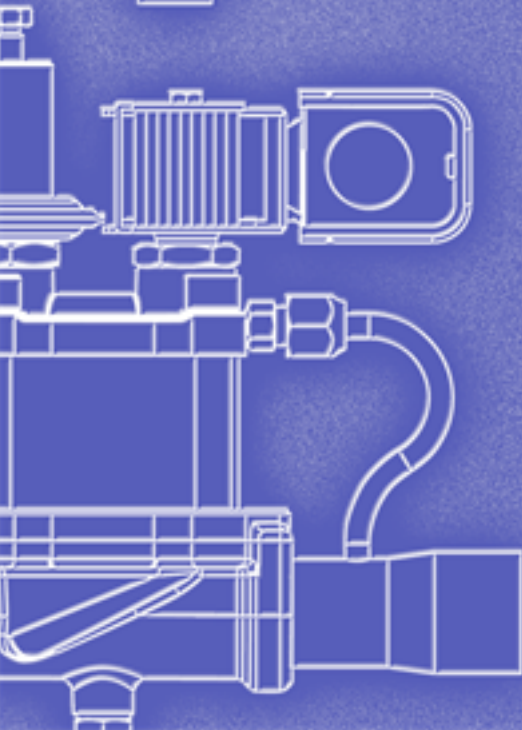
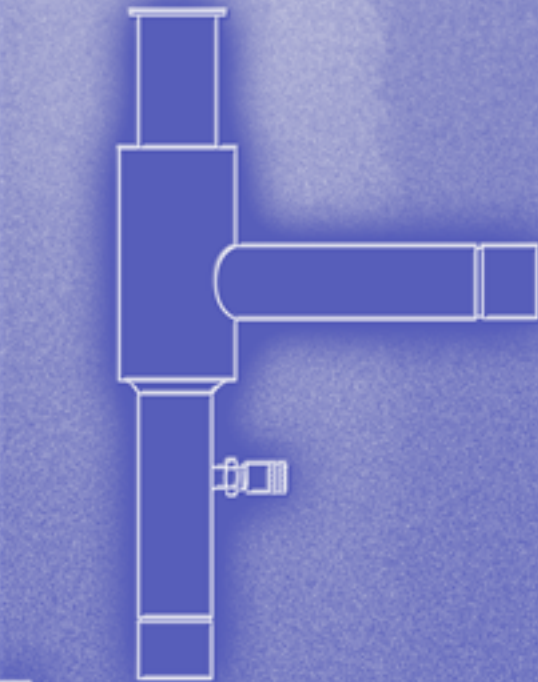
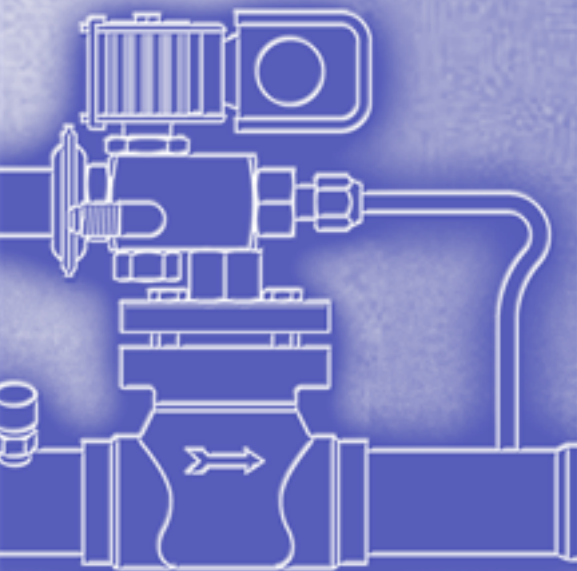


EVAPORATOR PRESSURE REGULATING VALVES

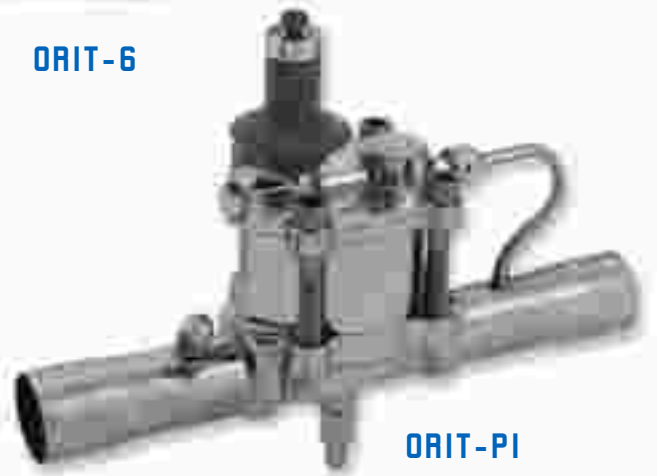
for Evaporator Temperature Control



SORIT-12



ORIT-6



ORIT-PI

ORIT-6

ORIT-15

ORIT-PI

SORIT-12



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FOR USE ON REFRIGERATION and/or AIR CONDITIONING SYSTEMS ONLY

Bulletin 90-20, May 2007, supersedes Bulletin 90-20, November 2001, 90-20-1, August 1991, 90-20-2, January 1996, and 90-20-2A, January 1999 and all prior publications.

Evaporator Pressure Regulation

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. 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.

Controlling evaporator temperature, by maintaining the saturation pressure of the refrigerant in the evaporator, provides more consistent evaporator temperature than a conventional thermostat or suction pressure cut-out control. These methods of control allow the evaporator pressure to decrease as the load drops off; lowering the evaporator temperature and decreasing evaporator performance, while increasing evaporator frost build up.

Sporlan offers three types of evaporator pressure regulating valves, covering applications from small spot coolers to large multiplex supermarket systems. The ORIT-6 and ORIT-10 EPRs are direct acting and offered with standard adjustment ranges and fitting options. The (S)ORIT and (S)ORIT-PI pilot operated EPRs provide more capacity at lower pressure drops, and offer additional features including solenoid shut off for defrost applications.

Application

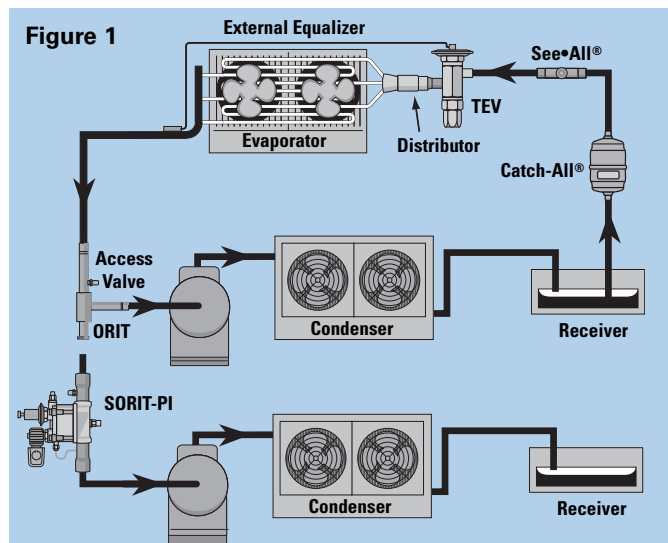
Sporlan evaporator pressure regulating valves are used in many applications to provide:

- **Consistent evaporator pressures and temperatures (during decreasing load conditions) for excellent system temperature control.**
- **Allow multiple evaporator systems to operate at different temperatures when piped to a common suction group.**

These applications are categorized as single evaporator or multiple evaporator systems.

Single evaporator/single compressor systems:

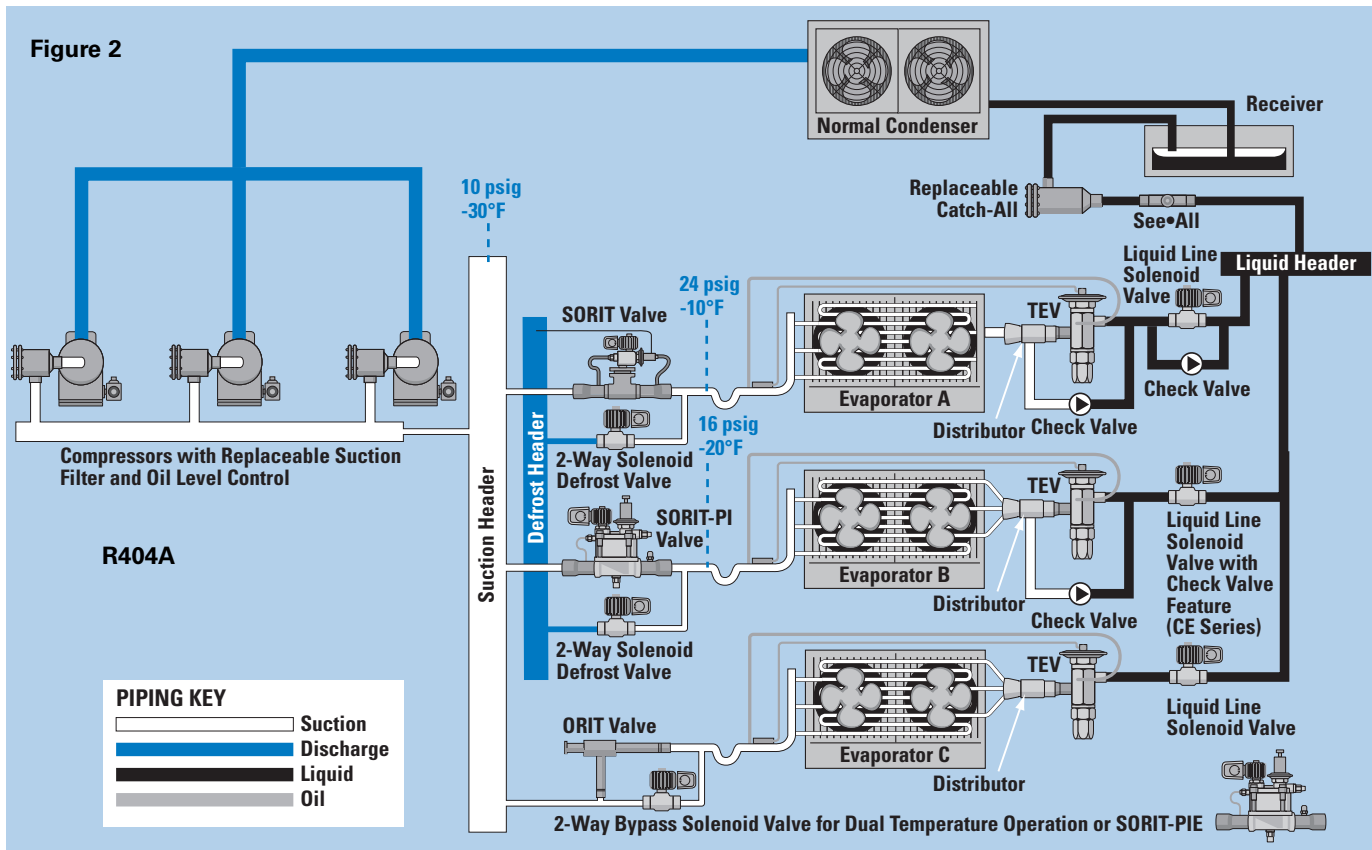
There are many single evaporator systems which utilize EPRs for precise evaporator temperature control (see Figure 1). However, there are several factors to consider. Proper valve selection is critical. Since pressure drop in the suction line is lost efficiency, EPRs are commonly oversized to reduce suction line pressure drop. Single evaporator systems can allow as little as 2 psi drop across direct acting EPRs (0.5 psi drop across SORIT and 1.0 psi drop across SORIT-PI pilot operated EPRs,) and still maintain acceptable control. Severely oversized valves can cause pressure hunting and negatively impact temperature control.



