

## HANSEN TECHNOLOGIES CORPORATION



2" HS4A Solenoid Valve

### INTRODUCTION

These advanced design, strong bodied, precision-manufactured solenoid valves control the on-off flow of refrigerant. They are superior in their ability to overcome dirt and sticky oil during opening and closing, and operate smoothly even in an oil-free "dry" system. When electrically energized, the upstream pressure is ported through the pilot solenoid to the top of the piston to push it downward and open the main valve seat wide; when de-energized, pressure is no longer ported to the top of the piston and a spring closes the main valve seat to stop flow in the arrow direction on the valve body.

### APPLICATIONS

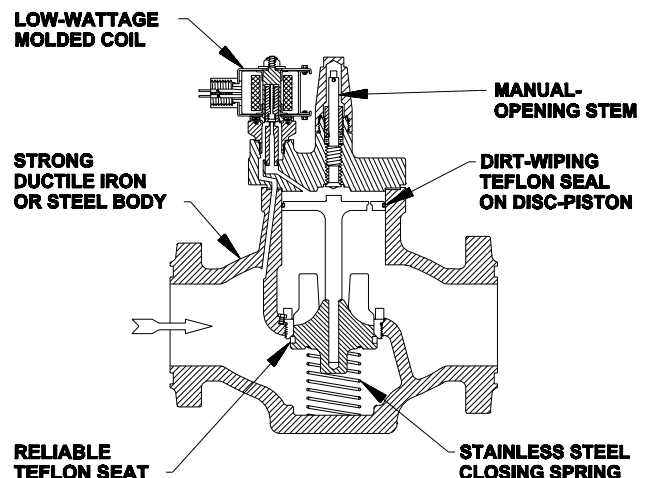
These reliable, flanged bodied valves are ideal for use as standard, stock refrigerant solenoid valves. While primarily for ammonia, these valves are also suitable for R22, R134a, and other approved refrigerants and warm refrigeration oil. Most common use is to automatically stop liquid feed to recirculating liquid overfeed evaporators, and as liquid makeup solenoid valve for pump recirculators. They are also suitable for hot gas defrost supply and evaporator suction stop applications. (Note: For gravity liquid drain or equalization applications, use low pressure drop Hansen Type HCK2 gas-powered suction stop valves or Type HS9B gas-powered solenoid valves.)

### Specifications, Applications, Service Instructions & Parts

#### HS4A SOLENOID VALVES 3/4" thru 6" PORT (20 thru 150 mm)

Flanged 3/4" thru 4"  
Weld End 5" & 6"  
for refrigerants

### KEY FEATURES



### ADDITIONAL FEATURES

- Tolerant of Dry Systems
- Teflon Main & Pilot Seats
- Molded Hansen Standard Coil
- Heavy Duty, Pilot Operation
- 300 psi MOPD (20.7 bar)
- Simple Serviceable Design
- Available Close-Coupled Strainer
- Available Close-Coupled Check Valve
- For Ammonia, R22, R134a, and Other Approved Refrigerants
- Non-Asbestos Gaskets
- Dimensionally Replaces Parker R/S S4A & S5A
- CSA Certification Available

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## MATERIAL SPECIFICATIONS

### Body:

¾"- 4": Ductile iron, ASTM A536

5" & 6": Cast steel, ASTM A352 LCB

### Adapter:

Ductile iron, ASTM A536

Piston: Steel, disc type, spring energized teflon seal

### V-Port/Seat:

¾" thru 1¼": Steel, plated, with teflon seat

1½" thru 6": Ductile iron with teflon seat

### Main Seat:

¾" thru 1¼": Integral ductile iron

1½" thru 6": Stainless steel, removable

Gaskets: Non-asbestos, graphite composite

Manual Opening Stem: Steel, plated

Solenoid Tube: Stainless steel

Solenoid Plunger: Stainless steel

Pilot Orifice: Stainless steel

Flanges: Forged steel, ASTM A105

Max. Opening Pressure (MOPD): 300 psi

Safe Working Pressure: 400 psig (27 bar)

Operating Temperature: -60°F to +240°F (-50°C to +115°C); (Lower temperatures possible at pressure down-ratings)

## ADVANTAGES

These valves combine modern design and new age materials with advanced manufacturing techniques and intense quality control to offer a significantly superior and reliable product. Their ductile iron bodies are stronger and more rugged than common cast iron, including so-called semi-steel (class B iron) valves. They are more dirt resistant than full skirted piston designed valves and use a single, standard, power saving, low wattage coil that can be used on all valve sizes. All valves incorporate reliable teflon seating and stainless steel spring closing. Non-asbestos gaskets are standard. Main seats are stainless steel on 1½" and larger valves. All valves use a spring activated, teflon, dirt-wiping piston seal. Manual opening stems are located on top of valves, up and away from dirt and rust particles to extend stem seal life. This also facilitates easier insulating of valves. Each valve is individually packaged or sealed for valve interior cleanliness and ease of storage until ready for use. All valve boxes are clearly marked with catalog numbers and description. These valves are length dimensionally interchangeable with Parker R/S type S4A & S5A solenoid valves (R/S 1¼"= Hansen 1¼" 4-bolt).

## INSTALLATION

Protect the interior of valve from dirt and moisture during storage and installation. Valve should be installed so that the arrow on the valve body is in direction of normal refrigerant flow. Valve will not prevent reverse flow; use check valves where necessary. System should be free from dirt, weld slag and rust particles. A 60 mesh, close-coupled strainer is available for installation at inlet of valve; no small internal screens are used. Pipe sizing, rating, anchoring, and similar prudent precautions should be taken to ensure "liquid hammer" will not occur when valves open or close. For proper flange gasket sealing, care must be taken when threading or welding to assure flanges are parallel to each other and perpendicular to pipe. Also, gaskets should be lightly oiled and all bolts must be tightened evenly.

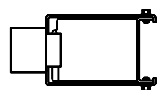
Valves in 5" and 6" size are Type HS4W with integral butt weld end only. These steel bodied solenoid valves are directly welded into the pipe line. During welding, the manual opening stem should be opened downward several turns to protect the teflon seat from weld heat.

Welds should be annealed as necessary in accordance with good practice. Supplementary painting of valves and welds is recommended for complete corrosion protection. Pipe covering, where applied, should have proper moisture barrier. Before putting valves into service, all pipe connections, valve seats and seals should be tested for leaks at pressure levels called for in appropriate codes.

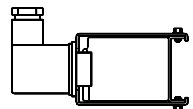
## ELECTRICAL

Standard coil voltages are 115V, 208/230V, or 24V; 50/60 Hz. Other voltages available, contact factory. Coils draw 16 watts and will operate properly between 85% and 110% of rated voltage (24V coils draw 19 watts). All coils have a standard zinc plated, steel housing which meets NEMA 4 (splashproof) requirements; junction box coil is considered NEMA 1. Nameplate coil voltages should be checked before wiring. Coil should only be energized while on solenoid tube; otherwise immediate coil burnout may occur. To avoid bending the solenoid tube, remove coil from valve before connecting conduit fitting. Unless otherwise specified, standard coil with ½" fitting for conduit will be supplied with valves. Coils below interchange with Danfoss.

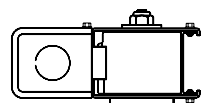
**Watertight Solenoid Coil with 18"** (450 mm) long wire pigtail leads and steel frame housing with ½" fitting for conduit is **standard**.



