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YORK 3 Ton, 1/8 Inch El, R-410A

York Thermal Expansion Valve User Manual

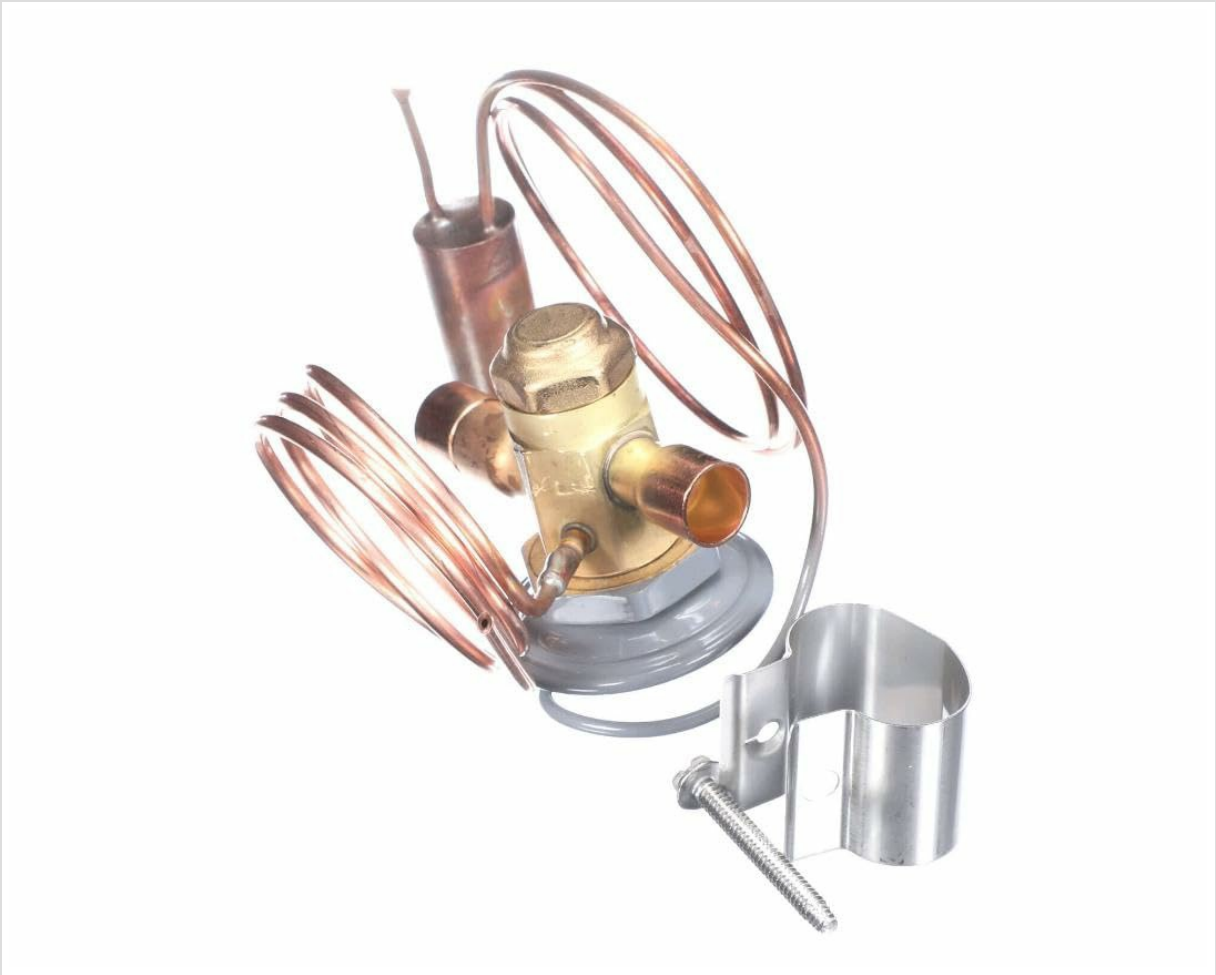
Model: 3 Ton, 1/8 Inch El, R-410A

1. Introduction

This manual provides essential information for the proper installation, operation, and maintenance of the York Thermal Expansion Valve (TXV). This genuine OEM part is designed to ensure optimal performance and reliability in compatible R-410A refrigerant systems. Please read this manual thoroughly before proceeding with any procedures.

