



Installation Instructions: (S)ORIT to CDS Conversion Kit

The Sporlan (S)ORIT pilot operated EPRs (Evaporator Pressure Regulators) have been the standard for accurate evaporator control for many years. A conversion to the increased accuracy of CDS step motor EEPs (Electronically controlled Evaporator Pressure Regulators) is now available for installation without removing the existing (S)ORIT bodies.

Conversion kits are available for (S)ORIT-12, (S)ORIT-15 and (S)ORIT-20. Part numbers for ordering can be found in Table 2.

Conversion will require the proper conversion kit and the interface board offered by the EMS controller manufacturer. Table 1 lists the part number of the board and contact information for the manufacturers. Manufacturers should be consulted for the latest information and conversion suggestions.

Figure 1

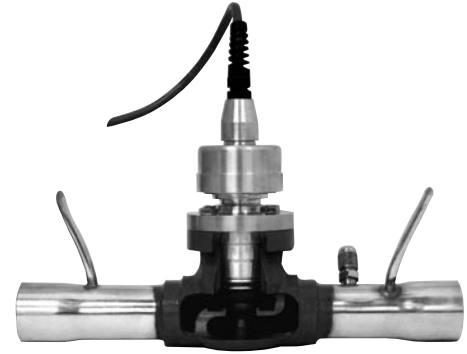


Table 1 - EMS Controller Manufacturers Contact Info and Required Interface Boards/Power Supplies

Controller Manufacturer and Model	Literature	Stepper Interface Board Required	Number of Valves per I.B.	Communication Interface Board Required	Low Voltage Transformer Required	Interface Boards per Transformer	Phone Number	Website
Com-Trol: 4K & 4K2E	ESB-8	4ZAB518G01 (Edge) 4ZAB618G01 (Flat)	8	No	425005BH07	1	888-444-1311	www.icca.invensys.com
CPC: Einstein I/II	026-1720 Rev 1 01-27-06	MultiFlex Board p/n 810-3198	8	No	640-0080	1	770-425-2724	www.emersonretailsolutions.com
Danfoss: AKC-55 AK2-SC 255	DKRCE.P1.R1. A2.22	AK2-XM-208B p/n 080Z0022	4	p/n 080Z0061 (1 per 4 I.B.)	p/n 080Z0052 (56 VA)	4	410-931-8250	www.danfoss.com/North_America
Micro-Thermo	—	MT-EEPR V	5	No	—	—	450-668-3033	www.microthermo.com

Disassembly - All valves

Refer to Table 2 for a quick reference guide.

- 1 High pressure supply to the valve should be shut off.
- 2 The circuit to be updated should be pumped down, isolated and residual refrigerant reclaimed.
- 3 All power should be removed from any solenoid operator on the valves.
- 4 The coils and all wiring should be removed at the relays or other connections in the control panel. Any vacant knockout holes should be plugged per electrical code.
- 5 Flare nuts on the pilot lines and high pressure sources should be loosened carefully in case of any residual pressure.

Note: As a safety precaution, partially loosen the flange plate lock nut [(S)ORIT-12 or the 4 flange plate bolts (S)ORIT-15/(S)ORIT-20], and break the seal between the flange plate and valve body. This will allow any refrigerant that may be trapped to vent before removing the flange plate.

- 6 The pilot lines should be removed from the pilot assembly and bent out of the way.

Disassembly and reassembly (S)ORIT-12

- 1 The locknut holding the pilot to the valve body should be loosened and the pilot removed.
- 2 Remove and discard the piston and spring.
- 3 The pilot lines may be closed with flare plugs but to avoid the possibility of leaks the lines should be crimped and brazed shut. The lines may be cut at a convenient location but not within 2 inches of the valve body to prevent harming the braze joint on the body. A wet cloth should be used and the brazing done before the kit is installed to prevent damage to the kit or wiring.

