aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Refrigeration Solenoid Valves & 3-Way Heat Reclaim Valves

Catalog D-1, May 2010

ENGINEERING YOUR SUCCESS.

Table of Contents

Introduction

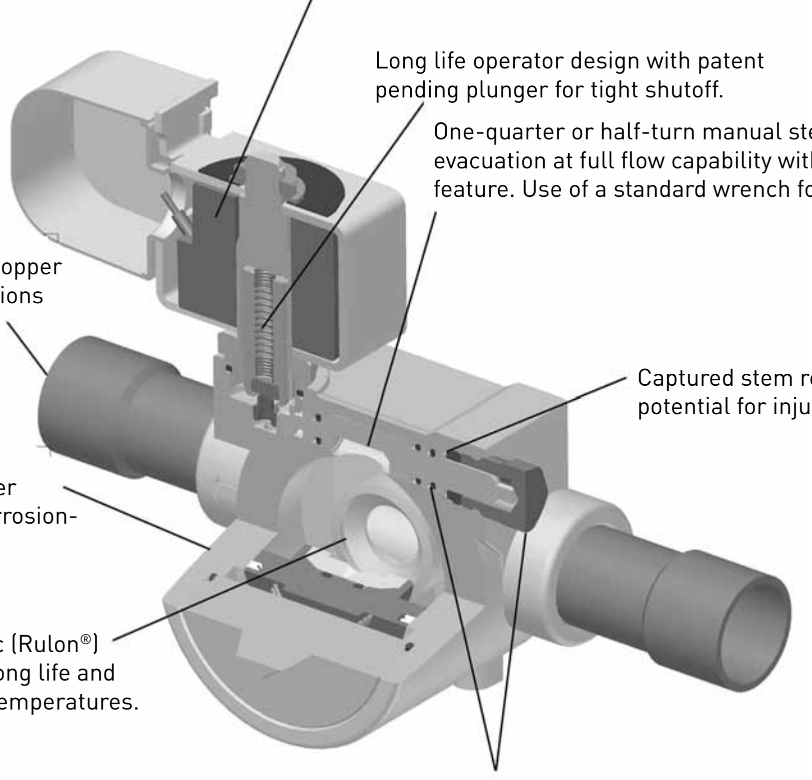
The Parker 'R' Series Refrigeration Valves consist of a family of direct and pilot operated solenoid valves for liquid, suction and hot gas defrost application requirements. The valves are compatible with virtually all of today's commercially available CFC, HCFC and HFC refrigerants and blends. The Parker refrigeration valves meet a broad range of system needs including refrigeration, air conditioning and freezing applications. From small fractional tonnage to large systems.

The portfolio is endowed with numerous benefits including:

- A full-line of normally closed and normally open valves.
- State of the art operator performance for long life, ease of service and tighter system integrity.
- Manual stem functionality.
- High pressure ratings to comply with newer refrigerants.
- Extended sweat connections enable brazing installation without disassembly.
- Complete line of watertight coil designs suitable for all valves are available per special order.
- AC & DC coils are interchangeable on all valve body versions.

The Parker 'R' Series Refrigeration Solenoid Valves are constructed of the highest quality materials available for exceptional quality, long life and reliability. All components have been rigorously qualified based on the international standard ISO9001 / 2000 certification processes providing rigorous standards for design, development, manufacturing and testing. High quality you've come to expect from Parker.

Compatible with virtually all CFC, HFC and HCFC refrigerants and oils



Specifically designed family of valves to meet the higher pressure of today's earth friendly refrigerants.

General Information

Solenoid Valve Nomenclature

The numbering system allows every user an easy method to identify, select and understand the valve being purchased. The following table describes the numbering system

Nomenclature for Complete Valve Assemblies:

Valve Assemblies						
Type	Family Configuration		Connection	Port Size	Connection Size	Optional Manual Stem
	Normally Closed	Normally Open				
R Refrigeration	10 20 30 42 46 52 56	15 25 35 43 47 53 57	E – Ext End F – Flare	Port sizes are measured in 1/32nds of an inch	Connection sizes are measured in 1/8ths of an inch	M

Valve Ordering

For combined Valve and Coil Assemblies:

Step 1: Select the Valve catalog number based on the application requirements as specified in the individual catalog section based on the connection type, port size, connection size and rating.

Step 2: Add the optional Manual Stem, if required.

Step 3: Select the appropriate coil type and wattage per the valve specification chart based on the system pressures.

Step 4: Use the Voltage Code to specify the correct voltage.

Example:

Step 1 & 2: To order a 2-way normally closed valve, 1/2 ODF connection, manual bypass option, R22, 5 ton liquid line rating, reference R20 valve catalog page. Select **R20E84M.**

Step 3 & 4: To order a junction box coil assembly, 10W, 208-240VAC rating, reference coil assembly catalog page. Select **K1U3 = for R10 thru R35. For R52 = PKC-1 208-240/50-60 JAN**

To order fully assembled valve with coil, simply add the 2 part numbers together.

Example: R20E84M + K1U3 = R20E84MK1U3

R52E359 + 208-240/50-60 JAN

For Valves Only:

Valve assemblies can be ordered as separate items. Simply select the catalog valve number in steps 1 & 2 above.

For Coil Assemblies:

Coil Assemblies can be ordered as separate items.

Example: To select a junction box coil assembly, 10W, 208-240VAC rating, reference coil assembly catalog page. Specify **RK1U3 = R10 thru R35/ PKC-1 208-240/50-60 JAN = R52**

Standard Voltages

Consult Parker for additional voltages that can be satisfied with a new coil of a specific voltage.

DC Voltage
12 VDC
24 VDC

AC Voltage
24/60
120/60; 110/50
208-240/60

Electrical Enclosures - R10 thru R35		
Coil Type	Coil Watts	Voltage Codes
D – Din K – Junction Box T – Spade C – Conduit Hub (Reference pages 28, 29 & 30 for details)	1-10 3-22	C1 = 12VDC C2 = 24VDC B2 = 24/60 2K = 208/60 P3 = 120/60 Q3 = 240/60 U3 = 208-240/60 (Reference standard voltages for a detailed description of each code)

Electrical Enclosures - R42 thru R57				
Coil Type	Voltage	Enclosure	Insulation Type	Lead Wire Color Code
PKC-1 for R52 OPKC-1 for R53 PKC-2 for R42, R46, R56 OPKC-2 for R43, R47, R57	24/50-60	J	A	Q (Orange)
	120/50-60	J	A	M (Blue)
	208-240/50-60	J	A	N (Red)
	12 VDC	J	A	K (Black)
	24 VDC	J	A	K (Black)

Standard enclosure is junction box. Conduit boss is available for some voltages. Contact Parker Hannifin Aftermarket in Broadview, IL for details.

General Specifications

Refrigerants..........R22, R134a, R404A, R410A, R507, etc.
Maximum Rated Pressure - R10 through R35 ......650psi
Maximum Rated Pressure - R42 through R57 ......700psi
Operating Temperature Range
Fluid .... -20°F to 240°F (-30°C to 116°C) (10w AC)
Ambient for AC voltages .... -20°F to 120°F (-30°C to 49°C)
Ambient for DC voltages.................... -20°F to 120°F (-30°C to 49°C)
(Valves not suitable for ammonia service)

UL Listed & CSA Certified with Standard Voltages:

AC Voltages	DC Voltages
24/60	12 VDC
110/50, 120/60	24 VDC
208-240/60	
240/60	

Coil Enclosures: Reference Coil Enclosure page 28 and Electrical Specifications pages 29 & 30.

Normally Closed Valve Specifications

Valve Series*	Port Size	Cv	AC Operating Pressure Differential (psi)						DC Operating Pressure Differential (psi)						
			Min	Maximum AC Ratings			Ambient Temp. °F	Fluid Temp. °F	Min	Maximum DC Ratings				Ambient Temp. °F	Fluid Temp. °F
				10w	15w	22w		All Watts		10w	15w	18w	22w		All Watts
R10 E2 & F2***	5/64	0.13	0	450	–	–	120	250	0	200	–	–	395	120	250/240
R10 E3	3/32	0.21	0	300	–	450	120	250/240	0	–	–	–	365	120	240
R20 E4 & F4***	1/8	0.40	1	450	–	–	120	250	1	–	–	–	250	120	240
R20 E6 & F6***	3/16	0.75	1	450	–	–	120	250	1	–	–	–	250	120	240
R20 E8 & F8***	1/4	1.09	1	450	–	–	120	250	1	–	–	–	250	120	240
R30 E10	5/16	1.77	1	450	–	–	120	250	1	270	–	–	425	120	250/240
R30 E12	3/8	1.86	1	450	–	–	120	250	1	270	–	–	425	120	250/240
R30 E15	15/32	2.86	1	450	–	–	120	250	1	270	–	–	425	120	250/240
R42 E19	19/32	4.60	1	–	450	–	120	240	1	–	–	400	–	120	240
R46 E25	25/32	7.80	1	–	450	–	120	240	1	–	–	400	–	120	240
R52 E35	1	10.9	1	450	–	–	120	240	1	–	400		–	120	240
R56 E42	1-5/16	24.0	1	–	450	–	120	240	1	–	–	400	–	120	240

* Reference individual catalog pages for specific valve numbers and connection sizes.
*** SAE Connections may require minimum order quantity.

Normally Open Valve Specifications

Valve Series*	Port Size	Cv	AC Operating Pressure Differential (psi)						DC Operating Pressure Differential (psi)						
			Min	Maximum AC Ratings			Ambient Temp. °F	Fluid Temp. °F	Min	Maximum DC Ratings				Ambient Temp. °F	Fluid Temp. °F
				10w	15w	22w		22w		10w	15w	18w	22w		22w
R15 E2	5/64	0.13	0	–	–	450	120	240	0	–	–	–	450	120	240
R15 E3	3/32	0.21	0	–	–	450	120	240	0	–	–	–	450	120	240
R25 E4	1/8	0.40	1	–	–	450	120	240	1	–	–	–	450	120	240
R25 E6	3/16	0.75	1	–	–	450	120	240	1	–	–	–	450	120	240
R25 E8	1/4	1.09	1	–	–	450	120	240	1	–	–	–	450	120	240
R35 E10	5/16	1.77	1	–	–	450	120	240	1	–	–	–	450	120	240
R35 E12	3/8	1.86	1	–	–	450	120	240	1	–	–	–	450	120	240
R35 E15	15/32	2.86	1	–	–	450	120	240	1	–	–	–	450	120	240
R43 E19**	19/32	4.60	1	–	–	–	120	240	1	–	–	400	–	120	240
R47 E25**	25/32	7.80	1	–	–	–	120	240	1	–	–	400	–	120	240
R53 E35	1	10.9	1	350	–	–	120	240	1	–	400	–	–	120	240
R57 E42**	1-5/16	24.0	1	–	–	–	120	240	1	–	–	400	–	120	240

* Reference individual catalog pages for specific valve numbers and connection sizes.

**** Normally open R43, R47 & R57 valves will not meet MOPD with AC voltage. However, rated MOPD can be achieved with DC voltage. Therefore, use DC voltage coil and supply proper DC voltage to the coil or use a properly sized rectifier to change AC voltage to DC voltage.**

General Specifications

Ratings Summary

Valve Series*	Nominal Capacity (Tons) ① ②											
	Liquid				Suction				Hot Gas			
	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
R10/15 E2	0.73	0.56	0.49	0.87	0.08	0.06	0.08	0.10	0.14	0.12	0.13	0.16
R10/15 E3	1.18	0.91	0.79	1.40	0.12	0.09	0.11	0.15	0.20	0.17	0.19	0.24
R20/25 E4	2.09	1.62	1.41	2.49	0.21	0.16	0.2	0.26	0.36	0.31	0.34	0.43
R20/25 E6	3.80	2.95	2.56	4.53	0.40	0.31	0.37	0.50	0.67	0.57	0.64	0.80
R20/25 E8	5.53	4.29	3.73	6.61	0.59	0.45	0.54	0.73	0.98	0.84	0.93	1.18
R30/35 E10	8.42	6.53	5.67	10.1	0.95	0.72	0.87	1.17	1.58	1.35	1.50	1.90
R30/35 E12	10.8	8.38	7.27	12.9	1.15	0.88	1.05	1.42	1.92	1.64	1.82	2.30
R30/35 E15	16.2	12.5	10.9	19.3	1.46	1.11	1.34	1.80	2.43	2.08	2.31	2.92
R42/43 E19	24.2	18.4	16.0	29.7	1.94	1.49	1.69	2.31	3.43	3.26	3.53	4.71
R46/47 E25	41.4	31.5	27.4	50.6	3.28	2.53	2.86	3.97	6.74	5.60	6.04	8.07
R52/53 E35	70.9	53.0	46.5	88.2	4.60	3.48	4.07	5.58	9.90	8.10	9.03	12.0
R56/57 E42	98.2	76.7	65.8	156	9.57	7.06	8.33	11.9	21.0	17.4	18.8	25.1

* Reference individual catalog pages for specific valve numbers and connection sizes.

① Nominal capacities are based on ARI Standard 760 under the following system conditions:

Liquid line capacities are based on 40°F evaporator, 10°F superheat and 100°F condenser temperatures and pressure drop across valve:

2 psi for R134a

3 psi for R22, R404A, R507

5 psi for R410A

Suction vapor capacities of 40°F evaporator temperature plus 25°F superheat, 100°F condenser and 1 psi drop across valve.

Rated hot gas capacities based on 40°F evaporator temperature plus 25°F superheat and 100°F condenser temperature and 2 psi drop.

② For capacities at other ratings, refer to Extended Capacity tables.

Extended Capacity Tables

R22

Valve Series	Liquid Line Capacities					Suction Line Capacities					Discharge (Hot Gas) Line Capacities					
	Tons at Pressure Drop Across Valve in psi					Tons at 1 psi Pressure Drop and Evaporating Temperature of:					Pressure Drop Across Valve					
	1 psi	2 psi	3 psi	4 psi	5 psi	40°F	20°F	0°F	-20°F	-40°F	2 psi	5 psi	10 psi	25 psi	50 psi	100 psi
R10/15 E2	0.42	0.59	0.73	0.83	0.94	0.08	0.07	0.05	0.04	0.03	0.14	0.23	0.34	0.50	0.77	1.25
R10/15 E3	0.68	0.96	1.18	1.35	1.52	0.12	0.10	0.07	0.06	0.04	0.20	0.34	0.51	0.73	1.12	1.84
R20/25 E4	1.21	1.71	2.09	2.40	2.70	0.21	0.17	0.13	0.10	0.08	0.36	0.60	0.90	1.30	2.00	3.27
R20/25 E6	2.19	3.10	3.80	4.35	4.90	0.40	0.32	0.25	0.19	0.14	0.67	1.13	1.68	2.44	3.74	6.12
R20/25 E8	3.19	4.52	5.53	6.33	7.14	0.59	0.47	0.36	0.28	0.21	0.98	1.66	2.46	3.58	5.49	8.98
R30/35 E10	4.86	6.88	8.42	9.64	10.9	0.95	0.75	0.59	0.45	0.33	1.58	2.67	3.97	5.77	8.85	14.5
R30/35 E12	6.23	8.82	10.8	12.7	13.9	1.15	0.91	0.71	0.54	0.40	1.92	3.24	4.82	7.00	10.7	17.6
R30/35 E15	9.33	13.2	16.2	18.5	20.9	1.46	1.16	0.90	0.69	0.51	2.43	4.11	6.11	8.88	13.6	22.3
R42/43 E19	13.9	19.8	24.2	28.0	31.4	1.94	1.54	1.21	0.93	0.70	3.93	6.23	8.84	14.4	19.1	23.4
R46/47 E25	23.8	33.8	41.4	47.8	53.5	3.28	2.62	2.06	1.59	1.19	6.74	10.7	15.1	23.0	30.5	37.4
R52/53 E35	38.9	56.8	70.9	83.0	93.7	4.60	3.61	2.78	2.10	1.54	9.90	16.3	23.8	40.3	53.7	66.8
R56/57 E42	60.9	82.3	98.2	111	123	9.57	7.64	6.00	4.62	3.48	21.0	33.1	46.8	67.2	89.0	109

Liquid Capacity based on 40°F evaporator temperature, 10°F superheat temperature and 100°F condenser temperature.
Suction line capacity based on 100°F condenser temperature, 25°F superheat temperature.
Discharge Gas bypass capacity based on isentropic compression from 40°F evaporator plus 25°F superheat to 100°F condenser plus 50°F superheat.

R134a

Valve Series	Liquid Line Capacities					Suction Line Capacities					Discharge (Hot Gas) Line Capacities					
	Tons at Pressure Drop Across Valve in psi					Tons at 1 psi Pressure Drop and Evaporating Temperature of:					Pressure Drop Across Valve					
	1 psi	2 psi	3 psi	4 psi	5 psi	40°F	20°F	0°F	-20°F	-40°F	2 psi	5 psi	10 psi	25 psi	50 psi	100 psi
R10/15 E2	0.40	0.56	0.69	0.79	0.89	0.06	0.05	0.04	0.03	0.02	0.12	0.20	0.29	0.46	0.74	1.31
R10/15 E3	0.65	0.91	1.12	1.28	1.44	0.09	0.07	0.05	0.04	0.03	0.17	0.29	0.43	0.68	1.09	1.92
R20/25 E4	1.15	1.62	1.99	2.27	2.56	0.16	0.13	0.09	0.07	0.05	0.31	0.52	0.77	1.21	1.94	3.42
R20/25 E6	2.08	2.95	3.61	4.13	4.66	0.31	0.23	0.18	0.13	0.09	0.57	0.97	1.44	2.26	3.64	6.39
R20/25 E8	3.04	4.29	5.26	6.02	6.79	0.45	0.34	0.26	0.19	0.14	0.84	1.42	2.11	3.31	5.33	9.37
R30/35 E10	4.62	6.53	8.00	9.16	10.3	0.72	0.56	0.42	0.30	0.22	1.35	2.29	3.40	5.34	8.59	15.1
R30/35 E12	5.92	8.38	10.3	11.8	13.3	0.88	0.67	0.50	0.37	0.26	1.64	2.78	4.13	6.47	10.4	18.3
R30/35 E15	8.86	12.5	15.4	17.3	19.8	1.11	0.85	0.64	0.46	0.34	2.08	3.52	5.23	8.21	13.2	23.2
R42/43 E19	13.0	18.4	22.6	26.1	29.2	1.49	1.14	0.86	–	–	3.26	5.17	7.34	11.5	14.5	15.8
R46/47 E25	22.2	31.5	38.6	44.6	49.9	2.53	1.94	1.46	–	–	5.56	8.87	12.6	18.4	23.2	25.2
R52/53 E35	36.3	53.0	66.2	77.4	87.4	3.48	2.62	1.93	–	–	8.10	13.4	19.6	32.1	40.8	44.9
R56/57 E42	56.7	76.7	91.5	104	114	7.36	5.66	4.26	–	–	17.4	27.5	38.9	53.6	67.6	73.3

Liquid Capacity based on 40°F evaporator temperature, 10°F superheat temperature and 100°F condenser temperature.
Suction line capacity based on 100°F condenser temperature, 25°F superheat temperature.
Discharge Gas bypass capacity based on isentropic compression from 40°F evaporator plus 25°F superheat to 100°F condenser plus 50°F superheat.