2. Product Overview

The York Thermal Expansion Valve is a critical component in refrigeration and air conditioning systems. Its primary function is to regulate the flow of liquid refrigerant into the evaporator while maintaining a constant superheat at the evaporator outlet. This specific model is rated for 3-ton capacity and features a 1/8 inch equalizer line connection, designed for use with R-410A refrigerant.



An image showing the York Thermal Expansion Valve, featuring its brass body, coiled copper sensing bulb capillary tube, and a metal mounting bracket with a screw. The valve is designed for R-410A refrigerant systems.

3. Safety Information

- Installation and service of this component must be performed by qualified HVAC technicians.
- Refrigerant systems operate under high pressure. Always depressurize the system before attempting any service or installation.
- R-410A refrigerant requires specific handling procedures and tools. Ensure proper training and equipment are used.
- Wear appropriate personal protective equipment (PPE), including safety glasses and gloves, when working with refrigerants and HVAC systems.
- Refer to all applicable local and national safety codes and regulations.

4. Setup and Installation

Proper installation is crucial for the efficient operation of the TXV. This procedure should only be carried out by a certified HVAC professional.

1. **System Depressurization:** Ensure the refrigeration system is completely depressurized and evacuated before beginning installation.
2. **Valve Placement:** Install the TXV in the liquid line just upstream of the evaporator. Ensure the flow direction arrow on the valve body matches the refrigerant flow.
3. **Brazing Connections:** Use appropriate brazing techniques and materials for R-410A systems.

Protect the valve body from excessive heat during brazing to prevent internal damage.

4. **Equalizer Line Connection:** Connect the 1/8 inch equalizer line from the TXV to the suction line, typically downstream of the evaporator and sensing bulb.
5. **Sensing Bulb Installation:** Securely attach the sensing bulb to the suction line at the evaporator outlet. Ensure good thermal contact by cleaning the pipe surface and using a clamp. Insulate the bulb to prevent ambient temperature interference.
6. **Leak Testing:** After installation, perform a thorough leak test on all connections using an appropriate leak detector.
7. **Evacuation and Charging:** Evacuate the system to a deep vacuum and then charge with the correct amount of R-410A refrigerant according to the system manufacturer's specifications.

5. Operating Principles

The Thermal Expansion Valve operates by balancing forces to control refrigerant flow. The primary forces are:

- **Sensing Bulb Pressure:** The pressure exerted by the refrigerant in the sensing bulb, which corresponds to the temperature of the suction line.
- **Evaporator Pressure:** The pressure within the evaporator, acting to close the valve.
- **Spring Pressure:** An adjustable spring force that also acts to close the valve, determining the superheat setting.

When the superheat at the evaporator outlet increases, the sensing bulb temperature rises, increasing its internal pressure. This pressure overcomes the combined evaporator and spring pressures, opening the valve further to allow more refrigerant into the evaporator. Conversely, if superheat decreases, the bulb pressure drops, causing the valve to close slightly, reducing refrigerant flow. This continuous modulation ensures efficient heat transfer and protects the compressor from liquid slugging.

6. Maintenance

The York TXV is designed for long-term reliability. Regular system maintenance by a qualified technician is recommended to ensure its continued optimal performance.

- **Periodic Inspection:** Visually inspect the valve and connections for any signs of leaks, corrosion, or physical damage during routine system checks.
- **Superheat Verification:** Periodically check the system's superheat to ensure the TXV is functioning correctly. Adjustments should only be made by trained personnel.
- **Cleanliness:** Ensure the sensing bulb remains clean and securely attached to the suction line with proper insulation.
- **System Cleanliness:** Maintain overall system cleanliness to prevent contaminants from affecting TXV operation.

7. Troubleshooting

If the refrigeration system is not performing as expected, the TXV may be a contributing factor. Troubleshooting should be performed by a qualified technician.

