July 2018 / **Bulletin 30-30**

SPORLAN

Pulse Width Modulation Valves

Models SPW-0 thru -7



Parker

ENGINEERING YOUR SUCCESS.



Features and Benefits

Pulse Width Modulation Valves (SPW)

- Controls refrigerant by cycling on/off during 6 second period
- Designed for CO_2, HFC, HCFC and HFO (nonflammable & nontoxic) System Operation
- Operates from 10% to 100% of rated capacity
- Tight seating design
- Robust Design, 50 Million+ Cycle Life
- Low Wattage NEMA-4X Coil, IP65 Rated, Class F
- Brass, Copper & Stainless Steel Design for Premier Corrosion Resistance
- Serviceable Design with Interchangeable Port & Strainer
- Maximum Rated Pressure (MRP) 1305 psig / 90 barg
- Maximum Operating Pressure Differential (MOPD) 507 psid / 35 bar

Pulse Width Modulation Valves

For Refrigerant Flow Control in Direct Expansion CO_2, HFC, HCFC and HFO Refrigeration Systems

The Sporlan SPW line of electric expansion valves uses pulse width modulation (PWM) control to manage refrigerant flow in direct expansion CO_2, HFC, HCFC and HFO (nonflammable & nontoxic) refrigeration systems. The valve's duty cycle is varied based on measured evaporator superheat. Typical controllers monitor superheat and vary the duty cycle across a 6 second period.

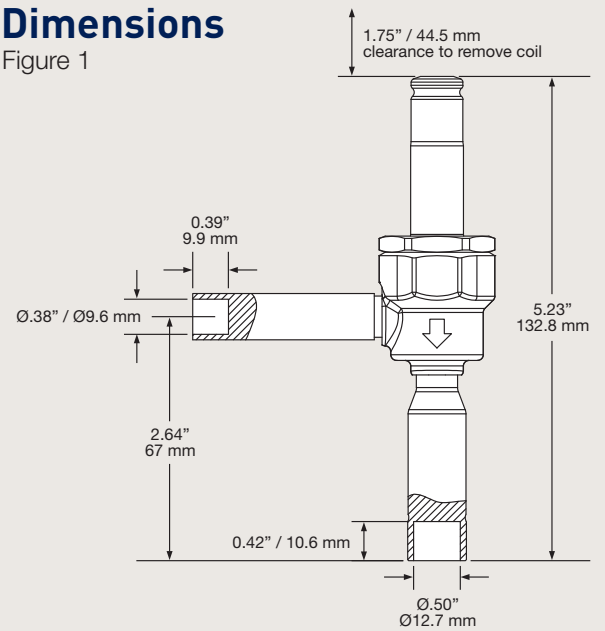
Sporlan's Pulse Width Modulation Valves are rated at 100% duty cycle, no reserve capacity. Pulse Width Modulation Valves are typically sized between 50% and 85% duty cycle. This allows additional capacity for pulldown at start-up and after defrost. Further consideration should be given to the liquid line size to avoid excessive liquid hammer. Liquid line velocity should not exceed 3 ft/second.

The SPW valve family offers 8 port sizes to cover a wide range of evaporator loads. The serviceable port and strainer design allows the contractor to service and clean the SPW valve or easily replace the port during a refrigerant retrofit.

The SPW Valve line is rated for a Maximum Rated Pressure (MRP) of 1305 psig (90 barg). The Maximum Operating Pressure Differential (MOPD) is 507 psid (35 bar). Solenoid coils are available for 24 VAC/60 Hz, 110-120 VAC / 50-60 Hz and 220-240 VAC / 50-60 Hz.

Dimensions

Figure 1



Specifications

SPW Valve Family General Specifications

Actuation Type	Pulse Width Modulation
Recommended Period	6 seconds
Control Range	10 – 100% Duty Cycle
Voltage	24 VAC/60 Hz 110-120 VAC/50-60 Hz 220-240 VAC/50-60 Hz
Power Input (Watts)	11W
Inrush (VA)	38 VA
Holding Power (VA)	22 VA
Coil Resistance (ohms)	4.0 Ω (24 VAC) 103.1 Ω (110-120 VAC) 412.9 Ω (220-240 VAC)
Electrical Connection Style	½" NPT Conduit W/18" leads
	DIN 43650A
Flow Direction	Side Inlet, Bottom Outlet
Mounting Orientation	Enclosing Tube No Less than Horizontal
Serviceability	Coil, Port and Strainer
Strainer Size (micron)	100
Approved Refrigerant (Class A1)	CO_2, HFC, HCFC, HFO (nontoxic & nonflammable)
Approved Refrigerant Oil	POE, PAG, PVE, Mineral
Max Internal Leak (sccm Air)	5 @ 100 psid
Max External Leak (sccm Helium)	0.1 oz/year @ 300 psig
Certifications & Compliance	UL File MH4576, PED, Reach, ROHS, LVD

APPLICATION LIMITATIONS	MAXIMUM	MINIMUM
Ambient temperature*	130°F (54°C)	-40°F (-40°C)
Fluid temperature	180°F (82°C)	-40°F (-40°C)
Installation Temperature	250°F, 15 minutes maximum	
Relative Ambient Humidity	95% Non-condensing (IP65 Rated)	
Maximum Rated Pressure (MRP)**	1305 psig (90 barg)	
Pressure Differential (MOPD)	507 psid (35 bar)	

* Approved only for liquid expansion applications.
** Maximum Rated Pressure for stand still conditions. Liquid must be present at valve inlet for operation.

