

GAS POWERED SUCTION STOP VALVE

Type CK-5

Port Size 32mm to 150mm (1¼" - 6")

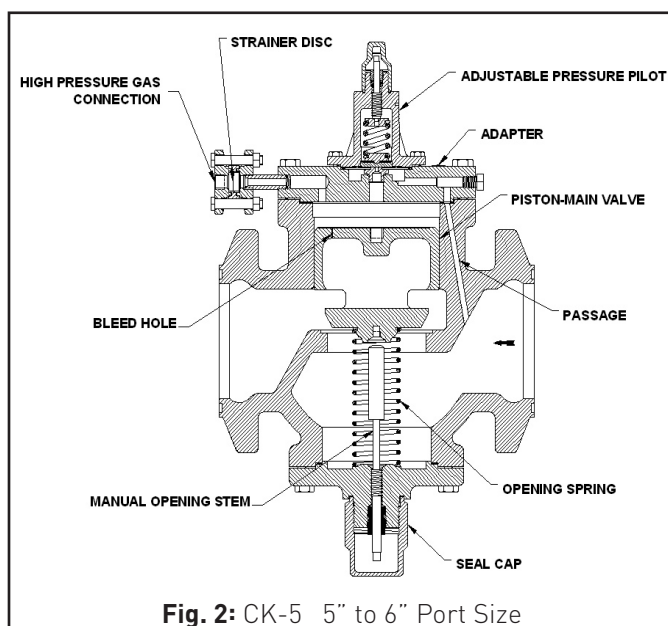
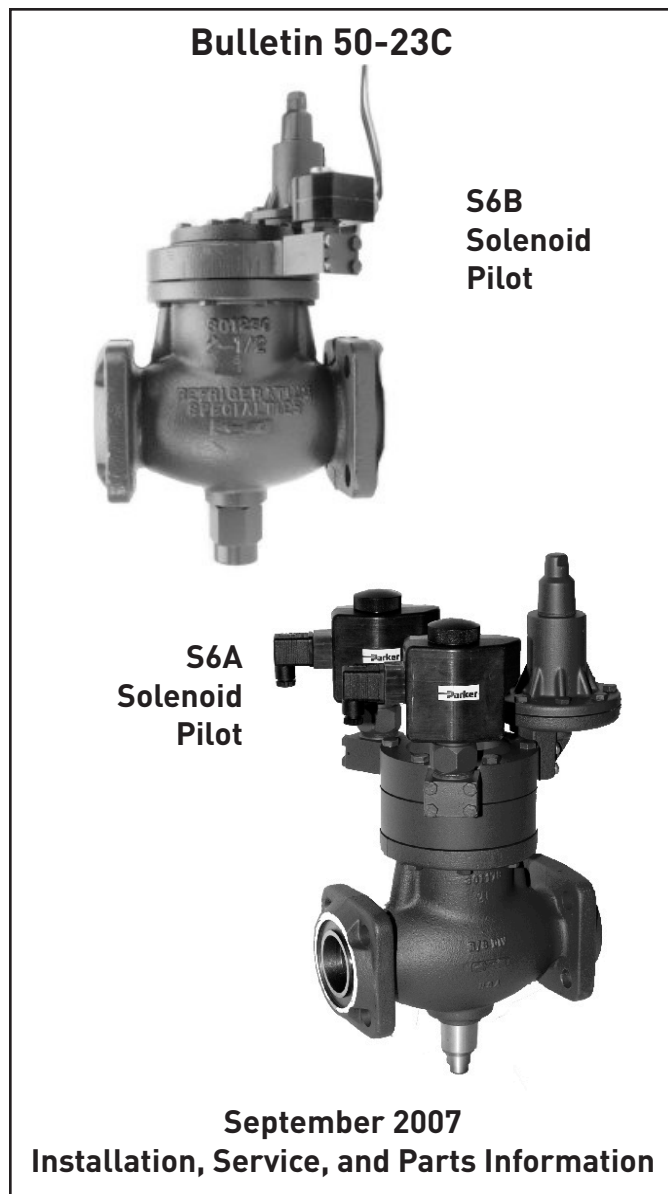
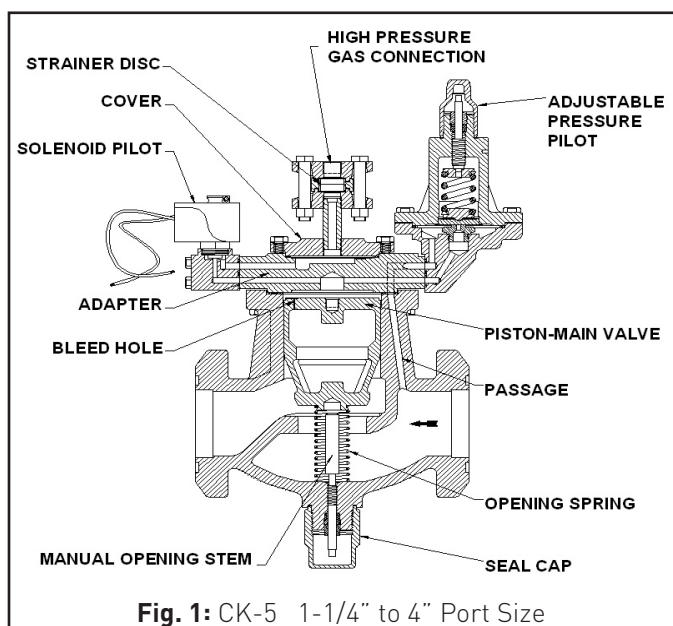
**Suitable For: Ammonia, R22, R502,
R134a, R404a and Other Common
Refrigerants**

FEATURES

- Normally Open
- Low Pressure Drop
- Manual Opening Stem
- Integrated Pilot Solenoid on 32mm to 100mm (1-1/4" to 4") Sizes
- Use in Vertical or Horizontal Line
- Valve may be mounted on its side
- Design Pressure (MRP): 27.6 bar (400 psig)

DESCRIPTION

These valves are piston-type, gas powered, and normally open. They are heavy duty, semi-steel bodied valves that are built with control precision. The 32mm (1-1/4") port size has a PTFE main seat, the 40mm (1-5/8") port and larger have a metal to metal seat, the 100mm and 125mm (5" and 6") port size versions of this unique suction stop valve utilize a larger capacity, remotely piped pilot operated solenoid, the R/S type S8F (Reference Bulletin 30-91). In addition, the pilot regulator for these two larger sized valves is mounted on top of valve (Fig. 2), with the strainer disc assembly piped into the side of the adapter.



