HANSEN TECHNOLOGIES

Bulletin S114c
FEB 2019

Specifications, Applications, Service Instructions & Parts

HS2 SOLENOID VALVE 5/32" (4 mm) PORT

Threaded End
1/4" thru 1/2" FPT
(7 mm thru 15 mm)
1/4" thru 3/4" Flanged
(7 mm thru 20 mm)
for refrigerants

HS2 Solenoid Valve

INTRODUCTION

This threaded end industrial refrigeration duty solenoid valve is very simple and compact but rugged in construction. Body is plated steel alloy. The direct lifting stainless steel plunger contains a Teflon seat which closes on a stainless steel orifice. When electrically energized, valve opens wide; when de-energized, flow stops in the direction of the arrow on the valve body.

APPLICATIONS

This small, direct lifting valve is used primarily as a pilot for various larger gas-powered or liquid powered main valves, as a remote pilot for back pressure regulators or other devices, or as a liquid stop valve for expansion valves, float valves, or as a general purpose pilot line for ammonia, R22, R134a, CO2 and other approved refrigerants or oil.

ADDITIONAL FEATURES

Compact, low cost

Low wattage, Hansen standard coil

300 psi (20 bar) MOPD

Stainless steel seat orifice

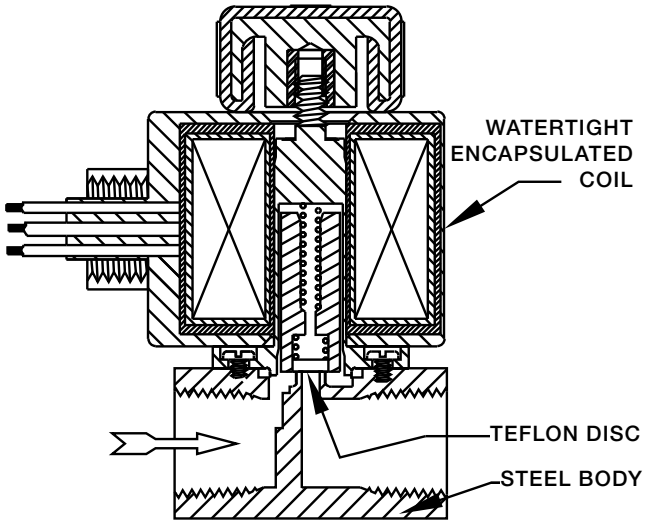
Removable solenoid tube

Heavy-duty, direct lift

CSA Certified

Non-asbestos gaskets

KEY FEATURES



MATERIAL SPECIFICATIONS

Body: Steel, plated

Solenoid Tube: Stainless steel

Plunger: Stainless steel

Seat Orifice: Stainless steel

Seat: Teflon

Safe Working Pressure: 400 psig (27 bar), 600 psig (40 bar) available for CO2

Operating Temperature: –60°F to +240°F (–50° to +115°C)

ADVANTAGES

Power-saving, low-wattage encapsulated coil; Teflon disc seat; stainless steel trim; spring-closing. One standard coil fits all Hansen valves. The valve can be installed in vertical lines.

INSTALLATION, THREADED CONNECTION

Match the arrow on the body with the system flow direction. Protect the interior of the valve from dirt during installation. Check mating pipe threads for cleanliness and accuracy before installing. Use a small quantity of pipe dope on pipe threads. Use a flat jaw wrench on the body close to the pipe, being careful not to damage the pipe threads with pipe wrench jaws. Allow 2.25" (57 mm) above the valve for coil removal.

