



HCK2 Gas-Powered Suction Stop Valve

INTRODUCTION

These heavy-duty, flanged, gas-powered suction stop valves are designed to control the flow of refrigerant in large industrial and commercial applications. They remain normally open via a spring and require no pressure drop to operate. Valves are best installed on their side for better conveyance of liquid overfeed or oil and to avoid trapping. A single pilot solenoid valve is required to control a higher pressure refrigerant gas which closes these valves during defrosting.

APPLICATIONS

These valves are ideally suited for low temperature applications to positively close, during defrost, the following: suction lines, liquid overfeed and flooded evaporator gas return lines, as well as gravity liquid and gas lines. Because they are gas powered to close, these valves operate reliably even under viscous oil conditions. They are suitable for ammonia, R22, R134a, CO₂ and other compatible refrigerants.

ADVANTAGES

Unique spool type piston/seats are more resistant to dirt than typical full skirted piston designs. The ductile iron body is much stronger and tougher than grey iron or "semi-steel" iron. Protective pilot line disc strainers are included. Manual opening stems are standard for positive opening during servicing or trouble shooting systems.

ADDITIONAL FEATURES

No pressure drop required to open

Durable metal-to-metal seating

Tough ductile iron piston

Pilot line disc strainer

Specifications, Applications, Service Instructions & Parts

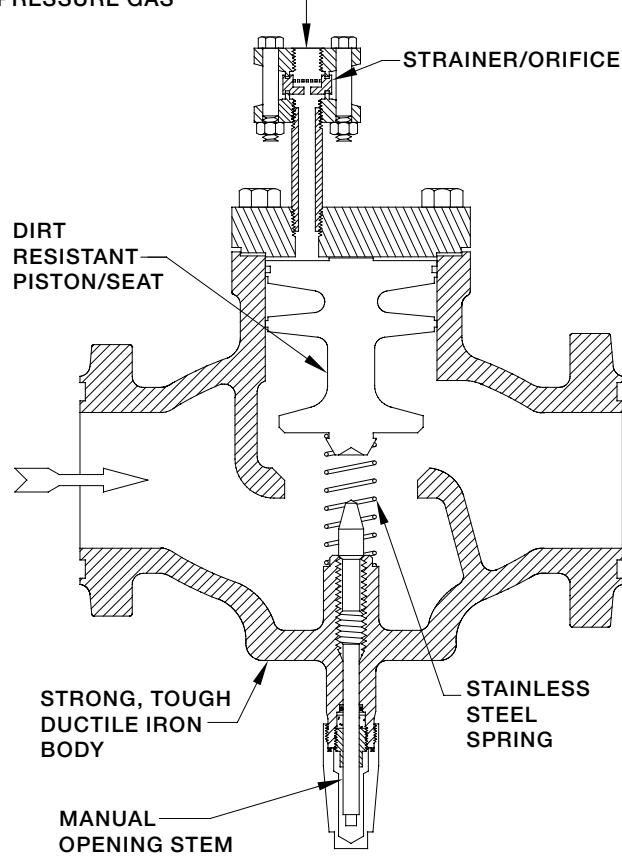
**HCK2, HCK2W
GAS-POWERED
SUCTION STOP VALVES
1-1/4" THRU 6" PORT
(32 mm THRU 150 mm)**

**Flanged
1-1/4" thru 4"
FPT, SW, WN, ODS
for refrigerants**



KEY FEATURES

ACTUATED BY HIGH PRESSURE GAS



MATERIAL SPECIFICATIONS

Body: Ductile iron, ASTM A536, 5" & 6": Cast steel.
 Top Cover: Steel, ASTM A36
 Piston/Seat: Ductile iron, ASTM A536; 1 1/4" only: stainless steel
 Piston Seal (5" & 6" only): Teflon®, spring activated
 Spring: Stainless steel
 Gaskets: Non-asbestos, graphite composite
 Stem: Plated steel
 Stem Seal: O-ring plus graphite composite packing
 Seal Cap: Steel, zinc chromate plated; 1 1/4" only: glass filled polymer
 Companion Flanges: Forged steel (1 1/4" to 4"), ASTM 105
 Safe Working Pressure: 400 psig (27 bar), 600 psig (40 bar) for CO₂
 Operating Temperature: -60°F to +240°F (-50° to 115°C)

OPERATION

These valves are held normally open by means of a spring. When a high pressure refrigerant gas is introduced to the valve through the pilot line inlet, the piston/seat is forced down, compressing the spring and seating the piston/seat firmly on the valve body taper seat. While the HCK2 is designed to withstand the shock of quick closing, if the noise or system or piping shock is excessive, a lower controlled pilot gas pressure may be advisable.

For opening, the high pressure gas source is interrupted and the remaining high pressure gas is bled-off past the piston/seat to the outlet side of the valve. The upstream pressure plus the spring causes the valve to open wide. It is advisable, especially for suction lines exceeding 2", to bleed down the evaporator pressure before opening the HCK2 (See page 7).