Capacity - Tons

R-744 Capacities in Tons (at Evaporator Temperature °F)

	Valve Type	20°F								0°F								-20°F								-40°F							
		Pressure Drop Across Valve (psid)																															
		100	150	200	250	300	350	400	450	100	150	200	250	300	350	400	450	100	150	200	250	300	350	400	450	100	150	200	250	300	350	400	450
R-744	SPW-0	0.12	0.15	0.17	0.19	0.21	0.23	0.24	0.26	0.12	0.15	0.17	0.20	0.21	0.23	0.25	0.26	0.12	0.15	0.18	0.20	0.21	0.23	0.25	0.26	0.12	0.15	0.17	0.19	0.21	0.23	0.25	0.26
	SPW-1	0.30	0.37	0.42	0.47	0.52	0.56	0.60	0.63	0.30	0.37	0.43	0.48	0.52	0.56	0.60	0.64	0.30	0.37	0.43	0.48	0.52	0.57	0.60	0.64	0.30	0.37	0.42	0.47	0.52	0.56	0.60	0.64
	SPW-2	0.54	0.66	0.76	0.85	0.93	1.00	1.07	1.14	0.54	0.66	0.77	0.86	0.94	1.01	1.08	1.15	0.54	0.66	0.77	0.86	0.94	1.01	1.09	1.15	0.54	0.66	0.76	0.85	0.93	1.01	1.08	1.14
	SPW-3	0.83	1.01	1.17	1.31	1.43	1.55	1.65	1.75	0.84	1.02	1.18	1.32	1.45	1.57	1.67	1.77	0.84	1.03	1.18	1.32	1.45	1.57	1.67	1.78	0.83	1.02	1.18	1.31	1.44	1.56	1.66	1.76
	SPW-4	1.43	1.75	2.02	2.26	2.48	2.68	2.86	3.04	1.45	1.77	2.05	2.29	2.51	2.71	2.90	3.07	1.45	1.77	2.05	2.29	2.51	2.71	2.90	3.07	1.44	1.76	2.04	2.28	2.49	2.69	2.88	3.05
	SPW-5	2.25	2.76	3.18	3.56	3.90	4.21	4.50	4.77	2.28	2.79	3.22	3.60	3.94	4.26	4.55	4.83	2.28	2.79	3.22	3.60	3.95	4.26	4.56	4.84	2.26	2.77	3.20	3.58	3.92	4.23	4.53	4.80
	SPW-6	3.78	4.63	5.35	5.98	6.55	7.08	7.56	8.02	3.83	4.69	5.41	6.05	6.63	7.16	7.65	8.12	3.83	4.69	5.42	6.06	6.63	7.17	7.66	8.13	3.80	4.66	5.38	6.01	6.59	7.12	7.61	8.07
	SPW-7	6.65	8.15	9.41	10.5	11.5	12.4	13.3	14.1	6.73	8.24	9.52	10.6	11.7	12.6	13.5	14.3	6.74	8.25	9.53	10.7	11.7	12.6	13.5	14.3	6.69	8.19	9.46	10.6	11.6	12.5	13.4	14.2

R-134a Capacities in Tons (at Evaporator Temperature °F)

	Valve Type	40°F								20°F								0°F							
		Pressure Drop Across Valve (psid)																							
		40	60	80	100	120	140	160	180	40	60	80	100	120	140	160	180	40	60	80	100	120	140	160	180
R-134a	SPW-0	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.12	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.11
	SPW-1	0.14	0.17	0.20	0.22	0.25	0.27	0.28	0.30	0.14	0.17	0.19	0.21	0.23	0.25	0.27	0.29	0.13	0.16	0.18	0.20	0.22	0.24	0.26	0.27
	SPW-2	0.25	0.31	0.36	0.40	0.44	0.48	0.51	0.54	0.24	0.30	0.34	0.38	0.42	0.45	0.49	0.52	0.23	0.28	0.33	0.36	0.40	0.43	0.46	0.49
	SPW-3	0.39	0.48	0.56	0.62	0.68	0.74	0.79	0.83	0.37	0.46	0.53	0.59	0.65	0.70	0.75	0.80	0.36	0.44	0.50	0.56	0.62	0.67	0.71	0.76
	SPW-4	0.68	0.83	0.96	1.08	1.18	1.27	1.36	1.44	0.65	0.79	0.92	1.03	1.12	1.21	1.30	1.38	0.62	0.75	0.87	0.97	1.07	1.15	1.23	1.31
	SPW-5	1.07	1.31	1.51	1.69	1.85	2.00	2.14	2.27	1.02	1.25	1.44	1.61	1.77	1.91	2.04	2.16	0.97	1.19	1.37	1.53	1.68	1.81	1.94	2.06
	SPW-6	1.80	2.20	2.54	2.84	3.11	3.36	3.60	3.81	1.71	2.10	2.42	2.71	2.97	3.21	3.43	3.64	1.63	2.00	2.30	2.58	2.82	3.05	3.26	3.46
	SPW-7	3.16	3.87	4.47	5.00	5.48	5.91	6.32	6.71	3.01	3.69	4.26	4.77	5.22	5.64	6.03	6.40	2.87	3.51	4.05	4.53	4.96	5.36	5.73	6.08

R-22 and R-407F Capacities in Tons (at Evaporator Temperature °F)

