EVAPORATOR PRESSURE REGULATING VALVES

The Sporlan line of evaporator pressure regulating (EPR) valves are designed to provide an accurate and economical means of balancing system capacity and load requirements during "low" loads and/or while maintaining different evaporator conditions on multi-temperature evaporator systems. These valves control evaporator temperature by maintaining evaporator pressure. As the evaporator load increases the **ORI** valves will **O**pen on **R**ise of **I**nlet pressure above the valve's setting to provide more flow capacity to meet the evaporator load. When the evaporator load decreases the valves will modulate closed to maintain the pressure setting of the valve.

Sporlan offers a number of EPR valve types in various sizes, and with optional features to accommodate almost any industry requirement. For more complete information on any of the EPR valve types see your nearest Sporlan Wholesaler or email europecold@parker.com

ORIT-6 and -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)

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Applications

- Maintain minimum evaporator temperature to avoid frost on air coils and provide improved humidity control
- Evaporator temperature control for food merchandisers (single and multiple evaporator systems)
- Evaporator temperature control on water chilling units

Required Sizing Information

- Refrigerant type
- Evaporator design capacity
- Design evaporator temperature or minimum evaporator pressure
- Available pressure drop
- Allowable evaporator pressure change (only applies to direct acting models)

These direct acting EPRs are offered in two sizes. The direct acting design although economical requires an evaporator pressure change above the minimum evaporator pressure setting to provide the rated flow capacity. The nominal ratings are based on an 0.55 bar evaporator pressure change for the 0/3.45 bar adjustment range, and a 0.83 bar change for the 2.07/6.90 bar adjustment range. Valves should be selected for the desired maximum variation in evaporator pressure using the capacity multipliers below.

ALLOWABLE EVAPORATOR PRESSURE CHANGE – bar		0.14	0.28	0.41	0.55	0.69	0.83	0.97
CAPACITY MULTIPLIER	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

Specifications

VALVE TYPE	PORT SIZE mm	ADJUSTMENT RANGE	STANDARD CONNECTIONS In BOLD
ORIT-6	19	**0/3.45** or 2.07/6.90 bar	1/2 & 5/8 SAE Flare* 1/2, 5/8, **7/8** & 1-1/8 ODF Solder
ORIT-10	31		7/8, 1-1/8 & **1-3/8** ODF Solder

Standard features in bold.
*Not available with inlet strainer.

Capacities – kW

Capacities based on 38°C condensing temperature, 0°C subcooling, 6°K superheat, 0.55 bar evaporator pressure change for 0/3.45 bar adjustment range, and a 0.83 bar evaporator pressure change for 2.07/6.90 bar adjustment range.

VALVE TYPE	EVAPORATOR TEMPERATURE °C	SATURATED PRESSURE – bar (Reference) REFRIGERANT					REFRIGERANT														
							22			134a			404A			407C			507		
							PRESSURE DROP ACROSS VALVE – bar														
		22	134a	404A	407C	507	0.1	0.4	0.7	0.1	0.4	0.7	0.1	0.4	0.7	0.1	0.4	0.7	0.1	0.4	0.7
ORIT-6	5	4.83	2.48	6.03	4.35	6.32	3.85	7.16	8.75	2.89	5.01	5.60	3.36	6.30	7.78	3.57	6.54	7.87	3.31	6.22	7.70
	-5	3.21	1.42	4.12	2.77	4.34	3.19	5.73	6.73	2.29	3.67	3.77	2.71	4.94	5.90	2.87	5.04	5.75	2.68	4.90	5.90
	-15	1.95	0.63	2.62	1.57	2.79	2.58	4.39	4.79	1.76	2.45	2.45	2.14	3.72	4.19	2.24	3.67	3.82	2.12	3.74	4.28
	-25	1.00	0.05	1.49	0.70	1.61	2.04	3.16	3.19	1.29	1.53	1.53	1.65	2.66	2.74	1.71	2.44	2.44	1.64	2.68	2.80
ORIT-10	5	4.83	2.48	6.03	4.35	6.32	9.45	18.7	24.4	7.25	14.2	18.3	8.23	16.3	21.3	8.79	17.3	22.6	8.08	16.0	21.0
	-5	3.21	1.42	4.12	2.77	4.34	7.88	15.5	20.2	5.83	11.3	14.4	6.69	13.2	17.2	7.13	14.0	18.1	6.59	13.0	16.9
	-15	1.95	0.63	2.62	1.57	2.79	6.48	12.6	16.3	4.60	8.77	11.0	5.35	10.5	13.6	5.70	11.1	14.2	5.28	10.4	13.4
	-25	1.00	0.05	1.49	0.70	1.61	5.23	10.1	12.8	3.55	6.58	8.01	4.19	8.12	10.4	4.46	8.52	10.7	4.15	8.07	10.4

