CLIMATEMASTER®

A NIBE GROUP MEMBER

COMMERCIAL

TRANQUILITY® (ST) ROOFTOP SERIES

INSTALLATION, OPERATION & MAINTENANCE MANUAL

Part#: 97B0162N01 | Revised: February 20, 2025

Models: ST 036-240

60Hz – R-454B

PRELIMINARY

Models:
ST
036-240

Table of Contents

Model Nomenclature

Models:
ST
036-240

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

PRODUCT NAME
S = Tranquility

MODEL TYPE
T = Rooftop Series

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

SIZE
036
048
060
072
096
120
144
180
240

REVISION
A = Current

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

CONTROLS

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

SPECIAL OPTIONS
S = Standard

BLOWER MOTOR
M = Plug EC

EXTENDED OPTIONS
0 = None
F = Smoke Detector

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

WATER OPTIONS
Standard
0 = None
M = MWV
C = MOD Valve
Standard with Check Valve[3]
3 = Internal Pump Standard Head (Variable)
4 = Internal Pump High Head (Variable)
Standard without Check Valve[3]
J = Internal Pump Standard Head (Variable)
K = Internal Pump High Head (Variable)

CABINET

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

Notes:
1 If Modulating Enthalpy Economizer option is selected, then an iGate communicating thermostat cannot be utilized. The thermostat must be a standard heat pump thermostat or wall sensor.
2 Size 036-072 must have DXM2.5 controls.
Size 096-240 must have CXM2 controls.
3 Only available on size 036-072.

Use ClimateMaster's selection software at https://climatemastersolutions.com/eRep/ to build your Tranquility ST.

Models:
ST
036-240

Attentions, Warnings & Cautions

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

Disconnect power supply(ies) before servicing. Refer servicing to qualified service personnel. Electric shock hazard. May result in injury or death!

⚠ 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.

⚠ 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

The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).

⚠ WARNING

An unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard.

⚠ WARNING

Auxillary devices which may be a POTENTIAL IGNITION SOURCE shall not be installed in the duct work. Examples of such POTENTIAL IGNITION SOURCES are hot surfaces with a temperature exceeding 1,292°F (700°C)

⚠ WARNING

Do not pierce or burn.

⚠ 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.

⚠ WARNING

An unventilated area where a water-source heat pump is installed and surpasses a R-454B refrigerant charge of 62 oz (1.76 kg), shall be without continuously operating open flames (for example an operating gas appliance) or other POTENTIAL IGNITION SOURCES (for example, an operating electric heater, hot surfaces).

⚠ WARNING

Some units may be charged with refrigerants other than 454B and are so labeled. Use appropriate refrigerant handling techniques. Mixing refrigerants in units is dangerous and can cause equipment damage. To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must only be serviced by technicians who meet local, state and federal proficiency requirements.

⚠ WARNING

If unit connected via an air duct system to one or more rooms with R-454B is installed in a room with an area less than Amin or has an Effective Dispersal Volume less than minimum, that room shall be without continuously operating open flames or other POTENTIAL IGNITION SOURCES. A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.

⚠ WARNING

Be aware that refrigerants may not contain odor.

⚠ WARNING

Only auxiliary electric heaters approved by ClimateMaster shall be installed in connecting ductwork. The installation of any other auxiliary devices is beyond ClimateMaster's responsibility.

⚠ WARNING

For mechanical ventilation, the lower edge of the air extraction opening where air is exhausted from the room shall not be more than 3.94 inches (100 mm) above the floor. The location where the mechanical ventilation air extracted from the space is discharged shall be separated by a sufficient distance, but not less than 9.84 feet (3 m), from mechanical ventilation air intake openings, to prevent recirculation to the space.

⚠ WARNING

To avoid equipment damage, do not use these units as a source of heat during the construction process. The mechanical components and filters used in these units will quickly become clogged with construction dirt and debris which may cause system damage.

⚠ WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

⚠ WARNING

Children being supervised are NOT to play with the appliance.

Attentions, Warnings & Cautions

Models:
ST
036-240

⚠ 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

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.

⚠ 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.

⚠ CAUTION

All three phase scroll compressors must have direction of rotation verified at startup. 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

Supply air duct is inaccessible from inside unit once unit is installed.

⚠ NOTICE

Servicing shall be performed only as recommended by the manufacturer.

⚠ NOTICE

REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS shall only be replaced with sensors specified by the appliance manufacturer.

⚠ NOTICE

An unconditioned attic is not considered natural ventilation.

⚠ NOTICE

Maximum external statics must be adhered to in order to maintain minimum CFM.

⚠ NOTICE

LEAK DETECTION SYSTEM installed. Unit must be powered except for service.

Models:
ST
036-240

General Information

INSPECTION

Upon receipt of the equipment, carefully check the shipment against the bill of lading. Make sure all units have been received. Inspect the carton or crating housing of each rooftop unit and inspect each unit for damage. Assure that the carrier makes proper notation of any shortages or damage on all copies of the freight bill and that he completes a Carrier Inspection Report. Concealed damage not discovered during unloading must be reported to the carrier within 15 days of receipt of shipment.

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

STORAGE

Upon the arrival of equipment at the job site, immediately store units in a clean, dry area. **Store units in an upright position at all times.** Stack unit model numbers ST-036 through ST-120 no more than two units high. Do not stack units larger than model number ST-120. **Do not remove equipment from pallets until equipment is required for installation.**

UNIT PROTECTION

Cover rooftop units on the job site. Cap the open ends of pipes. Cap the open ends of pipes stored on the job site. In areas where painting, plastering, or spraying has not been completed, all necessary precautions must be taken to avoid physical damage to the units and contamination by foreign material. **Physical damage and contamination may prevent proper startup and may result in costly equipment cleanup.**

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. Before unit startup, read all manuals and become familiar with the unit and its operation. Thoroughly check out the system before operation.

PREPARE ROOFTOP 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 that refrigerant tubing is free of kinks or dents, and that it has not been damaged during shipping.
4. Examine all pipes, fittings, valves and components before installing the system. Remove any dirt found on or in these components and assure that all components are securely fitted.
5. Verify curb is proper size for unit. Install curb according to manufacturer's instructions prior to installing unit.
6. Properly size supply and return duct work. Mount supply air duct to curb before installing unit.

Note: ST model units with the ERV option may be intended to be applied for 100% outdoor/make-up air service. Additional heat pumps should be provided for space conditioning if ST/ERV is used for 100% OA. ST/ERV units may have insufficient capacity for both OA/MA and space conditioning.

CHECKS TO THE AREA

Prior to beginning work on systems containing FLAMMABLE REFRIGERANTS, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the REFRIGERATING SYSTEM, these steps shall be completed prior to conducting work on the system.

Work Procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapor being present while the work is being performed.

General Work Area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

Presence of fire extinguisher

If any hot work is to be conducted on the refrigeration equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO_2 fire extinguisher adjacent to the charging area.

No ignition sources

No person carrying out work in relation to a REFRIGERATION SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

Checks to the Refrigeration Equipment

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- Refrigerant piping or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

General Information

Checks to Electrical Devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- Capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- That no live electrical components and wiring are exposed while charging, recovering, or purging the system;
- That there is continuity of earth bonding.

REPAIR TO INTRINSICALLY SAFE COMPONENTS

Intrinsically safe components must be replaced.

CABLING

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

REQUIRED AREA FOR INSTALLATION

The minimum room area of the space (A_{min}) or a minimum room area of conditioned space (TA_{min}) shall be corrected for unit's location altitude by multiplying A_{min} or TA_{min} by the applicable altitude adjustment factor (AF) for building ground-level altitude (H_{alt}) in feet or meters, as shown in .

Note: You can use Imperial or Metric measurements to calculate A_{min} or TA_{min}.

Table 1: Altitude Adjustment

H_{alt} ft (m)	AF
0 (0)	1.00
656 (200)	1.00
1,312 (400)	1.00
1,968 (600)	1.00
2,624 (800)	1.02
3,280 (1,000)	1.05
3,937 (1,200)	1.07
4,593 (1,400)	1.10
5,249 (1,600)	1.12
5,905 (1,800)	1.15
6,561 (2,000)	1.18
7,217 (2,200)	1.21
7,874 (2,400)	1.25
8,530 (2,600)	1.28
9,186 (2,800)	1.32
9,842 (3,000)	1.36
10,498 (3,200)	1.40

Minimum Installation Area

Models:
ST
036-240

Minimum area and CFM requirements for the conditioned space

Model (ST)	048	060	072	096	120	144	180	240
Charge [oz]	63.00	90.00	99.75	81.00	90.00	97.50	144.00	255.00
TA_{min} ft² (m²)	3.23 (0.30)	4.61 (0.43)	5.11 (0.47)	4.15 (0.39)	4.61 (0.43)	5.00 (0.46)	7.38 (0.69)	11.53 (1.07)
Q_{min} ft³/min (m²/min)	107 (3.02)	152 (4.31)	169 (4.78)	137 (3.88)	152 (4.31)	165 (4.67)	244 (6.90)	381 (10.78)

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

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

Models:
ST
036-240

Refrigerant System Servicing

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.

Removal and Evacuation

When breaking into the refrigerant circuit to make repairs - or for any other purpose - conventional procedures shall be used. However, for flammable refrigerants it is important that best practice be followed, since flammability is a consideration. The following procedure shall be adhered to:

- Safely remove refrigerant following local and national regulations
- Evacuate
- Purge the circuit with Inert gas
- Evacuate
- Continuously flush or purge with Inert gas when using flame to open circuit
- Open the circuit.

The refrigerant charge shall be recovered into the correct recovery cylinders. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, refrigerant purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for FLAMMABLE REFRIGERANT). This process shall be repeated until no refrigerant is remains in the system (optional for FLAMMABLE REFRIGERANT). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Charging Procedures

In addition to conventional charging procedures, the following requirements shall be followed:

- Ensure that contamination of different refrigerants does not occur when using charging equipment.
- Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the REFRIGERATION SYSTEM Is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the REFRIGERATION SYSTEM.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

Leak Detection

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.)

Refrigerant System Servicing

Models:
ST
036-240

Ensure that the detector is not a potential source of Ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the lower flammability limit of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE:
Examples of leak detection fluids are:

- Bubble method
- Fluorescent method agents

If a leak is suspected, all naked flames shall be removed/extinguished.

If a refrigerant leak that requires brazing is identified, all of the refrigerant shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak. Removal of refrigerant shall be according to Removal and Evacuation section.

DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

1. Become familiar with the equipment and its operation.
2. Isolate system electrically.
3. Before attempting the procedure, ensure that:
   - Mechanical handling equipment is available, if required, for handling refrigerant cylinders.
   - All personal protective equipment is available and being used correctly.
   - The recovery process is supervised at all times by a competent person.
   - Recovery equipment and cylinders conform to the appropriate standards.
4. Pump down refrigerant system, if possible.
5. If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
6. Make sure that cylinder is situated on the scales before recovery takes place.
7. Start the recovery machine and operate in accordance with instructions.
8. Do not overfill cylinders (no more than 80 % volume liquid charge).
9. Do not exceed the maximum working pressure of the cylinder, even temporarily.
10. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
11. Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Labeling - Upon decommissioning, equipment shall be labeled stating that is has been decommissioned and emptied of refrigerant. The label shall be dated and signed.

Models:
ST
036-240

Refrigerant System Servicing

RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted.

In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Physical Data

Models:
ST
036-240

Tranquility (ST) Series IP Units

ST Series	036	048	060	072	096	120	144	180	240
Compressor	Scroll								
Number of Circuits (Compressors)	1				2				
Factory Charge R-454B - (oz.) per circuit	54	71	102	113	92	102	111	182	255
Refrigerant Leak Detection System	O	R	R	R	R	R	R	R	R
Number of Sensors	2	2	2	2	2	2	2	2	2
Blower Motor	EC								
Blower Motor Quantity	1				2				3
Standard Motor (hp)	2.5								
Blower	Backward Curved Plug								
No. of Blowers	1				2				3
Blower Diameter (in.)	11.02		13.98		11.02	13.98			
Water Connection	Standard FPT								
Source FPT (in.)	3/4		1	1-1/4	1-1/2			2	
Coax Volume									
System Water Volume (US gal.)	0.61	0.77	1.11	1.30	1.69	2.29	2.68	3.83	4.77
Condensate Connection Size									
Source FPT (in.)	1								
Air Coil Data	Tube & Fin								
Air Coil Dimensions (h x w) - (in.)	36 x 20		36 x 28		42 x 32	42 x 36		80 x 36	
Air Coil Total Face Area (ft^2)	5		7		9.33	10.5		20	
Air Coil Tube Size (in.)	3/8								
Air Coil Fin Spacing (fpi)	14								
Air Coil Number of Rows	3				2	3	4	3	4
Internal Secondary Pump	Direct Drive Impeller								
Number of Pumps	1								
Standard Motor (hp)	1/6				1/2			3/4	1-1/2
Connection Size (in.)	3/4		1		1-1/2				2
General Data									
Filter Standard - 2" MERV 8 (qty.) (in.)	(QTY.4) 16 x 20				(QTY.6) 16 x 20			(QTY.8) 16 x 20 (QTY.2) 20 x 20	
Weight - Operating (lbs.)	735	785	835	880	1080	1125	1175	1870	1960
Weight - Packaged (lbs.)	750	800	850	900	1100	1150	1200	1900	2000