ELECTRICAL

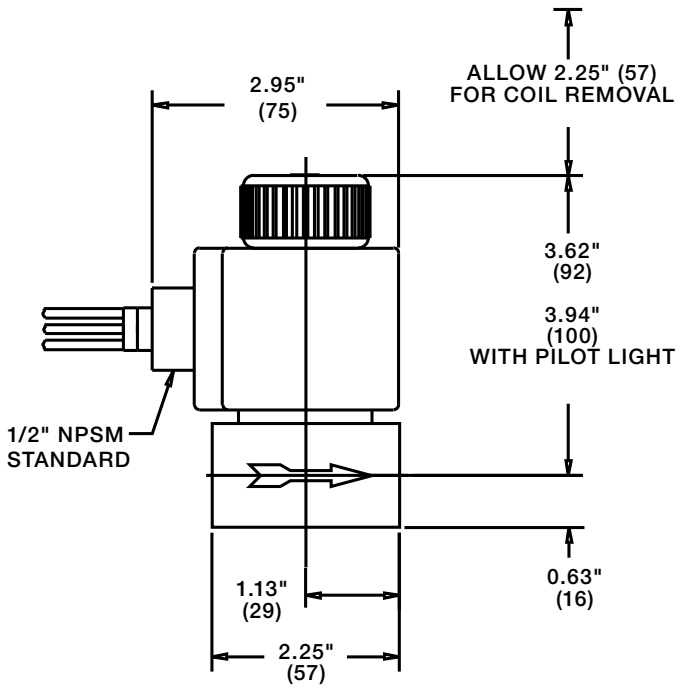
The coil draws 16 watts and will operate properly between 85% and 110% of the rated voltage (24V coil draws 19 watts). Standard coil connection is a 1/2" fitting (NPSM) for conduit, with two 18" wire leads plus ground wire. Coils with DIN plug or 1/2" NPSM quick disconnect plug are available. Contact the factory. All coils are totally encapsulated and meet NEMA 3R (rainproof) and NEMA 4 (splashproof, approx. IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from the valve before connecting any electrical conduit. Pilot lights are available.

Voltage	Frequency (Hertz)	Inrush Amps	Holding Amps	Resistance at Room Temperature (Ohms)
115 VAC	60	0.73	0.24	56 ± 6
	50	0.93	0.31	
208/230 VAC	60 (208V)	0.32	0.11	226 ± 23
	60 (240V)	0.41	0.14	
	50 (230V)	0.47	0.16	
24 VAC	60	3.42	1.14	2 ± .2
	50	4.56	1.52	
24 VDC	DC	1.20	1.20	20 ± 2

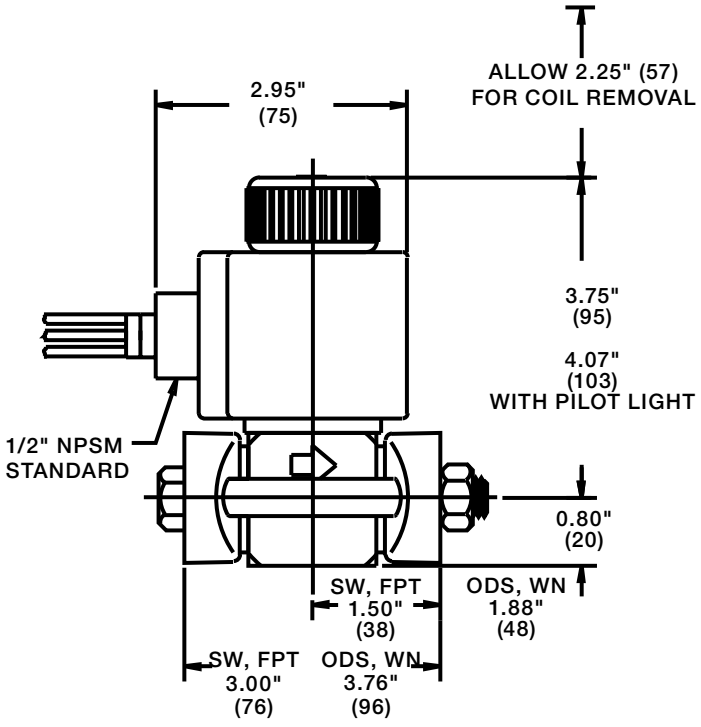
INSTALLATION DIMENSIONS

INCHES (MM)