Because of the constant bleed around the piston/seat when closed, these valves are recommended where closure is for short periods, as during defrost, or where bleed to suction is not objectionable. When a constant bleed to suction is not desired, use Hansen HS9B gas-powered solenoid valve having piston seal ring and dual pilot solenoid valves.

INSTALLATION

Protect the interior of the valves from dirt and moisture during storage and installation. These valves may be installed upright or on their sides in either a vertical or horizontal line. Arrow on valve body should be in normal direction of refrigerant flow. System should be free of dirt, weld slag, and rust particles. These valves require only a single pilot solenoid valve to close. A 5/32" (4 mm) port Hansen HS6 pilot solenoid valve with strainer is recommended to control the high pressure gas source to a 2" or smaller HCK2; a 1/2" (13 mm) port Hansen HS8A solenoid valve with strainer is recommended for 2 1/2" and larger valves. (If using a refrigerant liquid for the high pressure source, a Hansen HS9B gas-powered solenoid valve is recommended, instead of the HCK2.) The field installed pilot solenoid valve must be connected upstream of any hot gas defrost solenoid valve and should be located as close as possible to the main valve. This will help maintain full high pressure gas to top of piston/seat and minimize the amount of high pressure gas to be relieved past the piston/seat upon termination of the high pressure source. An integral orifice inside the pilot line disc strainer helps to retard piston/seat closing velocity. Where two HCK2 valves are to be operated simultaneously, a pilot line disk strainer/orifice assembly should be installed in each pilot line.

Important: To avoid system opening pressure shock including liquid slugs from the evaporator after defrost, especially for 2" and larger valves, use a small bypass solenoid valve to equalize evaporator to suction pressure before opening HCK2 suction stop valve. See page 7, Opening shock.