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

Models:
ST
036-240

Physical Data

Tranquility (ST) Series SI Units

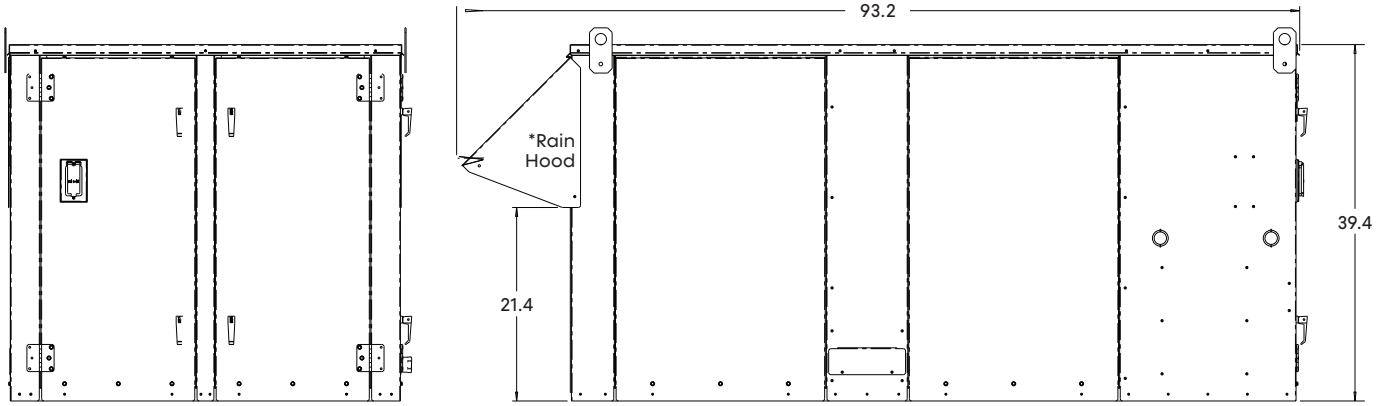
ST Series	036	048	060	072	096	120	144	180	240
Compressor	Scroll								
Number of Circuits (Compressors)	1				2				
Factory Charge R-454B - (kg) per circuit	1.81	2.02	2.90	3.21	2.61	2.90	3.15	5.17	7.24
Refrigerant Leak Detection System	O	R	R	R	R	R	R	R	R
Number of Sensors	2	2	2	2	2	2	2	2	2
Blower Motor	EC								
Blower Motor Quantity	1				2				3
Standard Motor (kw)	1.87								
Blower	Backward Curved Plug								
No. of Blowers	1				2				3
Blower Diameter (mm)	280		355		280	355			
Water Connection	Standard FPT								
Source FPT (mm)	19.05		25.4	31.75	38.1			50.8	
Coax Volume									
System Water Volume (L)	2.29	2.90	4.21	4.93	6.49	8.69	10.13	14.50	18.04
Condensate Connection Size									
Source FPT (mm)	25.4								
Air Coil Data	Tube & Fin								
Air Coil Dimensions (h x w) - (cm)	91.4 x 50.8		91.4 x 71.1		106.7 x 81.3	106.7 x 91.4		203.2 x 91.4	
Air Coil Total Face Area (m^2)	0.465		0.650		0.867	0.975		1.86	
Air Coil Tube Size (cm)	0.953								
Air Coil Fin Spacing (fins per cm)	5.5								
Air Coil Number of Rows	3				2	3	4	3	4
Internal Secondary Pump	Direct Drive Impeller								
Number of Pumps	1								
Standard Motor (kw)	0.124				0.373			0.556	1.120
Connection Size (cm)	1.91		2.54		3.81				5.08
General Data									
Filter Standard - 50.8 mm MERV 8 (qty.) (cm)	(QTY.4) 406 x 508				(QTY.6) 406 x 508			(QTY.8) 406 x 508 (QTY.2) 508 x 508	
Weight - Operating (kg)	333	356	379	399	490	510	534	850	889
Weight - Packaged (kg)	340	363	386	408	499	522	546	863	907

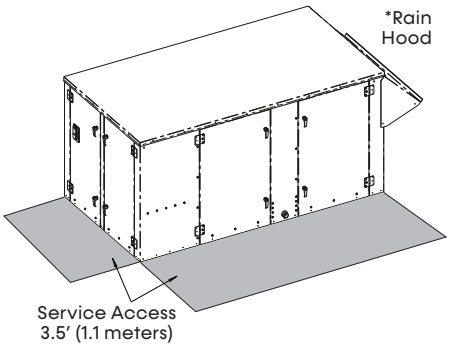
All units have TXV expansion device and 1.27 cm and 1.91 cm electrical knockouts.
FPT=Female Pipe Thread
O = Optional, R = Required

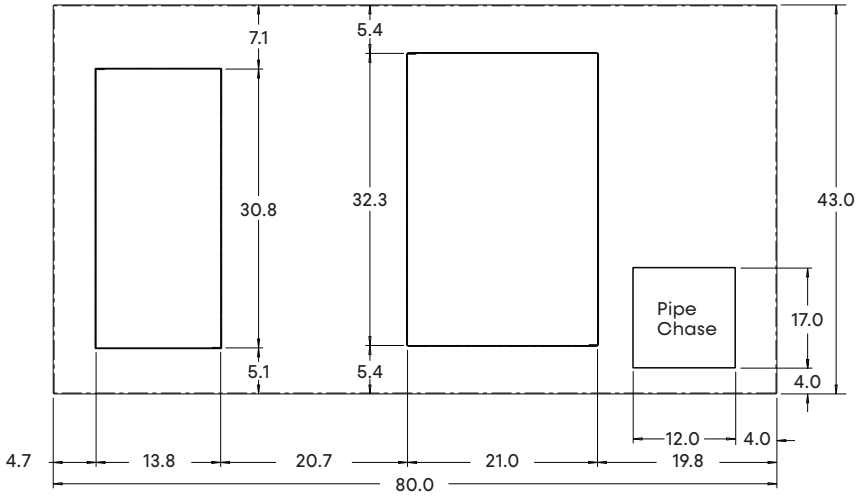
Dimensional Data 036-072

Models:
ST
036-240

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







Top View of Base

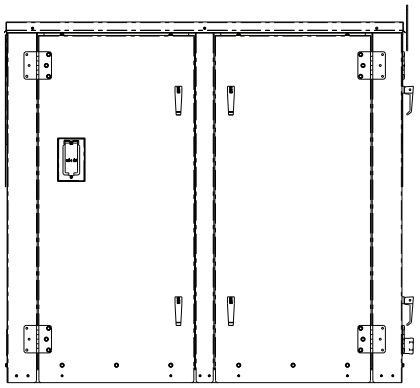
Note:

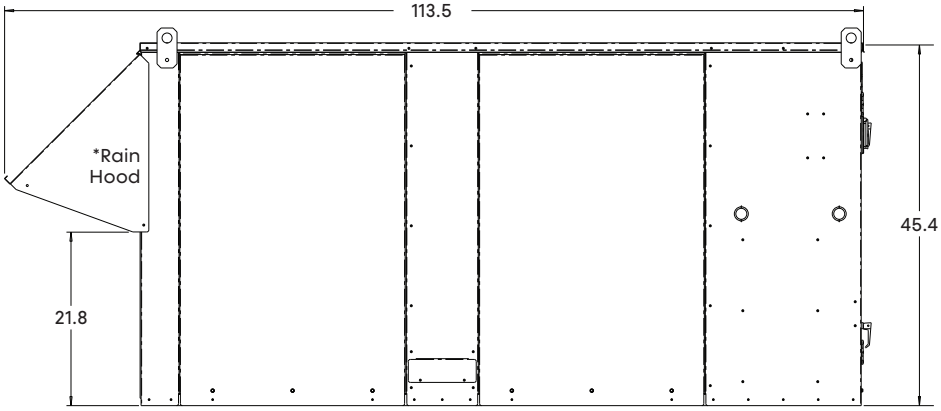
* Rain Hood only included when the Motorized Fresh Air damper or Modulating Enthalpy Economizer is selected in digit 3 of the ST model string.

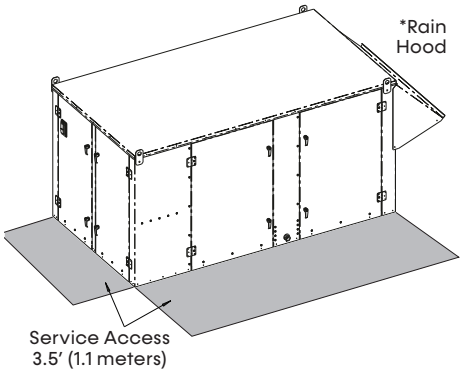
Models:
ST
036-240

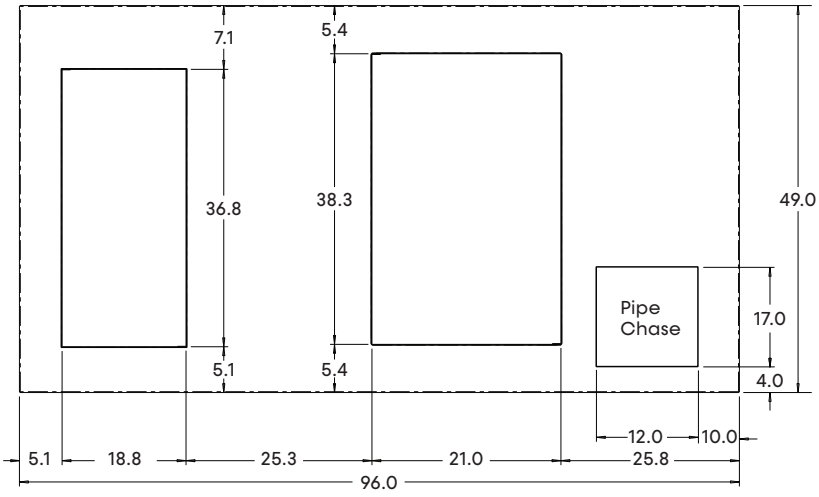
Dimensional Data
096-144

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









Top View of Base

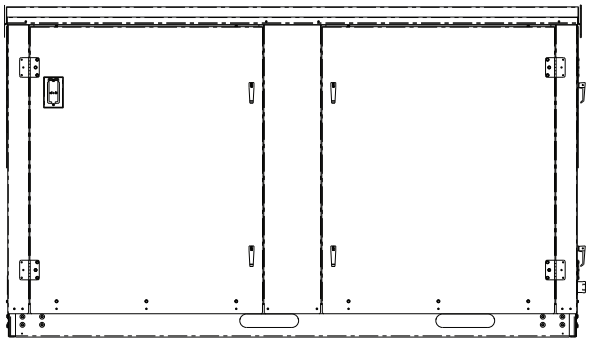
Note:

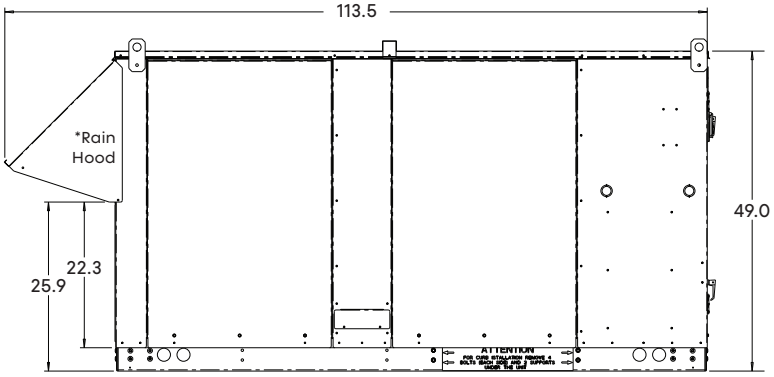
* Rain Hood only included when the Motorized Fresh Air damper or Modulating Enthalpy Economizer is selected in digit 3 of the ST model string.

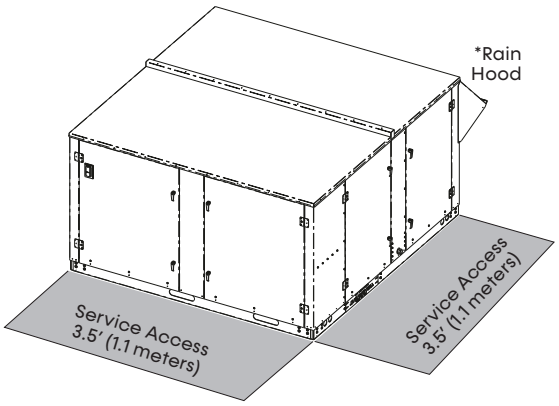
Dimensional Data 180-240

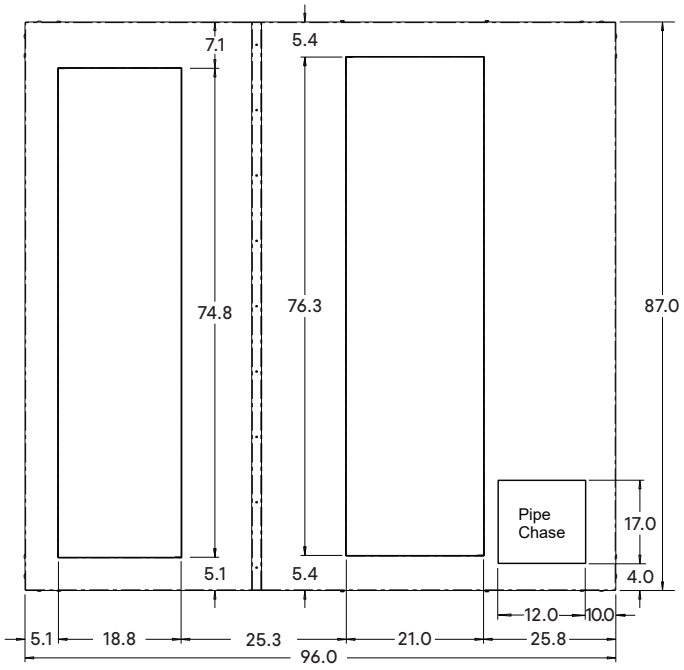
Models:
ST
036-240

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









Top View of Base

Note:

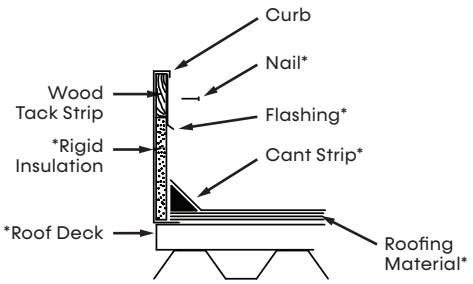
* Rain Hood only included when the Motorized Fresh Air damper or Modulating Enthalpy Economizer is selected in digit 3 of the ST model string.