	Valve Type	40°F								20°F								0°F								-20°F							
		Pressure Drop Across Valve (psid)																															
		75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250
R-22 & R-407F	SPW-0	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.16	0.08	0.10	0.11	0.12	0.13	0.14	0.14	0.15	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.15	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14
	SPW-1	0.21	0.24	0.27	0.29	0.32	0.34	0.36	0.38	0.20	0.23	0.26	0.29	0.31	0.33	0.35	0.37	0.20	0.23	0.25	0.28	0.30	0.32	0.34	0.36	0.19	0.22	0.25	0.27	0.29	0.31	0.33	0.35
	SPW-2	0.37	0.43	0.48	0.53	0.57	0.61	0.65	0.68	0.36	0.42	0.47	0.52	0.56	0.59	0.63	0.66	0.35	0.41	0.46	0.50	0.54	0.58	0.61	0.65	0.34	0.40	0.44	0.48	0.52	0.56	0.59	0.63
	SPW-3	0.58	0.67	0.74	0.82	0.88	0.94	1.00	1.05	0.56	0.65	0.73	0.80	0.86	0.92	0.97	1.03	0.55	0.63	0.71	0.77	0.83	0.89	0.95	1.00	0.53	0.61	0.68	0.75	0.81	0.86	0.92	0.97
	SPW-4	1.00	1.15	1.29	1.41	1.52	1.63	1.73	1.82	0.97	1.12	1.26	1.38	1.49	1.59	1.69	1.78	0.95	1.09	1.22	1.34	1.44	1.54	1.64	1.73	0.92	1.06	1.18	1.29	1.40	1.49	1.58	1.67
	SPW-5	1.57	1.81	2.03	2.22	2.40	2.56	2.72	2.87	1.53	1.77	1.98	2.16	2.34	2.50	2.65	2.79	1.49	1.72	1.92	2.10	2.27	2.43	2.58	2.71	1.44	1.66	1.86	2.04	2.20	2.35	2.49	2.63
	SPW-6	2.64	3.05	3.40	3.73	4.03	4.31	4.57	4.81	2.57	2.97	3.32	3.64	3.93	4.20	4.45	4.70	2.50	2.89	3.23	3.53	3.82	4.08	4.33	4.56	2.42	2.79	3.12	3.42	3.69	3.95	4.19	4.42
	SPW-7	4.64	5.36	5.99	6.56	7.08	7.57	8.03	8.47	4.52	5.22	5.84	6.40	6.91	7.38	7.83	8.26	4.39	5.07	5.67	6.21	6.71	7.18	7.61	8.02	4.25	4.91	5.49	6.02	6.50	6.95	7.37	7.77

R-407A and R-407C Capacities in Tons (at Evaporator Temperature °F)

	Valve Type	40°F								20°F								0°F								-20°F							
		Pressure Drop Across Valve (psid)																															
		75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250
R-407A & R-407C	SPW-0	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.14	0.07	0.08	0.09	0.10	0.11	0.12	0.12	0.13	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.13
	SPW-1	0.19	0.22	0.25	0.27	0.29	0.31	0.33	0.35	0.18	0.21	0.24	0.26	0.28	0.30	0.32	0.34	0.18	0.20	0.23	0.25	0.27	0.29	0.30	0.32	0.17	0.19	0.22	0.24	0.26	0.27	0.29	0.31
	SPW-2	0.34	0.40	0.44	0.49	0.53	0.56	0.60	0.63	0.33	0.38	0.43	0.47	0.50	0.54	0.57	0.60	0.31	0.36	0.41	0.45	0.48	0.51	0.55	0.57	0.30	0.35	0.39	0.42	0.46	0.49	0.52	0.55
	SPW-3	0.53	0.61	0.69	0.75	0.81	0.87	0.92	0.97	0.51	0.59	0.66	0.72	0.78	0.83	0.88	0.93	0.49	0.56	0.63	0.69	0.74	0.79	0.84	0.89	0.46	0.53	0.60	0.66	0.71	0.76	0.80	0.85
	SPW-4	0.92	1.06	1.19	1.30	1.40	1.50	1.59	1.68	0.88	1.02	1.14	1.25	1.35	1.44	1.53	1.61	0.84	0.97	1.09	1.19	1.28	1.37	1.46	1.54	0.80	0.93	1.03	1.13	1.22	1.31	1.39	1.46
	SPW-5	1.45	1.67	1.87	2.04	2.21	2.36	2.50	2.64	1.39	1.60	1.79	1.96	2.12	2.26	2.40	2.53	1.32	1.53	1.71	1.87	2.02	2.16	2.29	2.41	1.26	1.46	1.63	1.78	1.93	2.06	2.18	2.30
	SPW-6	2.43	2.80	3.14	3.43	3.71	3.97	4.21	4.43	2.33	2.69	3.01	3.29	3.56	3.80	4.03	4.25	2.22	2.57	2.87	3.14	3.39	3.63	3.85	4.06	2.12	2.45	2.74	3.00	3.24	3.46	3.67	3.87
	SPW-7	4.27	4.93	5.51	6.04	6.52	6.97	7.40	7.80	4.09	4.73	5.29	5.79	6.25	6.69	7.09	7.48	3.91	4.51	5.05	5.53	5.97	6.38	6.77	7.14	3.73	4.30	4.81	5.27	5.69	6.08	6.45	6.80

Capacity tables are in tons. Assumes 100°F Liquid Temperature for R-134a, R-22, R-407A, R-407C, R-407F, R-448, R-449A, R-404A & R-507A. Assumes 40°F Liquid Temperature for R-744.

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R-448A and R-449A Capacities in Tons (at Evaporator Temperature °F)

