cut-out on the CXM2/DXM2.5 control is properly set.
- ❑ Unit fan: Manually rotate fan to verify free rotation and ensure that blower wheel is secured to the motor shaft. Be sure to remove any shipping supports if needed. DO NOT oil motors upon start-up. Fan motors are pre-oiled at the factory. Check unit fan speed selection and compare to design requirements.
- ❑ Condensate line: Verify that condensate line is open and properly pitched toward drain.
- ❑ Water flow balancing: Record inlet and outlet water temperatures for each heat pump upon startup. This check can eliminate nuisance trip outs and high velocity water flow that could erode heat exchangers.
- ❑ Unit air coil and filters: Ensure that filter is clean and accessible. Clean air coil of all manufacturing oils.
- ❑ Unit controls: Verify that CXM2 or DXM2.5 field selection options are properly set.

#### SYSTEM CHECKOUT

- ❑ System water temperature: Check water temperature for proper range and also verify heating and cooling set points for proper operation.
- ❑ System pH: Check and adjust water pH if necessary to maintain a level between 6 and 8.5. Proper pH promotes longevity of hoses and fittings (see table 3).
- ❑ System flushing: Verify that all hoses are connected end to end when flushing to ensure that debris bypasses the unit heat exchanger, water valves and other components. Water used in the system must be potable quality initially and clean of dirt, piping slag, and strong chemical cleaning agents. Verify that all air is purged from the system. Air in the system can cause poor operation or system corrosion.
- ❑ Cooling tower/boiler: Check equipment for proper setpoints and operation.
- ❑ Standby pumps: Verify that the standby pump is properly installed and in operating condition.
- ❑ System controls: Verify that system controls function and operate in the proper sequence.
- ❑ Low water temperature cutout: Verify that low water temperature cut-out controls are provided for the outdoor portion of the loop. Otherwise, operating problems may occur.
- ❑ System control center: Verify that the control center and alarm panel have appropriate setpoints and are operating as designed.
- ❑ Miscellaneous: Note any questionable aspects of the installation.

### **CAUTION!**

**CAUTION!** Verify that ALL water control valves are open and allow water flow prior to engaging the compressor. Freezing of the coax or water lines can permanently damage the heat pump.

### **CAUTION!**

**CAUTION!** To avoid equipment damage, DO NOT leave system filled in a building without heat during the winter unless antifreeze is added to the water loop. Heat exchangers never fully drain by themselves and will freeze unless winterized with antifreeze.

## Tranquility® Compact (TC) Series

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## Unit Start-Up Procedure

## Unit Start-up Procedure

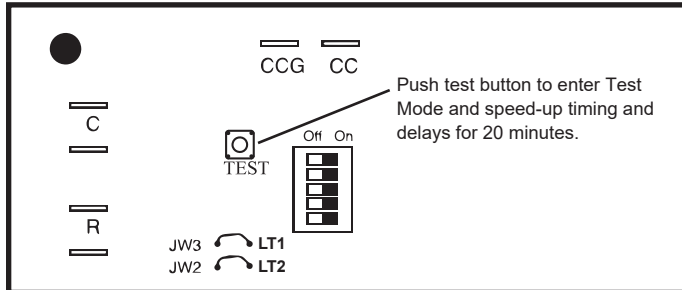
1. Turn the thermostat fan position to "ON". Blower should start.
  2. Balance air flow at registers.
  3. Adjust all valves to their full open positions. Turn on the line power to all heat pumps.
  4. Room temperature should be within the minimum-maximum ranges of table 7. During start-up checks, loop water temperature entering the heat pump should be between 60°F [16°C] and 95°F [35°C].
  5. Two factors determine the operating limits of ClimateMaster heat pumps, (a) return air temperature, and (b) water temperature. When any one of these factors is at a minimum or maximum level, the other factor must be at normal level to ensure proper unit operation.
    - a. Adjust the unit thermostat to the warmest setting. Place the thermostat mode switch in the "COOL" position. Slowly reduce thermostat setting until the compressor activates.
    - b. Check for cool air delivery at the unit grille within a few minutes after the unit has begun to operate.  
**Note: Units have a five minute time delay in the control circuit that can be eliminated on the CXM2/DXM2.5 control board as shown in Figure 22. See controls description for details.**
    - c. Verify that the compressor is on and that the water flow rate is correct by measuring pressure drop through the heat exchanger using the P/T plugs and comparing to table 9.
    - d. Check the elevation and cleanliness of the condensate lines. Dripping may be a sign of a blocked line. Check that the condensate trap is filled to provide a water seal.
    - e. Refer to table 11. Check the temperature of both entering and leaving water. If temperature is within range, proceed with the test. Verify correct water flow by comparing unit pressure drop across the heat exchanger versus the data in table 9. Heat of rejection (HR) can be calculated and compared to submittal data capacity pages. The formula for HR for systems with water is as follows:  
 $HR \text{ (Btuh)} = TD \times GPM \times 500$ , where TD is the temperature difference between the entering and leaving water, and GPM is the flow rate in U.S. GPM, determined by comparing the pressure drop across the heat exchanger to table 9. In S-I units, the formula is as follows:  $HR \text{ (kW)} = TD \times l/s \times 4.18$ .
    - f. Check air temperature drop across the air coil when compressor is operating. Air temperature drop should be between 15°F and 25°F [8°C and 14°C].
  - g. Turn thermostat to "OFF" position. A hissing noise indicates proper functioning of the reversing valve.
6. Allow five (5) minutes between tests for pressure to equalize before beginning heating test.
    - a. Adjust the thermostat to the lowest setting. Place the thermostat mode switch in the "HEAT" position.
    - b. Slowly raise the thermostat to a higher temperature until the compressor activates.
    - c. Check for warm air delivery within a few minutes after the unit has begun to operate.
    - d. Refer to table 11. Check the temperature of both entering and leaving water. If temperature is within range, proceed with the test. If temperature is outside of the operating range, check refrigerant pressures and compare to table 10. Verify correct water flow by comparing unit pressure drop across the heat exchanger versus the data in table 9. Heat of extraction (HE) can be calculated and compared to submittal data capacity pages. The formula for HE for systems with water is as follows:  
 $HE \text{ (kW)} = TD \times GPM \times 500$ , where TD is the temperature difference between the entering and leaving water, and l/s is the flow rate in U.S. GPM, determined by comparing the pressure drop across the heat exchanger to tables 10a through 10e. In S-I units, the formula is as follows:  $HE \text{ (kW)} = TD \times l/s \times 4.18$ .
    - e. Check air temperature rise across the air coil when compressor is operating. Air temperature rise should be between 20°F and 30°F [11°C and 17°C].
    - f. Check for vibration, noise, and water leaks.
  7. If unit fails to operate, perform troubleshooting analysis (see troubleshooting section). If the check described fails to reveal the problem and the unit still does not operate, contact a trained service technician to ensure proper diagnosis and repair of the equipment.
  8. When testing is complete, set system to maintain desired comfort level.
  9. BE CERTAIN TO FILL OUT AND FORWARD ALL WARRANTY REGISTRATION PAPERS TO CLIMATEMASTER.

**Note: If performance during any mode appears abnormal, refer to the CXM2/DXM2.5 section or troubleshooting section of this manual. To obtain maximum performance, the air coil should be cleaned before start-up. A 10% solution of dishwasher detergent and water is recommended.**



## Unit Start-Up Procedure, Cont'd.

Figure 22: Test Mode Button



### ! WARNING! !

**WARNING!** When the disconnect switch is closed, high voltage is present in some areas of the electrical panel. Exercise caution when working with energized equipment.

### ! CAUTION! !

**CAUTION!** Verify that ALL water control valves are open and allow water flow prior to engaging the compressor. Freezing of the coax or water lines can permanently damage the heat pump.

### ! CAUTION! !

**CAUTION!** Many units are installed with a factory or field supplied manual or electric shut-off valve. **DAMAGE WILL OCCUR** if shut-off valve is closed during unit operation. A high pressure switch must be installed on the heat pump side of any field provided shut-off valves and connected to the heat pump controls in series with the built-in refrigerant circuit high pressure switch to disable compressor operation if water pressure exceeds pressure switch setting. The field installed high pressure switch shall have a cut-out pressure of 300 psig and a cut-in pressure of 250 psig.