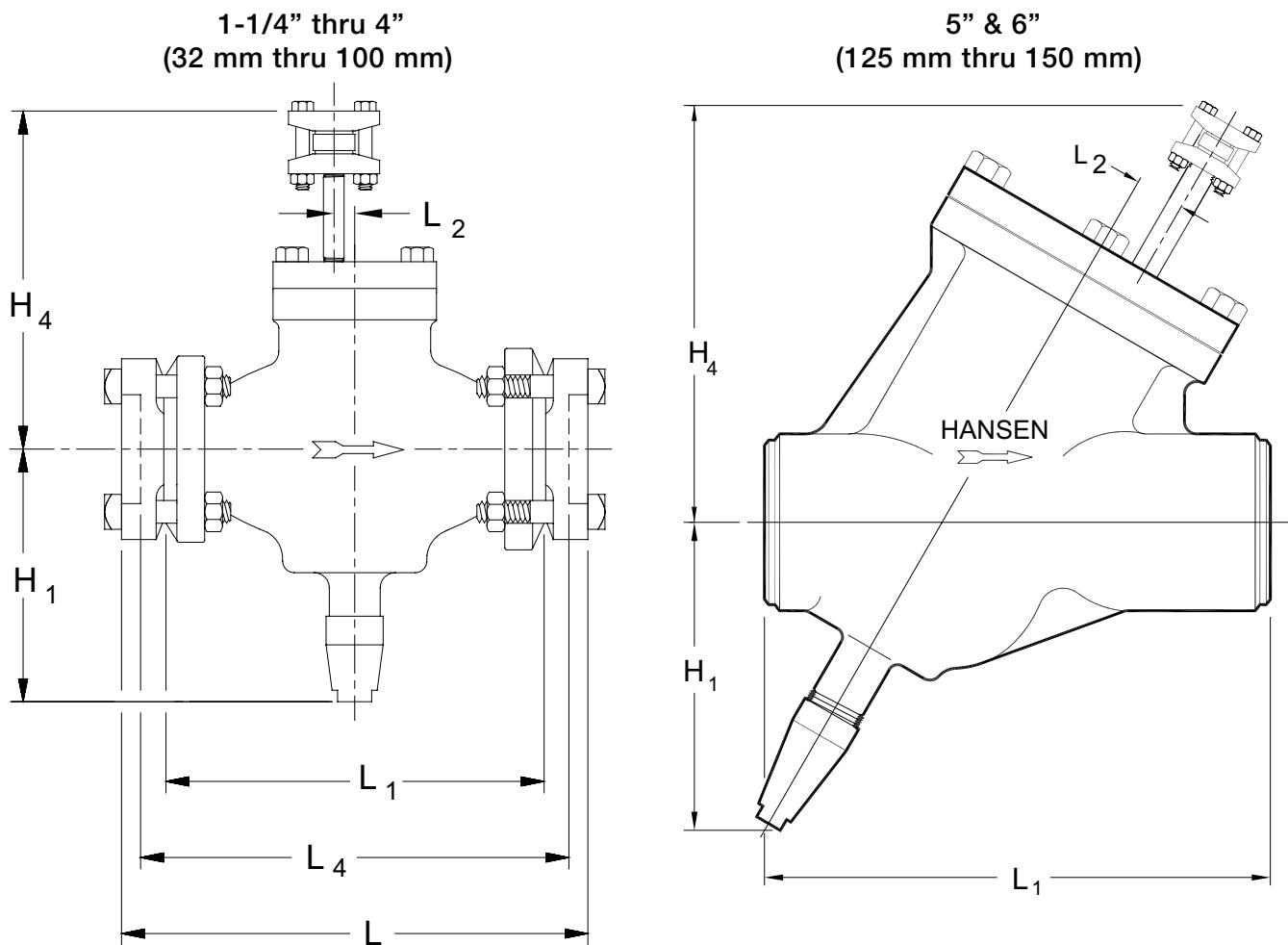
SUCTION VAPOR CAPACITIES - TONS

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

APPLICATION		PORT SIZE (mm)							
		1-1/4" (32)	1-1/2" (40)	2" (50)	2-1/2" (65)	3" (80)	4" (100)	5" (125)	6" (150)
R717	+20°F (-6.7°C)	24 (84)	58 (204)	68 (239)	110 (387)	156 (549)	341 (1199)	432 (1519)	556 (1955)
	0°F (-17.8°C)	20 (63)	47 (165)	55 (193)	90 (317)	127 (447)	278 (978)	353 (1242)	454 (1597)
	-20°F (-28.9°C)	16 (56)	38 (134)	44 (155)	73 (257)	101 (355)	221 (777)	281 (988)	361 (1270)
	-40°F (-40.0°C)	12 (42)	29 (102)	34 (120)	55 (193)	78 (274)	171 (601)	216 (760)	278 (978)
R22	+20°F (-6.7°C)	10 (35)	24 (84)	28 (98)	46 (162)	65 (289)	143 (503)	181 (637)	233 (819)
	0°F (-17.8°C)	9 (32)	21 (74)	24 (84)	39 (137)	55 (174)	121 (426)	154 (542)	197 (693)
	-20°F (-28.9°C)	7 (25)	17 (60)	20 (70)	32 (113)	45 (158)	99 (348)	126 (443)	162 (570)
	-40°F (-40.0°C)	5.9 (20.7)	14 (49)	16 (56)	26 (91)	36 (127)	80 (281)	101 (355)	130 (457)
Cv (Kv)		19.8 (17)	47 (40)	55 (47)	89 (76)	126 (108)	276 (236)	350 (300)	450 (385)

Above capacities are based on liquid temperature equal to evaporator temperature and 1 psi (0.07 bar) drop through the valve. For 0.5 psi (0.035 bar) drop, multiply above values by 0.71. For liquid overfeed systems, nominal 2:1 to 5:1 ratio, add 20% to the evaporator load and select a valve based on the increased load. For gravity flooded application, valve should be same port size as properly sized liquid leg or gas line. Consult flooded evaporator manufacturer for proper line sizing.

