

NTK coils

INSTALLATION INSTRUCTIONS

AIR CONDITIONING & HEAT PUMP INDOOR COILS

INTRODUCTION

Please note that HUD Manufactured Home Construction and Safety Standard Section 3280.714, paragraph (a) and subparagraph (4) and (5) clearly specifies when a cooling or heat pump coil and air conditioner blower are installed with a furnace or heating appliance they shall be tested and listed in combination for heating and safety performance by a nationally recognized testing agency(ies). Additionally, the cooling or heat pump systems to be installed in Manufactured Housing shall be certified, listed and rated based on US Department of Energy test procedures which are listed by AHRI and shall be tested and listed in combination for heating and safety performance by a nationally recognized testing agency(ies).

NTKcoils are designed specifically for use with various models of manufactured housing gas or electric furnaces in both down-flow and up-flow applications. A different pan will be required on up flow oil furnaces.

These instructions are primarily intended to assist qualified individuals trained and experienced in the proper installation of this type of equipment. Some state codes require installation and service personnel to be licensed. Refer to authorities having jurisdiction for additional guidance. Remember that the Clean Air Act of 1990 requires technician certification for handling refrigerant.

NOTE: EFFICIENCY AND CAPACITY RATINGS ARE LISTED IN CURRENT AHRI UNITARY DIRECTORY [UNDER SUMMIT MANUFACTURING] FOR NTKCOIL MODEL NUMBERS MATCHED WITH OUTDOOR CONDENSING OR HEAT PUMP UNITS. AIR CONDITIONING COIL MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER AIR CONDITIONING SECTION. HEAT PUMP COIL MATCHES ARE LISTED IN INDOOR COIL MANUFACTURER HEAT PUMP SECTION. INCORRECTLY MATCHED SYSTEMS MAY NOT WORK PROPERLY AND MAY VOID MANUFACTURER LIMITED WARRANTY.

Nortek Part #	NTKcoil Description	Coil Height	Indoor Coil Holding Charge	Metering Device TXV Part #
5620270	CM4B-1830U	18"	Nitrogen	R72DB0053
5620240	CM4Q-1830U	18"	4 oz. R-410A	R72DB0053
1018648	CM4B-G42U	24"	Nitrogen	R72DB0054
1018649	CM4Q-G42U	24"	4 oz. R-410A	R72DB0054
1018650	CM4B-R42U	18 1/2"	Nitrogen	R72DB0054
1018651	CM4Q-R42U	18 1/2"	4 oz. R-410A	R72DB0054
1018652	CM4B-G48U	24"	Nitrogen	R72DB0054
1018653	CM4Q-G48U	24"	4 oz. R-410A	R72DB0054
1018654	CM4B-L48U	18 1/2"	Nitrogen	R72DB0054
1018655	CM4Q-L48U	18 1/2"	8 oz. R-410A	R72DB0054
5595730	CM4B-53U	18 1/2"	Nitrogen	R72DB0054
5595760	CM4Q-53U	18 1/2"	8 oz. R-410A	R72DB0054
5595740	CM4B-54U	18 1/2"	Nitrogen	R72DB0054
5595770	CM4Q-54U	18 1/2"	8 oz. R-410A	R72DB0054
5627950	CM4Q-55U	24 1/2"	18 oz. R-410A	R72DB0044
5595750	CM4B-56U	24 1/2"	Nitrogen	R72DB0044
5595780	CM4Q-56U	24 1/2"	8 oz. R-410A	R72DB0044
1018656	CM4B-W60U	24 1/2"	Nitrogen	R72DB0044
1018657	CM4B-L60U	19 13/16"	Nitrogen	R72DB0044

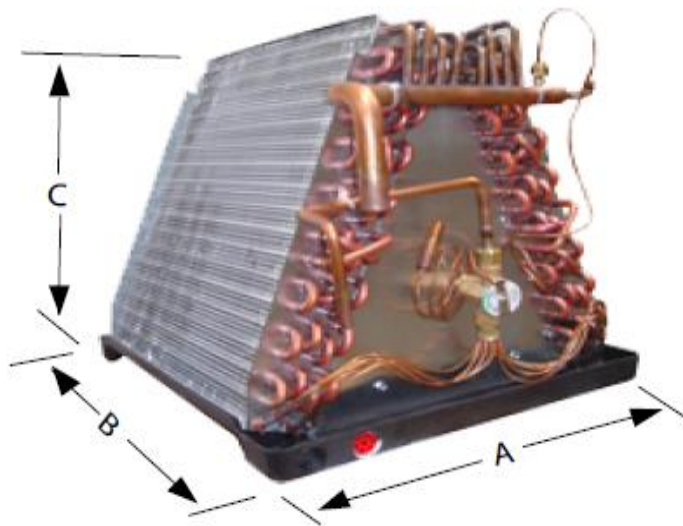
NTKcoil Spec. – 61BJ0040 (REV. 10) 03-21-18

CAUTION!

