AeroSys
INCORPORATED

THDC - T / S / R / P Series Shown

THDC – Series
Through-The-Wall Condensing Units

Installation and Maintenance Instructions

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Congratulations *on selecting a THDC-XX Unit from AeroSys. With proper installation and maintenance your system will provide you with years of satisfactory operation. This system is compatible with properly sized and laboratory listed Direct Expansion Indoor Air Handler.*

SHIPPING INSPECTION

Upon receiving the product, inspect it; notify the shipper or carrier of damage from shipping. Shipping damage and subsequent investigation is the responsibility of the carrier. Verify the model number, specifications, electrical characteristics and accessories are correct prior to installation. Check the blower housing to impeller alignment to ensure that it did not shift during shipment. The distributor or manufacturer cannot accept claims from dealers for transport damage or installation of incorrectly shipped units.

CODES AND REGULATIONS

This product is designed and manufactured to comply with National Codes. Installation in accordance with such codes and/or prevailing local codes/regulations is the responsibility of the installer. The manufacturer assumes no responsibility for equipment installed in violation of any local codes or regulations.

PRE-INSTALLATION INSTRUCTIONS

Before installing the unit, a duct analysis and heat load calculation must be performed. A heat load calculation begins by measuring all external surfaces and openings that conduct heat from the surrounding air and quantifying the resulting heat load. A heat load calculation also includes extra heat load caused by sunlight and humidity removal.

Carefully read all instructions for the installation prior to installing the product. Make sure each step or procedure is understood and any special considerations are taken into account before starting installation. Assemble all tools, hardware and supplies needed to complete the installation. Make sure everything needed to install the product is on hand before starting.

Before attempting any installation, consider:

- Structural strength of supporting members must be adequate to support the weight of the unit.
- Clearances and provisions for servicing must be sufficient.
- Power supply and wiring must be per NEC and local codes.
- Air duct connections must not exceed 0.3” w.c. and must prohibit recirculation of discharge air.
- Drain facilities and connections must be sufficient and where possible a secondary drain is recommended.

Improper installation or installations not performed in accordance with these instructions can result in unsatisfactory operation and/or dangerous conditions, and can cause the warranty to be revoked.

AeroSys is not responsible for the performance and operation of a mismatched system. Installers are encouraged to match to air handlers that are approved by AeroSys and listed in the AHRI database at www.ahri.org

UNIT INSTALLATION / START-UP CHECK LIST

_____ Install/mount unit, level, plumb and secure
_____ Check for air flow restrictions or blockage (internal & external)
_____ Pipes between units are protected from sharp, abrading edges
_____ Install or route piping to ensure proper suction line trapping
_____ Correct drier/strainer installed (R-410A applicability)
_____ Sight glass installed
_____ Adjust refrigerant charge for correct superheat and sub cooling (Liquid charge ONLY for R-410A units)
_____ Seal all holes/perforations in cabinet
_____ Unit properly wired and grounded
_____ Check for detached or hanging insulation (LX option Units)
_____ Check for correct thermostat wiring
_____ Secure cabinet access panel
_____ Turn power on

REPLACEMENT PARTS

When reporting shortages or damage, or ordering parts, give the complete product model and serial numbers as indicated on the product label. Replacement parts for this product are available through your contractor or local distributor.

IMPORTANT SAFETY INSTRUCTIONS

These instructions are intended as an aid to qualified licensed service technicians for proper installation and operation of this unit. Installers have the obligation to know the product better than the end-user. Pay special attention to all safety warnings. Remember, it is the installer's responsibility to install the product safely and then instruct the end-user in its safe operation.

The precautions listed in this Installation Manual are intended as supplemental to existing practices. However, if there is a direct conflict between existing practices and the content of this manual, the precautions listed here take precedence.

WARNINGS

HIGH VOLTAGE: *To avoid the risk of fire or equipment damage, use only copper conductors. Disconnect ALL power sources. Failure to do so may cause property damage, personal injury or death.*

The unit MUST have an uninterrupted electrical ground to minimize the possibility of personal injury if an electrical fault should occur. The electrical ground circuit may consist of the properly sized electrical wire connecting the ground lug in the unit and control box to the building's electrical service panel. Other methods are permitted if performed in accordance with the National Electric Code (NEC), American National Standards Institute (ANSI), National Fire Protection Association (NFPA) 70, and local/state codes. In Canada, electrical grounding is to be in accordance with the Canadian Electric Code CSA C22.1. Failure to observe this warning can result in electrical shock that can cause personal injury or death.

QUALIFIED TECHNICIAN: Installation and repairs of this unit should be performed ONLY by individuals meeting the requirements of an "Entry Level Technician" as specified by the Air Conditioning and Refrigeration Institute (ARI). Attempting to install or repair this unit without such background may result in product damage, personal injury or death.

APPROVED AIR HANDLERS: This unit should not be connected to, or used in conjunction with, any devices that are not design certified for use with this unit or have not been tested and approved by AeroSys. Reduced unit performance and/or hazardous conditions may result from the use of devices that have not been tested, approved or certified by AeroSys**.**

EMERGENCY CUTOFF: Have your HVAC technician identify the location of any and all cutoff switches that power this unit.

