

DEMAND DEFROST CONTROL CHECKOUT

IMPORTANT --- This document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

SYMPTOMS	CHECKS (see Check List)
1. LED off.	C1, C2
2. LED flashing greater than 4 times/sec or on continuously.	C3
3. Control does not initiate a defrost on its own.	C4, C5, C1, C6, C7, C8, C9
4. Control does not initiate a forced defrost.	C1, C9
5. Defrost initiates manually but terminates in less than 10 sec.	Replace defrost control: A18
6. Defrost initiates manually but terminates on time.	C6, C7, C11, C10, C12
7. Defrost initiates on 15 minute intervals.	C13, C11, C14, C10
8. Defrost initiates on 30 minute intervals.	C15, C5, C6, C7, C8, C16, C18, C10, C19
9. OD fan runs during defrost.	Replace defrost control: A18
10. No SOV delay on defrost termination.	C17
11. OD fan runs but does not change speed in clg mode (21C151619 controls ONLY)	C1, C21, C22, C23, C6, C7, C8
12. SCROLL compressor does not operate.	C1, C24
13. No 30 second off delay at defrost initiation on SCROLL bearing unit.	C25
14. No 30 second off delay at defrost termination with SCROLL bearing unit.	C25
15. Outdoor unit does not run with thermostat signal on "Y"	C26
CHECK LIST	ACTIONS (see Action List)
C1: 24V R-B AT BOARD and 24V Y-B AT BOARD?	NO: A1
C2: Short FRC_DFT pin to TEST_COMMON pin. Defrost cycle initiated?	NO: A18 YES: A2
C3: TEST_COMMON pin shorted to TST pin?	NO: A18 YES: A3
C4: Are the required conditions for defrost met? (OD Temp. below 49F, OD Coil Temp. below 35F, delta T increasing)	NO: A10
C5: Visually check sensor locations; ambient sensor in air stream, coil sensor inside sensor well mounted on OD coil circuit. Sensor(s) out of place?	YES: A4
C6: De-energize 24V Y-B and R-B signals. Place a DC multimeter between TEST_COMMON and TST. Energize 24V R-B ONLY. Does the voltage remain below 3.5VDC for a few seconds and then jump up to over 4.5VDC?	NO: A6 YES: A5
C7: Do the sensors make a loose connection with the pins on the board?	YES: A7
C8: Check sensors for correct resistance according to attached chart. Resistance in range?	NO: A9
C9: Short FRC_DFT pin to TEST_COMMON pin. Does a defrost cycle commence?	NO: A18 YES: A8
C10: Does OD fan cycle off in defrost?	NO: A18
C11: Coil sensor reading open circuit or very high resistance?	YES: A9
C12: Windy weather preventing normal termination on temperature?	YES: A12
C13: Verify that OD coil is clear of ice.	
C14: Ambient sensor reading shorted or less than normal?	YES: A9
C15: TEST_COMMON pin shorted to TST pin?	YES: A3
C16: Verify correct system charge.	A11
C17: Has J1 been cut or removed?	NO: A18 YES: A13
C18: Does a forced defrost terminate in less than 15 minutes?	NO: A18
C19: Does SOV operate properly?	NO: A1 or A14 as appropriate
C20: Check OD fan wiring from defrost control to fan motor. Miswired?	YES: A17
C21: Short LOW_FAN pin to TEST_COMMON pin. Does fan go to or stay on low rpm?	NO: A18
C22: Remove short from LOW_FAN pin to TEST_COMMON pin. Does fan go to high speed for at least 4 seconds?	NO: A18
C23: Check protection devices in YO circuit. 24V YO-B present after 30 seconds?	NO: A8 or A18 as appropriate
C24: Place an AC voltmeter between terminals 2 and 7 of the control and force a defrost cycle. Is 24V present for 30 seconds and then 0V thereafter?	NO: A18
C25: At defrost termination is there 24VAC for 30 seconds between terminals 2 and 7 and then 0 VAC thereafter?	NO: A16
C26: Verify that the Ambient Sensor is connected and within range using the Temperature/Resistance chart. Is the resistance of the Ambient Sensor within range?	NO: A17
Note: 14/15"e" defrost controls have a selectable defrost termination temperature. As shipped, defrost will terminate at 47°F and follow Demand Defrost logic. For a higher termination temperature, cut Jumper 2 to achieve 70°F when at or below 30°F ambient. At temperatures below 6°F the control forces defrost every 3 hours for 12 minutes.	