INSTALLATION DIMENSIONS



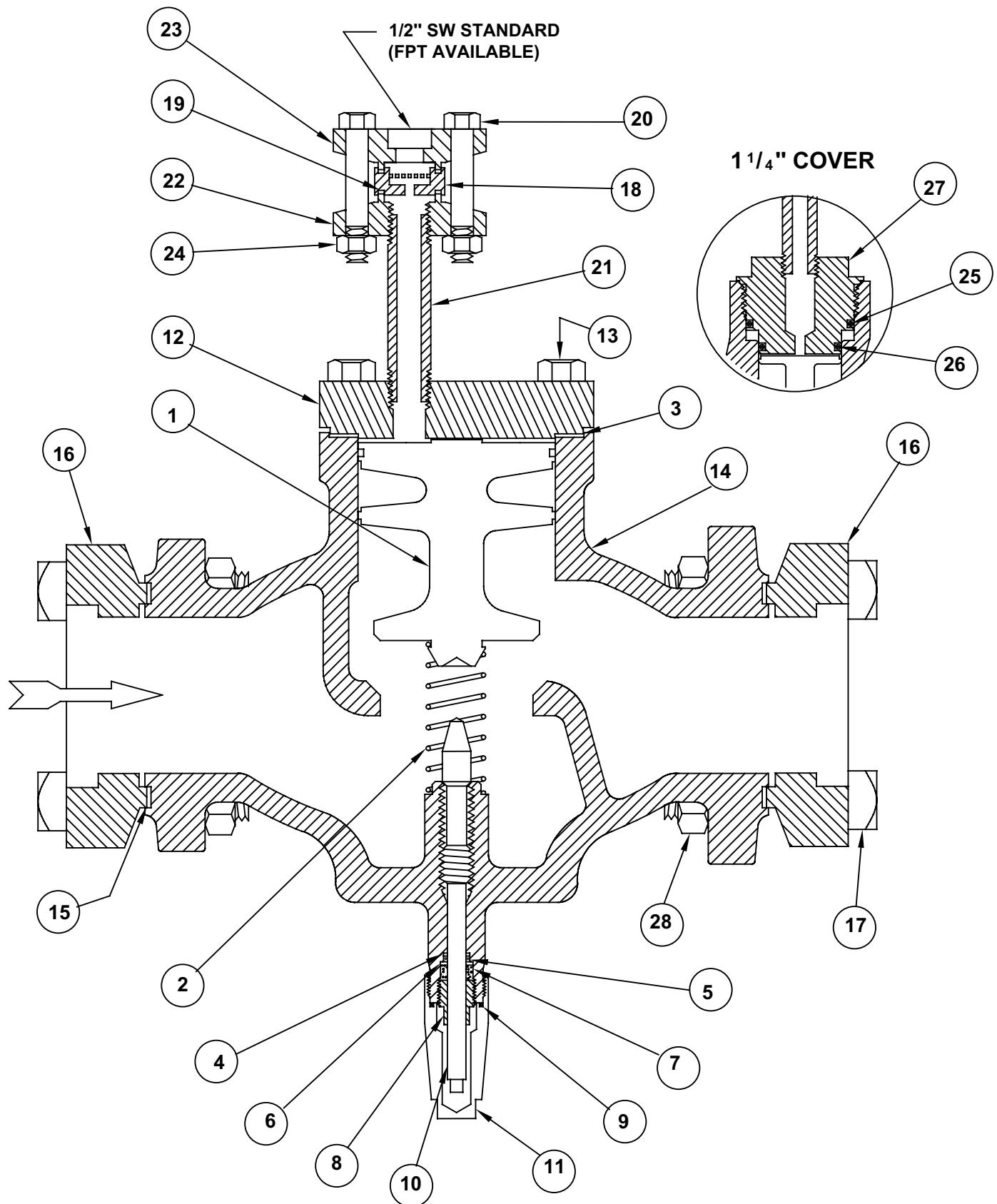
PORT SIZE (mm)	DIMENSIONS (mm)								
	H_1	H_4	L		L_1	L_2	L_4	W	
FPT, SW	WN, ODS								
1-1/4" (32)	4.21" (107)	8.99" (228)	8.20"	8.94" (208)	6.19" (227)	-	7.20" (183)	4.50" (114)	
1-1/2", 2" (40), (50)	7.12" (107)	9.55" (243)	12.39" (315)	13.39" (340)	9.88" (251)	0.86" (22)	10.89" (277)	4.50" (114)	
2-1/2" (65)	8.06" (205)	10.23" (260)	13.01" (330)	14.03" (356)	9.88" (251)	1.15" (29)	11.01" (280)	5.62" (143)	
3" (80)	8.38" (213)	10.57" (268)	15.38" (391)	16.40" (417)	12.25" (311)	1.15" (29)	13.38" (340)	6.50" (165)	
4" (100)	9.88" (251)	11.45" (291)	17.01" (432)	20.51" (521)	14.12" (359)	1.50" (38)	15.01" (381)	8.06" (205)	
5" (125)	12.13" (308)	17.00" (432)	-	-	20.40" (518)	2.00" (51)	-	12.75" (324)	
6" (150)	12.13" (308)	17.00" (432)	-	-	20.40" (518)	2.00" (51)	-	12.75" (324)	

*Allow additional 2.75" for seal cap removal. W= maximum width of valve.

HCK2 PARTS LIST
1-1/4" thru 4" (32 mm thru 100 mm)