REFRIGERANT RECOVERY: The US Environmental Protection Agency (EPA) has regulations regarding the introduction and disposal of refrigerants. Failure to follow these regulations may harm the environment and can lead to substantial fines. These regulations may vary by jurisdiction. A certified technician must perform the installation and service of this product. Should you have any questions please contact the local EPA office.

SITE PREPARATION AND INSTALLATION: To insure a satisfactory air supply, locate condensing units in a clean area, away from loose dirt and foreign matter that may clog the coil. The condensing unit's coil/blower side must not be located near any exhaust of steam, hot air, grease or corrosive fumes. The coil and discharge of the unit must be free from obstruction.
The condensing unit should be located at least 30 inches from a wall, adjacent unit or other obstruction that may restrict accessibility for maintenance. For multiple unit installations, space the units so that the hot exhaust air is **not** directed toward the air inlet of an adjacent unit. We recommend minimum of 18 to 24 inches vertical spacing between units .

The base of the unit is sloped to drain water away from the maintenance access side (inside face) of the equipment. When installing the unit, ensure that the top of the unit is level in order to maintain the drainage angle toward the coil side of the condensing unit (the outside of the building in an exterior thru-the-wall mount).

The metal components of this unit may oxidize and corrode if exposed to a corrosive environment. This oxidation could shorten the equipment's useful life. Corrosive environments include , but are not limited to, salt spray, fog or mist near the coastal areas, sulphur or chlorine from lawn sprinkler systems and various contaminants from industries such as paper mills and petroleum refineries. If it is necessary to install a unit in a corrosive environment special consideration should be given to equipment exposure.

- Avoid having lawn sprinklers spray directly on the unit.
- In coastal areas locate the unit away from the waterfront.
- Frequent washing of the coil with fresh water will remove most of the salt or other contaminants that build up on the unit.
- Coil cleaner can be used if there is still residue after washing with water.

Outdoor louvers provided by others must be approved by AeroSys to ensure unit performance and guarantee warranty coverage.

The unit must be mounted in an area where there is adequate fresh outside air to ensure that the condenser operates properly.

The unit must never be placed on its side or upside down to ensure proper oil recirculation. The unit must always be handled and installed with the compressor upright.

REFRIGERANT PIPING CONNECTIONS

Refrigeration piping should be installed with high temperature brazed joints. When replacing an R-22 system, new line sets are highly recommended. A thermal expansion valve must be used and the indoor coil must be replaced.

ALWAYS keep the line set sealed until ready to use. See Tables 1 & 2 for correct line size(s) and multipliers used to determine capacity for various line diameters and lengths of run.

ALWAYS use the smallest diameter liquid line permitted to minimize refrigerant charge thereby maximizing compressor reliability. Use clean, dehydrated type "L" refrigerant grade tubing. Blow out the liquid and suction lines with dry nitrogen prior to installation. When cutting tubing, debur the cut area. Do not kink or twist tubing.

ALWAYS use damp rags wrapped around the valve body to protect the valve from heat damage.

Two refrigerant lines, an insulated copper suction line and a copper liquid line, are required between the evaporator and the condenser. **A refrigerant drier must be installed in the liquid line.**

When brazing to the unit's refrigerant service valves:

- Low pressure dry nitrogen should always be supplied inside the heated tubing. Maintain the nitrogen flow until tubes have cooled.
- Prior to brazing at the service valves, remove the schraeder cores and caps, wrap the valves with a wet rag to prevent damage to the cabinet or valve. Suction lines should be insulated with minimum ½" wall insulation from the indoor coil to the compressor suction inlet.
- Piping connections to the unit are mounted on the right side wall of the cabinet. The valve may be temporarily loosened from the wall to facilitate brazing.

Maximum recommended refrigerant line length is 50' Refer to Tables 1 & 2 if longer line-sets are required

Table 1 Suction Line Sizing

Capacity Tons		1.5	2	2.5	3	4	5
25'	Line Size	3/4"	3/4"	3/4"	3/4"	7/8"	7/8"
50'	Line Size	3/4"	7/8"	7/8"	1-1/8"	1-1/8"	1-1/8"
100'	Line Size	7/8"	7/8"	1-1/8"	1-1/8"	1-1/8"	1-1/8"

Using a suction line larger than indicated in Table 1 will result in poor oil return and is strongly discouraged.

Table 2 Liquid Line Sizing to TXV (5 psi Max Press Drop)							
Capacity Tons		**1.5**	**2**	**2.5**	**3**	**4**	**5**
25'	Line Size	3/8"	3/8"	3/8"	3/8"	3/8"	3/8"
50'	Line Size	3/8"	3/8"	3/8"	3/8"	1/2"	1/2"
100'	Line Size	3/8"	1/2"	1/2"	1/2"	1/2"	1/2"

Note on refrigerant Traps: *When installing remote condensing units above the indoor air handler, the suction gas line should be trapped at the indoor unit. This trap will retain refrigerant oil in the off cycle. When the unit starts, oil in the trap is carried UP the vertical riser and returns to the compressor.*
When installing remote condensing units below the indoor air handler, the suction gas line should be trapped with an inverted trap the height of the indoor air handler. This prevents refrigerant migration to the compressor during off cycles.

Leak Check and Evacuation: Field pressure testing, evacuation, and refrigerant charging may be done through the side ports on the suction and liquid line service valves. These ports are open to the field side of the piping. Replace the schraeder inserts that were removed for brazing.

