


HEAT CONTROLLER

**INSTALLATION, OPERATION  
& MAINTENANCE MANUAL**

**CCG / VCG / MCG Coils**

### Safety Instruction

Potential safety hazards are alerted using  symbol. The symbol is used in conjunction with terms that indicate the intensity of the hazard.

#### WARNING

This symbol indicates a potentially hazardous situation, which if not avoided, could result in serious injury, property damage, product damage or death.

#### CAUTION

This symbol indicates a potentially hazardous situation, which if not avoided, may result in moderate injury or property damage.

#### WARNING

**Certified technicians or those individuals meeting the requirements specified by NATE may use this information. Property and product damage or personal injury hazard may occur without such background.**

#### WARNING

All power sources should be disconnected prior to servicing. Failure to do so may cause personal injury or property damage.

#### WARNING

Product designed and manufactured to permit installation in accordance with local and national building codes. It is the installer's responsibility to ensure that product is installed in strict compliance with national and local codes. Manufacturer takes no responsibility for damage (personal, product or property) caused due to installations violating regulations.

### Inspection

Upon receiving the product, visually inspect it for any major shipping related damages. Shipping damages are the carrier's responsibility. Inspect the product labels to verify the model number and options are in accordance with your order. Manufacturer will not accept damage claims for incorrectly shipped product.

### Installation Preparation

Read all the instructions in this guideline carefully while paying special attention to the WARNING and CAUTION alerts. If any of the instructions are unclear clarify with certified technicians. Gather all the tools

needed for successful installation of the unit prior to beginning the installation.

### Condensate Drain Preparation

An **auxiliary drain pan** must be provided by the installer and placed under the entire unit with a separate drain line that is properly sloped and terminated in an area visible to the home owner. The auxiliary pans provide extra protection to the area under the unit should the primary and secondary drain plug up and overflow. As expressed in our product warranty; **MANUFACTURER WILL NOT BE BILLED FOR ANY STRUCTURAL DAMAGES CAUSE BY FAILURE TO FOLLOW THIS INSTALLATION REQUIREMENT.** The drains from the auxiliary drain pan must be installed according to the local building codes.

#### CAUTION

The drain lines from the Auxiliary should **NOT** be connected to the primary drain line of the coil.

#### WARNING

Do **NOT** install coils with plastic drain pans on any OIL or DRUM type furnaces or applications where temperature of the drain pan might exceed  $260\pm 5$  °F ( $126.6\pm 5$  °C). A metal pan should be specified in these applications.

Install cased coils with plastic drain pans on a level, flat surface. In case of coils with metal drain pans slop the coil  $\frac{1}{4}$ " towards the drain. No such pitch is necessary in case of plastic drain pans. Condensate drain lines must be installed in accordance with local building codes.

The drain lines must be installed with  $\frac{1}{4}$ " per foot pitch to provide free drainage. A condensate trap **MUST** be installed on the primary drain line to ensure proper drainage of the condensate. The trap must be installed in the drain line below the bottom of the drain pan. Figure 1 illustrates the typical drain trap installation

#### CAUTION

If the drain pan is constructed of nylon or plastic; use Teflon tape to connect the drain lines to the threads in the drain pan. **DO NOT USE SOLVENT BASED PIPE DOPE. THIS WILL REDUCE THE LIFE OF THE PAN.**