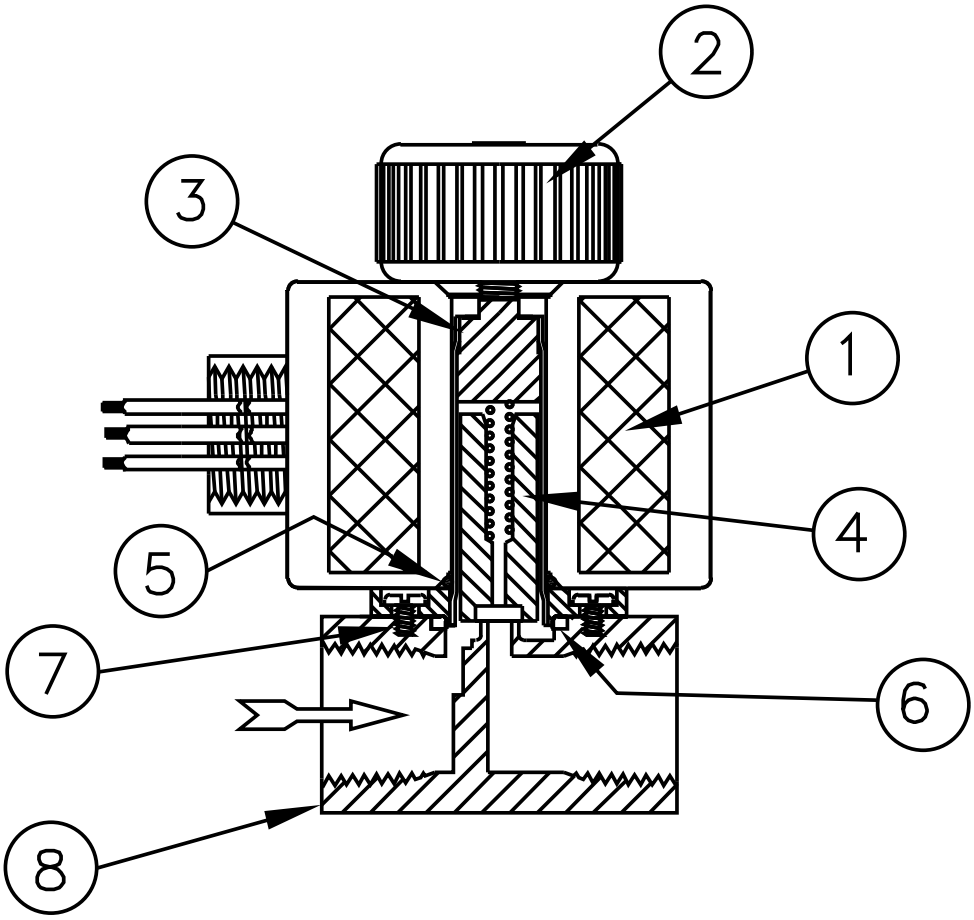
HS2



HS2F



PARTS LIST



ITEM	DESCRIPTION	QTY	PART NO.
1a	**Coil Kit (115V) 1/2" Fitting w/leads**	1	**70-1085**
1b	**Coil Kit (208/230V) 1/2" Fitting w/leads**	1	**70-1086**
1c	**Coil Kit (24V) 1/2" Fitting w/leads**	1	**70-1087**
1d	**Coil Kit (Other Voltages)**	1	**FACTORY**
	Above kits consist of:		
1	Bare Coil,	1	N/A
2	Coil Knob	1	70-0579
5	Coil O-Ring	1	70-0340
	Solenoid Tube/Plunger Kit	**1**	**70-1059**
	Above kits consist of:		
3	Solenoid Tube	1	70-0298
4	Plunger	1	70-0295
5	Coil O-Ring	1	75-0340
6	Solenoid Tube O-Ring	1	72-0066
7	Screws	4	70-0297

SERVICE AND MAINTENANCE

Failure to open: Wrong voltage coil; low line voltage; controlling switch or thermostat not contacting; coil is burned-out; inlet/outlet pressure differential too high; plunger jammed closed with dirt.

Failure to close: Controlling switch or thermostat not opening contacts; dirt under seat; eroded seat parts; plunger jammed upward by dirt.

Before opening the valve for service, be sure it is isolated from the system and all refrigerant is removed. Disconnect electrical power from the coil. Remove the coil by unscrewing the coil knob. Loosen the four solenoid tube screws sufficiently and break seal, proceeding cautiously to avoid any refrigerant still remaining inside. Remove the tube screws to separate the solenoid tube from the body.

Check face of Teflon seat in plunger, plunger spring, and seat orifice in body. Clean, polish, or replace parts as necessary. Always replace the solenoid tube when replacing the plunger. These are wear parts and must be inspected as part of a routine maintenance program. The seat orifice is integral with the body. Install a new solenoid tube gasket and oil lightly. Reassemble the solenoid tube to the body with four screws. Factory torque is 2 ft-lbs (2.8 Nm). Carefully check the valve for leaks before restoring to service.

CAUTION

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

WARRANTY

Hansen valves are guaranteed against defective materials or workmanship for one year FOB factory. No consequential damages or field labor is included.