In addition, special consideration must be given to single compressor systems. In these applications the suction pressure can drop to an undesirably low level as the EPR throttles to maintain the evaporator pressure. In these cases, a discharge bypass valve must be used to maintain acceptable compressor suction pressure. These valves are typically piped with the valve outlet feeding the suction line downstream of the EPR. Special considerations must be taken to protect the compressor from overheating when using a discharge bypass valve. These considerations and the application of the discharge bypass valve are discussed further in Sporlan Bulletin 90-40. Bypassed discharge gas can be introduced at the inlet of the evaporator or upstream of the evaporator pressure regulator to maintain a minimum suction pressure. But, the discharge bypass valve must be externally equalized, and the external equalizer connection must be downstream of the evaporator pressure regulator.

Multiple evaporator systems:

Many supermarket applications use multiple evaporators piped to a common suction header (see Figure 2). These evaporators can be operated at different temperatures for the various products being refrigerated. This is the most common application for pilot operated EPRs. Any group of evaporators where the desired saturation temperature is higher than the saturation temperature corresponding to the common suction pressure will require an EPR. For example, if evaporator A in Figure 2 is designed for -10°F (24.0 psig for R404A), and evaporator B for -20°F (16.0 psig), an EPR would be used to maintain evaporator A at the 24.0 psig setting. In addition, if the common suction at the compressors was set for -30°F (10.0 psig) then an EPR would also be required on evaporator B. In many applications, EPRs are installed with every evaporator group to act as a suction stop solenoid valve for defrost while still maintaining the flexibility to set the evaporator saturation pressure if necessary. As with the single evaporator applications,



proper valve selection will always yield the optimum performance under all operating conditions (See selection procedure for more detail).

Loop Systems:

On these systems, the evaporator groups are piped to a common liquid and suction trunk line “looped” throughout the store. EPRs are installed in or near the case on loop systems. Sporlan direct acting ORITs and the internally piloted (S)ORIT-PIs are recommended for loop systems requiring EPRs. Externally piloted (S)ORITs are not recommended, as high pressure vapor is required to operate the valve.

Dual Temperature Applications:

Dual temperature applications allow a supermarket to operate a refrigerated display case at either low or medium temperature to meet the promotional needs of the store. Typically a refrigerated display case (or cases) applied in this manner would be piped to the low temperature suction group.

Direct acting ORIT-6 and -10 EPRs are used in these applications with a solenoid valve in parallel (see Evaporator C, Figure 2). If a normally closed solenoid valve is used, energizing the coil will bypass the EPR and allow the case to pull down to the common suction pressure. De-energizing the coil will return control to the EPR. Some applications with ORI-6 or -10s use a normally open

solenoid in parallel to allow the system to “fail-safe” in low temperature mode. In these applications energizing the coil will cause the valve to close, diverting refrigerant flow to the EPR. The EPR will then control the evaporator at the higher pressure setting.

Pilot Operated EPRs are wide open in the low temperature operating mode and can be electrically switched to control at the valve set point. The (S)ORIT-PIE internally piloted EPRs are offered with an optional **Electric open** feature designed specifically for these applications. In addition the (S)ORIT-PIE can be installed at the rack, or in the case, since a high-side pilot connection is not necessary. Operation details of the electric open feature of the (S)ORIT-PIE are covered on Page 7. The (S)ORIT high pressure piloted EPRs can be converted for dual temperature applications by installing an A3/E3 solenoid valve in the high pressure vapor pilot line.

Defrost Applications:

Most refrigeration applications require occasional defrosting of the evaporator to maintain proper performance and temperature control of the refrigerated space. There are several means of defrosting the evaporator including off-time, electric heat, and gas defrost. The SORIT and SORIT-PI EPRs are equipped with a suction stop solenoid feature that will close the valve when de-energized to assist with any of these methods of defrost. In the case of gas defrost, high

pressure vapor is usually introduced upstream of the EPR, and the SORIT or SORIT-PI solenoid stop feature is used to prevent the defrost gas from entering the suction line and overheating/overloading the compressors.

Some gas defrost applications require reverse flow through the EPR. The SORIT-PI internally piloted EPRs will allow reverse flow of defrost gas through the valve. This allows the valve to be installed in the refrigerated display case or in the store piping trench on gas defrost systems without additional check valve piping. The SORIT-PI suction stop solenoid coil must be de-energized for proper reverse flow operation.

Paralleling Evaporator Pressure Regulators:

If the system capacity is greater than the largest EPR model available for the application, like model and size valves can be applied in parallel. The valve should be selected for half the system capacity to provide the proper selection, and both valves adjusted to control the same setting. This will ensure that the pressure drop across each valve is the same.

Piping Suggestions:

The piping schematics used in this bulletin are for illustration purposes only to demonstrate general location of the evaporator pressure regulating valve in the system. Sporlan recommends that recognized piping references be consulted for assistance in piping procedures. Sporlan is not responsible for system design, any damage resulting from faulty system design, or for the misapplication of its products. Sporlan reserves the right to void the product warranty if the product is not applied as described in this bulletin.

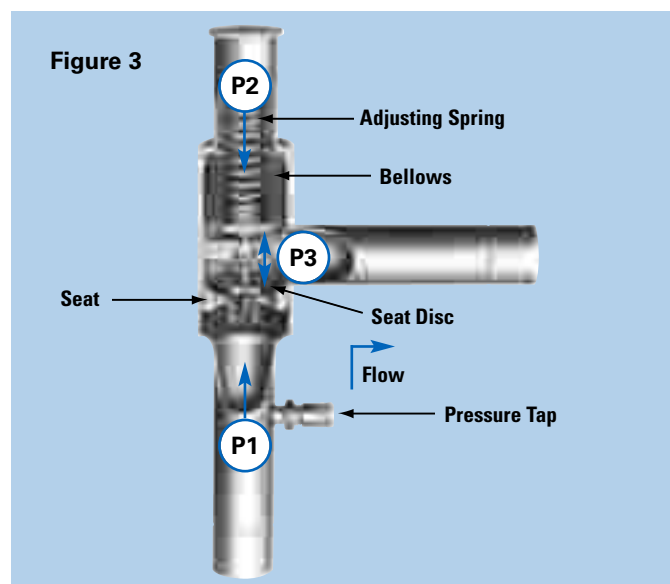
Refrigerants:

Sporlan evaporator pressure regulating valves can be applied with any of the commonly used CFC, HCFC, and HFC refrigerants. None of the Sporlan EPR products are suitable for R717(Ammonia).

Valve Operation

Understanding valve operation of Sporlan's different EPR models is critical to ensuring proper product selection for each application. Each model offers unique features that provide distinct benefits for various applications where these products can be used. All Sporlan EPRs are applied at the outlet of the evaporator and control evaporator or valve inlet pressure only. To indicate this trait, the valve nomenclature describes valve operation as **Open on Rise of Inlet pressure** or **ORI**.

For pressure regulating valves to modulate closed or open, requires a change in the pressure being regulated by the valve. The amount of change in valve stroke, for a given change in pressure, is the **valve gradient**. Every valve has



a gradient designed to provide the best possible operation. **Valve sensitivity** or “**gain**” relates to how the valve reacts with the system and how well it controls the regulated pressure. Valve gain is a function of both the valve gradient and the valve capacity. The more “over-sized” a valve and the “steeper” the gradient, the more sensitive or higher the gain will be, and the more the flow will change with a change in inlet pressure. Generally speaking, a more sensitive valve will provide closer control of the inlet pressure. However, a grossly oversized valve can cause hunting and fluctuating system pressures. Direct acting models require more valve gradient to fully stroke the valve, and are generally more sensitive to over-sizing than the pilot operated models.

Valve setting is defined as the minimum control pressure, or the opening inlet pressure of the valve. Below the setting the valve will close and stop refrigerant flow until the valve setting is reached. As inlet pressure increases above the valve setting, the valve will open at the rate of the valve's gradient, to provide more flow.

Direct Acting Valves - ORIT-6 and ORIT-10:

These models control inlet pressure only and have no other optional modes of operation. As illustrated in Figure 3, the outlet pressure (P3) is exerted against both the bellows effective area and the outlet side of the seat disc. Since the effective area of the bellows is equal to the area of the valve port the outlet pressure forces are cancelled and do not affect valve operation. The force created by the valve inlet pressure (P1) operating on the seat disc across the area of the port, opposes the force exerted by the adjustment spring (P2), and provides the two operating forces for these direct acting evaporator pressure regulating valves. The force exerted by the valve's adjustment spring determines the valve's pressure setting. As the inlet pressure increases above the valve setting, the inlet pressure acting on the seat

disc at the port of the valve will overcome the force exerted by the adjustment spring and will cause the valve to open. This allows flow through the valve. Increasing the adjustment spring force will increase the valve setting and the pressure required to open the valve. As evaporator loads drop, and less refrigerant is boiled off in the evaporator, the evaporator pressure will decrease and cause the seat disc to move to a more closed position, until it reaches the valve setting or minimum evaporator pressure. Any decrease in pressure below the setting will cause the valve to close.

Since direct acting valves are set at the minimum evaporator pressure, and require an increase in inlet pressure to open against the valve gradient, Sporlan's direct acting EPRs are rated for capacity at a design evaporator pressure higher than the valve setting (see Selection Procedures for more information).