(INFORMATION CONTINUED ON BACK OF PAGE)



WARNING

THIS INFORMATION IS INTENDED FOR USE BY INDIVIDUALS POSSESSING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

ACTION LIST

A1: Repair low voltage wiring
A2: LED is bad but control will still function.
A3: Remove short.
A4: Correct the positioning of the sensors.
A5: Both sensors are reading in-range by the control.
A6: One of the sensors is reading either open or shorted. Clean sensor pins on board if necessary.
A7: Repair bent contacts inside sensor connectors or replace sensors if unrepairable.
A8: Y-B signal or control may be intermittent.
A9: Replace defective sensor.
A10: Check refrigerant circuits for balanced distribution of refrigerant if OD coil is frosting and deltaT is not increasing.
A11: Adjust as needed.
A12: Block unit from wind without obstructing airflow to the coil.
A13: The soft-switch time is defeated when J1 is cut.
A14: Replace SOV if necessary.
A15: Repair OD fan motor circuit wiring.
A16: Replace defrost control.
A17: Replace the Ambient Sensor. Note: 14/15 SEER R410A scroll (3.5-5 ton) defrost controls turn OFF the compressor at 0°F and resume compressor heat above 5°F.

If none of these "ACTIONS" restore proper operation, contact your local Field Service Representative or Dealer Support Specialist.

Procedure:

Measure the temperature the subject sensor is exposed to. If the sensor is mounted on a tube, place the lead on an Annie A-8 (or equiv.) temp. tester on the same tube near the sensor and insulate the bulb.

Unplug the sensor and measure the resistance with a good quality ohm meter (Simpson 260 or equiv.). Read the value as quickly as possible to prevent the meter current from changing the resistance reading.

Using the chart on the right, locate (as close as possible) the actual sensor temperature. The measured resistance should be relatively close to the resistance value shown in the chart.

Example:

Sensor temp = 19°F

Measured Resistance = 46.5K ohms

This sensor is good since the measured value is relatively close to the chart value.

TEMP °F	RESISTANCE
86	7.9K
81	8.9K
75	10.3K
70	11.6K
65	13.2K
59	15.3K
55	17.0K
50	19.4K
45	22.2K
41	24.8K
36	28.5K
32	31.9K
25	39.0K
19	46.5K
14	54.0K
10	60.9K
5	71.1K
0	83.2K

FLASH RATE INDICATIONS:

1 — Flash/Second = Normal operation

2 — Flashes/Second = Fault A (low delta T) i.e.: Inoperative Compressor, loss of charge, open amb. sensor, shorted coil sensor.

3 — Flashes/Second = Fault B (10 defrosts terminated on time)

Fault C (High—delta T) i.e.: SOV stuck in heating, shorted amb. sensor, open coil sensor, closed TXV, OD fan motor failure, OD fan on in defrost, undercharged unit.

4 — Flashes/Second = Fault A & C or A & B

For additional information consult Pub. No. 34-1001 Heat Pump Defrost Controls.

The Trane Company

Unitary Products Group - Troup Highway - Tyler, TX 75711

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Air Handlers, Heat Pumps and Air Conditioners – Owner's Guide

Congratulations on the purchase of your new outdoor unit. Your outdoor unit is designed to work with a matched indoor unit creating a system that delivers years of dependable service and performance.

Proper Maintenance*

Your system requires maintenance and repair by a properly trained service technician. "Do-it-yourself" repairs on an in-warranty unit may void your warranty.