ITEM	DESCRIPTION	QTY	PART NO	ITEM	DESCRIPTION	QTY	PART NO
	Piston/Seat Kit 1-1/4"		75-1057		Stem Kit 1-1/4"		75-1425
	Piston/Seat Kit 1-1/2"		75-1073		Stem Kit 1-1/2",2"		75-1010
	Piston/Seat Kit 2"		75-1004		Stem Kit 2-1/2"		75-1011
	Piston/Seat Kit 2-1/2"		75-1005		Stem Kit 3"		75-1012
	Piston/Seat Kit 3"		75-1006		Stem Kit 4"		75-1013
	Piston/Seat Kit 4"		75-1018		<i>Above kits consist of:</i>		
1a	Piston/Seat 1-1/4"	1	75-0486	10a	Stem 1-1/4"	1	75-0506
1b	Piston/Seat 1-1/2"	1	75-0597	10b	Stem 1-1/2",2"	1	75-0118
1c	Piston/Seat 2"	1	75-0282	10c	Stem 2-1/2"	1	75-0118
1d	Piston/Seat 2-1/2", 3"	1	75-0281	10d	Stem 3"	1	75-0135
1e	Piston/Seat 4"	1	75-0244	10e	Stem 4"	1	75-0242
2a	Spring 1-1/4"	1	75-0446		Gasket Kit 1-1/4"	1	75-1056
2b	Spring 1-1/2", 2"	1	75-0130		Gasket Kit 1-1/2",2"	1	75-1007
2c	Spring 2-1/2"	1	75-0131		Gasket Kit 2-1/2"	1	75-1008
2d	Spring 3"	1	75-0195		Gasket Kit 3"	1	75-1009
2e	Spring 4"	1	75-0240		Gasket Kit 4"	1	75-1017
25	Upper Body O-Ring (1-1/4" only)	1	75-0131		Seal Cap Kit 1-1/4"		75-1023
26	Lower Body O-Ring (1-1/4" only)	1	75-0130		Seal Cap Kit 1-1/2", 2", 2-1/2", 3"		75-1014
3a	Cover Gasket 1-1/2", 2"	1	75-0196		Seal Cap Kit 4"		75-1027
3b	Cover Gasket 2-1/2", 3"	1	75-0128		<i>Above kits consist of:</i>		
3c	Cover Gasket 4"	1	75-0234	11a	Seal Cap 1-1/4"	1	50-0411
20	Disc Strainer Flange Gasket	2	70-0065	11b	Seal Cap 1-1/2", 2", 2-1/2", 3"	1	75-0139
	Gasket Kit 1-1/4"		75-1056	11c	Seal Cap 4"	1	50-0260
	Gasket Kit 1-1/2", 2"		75-1007	9a	Seal Cap O-Ring 1-1/2",2",2-1/2",3	1	75-0011
	Gasket Kit 2-1/2"		75-1008	9b	Seal Cap O-Ring 1-1/2",2",2-1/2",3	1	50-0432
	Gasket Kit 3"		75-1009	9c	Seal Cap Gasket 4"	4	50-0270
	Gasket Kit 4"		75-1017		Disc Strainer/Orifice Kit		75-1422
	<i>Above kits consist of:</i>				<i>Above kits consist of:</i>		
25	Upper Body O-Ring (1-1/4" only)	1	70-0131	18	Disc Strainer Orifice Assembly	1	78-0065
26	Lower Body O-Ring (1-1/4" only)	1	70-0130	19	Disc Strainer Flange Gasket	2	70-0065
3a	Cover Gasket 1-1/2", 2"	1	75-0196	20	Disc Strainer Flange Bolt	2	70-0054
3b	Cover Gasket 2-1/2", 3"	1	75-0128	21	Nipple (1/2" x 3.5")	1	75-0677
3c	Cover Gasket 4"	1	75-0234	22	Disc Strainer Flange 1/2" SW	1	70-0238
4a	Back-up Washer 1-1/2", 2", 2-1/2", 3"	1	75-0245	23	Disc Strainer Flange 1/2" FPT	1	70-0023
4b	Back-up Washer 4"	1	50-0351	24	Disc Strainer Flange Nut	2	70-0055
5a	Stem O-Ring 1-1/4"	1	70-0010				
5b	Stem O-Ring 1-1/2", 2", 2-1/2", 3"	1	50-0179	27	Cover 1-1/4"	1	78-0065
5c	Stem O-Ring 4"	1	50-0253	12a	Cover Kit 1-1/2",2"	1	70-0065
6a	Stem Washer 1-1/4"	1	70-0026	12b	Cover 2-1/2",2"	1	75-0677
6b	Stem Washer 1-1/2", 2", 2-1/2", 3"	1	50-0046	12c	Cover Kit 4"	1	75-0238
6c	Stem Washer 4"	1	50-0247	14	Body	1	N/A
7a	Packing 1-1/4"	1	70-0025	16	Flange (FPT, SW, WN, ODS)	2	FACTORY
7b	Packing 1-1/2", 2", 2-1/2", 3"	1	50-0045	17a	Flange Bolt 1-1/4"	8	78-0065
7c	Packing 4"	1	50-0248	17b	Flange Bolt 1-1/2", 2"	8	70-0065
8a	Packing Nut 1-1/4"	1	70-0499	17c	Flange Bolt 2-1/2", 3"	8	75-0677
8b	Packing Nut 1-1/2", 2", 2-1/2", 3"	1	50-0013	17d	Flange Bolt 4"	8	75-0238
8c	Packing Nut 4"	1	50-0251	28a	Flange Nut 1-1/4",1-1/2", 2"	8	
9a	Seal Cap O-Ring 1-1/4"	1	70-0011	28b	Flange Nut 2-1/2", 3" (3/4"-10)	8	70-0055
9b	Seal Cap O-Ring 1-1/2", 2", 2-1/2", 3"	1	50-0432	28c	Flange Nut 4" (7/8"-9)	8	70-0054
9c	Seal Cap Gasket 4"	1	50-0270				
20	Disc Strainer Flange Gasket	2	70-0065				
15a	Flange Gasket 1-1/4"	2	70-0132				
15b	Flange Gasket 1-1/2", 2"	2	75-0138				
15c	Flange Gasket 2-1/2"	2	75-0125				
15d	Flange Gasket 3"	2	75-0137				
15e	Flange Gasket 4"	2	75-0253				

