



## Virtual Engineer: Sporlan Division

### Temperature Responsive Expansion Valve

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#### Temperature Responsive Expansion Valve

The function of a temperature responsive expansion valve (TREV) is to prevent the compressor from running excessive discharge temperatures by injecting liquid refrigerant into the suction line. This valve responds to the temperature of its sensing bulb which is located on the discharge line, normally 6 to 12 inches (15 to 30 cm) from the compressor's discharge service valve. As the discharge temperature at the bulb location rises above the valve's setting, the valve feed liquid to suction which reduces discharge temperature. The TREV may also be used to maintain proper discharge temperatures with two-stage compressors and would be installed to inject liquid refrigerant into the interstage in this case.

Refer to [Bulletin 10-10-2](#) for more information on Sporlan Temperature Responsive Expansion Valves.

# Valve Sizing in Virtual Engineer

## Inputting Sizing Information

**Refrigerant** is the type of refrigerant the system is operating with, by ASHRAE R-number designation.

**Evaporator Temperature** is the saturated temperature at evaporator or suction pressure. Virtual Engineer will allow Liquid Temperature to be less than the Evaporator Temperature.

**Condensing Temperature** is the saturated temperature at discharge or condensing pressure. It is checked against the Liquid Temperature. Virtual Engineer will not allow Condensing Temperature to be less than Liquid Temperature.

**Liquid Temperature** value is the liquid refrigerant temperature at the inlet of the expansion valve.

**Suction Vapor Temperature** is the temperature of the suction vapor entering the compressor.

**Bulb Temperature Setting** is the maximum allowable compressor discharge temperature.

**Compressor Capacity** is the total cooling capacity of the compressor the temperature responsive valve is protecting. Virtual engineer expects one TREV per compressor

Enter the required information into the left pane of the sizing tool. As information is entered, Virtual Engineer will filter products meeting that criteria in the right pane. When you have entered the required information, valid products will be available to compare in the right pane. All valid products are included to compare by default. You may uncheck any product you don't wish to compare.

## Getting Results and Comparing Choices

Click the "Compare" button at the top of the right pane to be taken to the Compare Table. The Compare Table will display the results of the selection, and the values input. The best selection within each compared product will be highlighted. The Compare Table will also show other selections within the compared products.

Click the "Select Columns" button at the upper left corner of the Compare Table to select what values you would like to appear in the Compare Table. Below is a quick explanation of the columns that can be selected for the temperature Responsive Expansion Valve tool:

- **Valve Type:** The family that the valve belongs to
- **Nominal Capacity:** The rated capacity of the valve per ANSI/AHRI Standards
- **Percent of Rated Capacity:** How much of the valve's capacity is being used

- **Maximum Rated Pressure:** The maximum working pressure of the valve in ambient conditions
- **Warnings:** Any warnings associated with the selection, such as a high or low loading condition, will display here.

After selecting columns, you can click and drag the column header to change the order of the columns. You can also click the ▼ in the column headers to further narrow or sort your results.

Click the “Group by Series” button at the top of the Compare Table to group the results by the valve family they belong to. Click the button again to ungroup.

Click the “Close” button below the Compare Table or the X in the upper right corner of the screen to close the Compare Table and return to the input screen.

## Configuring a Part and Saving Results

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In the second column of the Compare Table, there are two buttons that can appear: “Configure” or “Select.”

Click the “Configure” button next to the desired series to be taken to its eConfigurator. The eConfigurator can be used to configure a part according to your unique system. The eConfigurator will give an item number that can be used to purchase your part. Click the “Save” button to save your configuration and return to Virtual Engineer’s dashboard. The configured part will appear in your system.

If a “Select” button appears next to the desired series, then there is no eConfigurator currently available for that product, and the series will be selected without any configuration.

Click the “Export” button at the upper right corner of the Compare Table to save your results as an Excel spreadsheet.

Click the blue page icon in the “RPT” column of the Compare Table to generate a summary report of your inputs and choices. If the part was configured using an eConfigurator, the item number will also appear in the summary report. This report can be downloaded as a PDF and printed as needed.