Externally Pilot Operated Valves – (S)ORIT-12, -15, and -20:

Pressure Regulating Operation: These pilot operated EPRs use high side pilot pressure to control the main valve piston that regulates upstream/inlet pressure. The high side pressure source allows this valve to be provided normally open. This allows the valve to be operated at minimal pressure drop to ensure maximum capacity by minimizing suction line pressure losses. The high side pressure source must meet the following criteria to ensure optimum performance of the pilot operated pressure regulating valve:

- Only refrigerant vapor should be used as the high pressure supply source to the pilot valve.
- The pilot supply line should be kept as short as possible to minimize refrigerant condensation.
- The high pressure supply source should be at least 50 psi

greater than the downstream, or common suction pressure, at the outlet of the pressure regulating valve.

- If used with gas defrost, the pilot supply source must be at the same supply source or higher pressure supply source than the defrost gas.

The pilot valve modulates in response to the upstream, or inlet pressure, as shown in Figure 4. As the inlet or evaporator pressure drops (P1 acting on the underside of the pilot valve diaphragm through the inlet pilot tube connection), the adjustment spring (P2 on top of the pilot valve diaphragm) modulates the pilot port open, and allows high side pressure (P5) to enter the chamber on top of the main valve piston. As soon as the pressure in the chamber (P3) exceeds the evaporator pressure, the main piston begins to move closed against the opening spring (P4). As the valve inlet/evaporator pressure increases under the diaphragm the pilot port will modulate closed, and decrease the flow of high side pressure on top of the piston. This will allow the pressure on the top of the piston to vent to the outlet of the valve through the bleed orifice. Once the pressure approaches the valve inlet pressure the opening spring will open the main port and allow additional flow from the evaporator.

Defrost Operation: The SORIT version is equipped with a suction stop feature in the pilot valve. This feature will immediately close the valve for defrost applications. With the pilot solenoid de-energized, as shown in Figure 5, high side pressure is allowed to enter on top of the piston, bypassing the pilot valve port. The high side pressure forces the main piston closed as long as the inlet pressure to the valve does not exceed the pressure of the high side source to the pilot.

When defrost is terminated, the pilot solenoid coil is

Figure 4

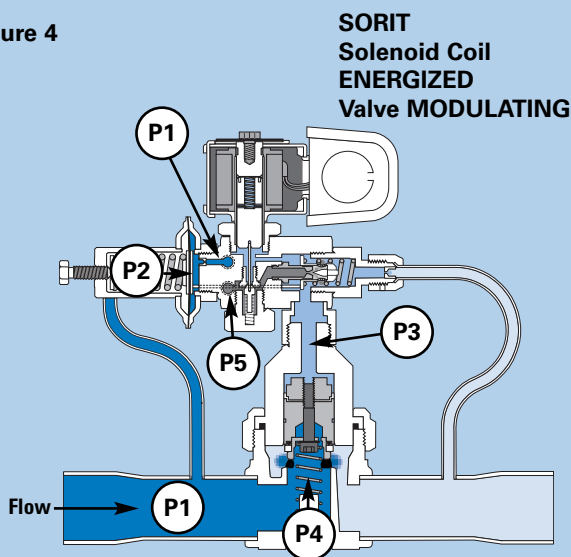
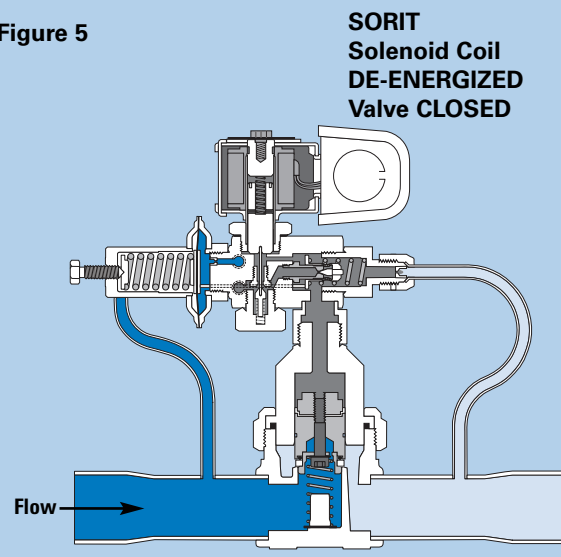
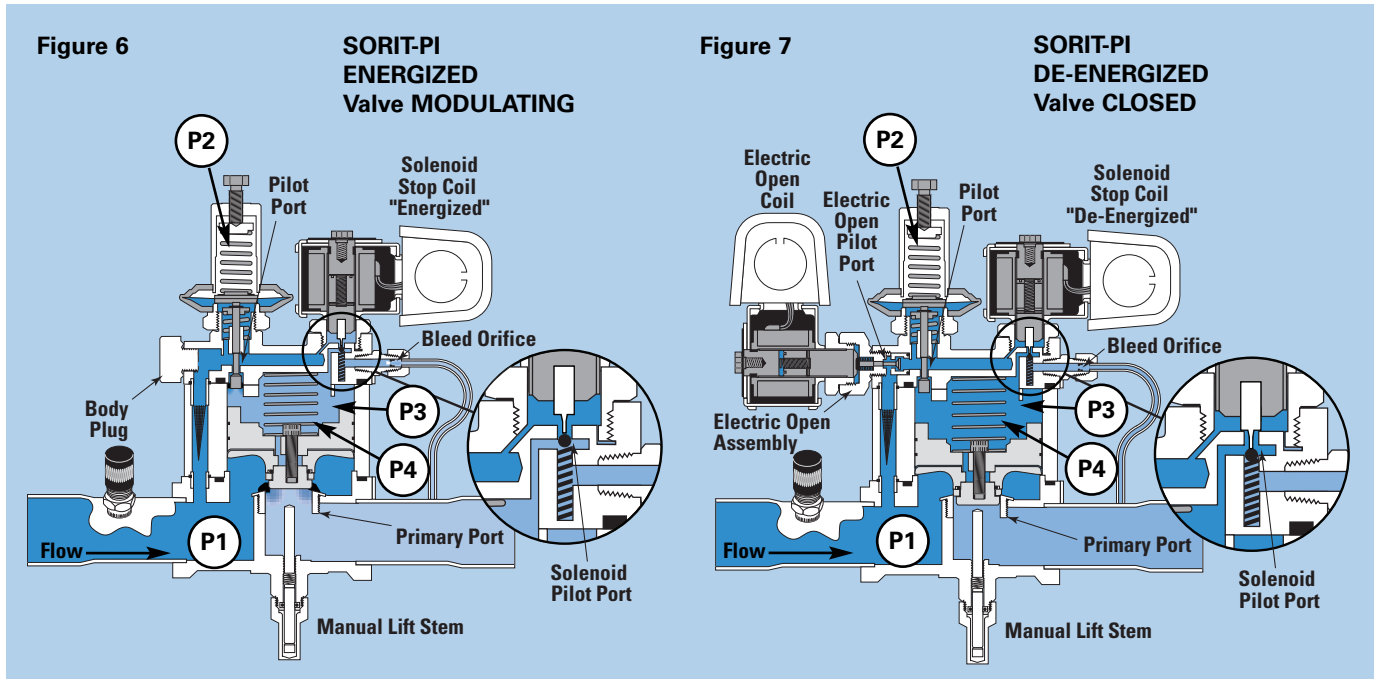


Figure 5





energized and the pilot solenoid port is closed. High side pressure on top of the piston is vented to the outlet of the valve through the bleed orifice. Once the pressure approaches the valve setting the valve begins to modulate to control the inlet pressure setting.

Operation Savings: (S)ORIT high side piloted EPRs can provide significant energy savings by reducing suction line pressure drop. Piloting with high side vapor allows a normally open valve design that can be applied at pressure drops less than 0.5 psi. This allows the common suction to run at the highest possible pressure and still maintain the coldest evaporator temperature on the rack. Table 1 shows the percentage of compressor capacity loss due to suction line pressure drop. As shown in the table, this capacity loss increases considerably at lower evaporator temperatures. For example, an R-22 system running at a -25°F common suction would use approximately 3.5% less compressor power with high side piloted EPRs sized at a 0.5 psi drop, when compared to internally piloted EPRs sized for a 1 psi drop.

Table 1

Suction Line Pressure Drop	% of Compressor Capacity Loss due to Pressure Drop		
	R22	R22	R404A
	+ 10°F Evap.	-25°F Evap.	-25°F Evap.
0	—	—	—
1	2.2	5.6	6.1
2	4.4	12.7	10.4
3	7.1	18.1	15.3
4	9.5	24.2	19.5

Based on compressor capacity curves at 100°F condensing.

Internally Pilot Operated Valves – (S)ORIT-PI-2, -3, -4, and -5:

Pressure Regulating Operation: Since these EPRs are Piloted Internally, they do not require a high side pressure source to operate. The valves are operated by the pressure differential across the valve and require a minimum pressure drop of 1 psi to obtain full capacity. The pilot valve modulates in response to the upstream or inlet pressure. The inlet pressure (P1) is transmitted through internal passages to the underside of the pilot valve diaphragm as shown in Figure 6. As the inlet or evaporator pressure drops, the adjustment spring (P2) on top of the pilot valve diaphragm modulates the pilot port open, and allows inlet pressure to enter the chamber on top of the valve piston. As the pressure in the piston chamber (P3) approaches the inlet or evaporator pressure (P1), the closing spring force (P4) causes the valve piston to modulate to a more closed position. With the valve piston further closed an increase in inlet or evaporator pressure (P1) will move the pilot port to a more closed position and allow the piston chamber pressure (P3) to decrease by venting to the outlet of the valve through the bleed orifice. As the piston chamber pressure (P3) decreases, the inlet pressure (P1) will push against the valve piston causing it to modulate open and compress the closing spring.

Defrost Operation: The SORIT-PI version is equipped with a suction stop feature in the pilot that allows the valve to completely close for defrost applications. This is accomplished with a 3-way solenoid operator, date codes 26-02 and after, as shown in Figures 6 and 7. With the pilot solenoid coil de-energized, as shown in Figure 7, inlet pressure (P1) is allowed to enter the piston chamber through the

upper solenoid port. At the same time, the lower solenoid port is closed, preventing flow to the bleed orifice from the piston chamber. The pressure in the piston chamber (P3) plus the closing spring force (P4) will exceed the force of inlet pressure (P1), allowing the valve to close during defrost.

When defrost is terminated, the pilot solenoid coil is energized as shown in Figure 6 and the upper solenoid port is closed and the lower solenoid port is opened. This returns the valve to pressure regulating mode, and the valve opens to allow the evaporator to pull down to the valve setting.

In addition, SORIT-PI or ORIT-PI valves may be applied in the display case or piping trench and can be “reverse-flowed” for gas defrost. See Defrost Applications on page 4.