**DIN Plug Coil** is optional for grounded cord connection; includes necessary DIN plug socket with gasket.



**Coil with Junction Box**, optional. These coils have integral, steel junction box for connection of the 18" (450 mm) long wire pigtail leads.



## LIQUID CAPACITIES (TONS)

PORT SIZE (mm)	R717		R22	
	PRESSURE DROP (ΔP)		PRESSURE DROP (ΔP)	
	2 PSI	4 PSI	2 PSI	4 PSI
3/4" (20)	164	232	28	40
1" (25)	300	425	52	74
1 1/4" (32)	421	595	73	103
1 1/2" (40)	899	1271	155	220
2" (50)	1207	1706	209	295
2 1/2" (65)	1977	2796	342	484
3" (80)	2670	3776	462	653
4" (100)	4262	6027	737	1043

R717 capacities based on 20°F (−6.7°C) liquid temperature and 5°F (−15°C) evaporator temperature and no flashing through valve. For overfeed systems, multiply evaporator tons by recirculating rate and size valve to the tons result. To convert to 86°F (30°C) liquid, multiply values in table by 0.9. R22 capacities based on 86°F (30°C) condensing temperature and 5°F (−15°C) evaporator temperature and no flashing through valve. To convert liquid capacities from R22 to R134a, multiply table tons by 0.92 (accuracy within 8%).

## SUCTION VAPOR CAPACITIES (TONS)

(1 Ton= 12,000 Btu/hr= 3.517 kW= 3024 kcal/hr)

PORT SIZE (mm)	Cv (Kv)	PRESSURE DROP ACROSS VALVE	R717				R22			
			EVAPORATING TEMPERATURE				EVAPORATING TEMPERATURE			
			-20F† (-28°C)	0F (-17.8°C)	+20F (-6.7°C)	+40F (4.4°C)	-20F† (-28.9°C)	0F (-17.8°C)	+20F (-6.7°C)	+40F (4.4°C)
3/4" (20)	6.4 (5.5)	2 PSI	6.4	7.4	9.5	12	2.8	2.8	3.6	4.4
		5 PSI	9.7	8.7	15	19	4.3	4.4	5.5	6.9
1" (25)	11.7 (10)	2 PSI	12	13	17	22	5.2	5.2	6.5	8.0
		5 PSI	18	16	27	34	7.9	8.0	10	13
1 1/4" (32)	16.4 (14)	2 PSI	16	19	24	31	7.2	7.2	9.1	11.3
		5 PSI	25	22	38	48	11	11	14	18
1 1/2" (40)	35 (30)	2 PSI	35	40	52	65	15	15	19	24
		5 PSI	53	48	81	102	24	24	30	38
2" (50)	47 (40)	2 PSI	47	54	70	87	21	21	26	32
		5 PSI	71	64	108	137	32	32	41	51
2 1/2" (65)	77 (66)	2 PSI	77	89	114	143	34	34	43	53
		5 PSI	116	105	177	224	52	53	67	83
3" (80)	104 (89)	2 PSI	104	120	154	193	46	46	58	71
		5 PSI	157	141	239	303	70	71	90	112
4" (100)	166 (142)	2 PSI	166	191	246	309	73	73	92	114
		5 PSI	251	226	382	483	112	114	144	179
5" (125)	242 (207)	2 PSI	242	278	358	450	107	107	135	166
		5 PSI	365	329	557	704	163	166	210	261
6" (150)	413 (354)	2 PSI	412	475	611	768	182	183	230	283
		5 PSI	624	562	950	1202	278	282	358	446

2 psi = 0.14 bar

5 psi = 0.35 bar

Kv = valve capacity factor m<sup>3</sup>/hr of water at 1 bar differential.

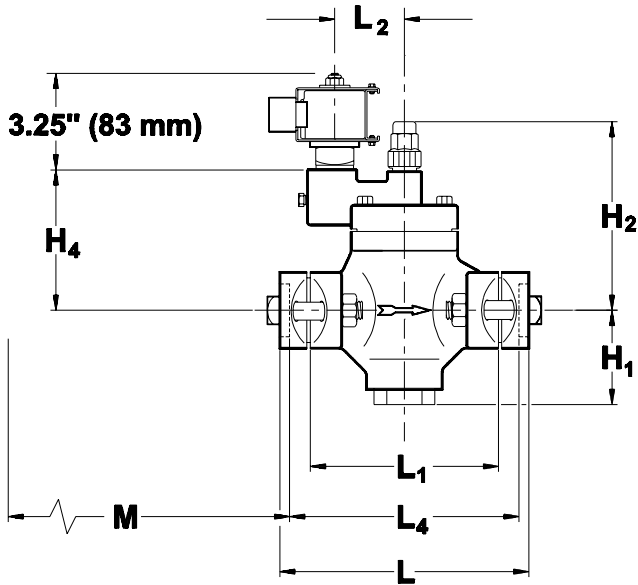
†−20°F (−28°C) capacities are based on a two stage system. For suction closure at temperatures below 0°F (−18°C) alternate low pressure drop valves are preferably used such as Hansen Gas-Powered Suction Stop Valve Type HCK2 or Gas-Powered Solenoid Valve Type HS9B.

**Conditions:** Capacities based on evaporator temperatures shown and 86°F (30°C) liquid. R717: For each 10°F (5.6°C) lower liquid temperature increase above table capacity by 3%. R22: For each 10°F (5.6°C) lower liquid temperature increase above table capacity by 5%. To convert for R134a, multiply R22 table values by 0.73 (accuracy within 8%).

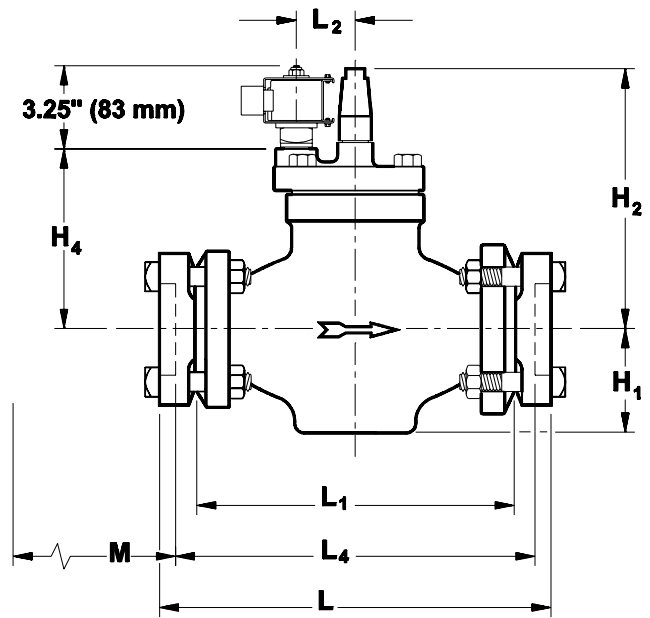
For liquid overfeed evaporator suction between normal 2:1 to 5:1 rate, add 20% to the evaporator load or use the next larger port size to accommodate liquid volume accompanying the suction gas and to reduce impact velocities.