Connect a dry nitrogen tank to the service port on the liquid line. Pressurize the line set and indoor section to 100 PSIG. Check for leaks using a liquid soap solution. If leaks are detected, release the nitrogen, repair the leak and repeat this operation.

Connect a vacuum pump to the gauge set with both the liquid and suction valves on the gauge set open and connected to the unit. On a new install, the service valves should remain closed until after evacuation and leak back tests. On a system where charge has been lost, the service valves should be open until after evacuation and leak back tests. A vacuum of at least 250 microns should be pulled on the system. Allow the vacuum pump to run an additional 15 minutes after achieving 250 microns. Isolate the vacuum pump from the system and micron gauge and verify that the pressure does not rise above 500 microns within 10 minutes. If the pressure rises above the 500 microns it is indicating a leak or moisture in the compressor oil due to the system piping being left open during installation. Identify the leak and repair it. Repeat the process.

On a new installation, open both service valves (back valve stem out) all the way for proper system operation.

On a system where charge has been lost break the vacuum with refrigerant by opening suction line gauge set valve.

Vibration isolating supports should be used to isolate the refrigeration piping from the building. Pack a soft flexible material around tubing to prevent damage when sealing openings in walls and to reduce vibration transmission.

Charging the System

THDC systems are factory shipped charged with refrigerant R-410A suitable for a 15 foot line set. For different line set lengths use the following guideline: $^{3}/_{8}$" ± 0.6 oz. per foot; ½" ± 1.2 oz. per foot, $^{5}/_{8}$"+- 1.7 oz. To add charge to the system, attach the gauge set to the discharge and suction access ports making sure there is no air in the refrigerant hoses. After the pressure is sufficient to activate the low pressure switch,(On LX Units Only) the compressor will turn on. Continue to charge the system, observing the refrigerant in sight glass (if applicable), for system pressures, and super heat and subcooling. Compare to the ranges in Table 4.

Condenser Air Ducting (if used)

The total external static pressure for any inlet and outlet ducting, including louvers, must not exceed 0.3 inches of water.

If the condensing unit draws ducted air from the outside of the building, rain hoods must be installed. In addition, install screens over the rain hood openings to eliminate the possibility of birds, insects, water or debris entering the unit.

Normal operating sound may be objectionable if the condensing unit is placed directly over quiet work areas. Use flexible ductwork or nonflammable cloth collars to attach ductwork to the unit to control vibration transmission to the building.

Locate the unit and ductwork so that the discharge air does not short circuit to the condenser air inlet. Avoid directing the hot exhaust air toward adjacent doors or windows.

Refrigerant Pressures

Suction and discharge pressures will vary with load and ambient conditions. Normal pressures in the COOLING start-up mode are displayed in Table 3.

Thermocouple should be placed within 6 inches of compressor suction inlet in order to get a proper measurement and optimal for performance.

Long Line Sets

On installations with line sets longer than 50 feet, it may be necessary to add a crankcase heater and a suction line accumulator. While scroll compressors do not usually require crankcase heaters, there are instances when a heater is needed. Refrigerant migration in the off cycle can cause a noisy startup and bearing “wash out” on systems with long line sets. Employ a crankcase heater and suction line accumulator to avoid these problems.

TABLE 3 THDC Liquid / Suction Pressures

	18PGA		18RGA		18SGA		18TGA		24PGA		24RGA		24SGA		24TGA		30PGA		30RGA		30SGA		30TGA	
OEDB	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**	**L**	**S**
115	546	149	550	147	540	145	532	147	590	144	561	153	550	149	554	149	609	150	590	149	573	150	556	147
105	473	146	477	144	468	142	461	144	511	141	486	150	477	146	580	146	528	147	511	146	496	147	481	144
95	410	145	413	143	405	141	399	143	443	140	421	147	413	145	416	145	457	146	443	145	430	146	417	143
82	347	143	345	140	340	139	335	140	374	137	353	146	346	143	350	143	390	143	366	133	363	143	353	141
75	319	139	317	136	312	135	308	136	344	133	324	142	318	139	322	139	358	139	336	129	334	139	324	134
55	245	133	244	130	241	129	237	130	265	127	250	136	245	133	248	133	276	133	259	124	257	133	250	131

THDC Liquid / Suction Pressures

OEDB	18PGA	18RGA	18SGA	18TGA	24PGA	24RGA	24SGA	24TGA	30PGA	30RGA	30SGA	30TGA
115	14	18	18	18	18	17	16	18	15	8	18	14
105	14	18	18	18	18	17	16	18	15	8	18	14
95	15	20	20	20	20	19	18	20	17	10	20	16
82	15	20	20	20	20	19	18	20	17	10	20	16
75	15	20	20	20	20	19	18	20	17	10	20	16
55	17	22	22	22	22	21	20	22	19	12	22	18

ELECTRICAL SUPPLY AND CONNECTIONS

Power Supply Connections

Each unit ships from the factory with all internal wiring completed. Refer to the electrical schematic when making connections.

This unit is designed for a specific electrical supply. Measure the power supply to the unit. The supply voltage must be in agreement with the unit nameplate power requirement and within the range shown in Table 6. Every installation must include an NEC (USA) or CEC (Canada) approved over current protection device. Also check with local or state codes for any special regional requirements.