All valves contain a manual lift stem. The table below displays the correct solenoid and pressure pilot for each valve size:

PORT SIZE		SOLENOID	PRESSURE
MM	INCH	PILOT	PILOT
32	1-1/4	S6B	A2D2
40	1-5/8	S6B	A2D2
50	2	S6B	A2D2
65	2-1/2	S6B	A2D
75	3	S6B, S6A	A2D
100	4	S6B, S6A	A2D
125	5	S8F	A2D
150	6	S8F	A2D

PURPOSE

The purpose of the CK-5 gas-powered suction stop valve is to provide the normal operating features of the R/S CK-2 stop valve. In addition, this unique control valve incorporates a built-in mechanical fail-safe feature which prevents the undesirable effects of an immediate opening of the valve in the event of an electrical power failure while the evaporator is in defrost.

Along with the standard R/S type CK-2 gas-powered suction stop valve, the CK-5 is typically used for low temperature applications in wet return lines on liquid recirculation systems or on the liquid and gas return legs of flooded evaporators. Due to its normally open construction, pressure drop is minimal in suction or wet return applications. In addition, normal gravity circulation is unrestricted on flooded evaporators. For gravity flooded evaporators, both valves should be installed with their flow arrows pointing towards the surge drum.

PRINCIPLES OF OPERATION

For closing of the CK-5 valve, high pressure gas from an external source is admitted through the pilot solenoid valve to the top of the piston. This gas pressure acts on the piston, forcing it down, compressing the opening spring, firmly seating the valve's seat bead. The valve will not close unless pressure above the piston exceeds the downstream pressure by at least 5 psi (0.35 bar). After the termination of the hot gas injection period, any style of suction stop valve must re-open in order for refrigeration to resume. For the CK-5 to open, the valve's pilot solenoid de-energizes, thereby interrupting the pilot stream flow of discharge gas to the top of the valves piston. The main valve will continue to remain closed, however, since residual pressure in the coil is transmitted through passage "N", through the pilot regulator to the top of the piston. **[Note: The pilot regulator should be adjusted to maintain a minimal set point, approximately 10 psi.]** Under a standard defrost sequence for most low

temperature evaporators, a "bleed down" or vent solenoid will energize to slowly equalize pressures between the coil and the suction line. It is imperative to incorporate a "bleed down" solenoid in a defrost group of control valves which includes a CK-5 (See Fig. 10 - 12). Without this gradual equalization period, which generally takes one to two minutes, the CK-5 will stay closed for a prolonged period of time as the coil pressure slowly equalizes in series through the pilot regulator, then through the piston bleed hole. The ability of the CK-5 to stay closed during an interruption of power, while an evaporator is in the process of defrosting, is its single greatest advantage. Where power failures can occur regularly, consideration should be given to this unique valve. By design, a standard CK-2, or a competitive valve with a similar design, would open immediately as residual coil pressure surges through the valve should the power to the pilot solenoid suddenly be interrupted during a defrost. The design of the CK-5 prevents this from occurring and prevents the dangerous consequences to the system under these conditions. In the event the CK-5 pilot solenoid de-energizes due to a power failure while the evaporator is in defrost, the defrost coil pressure (typically at or about 70 psig for ammonia) will continue to be transmitted through passage "N", through the pilot regulator and to the top of the piston. This pilot pressure acts as a "closing" force acting upon the larger effective area of the top of the piston, and will overcome the "opening" force of coil pressure working against the underside of the piston. The valve will therefore remain closed due to the greater closing force until the coil pressure is equalized through the piston bleed hole. The larger the evaporator, and the greater its internal volume, the longer this venting or equalization period will require. By utilizing a bleed down solenoid in the control group during the standard defrost sequence, the CK-5 will return to its open position immediately after the equalizing period which is controlled by the time clock.

ADJUSTMENT

The pilot regulator should be adjusted to maintain a minimum set point of about 10 psi. This represents approximately 1/2 turn clockwise of the adjusting stem starting with the stem turned completely out.

MANUAL LIFT STEM

If it is desired to hold open the CK-5 manually, remove #34 Sealing Cap and turn #27 Seat Lifting Stem inward as far as possible. The valve cannot close now until the #27 Seat Lift Stem is once again turned out.

INSTALLATION

Protect inside of valve from dirt and chips during installation. The CK-5 Suction Stop Valve may be installed on its side or vertically upright in either vertical or horizontal pipe lines. Figure 10 illustrates the installation of the 32mm through 100mm (1-1/4" through 4") port size valves with a S6B solenoid in a horizontal pipe line. Figure 11 illustrates the installation of the 75mm and

