



SUPERFREEZE



SOLENOID VALVES
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SUPERFREEZE

SOLENOID VALVES

TYPE : SFA

REFRIGERANTS

Suitable for all common refrigerant including R-717 (Ammonia), R-12, R-22, R-134a, R-404a, R-502 etc.

INTRODUCTION

The primary purpose of an electrically operated solenoid valve is to control automatically the flow of fluids, liquids or gases. Solenoid valves may be applied on a wide variety of applications. This flanged, industrial refrigeration duty solenoid valve is very simple and compact but rugged in construction. These are direct acting or pilot operation solenoid valves for liquid suction and hot gas lines with ammonia or fluorinated refrigerant.

Ammonia Solenoid valve type SFA5 is direct operating type & type SFA 17, SFA 25, SFA 32, SFA 40, SFA 50 are higher capacity pilot operated solenoid valves for refrigeration controls & air conditioning applications.

Ammonia Solenoid Valves type SFA series are supplied complete or as separate components, i.e., valve body, coil and flanges can be ordered separately.

TECHNICAL SPECIFICATION

Body	: Semi-Steel / Nodular Iron
Solenoid Tube	: Stainless Steel
Plunger	: Stainless Steel
Stem	: Manual Opening
Coil	: Same for all Superfreeze SFA Series Solenoid Valves
Temperature of medium	: -40°C to +80°C with 18 Watt coil : Max. 130°C during defrosting.
Working Pressure	: 300 psig (21 bar)
Body Testing	: 450 psig (32 bar)

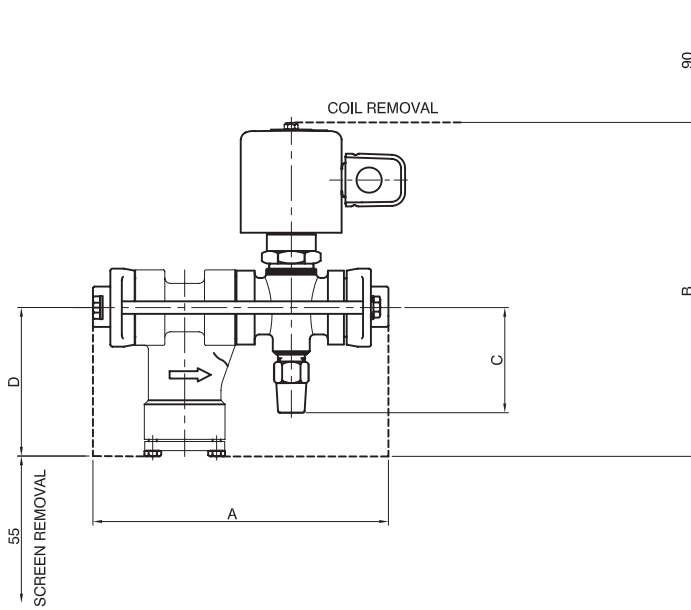
Counter flanges are included.



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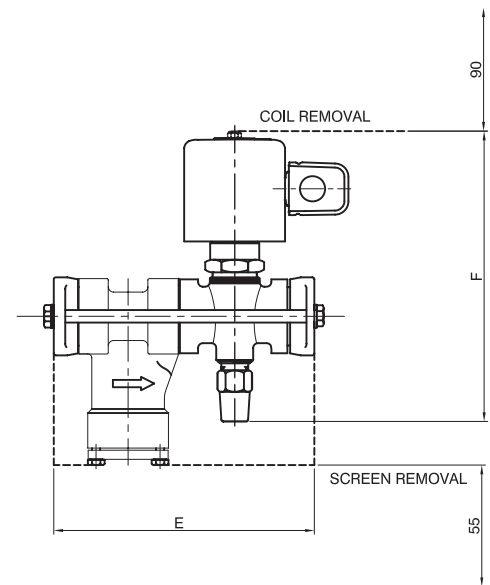
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DIMENSIONS



SOLENOID VALVE WITH STRAINER
(BUTT WELD)

Fig-1



SOLENOID VALVE WITH STRAINER
(SOCKET WELD)