R-448A & R-449A	Valve Type	40°F								20°F								0°F								-20°F								-40°F							
		Pressure Drop Across Valve (psid)																																								
		75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250
	SPW-0	0.08	0.09	0.10	0.11	0.12	0.13	0.14	0.14	0.08	0.09	0.10	0.11	0.12	0.12	0.13	0.14	0.07	0.08	0.09	0.10	0.11	0.12	0.13	0.13	0.07	0.08	0.09	0.10	0.11	0.11	0.12	0.13	0.07	0.08	0.09	0.09	0.10	0.11	0.12	0.12
	SPW-1	0.19	0.22	0.25	0.27	0.29	0.31	0.33	0.35	0.19	0.21	0.24	0.26	0.28	0.30	0.32	0.34	0.18	0.21	0.23	0.25	0.27	0.29	0.31	0.33	0.17	0.20	0.22	0.24	0.26	0.28	0.30	0.31	0.16	0.19	0.21	0.23	0.25	0.26	0.28	0.30
	SPW-2	0.35	0.40	0.45	0.49	0.53	0.57	0.60	0.63	0.33	0.39	0.43	0.47	0.51	0.55	0.58	0.61	0.32	0.37	0.41	0.45	0.49	0.52	0.56	0.59	0.31	0.35	0.40	0.43	0.47	0.50	0.53	0.56	0.29	0.34	0.38	0.41	0.44	0.48	0.50	0.53
	SPW-3	0.53	0.62	0.69	0.76	0.82	0.87	0.93	0.98	0.52	0.60	0.67	0.73	0.79	0.84	0.89	0.94	0.50	0.57	0.64	0.70	0.76	0.81	0.86	0.90	0.47	0.55	0.61	0.67	0.72	0.77	0.82	0.86	0.45	0.52	0.58	0.64	0.69	0.73	0.78	0.82
	SPW-4	0.92	1.07	1.19	1.31	1.41	1.51	1.60	1.69	0.89	1.03	1.15	1.26	1.36	1.46	1.55	1.63	0.86	0.99	1.11	1.21	1.31	1.40	1.49	1.57	0.82	0.94	1.06	1.16	1.25	1.34	1.42	1.49	0.78	0.90	1.00	1.10	1.19	1.27	1.35	1.42
	SPW-5	1.45	1.68	1.88	2.06	2.22	2.37	2.52	2.66	1.40	1.62	1.81	1.98	2.14	2.29	2.43	2.56	1.35	1.56	1.74	1.91	2.06	2.20	2.34	2.46	1.29	1.49	1.66	1.82	1.97	2.10	2.23	2.35	1.22	1.41	1.58	1.73	1.87	2.00	2.12	2.23
	SPW-6	2.44	2.82	3.15	3.46	3.73	3.99	4.23	4.46	2.36	2.72	3.04	3.34	3.60	3.85	4.09	4.31	2.27	2.62	2.93	3.20	3.46	3.70	3.93	4.14	2.16	2.50	2.79	3.06	3.30	3.53	3.75	3.95	2.06	2.37	2.65	2.91	3.14	3.36	3.56	3.75
	SPW-7	4.30	4.96	5.55	6.08	6.56	7.02	7.44	7.85	4.15	4.79	5.35	5.87	6.34	6.77	7.18	7.57	3.99	4.60	5.15	5.64	6.09	6.51	6.90	7.28	3.80	4.39	4.91	5.38	5.81	6.21	6.59	6.94	3.62	4.18	4.67	5.11	5.52	5.90	6.26	6.60

R-404A and R-507A Capacities in Tons (at Evaporator Temperature °F)

R-404A & R-507A	Valve Type	40°F								20°F								0°F								-20°F								-40°F							
		Pressure Drop Across Valve (psid)																																								
		75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250	75	100	125	150	175	200	225	250
	SPW-0	0.06	0.06	0.07	0.08	0.08	0.09	0.10	0.10	0.05	0.06	0.07	0.07	0.08	0.09	0.09	0.10	0.05	0.06	0.06	0.07	0.08	0.08	0.09	0.09	0.05	0.05	0.06	0.07	0.07	0.08	0.08	0.08	0.04	0.05	0.06	0.06	0.07	0.07	0.07	0.08
	SPW-1	0.13	0.16	0.17	0.19	0.21	0.22	0.23	0.25	0.13	0.15	0.16	0.18	0.20	0.21	0.22	0.23	0.12	0.14	0.16	0.17	0.18	0.20	0.21	0.22	0.11	0.13	0.15	0.16	0.17	0.18	0.19	0.21	0.10	0.12	0.13	0.15	0.16	0.17	0.18	0.19
	SPW-2	0.24	0.28	0.31	0.34	0.37	0.40	0.42	0.44	0.23	0.26	0.30	0.32	0.35	0.37	0.40	0.42	0.22	0.25	0.28	0.31	0.33	0.35	0.37	0.39	0.20	0.23	0.26	0.29	0.31	0.33	0.35	0.37	0.19	0.22	0.24	0.27	0.29	0.31	0.32	0.34
	SPW-3	0.37	0.43	0.48	0.53	0.57	0.61	0.65	0.68	0.35	0.41	0.46	0.50	0.54	0.58	0.61	0.65	0.33	0.39	0.43	0.47	0.51	0.54	0.58	0.61	0.31	0.36	0.40	0.44	0.48	0.51	0.54	0.57	0.29	0.33	0.37	0.41	0.44	0.47	0.50	0.53
	SPW-4	0.65	0.75	0.84	0.91	0.99	1.06	1.12	1.18	0.61	0.71	0.79	0.87	0.94	1.00	1.06	1.12	0.58	0.67	0.75	0.82	0.88	0.94	1.00	1.05	0.54	0.62	0.70	0.76	0.82	0.88	0.93	0.98	0.50	0.58	0.65	0.71	0.77	0.82	0.87	0.91
	SPW-5	1.02	1.17	1.31	1.44	1.55	1.66	1.76	1.86	0.96	1.11	1.24	1.36	1.47	1.57	1.67	1.76	0.91	1.05	1.17	1.28	1.39	1.48	1.57	1.66	0.85	0.98	1.09	1.20	1.29	1.38	1.47	1.55	0.79	0.91	1.02	1.11	1.20	1.29	1.36	1.44
	SPW-6	1.71	1.97	2.21	2.42	2.61	2.79	2.96	3.12	1.62	1.87	2.09	2.29	2.47	2.64	2.80	2.96	1.53	1.76	1.97	2.16	2.33	2.49	2.64	2.79	1.42	1.64	1.84	2.01	2.17	2.32	2.47	2.60	1.32	1.53	1.71	1.87	2.02	2.16	2.29	2.42
	SPW-7	3.01	3.47	3.88	4.25	4.59	4.91	5.21	5.49	2.85	3.29	3.68	4.03	4.35	4.65	4.93	5.20	2.68	3.10	3.46	3.80	4.10	4.38	4.65	4.90	2.50	2.89	3.23	3.54	3.82	4.09	4.34	4.57	2.33	2.69	3.01	3.29	3.56	3.80	4.03	4.25

Capacity tables are in tons. Assumes 100°F Liquid Temperature for R-134a, R-22, R-407A, R-407C, R-407F, R-448, R-449A, R-404A & R-507A. Assumes 40°F Liquid Temperature for R-744.