Temperature Correction Factors - R10 thru R35

Liquid Temperature °F	90	100	110	120	130
Correction Factor	1.05	1.00	0.95	0.90	0.86

For Liquid Capacities

Evaporator Temperature°F	40	30	20	10	0	-10	-20	-30	-40
Correction Factor	1.00	0.96	0.92	0.88	0.84	0.80	0.77	0.74	0.71

For Suction and Discharge Gas Capacities

Temperature Correction Factors - R42 thru R57

Liquid Temperature °F	90	100	110	120	130
Correction Factor	1.06	1.00	0.93	0.88	0.81

For Liquid Capacities

Evaporator Temperature°F	40	30	20	10	0	-10	-20	-30	-40
Correction Factor	1.00	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75

For Suction and Discharge Gas Capacities

Extended Capacity Tables

R404A and R507

Valve Series	Liquid Line Capacities: Tons at Pressure Drop Across Valve in psi					Suction Line Capacities: Tons at 1 psi Pressure Drop and Evaporating Temperature of:					Discharge (Hot Gas) Line Capacities: Pressure Drop Across Valve					
	1 psi	2 psi	3 psi	4 psi	5 psi	40°F	20°F	0°F	-20°F	-40°F	2 psi	5 psi	10 psi	25 psi	50 psi	100 psi
R10/15 E2	0.28	0.40	0.49	0.56	0.63	0.08	0.06	0.04	0.03	0.02	0.13	0.22	0.33	0.49	0.78	1.36
R10/15 E3	0.46	0.65	0.79	0.90	1.02	0.11	0.09	0.07	0.05	0.03	0.19	0.32	0.48	0.71	1.15	2.00
R20/25 E4	0.81	1.15	1.41	1.61	1.82	0.20	0.15	0.12	0.09	0.06	0.34	0.57	0.85	1.27	2.04	3.56
R20/25 E6	1.48	2.09	2.56	2.93	3.30	0.37	0.29	0.22	0.16	0.12	0.64	1.08	1.60	2.38	3.81	6.66
R20/25 E8	2.15	3.04	3.73	4.27	4.81	0.54	0.42	0.32	0.24	0.17	0.93	1.58	2.34	3.49	5.59	9.77
R30/35 E10	3.27	4.63	5.67	6.49	7.32	0.87	0.68	0.51	0.38	0.27	1.50	2.54	3.78	5.62	9.01	15.8
R30/35 E12	4.20	5.94	7.27	8.33	9.39	1.05	0.82	0.62	0.46	0.33	1.82	3.08	4.59	6.82	10.9	19.1
R30/35 E15	6.28	8.88	10.9	12.5	14.1	1.34	1.04	0.79	0.58	0.42	2.31	3.91	5.82	8.65	13.8	24.2
R42/43 E19	9.20	13.1	16.0	18.5	20.7	1.69	1.30	0.99	0.74	0.53	3.53	5.59	7.93	13.0	17.4	21.8
R46/47 E25	15.7	22.3	27.4	31.6	35.4	2.86	2.21	1.68	1.26	0.91	6.04	9.60	13.6	20.8	27.8	34.9
R52/53 E35	25.5	37.3	46.5	54.4	61.4	4.07	3.09	2.31	1.69	1.20	9.03	14.9	21.7	36.4	49.0	62.2
R56/57 E42	40.8	55.2	65.8	74.6	82.2	8.33	6.45	4.91	3.66	2.65	18.8	29.7	41.9	60.7	81.1	102

Liquid Capacity based on 40°F evaporator temperature, 10°F superheat temperature and 100°F condenser temperature.
Suction line capacity based on 100°F condenser temperature, 25°F superheat temperature.
Discharge Gas bypass capacity based on isentropic compression from 40°F evaporator plus 25°F superheat to 100°F condenser plus 50°F superheat.

Temperature Correction Factors R10 thru R57

Liquid Temperature °F	90	100	110	120	130
Correction Factor	1.10	1.00	0.90	0.79	0.68

For Liquid Capacities

Evaporator Temperature°F	40	30	20	10	0	-10	-20	-30	-40
Correction Factor	1.00	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75

For Suction and Discharge Gas Capacities

R410A

Valve Series	Liquid Line Capacities: Tons at Pressure Drop Across Valve in psi					Suction Line Capacities: Tons at 1 psi Pressure Drop and Evaporating Temperature of:					Discharge (Hot Gas) Line Capacities: Pressure Drop Across Valve					
	1 psi	2 psi	3 psi	4 psi	5 psi	40°F	20°F	0°F	-20°F	-40°F	2 psi	5 psi	10 psi	25 psi	50 psi	100 psi
R10/15 E2	0.39	0.55	0.67	0.77	0.87	0.10	0.08	0.06	0.05	0.04	0.16	0.28	0.41	0.70	0.84	1.31
R10/15 E3	0.63	0.89	1.09	1.25	1.40	0.15	0.12	0.09	0.07	0.05	0.24	0.41	0.61	1.03	1.24	1.93
R20/25 E4	1.12	1.58	1.93	2.21	2.49	0.26	0.21	0.16	0.13	0.09	0.43	0.73	1.08	1.82	2.20	3.43
R20/25 E6	2.03	2.87	3.51	4.02	4.53	0.50	0.39	0.31	0.24	0.17	0.80	1.36	2.02	3.41	4.12	6.42
R20/25 E8	2.95	4.18	5.12	5.86	6.61	0.73	0.58	0.45	0.34	0.26	1.18	1.99	2.96	5.00	6.04	9.41
R30/35 E10	4.49	6.35	7.78	8.94	10.1	1.17	0.93	0.72	0.56	0.41	1.90	3.21	4.77	8.07	9.75	15.2
R30/35 E12	5.77	8.16	9.99	11.5	12.9	1.42	1.13	0.88	0.67	0.50	2.30	3.89	5.79	9.79	11.8	18.4
R30/35 E15	8.63	12.2	14.9	17.1	19.3	1.80	1.43	1.11	0.86	0.64	2.92	4.94	7.34	12.4	15.0	23.3
R42/43 E19	13.2	18.7	22.9	26.5	29.7	2.31	1.90	–	–	–	4.71	7.47	10.6	17.6	23.9	31.0
R46/47 E25	22.5	31.9	39.2	45.3	50.6	3.97	3.26	–	–	–	8.07	12.8	18.1	28.1	38.2	49.5
R52/53 E35	36.7	53.5	66.8	78.1	88.2	5.58	4.50	–	–	–	12.0	19.8	28.9	49.3	67.3	88.5
R56/57 E42	69.6	98.4	120	139	156	11.9	10.2	–	–	–	25.1	39.6	56.0	82.1	111	144

Liquid Capacity based on 40°F evaporator temperature, 10°F superheat temperature and 100°F condenser temperature.
Suction line capacity based on 100°F condenser temperature, 25°F superheat temperature.
Discharge Gas bypass capacity based on isentropic compression from 40°F evaporator plus 25°F superheat to 100°F condenser plus 50°F superheat.

Temperature Correction Factors - R10 thru R35

Liquid Temperature °F	90	100	110	120	130
Correction Factor	1.05	1.00	0.95	0.90	0.86

For Liquid Capacities

Evaporator Temperature°F	40	30	20	10	0	-10	-20	-30	-40
Correction Factor	1.00	0.96	0.92	0.88	–	–	–	–	–

For Suction and Discharge Gas Capacities

Temperature Correction Factors - R42 thru R57

Liquid Temperature °F	90	100	110	120	130
Correction Factor	1.08	1.00	0.92	0.83	0.74

For Liquid Capacities

Evaporator Temperature°F	40	30	20	10
Correction Factor	1.00	0.99	0.98	0.97

For Suction and Discharge Gas Capacities

Series R10 and R15 Direct Acting Valves

Series R10 — 2-Way Direct Acting Normally Closed Valves
Series R15 — 2-Way Direct Acting Normally Open Valves

Materials of Construction

Body .... Brass
Seating Material .... Rulon®
Seals .... Neoprene
Plunger .... 430 Stainless
Sleeve Tube .... 305 Stainless
Stop .... 430 Stainless
Springs .... Stainless
Shading Ring .... Copper
Connections .... Extended Ends - Copper
SAE Flare Ends Available
Manual Stem .... 430 Stainless (available)

Specifications

R10 Valve — Normally Closed

Valve Number*	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ② Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R10E22M	1/4 ODF	5/64	0.13	0.73	0.56	0.49	0.87	0.08	0.06	0.08	0.10	0.14	0.12	0.13	0.16
R10E23M	3/8 ODF														
R10E32M	1/4 ODF	3/32	0.21	1.18	0.91	0.79	1.40	0.12	0.09	0.11	0.15	0.20	0.17	0.19	0.24
R10E33M	3/8 ODF														
Flare Ends**															
R10F32M	1/4 SAE	3/32	0.21	1.18	0.91	0.79	1.40	0.12	0.09	0.11	0.15	0.20	0.17	0.19	0.24

* Without Manual Bypass – Omit suffix "M" for the valve number.
** SAE Connections may require minimum order quantity.

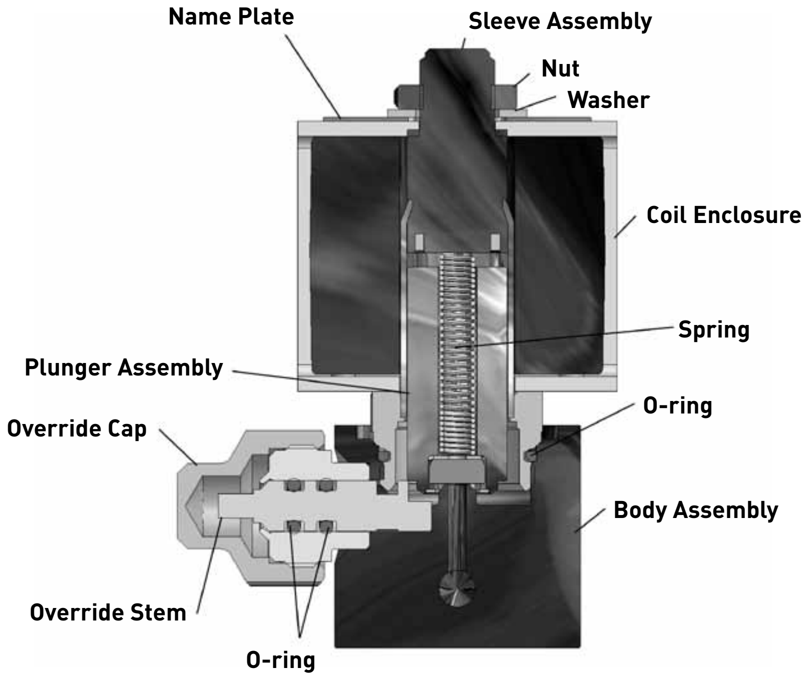
R15 Valve — Normally Open

Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ② Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R15E22	1/4 ODF	5/64	0.13	0.73	0.56	0.49	0.87	0.08	0.06	0.08	0.10	0.14	0.12	0.13	0.16
R15E23	3/8 ODF														
R15E32	1/4 ODF	3/32	0.21	1.18	0.91	0.79	1.40	0.12	0.09	0.11	0.15	0.20	0.17	0.19	0.24
R15E33	3/8 ODF														

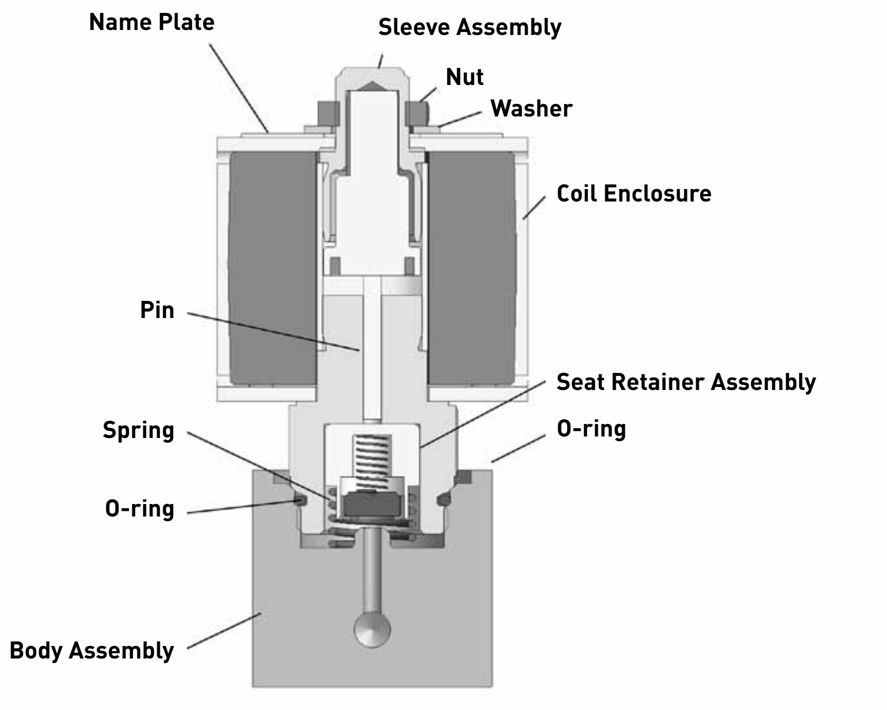
① Reference Ratings Summary for nominal capacity system conditions on page 6.
② For capacities at other ratings, refer to Extended Capacity tables on pages 7 & 8.
Coils available separately. Use Coil "R" with "R" Series valves. Reference Coil Enclosure page 28 for electrical coil enclosure options.

Call-Outs

R10 Direct Acting Valves

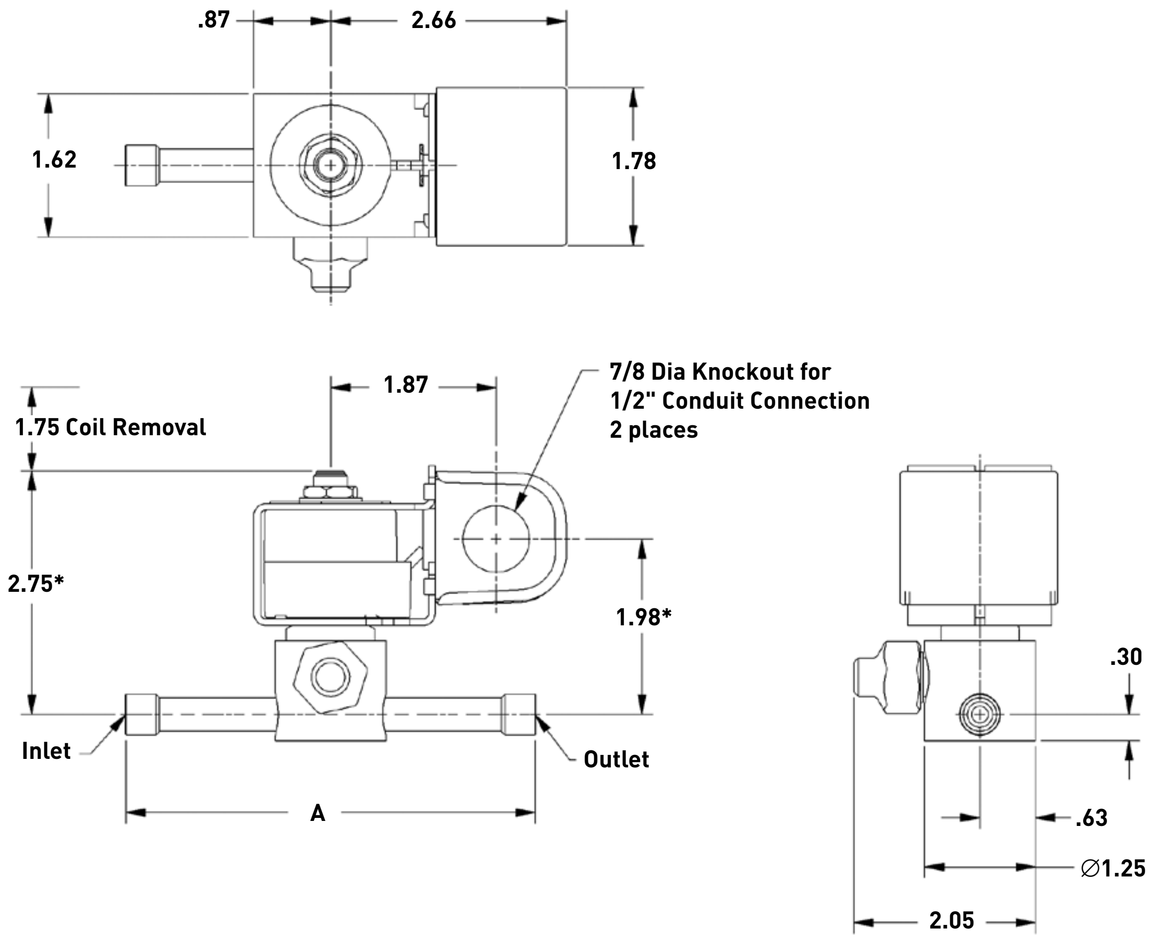


R15 Direct Acting Valves



Dimensions - Inches

R10 and R15 Direct Acting Valves



R10 Valve Shown

Connection	Dimension "A" ± .125
1/4 ODF	4.62
3/8 ODF	5.00

Manual override components and body features are shown for manual override valve option only.

*Add 0.19 for normally open R15 valve.

