



## Virtual Engineer: Sporlan Division

### Solenoid Valves

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#### Solenoid Valves

The primary purpose of an electrically operated solenoid valve is to control automatically the flow of fluids, liquid, or gas. Sporlan Solenoid Valves may be applied on a wide variety of applications. Each coil offered for Sporlan solenoid valves is interchangeable between a number of valves within a given size range.

There are two basic types of solenoid valves. The most common is the normally-closed type, in which the valve opens when the coil is energized and closes when the coil is de-energized. The other type is the normally-open valve which opens when the coil is deenergized and closes when the coil is energized. Occasionally, circumstances require that a solenoid valve be opened independently of the electrical power. Therefore, a manual lift stem is available on all valves from the B6 and E6 series up through the MA50 series.

Refer to [Bulletin 30-10](#) for more information on Sporlan solenoid valves.

## Solenoid Sizing in Virtual Engineer

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Virtual Engineer will attempt to select the smallest size valve such that the pressure drop across the valve is less than or equal to the following pressure drops:

Service	Pressure Drop (psi)
liquid line	1°F equivalent, 1 psi minimum
suction line	2°F equivalent, 1 psi minimum
discharge line	10

### Inputting Sizing Information

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**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.

**Suction Vapor Temperature** is the temperature of the suction vapor entering the compressor. Virtual Engineer will not allow Suction Vapor Temperature to be less than Evaporator Temperature.

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

**Line Capacity** is the cooling capacity the valve controls.

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

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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. Virtual engineer assumes isentropic compression plus 50°F, with 25°F superheated vapor entering the compressor.

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 solenoid tools:

- **Solenoid Valve Type:** The family that the valve belongs to
- **Coil Size:** Standard Sporlan Coil Sizes are MKC-1, MKC-2, OMKC-1, and OMKC-2. Refer to [Bulletin 30-10](#) for more information on Sporlan Coils.
- **Pressure Drop:** Reduction of pressure from inlet to outlet of the valve
- **Percent Rated Capacity:** How much of the valve’s capacity is being used
- **Confidence Factor:** How close the Percent Rated Capacity is to 100
- **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.