°F Liquid Correction Factors by Refrigerant

Liquid Temperature Correction Factors	°F	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140
	R-744	1.32	1.24	1.17	1.09	1.00	0.91	0.82	0.72	0.60	--	--	--	--	--	--
	R-134a	1.69	1.63	1.56	1.49	1.42	1.35	1.28	1.21	1.14	1.07	1.00	0.93	0.86	0.78	0.71
	R-22	1.57	1.51	1.46	1.40	1.34	1.29	1.23	1.18	1.12	1.06	1.00	0.94	0.88	0.82	0.76
	R-407A	1.78	1.70	1.63	1.55	1.48	1.40	1.32	1.24	1.16	1.08	1.00	0.92	0.83	0.75	0.66
	R-407C	1.72	1.65	1.58	1.51	1.44	1.37	1.30	1.22	1.15	1.08	1.00	0.92	0.85	0.77	0.69
	R-407F	1.72	1.65	1.58	1.51	1.44	1.37	1.30	1.23	1.15	1.08	1.00	0.92	0.84	0.76	0.68
	R-404A	2.01	1.92	1.82	1.72	1.62	1.52	1.42	1.32	1.22	1.11	1.00	0.89	0.78	0.66	0.54
	R-507A	2.05	1.95	1.85	1.75	1.64	1.54	1.44	1.33	1.22	1.11	1.00	0.89	0.77	0.65	0.52
	R-448A	1.78	1.70	1.63	1.55	1.48	1.40	1.32	1.24	1.16	1.08	1.00	0.92	0.83	0.75	0.66
	R-449A	1.78	1.71	1.63	1.56	1.48	1.40	1.32	1.25	1.17	1.08	1.00	0.92	0.83	0.75	0.66
	R-410A	1.77	1.70	1.62	1.55	1.48	1.40	1.32	1.25	1.17	1.09	1.00	0.92	0.83	0.73	0.63

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Capacity - kW

R-744 Capacities in kW (at Evaporator Temperature °C)

R-744	Valve Type	-10°C								-20°C								-30°C								-40°C							
		Pressure Drop Across Valve (bar)																															
		6	8	10	12	16	20	24	28	6	8	10	12	16	20	24	28	6	8	10	12	16	20	24	28	6	8	10	12	16	20	24	28
	SPW-0	0.41	0.47	0.52	0.57	0.66	0.74	0.81	0.88	0.41	0.47	0.53	0.58	0.67	0.75	0.82	0.88	0.41	0.47	0.53	0.58	0.67	0.75	0.82	0.88	0.41	0.47	0.52	0.57	0.66	0.74	0.81	0.88
	SPW-1	0.99	1.14	1.28	1.40	1.62	1.81	1.98	2.14	1.00	1.15	1.29	1.41	1.63	1.82	1.99	2.15	1.00	1.15	1.29	1.41	1.63	1.82	1.99	2.15	0.99	1.14	1.28	1.40	1.62	1.81	1.98	2.14
	SPW-2	1.78	2.05	2.29	2.51	2.90	3.24	3.55	3.84	1.79	2.07	2.31	2.53	2.92	3.27	3.58	3.87	1.79	2.07	2.31	2.53	2.92	3.27	3.58	3.87	1.78	2.05	2.30	2.51	2.90	3.25	3.56	3.84
	SPW-3	2.74	3.17	3.54	3.88	4.48	5.01	5.49	5.92	2.76	3.19	3.57	3.91	4.51	5.05	5.53	5.97	2.76	3.19	3.57	3.91	4.51	5.04	5.53	5.97	2.74	3.17	3.54	3.88	4.48	5.01	5.49	5.93
	SPW-4	4.75	5.48	6.13	6.71	7.75	8.67	9.49	10.3	4.78	5.52	6.17	6.76	7.81	8.73	9.57	10.3	4.78	5.52	6.17	6.76	7.81	8.73	9.56	10.3	4.75	5.48	6.13	6.72	7.76	8.67	9.50	10.3
	SPW-5	7.47	8.62	9.64	10.6	12.2	13.6	14.9	16.1	7.52	8.69	9.71	10.6	12.3	13.7	15.0	16.3	7.52	8.68	9.71	10.6	12.3	13.7	15.0	16.2	7.47	8.63	9.64	10.6	12.2	13.6	14.9	16.1
	SPW-6	12.5	14.5	16.2	17.7	20.5	22.9	25.1	27.1	12.6	14.6	16.3	17.9	20.6	23.1	25.3	27.3	12.6	14.6	16.3	17.9	20.6	23.1	25.3	27.3	12.6	14.5	16.2	17.8	20.5	22.9	25.1	27.1
	SPW-7	22.1	25.5	28.5	31.2	36.0	40.3	44.1	47.7	22.2	25.7	28.7	31.4	36.3	40.6	44.5	48.0	22.2	25.7	28.7	31.4	36.3	40.6	44.5	48.0	22.1	25.5	28.5	31.2	36.1	40.3	44.2	47.7

R-134a Capacities in kW (at Evaporator Temperature °C)

R-134a	Valve Type	5°C								-10°C								-20°C							
		Pressure Drop Across Valve (bar)																							
		2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13	2.5	4	5.5	7	8.5	10	11.5	13
	SPW-0	0.19	0.25	0.29	0.33	0.36	0.39	0.42	0.44	0.18	0.23	0.27	0.30	0.34	0.36	0.39	0.42	0.17	0.22	0.26	0.29	0.32	0.35	0.37	0.40
	SPW-1	0.47	0.60	0.70	0.79	0.87	0.95	1.02	1.08	0.44	0.56	0.66	0.74	0.82	0.89	0.95	1.01	0.42	0.54	0.63	0.71	0.78	0.85	0.91	0.97
	SPW-2	0.85	1.08	1.26	1.43	1.57	1.70	1.83	1.94	0.80	1.01	1.18	1.34	1.47	1.60	1.71	1.82	0.76	0.96	1.13	1.27	1.40	1.52	1.63	1.74
	SPW-3	1.31	1.66	1.95	2.20	2.42	2.63	2.82	3.00	1.23	1.56	1.83	2.06	2.27	2.46	2.64	2.81	1.18	1.49	1.74	1.97	2.17	2.35	2.52	2.68
	SPW-4	2.28	2.88	3.37	3.81	4.19	4.55	4.88	5.19	2.13	2.70	3.16	3.57	3.93	4.26	4.57	4.86	2.03	2.57	3.02	3.40	3.75	4.07	4.36	4.64
	SPW-5	3.58	4.53	5.31	5.99	6.60	7.16	7.67	8.16	3.35	4.24	4.97	5.61	6.18	6.71	7.19	7.65	3.20	4.05	4.74	5.35	5.90	6.40	6.86	7.29
	SPW-6	6.01	7.61	8.92	10.1	11.1	12.0	12.9	13.7	5.64	7.13	8.36	9.43	10.4	11.3	12.1	12.9	5.38	6.80	7.97	9.00	9.91	10.8	11.5	12.3
	SPW-7	10.6	13.4	15.7	17.7	19.5	21.1	22.7	24.1	9.91	12.5	14.7	16.6	18.3	19.8	21.3	22.6	9.45	12.0	14.0	15.8	17.4	18.9	20.3	21.6

