

EVAPORATOR PRESSURE REGULATING VALVES

Installation & Service Instructions

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



(S)ORIT



ORIT

INSTALLATION INSTRUCTIONS

To insure optimum performance, evaporator pressure regulating valves must be selected and applied correctly. This is covered thoroughly in Bulletin 90-20-1. However, proper installation procedures are equally important. All of the information in the Application Section should be reviewed before installing (S)ORIT valves.

VALVE LOCATION – The (S)ORIT-12, -15 and -20 must be installed upstream of any other suction line controls or accessories. They may be installed in the horizontal or vertical position (Do not install upside down.) ... whichever best suits the application and permits easy adjustment and accessibility. However, consideration should be given to locating these valves so they don't act as an oil trap, or so solder can run into the internal parts during brazing in the suction line. Reverse flow is not recommended. Therefore, a high side to low side hot gas defrost line must be connected upstream of the (S)ORIT-12, -15 and -20.

INSTALLATION and BRAZING PROCEDURES — It is not necessary to disassemble the valve when soldering to the connecting lines. Any of the commonly used types of solder (such as 50-50, 95-5, Easy-Flo, Phos-Copper or equivalents) are satisfactory. It is important — regardless of the solder used — to direct the flame away from the valve body and avoid excessive heat on the diaphragm of the pilot valve. As an extra precaution, a damp cloth should be wrapped around the diaphragm during the soldering operation.

IMPORTANT: The pilot valve high pressure source is the primary valve port closing force, so this connection must be made for proper performance. There are several precautions to observe when making this connection.

1. Generally the high pressure connection is made either to the discharge line or the top of the receiver. If hot discharge gas is used for defrost, the (S)ORIT pilot supply line must originate from the same location as that of the hot gas defrost line. However, equipment manufacturers sometime select other locations that are compatible with their specific design requirements. Precautions should always be taken so this line does not serve as an oil trap.

The pilot supply line should be kept as short as possible to minimize condensing. Alternate feeding of gas and liquid to the pilot supply may cause the valve to operate erratically.

2. It is also recommended that a hand valve or solenoid valve (Sporlan A3/E3) be installed in this line so the pilot can be isolated should servicing become necessary. The hand valve or solenoid valve is mandatory if it is necessary to pump out an evaporator for service or for a pump-down system. Closing the hand valve or solenoid valve will cause the main piston to shift to the full open position for rapid evacuation of the evaporator. The positive closure of the pilot supply line is also necessary on pump-down systems to eliminate the high side to low side equalization path.



FOR USE ON REFRIGERATION and/or AIR CONDITIONING SYSTEMS ONLY

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The (S)ORIT-12, -15 and -20 are normally open and by closing off the pilot supply pressure (closing pressure), the (S)ORIT main piston will shift to the full open position. For dual temperature applications, closing of the solenoid valve located in the pilot supply line will allow the evaporator to operate at the lower suction pressure/temperature. Note: The solenoid valve must be open at all times during defrost no matter the application.

3. To insure proper performance, the high pressure source supplied to the inlet of the pilot valve must be at least 50 psi above the outlet suction pressure of the (S)ORIT evaporator pressure regulator.

TEST PRESSURES and DEHYDRATION TEMPERATURES — For better leak detection, an inert dry gas, such as nitrogen or CO₂, may be added to an idle system.

CAUTION: Inert gases must be added to the system carefully through a pressure regulator. Unregulated gas pressure can seriously damage the system and endanger human life. Never use oxygen or explosive gases.

Excessive pressure can shorten the life of the pilot regulator valve diaphragm. The maximum low side test pressure that can safely be applied is 450 psig. This maximum pressure is well above the minimum field leak test pressures for low side listed in the ANSI/ASHRAE Standard 15-1994.

The maximum dehydration temperature the valve body can be subjected without danger is 240°F.