All sweat coils are shipped with nitrogen and quick connect coils is shipped from factory pressure with R410A. Relieve nitrogen pressure before opening the refrigerant circuit.

ATTENTION!

Some NTKcoils have a TXV as the metering device. However, the sensor bulb is not mounted due to potential heat damage and / or proper bulb location. Therefore, after the suction and liquid line have been properly connected to the coil the bulb can be mounted on the suction. Many times, due to space limitations in the manufactured housing applications it will require the sensor bulb to be mounted vertically. If that is the case the bulb should be located at least 6" away from any bend (elbow) and fastened on the tubing side opposite the plane of the bend. The bulb should be insulated using the thermal insulation to protect it from the effects of the surrounding ambient temperature. (SEE PAGE 7)



NOTE!

NTKcoils and other accessories installed when air conditioning is added to manufactured housing furnaces will comply with HUD regulations requiring third party approvals. Efficiency and capacity ratings as required by HUD are listed in the current AHRI directory for matched with the outdoor units. These coil ratings are based on air quantities consistent with those that are encountered in typical manufactured housing air condition and heat pump applications.



GENERAL COIL INSTALLATION NOTES

1. All NTKcoils are shipped pressurized with Nitrogen. Coils with quick connect fittings are shipped with an R-410A for that system.
ALL COILS SHOULD BE CHECKED FOR PRESSURE BEFORE LEAVING THE DISTRIBUTOR OR BEFORE INSTALLATION! IF THERE IS NO PRESSURE PRESENT, THE COIL MAY HAVE DEVELOPED A LEAK DURING SHIPMENT AND SHOULD BE RETURNED TO THE POINT OF PURCHASE FOR EXCHANGE.

On a quick connect coil, test for pressure by pushing against the diaphragm located inside the quick connect fitting on the suction manifold. If you are not able to depress the diaphragm, the coil contains a R-410A refrigerant charge.

To test for pressure on a sweat connect coil, remove the cap or flare nut on the Schrader fitting and depress the core valve located on the suction manifold.

2. The blower and duct system must be properly Sized in order to provide adequate cooling and heating performance. Select the correct motor speed tap on the furnace blower to give the required CFM needed for rated cooling capacity or upgrade the blower assembly to attain the proper CFM. Return air filters of generous size must be provided, in order to avoid contaminating the coil, blower and ductwork, or restricting necessary airflow. Failure to deliver the proper air flow across the indoor coil will cause system and/or component problems, i.e. TXV performance problems.

3. It is essential that the indoor coil and outdoor unit be properly matched and charged with the proper amount of refrigerant. Incorrect charge levels will result in inefficient operation. See more details in installation instructions for the outdoor unit.
4. For optimum performance and efficiency of air conditioning or heat pump coils, adjust system charge and/or industry standards superheat / sub cooling.
5. It is recommended that the coil be sprayed with liquid detergent thoroughly and rinsed thoroughly before installation to assure proper drainage of condensate from the coil fins to eliminate water blowoff and to assure maximum coil performance. If not sprayed, approximately 50 hours of break in time is required to achieve the same results.
6. Always be sure coil is installed level or sloped slightly toward primary and secondary (the higher of the two) drain fittings. If mandated by code, connect both drain lines to open drain, but never to a closed sewer. Pitch drain lines away from drain pan. **Always**, test drain lines with water before operating. This step is mandatory in all manufactured housing installations. Reduction in size of the drain lines is not recommended and many times not allowed.

7. **A WATER TRAP IS RECOMMENDED ON ALL COIL APPLICATIONS, BUT IS REQUIRED ON PULL THROUGH INSTALLATIONS ON ELECTRIC FURNACES. FAILURE TO PROVIDE CAN RESULT IN IMPROPER DRAINAGE OR POTENTIAL SHOCK HAZARD.**

ATTENTION!