Tranquility® Compact (TC) Series

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Unit Operating Conditions

Table 9: TC Coax Water Pressure Drop

| Model | U.S. GPM | l/s  | Pressure Drop, psi [kPa]* |             |             |             |
|-------|----------|------|---------------------------|-------------|-------------|-------------|
|       |          |      | 30°F [-1°C]               | 50°F [10°C] | 70°F [21°C] | 90°F [32°C] |
| 006   | 0.75     | 0.05 | 0.5 [3.7]                 | 0.3 [2.3]   | 0.2 [1.6]   | 0.2 [1.6]   |
|       | 1.1      | 0.07 | 0.8 [5.3]                 | 0.5 [3.5]   | 0.4 [2.7]   | 0.3 [2.2]   |
|       | 1.5      | 0.09 | 1.3 [8.8]                 | 0.9 [6.1]   | 0.7 [4.8]   | 0.6 [4.0]   |
| 009   | 1.1      | 0.07 | 1.3 [9.0]                 | 0.6 [4.4]   | 0.4 [2.8]   | 0.3 [1.9]   |
|       | 1.8      | 0.11 | 2.1 [14.1]                | 1.4 [9.4]   | 1.1 [7.4]   | 0.9 [6.2]   |
|       | 2.3      | 0.14 | 3.5 [24.3]                | 2.6 [17.9]  | 2.1 [14.7]  | 1.8 [12.7]  |
| 012   | 1.5      | 0.09 | 1.9 [12.8]                | 1.1 [7.6]   | 0.8 [5.3]   | 0.6 [4.1]   |
|       | 2.3      | 0.15 | 3.6 [25.0]                | 2.6 [17.8]  | 2.1 [14.3]  | 1.8 [12.1]  |
|       | 3.0      | 0.19 | 6.7 [46.1]                | 5.0 [34.3]  | 4.1 [28.3]  | 3.6 [24.5]  |
| 015   | 1.9      | 0.12 | 1.0 [6.9]                 | 0.6 [4.4]   | 0.5 [3.4]   | 0.4 [2.8]   |
|       | 2.8      | 0.18 | 1.8 [12.4]                | 1.4 [9.3]   | 1.1 [7.6]   | 1.0 [6.9]   |
|       | 3.8      | 0.24 | 3.3 [22.7]                | 2.5 [17.5]  | 2.1 [14.7]  | 1.9 [13.1]  |
| 018   | 2.3      | 0.14 | 2.1 [14.5]                | 1.4 [9.9]   | 1.1 [7.6]   | 0.9 [6.2]   |
|       | 3.4      | 0.21 | 3.4 [23.4]                | 2.6 [17.6]  | 2.1 [14.7]  | 1.8 [12.4]  |
|       | 4.5      | 0.28 | 5.9 [40.6]                | 4.6 [31.5]  | 3.9 [26.9]  | 3.4 [23.4]  |
| 024   | 3.0      | 0.19 | 2.2 [15.2]                | 1.7 [11.6]  | 1.4 [9.6]   | 1.2 [8.3]   |
|       | 4.5      | 0.28 | 4.0 [27.6]                | 3.2 [22.2]  | 2.8 [19.3]  | 2.5 [17.2]  |
|       | 6.0      | 0.38 | 7.2 [49.6]                | 5.9 [40.6]  | 5.2 [35.8]  | 4.7 [32.4]  |
| 030   | 3.8      | 0.24 | 1.3 [9.0]                 | 0.9 [6.1]   | 0.7 [4.8]   | 0.6 [4.1]   |
|       | 5.6      | 0.35 | 2.3 [15.8]                | 1.8 [12.5]  | 1.5 [10.3]  | 1.4 [9.6]   |
|       | 7.5      | 0.47 | 4.2 [28.9]                | 3.4 [23.2]  | 2.9 [20]    | 2.6 [17.9]  |
| 036   | 4.5      | 0.28 | 1.8 [12.4]                | 1.4 [9.6]   | 1.2 [8.3]   | 1.0 [6.9]   |
|       | 6.8      | 0.43 | 3.1 [21.4]                | 2.4 [16.8]  | 2.1 [14.7]  | 1.9 [13.1]  |
|       | 9.0      | 0.57 | 5.4 [37.2]                | 4.4 [30.0]  | 3.8 [26.2]  | 3.4 [23.4]  |
| 041   | 5.0      | 0.32 | 2.2 [15.0]                | 1.6 [10.8]  | 1.1 [7.7]   | 0.8 [5.6]   |
|       | 7.5      | 0.47 | 4.6 [32.0]                | 3.5 [24.0]  | 2.6 [18.01] | 2.1 [14.5]  |
|       | 10.0     | 0.63 | 7.7 [53.3]                | 6.1 [42.1]  | 5.1 [34.8]  | 4.6 [31.4]  |
| 042   | 5.3      | 0.33 | 2.3 [15.8]                | 1.8 [12.1]  | 1.5 [10.3]  | 1.3 [9.0]   |
|       | 7.9      | 0.50 | 4.3 [29.6]                | 3.5 [24.2]  | 3.1 [26.4]  | 2.8 [19.3]  |
|       | 10.5     | 0.66 | 7.9 [54.4]                | 6.5 [44.8]  | 5.7 [39.3]  | 5.2 [35.8]  |
| 048   | 6.0      | .038 | 1.8 [12.4]                | 1.5 [10.1]  | 1.3 [9.0]   | 1.2 [8.3]   |
|       | 9.0      | 0.57 | 3.4 [23.4]                | 3.0 [20.4]  | 2.7 [18.6]  | 2.6 [17.9]  |
|       | 12.0     | 0.76 | 6.2 [42.7]                | 5.5 [37.9]  | 5.1 [35.1]  | 4.8 [35.1]  |
| 060   | 7.5      | 0.47 | 3.4 [23.4]                | 2.8 [19.2]  | 2.4 [16.5]  | 2.2 [15.2]  |
|       | 11.3     | 0.71 | 6.8 [46.9]                | 5.9 [40.8]  | 5.4 [37.2]  | 5.0 [34.5]  |
|       | 15.0     | 0.95 | 12.6 [86.8]               | 11.1 [76.8] | 10.3 [71.0] | 9.6 [66.1]  |

Unit Operating Conditions, Cont'd.

Table 10: TC Series Typical Unit Operating Pressures and Temperatures

| 006                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 124-134               | 159-179                  | 17-22        | 5-10          | 18.7-20.7          | 17-23               | 71-81                 | 295-315                  | 13-18        | 5-10          | 5.9-7.9            | 17-23               |
|                         | 2.25               | 120-130               | 147-167                  | 20-25        | 5-10          | 13.6-15.6          | 18-24               | 72-82                 | 296-316                  | 14-19        | 5-10          | 4.2-6.2            | 17-23               |
|                         | 3                  | 117-127               | 136-156                  | 24-29        | 5-10          | 8.5-10.5           | 18-24               | 74-84                 | 297-317                  | 15-20        | 5-10          | 2.5-4.5            | 17-23               |
| 50                      | 1.5                | 132-142               | 210-230                  | 7-12         | 5-10          | 16.2-18.2          | 18-24               | 105-115               | 330-350                  | 8-13         | 9-14          | 8.2-10.2           | 22-28               |
|                         | 2.25               | 131-141               | 199-219                  | 8-13         | 5-10          | 11.9-13.9          | 19-25               | 110-120               | 335-355                  | 9-14         | 9-14          | 6.1-8.1            | 22-28               |
|                         | 3                  | 130-140               | 189-209                  | 9-14         | 4-9           | 7.7-9.7            | 19-25               | 115-125               | 339-359                  | 9-14         | 9-14          | 4-6                | 23-29               |
| 70                      | 1.5                | 136-146               | 275-295                  | 5-10         | 5-10          | 15.1-17.1          | 17-23               | 136-146               | 362-382                  | 9-14         | 10-15         | 11.3-13.3          | 27-33               |
|                         | 2.25               | 136-146               | 262-282                  | 6-11         | 4-9           | 11.1-13.1          | 18-24               | 141-151               | 368-388                  | 9-14         | 10-15         | 16.9-18.9          | 28-34               |
|                         | 3                  | 135-145               | 250-270                  | 6-11         | 4-9           | 7.2-9.2            | 18-24               | 147-157               | 374-394                  | 9-14         | 10-15         | 5.6-7.6            | 29-35               |
| 90                      | 1.5                | 142-152               | 365-385                  | 5-10         | 4-9           | 13.8-15.8          | 16-22               | 170-180               | 402-422                  | 14-19        | 12-17         | 14.4-16.4          | 33-39               |
|                         | 2.25               | 141-151               | 353-373                  | 5-10         | 4-9           | 10.2-12.2          | 16-22               | 173-183               | 407-427                  | 15-20        | 12-17         | 11.1-13.1          | 33-39               |
|                         | 3                  | 140-150               | 340-360                  | 5-10         | 4-9           | 6.6-8.6            | 16-22               | 177-187               | 412-432                  | 17-22        | 12-17         | 7.7-9.1            | 34-40               |
| 110                     | 1.5                | 148-158               | 462-482                  | 5-10         | 4-9           | 12.5-14.5          | 14-20               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 147-157               | 449-469                  | 5-10         | 3-8           | 9.2-11.2           | 14-20               |                       |                          |              |               |                    |                     |
|                         | 3                  | 146-156               | 438-458                  | 5-10         | 3-8           | 5.9-7.9            | 14-20               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 009                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 113-123               | 160-180                  | 22-27        | 13-18         | 19.5-21.5          | 17-23               | 69-79                 | 331-351                  | 11-16        | 20-25         | 7.3-9.3            | 17-23               |
|                         | 2.25               | 110-120               | 147-167                  | 25-30        | 11-16         | 14.2-16.2          | 17-23               | 72-82                 | 335-355                  | 11-16        | 20-25         | 5.4-7.4            | 18-24               |
|                         | 3                  | 108-118               | 135-155                  | 28-33        | 9-14          | 8.9-10.9           | 16-21               | 75-85                 | 339-359                  | 11-16        | 21-26         | 3.5-5.5            | 19-25               |
| 50                      | 1.5                | 124-134               | 211-231                  | 9-14         | 10-15         | 18-20              | 17-23               | 101-111               | 360-380                  | 9-14         | 20-25         | 9.8-11.8           | 23-29               |
|                         | 2.25               | 122-132               | 199-219                  | 12-17        | 9-14          | 13.2-15.2          | 17-23               | 105-115               | 363-383                  | 9-14         | 19-24         | 7.4-9.4            | 24-30               |
|                         | 3                  | 120-130               | 187-207                  | 15-20        | 8-13          | 8.4-10.4           | 17-23               | 110-120               | 366-386                  | 9-14         | 19-24         | 4.9-6.9            | 24-30               |
| 70                      | 1.5                | 129-139               | 275-295                  | 7-12         | 8-13          | 17.4-19.4          | 16-22               | 130-140               | 400-420                  | 10-15        | 20-25         | 12.8-14.8          | 28-34               |
|                         | 2.25               | 128-138               | 261-281                  | 8-13         | 7-12          | 12.8-14.8          | 16-22               | 137-147               | 407-427                  | 10-15        | 19-24         | 9.6-11.6           | 29-35               |
|                         | 3                  | 127-137               | 247-267                  | 8-13         | 6-11          | 8.2-10.2           | 16-22               | 144-154               | 414-434                  | 10-15        | 18-23         | 6.4-8.4            | 30-36               |
| 90                      | 1.5                | 136-146               | 364-384                  | 7-12         | 3-8           | 15.7-17.7          | 15-21               | 170-180               | 449-469                  | 13-18        | 17-22         | 16-18              | 34-40               |
|                         | 2.25               | 135-145               | 350-370                  | 7-12         | 4-9           | 11.7-13.7          | 15-21               | 178-188               | 455-475                  | 14-19        | 15-20         | 12-14              | 35-41               |
|                         | 3                  | 134-144               | 336-356                  | 7-12         | 4-9           | 7.6-9.6            | 15-21               | 186-196               | 460-480                  | 15-20        | 13-18         | 7.9-9.9            | 36-42               |
| 110                     | 1.5                | 142-152               | 467-487                  | 5-10         | 4-9           | 13.5-15.5          | 13-19               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 141-151               | 451-471                  | 5-10         | 4-9           | 9.9-11.9           | 13-19               |                       |                          |              |               |                    |                     |
|                         | 3                  | 140-150               | 435-455                  | 5-10         | 3-8           | 6.3-8.3            | 13-19               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 012                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 116-126               | 155-175                  | 14-19        | 9-14          | 19.4-21.4          | 18-24               | 70-80                 | 311-331                  | 8-13         | 8-13          | 6.9-8.9            | 18-24               |
|                         | 2.25               | 113-123               | 144-164                  | 15-20        | 8-13          | 14.3-16.3          | 18-24               | 72-82                 | 315-335                  | 8-13         | 8-13          | 5.1-7.1            | 19-25               |
|                         | 3                  | 111-121               | 132-152                  | 17-22        | 6-11          | 9.1-11.1           | 18-24               | 75-85                 | 319-339                  | 8-13         | 8-13          | 3.2-5.2            | 19-25               |
| 50                      | 1.5                | 123-133               | 208-228                  | 8-13         | 9-14          | 18.1-20.1          | 17-23               | 102-112               | 354-364                  | 8-13         | 9-14          | 9.3-11.3           | 25-31               |
|                         | 2.25               | 122-132               | 196-216                  | 9-14         | 7-12          | 13.4-15.4          | 18-24               | 106-116               | 355-375                  | 8-13         | 9-14          | 7-9                | 26-32               |
|                         | 3                  | 121-131               | 184-204                  | 9-14         | 5-10          | 8.6-10.6           | 18-24               | 110-120               | 355-375                  | 8-13         | 9-14          | 4.6-6.6            | 26-32               |
| 70                      | 1.5                | 127-137               | 266-286                  | 7-12         | 8-13          | 17.2-19.2          | 16-22               | 131-141               | 392-412                  | 9-14         | 8-13          | 12-14              | 30-36               |
|                         | 2.25               | 126-136               | 255-275                  | 8-13         | 7-12          | 12.7-14.7          | 16-22               | 137-147               | 395-415                  | 9-14         | 8-13          | 9-11               | 31-37               |
|                         | 3                  | 126-136               | 244-264                  | 8-13         | 5-10          | 8.2-10.2           | 16-22               | 144-154               | 398-418                  | 9-14         | 7-12          | 6-8                | 32-38               |
| 90                      | 1.5                | 133-143               | 362-382                  | 6-11         | 7-12          | 16-18              | 15-21               | 175-185               | 443-463                  | 10-15        | 3-8           | 15-17              | 36-42               |
|                         | 2.25               | 132-142               | 342-362                  | 7-12         | 5-10          | 11.8-13.8          | 15-21               | 183-193               | 452-472                  | 11-16        | 3-8           | 11.2-13.2          | 37-43               |
|                         | 3                  | 132-142               | 331-351                  | 7-12         | 4-9           | 7.6-9.6            | 15-21               | 190-200               | 461-491                  | 13-18        | 3-8           | 7.4-9.4            | 38-44               |
| 110                     | 1.5                | 140-150               | 459-479                  | 6-11         | 4-9           | 14.4-16.4          | 13-19               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 140-150               | 441-461                  | 6-11         | 4-9           | 10.6-12.6          | 13-19               |                       |                          |              |               |                    |                     |
|                         | 3                  | 139-149               | 431-451                  | 6-11         | 3-8           | 6.9-8.9            | 13-19               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