ORIT – Valve Nomenclature/Ordering Instructions

ORI	T	– 6	– 0/50	– 7/8" ODF
Valve Type: **O**pen on **R**ise of **I**nlet Pressure	Pressure Tap on Inlet Connection	Port Size in Eighths of an Inch	Adjustment Range – psig*	Connection ODF Solder or SAE Flare

* Other pressure ranges are available.

EVAPORATOR PRESSURE REGULATING VALVES

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

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

These EPRs are pilot operated using "high side" pressure and require a pilot supply connection from the compressor discharge to operate. They are designed to be "normally open" providing an unparalleled ability to operate with virtually no suction line pressure drop. The pilot operated design does not require the "allowable evaporator pressure change" necessary with the direct acting models, and can be simply sized based on design evaporator temperature and available pressure drop across the valve at full load conditions.

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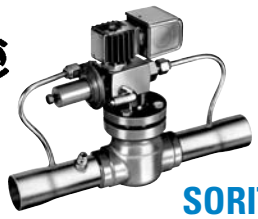

SORIT

Specifications

VALVE TYPE	PORT SIZE mm	ADJUSTMENT RANGE bar	STANDARD COIL RATINGS *MKC-1		CONNECTIONS ODF SOLDER Inches
			VOLTS/CYCLES	WATTS	
(S)ORIT-12	19.8	0/6.90	24/50-60 120/50-60 208-240/50-60 120-208-240/50-60	10	1-1/8
(S)ORIT-15	25.4				1-3/8
(S)ORIT-20	33.3				1-5/8

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

Capacities – kW

Capacities based on 15°C condensing temperature, 0°K superheat at the evaporator, and 14°K superheat at the valve.

VALVE TYPE	EVAPORATOR TEMPERATURE °C	REFRIGERANT															
		22				134a				404A				507			
		PRESSURE DROP ACROSS VALVE – bar															
		0.03	0.10	0.40	0.70	0.03	0.10	0.40	0.70	0.03	0.10	0.40	0.70	0.03	0.10	0.40	0.70
(S)ORIT-12	5	7.64	13.9	27.3	35.5	6.09	11.0	21.4	27.4	7.41	13.5	26.6	34.6	7.17	13.0	25.7	33.5
	-5	6.40	11.6	22.7	29.3	4.95	8.94	17.1	21.5	6.11	11.1	21.7	28.1	5.92	10.8	21.1	27.3
	-15	5.29	9.59	18.5	23.6	3.95	7.11	13.3	16.3	4.96	8.99	17.4	22.4	4.82	8.74	17.0	21.8
	-25	4.30	7.76	14.7	18.5	—	—	—	—	3.96	7.16	13.7	17.3	3.86	6.97	13.4	16.9
(S)ORIT-15	5	12.6	22.9	44.8	57.9	10.1	18.2	34.9	44.0	12.3	22.3	43.7	56.5	11.9	21.6	42.3	54.8
	-5	10.6	19.2	37.1	47.4	8.18	14.7	27.6	34.1	10.1	18.3	35.6	45.7	9.79	17.8	34.6	44.4
	-15	8.75	15.8	30.1	37.8	6.53	11.7	21.1	25.0	8.20	14.8	28.4	36.0	7.97	14.4	27.7	35.2
	-25	7.11	12.8	23.7	29.0	—	—	—	—	6.55	11.8	22.1	27.4	6.38	11.5	21.6	26.9
(S)ORIT-20	5	27.7	50.3	98.5	127	22.1	40.0	76.8	97.4	26.9	48.9	95.9	124	26.0	47.3	92.8	121
	-5	23.2	42.1	81.6	105	17.9	32.3	60.9	75.7	22.1	40.2	78.2	101	21.5	39.0	76.0	97.9
	-15	19.2	34.7	66.3	83.7	14.3	25.6	46.8	56.1	18.0	32.5	62.6	79.5	17.5	31.6	61.0	77.7
	-25	15.6	28.0	52.4	64.5	—	—	—	—	14.4	25.9	48.8	60.8	14.0	25.2	47.8	59.6