It is mandatory to use an emergency auxiliary drain pan with any coil or air handler installed in an attic or above a finished ceiling. It must have its own drain line (a water trap is not necessary) with its output into an open drain (not a closed sewer). It should allow easy visual inspection so that if condensate flow is seen the homeowner knows that the coil drain pan lines are plugged and need maintenance.

8. Refrigerant piping is critical on any coil installation when the outdoor unit is to be located below the level of the coil. For proper piping design considerations, refer to the guidelines furnished by the manufacturer of the outdoor unit.
9. Check all field installed refrigerant connections with electronic leak detector, halide torch, or soap bubbles.
10. Refer to installation instructions provided with the outdoor unit, gas or electric furnace, and line sets for completion of system installation.

INSTALLATION WITH ELECTRIC FURNACE:

Typical electric furnace installation consists of a coil without cabinet installed on top of a downflow furnace or the coil inside a cavity on either a downflow or upflow furnace.

The following NTKcoil installation kits are unique to manufactured housing air conditioning and these kits are required to complete the installation.

1. Filter-Electrostatic (95-1741-UES) is required when using NTKcoil models on all electric furnaces without cavities. [See #3 below]
2. A Coil Support Bracket (99-3420-14) is required to support coils in Coleman furnaces.
3. Coil & Filter Cabinets (97-BCC-02N) are recommended and many times required for Nordyne furnaces as a preferred option.

Installation procedure:

1. Turn off electrical power to the furnace by turning off breaker in house panel. **CAUTION: Furnace may be connected to more than one supply circuit. Do not use furnace disconnect only. Check power at furnace to insure power is off.**
2. Remove filter at top of furnace cabinet (Nortek or Coleman only).
3. Remove refrigerant line knockout at top of furnace (Nortek only).
4. Install insulation if needed.
5. Attach drain pan gasket provided with coil to underside of coil pan and center evaporator coil on furnace. See figure A on page 5.
6. Attach filters to sides of coil.

7. Route low voltage wiring, refrigerant lines and drain tubing through floor penetration.
WARNING: If drain hose is below 40 Deg F during installation warm before expanding and/or forming.
8. Form 3" deep trap using (field supplied) tape and (provided) flexible drain hose and connect to coil pan drain securing with clamp provided. See figure B on page 5. The most efficient use of drain material is to form a "P" trap under the house. **All pull through furnaces must have a condensate trap in the drain line.**
9. Connect refrigerant lines per instructions with line set. Make sure to lubricate quick connect threads with refrigeration oil for proper mating. Refer to outdoor unit installation instructions for additional information on line set hook-ups and proper torque values.
10. With the coil in place seal off any openings at top or bottom of furnace to prevent air leakage or air bypass (use silver backed tape provided, if needed).
11. Turn power on to furnace.
12. Replace front door.

INSTALLATION WITH GAS FURNACE:

ATTENTION!

Do not install any coil containing refrigerant in a gas furnace which is to be operated during the heating season without attaching the refrigerant lines to the coil. Possible coil damage will result from excessive pressure build up during heating operation.

Typical downflow gas furnace installation consists of a coil without cabinet installed in the cavity of a downflow furnace. Coil with plastic pan is not suitable for upflow oil furnaces.

Installation procedure:

1. Turn off electrical power to furnace.
2. Remove the lower front panel of the furnace, and re-route any gas piping in front of coil compartment as required to install coil.

WARNING!

Contractor must comply with all local, state, and federal codes and regulations when working with gas piping. Personal injury or death may result from improper installations!

3. Remove the coil cover panel(s).
4. Remove knockouts in front left bottom of furnace for routing of refrigerant lines, low voltage wiring, and condensate drain.

5. Attach drain pan gasket provided, see figure "A", page 5, to underside of coil pan and center coil in coil cavity.
6. Connect drain hose to condensate pan fitting, securing with clamp. See figure "B", page 5.
7. Remove knockouts from coil cover panel(s), cut fiberglass insulation covering openings and reinstall cover.
8. Install silver backed tape provided to cover openings in interior panel door and over refrigerant lines to seal around lines
9. Connect refrigerant lines and make sure all connections are tight and without leaks.
10. Reconnect the gas piping if it was disconnected and seal off any openings at bottom of furnace. National, state and local codes must be followed.
11. Install filter if not located in furnace door.
12. Turn on gas/electrical supply and make final system check.
13. Replace front door.