Protection can be in the form of using fusing or HACR style circuit breakers. The unit nameplate can be used as a guide for selecting the Maximum Overcurrent Protection (MOP) device.

NOTE: Fuses or circuit breakers are to be sized larger than the equipment MCA but not to exceed the MOP.

A knockout is provided on the back of the unit to allow for the entry of the supply voltage conductors. If the knockout is used for electrical conduit, an adapter ring must be used in order to meet UL1995 safety requirements. An NEC or CEC approved strain relief is to be used at this entry point. The wire is to be sized in accordance with the Wire Sizing section of this manual. Some areas require the supply wire to be enclosed in conduit. Consult your local codes for applicability. Attach supply wire to unit's power distribution block or available power leads (depending on option). Route the supply power to a field supplied disconnect switch so the unit can be isolated from supply power maintenance activities.

Connect an earth ground to the lug provided in electric junction box.

Table 6

Nominal Input	Minimum Voltage	Maximum Voltage
208/230	187	253
460	414	506

REMEMBER: THE LINE SIDE OF DISCONNECT REMAINS ENERGIZED WHEN DISCONNECT IS "OFF"

Wire Sizing

Wire sizing is important to the operation of the unit. Use the following check list when selecting the appropriate wire size for your unit.

- Wire size must carry Minimum Circuit Ampacity (MCA)
- Wire sized for no more than 2% voltage drop from the building breaker/fuse panel to the unit.

Refer to the latest edition of the National Electric Code or in Canada, the Canadian Electric Code when determining the correct wire size. The following table shows the current carrying capabilities of copper conductors rated at 75°C with a 2% voltage drop. Use Table 7 to determine the voltage drop per foot of various conductors.

Table 7

Maximum allowable length in feet to Limit Voltage Drop to 2%								
Wire Size (AWG)	Minimum Circuit Ampacity (MCA)							
	10	15	20	25	30	35	40	45
14	75	50	37	NR	NR	NR	NR	NR
12	118	79	59	47	NR	NR	NR	NR
10	188	125	95	75	63	54	NR	NR
8	301	201	150	120	100	86	75	68
6	471	314	235	188	157	134	118	110

* Reference NEC 1996

Control Connections

A field-installed, 2-wire control connection (24VAC) is required between the thermostat and the unit. Control wiring must be installed in accordance with the National Electrical Code (NEC), Class II circuit.

Control wiring between the thermostat and the unit must not allow a voltage drop in the line of more than 1 volt (16 gauge minimum for 75 feet). The thermostat should be located in the airflow path of the room.

Air Distribution

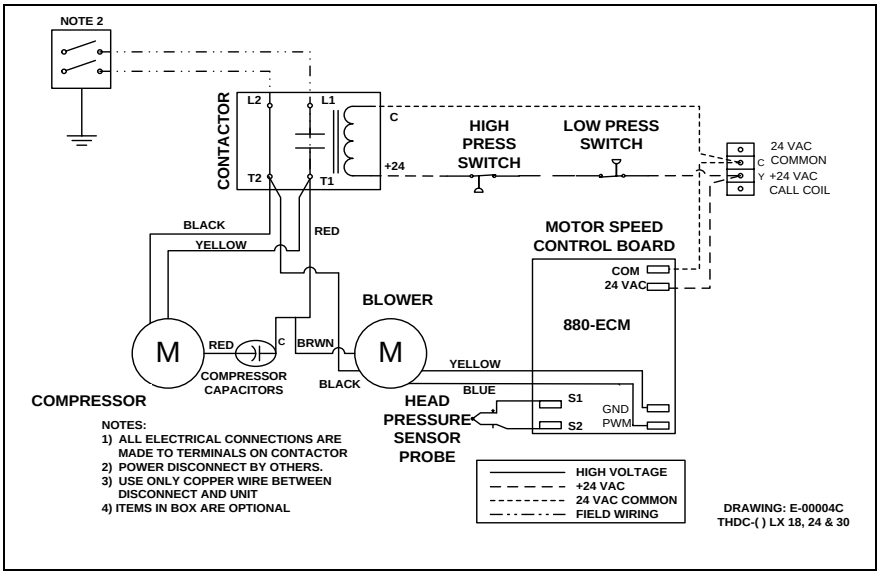
Since all unit models are designed for constant volume air delivery, any unusual air flow restrictions must be avoided. Restricted airflow through the indoor coil will reduce the operating efficiency of the unit. Additionally, it can result in high compressor head pressure and loss of cooling. Using compressed air or a commercial coil cleaner; clean the condenser coil of all debris that will inhibit airflow. Check for bent or damaged coil fins and repair as necessary.