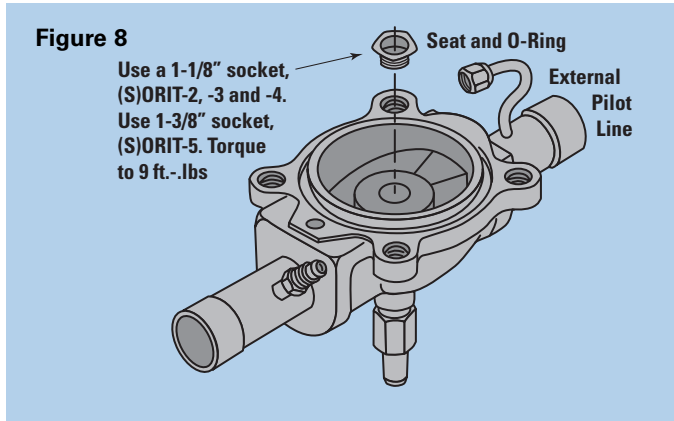
Manual Lift Operation: All (S)ORIT-PI valves are equipped with a manual lift stem that will mechanically open the valve independent of refrigerant flow or operating mode (see Figure 7). Turning the lift stem clockwise will push the main piston open. The lift stem must be fully retracted (turn counterclockwise to stop) to ensure proper operation during other operating modes. The lift stem is typically used to simplify installation and service. This will facilitate nitrogen flow and system evacuation prior to start-up.

Electric Open Operation: The (S)ORIT-PI valve can be specified with an optional electric open feature, as shown in Figure 7, for dual temperature applications. See Dual Temperature Applications on Page 4. The body plug in the (S)ORIT-PI pilot valve shown in Figure 6 is replaced with a solenoid operator that when energized will prevent the flow of inlet pressure to the pilot (if using the electric open feature with a SORIT-PI valve it is also necessary to simultaneously energize the defrost solenoid operator to ensure proper operation). The pressure above the piston will vent to the valve outlet through the bleed orifice allowing the valve piston to fully open. When the electric open solenoid is de-energized, the solenoid port will open and allow flow

Table 2

Current Valve Size	Desired Valve Size	Remove Existing Seat	Install New Seat	Piston Assembly and Seat Kit
(S)ORIT-PI-2	(S)ORIT-PI-3	Yes	Yes	SK-PI-4 to 3
(S)ORIT-PI-2	(S)ORIT-PI-4	Yes	No	SK-PI-4*
(S)ORIT-PI-3	(S)ORIT-PI-2	Yes	Yes	SK-PI-4 to 2
(S)ORIT-PI-3	(S)ORIT-PI-4	Yes	No	SK-PI-4*
(S)ORIT-PI-4	(S)ORIT-PI-2	N/A	Yes	SK-PI-4 to 2
(S)ORIT-PI-4	(S)ORIT-PI-3	N/A	Yes	SK-PI-4 to 3
(S)ORIT-PI-5	(S)ORIT-PI-3	N/A	Yes	SK-PI-5 to 3
(S)ORIT-PI-5	(S)ORIT-PI-4	N/A	Yes	SK-PI-5 to 4

* Seat not supplied or required.



of inlet pressure to the pilot valve, returning the valve to pressure regulating operation.

Interchangeable Valve Seats: As a new feature, date code 26-02 and after, the (S)ORIT-PI EPRs have been redesigned to include a threaded port and interchangeable valve seat. This new design provides an easy means of changing valve capacity/port size without having to replace the valve body. Refer to Figure 8 for installation and removal method, and Table 2 for available sizing kits.

Selection Procedures

Proper specification of a Sporlan EPR involves selecting a model type based on desired features, options, application, and the proper valve sizing to match the evaporator(s) design capacity. The following information is required to properly size an evaporator pressure regulating valve:

1. **Refrigerant.**
2. **Minimum evaporator temperature or valve setting** (for direct acting ORI(T)-6 and -10 models only).
3. **Evaporator design temperature.**
4. **Design common suction pressure** (multiple evaporator systems) **or available pressure drop across valve at evaporator design capacity** (single evaporator systems).
5. **Evaporator(s) design capacity** (Tons or Btu/hr).
6. **Liquid Temperature.**

With these application conditions valve selections can be made directly from the capacity tables on Page 13 for any application. Special considerations for selecting direct acting models are covered on Page 9. Capacity tables on Pages 14 and 15 are quick pick selection tables for pilot operated EPRs used on supermarket rack applications (multiple evaporator systems). The available pressure drop, on supermarket rack applications, is a function of the system design and the difference between the saturated pressure at the evaporator design temperature (circuit temperature) – the design common suction pressure (header temperature). This is referred to as the “natural” pressure drop for these

systems. The Quick Pick Selection tables on Pages 14 and 15, allow easy selection of a pilot operated EPR, based on the applicable conditions and considers the “natural” pressure drop for the system design criteria listed.

Direct Acting ORI(T)-6 & ORI(T)-10 Selection:

As described in Valve Operation-Direct Acting Valves – ORIT-6 & ORIT-10, Page 5, the reported valve capacities are provided with the minimum evaporator pressure assumed to be 8 psi lower than the evaporator pressure at design load for the 0 – 50 psig adjustment range product, and 12 psi lower than the evaporator pressure for the 30 – 100 psig adjustment range product. The difference between the design evaporator pressure and the minimum evaporator pressure is referred to as the allowable evaporator pressure change. Therefore, for an ORI-6 0/50 rated for a 40°F R22 evaporator, the nominal capacity would allow the evaporator pressure to drop from the design 68.5 psig to the minimum evaporator pressure of 60.5 psig or a minimum evaporator temperature of approximately 34°F. Refer to Table 3 for capacity multipliers for other allowable pressure changes.

Table 3

ALLOWABLE EVAPORATOR PRESSURE CHANGE – psi		2	4	6	8	10	12	14
CORRECTION FACTOR	ORIT-6, 10-0/50	.3	.6	.8	1.0	1.2	1.3	1.4
	ORIT-6, 10-30/100	—	.2	.6	.7	.9	1.0	1.1

It is considered acceptable to size most single evaporator systems with a 2 psi available pressure drop across the direct acting ORIT valves. This is not to be confused with the allowable evaporator pressure change. This is the pressure drop across the valve when open at the rated condition with the specified amount of refrigerant flowing through the valve.

Example: Select a direct acting ORIT for a R404A single evaporator refrigeration system with a design evaporator temperature of 20°F, a design capacity of 1.4 tons, a minimum allowable evaporator temperature of 14°F, and an available pressure drop of 2 psi.

1. From the capacity table on Page 13 the ORIT-10 is capable of providing 2.29 tons at the design evaporator temperature and available pressure drop.
2. From the capacity table on Page 13 the saturation pressure at the design evaporator is 55.7 psig. This application will require a 30 – 100 psig adjustment range valve, and the minimum evaporator pressure for the nominal capacity selected in step 1 will be 44 psig (10°F) or 12 psi lower. Since the specified minimum allowable evaporator temperature is 14°F (48 psig) a correction factor will have to be used to the nominal capacity to check the selection. The allowable evaporator pressure change is approximately 8 psi (56 – 48) so the resulting capacity is 1.6 tons (2.29 x .7). The ORIT-10 is the proper selection.

Pilot Operated EPR Selection:

As previously described, pilot operated EPRs have a high gain relationship and steep gradient. As a result they require negligible allowable evaporator pressure change to control from valve setting to full valve stroke. Therefore, pilot operated EPRs are rated for capacity at a full open position, and no correction factors for minimum evaporator temperatures are necessary.

Example: Select a pilot operated EPR for a 20°F R22 evaporator line up, with a 86,800 Btu/hr load, and piped to a 10°F rack suction header temperature. The refrigerant liquid entering the TEV is 60°F, and the return gas temperature entering the EPR is 45°F (20°F Evaporator + 25°F Superheat = 45°F return gas).

Using quick-pick selection table (Page 14):

1. Locate 10°F “Common Suction” temperature.
2. Locate 20°F “Circuit Temperature”
3. If necessary appropriate correction factor for liquid temperatures from the table on page 14 that vary from the 60°F liquid used for the capacities in this table (see step 3 below).
4. Scan horizontally across capacity columns to select the first model (of desired type) that exceeds the specified capacity in Btu/hr for R22 refrigerant. In this case a SORIT-PI-3 or a SORIT-12 would be selected at 132,100 and 96,700 Btu/hr respectively.

Using conventional capacity tables (Page 13):

1. Determine the “natural” pressure drop across the valve by subtracting the saturated pressure at the 10°F rack suction header temperature from the saturated pressure at the 20°F. In this case the 33 psi header pressure is subtracted from the 43 psi circuit pressure to provide a 10 psi drop across the valve.
2. Converting 86,800 Btu/hr to tons by dividing by 12,000 Btu/ton, yields 7.23 tons.
3. Locate the liquid temperature correction factor for 60°F from the table on page 13, since the capacity table is calculated with a 90°F liquid temperature. Divide the 7.23 ton load from step 2, by the correction factor 1.13. Only 6.51 tons are required.
4. Scan vertically down the 10 psi R22 column and select the first model (of desired type) that exceeds the tons for 20°F evaporator design temperature. As above, the SORIT-12 or SORIT-PI-3 are the appropriate selections.

Sporlan also offers a computer selection program that can provide quick and easy product selections for a wide variety of operating conditions. Contact your Sporlan representative for more information.