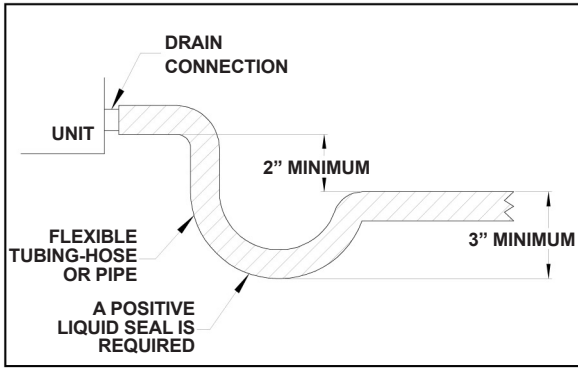


Figure. 1. Typical drain line trap set up

The drain pan has primary and secondary drain connections. If a secondary drain line is required it should be run separately from the primary and should terminate in a highly visible location. Condensate disposal through the secondary drain line indicates that the primary drain line is plugged and needs cleaning. If a secondary drain line will not be provided plug the secondary drain. The red drain plugs are **NOT** to be reused without plumbers tape or putty. The drain line connectors should be hand tightened to a torque of approximately 35-40 lb (4-5 turns).

## Coil Installation

### ⚠ WARNING

The coil was manufactured with dry nitrogen pre-charge. Release the pressure through the Schrader valve test port prior to installation. If holding pressure is not present, return coil to distributor for exchange.

Clean coil fins with degreasing agent or mild detergent and rinse fins clean prior to installation.

### ⚠ CAUTION

Coil should be installed on the discharge side of the furnace

The refrigerant line sizes should be selected according to the recommendations of the outdoor unit manufacturer.

All connection joints should be burr free and clean. Not removing burr and cleaning may increase chances of a leak. It is recommended to use a pipe cutter to remove the spun closed end of the suction line.

To avoid damage to grommets (where present); remove these prior to brazing by sliding over the lines. Use a quenching cloth or allow the lines to cool down before reinstalling the grommets.

Use of wet rags/quenching cloth is highly recommended to prevent weld-related damages to the casing and Schrader valve (if present).

### ⚠ CAUTION

Some coils may include a Schrader valve on the suction manifold. Ensure that the Schrader valve and valve core (where present) are protected from heat to prevent leakage.

## Metering Device

Coils are available with two kinds of metering devices a) flowrator or b) TXV. Instructions below are separated in sections according to the metering device. Ensure that the applicable section is thoroughly read and understood.

### Flowrator Coils:

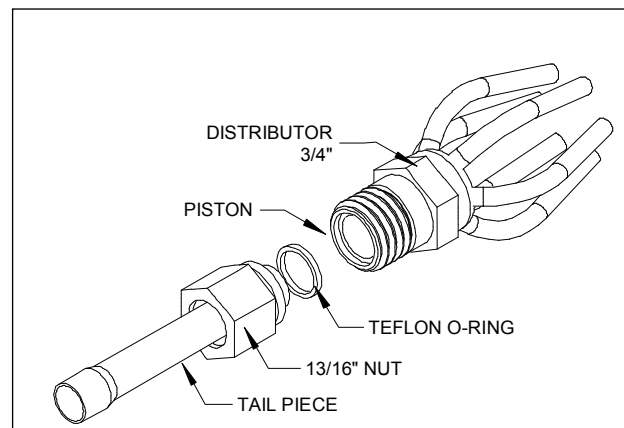


Figure. 2. Flowrator assy components

### ⚠ CAUTION

Use Piston sizes recommended by the outdoor unit manufacturer whenever possible. The piston should be sized according to the capacity of the outdoor unit.

### ⚠ WARNING

Failure to install the proper piston can lead to poor system performance and possible compressor damage.

During some installations a piston change may be required. If so the installer **MUST** change the piston. As stated earlier, use piston sizes recommended by the outdoor unit manufacturer. If a sizing chart is not available, use the piston size chart provided below to size the required piston. The size of the piston is stamped on the piston body. Use this chart when matching coil with an outdoor unit with a different nominal capacity than the coil.

Outdoor Capacity	Orifice Size–R22	Orifice Size-R410A
12,000	0.041	N/A
18,000	0.055	0.049
24,000	0.059	0.055
30,000	0.068	0.059
36,000	0.074	0.068
42,000	0.080	0.074
48,000	0.084	0.080
60,000	0.092	0.089

**Table. 1. Piston Size Chart**

### Instruction for piston change

1. Turn the 13/16 nut once to release any residual pressure in the coil.
2. After ensuring that the coil is free of any residual pressure, disassemble the flowrator body completely using two wrenches. Distortion of the feeder tubes **SHOULD** be avoided.
3. The wrench used to clasp the nut should be turned in counter-clockwise direction to unscrew the nut.
4. Slide the 13/16 nut over the line set and separate the two halves of the flowrator.