SPECIAL CONSIDERATIONS FOR SELECTING HEAT PUMP COILS

The selection of indoor heat pump coils is much more critical than selection of indoor coils for air conditioning units. The differences are as follows:

1. Only indoor coils with expansion/check valve flow control devices may be used with outdoor heat pump units. These devices permit reversing refrigerant flow in the coils when changing from cooling to heating. All NTKcoil expansion valves and pistons have a built-in check making them heat pump capable when matched with the proper AHRI rated outdoor unit. **CAP TUBE OR FIXED RESTRICTOR COILS MUST NOT BE USED WITH HEAT PUMP.**
2. **Matching of indoor coils for heat pumps demands that the heat rejection capacity, internal volume, and equivalent metering device of the matched coil be at least equal to that of the smallest internal volume matched coil recommended by outdoor unit manufacturer for that outdoor unit.**
3. **It is important that selection be based on Nortek recommendation for a specific coil with a specific metering device to be used with an outdoor heat pump unit of a specific make, series, and model number.**
4. Failure to conform to proper selection requirements will affect efficiency, charging, and reliability and may result in damage to the system or system components.
5. The matching of specific indoor heat pump coils with specific outdoor heat pump units as certified in the heat pump section of the current AHRI Directory will assure proper and efficient operation of heat pump systems. See www.ahri.org.

SPECIAL INSTRUCTIONS FOR CHARGING HEAT PUMP COILS

Specific detailed instructions for refrigerant charging of a heat pump system as recommended. These instructions will differ between manufacturers, but in general are as follows:

WITH EXPANSION/CHECK VALVE IN INDOOR COIL, USE LIQUID LINE SUBCOOLING METHOD IN COOLING MODE. Measure following values from system: liquid line pressure at gauge and liquid line temperature. Compare measurements to refrigerant T&P chart. **Allow 20-30 minutes to insure the system has stabilized before verifying that the charge is correct. Adjust charge to achieve liquid line sub cooling.**

IF PISTON METERING DEVICE IS USED IN INDOOR COIL, USE SUCTION LINE SUPER HEAT METHOD IN COOLING MODE. Measure following values from system: Suction line pressure at gauge and suction line temperature. Compare measurements to refrigerant T&P chart. **Adjust charge to achieve Suction line super heat.**

NOTE: Micro-channel coils are charged differently than tube & fin coils.

If the installer encounters a problem using the outdoor manufacturers suggested charging method technician should contact the factory for assistance.

Figure "A" Drain Pan Gaskets

GASKETS

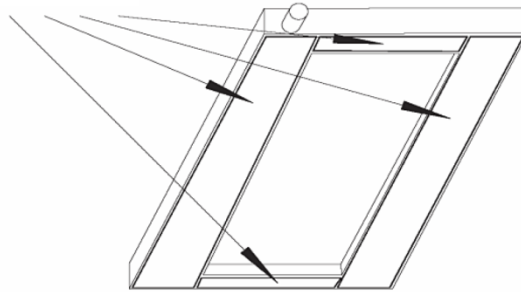


Figure "B" Drain Hose

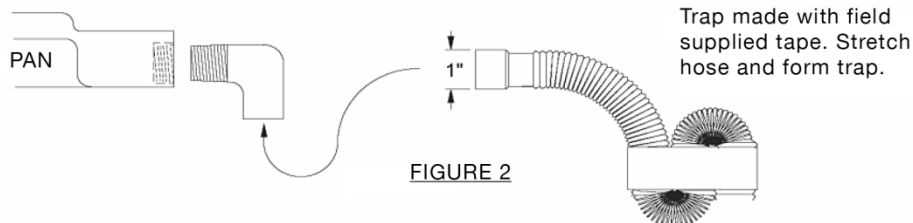
TWO FITTINGS ARE SHIPPED IN THE ACCESSORY PACKAGE TO BE USED WITH THE MOBILE HOME PLASTIC PAN THE 90 DEG ELL CAN BE SCREWED IN THE LEFT DRAIN FITTING (MAIN) TO TURN DOWN AND EXIT FURNACE