PRODUCT FEATURES, SPECIFICATIONS, & NOMENCLATURE

ORIT-6 and ORIT-10



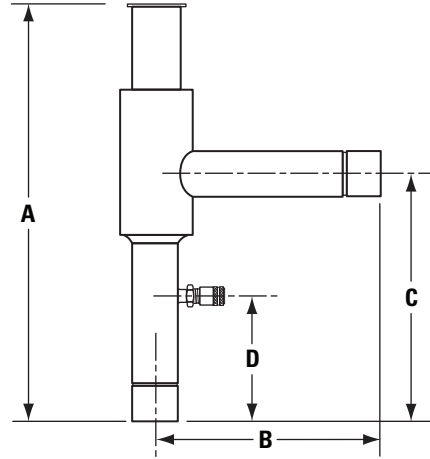
Features

- Direct acting (most economical)
- Adjustable
- Hermetic construction (no gaskets or seals)
- Corrosion resistant construction
- Inlet pressure tap (standard)
- Inlet strainer (standard on ODF models)

Specifications

- Maximum Rated Pressure = 400 psig
- Maximum Test Pressure = ORI-6 = 300 psi
ORI-10 = 200 psi
- Maximum Ambient Temperature = 155°F
- Maximum Fluid Temperature = 240°F
- Minimum Ambient/Fluid Temperature = -40°F
- Factory Setting = See table
- Agency Certifications:

Agency	Product	Guide	File	Country
UL	ORI-6, -10	SFJQ	SA5460	USA
CSA	ORI-6, -10	1223-01	19953	Canada



VALVE TYPE	ADJUSTMENT RANGE psig (Standard BOLD)	CONNECTION Inches Standard Connections BOLD	DIMENSIONS – Inches					WEIGHT – Pounds		INLET STRAINER PART NUMBER
			A	B	C	D	SOCKET	NET	SHIPPING	
ORIT-6	0/50 (Factory set 30)* 30/100 (Factory Set 60)*	5/8 ODF Solder	9.75	5.25	6.38	4.06	0.50	1.00	1.25	825-5
		7/8 ODF Solder	9.75	5.25	6.38	4.06	0.75	1.00	1.25	825-7
		1-1/8 ODF Solder	9.75	5.25	6.38	4.06	0.91	1.25	1.50	825-9
		1/2 SAE Flare	6.41	2.68	2.86	0.94	—	1.00	1.25	Not Available
		5/8 SAE Flare	6.38	2.81	3.00	1.06	—	1.00	1.25	
ORIT-10	0/50 (Factory set 30)* 30/100 (Factory Set 60)*	7/8 ODF Solder	11.19	5.69	6.50	3.25	0.75	2.50	2.75	825-7
		1-1/8 ODF Solder	11.19	5.69	6.50	3.25	0.91	2.50	2.75	825-9
		1-3/8 ODF Solder	11.19	5.69	6.50	3.25	0.91	2.50	2.75	825-11

* Manufacturers can specify special settings.

Materials and Construction Details

VALVE TYPE	ELEMENT TYPE AND MATERIAL	CONNECTIONS		BODY MATERIAL	SEATING MATERIAL
		TYPE	MATERIAL		
ORIT-6	Bellows – Brass	ODF Solder	Copper	Brass	Metal-to-Metal
		SAE Flare	Brass		
ORIT-10	Bellows – Brass	ODF Solder	Copper		

Valve Nomenclature:

ORI Valve type: Open on Rise of Inlet Pressure	T	Pressure tap on inlet connection	–	6 Port size in eighths of an inch	–	0/50 Adjustment range psig*	–	7/8" ODF Connections ODF Solder or SAE Flare
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* Other pressure ranges are available
 To eliminate delays in shipments, specify complete valve designations.

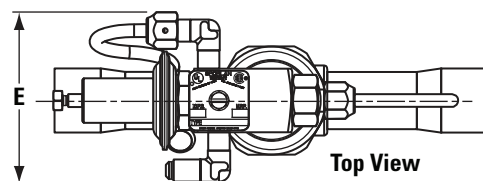
PRODUCT FEATURES, SPECIFICATIONS, & NOMENCLATURE

(S)ORIT-12, -15, and -20



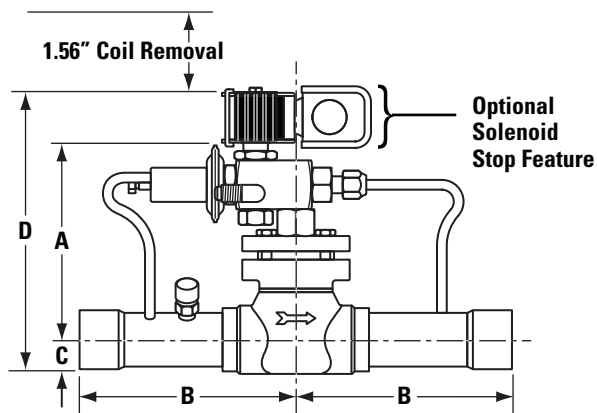
Features

- High side pilot for improved temperature control and low ΔP operation
- Adjustable settings up to 150 psig
- Optional solenoid stop feature to close valve during system defrost
- Normally open design allows system evacuation without a manual operator



Specifications

- Maximum Rated Pressure = 450 psig
- Maximum Test Pressure = 450 psig
- MOPD = 300 psi (SORIT model only)
- Maximum Ambient Temperature = 120°F
- Maximum Fluid Temperature = 240°F
- Minimum Ambient/Fluid Temperature = -40°F
- Factory Setting = See table
- Agency Certifications:



Agency	Product	Guide	File	Country
UL	SORIT-12, -15, -20	YIOZ	MH4576	USA
ULc	SORIT-12, -15, -20	YIOZ7	MH4576	Canada
UL	ORIT-12, -15, -20	SFJQ	SA5460	USA
ULc	ORIT-12, -15, -20	SFJQ7	SA5460	Canada

VALVE TYPE	PORT SIZE	ADJUSTMENT RANGE psig (Standard BOLD)	STANDARD COIL RATINGS **MKC-1		CONNECTION ODF SOLDER Inches	DIMENSIONS – Inches					WEIGHT – Pounds with solenoid stop		WEIGHT – Pounds without solenoid stop	
			Volts/Cycles	Watts		A	B	C	D	E	NET	SHIPPING	NET	SHIPPING
(S)ORIT-12	25/32	0/100 (Factory set 30)*	24/50-60	10	7/8, 1-1/8, 1-3/8	4.99	4.25	0.72	6.50	3.46	4.00	4.75	3.50	4.25
(S)ORIT-15	1	75/150	120/50-60		1-3/8	4.91	5.53	0.88	6.42	3.46	5.75	7.00	5.25	6.50
(S)ORIT-20	1-5/16	(Factory set 120)*	208-240/50-60		1-5/8, 2-1/8	5.66	5.53	1.44	7.16	3.50	9.75	11.00	9.25	10.50

* Manufacturers can specify special settings.

** Available with junction box or conduit boss at no extra charge. For voltages other than listed consult Bulletin 30-10.

Valve Nomenclature:

S	ORI	T	-	15	-	0/100	-	1-3/8" ODF	-	120/50-60
Solenoid Stop feature (optional)	Valve type: Open on Rise of Inlet pressure	Pressure tap on inlet connection		Valve size		Adjustment range psig*		Connections ODF Solder		Electrical specifications for Solenoid Stop Feature (optional)

* Other pressure ranges are available

Omission of designation for an optional item indicates a request for a valve less that specific option. **Example: ORIT-15-0/75-1-3/8 ODF; this indicates a valve less the solenoid stop feature.**

When ordering a valve with a solenoid stop feature, specify voltage and cycles.

When ordering the solenoid coil assembly only, specify MKC-1 coil, voltage and cycles. **Example: MKC-1-120 volts/50-60 cycles.**

PRODUCT FEATURES, SPECIFICATIONS, & NOMENCLATURE

(S)ORIT-PI-2, -3, -4, and -5



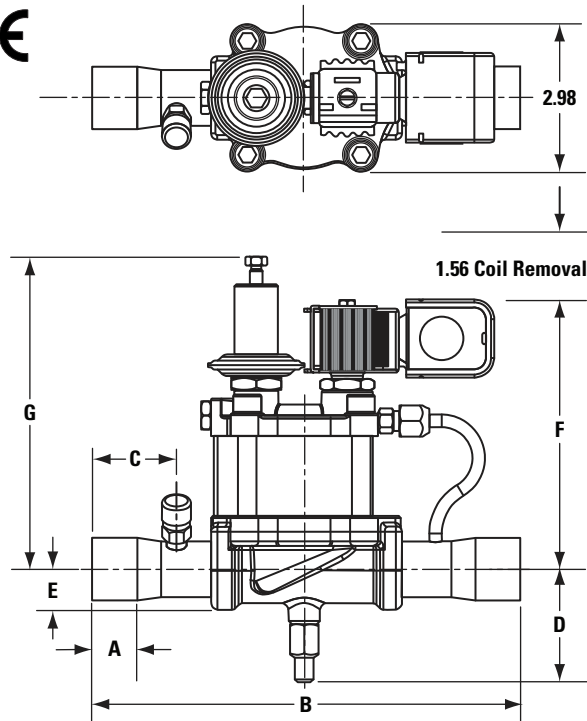
Features

- Piloted internally (no high side connection required)
- Adjustable settings up to 150 psig
- Optional solenoid stop feature to close valve during system defrost
- Optional electric open feature for "two temperature operation"
- Corrosion resistant construction
- Manual lift stem to allow system evacuation

Specifications

- Maximum Rated Pressure = 400 psig
- Maximum Test Pressure = 400 psig
- MOPD = 190 psig (SORIT-PI model only)
- Maximum Ambient Temperature = 120°F
- Maximum Fluid Temperature = 240°F
- Minimum Ambient/Fluid Temperature = -40°F
- Factory Setting = See table
- Agency Certifications:

Agency	Product	Guide	File	Country
UL	SORIT-PI-2, -3, -4, -5	YIOZ	MH4576	USA
ULc	SORIT-PI-2, -3, -4, -5	YIOZ7	MH4576	Canada
UL	ORIT-PI-2, -3, -4, -5	SFJQ	SA5460	USA
ULc	ORIT-PI-2, -3, -4, -5	SFJQ7	SA5460	Canada



VALVE TYPE	PORT SIZE	ADJUSTMENT RANGE psig (Standard BOLD)	STANDARD COIL RATINGS **MKC-1		CONNECTION ODF SOLDER Inches	DIMENSIONS – Inches							WEIGHT – Pounds with solenoid stop		WEIGHT – Pounds without solenoid stop	
			Volts/Cycles	Watts		A	B	C	D	E	F	G	NET	SHIPPING	NET	SHIPPING
(S)ORIT-PI-2	1/2	0/100	24/50-60	10***	5/8	.50	8.63	1.70	2.28	.72	5.25	6.30	5.94	7.12	5.83	7.00
					7/8	.78	8.63	1.70	2.28	.72	5.25	6.30	6.04	7.22	5.47	6.65
					1-1/8	.91	8.63	1.70	2.28	.72	5.25	6.30	6.06	7.24	5.84	7.00
					1-3/8	1.00	10.9	2.54	2.28	.72	5.25	6.30	6.00	7.18	6.05	7.22
(S)ORIT-PI-3	3/4	0/100	120/50-60	10***	7/8	.78	8.63	1.70	2.28	.72	5.25	6.30	6.06	7.24	5.87	7.04
					1-1/8	.91	8.63	1.70	2.28	.72	5.25	6.30	6.06	7.24	5.47	6.65
					1-3/8	1.00	10.9	2.54	2.28	.72	5.25	6.30	6.06	7.24	5.99	7.16
					1-5/8	1.09	10.9	2.54	2.28	.72	5.25	6.30	6.20	7.38	5.99	7.16
(S)ORIT-PI-4	1	75/150	208-240/50-60	10***	1-1/8	.91	8.63	1.70	2.28	.72	5.25	6.30	6.06	7.24	5.47	6.65
					1-3/8	1.00	10.9	2.54	2.28	.72	5.25	6.30	5.94	7.12	5.84	7.00
					1-5/8	1.09	10.9	2.54	2.28	.72	5.25	6.30	6.06	7.24	5.89	7.06
					2-1/8	1.25	10.9	2.54	2.28	.72	5.25	6.30	6.10	7.28	6.43	7.60
(S)ORIT-PI-5	1-1/4	120/50-60	120-208-240/50-60	10***	1-3/8	1.00	10.9	2.25	2.78	1.28	5.69	6.74	6.30	7.92	7.00	8.60
					1-5/8	1.09	10.9	2.25	2.78	1.28	5.69	6.74	7.00	8.62	7.00	8.60
					2-1/8	1.25	10.9	2.25	2.78	1.28	5.69	6.74	7.28	8.90	7.00	8.60

* Manufacturers can specify special settings.