### CAUTION

Pay close attention to the Teflon O-ring. Be sure to replace the O-ring to attain a proper seal. (The Teflon O-ring is located between the two halves of the flowrator)

5. Pull the piston out using a small wire or pick. Verify the piston size (size is typically stamped on the body of the piston). If a different piston size is required by the outdoor unit manufacturer replace the piston using the small wire provided with the piston kit.

### CAUTION

Pay close attention to the piston orientation. The pointed end of the piston **MUST** go into the distributor body/ towards the coil. Failure to ensure this orientation will cause the piston to be bypassed during operation which might damage the outdoor unit.

6. Assemble the two halves correctly and ensure that the white Teflon O-ring is present between the two halves.
7. Slide the 13/16 nut onto the distributor body.
8. Tighten the nut to a torque of approximately 10-30 ft-lbs. Do **NOT** over tighten the nut. This will hamper the piston movement during operation.

9. Slide the grommet back to position to prevent air leakage.

### TXV Coils:

#### WARNING

The sensing bulb and TXV body **MUST** be protected from overheating during brazing. The sensing bulb and TXV body must be covered using a quench cloth or wet cloth when brazing. Pointing the brazing flame away from the valve and sensing bulb provide partial protection only.

#### CAUTION

Ensure that the TXV selected is compatible with the refrigerant used in the outdoor system (R22 or R410A). TXV caps are painted green for R22 or pink for R410A. In absence of color, the caps will be marked with the compatible refrigerant.

#### CAUTION

The valves should be sized according to the capacity of the outdoor unit. Failure to install the right valve can lead to poor performance and possible compressor damage.

### TXV Bulb Mounting

The orientation and location of the TXV bulb has a major influence on the system performance.

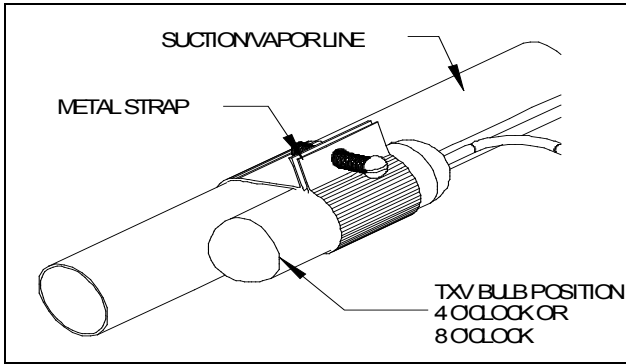
#### CAUTION

Ensure that the TXV bulb is in direct contact with the suction/vapor line. Gap between the bulb and tube should be avoided. Failure to do so will impair the proper functioning of the TXV valve.

It is recommended that the TXV bulb be installed parallel to the ground (in a horizontal plane). The bulb position should be above and between 4 o'clock and 8 o'clock. Fig. 3 shows the recommended position for the TXV bulb installation in the horizontal plane.

The TXV sensing bulb **SHOULD** be mounted using the metal clamp provided. In order to obtain a good temperature reading and correct superheat control, the TXV sensing bulb must conform to ALL of the following criteria:

- 1) The sensing bulb **MUST** be in direct and continuous contact with the suction line
- 2) The sensing bulb should be mounted horizontally on the suction line.
- 3) The sensing bulb **MUST** be in direct and continuous contact with the suction line
- 4) The sensing bulb should be mounted horizontally on the suction line.