VALVE SETTING and ADJUSTMENT — The standard factory setting for the 0/100 psig range is 30 psig. The main function of an (S)ORIT valve is to keep the evaporator pressure above some given point at minimum load conditions. Therefore, even though the valves are selected on the basis of pressure drop at full load conditions, they should be adjusted to maintain the minimum allowable evaporator pressure under the actual minimum load conditions.

When adjusting both evaporator pressure regulating valves and thermostatic expansion valves, the following procedure is recommended.

With the expansion valve at the Sporlan factory setting, or at a manufacturer's predetermined setpoint, and under the actual minimum load condition, the evaporator pressure regulating valve should be adjusted to the desired setting.

If necessary, the thermostatic expansion valve or valves can be adjusted to the desired superheat setting while under the normal operating load condition.

Finally, if superheat adjustments were made to the thermostatic expansion valve then the evaporator pressure regulator set point should be confirmed at minimum load conditions.

When an evaporator pressure regulating valve has been operating for a period of time at a given setting and an increase in the setting is required, as much as 30 minutes may be required for the new balance to take place after an adjustment is made. If the valve is being adjusted to a lower setting an immediate response to an adjustment should be observed.

To adjust the (S)ORIT valves, turn the adjustment screw with a 3/8" hex wrench. A clockwise rotation increases the valve setting, while a counterclockwise rotation decreases

the setting. To obtain the desired setting, a pressure gauge should be utilized on the inlet side of the valve so the effects of any adjustments can be observed.

When (S)ORITs are installed in parallel, each should be adjusted the same amount to obtain optimum performance. If one valve has been adjusted more than the other, both valves should be adjusted all the way in before resetting them an equal amount.

SERVICE INSTRUCTIONS

The (S)ORIT-12, -15 and -20 can be easily disassembled for inspection and cleaning, or for replacement of the pilot assembly. The pilot assembly is available with (Kit number K-Y1005) or without (Kit number K-Y1010) the solenoid stop valve. **The solenoid stop valve is not available separately and should not be removed from the pilot regulator, nor should a standard solenoid valve be added to the pilot assembly to achieve the stop feature.** The pilot port is critically sized with an orifice in the outlet of the pilot assembly. See page 4 for pilot kit components.

CAUTION: The pilot assembly should be isolated from the high pressure power source before removal, and the main valve body should be isolated from inlet and outlet pressures. The (S)ORIT-12, -15 and -20 are normally open and by closing off the pilot supply pressure (closing pressure), the (S)ORIT main piston will shift to the full open position.

PILOT REPLACEMENT INSTRUCTIONS

1. Disconnect the three connections of the pilot valve. They are:
 - inlet pilot tube
 - outlet pilot tube
 - high pressure source
2. With the locknut or body flange still intact, place a wrench on the bottom fitting of the pilot valve. Turn counterclockwise and remove the pilot assembly from the adaptor.
3. Install the new pilot assembly. (At this point the flange is still securely bolted to the valve body.) Again place a wrench on the bottom connection of the pilot valve. Turn clockwise until the pilot assembly is firmly in place. **Do not attempt to align the three pilot valve connections at this time.**
4. Remove the locknut or cap screws and replace the gasket under the adaptor. Two gaskets are supplied with each pilot assembly kit. The correct gasket for the (S)ORIT-12 and -15 is the tetraseal. The (S)ORIT-20 uses the composition gasket. See Figure 2 for actual dimensions of the tetraseal and the gasket.
5. Reassemble the valve. Allen head cap screws must be replaced with the hex head screws included with the pilot assembly kit. Before completely tightening the locknut or cap screws, rotate the pilot valve to properly align the inlet, outlet and external equalizer connections. Join these connections and tighten the locknut of the (S)ORIT-12 to 30 ft-lbf. The torque value for the cap screws on the SORIT-15 should be 110 in-lbf and 180 in-lbf for the SORIT-20. Uniformity of compression from the four cap screws is important. Screw the flange down evenly and firmly. The pilot replacement is now complete.