## INSTALLATION DIMENSIONS

**3/4" THRU 1 1/4" (20 THRU 32 mm)**



**1 1/2" THRU 4" (40 THRU 100 mm)**



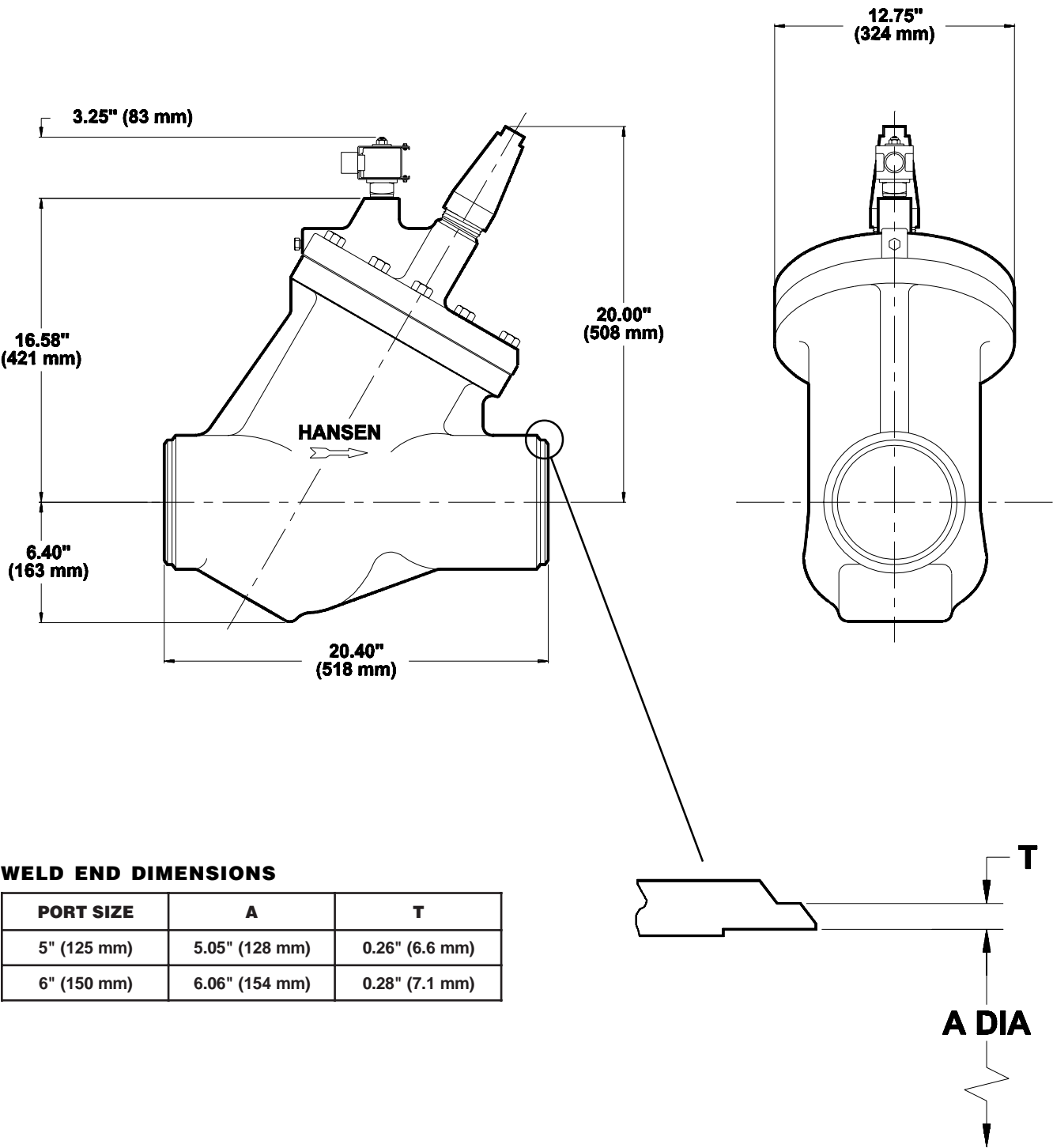
**M = Additional length for close-coupled strainer.**

PORT SIZE (mm)	H <sub>1</sub>	H <sub>2</sub>	H <sub>4</sub>	L		L <sub>1</sub>	L <sub>2</sub>	L <sub>4</sub>	M	W*
				FPT,SW	WN,ODS					
3/4", 1", 1 1/4" † (20, 25, 32)	3.09" (78)	6.77" (172)	4.63" (117)	8.20" (208)	8.94" (227)	6.19" (157)	2.38" (60)	7.20" (183)	3.70" (94)	4.50" (114)
1 1/2", 2" (40, 50)	2.87" (73)	8.84" (225)	5.72" (145)	12.39" (315)	13.39" (340)	9.88" (251)	2.35" (60)	10.89" (277)	9.83" (250)	4.50" (114)
2 1/2" (65)	3.62" (92)	9.69" (246)	6.53" (166)	13.01" (330)	14.03" (356)	9.88" (251)	2.35" (60)	11.01" (280)	9.83" (250)	5.62" (143)
3" (80)	4.06" (103)	10.00" (254)	6.88" (175)	15.38" (391)	16.40" (417)	12.25" (311)	2.35" (60)	13.38" (340)	12.20" (310)	6.50" (165)
4" (100)	4.69" (119)	10.56" (268)	7.46" (189)	17.01" (432)	20.51" (521)	14.12" (359)	2.56" (65)	15.01" (381)	14.07" (357)	8.06" (205)

\*Maximum width of valve.

†Alternate special 1 1/4" 4-bolt version is available with face-to-face (L<sub>1</sub>) same dimension as R/S 1 1/4" for replacements.

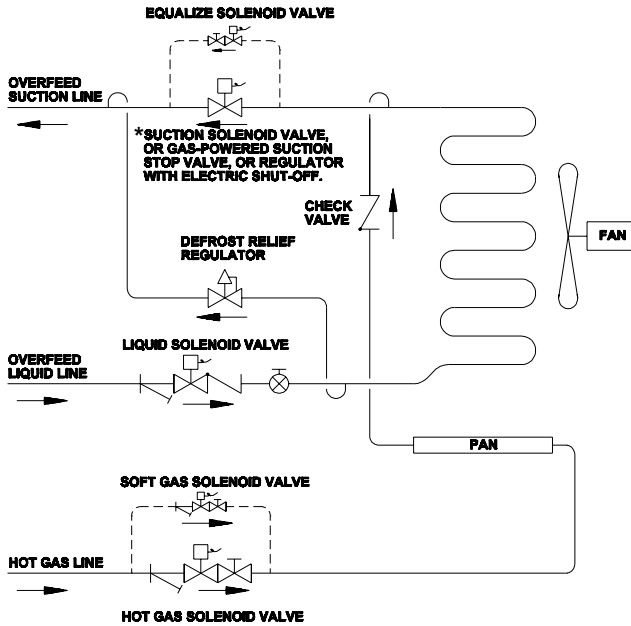
**INSTALLATION DIMENSIONS 5" AND 6" (125 and 150 mm)**



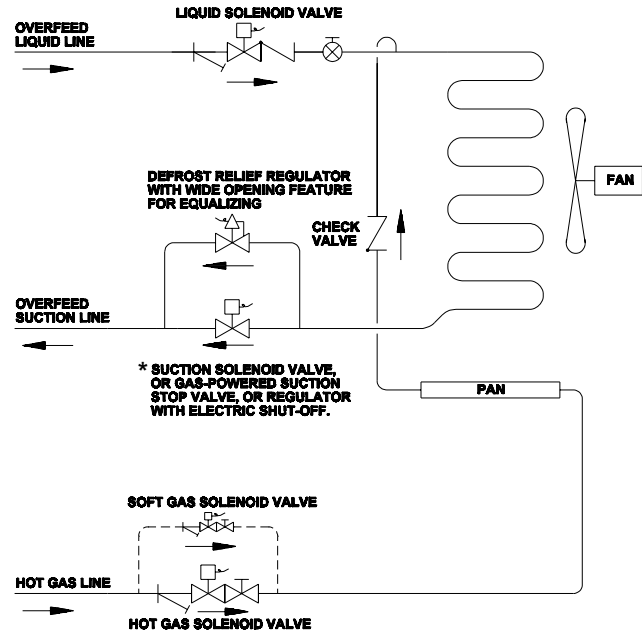
## TYPICAL APPLICATIONS FOR HOT GAS DEFROST

These are only examples of possible control valve schemes. As always, they are provided only to assist system designer in applying and selecting valves and controls. Ultimately, designer is responsible for safe and satisfactory operation of any defrost system.