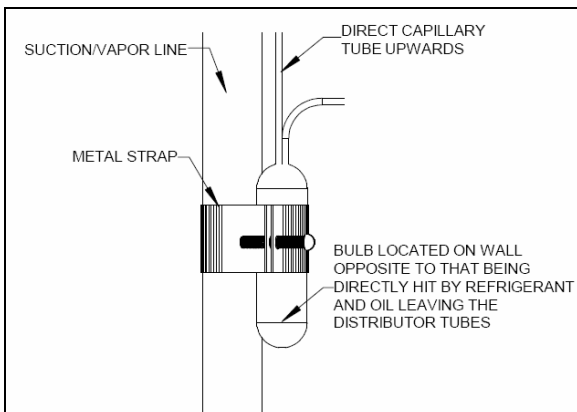


**Fig. 3. Recommended location of the TXV bulb in a horizontal orientation**

- 5) The sensing bulb **MUST** be mounted above and between the 4 and 8 o'clock position on the circumference of the suction line.
- 6) The sensing bulb **MUST** be insulated from outside air.

The mounting location and insulation guards THE sensing bulb from false reading due to hot outside air or liquid refrigerant formed inside the suction/vapor line.

As recommended earlier, the TXV sensing bulb should be mounted in a horizontal plane in relation to the suction/vapor line. However, in case such a mounting is not feasible and the sensing bulb has to be mounted vertically; then place the bulb as shown in Fig. 4.



**Fig. 4. Figure showing the sensing bulb mounted in a vertical orientation**

### ⚠ CAUTION

If the TXV sensing bulb is mounted vertically; the capillary tube **MUST** be directed upwards. The bulb must be mounted on the wall opposite to that being directly hit by the refrigerant and oil leaving the distributor tubes.

### Field – Installed Expansion Valve Coils

Remove the valve identification sticker from the valve and place it adjacent to the model number on unit name plate. When installing an expansion valve, it is not necessary to remove all the access panels and slide the coil out of the housing.

- 1) Disassemble the flowrator body using two wrenches. Unscrew the body with a counter-clockwise motion.
- 2) Replace the white Teflon seal in place (located between the halves).
- 3) Remove the existing flowrator piston using a small wire or pick.
- 4) Inspect the TXV box to confirm that the valve is compatible with the refrigerant in the system.
- 5) Remove the valve from the box and note the location of the inlet side (threaded male port) and the outlet side (female swivel nut port).
- 6) After ensuring that the white Teflon seal is still in place inside the flowrator body, screw the female swivel nut onto the flowrator body.
- 7) Place the attachment nut on the liquid line.
- 8) Braze the stub-out portion to the liquid line and let cool.

### ⚠ WARNING

Do not attempt to touch the braze joint while hot. Touching it may cause severe burns.

- 9) Remove the additional white Teflon seal ring from the box and place on the shoulder just inside the inlet port. Screw the nut attached to the stub-out portion of the flowrator body onto the inlet port of the TXV.
- 10) Tighten all connections taking care to use proper back up.

Some coils come with a Schrader valve on the suction line. If a Schrader port is present

- 11) Remove valve stem from the Schrader port mounted on the suction line
- 12) Screw flare nut on TXV equalization tube in to the Schrader valve stem

Typical expansion valve assembly is shown below in Fig. 5.

### ⚠ CAUTION

Using a non-bleed expansion valve may require the use of a hard-start kit. Follow the outdoor unit manufacturer's guidelines.