HCK2 PARTS LIST
1-1/4" thru 4" (32 mm thru 100 mm)

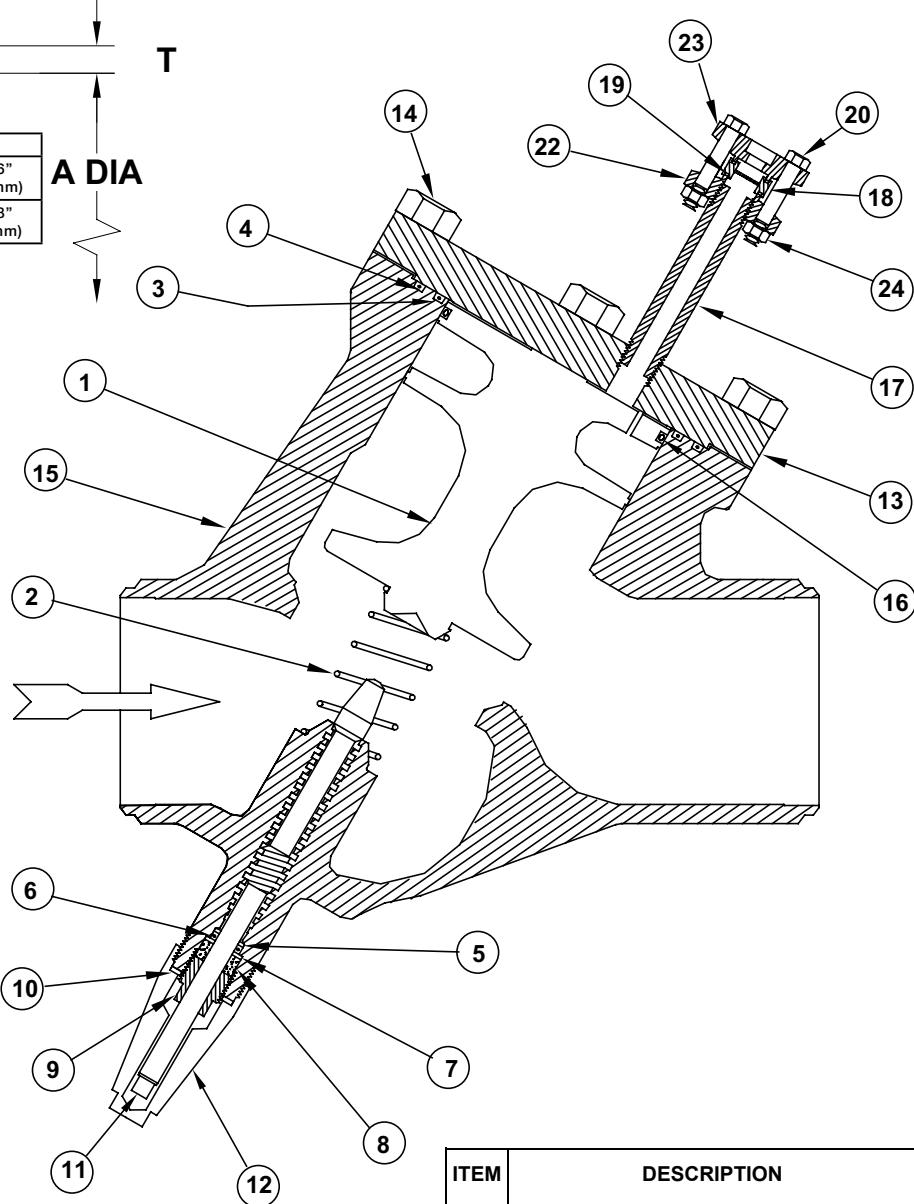


HCK2W PARTS LIST
5" & 6" (125 mm thru 150 mm)

WELD END DIMENSIONS 5" & 6"



PORT SIZE	A	T
5"	5.05" (128 mm)	0.26" (6.6 mm)
6"	6.06" (154 mm)	0.28" (7.1 mm)



ITEM	DESCRIPTION	QTY	PART NO
	Gasket Kit 5",6" Above kits consist of:		75-1111
3	Cover O-Ring, Inner	1	75-0656
4	Cover O-Ring, Outer	1	75-0606
5	Back-up Washer	1	50-0324
6	Stem Seal O-Ring	1	50-0293
7	Stem Washer	1	50-0299
8	Packing	1	50-0290
9	Packing Nut	1	50-0292
10	Seal Cap Gasket	1	50-0315
	Piston/Seat Kit 5",6" Above kits consist of:		75-1109
1	Piston/Seat, sealed	1	N/A
3	Cover O-Ring, Inner	1	75-0605
4	Cover O-Ring, Outer	1	75-0606
2	Spring	1	75-0600