PISTON REPLACEMENT

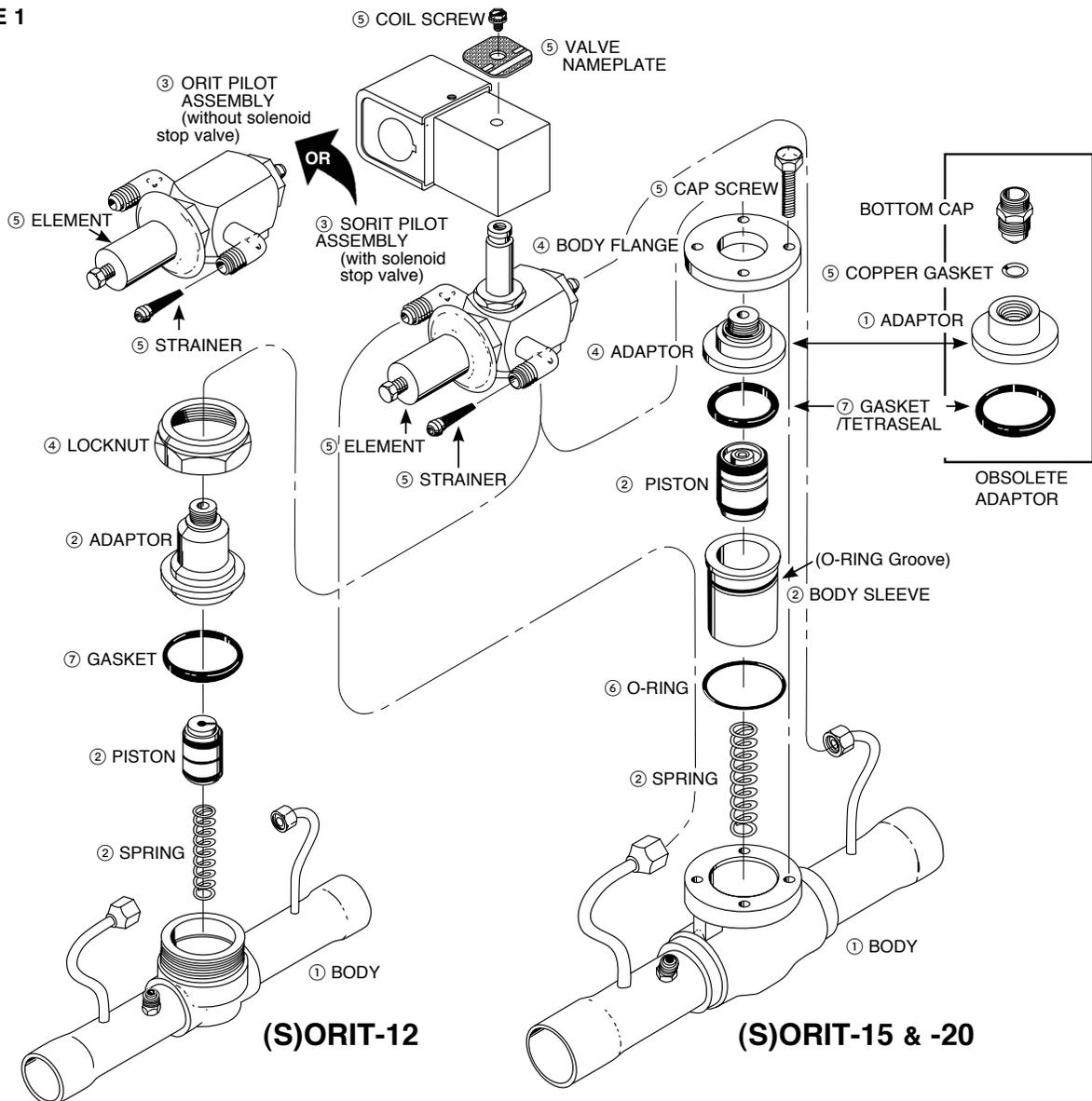
(S)ORIT-12:

1. Remove the pilot assembly from the adaptor as described in Steps 1 and 2 of the pilot replacement instructions.
2. Remove the locknut and replace the adaptor, tetraseal, piston assembly and bottom spring. Reassemble the valve and tighten the locknut to 30 ft. lbs.
3. Reinstall the pilot assembly. Place a wrench on the bottom connection of the pilot valve and turn clockwise until the pilot assembly is firmly in place. **Do not attempt to align the three pilot valve connections at this time.**
4. Loosen the locknut and rotate the pilot valve to properly align the inlet, outlet and external equalizer connections.

(S)ORIT-15 & 20:

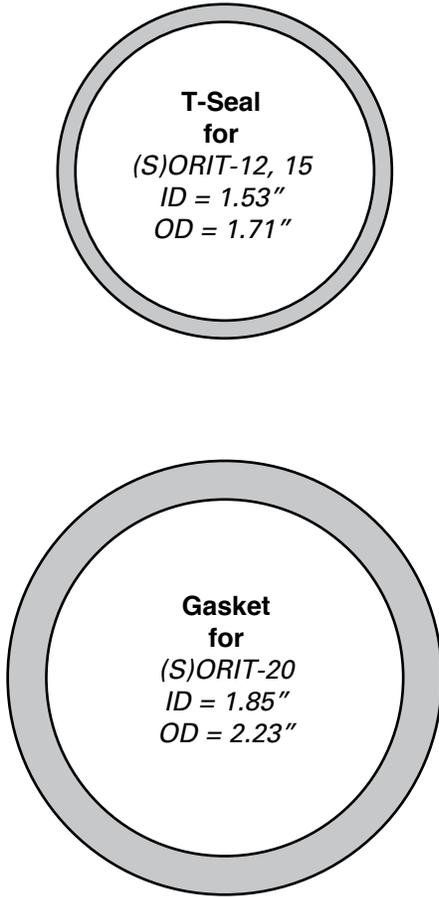
1. Disconnect the three connections of the pilot valve and remove the four cap screws. The complete pilot assembly adaptor and body flange can now be lifted off the main valve body.
2. Replace the piston assembly, body sleeve and bottom spring.
3. Install a new gasket and reassemble the valve. Before completely tightening the cap screws, rotate the pilot valve to properly align the inlet, outlet and external equalizer connections. Join these connections and tighten the cap screws. A torque value for the cap screws is not recommended but uniformity of compression from the four cap screws is important. Screw the flange down evenly and firmly.

FIGURE 1



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| <ul style="list-style-type: none"> ① Replacement part not available. ② Part is not available separately, but is included with the Internal Parts Kit(s). ③ Part is not available separately, but is included with the Pilot Assembly Kit(s). ④ Part is available separately. | <ul style="list-style-type: none"> ⑤ Part is available separately, and is also included with the Pilot Assembly Kit(s). ⑥ Part is available separately, and is also included with the Internal Parts Kit(s). ⑦ Part is available separately, and is also included with the Pilot Assembly Kit(s) and the Internal Parts Kit(s). |
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FIGURE 2