Refrigerant Liquid Temperature Correction Factors

REFRIGERANT	LIQUID TEMPERATURE ENTERING VALVE °C										
	-15°	-10°	-5°	0°	5°	10°	15°	20°	30°	35°	40°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE										
R-22	1.21	1.17	1.14	1.11	1.07	1.04	1.00	0.96	0.91	0.87	0.84
R-134a	1.25	1.21	1.17	1.14	1.09	1.05	1.00	0.95	0.89	0.84	0.81
R-404A	1.31	1.27	1.22	1.16	1.12	1.06	1.00	0.94	0.86	0.79	0.74
R-507	1.32	1.28	1.22	1.16	1.12	1.06	1.00	0.94	0.86	0.80	0.75

*ARI standard capacities are based on 38°C saturated liquid temperature. Use the correction factor for 40°C liquid temperature and the capacities at 5°C evaporator temperature to determine approximate ARI standard capacity ratings.

Example: The capacity of a (S)ORIT-12 using R-404A, evaporator temperature of -5°C, 0.1 bar pressure drop across the valve and a liquid temperature of 10°C, is equal to 11.1 x 1.06 = 11.8 kW.

Installation

When installing these valves with solder connections, the internal parts should be protected from overheating by wrapping the valve with a wet cloth.

(S)ORIT – Valve Nomenclature/Ordering Instructions

S	ORI	T	–	15	–	0/100	–	1-3/8" ODF	–	120/50-60
Solenoid Stop Feature (optional)	Valve Type: **O**pen on **R**ise of **I**nlet 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.

EVAPORATOR PRESSURE REGULATING VALVES

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

- Piloted internally (No high side connection required)
- Superior corrosion resistance
- Optional solenoid "stop" feature to close valve during defrost
- Optional electric open feature for "two temperature operation"
- Manual lift stem (standard) to allow system evacuation

These EPRs are **P**iloted **I**nternally using the natural pressure drop across the valve to operate and do not require a "high side" pilot connection. Like the (S)ORIT valves, the pilot operated design does not require the "allowable evaporator pressure change" necessary with the direct acting models, and can be simply sized based on design evaporator temperature and available pressure drop across the valve at full load conditions.

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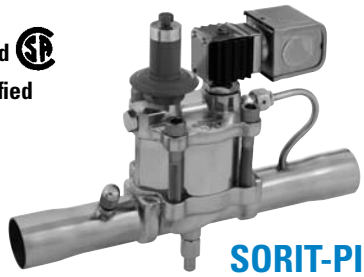

SORIT-PI

Specifications

VALVE TYPE	PORT SIZE mm	ADJUSTMENT RANGE bar	STANDARD COIL RATINGS *MKC-1		CONNECTIONS ODF SOLDER Inches
			VOLTS/CYCLES	WATTS	
(S)ORIT-PI-2	12.7	0/6.90 or 5.17/10.3	24/50-60 120/50-60 208-240/50-60 120-208-240/50-60	10	5/8, 7/8, 1-1/8, 1-3/8
(S)ORIT-PI-3	19.1				7/8, 1-1/8, 1-3/8, 1-5/8
(S)ORIT-PI-4	25.4				1-1/8, 1-3/8, 1-5/8, 2-1/8
(S)ORIT-PI-5	31.8				1-3/8, 1-5/8, 2-1/8

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

Capacities – kW

Capacities based on 15°C liquid temperature, 0°K superheat at the evaporator and 14°K superheat at the valve.