** Available with junction box or conduit boss at no extra charge. For voltages other than listed consult Bulletin 30-10.

*** 10 watts/coil if specifying SORIT-PI-xxx, SE would be 20 watts with both coils energized.

Valve Nomenclature:

S	ORI	T	PI	2	7	S	E	0/100	120/50-60
Solenoid Stop feature (optional)	Basic type: Open on Rise of Inlet pressure	Pressure tap on inlet connection	Piloted internally	Port size in 1/4 of an inch	Fitting size in 1/8 of an inch	Solenoid stop feature (optional)	Electric open feature (optional)	Adjustment range psig *	Electrical specifications for Solenoid Stop Feature (optional)

* Other pressure ranges are available.

Omission of designation for an optional item indicates a request for a valve less that specific option.

Example: ORIT-PI-411-0/100; this indicates a valve less the solenoid stop feature.

When ordering a valve with a solenoid stop feature, specify voltage and cycles.

When ordering the solenoid coil assembly only, specify MKC-1 coil, voltage and cycles. **Example: MKC-1-120 volts/50-60 cycles.**

CAPACITY TABLE — Capacity (Tons)

VALVE TYPE	EVAPORATOR DESIGN TEMPERATURE °F	SATURATION PRESSURE - psig		REFRIGERANT																			
		REFRIGERANT		PRESSURE DROP ACROSS VALVE - psi																			
		22	404A	507	0.5	1	2	5	10	20	0.5	1	2	5	10	20	0.5	1	2	5	10	20	
ORIT-6 0/50 or 30/100	40	68.5	35.4	85.7	89.8	-	0.93	1.29	1.94	2.50	2.84	-	0.71	0.97	1.39	1.61	1.62	-	0.84	1.17	1.76	2.30	2.69
	20	43.1	18.4	55.7	58.8	-	0.76	1.04	1.52	1.86	1.92	-	0.55	0.74	0.99	1.04	-	-	0.67	0.92	1.36	1.69	1.80
	0	24.0	06.5	32.9	35.2	-	0.60	0.81	1.13	1.25	1.25	-	0.41	0.54	0.64	-	-	-	0.51	0.70	0.99	1.14	1.14
	-20	10.2	10.2	16.3	17.8	-	0.46	0.61	0.70	0.78	0.79	-	-	-	-	-	-	-	0.38	0.52	0.68	0.70	0.70
ORIT-10 0/50 or 30/100	40	68.5	35.4	85.7	89.8	-	2.27	3.20	5.02	6.99	9.61	-	1.76	2.48	3.85	5.31	7.10	-	2.04	2.88	4.52	6.31	8.70
	20	43.1	18.4	55.7	58.8	-	1.86	2.61	4.08	5.65	7.66	-	1.38	1.94	3.00	4.07	-	-	1.63	2.29	3.59	4.98	6.79
	0	24.0	06.5	32.9	35.2	-	1.49	2.09	3.25	4.45	5.88	-	1.06	1.49	2.26	-	-	-	1.22	1.72	2.67	3.66	4.88
	-20	10.2	10.2	16.3	17.8	-	1.18	1.65	2.53	3.40	4.30	-	-	-	-	-	-	-	0.97	1.36	2.10	2.84	3.66
(S)ORIT-12 0/75 or 75/150	40	68.5	35.4	85.7	89.8	2.04	2.88	4.06	6.34	8.79	11.9	1.58	2.23	3.13	4.85	6.54	8.62	1.84	2.59	3.66	5.72	7.94	10.8
	20	43.1	18.4	55.7	58.8	1.67	2.36	3.31	5.15	7.06	9.39	1.25	1.75	2.45	3.75	5.00	-	1.47	2.07	2.91	4.53	6.24	8.36
	0	24.0	06.5	32.9	35.2	1.34	1.89	2.65	4.08	5.51	7.06	0.96	1.35	1.87	2.80	-	-	-	1.15	1.61	2.27	3.50	4.76
	-20	10.2	10.2	16.3	17.8	1.06	1.49	2.08	3.15	4.14	4.94	-	-	-	-	-	-	-	0.88	1.23	1.72	2.62	3.48
(S)ORIT-15 0/75 or 75/150	40	68.5	35.4	85.7	89.8	3.38	4.76	6.70	10.4	14.3	19.1	2.62	3.69	5.16	7.91	10.6	13.3	3.04	4.29	6.03	9.40	13.0	17.4
	20	43.1	18.4	55.7	58.8	2.76	3.89	5.46	8.42	11.4	14.8	2.06	2.89	4.03	6.07	7.89	-	2.42	3.42	4.80	7.42	10.1	13.2
	0	24.0	06.5	32.9	35.2	2.22	3.12	4.36	6.63	8.79	10.7	1.58	2.21	3.06	4.47	-	-	-	1.89	2.66	3.73	5.71	7.63
	-20	10.2	10.2	16.3	17.8	1.75	2.46	3.41	5.07	6.43	6.61	-	-	-	-	-	-	-	1.45	2.03	2.82	4.24	5.47
(S)ORIT-20 0/75 or 75/150	40	68.5	35.4	85.7	89.8	7.40	10.4	14.7	22.9	31.5	42.3	5.74	8.09	11.3	17.4	23.4	29.8	6.66	9.40	13.2	20.7	28.5	38.5
	20	43.1	18.4	55.7	58.8	6.06	8.53	12.0	18.5	25.2	32.8	4.52	6.35	8.85	13.4	17.5	-	5.31	7.49	10.5	16.3	22.3	29.4
	0	24.0	06.5	32.9	35.2	4.86	6.84	9.57	14.6	19.5	24.1	3.48	4.86	6.72	9.91	-	-	4.15	5.84	8.19	12.6	16.9	21.3
	-20	10.2	10.2	16.3	17.8	3.85	5.39	7.49	11.2	14.4	15.8	-	-	-	-	-	-	3.17	4.45	6.20	9.35	12.2	14.2
(S)ORIT-PI-2 0/100 or 75/150	40	68.5	35.4	85.7	89.8	-	2.19	3.04	4.67	6.92	9.07	-	1.72	2.39	3.83	5.05	6.14	-	1.95	2.70	4.16	6.27	8.31
	20	43.1	18.4	55.7	58.8	-	1.81	2.51	3.87	5.48	6.90	-	1.37	1.90	2.91	3.70	-	-	1.57	2.18	3.36	4.86	6.22
	0	24.0	06.5	32.9	35.2	-	1.48	2.04	3.20	4.16	4.86	-	1.08	1.48	2.12	-	-	-	1.25	1.73	2.76	3.63	4.37
	-20	10.2	10.2	16.3	17.8	-	1.18	1.63	2.41	2.95	3.07	-	-	-	-	-	-	-	0.97	1.34	2.03	2.95	2.74
(S)ORIT-PI-3 0/100 or 75/150	40	68.5	35.4	85.7	89.8	-	3.89	5.42	8.42	12.1	16.1	-	3.05	4.25	6.71	8.94	11.1	-	3.47	4.85	7.52	11.0	14.7
	20	43.1	18.4	55.7	58.8	-	3.21	4.47	6.94	9.66	12.4	-	2.42	3.38	5.14	6.61	-	-	2.79	3.90	6.05	8.56	11.1
	0	24.0	06.5	32.9	35.2	-	2.60	3.63	5.62	7.39	8.88	-	1.88	2.59	3.76	-	-	-	2.20	3.07	4.84	6.43	7.92
	-20	10.2	10.2	16.3	17.8	-	2.07	2.88	4.25	5.33	5.70	-	-	-	-	-	-	-	1.70	2.37	3.58	4.58	5.09
(S)ORIT-PI-4 0/100 or 75/150	40	68.5	35.4	85.7	89.8	-	5.85	8.22	12.9	18.9	25.2	-	4.57	6.42	10.4	14.0	17.6	-	5.25	7.38	11.6	17.1	23.0
	20	43.1	18.4	55.7	58.8	-	4.81	6.76	10.6	15.1	19.5	-	3.62	5.08	8.00	10.4	-	-	4.21	5.91	9.26	13.3	17.5
	0	24.0	06.5	32.9	35.2	-	3.89	5.46	8.75	11.6	14.2	-	2.81	4.03	5.90	-	-	-	3.30	4.64	7.52	10.1	12.6
	-20	10.2	10.2	16.3	17.8	-	3.07	4.32	6.65	8.43	9.25	-	-	-	-	-	-	-	2.54	3.57	5.59	7.21	8.26
(S)ORIT-PI-5 0/100 or 75/150	40	68.5	35.4	85.7	89.8	-	7.32	10.3	16.1	22.4	30.4	-	5.67	7.97	12.3	16.8	22.0	-	6.59	9.28	14.5	20.2	27.6
	20	43.1	18.4	55.7	58.8	-	5.98	8.42	13.1	18.0	24.0	-	4.46	6.24	9.55	12.8	-	-	5.25	7.39	11.5	15.9	21.3
	0	24.0	06.5	32.9	35.2	-	4.80	6.73	10.4	14.1	18.1	-	3.42	4.76	7.15	-	-	-	4.10	5.76	8.90	12.1	15.8
	-20	10.2	10.2	16.3	17.8	-	3.77	5.26	7.98	10.5	12.7	-	-	-	-	-	-	-	3.13	4.37	6.68	8.89	11.0

		Refrigerant Liquid Temperature Correction Factors for 90°F Liquid															
		0	10	20	30	40	50	60	70	80	90	100					
R-22		1.38	1.34	1.30	1.26	1.22	1.17	1.13	1.09	1.04	1.00	0.95					
R-134a		1.48	1.43	1.38	1.33	1.27	1.22	1.17	1.11	1.06	1.00	0.94					
R-404A & R-507		1.65	1.58	1.51	1.45	1.38	1.31	1.23	1.16	1.08	1.00	0.92					

Capacities are calculated in accordance with ASHRAE Standard 158.2, "Methods of testing Capacity of Refrigerant Pressure Regulators." Capacities are based on 90°F Liquid Temperature entering the expansion valve and 25°F superheated vapor entering the compressor.
 ORIT-6 and ORIT-10 are rated based on a valve setting 8 psi lower than the Evaporator Design Temperature for the 0/50 psi adjustment range, and 12 psi lower for the 30/100 psi adjustment range.