Tranquility® Compact (TC) Series

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Unit Operating Conditions, Cont'd.

Table 10: TC Series Typical Unit Operating Pressures and Temperatures: Continued

| 015                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 116-126               | 167-187                  | 15-20        | 9-14          | 18.3-20.3          | 18-24               | 70-80                 | 279-299                  | 6-11         | 1-5           | 7-8                | 16-22               |
|                         | 2.25               | 116-126               | 154-174                  | 15-20        | 7-12          | 13.9-15.9          | 19-25               | 73-83                 | 281-301                  | 7-12         | 1-5           | 5.1-7.1            | 17-23               |
|                         | 3                  | 116-126               | 140-160                  | 15-20        | 7-12          | 9.5-11.5           | 19-25               | 75-85                 | 284-304                  | 7-12         | 1-5           | 3.3-5.3            | 17-23               |
| 50                      | 1.5                | 128-138               | 194-214                  | 11-14        | 9-14          | 17.9-19.9          | 18-24               | 102-112               | 312-332                  | 10-15        | 2-6           | 9.9-11.9           | 22-28               |
|                         | 2.25               | 128-138               | 180-200                  | 11-14        | 7-12          | 13.7-15.7          | 19-25               | 106-116               | 316-336                  | 10-15        | 2-6           | 7.4-9.4            | 23-29               |
|                         | 3                  | 128-138               | 166-186                  | 11-14        | 7-12          | 9.4-11.4           | 19-25               | 110-120               | 321-341                  | 10-15        | 2-6           | 4.9-6.9            | 23-29               |
| 70                      | 1.5                | 136-146               | 289-309                  | 7-12         | 9-14          | 17.4-19.4          | 17-23               | 128-138               | 335-355                  | 12-17        | 3-8           | 12.9-14.9          | 27-34               |
|                         | 2.25               | 136-146               | 275-295                  | 7-12         | 7-12          | 15.3-17.3          | 18-24               | 134-144               | 340-360                  | 12-17        | 3-8           | 9.7-11.7           | 28-35               |
|                         | 3                  | 136-146               | 261-281                  | 7-12         | 6-11          | 8.8-10.8           | 18-24               | 141-151               | 346-366                  | 12-17        | 3-8           | 6.5-8.5            | 28-35               |
| 90                      | 1.5                | 139-149               | 386-406                  | 6-11         | 9-14          | 16.8-18.8          | 16-22               | 160-170               | 373-393                  | 15-20        | 3-8           | 15.8-17.8          | 30-38               |
|                         | 2.25               | 139-149               | 370-390                  | 6-11         | 7-12          | 12.5-14.5          | 16-22               | 167-177               | 380-400                  | 16-21        | 3-8           | 12-14              | 31-39               |
|                         | 3                  | 139-149               | 356-376                  | 6-11         | 6-11          | 8.2-9.2            | 16-22               | 174-184               | 388-408                  | 17-22        | 3-8           | 8.1-10.1           | 32-40               |
| 110                     | 1.5                | 145-155               | 483-503                  | 6-11         | 9-14          | 15.8-17.8          | 15-21               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 144-154               | 466-486                  | 6-11         | 7-12          | 11.7-13.7          | 15-21               |                       |                          |              |               |                    |                     |
|                         | 3                  | 143-153               | 449-469                  | 6-11         | 6-11          | 7.5-9.5            | 15-21               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 018                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 122-132               | 171-191                  | 15-20        | 14-19         | 22.5-24.5          | 20-28               | 70-80                 | 272-292                  | 4-9          | 2-6           | 7.4-9.4            | 18-24               |
|                         | 2.25               | 122-132               | 157-177                  | 15-20        | 13-18         | 16.8-19.8          | 20-28               | 73-83                 | 275-295                  | 4-9          | 2-6           | 5.5-7.5            | 19-25               |
|                         | 3                  | 122-132               | 145-165                  | 15-20        | 13-18         | 11.2-13.2          | 20-28               | 77-87                 | 278-298                  | 4-9          | 2-6           | 3.5-5.5            | 19-25               |
| 50                      | 1.5                | 136-146               | 198-218                  | 10-15        | 14-19         | 22-24              | 19-25               | 101-111               | 302-322                  | 8-13         | 3-7           | 10.3-12.3          | 23-29               |
|                         | 2.25               | 134-144               | 183-203                  | 10-15        | 13-18         | 16.5-18.5          | 19-25               | 105-115               | 306-326                  | 8-13         | 3-7           | 7.9-9.9            | 24-30               |
|                         | 3                  | 133-143               | 171-191                  | 11-16        | 13-18         | 11-13              | 19-25               | 109-119               | 311-331                  | 8-13         | 3-7           | 5.5-7.5            | 25-31               |
| 70                      | 1.5                | 139-149               | 293-313                  | 6-10         | 14-19         | 19-21              | 18-24               | 130-140               | 329-349                  | 10-15        | 4-9           | 13.6-15.6          | 27-33               |
|                         | 2.25               | 138-148               | 280-300                  | 6-10         | 13-18         | 14.4-16.4          | 18-24               | 137-147               | 337-357                  | 10-15        | 4-9           | 10.4-12.4          | 29-35               |
|                         | 3                  | 137-147               | 267-287                  | 7-11         | 13-18         | 9.8-11.7           | 18-24               | 139-149               | 342-362                  | 10-15        | 4-9           | 7.2-9.2            | 30-36               |
| 90                      | 1.5                | 142-152               | 389-409                  | 5-10         | 17-22         | 16-18              | 17-23               | 160-170               | 360-380                  | 13-18        | 5-10          | 17-19              | 33-41               |
|                         | 2.25               | 141-151               | 376-396                  | 5-10         | 15-20         | 12.3-14.3          | 17-23               | 169-179               | 368-388                  | 14-19        | 5-10          | 12.9-14.9          | 35-43               |
|                         | 3                  | 140-150               | 363-383                  | 5-10         | 13-18         | 8.5-10.5           | 17-23               | 178-188               | 376-396                  | 14-19        | 4-9           | 8.8-10.8           | 36-44               |
| 110                     | 1.5                | 148-158               | 486-506                  | 5-10         | 17-22         | 14.9-16.9          | 16-22               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 147-157               | 472-492                  | 5-10         | 15-20         | 11.4-13.4          | 16-22               |                       |                          |              |               |                    |                     |
|                         | 3                  | 146-156               | 458-478                  | 5-10         | 13-18         | 7.8-9.8            | 16-22               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 024                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 121-131               | 174-194                  | 13-18        | 6-11          | 19.3-21.3          | 20-28               | 65-75                 | 287-307                  | 4-9          | 3-8           | 6.8-8.8            | 17-23               |
|                         | 2.25               | 120-130               | 165-185                  | 13-18        | 5-10          | 14.5-16.5          | 20-28               | 68-78                 | 290-310                  | 5-10         | 3-8           | 5-7                | 18-24               |
|                         | 3                  | 120-130               | 155-175                  | 13-18        | 5-10          | 9.6-11.6           | 20-28               | 71-81                 | 292-312                  | 5-10         | 3-8           | 3.2-5.2            | 18-24               |
| 50                      | 1.5                | 127-137               | 245-265                  | 8-13         | 6-11          | 18.3-20.3          | 19-27               | 96-106                | 318-338                  | 6-11         | 3-8           | 9.8-11.8           | 22-28               |
|                         | 2.25               | 128-138               | 231-251                  | 8-13         | 7-12          | 13.7-15.7          | 19-27               | 101-111               | 322-342                  | 7-12         | 3-8           | 7.2-9.2            | 23-29               |
|                         | 3                  | 128-138               | 217-237                  | 8-13         | 7-12          | 9.1-11.1           | 19-27               | 105-115               | 327-347                  | 8-13         | 3-8           | 4.8-6.8            | 24-30               |
| 70                      | 1.5                | 130-140               | 352-372                  | 6-11         | 8-13          | 17.5-19.5          | 18-26               | 127-137               | 349-369                  | 9-14         | 3-8           | 12.7-14.7          | 27-34               |
|                         | 2.25               | 130-140               | 334-354                  | 6-11         | 9-14          | 26.2-28.2          | 18-26               | 132-142               | 353-373                  | 9-14         | 3-8           | 9.5-11.5           | 28-35               |
|                         | 3                  | 130-140               | 306-326                  | 6-11         | 9-14          | 8.7-10.7           | 18-26               | 137-147               | 358-378                  | 10-15        | 3-8           | 6.3-8.3            | 29-36               |
| 90                      | 1.5                | 134-144               | 439-459                  | 5-10         | 11-16         | 16.7-18.7          | 17-23               | 159-169               | 379-399                  | 13-18        | 3-8           | 15.6-17.6          | 32-40               |
|                         | 2.25               | 133-143               | 416-436                  | 5-10         | 12-17         | 12.5-14.5          | 17-23               | 164-174               | 384-404                  | 14-19        | 3-8           | 11.7-13.7          | 33-41               |
|                         | 3                  | 133-143               | 394-414                  | 5-10         | 12-17         | 8.3-10.3           | 17-23               | 170-180               | 390-410                  | 16-21        | 3-8           | 7.8-9.8            | 34-42               |
| 110                     | 1.5                | 140-150               | 536-556                  | 4-9          | 22-27         | 17.1-19.1          | 17-23               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 139-149               | 512-532                  | 4-9          | 19-23         | 12.6-14.6          | 17-23               |                       |                          |              |               |                    |                     |
|                         | 3                  | 138-148               | 488-508                  | 4-9          | 17-22         | 8-10               | 17-23               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