VALVE TYPE	EVAPORATOR TEMPERATURE °C	REFRIGERANT															
		22				134a				404A				507			
		PRESSURE DROP ACROSS VALVE – bar															
		0.03	0.1	0.4	0.7	0.03	0.1	0.4	0.7	0.03	0.1	0.4	0.7	0.03	0.1	0.4	0.7
(S)ORIT-PI-2	5	2.78	8.66	20.3	27.6	2.22	6.92	16.6	20.9	2.70	8.40	19.6	27.0	2.61	8.13	18.9	26.2
	-5	2.33	7.26	17.7	22.6	1.81	5.63	13.1	16.1	2.22	6.93	16.3	21.8	2.15	6.71	15.7	21.2
	-15	1.93	6.01	14.4	17.9	1.45	4.51	9.99	11.7	1.81	5.63	13.6	17.1	1.76	5.47	13.2	16.7
	-25	1.57	4.90	11.3	13.6	—	—	—	—	1.44	4.50	10.5	12.9	1.41	4.38	10.3	12.7
(S)ORIT-PI-3	5	3.55	20.3	40.1	53.6	2.84	16.3	32.3	40.9	3.45	19.7	38.7	52.3	3.33	19.0	37.4	50.7
	-5	2.98	17.1	34.3	44.0	2.31	13.3	25.6	31.8	2.84	16.3	32.0	42.3	2.75	15.8	31.0	41.2
	-15	2.47	14.2	27.9	35.2	1.85	10.7	19.7	23.5	2.31	13.3	26.3	33.4	2.24	12.9	25.6	32.6
	-25	2.01	11.6	22.0	27.1	—	—	—	—	1.85	10.7	20.5	25.5	1.80	10.4	20.1	25.0
(S)ORIT-PI-4	5	7.72	27.3	54.6	72.1	6.17	21.8	43.5	55.5	7.49	26.5	53.0	70.3	7.24	25.6	51.2	68.1
	-5	6.48	22.9	46.1	59.4	5.02	17.7	34.6	43.4	6.18	21.8	43.7	57.1	5.99	21.1	42.3	55.5
	-15	5.36	18.9	37.6	47.8	4.02	14.2	26.8	32.6	5.02	17.7	35.4	45.3	4.88	17.2	34.5	44.2
	-25	4.36	15.4	29.8	37.2	—	—	—	—	4.01	14.2	27.7	34.9	3.91	13.8	27.1	34.2
(S)ORIT-PI-5	5	22.0	42.2	83.1	108	17.6	33.6	65.2	83.6	21.3	41.0	80.9	105	20.6	39.6	78.3	102
	-5	18.4	35.4	69.1	89.3	14.3	27.2	52.1	65.8	17.6	33.7	66.1	85.7	17.0	32.7	64.2	83.3
	-15	15.3	29.2	56.4	72.1	11.4	21.6	40.5	49.8	14.3	27.3	53.1	68.2	13.9	26.6	51.7	66.6
	-25	12.4	23.6	44.9	56.4	—	—	—	—	11.4	21.8	41.7	52.8	11.1	21.2	40.8	51.7

Refrigerant Liquid Temperature – Correction Factors

REFRIGERANT	LIQUID TEMPERATURE ENTERING VALVE °C										
	-15°	-10°	-5°	0°	5°	10°	15°	20°	30°	35°	40°
	CORRECTION FACTOR, CF LIQUID TEMPERATURE										
R-22	1.21	1.17	1.14	1.11	1.07	1.04	1.00	0.96	0.91	0.87	0.84
R-134a	1.25	1.21	1.17	1.14	1.09	1.05	1.00	0.95	0.89	0.84	0.81
R-404A	1.31	1.27	1.22	1.16	1.12	1.06	1.00	0.94	0.86	0.79	0.74
R-507	1.32	1.28	1.22	1.16	1.12	1.06	1.00	0.94	0.86	0.80	0.75

*ARI standard capacities are based on 38°C saturated liquid temperature. Use the correction factor for 40°C liquid temperature and the capacities at 5°C evaporator temperature to determine approximate ARI standard capacity ratings.

Example: The capacity of a (S)ORIT-PI-3 using R-22, evaporator temperature of -15°C, 0.1 bar pressure drop across the valve and a liquid temperature of 10°C, is equal to 14.2 x 1.04 = 14.8 kW.

Installation

When installing these valves with solder connections, the internal parts should be protected from overheating by wrapping the valve with a wet cloth.

(S)ORIT-PI Series – Valve Nomenclature/Ordering Instructions

S	ORI	T	–	PI	–	2	7	S	E	–	0/100	120/50-60
Solenoid Stop Feature (optional)	Valve Type: **O**pen on **R**ise of **I**nlet 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.

For complete information consult your nearest Sporlan Wholesaler or email europecold@parker.com and request Bulletin 90-20-2 and 90-20-2A.