Models:
ST
036-240

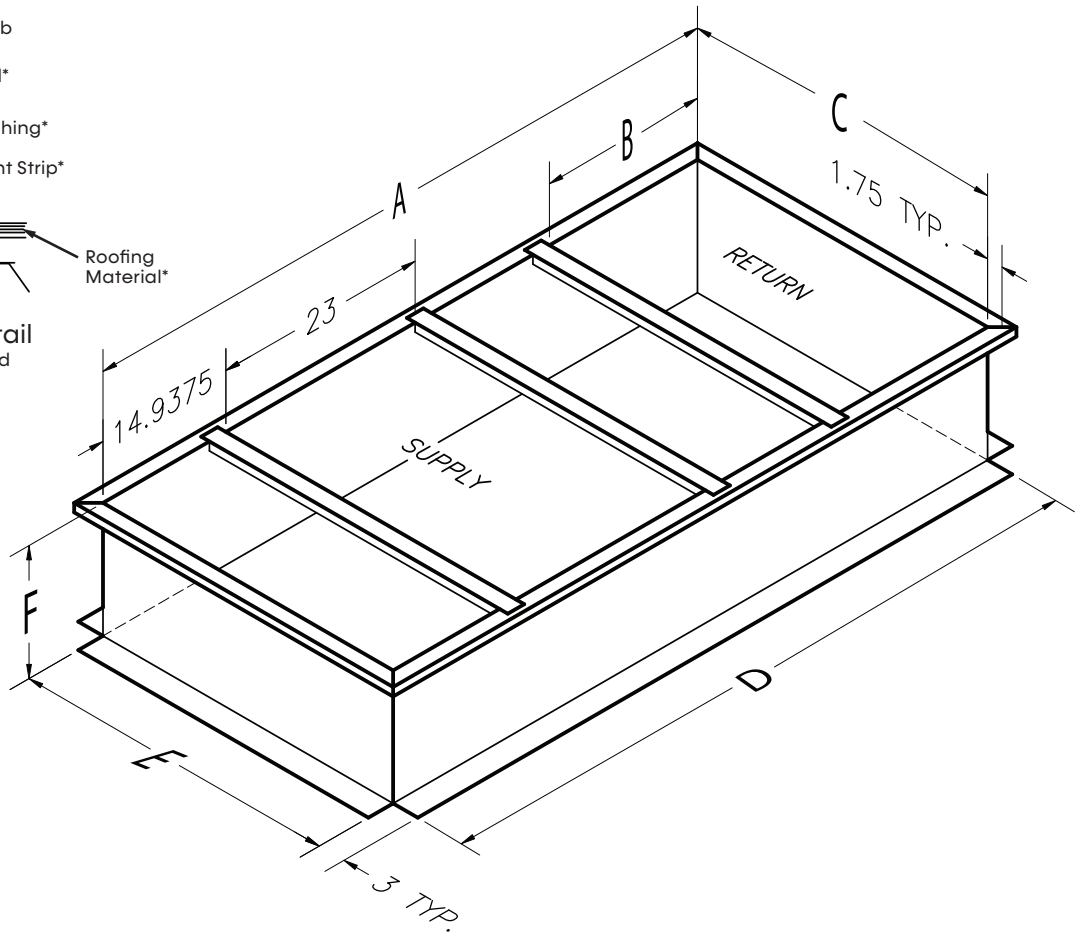
Standard Roof Curbs

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

Note:
- * "F" dimension can be 14" or 24"



Roofing Detail
*Field Supplied

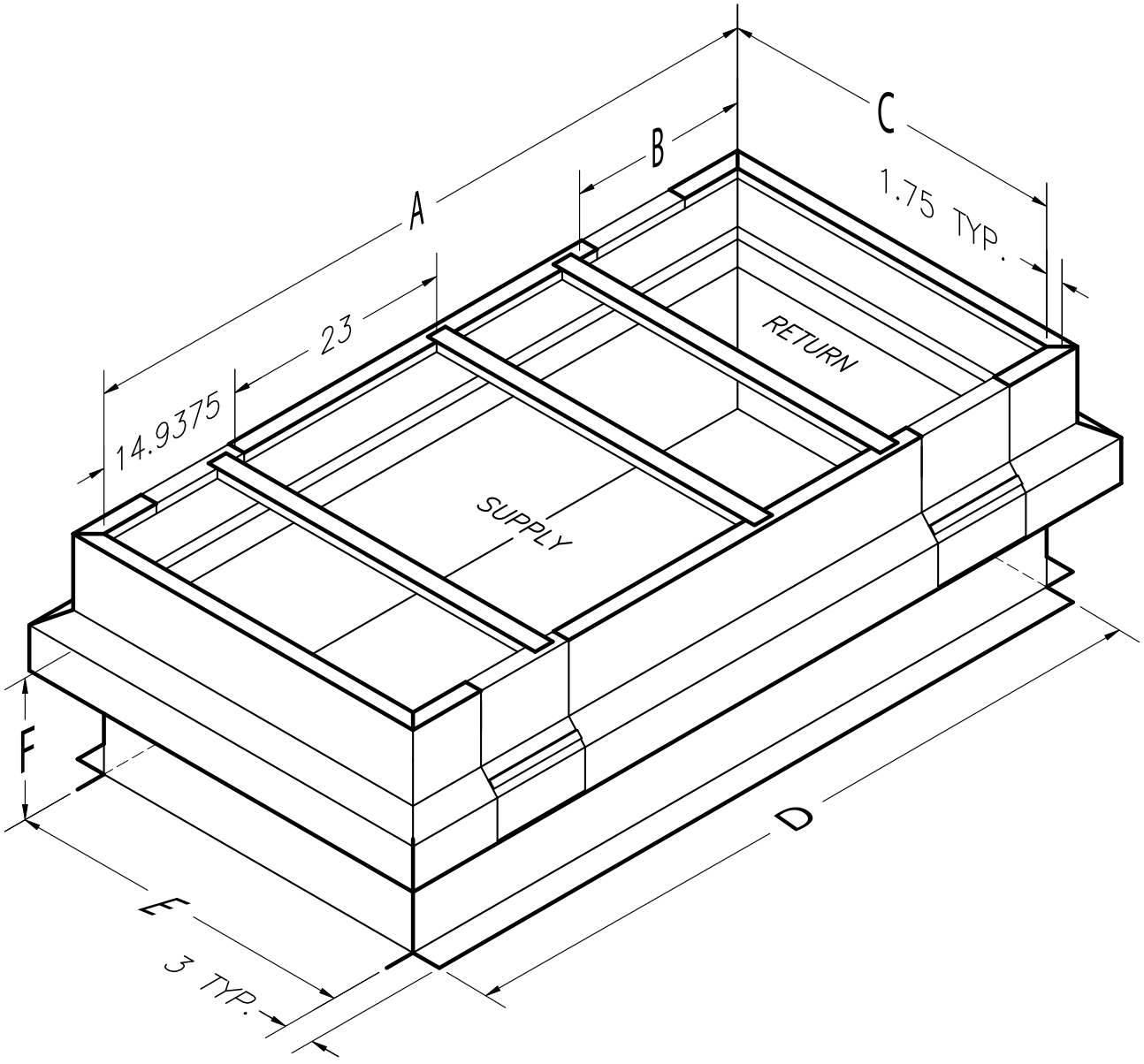


Standard Curb with Vibration Isolation

Models:
ST
036-240

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

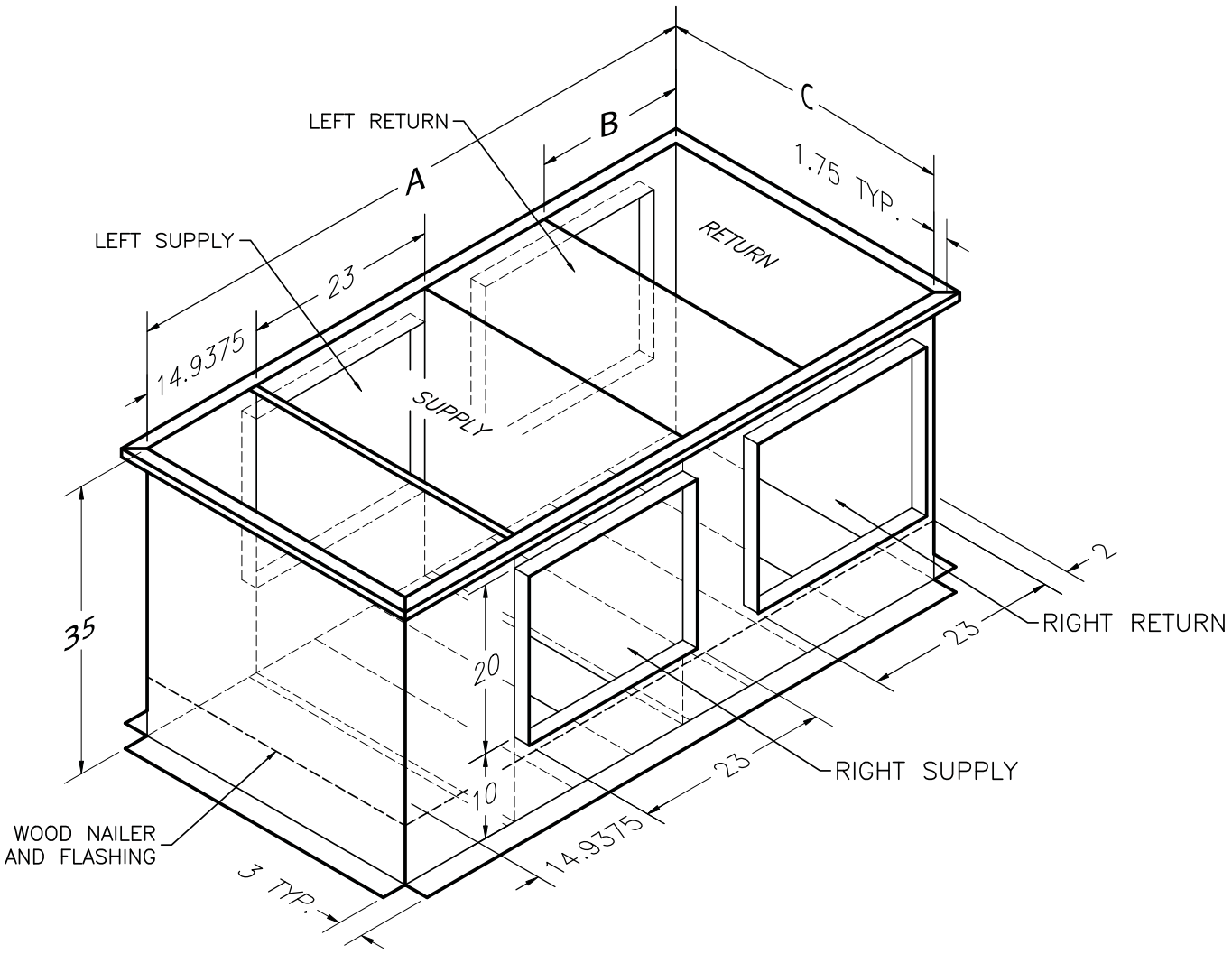
Note:
- Finish height is 12.5" taller than the base curb height.
- * "F" dimension can be 14" or 24"



Models:
ST
036-240

Side Discharge Supply & Return Roof Curb

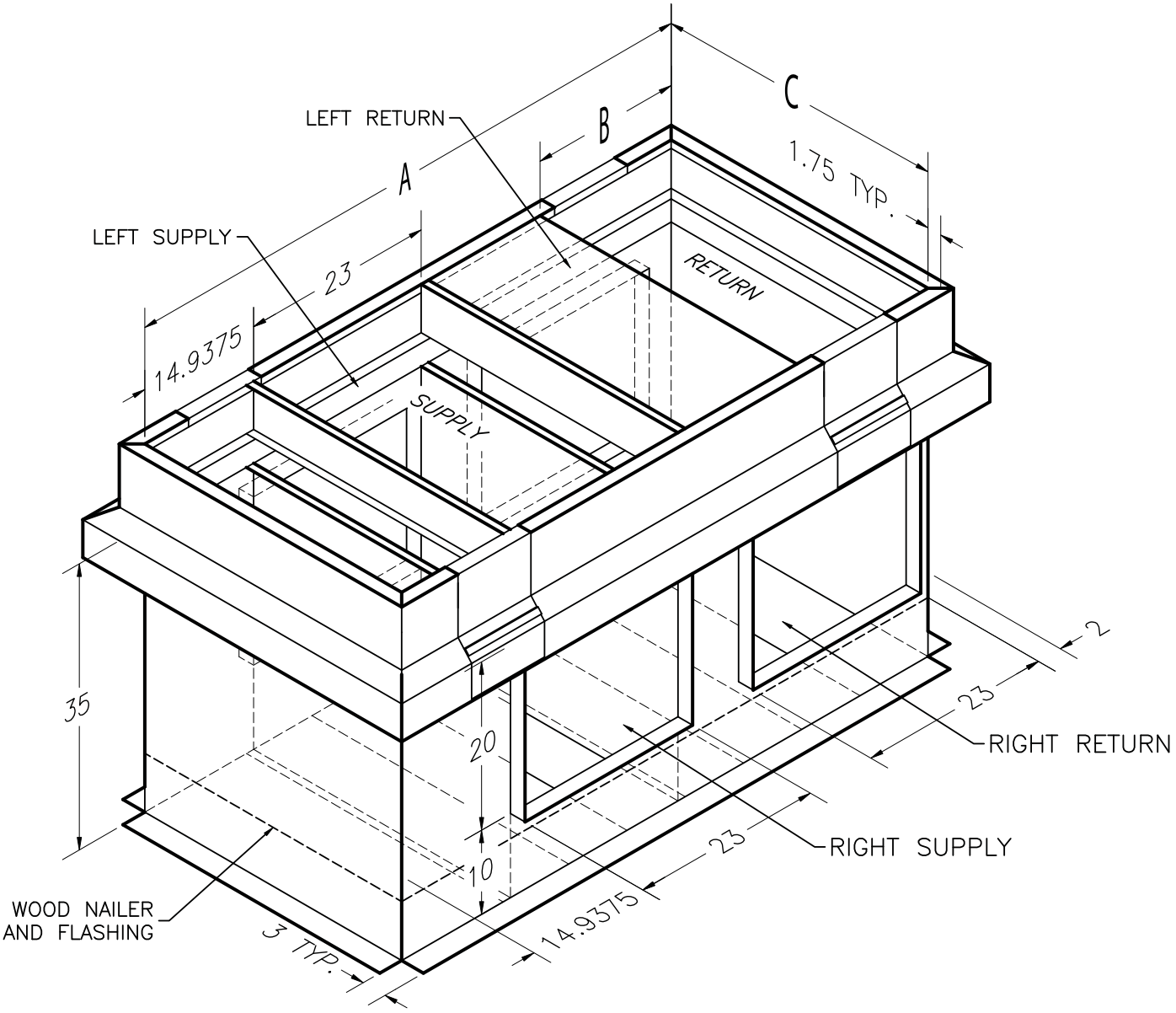
Models	A	B	C
036 048 060 072	72.25"	18.00"	35.25"
096 120 144	82.25"	21.00"	41.25"
180 240	82.25"	21.00"	78.88"



Side Discharge Supply & Roof Isolation Curb

Models:
ST
036-240

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



Models:
ST
036-240

Installation

The installation of rooftop water-source heat pump units and all associated components, parts and accessories that 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.