## Unit Operating Conditions, Cont'd.

Table 10: TC Series Typical Unit Operating Pressures and Temperatures: Continued

| 030                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 113-123               | 188-208                  | 14-19        | 14-19         | 19.5-21.5          | 18-26               | 67-77                 | 322-342                  | 8-13         | 15-20         | 6.9-8.9            | 17-25               |
|                         | 2.25               | 114-124               | 177-197                  | 14-19        | 13-18         | 14.5-16.5          | 19-27               | 69-79                 | 324-344                  | 8-13         | 15-20         | 5.1-7.1            | 18-26               |
|                         | 3                  | 114-124               | 166-186                  | 14-19        | 13-18         | 9.5-11.5           | 19-27               | 71-81                 | 326-346                  | 8-13         | 15-20         | 3.3-5.3            | 18-26               |
| 50                      | 1.5                | 124-134               | 248-268                  | 11-16        | 14-19         | 18.7-20.7          | 18-26               | 95-105                | 346-366                  | 10-15        | 15-20         | 9.8-11.8           | 23-31               |
|                         | 2.25               | 124-134               | 233-253                  | 11-16        | 13-18         | 13.9-15.9          | 19-27               | 99-109                | 350-370                  | 10-15        | 15-20         | 7.3-9.3            | 24-32               |
|                         | 3                  | 124-134               | 218-238                  | 11-16        | 13-18         | 9.1-11.1           | 19-27               | 103-113               | 355-375                  | 11-16        | 15-20         | 4.8-6.8            | 25-33               |
| 70                      | 1.5                | 132-142               | 333-353                  | 9-14         | 13-18         | 17.5-19.5          | 18-26               | 125-135               | 376-396                  | 13-18        | 14-19         | 12.7-14.7          | 27-35               |
|                         | 2.25               | 132-142               | 313-333                  | 9-14         | 12-17         | 13-15              | 18-26               | 133-143               | 386-406                  | 13-18        | 14-19         | 9.8-11.8           | 28-36               |
|                         | 3                  | 132-142               | 293-313                  | 9-14         | 12-17         | 8.5-10.5           | 18-26               | 136-146               | 393-413                  | 13-18        | 14-19         | 6.4-8.4            | 30-38               |
| 90                      | 1.5                | 135-145               | 431-451                  | 7-12         | 17-22         | 16.5-18.5          | 17-25               | 155-165               | 415-435                  | 15-20        | 13-18         | 15.6-18.6          | 33-41               |
|                         | 2.25               | 135-145               | 411-431                  | 7-12         | 15-20         | 12.3-14.3          | 17-25               | 167-177               | 422-442                  | 16-21        | 13-18         | 11.8-13.8          | 34-42               |
|                         | 3                  | 135-145               | 391-411                  | 7-12         | 13-18         | 8-10               | 17-25               | 170-180               | 430-450                  | 17-22        | 13-18         | 7.9-9.9            | 36-44               |
| 110                     | 1.5                | 140-150               | 528-548                  | 6-11         | 17-22         | 16.2-18.2          | 16-24               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 140-150               | 506-526                  | 7-12         | 15-20         | 11.9-13.9          | 16-24               |                       |                          |              |               |                    |                     |
|                         | 3                  | 139-149               | 485-505                  | 7-12         | 13-18         | 7.6-9.6            | 16-24               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 036                     |                    | COOLING               |                          |              |               |                    |                     | HEATING               |                          |              |               |                    |                     |
|-------------------------|--------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|-----------------------|--------------------------|--------------|---------------|--------------------|---------------------|
| En-tering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Dis-charge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                     | 1.5                | 113-123               | 185-205                  | 17-22        | 9-14          | 19.5-21.5          | 18-26               | 64-74                 | 327-347                  | 4-9          | 15-20         | 7.7-9.7            | 19-27               |
|                         | 2.25               | 113-123               | 174-194                  | 17-22        | 8-13          | 14.5-16.5          | 19-27               | 66-76                 | 331-351                  | 4-9          | 15-20         | 5.7-7.7            | 19-27               |
|                         | 3                  | 113-123               | 163-183                  | 17-22        | 8-13          | 9.6-11.6           | 19-27               | 69-79                 | 335-365                  | 4-9          | 15-20         | 3.7-5.7            | 20-28               |
| 50                      | 1.5                | 121-131               | 249-269                  | 12-17        | 9-14          | 19.4-21.4          | 17-25               | 91-101                | 360-380                  | 10-15        | 15-20         | 11.2-13.2          | 25-33               |
|                         | 2.25               | 120-130               | 231-251                  | 12-17        | 8-13          | 14.4-16.4          | 18-26               | 96-106                | 370-390                  | 9-14         | 16-21         | 8.2-10.2           | 26-34               |
|                         | 3                  | 120-130               | 214-234                  | 12-17        | 8-13          | 9.4-11.4           | 18-26               | 102-112               | 380-400                  | 8-13         | 16-21         | 5.2-7.2            | 27-35               |
| 70                      | 1.5                | 128-138               | 327-347                  | 9-14         | 13-18         | 19.1-21.1          | 16-24               | 125-135               | 402-422                  | 10-15        | 14-19         | 14.7-16.7          | 32-40               |
|                         | 2.25               | 128-138               | 304-324                  | 9-14         | 11-16         | 14.1-16.1          | 17-25               | 132-142               | 413-433                  | 10-15        | 14-19         | 11-13              | 33-41               |
|                         | 3                  | 127-137               | 282-302                  | 9-14         | 10-15         | 9.1-11.1           | 17-25               | 140-150               | 423-443                  | 10-15        | 14-19         | 7.3-9.3            | 34-42               |
| 90                      | 1.5                | 132-142               | 416-436                  | 8-13         | 20-25         | 18.8-20.8          | 15-23               | 158-168               | 445-465                  | 13-18        | 12-17         | 18.1-20.1          | 37-45               |
|                         | 2.25               | 132-142               | 396-416                  | 8-13         | 18-23         | 13.9-15.9          | 16-24               | 167-177               | 456-476                  | 13-18        | 11-16         | 13.8-15.8          | 38-46               |
|                         | 3                  | 131-141               | 376-396                  | 8-13         | 16-21         | 8.9-10.9           | 16-24               | 177-187               | 467-487                  | 14-19        | 11-16         | 9.4-11.4           | 40-48               |
| 110                     | 1.5                | 138-148               | 550-570                  | 8-13         | 20-25         | 18.5-20.5          | 15-23               |                       |                          |              |               |                    |                     |
|                         | 2.25               | 136-146               | 525-545                  | 8-13         | 18-23         | 13.6-15.6          | 15-23               |                       |                          |              |               |                    |                     |
|                         | 3                  | 135-145               | 500-520                  | 8-13         | 16-21         | 8.7-10.7           | 15-23               |                       |                          |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| TCV 041                |                    | Cooling               |                         |              |               |                    |                     | Heating               |                         |              |               |                    |                     |
|------------------------|--------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|
| Entering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Drop °F DB | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30                     | 1.5                | 115-125               | 174-194                 | 12-17        | 10-15         | 19.8-21.8          | 16-24               | 69-79                 | 323-343                 | 8-11         | 5-12          | 7-9                | 23-25               |
|                        | 2.25               | 115-125               | 159-179                 | 12-17        | 9-14          | 14.6-16.6          | 16-24               | 72-82                 | 327-347                 | 8-11         | 5-11          | 5-7                | 24-26               |
|                        | 3                  | 115-125               | 144-164                 | 12-17        | 9-14          | 9.5-11.5           | 16-24               | 74-84                 | 330-350                 | 9-12         | 5-11          | 3-6                | 24-26               |
| 50                     | 1.5                | 122-132               | 226-246                 | 9-13         | 12-16         | 19-22              | 22-24               | 107-117               | 360-380                 | 10-13        | 5-10          | 9-12               | 29-31               |
|                        | 2.25               | 121-131               | 206-226                 | 10-14        | 10-14         | 13-15              | 22-24               | 102-112               | 366-386                 | 10-13        | 5-9           | 6-9                | 31-33               |
|                        | 3                  | 121-131               | 196-216                 | 10-14        | 8-12          | 9-12               | 22-24               | 105-115               | 370-390                 | 10-13        | 5-9           | 4-7                | 31-33               |
| 70                     | 1.5                | 126-136               | 302-322                 | 7-11         | 12-17         | 19-21              | 21-23               | 127-137               | 398-418                 | 11-14        | 5-9           | 12-15              | 36-38               |
|                        | 2.25               | 125-135               | 280-300                 | 7-11         | 11-15         | 12-14              | 21-23               | 136-146               | 409-429                 | 11-14        | 4-8           | 8-11               | 37-39               |
|                        | 3                  | 125-135               | 268-288                 | 8-12         | 10-14         | 9-12               | 21-23               | 140-150               | 413-433                 | 11-14        | 4-8           | 6-9                | 38-40               |
| 90                     | 1.5                | 132-142               | 392-412                 | 6-8          | 15-18         | 18-21              | 19-21               | 162-172               | 440-460                 | 12-16        | 4-7           | 15-18              | 42-44               |
|                        | 2.25               | 131-141               | 367-387                 | 7-9          | 12-14         | 11-14              | 19-21               | 173-183               | 451-471                 | 13-17        | 4-7           | 10-13              | 44-46               |
|                        | 3                  | 131-141               | 354-374                 | 7-9          | 11-13         | 8-11               | 19-21               | 178-188               | 478-498                 | 14-18        | 4-6           | 8-11               | 45-47               |
| 100                    | 1.5                | 135-145               | 443-463                 | 6-8          | 16-18         | 17-20              | 19-21               |                       |                         |              |               |                    |                     |
|                        | 2.25               | 134-144               | 417-437                 | 6-8          | 13-15         | 11-14              | 19-21               |                       |                         |              |               |                    |                     |
|                        | 3                  | 134-144               | 404-424                 | 7-9          | 12-14         | 8-11               | 19-21               |                       |                         |              |               |                    |                     |
| 110                    | 1.5                | 138-148               | 499-519                 | 6-8          | 17-19         | 17-20              | 18-20               |                       |                         |              |               |                    |                     |
|                        | 2.25               | 137-147               | 472-492                 | 6-8          | 14-16         | 11-14              | 18-20               |                       |                         |              |               |                    |                     |
|                        | 3                  | 137-147               | 457-477                 | 7-9          | 12-14         | 8-11               | 18-20               |                       |                         |              |               |                    |                     |

Tranquility® Compact (TC) Series

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Unit Operating Conditions, Cont'd.