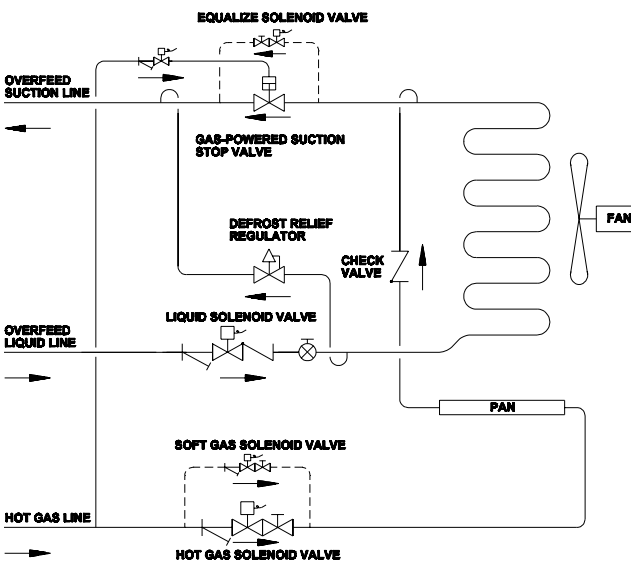
### BOTTOM FEED EVAPORATOR



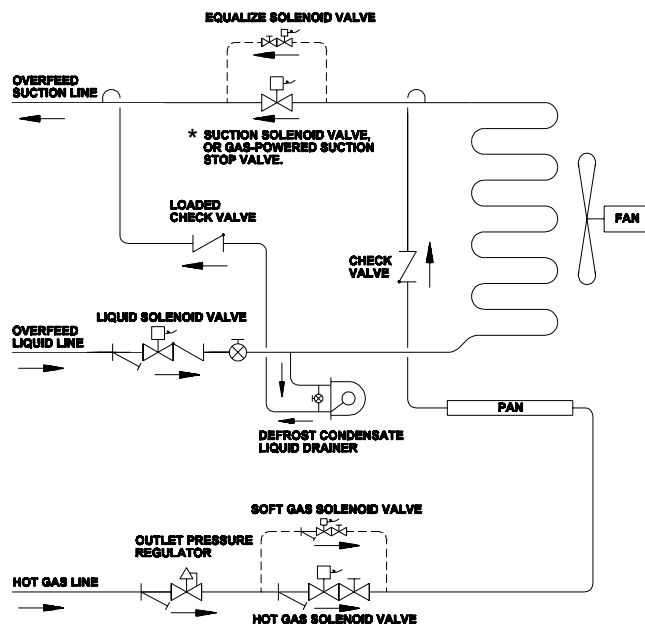
### TOP FEED EVAPORATOR



### EVAPORATOR WITH GAS-POWERED SUCTION STOP VALVE

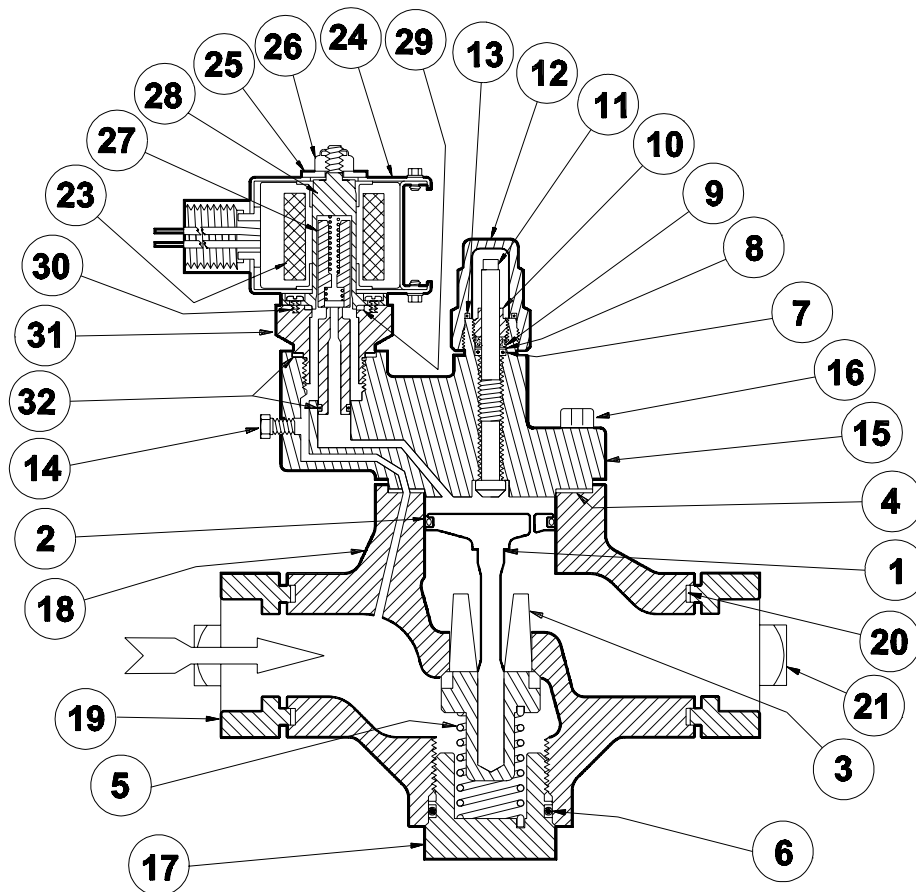


### EVAPORATOR WITH DEFROST CONDENSATE LIQUID DRAINER



\*For suction closure at temperatures below 0°F (-18°C) alternate low pressure drop valves are preferably used such as Hansen Gas-Powered Suction Stop Valve Type HCK2.