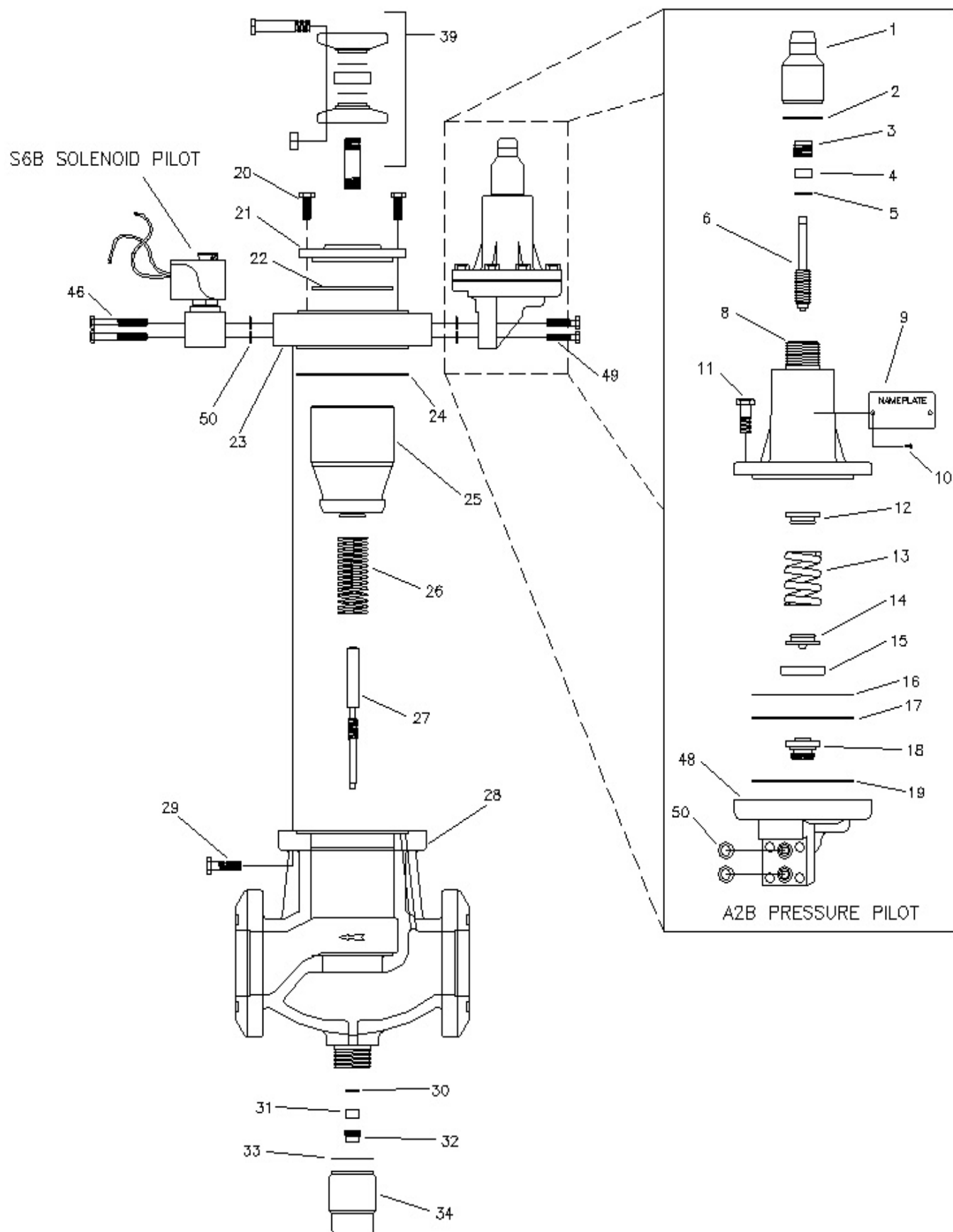


Fig. 3: CK-5 1-1/4" - 4" Port Size Assembly and Parts List

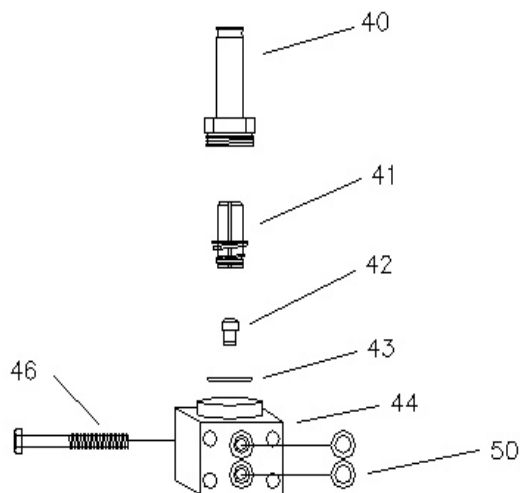


Fig. 4: S6B Solenoid Assembly and Parts List

S6B SOLENOID PILOT PARTS KITS (CK-5 1-1/4" - 4" VALVES ONLY)

ITEM	DESCRIPTION	QTY	KIT NO.
40-41	Plunger	1	
42	Seat, Pilot	1	
43	O-Ring	1	
41-42	Solenoid Repair Kit		204707
44	Body	1	
46	Bolt (1/4"-20)	4	
50	O-Ring	2	
46, 50	Bolt / O-Ring Kit		201574

100mm (3" and 4") port size CK-5 stop valves with a S6A solenoid in a vertical pipe line. Figure 12 illustrates the installation of the 125mm and 150mm (5" and 6") port size CK-5 stop valves in a horizontal pipe line. A bypass equalizing solenoid valve, a requirement with any size CK-5, 'is also shown. The remote discharge gas supply solenoid used with the larger 75mm through 150mm (3" through 6") valves, the R/S type S8F, is a gravity closing valve and must be mounted in a horizontal line with its manual opening stem in a vertical position as shown. Never install the valve with its pilot section directly beneath the main valve. The direct mounted pilot solenoid on the 32mm through 100mm (1-1/4" through 4") port size valves should be maintained above the center line on a horizontal pipe. When used on a suction or wet return line, the arrow on the valve should point in the direction of normal fluid flow. When used on either gas or liquid legs of a flooded evaporator, the arrow on the valve body should point from the evaporator to the surge drum.

ELECTRICAL

The pilot solenoid used on the 32mm through 100mm (1-1/4" through 4") port size CK-5 stop valves, type S6B, is unique to the Refrigerating Specialties line of control