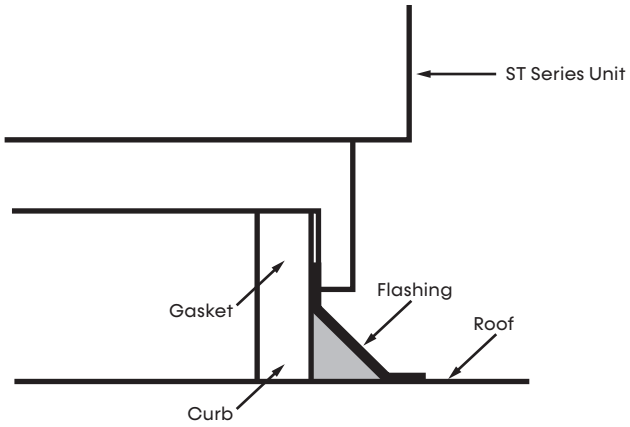
⚠ CAUTION

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.

When a compressor is removed from this unit, system refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, the refrigerant lines of the compressor must be sealed after it is removed.

Mineral oil or equipment exposed to mineral oil (manifold gauges, vacuum pumps or hoses) cannot be used to service units charged with R-454B refrigerant and P.O.E. oil. R-454B and P.O.E. oil are extremely hygroscopic (they absorb water from air). Only P.O.E. oil that has been verified as moisture free can be added to the system. Consult factory for more information.

Figure 1: ST Curb Installation



LOCATION, ACCESS AND CURB INSTALLATION

Install curbs with adequate clearance to allow unit maintenance and servicing. Conform to the following guidelines when selecting curb location.

Provide adequate clearance for filter replacement and drain pan removal. Do not block filter access with piping, conduit or other materials.

Provide access for fan and fan motor maintenance and for servicing the compressor and coils without removal of the unit.

Provide an unobstructed path to the unit to enable removal of the unit if necessary.

Provide access to water valves and fittings, and adequate access to the unit side panels and all electrical connections.

Follow these guidelines when installing the curb.

1. Set unit on curb.
2. Align unit so that return air and supply air in the unit match return and supply air opening in the curb frame.
3. Run supply and return loop piping and electrical supply lines through the pipe chase provided in the curb.

Note: Refer to previous pages for actual unit dimensions.

Piping Installation

Models:
ST
036-240

INSTALLATION 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.

Always insulate where the piping runs through unheated areas or outside the building. If loop temperature is maintained between 60°F and 90°F, piping will not sweat nor lose heat under normal ambient conditions. Otherwise, insulation is required on loop water piping.

All loop piping above grade must be insulated on any unit connected to an open or closed geothermal loop (GLHP, GWHP).

Pipe joint compound is not necessary when Teflon® threaded 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 male pipe threads of the fitting adapters. Prevent sealant from reaching the flared surfaces of the joint.

Maximum allowable torque for brass fittings is 30 foot-pounds. If a torque wrench is not available, tighten finger-tight plus one quarter turn. Tighten steel fittings as necessary.

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.

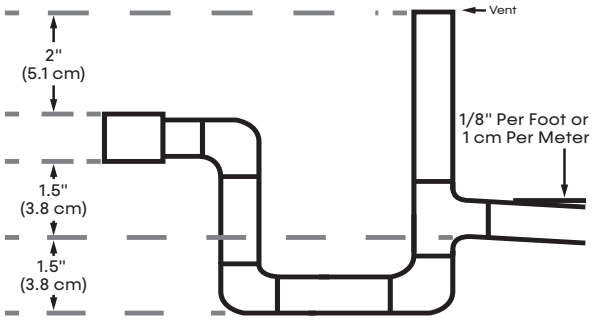
CONDENSATE PIPING

Install a condensate trap at each unit with the top of the trap positioned below the unit condensate drain connection.

Design the length of the trap (water-seal) based upon the amount of positive or negative pressure on the drain pan. As a general rule, 1 inch of trap is required for each 1 inch of negative pressure on the unit with a 1.5 inch (38 mm) minimum. Each unit must be installed with a dedicated trap for that unit.

Note: that condensate may be allowed to drain onto the roof.

Figure 2: Condensate Drain



⚠ WARNING

Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with R-454B 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 R-454B as system failures and property damage may result.

⚠ CAUTION

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

⚠ CAUTION

Do not bend or kink supply lines or hoses.

⚠ CAUTION

Piping must comply with all applicable codes.

Models:
ST
036-240

Water Quality Requirements

Table 2: 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-loop water systems should undergo water quality testing and be maintained to the water quality standards listed in this table. All open-loop water systems shall be tested upon installation and periodically to ensure water quality standard in the table below are met.

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 - Chilled Water >85°F			8.0 to 10.0	8.0 to 10.0	8.0 to 10.0	8.0 to 10.0
	Alkalinity	($HCO3^-$)	ppm - $CaC0_3$ equivalent	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	($CaCO_3$)	ppm - $CaC0_3$ equivalent	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 - $CaC0_3$ equivalent	<1000	<1000	<1000	<1000
	Sulfate	(SO_4^{2-})	ppm	<200	<200	<200	<200
	Nitrate	(NO_3^-)	ppm	<100	<100	<100	<100
	Chlorine (free)	(Cl)	ppm	<0.5	<0.5	<0.5	<0.5
	Chloride (water < 80°F)	(Cl^-)	ppm	<20	<20	<150	<150
	Chloride (water > 120°F)	(Cl^-)	ppm	<20	<20	<125	<125
	Hydrogen Sulfide[α]	(H_2S)	ppb	<0.5	<0.5	<0.5	<0.5
	Carbon Dioxide	(CO_2)	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_3)	ppm	<0.05	<0.1	<0.1	<0.1
	Chloramine	(NH_2CL)	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[β]	(TSS)	ppm	<10	<10	<10	<10
Electrolysis All HX types	Earth Ground Resistance[χ]		Ohms	Consult NEC and local electrical codes for grounding requirements			
	Electrolysis Voltage[δ]		mV	Measure voltage and internal water loop to HP ground			
	Leakage Current[δ]		mA	Measure current in water loop pipe			
	Building Primary Electrical Ground to unit, must meet local diameter and penetration length requirements. 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						

Water Quality Requirements

Models:
ST
036-240

1. The Water Quality table provides water quality requirements for coaxial and 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 (4.4°C), antifreeze is required. Refer to the heat pump IOM for the correct solution ratios to prevent freezing.

Strainer / Filter Sizing

Mesh Size	Particle Size		
	Microns	Millimeter	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

α Hydrogen Sulfide has an odor of rotten eggs. If one detects this smell, a test for H_2S must be performed. If H_2S is detected above the limit indicated, remediation is necessary. Consult with your water testing/treatment professional. If a secondary heat exchanger is required, use 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 inch) 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.

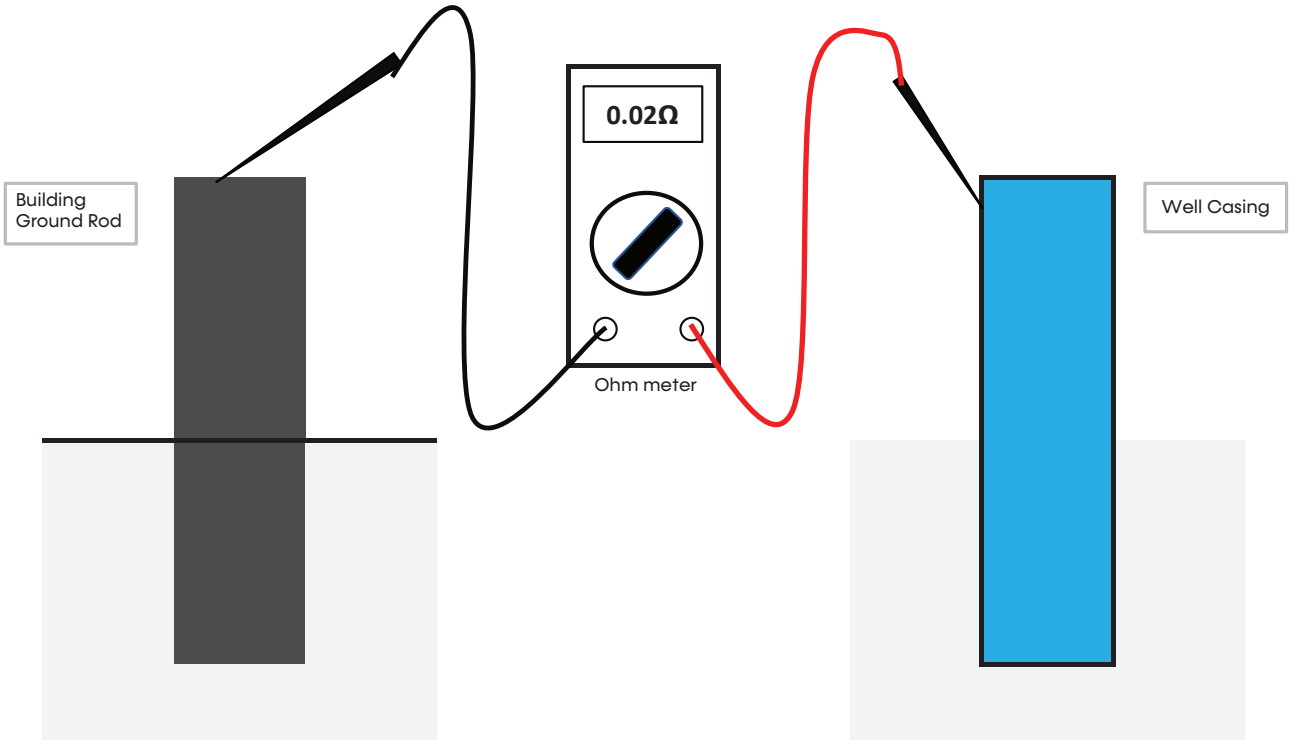
χ The WSHP piping system or other plumbing pipes must not be used as the building ground. An electrical grounding system using a dedicated ground rod meeting NEC and local electrical codes must be installed.

δ Refer to the Antifreeze Percentages by Volume table for instructions on measuring resistance and leakage currents within water loops.

Models:
ST
036-240

Water Quality Requirements

Measuring Earth Ground Resistance for Ground-Water Applications



Measure the earth ground bond using an Ohm meter between the building's ground rod and the steel well casing.

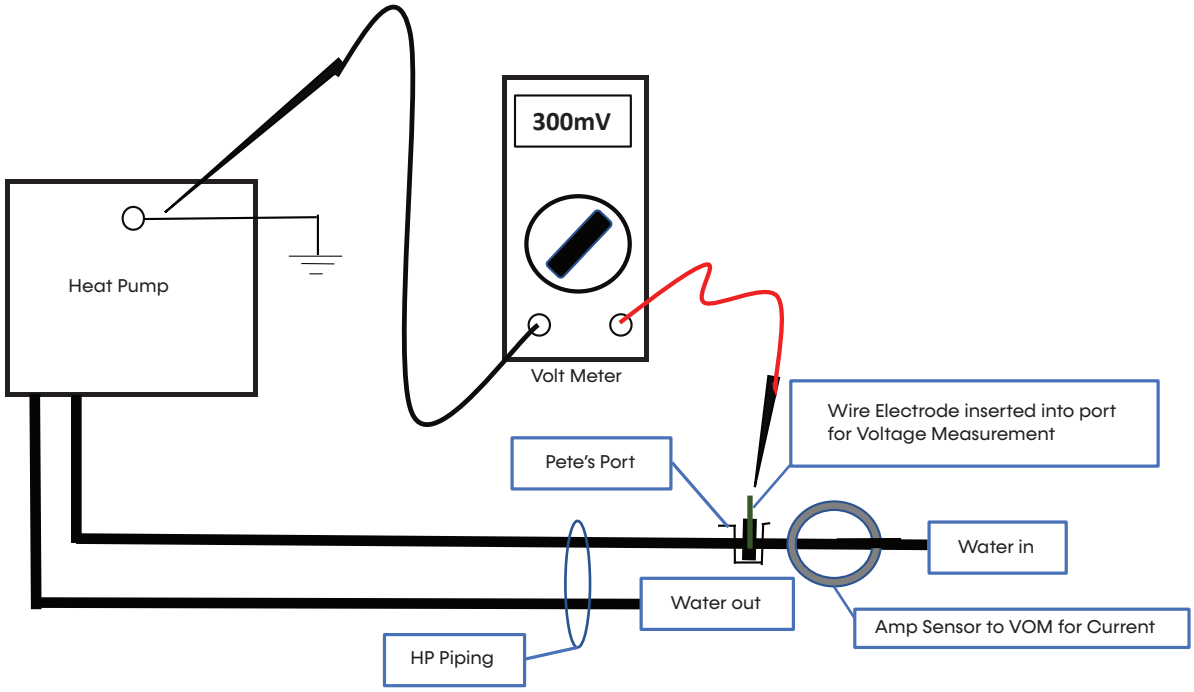
The resistance measured should be zero Ohms. The NEC allows a resistance to ground up to 20 Ohms. Any resistance above zero indicates a poor earth ground, which may be the result of a hot neutral line or that conductive water is present. Both of these may lead to electrolysis and corrosion of the heat pump piping. A check for both should be performed and resolved.