R-22 and R-407F Capacities in kW (at Evaporator Temperature °C)

R-22 & R-407F	Valve Type	5°C								-10°C								-20°C								-30°C							
		Pressure Drop Across Valve (bar)																															
		4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
	SPW-0	0.26	0.32	0.37	0.42	0.46	0.49	0.53	0.56	0.25	0.31	0.36	0.40	0.44	0.48	0.51	0.54	0.25	0.30	0.35	0.39	0.43	0.46	0.49	0.52	0.24	0.29	0.34	0.38	0.42	0.45	0.48	0.51
	SPW-1	0.64	0.79	0.91	1.02	1.11	1.20	1.29	1.36	0.62	0.76	0.88	0.98	1.07	1.16	1.24	1.32	0.60	0.74	0.85	0.95	1.05	1.13	1.21	1.28	0.59	0.72	0.83	0.93	1.02	1.10	1.17	1.25
	SPW-2	1.15	1.41	1.63	1.83	2.00	2.16	2.31	2.45	1.11	1.36	1.58	1.76	1.93	2.08	2.23	2.36	1.08	1.33	1.53	1.71	1.88	2.03	2.17	2.30	1.05	1.29	1.49	1.67	1.83	1.97	2.11	2.24
	SPW-3	1.78	2.18	2.52	2.82	3.09	3.34	3.57	3.78	1.72	2.11	2.43	2.72	2.98	3.22	3.44	3.65	1.67	2.05	2.37	2.64	2.90	3.13	3.35	3.55	1.63	1.99	2.30	2.57	2.82	3.04	3.25	3.45
	SPW-4	3.09	3.78	4.36	4.88	5.34	5.77	6.17	6.54	2.98	3.64	4.21	4.70	5.15	5.57	5.95	6.31	2.89	3.55	4.09	4.58	5.01	5.42	5.79	6.14	2.82	3.45	3.98	4.45	4.88	5.27	5.63	5.97
	SPW-5	4.85	5.94	6.86	7.67	8.40	9.08	9.70	10.3	4.68	5.73	6.62	7.40	8.10	8.75	9.36	9.93	4.55	5.58	6.44	7.20	7.89	8.52	9.11	9.66	4.43	5.42	6.26	7.00	7.67	8.29	8.86	9.40
	SPW-6	8.15	9.99	11.5	12.9	14.1	15.3	16.3	17.3	7.86	9.63	11.1	12.4	13.6	14.7	15.7	16.7	7.65	9.37	10.8	12.1	13.3	14.3	15.3	16.2	7.44	9.12	10.5	11.8	12.9	13.9	14.9	15.8
	SPW-7	14.3	17.6	20.3	22.7	24.8	26.8	28.7	30.4	13.8	16.9	19.6	21.9	24.0	25.9	27.7	29.3	13.5	16.5	19.0	21.3	23.3	25.2	26.9	28.5	13.1	16.0	18.5	20.7	22.7	24.5	26.2	27.8

R-407A and R-407C Capacities in kW (at Evaporator Temperature °C)

R-407A & R-407C	Valve Type	5°C								-10°C								-20°C								-30°C							
		Pressure Drop Across Valve (bar)																															
		4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
	SPW-0	0.24	0.30	0.34	0.38	0.42	0.45	0.48	0.51	0.23	0.28	0.32	0.36	0.40	0.43	0.46	0.48	0.22	0.27	0.31	0.35	0.38	0.41	0.44	0.46	0.21	0.26	0.30	0.33	0.36	0.39	0.42	0.44
	SPW-1	0.59	0.72	0.84	0.93	1.02	1.11	1.18	1.25	0.56	0.68	0.79	0.88	0.97	1.04	1.12	1.18	0.53	0.65	0.75	0.84	0.92	1.00	1.07	1.13	0.51	0.63	0.72	0.81	0.89	0.96	1.02	1.08
	SPW-2	1.06	1.30	1.50	1.68	1.84	1.99	2.12	2.25	1.00	1.23	1.42	1.58	1.73	1.87	2.00	2.12	0.96	1.17	1.36	1.52	1.66	1.79	1.92	2.03	0.92	1.12	1.30	1.45	1.59	1.72	1.84	1.95
	SPW-3	1.64	2.01	2.32	2.59	2.84	3.06	3.28	3.48	1.55	1.89	2.19	2.44	2.68	2.89	3.09	3.28	1.48	1.81	2.09	2.34	2.56	2.77	2.96	3.14	1.42	1.74	2.00	2.24	2.45	2.65	2.83	3.01
	SPW-4	2.83	3.47	4.01	4.48	4.91	5.30	5.67	6.01	2.67	3.27	3.78	4.23	4.63	5.00	5.35	5.67	2.56	3.14	3.62	4.05	4.43	4.79	5.12	5.43	2.45	3.00	3.47	3.88	4.25	4.59	4.90	5.20
	SPW-5	4.46	5.46	6.31	7.05	7.72	8.34	8.92	9.46	4.21	5.15	5.95	6.65	7.28	7.87	8.41	8.92	4.03	4.93	5.69	6.37	6.97	7.53	8.05	8.54	3.86	4.72	5.45	6.10	6.68	7.22	7.71	8.18
	SPW-6	7.49	9.18	10.6	11.8	13.0	14.0	15.0	15.9	7.07	8.66	9.99	11.2	12.2	13.2	14.1	15.0	6.77	8.29	9.57	10.7	11.7	12.7	13.5	14.4	6.48	7.94	9.17	10.2	11.2	12.1	13.0	13.7
	SPW-7	13.2	16.1	18.6	20.8	22.8	24.7	26.4	28.0	12.4	15.2	17.6	19.6	21.5	23.2	24.9	26.4	11.9	14.6	16.8	18.8	20.6	22.3	23.8	25.2	11.4	14.0	16.1	18.0	19.7	21.3	22.8	24.2