HAND TIGHTEN ONLY-OVERTIGHTENING CAN RESULT IN CRACKS IN DRAIN PAN
ENCLOSED DRAIN HOSE WILL SLIP OVER THE FITTING OR A STANDARD PVC FITTING CAN BE USED IF CODE REQUIRES
RIGHT DRAIN CONNECTION HAS A PLUG IN IT TO PREVENT FLOW UNLESS A SECONDARY DRAIN IS REQUIRED

A STRAIGHT FITTING IS SHIPPED IN THE ACCESSORY PACKAGE TO BE USED FOR THE AUXILIARY DRAIN
WHERE REQUIRED. REMOVE PLUG AND INSERT FITTING. TURN DOWN WITH A STANDARD 3/4 IN PVC ELL

INSTALLATION OF COLLAPSIBLE HOSE ON SINGLE / AUX. CONDENSATE DRAIN CONNECTION

CAUTION-----BEFORE INSTALLING COIL IN FURNACE, SEE FIGURE 2.



SLIP 1" I.D. SECTION OF HOSE ON TO 90 DEG. DRAIN FITTING.

HOSE IN SOME CASES IS VERY TIGHT BUT WILL STRETCH AS IT IS WORKED ON.

IF HOSE CAN BE LEFT ON DURING INSTALLATION, INSTALL PROVIDED HOSE CLAMP AT THE TIME

IF HOSE MUST BE REMOVED TO COMPLETE INSTALLATION MAKE SURE IT IS STRETCHED TO ALLOW FOR EASIER REATTACHMENT.

NOTE: Good preventive maintenance on heat pumps is critical to ensure proper airflow across the coils. Low airflow on indoor coils during winter months causes high head pressures and premature compressor damage due to oil breakdown. This problem is normally the result of a dirty air filter. The installer should instruct the homeowner of the importance of keeping filters clean.

CONTACT US FOR HELP OR FOR ANY COMMENTS ON OUR PRODUCTS. As we strive to better serve our customers like you, we are always ready to help you. We also welcome any comments from our customers concerning quality and improvements that could be made to our products.

Thank you for the purchase of our product.

THERMAL EXPANSION VALVE INSTALLATION INSTRUCTIONS

A. INTRODUCTION

Thermal expansion valve (TXV) can be used on both heat pump and air conditioning applications. All TV's have a built-in check valve making them heat pump capable. All are externally equalized with non-adjustable superheat and are available with non-bleed construction. Hard start capability for outdoor units is required when non-bleed valve is used. The external equalizer line attached to the TXV has a female flare nut with built in **Schrader valve depressor** that attached to the Schrader valve port provided on most coils.

B. INSTALLATION NOTES

With reference to Figure 1, the TXV assembly is to be installed between the flowrator distributor and the existing liquid line attached to the flowrator distributor.

WARNING: COIL IS PRESSURIZED. RELIEVE PRESSURE BEFORE INSTALLING TXV BY DEPRESSING SCHRADER VALVE ON COIL MANIFOLD IF NITROGEN, OR RECLAIM REFRIGERANT IF COIL HAS HOLDING CHARGE.

C. INSTALLATION STEPS ARE AS FOLLOWS:

1. After coil pressure has been relieved, turn female swivel nut counter-clockwise to remove.
2. Remove the piston from the flowrator distributor fitting using a small diameter wire or paper clip (ALWAYS REMOVE THE PISTON FROM THE DISTRIBUTOR BODY WHEN TXV IS INSTALLED).
3. Attach the TXV by connecting the female swivel nut on TXV outlet to the flowrator distributor (aligning Teflon seal first) and torque swivel nut to 10 – 30 in. lb.
4. Attach liquid line with female swivel nut to male rotalock fitting on TXV inlet (aligning Teflon seal first) and torque swivel nut to 10 – 30 in. lb.

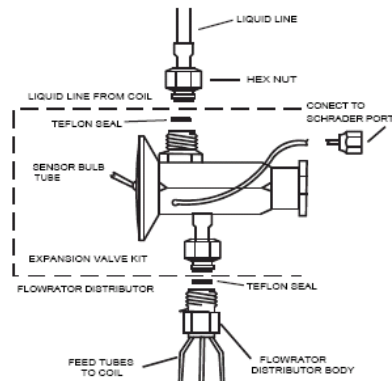
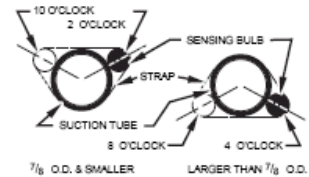