Other than performing the simple maintenance recommended below, you should not attempt to make any adjustments or repairs to your system. Your dealer can assist you with questions or problems.

1) Replace the air filter(s)

A clean filter saves you money by helping ensure top system efficiency.

When replacing your filter(s), always use the same size and type that was originally supplied or consult with your dealer for recommendations. Be sure to replace it with the arrows pointing in the direction of the airflow.

Where disposable filters are used, they must be replaced every month with the same size as originally supplied. Clean or replace your filter twice a month during seasons when the unit runs more often.

Ask your dealer where the filter is located in your system and how to service it.

2) Maintain free outdoor coil airflow

Efficient operation of your system depends on the free flow of air over outdoor unit's coil.

Do not plant flowers or shrubbery right next to the unit. Also, make sure that nothing is stacked against the sides of the unit or draped over it.

Buildup of snow and ice can restrict airflow. As soon as possible after accumulation, clean snow from the area around the outdoor unit.

3) Clean the finish

To ensure the longevity of the outdoor unit appearance, clean the exterior finish with soap and fresh water. For stubborn grease spots, use a household detergent. Do not use lacquer thinner or other synthetic solvents as they may damage the finish. *Note: For coastal region locations, a monthly fresh water rinse is recommended.*

4) Call your dealer for additional routine maintenance

Your system should be inspected at least once per year by a properly trained service technician.

Ask your dealer about economical service or preventative maintenance agreements that cover seasonal

⚠ WARNINGS

1. Disconnect all electrical power to the indoor air handler or furnace before removing access panels to perform indoor and outdoor maintenance. Disconnect power to both the indoor and outdoor units. **NOTE:** There may be more than one electrical disconnect switch. Electric shock can cause personal injury or death.
2. Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury or property damage. Consult a qualified installer or service agency for information or assistance.

⚠ CAUTIONS

1. To prevent injury, death, or property damage, read and follow all instructions and warnings, including labels shipped with or attached to unit before operating your new outdoor system.
2. Although special care has been taken to minimize sharp edges in the construction of your unit, be extremely careful when handling parts or reaching into the unit.
3. Condensate drains should be checked and cleaned periodically to assure condensate can drain freely from coil to drain. If condensate cannot drain freely, water damage could occur.
4. If heating system is not operational during the cold weather months, provisions must be taken to prevent freeze-up of all water pipes and water receptacles. This is very important during times of vacancy.

*Visit our website or ask your dealer for more information on:

- System operation
- Optimizing system performance/Energy savings
- Troubleshooting/Maintenance
- Warranties and Product Registration

Before you call for service, check the following:

Problem	Possible cause	Remedy
Insufficient heating or cooling	a. dirty filters b. air not circulating freely c. blocked outdoor coil	a. clean or replace b. check supply registers and return grills for blockage c. clear away leaves or other debris
Failure to operate	a. power off b. open circuit breaker or burned-out fuses c. improperly adjusted thermostat	a. make sure main switch is in ON position b. reset circuit breaker, or replace burned-out fuses c. check setting, adjust thermostat
Auxiliary heat indicator on	When outdoor temperature falls, intermittent lighting is normal	Monitor light. If it stays on continuously when above 30°F, or if it comes on when 50°F outdoors, call for service.
No Heating or Cooling – Blower does not operate	Blower door removed or ajar	Close door securely to restore power to blower
Unusual Noise		Call your local servicer

Product Registration

Registered Limited Warranty terms are available if the product is registered within 60 days of installation. If the product is not registered within 60 days of installation, the Base Limited Warranty terms will apply.

Registration can be completed online. Please take a few moments to record the following information to ensure your product registration process is quick and easy:

Indoor Unit Model No.: _____ Serial No.: _____

Outdoor Unit Model No.: _____ Serial No.: _____

Thermostat Model Number _____

Installation/Startup Date _____

Dealer _____

Dealer Service Phone _____

IMPORTANT: If the indoor air exceeds 60% relative humidity or simply feels uncomfortably humid, it is recommended that the indoor fan only be used in the AUTO mode.