Capacity tables are in kW. Assumes 38°C Liquid Temperature for R-134a, R-22, R-407A, R-407C, R-407F, R-448, R-449A, R-404A & R-507A. Assumes 4°C Liquid Temperature for R-744.

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R-448A and R-449A Capacities in kW (at Evaporator Temperature °C)

R-448A & R-449A	Valve Type	5°C								-10°C								-20°C								-30°C								-40°C							
		Pressure Drop Across Valve (bar)																																							
		4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
	SPW-0	0.24	0.30	0.35	0.39	0.42	0.46	0.49	0.52	0.23	0.28	0.33	0.37	0.40	0.43	0.46	0.49	0.22	0.27	0.32	0.35	0.39	0.42	0.45	0.47	0.21	0.26	0.30	0.34	0.37	0.40	0.43	0.46	0.20	0.25	0.29	0.32	0.36	0.38	0.41	0.43
	SPW-1	0.60	0.73	0.84	0.94	1.03	1.12	1.19	1.26	0.57	0.69	0.80	0.90	0.98	1.06	1.13	1.20	0.55	0.67	0.77	0.86	0.95	1.02	1.09	1.16	0.52	0.64	0.74	0.83	0.91	0.98	1.05	1.11	0.50	0.61	0.71	0.79	0.87	0.94	1.00	1.06
	SPW-2	1.07	1.31	1.51	1.69	1.85	2.00	2.14	2.27	1.02	1.25	1.44	1.61	1.76	1.91	2.04	2.16	0.98	1.20	1.39	1.55	1.70	1.83	1.96	2.08	0.94	1.15	1.33	1.49	1.63	1.76	1.88	2.00	0.90	1.10	1.27	1.42	1.56	1.68	1.80	1.91
	SPW-3	1.65	2.02	2.34	2.61	2.86	3.09	3.30	3.50	1.57	1.93	2.22	2.49	2.72	2.94	3.14	3.33	1.51	1.85	2.14	2.39	2.62	2.83	3.03	3.21	1.45	1.78	2.05	2.30	2.52	2.72	2.91	3.08	1.39	1.70	1.96	2.19	2.40	2.59	2.77	2.94
	SPW-4	2.86	3.50	4.04	4.52	4.95	5.35	5.72	6.07	2.72	3.33	3.85	4.30	4.71	5.09	5.44	5.77	2.62	3.21	3.70	4.14	4.53	4.90	5.24	5.55	2.51	3.08	3.56	3.98	4.36	4.70	5.03	5.33	2.40	2.94	3.39	3.79	4.16	4.49	4.80	5.09
	SPW-5	4.50	5.51	6.36	7.11	7.79	8.41	8.99	9.54	4.28	5.24	6.05	6.76	7.41	8.00	8.56	9.08	4.12	5.04	5.82	6.51	7.13	7.70	8.24	8.74	3.95	4.84	5.59	6.25	6.85	7.40	7.91	8.39	3.77	4.62	5.34	5.97	6.54	7.06	7.55	8.01
	SPW-6	7.56	9.26	10.69	11.95	13.09	14.14	15.11	16.03	7.19	8.81	10.17	11.37	12.45	13.45	14.38	15.25	6.92	8.48	9.79	10.94	11.99	12.95	13.84	14.68	6.65	8.14	9.40	10.51	11.51	12.43	13.29	14.10	6.34	7.77	8.97	10.03	10.99	11.87	12.69	13.45
	SPW-7	13.29	16.28	18.79	21.01	23.02	24.86	26.58	28.19	12.64	15.48	17.88	19.99	21.90	23.65	25.29	26.82	12.17	14.90	17.21	19.24	21.08	22.77	24.34	25.82	11.69	14.31	16.53	18.48	20.24	21.87	23.38	24.79	11.15	13.66	15.77	17.64	19.32	20.87	22.31	23.66

R-404A and R-507A Capacities in kW (at Evaporator Temperature °C)