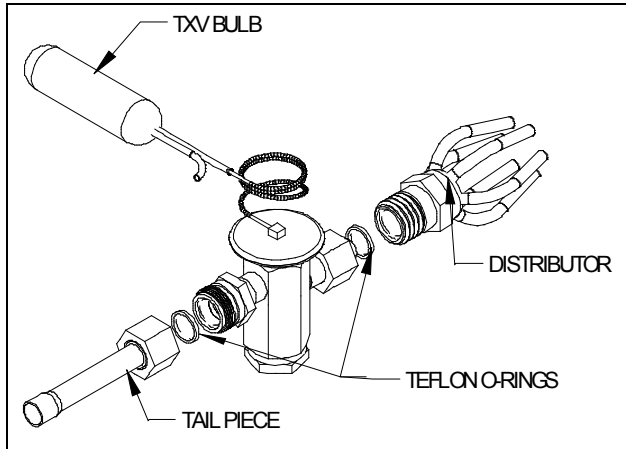


Fig. 5. Components of a typical TXV assembly

### Coil Application

#### Vertical

CCG (Uncased Coils), VCG (Cased Upflow/ Downflow) and MCG (Multi-Position) can be installed in either an upflow or a downflow application. Fig 6 shows the typical configuration for the same.

#### CAUTION

When installing in conjunction with a gas furnace in a vertical orientation, ensure that there is 2" gap between the bottom of the drain pan and the outlet of the furnace.

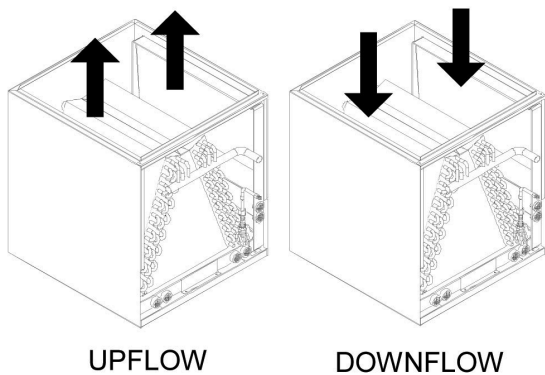


Fig. 6. Typical Vertical Application of Coils

#### CAUTION

To position the coil on a furnace:

- 1) Locate the air outlet of the furnace
- 2) Position the coil over/under the outlet after adjusting the flanges accordingly.
- 3) Place ductwork over the casing flanges

#### Note:

To set up a multi-position (MCG) and or upflow/downflow (VCG) coils for downflow application, install a 3" wide by 16" long galvanized metal plates on the outside of the coil, against the fins as shown in FIG.7.

#### WARNING

As mentioned elsewhere in this document in an application involving oil furnace a metal drain pan **MUST** be used. Coils installed on an oil furnace must have a minimum of six inches clearance between the top of the furnace and bottom of the drain pan.

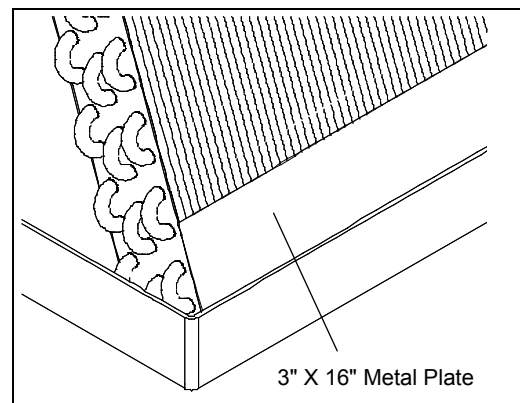


Fig. 7. Metal Plate location for a Downflow/ Counterflow Application

#### Horizontal

Multi-position coils (MCG) are shipped from the factory such that they can be installed in both vertical and horizontal application without any change to the coil. Cautions, warnings and instructions to install these in the vertical application are mentioned in the relevant section above. When installing these coils in the horizontal application, the details mentioned in this section must be followed.

Fig. 8 shows horizontal right and left application of the CE coils.

#### CAUTION

Coils are shipped from the factory for specific horizontal applications viz. horizontal right or horizontal left. Installer must ensure that the coil is installed in the orientation for which it was intended (horizontal drain pan side down). Failure to follow these instructions might lead to property and equipment damage.

Multiposition (MCG) coils come equipped with a horizontal drain pan (Plastic/Metal). The plastic drain pan is protected using a metal clip at the apex of the coil.