Base Limited Warranty

Subject to the terms and conditions of this limited warranty, Trane U.S., Inc. ("Company") extends a limited warranty to the original purchaser ("Purchaser") only for parts (but not labor) replaced as a result of manufacturing defects for the product(s) identified in **Table 1** attached hereto ("Products") that are installed in residential/multi-family application (personal, family, or household use) and subject to normal use and maintenance in the United States and Canada. All repairs of Products covered under this limited warranty must be made with authorized service parts and by a licensed service provider. You must pay any repair charges associated charges not covered by this warranty. Improper or incorrect repair that causes damage to the Products may void this warranty. Products installed in commercial applications are extended a limited warranty for a different term as stated in **Table 1** attached hereto. "Commercial applications" shall mean any application other than for personal, family, or household use.

This limited warranty applies to Products manufactured on or after March 1, 2024.

This limited warranty can also be found online at <https://www.trane.com/residential/en/for-owners/warranty-and-registration> or <https://www.americanstandardair.com/owner-support/warranty-and-registration>. We limit the duration and remedies of all implied warranties, including without limitation the warranties of merchantability and fitness for a particular purpose to the duration of this express limited warranty. Some states do not allow limitations on how long an implied warranty lasts, so the limitations expressed here may not apply to you. Please read the limited warranty in its entirety for more information.

Base Limited Warranty Term: **Table 1** (attached hereto) contain the base limited warranty terms for the Purchaser:

- For most installed Products including, but not limited to, Products installed in a builder's model home, the Commencement Date of the base limited warranty term shall be the date that the original installation is complete, and all Product start-up procedures have been properly completed and recorded on the installer's invoice, which includes all model and serial numbers of the installed Product(s). If the installation and start-up date was not recorded on the installer's invoice the Commencement Date of the base limited warranty term shall be sixty (60) days after the factory manufacture date, as determined by the Product serial number.
- If a Product is installed in a newly constructed home, which is not a builder's model home, the Commencement Date of the base limited warranty term is the date the Purchaser closed on the sale of the residence from the builder. Proof of Product purchase, installation, and/or closing date of the residence may be required to confirm the Commencement Date.
- The installation of Product replacement parts under this limited warranty shall not extend the original warranty period. The warranty period for any Product part replaced under this limited warranty is the applicable warranty period remaining under the original Product warranty.

Registered Limited Warranty Term and Registration Requirements: If the Purchaser properly registers the Products online within sixty (60) days of the Commencement Date, the base limited warranty term shall be extended as stated in **Table 1**, attached hereto (the "Registered Limited Warranty Term"). Any Product not properly registered online by the Purchaser within sixty (60) days of the Commencement Date shall be subject to the base limited warranty term outlined above and in **Table 1**. To properly register online, go to: <https://www.trane.com/residential/en/for-owners/warranty-and-registration> and click on "Register" or <https://www.americanstandardair.com/owner-support/warranty-and-registration> and click on "Registration can be completed online".

Limited Warranty Transferability: The limited warranty on a Product is transferable from the Purchaser to a subsequent owner of the residence where the Product was originally installed provided the transfer is made within ninety (90) days from the date of closing on the sale of the residence and the applicable transfer fee, if any, has been paid in full. To transfer a limited warranty from the Purchaser to a subsequent owner, please call 855-260-2975 and be prepared to provide the Product(s) serial number, installed address, closing date of the sale of the residence between Purchaser and subsequent purchaser and credit card information to pay the appropriate limited warranty transfer fee, if applicable. The transfer fee amount is available online at: <https://www.trane.com/residential/en/for-owners/warranty-and-registration> or <https://www.americanstandardair.com/owner-support/warranty-and-registration>. Provided the limited warranty transfer is complete and the transfer fee is paid in full within ninety (90) days from the date of closing on the sale of the residence, the subsequent purchaser will retain either: (1) the balance of the base limited warranty term, if any, as measured from the Commencement Date; or (2) if the Product was registered in accordance with the terms herein, the balance of the registered limited warranty term as measured from the Commencement Date.