ITEM	DESCRIPTION	QTY	PART NO
11	Stem Kit 5"6" Above kits consist of: Stem Gasket Kit	1	75-1423
12	Seal Cap Kit 5",6"	1	70-1038
10	Above kits consist of: Seal Cap Seal Cap Gasket	1	50-0304 50-0315
	Disc Strainer Screen Kit		75-1423
18	Above kits consist of: Disc Strainer Screen	1	78-0049
19	Assembly Disc Strainer Flange	2	70-0065
20	Gasket Disc Strainer Flange	2	70-0054
21	Bolt Nipple (3/4" x 6")	1	75-0677
22	Disc Strainer Flange 1/2" SW	1	70-0238
23	Disc Strainer Flange 3/4" FPT	1	70-0024
24	Disc Strainer Flange Nut	2	70-0055
13	Cover 5",6"	1	75-0583
15a	Body 5"	1	N/A
15b	Body 6"	1	N/A

SERVICE AND MAINTENANCE

Failure to close: The pilot solenoid valve is not opening due to an electrical problem. Disc strainer or high pressure pilot line may be plugged. Pilot pressure source is not high enough; it must be at least 10 psi (0.7 bar) above pressure through main valve. Manual opening stem is turned in. Dirt may be lodged between the piston/seat and valve piston wall.

Failure to open: The pilot solenoid valve is jammed open with dirt. Pilot solenoid valve manual opening stem is turned in. Pilot pressure and pressure through main valve are not equalizing. Check for reverse installation of main valve preventing pressure above piston/seat from bleeding down to outlet of main valve. Dirt may be lodged between piston/seat and valve piston wall. The opening spring may be damaged or broken.

Manual operation: If it is necessary to manually hold open the HCK2 valve, cautiously remove the seal cap and turn the manual opening stem inward (clockwise) as far as possible. The piston/seat should now be mechanically held open, and valve will not close until the manual opening stem is turned out (counter-clockwise). Do not operate the HCK2 automatically when the manual opening stem is turned in or else stem may break after repeated cycles.

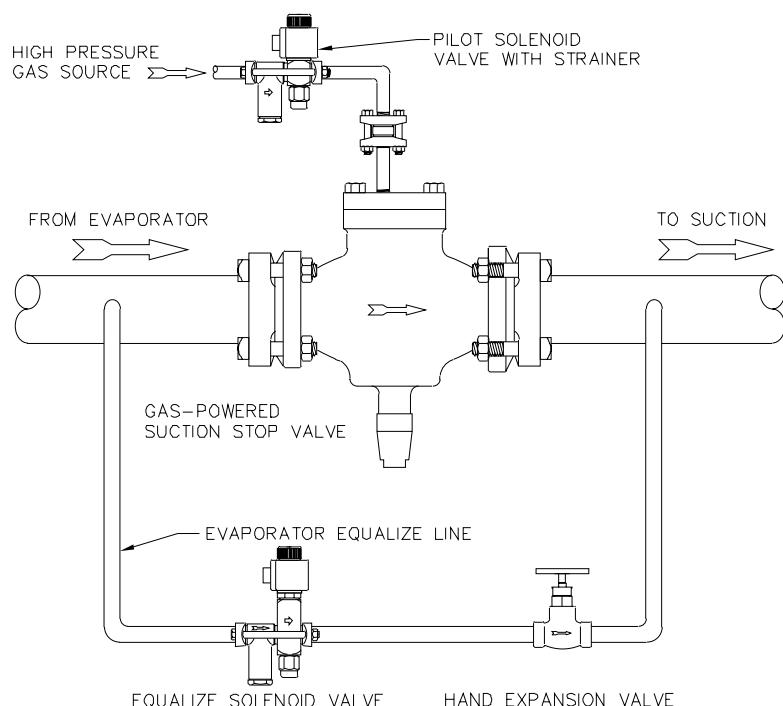
Loss of power: If the HCK2 pilot solenoid is de-energized, the HCK2 will open. If this must be avoided during mid-defrost of large evaporators, merely use a normally open pilot solenoid valve. As an alternate, a unique HCK5 model is available which stays closed until the system pressure equalizes if the pilot solenoid loses electric supply.

Disassembly: If it is necessary to remove or disassemble valve for servicing, be sure the high pressure pilot line and main valve are completely

isolated from the refrigeration system and all refrigerant is removed (pumped out to zero pressure). Be sure to follow refrigeration system safe procedures. Disconnect pilot line, clean or replace disc strainer/orifice assembly as necessary.