When installing in horizontal applications with airflow directed into the apex ensure the presence of a metal plate as shown in Fig 8. Absence of the plate in such an application might increase the chances of property damage due to fire or electric hazard.

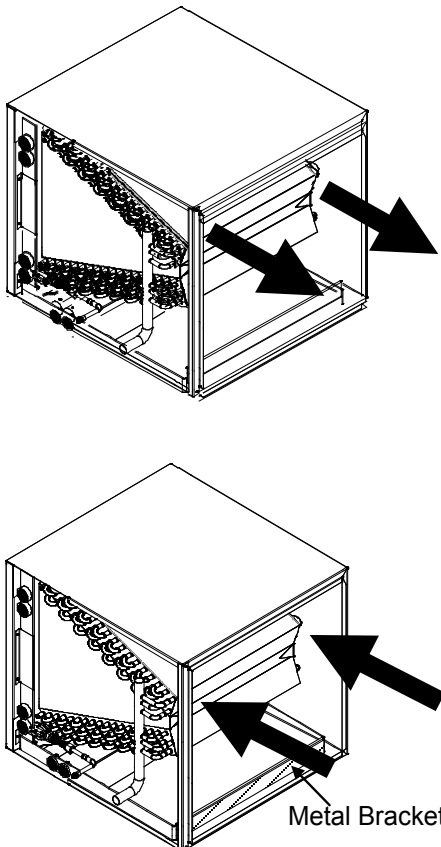


Fig. 8. Horizontal right application of a MCG coil

## System Charging

### ⚠ CAUTION

An improperly charged system might cause degradation in system performance and may damage the compressor.

After installation of the coil, refer to the outdoor unit manufacturer for charging techniques and amount of charge.

- 1) For a downflow application do **NOT** exceed 350 cfm/ton of airflow
- 2) Flowrator coils – Add refrigerant until the superheat measured at the outdoor unit suction/vapor line matches the superheat from the chart below
- 3) Expansion valve coils – Add refrigerant until the subcooling measured at the outdoor unit liquid line matches the subcooling recommendation of the outdoor manufacturer (typically 7° – 10° F). If chart is unavailable refer to chart below

## SUPERHEAT AND SUBCOOL CHART

Outdoor Temp °F D.B. (°C)	Superheat °F (°C)			Subcooling °F (°C)		
	Min.	Nom.	Max.	Min.	Nom.	Max.
65 (18.3)	35 (-1.7)	40 (4.4)	45 (7.2)	12 (-11.1)	14 (-10)	15 (-9.4)
70 (21.1)	31 (-0.6)	35 (1.7)	39 (3.9)	12 (-11.1)	14 (-10)	15 (-9.4)
75 (23.9)	26 (-3.3)	30 (-1.1)	34 (1.1)	12 (-11.1)	14 (-10)	15 (-9.4)
80 (26.7)	22 (-5.6)	25 (-3.9)	28 (-2.2)	12 (-11.1)	14 (-10)	15 (-9.4)
85 (29.4)	17 (-8.3)	20 (-6.7)	23 (-5)	12 (-11.1)	14 (-10)	15 (-9.4)
90 (32.2)	13 (-10.6)	15 (-9.4)	17 (-8.3)	12 (-11.1)	14 (-10)	15 (-9.4)
95 (35.0)	8 (-13.3)	10 (-12.2)	12 (-11.1)	12 (-11.1)	14 (-10)	15 (-9.4)
100 (37.8)	4 (-15.6)	5 (-15)	6 (-14.4)	12 (-11.1)	14 (-10)	15 (-9.4)

Due to ongoing product improvements, specifications and dimensions are subject to change and correction without notice or incurring obligations. Determining the application and suitability for use of any product is the responsibility of the installer. Additionally, the installer is responsible for verifying dimensional data on the actual product prior to beginning any installation preparations.

Incentive and rebate programs have precise requirements as to product performance and certification. All products meet applicable regulations in effect on date of manufacture; however, certifications are not necessarily granted for the life of a product.

