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› Goodman TXV (Thermal Expansion Valve) Instruction Manual

Goodman TX3N2

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Model: TX3N2

1. PRODUCT OVERVIEW

The Goodman OEM Thermal Expansion Valve (TXV) is a critical component in HVAC and refrigeration systems designed to precisely meter the flow of liquid refrigerant into the evaporator coil. This specific model is engineered for systems utilizing R-22 refrigerant and is suitable for units with a cooling capacity ranging from 2.0 to 3.0 tons. Its primary function is to maintain a constant superheat at the evaporator outlet, ensuring optimal system efficiency and preventing liquid refrigerant from returning to the compressor.

This TXV is a non-bleed type accessory, featuring a robust construction primarily of copper and brass components, with black and blue accents. Its compact design allows for integration into various HVAC setups.

2. SAFETY INFORMATION

WARNING: Installation and servicing of HVAC equipment can be hazardous due to system pressure, electrical components, and sharp metal edges. Only qualified and trained HVAC technicians should attempt installation, maintenance, or repair of this component. Failure to follow these instructions could result in property damage, personal injury, or death.

- Always disconnect power to the HVAC unit before beginning any work.
- Wear appropriate personal protective equipment (PPE), including safety glasses, gloves, and long sleeves.
- Refrigerant systems operate under high pressure. Ensure proper refrigerant recovery and handling procedures are followed.
- Use caution when brazing; ensure proper ventilation and fire safety measures are in place.
- Refer to the overall HVAC system's installation and service manual for complete safety guidelines.

3. COMPONENTS

The Goodman TXV assembly includes several key components necessary for its function and installation:



Figure 1: Goodman TXV kit. This image displays the main thermal expansion valve body, the coiled copper sensing bulb with its capillary tube, the external equalizer line, and a black insulating sleeve designed to cover the sensing bulb. Also visible are various copper pipe sections and fittings, indicating the components required for a complete installation.

- **TXV Valve Body:** The main brass component that regulates refrigerant flow.
- **Sensing Bulb:** A copper bulb attached to the suction line, containing a charge that responds to temperature changes, controlling the valve.
- **Capillary Tube:** Connects the sensing bulb to the valve diaphragm.
- **External Equalizer Line:** A small copper tube that connects the outlet of the evaporator to the diaphragm chamber of the TXV, ensuring accurate pressure sensing.
- **Insulation Sleeve:** A black foam sleeve designed to insulate the sensing bulb from ambient air, ensuring it accurately senses the suction line temperature.
- **Fittings and Adapters:** Various copper and brass fittings for connecting the TXV to the refrigerant lines.

4. SETUP AND INSTALLATION

Installation of a TXV requires specialized tools and knowledge of HVAC refrigeration systems. It is strongly recommended that this procedure be performed by a certified HVAC technician.

1. **Refrigerant Recovery:** Safely recover all refrigerant from the system using a certified recovery machine.
2. **Isolation:** Close service valves to isolate the evaporator coil.
3. **Removal of Old TXV (if applicable):** Carefully cut and remove the old TXV, ensuring no debris enters the system.
4. **Brazing New TXV:** Braze the new Goodman TXV into the liquid line and evaporator inlet. Ensure a nitrogen purge is maintained during brazing to prevent oxidation. Connect the external equalizer line to the suction line.
5. **Sensing Bulb Installation:** Clean the suction line where the sensing bulb will be attached. Securely fasten the sensing bulb to the horizontal section of the suction line using clamps, ensuring good thermal contact. Insulate the bulb with the provided sleeve to prevent ambient temperature interference.
6. **Leak Check:** Pressurize the system with nitrogen and perform a thorough leak check using an electronic leak detector or soap bubbles.
7. **Evacuation:** Evacuate the system to a deep vacuum (typically 500 microns or lower) to remove all non-condensable gases.

and moisture. Hold the vacuum to ensure system integrity.

- 8. **Refrigerant Charging:** Recharge the system with the correct type and amount of R-22 refrigerant as specified by the system manufacturer.
- 9. **System Startup and Adjustment:** Start the system and allow it to stabilize. Monitor superheat and subcooling. Adjust the TXV if necessary to achieve the manufacturer's recommended superheat settings.

5. OPERATING PRINCIPLES

The Thermal Expansion Valve (TXV) operates by controlling the flow of liquid refrigerant into the evaporator based on the superheat of the refrigerant vapor leaving the evaporator. The sensing bulb, filled with a charge similar to the system's refrigerant, is attached to the suction line. As the temperature of the suction line changes, the pressure within the sensing bulb changes, which in turn acts on a diaphragm inside the TXV. This diaphragm movement opens or closes the valve's orifice, allowing more or less liquid refrigerant to enter the evaporator.

The goal is to maintain a small, consistent amount of superheat (typically 8-12°F) at the evaporator outlet. This ensures that all liquid refrigerant has vaporized before reaching the compressor, preventing liquid slugging and protecting the compressor from damage, while also maximizing the evaporator's heat transfer efficiency.

6. MAINTENANCE

TXVs are generally low-maintenance components. Regular HVAC system maintenance should include:

- **Leak Detection:** Periodically check for refrigerant leaks around the TXV connections using an electronic leak detector.
- **Insulation Integrity:** Ensure the sensing bulb insulation remains intact and properly secured to prevent inaccurate temperature readings.
- **Superheat Verification:** During routine service, a technician should verify the system's superheat to ensure the TXV is operating correctly.
- **Cleanliness:** Keep the area around the TXV clean and free of debris.

7. TROUBLESHOOTING

Common issues related to TXV malfunction and potential causes:

Symptom	Possible Cause (TXV Related)	Resolution
High Superheat / Low Suction Pressure	TXV underfeeding (stuck closed, restricted orifice, loss of bulb charge, improperly installed bulb)	Check bulb contact and insulation. Inspect for restrictions. Replace TXV if faulty.
Low Superheat / High Suction Pressure (Liquid Slugging)	TXV overfeeding (stuck open, oversized TXV, bulb losing contact, external equalizer line blocked)	Check bulb contact and insulation. Clear equalizer line. Replace TXV if faulty.
Fluctuating Suction Pressure / Superheat	Hunting TXV (improperly sized, poor bulb contact, external influences on bulb)	Verify bulb installation and insulation. Consider TXV replacement if hunting persists.

Note: Many system issues can mimic TXV problems. A thorough diagnosis by a qualified technician is essential to correctly identify the root cause.

8. SPECIFICATIONS

Attribute	Value
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Attribute	Value
Brand	Goodman
Model Number	TX3N2
Refrigerant Type	R-22
Cooling Capacity	2.0 - 3.0 Tons
HVAC Accessory Type	Non-Bleed
Exterior Material	Brass
Item Weight	1 pound
Product Dimensions	9.8 x 3.8 x 5.9 inches
Colors	Copper, Brass, Black, Blue

9. WARRANTY AND SUPPORT

Warranty information for Goodman products, including this TXV, is typically provided by the manufacturer or the authorized distributor/seller at the time of purchase. Please retain your proof of purchase for warranty claims.

For technical support, installation inquiries, or warranty service, please contact your certified HVAC technician or refer to the official Goodman website for their customer support contact information. Always provide the model number (TX3N2) and any relevant system details when seeking support.

Goodman Official Website: www.goodmanmfg.com

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Example: How do I reset this device or fix this error?

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