Table 10: TC Series Typical Unit Operating Pressures and Temperatures: Continued

| 042                    |                    | COOLING               |                         |              |               |                    |                     | HEATING               |                         |              |               |                    |                     |
|------------------------|--------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|
| Entering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                    | 1.5                | 115-125               | 174-194                 | 12-17        | 10-15         | 19.8-21.8          | 16-24               | 66-76                 | 314-334                 | 6-11         | 11-16         | 7.3-9.3            | 18-26               |
|                        | 2.25               | 115-125               | 159-179                 | 12-17        | 9-14          | 14.6-16.6          | 16-24               | 69-79                 | 318-338                 | 5-10         | 12-17         | 5.4-7.4            | 19-27               |
|                        | 3                  | 115-125               | 144-164                 | 12-17        | 9-14          | 9.5-11.5           | 16-24               | 72-82                 | 321-341                 | 4-9          | 12-17         | 3.4-5.4            | 19-27               |
| 50                     | 1.5                | 123-133               | 233-253                 | 9-14         | 10-15         | 19-21              | 16-24               | 97-107                | 354-374                 | 9-14         | 13-18         | 10.2-12.2          | 24-32               |
|                        | 2.25               | 122-132               | 219-239                 | 9-14         | 9-14          | 14-16              | 16-24               | 101-111               | 360-380                 | 8-13         | 13-18         | 7.6-9.6            | 25-33               |
|                        | 3                  | 122-132               | 205-225                 | 9-14         | 9-14          | 9.1-11.1           | 16-24               | 106-116               | 365-385                 | 6-11         | 13-18         | 5-7                | 26-34               |
| 70                     | 1.5                | 128-138               | 309-329                 | 6-11         | 12-17         | 18.3-20.3          | 16-24               | 130-140               | 394-414                 | 7-12         | 13-18         | 13.3-15.3          | 30-38               |
|                        | 2.25               | 128-138               | 290-310                 | 6-11         | 11-14         | 13.5-15.5          | 16-24               | 136-146               | 401-421                 | 7-12         | 13-18         | 9.9-1.9            | 31-39               |
|                        | 3                  | 128-138               | 271-291                 | 6-11         | 11-14         | 8.7-10.7           | 16-24               | 143-153               | 409-429                 | 8-13         | 13-18         | 6.6-8.6            | 32-40               |
| 90                     | 1.5                | 133-143               | 406-426                 | 5-10         | 14-19         | 17.6-19.6          | 16-24               | 164-174               | 434-454                 | 10-15        | 12-17         | 16.4-18.4          | 37-45               |
|                        | 2.25               | 133-143               | 386-406                 | 5-10         | 13-18         | 12.9-14.9          | 16-24               | 172-182               | 443-463                 | 11-16        | 12-17         | 12.3-14.3          | 38-46               |
|                        | 3                  | 132-142               | 367-387                 | 5-10         | 13-18         | 8.3-10.3           | 16-24               | 180-190               | 453-473                 | 11-16        | 12-17         | 8.3-10.3           | 39-47               |
| 110                    | 1.5                | 138-148               | 505-525                 | 5-10         | 19-24         | 16.8-18.8          | 16-24               |                       |                         |              |               |                    |                     |
|                        | 2.25               | 138-148               | 484-504                 | 5-10         | 16-21         | 12.4-14.4          | 16-24               |                       |                         |              |               |                    |                     |
|                        | 3                  | 138-148               | 463-483                 | 5-10         | 14-19         | 7.9-9.9            | 16-24               |                       |                         |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 048                    |                    | COOLING               |                         |              |               |                    |                     | HEATING               |                         |              |               |                    |                     |
|------------------------|--------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|
| Entering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                    | 1.5                | 119-129               | 190-210                 | 15-20        | 10-15         | 19.3-21.3          | 18-26               | 63-73                 | 284-304                 | 5-10         | 3-8           | 6.9-8.9            | 17-25               |
|                        | 2.25               | 119-129               | 179-199                 | 15-20        | 9-14          | 14.6-16.6          | 19-27               | 66-76                 | 288-308                 | 6-10         | 3-8           | 5-7                | 18-26               |
|                        | 3                  | 119-129               | 158-178                 | 15-20        | 9-14          | 9.8-11.8           | 19-27               | 69-79                 | 292-312                 | 6-11         | 3-8           | 3.1-5.1            | 18-26               |
| 50                     | 1.5                | 124-134               | 248-268                 | 10-15        | 10-15         | 19-21              | 18-26               | 92-102                | 309-329                 | 8-13         | 3-8           | 9.5-11.5           | 23-31               |
|                        | 2.25               | 123-133               | 230-250                 | 10-15        | 9-14          | 14.3-16.3          | 19-27               | 96-106                | 313-333                 | 9-14         | 3-8           | 7-9                | 24-32               |
|                        | 3                  | 123-133               | 213-233                 | 10-15        | 9-14          | 9.6-11.6           | 19-27               | 100-110               | 317-337                 | 9-14         | 3-8           | 4.6-6.6            | 24-32               |
| 70                     | 1.5                | 129-139               | 337-357                 | 8-13         | 12-17         | 18.6-20.6          | 17-25               | 123-133               | 339-359                 | 11-16        | 3-8           | 12.5-14.5          | 29-37               |
|                        | 2.25               | 129-139               | 328-348                 | 8-13         | 11-16         | 14-16              | 18-26               | 128-138               | 344-364                 | 11-16        | 3-8           | 9.3-11.3           | 29-37               |
|                        | 3                  | 129-139               | 300-320                 | 8-13         | 11-16         | 9.4-11.4           | 18-26               | 133-143               | 350-370                 | 12-17        | 3-8           | 6.2-8.2            | 30-38               |
| 90                     | 1.5                | 134-144               | 426-446                 | 6-11         | 15-20         | 18.2-20.2          | 16-24               | 153-163               | 369-389                 | 14-19        | 1-6           | 15.4-17.4          | 33-41               |
|                        | 2.25               | 134-144               | 406-426                 | 6-11         | 15-20         | 13.7-15.7          | 17-25               | 160-170               | 376-396                 | 15-20        | 1-6           | 11.6-13.6          | 35-43               |
|                        | 3                  | 134-144               | 386-406                 | 6-11         | 15-20         | 9.2-11.2           | 17-25               | 167-177               | 384-404                 | 16-21        | 1-6           | 7.8-9.8            | 36-44               |
| 110                    | 1.5                | 140-150               | 560-580                 | 4-9          | 23-28         | 17.7-19.7          | 16-24               |                       |                         |              |               |                    |                     |
|                        | 2.25               | 140-150               | 536-556                 | 4-9          | 20-25         | 13.4-15.4          | 16-24               |                       |                         |              |               |                    |                     |
|                        | 3                  | 139-149               | 511-531                 | 4-9          | 18-22         | 9-11               | 16-24               |                       |                         |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

| 060                    |                    | COOLING               |                         |              |               |                    |                     | HEATING               |                         |              |               |                    |                     |
|------------------------|--------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|-----------------------|-------------------------|--------------|---------------|--------------------|---------------------|
| Entering Water Temp °F | Water Flow GPM/ton | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Rise °F | Air Temp Drop °F DB | Suction Pressure PSIG | Discharge Pressure PSIG | Superheat °F | Subcooling °F | Water Temp Drop °F | Air Temp Rise °F DB |
| 30*                    | 1.5                | 108-118               | 180-200                 | 16-21        | 10-15         | 20.6               | 19-27               | 61-71                 | 314-334                 | 6-11         | 14-19         | 7.6-9.6            | 19-27               |
|                        | 2.25               | 108-118               | 165-185                 | 16-21        | 9-14          | 15.2-17.2          | 20-28               | 64-74                 | 317-337                 | 7-12         | 13-18         | 5.6-7.6            | 20-28               |
|                        | 3                  | 108-118               | 150-170                 | 16-21        | 9-14          | 9.7-11.7           | 20-28               | 66-76                 | 319-339                 | 7-12         | 13-18         | 3.6-5.6            | 20-28               |
| 50                     | 1.5                | 113-123               | 206-226                 | 11-14        | 10-15         | 19.8-21.8          | 18-26               | 90-100                | 350-370                 | 11-16        | 14-19         | 10.5-12.5          | 25-33               |
|                        | 2.25               | 113-123               | 190-210                 | 11-14        | 9-14          | 14.5-16.5          | 19-27               | 95-105                | 357-377                 | 11-16        | 14-19         | 7.9-9.9            | 27-35               |
|                        | 3                  | 113-123               | 173-193                 | 11-14        | 9-14          | 9.3-11.3           | 19-27               | 99-109                | 364-384                 | 10-15        | 14-19         | 5.2-7.2            | 28-36               |
| 70                     | 1.5                | 119-129               | 305-325                 | 9-14         | 12-17         | 18.8-20.8          | 17-25               | 123-133               | 391-411                 | 12-17        | 14-19         | 13.7-15.7          | 33-41               |
|                        | 2.25               | 118-128               | 287-307                 | 9-14         | 11-14         | 13.8-15.8          | 18-26               | 129-139               | 399-419                 | 12-17        | 14-19         | 10.3-12.3          | 34-42               |
|                        | 3                  | 118-128               | 269-289                 | 9-14         | 11-14         | 8.8-10.8           | 18-26               | 135-145               | 407-427                 | 13-18        | 14-19         | 6.9-8.9            | 35-43               |
| 90                     | 1.5                | 124-134               | 402-422                 | 7-12         | 14-19         | 17.8-19.8          | 16-24               | 157-167               | 431-451                 | 13-18        | 13-18         | 16.8-18.8          | 38-46               |
|                        | 2.25               | 124-134               | 382-402                 | 7-12         | 13-18         | 13.1-15.1          | 17-25               | 164-184               | 440-460                 | 14-19        | 13-18         | 12.7-14.7          | 39-47               |
|                        | 3                  | 123-133               | 363-383                 | 7-12         | 13-18         | 8.3-10.3           | 17-25               | 172-182               | 450-470                 | 16-21        | 12-17         | 8.6-10.6           | 41-49               |
| 110                    | 1.5                | 130-140               | 500-520                 | 7-12         | 20-25         | 17-19              | 16-24               |                       |                         |              |               |                    |                     |
|                        | 2.25               | 129-139               | 479-499                 | 6-11         | 16-21         | 12.4-14.4          | 16-24               |                       |                         |              |               |                    |                     |
|                        | 3                  | 128-138               | 458-478                 | 5-10         | 13-18         | 7.8-9.8            | 16-24               |                       |                         |              |               |                    |                     |

\*Based on 15% Methanol antifreeze solution

Table 11: Water Temperature Change Through Heat Exchanger

| Water Flow, gpm [l/m]   | Rise, Cooling °F, [°C]   | Drop, Heating °F, [°C] |
|---|--------------------------|------------------------|
| For Closed Loop: Ground Source or Closed Loop Systems at 3 gpm per ton [3.2 l/m per kW] | 9 - 12<br>[5 - 6.7]      | 4 - 8<br>[2.2 - 4.4]   |
| For Open Loop: Ground Water Systems at 1.5 gpm per ton [1.6 l/m per kW]                 | 20 - 26<br>[11.1 - 14.4] | 10 - 17<br>[5.6 - 9.4] |

## Preventive Maintenance

**Water Coil Maintenance** - (Direct ground water applications only) If the system is installed in an area with a known high mineral content (125 P.P.M. or greater) in the water, it is best to establish a periodic maintenance schedule with the owner so the coil can be checked regularly. Consult the well water applications section of this manual for a more detailed water coil material selection. Should periodic coil cleaning be necessary, use standard coil cleaning procedures, which are compatible with the heat exchanger material and copper water lines. Generally, the more water flowing through the unit, the less chance for scaling. Therefore, 1.5 gpm per ton [1.6 l/m per kW] is recommended as a minimum flow. Minimum flow rate for entering water temperatures below 50°F [10°C] is 2.0 gpm per ton [2.2 l/m per kW].