ORDERING INFORMATION

MODEL	CONNECTIONS INCHES (MILLIMETERS)	
	STD	ALSO
HS2	1/2" (15) FPT	1/4" (7), 3/8" (10) FPT
HS2F	1/2" (15) FPT	1/4" (7), 3/8" (10) FPT 1/2" (15), 3/4" (20) SW,WN

FPT: Female Pipe Thread (American National Standard)
SW: Socket Weld to accomodate American and API pipe
WN: Weld Neck to match American Schedule 40 pipe

Standard molded solenoid coil is included for 50/60Hz 208/230, 115, or 24 volts; other voltages offered. Standard coil connection is a a 1/2" fitting (NPSM). Coils with DIN plug or 1/2" NPSM quick disconnect plug are available; specify when ordering. Pilot lights are available.

OPTIONAL BEACON PILOT LIGHTS

PILOT LIGHT KIT	
COLOR	PART NO.
Red	70-1100
Amber	70-1101
Green	70-1102

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

TO ORDER:

Specify type, connection type and size, and volts. Unless otherwise specified, standard coil with 1/2" connection will be supplied.

TYPICAL SPECIFICATIONS

"Refrigerant direct operating solenoid valves shall have encapsulated, watertight coils, Teflon seat, steel bodies, spring closing plunger, and be suitable for a safe working pressure of 400 psig (27 bar), model HS2 (HS2F) as manufactured by Hansen Technologies Corporation or approved equal."

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HANSEN TECHNOLOGIES

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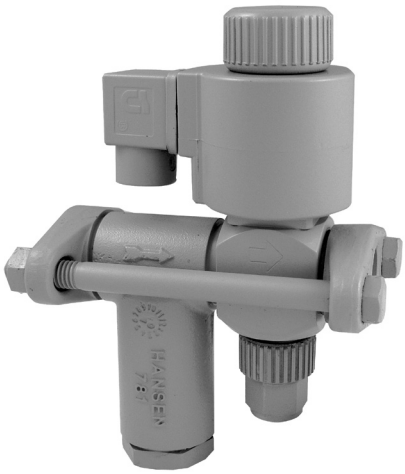


HS6 Solenoid Valve
with Close-Coupled ST050 Strainer

Specifications, Applications, Service Instructions & Parts

HS6
SOLENOID VALVE
5/32” (4 mm) PORT

Flanged
1/4” thru 3/4”
(7 mm thru 20 mm)
for refrigerants

C US CRN Canadian Registration

INTRODUCTION

This flanged, industrial refrigeration duty solenoid valve is very simple and compact but rugged in construction. Body is plated steel alloy with a direct lifting stainless steel plunger that contains a teflon seat that closes on a stainless steel orifice. When electrically energized, seat opens wide; when de-energized, it closes to stop flow in the arrow direction on the valve body.

APPLICATIONS

This small, direct lifting valve is used primarily as a pilot for various larger gas-powered or liquid powered main valves, as a remote pilot for back pressure regulators or other devices, or as a liquid stop valve for expansion valves, float valves, or as a general purpose pilot line for ammonia, R22, R134a, CO2 and other approved refrigerants or oil.

MAXIMUM RATINGS, AMMONIA

Liquid, Receiver Pressure: 15 Tons (52 kW)

Flow Factor: Cv=0.41 (Kv=0.35)

ADDITIONAL FEATURES

Encapsulated Hansen standard coil

300 psi (20 bar) MOPD

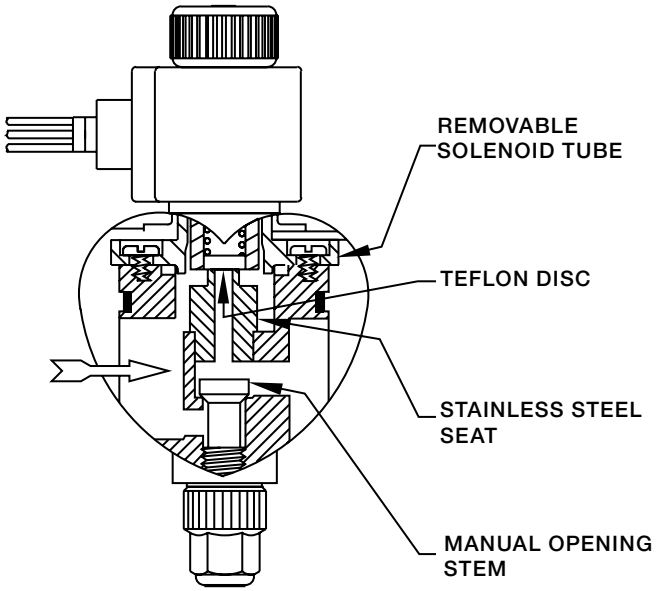
Available close-coupled strainer

Heavy-duty, direct lift

CSA Certified Status

Non-asbestos gaskets

KEY FEATURES



MATERIAL SPECIFICATIONS

Body: Steel, plated

Solenoid Tube: Stainless steel

Plunger: Stainless steel

Seat Orifice: Stainless steel

Seat: Teflon

Safe Working Pressure: 400 psig (27 bar),

600 psig (40 bar) available for CO2

Operating Temperature: -60°F to 240°F

(-50°C to 115°C)