QUICK PICK SELECTION TABLES for SUPERMARKET MULTIPLE EVAPORATOR SYSTEMS – Valve Capacity Btuh

COMMON SUCTION °F	CIRCUIT or EVAP. °F	REFRIGERANT Z2										REFRIGERANT 404A & 507									
		(S)ORIT-PI					(S)ORIT					(S)ORIT-PI					(S)ORIT				
		2	3	4	5	20	2	3	4	5	20	2	3	4	5	20	2	3	4	5	20
-35	-35*	8,900	15,500	23,000	28,000	39,900	11,000	18,500	27,000	33,000	45,000	8,800	15,300	22,700	27,700	39,600	12,700	22,300	33,200	40,600	55,000
	-33	12,900	22,500	33,600	40,900	58,100	16,100	27,000	40,000	50,000	70,000	12,700	22,300	33,200	40,600	55,000	16,100	26,700	39,600	48,000	66,000
	-30	20,600	36,200	56,300	66,700	94,100	26,200	44,000	66,000	80,000	110,000	20,500	36,000	56,000	66,300	93,500	26,100	43,700	66,000	80,000	110,000
	-25	29,900	52,900	82,700	99,600	138,700	39,100	65,400	99,600	124,000	173,000	29,700	52,600	82,300	99,300	138,100	39,000	65,100	99,300	124,000	173,000
	-25*	11,100	19,400	28,700	35,000	50,000	13,800	23,200	33,000	41,000	57,000	11,000	19,200	28,500	35,000	49,900	13,800	23,100	33,000	41,000	57,000
-25	-23	16,000	28,100	41,900	51,200	72,700	20,100	33,800	47,000	58,000	81,000	15,800	27,800	41,700	51,200	72,700	20,100	33,800	47,000	58,000	81,000
	-21	23,000	40,300	62,600	73,800	104,400	29,000	48,700	73,000	89,000	124,000	23,000	40,300	62,600	73,900	104,400	29,000	48,700	73,000	89,000	124,000
	-18	30,800	54,200	84,500	100,600	141,300	39,500	66,200	100,000	124,000	173,000	30,800	54,300	84,600	100,900	141,600	39,600	66,400	100,000	124,000	173,000
	-15	37,300	66,000	103,200	124,100	173,000	48,700	81,400	124,000	154,000	211,000	37,400	66,200	103,500	124,600	173,600	48,900	81,800	124,000	154,000	211,000
	-10	46,900	83,700	131,400	160,300	221,100	62,800	104,800	160,000	200,000	280,000	47,000	84,000	132,000	161,400	222,200	63,200	105,500	160,000	200,000	280,000
-15	-15*	13,600	23,900	35,400	43,400	61,900	17,100	28,700	43,000	53,000	75,000	13,500	23,700	35,400	43,700	62,200	17,200	28,900	43,000	53,000	75,000
	-13	19,600	34,500	51,500	63,300	90,000	24,900	41,800	63,000	78,000	110,000	19,400	34,400	51,600	63,700	90,600	25,100	42,100	63,000	78,000	110,000
	-10	31,900	56,000	87,000	102,900	145,300	40,500	67,800	103,000	124,000	173,000	32,200	56,400	87,700	103,800	146,500	40,800	68,400	103,000	124,000	173,000
	-5	46,100	81,500	127,300	152,800	213,400	60,000	100,300	152,000	188,000	260,000	46,500	82,300	128,600	154,600	215,600	60,700	101,500	154,000	188,000	260,000
	0	57,900	103,100	161,700	196,900	272,000	77,200	128,800	196,000	240,000	330,000	58,500	104,200	163,700	199,700	275,500	78,300	130,600	196,000	240,000	330,000
	5	68,700	123,200	194,200	239,500	327,600	93,700	156,200	239,000	290,000	390,000	69,500	124,800	197,000	243,600	332,500	95,300	158,800	239,000	290,000	390,000
	10*	21,600	38,200	57,100	70,800	101,000	27,900	46,800	70,000	87,000	120,000	21,800	38,700	58,300	72,500	103,400	28,600	48,000	70,000	87,000	120,000
	11	22,000	38,800	58,200	72,100	102,800	28,400	47,700	71,000	88,000	121,000	22,200	39,400	59,400	73,900	105,000	29,100	48,900	71,000	88,000	121,000
	12	30,900	54,900	82,900	102,800	146,300	40,500	67,900	103,000	124,000	173,000	31,300	55,800	84,600	105,500	150,100	41,500	69,700	103,000	124,000	173,000
	13	37,900	67,700	102,500	127,000	180,300	50,000	83,900	127,000	158,000	211,000	38,400	68,800	104,800	130,400	185,100	51,300	86,100	127,000	158,000	211,000
10	14	44,000	78,800	119,700	147,900	209,500	58,200	97,600	147,000	183,000	250,000	44,600	80,200	122,500	151,900	215,200	59,800	100,200	147,000	183,000	250,000
	15	51,900	91,000	141,300	166,700	235,800	65,600	110,000	166,000	205,000	280,000	53,300	93,500	145,100	171,400	242,300	67,400	113,000	166,000	205,000	280,000
	20	74,900	132,100	206,000	246,300	344,800	96,700	161,900	246,000	300,000	400,000	77,000	135,900	212,100	254,000	355,200	99,700	166,900	246,000	300,000	400,000
	25	93,700	166,400	260,600	315,500	437,600	123,700	206,700	315,000	380,000	500,000	96,600	171,600	269,000	326,300	452,000	127,900	213,700	315,000	380,000	500,000
	15*	23,600	41,600	62,400	77,500	110,600	30,500	51,300	77,000	95,000	130,000	23,900	42,400	63,900	79,800	113,700	31,400	52,700	77,000	95,000	130,000
	16	24,000	42,400	63,500	78,900	112,600	31,100	52,200	78,000	96,000	131,000	24,300	43,200	65,100	81,300	115,900	32,000	53,700	78,000	96,000	131,000
	17	33,700	59,900	90,500	112,500	160,100	44,300	74,400	112,000	139,000	197,000	34,200	61,100	92,800	115,900	164,900	45,600	76,600	112,000	139,000	197,000
	18	41,300	73,800	112,000	139,000	197,000	54,700	91,800	139,000	174,000	240,000	41,900	75,300	114,900	143,200	203,400	56,400	94,600	139,000	174,000	240,000
	19	47,900	85,800	130,700	161,800	223,300	63,600	106,800	161,000	200,000	270,000	48,700	87,700	134,300	166,900	236,400	65,600	110,100	161,000	200,000	270,000
	20	56,800	99,600	154,600	182,400	258,000	71,700	120,300	182,000	220,000	290,000	58,600	102,700	159,400	188,200	266,100	74,000	124,100	182,000	220,000	290,000
15	25	81,900	144,500	225,200	269,100	377,100	105,700	176,900	269,000	330,000	440,000	84,600	149,300	232,900	278,600	390,000	109,400	183,100	269,000	330,000	440,000
	35	121,200	216,400	340,200	416,000	572,700	163,000	271,900	416,000	500,000	670,000	125,700	224,700	353,500	433,500	595,500	169,800	283,100	416,000	500,000	670,000
	20*	25,600	45,400	68,100	84,700	120,800	33,400	56,000	84,000	103,000	140,000	26,100	46,400	70,000	87,500	124,800	34,400	57,900	84,000	103,000	140,000
	21	26,100	46,100	69,300	86,200	123,000	33,900	57,000	86,000	105,000	142,000	26,500	47,200	71,300	89,100	127,100	35,100	58,900	86,000	105,000	142,000
	22	36,600	65,200	98,700	122,900	174,900	48,400	81,200	122,000	150,000	200,000	37,300	66,800	101,600	127,100	180,900	50,000	84,000	122,000	150,000	200,000
	23	44,800	80,300	122,000	151,700	215,500	59,700	100,200	151,000	180,000	240,000	45,700	82,300	125,700	157,000	223,000	61,800	103,700	151,000	180,000	240,000
	24	52,000	93,400	142,400	176,600	249,000	69,500	116,600	176,000	210,000	280,000	53,100	95,800	146,900	182,900	259,200	71,900	120,700	176,000	210,000	280,000
	25	62,100	108,700	168,800	199,100	281,700	78,300	131,300	199,000	240,000	320,000	64,300	112,600	174,800	206,500	291,800	81,100	136,100	199,000	240,000	320,000
	35	111,900	198,500	310,600	375,300	521,400	147,200	246,000	375,000	450,000	600,000	116,300	206,400	323,300	391,400	543,000	153,500	256,500	375,000	450,000	600,000

Capacities are calculated in accordance with ASHRAE Standard 158.2, "Methods of testing Capacity of Refrigerant Pressure Regulators." Capacities are based on 60°F Liquid Temperature entering the expansion valve and 25°F superheated vapor entering the compressor.
 *Capacities are calculated at 1 psi ΔP when common suction and circuit evaporator temperatures are the same. For capacities at conditions other than those shown in the tables, use Sporlan Selection Program or contact Sporlan Headquarters.