**Water Coil Maintenance** - (All other water loop applications) Generally water coil maintenance is not needed for closed loop systems. However, if the piping is known to have high dirt or debris content, it is best to establish a periodic maintenance schedule with the owner so the water coil can be checked regularly. Dirty installations are typically the result of deterioration of iron or galvanized piping or components in the system. Open cooling towers requiring heavy chemical treatment and mineral buildup through water use can also contribute to higher maintenance. Should periodic coil cleaning be necessary, use standard coil cleaning procedures, which are compatible with both the heat exchanger material and copper water lines. Generally, the more water flowing through the unit, the less chance for scaling. However, flow rates over 3 gpm per ton (3.9 l/m per kW) can produce water (or debris) velocities that can erode the heat exchanger wall and ultimately produce leaks.

**Filters** - Filters must be clean to obtain maximum performance. Filters should be inspected every month under normal operating conditions and be replaced when necessary. Units should never be operated without a filter.

Washable, high efficiency, electrostatic filters, when dirty, can exhibit a very high pressure drop for the fan motor and reduce air flow, resulting in poor performance. It is especially important to provide consistent washing of these filters (in the opposite direction of the normal air flow) once per month using a high pressure wash similar to those found at self-serve car washes.

**Condensate Drain** - In areas where airborne bacteria may produce a “slimy” substance in the drain pan, it may be necessary to treat the drain pan chemically with an algaecide approximately every three months to minimize the problem. The condensate pan may also need to be cleaned periodically to ensure indoor air quality. The condensate drain can pick up lint and dirt, especially with dirty filters. Inspect the drain twice a year to avoid the possibility of plugging and eventual overflow.

**Compressor** - Conduct annual amperage checks to ensure that amp draw is no more than 10% greater than indicated on the serial plate data.

**Fan Motors** - All units have permanently lubricated fan motors. Fan motors should never be lubricated unless obvious, dry operation is suspected. Periodic maintenance oiling is not recommended, as it will result in dirt accumulating in the excess oil and cause eventual motor failure. Conduct annual dry operation check and amperage check to ensure amp draw is no more than 10% greater than indicated on serial plate data.

**Air Coil** - The air coil must be cleaned to obtain maximum performance. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Care must be taken not to damage the aluminum fins while cleaning. CAUTION: Fin edges are sharp.

**Cabinet** - Do not allow water to stay in contact with the cabinet for long periods of time to prevent corrosion of the cabinet sheet metal. Generally, vertical cabinets are set up from the floor a few inches [7 - 8 cm] to prevent water from entering the cabinet. The cabinet can be cleaned using a mild detergent.

**Refrigerant System** - To maintain sealed circuit integrity, do not install service gauges unless unit operation appears abnormal. Reference the operating charts for pressures and temperatures. Verify that air and water flow rates are at proper levels before servicing the refrigerant circuit.

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Functional Troubleshooting

| Fault  | Htg | Clg                          | Possible Cause   | Solution   |
|--|-----|------------------------------|--|--|
| <b>Main power problems</b>                                   | X   | X                            | Green Status LED Off   | Check line voltage circuit breaker and disconnect.   |
|  |     |                              |  | Check for line voltage between L1 and L2 on the contactor.                                       |
|  |     |                              |  | Check for 24VAC between R and C on CXM2/DXM2.5.  |
|  |     |                              |  | Check primary/secondary voltage on transformer.  |
| <b>HP Fault Code 2<br/>High Pressure</b>                     |     | X                            | Reduced or no water flow in cooling                                      | Check pump operation or valve operation/setting.<br>Check water flow adjust to proper flow rate. |
|  |     | X                            | Water Temperature out of range in cooling                                | Bring water temp within design parameters.   |
|  | X   |                              | Reduced or no airflow in heating   | Check for dirty air filter and clean or replace.   |
|  |     |                              |  | Check fan motor operation and airflow restrictions.  |
|  |     |                              |  | Dirty Air Coil - construction dust etc.  |
|  |     |                              |  | Too high of external static? Check static vs blower table.                                       |
|  | X   |                              | Air temperature out of range in heating                                  | Bring return air temp within design parameters.  |
| X  | X   | Overcharged with refrigerant | Check superheat/subcooling vs typical operating condition table.         |  |
| X  | X   | Bad HP Switch                | Check switch continuity and operation. Replace.                          |  |
| <b>LP/LOC Fault Code 3<br/>Low Pressure / Loss of Charge</b> | X   | X                            | Insufficient charge  | Check for refrigerant leaks.   |
|  | X   |                              | Compressor pump down at start-up   | Check charge and start-up water flow.  |
| <b>LT1 Fault Code 4<br/>Water coil low temperature limit</b> | X   |                              | Reduced or no water flow in heating                                      | Check pump operation or water valve operation/setting.   |
|  |     |                              |  | Plugged strainer or filter? Clean or replace.  |
|  |     |                              |  | Check water flow. Adjust to proper flow rate.  |
|  | X   |                              | Inadequate antifreeze level  | Check antifreeze density with hydrometer.  |
|  | X   |                              | Improper temperature limit setting (30°F vs 10°F [-1°C vs -2°C])         | Clip JW3 jumper for antifreeze (10°F [-12°C]) use.   |
|  | X   |                              | Water Temperature out of range   | Bring water temp within design parameters.   |
| X  | X   | Bad thermistor               | Check temp and impedance correlation per chart.                          |  |
| <b>LT2 Fault Code 5<br/>Air coil low temperature limit</b>   |     | X                            | Reduced or no airflow in cooling   | Check for dirty air filter and clean or replace.   |
|  |     |                              |  | Check fan motor operation and airflow restrictions.  |
|  |     |                              |  | Too high of external static? Check static vs blower table.                                       |
|  |     | X                            | Air Temperature out of range   | Too much cold vent air? Bring entering air temp within design parameters.                        |
|  |     | X                            | Improper temperature limit setting (30°F vs 10°F [-1°C vs -12°C])        | Normal airside applications will require 30°F [-1°C] only.                                       |
|  | X   | X                            | Bad thermistor   | Check temp and impedance correlation per chart.  |
| <b>Condensate Fault Code 6</b>                               | X   | X                            | Blocked drain  | Check for blockage and clean drain.  |
|  | X   | X                            | Improper trap  | Check trap dimensions and location ahead of vent.  |
|  |     | X                            | Poor drainage  | Check for piping slope away from unit.   |
|  |     |                              |  | Check slope of unit toward outlet.   |
|  |     |                              |  | Poor venting? Check vent location.   |
|  |     | X                            | Moisture on sensor   | Check for moisture shorting to air coil.   |
|  | X   | X                            | Plugged air filter   | Replace air filter.  |
| X  | X   | Restricted Return Airflow    | Find and eliminate restriction. Increase return duct and/or grille size. |  |

Table continued on next page.



## Functional Troubleshooting, Cont'd.

Table continued from previous page.

| Fault   | Htg | Clg | Possible Cause                                   | Solution  |
|---|-----|-----|--|---|
| <b>Over/Under Voltage Code 7 (Auto resetting)</b> | X   | X   | Under Voltage                                    | Check power supply and 24VAC voltage before and during operation.   |
|   |     |     |  | Check power supply wire size.   |
|   | X   | X   | Over Voltage                                     | Check compressor starting. Need hard start kit?   |
|   |     |     |  | Check 24VAC and unit transformer. Tap for correct power supply voltage.   |
| <b>Unit Performance Sentinel Code 8</b>           | X   |     | Heating mode LT2>125°F [52°C]                    | Check for poor airflow or overcharged unit.   |
|   |     | X   | Cooling Mode LT1>125°F [52°C] OR LT2< 40°F [4°C] | Check for poor water flow or airflow.   |
| <b>Swapped Thermistor Code 9</b>                  | X   | X   | LT1 and LT2 swapped                              | Reverse position of thermistors   |
| <b>No Fault Code Shown</b>                        | X   | X   | No compressor operation                          | See "Only Fan Operates".  |
|   | X   | X   | Compressor overload                              | Check and replace, if necessary.  |
|   | X   | X   | Control board                                    | Reset power and check operation.  |
| <b>Unit Short Cycles</b>                          | X   | X   | Dirty air filter                                 | Check and clean air filter.   |
|   | X   | X   | Unit in "test mode"                              | Reset power or wait 20 minutes for auto exit.   |
|   | X   | X   | Unit selection                                   | Unit may be oversized for space. Check sizing for actual load of space.   |
|   | X   | X   | Compressor overload                              | Check and replace, if necessary.  |
| <b>Only Fan Runs</b>                              | X   | X   | Thermostat position                              | Ensure thermostat set for heating or cooling operation.   |
|   | X   | X   | Unit locked out                                  | Check for lockout codes. Reset power.   |
|   | X   | X   | Compressor Overload                              | Check compressor overload. Replace if necessary.  |
|   | X   | X   | Thermostat wiring                                | Check thermostat wiring at heat pump. Jumper Y and R for compressor operation in test mode.   |
| <b>Only Compressor Runs</b>                       | X   | X   | Thermostat wiring                                | Check G wiring at heat pump. Jumper G and R for fan operation.  |
|   | X   | X   |  | Check thermostat wiring at heat pump. Jumper Y and R for compressor operation in test mode.   |
|   | X   | X   | Fan motor relay                                  | Jumper G and R for fan operation. Check for line voltage across BR contacts.  |
|   | X   | X   |  | Check fan power enable relay operation (if present).  |
|   | X   | X   | Fan motor  | Check for line voltage at motor. Check capacitor.   |
| <b>Unit Doesn't Operate in Cooling</b>            |     | X   | Reversing valve                                  | Set for cooling demand and check 24VAC on RV coil and at CXM2/DXM2.5 board.   |
|   |     | X   |  | If RV is stuck, run high pressure up by reducing water flow and while operating engage and disengage RV coil voltage to push valve.   |
|   |     | X   | Thermostat setup                                 | Check for 'O' RV setup not 'B'.   |
|   |     | X   | Thermostat wiring                                | Check O wiring at heat pump. Jumper O and R for RV coil 'click'.  |
|   |     | X   |  | Put thermostat in cooling mode. Check 24 VAC on O (check between C and O); check for 24 VAC on W (check between W and C). There should be voltage on O, but not on W. If voltage is present on W, thermostat may be bad or wired incorrectly. |