NOTE: If the well casing is plastic, a conductive path can be achieved by inserting a #6 AWG bare copper wire into the well water. Remove the temporary conductor when finished.

Water Quality Requirements

Models:
ST
036-240

Measuring Electrolysis, Voltage, and Current for Ground-Water Applications



Measure the electrolysis voltage using a volt meter between the heat pump ground and a #14 AWG solid copper wire electrode inserted into the water using a Pete's style access port.

The heat pump must be operating and the water stream flowing.

The voltage measured should be less than 300mV (0.300V). If the voltage is higher than 500mV, electrolysis will occur and corresion will result.

If voltage is measured, the cause is a high-resistance earth ground or current on the neutral conductor. Remedial measures should be performed.

Measure the current flowing through the piping system by using an amp clamp probe on the water-in line. The heat pump must be operating and the water stream flowing.

There should be zero amps measured. If current is present, there is leakage current to the plumbing system and it must be rectified to prevent pipe corrosion.

Models:
ST
036-240

Electrical Data: Plug EC

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor			Total Unit FLA	Min. Circuit AMP	MOP	Fuse/ HACR AMP
				QTY	RLA	LRA	QTY	FLA	HP				
ST036	H	208/230-3-60	187/252	1	9.9	82.0	1	4.8	2.5	14.7	17.1	27.0	25
	F	460-3-60	432/504	1	4.8	44.3	1	3.3	3.2	8.1	9.3	14.1	15
ST048	H	208/230-3-60	187/252	1	11.9	112.0	1	4.8	2.5	16.7	19.6	31.5	30
	F	460-3-60	432/504	1	6.8	61.8	1	3.3	3.2	10.1	11.8	18.6	15
ST060	H	208/230-3-60	187/252	1	14.0	150.0	1	4.7	2.5	18.7	22.2	36.2	35
	F	460-3-60	432/504	1	6.3	58.0	1	3.9	3.8	10.2	11.8	18.1	15
ST072	H	208/230-3-60	187/252	1	18.9	162.3	1	4.7	2.5	23.6	28.4	47.3	45
	F	460-3-60	432/504	1	9.1	70.8	1	3.9	3.8	13.0	15.3	24.4	20
ST096	H	208/230-3-60	187/252	2	12.8	120.4	2	4.8	2.5	35.1	38.3	51.1	50
	F	460-3-60	432/504	2	6.0	49.4	2	3.3	3.2	18.7	20.2	26.2	25
ST120	H	208/230-3-60	187/252	2	16.0	156.4	2	4.7	2.5	41.5	45.5	61.5	60
	F	460-3-60	432/504	2	7.1	69.0	2	3.9	3.8	22.0	23.8	30.9	30
ST144	H	208/230-3-60	187/252	2	21.2	156.5	2	4.7	2.5	51.9	57.2	78.4	70
	F	460-3-60	432/504	2	9.1	74.8	2	3.9	3.8	26.0	28.3	37.4	35
ST180	H	208/230-3-60	187/252	2	24.4	200.0	2	4.7	2.5	58.3	64.4	88.8	80
	F	460-3-60	432/504	2	11.9	103.0	2	3.9	3.8	31.6	34.6	46.5	45
ST240	H	208/230-3-60	187/252	2	28.5	255.0	3	4.7	2.5	71.2	78.3	106.8	100
	F	460-3-60	432/504	2	13.5	123.0	3	3.9	3.8	38.8	42.1	55.6	50

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

Electrical Data: Plug EC with Internal Secondary Pump

Models:
ST
036-240

High Head Variable Pump

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor			Pump		Rated Current	Min. Circuit AMP	MOP	Fuse/ HACR AMP
				QTY	RLA	LRA	QTY	FLA	HP	QTY	FLA				
ST036	H	208/230-3-60	187/252	1	9.9	82.0	1	4.8	2.5	1	1.44	16.1	18.6	28.5	25
ST048	H	208/230-3-60	187/252	1	11.9	112.0	1	4.8	2.5	1	1.44	18.1	21.1	33.0	25
ST060	H	208/230-3-60	187/252	1	14.0	150.0	1	4.7	2.5	1	1.44	20.2	23.7	37.7	35
ST072	H	208/230-3-60	187/252	1	18.9	162.3	1	4.7	2.5	1	1.44	25.1	29.8	48.7	45

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

Standard Head Variable Pump

Model	Voltage Code	Voltage	Voltage Min/max	Compressor			Blower Motor			Pump		Rated Current	Min. Circuit AMP	MOP	Fuse/ HACR AMP
				QTY	RLA	LRA	QTY	FLA	HP	QTY	FLA				
ST036	H	208/230-3-60	187/252	15.4	9.9	82.0	1	4.8	2.5	1	0.64	15.3	17.8	27.7	25
ST048	H	208/230-3-60	187/252	18.6	11.9	112.0	1	4.8	2.5	1	0.64	17.3	20.3	32.2	25
ST060	H	208/230-3-60	187/252	21.8	14.0	150.0	1	4.7	2.5	1	0.64	19.4	22.9	36.9	35
ST072	H	208/230-3-60	187/252	29.5	18.9	162.3	1	4.7	2.5	1	0.64	24.3	29.0	47.9	45

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

Models:
ST
036-240

Electrical: Power Wiring

⚠ WARNING

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

⚠ CAUTION

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

⚠ CAUTION

Maintain zone integrity to assure accurate and efficient operational control of units or groups of units. Without adequate zone control, adjacent units may operate in heating and cooling mode simultaneously.

ELECTRICAL

Figure 2 illustrates a typical trap used with ST Heat Pumps.

Multiple units within the same zone should be operated from a common temperature control.

Line Voltage - All field installed wiring, including electrical ground, must comply with NFPA 70: National Electrical Code (NEC), CSA C22.1: Canadian Electrical Code (CE Code), as well as 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.

Refer to Table 3 for wire sizes and lengths. Do not allow the total resistance of all low-voltage wires used to exceed 1 ohm. Resistance in excess of 1 ohm may cause high-voltage drop which may result in control malfunction.

Refer to the thermostat installation and operation manual to determine recommended heat anticipator settings.

When using a DDC building management system (BMS), communication grade wire may be required. Verify required communication and sensor wiring type with the manufacturer of the BMS system components.

GENERAL LINE VOLTAGE WIRING

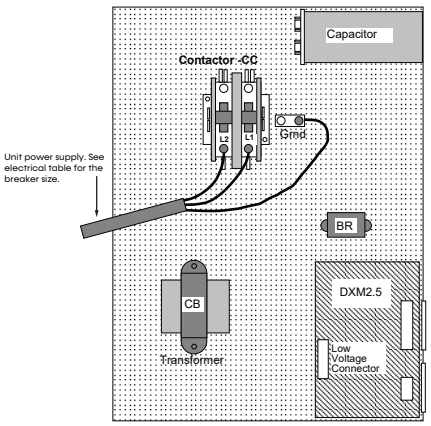
Be sure the available power is the same voltage and phase shown on the unit serial plate.
Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

Table 3: Recommended Thermostat Wire Size

WIRE SIZE	MAX. WIRE LENGTH*
22 - Gauge	30 feet [9.14m]
20 - Gauge	50 feet [15.24m]
18 - Gauge	75 feet [22.86m]
16 - Gauge	125 feet [38.1m]
14 - Gauge	200 feet [60.96m]
200	74

* Length = physical length of wire from thermostat to unit.

Figure 3: Single Phase Line Voltage Field Wiring



POWER CONNECTION

Line-voltage connection is made by connecting the incoming line-voltage wires to the "L" side of the contactor as shown in Figure 3. Consult electrical data tables for maximum fuse size.

TRANSFORMER

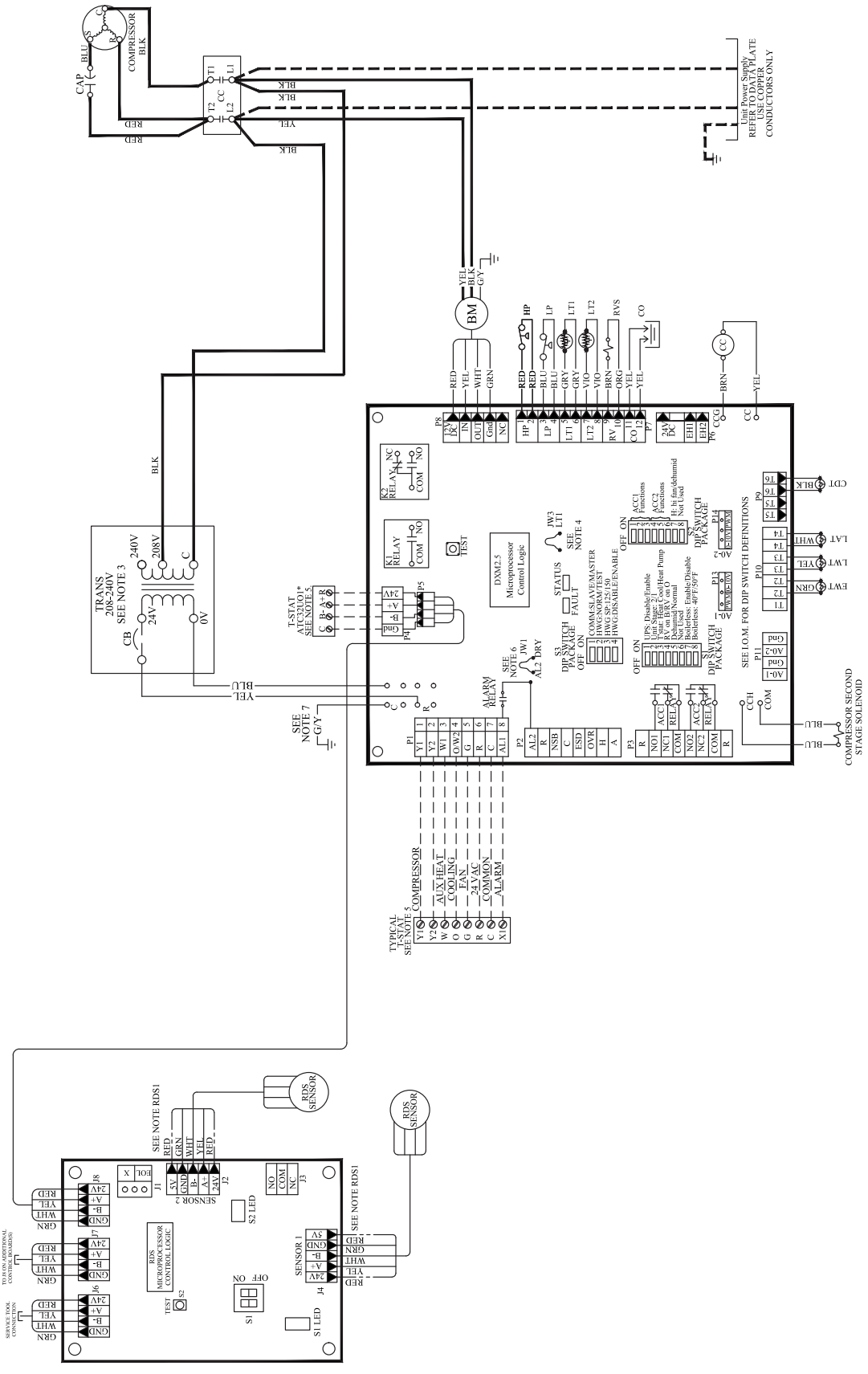
All 208/240V units are factory wired for 208V.
If supply voltage is 240V, installer must rewire transformer. See wire diagram for connections.
Optional GFI Outlet requires dedicated 115V - 20 AMP circuit provided by installer.

DISCONNECT

Field-installed disconnect switches connected to supply terminals must have contact separation for **all poles** providing full disconnection. Manufacturer-installed disconnect (optional) provides all-pole disconnection from the supply mains.