# **PARTS LIST 3/4" THRU 1 1/4" (20 THRU 32 mm)**



ITEM	DESCRIPTION	QTY	PART NO.
	<b>Piston Kit</b>		<b>75-1019</b>
	Above kit consists of:		
1	Piston	1	75-0191
2	Piston Seal	1	75-0353
4	Adapter Gasket	1	75-0489
20	Flange Gasket	2	70-0132
	<b>V-Port/Seat Kit 3/4"</b>		<b>75-1020</b>
	<b>V-Port/Seat Kit 1"</b>		<b>75-1021</b>
	<b>V-Port/Seat Kit 1 1/4"</b>		<b>75-1022</b>
	Above kits consist of:		
3a	3/4" V-Port/Seat	1	75-0194
3b	1" V-Port/Seat	1	75-0193
3c	1 1/4" V-Port/Seat	1	75-0192
5	Closing Spring	1	75-0287
6	Bottom Cap O-ring	1	75-0183
	<b>Gasket Kit</b> consists of:		<b>75-1023</b>
4	Adapter Gasket	1	75-0489
6	Bottom Cap O-ring	1	75-0183
7	Stem O-ring	1	70-0010
8	Stem Washer	1	70-0026
9	Stem Packing	1	70-0025
10	Packing Nut	1	70-0019
13	Seal Cap O-ring	1	70-0011
20	Flange Gasket	2	70-0132
29	Solenoid Tube Gasket	1	70-0301
32	Port Plug Gasket & O-ring	1	75-1071
11	Manual Opening Stem	1	75-0164
12	Seal Cap	1	50-0411
14	Gauge Port Plug (1/4" NPT)	1	75-0189
15	Adapter	1	75-0163
16	Adapter Bolts, socket cap	4	75-0190
17	Bottom Cap	1	75-0155

ITEM	DESCRIPTION	QTY	PART NO.
18a	Body, 3/4", 1"	1	75-0156
18b	Body, 1 1/4", 2-Bolt	1	75-0154
19	Flange (various)	2	FACTORY
21	Flange Bolt (5/8"-11 x 2.75")	4	70-0339
22	Flange Nut (5/8"-11)	4	70-0136
	<b>Coil Kit (115V) 1/2" Fitting</b>		<b>70-1057</b>
	<b>Coil Kit (208/230V) 1/2" Fitting</b>		<b>70-1056</b>
	<b>Coil Kit (24V) 1/2" Fitting</b>		<b>70-1058</b>
	<b>Coil Kit (Other Voltages)</b>		<b>FACTORY</b>
	Above kits consist of:		
23a	Bare Coil, 115V 50/60Hz, wire leads	1	70-0271*
23b	Bare Coil, 208/230V 50/60Hz, wire leads	1	70-0286*
23c	Bare Coil, 24V 50/60Hz, wire leads	1	70-0284*
23d	Other Voltage Bare Coils	1	FACTORY
24	Coil Housing Assembly Kit	1	70-1060
25	Coil Washer	1	70-0289
26	Coil Nut	1	70-0281
	<b>Solenoid Tube/Plunger Kit</b>		<b>70-1059</b>
	Above kit consists of:		
25	Coil Washer	1	70-0289
26	Coil Nut	1	70-0281
27	Plunger	1	70-0295†
28	Solenoid Tube	1	70-0298†
29	Solenoid Tube Gasket	1	70-0301
30	Tube Screws	4	70-0297
31	<b>Solenoid Control Module</b>		<b>70-1052</b>
	Control Module Body, including Plunger Kit, Port Plug Gasket & O-ring (less coil)		

\*Bare coils only are not interchangeable with Danfoss.

† Since 1993, a new interchangeable, threaded top, solenoid tube has been used on all solenoid valves. See Hansen Coil Bulletin SC1 for more details.

# PARTS LIST 1½" THRU 4" (40 THRU 100 mm)

ITEM	DESCRIPTION	QTY	PART NO
	<b>Piston Kit 1½", 2"</b>		<b>75-1025</b>
	<b>Piston Kit 2½"</b>		<b>75-1026</b>
	<b>Piston Kit 3"</b>		<b>75-1027</b>
	<b>Piston Kit 4"</b>		<b>75-1028</b>
	Above kits consist of:		
1a	Piston 1½", 2"	1	75-0168
1b	Piston 2½"	1	75-0169
1c	Piston 3"	1	75-0159
1d	Piston 4"	1	75-0278
2a	Piston Seal 1½", 2"	1	75-0292
2b	Piston Seal 2½", 3"	1	75-0293
2c	Piston Seal 4"	1	75-0236
3a	Adapter Gasket 1½", 2"	1	75-0113
3b	Adapter Gasket 2½", 3"	1	75-0093
3c	Adapter Gasket 4"	1	75-0233
23a	Flange Gasket 1½", 2"	2	75-0138
23b	Flange Gasket 2½"	2	75-0125
23c	Flange Gasket 3"	2	75-0137
23d	Flange Gasket 4"	2	75-0253
	<b>V-Port/Seat Kit 1½"</b>		<b>75-1029</b>
	<b>V-Port/Seat Kit 2"</b>		<b>75-1030</b>
	<b>V-Port/Seat Kit 2½"</b>		<b>75-1031</b>
	<b>V-Port/Seat Kit 3"</b>		<b>75-1032</b>
	<b>V-Port/Seat Kit 4"</b>		<b>75-1033</b>
	Above kits consist of:		
4a	V-Port/Seat 1½"	1	75-0369
4b	V-Port/Seat 2"	1	75-0177
4c	V-Port/Seat 2½"	1	75-0178
4d	V-Port/Seat 3"	1	75-0179
4e	V-Port/Seat 4"	1	75-0313
3a	Adapter Gasket 1½", 2"	1	75-0113
3b	Adapter Gasket 2½", 3"	1	75-0093
3c	Adapter Gasket 4"	1	75-0233
6a	Seat Seal O-ring 1½", 2"	1	75-0274
6b	Seat Seal O-ring 2½"	1	75-0275
6c	Seat Seal O-ring 3", 4"	1	75-0276
7	Seat Screw	1	75-0220
8a	Closing Spring 1½", 2"	1	75-0171
8b	Closing Spring 2½"	1	75-0201
8c	Closing Spring 3"	1	75-0248
8d	Closing Spring 4"	1	75-0235
	<b>Coil Kit (115V) ½" Fitting</b>		<b>70-1057</b>
	<b>Coil Kit (208/230V) ½" Fitting</b>		<b>70-1056</b>
	<b>Coil Kit (24V) ½" Fitting</b>		<b>70-1058</b>
	<b>Coil Kit (Other Voltages)</b>		<b>FACTORY</b>
	Above kits consist of:		
26a	Bare Coil, 115V 50/60Hz, wire leads	1	70-0271*
26b	Bare Coil, 208/230V 50/60Hz, wire leads	1	70-0286*
26c	Bare Coil, 24V 50/60Hz, wire leads	1	70-0284*
26d	Other Voltage Bare Coils	1	FACTORY
27	Coil Housing Assembly Kit	1	70-1060
28	Coil Washer	1	70-0289
29	Coil Nut	1	70-0281
	<b>Solenoid Tube/Plunger Kit</b>		<b>70-1059</b>
	Above kit consists of:		
28	Coil Washer	1	70-0289
29	Coil Nut	1	70-0281
30	Plunger	1	70-0295
31	Solenoid Tube	1	70-0298†
32	Solenoid Tube Gasket	1	70-0301
33	Tube Screws	4	70-0297
34	<b>Solenoid Control Module</b> Control Module Body, including Plunger Kit, Port Plug Gasket & O-ring (less coil)		<b>70-1052</b>