Symptom	Possible Cause	Action

Symptom	Possible Cause	Action
High Superheat, Low Suction Pressure	TXV stuck closed or restricted; low refrigerant charge; dirty evaporator coil.	Check refrigerant charge; clean evaporator; inspect TXV for blockage or failure.
Low Superheat, High Suction Pressure (Liquid Slugging)	TXV stuck open; sensing bulb loose or uninsulated; oversized TXV.	Re-secure/insulate sensing bulb; inspect TXV for failure; verify correct TXV sizing.
Fluctuating Superheat/Suction Pressure	Moisture in system; non-condensables; improper sensing bulb contact.	Evacuate and recharge system; check sensing bulb installation.
External Refrigerant Leak	Loose connections; damaged valve body or capillary tube.	Locate and repair leak; replace TXV if damaged.

Always consult with a professional HVAC technician for accurate diagnosis and repair of TXV-related issues.

8. Specifications

Product Type: Thermal Expansion Valve

Brand: YORK

Model Identifier: 3 Ton, 1/8 Inch EI, R-410A

Refrigerant Compatibility: R-410A

Capacity: 3 Ton

Equalizer Line Connection: 1/8 Inch

Product Dimensions: 9 x 6 x 5 inches

Item Weight: 1 Pound

Manufacturer: York

ASIN: B0BW55652T

Date First Available: February 18, 2023

9. Warranty Information

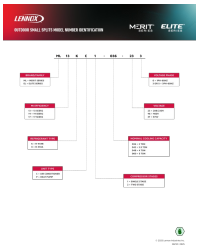
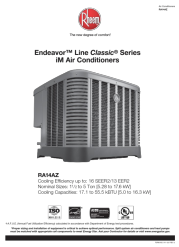
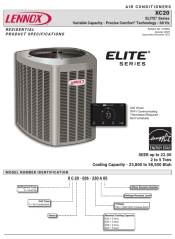
This York Thermal Expansion Valve is a genuine OEM part. Warranty coverage for this product is typically provided by the manufacturer, York, against defects in materials and workmanship. Specific warranty terms, duration, and conditions may vary. Please retain your proof of purchase and contact your seller or the official York customer support for detailed warranty information and claims procedures.

10. Support Information

For technical assistance, installation guidance, or troubleshooting beyond the scope of this manual, please contact:

- Your authorized York distributor or HVAC service provider.
- The seller from whom you purchased this product.
- Refer to the official York website for contact information and additional resources.

Related Documents - 3 Ton, 1/8 Inch El, R-410A

	[Lennox Small Splits Model Number Identification Guide] A guide to understanding Lennox Outdoor and Indoor Small Splits model numbers, detailing specifications like brand, efficiency, refrigerant type, voltage, cooling capacity, and unit type.
	[Rheem Endeavor Line Classic Series iM Air Conditioners RA14AZ] Detailed specifications and features for the Rheem Endeavor Line Classic Series iM Air Conditioners, model RA14AZ. Includes technical data, dimensions, performance, and installation guidelines.
	[YORK Sun Premier Rooftop Units 25-50 Ton Installation and Maintenance Manual] Detailed installation and maintenance guide for YORK Sun Premier 25-50 Ton Rooftop Units (RTUs). Covers unit specifications, installation procedures, electrical requirements, safety protocols, and routine maintenance for optimal performance.
	[TruClimate 100 1.5-6 Ton Installation Manual | WaterFurnace Commercial Heat Pumps] Comprehensive installation manual for the WaterFurnace TruClimate 100 commercial water-to-water heat pump (1.5-6 Tons), covering general installation, water quality, piping, electrical, controls, and troubleshooting.
	[Carrier WeatherMaker® 48TC Rooftop HVAC: Gas Heat/Electric Cooling Product Data] Explore the Carrier WeatherMaker® 48TC series of packaged rooftop units, offering gas heat and electric cooling for 6 to 15 nominal tons. This product data document details specifications, performance, options, and applications for efficient commercial HVAC solutions.
	[Lennox XC20 Elite Series Variable Capacity Air Conditioner Specifications] Detailed specifications, features, and installation information for the Lennox XC20 Elite Series variable capacity air conditioner, offering precise comfort and up to 22.00 SEER.