ADVANTAGES

Power saving, low-wattage encapsulated coil; teflon seat; stainless steel trim; spring-closing; double-seal manual opening stem. One standard encapsulated coil fits all Hansen valves.

INSTALLATION

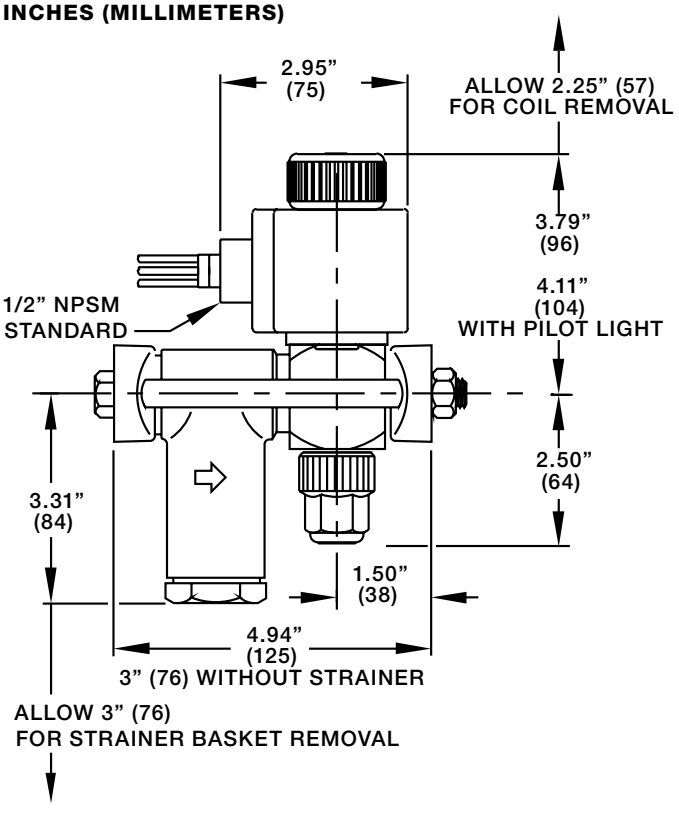
Match arrow on body with system flow direction. Protect interior of valve from dirt during installation; normally use close-coupled inlet strainer. Allow 2.25" (57 mm) above valve for coil removal, 1" (25 mm) below for seal cap removal, and 3" (76 mm) below strainer for screen removal. If a pressure reversal can occur, as during hot gas defrost with liquid recirculation, use a check valve on the outlet side of the HS6. 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.

ELECTRICAL

The coil draws 16 watts and will operate properly between 85% and 110% of rated voltage (24V coil draws 19 watts). Standard coil connection is a 1/2" fitting (NPSM) for conduit, with two 18" wire leads and ground wire. Coils with DIN plug or 1/2" NPSM quick disconnect plug are available. Contact the factory. All coils are totally encapsulated and meet NEMA 3R (rainproof) and NEMA 4 (splashproof, approx. IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from valve before connecting any electrical conduit. Pilot lights are available.