- 4 Inspect the gasket seating surface to assure that it is clean and flat.
- 5 Lubricate the tetraseal with refrigeration oil and mount the kit to the valve.
- 6 Care should be taken to ensure that the motor/piston is not driven more than 50% closed before installing on (S)ORIT body.
- 7 Tighten locknut to 60-65 foot pounds of torque.

Disassembly and reassembly (S)ORIT-15

- 1 Loosen and remove the bolts holding the flange plate to the body. Penetrating oil may be used to help loosen the bolts.
- 2 Remove the pilot assembly.
- 3 Remove and discard the piston, spring, gasket and piston sleeve. A bearing puller may be helpful.
- 4 **Caution: sleeve must be removed to prevent kit damage.**
- 5 Care should be taken to ensure that the motor/piston is not driven more than 50% closed before installing on (S)ORIT body.
- 6 Remove any residual penetrating oil, if used on the bolts.
- 7 Inspect gasket seating surface to assure that it is clean and flat.
- 8 Lubricate gasket with refrigeration oil and install kit to body.
- 9 Tighten the 4 flange plate bolts to the appropriate torque setting listed in Table 2.

Note: The mounting screws are captive to the flange plate and must be tightened alternately. No attempt should be made to remove the flange plate from the kit to gain access to the bolts.

Disassembly and reassembly (S)ORIT-20

Follow instructions for the (S)ORIT-15 kit, but there is no need to remove the sleeve.

Table 2 - Pilot Assembly/Adaptor Disassembly and Assembly

Valve Type	Conversion Kit Part Number	Remove Pilot Assembly & Adaptor	Piston	Piston Sleeve	Piston Spring	Required Seal (Included with kit)	Torque Setting (ft-lbs)
(S)ORIT-12	Kit-SORIT-12 to CDS Sporlan Item # 901656	Loosen Locknut	Piston In Adaptor	No Sleeve in Body	Remove	Tetra-Seal p/n 2645-000	Locknut: 60-65 ft-lbs
(S)ORIT-15	Kit-SORIT-15 to CDS Sporlan Item # 901654	Loosen 4 Flange Plate Bolts	Remove Piston From Body	Remove Piston Sleeve from Body	Remove	O-Ring p/n 0621-129	Flange Plate Bolts: 9-12 ft-lbs
(S)ORIT-20	Kit-SORIT-20 to CDS Sporlan Item # 901655	Loosen 4 Flange Plate Bolts	Remove Piston From Body	Leave Piston Sleeve in Body	Remove	Wolverine Gasket p/n 2539-000	Flange Plate Bolts: 13-20 ft-lbs

Wiring the valves

- 1 Route the kit cables to the appropriate control panel and connect to the interface boards used. To prevent cable damage, grommets or strain reliefs should be used whenever the cable passes through the panel or any metallic bulkhead.
- 2 The cable should be supported in the proper manner and care should be taken that routing avoids hot piping or sharp edges.
- 3 Connect the 4 wire leads on the CDS motor kit to the appropriate terminals on the interface board (Molex connectors may be required on certain CPC interface boards). Consult the controller manufacturer for the correct wiring sequence.

Settings

The required set-points should be entered in the EMS controller. The following are general guidelines. Refer to the EMS manufacturer's setup instructions for specific instructions.

The set-points specific to CDS valves are shown in Table 3. If these are not entered as listed, the valve will not control correctly.

Note: Most EMS controllers come with defined factory default settings for step-motor suction line regulators. These will likely be different than those required for the CDS valve.

All remaining set-points must be entered. Refer to the controller setup instructions for the proper procedure. These may include the following: (1) temperature set-point, (2) dual temperature, (3) defrost type, (4) valve over close percentage, (5) maximum valve opening percentage, (6) pulldown valve opening percentage, (7) temperature/communication failure valve opening percentage, (8) specifying a lead circuit for suction pressure float.