Series R20 and R25 Pilot-Operated Valves

Series R20 — 2-Way Pilot-Operated Normally Closed Valves
Series R25 — 2-Way Pilot-Operated Normally Open Valves

Materials of Construction

Body .... Brass
Seating Material .... Rulon®
Seals .... Neoprene
Plunger .... 430 Stainless
Sleeve Tube .... 305 Stainless
Stop .... 430 Stainless
Piston .... Brass
Springs .... Stainless
Shading Ring .... Copper
Connections .... Extended Ends – Copper
SAE Flare Available
Manual Stem .... 430 Stainless (available)

Specifications

R20 Valve — Normally Closed

Valve Number*	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R20E42M	1/4 ODF	1/8	0.40	2.09	1.62	1.41	2.49	0.21	0.16	0.20	0.26	0.36	0.31	0.34	0.43
R20E43M	3/8 ODF														
R20E62M	1/4 ODF	3/16	0.75	3.80	2.95	2.56	4.53	0.40	0.31	0.37	0.50	0.67	0.57	0.64	0.80
R20E63M	3/8 ODF														
R20E83M	3/8 ODF	1/4	1.09	5.53	4.29	3.73	6.61	0.59	0.45	0.54	0.73	0.98	0.84	0.93	1.18
R20E84M	1/2 ODF														
Flare Fitting**															
R20F43	3/8 SAE	1/8	0.40	2.09	1.62	1.41	2.49	0.21	0.16	0.20	0.26	0.36	0.31	0.34	0.43
R20F63	3/8 SAE	3/16	0.75	3.80	2.95	2.56	4.53	0.40	0.31	0.37	0.50	0.67	0.57	0.64	0.80
R20F83	3/8 SAE	1/4	1.09	5.53	4.29	3.73	6.61	0.59	0.45	0.54	0.73	0.98	0.84	0.93	1.18

* Without Manual Bypass – Omit suffix "M" for the valve number.
** SAE Connections may require minimum order quantity.

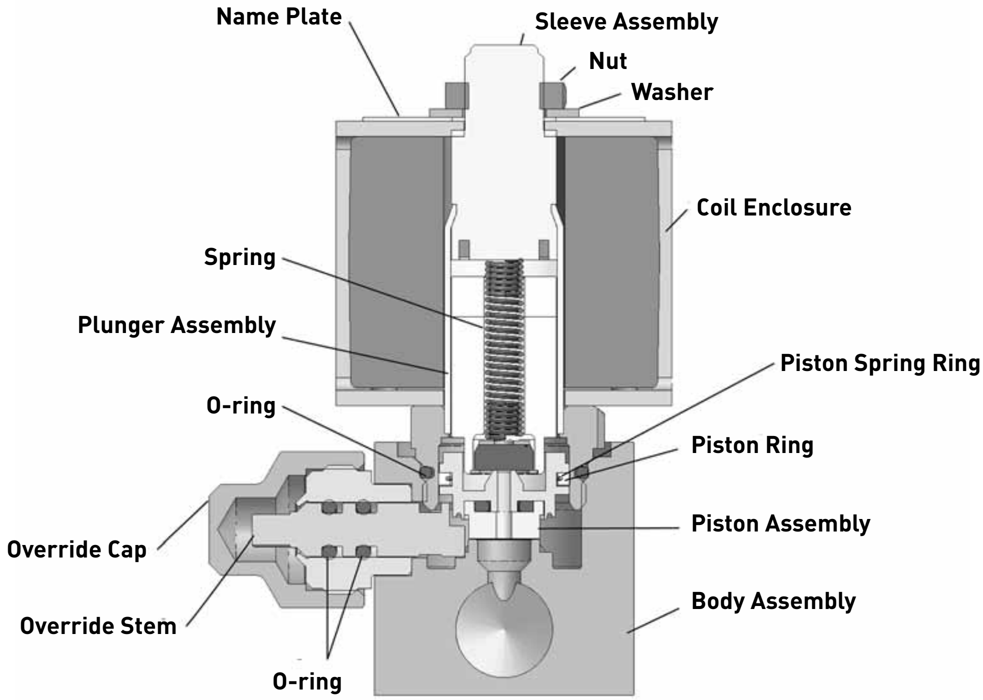
R25 Valve — Normally Open

Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
~~**R25E42**~~	~~1/4 ODF~~	~~1/8~~	~~0.40~~	~~2.09~~	~~1.62~~	~~1.41~~	~~2.49~~	~~0.21~~	~~0.16~~	~~0.20~~	~~0.26~~	~~0.36~~	~~0.31~~	~~0.34~~	~~0.43~~
~~**R25E43**~~	~~3/8 ODF~~	~~1/8~~	~~0.40~~	~~2.09~~	~~1.62~~	~~1.41~~	~~2.49~~	~~0.21~~	~~0.16~~	~~0.20~~	~~0.26~~	~~0.36~~	~~0.31~~	~~0.34~~	~~0.43~~
R25E83	3/8 ODF	1/4	1.09	5.53	4.29	3.73	6.61	0.59	0.45	0.54	0.73	0.98	0.84	0.93	1.18
~~**R25E84**~~	~~1/2 ODF~~	~~1/4~~	~~1.09~~	~~5.53~~	~~4.29~~	~~3.73~~	~~6.61~~	~~0.59~~	~~0.45~~	~~0.54~~	~~0.73~~	~~0.98~~	~~0.84~~	~~0.93~~	~~1.18~~

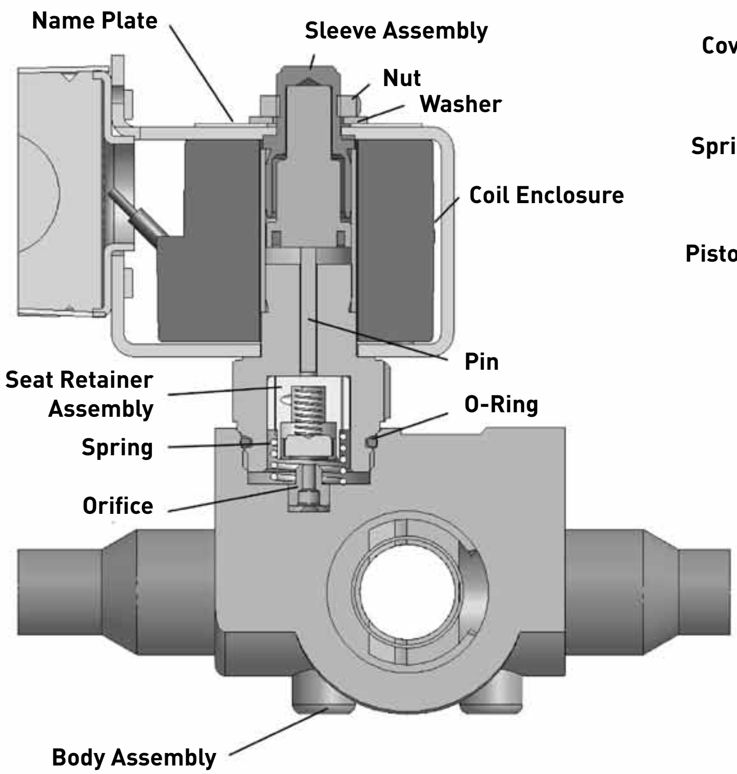
① Reference Ratings Summary for nominal capacity system conditions on page 6.
② For capacities at other ratings, refer to Extended Capacity tables on pages 7 & 8.
Coils available separately. Use Coil "R" with "R" Series valves. Reference Coil Enclosure page 28 for electrical coil enclosure options.
Note: Strike through means valve is no longer available. If desired, large quantity would be required.

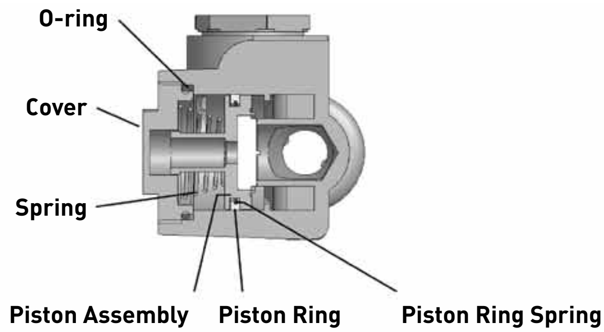
Call-Outs

R20 Pilot-Operated Valves



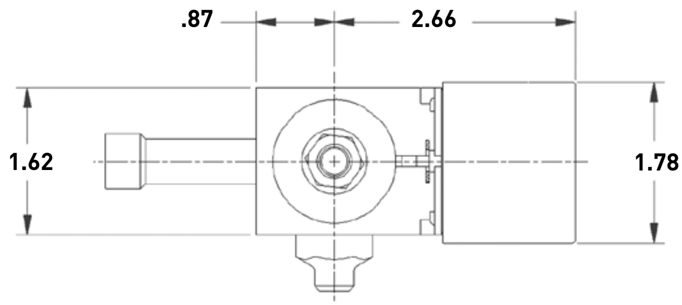
R25 Pilot-Operated Valves

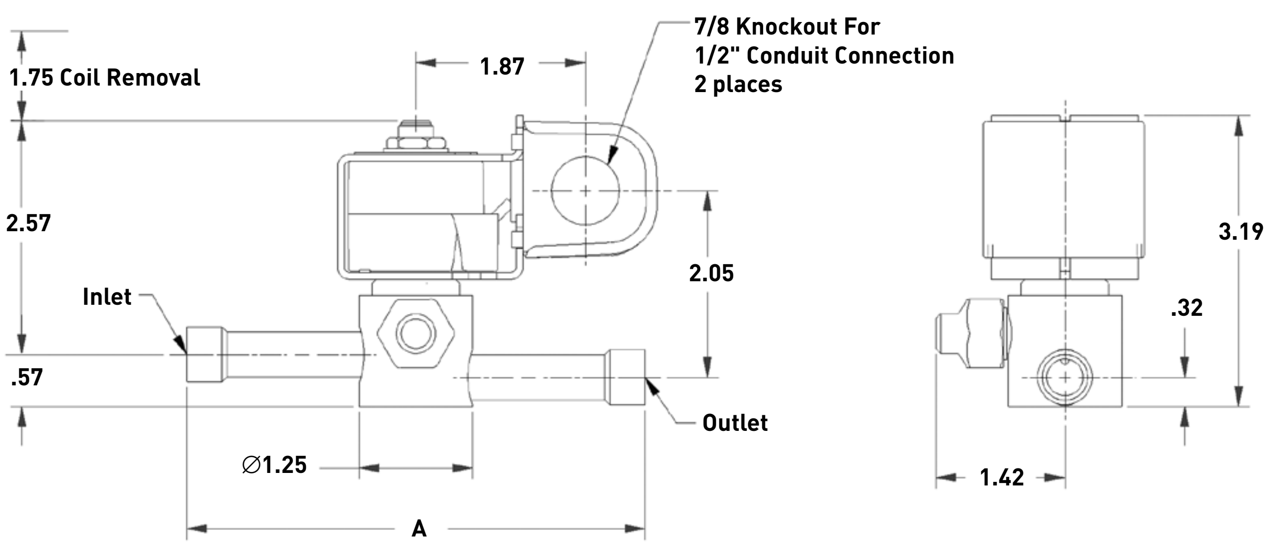




Dimensions - Inches

R20 and R25 *Pilot-Operated Valves





R20 Valve Shown

Connection	Dimension "A" ± .125
1/4 ODF	4.62
3/8 ODF	5.00
1/2 ODF	5.00

Manual override components and body features are shown for manual override valve option only.
*** For R25 valve dimensions, refer to R35 valve dimensions on page 17.**

Series R30 and R35 Pilot-Operated Valves

Series R30 — 2-Way Pilot-Operated Normally Closed Valves
Series R35 — 2-Way Pilot-Operated Normally Open Valves

Materials of Construction

Body .... Brass
Seating Material .... Rulon®
Seals .... Neoprene
Plunger .... 430 Stainless
Sleeve Tube .... 305 Stainless
Stop .... 430 Stainless
Piston .... Brass
Springs .... Stainless
Shading Ring .... Copper
Connections .... Extended Ends - Copper
Manual Stem .... 430 Stainless (available)

Specifications

R30 Valve — Normally Closed

Valve Number*	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R30E103	3/8 ODF														
R30E104	1/2 ODF	5/16	1.77	8.42	6.53	5.67	10.1	0.95	0.72	0.87	1.17	1.58	1.35	1.50	1.90
R30E105M	5/8 ODF														
R30E124M	1/2 ODF	3/8	1.86	10.8	8.38	7.27	12.9	1.15	0.88	1.05	1.42	1.92	1.64	1.82	2.30
R30E125M	5/8 ODF														
R30E154M	1/2 ODF														
R30E155M	5/8 ODF	15/32	2.86	16.2	12.5	10.9	19.3	1.46	1.11	1.34	1.80	2.43	2.08	2.31	2.92
R30E157M	7/8 ODF														

* Without Manual Bypass – Omit suffix "M" for the valve number.

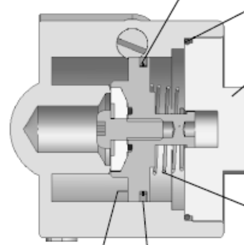
R35 Valve — Normally Open

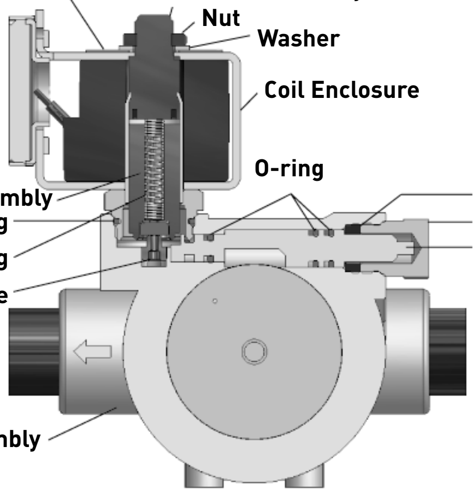
Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404a R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
~~**R35E103**~~	~~3/8 ODF~~	~~5/16~~	~~1.77~~	~~8.42~~	~~6.53~~	~~5.67~~	~~10.1~~	~~0.95~~	~~0.72~~	~~0.87~~	~~1.17~~	~~1.58~~	~~1.35~~	~~1.50~~	~~1.90~~
~~**R35E104**~~	~~1/2 ODF~~	~~5/16~~	~~1.77~~	~~8.42~~	~~6.53~~	~~5.67~~	~~10.1~~	~~0.95~~	~~0.72~~	~~0.87~~	~~1.17~~	~~1.58~~	~~1.35~~	~~1.50~~	~~1.90~~
R35E105	5/8 ODF	5/16	1.77	8.42	6.53	5.67	10.1	0.95	0.72	0.87	1.17	1.58	1.35	1.50	1.90
~~**R35E124**~~	~~1/2 ODF~~	~~3/8~~	~~1.86~~	~~10.8~~	~~8.38~~	~~7.27~~	~~12.9~~	~~1.15~~	~~0.88~~	~~1.05~~	~~1.42~~	~~1.92~~	~~1.64~~	~~1.82~~	~~2.30~~
~~**R35E125**~~	~~5/8 ODF~~	~~3/8~~	~~1.86~~	~~10.8~~	~~8.38~~	~~7.27~~	~~12.9~~	~~1.15~~	~~0.88~~	~~1.05~~	~~1.42~~	~~1.92~~	~~1.64~~	~~1.82~~	~~2.30~~
~~**R35E154**~~	~~1/2 ODF~~	~~15/32~~	~~2.86~~	~~16.2~~	~~12.5~~	~~10.9~~	~~19.3~~	~~1.46~~	~~1.11~~	~~1.34~~	~~1.80~~	~~2.43~~	~~2.08~~	~~2.31~~	~~2.92~~
~~**R35E155**~~	~~5/8 ODF~~	~~15/32~~	~~2.86~~	~~16.2~~	~~12.5~~	~~10.9~~	~~19.3~~	~~1.46~~	~~1.11~~	~~1.34~~	~~1.80~~	~~2.43~~	~~2.08~~	~~2.31~~	~~2.92~~
R35E157	7/8 ODF	15/32	2.86	16.2	12.5	10.9	19.3	1.46	1.11	1.34	1.80	2.43	2.08	2.31	2.92

① Reference Ratings Summary for nominal capacity system conditions on page 6.
② For capacities at other ratings, refer to Extended Capacity tables on page 7 & 8.
Coils available separately. Use Coil "R" with "R" Series valves. Reference Coil Enclosure page 28 for electrical coil enclosure options.
Note: Strike through means valve is no longer available. If desired, large quantity would be required.

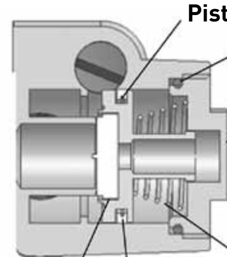
Call-Outs

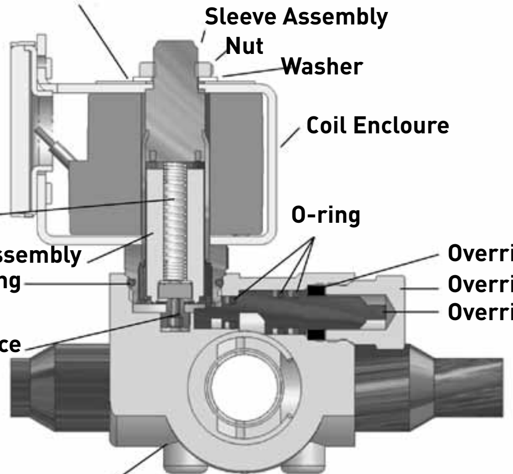
R30 Pilot-Operated Valves





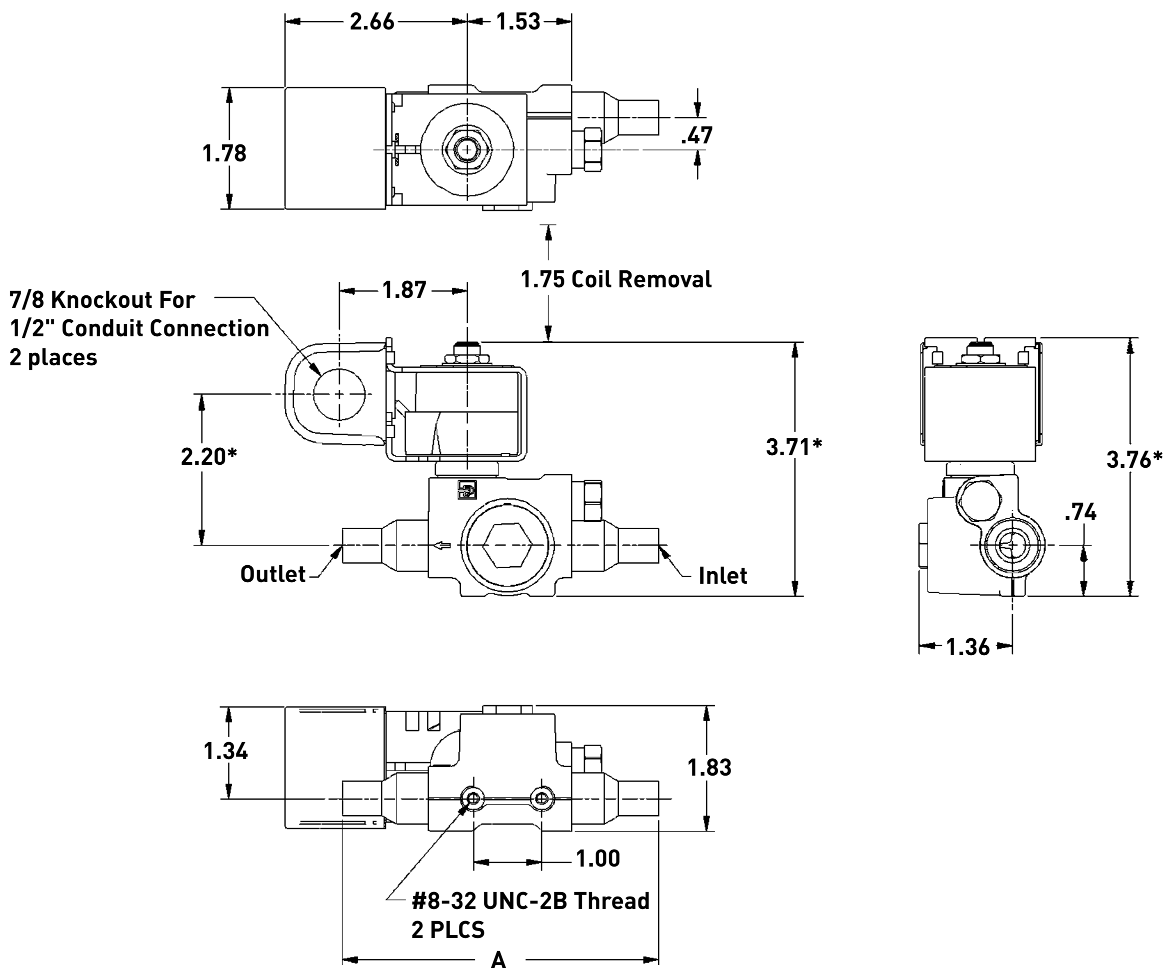
R35 Pilot-Operated Valves





Dimensions - Inches

R30 and R35 Pilot-Operated Valves



R30 Valve Shown

Connection	Dimension "A" ± .125
3/8 ODF	4.62
1/2 ODF	5.00
5/8 ODF	5.50
7/8 ODF	7.12

Manual override components and body features are shown for manual override valve option only.