REPLACEMENT PARTS AND PARTS KITS							
PART NUMBER	DESCRIPTION	VALVE TYPE AND SIZE					
		ORIT			SORIT		
		12	15	20	12	15	20
REPLACEMENT PARTS SOLD SEPARATELY							
QUANTITY REQUIRED							
2421-000	ADAPTOR		1			1	
2422-000	ADAPTOR			1			1
2420-002	BODY FLANGE		1			1	
2423-002	BODY FLANGE			1			1
2625-001	CAP SCREW			4			4
2625-002	CAP SCREW		4			4	
1390-000	COIL SCREW				1	1	1
2539-000	GASKET			1			1
2645-000	GASKET/TETRASEAL	1	1		1	1	
6041-000	LOCKNUT	1			1		
0621-028	O-RING		1				
4508-031	O-RING			1			1
4323-000	GASKET (Enclosing Tube Locknut Style from Date Code 3998 to Present) Not Shown				1	1	1
621-016	O-RING (Enclosing Tube Locknut Style Through Date Code 3898) Not Shown				1	1	1
621-014	O-RING (Enclosing Tube 4 Screw Style ONLY) Not Shown				1	1	1
2445-000	STRAINER	1	1	1	1	1	1
0532-001	VALVE NAMEPLATE				1	1	1
0532-002					1	1	1
0532-003					1	1	1
JP-543-002	COPPER FLARE GASKET				②		
REPLACEMENT PILOT VALVE PARTS KITS ①							
A-4-0/100	ELEMENT	1	1	1	1	1	1
K-Y1005-1	All Kits Include: Pilot Assembly, Strainer, Cap Screws, Nameplates, Gaskets and Tetraseals. K-Y1005-1 also includes a coil screw.				1	1	1
K-Y1010		1	1	1			
REPLACEMENT INTERNAL PARTS KITS							
KS-ORI-12 ③	All Kits include: Gasket(s), Piston and Spring. The KS-ORI-12 also includes the Adaptor. The KS-ORI/CDA-15 and KS-ORI/CDA-20 includes a Body Sleeve and O-Ring.	1			1		
KS-ORI/CDA-15			1			1	
KS-ORI/CDA-20				1			1

- ① The pilot valve is available with or without the solenoid stop valve. The solenoid stop valve is not available separately and should not be removed from the pilot regulator.
- ② This part may be necessary to adapt a new pilot to some obsolete valves.
- ③ Replacement (S)ORIT-12 internal parts are only compatible with the Y1005 and Y1010 pilot valves. When using these parts with obsolete pilot valves, the pilot valve must also be replaced.

SERVICE TIPS

MALFUNCTION	CAUSE	REMEDY
Failure to open	<ol style="list-style-type: none"> Dirt or foreign material holding pilot port open. Pilot solenoid valve coil failure. If applicable. 	<ol style="list-style-type: none"> Disassemble and clean pilot port. Replace solenoid valve coil. Use the MKC-1 coil with the proper voltage.
Does not regulate or regulates sluggishly	<ol style="list-style-type: none"> The high pressure source supplied to the inlet of the pilot valve must be at least 50 psi above the outlet suction pressure of the (S)ORIT. If the pilot supply line is of considerable distance, condensing may occur. 	<ol style="list-style-type: none"> Re-locate pilot valve power source. Insulate pilot supply line or if supply line originates from the top of the receiver move it to the top of the discharge line.
Failure to close for defrost	<ol style="list-style-type: none"> High pressure supply line pinched shut or plugged. T-seal or gasket between adaptor and valve body does not seal. If this occurs, pressure can bleed out of the chamber faster than can be supplied by the pilot valve. Dirt or foreign material either lodged between piston and sleeve causing hang-up or excessive scoring in the sleeve or the piston allowing the high pressure to bleed out of the chamber above the piston. Inlet strainer to pilot plugged with foreign material. Refrigerant flow through pilot is restricted by oil in the pilot supply line either due to a trapped supply line or too much oil in the system. Pilot supply pressure originates from a lower pressure source than is used for defrost. 	<ol style="list-style-type: none"> Replace or clean high pressure supply line. Replace T-seal or gasket. These should be replaced any time the pilot assembly is removed from the valve body. Clean or if necessary replace the piston and the sleeve. Clean or replace strainer. Check the pilot supply line to be sure that it is open, and that it does not serve as an oil trap. If the pilot pressure source originates from the top of the receiver, and the valve is not closing for defrost, move the pilot supply pressure source to the discharge line.



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