

*Ask
for a
TXV!*

Air conditioning is a major energy consumer—accounting for as much as half of summer energy bills. If you are in the market for a new central air conditioning or heat pump system, choosing one that's equipped with a Thermostatic Expansion Valve (known as a TXV or a TEV) will result in superior performance over a wide range of operating conditions, as well as energy and cost savings.

A TXV meters the flow of refrigerant to the indoor/evaporator coil of your central air conditioner.* Much as our eyes automatically adjust to changes in light conditions, a TXV automatically adjusts to changing cooling conditions. When the cooling load is high, the TXV opens wider to allow more refrigerant to flow through the indoor coil. When the cooling load is low, the TXV reduces the flow of refrigerant, thus creating a more efficient air conditioning system.

IF I DON'T HAVE A TXV, WHAT DO I HAVE?

Air conditioners that are not equipped with a TXV come with fixed orifices or capillary tubes. Although these devices also meter the flow of refrigerant to the indoor coil, they do not change size. Instead, changes in refrigerant flow respond to system pressure dynamics, which is not as precise or complete as the control provided by a TXV.

* A TXV provides the same performance benefits for central heat pump systems as for central air conditioning. For simplicity, this fact sheet discusses the central air conditioner application only.

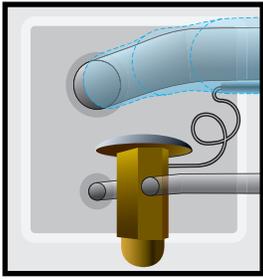
BENEFITS OF A TXV

Cooling When You Need It

For your central air conditioner to maintain comfort, its rated capacity, as measured in British Thermal Units (BTUs) per hour, must match the cooling requirements or “cooling load” of your home or business. The cooling load varies constantly due to outdoor temperature changes, sun intensity, and other factors—including indoor activities, fixtures, or appliances that generate heat, such as cooking, display case lighting, or refrigeration. A TXV can help your system better respond to these continuously changing requirements.

Compressor Protection

A TXV maintains your air conditioner's rated cooling capacity when the cooling load is high by increasing the flow of refrigerant to the indoor coil. Under high cooling loads, a fixed orifice or capillary tube may starve the coil of refrigerant, since it is set to work well under average conditions. If more refrigerant enters the evaporator coil than can be evaporated during low cooling conditions, liquid refrigerant can reach and damage the compressor. Thus a TXV protects the compressor and can increase its life and reliability.



Example of an exterior TXV

Energy Savings

A TXV-equipped air conditioner provides energy savings. Tests with TXVs have shown that they maintain a higher level of air conditioner efficiency than systems without them, even when refrigerant charge is below the manufacturer's specifications.

Recent field studies suggest that approximately 75% of installed cooling equipment may be improperly charged. According to the US EPA, improper refrigerant charge can lower efficiency by 5% to 20%.

WHAT DOES IT DO?

The TXV opens and closes in response to the cooling load by sensing the temperature of the gaseous refrigerant at the outlet of the indoor coil. When the temperature rises in the air flowing over the coil, the load on the coil increases. The TXV senses this change and opens to let more refrigerant into the coil. The additional refrigerant absorbs more heat from the air flowing over the coil. When the cooling load decreases, the TXV reduces the flow of refrigerant to the coil.

The TXV controls refrigerant flow so that a constant temperature difference is maintained. A sensing bulb is attached to the suction line and connected to the TXV with a small copper tube. This tube and the sensing bulb tell the TXV when to open and close. The sensing bulb should be located properly, tightly clamped to the suction line, and covered in insulation.

WHERE DO I GET A TXV?

There are two types of central air conditioners: split system and package unit. In a split system, the condenser and indoor coil are separate. If you are buying a split system, ask your contractor to make sure that it includes a TXV. At your request, your contractor will either install a TXV or order an indoor coil that comes with a factory-installed TXV.

A package unit combines the condenser and indoor coil in one outdoor housing. If you are buying a package unit, it is preferable to purchase one that comes with a TXV. Adding a TXV to a package unit after purchase is not recommended, because replacing the factory-installed metering device may void the warranty.

HOW CAN I TELL IF I HAVE A TXV?

If your contractor installs the TXV, it will be visible and located outside the indoor coil. The TXV is a brass valve that is connected to the indoor coil by copper tubing coming from the outdoor condenser. A factory-installed TXV is located inside the indoor coil cabinet and can be seen before the

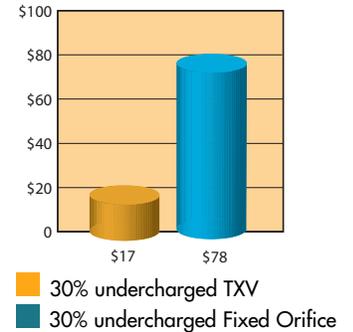
cabinet is installed. Manufacturers may provide indication of a factory-installed TXV in the model number or on other product labeling.

WILL A TXV COST EXTRA?

A TXV added to your split system central air conditioner by your contractor could cost between \$100 and \$200. A factory-installed TXV could cost an additional \$40 to \$70. As you can see from the graph, however, a TXV could save you approximately \$61 over one cooling season if your central air conditioner is undercharged (i.e. lacks the proper amount of refrigerant).

Because proper refrigerant charge is important for all air conditioning systems, having your system serviced by a licensed Heating, Ventilation, and Air Conditioning (HVAC) contractor with a C-20 state licensing certification is important too. And when you install a new central air conditioner, get the most value for your investment by choosing one that includes a TXV.

First Year Cost of Undercharge Operation at 95°F and Above



RELATED FACT SHEETS

- Buying an Air Conditioner? Remember the EER!
- What Is HVAC System Sizing? • Duct Testing: Why Is It Important? • A Whole-System Approach to Heating and Cooling • Cooling • Heating • Heat Pump • Air Conditioner Refrigerant Charge and Airflow

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