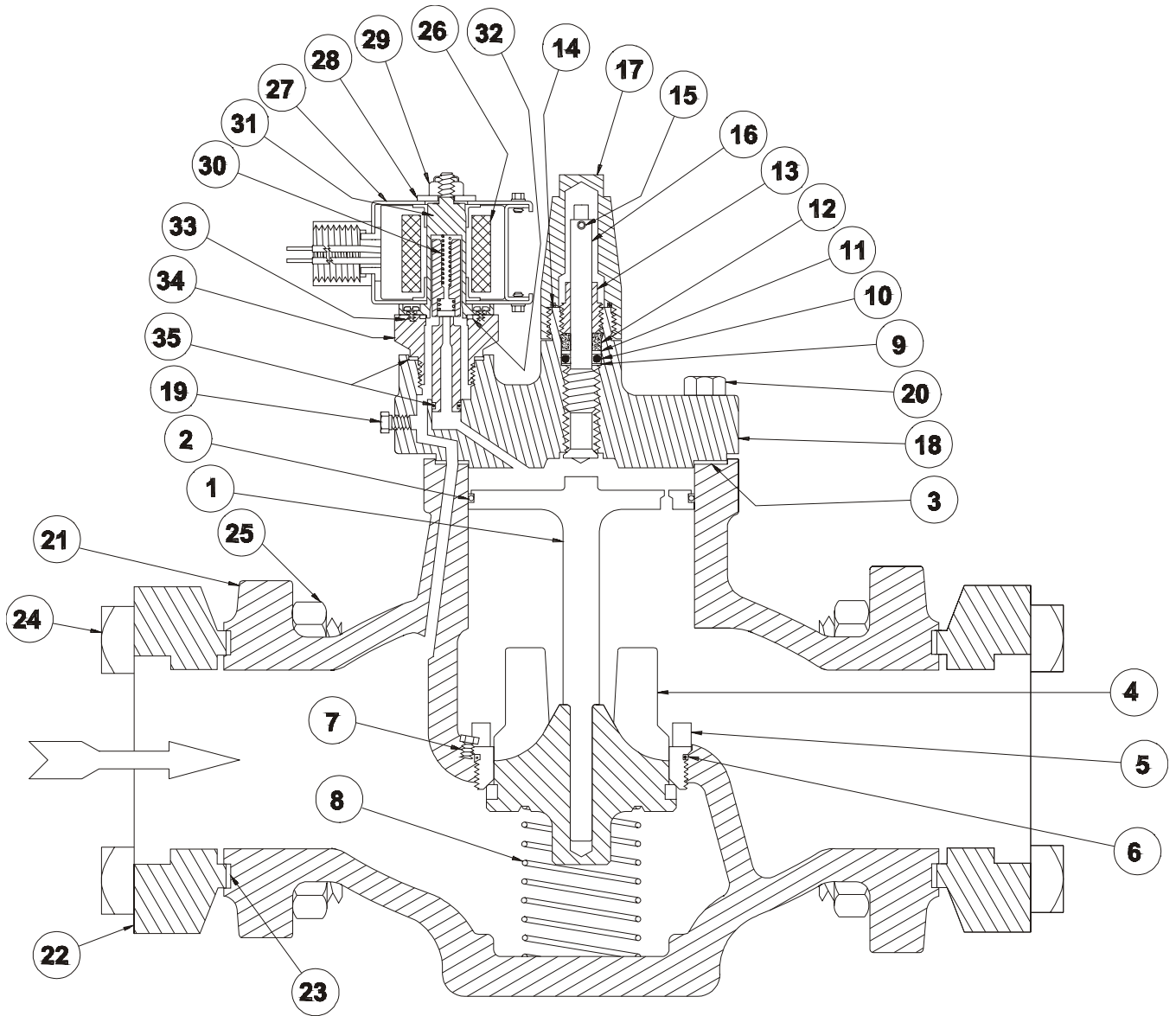
ITEM	DESCRIPTION	QTY	PART NO
	<b>Gasket Kit 1½", 2"</b>		<b>75-1039</b>
	<b>Gasket Kit 2½"</b>		<b>75-1040</b>
	<b>Gasket Kit 3"</b>		<b>75-1041</b>
	<b>Gasket Kit 4"</b>		<b>75-1042</b>
	Above kits consist of:		
3a	Adapter Gasket 1½", 2"	1	75-0113
3b	Adapter Gasket 2½", 3"	1	75-0093
3c	Adapter Gasket 4"	1	75-0233
6a	Seat Seal O-ring 1½", 2"	1	75-0274
6b	Seat Seal O-ring 2½"	1	75-0275
6c	Seat Seal O-ring 3", 4"	1	75-0276
9a	Back-up Washer 1½" - 3"	1	75-0245
9b	Back-up Washer 4"	1	50-0351
10a	Stem O-ring 1½" - 3"	1	50-0179
10b	Stem O-ring 4"	1	50-0253
11a	Stem Washer 1½" - 3"	1	50-0046
11b	Stem Washer 4"	1	50-0247
12a	Stem Packing 1½" - 3"	1	50-0045
12b	Stem Packing 4"	1	50-0248
13a	Packing Nut 1½" - 3"	1	50-0013
13b	Packing Nut 4"	1	50-0251
14a	Seal Cap O-ring	1	50-0432
14b	Seal Cap Gasket	1	50-0270
15a	Stem Pin 1½" - 3"	1	75-0173
15b	Stem Pin 4"	1	75-0434
23a	Flange Gasket 1½", 2"	2	75-0138
23b	Flange Gasket 2½"	2	75-0125
23c	Flange Gasket 3"	2	75-0137
23d	Flange Gasket 4"	2	75-0253
32	Solenoid Tube Gasket	1	70-0301
35	Port Plug Gasket & O-ring	1	75-1071
5a	Seat Ring 1½", 2"	1	75-0084
5b	Seat Ring 2½"	1	75-0170
5c	Seat Ring 3"	1	75-0071
5d	Seat Ring 4"	1	75-0231
16a	Manual Opening Stem 1½" - 3"	1	75-0079
16b	Manual Opening Stem 4"	1	75-0427
17a	Seal Cap 1½" - 3"	1	75-0139
17b	Seal Cap 4"	1	50-0260
18a	Adapter 1½", 2"	1	75-0060
18b	Adapter 2½", 3"	1	75-0056
18c	Adapter 4"	1	75-0334
19	Gauge Port Plug (¼" NPT)	1	75-0189
20a	Adapter Bolts 1½", 2"	4	75-0175
20b	Adapter Bolts 2½", 3"	4	65-0057
20c	Adapter Bolts 4"	4	75-0291
21a	Body 1½", 2"	1	75-0016
21b	Body 2½"	1	75-0018
21c	Body 3"	1	75-0019
21d	Body 4"	1	75-0215
22	Flange (various)	2	FACTORY
24a	Flange Bolt 1½", 2" (5/8"-11x3.25")	8	70-0135
24b	Flange Bolt 2½", 3" (¾"-10x3.75")	8	75-0202
24c	Flange Bolt 4" (7/8"-9x4")	8	75-0279
25a	Flange Nut 1½", 2" (5/8"-11)	8	70-0136
25b	Flange Nut 2½", 3" (¾"-10)	8	75-0210
25c	Flange Nut 4" (7/8"-9)	8	75-0280

\* Bare coils only are not interchangeable with Danfoss.