Electrical: DXM2.5 Example Wiring Diagram

Models:
ST
036-240



Models:
ST
036-240

Electrical: Low Voltage Wiring

THERMOSTAT CONNECTIONS

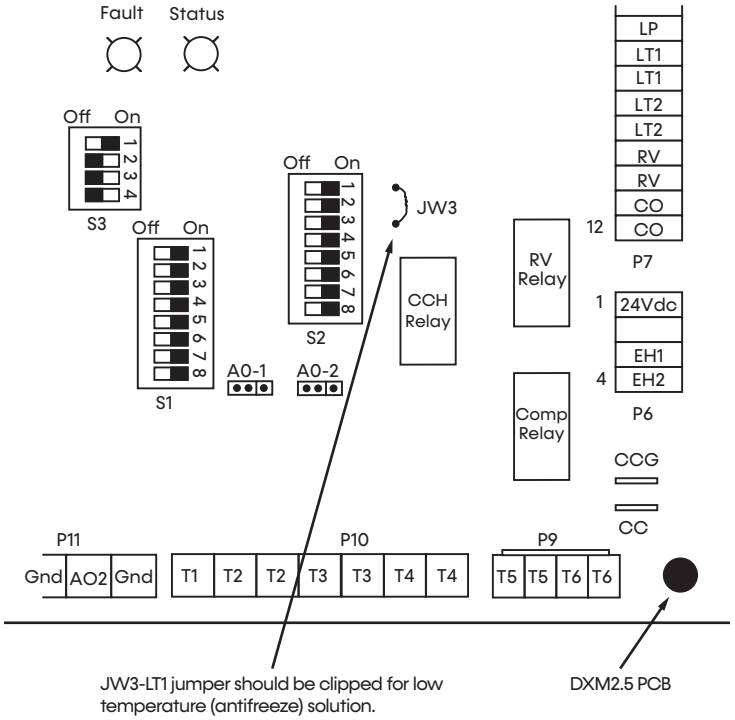
The thermostat should be wired directly to the DXM2.5 or CXM2 board. See Electrical: Thermostat Wiring for specific terminal connections. Review the appropriate AOM (Application, Operation and Maintenance) manual for units with DDC controls.

LOW WATER TEMPERATURE CUTOUT SELECTION

The DXM2.5/CXM2 control allows the field selection of low-water (or water-antifreeze solution) temperature limit by clipping jumper JW3 (see the figure below), 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 the figure below 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.

Figure 4: LT1 Limit Setting (DXM2.5 pictured)



Electrical: Low Voltage Wiring

Models:
ST
036-240

ACCESSORY CONNECTIONS

A terminal paralleling the compressor contactor coil has been provided on the CXM2/DXM2.5. Terminal "A" is designed to control accessory devices.

NOTE: This terminal should be used only with 24V signals and not line voltage. Terminal "A" is energized with the compressor contactor.

The controller includes two accessory relays ACC1 and ACC2. Each relay includes a normally open (NO) and a normally closed (NC) contact. Accessory relays may be configured to operate as shown in the table below.

Accessory Relay 1 Configuration

DIP 2.1	DIP 2.2	DIP 2.3	ACC1 Relay Option
ON	ON	ON	Cycle with fan
OFF	ON	ON	N/A for Residential Applications
ON	OFF	ON	Water valve – Slow opening
ON	ON	OFF	Outside air damper
OFF	OFF	ON	N/A for Residential Applications
ON	OFF	OFF	N/A for Residential Applications

All other DIP combinations are invalid

Accessory Relay 2 Configuration

DIP 2.4	DIP 2.5	DIP 2.6	ACC2 Relay Option
ON	ON	ON	Cycle with compressor
OFF	ON	ON	N/A for Residential Applications
ON	OFF	ON	Water valve – Slow opening
OFF	OFF	ON	Humidifier
ON	ON	OFF	Outside air damper

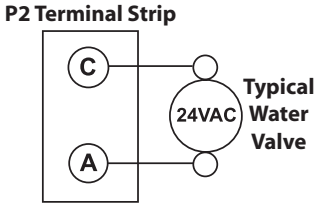
All other DIP combinations are invalid

UNITS WITHOUT VARIABLE FLOW

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 5 shows typical wiring for a 24VAC external solenoid valve. Figure 6 and Figure 7 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:

Figure 5: Accessory Wiring



1. The valve will remain open during a unit lockout.
2. The valve will draw approximately 25-35VA 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.

TWO-STAGE UNITS

Two-stage units without vFlow should be designed with two parallel valves for ground water applications to limit water use during first stage operation. For example, at 1.5 gpm/ton (2.0 l/m per kW), a ST048 unit requires 6 gpm (23 l/m) for full load (2nd stage) operation, but only 4 gpm (15 l/m) during 1st stage operation. Since the unit will operate on first stage 80-90% of the time, significant water savings can be realized by using two parallel solenoid valves with two flow regulators. In the example above, stage one solenoid would be installed with a 4 gpm (15 l/m) flow regulator on the outlet, while stage two would utilize a 2 gpm (8 l/m) flow regulator. When stage one is operating, the second solenoid valve will be closed. When stage two is operating, both valves will be open, allowing full load flow rate. Figure 8 illustrates piping for two-stage solenoid valves.

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

Models:
ST
036-240

Electrical: Low Voltage Wiring For Units Using External Motorized Water Valve

Figure 6: Accessory Motorized Water Valve Typical Wiring Example #1

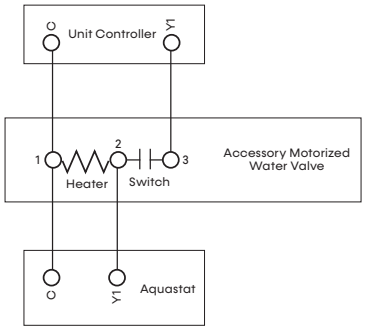


Figure 7: Accessory Motorized Water Valve Typical Wiring Example #2

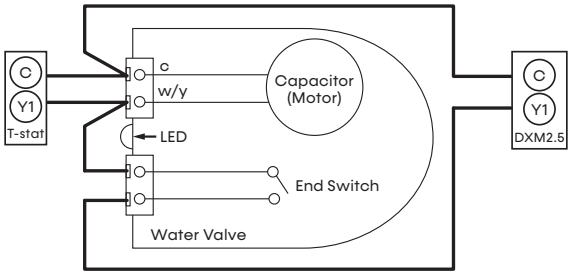
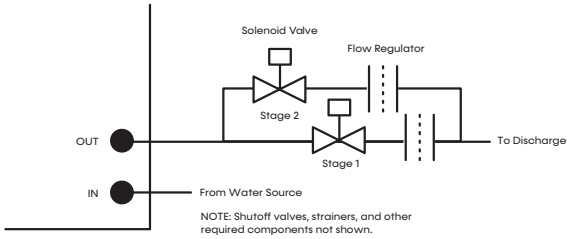


Figure 8: Two-Stage Piping



Electrical: Low Voltage Wiring
Refrigeration Detection System

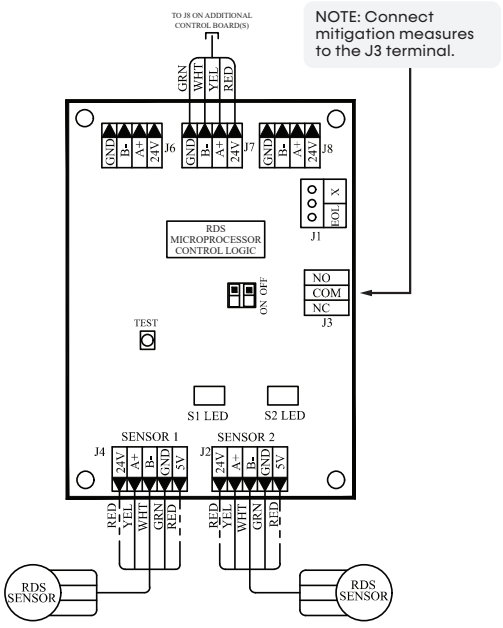
Models:
ST
036-240

REFRIGERANT DETECTION SYSTEM (RDS)

The function, operation, and required servicing measures for the Refrigerant Detection System (RDS) include the following:

- The RDS monitors the status of the refrigerant sensor(s) in the unit. If refrigerant is detected above the maximum threshold, the control enables the unit blower, disables the compressor(s), and enables the pilot relay on the RDS control board. You can use this relay to open external zoning dampers and/or activate external mechanical ventilation. The relay is normally closed (NC) and can control a signal with a maximum of 28VA @ 24VAC.
- A fault is enabled if the RDS control board loses communication with a refrigerant sensor or if the main control board loses communication with the RDS board. See Functional Troubleshooting for steps to troubleshoot the RDS.
- The End of Line (EoL) termination is used to prevent signal reflection issues in the communication network. When the EoL termination is enabled, it places a resistor at the end of the communication line, ensuring proper signal integrity and reducing potential communication errors. Add the EoL termination resistor when the RDS board is the end of a daisy-chain, and the total length of the wire is greater than 50 feet.

Figure 9: RDS Board



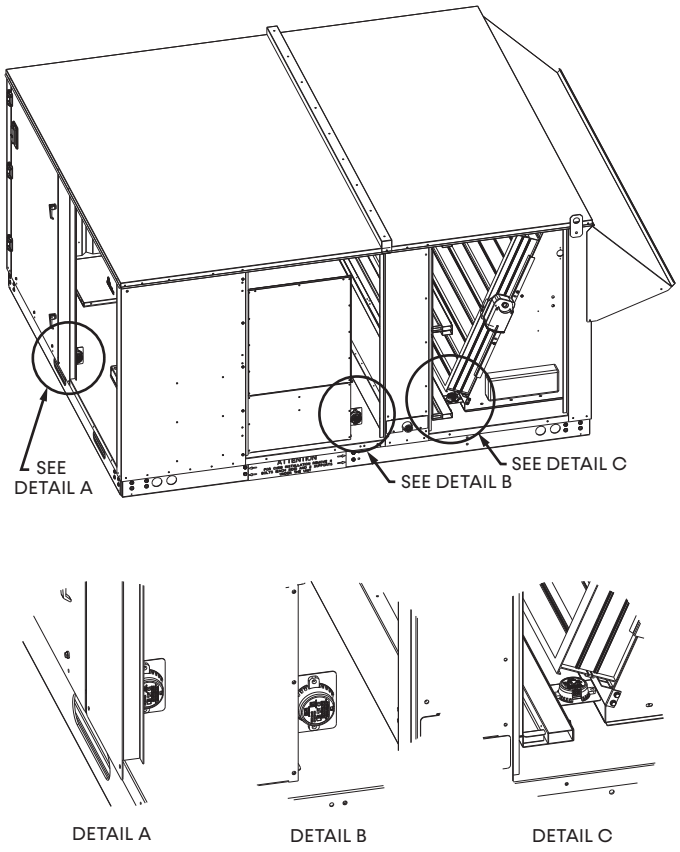
FIELD-INSTALLED RDS SYSTEM

Field-installed RDS sensors should be placed per the preferred locations featured in Figure 10.

⚠ NOTICE

The sensor cannot be installed in a way that exposes it to water and must be installed using the orientation displayed in the figure below.

Figure 10: Factory-supplied RDS Sensor Locations



Note:

Graphic shows preferred factory-supplied RDS sensor locations. Number of sensors installed may differ. Refer to Series Physical Data for number of sensors required for each model size.

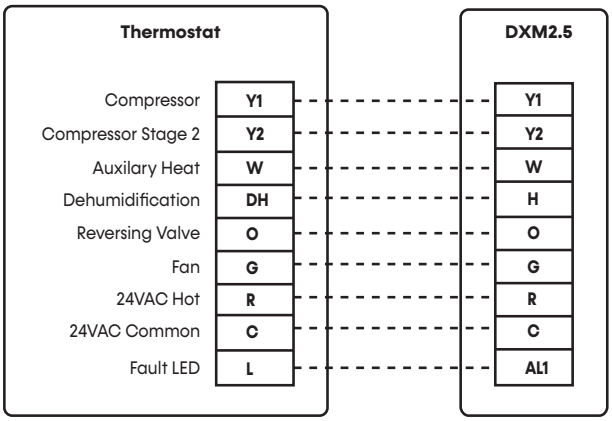
Models:
ST
036-240

Electrical: Thermostat Wiring

THERMOSTAT INSTALLATION

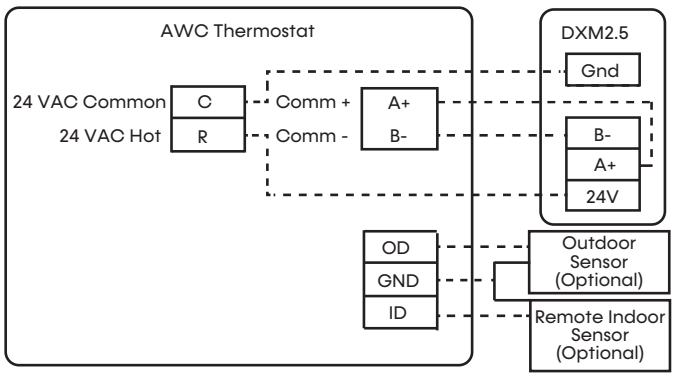
The thermostat should be located on an interior wall in a larger room, away from supply duct drafts. DO NOT locate the thermostat in areas subject to sunlight, drafts or on external walls. The wire access hole behind the thermostat may, in certain cases, need to be sealed to prevent erroneous temperature measurement.

Figure 11: Conventional 3 Heat / 2 Cool Thermostat Connection to DXM2.5



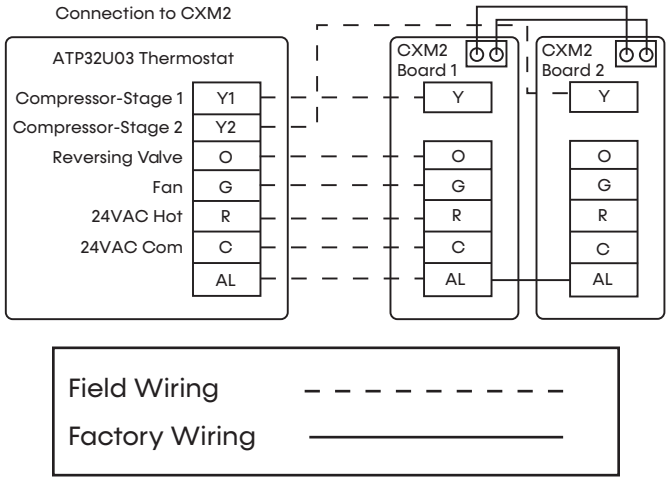
NOTES:
1. EC automatic dehumidification mode operates with dehumidification airflows in the cooling mode when the dehumidification output from thermostat is active. Normal heating and cooling airflows are not affected.
2. DXM2.5 DIP switch S2-7 must be in the auto dehumidification mode for automatic dehumidification.
3. DH connection not possible with units with internal variable speed pump. Use the AWC Thermostat.
4. Only use the AWC Thermostat when using Humidifier (H Input) in units with internal variable speed pump.