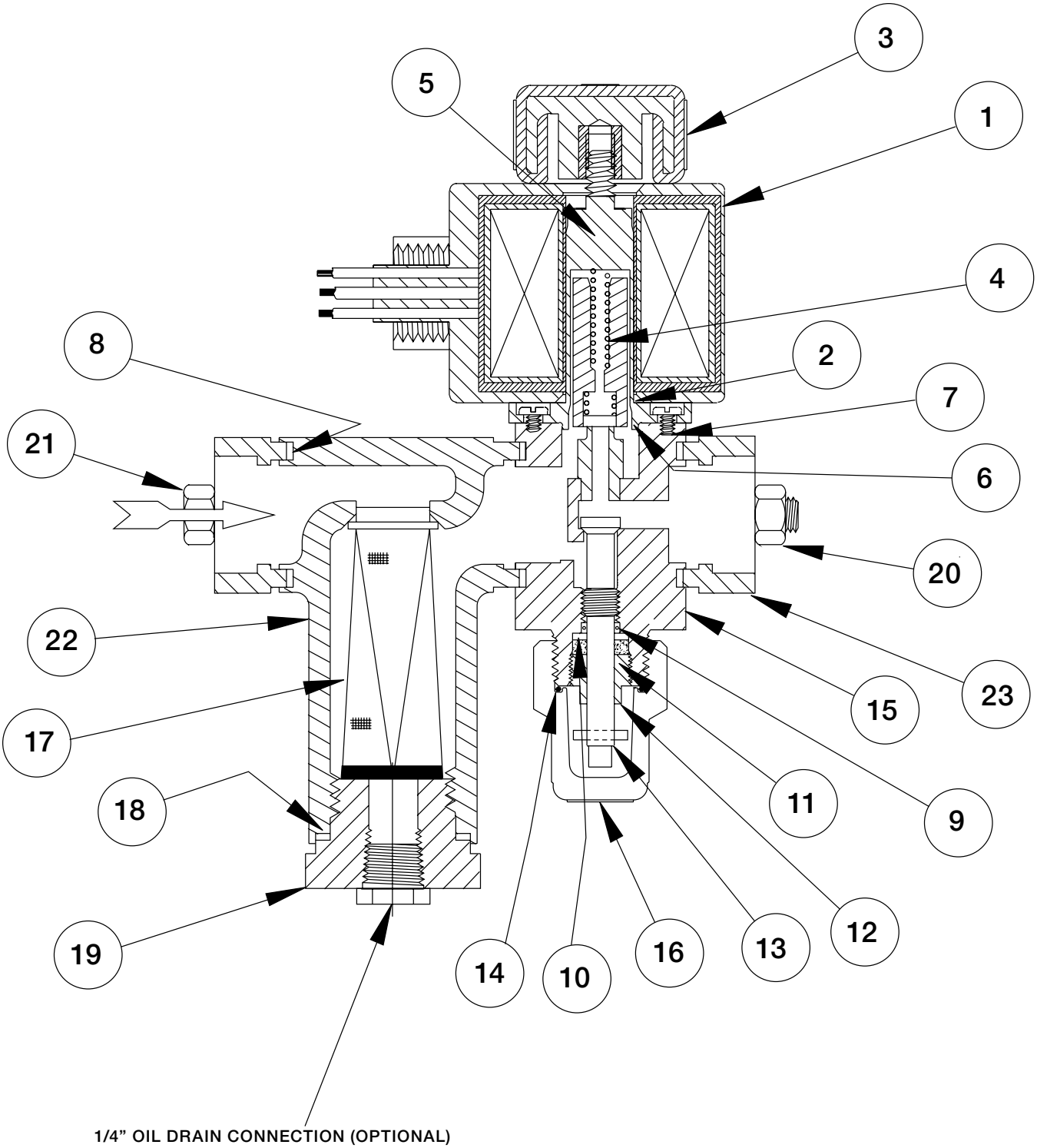
INSTALLATION DIMENSIONS

INCHES (MILLIMETERS)