* Add 0.19 for normally open R35 valve.

Series R42, R46 and R43, R47 Pilot-Operated Valve

Series R42 & R46 — 2-Way Pilot-Operated Normally Closed Valve
Series R43 & R47 — 2-Way Pilot-Operated Normally Open Valve

Materials of Construction

Body .... Brass
Seating Material .... Teflon®
Seals .... Gasket
Plunger .... Stainless
Sleeve Tube .... Stainless
Stop .... Stainless
Piston .... Brass
Springs .... Stainless
Shading Ring .... Copper
Connections .... Extended Ends – Copper
Manual Stem .... Brass

Specifications

R42 and R46 Valve — Normally Closed

Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R42E195M	5/8 ODF	19/32	4.57	24.2	18.4	16.0	29.7	1.94	1.49	1.69	2.31	3.93	3.26	3.53	4.71
R42E197M	7/8 ODF														
R46E257M	7/8 ODF	25/32	7.81	41.4	31.5	27.4	50.6	4.64	3.28	2.54	2.86	3.44	6.74	6.04	8.07
R46E259M	1-1/8 ODF														

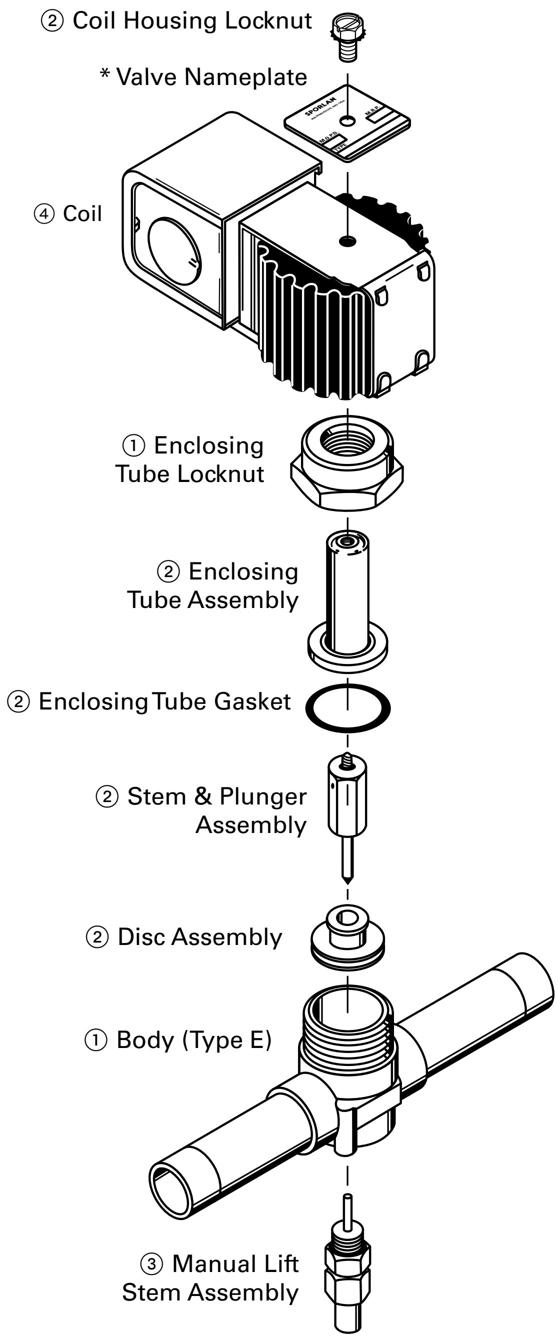
R43 and R47 Valve — Normally Open

Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R43E195*	5/8 ODF	19/32	4.57	24.2	18.4	16.0	29.7	1.94	1.49	1.69	2.31	3.93	3.26	3.53	4.71
R43E197*	7/8 ODF	19/32	4.57	24.2	18.4	16.0	29.7	1.94	1.49	1.69	2.31	3.93	3.26	3.53	4.71
R47E257*	7/8 ODF	25/32	7.81	41.4	31.5	27.4	50.6	3.28	2.54	2.86	3.94	6.04	5.60	6.04	8.07
R47E259*	1-1/8 ODF	25/32	7.81	41.4	31.5	27.4	50.6	3.28	2.54	2.86	3.94	6.04	5.60	6.04	8.07

① Reference Ratings Summary for nominal capacity system conditions on page 6.
② For capacities at other ratings, refer to Extended Capacity tables on pages 7 & 8.
Coils available separately. Use Coil PKC-2 with R42 & R46 Series valves. Reference Coil Enclosure page 28 for electrical coil enclosure options.
Use coil OPKC-2 with R43 & R47 Series valves.
*** Normally open R43 and R47 valves will not meet MOPD with AC voltage. However, rated MOPD can be achived with DC voltage. Therefore, use DC voltage coil and supply proper DC voltage to the coil or use a properly sized rectifier to change AC voltage to DC voltage.**

Call-Outs

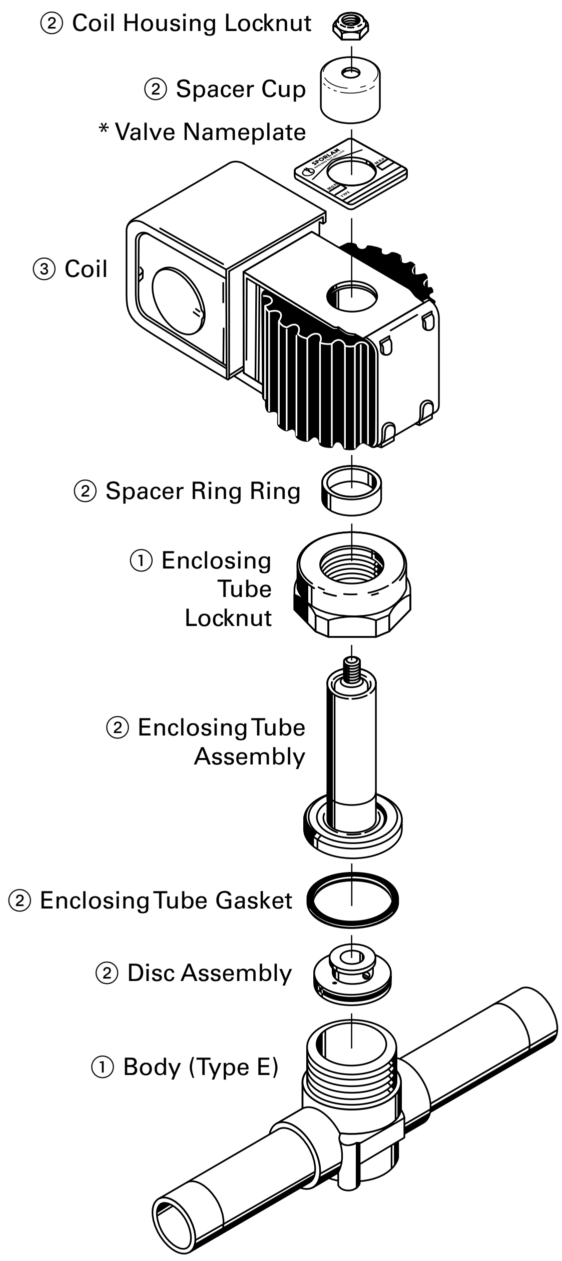
R42 and R46 Normally Closed Pilot Operated Valves



① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available in Manual Lift Stem Kit.
④ Part **is** available separately.

*Part is available in small quantities. Must provide valve type, connections and voltage.

R43 and R47 Normally Open Pilot Operated Valves

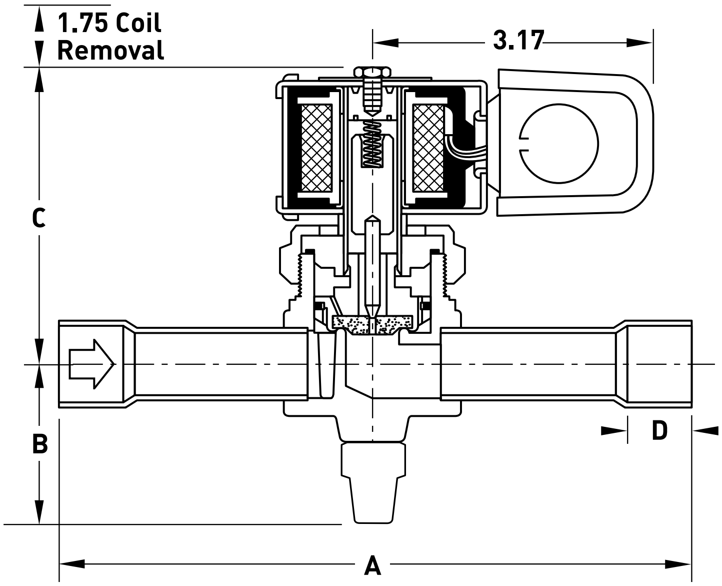


① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available separately.

*Part is available in small quantities. Must provide valve type, connections and voltage.

Dimensions - Inches

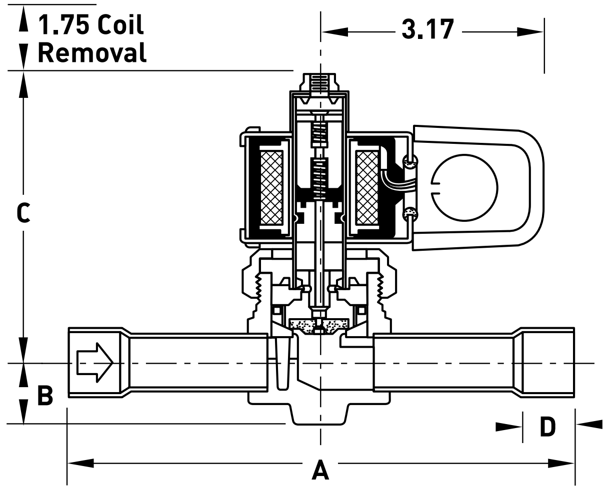
R42 and R46 Pilot-Operated Valves



Valve Type	A	B	C	D
R42E195M	6.88	1.93	3.41	0.50
R42E197M	7.13	1.93	3.41	0.75
R46E257M	7.50	1.84	3.81	0.75
R46E259M	8.50	1.84	3.81	0.91

Dimensions - Inches

R43 and R47 Pilot-Operated Valves



Valve Type	A	B	C	D
R43E195	6.88	0.81	3.87	0.50
R42E197	7.13	0.81	3.87	0.75
R46E257	7.50	0.72	4.06	0.75
R46E259	8.50	0.72	4.06	0.91

Series R52, R56 and R53, R57 Pilot-Operated Valves

Series R52, R56 — 2-Way Pilot-Operated Normally Closed Valves
Series R53, R57 — 2-Way Pilot-Operated Normally Open Valves

Materials of Construction

R52, R53

Body .... Brass
Seating Material .... Teflon®
Seals .... Gasket
Plunger .... Stainless
Sleeve Tube .... Stainless
Stop .... Stainless
Piston .... Aluminum
Springs .... Stainless
Shading Ring .... Copper
Connections .....Extended Ends - Copper
Manual Stem .... Brass

R56, R57

Body .... Steel
Seating Material .... Teflon®
Seals .... Gasket
Plunger .... Stainless
Sleeve Tube .... Stainless
Stop .... Stainless
Piston .... Aluminum
Springs .... Stainless
Shading Ring .... Copper
Connections .....Extended Ends - Copper
Manual Stem .... Steel

Specifications

R52, R56 Valve — Normally Closed

Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R52E359M	1-1/8 ODF	1	10.9	70.9	53.0	46.5	88.2	4.60	3.48	4.07	5.58	9.4	8.1	9.03	12.0
R52E3511M	1-3/8 ODF														
R56E4213M	1-5/8 ODF	1-5/16	24.0	127	96.9	84.2	156	9.57	7.36	8.33	11.9	21.0	17.4	18.8	25.1
R56E4217M	2-1/8 ODF														

R53, R57 Valve — Normally Open

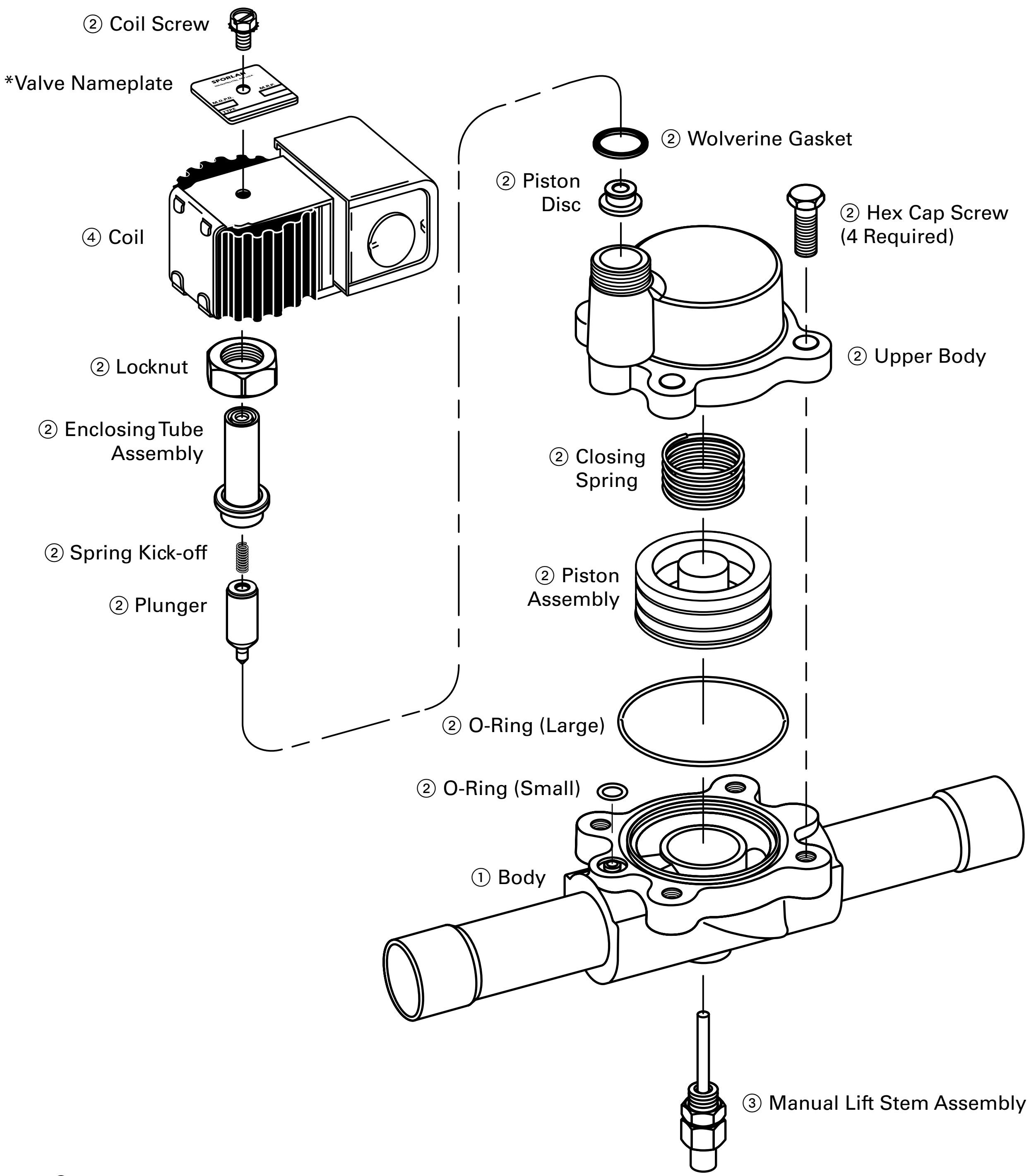
Valve Number	Connection (Inches)	Port (Orifice) (Inches)	Cv	Nominal Capacity (Tons) ① ②											
				Liquid				Suction Vapor				Hot Gas			
				R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A	R22	R134a	R404A R507	R410A
Extended Ends															
R53E359	1-1/8 ODF	1	10.9	70.9	53.0	46.5	88.2	4.60	3.48	4.07	5.58	9.4	8.1	9.03	12.0
R53E3511	1-3/8 ODF														
R57E4213*	1-5/8 ODF	1-5/16	24.0	12.7	96.9	84.2	156	9.57	7.36	8.33	11.9	21.0	17.4	18.8	25.1
R57E4217*	2-1/8 ODF														

① Reference Ratings Summary for nominal capacity system conditions on page 6.
② For capacities at other ratings, refer to Extended Capacity tables on pages 7 & 8.
Coils available separately. Use Coil PKC-1 for R52, OPKC-1 for R53, PKC-2 for R56, OPKC-2 for R57 Series valves. Reference Coil Enclosure page 28 for electrical coil enclosure options.