To inspect valve interior, after removing pressure, slowly loosen the cover bolts equally (or screwed cover of 1 1/4" HCK2) and break gasket seal, being careful to avoid any refrigerant which may still remain. Remove cover bolts and cover. Remove piston/seat. If necessary, a cover bolt can be screwed into center of piston/seat to lift it from valve body; use 3/8"-16 bolt for 1 1/4" piston/seat. Clean and inspect for burrs and damage to seating surfaces. Slight marks and burrs can often be removed with emery paper by hand or power lapping. Damaged parts should be replaced. When replacing piston/seat in field, for maximum valve tightness it is advisable to lap the seat into the valve body. Lightly lubricate main valve interior bore with refrigerant oil and install spring and piston/seat. Manually simulate valve operation by pushing on top of piston/seat. Action should be smooth and spring should readily push piston/seat back; if not, polish the bore and piston with emery cloth and check the spring for position and integrity. Re-assemble cover, gasket and bolts, pilot line and disc strainer. Carefully check the entire valve for leaks before restoring the valve to service.

Opening shock (at the conclusion of defrost): To minimize this sudden drop in pressure and possible evaporator exit slugs of liquid, bleed down evaporator pressure with a small equalize solenoid (bypass) valve before de-energizing the pilot solenoid valve to open the HCK2, see below. Alternately use the lowest possible defrost pressure by properly setting the defrost relief regulator and controlling incoming high pressure gas (hot gas).



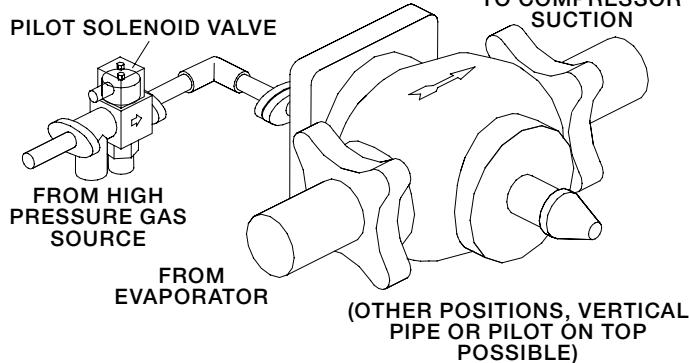
CAUTION

Hansen valves are only for refrigeration systems. These instructions must be completely read and understood before selecting, using or servicing Hansen valves. Only knowledgeable, trained refrigeration mechanics should install, operate, or service these valves. Stated temperature and pressure limits should not be exceeded. Bonnets, solenoid tubes, etc. should not be removed from valves unless system has been evacuated to zero pressure. Must also see 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 products, except electronics, are guaranteed against defective materials or workmanship for one year F.O.B. factory. Electronics are guaranteed against defective materials or workmanship for 90 days F.O.B. factory. No consequential damages or field labor is included.

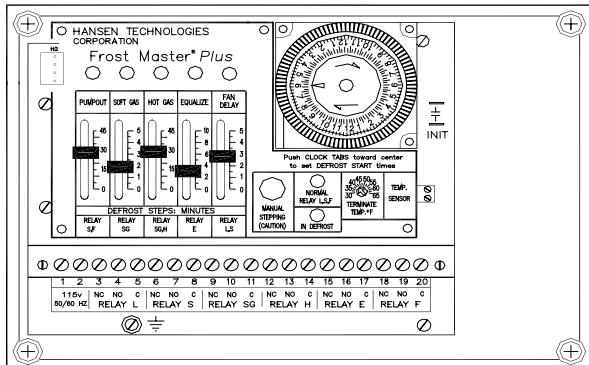
TYPICAL APPLICATION



DEFROST CONTROL

Control of the entire defrost process of large, low temperature evaporators, including those using HCK2 Gas-Powered Suction Stop Valves is ideally accomplished by the use of a Hansen Frost Master® or Frost Master® Plus Defrost Controller. In general, the Frost Master® is able to reduce the amount of cold liquid in the coil at the start of defrost, reduce the initial shock of hot gas entry (soft gas), efficiently terminate hot gas stage and to permit the evaporator to return to low pressure with minimum shock to the system and its piping and evaporator.

FROST MASTER® PLUS



ORDERING INFORMATION

PORT SIZE INCHES (mm)	FLANGE CONNECTION STYLE & SIZES		
	FPT, SW, WN		ODS
	STD	ALSO	STD
1-1/4" (32)	1-1/4"	1", 3/4"	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" & 6" are integral butt weld only, Type HCK2W.

TO ORDER: Specify type HCK2, port size, flange connection style and size, and pilot solenoid valve if desired. For pilot solenoid valve: specify HS6 for 2" and smaller HCK2, or HS8A for 2½" and larger; connection style and size: ½" SW standard, FPT or WN available; voltages: 115V, 230V, 24V; 50/60Hz. Unless otherwise specified standard coil with ½" fitting for conduit will be supplied with pilot valve. Also available, DIN plug coil for grounded cord connection or quick disconnect connection.

TYPICAL SPECIFICATIONS

"Gas-powered suction stop valves shall be normally open, remote pilot pressure operated, with manual opening stem, pilot line disc strainer and suitable for a safe working pressure of 400 psig (27 bar), as manufactured by Hansen Technologies Corporation or approved equal."

HANSEN
TECHNOLOGIES

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