The CDS Motor Kit is shipped approximately 50% open. After the motor kit has been installed on the (S)ORIT body, and the motor leads are connected to the interface board, the valve's motor must be initialized. This requires verifying that the CDS motor is 0% open when the controller is calling for it to be 0% open. Normal initialization occurs on board power-up. Two initializations may be required to assure full closing and zero position. Failure to initialize the valve may prevent it from closing fully for pumpdown or defrost. This can be confirmed by using an SMA-12 to manually drive the valve closed, and monitoring suction pressure.

System Start-Up

- 1 Pressurize the circuit and verify that there are no refrigerant leaks.
- 2 Evacuate circuit with a vacuum pump.
- 3 Open all shutoff valves and restore power to the controller if not already completed. Resume system operation.

Diagnostics

If the CDS valve is not controlling properly, verify that the correct set-points have been entered into the EMS controller. These would include total number of steps, step rate, and PID settings. Refer to Table 3 for these values.

Erratic temperature control can occur if the discharge air sensor is not precisely located with full exposure to the discharge air. If the sensor is not secured directly in the discharge air stream, reposition it as required.

Table 3 – EMS set-points for CDS valves

Controller Type	Total Number of Steps	Step Rate (Steps/Second)	Proportional Setting (P)	Integral Setting (I)	Derivative Setting (D)
Com-Trol	6386	200	.5	.5	.5
CPC – Einstein I/II	6386	200	.5	.5	.5
Danfoss – AKC55	6386	200	Factory Set – Cannot Be Changed		
Micro-Thermo	6386	200	.5	.5	.5

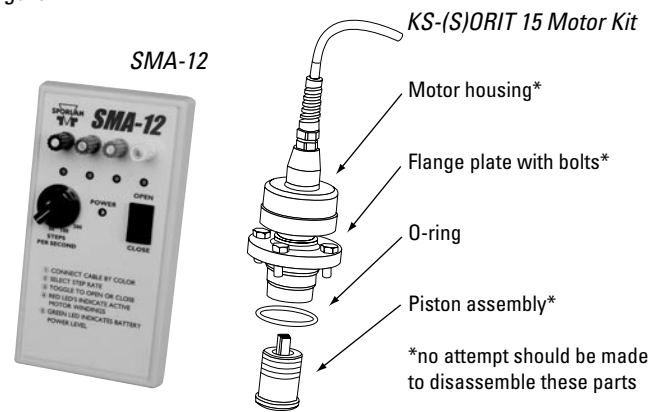
If steps A and B have been verified, and the CDS motor appears inoperative, check the resistance of the motor windings. Resistance between the black/white leads and red/green leads should be approximately 75 ohms. A difference of greater than 10% between the two windings indicates a faulty motor. A resistance reading between black/green, or any lead and the motor housing other than infinite indicates a shorted motor, and the CDS motor will require replacement.

The CDS motor operation can be proven with the SMA-12 (See Figure 2). Disconnect the four CDS motor leads from the interface board and reconnect them (color coded) to the appropriate terminals on the SMA-12. Verify that the CDS motor can be driven 100% closed, and 100% open. This can be checked by removing the motor assembly from the valve body and visually inspecting piston travel, or while operating on the system, observing the change in circuit suction pressure as the valve moves from fully closed to fully open.

Caution: If this test is made with the motor assembly removed from the valve body, the valve piston must be fully retracted into the adapter before reassembly. Failure to do this may permanently damage the valve.

If proper CDS motor operation has been verified, the problem may lie in the controller. Consult the controller manufacturer for their troubleshooting recommendations for the controller, interface board or sensor.

Figure 2



Support Information

Phone/Web address to access Sporlan Valve literature:
636-239-1111 (Electric Valve or Supermarket Technical Support)
www.sporlan.com/literature.shtm

Web address to access CPC literature:
www.emersonretailsolutions.com/library/manuals.html

Web address to access Danfoss literature:
www.danfoss.com/North_America/BusinessAreas/Refrigeration+and+Air+Conditioning/Food+Retail+Literature+and+Software+Select+ion.htm

Literature requests for Com-Trol and Micro-Thermo can be made using the phone numbers in Table 1.