Florida Residents Only: Beginning July 1, 2024, Failure to complete product registration does not diminish any warranty rights or decrease the limited warranty length. The sale of residential property that includes an HVAC system as a fixture to the property occurs on or after July 1, 2024, the manufacturer's limited warranty is still in effect on the HVAC system or a component of the system.

How to Obtain Service: To locate a service provider in your area, who will provide service under this limited warranty, for Trane Product(s) please visit: www.trane.com or call 800-945-5884, for American Standard Product(s) please visit: www.americanstandardair.com or call 877-374-0902. Company may request proof of Product purchase and/or installation, including installation address, in order to provide replacement part(s) under this limited warranty.

What Company Will Do: As the Company's only responsibility and the Purchaser's only remedy under this limited warranty, Company will furnish a replacement part for installation by licensed HVAC service provider, without charge for the part only, to replace any Product part that fails due to a manufacturing defect under normal use and maintenance. The Purchaser must pay for any and all shipping and handling charges and other costs of warranty service for the replacement part. If the Product part is not available, the Company will, at its option, provide a free suitable part or provide a credit in the amount of the then factory selling price for a new suitable substitute part to be used by the Purchaser towards the retail purchase price of a new Company product. Any new Product purchase shall be at Purchaser's sole cost and expense including, but not limited to, all shipping, removal, and installation costs and expenses.

Eligibility Requirements: The following items are required for the Product(s) to be covered under this limited warranty:

- The Product(s) must be in the same location where they were originally installed.
- The Product(s) must be properly installed, operated, and maintained by a licensed HVAC service provider in accordance with the Product specifications or installation, operation, and maintenance instructions provided by Company with each Product. Failure to conform to such specification and/or installation, operation, and maintenance instructions shall void this limited warranty.
- Company may request written documentation showing the proper preventative maintenance.
- All Product parts replaced by Company under this limited warranty must be given to the servicing provider for return to Company.
- Air handler, air conditioner, heat pumps, cased or uncased coils, stand-alone furnaces, and packaged units must be part of an Air Conditioning, Heating, and Refrigeration Institute rated and matched system or a specification in a Company provided bulletin or otherwise approved in writing by a Company authorized representative.
- All claims under this limited warranty must be filed within 90 days of failure date.

Exclusions: The following are not covered by this limited warranty:

- Labor costs, including, but not limited to, costs for diagnostic calls or the removal and reinstallation of Products and/or Product parts.
- Shipping and freight expenses required to ship Product replacement parts.
- Failures, defects or damage (including, but not limited to, any loss of data or property) caused by:
 - Any third-party product, service, or system connected or used in conjunction with the Product(s);
 - Any use that is not designed or intended for the Product(s);
 - Modification, alteration, abuse, misuse, negligence, or accident;
 - Improper storage, installation, maintenance, or operation including, but not limited to, operation of electrical equipment at voltages other than the range specified on the Product nameplate;
 - Any use in violation of the written instructions or specifications provided by Company;
 - Any acts of God including, but not limited to, fire, water, storms, lightning, or earthquakes, or any theft or riots;
 - A corrosive atmosphere or contact with corrosive material such as, but not limited to, chlorine, fluorine, salt, sulfur, recycled waste water, urine, fertilizers, rust, or other damaging substances or chemicals.
- Purchases of Products made on an uninstalled basis, whether direct, online or through a secondary or auction market.
- Cabinets or cabinet pieces that do not affect Product performance, air filters, refrigerant, refrigerant line sets, belts, wiring, fuses, surge protection devices, non-factory installed driers, and Product accessories.
- Increased utility usage costs.
- Replacement parts required to convert Product(s) from R-410A refrigerant to any other refrigerant.
- For units or systems with a nameplate refrigerant designation, the use of or conversion to any other refrigerant is prohibited and will void this limited warranty.
- Use of alternate, contaminated, counterfeit, non-manufacture approved refrigerants, and/or non-approved refrigerant additives including, but not limited to, dyes will void this warranty.
- Liquid line filter drier must be replaced when a compressor replacement is necessary. A suction line filter drier must be added for compressor failures defined as burnouts and failure to do so will void this limited warranty.