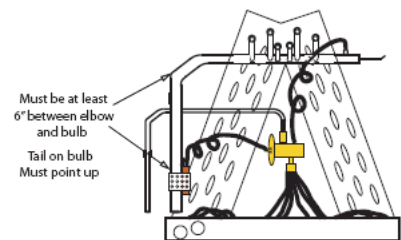
Figure 1

5. Remove the cap on Schrader valve port on coil manifold. Attach equalizer tubing with 1/4" female flare nut that includes depressor to this male Schrader port. Torque flare nut to 10 – 30 in. lb. **If using a different brand TXV, you must remove the Schrader valve core prior to attaching the equalizer tube.**
6. Install the TXV bulb to the suction manifold of coil or the suction line using the two bulb clamps, or single large clamp, furnished with kit.
 - a. Bulb should be installed on a horizontal run of the manifold if possible. On line 7/8" OD and smaller the bulb should be installed at 2 or 10 o'clock. With line larger than 7/8" OD, the bulb should be installed in a position of about 4 or 8 o'clock.



Horizontal Bulb Locations

- b. If bulb installation is made on a vertical run, the bulb should be located at least 6 inches from any bend, and on the tubing side opposite the plane of the bend. On vertical bulb installations, the bulb should be positioned with bulb capillary tube at the top.
- c. The bulb should be insulated using thermal insulation to protect it from the effect of the surrounding ambient temperature.



Vertical Riser Application

7. After completing installation of TXV (including equalizer tube), it will be necessary to leak check the coil and evacuate the coil through the service access fittings of liquid and suction line valves. SEE COIL AND UNIT INSTALLATION INSTRUCTIONS.

TXV Troubleshooting

TXV sensing bulbs are not installed at the factory and should be installed in the field **after** the line set connections are made to prevent damage and bulb charge loss. Additionally, sensing bulbs installed on a vertical line should be installed "bulb up" so the capillary tubes is coming out the bottom of the bulb to help keep the gas in the bulb.

The correct operation of a TXV is depending on a number of variables, and any variables for the TXV misdiagnosis, in the order of occurrence, are:

1. Airflow (minimum of 350 cfm per 12,000 BTUH).
2. Correct sensing bulb location, with maximum contact with the suction line, and insulated from ambient condition. (Bulb should be located on the suction line close to the evaporator outlet at the 10 or 2 o'clock position and away from bends).
3. System refrigerant charge.

When charging a TXV system, the contractor should always use the sub-cooling method. This method accomplishes two things:

1. A liquid seal at the TXV which allows proper metering.
2. Reduce the potential of overcharging.

TO DETERMINE SUB-COOLING

1. Take the high side pressure and convert it to temperature using chart or gauge (Saturation Temperature).
2. Measure the temperature of the liquid line as close to condenser as possible. Must make good connection from sensor to line
3. Take the difference between the above readings. (Saturation temp [GAUGE] – Liquid line temp = Sub-Cooling). **NOTE:** Liquid line refrigerant temperature should be within 7 - 10 degrees of the liquid line temp at condensing unit. If not, there could be restriction, over / under charged or line set is too long.

TXV are designed to maintain optimum Super Heat at the suction side of the evaporator coil. TXV system cannot be charged using the super heat method. However, super heat can be used to determine if the TXV is working correctly, but that is also dependent on the air flow.

TO DETERMINE SUPERHEAT

1. Take the suction line temperature as close to the condensing section as possible; stay at least 6 inches from the compressor.
2. Take the low side pressure reading from gauges and convert it to temperature using chart or gauges (Saturation Temperature).
3. Take the difference between the above readings: (Suction line temp – Saturation temp = Super Heat).
4. When outside air temperature is 75-85 degrees the superheat should be 12-15 degrees, if the ambient temperature is 85 degrees or over the superheat should be 8-12 degrees.
5. If superheat is low, flooding of the evaporator is occurring.
6. If superheat is high then starving the evaporator is likely.
7. Do not adjust charge. Ensure airflow is correct and check charge using sub-cooling method.

FOR ADDITIONAL INFORMATION ON TXV OPERATION AND APPLICATION SEE SPORLAN BULLETIN 10-9 WHICH IS LOCATED:

<http://www.parker.com/literature/sporlan/sporlan%20pdf%20files/sporlan%20pdf%20010/10-9.pdf>