*** Normally open R57 valves will not meet MOPD with AC voltage. However, rated MOPD can be achived with DC voltage. Therefore, use DC voltage coil and supply proper DC voltage to the coil or use a properly sized rectifier to change AC voltage to DC voltage.**

Call-Outs

R52 Normally Closed Pilot Operated Valve

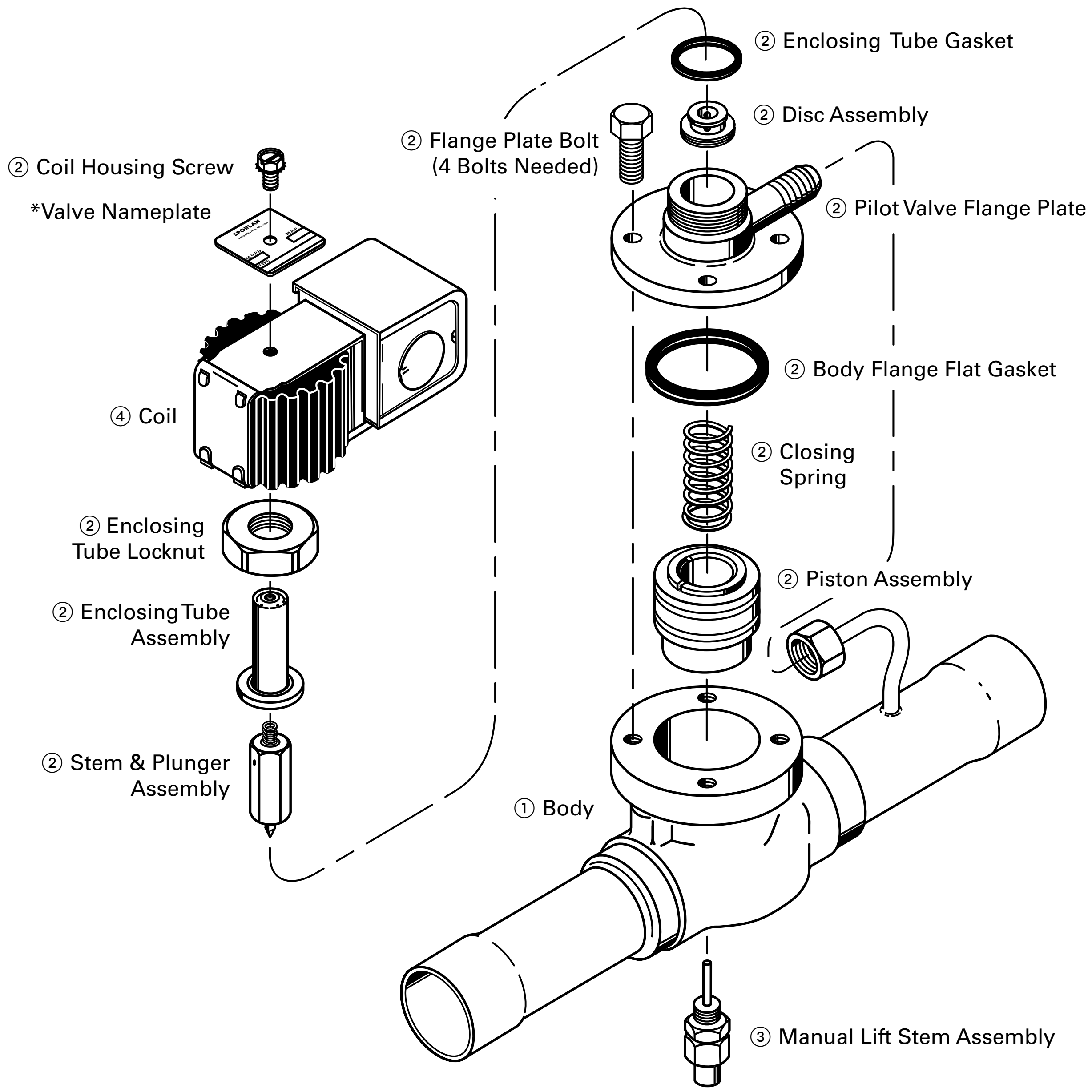


① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available in Manual Lift Stem Kit.
④ Part **is** available separately.

* Part **is** available in small quantities. Must provide valve type, connections and voltage.

Call-Outs

R56 Normally Closed Pilot Operated Valve

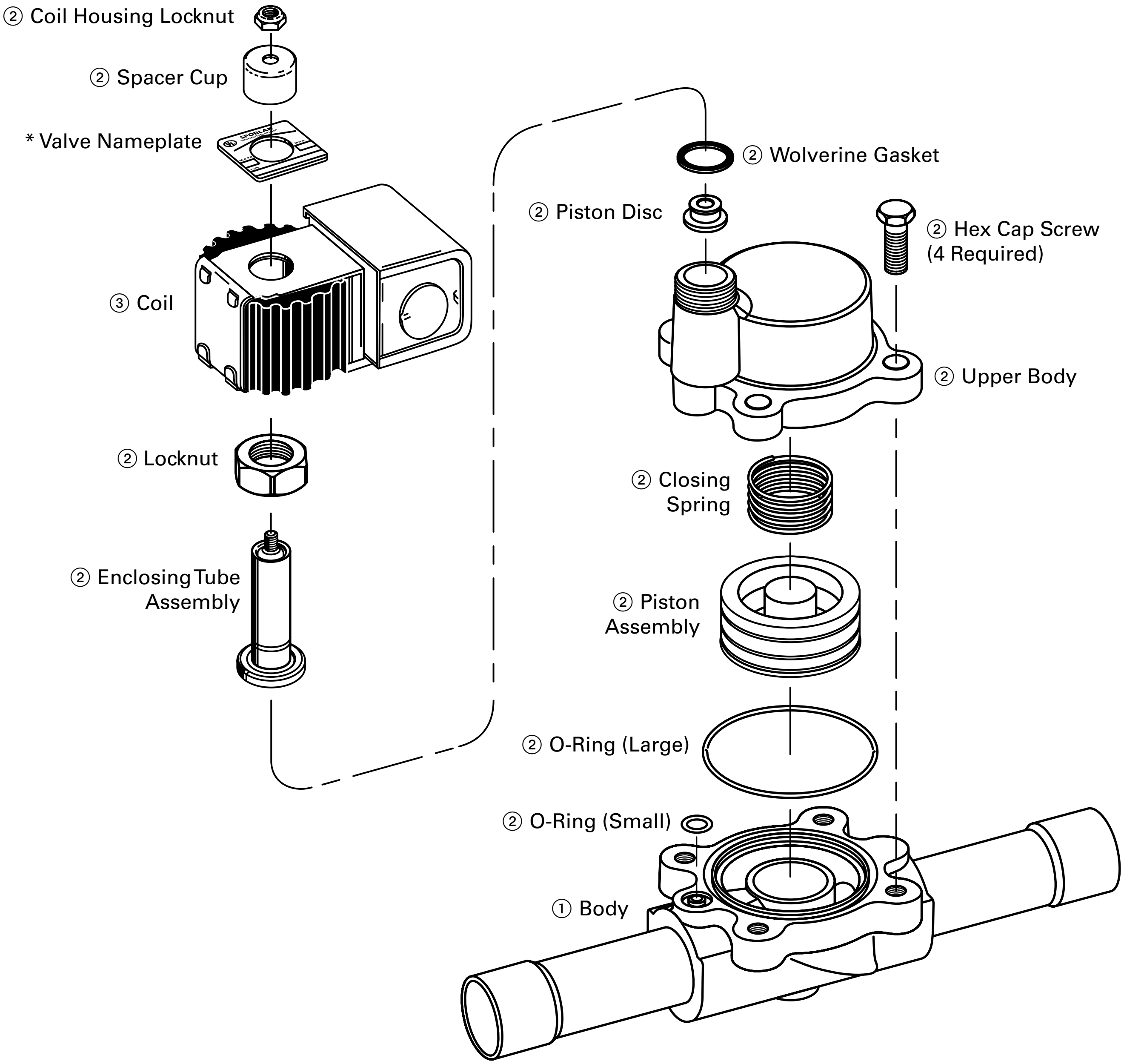


① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available in Manual Lift Stem Kit.
④ Part **is** available separately.

*Part is available in small quanities. Must provide valve type, connections and voltage.

Call-Outs

R53 Normally Open Pilot Operated Valve

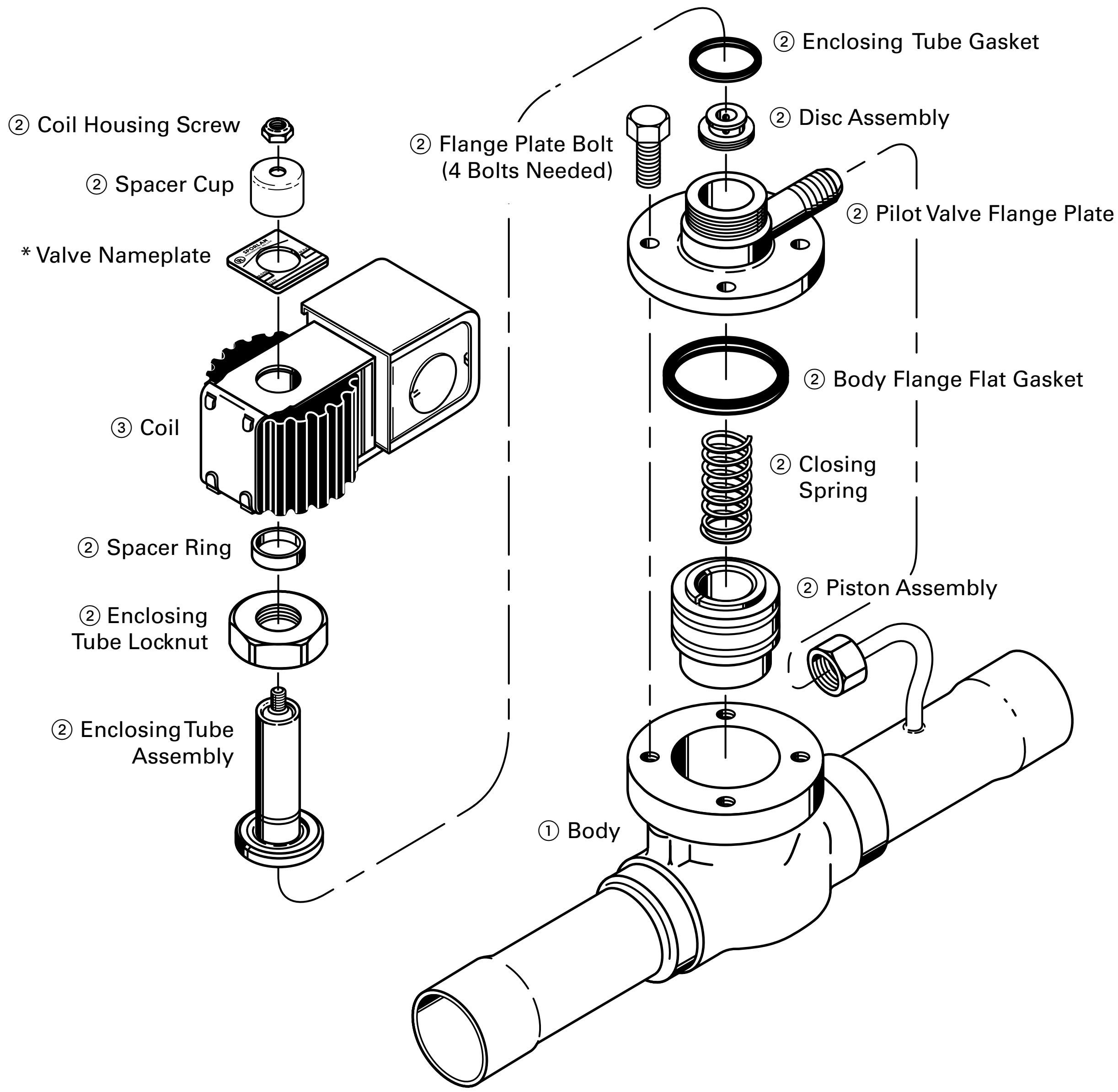


① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available separately.

*Part is available in small quantities. Must provide valve type, connections and voltage.

Call-Outs

R57 Normally Open Pilot Operated Valve

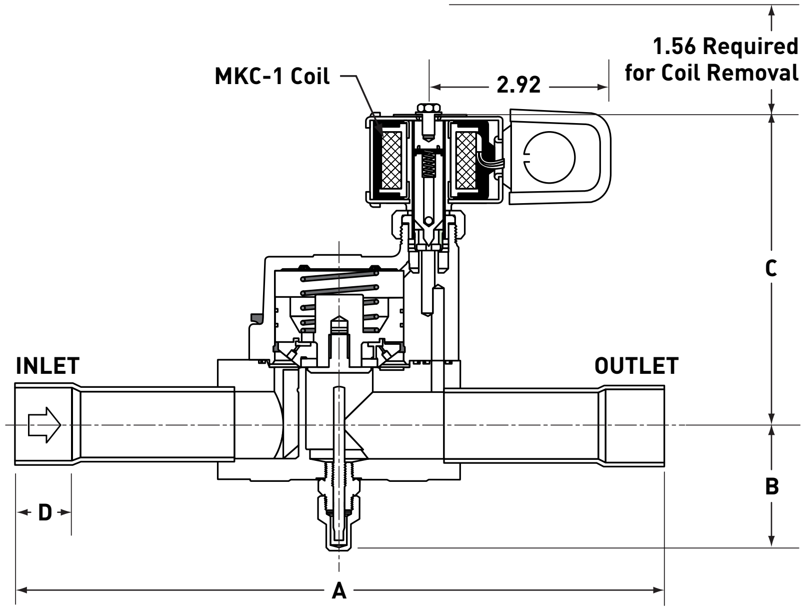


① Replacement part is **not** available.
② Part **is** available in Internal Parts Kit.
③ Part **is** available separately.

*Part is available in small quantities. Must provide valve type, connections and voltage.

Dimensions - Inches

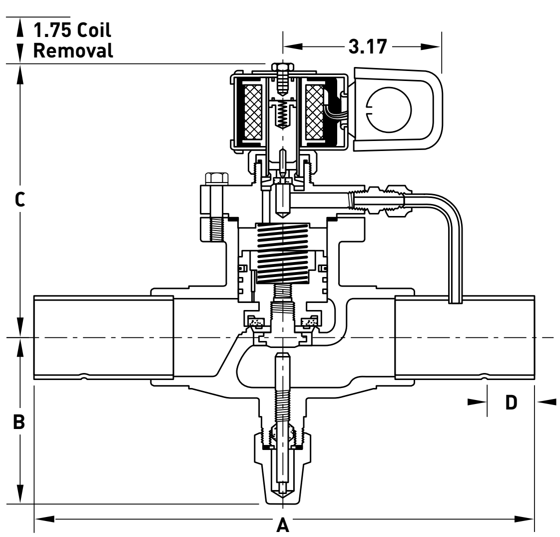
R52 Pilot-Operated Valves



Valve Type	A	B	C	D
R52E359M	10.06	1.96	4.81	0.91
R52E3511M	11.06	1.96	4.81	0.97

Dimensions - Inches

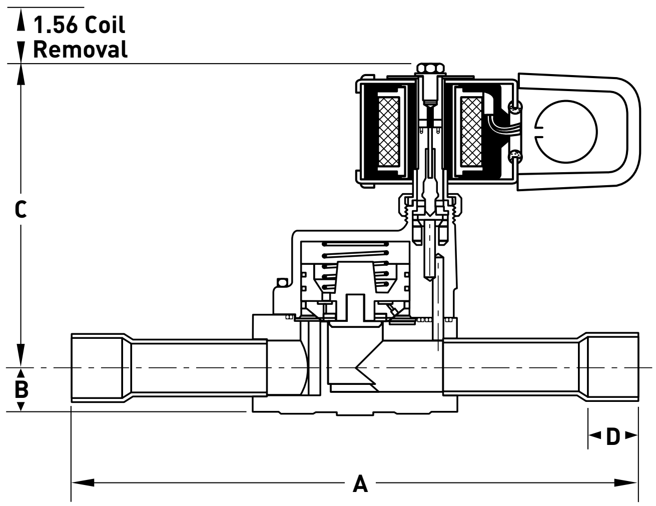
R56 Pilot-Operated Valves



Valve Type	A	B	C	D
R56E4213M	11.06	3.53	5.70	1.09
R56E4217M	11.06	3.53	5.70	1.34

Dimensions - Inches

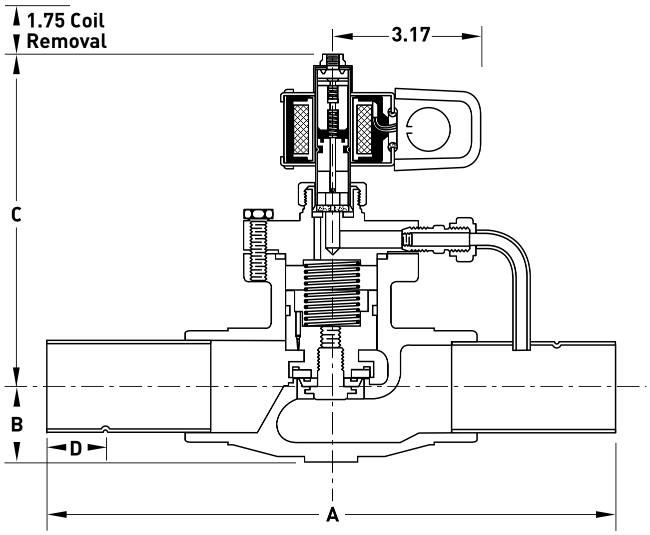
R53 Pilot-Operated Valves



Valve Type	A	B	C	D
R53E359	10.06	0.84	5.94	0.91
R53E3511	11.06	0.84	5.94	0.97

Dimensions - Inches

R57 Pilot-Operated Valves



Valve Type	A	B	C	D
R57E4213	11.06	1.40	6.31	1.09
R57E4217	11.06	1.40	6.31	1.34

Coil Enclosures

Standard Features

- Suitable for all Parker 'R' Series Refrigeration Solenoid Valves.
- Encapsulated waterproof designs.
- Meets UL, CSA, NEMA & other acceptable standards.
- Easy installation with nut and washer.
- UL and CSA approvals on "R" Series valves with applicable "R" coil/enclosure combinations.