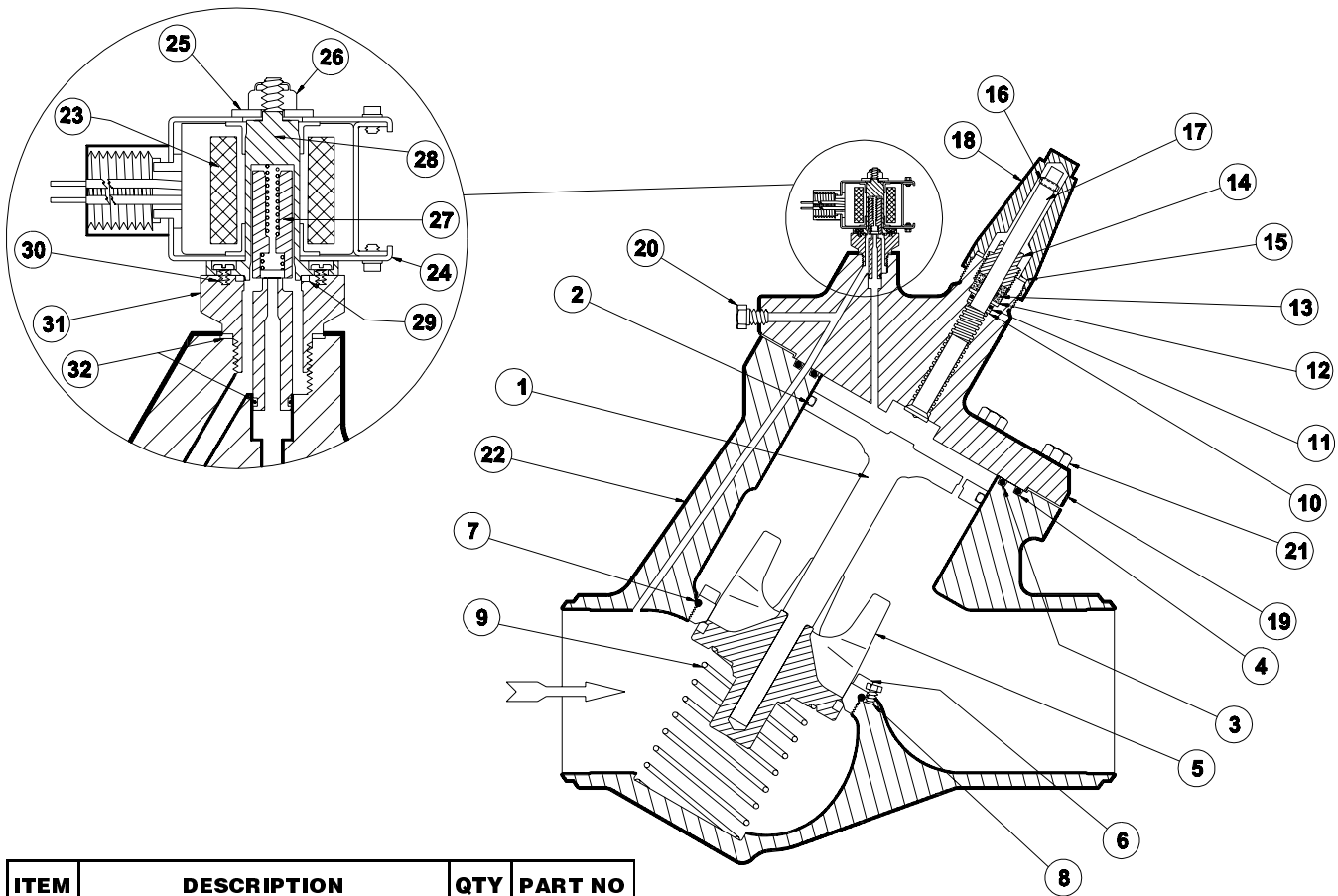
† Since 1993, a new interchangeable, threaded top, solenoid tube has been used on all solenoid valves. See Hansen Coil Bulletin SC1 for more details.



**PARTS LIST 1½" THRU 4" (40 THRU 100 mm)**



## PARTS LIST 5" AND 6" (125 AND 150 mm)



ITEM	DESCRIPTION	QTY	PART NO
	<b>Piston Kit consists of:</b>		<b>75-1110</b>
1	Piston	1	75-0570
2	Piston Seal	1	75-0602
3	Adapter O-ring, inner	1	75-0605
4	Adapter O-ring, outer	1	75-0606
	<b>Gasket Kit</b>		<b>75-1111</b>
3	Adapter O-ring, inner	1	75-0605
4	Adapter O-ring, outer	1	75-0606
7	Seat Seal O-ring	1	75-0613
10	Back-up Washer	1	50-0324
11	Stem O-ring	1	50-0293
12	Stem Washer	1	50-0299
13	Stem Packing	1	50-0290
14	Packing Nut	1	50-0292
15	Seal Cap Gasket	1	50-0315
16	Manual Opening Stem Pin	1	75-0607
29	Solenoid Tube Gasket	1	75-0301
32	Port O-ring & Gasket	1	75-1071
	<b>Coil Kit (115V) ½" Fitting</b>		<b>70-1057</b>
	<b>Coil Kit (208/230V) ½" Fitting</b>		<b>70-1056</b>
	<b>Coil Kit (24V) ½" Fitting</b>		<b>70-1058</b>
	<b>Coil Kit (Other Voltages)</b>		<b>FACTORY</b>
	Above kits consist of:		
23a	Bare Coil, 115V 50/60Hz, wire leads	1	70-0271*
23b	Bare Coil, 208/230V 50/60Hz, wire leads	1	70-0286*
23c	Bare Coil, 24V 50/60Hz, wire leads	1	70-0284*
23d	Other Voltage Bare Coils	1	FACTORY
24	Coil Housing Assembly Kit	1	70-1060
25	Coil Washer	1	70-0289
26	Coil Nut	1	70-0281
31	<b>Solenoid Control Module</b>		<b>70-1052</b>
	Control Module Body, including Plunger Kit, Port Plug Gasket & O-ring (less coil)		

ITEM	DESCRIPTION	QTY	PART NO
	<b>V-Port/Seat Kit 5"</b>		<b>75-1112</b>
	<b>V-Port/Seat Kit 6"</b>		<b>75-1113</b>
	Above kits consist of:		
5a	V-Port/Seat 5"	1	75-0640
5b	V-Port/Seat 6"	1	75-0641
3	Adapter O-ring, inner	1	75-0605
4	Adapter O-ring, outer	1	75-0606
7	Seat Seal O-ring	1	75-0613
8	Seat Screw	1	75-0220
9	Closing Spring	1	75-0601
	<b>Solenoid Tube/Plunger Kit</b>		<b>70-1059</b>
	Above kit consists of:		
25	Coil Washer	1	70-0289
26	Coil Nut	1	70-0281
27	Plunger	1	70-0295
28	Solenoid Tube	1	70-0298†
29	Solenoid Tube Gasket	1	70-0301
30	Tube Screws	4	70-0297
6	Seat Ring	1	75-0558
17	Manual Opening Stem	1	75-0581
18	Seal Cap	1	50-0304
19	Adapter	1	75-0554
20	Gauge Port Plug	1	75-0189
21	Adapter Bolts	8	75-0604
22a	Body, 5"	1	75-0542
22b	Body, 6"	1	75-0541

\*Bare coils only are not interchangeable with Danfoss.

† Since 1993, a new interchangeable, threaded top, solenoid tube has been used on all solenoid valves. See Hansen Coil Bulletin SC1 for more details.

## SERVICE AND MAINTENANCE

**Failure to Open:** Wrong voltage coil; low line voltage; controlling switch or thermostat not contacting; coil is burned-out; adjacent shut-off valve closed; plunger or main valve seat is dirt jammed; adapter gasket hole not aligned with hole in body and adapter; dirt packed under teflon seal ring enabling excessive blow-by; dirt blocking internal passages.

**Failure to Close:** controlling switch or thermostat not opening contacts; manual opening stem is turned in; valve installed in wrong direction; damage or dirt at main valve seat or pilot seat; piston bleed hole plugged.