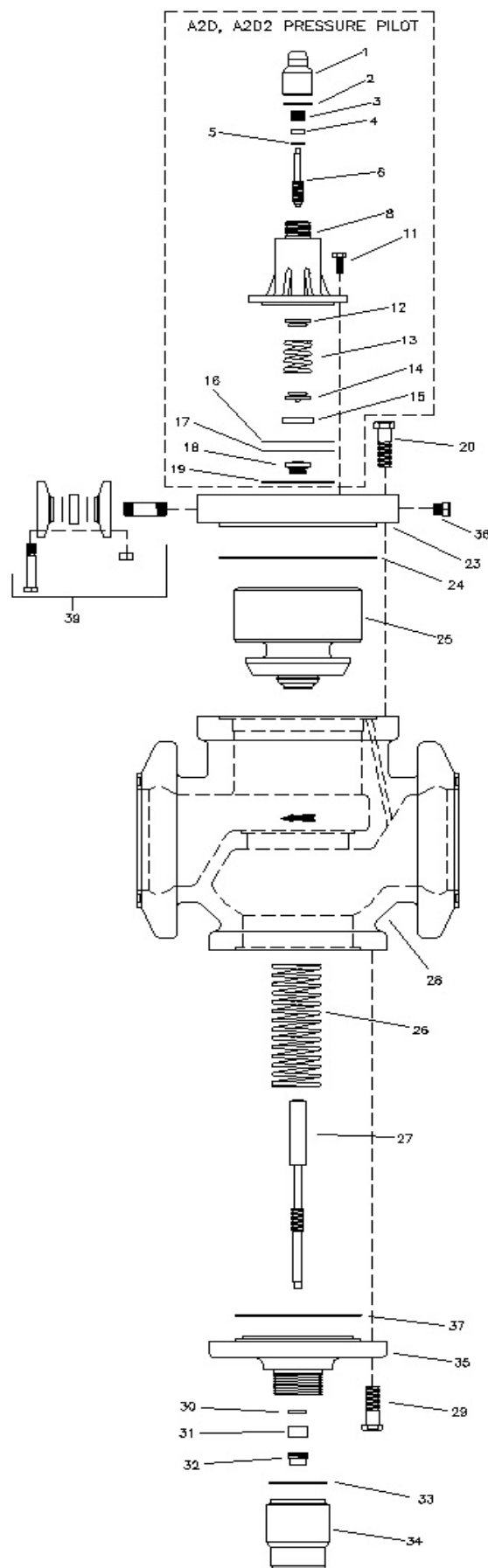


Fig. 5: CK-5 5" - 6" Port Size Assembly and Parts List

A2D2, A2D PRESSURE PILOT PARTS KITS

ITEM	DESCRIPTION	QTY	1-1/4"	1-5/8"	2"	2-1/2"	3"	4"	5"	6"
1	Cap	1								
2	Gasket	1								
1,2	Seal Cap Kit		202110	202110	202110	202110	202110	202110	202110	202110
3	Nut, Packing	1								
4	Packing, Stem	1								
5	Washer	1								
3-5	Spring / Stem Kit		202100	202100	202100	202100	202100	202100	202100	202100
6	Stem	1								
8	Bonnet	1								
9	Name Plate	1								
10	Bolt, Name Plate	1								
11	Screw	*								
12	Plate, Spring Lower	1								
13	Spring	1								
14	Plate, Spring Lower	1								
15	Follower, Diaphragm	1								
3-6, 12-15	Spring / Stem Kit		202006	202006	202006	202006	202006	202006	202006	202006
16	Gasket	1								
1-6, 8, 11-16			202008	202008	202008	202008	202008	202008	202008	202008
12-14, 16	Spring Kit, Bonnet		202481	202481	202481	202481	202481	202481	202481	202481
17	Diaphragm	1								
18	Seat	1								
19	Gasket	1								
16, 17, 19	Diaphragm Kit		200770	200770	200770	200770	200770	200770	200770	200770
16-19	Seal Kit, Pilot		202000	202000	202000	202001	202001	202001	202001	202001
48	Body	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
49	Screw, Pressure Pilot	*								
50	O-Ring	2								
49-50	Bolt / O-Ring Kit		201572	201572	201572	201572	201572	201572	N/A	N/A

A2D2, A2D SPARE OR ADDITIONAL PARTS KITS

ITEM	DESCRIPTION	QTY	KIT NO.
2	Gasket Pkg / Seal Cap	12	202408
50	O-Ring Pkg / Moduplate	12	202424
4	Stem Packing, Pkg.	25	202478

valves. In addition, the pilot light assembly used with the S6B, the R/S type PLT-5, is unique to the product line. Like the R/S type PLT-2, the PLT-5 is designed to meet NEMA 4 (watertight) requirement for outdoor use. However, unlike other pilot lights available from R/S (types PLT-1 and PLT-2), **the PLT-5 is wired directly to line voltage.** Please refer to R/S product bulletin 60-30 for additional information regarding the PLT-5 pilot light assembly.

The Refrigerating Specialties Division's molded, water resistant, Class "H" solenoid coil is designed for long life and powerful opening force. The standard coil housing meets NEMA 3R and 4 requirements. This sealed construction can withstand direct contact with moisture and ice. By definition, Class "H" coil construction will permit coil temperatures, as measured by resistance method, as high as 356°F (180°C). Final coil temperatures are a function of both liquid and ambient temperatures.

CK-5 GAS POWERED SUCTION STOP VALVE PARTS KIT

ITEM	DESCRIPTION	QTY	1-1/4"	1-5/8"	2"	2-1/2"	3"	4"	5"	6"
20	Screw, Adaptor	*								
21	Cover	1								
22	Gasket	1								
20-22	Cover Kit		204701	204701	204701	204701	204701	204701	N/A	N/A
23	Adapter	1								
24	Gasket	1								
23-24	Adapter Kit		204702	204703	204703	204704	204705	204706	204753	204754
25	Piston Plug	1								
24-25	Piston Plug Kit		204750	204749	204757	204756	204755	204760	204759	204758
26	Spring	1	301528	301490	301490	301494	301505	301500	301511	301534
27	Stem	1								
28	Bonnet	1								
29	Srew, Bottom Cover	*								
30	Washer	1								
31	Packing, Stem	1								
32	Nut, Packing	1								
27, 31, 32	Stem Kit		201514	201133	201133	201118	201216	201213	202363	202364
30-32	Packing Kit		202100	202100	202100	202100	202101	202101	202101	202101
33	Gasket	1								
34	Cap, Seal	1								
33, 34	Cap Kit		202110	202110	202110	202144	202111	202111	202111	202111
35	Cover	1								
37	Gasket	1								
35, 37	Bottom Cover		N/A	N/A	N/A	N/A	N/A	N/A	200724	200755
39	Disc Strainer Assembly						See Note Below			

Note: Item #39 is available in various connection sizes and styles; 3/8" FPT will be supplied unless otherwise specified. For a parts break down of the remote S8F pilot solenoid, please see R/S Bulletin 30-91.

The higher fluid temperatures require lower ambient temperatures so the maximum coil temperature is not exceeded. Conversely, low fluid temperatures permit higher ambient temperatures. A solenoid coil should never be energized except when mounted on its corresponding solenoid tube.

The solenoid coil must be connected to an electrical line with volts and Hertz the same as stamped on the coil. The supply circuits must be properly sized to give adequate voltage at the coil leads even when other electrical equipment is operating. The coil is designed to operate with line voltage from 85% to 110% of rated coil voltage. Operating with a coil voltage above or below these limits may result in coil burnout. Also, operating with a coil voltage below the limit will definitely result in lowering the valve's maximum opening pressure differential. Power consumption during normal operation will be 18.2 watts or less.

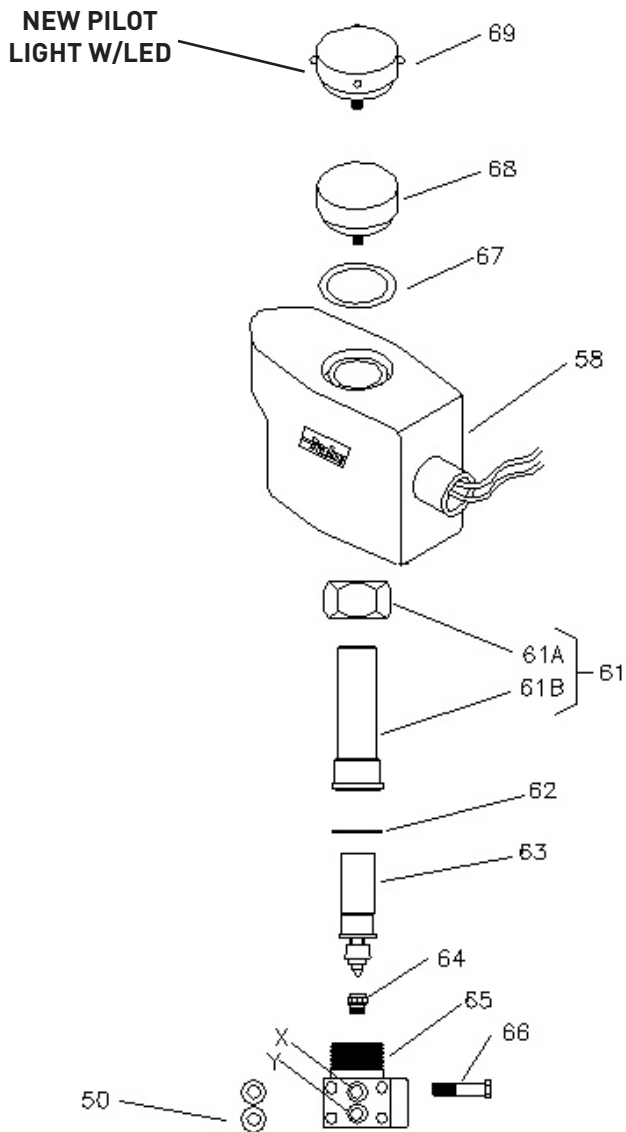


Fig. 6: S6A Solenoid Assembly and Parts List

ENCAPSULATED COIL (ITEMS 58, 67, & 68)