Therefore, it is the responsibility of the applicant to determine whether a specific model qualifies for these incentive/rebate programs.

## HEAT CONTROLLER

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A  Company



# Congratulations on your new HVAC equipment

All Heat Controller products are designed for long life and reliable service to help keep your home comfortable. We're so confident in the design, quality components and construction that we back your unit with one of the strongest warranties in the industry. To be eligible for the full term of this Limited Warranty coverage, register your purchase within 90 days of the purchase.

**Save time and money—register online 24/7 at [www.heatcontroller.com](http://www.heatcontroller.com)**  
Registration also may be completed by mail using card below.

Don't forget to read your owner's manual and ask your installer about regular maintenance procedures that will help keep your unit operating at peak efficiency.

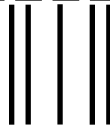
## KEEP THIS INFORMATION AS A RECORD OF YOUR PURCHASE

Apply Serial Number and Model Number sticker here  
(from product carton). If unavailable, write serial number and  
model number below (can be found on unit rating plate).



\_\_\_\_\_ Date of Purchase      \_\_\_\_\_ Date Installation Completed  
 Component of new HVAC system       Replacement air handler only  
 Retain your bill of sale as proof of warranty period and ownership.

To register by mail, cut out along the dotted lines, complete form, and affix postage.



PLACE  
STAMP  
HERE

**HEAT CONTROLLER**  
**P. O. Box 1089**  
**Jackson, MI 49204**

## HEAT CONTROLLER

# Limited Express Warranty R-410A Air Handlers & Coils

### LIMITED FIVE (5) YEAR PARTS EXPRESS WARRANTY

All parts are warranted to be free from defects in workmanship and materials for normal residential use and maintenance for five (5) years from the date of purchase by the original consumer for the original residential installation, when the air handler or coil is installed in a non-AHRI matched system. This Limited Express Warranty applies only when the air handler or coil is installed per Heat Controller installation instructions and in accordance with all local, state and national codes for normal residential use.

### MATCHED SYSTEM LIMITED EXPRESS WARRANTY

When the air handler or coil is installed as part of a residential AHRI-matched system with a Heat Controller air conditioning condenser or heat pump, the condenser or heat pump warranty applies to the air handler or coil under normal use and maintenance. Refer to the condenser or heat pump warranty for details, and register the product within 90 days of the purchase for the AHRI-matched system warranty.

### EXCEPTIONS

The Limited Express Warranty does not cover normal maintenance—Heat Controller recommends that regular inspection/maintenance be performed according to the Installation/Operation/Maintenance Manual. Additionally, labor charges, transportation charges for replacement parts, replacement of refrigerant or filters, any other service calls/repairs are not covered by this Limited Express Warranty. It also does not cover any portion or component of the system that is not supplied by Heat Controller, regardless of the cause of failure of such portion or component.

### CONDITIONS FOR WARRANTY COVERAGE

- Unit must be operated according to Heat Controller operating instructions included with the unit and cannot have been subjected to accident, neglect or misuse, alteration, improper repair, or an act of God (such as a flood)
- Installation was done by a trained, licensed or otherwise qualified HVAC dealer/contractor
- Performance has not been impaired by use of any product not authorized by Heat Controller, or by any adjustments or adaptations to components
- Serial numbers and/or rating plate have not been altered or removed
- Damage has not been a result of inadequate wiring or voltage conditions, use during brown-out conditions, or circuit interruptions

OVER ►

- Air flow around the unit has not been restricted
- Unit remains in the original residential installation
- Any extended warranty is valid to original purchaser only (non-transferable)
- Owner must supply proof of proper maintenance over the life of the unit
- Unit was not purchased over the internet

#### DURATION OF WARRANTY & REGISTRATION

With registration, the warranty begins on the date of purchase by the original consumer (homeowner). The original consumer must complete and return the warranty registration card or register at [www.heatcontroller.com](http://www.heatcontroller.com) within 90 days of purchase. **The original consumer must retain a receipted bill of sale as proof of warranty period. To receive the AHRI-matched system warranty, also retain proof of the AHRI-matched system installation (part numbers, serial numbers, purchase and installation dates).** Without this proof, the warranty begins on date of shipment from the factory and reverts to the Five-Year Limited Express Parts Warranty.