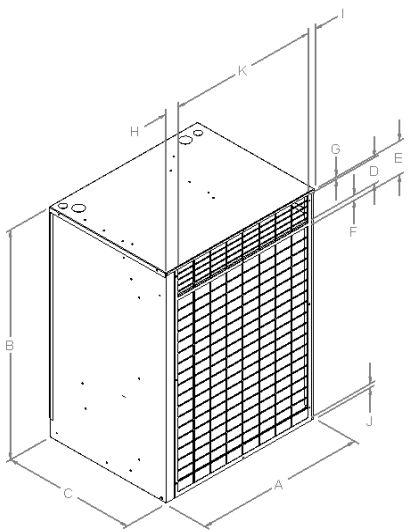
Refrigerant System

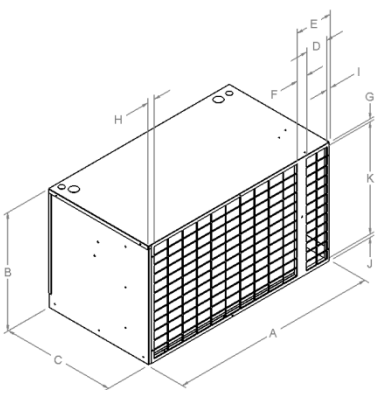
Inspect all refrigerant lines and capillaries for vibration and support as necessary. Carefully inspect all refrigerant lines for signs of oil leaks.

The table below provides suggested service intervals of major product components for equipment in normal use. Depending on severity of the environment, you equipment may require more frequent service.

THDC Standard / LX - SCHEMATIC







Dimensional Data (in.)											
MODEL	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
THDC-P	33 ¾	19	18 ½	3 ⅝	6 ⅛	1 ¾	½	1	⅝	½	18
THDC-R	29 ½	23	18 ½	3 ⅝	4 ⅝	⅝	⅜	1	1 ⅞	½	26 ⅝
THDC/THHP-S	26	28 ⅝	18 ½	3 ⅝	4 ⅝	⅝	⅜	1 ⅞	1	½	23 ⅛
THDC/THHP-T	23 ¾	32	18 ½	3 ⅝	4 ⅝	⅝	⅜	1 ⅞	1	½	20 ⅞

RECOMMENDED MAINTENANCE SCHEDULE

This unit is designed to provide many years of dependable, trouble free comfort when properly maintained. Proper maintenance will consist of annual checkups and cleaning of the internal electrical and heat transfer components by a qualified service technician. Failure to provide periodic checkup and cleaning can result in excessive operating cost and/or equipment malfunction.

- The electric panel should be cleaned and inspected annually for loose electrical connections
- Blower impellers should be thoroughly inspected and any debris removed.
- Check to see if they are tightly mounted on the fan shaft and do not rub against the fan housing during rotation.
- Where applicable, once every year add 3 drops of SAE 20 weight non-detergent oil to each of the two oil ports on the blower motor if your system is supplied with oil ports.

Maintenance Item	Monthly	Quarterly Seasonally	Semi Annually	Annually
Check filter	X			
Inspect unit mounting & line connections			X	
Tighten wire connections				X
Inspect wires for wear				X
Check refrigerant charge			X	
Inspect & Clean:				
COILS			X	
CONDENSING UNIT		X		
MOTOR			X	
CONDENSATE PUMP			X	
BLOWERS			X	
CONDENSATE PAN/DRAIN		X		

X = Heating Cycle Only (Heat Pump)

ORIGIN or BASIS of FAILURE		TEST and REPAIR or REPLACE	Test Voltage	Inspect Fuse Size & Type	Test Voltage	Inspect Connection - Tighten	Test Circuits With OhmMeter	Test Continuity of Overload	Test Continuity of Thermostat & Wiring	Check Control Circuit with Voltmeter
Power Failure	Pressure	Low suction pressure								
		Low head pressure								
		High suction pressure								
		High head pressure								
Blown Fuse	No Cooling	System will not start	•	•		•	•		•	•
		Compressor will not start - fan runs			•		•			
		Comp. and Cond. Fan will not start		•			•		•	•
		Evaporator fan will not start		•		•	•	•	•	
		Condenser fan will not start					•	•		
		Compressor runs - goes off on overload			•	•	•			
		Compressor cycles on overload			•					
Unbalanced Power, 3phase	Cooling/Heating Issue(s)	System runs continuously - little cooling/htg								
		Too cool and then too warm							•	
		Not cool enough on warm days								
		Certain areas too cool, others too warm								
		Compressor is noisy								
		System runs - blows cold air in heating								
		Unit will not terminate defrost								
		Unit will not defrost								
Loose Connection										
Shorted or Broken Wires										
Open Fan Overload										
Faulty Thermostat										
Faulty Transformer										

● = Cooling Or Heating Cycle (Heat Pump)

Shorted or Open Capacitor				•		•		•	•	•	•								Test Capacitor
Capacitor Wired Wrong (Dual Caps)				•															Verify Ground/Power Connections
Internal Compressor Overload Open					•												X		Test Continuity of Overload
Shorted or Grounded Compressor						•				•									Test Motor Windings
Compressor Stuck						•				•	•						X		Use Test Cord
Faulty Compressor Contactor							•		•	•									Test Continuity of Coil & Contacts
Faulty Fan Relay								•											Test Continuity of Coil And Contacts
Open Control Circuit								•											Test Control Circuit with Voltmeter
Low Voltage						•				•	•								Test Voltage
Faulty Evap. Fan Motor	•			X				•											Repair or Replace
Shorted or Grounded Fan Motor				•					•										Test Motor Windings
Improper Cooling Anticipator											•		•						Check Resistance of Anticipator
Shortage of Refrigerant	•	•									•	•				X			Test For Leaks, Add Refrigerant
Restricted Liquid Line	•	•		•							•	•							Remove Restriction, Replace Restricted Part
Open Element or Limit on Elec. Heater	•											X				X			Test Heater Element and Controls
Dirty Air Filter	•			X								•		•	•				Inspect Filter-Clean or Replace