VOLTAGE (V)	FREQUENCY (Hz)	LEADED	*DIN
115	50	205206	205224
230	50	205207	205225
240	50	205208	205226
120	60	205209	205227
240	60	205210	205536
208	60	205211	N/A
24	60	205212	206018
24	50	205213	205635
48	50	205214	206755
24	DC	205215	205791
12	DC	206766	N/A
48	DC	N/A	205796

***DIN:** Quick Disconnect (Q.D.) / Quick Connect (Q.C.)

S6A SOLENOID PILOT PARTS KITS (CK-5 3" - 4" VALVES ONLY)

ITEM	DESCRIPTION	QTY	KIT NO.
58	Coil Assembly	1	C.F.
61A	Nut, Solenoid Tube	1	
61B	Solenoid Tube	1	
62	Gasket	1	
61A, 61B, 62	Tube Kit, Solenoid		201036
50	O-Ring	2	
66	Bolts (1/4" -20)	4	
50, 66	Bolts, O-Ring Kit		201574
62	Gasket	1	
63	Plunger / Needle Assembly	1	
62, 63	Plunger Kit, Needle Plunger Kit, Needle (DC only)		201019 201021
64	Seat Assembly	1	
62-64	Plunger Seat Kit		2501630
65	Body, S6A	1	
67	O-Ring / Gasket	1	
68	Knob	1	
67-68	Knob Kit		205237

S6A SPARE OR ADDITIONAL PARTS KITS

ITEM	DESCRIPTION	QTY	KIT NO.
50	O-Ring Package, Moduplate	12	202424
70	Bulb	6	205282
69, 67	Knob Kit (Green LED)	1	208543
	Knob Kit (Red LED)	1	208544

ENCAPSULATED COIL (ITEMS 58, 67, & 69) W/LED PILOT LIGHT

VOLTAGE (V)	FREQUENCY (Hz)	LEADED	*DIN	LED COLOR
115	50	N/A	208558	RED
230	50	208553	208559	
240	50	N/A	208560	
120	60	208550	208561	
208	60	208552	N/A	
240	60	208551	208562	
115	50	N/A	208563	GREEN
230	50	208557	208564	
240	50	N/A	208565	
120	60	208554	208566	
208	60	208556	N/A	
240	60	208555	208567	

**NEW PILOT
LIGHT W/LED**

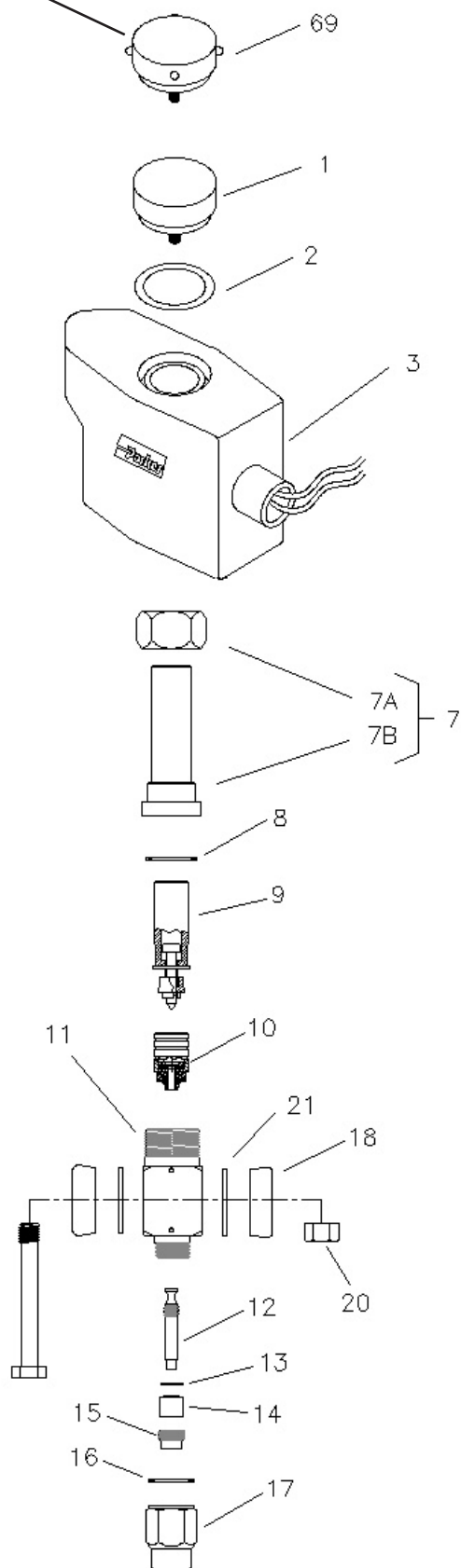


Fig. 7: S8F Solenoid Assembly and Parts List

**S8F SOLENOID PILOT PARTS KITS
(CK-5 5" - 6" VALVES ONLY)**

ITEM	DESCRIPTION	QTY	KIT NO.
1	Knob	1	
2	O-Ring / Gasket	1	
1,2	Knob Kit		205237
3	Coil Assembly	1	C.F.
7A	Nut, Solenoid Tube	1	
7B	Solenoid Tube	1	
8	Gasket	1	
7A-8	Tube Kit		201036
9	Plunger / Needle Assembly**	1	
10	Piston Plug Assembly	1	
8-10	Plunger Piston Kit **		202072
11	Body, S8F	1	
12	Stem, Manual Opening	1	
13	Washer	1	
14	Packing, Stem	1	
15	Nut, Packing	1	
12-15	Stem Kit, Opening		202238
16	O-Ring	1	
17	Seal Cap	1	
16-17	Cap Kit		202713
18	Flange Kit (Specify Flange Style & Connection Size) includes 2 Flanges Only. Sold Separately	1	FK-13. Also Specify Size and Style of Connection
19	Bolt	2	
20	Nut	2	
21	Gasket (H2 if Without Strainer, 3 if With Strainer)	H	
19-21	Bolt Kit (S8F Without Strainer)		201290
19-21	Bolt Kit (S8F With Strainer)		201287
8, 16, 21	Gasket Kit (Includes 2 Flange Gaskets)		201632
7-17, 21	Complete Valve Gosdy Assembly		100997

**Not for D.C. Consult factory for correct parts.

S8F SPARE OR ADDITIONAL PARTS KITS

ITEM	DESCRIPTION	QTY	KIT NO.
1, 69	Knob Kit (Green LED)	1	208543
	Knob Kit (Red LED)	1	208544

For intullation information for the S8F solenoid valvereferance bulletin 30-91. Bulletins are located on the Refrigerating Specialties Division Parker website (www.parker.com/rs/rsliterature.html).