Figure 12: Communicating (AWC) Thermostat Connection to DXM2.5



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-inch (5 mm) bit. Install supplied anchors and secure plate to the wall. Thermostat wire must be 18 AWG wire. Representative thermostat wiring is shown in the figures below however, actual wiring connections should be determined from the thermostat IOM and or unit wiring diagram. Practically any heat pump thermostat will work with ClimateMaster units, provided it has the correct number of heating and cooling stages.

Figure 13: Conventional 3 Heat / 2 Cool Thermostat Connection to CXM2



Controls: CXM2 and DXM2.5

Models:
ST
036-240

CXM2 Communicating 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 Advanced Communicating 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.

Models:
ST
036-240

Operating Limits and Commissioning Conditions

OPERATING LIMITS

Environment – Units are designed for roof mount or indoor installation.

Power Supply – Voltage utilization shall comply with AHRI Standard 110 or values provided in the electrical data tables.

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.

COMMISSIONING CONDITIONS

Starting conditions vary depending upon model and are based upon the following notes:

NOTES:

1. Commissioning Conditions are not normal or continuous operating conditions. Minimum/maximum limits are startup 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 4: Operating Limits

Operating Limits	Cooling	Heating
Air Limits		
Min. entering air	60°F [15.5°C]	50°F [10°C]
Max. entering air db	90°F [32.2°C]	80°F [27°C]
Fluid Limits		
Min. entering fluid	40°F [4°C]	20°F [-6.7°C]
Max. entering fluid	120°F [49°C]	120°F [49°C]*

* Variable flow water circuit options are required for operation at this range. The maximum entering fluid temperature in heating for this series without variable flow water circuit options selected is 90°F.

Table 5: Commissioning Conditions

Operating Limits	Cooling	Heating
Air Limits		
Min. entering air	40°F [4.4°C]	40°F [4°C]
Max. entering air db	110°F [43°C]	80°F [27°C]
Fluid Limits		
Min. entering fluid	40°F [4°C]	20°F [-6.7°C]
Max. entering fluid	120°F [49°C]	90°F [32.2°C]

Sound Data

Models:
ST
036-240

Model	Mode	Ducted Discharge Octave Band Frequency, Hz							Free Air Inlet Combined With Casing (Cabinet) Radiated Octave Band Frequency, Hz						
		125	250	500	1000	2000	4000	8000	125	250	500	1000	2000	4000	8000
ST036	Fan Only	55	50	37	33	34	36	34	64	51	48	48	41	47	40
	Cooling: Full Load	61	52	47	47	45	42	38	75	64	58	54	54	54	45
	Heating: Full Load	61	52	47	47	45	40	37	75	63	58	55	52	50	47
	Cooling: Part Load	53	49	34	34	37	38	36	69	65	55	58	57	54	43
	Heating: Part Load	53	46	36	32	30	33	35	69	65	56	53	48	46	44
ST048	Fan Only	49	41	35	31	28	33	36	61	52	49	45	42	48	42
	Cooling: Full Load	59	54	50	47	48	47	42	72	65	62	59	55	56	49
	Heating: Full Load	59	53	49	47	46	44	40	72	63	60	56	53	55	48
	Cooling: Part Load	52	43	37	33	31	33	35	67	64	57	54	50	49	43
	Heating: Part Load	54	44	37	32	28	32	36	67	59	54	46	43	48	41
ST060	Fan Only	51	40	33	32	31	34	35	60	53	50	53	46	46	40
	Cooling: Full Load	60	52	46	40	40	43	38	69	62	58	57	54	54	46
	Heating: Full Load	60	51	44	41	40	42	37	69	63	62	57	54	52	45
	Cooling: Part Load	52	43	34	33	33	35	35	63	59	53	52	46	47	42
	Heating: Part Load	53	44	32	31	30	33	35	63	61	55	52	45	46	42
ST072	Fan Only	52	40	36	31	30	34	36	62	54	51	50	44	48	42
	Cooling: Full Load	64	54	52	46	47	49	49	72	65	68	60	58	61	53
	Heating: Full Load	64	54	50	46	46	48	41	72	64	64	60	57	60	51
	Cooling: Part Load	53	42	37	31	31	35	35	65	60	56	56	49	53	50
	Heating: Part Load	53	40	37	31	30	34	36	65	64	55	56	49	52	49
ST096	Fan Only	81	70	65	61	57	49	44	78	66	65	62	60	56	48
	Cooling: Part Load	81	71	65	61	57	50	46	80	66	65	63	60	57	50
	Cooling: Full Load	82	72	66	62	58	50	45	81	67	66	63	61	57	49
	Heating: Part Load	81	72	66	62	57	50	47	79	68	68	63	60	57	51
	Heating: Full Load	83	73	67	62	57	50	50	80	69	69	63	61	57	55
ST120	Fan Only	81	72	66	62	58	50	45	80	67	67	64	61	57	49
	Cooling: Part Load	82	73	67	62	58	51	47	80	68	67	64	61	58	51
	Cooling: Full Load	83	73	67	63	59	51	46	81	69	67	64	62	58	51
	Heating: Part Load	83	73	68	63	58	51	47	80	69	70	64	62	58	52
	Heating: Full Load	83	74	68	63	59	51	47	82	70	70	65	62	58	53
ST144	Fan Only	84	74	69	64	59	50	44	82	72	69	66	62	57	48
	Cooling: Part Load	84	74	70	65	59	50	45	83	73	70	66	63	57	49
	Cooling: Full Load	84	75	70	65	60	50	45	83	74	70	66	63	57	49
	Heating: Part Load	84	74	70	65	60	50	46	84	73	70	66	63	58	51
	Heating: Full Load	85	75	70	65	60	51	46	84	74	70	67	63	58	51
ST180	Fan Only	78	74	68	67	61	55	51	75	70	69	68	66	62	54
	Cooling: Part Load	79	74	68	67	62	55	51	76	70	69	68	65	62	55
	Cooling: Full Load	79	75	69	67	62	55	51	76	70	69	68	65	62	55
	Heating: Part Load	79	74	69	67	62	55	51	76	71	69	69	66	63	56
	Heating: Full Load	79	75	69	67	62	55	51	76	71	69	69	66	63	56
ST240	Fan Only	81	77	69	68	64	55	51	78	71	70	70	66	63	56
	Cooling: Part Load	81	77	70	68	64	56	52	78	72	70	70	67	64	56
	Cooling: Full Load	81	77	71	68	64	56	52	78	72	71	70	67	64	57
	Heating: Part Load	81	76	70	69	64	56	52	79	73	71	71	68	64	57
	Heating: Full Load	81	77	70	69	64	56	53	79	73	71	71	68	65	57

ST Series Octave Band Sound Power Level (dB re 1PW)
Standard 60Hz. Construction - EC Plug Fan
Tested in accordance with ARI 260
ST comes standard with mute construction

Models:
ST
036-240

Startup Procedure

⚠ WARNING

To prevent injury or death due to electrical shock or contact with moving parts, open unit disconnect before servicing unit.

SYSTEM CLEANING AND FLUSHING

Cleaning and flushing the unit 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. Verify that electrical power to the units 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. Open all air vents. Fill the system with water. Do not allow system to overflow. Bleed all air from the system. Check the system for leaks and repair appropriately.
4. Verify that all strainers are in place. Start the pumps and systematically check each vent to ensure that all air is bled from the system.
5. Verify that makeup water is available. Adjust makeup water appropriately 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 (when used) to raise the loop temperature to approximately 85° F. Open a drain at the lowest point in the system. Adjust the makeup 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 of water. Reset the boiler (when used) to raise the loop temperature to about 100°F.
8. Circulate the solution for a minimum of eight to 24 hours. At the end of this period, shut off the circulating pump and drain the solution. Repeat system cleaning if necessary.

⚠ CAUTION

To avoid possible damage to piping systems constructed of plastic piping, DO NOT allow loop temperature to exceed 115° F.

9. 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 Rooftop Units. Refill the system and bleed off all air.
10. Add antifreeze to the system in climates where ambient temperature falls below freezing, using the proportion of antifreeze shown in Table 5. The volume of antifreeze required will vary based on outdoor design temperature.
11. Test the system pH with litmus paper. The system water should be slightly alkaline (pH 7.5 to 8.5). Add chemicals as appropriate to maintain acidity levels.
12. 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

Do Not use "Stop-Leak" or any similar chemical agent in this system. Addition of these chemicals to the loop water will foul the system and will inhibit unit operation.

Table 6: Antifreeze Percentage Required By Volume

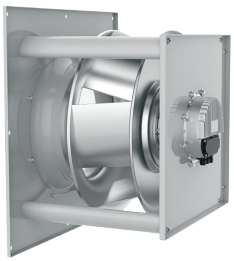
Antifreeze	Minimum Ambient Temperature			
	0°F	10°F	20°F	30°F
Methanol	25%	21%	16%	10%
Propylene Glycol	26%	23%	19%	9%
Ethylene Glycol	24%	20%	16%	12%

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.

Blower Motor Controls

Models:
ST
036-240

BLOWER DESCRIPTION



EC Plug Fan

Electrically Commutated Motors are electronically-switched, brushless, DC, external-rotor motors with permanent magnets. Motor speed is controlled by an integrated controller that directs the fan motor to ramp speed (CFM) up or down to match the load of the space they are servicing. Tranquility ST units use EC Motors to deliver variable capacity, optimizing system efficiency and saving owners money.

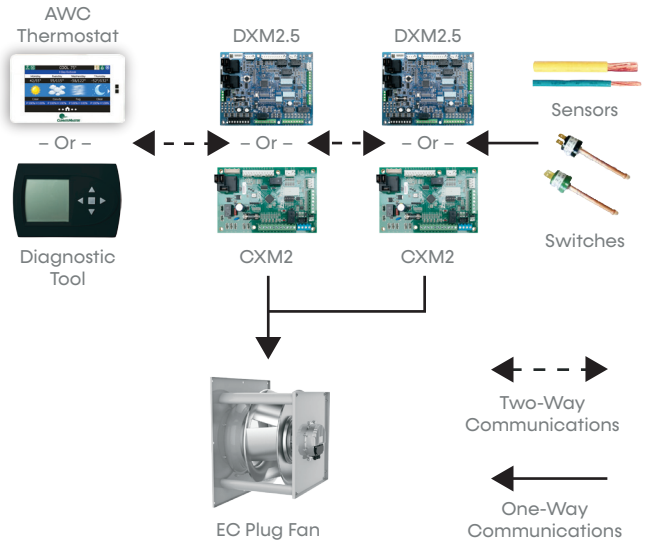
EC motors are quieter, more efficient, and are eligible for utility rebates. These products are commonly used in single-zone, variable-air-volume (VAV) applications. When applied to single-zone VAV applications the system modulates the indoor fan and stages compressors as space temperature changes. This greater control increases part-load efficiency and provides more precise temperature control, reaching fan speeds as low as 37.5% of maximum air flow. Blower controls are paired with our intelligent DXM2.5 or CXM2 controls to provide superior service and functionality.

BLOWER SEQUENCE OF OPERATION

The blower comes factory programmed with the standard DXM2.5 (for 036-072) or CXM2 (for 096-240) controls. The DXM2.5 or CXM2 controls the blower controller using a 0–10VDC control signal, and comes factory programed for Leaving Air Temperature (LAT) control mode. The actual operating range for the active blower will be 3.7–10VDC associated to the operating speeds of 37–100%. When the blower is off, the output should be set to 0VDC. For each unit size, there will be a maximum and minimum operating speed at which the blower can be operated for any mode, defined in Table 8.

The blower may be operated in LAT or discrete speed control modes.

NOTE: Blower output is 50% of last value during heating or cooling blower-off delay times.



Models:
ST
036-240

Blower Motor Controls

LAT CONTROL BLOWER OPERATION

The DXM2.5 or CXM2 will come factory configured for LAT control operation. The blower speed will be controlled by the control board to maintain the factory default LAT set point, 55°F for cooling and 105° F for heating. LAT can be adjusted in the field. See Table 7 for full details.

When a compressor demand is recognized, the blower output will be set to the most recent operating speed of the blower in the current operating mode (heating or cooling). If there is no value stored from a previous heating or cooling cycle, the blower speed will initially set to 75% or 8.0VDC. After the blower speed is initially set, the blower-control signal will not be adjusted until after 90 seconds of compressor operation, and then will be periodically checked and adjusted every 10 seconds if needed to maintain the LAT.

If the control switches from the heating mode to cooling, or cooling to heating without deactivating the compressor, the blower control voltage will immediately switch to the last stored control voltage for the new operating mode, and then will not be adjusted for the first 90 seconds of operation in the new operating mode.

The blower-control voltage is increased or decreased incrementally based on the magnitude of the differential between the current LAT and the target LAT defined in Table 7.

DISCRETE SPEED BLOWER OPERATION

When the DXM2.5 or CXM2 is configured for discrete-speed blower operation, the blower speed will be set to the selected operating speed (A, B or C) for full-load heating or cooling. Full-load operation is defined as second-stage enabled in either heating or cooling.

When the control board is configured for discrete speed blower operation, the blower operating speed may be increased or decreased by 10%. The speed offset option defaults to normal (no offset). To increase the blower operating speed by 10%, set the speed offset option to **increase**. To decrease the blower operating speed by 10%, set the speed-offset option to **decrease**.

When operating in first-stage heating or cooling, the blower speed will be set to a percentage of the selected full-load operating speed (A, B or C, plus-or-minus adjustment) listed for each unit size as defined in Table 8.