#### REMEDY PROVIDED BY THE LIMITED EXPRESS WARRANTY

The sole remedy under the Limited Warranty is replacement of the defective part. If replacement parts are required within the period of this warranty, Heat Controller replacement parts shall be used; any warranty on the replacement part(s) shall not affect the applicable original unit warranty. Labor to diagnose and replace the defective part is not covered by this Limited Express Warranty. Ready access to the unit for service is the owner's responsibility. If for any reason the replacement part/product is no longer available during the warranty period, Heat Controller shall have the right to allow a credit in the amount of the current suggested retail price of the part/product instead of providing repair or replacement.

#### LIMITATION OF LIABILITY

**1. EXCLUSION OF ALL IMPLIED WARRANTIES AND LIMITATION.** There are no other express or implied warranties. Heat Controller makes no warranty of merchantability. We do not warrant that the unit is suitable for any particular purpose or can be used in buildings or rooms of any particular size or condition except as specifically provided in this document. There are no other warranties, express or implied, which extend beyond the description in this document.

2. All warranties implied by law are limited in duration to the five-year term of the non-AHRI matched system Pars Warranty. Your exclusive remedy is limited to the replacement of defective parts. **We will not be liable for any consequential or incidental damages caused by any defect in this unit.** 3. This warranty gives you specific legal rights and you may also have other rights which vary from state to state. Some states do not allow limitation on how long an implied warranty lasts or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations or exclusions may not apply to you.

4. No warranties are made for units sold outside the continental United States and Canada. Your distributor or final seller may provide a warranty on units sold outside these areas.
5. Heat Controller will not be liable for damages if our performance regarding warranty resolution is delayed by events beyond our control including accident, alteration, abuse, war, government restrictions, strikes, fire, flood, or other acts of God.

#### HOW TO OBTAIN WARRANTY SERVICE OR PARTS

If you have a warranty claim, notify your installer promptly. If he doesn't take care of your claim, write to Heat Controller, P.O. Box 1089, Jackson MI 49204. Enclose a report of inspection by your installer or service person. Include model number, serial number, and date of purchase.

#### Owner responsibilities are set forth in the instruction manual—read it carefully.

#### COMMERCIAL INSTALLATION LIMITED EXPRESS WARRANTY

When installed in a commercial application, all parts are warranted to be free from defects in material and workmanship for ONE YEAR from the date of purchase by the original consumer for the original installation. The compressor only is warranted to be free from defects in material and workmanship for FIVE (5) YEARS from the date of purchase by the original consumer. All conditions/exceptions/remedy/limitation of liability as described in this warranty document apply to commercial installation coverage except for references to "residential" installation. Registration is required for units used in commercial applications. Form No. 7954-1084Rev. 06/13

#### LIMITED PRODUCT WARRANTY REGISTRATION

The limited warranty for this unit begins on the date of purchase by the original consumer. Return this registration card or register at [www.heatcontroller.com](http://www.heatcontroller.com) within 90 days to record the date of purchase. If you don't register the purchase, the warranty begins on the date of shipment from the factory and you will not receive the benefit of the entire warranty term. By signing, the purchaser acknowledges that he or she has read the limited warranty for this unit.

Purchaser's Signature—Read the warranty before signing

Date

Purchaser's Name (Please Print)

Purchaser's Address

Apt. No.

City

State

Postal Code

Dealer/Contractor

Date of Purchase

Date of Installation

Apply Serial No. and Model No. sticker here (from product carton). If unavailable, write model number and serial number below (can be found on unit rating plate).

Cut out and mail this card only. Retain the warranty for your records.