CK-5 Dimensions(In Inches)								
Port Size	1-1/4"	1-5/8"	2"	2-1/2"	3"	4"	5"	6"
A	17.6	19.7	19.7	20.2	24.9	27	23.2	2.8
B	---	---	---	---	---	---	8.4	7.7
C	8	9.9	9.9	9.9	12.1	14.1	15	20.2
D	6.3	6.9	6.9	7.1	10.7	11.5	11.7	14.2
E	4.6	5.5	5.5	6.2	7	8.8	9	11.6
F	4.4	4.6	4.6	4.9	5.6	6.2	---	---
G	5.4	5.5	5.5	5.9	6.6	7.7	---	---
H	4.8	5.3	5.3	5.2	4.8	5.5	---	---

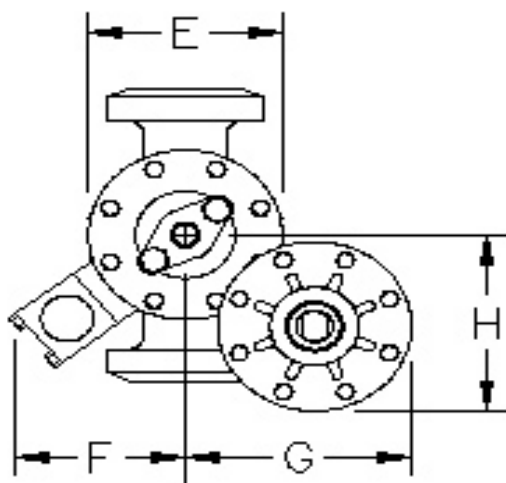
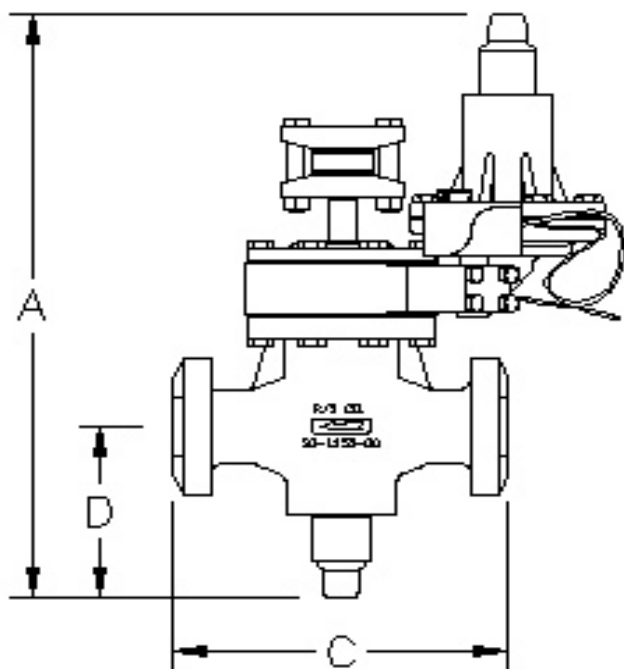


Fig. 8: CK-5 1-1/4" and 4" Port Size Dimensions

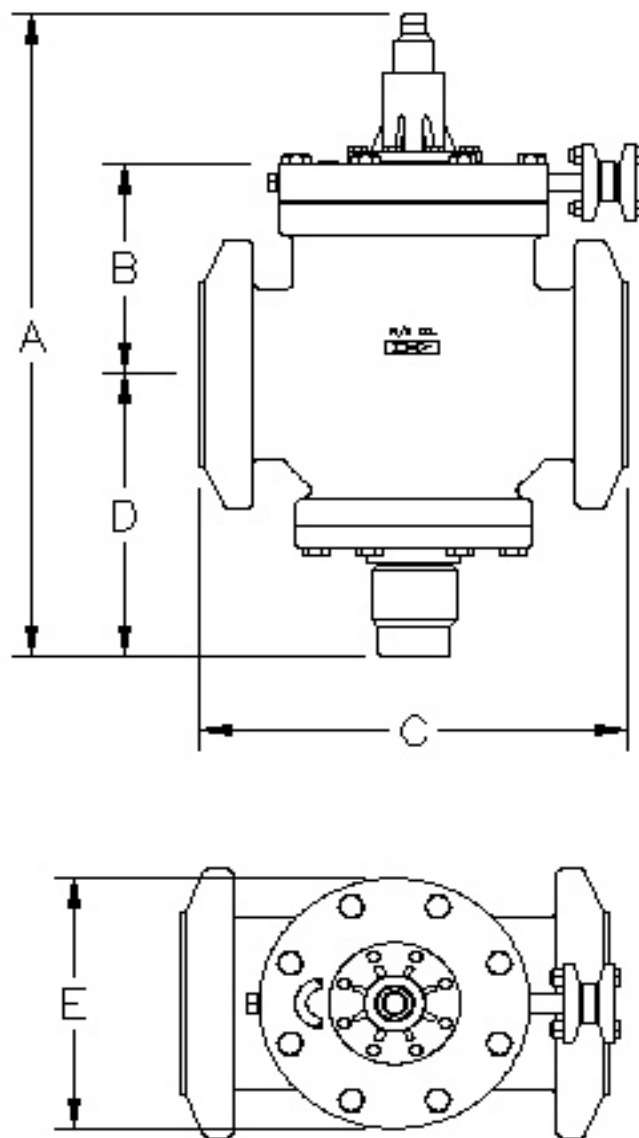


Fig 9: CK-5 5" and 6" Port Size Dimensions

Bolt Torque Table		
Item	Port Size	Torque(ft lbs)
7/16" Flange bolt	1/2"	28
5/8" Flange bolt	3/4"-2"	85
3/4" Flange bolt	2-1/2"-3"	105
7/8" Flange bolt	4"	150
5/16" Bonnet bolt	3/4"-4"	11
5/16" Adaptor bolt	3/4"-2"	11
5/8" Adaptor bolt	3"-4"	75
Bottom Cap	3/4"-1-1/4"	150
1/2" Bot. cap bolt	1-5/8" - 2-1/2"	50
5/8" Bot. Cap Bolt	3" - 4"	75