Fig-2

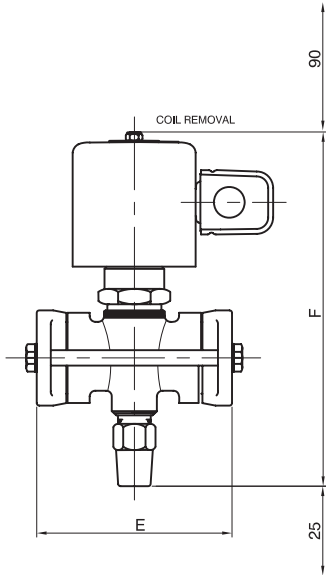
Dimension Details Solenoid Valve with Strainer (Butt and Socket weld) (Ref.fig. 1&2)

Type	Flanged End	A	B	C	D	E	F
SFA 5	1/2" 15	174	230	74	94	207	158
SFA 17	3/4" 20	240	237	89	108	128	214



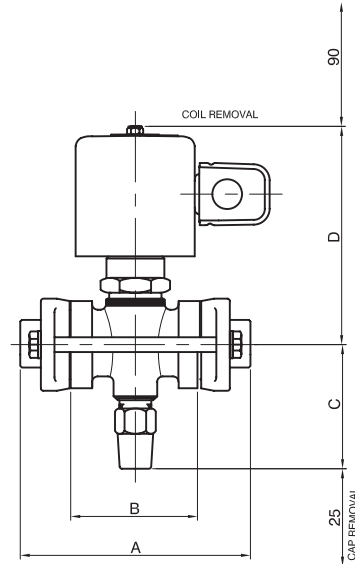
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SOLENOID VALVE (SOCKET WELD)

FIG.3



SOLENOID VALVE (BUTT WELD)

FIG.4

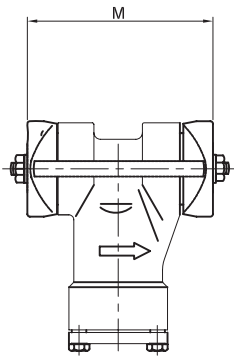
Dimension Details of Solenoid valve (Butt and Socket Weld) (Ref.fig.3&4)

Type	Flanged Connection		A	B	C	D	E	F
	Inches	MM						
SFA 5	1/2"	15	117	47	74	135	100	209
SFA 17	3/4"	20	165	85	89	137	138	226
SFA 25	1"	25	215	115	84	157	208	241
SFA 32	1 1/4"	32	215	115	84	157	216	241
SFA 40	1 1/2"	40	235	168	85	170	228	255
SFA 50	2"	50	270	187	99	181	253	280

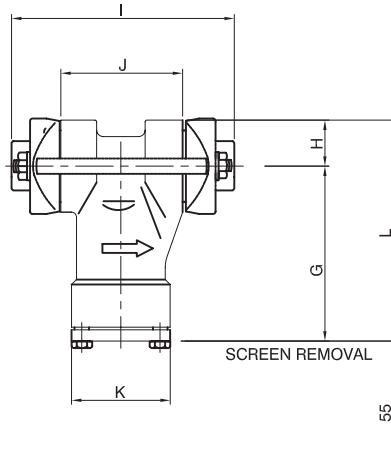


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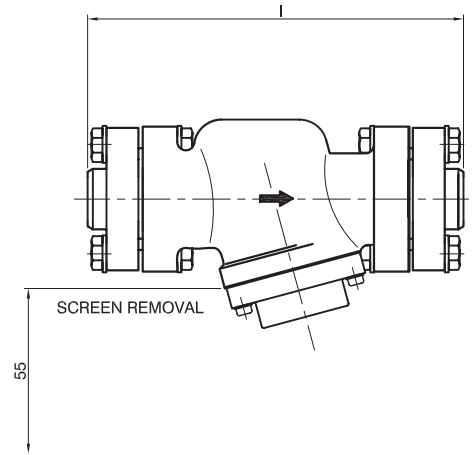
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STRAINER (SOCKET WELD)



STRAINER (BUTT WELD)
(STA 5 AND STA 17)



STRAINER (BUTT WELD)
(STA25,STA 32)