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Performance Troubleshooting

| Symptom                                       | Htg   | Clg                             | Possible Cause   | Solution   |
|---|---|---------------------------------|--|--|
| Insufficient capacity/ Not cooling or heating | X   | X                               | Dirty filter   | Replace or clean.  |
|   | X   |                                 | Reduced or no airflow in heating   | Check for dirty air filter and clean or replace.   |
|   |   |                                 |  | Check fan motor operation and airflow restrictions.  |
|   |   |                                 |  | Too high of external static? Check static vs blower table.   |
|   |   | X                               | Reduced or no airflow in cooling   | Check for dirty air filter and clean or replace.   |
|   |   |                                 |  | Check fan motor operation and airflow restrictions.  |
|   |   |                                 |  | Too high of external static? Check static vs blower table.   |
|   | X   | X                               | Leaky duct work  | Check supply and return air temperatures at the unit and at distant duct registers if significantly different, duct leaks are present. |
|   | X   | X                               | Low refrigerant charge   | Check superheat and subcooling per chart.  |
|   | X   | X                               | Restricted metering device   | Check superheat and subcooling per chart. Replace.   |
|   | X   | Defective reversing valve       | Perform RV touch test.   |  |
| X   | X   | Thermostat improperly located   | Check location and for air drafts behind stat.                                   |  |
| X   | X   | Unit undersized                 | Recheck loads & sizing. Check sensible clg. load and heat pump capacity.         |  |
| X   | X   | Scaling in water heat exchanger | Perform scaling check and clean if necessary.                                    |  |
| X   | X   | Inlet water too hot or too cold | Check load, loop sizing, loop backfill, ground moisture.                         |  |
| High Head Pressure                            | X   |                                 | Reduced or no airflow in heating   | Check for dirty air filter and clean or replace.   |
|   |   |                                 |  | Check fan motor operation and air flow restrictions.   |
|   |   |                                 |  | Too high of external static? Check static vs blower table.   |
|   |   | X                               | Reduced or no water flow in cooling  | Check pump operation or valve operation/setting.   |
|   | Check water flow. Adjust to proper flow rate. |                                 |  |  |
|   |   | X                               | Inlet water too hot  | Check load, loop sizing, loop backfill, ground moisture.   |
|   | X   |                                 | Air temperature out of range in heating  | Bring return air temperature within design parameters.   |
|   |   | X                               | Scaling in water heat exchanger  | Perform scaling check and clean if necessary.  |
| X   | X   | Unit overcharged                | Check superheat and subcooling. Re-weigh in charge.                              |  |
| X   | X   | Non-condensables in system      | Vacuum system and re-weigh in charge.  |  |
| X   | X   | Restricted metering device      | Check superheat and subcooling per chart. Replace.                               |  |
| Low Suction Pressure                          | X   |                                 | Reduced water flow in heating  | Check pump operation or water valve operation/setting.   |
|   |   |                                 |  | Plugged strainer or filter? Clean or replace.  |
|   |   |                                 |  | Check water flow. Adjust to proper flow rate.  |
|   | X   |                                 | Water temperature out of range   | Bring water temperature within design parameters.  |
|   |   | X                               | Reduced airflow in cooling   | Check for dirty air filter and clean or replace.   |
|   |   |                                 |  | Check fan motor operation and air flow restrictions.   |
|   |   |                                 | Too high of external static? Check static vs blower table.                       |  |
|   | X   | Air temperature out of range    | Too much cold vent air? Bring entering air temperature within design parameters. |  |
| X   | X   | Insufficient charge             | Check for refrigerant leaks.   |  |
| Low Discharge Air Temperature in Heating      | X   |                                 | Too high of airflow  | Check fan motor speed selection and airflow chart.   |
|   | X   |                                 | Poor performance   | See 'Insufficient Capacity'.   |
| High humidity                                 |   | X                               | Too high of airflow  | Check fan motor speed selection and airflow chart.   |
|   |   | X                               | Unit oversized   | Recheck loads & sizing. Check sensible cooling load and heat pump capacity.  |

## Start-Up Log Sheet

**Installer:** Complete unit and system checkout and follow unit start-up procedures in the IOM. Use this form to record unit information, temperatures and pressures during start-up. Keep this form for future reference.

**Job Name:** \_\_\_\_\_ **Street Address:** \_\_\_\_\_

**Model Number:** \_\_\_\_\_ **Serial Number:** \_\_\_\_\_

**Unit Location in Building:** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Sales Order No:** \_\_\_\_\_

In order to minimize troubleshooting and costly system failures, complete the following checks and data entries before the system is put into full operation.

| Fan Motor | Description | Value |
|-----------|-------------|-------|
| PSC       | Speed Tap   |       |
| CT ECM    | Speed Tap   |       |
| CV ECM    | CFM Setting |       |

**Temperatures: F or C**

**Antifreeze:** \_\_\_\_\_ %

**Pressures: PSIG or kPa**

**Type:** \_\_\_\_\_

|  | Cooling Mode | Heating Mode |
|--|--------------|--------------|
| Entering Fluid Temperature                     |              |              |
| Leaving Fluid Temperature                      |              |              |
| Temperature Differential                       |              |              |
| Return-Air Temperature                         | DB           | WB DB        |
| Supply-Air Temperature                         | DB           | WB DB        |
| <b>Temperature Differential</b>                |              |              |
| Water Coil Heat Exchanger (Water Pressure IN)  |              |              |
| Water Coil Heat Exchanger (Water Pressure OUT) |              |              |
| Pressure Differential                          |              |              |
| Water Flow GPM                                 |              |              |
| <b>Compressor</b>                              |              |              |
| Amps   |              |              |
| Volts  |              |              |
| Discharge Line Temperature                     |              |              |
| <b>Motor</b>                                   |              |              |
| Amps   |              |              |
| Volts  |              |              |

Allow unit to run 15 minutes in each mode before taking data.

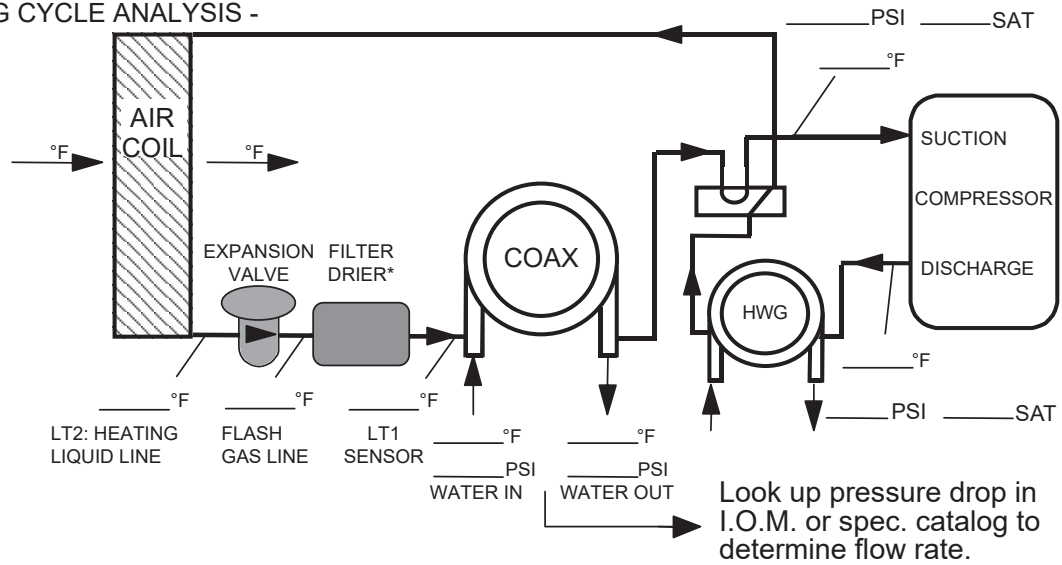
Note: Never connect refrigerant gauges during startup procedures. Conduct water-side analysis using P/T ports to determine water flow and temperature difference. If water-side analysis shows poor performance, refrigerant troubleshooting may be required. Connect refrigerant gauges as a last resort.

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Functional Troubleshooting Form

HEATING CYCLE ANALYSIS -



COOLING CYCLE ANALYSIS -

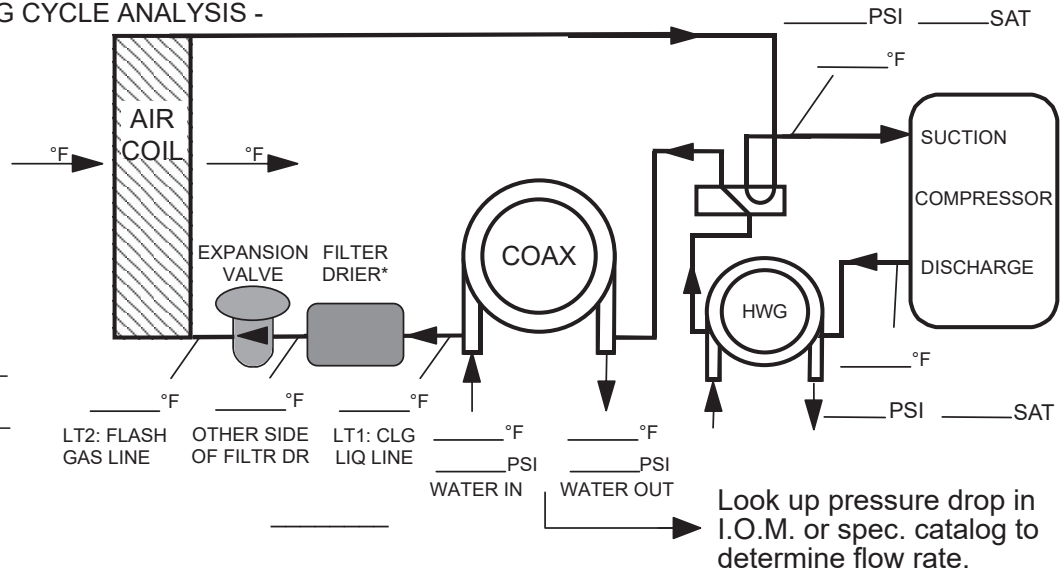
Refrigerant Type:

HFC-410A

Voltage: \_\_\_\_\_

Comp Amps: \_\_\_\_\_

Total Amps: \_\_\_\_\_



Heat of Extraction (Absorption) or Heat of Rejection =  
 \_\_\_\_\_ flow rate (gpm) x \_\_\_\_\_ temp. diff. (deg. F) x \_\_\_\_\_ fluid factor† = \_\_\_\_\_ (Btu/hr)

Superheat = Suction temperature - suction saturation temp. = \_\_\_\_\_ (deg F)

Subcooling = Discharge saturation temp. - liquid line temp. = \_\_\_\_\_ (deg F)

† Use 500 water for water, 485 for antifreeze.