X = Heating Cycle Only (Heat Pump)

	Inspect Coil - Clean	Check Blower Speed, Duct Static Press, Filter	Reduce Blower Speed	Recover Part of Charge	Inspect Coil - Clean	Recover Charge, Evacuate, Recharge	Remove Obstruction to Air Flow	Check Windows, Doors, Vent Fans Etc.
Unit will not defrost								
Unit will not terminate defrost								
System runs - blows cold air in heating				X		X		
Compressor is noisy				•				
Certain areas too cool, others too warm	•	•						•
Not cool enough on warm days	•	•			•	•	•	•
Too cool and then too warm								
System runs continuously - little cooling/htg	•	•						•
Compressor cycles on overload				•	•	•	•	
Compressor runs - goes off on overload				•	•			
Condenser fan will not start								
Evaporator fan will not start								
Comp. and Cond. Fan will not start								
Compressor will not start - fan runs								
System will not start								
High head pressure	X	X		•	•	•	•	
High suction pressure			•	•				
Low head pressure			X					
Low suction pressure	•	•			X			
	Dirty Indoor Coil	Not enough air across Indoor Coil	Too much air across Indoor Coil	Overcharge of Refrigerant	Dirty Outdoor Coil	Noncondensibles	Recirculation of Condensing Air	Infiltration of Outdoor Air

• = Cooling Or Heating Cycle (Heat Pump)

Improperly Located Thermostat										•			•						Relocate Thermostat
Air Flow Unbalanced													•		•				Readjust Air Volume Dampers
System Undersized												•		•					Refigure Cooling Load
Broken Internal Parts																•	X		Replace Compressor
Broken Valves		•	•									•				•			Test Compressor Efficiency
Inefficient Compressor		•	•									•					X		Test Compressor Efficiency
Wrong Type Expansion Valve	•	•		X						•	•	•		•					Replace Valve
Expansion Device Restricted	•	•		•						•	•	•		•					Clear Blockage or Replace Expansion Device
Oversized Expansion Valve				•								•							Replace Valve
Undersized Expansion Valve	•									•	•	•		•					Replace Valve
Expansion Valve Bulb Loose			•													•			Tighten Bulb Bracket
Inoperative Expansion Valve	•									•		•							Check Valve Operation
Loose Hold-down Bolts																•			Tighten Bolts/Nuts
Faulty Reversing Valve		X	X	X						•							X	X	X Replace Valve or Solenoid
Faulty Defrost Control	X	X		X					•								X	X	X Test Control
Faulty Defrost Thermostat	X	X	X	X													X	X	X Test Defrost Thermostat
Flowrator Not Seating Properly		•	•									•							Check Flowrator & Seat/Replace Flowrator

ECM Motor

The THDC and THHP model units employ an ECM motor on all models. On all standard models series the motor is programmed to energize with the call for cooling. On the LX models the motor is controlled by a head pressure controller which outputs a pulse width modulated signal. If the motor is not operating correctly the following checks can be performed:

ECM Motor Trouble Shooting Guide	
Motor will not run	**Solution**
1. Improper installation, motor not wired correctly.	1. Check wiring, review instructions.
2. 24 VAC not present.	2. Verify 24 VAC supply.
3. Sensor below 50°F up to 70°F as set by "Range Adjust" pot.	3. Normal operation.
4. Motor "OFF" on internal overload.	4. Determine cause of overheated motor and correct it.
5. Sensor opened, verify ohms vs. temp per Table 6.	5. Replace sensor.
Motor runs at full speed only	**Solution**
1. Sensor shorted verify ohms vs. temp per Table 6.	1. Replace sensor.
2. Control damaged.	2. Replace control.
3. Low refrigerant. (Hot gas in the liquid line)	3. Add charge
4. Sensor above 80°F up to 100°F, as set by the "Range Adjustment" pot.	4. Normal operation.
Motor will not modulate properly	**Solution**
1. Sensor not properly located or attached to liquid line.	1. Relocate per instructions.
2. Sensor ohms vs. temperature measured not in accordance with Table 6.	2. Replace sensor.
3. System not charged properly.	3. Correct the charge.
4. Expansion valve not metering properly, cap tube or orifice sized improperly for low ambient operation.	4. Adjust or replace expansion valve, cap tube or orifice to provide proper control of the low side.
5. Low evaporator temperature and/or head pressure.	5. Adjust "Range Adjustment" pot to assure that the evaporator is above 32°F.