FIG.5

FIG.6

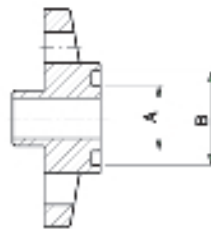
Dimension Details of Strainers (Butt and Socket Weld)(Ref. Fig. 5 &6)

Type	Flanged Connection		G	H	I	J	K	L	M
	Inches	MM							
STA 5	1/2"	15	94	22	131	60	52	116	115
STA 17	3/4"	20	108	28	158	78	60	136	135
STA 25	1"	25	91	44	214	154	80	135	210
STA 32	1 1/4"	32	91	44	214	154	80	135	215



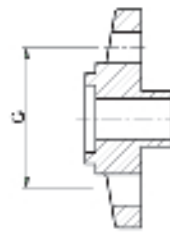
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SOLENOID VALVES



BUTT WELDED
FLANGES

FIG.7



SOCKET
WELDED

FIG.8

Dimension Details of Counter Flanges (Butt and Socket Weld) (Ref. Fig.7 &8))

For Solenoid valves Type	Flanged Connection		Bolt Size	A	B	C	D	E
	Inches	MM						
SFA 5	½"	15	1/2	32.4	44.1	76	22	10
SFA 17	¾"	20	1/2	34.7	45.0	76	28	13
SFA 25	1"	25	5/8	41.2	52.9	82.5	34.5	13
SFA 32	1.1/4"	32	5/8	48.3	58.6	86.3	43.5	13
SFA 40	1.1/2"	40	5/8	56.8	70.2	96.2	50	13
SFA 50	2"	50	5/8	63.4	83.3	112	62	16

Nominal.Liquid.Capacities

Type	FLANGED CONNECTIONS (Inches)	PORT SIZE Inches	MOPD SIZE Inches	NOMINAL LIQUID CAPACITIES Tones of Refrigeration					STANDARD COIL RATINGS	Watts
				AMMONIA						
	Sizes in bold delivered as std. unless otherwise specified.(Butt Weld)			Pressure Drop – psi						
				AC	1	2	3	4	5	Volt / Cycles
SFA 5	¼, 3/8 or ½	.140	250	8.0	11.3	13.7	16	17.8		
SFA 17	½, ¾ or 1	17/32	275	73	95	122	143	160	230/50	18
SFA 25	1	1	250	125	176	225	250	280	110/50	
SFA 32	1 ¼	1	250	125	176	225	250	280		
SFA 40	1 ½	1 5/16	300	275	390	500	550	625		
SFA 50	2	1 9/16	300	500	725	875	1000	1110		