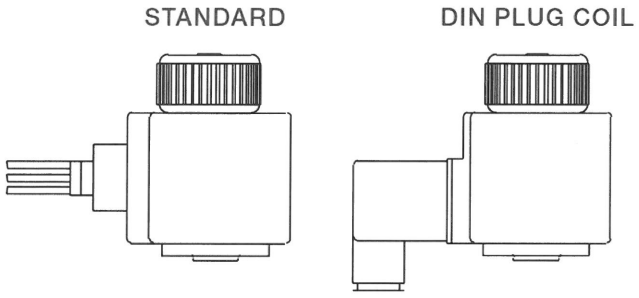
PARTS LIST

Item	Description	Qty	Part No.
1a	**Coil Kit (115V) 1/2" Fitting 18" w/leads**	**1**	**70-1085**
1b	**Coil Kit (208/230V) 1/2" Fitting w/leads**	**1**	**70-1086**
1c	**Coil Kit (24V) 1/2" Fitting w/leads**	**1**	**70-1087**
	Coil Kit (Other Voltages / Connections)		**FACTORY**
	Above kits consist of:		
1	Bare Coil	1	
3	Coil Knob	1	
2	Coil O-Ring	1	
	Solenoid Tube/Plunger Kit	**1**	**70-1059**
	Above kit consists of:		
5	Solenoid Tube	1	
4	Plunger	1	
6	Solenoid Tube O-Ring	1	
2	Coil O-Ring	1	
3	Coil Knob	1	
7	Screws	4	
	Gasket Kit	**1**	**70-1011**
	Above kit consists of:		
6	Solenoid Tube Gasket	1	
8	Flange Gasket	3	
9	Stem O-Ring	1	
10	Stem Washer	1	
11	Stem Packing	1	
12	Packing Nut	1	
13	Pin	1	
14	Seal Cap O-Ring	1	
	Seal Cap Kit	**1**	**70-1075**
	Above kit consists of:		
16	Seal Cap	1	
14	Seal Cap O-Ring	1	
	Strainer Screen Kit	**1**	**78-1001**
	Above kit consists of:		
17	Screen Assembly	1	
18	Strainer Cap O-Ring	1	
	Bolt and Nut Kit for HS6 less Strainer	**1**	**70-1006**
	Bolt and Nut Kit for HS6 with Strainer	**1**	**70-1007**
	Above kits consist of:		
20	Flange Nut (7/16" - 14")	2	
21a	Flange Bolt (less strainer) 3.75"	2	
21b	Flange Bolt (with strainer) 5.5"	2	
15	Body	1	
19	Strainer Cap	1	
22	1/2" Strainer	1	
23	Flanges		



1/4" OIL DRAIN CONNECTION (OPTIONAL)

Voltage	Frequency (Hertz)	Inrush Amps	Holding Amps	Resistance at Room Temperature (Ohms)
115 VAC	60	0.73	0.24	56 ± 6
	50	0.93	0.31	
208/230 VAC	60 (208V)	0.32	0.11	226 ± 23
	60 (240V)	0.41	0.14	
	50 (230V)	0.47	0.16	
24 VAC	60	3.42	1.14	2 ± .2
	50	4.56	1.52	
24 VDC	DC	1.20	1.20	20 ± 2



SERVICE AND MAINTENANCE

Failure to open: Wrong voltage coil; low line voltage; controlling switch or thermostat not contacting; coil is burned-out; inlet/outlet pressure differential too high; plunger is jammed closed with dirt.

Failure to close: Controlling switch or thermostat not opening contacts; manual opening stem is turned in; dirt under seat; eroded seat parts; plunger is jammed upward by dirt.

Before opening the valve for service, be sure it is isolated from the system and all refrigerant is removed. Disconnect electrical power from coil. Remove the coil by unscrewing the coil knob. Loosen the four solenoid tube screws and break gasket seal, proceeding cautiously to avoid any refrigerant still remaining inside the valve. Remove the tube screws to separate the solenoid tube from the body.

Check face of teflon seat in plunger, plunger spring, and seat orifice in body. Clean, polish or replace parts as necessary. Always replace the solenoid tube when replacing the plunger. These are wear parts and must be inspected as part of a routine maintenance program. The seat orifice is integral with the body. Install new solenoid tube gasket and oil lightly. Reassemble tube to body with four screws. Factory torque is 2 ft-lbs (2.8 Nm). Carefully check the valve for leaks before restoring to service.

CAUTION

Hansen valves are for refrigeration systems only. These instructions must be completely read and understood before selecting, using or servicing valves. Only knowledgeable, trained refrigeration mechanics should install, operate, or service these valves. Stated temperature and pressure limits should not be exceeded. Solenoid tubes should not be removed from valves unless system has been evacuated to zero pressure. See also the Safety Precautions in the current List Price and the 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.

ORDERING INFORMATION

Flange Connection Style & Sizes Inches (Millimeters)		
FPT, SW, WN		ODS
STD	ALSO	STD
1/2" (15)	1/4" (7) 3/8" (10) 3/4" (20)	5/8" (16)

FPT: Female Pipe Thread (American National Standard)
SW: Socket Weld to accommodate American and API pipe
WN: Weld Neck to match American Schedule 40 pipe
ODS: Outside Diameter Sweat, for copper tube size

Standard encapsulated solenoid coil is included for 50/60Hz 208/230, 115, or 24 volts; other voltages offered. Standard coil connection is a 1/2" fitting (NPSM). Coils with DIN plug or 1/2" NPSM quick disconnect plug are available; please specify when ordering. Pilot lights are also available.