**NOTE: Never connect refrigerant gauges during startup procedures. Conduct water-side analysis using P/T ports to determine water flow and temperature difference. If water-side analysis shows poor performance, refrigerant troubleshooting may be required. Connect refrigerant gauges as a last resort.**

Warranty (U.S. & Canada)

**CLIMATE MASTER, INC.  
LIMITED EXPRESS WARRANTY/LIMITATION OF REMEDIES AND LIABILITY**



It is expressly understood that unless a statement is specifically identified as a warranty, statements made by Climate Master, Inc., a Delaware corporation, ("CM") or its representatives, relating to CM's products, whether oral, written or contained in any sales literature, catalog or any other agreement, are not express warranties and do not form a part of the basis of the bargain, but are merely CM's opinion or commendation of CM's products.

**EXCEPT AS SPECIFICALLY SET FORTH HEREIN, THERE IS NO EXPRESS WARRANTY AS TO ANY OF CM'S PRODUCTS. CM MAKES NO WARRANTY AGAINST LATENT DEFECTS. CM MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.**

**GRANT OF LIMITED EXPRESS WARRANTY**

CM warrants CM products purchased and retained in the United States of America and Canada to be free from defects in material and workmanship under normal use and maintenance as follows: (1) All complete air conditioning, heating and/or heat pump units built or sold by CM for twelve (12) months from date of unit start up or eighteen (18) months from date of shipment (from factory), whichever comes first; (2) Repair and replacement parts, which are not supplied under warranty, for ninety (90) days from date of shipment (from factory). All parts must be returned to CM's factory in Oklahoma City, Oklahoma, freight prepaid, no later than sixty (60) days after the date of the failure of the part; If CM determines the part to be defective and within CM's Limited Express Warranty, CM shall, when such part has been either replaced or repaired, return such to a factory recognized dealer, contractor or service organization, F.O.B. CM's factory, Oklahoma City, Oklahoma, freight prepaid. The warranty on any parts repaired or replaced under warranty expires at the end of the original warranty period.

This warranty does not cover and does not apply to: (1) Air filters, fuses, refrigerant, fluids, oil; (2) Products relocated after initial installation; (3) Any portion or component of any system that is not supplied by CM, regardless of the cause of the failure of such portion or component; (4) Products on which the unit identification tags or labels have been removed or defaced; (5) Products on which payment to CM has been in default; (6) Products which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, alteration or misapplication of the product; (7) Products which have defects or damage which result from a contaminated or corrosive air liquid supply, operation at abnormal temperatures, or unauthorized opening of refrigerant circuit; (8) Mold, fungus or bacteria damages; (9) Products subjected to corrosion or abrasion; (10) Products manufactured or supplied by others; (11) Products which have been subjected to misuse, negligence or accidents; (12) Products which have been operated in a manner contrary to CM's printed instructions; or (13) Products which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application of CM's products.

CM is not responsible for: (1) The costs of any fluids, refrigerant or other system components, or associated labor to repair or replace the same, which is incurred as a result of a defective part covered by CM's Limited Express Warranty; (2) The costs of labor, refrigerant, materials or service incurred in removal of the defective part, or in obtaining and replacing the new or repaired part; or, (3) Transportation costs of the defective part from the installation site to CM or of the return of any part not covered by CM's Limited Express Warranty.

**Limitation:** This Limited Express Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such warranties, including without limitation any express warranties or any implied warranties of fitness for particular purpose and merchantability, shall be limited to the duration of the Limited Express Warranty.

**LIMITATION OF REMEDIES**

In the event of a breach of the Limited Express Warranty, CM will only be obligated at CM's option to repair the failed part or unit, or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If after written notice to CM's factory in Oklahoma City, Oklahoma of each defect, malfunction or other failure and a reasonable number of attempts by CM to correct the defect, malfunction or other failure and the remedy fails of its essential purpose, CM shall refund the purchase price paid to CM in exchange for the return of the sold goods(s). Said refund shall be the maximum liability of CM. **THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER OR THEIR PURCHASER AGAINST CM FOR BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR CM'S NEGLIGENCE OR IN STRICT LIABILITY.**

**LIMITATION OF LIABILITY**

CM shall have no liability for any damages if CM's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to: any war, civil unrest, government restrictions or restraints, strikes or work stoppages, fire, flood, accident, shortages of transportation, fuel, material, or labor, acts of God or any other reason beyond the sole control of CM. **CM EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR CM'S NEGLIGENCE OR AS STRICT LIABILITY.**

**OBTAINING WARRANTY PERFORMANCE**

Normally, the contractor or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any CM recognized dealer, contractor or service organization. If assistance is required in obtaining warranty performance, write or call:

Climate Master, Inc. • Customer Service • 7300 S.W. 44th Street • Oklahoma City, Oklahoma 73179 (405) 745-6000

NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and from Canadian province to Canadian province.

Please refer to the CM Installation, Operation and Maintenance Manual for operating and maintenance instructions.



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Warranty (International)



**CLIMATE MASTER, INC.  
LIMITED EXPRESS WARRANTY /LIMITATION OF REMEDIES AND LIABILITY  
(FOR INTERNATIONAL CLASS PRODUCTS)**

This warranty does not cover and does not apply to: (1) Air filters, fuses, refrigerant, fluids, oil; (2) Products relocated after initial installation; (3) Any portion or component of any system that is not supplied by CM, regardless of the cause of the failure of such portion or component; (4) Products on which the unit identification tags or labels have been removed or defaced; (5) Products on which payment by Customer to CM or its distributors or Representatives, or the Customer's seller is in default; (6) Products which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or from parts or components manufactured by others; or are caused by accident, misuse, negligence, abuse, fire, flood, lightning, alteration or misapplication of the product; (7) Products which have defects or damage which result from a contaminated or corrosive air or liquid supply, operation at abnormal temperatures or flow rates, or unauthorized opening of the refrigerant circuit; (8) Mold, fungus or bacteria damage; (9) Products subjected to corrosion or abrasion; (10) Products, parts or components manufactured or supplied by others; (11) Products which have been subjected to misuse, negligence or accidents; (12) Products which have been operated in a manner contrary to CM's printed instructions; (13) Products which have defects, damage or insufficient performance as a result of insufficient or incorrect system design or the improper application, installation, or use of CM's products; or (14) Electricity or fuel costs, or any increases or unrealized savings in same, for any reason.

CM is not responsible for: (1) The cost of any fluids, refrigerant or other system components, or the associated labor to repair or replace the same, which is incurred as a result of a defective part covered by CM's Limited Express Warranty; (2) The cost of labor, refrigerant, materials or service incurred in diagnosis and removal of the defective part, or in obtaining and replacing the new or repaired part; (3) Transportation costs of the defective part from the installation site to CM or of the return of any part not covered by CM's Limited Express Warranty; or (4) The costs of normal maintenance.

Limitation: This Limited Express Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined by a court or other qualified judicial body that other warranties exist, any such warranty, including without limitation any express warranty or any implied warranty of fitness for particular purpose and merchantability, shall be limited to the duration of the Limited Express Warranty. This Limited Express Warranty does not exclude any warranty that is mandatory and that may not be excluded under applicable imperative law.

**LIMITATION OF REMEDIES**  
In the event of a breach of this Limited Express Warranty or any warranty that is mandatory under applicable imperative law, CM will only be obligated at CM's option to either repair the failed part or unit or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If, after written notice to CM's factory in Oklahoma City, Oklahoma, U.S.A. of each defect, malfunction or other failure and a reasonable number of attempts by CM to correct the defect, malfunction or other failure and the remedy fails of its essential purpose, CM shall refund the purchase price paid to CM in exchange for the return of the sold good(s). Said refund shall be the maximum liability of CM. **TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE CUSTOMER AGAINST CM FOR BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR CM'S NEGLIGENCE OR IN STRICT LIABILITY.**

**LIMITATION OF LIABILITY**  
CM shall have no liability for any damages if CM's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to: any war, civil unrest, government restrictions or restraints, strikes, or work stoppages, fire, flood, accident, allocations, shortages of transportation, fuel, materials, or labor, acts of God or any other reason beyond the sole control of CM. **TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW AND SUBJECT TO THE NEXT SENTENCE, CM EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR LOSS OF PROFITS, LOSS OF BUSINESS OR GOODWILL, CONSEQUENTIAL, INCIDENTAL, SPECIAL, LIQUIDATED, OR PUNITIVE DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR CM'S NEGLIGENCE OR AS STRICT LIABILITY.** Nothing in this Agreement is intended to exclude CM's liability for death, personal injury or fraud.

**OBTAINING WARRANTY PERFORMANCE**  
Normally, the contractor or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any CM recognized Representative. If assistance is required in obtaining warranty performance, write or call:

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NOTE: Some countries do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and country to country.

Please refer to the CM Installation, Operation and Maintenance Manual for operating and maintenance instructions.

Created: 10/09

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TRANQUILITY COMPACT (TC) SERIES

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**Notes:**

## Tranquility® Compact (TC) Series

Rev.: January 24, 2023

### Revision History

| Date:    | Item:  | Action:   |
|----------|--|---|
| 1/24/23  | Page 33, 39  | Updated SBV valve wiring diagram. Added SCCR values to electrical data table.     |
| 10/18/22 | All  | Transitioned from CXM to CXM2 and DXM2 to DXM2.5 unit controls                    |
| 10/01/21 | Page 19-22   | Updated Water Quality Requirements table  |
| 09/27/21 | All  | Removed LON option, discontinued  |
| 07/08/21 | All  | Updated to include polymer drain pan  |
| 07/07/20 | Pgs. 22-23, 27-28 and 52                           | Added Note 11 and 6, Updated Wiring Diagram Matrix                                |
| 06/05/20 | Page 77  | Updated Start-Up Log Sheet  |
| 5/20/20  | Pgs 20, 21, 24, 25, 26, 29                         | Added Dimensional Data from Submittal   |
| 5/13/20  | All  | Added CT ECM fan motors; Replaced DXM with DXM2 controls, updated all data tables |
| 10/26/18 | Decoder  | Added disconnect to controls  |
| 8/21/18  | Page 31  | Updated TC041 rated airflow   |
| 11/2/17  | Page 58  | Added WSE DIP setting table   |
| 07/25/17 | Page 7   | Update hanger and mounting instructions   |
| 06/14/17 | Page 34  | Update drawing  |
| 1/30/17  | Page 22, 23  | Update notes  |
| 10/6/16  | Page 7   | Text Update   |
| 10/4/16  | WSE right hand Field Fabricated Tube               | Corrected   |
| 9/27/16  | TCH WSE Dim Q                                      | Corrected   |
| 9/7/16   | Page,24  | Updated voltage codes size 041  |
| 05/16/16 | Table- corrected centimeters in dimensional tables | Updated   |
| 04/15/16 | Text   | Updated   |
| 2/24/16  | Pages 30, 31                                       | EMC Blower Performance information,   |
| 02/06/15 | Page 3   | Changed E-Coated to Tin-Plated  |
| 01/27/16 | All  | Added WSE Information   |
| 01/21/15 | All  | Added ECM Information   |
| 06/16/14 | Pages 8, 11 & 19                                   | Change Text - Filter "rack" to "frame"  |



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