GW-OTDR-2401A

Additional Terms: THIS LIMITED WARRANTY AND LIABILITY SET FORTH HEREIN ARE IN LIEU OF ALL OTHER WARRANTIES AND LIABILITIES, WHETHER IN CONTRACT OR IN NEGLIGENCE, EXPRESS OR IMPLIED, IN LAW OR IN FACT. THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE LIMITED TO THE DURATION OF THE APPLICABLE PRODUCT WARRANTY. COMPANY DOES NOT AUTHORIZE ANY PERSON TO CREATE FOR IT ANY OBLIGATION OR LIABILITY IN CONNECTION WITH THE PRODUCT(S). NOTWITHSTANDING ANYTHING IN THIS LIMITED WARRANTY TO THE CONTRARY, COMPANY SHALL NOT BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, AND/OR PUNITIVE DAMAGES, WHETHER BASED ON CONTRACT, WARRANTY, TORT, (INCLUDING, BUT NOT LIMITED TO, STRICT LIABILITY OR NEGLIGENCE), PATENT INFRINGEMENT, OR OTHERWISE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. COMPANY'S MAXIMUM LIABILITY HEREUNDER IS LIMITED TO THE ORIGINAL PURCHASE PRICE OF THE PRODUCT(S).

No action arising out of any claimed breach of this limited warranty may be brought by the Purchaser (or any subsequent purchaser retaining the balance of a properly transferred limited warranty) more than one (1) year after the cause of action has arisen.

This limited warranty gives you specific legal rights, and you also have other rights that vary from state to state. If this Product is considered a consumer product, please be advised that some local laws do not allow exclusions or limitations on incidental or consequential damages, or limitations on how long a warranty lasts; or how long an implied warranty lasts, so that the above limitations may not apply to you. Refer to your local laws for your specific rights under this limited warranty. If you have any questions regarding this limited warranty, please contact your original installation dealer, or any participating dealer, should your original installation dealer no longer be available.

Customer Relations, PO Box 4419, Bridgeton, MO 63044; Phone 1-800-945-5884
Or visit our website at www.trane.com or www.americanstandardair.com

Table 1: Limited Warranty Term for Trane and American Standard Products Installed in Residential Applications

Single Phase Outdoor Units:

4TTR, 5TTR, 4TWR, 5TWR, 4TTL, 4TWL, 4A6H, 5A6H, 4A6L, 4A7A, 5A7A, 4A7L, E4HL5

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years

Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – ten (10) years

4TTX, 5TTX, 4TTV, 5TTV, 4TWX, 5TWX, 4TWV, 5TWV, 4A6H6, 4A6H7, 5A6H7, 4A6V, 5A6V, 4A7A6, 4A7A7, 5A7A7, 4A7V, 5A7V

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years

Registered Limited Warranty Period: Compressor – twelve (12) years, Outdoor Coil, Parts – ten (10) years

Specific Terms for 3-Phase Units (Models up to 5 Tons in a RESIDENTIAL Application):

4TTA, 5TTA, 4TWA, 5TWA, 4A7C, 5A7C, 4A6C, 5A6C

Base Limited Warranty Period: Compressor, Outdoor Coil, Parts – five (5) years

Registered Limited Warranty Period: Compressor, Outdoor Coil, Parts – ten (10) years

ACCESSORIES:

Compressor Control Module: BAY24CCVK

Limited Warranty Period: ten (10) years

Limited Warranty Term for Trane and American Standard Products Installed in Commercial Applications:

Limited Warranty Period: Coil, Parts – one (1) year

Limited Warranty Period: Compressor – five (5) years