Junction Box Electrical Characteristics

Materials of Construction

Encapsulant ....Molded Coil
Metal Enclosure .... Plated Carbon Steel
Conduit Cable.......................... 1/2" NPT with 6" leads

R10 thru R35 Valves

Coil Code	Wattage	Class
K1	10	F
K3	22	H

R42 thru R57 Valves

Coil Code	Wattage	Class
PKC-1	10	F
PKC-2	15	F
OPKC-1	10	F
OPKC-2	15	F

Conduit Coil Electrical Characteristics

Materials of Construction

Encapsulant .... Molded Thermoplastic
Conduit & Yoke............................ Plated Carbon Steel
Conduit Cable........................ 1/2" NPT with 18" leads
Safety Code ....NEMA Type 4

R10 thru R35 Valves

Coil Code	Wattage	Class
C1	10	F
C3	22	H

Minimum order may be required.

R42 thru R57 Valves

Coil Code	Wattage	Class
PKC-1	10	F
PKC-2	15	F
OPKC-1	10	F
OPKC-2	15	F

Minimum order may be required.

Electrical Specifications

All Parker R10 thru R57 Series Refrigeration Solenoid Valves use standard coil designs. They are available in a wide variety of standard voltages and frequencies. Coils are labeled with electrical data providing easy identification.

Construction

Numerous construction options are available including junction box housing, DIN terminals, conduit hub housing and spade termination coils.

Encapsulated moistureproof coils are standard on all valves listed in the catalog. The special compound is moistureproof and impervious to oil, dust and most corrosive fumes and vapors.

All coils are Class "F" or "H" rated for high temperature application requirements. The coils are molded in accordance with UL, NEMA, and other accepted standards.

Electrical Supply Requirements

The solenoid coil must be connected to electrical lines of correct voltage and frequency as indicated on the coil label. The supply circuits must be properly sized to give adequate voltage at the coil leads even when other electrical equipment is operating. The molded coil is designed to operate with line voltage from 85% to 110% of the coil AC rated voltage. Operating with a line voltage above or below these limits may result in reduced coil life or coil burn out. Also, operating with line voltage below the limit will result in lowering the maximum operating pressure differential (MOPD).

Wiring

Check the electrical specifications of the coil to make sure they correspond to the available electrical service. Wiring and fusing must comply with prevailing local and national wiring codes and ordinances.

Conversion from AC to DC Coils

The same valve assembly can be used for both AC and DC service requirements. AC and DC coils are interchangeable. To convert a valve assembly from AC to DC service, select the appropriate DC coil wattage and voltage per the valve specification chart based on the system pressure requirements.

Electrical Data

To determine the approximate Holding or Inrush Current for AC voltages including 24/60, 120/60, 208/60 and 240/60 in amperes, divide the voltage into the VA rating indicated in the AC Power Consumption tables. DC valves have no inrush current. The current rating in amperes are shown in the DC table. Figures are based on nominal values and will vary slightly depending on operating voltage and coil tolerances.

Standard Coil Options

Coil Type	Standard Termination	Protection
Junction Box	6" lead length	Junction box equipped with grounding screw provision
Conduit Hub	18" lead length - 2 wires	Type 1, 2, 3, 3S, 4, 4X

Valve Series	AC Power Consumption Ratings			
	10 watt Coils		22 watt Coils	
	VA Holding	VA Inrush	VA Holding	VA Inrush
Normally Closed Valves				
R10 Series	18	37	38	68
R20 Series	19	43	40	78
R30 Series	19	32	42	59
Normally Open Valves				
R15 Series	17	33	42	63
R25 Series	16	33	42	63
R35 Series	16	33	42	63

Coil Kit	24 Volts 50-60 Cycles		120 Volts 50-60 Cycles		240 Volts 50-60 Cycles		Transformer Rating Volts-Amperes
	VA		VA		VA		For 100% of Rated MOPD of Valve
	Holding	Inrush	Holding	Inrush	Holding	Inrush	
R52, R53	15	46	17	47	21.5	46	60
R42, R43, R46, R47, R56, R57	33.5	74.5	31	72	31	74.5	100

All current values are based on 60 cycles.
Contact Parker for coil characteristics on specific valve types.

Standard Voltages

Voltage Code		DC Voltage
R10 thru R35	R42 thru R57	
C1	K	12 VDC
C2	K	24 VDC

Voltage Code		AC Voltage
R10 thru R35	R42 thru R57	
B2	Q	24/60
P3	M	120/60; 110/50
2K	–	208/60
U3	N	208-240/60
Q3	–	240/60

Consult Parker for additional voltages that can be satisfied with a new coil of a specific voltage.

DC Current Comsumption Ratings (Amperes) R10 thru R35		
Coil Type	12 VDC	24 VDC
10 watt	0.81	0.41
22 watt	1.64	0.83

DC Current Comsumption Ratings (Amperes) R42 thru R57		
Coil Type	12 VDC	24 VDC
10 watt	1.08	0.52
15 watt	1.48	0.75

Valve and Coil Identification

All Parker 'R' Series Refrigeration Solenoid Valves are identified with a valve name-plate. The nameplate indicates the valve type and size, Maximum Operating Pressure Differential (MOPD) and Maximum Rated Pressure. In addition, the nameplate also specifies the appropriate electrical specifications for agency compliance.

Example (shown at right):

R20E84 .... Valve Number
MOPD .... Maximum Operating Pressure Differential (psi)
SWP (MRP) .... Safe Working Pressure (psi) (Maximum Rated Pressure)
Agency Requirement Assembly consists of "R" body and "R" Coil

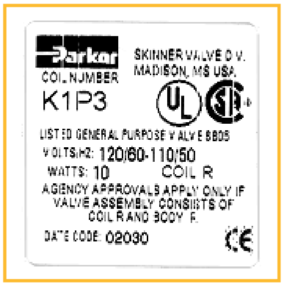
Valve Identification

Coil Identification

All Parker coil enclosures are identified with a label. The label indicates the coil part number, voltage and frequency.

Example (shown below):

RK1P3 .... Coil Enclosure Part Number
120/60................. Voltage & Frequency
UL and CSA .... Agency Approved



Coil Identification

Agency Approvals

The Parker R10 thru R35 Refrigeration Valves are approved by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). The Parker R42 thru R57 are approved by UL, cUL or CSA. Agency approval is specified based on assembly of an approved valve and coil enclosure assembly.

R10 thru R35
UL File Number: MH15507
CSA File Number: LR64702 legacy file

R10 thru R35 'R' Series Seal Material Designations

ASTM Designation	Commercial Designations and/or Trade Names
PTFE	Rulon® AR

Rulon® AR is a Furon-Advanced Polymers Division trademark.

Design Terminology

Continuous Duty – A rating given to a valve that can be energized continuously without overheating.

Correction Factor – A mathematical relationship related to a fluids specific gravity used to convert specific flows from a standard media to the media in question.

Current Drain – The amount of current (expressed in amperes) that flows through the coil of a solenoid valve when it is energized.

Cv Factor – A mathematical factor that represents the flow of water at 60°F, in gallons per minute, that will pass through a valve with a 1 psi pressure drop across the valve.

Flow – Movement of fluid created by a pressure differential.

Flow Capacity – the quantity of fluid that will pass through a valve under a given set of temperature and pressure conditions.

Manual Stem – A mechanical device that permits the manual opening of a valve in the case of emergency or power failure. A manual stem is available on all normally closed valves.

Maximum Operating Pressure Differential (MOPD) – The maximum pressure difference between the inlet and outlet pressures of the valve must not be exceeded, allowing the solenoid to operate in both the energized and de-energized positions.

Minimum Operating Pressure Differential – The minimum pressure difference between the inlet and outlet pressures required for proper operation. This minimum operating pressure differential must be maintained throughout the operating cycle of pilot operated valves to assure proper shifting from the closed position to the open position and visa versa. In the absence of the minimum operating pressure, the valve may close or will not fully open.

Orifice – The main opening through which fluid flows.

Safe Working Pressure or Maximum Rated Pressure – The maximum pressure a valve may be exposed to without experiencing any damage. The valve does not have to be operable at this pressure, but merely withstand the pressure without damage.

Operating Principles

Introduction

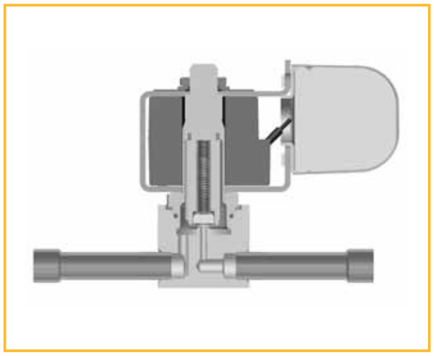
Solenoid valves are highly engineered products which can be used in many diverse and unique system applications. This section provides a brief overview of the components and functional varieties of solenoid valves.

General Information

Valve Construction and Basic Operation

A solenoid valve is an electrically operated device. It is used to control the flow of liquids or gases in a positive, fully-closed or fully-open mode. The valve is commonly used to replace a manual valve or where remote control is desirable. A solenoid valve is operated by opening and closing an orifice in a valve body which permits or prevents flow through the valve. The orifice is opened or closed through the use of a plunger that is raised or lowered within a sleeve tube by energizing the coil. The bottom of the plunger contains a compatible sealing material, which closes off the orifice in the body, stopping flow through the valve.

The solenoid assembly consists of a coil, plunger and sleeve assembly. In a normally closed valve, a plunger, return spring holds the plunger against the orifice, preventing flow through the valve. When the coil is energized, a magnetic field is produced raising the plunger allowing flow through the valve. In a normally open valve, when the coil is energized, the plunger seals off the orifice, stopping flow through the valve.

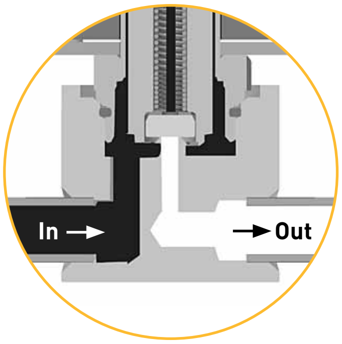


Two-Way Solenoid Valves

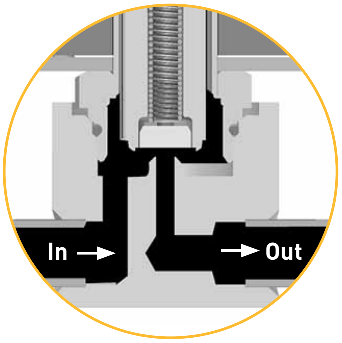
Two way valves control flow in one direction. They may be direct operated or pilot operated.

Direct Operated Solenoid Valves

Direct operated solenoid valves function to directly open or close the main valve orifice, which is the only flow path in the valve. Direct operated valves are used in systems requiring low flow capacities or in applications with low pressure differential across the valve orifice. The sealing surface that opens and closes the main valve orifice is connected to the solenoid plunger. The valve operates from zero pressure differential to maximum rated pressure differential (MOPD) regardless of line pressure. Pressure drop across the valve is not required to hold the valve open.



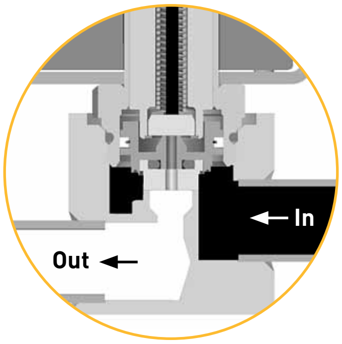
Normally Closed
Coil De-energized - Valve Closed



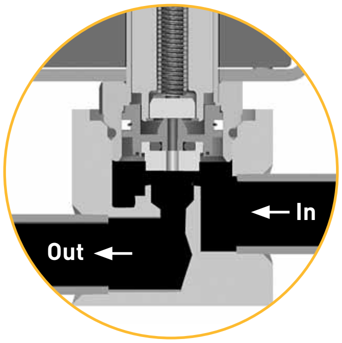
Normally Closed
Coil Energized - Valve Open

Pilot Operated Valves

Pilot operated valves are the most widely used solenoid valves. Pilot operated valves utilize system line pressure to open and close the main orifice in the valve body. In a piston style valve, the main orifice is held closed with a piston seal pressed against the main orifice by the combined fluid pressure and spring pressure. In a normally closed valve, the piston is shifted, or opened, when the pilot operator is energized. This allows process fluid behind the piston to evacuate through the valve outlet. At this point, the system line pressure moves the piston, opening the main orifice of the valve, allowing high capacity flow through the valve. When energizing the coil of a normally open valve, fluid pressure builds up behind the piston forcing the piston to seal the main orifice of the valve.



Normally Closed
Coil De-energized - Valve Closed



Normally Closed
Coil Energized - Valve Open

Typical Applications

Evaporator Temperature Control

A solenoid valve installed in the liquid line as close to the evaporator as possible, in conjunction with a narrow differential thermostat, is an excellent temperature control. By mounting the thermostat bulb in the supply or discharge air across the evaporator, the temperature swing is limited only by the differential of the thermostat.

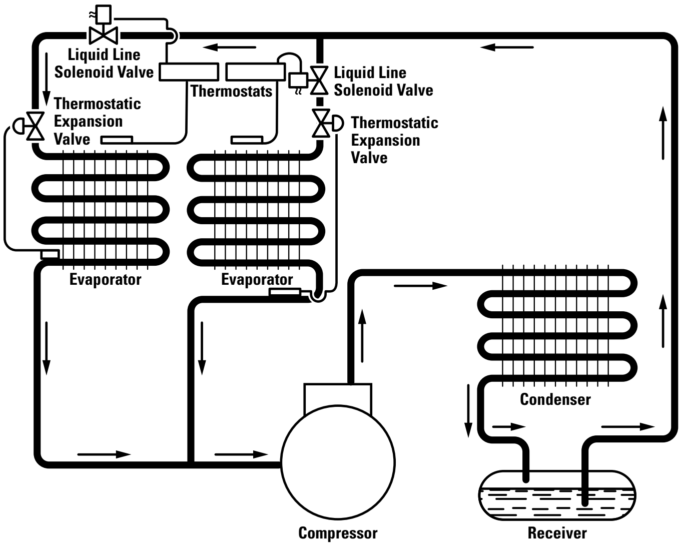
This type of temperature control can be used on a single or multiple evaporator system and is particularly useful on multiplexed systems with evaporators at different temperatures.

Defrost Pump Down

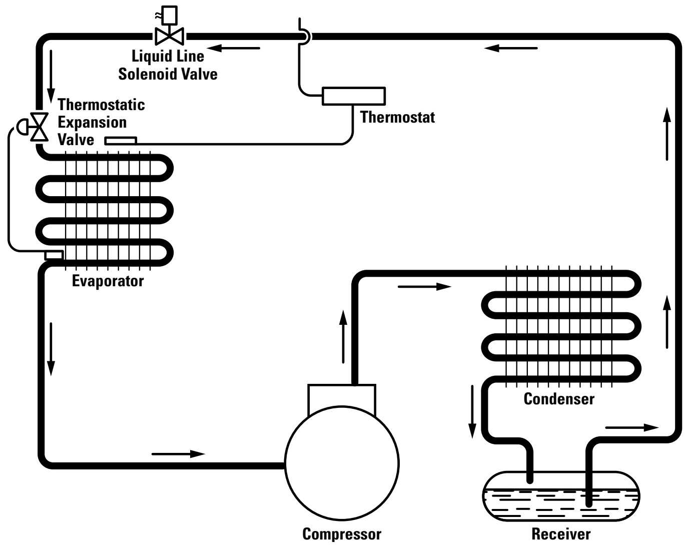
In situations where the condensing unit is installed in a low ambient, such as on a rooftop in northern climates, and the evaporator is operating at a temperature above the ambient, a pump down solenoid valve should be used. This allows the pressure control to be set at a cut out of 1 to 2 psi and the cut in to be set at a pressure below the pressure corresponding to the ambient temperature. This will ensure that the condensing unit will start after cooling down during the defrost.

When a system has a defrost pump down solenoid valve, a thermostat should be used in series with the time clock defrost to control the temperature of the space or fixture. An alternative to the thermostat would be an evaporator pressure regulator.

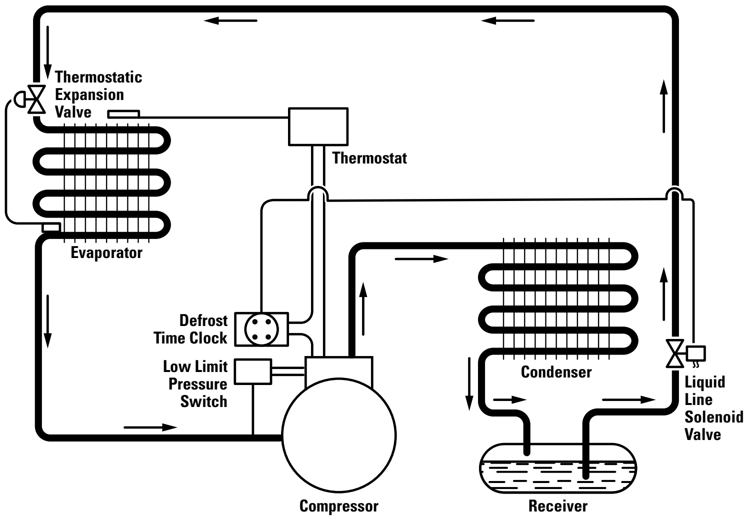
Note: System diagrams are for illustrative purposes and are intended to show application of solenoid valves only.



Thermostatic Control of Two Separate Evaporators



Thermostatic Control of Evaporator Temperature



Pump Down Defrost with Low Ambient Conditions

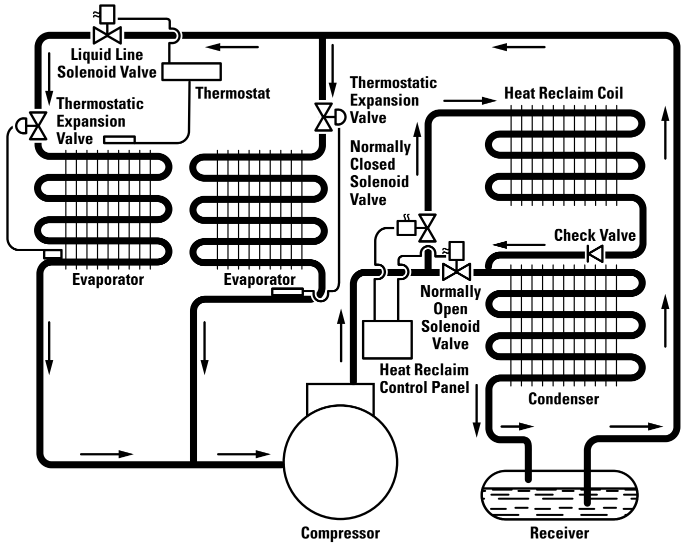
Typical Applications

Heat Reclaim Systems

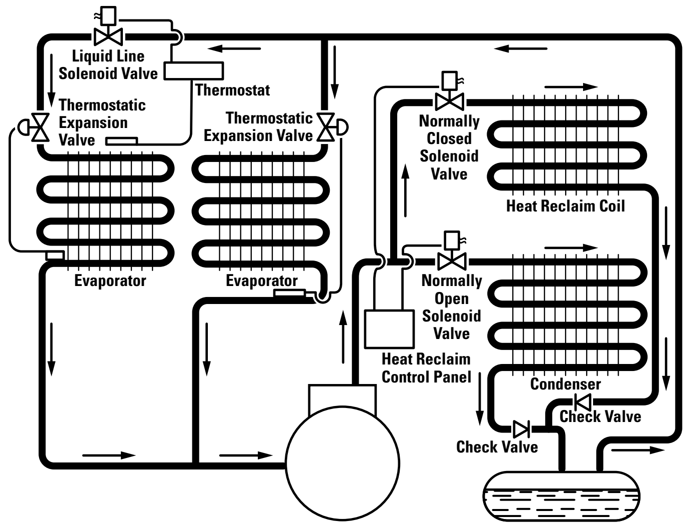
There are basically 2 types of heat reclaim systems: The series system and the parallel system.