Refrigerant	Refrigerant Liquid Temperature Correction Factors for 60°F Liquid										
	0	10	20	30	40	50	60	70	80	90	100
R-22	1.22	1.18	1.15	1.11	1.07	1.04	1.00	0.96	0.92	0.88	0.84
R-404A & R-507	1.33	1.28	1.23	1.17	1.12	1.06	1.00	0.94	0.88	0.81	0.74

QUICK PICK SELECTION TABLES for SUPERMARKET MULTIPLE EVAPORATOR SYSTEMS – Valve Capacity Btuh

COMMON SUCTION °F	CIRCUIT or EVAP. °F	REFRIGERANT 134a										REFRIGERANT 401A														
		(S)IORT-PI					(S)IORT					(S)IORT-PI					(S)IORT									
		2	3	4	5	20	2	3	4	5	20	2	3	4	5	20	2	3	4	5	20					
-35	-35*	4,600	7,900	12,000	14,400	20,500	5,700	9,500	13,900	18,700	26,600	8,400	12,700	18,700	22,400	30,000	4,800	7,100	10,900	15,300	21,800	6,000	8,800	12,300	16,700	23,900
	-33	6,600	11,600	17,600	21,100	30,000	8,300	13,900	20,800	25,100	35,900	12,300	18,700	27,000	32,400	44,400	7,100	12,300	18,700	22,400	31,900	8,800	14,800	21,900	26,700	37,900
	-30	10,600	18,700	29,100	34,600	48,700	13,600	22,800	34,100	42,900	60,400	19,900	30,900	45,500	55,200	76,500	11,300	19,900	29,100	36,700	51,700	14,400	24,200	36,700	45,500	64,000
	-25	15,400	27,400	42,900	52,100	72,200	20,400	34,100	51,100	62,900	87,200	29,100	45,500	67,000	82,700	113,900	16,400	29,100	45,500	55,200	76,500	21,600	36,100	53,200	65,200	90,000
	-25*	5,900	10,300	15,500	18,700	26,600	7,400	12,300	18,100	22,700	31,900	10,900	16,300	23,900	29,800	41,000	6,200	10,900	16,300	19,700	28,100	7,800	13,000	19,700	24,400	33,900
-25	-23	8,600	15,100	22,700	27,400	38,900	10,800	18,100	26,100	33,500	46,300	15,900	23,900	34,100	42,900	59,900	9,100	15,900	23,900	29,800	41,000	11,400	19,100	27,500	35,900	50,000
	-21	12,300	21,500	33,500	39,600	55,900	15,600	26,100	39,600	48,700	67,500	22,700	35,300	51,100	62,900	87,200	13,000	22,700	35,300	44,700	61,000	16,400	27,500	41,700	51,100	69,900
	-18	16,500	29,100	45,300	54,300	75,900	21,300	35,700	54,300	67,500	93,200	30,600	47,700	69,000	85,700	118,900	17,400	30,600	47,700	57,100	79,900	22,400	37,500	54,300	66,000	90,000
	-15	20,000	35,400	55,500	67,200	93,200	26,400	44,000	66,000	82,700	113,900	37,300	58,400	84,300	103,000	141,600	21,000	37,300	58,400	70,600	98,100	27,700	46,300	67,000	82,700	113,900
	-10	25,100	45,100	71,000	87,500	119,800	34,300	57,100	87,500	109,100	150,000	47,400	74,700	109,100	141,600	192,200	26,500	47,400	74,700	91,800	125,900	35,900	59,900	89,000	113,900	155,000
-15	-15*	7,600	13,200	19,700	23,900	34,100	9,400	15,800	23,100	28,900	39,600	13,900	20,700	30,200	36,700	49,000	8,000	13,900	20,700	25,100	35,700	9,900	16,600	25,100	31,900	43,000
	-13	11,000	19,300	28,900	35,000	49,800	13,800	23,100	33,500	42,200	58,400	20,200	30,200	44,400	54,300	74,000	11,600	20,200	30,200	36,700	52,100	14,400	24,200	35,900	44,700	61,000
	-10	17,600	31,000	48,200	57,200	80,600	22,500	37,700	56,100	70,800	98,100	32,400	50,400	74,000	91,800	125,900	18,500	32,400	50,400	59,800	84,300	23,500	39,400	57,100	70,600	98,100
	-5	25,500	45,300	70,800	85,600	118,900	33,600	56,100	84,300	103,000	141,600	47,300	74,000	109,100	141,600	192,200	26,700	47,300	74,000	89,300	124,200	35,000	58,600	85,700	103,000	141,600
	0	32,100	57,400	90,400	111,100	152,400	43,500	72,500	108,000	136,300	184,700	59,900	94,300	136,300	173,700	238,900	33,500	59,900	94,300	115,700	158,900	45,300	75,600	113,900	141,600	192,200
10	5	38,200	68,900	109,100	136,300	184,700	53,300	88,600	136,300	173,700	238,900	71,900	113,700	173,700	224,400	306,000	39,900	71,900	113,700	141,600	192,200	55,400	92,100	137,000	173,700	238,900
	10*	13,300	23,200	34,400	42,200	60,200	16,600	27,900	41,000	50,400	69,000	23,900	35,400	50,400	62,900	85,700	13,700	23,900	35,400	43,000	59,900	17,100	28,700	41,000	50,400	69,000
	11	13,500	23,700	35,200	43,200	61,500	17,000	28,500	42,200	51,100	70,600	24,400	36,200	51,100	63,300	86,900	14,000	24,400	36,200	44,400	63,300	17,500	29,300	41,000	50,400	69,000
	12	19,100	33,600	50,200	61,600	87,600	24,200	40,700	60,400	76,200	108,000	34,600	51,600	74,000	91,800	125,900	19,600	34,600	51,600	63,300	89,000	24,900	41,800	60,400	74,000	103,000
	13	23,500	41,500	62,300	76,200	108,000	30,000	50,300	74,000	91,800	125,900	42,700	64,000	91,800	113,900	155,000	24,100	42,700	64,000	78,300	109,100	30,800	51,700	74,000	91,800	125,900
15	14	27,700	48,500	75,300	88,800	125,600	34,900	58,600	88,800	111,100	152,400	49,800	77,400	111,100	141,600	192,200	28,400	49,800	77,400	91,200	129,100	35,900	60,200	85,700	103,000	145,000
	15	31,000	54,500	84,700	100,300	141,500	39,400	66,100	100,300	123,900	173,700	56,000	87,000	123,900	157,400	213,900	31,900	56,000	87,000	103,000	145,000	40,500	67,900	99,000	125,900	173,700
	20	44,800	79,300	123,900	149,000	207,700	58,500	97,800	149,000	192,100	266,800	81,400	127,100	192,100	252,700	344,400	46,000	81,400	127,100	157,400	213,900	59,900	100,300	145,000	184,700	252,700
	25	56,200	100,200	157,400	192,100	266,800	75,300	125,600	192,100	252,700	344,400	102,700	161,300	252,700	324,400	430,000	57,600	102,700	161,300	196,600	271,300	77,000	128,600	184,700	238,900	324,400
	15*	14,700	25,700	38,200	46,900	66,900	18,500	31,000	46,900	58,400	80,600	26,400	39,200	58,400	72,000	98,100	15,100	26,400	39,200	48,100	66,000	19,000	31,800	48,100	59,800	81,000
20	16	15,000	26,200	39,000	47,900	68,300	18,900	31,700	45,200	55,600	76,200	26,900	40,000	55,600	70,600	95,000	15,400	26,900	40,000	49,100	67,000	19,300	32,500	49,100	60,400	81,000
	17	21,100	37,200	55,600	68,400	97,300	26,900	45,200	68,400	84,600	118,900	38,100	57,000	84,600	103,000	141,600	21,600	38,100	57,000	70,100	99,000	27,600	46,300	66,000	82,700	113,900
	18	25,900	45,900	69,000	84,600	120,000	33,300	55,800	84,600	103,000	141,600	47,000	70,600	103,000	125,900	173,700	26,500	47,000	70,600	86,600	122,900	34,100	57,200	82,700	103,000	142,900
	19	30,700	53,800	83,600	98,600	139,500	38,800	65,000	98,600	123,900	173,700	54,800	82,600	123,900	157,400	213,900	30,800	54,800	82,600	100,900	142,900	39,700	66,600	99,000	125,900	173,700
	20	34,500	60,500	94,000	111,300	157,000	43,700	73,300	108,000	136,300	184,700	62,000	96,300	136,300	173,700	238,900	35,300	62,000	96,300	113,900	160,800	44,800	75,100	109,100	141,600	192,200
25	25	49,700	88,000	137,400	165,200	230,400	64,800	108,400	165,200	209,300	288,800	90,000	140,600	209,300	263,300	353,300	50,900	90,000	140,600	168,800	235,600	66,200	110,800	168,800	213,900	288,800
	35	73,800	132,600	209,300	258,800	353,300	101,300	168,700	258,800	324,400	430,000	135,300	213,400	324,400	410,000	544,400	75,400	135,300	213,400	263,300	360,100	103,100	171,700	263,300	324,400	430,000
	20*	16,200	28,400	42,200	52,000	74,200	20,500	34,400	52,000	63,300	86,900	29,000	43,200	63,300	78,300	106,000	16,600	29,000	43,200	53,200	75,800	20,900	35,200	53,200	66,000	90,000
	21	16,500	28,900	43,100	53,100	75,700	20,900	35,100	53,100	64,000	87,600	29,600	44,000	64,000	78,300	106,000	16,900	29,600	44,000	54,300	77,400	21,400	35,900	54,300	67,000	90,000
	22	23,200	41,000	61,500	75,800	107,800	29,800	50,100	75,800	93,700	132,900	41,900	62,800	93,700	113,900	155,000	23,700	41,900	62,800	77,400	110,100	30,500	51,100	77,400	99,000	132,900
30	23	28,500	50,600	76,200	93,700	132,900	36,900	61,800	93,700	118,900	160,800	51,700	77,800	118,900	152,400	207,700	29,100	51,700	77,800	95,600	135,700	37,600	63,100	95,600	125,900	173,700
	24	34,100	59,600	92,600	109,200	154,500	42,900	72,000	109,200	136,300	184,700	60,200	91,000	136,300	173,700	238,900	33,800	60,200	91,000	111,400	157,700	43,800	73,500	111,400	141,600	192,200
	25	38,200	67,000	104,200	123,200	173,900	48,400	81,200	123,200	157,400	213,900	68,400	106,300	157,400	200,000	271,300	39,000	68,400	106,300	125,700	177,500	49,400	82,800	125,700	157,400	213,900
	35	69,000	122,900	193,000	235,100	324,500	92,100	153,800	235,100	298,800	400,000	125,200	196,400	298,800	374,400	500,000	70,300	125,200	196,400	238,900	330,300	93,600	156,400	238,900	298,800	400,000

Capacities are calculated in accordance with ASHRAE Standard 158.2, "Methods of testing Capacity of Refrigerant Pressure Regulators." Capacities are based on 60°F Liquid Temperature entering the expansion valve and 25°F superheated vapor entering the compressor.
 *Cap



Sporlan Division
Parker Hannifin Corporation
206 Lange Drive
Washington, MO 63090
636-239-1111 • FAX 636-239-9130
www.sporlan.com