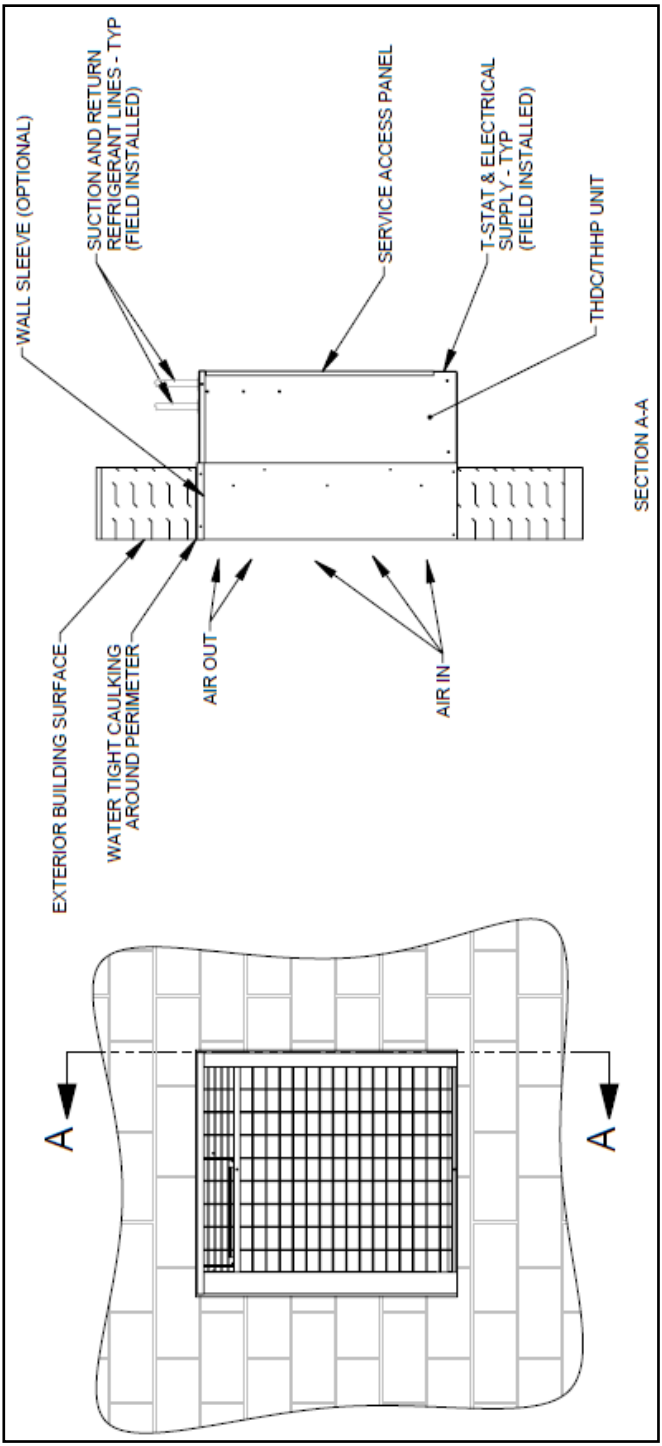
If the steps above do not solve the problem, disconnect the head pressure control board and place an RMS multimeter in DCV mode across the PWM terminals. You should see a DC voltage varying from about 2 VDC @ 53^{o}F to about 13.5 VDC @ 80^{o}F. Measure the input resistance of the motor by placing a multimeter in resistance mode across the blue and yellow wire to ensure that it is not shorted.

Table 8

Sensor Temperature vs. Resistance Chart					
Temp °F	Sensor (ohms)	Temp °F	Sensor (ohms)	Temp °F	Sensor (ohms)
28	36,627	56	16,990	84	8,433
30	34,582	58	16,128	86	8,056
32	32,660	60	15,315	88	7,685
34	30,869	62	14,547	90	7,332
36	29,180	64	13,823	92	6,997
38	27,600	66	13,139	94	6,679
40	26,109	68	12,492	96	6,378
42	24,712	70	11,881	98	6,092
44	23,398	72	11,303	100	5,820
46	22,160	74	10,851	102	5,561
48	20,996	76	10,210	104	5,316
50	19,899	78	9,750	106	5,094
52	18,872	80	9,287	108	4,873
54	17,903	82	8,848	110	4,662

NOTE: SPECIFICATIONS AND PERFORMANCE DATA LISTED HEREIN ARE SUBJECT TO CHANGE WITHOUT NOTICE

INSTALLATION DATA



NOTES

THXX Series

LIMITED WARRANTY

To Our Valued Customer

Please remember that all units must be registered to qualify for the full AeroSys warranty coverage. If a unit is not registered within 30 days of installation, warranty coverage begins based on the unit's Serial Number (manufacture date) instead of the installation date.

AeroSys split system unit is a component part of a cooling and heating application. When two products are installed together, it may become confusing when trying to diagnose an operational problem. Our goal is that you experience the highest level of performance, with minimal amount of service and attention. In order to do this, our technicians will require on-site performance data, the indoor AHU model in the system and specific installation information. The lack of this data, may limit our ability to properly solve the problem and affect your warranty coverage.

Service technicians may contact the factory Tel: 301.620.0002 for technical assistance; view our trouble shooting guide or report a failure to the factory via the links below and then contact your local AeroSys wholesaler for the replacement part.

TWO YEAR WARRANTY:
AeroSys Inc. products are warranted to be free from all manufacturing defects, material or workmanship, for a period of two years from installation (registration required), whether or not actual use begins on this date; **or** two years from the date of manufacture if product has not been registered.

A new or remanufactured part for any defective component will be supplied, providing the defective part is processed through our distributor or service department following the return instructions below. The replacement part assumes the unused portion of the warranty.

EXTENDED COMPRESSOR WARRANTY FOR YEARS 3 THROUGH 5:
For a registered product, if, under normal operation, proper installation, maintenance/service as specified in the Installation, Operation and Maintenance manual a compressor fails due to a manufacturing defect, AeroSys, Inc. will provide a replacement new or remanufactured compressor.