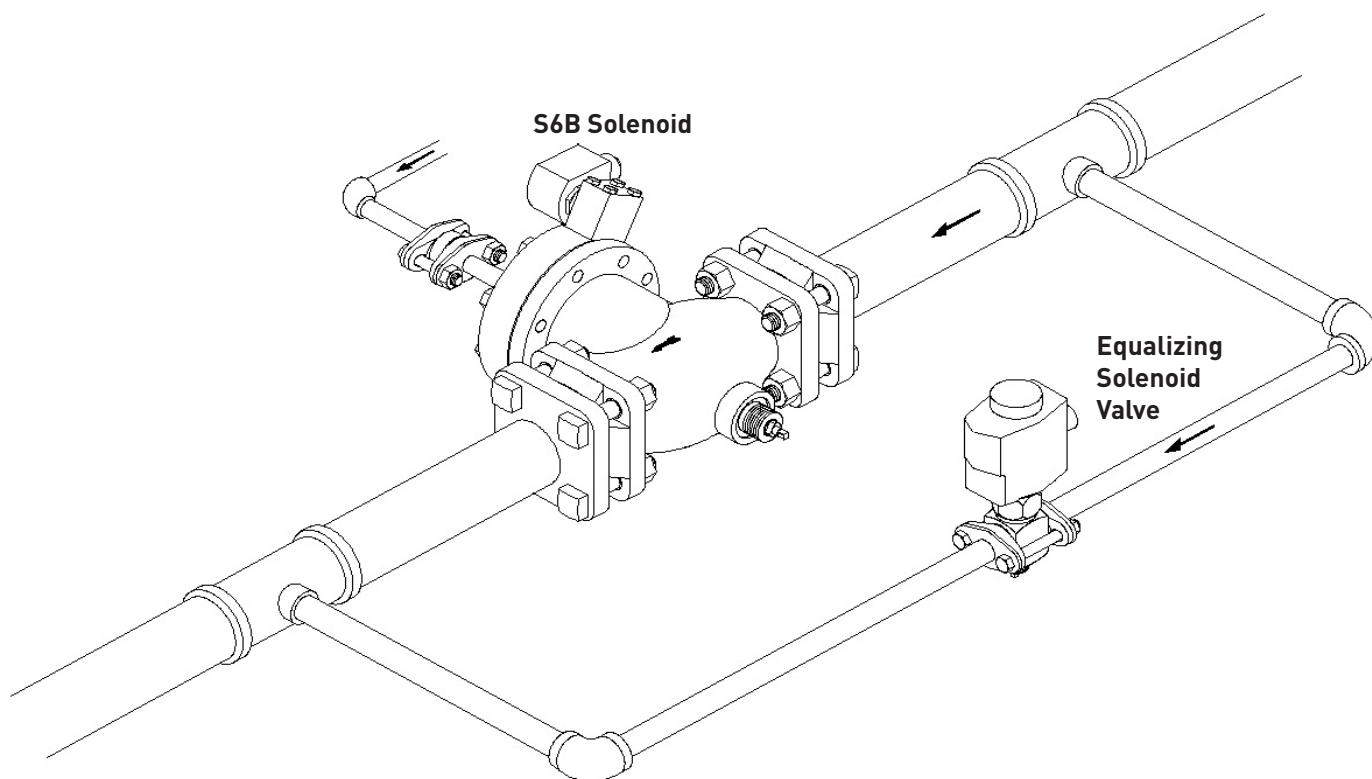


Fig 10: Installation Position (Horizontal) for a CK-5 1-1/4" to 4" Port Size with a S6B Solenoid

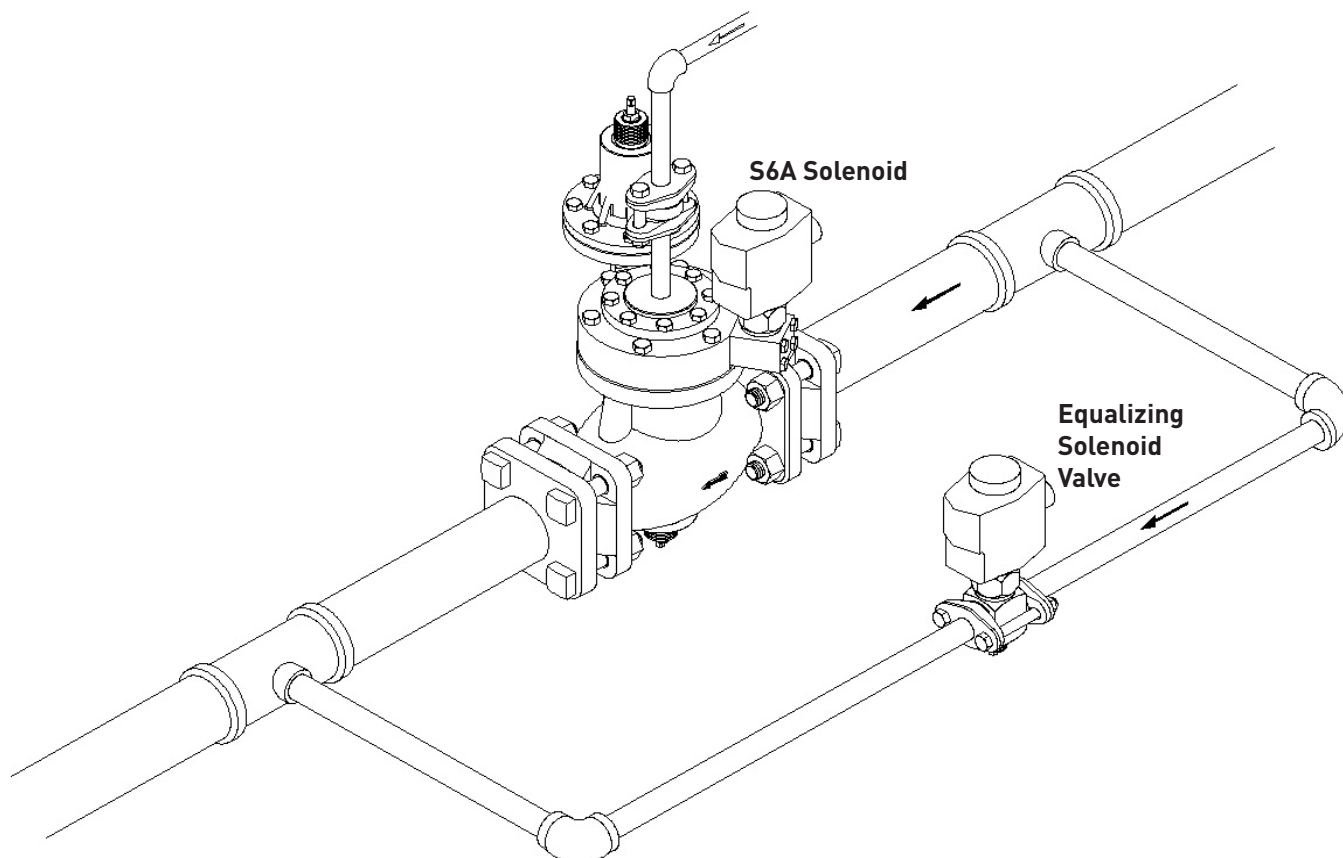


Fig 11: Installation Position (Vertical) for a CK-5 3" to 4" Port Size with a S6A Solenoid

