



Virtual Engineer: Sporlan Division

Evaporator Pressure Regulators

Contents

Evaporator Pressure Regulators	1
Mechanical Evaporator Pressure Regulator	1
Electric Evaporator Pressure Regulator	2
Valve Sizing in Virtual Engineer.....	2
Inputting Sizing Information	2
Getting Results and Comparing Choices	3
Configuring a Part and Saving Results	4

Evaporator Pressure Regulators

Sporlan Evaporator Pressure Regulating valves (EPRs) are designed to provide an economical means of accurately maintaining evaporator pressure and temperature under varying evaporator loads. The primary function of an EPR is to prevent the evaporator pressure from falling below a predetermined value or setting. Sporlan EPRs provide consistent evaporator pressures and temperatures (during decreasing load conditions) for excellent system temperature control, and they allow multiple evaporator systems to operate at different temperatures when piped to a common suction group.

Mechanical Evaporator Pressure Regulator

Sporlan offers three types of mechanically operated evaporator pressure regulating valves, covering applications from small spot coolers to large multiplex supermarket systems. A consistent evaporating temperature is maintained at the valve setting as evaporator loads decrease. When the evaporator load increases, the valve **O**pens on a **R**ise of **I**nlet pressure above its setting. The ORIT-6 and ORIT-10 valves are direct acting and offered with standard adjustment ranges and fitting options. The (S)ORIT and (S)ORIT-PI pilot operated valves provide more capacity at lower pressure drops, and offer additional features including solenoid shut off for defrost applications.

While EPRs are most commonly used in systems with multiple evaporators, such as in supermarket applications, they can also be used in single evaporator/single compressor systems. However, there are several factors to consider with this application. Proper valve selection is critical. Since pressure drop in the suction line is lost efficiency, EPRs are commonly oversized to reduce suction line pressure drop.

Refer to [Bulletin 90-20](#) for more information on Sporlan Mechanical Evaporator Pressure Regulators.

Electric Evaporator Pressure Regulator

The Sporlan CDS family represents a line of electronically controlled step motor valves, designed to contribute minimal pressure drop to the system. By providing synchronized signals to the step motor, discrete angular movements are translated through a Digital Linear Actuator (DLA) into precise linear positioning of the valve piston. The balanced pistons and ports are uniquely characterized, providing superb flow resolution and performance across a range of applications and operating conditions.

Sporlan CDS valves are available in two styles—the CDS-2, CDS-4 and CDS-7 provide 2500 steps of resolution, while the larger CDS-9, CDS-16 and CDS-17 provide 6386 steps of resolution. Capable of tremendous versatility, CDS valves can be used to replace a variety of mechanical and solenoid valves throughout typical refrigeration and air conditioning systems, where low pressure drop and precise refrigerant flow control are desired. And because the valves are powered by an external controller, no pilot lines or high to low side bleeds are required.

Refer to [Bulletin 100-40](#) for more information on Sporlan Electric Evaporator Pressure Regulators.

Valve Sizing in Virtual Engineer

Inputting Sizing Information

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

EPR Valve Setting is the evaporator temperature setpoint for the valve. Virtual Engineer will not allow EPR Valve Setting to be less than the Common Suction Temperature.

Common Suction Temperature is the saturated temperature of the suction header to which this Evaporator Pressure Regulator is connected.

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

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

Evaporator Capacity is the total cooling capacity of the evaporator(s) which this Evaporator Pressure Regulator 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, including (S)ORIT, (S)ORIT-PI, and CDS(T) valves. 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, based on a % loading criteria of 0%-120%.

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 Evaporator Pressure Regulator 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
- **Mechanical or Electric Valve:** Is the valve mechanically or electrically operated?
- **Internal Port Size:** The size of the valve's internal port
- **Adjustment Range (Mechanical Only):** The pressure adjustment range
- **Maximum Rated Pressure:** The maximum working pressure of the valve in ambient conditions
- **Required Pressure Drop:** Reduction of pressure required to deliver specified capacity
- **Number of Steps (Electric Only):** Total number of steps at full stroke
- **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

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.