A RETURN MATERIAL AUTHORIZATION (RMA) will be issued only if a replacement part needs to be installed. All defective parts covered under warranty must be returned to the wholesaler for shipment back to AeroSys for inspection and credit. Note: All warranty parts, returns and paperwork must be submitted no later than 60 days after the failure. All RMA's are closed at 61 days.

Troubleshooting Guide
Report A Failure

www.aerosysinc.com/warranty

Locate A Local
Copeland Distributor

www.emersonclimatecustomer.com/webapp/wcs/stores/servlet/ctp/MapQuest/MapQuestNewSearch.jsp

AEROSYS WILL NOT BE RESPONSIBLE FOR:

- Cost incurred for replacing, removing, ship-back to factory, servicing, installing, or handling of either defective parts or replacement parts.
- Damage or repairs required due to installations that do not adhere to approved application spec's as listed in the unit's Installation, Operations and Maintenance manual or found on our website.
- Start failures due to voltage conditions, blown fuses, open circuit breakers, or other damage due to the inadequacy; surge or interruption of electrical service.
- Damage as a result of floods, winds, fires, lightning, accidents, corrosive atmosphere, or other conditions beyond the control of AeroSys Inc.
- Parts not supplied or designated by AeroSys Inc.
- AeroSys Inc. products installed outside the United States and Canada.
- Damage or repairs needed as a consequence of any misapplication, abuse, improper servicing, unauthorized alteration, or improper operation.
- Any special, indirect, consequential, property, or commercial damage of any nature whatsoever.
- All material is inspected at the factory and is only released for transport in perfect condition unless otherwise noted. When received, visual inspection must be made immediately. All deliveries must be inspected in the presence of the carrier's representative and any shipping damage (even "potential" issue) noted on the delivery receipt before the driver leaves. If damage is found, a freight claim must be filed with the carrier immediately. Original packaging should remain intact for Carrier Inspection. Shipping/Freight damage is not covered under this warranty policy, but AeroSys will assist with damage assessment and any rework required and approved by the freight company.

LIMITATION OF WARRANTIES

THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. THE REMEDIES PROVIDED FOR THIS WARRANTY ARE EXCLUSIVE AND SHALL CONSTITUTE THE ONLY LIABILITIES ON THE PART OF AEROSYS INC.

AeroSys INCORPORATED

929 Eldridge Drive, Hagerstown, Maryland 21740
P: 301-620-0002 / F: 301-620-0685
W: www.aerosysinc.com / E: asinfo@aerosysinc.com

Maintenance Dates

		Check filter	Inspect unit mounting & line connections	Tighten wire connections	Inspect wires for wear	Check refrigerant charge	Coils	Condensing Unit	Motor	Condensate Pumps	Blower	Condensate Pan
(Example) Date	**XX / XX / XX**	**X**										**X**

Maintenance Dates

		Check filter	Inspect unit mounting & line connections	Tighten wire connections	Inspect wires for wear	Check refrigerant charge	Coils	Condensing Unit	Motor	Condensate Pumps	Blower	Condensate Pan
(Example) Date	**XX / XX / XX**	**X**										**X**

Maintenance Dates

		Check filter	Inspect unit mounting & line connections	Tighten wire connections	Inspect wires for wear	Check refrigerant charge	Coils	Condensing Unit	Motor	Condensate Pumps	Blower	Condensate Pan
(Example) Date	**XX / XX / XX**	**X**										**X**

Steps to Register Your AeroSys Product
AeroSys Warranty Coverage

2 year Parts:

- AeroSys Inc. products are warranted to be free from all manufacturing defects for a period of two years from installation registration; whether or not actual use begins on this date; or if product was never registered, two years from date of manufacture.

5 year Compressor:

- Compressors in all AeroSys THDC and THHP Series units come with a 5 year warranty.

To Our Valued Customers

Please remember that all units must be registered to qualify for the maximum warranty coverage. If a unit is not registered within 30 days of installation, warranty coverage begins based on the unit's Serial Number (manufacturer date) instead of install date.

Units can be registered by mailing/faxing this form or entering the data on-line at the link(s) listed herein

1. Model Number _____
2. Serial Number _____
3. Install Date _____
4. Installer / Service Technician Information
    - Installer / Company _____
    - Preferred Contact:
    - E-Mail _____
    - Phone _____
    - Mail _____
    - Street _____
    - City _____
    - State / Zip _____

Online Registration

www.aerosysinc.com/warranty

Line Set Length:

V ____ (ft) Liquid ___ 1/4" ___ 3/8" ___ 1/2" ___ 5/8" ___ 3/4" ___

H ____ (ft) Suction ___ 5/8" ___ 3/4" ___ 7/8" ___ 1-1/8" ___ 1-3/8" ___

- Air Handler Manufacturer: _____

5. Owner Contact Information: _____
    - Name: _____
    - Contact:_____

AeroSys Warranty Registration Confirmation#:_____ (Issued At Registration)

If you cannot access the internet please mail your registration to:

Registration Department

AeroSys Inc.

929 Eldridge Drive

Hagerstown, MD 21740

(Cut Here To Mail In Registration)