

Technical Article | Thermostatic Expansion Valves

Thermostatic Expansion Valve Troubleshooting

Tips and tricks for TXVs in air conditioning systems.

Thermostatic expansion valves (TXVs) are often misdiagnosed as the root problem in poorly performing air conditioning and heat pump systems. The truth is that two-thirds of TXVs returned to Danfoss show no signs of failure. For this reason, Danfoss recommends taking a system-wide approach when troubleshooting. Eliminate all other components as a source of the system's performance issues before investigating the TXV as the culprit.

Low airflow

Low airflow is one sign that the cooling system is not functioning properly that has nothing to do with the TXV.

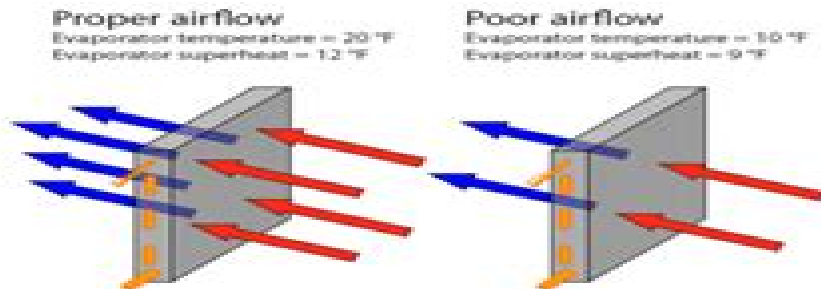


Figure 1

Figure 1 shows two identical evaporators being fed by a TXV with the evaporator on the left getting adequate airflow while the one on the right has inadequate airflow (note the superheat values and evaporator temperatures). Low airflow can be caused by a dirty or clogged air filter or a malfunctioning fan or blower motor, so be sure to investigate those components as the source of insufficient airflow. Low refrigerant charge

Low refrigerant charge

Proper charge	Poor charge
Evaporator temperature = 20 °F	Evaporator temperature = 5 °F
Evaporator superheat = 12 °F	Evaporator superheat = 28 °F
Condenser subcooling = 12 °F	Condenser subcooling = 2 °F

Figure 2

As seen in the table in Figure 2, a low refrigerant charge will result in a higher superheat and a lower subcooling and lower evaporator pressure. The biggest difference between low airflow and low charge is the level of superheat and subcooling. In a poor refrigerant charge scenario, the load is still there, but there is not enough refrigerant to absorb the heat. If signs point to the refrigerant charge being low, charge the system while following proper field procedures or original equipment manufacturer's (OEM's) recommendation.

Upstream obstructions

An obstruction in the liquid line, such as a clogged filter drier or smashed or crimped liquid line tubing, can produce flash gas (see Figure 3), even though there is a proper refrigerant charge. Make sure to check upstream for blockages if there is flash gas at the TXV inlet. Check subcooling at both the condenser outlet and the TXV inlet prior to adding any refrigerant. A dirty or clogged filter drier is a potential culprit, especially since they are most often installed upstream from TXVs.

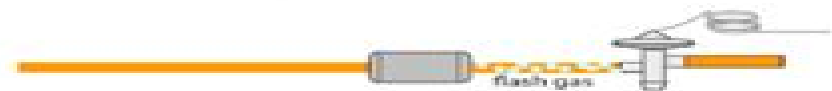


Figure 3

Valve installation

Ensure that the valve has been correctly installed: inadequately brazed fittings or mounted bulbs will all negatively affect the TXV's ability to operate. Inspect the valve, looking for physical signs of damage, such as dents in the power element, kinks in the tubing, or signs of overheating like discoloration.

Txv Troubleshooting Guide

Tobias Bleicker

A red circular graphic with a gradient, appearing as a stylized arrow or a partial circle, located to the right of the author's name.

Txx Troubleshooting Guide:

Air Conditioning Service Guide 2nd Edition Michael Prokup, 2021-09-01 Now in its Second Edition this training manual was written by industry renowned presenter and author Michael Prokup This e book is a comprehensive reference for servicing R 22 R 410A residential split air conditioning systems and is a must have for every student and service technician Step by step service procedures and quick reference diagrams will help guide technicians through troubleshooting and service 168 pages and fully illustrated Copyright 2022 Topics covered include Mechanical Refrigeration Cycle Basics Refrigerants and Oils Superheat Subcooling and Condensers Refrigerant Piping Charging Diagnosing Refrigeration Circuit Problems High Voltage Circuit Compressors ECM Blower Motors PSC Motors Air Volume

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information necessary to properly charge modern equipment Basic Refrigeration and Charging Procedures covers refrigerant pressures states and conditions how they apply to the refrigeration system vapor pressures subcooling superheat saturation latent heat sensible heat and the refrigeration cycle Basic system components their functions and applications are included Detailed explanations of each point in the refrigeration cycle will clarify questions the reader may have *Understanding Your AC Split System: An Illustrated Guide to Home Cooling* Charles Nehme, In our pursuit of comfort especially during sweltering summers or unexpectedly warm days the air conditioner has become an indispensable part of modern living Among the various types of cooling systems available the AC split system stands out for its efficiency quiet operation and widespread use in homes and offices around the globe It s a marvel of engineering designed to quietly transform uncomfortably warm air into a cool refreshing breeze While we often take our air conditioners for granted simply turning them on with the press of a button the intricate dance of components working within those sleek indoor and rugged outdoor units is fascinating Have you ever wondered what exactly happens when you lower the temperature on your thermostat What allows heat to be magically pulled from your living room and expelled into the outside air This book *Understanding Your AC Split System* aims to demystify this essential appliance Using an exploded view as our guiding map we will embark on a journey to explore each individual part of a typical AC split system We ll uncover its function understand its importance to the overall cooling process and see how these diverse components collaborate in a complex yet harmonious system By the end of this guide you won t just be operating your air conditioner you ll be understanding it This knowledge will not only satisfy your curiosity but also empower you to appreciate the technology identify potential issues and perhaps even perform basic maintenance that can extend the life and efficiency of your unit Get ready to peel back the layers and discover the fascinating world inside your AC split system your personal gateway to home cooling **Air Conditioning Heating & Refrigeration News** ,1988 **Heating, Ventilating, and Air-conditioning Fundamentals** Raymond A. Havrella,1981 **Heating, Cooling, and Ventilating** ,1987 *Automotive Heating, Ventilation, and Air Conditioning Systems* ,1991-02 **Troubleshooting and Servicing Heat Pumps** Richard Jazwin,2002 This unique field guide discusses in detail the various aspects of heat pump selection installation and service This book covers basic heat pump operation including a review of the refrigeration cycle heat pump configurations four way valves electrical schematics defrost systems controls and accessories the scroll compressor and service and troubleshooting *Your Personal Hvac Troubleshoot Guide* johnnie thomas,2024-08-01 Whether you re a DIY enthusiast a curious homeowner or just someone tired of paying exorbitant repair bills this book offers a refreshing take on home maintenance It s packed with smooth easy to follow instructions that feel more like a conversation with an old friend than a technical lecture You ll uncover impractical yet charming tidbits about HVAC systems that will make you the star of your next dinner party

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