R-404A & R-507A	Valve Type	5°C								-10°C								-20°C								-30°C								-40°C							
		Pressure Drop Across Valve (bar)																																							
		4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18	4	6	8	10	12	14	16	18
	SPW-0	0.17	0.21	0.24	0.27	0.30	0.32	0.34	0.36	0.16	0.19	0.22	0.25	0.27	0.30	0.32	0.34	0.15	0.18	0.21	0.24	0.26	0.28	0.30	0.32	0.14	0.17	0.20	0.22	0.24	0.26	0.28	0.30	0.13	0.16	0.19	0.21	0.23	0.25	0.26	0.28
	SPW-1	0.42	0.51	0.59	0.66	0.72	0.78	0.83	0.88	0.39	0.47	0.55	0.61	0.67	0.72	0.77	0.82	0.37	0.45	0.52	0.58	0.63	0.68	0.73	0.78	0.34	0.42	0.49	0.54	0.59	0.64	0.69	0.73	0.32	0.39	0.45	0.51	0.56	0.60	0.64	0.68
	SPW-2	0.75	0.91	1.06	1.18	1.29	1.40	1.49	1.58	0.69	0.85	0.98	1.09	1.20	1.30	1.38	1.47	0.66	0.80	0.93	1.04	1.14	1.23	1.31	1.39	0.62	0.76	0.87	0.97	1.07	1.15	1.23	1.31	0.58	0.71	0.81	0.91	1.00	1.08	1.15	1.22
	SPW-3	1.15	1.41	1.63	1.82	2.00	2.16	2.31	2.45	1.07	1.31	1.51	1.69	1.85	2.00	2.14	2.27	1.01	1.24	1.43	1.60	1.75	1.89	2.02	2.15	0.95	1.17	1.35	1.51	1.65	1.78	1.90	2.02	0.89	1.09	1.26	1.41	1.54	1.66	1.78	1.89
	SPW-4	2.00	2.44	2.82	3.16	3.46	3.73	3.99	4.23	1.85	2.27	2.62	2.92	3.20	3.46	3.70	3.92	1.75	2.15	2.48	2.77	3.03	3.28	3.50	3.72	1.65	2.02	2.33	2.60	2.85	3.08	3.29	3.49	1.54	1.88	2.18	2.43	2.67	2.88	3.08	3.26
	SPW-5	3.14	3.84	4.44	4.96	5.44	5.87	6.28	6.66	2.91	3.56	4.11	4.60	5.04	5.44	5.82	6.17	2.76	3.37	3.90	4.36	4.77	5.16	5.51	5.85	2.59	3.17	3.66	4.10	4.49	4.85	5.18	5.50	2.42	2.96	3.42	3.83	4.19	4.53	4.84	5.13
	SPW-6	5.27	6.46	7.46	8.34	9.14	9.87	10.55	11.19	4.89	5.99	6.91	7.73	8.47	9.15	9.78	10.37	4.63	5.67	6.55	7.32	8.02	8.66	9.26	9.82	4.35	5.33	6.16	6.88	7.54	8.14	8.71	9.24	4.07	4.98	5.75	6.43	7.05	7.61	8.14	8.63
	SPW-7	9.28	11.36	13.12	14.67	16.07	17.35	18.55	19.68	8.60	10.53	12.16	13.59	14.89	16.08	17.20	18.24	8.14	9.97	11.52	12.88	14.11	15.24	16.29	17.28	7.66	9.38	10.83	12.11	13.26	14.32	15.31	16.24	7.15	8.76	10.12	11.31	12.39	13.38	14.31	15.17

Capacity tables are in kW. Assumes 38°C Liquid Temperature for R-134a, R-22, R-407A, R-407C, R-407F, R-448, R-449A, R-404A & R-507A. Assumes 4°C Liquid Temperature for R-744.

°C Liquid Correction Factors by Refrigerant

Liquid Temperature Correction Factors	°C	-18	-12	-7	-1	4	10	16	21	27	32	38	43	49	54	60
	R-744	1.32	1.24	1.17	1.09	1.00	0.91	0.82	0.72	0.60	--	--	--	--	--	--
	R-134a	1.69	1.63	1.56	1.49	1.42	1.35	1.28	1.21	1.14	1.07	1.00	0.93	0.86	0.78	0.71
	R-22	1.57	1.51	1.46	1.40	1.34	1.29	1.23	1.18	1.12	1.06	1.00	0.94	0.88	0.82	0.76
	R-407A	1.78	1.70	1.63	1.55	1.48	1.40	1.32	1.24	1.16	1.08	1.00	0.92	0.83	0.75	0.66
	R-407C	1.72	1.65	1.58	1.51	1.44	1.37	1.30	1.22	1.15	1.08	1.00	0.92	0.85	0.77	0.69
	R-407F	1.72	1.65	1.58	1.51	1.44	1.37	1.30	1.23	1.15	1.08	1.00	0.92	0.84	0.76	0.68
	R-404A	2.01	1.92	1.82	1.72	1.62	1.52	1.42	1.32	1.22	1.11	1.00	0.89	0.78	0.66	0.54
	R-507A	2.05	1.95	1.85	1.75	1.64	1.54	1.44	1.33	1.22	1.11	1.00	0.89	0.77	0.65	0.52
	R-448A	1.78	1.70	1.63	1.55	1.48	1.40	1.32	1.24	1.16	1.08	1.00	0.92	0.83	0.75	0.66
	R-449A	1.78	1.71	1.63	1.56	1.48	1.40	1.32	1.25	1.17	1.08	1.00	0.92	0.83	0.75	0.66
	R-410A	1.77	1.70	1.62	1.55	1.48	1.40	1.32	1.25	1.17	1.09	1.00	0.92	0.83	0.73	0.63

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Ordering Instructions

Nomenclature

VALVE				COIL						
SPW –	1	3 X 4	ODF	PWC –	1	E	110-120/50-60	C	A	18
Valve Model	Port Size	Connection Size (Inlet x Outlet)	Connection Style	Coil Model	Coil Size	E - DIN or Blank	Coil Voltage 110-120 VAC/50-60 Hz 220-240 VAC/50-60 Hz 24 VAC/60 Hz	Coil Type C - Conduit or Blank	Wire Gauge A - 3/16" Insulation or Blank	Lead Length (Inches) or Blank

Product Offering

Item Description	Item Number
Valve Description	
SPW-0 3X4 ODF LESS COIL	953430
SPW-1 3X4 ODF LESS COIL	953431
SPW-2 3X4 ODF LESS COIL	953432
SPW-3 3X4 ODF LESS COIL	953433
SPW-4 3X4 ODF LESS COIL	953434
SPW-5 3X4 ODF LESS COIL	953435
SPW-6 3X4 ODF LESS COIL	953436
SPW-7 3x4 ODF LESS COIL	953437
Coil Description	
PWC-1 24/60 CA18	335002
PWC-1 110-120/50-60 CA18	335003
PWC-1 220-240/50-60 CA18	335004
PWC-1E 24/60	335005
PWC-1E 110-120/50-60	335006
PWC-1E 220-240/50-60	335007
DIN Connector (DIN 43650 Form A)	382616
Service Parts	
KS - SPW Service Kit	953423
KS - SPW Port Service Kit	953424

NOTE: Liquid line velocity should not exceed 3 ft./second.

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