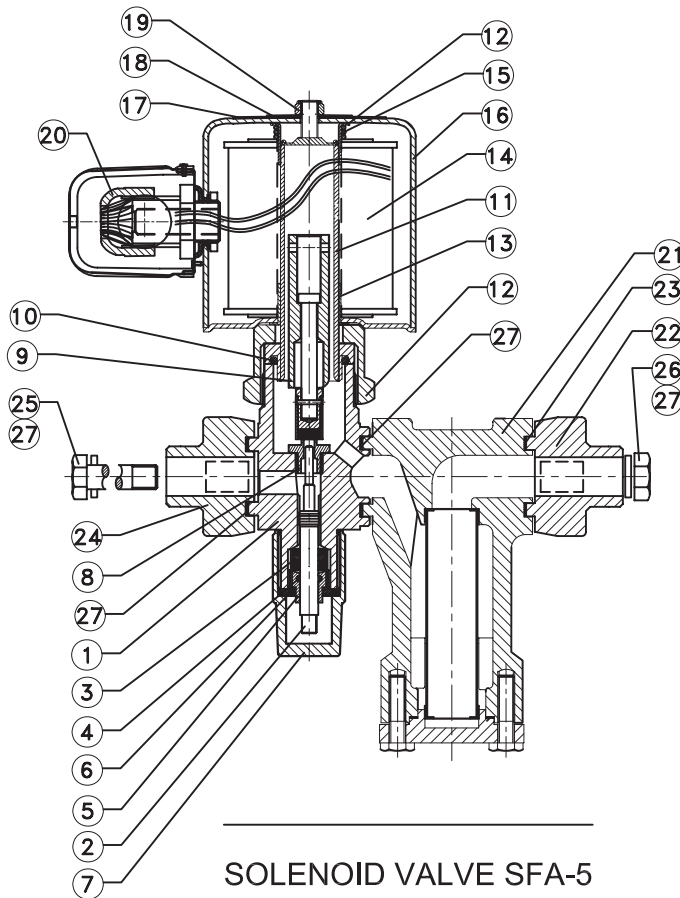


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SOLENOID VALVES

- Type SFA 40 and SFA 50 are available with special spring construction for suction line services.
- Solenoid valve type SFA5 and SFA17 are available with built in strainer for SFA 32 ,40&50 are separately available.

PART LIST

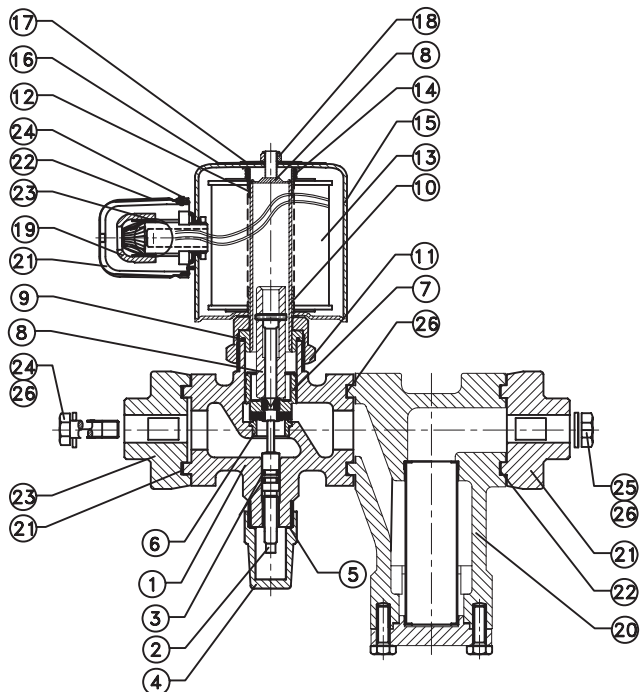


27	SPRING WASHER B12.2	SWB12S9	04
26	HEX NUT M12,Gr.8.8	HNM12S9	02
25	HEX BOLT M12 X 160,Gr8.8	HSM12L240S9	02
24	FLANGE-2	1000118C7	01
23	GASKET	10001112028R4	03
22	FLANGE-1	1000118C7	01
21	STRAINER ASSEMBLY	7103C8	01
20	COIL CONNECTOR	1000160R3	01
19	NYLOCK NUT M6	NNM6S9	01
18	NAME PLATE	1000159D26NF1	01
17	NAME PLATE	1000159D48NF1	01
16	COIL HOUSING	1000142S13	01
15	SPRING	1000119S12	01
14	COIL	1000145NF5	01
13	COIL SLEEV	1000151S13	02
12	BODY NUT	1000123S1	01
11	ENCLOSING TUBE ASSEMBLY	1000322S11	01
10	O-RING	10001082528R1	01
9	PLUNGER ASSEMBLY	1000149S1	01
8	SEAT	1000153S8	01
7	SEAL CAP	1000152S15	01
6	GASKET	1000111722R2	01
5	STEM NUT	1000123S1	01
4	O-RING	100010869R1	01
3	STEM PACKING	1000111611R1	05
2	STEM	1000103S8	01
1	BODY	1000101C8	01
ITEM NO.	DESCRIPTION	PART NO.	QTY.