In the series system, during normal operation, the discharge gas is condensed completely in the condenser. During the heating mode, the normally opened solenoid valve closes off the condenser and the normally closed solenoid opens to allow the discharge gas to flow into the heat reclaim coil. Complete condensation can occur in the heat reclaim coil if so designed, but manufacturers often prefer to take advantage of all the sensible heat available but only part of the latent heat, depending on the condenser for complete condensation.

In the parallel systems there are, in effect, two separate condensers. During normal operation, the condenser is used for complete condensation of the discharge gas. In the heat reclaim mode the discharge gas is completely condensed in the heat reclaim coil thus maximizing the use of both sensible and latent heat. Some manufacturers recommend installing a 1/4" line from the heat reclaim coil, at its lowest point, back to the receiver to ensure the proper drainage of oil and liquid refrigerant during the off cycle. Other manufacturers suggest the installation of a pressure control, to ensure that the system will switch from the heat reclaim mode to the condenser in the event of fan stoppage or clogged filters.



Heat Reclaim System (Series)

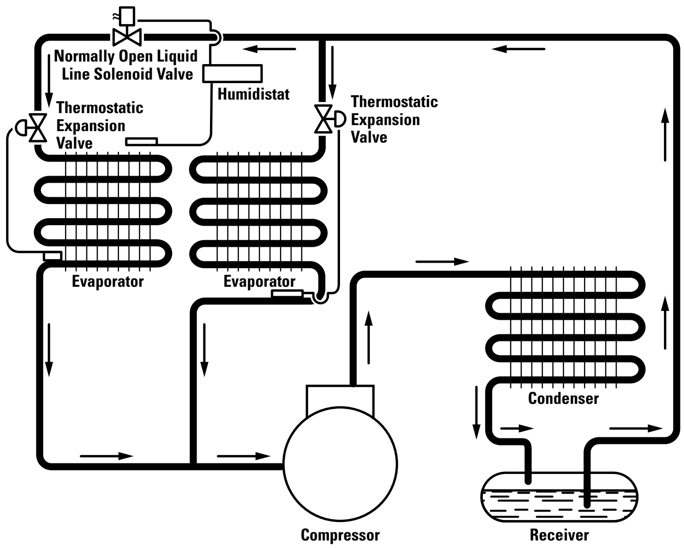


Heat Reclaim System (Parallel)

Typical Applications

Split Evaporator — Humidity Control

There are often times when the air temperature is satisfactory but the humidity level is too high. This can be remedied by using only half the evaporator to dehumidify the air without excessive cooling and the addition of auxiliary heat. This can best be accomplished by using a normally open solenoid valve on one half of the evaporator controlled by a humidistat.



Split Coil Air Conditioning Dehumidification System

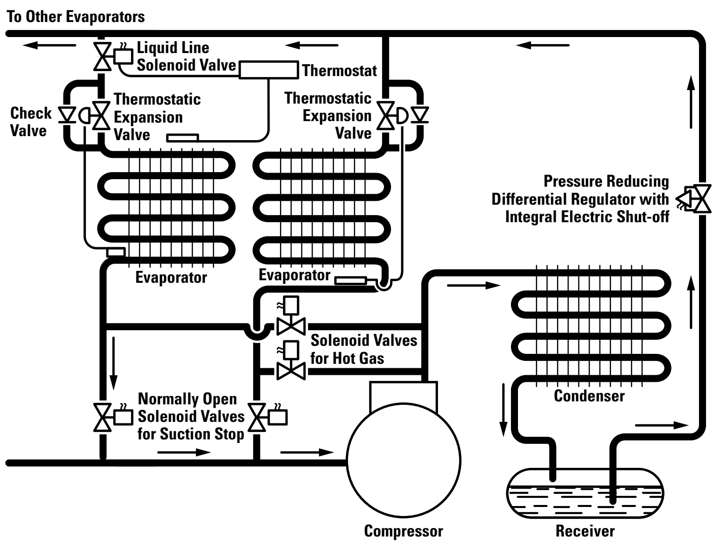
Hot Gas Defrost System

Hot gas defrost offers an excellent alternative to electric or air defrost. In this system the hot compressor discharge gas is routed to the outlet of the evaporator. This hot gas warms the evaporator, thaws any frost that has accumulated, condenses into a liquid and flows into the common liquid line to feed the other evaporators.

In order for this system to work properly, check valves must be installed to allow flow around the expansion valves. A pressure reducing valve should be used in the liquid line to provide a pressure differential between the condensed refrigerant leaving the defrosting evaporator and the common liquid line.

This system is drawn with only two evaporators but it is recommended that only twenty-five percent of any multiplexed system be hot gas defrosted at any given time.

An alternative to the hot gas defrost system is the cool gas defrost which uses the gas from the top of the receiver to defrost the evaporators. Because the cool gas defrost operates at a lower temperature, the thermal expansion of the refrigeration lines is reduced. This often eliminates the need for special piping techniques and leaks caused at line connections by excessive thermal flexing.



Hot Gas Defrost Systems

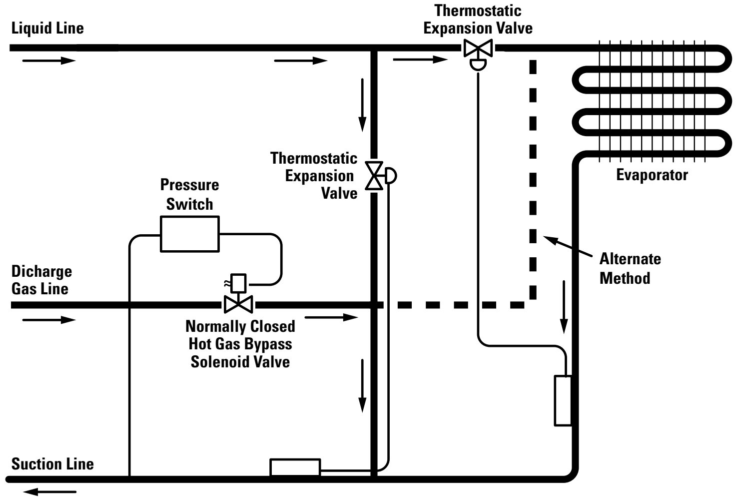
Typical Applications

Capacity Control System

A simple method of providing compressor unloading is to use a solenoid valve connecting the discharge and suction lines of the compressor. The solenoid valve is controlled by a pressure control which responds to suction pressure. When the switch closes, it opens the normally closed solenoid valve and discharge gas is short circuited back to the suction side of the compressor.

In order to prevent overheating of the compressor, a thermostatic expansion valve should be installed to provide cooling to the compressor suction gas. An alternative method consists of injecting hot gas into the evaporator inlet. This prevents overheating of the compressor and increases the velocity of the gas through the evaporator.

This type of unloading should not be attempted without thorough analysis of solenoid valve and expansion valve sizing.



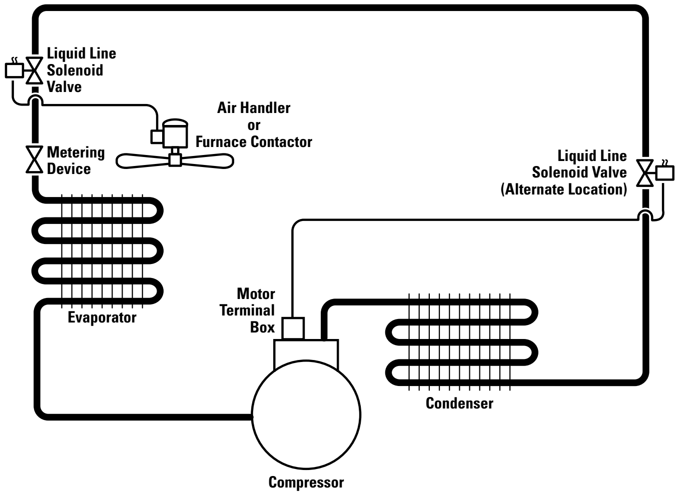
Capacity Control System

Liquid Line Shut-Off

In an effort to obtain a higher efficiency rating on residential and commercial air conditioning systems, a normally closed solenoid valve typically is installed in the liquid line located near the air handler or furnace. In this case, the solenoid valve is wired in parallel with the contactor circuit (24 VAC) and may require a larger transformer to accommodate the valve.

As an alternative method, a normally closed solenoid valve may be located in the liquid line near the condensing unit and wired directly to the compressor motor terminal box. This solution improves system efficiency and maintains the refrigerant charge in the condenser coil during the off-cycle of the compressor which prevents refrigerant migration when long piping runs are used.

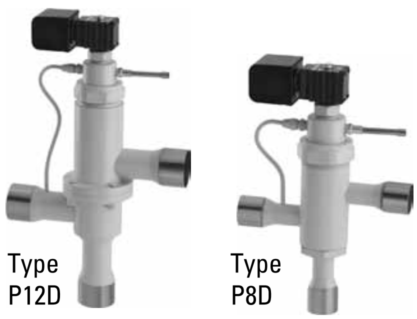
If the application requires a fail-safe or open mode, a normally open solenoid valve may be used. In this instance, the valve may also be located in the condensing unit and wired in series with the compressor crankcase heater.



Liquid Line Shut-Off

Introduction

Parker 3-Way Heat Reclaim Valves Offer the Following Advantages



UL and CSA Listed
CE Approved

- 3-Way Pilot eliminates costly high- to low-side leaks.
- "B" Type reduces total installed cost by eliminating need for normally open solenoid valve on systems requiring reclaim condenser pump out.
- High capacity at minimum pressure drop.
- Tight synthetic main port seating.
- Easily mounted in vertical or horizontal line to simplify piping requirements.
- Proven performance backed by service, engineering and technical support.
- UL Listed file #MH4576, CSA Listed file #LR19953, CE Approved

General

Today more and more applications are utilizing "heat reclaim" as a means of providing a supplementary or even a primary heat source. Heat reclaim can significantly lower energy costs. Heat reclaim is best described as the process of reclaiming heat that would normally be rejected by an outdoor condenser. Typically, the refrigerant is diverted to an air handler in an area that requires heat. One of the older applications of heat reclaim is in a supermarket, since a supermarket has a constant supply of heat removed from the many refrigerated display fixtures and coolers. Today there are many cost-effective applications of heat reclaim in refrigeration, air conditioning, dehumidification and heat pump systems.

While the most popular application of heat reclaim is air, water heating is popular in supermarkets, convenience stores and restaurants, which all use considerable amounts of hot water. Essentially any application that requires heat can recover the heat from a refrigeration or air conditioning system. The energy efficiency of recovered heat will almost always be more efficient than any other purchased heat source. The common sense question is "Why reject heat to the outdoors when additional heat is required in any other moderate temperature application within the system or building?" 3-Way refrigerant heat reclaim valves make it convenient to recover rejected or waste heat.

Application

Valves may be installed in either a horizontal or vertical position. However, it should not be mounted with the coil housing below the valve body.

Series versus Parallel Piping Schematics

Figures 2 & 3, Pages 38 & 39 show typical piping schematics for the two basic types of piping arrangements, series and parallel condensers. The selection of the piping arrangement will depend on the sizing of the reclaim coil and the control scheme of the system.

If the parallel piping arrangement is used, the reclaim condenser must be sized to handle 100% of the rejected heat at the conditions and time at which the reclaim coil is being utilized.

If the series piping arrangement is used, care and safety measures should be taken to prevent the mixing of subcooled refrigerant with hot gas vapors. These safety measures could include pressure or temperature lockout controls and time delay relays.

For both parallel and series piping, when the idle condenser is pumped down to suction pressure, a small solenoid valve can be used to pressurize the idle condenser prior to the 3-way valve shifting. This may reduce the potential for stress and fatigue failure of the refrigerant piping.

Heat Reclaim with or without a Bleed Port

3-Way Heat Reclaim Valves with 3-way pilot valves are available in a variety of different sizes. These valves are available with an optional "bleed" port, see Figure 1. The bleed port allows the refrigerant to be removed from the heat reclaim coil or heat exchanger when it is not being used. There are two reasons why the refrigerant is removed from the heat reclaim coil. One is to maintain a proper balance of refrigerant in the system (i.e., refrigerant left in the reclaim coil could result in the remainder of the system operating short of charge). A second reason is to eliminate the potential of having condensed refrigerant in an idle coil. When an idle reclaim coil has condensed or even subcooled liquid

Application

refrigerant sitting in the tubes there is a potential for a problem. When refrigerant liquid, either saturated or subcooled, is mixed with hot gas refrigerant, the reaction of the mixing can cause severe liquid hammer. Hot gas mixed with liquid can create thousands of pounds of force and has the potential of breaking refrigerant lines and valves.

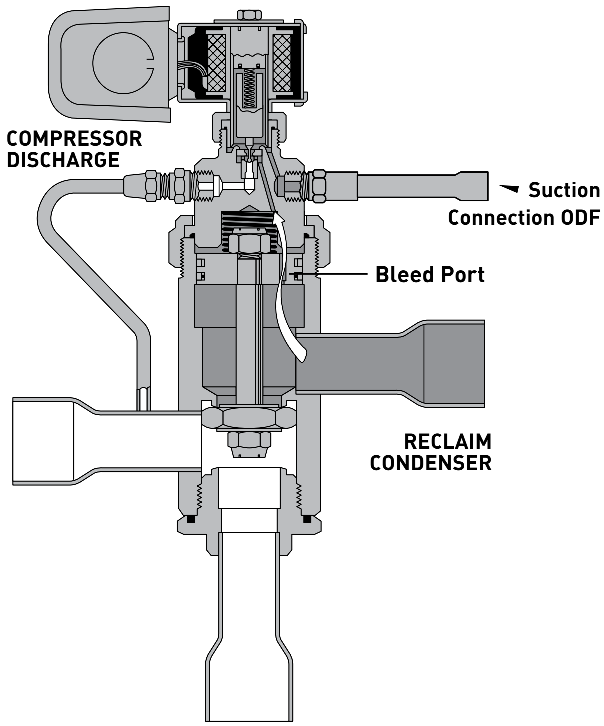
An alternate method of removing the refrigerant from a heat reclaim coil is to use a separate normally open solenoid valve and an optional fixed metering device, see Figures 2 & 3, Pages 38 & 39. The separate solenoid valve allows the flexibility of pumping out the reclaim heat exchanger as a liquid instead of a vapor. There are two benefits to pumping out the reclaim coil as a liquid: (1) Removal of any oil that may be present in the reclaim heat exchanger. (2) The refrigerating effect of the liquid can be used to lower the superheat of vapor entering the compressor, instead of cooling the heat reclaim heat exchanger.

Parker recommends that recognized piping references be consulted for assistance in piping procedures. Parker is not responsible for system design, any damage resulting from system design, or for misapplication of its products.

Note: A check valve should be installed in the heat reclaim pump out or bleed line whenever the reclaim heat exchanger is exposed to temperatures lower than the saturated suction temperature of the system. This will prevent migration of refrigerant to the coldest location in the system.

TYPE B - Reclaim Condenser Pump Out

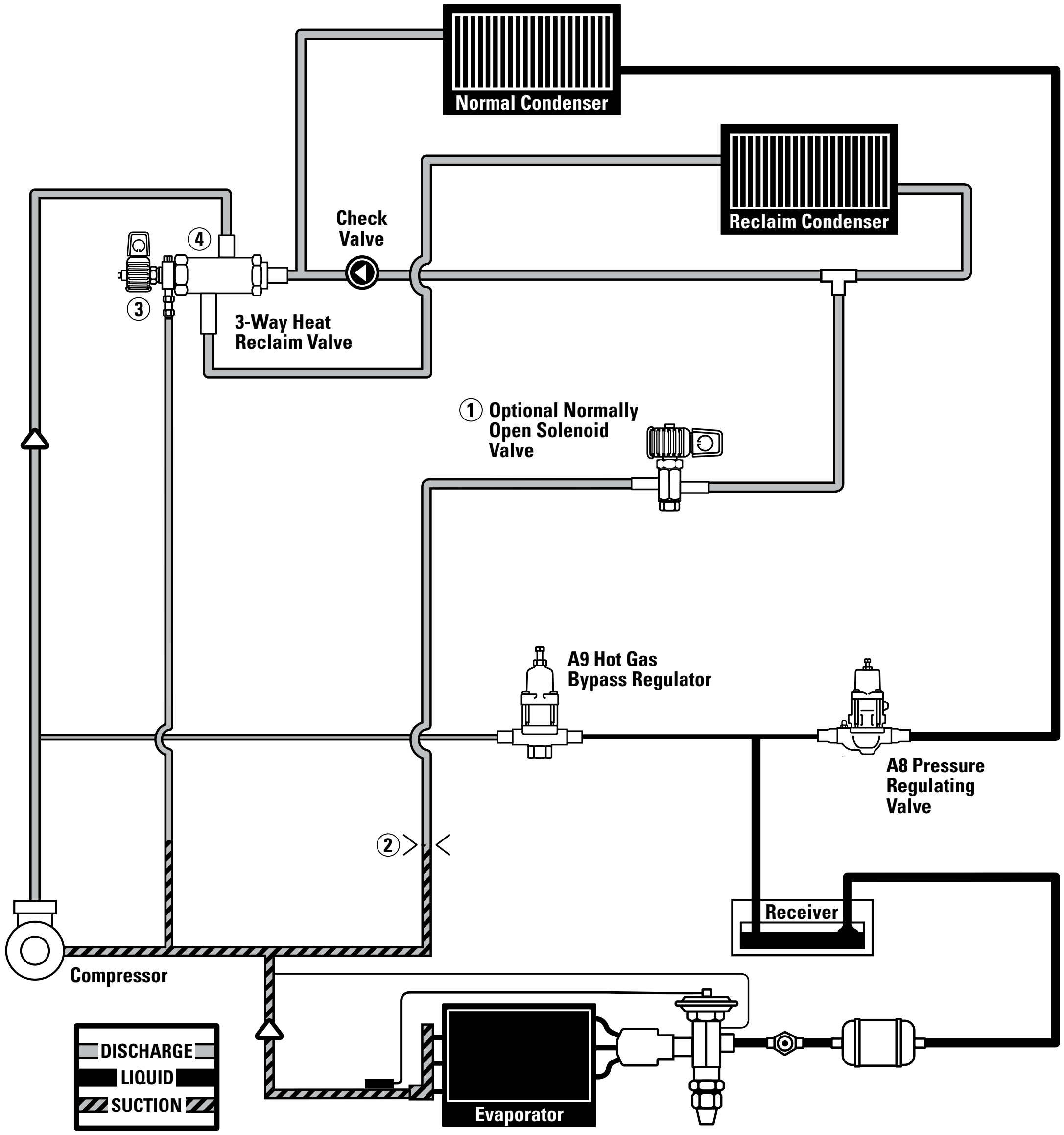
Figure 1



Schematic

Figure 2

Series Condenser Typical Piping



① Use optional solenoid valve and piping if pump out is required and "C" model Heat Reclaim Valve is used, see Note 4. It is optional to omit this solenoid valve and piping on systems using "B" model Heat Reclaim Valve.