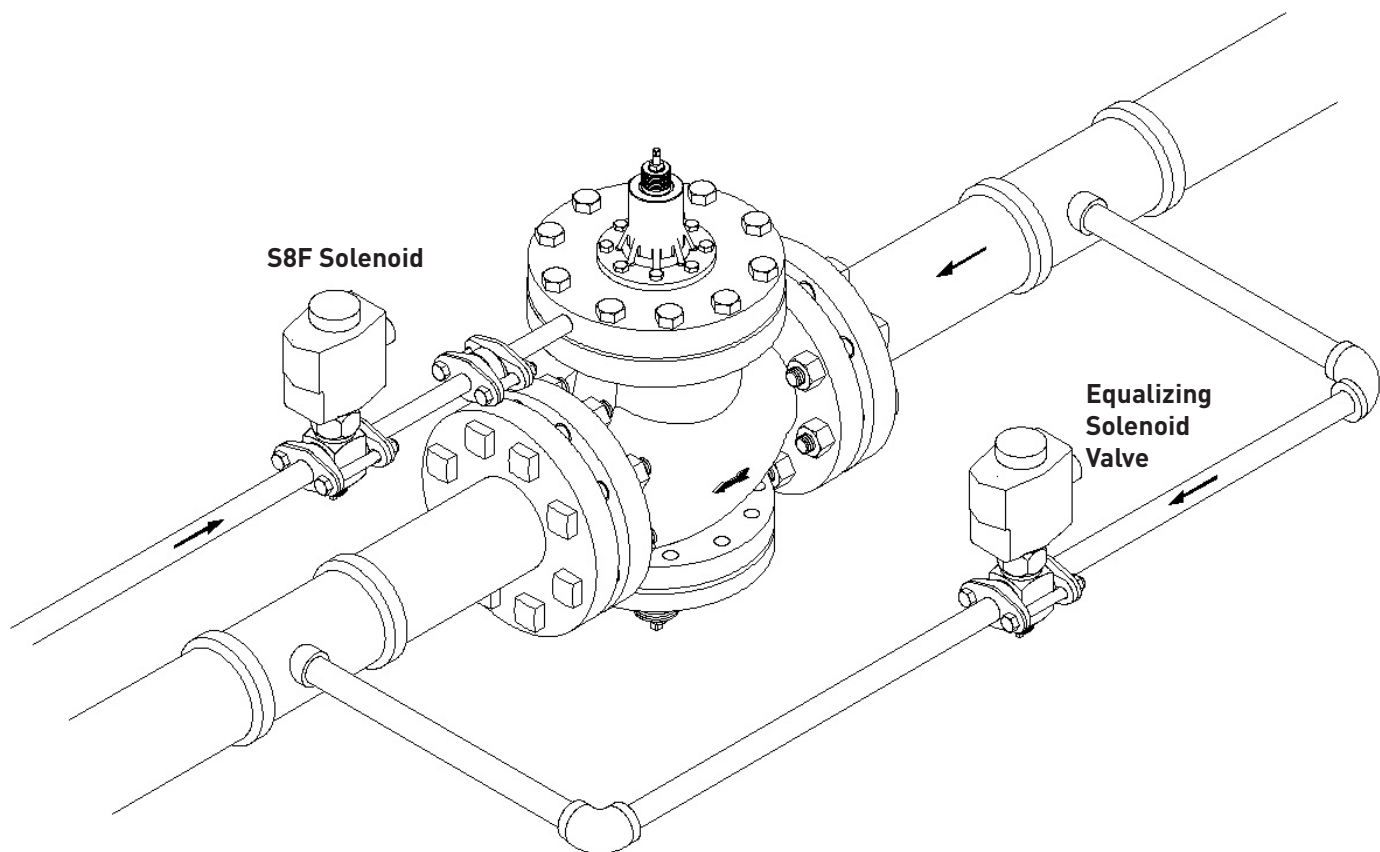


Fig 12: Installation Position (Vertical or Horizontal) for a CK-5 5" to 6" Port Size with a S8F Solenoid

Safe Operation (see also Bulletin RSBCV)

People doing any work on a refrigeration system must be qualified and completely familiar with the system and the Refrigerating Specialties Division valves involved, or all other precautions will be meaningless. This includes reading and understanding pertinent Refrigerating Specialties Division product Bulletins and Safety Bulletin RSBCV prior to installation or servicing work.

Where cold refrigerant liquid lines are used, it is necessary that certain precautions be taken to avoid damage which could result from liquid expansion. Temperature increase in a piping section full of solid liquid will cause high pressure due to the expanding liquid which can possibly rupture a gasket, pipe or valve. All hand valves isolating such sections should be marked, warning against accidental closing, and must not be closed until the liquid is removed. Check valves, or regulators with electric shutoff, nor should hand valves upstream of solenoid valves or downstream of check valves be closed until the liquid has been removed. It is advisable to properly install relief devices in any section where liquid expansion could take place.

Avoid all piping or control arrangements which might produce thermal or pressure shock.

For the protection of people and products, all refrigerant must be removed from the section to be worked on before a valve, strainer, or other device is opened or removed.

Flanges with ODS connections are not suitable for ammonia service.

Warranty

All Refrigerating Specialties Products are warranted against defect in workmanship and material for a period of one year from the date of shipments from the factory. This warranty is in force only when products are properly installed, field assembled, maintained and operated in use and service as specifically stated in Refrigerating Specialties Catalogs or Bulletins for normal refrigeration applications, unless otherwise approved in writing by Refrigerating Specialties Division. Defective products, or parts thereof, returned to the factory with transportation charges prepaid and found to be defective by factory inspection will be replaced or repaired at Refrigerating Specialties' option, free of charge, F.O.B. factory. Warranty does not cover products which have been altered or repaired in the field; damaged in transit, or have suffered accidents, misuse, or abuse. Products disabled by dirt, or other foreign substances will not be considered defective.

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