**Before opening valve or disassembling pilot for service, be sure its isolated from the system and all refrigerant is removed (pumped out to zero pressure).** Follow usual refrigeration system safe servicing procedure. Read CAUTION section of this bulletin before attempting to service; see page 12.

To check solenoid pilot section of valve, disconnect the electrical coil. Unscrew the coil nut and remove washer. Lift coil housing away from the valve. Remove the four solenoid tube screws, solenoid tube and plunger from valve. Inspect for dirt and damage to teflon seat and stainless steel pilot orifice. Clean, polish or replace parts as necessary. Lightly oil solenoid tube gasket, re-assemble pilot section of valve and replace electrical coil housing washer and nut.

**3/4" thru 1 1/4" (20 thru 32 mm):** Use a 3/8" (9 mm) male hexagon wrench to loosen the four adapter bolts. Carefully break gasket seal before removing bolts; proceed slowly to avoid any refrigerant which may still remain in the valve. If piston parts are stuck, remove the 2" hex bottom cap to facilitate separation of the valve V-port/seat from the disc piston. Inspect disc and piston bore for burrs, nicks and other damage. Remove burrs and nicks, clean or replace disc piston as necessary. Long-life seal on disc piston need only be replaced when damaged or severely worn. Inspect V-port/seat and main valve seat for nicks, marks, etc. Main valve seat may be lapped by hand or power drill to remove marks. Clean, polish or replace parts as necessary. If necessary, the V-port tapered seat may be reconditioned by removing up to 0.04" (1 mm) of teflon from it on a lathe. Lightly lubricate all parts and gaskets with soft rag containing refrigerant oil. Align hole in valve body, adapter gasket, and adapter to assure proper operation. Re-assemble valve. Carefully check entire valve for leaks before restoring it to service.

**1 1/2" thru 6" (40 thru 150 mm):** Loosen adapter bolts using a 12" adjustable wrench (15" wrench for 5" and 6" valves). Carefully break gasket seal before removing bolts; proceed slowly to avoid any refrigerant which may still remain in the valve. If disc piston is difficult to remove, insert a 1/4"-20 threaded screw (3/8"-16 for 5" & 6" valves) into center of piston and lift straight-up. Inspect piston and piston bore for burrs, nicks and other damage. Remove burrs and nicks, clean or replace piston as necessary. Long-life seal on disc piston need only be replaced when damaged or severely worn. These valves have a removable stainless steel main valve seat. To remove seat ring for inspection, first remove small hex head seat screw. Turn seat ring counter-clockwise by turning it out with wrench and a steel bar tool positioned horizontally or by carefully tapping seat ring notch with a punch and hammer. Inspect V-port/seat and main valve seat for nicks, marks, etc. Main valve seat may be lapped by hand or power drill to remove marks. Grease and replace seat seal O-ring. Clean, polish or replace parts as necessary. The V-port tapered seat may be reconditioned by removing up to 0.04" (1 mm) of teflon from it on a lathe. Lightly lubricate all parts and gaskets with soft rag containing refrigerant oil. Align hole in valve body, adapter gasket, and adapter to assure proper operation (5" & 6" have dual O-ring adapter seal.) Reassemble valve. Carefully check entire valve for leaks before restoring it to service.

## MANUAL OPENING

The stem is located on top of adapter cover. Slowly remove manual opening stem seal cap, being cautious to avoid any refrigerant which may have collected under it. Turn stem in (clockwise) to open valve manually; Counter-clockwise to return valve to automatic operation.

## CAUTION

Hansen solenoid valves are only for refrigeration systems. These instructions and related safety precautions must be read completely and understood before selecting, using or servicing these Hansen valves. Only knowledgeable, trained refrigeration mechanics should install, operate or service these valves. Stated temperature and pressure limits should not be exceeded. Adapters, bottom caps, solenoid tubes, control modules, etc. should not be removed from valves unless system has been evacuated to zero pressure. See also Safety Precautions in current List Price Bulletin and Safety Precautions Sheet supplied with product. Escaping refrigerant might cause personal injury, particularly to the eyes and lungs.

## WARRANTY

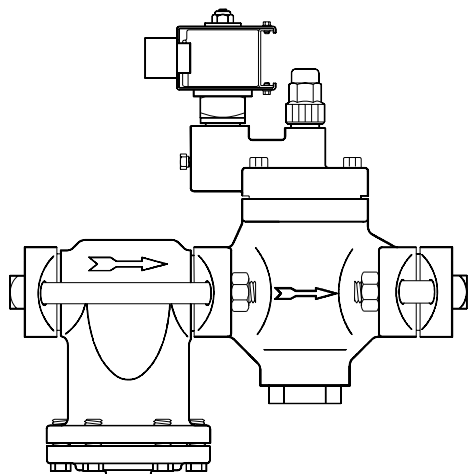
All Hansen Technologies products, except electric motors and electronic items, are warranted against defects in workmanship and materials for a period of one year F.O.B. our plant. Electric motors and electronic items are warranted against defects for 90 days. No consequential damages or field labor is included.

## OPTIONS

**Strainers:** Generous capacity strainer is a separate, close-coupled, 60 mesh (233 micron rating), flanged unit that bolts directly to the solenoid valve inlet.

**Pilot Light with NEMA 1 box:** To connect to standard 1/2" fitting coil. These long-life, vibration resistant neon pilot lights operate on primary voltage; no special coil with secondary winding necessary (green, red, or amber light). Specify Voltage and Color of Pilot Lights.

**Watertight Pilot Light assembly with NEMA 4 box and long-life LED light** (green, red, or amber). Specify Voltage and Color of Pilot Lights.



**HS4A with Close-coupled Strainer**

## ORDERING INFORMATION, HS4A SOLENOID VALVES

PORT SIZE (mm)	FLANGE CONNECTION STYLES & SIZES		
	FPT, SW, WN		ODS
	STD	ALSO	STD
3/4" (20)	3/4"	1", 1 1/4"	7/8"
1" (25)	1"	3/4", 1 1/4"	1 1/8"
1 1/4" * (32)	1 1/4"	3/4", 1"	1 3/8"
1 1/2" (40)	1 1/2"	2"	1 5/8"
2" (50)	2"	1 1/2"	2 1/8"
2 1/2" (65)	2 1/2"	3"	2 5/8"
3" (80)	3"	--	3 1/8"
4" (100)	4"	--	4 1/8"
5" (125)	5" BW	--	--
6" (150)	6" BW	--	--

5" and 6" valves are Type HS4W having integral butt weld end only.

\*1 1/4" port valve is standard 2-bolt flange design; 4-bolt flange style available upon request to field replace 1 1/4" R/S S4A and S5A.

**TO ORDER:** Specify Type, Port, Connection Style and Size, Voltage, Strainer, and Options if required. Specify Voltage and Color of optional Pilot Lights. Unless otherwise specified, standard coil with 1/2" fitting will be supplied with valve.

**See also the following HANSEN solenoid valve bulletins:**

S121 — HS7 3/4" thru 1 1/4" port, pilot operated, flanged  
S119 — HS8 1/2" port, pilot operated, flanged  
S117 — HS6 5/32" port, direct lift, flanged  
S114 — HS2 5/32" port, direct lift, screwed end

## TYPICAL SPECIFICATIONS

"Refrigerant solenoid valves shall be ductile iron or steel bodied and have manual opening stems, molded, watertight coils, and stainless steel spring closing main and pilot teflon seats, as manufactured by Hansen Technologies Corporation or approved equal."



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