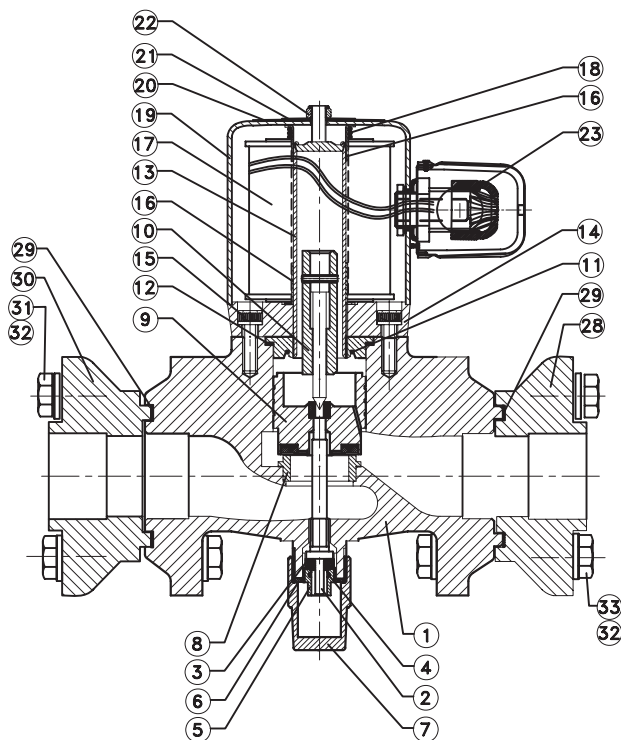
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SOLENOID VALVES



SOLENOID VALVE SFA-17

26			
25	SPRING WASHER B12.2	SWB12S9	04
24	HEX NUT M12, 8.8	HNM12S9	02
23	FLANGE-2 LT M12 X 240,Gr.8.8	HSM12L240S9	02
22	GASKET	10002113244R4	03
21	FLANGE-1	1000218C7	01
20	STRAINER ASSEMBLY	7102C8	01
19	COIL CONNECTOR	1000158R3	01
18	NYLOCK NUT M6	NNM6S9	01
17	NAME PLATE	1000159D26NF1	01
16	NAME PLATE	1000159D48NF1	01
15	COIL HOUSING	1000142S13	01
14	SPRING	1000119S12	01
13	COIL	1000145NF5	01
12	COIL SLEEV	1000151S13	02
11	BODY NUT	1000123S1	01
10	ENCLOSING TUBE ASSEMBLY	1000122S11	01
9	O-RING	10001082528R1	01
8	PLUNGER	1000249S1	01
7	PISTON	1000217S11	01
6	SEAT	1000253S8	01
5	GASKET	1000111722R2	01
4	SEAL CAP	1000152S15	01
3	O-RING	100010869R1	01
2	STEM	1000203S8	01
1	BODY	1000201C8	01
ITEM NO.	DESCRIPTION	PART NO.	QTY.



SOLENOID VALVE SFA-32

29	SPRING WASHER B16.2	SWB16S9	04
28	HEX NUT M16,8.8	HNM16S9	02
27	HEX BOLT M16 X 75,Gr.8.8	HSM16L75S9	02
26	FLANGE-2	1000418C7	01
25	GASKET	10004114658R4	02
24	FLANGE-1	1000418C7	01
23	COIL CONNECTOR	1000160R3	01
22	NYLOCK NUT M6	NNM6S9	01
21	NAME PLATE	1000159D26NF1	01
20	NAME PLATE	1000159D48NF1	01
19	COIL HOUSING	1000142S13	01
18	SPRING	1000119S12	01
17	COIL	1000145NF5	01
16	COIL SLEEV	1000151S13	02
15	HEX. SOCKET HEAD SCREW M6X20	ASM6L20S9	04
14	BONNET	1000423S15	01
13	ENCLOSING TUBE ASSEMBLY	1000422S11	01
12	GASKET	10004113844R2	01
11	O-RING	10001082528R1	01
10	PLUNGER ASSEMBLY	1000449S11	01
9	PISTON	1000417S1	01
8	SEAT	1000253S8	01
7	SEAL CAP	1000152S15	01
6	GASKET	1000111722R2	01
5	STEM NUT	1000123S1	01
4	O-RING	100010869R1	01
3	STEM PACKING	100011611R1	05
2	STEM	1000403S8	01
1	BODY	1000401C8	01
ITEM NO.	DESCRIPTION	PART NO.	QTY.



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SOLENOID VALVES

INSTALLATION

Protect the interior of Valve from dirt and moisture during storage and installation. Mount the valves only in horizontal pipe line with solenoid coil at the top. This valve will work properly only in this position. It is advisable to install a strainer upstream of each valve to prevent entrance of foreign material into the valve and the rest of the system. Use Superfreeze close coupled inlet strainer ahead of solenoid valve to keep any foreign matter entering into the valves.