Table 7: LAT Mode Operating Temperatures

Model	Min Heat LAT	Max Heat LAT	Default Heat LAT	Min Cool LAT	Max Cool LAT	Default Cool LAT
ST036	85°	125°	105°	45°	65°	55°
ST048	85°	125°	105°	45°	65°	55°
ST060	85°	125°	105°	45°	65°	55°
ST072	85°	125°	105°	45°	65°	55°
ST096	85°	125°	105°	45°	65°	55°
ST120	85°	125°	105°	45°	65°	55°
ST144	85°	125°	105°	45°	65°	55°
ST160	85°	125°	105°	45°	65°	55°
ST192	85°	125°	105°	45°	65°	55°
ST240	85°	125°	105°	45°	65°	55°

Table 8: 0-10V Discrete Speed Control

Model	Min Speed	Max Speed	Fixed Speed A	Fixed Speed B	Fixed Speed C	Part-Load Multiplier	Default Fan Speed
ST036	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST048	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST060	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST072	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST096	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST120	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST144	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST160	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST192	TBD	TBD	TBD	TBD	TBD	TBD	TBD
ST240	TBD	TBD	TBD	TBD	TBD	TBD	TBD

Unit and System Checkout

Models:
ST
036-240

UNIT CHECKOUT

- ☐ Voltage: Ensure that voltage is within the utilization range specifications of the unit compressor and fan motor.
- ☐ Water Flow Rate to Heat Pump: System is balanced.
- ☐ Control Box: Tighten/check all electrical connections. Ensure transformer is wired on correct voltage TAP (208 - 230 Volt only).
- ☐ Access Panels: Assure that all access panels in the filter and fan section are securely closed.
- ☐ Air Dampers: Assure that all air dampers are properly set.
- ☐ Unit Filters: To avoid system damage, ensure that the unit filter is clean.
- ☐ Unit Fans: Manually rotate fans to assure free rotation. Ensure that fans are properly secured to the fan shaft. Do not oil fan motors on start-up since they are lubricated at the factory.

SYSTEM CHECKOUT

- ☐ System Water Temperature: Ensure that it is within an acceptable range to facilitate start-up. (When conducting this check, also verify proper heating and cooling setpoints.)
- ☐ Freeze Protection for Water System: Verify that freeze protection is provided for the building loop water system when outdoor design conditions require antifreeze. Inadequate freeze protection can lead to expensive tower and system piping repairs.
- ☐ System Water Loop: Verify that all air is bled from the system. Air in the system impedes unit operation and causes corrosion in the system piping.
- ☐ System Water pH: Verify system water acidity. (pH = 7.5 or 8.5) Proper pH promotes the longevity of hoses and heat exchangers.
- ☐ System Flushing: Properly clean and flush system periodically. Ensure that all supply and return hoses are connected end-to-end to facilitate system flushing and prevent fouling of the heat exchanger by system water. Water used in the system must be of potable quality and clean of dirt, piping slag, and chemical cleaning agents.
- ☐ Closed-Type Cooling Tower or Open Tower with Heat Exchanger: Check equipment for proper temperature set points and operation.
- ☐ Standby Pump: Verify that the standby pump is properly installed and in operating condition.
- ☐ System Controls: To ensure that no catastrophic system failures occur, verify that system controls are functioning and that the sequencing is correct.
- ☐ System Control Center: To ensure control of the temperature set-points for operation of the system's heat rejector and boiler (when used), examine the system control and alarm panel for proper installation and operation.
- ☐ Miscellaneous: Note any questionable aspects of the installation.

Models:
ST
036-240

Unit Startup

⚠ WARNING

Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with R-454B 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 R-454B as system failures and property damage may result.

⚠ 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.

1. Adjust all water valves to their full open position. Turn on the line power to all heat pump units.
2. Operate each unit in the cooling cycle. Room temperature should be approximately 70° to 75°F DB, and 61° to 65°F WB. Loop water temperature entering the heat pumps should be between 60°F and 110°F. When the unit is operating in the cooling mode under AHRI conditions, the leaving water temperature is approximately 10°F warmer than the entering water temperature at 3 GPM / ton.
    a. Adjust the unit thermostat to the coolest position. If the unit has a MCO thermostat, set the selector switch to cool. Both the fan and compressor should run. For heat pumps with ACO, adjust the cooling set point to a temperature at least 3°F below room temperature.
    b. Check for cool air delivery at the unit grille within a few minutes after the unit has begun to operate. List the identification number of any machines that do not function.
3. Operate each heat pump in the heating cycle immediately after checking cooling cycle operation. A time delay will prevent the compressor from restarting for approximately 5 minutes.

    NOTE: Rooftop heat pump units are designed to start heating at a minimum return air temperature of 40°F with normal water flow rate and ambient temperature.
    a. If the unit has a MCO thermostat, set the temperature indicator to the highest setting and set the selector switch to HEAT. The fan and the compressor should start. If the unit has an optional ACO thermostat, set the temperature indicator to the highest setting and set the selector switch to AUTO. The fan and the compressor should start.
    b. Once the unit has begun to run, check for warm air delivery at the unit grille. List the serial number of any machines that do not function.
4. Establish a permanent operating record by logging the unit operating conditions at initial start-up for each unit.
5. If a unit fails to operate, conduct the following checks:
    a. Check the voltage and current. They should comply with the electrical specifications described on the unit nameplate.
    b. Look for wiring errors. Check for loose terminal screws where wire connections have been made on both the line and low-voltage terminal boards.
    c. Check for dirty filters. A clogged filter will cause safety cutouts to stop unit operation.
    d. Check the supply and return piping. They must be properly connected to the inlet and outlet connections on the unit.
    e. Check the fan. If the fan fails to operate, verify that the fan wheel turns freely and that it is secured to the shaft. Also verify that the fan operates in both heating and cooling modes.
    f. If the checks described above fail to reveal the problem and the unit still will not operate, contact a trained service technician to ensure proper diagnosis and repair of the equipment.

Operating Temperatures and Pressures

Models:
ST
036-240

Subcooling/Superheating

Entering Water Temp °F	Water Flow GPM/ton	Cooling						Heating					
		Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Rise F	Air Temp Drop F DB	Suction Pressure PSIG	Discharge Pressure PSIG	Super-heat	Sub-cooling	Water Temp Drop F	Air Temp Rise F DB
20	1.5	Opperation not recommended											
	2.25												
	3.0							56-66	280-320	6-16	3-9	3-5	17-21
30	1.5	123-133	176-206	19-29	19-29	21-25	20-22	62-72	291-321	6-16	4-10	7-9	18-22
	2.25	111-131	164-184	25-35	18-28	14-16	18-22	67-77	291-331	6-16	4-10	5-7	20-22
	3.0	107-127	156-176	29-39	17-27	10-12	16-22	69-79	294-334	6-16	4-10	4-6	21-23
50	1.5	129-139	225-255	10-20	13-23	20-24	19-25	93-103	320-360	5-15	6-12	10-12	25-27
	2.25	128-138	213-233	15-25	12-22	12-16	19-23	99-109	325-365	6-16	6-12	7-9	26-28
	3.0	126-136	203-223	18-28	12-22	10-12	19-23	103-113	329-369	6-16	6-12	5-7	27-29
70	1.5	135-145	300-330	5-15	12-22	19-23	19-21	125-135	247-397	6-16	6-12	14-16	31-33
	2.25	135-145	281-301	6-16	10-20	12-16	18-22	135-145	362-402	6-16	5-11	10-12	33-35
	3.0	134-144	269-289	7-17	8-18	8-14	17-23	139-149	361-411	7-17	5-11	7-9	33-35
90	1.5	140-150	386-426	3-13	13-23	17-23	17-21	160-170	382-432	8-18	5-11	17-19	36-40
	2.25	139-149	366-396	4-14	10-20	11-15	17-21	164-184	388-448	11-21	5-11	11-15	39-41
	3.0	138-148	358-378	4-14	8-18	9-11	17-21	170-190	395-455	12-22	5-11	9-11	38-42
100	1.5	138-158	428-478	3-13	13-23	16-22	16-20	Opperation not recommended					
	2.25	137-157	409-449	3-13	10-20	11-15	17-21						
	3.0	141-151	397-737	4-14	8-18	9-11	17-21						
120	1.5	144-164	544-574	2-12	11-21	15-21	11-15						
	2.25	143-163	511-571	3-13	10-20	10-14	15-19						
	3.0	142-162	495-555	3-13	8-18	7-11	14-20						

Models:
ST
036-240

Startup Log Sheet

7300 S.W. 44th Street, Oklahoma City, OK 73179 • Phone: 405.745-6000

Installer: Complete *Unit and System Checkout* and follow *Unit Startup Procedures* in the IOM. Use this form to record unit information, temperatures, and pressures during startup. Keep this form for reference.

Job Name:

Street Address:

Model Number: **Serial Number:**

Unit Location in Building:

Date: **Sales Order Number:**

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

External Static: _____

Temperatures (check one): ☐ °F ☐ °C Antifreeze: _____ %

Pressures (check one): ☐ PSIG ☐ kPa Type: _____

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

NOTES:
1. Allow unit to run 15 minutes in each mode before taking data.
2. Never connect refrigerant gauges during startup procedures.
3. Conduct water-side analysis using P/T ports to determine water flow and temperature difference.
4. If water-side analysis shows poor performance, refrigerant troubleshooting may be required.
5. Connect refrigerant gauges as a last resort.

Preventative Maintenance

Models:
ST
036-240

MAINTENANCE PROCEDURES

Perform the maintenance procedures outlined below periodically as indicated.

⚠ WARNING

To prevent injury or death due to electrical shock or contact with moving parts, open unit disconnect before servicing unit.

FILTERS

Inspect filters. Establish a regular maintenance schedule. Clean filter and maintenance frequently depending upon need. To remove the filter from a Rooftop Unit, slide the filter out of its frame located in the return air opening. When reinstalling the filter, use the slide-in rails of the filter frame to guide the filter into the proper position. Verify that the airflow arrow found on the top of each filter points toward the unit. Always replace filters with the same size and quantity of filters as removed from the unit.

⚠ CAUTION

To avoid fouled machinery and extensive unit cleanup, do not operate units without filters in place. Do not use equipment as a temporary heat source during construction.

CONDENSATE PANS

Check condensate drain pans for algae growth every three months. If algae growth is apparent, consult a water treatment specialist for proper chemical treatment. The application of an algaecide every three months will typically eliminate algae problems in most locations.

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.

FAN MOTORS

Conduct Amperage checks annually. Amp draw should not exceed normal full load or rated load amps by more than 10 percent of the values noted on the unit nameplate. Maintain a log of Amperage values to detect deterioration prior to component failure.

⚠ CAUTION

Fin edges are sharp and may cause injury.

UNIT INSPECTION

Visually inspect the unit annually. Pay special attention to hose assemblies. Repair any leaks and replace deteriorated hoses immediately.

COMPRESSOR

Conduct annual amperage checks to ensure that amp draw is no more than 10% greater than indicated on the serial dataplate.

REPAIRS TO SEALED COMPONENTS

Sealed electrical components shall be replaced.

⚠ WARNING

When replacing the compressor contactor or lockout controls, use only ClimateMaster replacement parts. Substitution of other components may result in an inoperative safety circuit and may cause a hazardous condition.

Models:
ST
036-240

Warranty (U.S. & Canada)

CLIMATEMASTER
A NIBE GROUP MEMBER

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 nintey (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 is or 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 or 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 good(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.

Rev.: 11/09

LC083

A NIBE GROUP MEMBER

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

Disclaimer: It is expressly understood that unless a statement is specifically identified as a warranty, statements made by Climate Master, Inc., a Delaware corporation, U. S. A. ("CM") or its representatives, relating to CM's products, whether oral, written or contained in any sales literature, catalog, this or any other agreement or other materials, 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 AND TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, CM MAKES NO WARRANTY AS TO ANY OF CM'S PRODUCTS, AND CM MAKES NO WARRANTY AGAINST LATENT DEFECTS OR ANY 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 installed outside the United States of America ("U.S.A.") and Canada to be free from material defects in materials and workmanship under normal use and maintenance as follows: (1) All complete air conditioning, heating 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 CM's factory), whichever comes first; and, (2) Repair and replacement parts, which are not supplied under warranty, for ninety (90) days from date of shipment (from factory).

Warranty parts shall be furnished by CM if ordered through an authorized sales representative of CM ("Representative") within sixty (60) days after the failure of the part. If CM determines that a parts order qualifies for replacement under CM's warranty, such parts shall be shipped freight prepaid to the Representative or the ultimate user, as requested by Representative. All duties, taxes and other fees shall be paid by the ultimate user through the Representative.

If requested by CM, all defective parts shall be returned to CM's factory in Oklahoma City, Oklahoma, U.S.A, freight and duty prepaid, not later than sixty (60) days after the date of the request. If the defective part is not timely returned or if CM determines the part to not be defective or otherwise not to qualify under CM's Limited Express Warranty, CM shall invoice Customer the costs for the parts furnished, including freight. The warranty on any part 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 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 damages; (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, allocation, 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:

Climate Master, Inc. • Customer Service • 7300 S.W. 44th Street • Oklahoma City, Oklahoma, U.S.A. 73179 • (405) 745-6000 • FAX (405) 745-6068

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.

LC079

Created: 10/09

Notes

Notes

Models:
ST
036-240

Models:
ST
036-240

Revision History

Date	Section	Description
02/20/25	All	Removed Neutral Connection requirement and related notices and warnings. Updated references to a "diagnostic tool" to the "Wireless Service Tool".
01/16/25	All	Updated naming conventions for AWC Communicating Thermostat, DXM2.5, and CM2 features.
	Electrical: Low Voltage Wiring	RDS Board Updated Added content concerning the End of Line (EoL) termination on the RDS board
08/21/24	Attentions, Cautions, and Warnings;	Added a notice that addresses powering off the unit while the RDS is active
08/01/2024	All	Corrected size offerings
	Refrigerant System Servicing	Added sections on decommissioning and recovery
05/14/2024	All	Created

CLIMATEMASTER®
A NIBE GROUP MEMBER
7300 SW 44th St | Oklahoma City, OK 73179
Phone: 800.299.9747
www.climatemaster.com

97B0162N01