② A restrictor may be required to control pump out rate on inactive condenser.

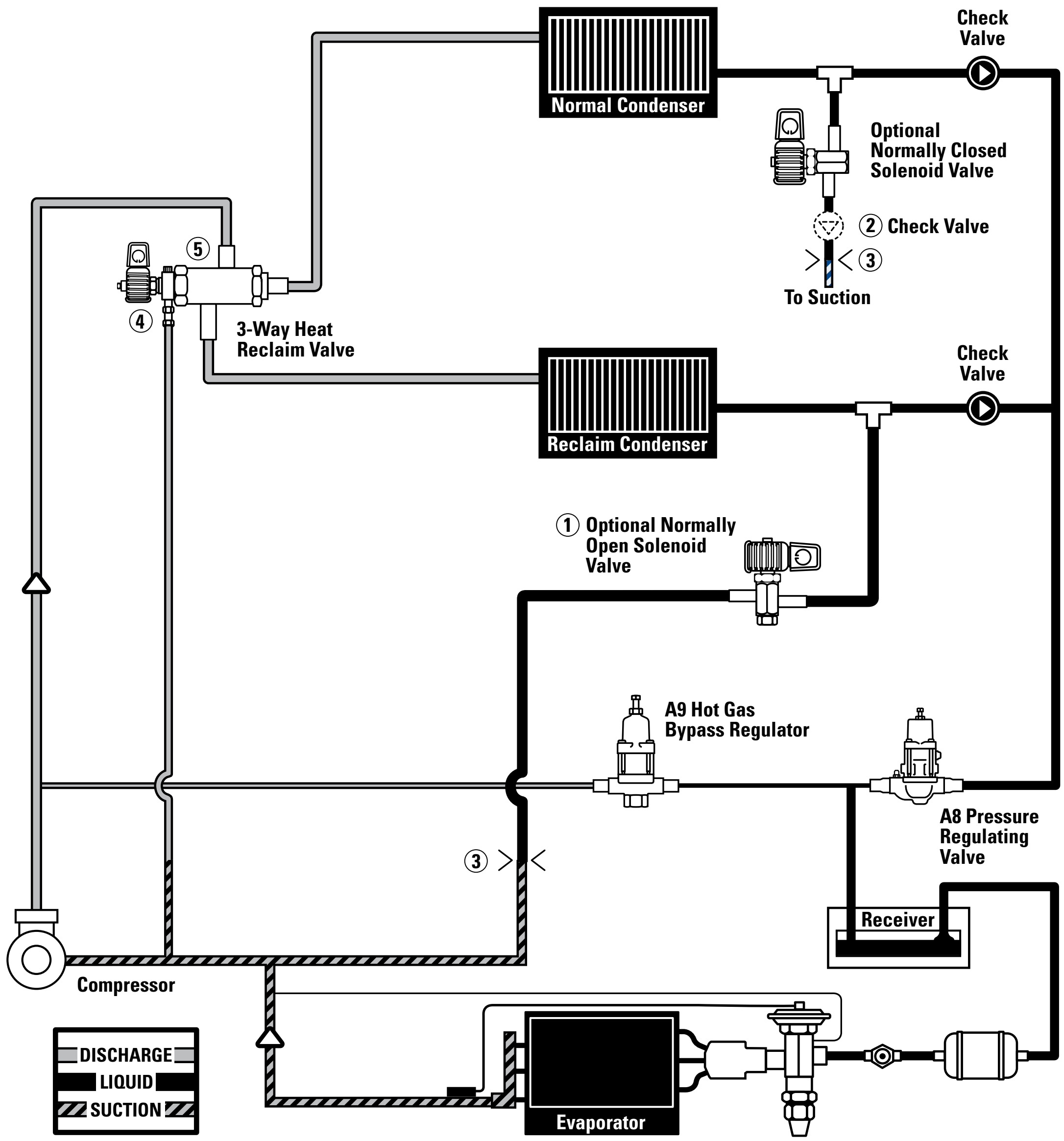
③ Pilot suction line must be open to common suction whether or not Heat Reclaim Coil is installed at time of installation and regardless of Heat Reclaim Valve model/type.

④ Proper support of heat reclaim valves is essential. Concentrated stresses resulting from thermal expansion or compressor vibrations can cause fatigue failure of tubing, elbows and valve fittings. Fatigue failures can also result from vapor propelled liquid slugging, and condensation induced shock. The use of piping brackets close to each of the 3-Way valve fittings is recommended.

Schematic

Figure 3

Parallel Condenser Typical Piping



① Use optional solenoid valve and piping if pump out is required and "C" model Heat Reclaim Valve is used, see Note 4. It is optional to omit this solenoid valve and piping on systems using "B" model Heat Reclaim Valve.

② This check valve is required if lowest operating ambient temperature is lower than evaporator temperature.

③ A restrictor may be required to control pump out rate on inactive condenser.

④ Pilot suction line must be open to common suction whether or not Heat Reclaim Coil is installed at time of installation and regardless of Heat Reclaim Valve model/type.

⑤ Proper support of heat reclaim valves is essential. Concentrated stresses resulting from thermal expansion or compressor vibrations can cause fatigue failure of tubing, elbows and valve fittings. Fatigue failures can also result from vapor propelled liquid slugging, and condensation induced shock. The use of piping brackets close to each of the 3-Way valve fittings is recommended.

Operation

All Parker 3-Way Heat Reclaim Valves have a pilot operated design that shifts the refrigerant flow to either the normal condenser or the reclaim condenser based on the heating requirements of the application.

"B" Type Normal (Outdoor) Condenser – De-energized

See Figure 4. With the pilot valve de-energized, high side pressure ① is prevented from entering the cavity above the piston-seat assembly ②. At the same time the upper pilot port is opened to suction pressure ③. The resulting pressure differential across the piston moves the piston-seat assembly to close the reclaim condenser port (upper main port). In this mode the system refrigerant flows to the normal condenser.

The pilot valve opens the cavity above the piston ②, to suction ③. This allows the reclaim condenser to be pumped out through a small bleed hole in the piston. The pump out process reduces the reclaim condenser to suction pressure. Once the suction pressure is reached, the flow through the bleed hole in the piston stops. There is no remaining high to low side bleed, with continued operation in the normal condenser mode. For a more efficient pump out of the reclaim condenser, a normally open solenoid valve can be added to the lowest physical location of the heat reclaim coil to remove liquid.

"C" Type Normal (Outdoor) Condenser – De-energized

See Figure 4. With the pilot valve de-energized, high side pressure ① is prevented from entering cavity above the piston-seat assembly ②. At the same time the upper pilot port is opened to suction pressure ③. The resulting pressure differential across the piston moves the piston-seat assembly to close the reclaim (upper) main port. We use a solid piston ring on the piston thereby eliminating high to low side bleed, and the resulting capacity loss with the system in the normal condenser mode.

Note: When the heat reclaim condenser is used for heating hot water, some form of bleed is required. Type C valves with no method of bleed in the heat reclaim condenser may result in isolated reclaim condenser pressures higher than the saturated discharge pressure of the system. In this condition, the higher reclaim condenser pressure could prevent the valve from shifting into the reclaim mode. Or, the balance of pressures and spring forces could result in flow to both the reclaim and normal condenser connections. One solution is to install a check valve in the reclaim condenser line and either use a Type B valve or provide a pump out solenoid connected to the tubing between the reclaim connection of the 3-way valve and the check valve.

"B" and "C" Type Reclaim (Reheat) Condenser – Energized

See Figure 5. When the pilot valve is energized, high side pressure ① is permitted to flow through the lower pilot port. At the same time, the upper pilot port is closed to suction ③. High side pressure ①, builds up on top of the piston ②, moves the piston-seat assembly to close the normal condenser port, and opens the reclaim (upper) main port. With the upper pilot port closed, there is no high to low side bleed with the system in the reclaim mode.

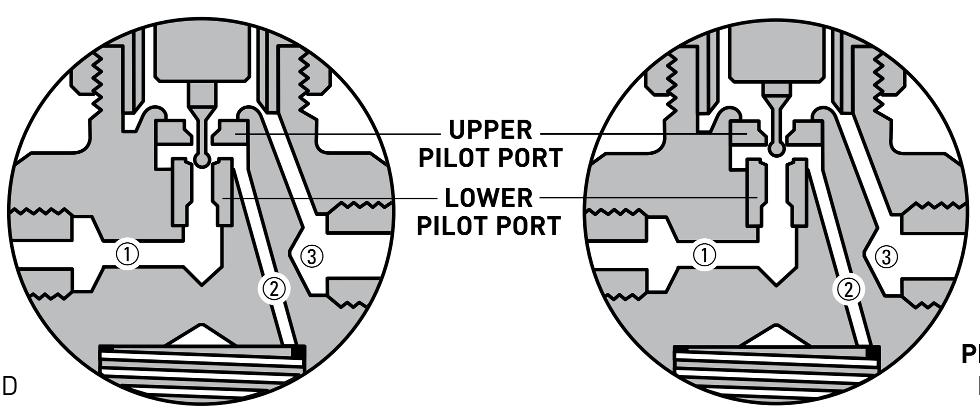


Figure 4
PILOT VALVE
DE-ENERGIZED

Figure 5
PILOT VALVE
ENERGIZED

Selection

1. For a given refrigerant, select a valve having a port size with capacity most closely matching the evaporator maximum load requirements in tons at the design evaporator temperature. Refer to the tables on Page 43. Take into account the allowable pressure drop across the valve port.

2. Select the proper coil assembly for the valve type and match the voltage requirements. All standard AC voltage options are available. For voltages not listed in coil specification, consult Parker, Broadview, IL.

Ordering Instructions

When ordering complete valves, specify Valve Type, Voltage and Cycles.

When ordering Valve Body ONLY, specify Valve Type.

When ordering Coil Assembly ONLY, specify Coil Type, Voltage and Cycles.
Example: PKC-1 120/50-60

Valve Nomenclature

P12D	11	C
Valve Type	Connections in 1/8″	Non-Bleed Version

Specifications

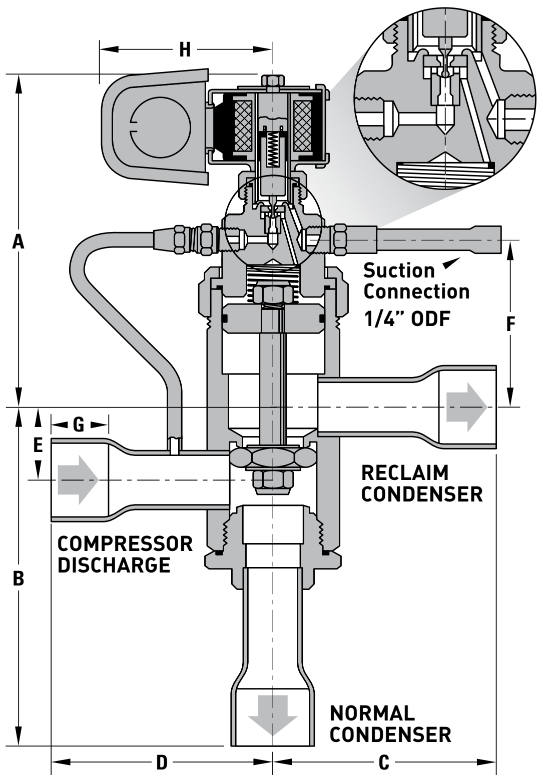
Valve Series	Type	Standard Connections Inches	Port Size Inches	MOPD psi*	MRP psi**	Standard Coil Ratings		
						VOLTS/CYCLES	WATTS	COIL
P8D	P8D7B	7/8	3/4	400	680	24/50-60 120/50-60 208-240/50-60	10	PKC-1
	P8D7C							
	P8D9B	1-1/8						
	P8D9C							
P12D	P12D11B	1-3/8	1-1/4					
	P12D11C							
	P12D13B	1-5/8						
	P12D13C							

*MOPD stands for Maximum Operating Pressure Differential.
** MRP stands for Maximum Rated Pressure.
▪ Available with junction box.

Dimensions – Inches

Figure 6

TYPE P8D - P12D



Type	A	B	C	D	E	F	G	H	J
P8D7B	5.11	5.06	3.44	3.44	1.12	2.62	0.75	2.92	1.64
P8D7C									
P8D9B		5.12					0.91		
P8D9C									
P12D11B	6.73	6.94	4.19	4.19	2.39	4.24	0.97	2.92	1.64
P12D11C									
P12D13B							1.09		
P12D13C									
PKC-1	---	---	---	---	---	---	---	2.92	1.64
PKC-2									

Evaporator Capacities — Tons

Capacities are based on 100°F condensing temperature isentropic compression plus 50°F, evaporator temperature as shown plus 25°F superheat suction gas. For capacities at other conditions, use the correction table below. All capacity ratings are in accordance with ARI Standard No. 760-80.

Evaporator Temperature°F	R22				R134a				R401A				R402A			
	PSI - Pressure Drop				PSI - Pressure Drop				PSI - Pressure Drop				PSI - Pressure Drop			
	2		4		2		4		2		4		2		4	
	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D
40	10.1	29.1	14.2	41.8	8.4	24.0	11.8	34.5	9.2	26.2	12.9	37.7	8.8	25.9	12.4	37.3
30	9.9	28.6	13.9	41.0	8.2	23.5	11.5	33.7	9.0	25.6	12.6	36.8	8.6	25.3	12.1	36.3
20	9.7	28.0	13.7	40.2	8.0	22.9	11.2	32.9	8.8	25.0	12.3	36.0	8.4	24.6	11.7	35.3
10	9.5	27.4	13.4	39.4	7.8	22.3	10.9	32.0	8.6	24.4	12.0	35.1	8.1	23.8	11.4	34.2
0	9.3	26.8	13.1	38.5	7.6	21.7	10.7	31.1	8.3	23.8	11.7	34.1	7.9	23.1	11.0	33.1
-10	9.1	26.2	12.8	37.6	7.4	21.0	10.3	30.2	8.1	23.1	11.4	33.2	7.6	22.3	10.7	32.0
-20	8.9	25.5	12.5	36.7	---	---	---	---	---	---	---	---	7.3	21.5	10.3	30.9
-30	8.7	24.9	12.2	35.8	---	---	---	---	---	---	---	---	7.1	20.7	9.9	29.7
-40	8.4	24.2	11.8	34.7	---	---	---	---	---	---	---	---	6.8	19.9	9.5	28.6

Evaporator Temperature°F	R404A				R407C				R410A				R502			
	PSI - Pressure Drop				PSI - Pressure Drop				PSI - Pressure Drop				PSI - Pressure Drop			
	2		4		2		4		2		4		2		4	
	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D	P8D	P12D
40	9.0	26.4	12.7	38.0	10.6	30.8	14.9	44.2	12.0	34.7	16.9	49.9	8.0	23.4	11.2	33.6
30	8.8	25.7	12.3	37.0	10.4	30.0	14.5	43.1	11.7	34.1	16.4	49.1	7.8	22.8	10.9	32.8
20	8.6	25.0	12.0	35.9	10.1	29.3	14.2	42.1	11.5	33.5	16.1	48.2	7.6	22.2	10.7	31.9
10	8.3	24.2	11.6	34.9	9.9	28.5	13.8	40.9	---	---	---	---	7.4	21.6	10.3	31.0
0	8.0	23.4	11.2	33.7	9.6	27.7	13.5	39.8	---	---	---	---	7.2	21.0	10.1	30.2
-10	7.7	22.6	10.8	32.5	9.3	26.9	13.0	38.7	---	---	---	---	7.0	20.3	9.8	29.3
-20	7.5	21.8	10.4	31.3	9.0	26.1	12.7	37.4	---	---	---	---	6.7	19.7	9.4	28.3
-30	7.2	20.9	10.0	30.1	8.7	25.2	12.2	36.3	---	---	---	---	6.5	19.0	9.1	27.3
-40	6.9	20.0	9.6	28.8	---	---	---	---	---	---	---	---	6.3	18.3	8.8	26.3

Evaporator Temperature°F	R507			
	PSI - Pressure Drop			
	2		4	
	P8D	P12D	P8D	P12D
40	8.8	25.7	12.3	36.9
30	8.5	25.0	12.0	35.9
20	8.3	24.3	11.6	34.9
10	8.0	23.5	11.2	33.8
0	7.8	22.8	10.9	32.7
-10	7.5	22.0	10.5	31.6
-20	7.3	21.2	10.1	30.5
-30	7.0	20.4	9.8	29.3
-40	6.7	19.6	9.4	28.1

Evaporator Temperature Correction Factors

Evaporator Temperature °F	40	30	20	10	0	-10	-20	-30	-40
Multiplier	1.00	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.75

Head Pressure Control for Reclaim Systems

When employing heat reclaim on a refrigeration system, the addition of head pressure controls is important not only to maintain liquid pressure at the expansion valve inlet, but also to assure the availability of quality hot gas at the reclaim heat exchanger. Typically, the additional energy required to maintain a higher head pressure, is not enough to pay for an alternate method of heating.

Split condenser controls are also important to minimize the required refrigerant charge for winter time operation. See Page 10.

See Parker, Head Pressure Control Valves for high and low ambient stability. When low ambient conditions are encountered during fall-winter-spring operation, the Parker head pressure controls hold back liquid refrigerant so a portion of the condenser surface is inactive. This results in a rise in condensing pressure.

Parker Hannifin Corporation
Climate and Industrial Controls Group
2445 South 25th Avenue • Broadview, IL 60155-3891 USA
phone 800 742 2681 • fax 800 241 2872
www.parker.com/coolparts