Valve should be installed so that arrow on the valve body is in direction of normal refrigerant flow. If the valve is backwards the flow will not be stopped when the valve is electrically de energized. Like all solenoid valves the these valves can stop only in direction from normal inlet to normal outlet (as shown by the arrow in the body). In case of this type of pressure reversal (as encountered during hot gas defrost with liquid recirculation systems) a check valve must be installed in series with the solenoid valve which will prevent flow reversal. Pipe sizing, rating, anchoring and similar precaution should be taken to ensure liquor hammer will not occur when valve open or closed. For proper flange gasket sealing care must be taken when welding to assure flanges are parallel to each other and perpendicular to pipe. The gasket should be lightly oiled and all bolts tightened evenly.

The manual opening stem on these valve is the purpose of opening the valve with our energizing the solenoid coils. For access to stem the seal cap of the bottom of the valve must be removed. This must be done with caution as refrigerant may have been trapped inside the seal cap.

ELECTRICAL

Standard coil voltages is 220V $\pm 10\%$, 50/60Hz other voltages available on request. Coils draw 18 Watts. Name plate coil voltages should be checked before wiring. The supply circuit must be properly sized to give adequate voltage at the coil leads even when other electrical equipment is operation. All coils are have standard zinc plated steel housing which meets flash proof requirements.. Coil should only be energized while on solenoid tube; otherwise immediate coil burnout may occur. To avoid bending these solenoid tube, remove coil from valves before connecting conduit fitting.

SERVICE AND MAINTENANCE

Failure to open:

1. Coil is of incorrectly high voltage- Check coil voltage printed on the coil / name plate.
2. Low line voltage- Check line voltage at coil leads with volt meter.
3. Failure to electrically energies check controlling switch or controlling circuit (controlling switch or thermostat not contacting)
4. Inlet outlet pressure differential too high.- The MOPD across the valves should be 275
5. Coil is burned out – Replace with proper coil
6. Plunger / needle assembly is jammed due to dirt or sludge- Disassemble the valve. Before opening the valve for service be sure it is isolated from the system and all refrigerant is removed. Disconnect power source to solenoid coil. Remove every trace of dirt from the inside of the valves. Thoroughly clean all parts and re assemble using of light film of refrigeration oil on the piston/plunger.(Use Superfreeze close coupled inlet strainer ahead of solenoid valve to keep any foreign matter entering into the valves.)



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Failure to close :

- a) Controlling switch or thermostat are not opening contacts- Check wiring and controls
- b) Manual opening stem is turned in permitting flow through the valve.
- c) Dirt under the seat preventing proper sitting – Disassemble and clean valves as mentioned in point 6 above.
- d) Seat parts eroded, worn or damaged and therefore leaking – Disassemble, clean, and replace parts using proper replacement kit.
- e) Noise in Solenoid Valve – A partially open Solenoid Valve is apt to develop a mechanical chatter which may be amplified to an objectionable level by the system piping. This type of noise can be caused by low voltage, excessive pressure differential of foreign material, causing the valve to “hang” in a partially open position. The noise can usually be eliminated by removing the cause of the sticking. A Solenoid Valve with a loose or miss-assembled coil and housing can exhibit an electrical hum. This type of noise is corrected by either tightening the coil housing nut securely, or by reassembling the valve parts in their proper order. Rarely, this may be caused by loose coil sleeves, in which cases deforming slightly will eliminate the hum.
- f) Plunger / needle assembly is jammed due to dirt or sludge- Disassemble and clean valve as mentioned in point No. 6 above.(Use Superfreeze close coupled inlet strainer ahead of solenoid valve to keep any foreign matter entering into the valves.)

SAFE OPERATION

Superfreeze valves are only for refrigeration system. People doing any work on refrigeration system must be qualified and completely familiar with the system. All instructions should be completely understood and followed while using the valves. Stated temperature and pressure limit should not be exceeded. Solenoid tubes should not be removed from the valves unless system has been evacuated to zero pressure. 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.

Check valves must never be installed upstream of Solenoid Valves or regulators with electric shutoff, nor should hand valves upstream of solenoid valves or down stream 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.