OPTIONAL BEACON PILOT LIGHTS

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

TO ORDER:

Specify type, connection type and size, volts, and strainer if required. Unless otherwise specified, standard coil with 1/2" connection will be supplied.

Beacon Pilot Light Kits	
Color	Part No.
Red	70-1100
Amber	70-1101
Green	70-1102

TYPICAL SPECIFICATIONS

"Refrigerant solenoid valves shall have encapsulated, watertight coils, Teflon seats, steel or ductile iron bodies, spring closing pilot and main valve seats, and be 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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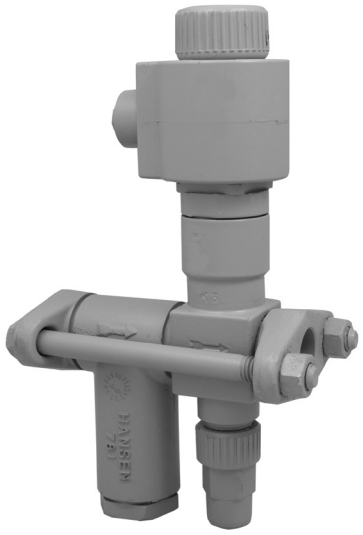
HANSEN TECHNOLOGIES

Bulletin S119f
DEC 2021

Specifications, Applications, Service Instructions & Parts

HS8A & HS8W SOLENOID VALVE 1/2” (13mm) PORT

3/8” thru 3/4” FPT, SW, WN, ODS for refrigerants



HS8A with Close-Coupled ST050 Strainer

C US CRN Canadian Registration

INTRODUCTION

This heavy-duty HS8 refrigeration solenoid valve is compact and pilot-operated. It is now more dirt resistant, erosion resistant, and corrosion resistant than other similar refrigerant valves. A dirt controlling Teflon piston seal helps prevent sticking. The valve body has improved, erosion resistant flow passages. The HS8 is used to provide on-off control of refrigerant flow. When the coil is energized, a pressure difference across the piston opens the valve seat. When the coil is de-energized, a spring closes the main Teflon seat to stop all flow.

APPLICATIONS

The HS8 is ideal as a liquid line solenoid valve. While primarily for ammonia, this valve is also suitable for R22, R134a, CO2 and other compatible refrigerants. The most common use of this valve is to control flow to: expansion devices, recirculating liquid overfeed evaporators, hot gas defrost, and small capacity evaporator suction. In addition, the HS8 makes an ideal noncondensible gas (air) purge point solenoid valve, and is recommended for use with Hansen AUTO-PURGER.

MAXIMUM RATINGS, AMMONIA

Liquid, Receiver Pressure: 110 Tons (387 kW)

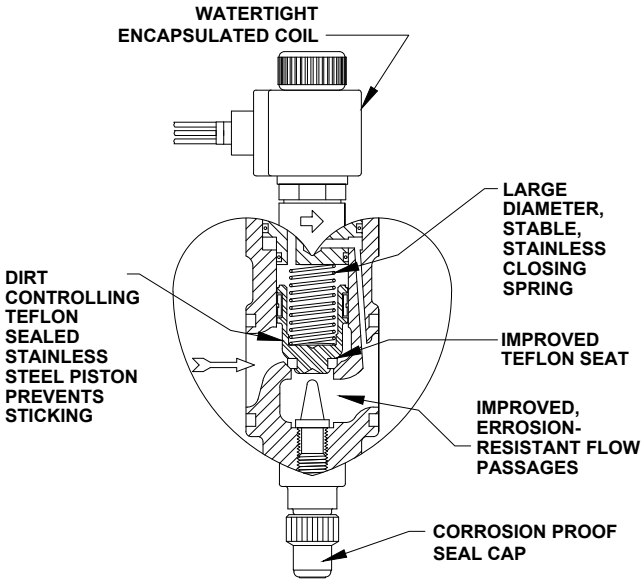
Recirculation, 4 to 1: 36 Tons (127 kW)

Hot Gas: 10 Tons (35 kW)

Suction: 5.0 Tons (18 kW)

Flow Factor: Cv = 3.3 (2.9 Kv)

KEY FEATURES



ADDITIONAL FEATURES

Low-wattage coil

300 psi (20 bar) MOPD, 500 psi (34 bar) for CO2

Teflon main & pilot seats

Close-couples to ST050 (100 mesh) strainer or HS8W integral strainer

Heavy-duty construction

CSA certified status

Wireless pilot lights (see page 2)

Replaceable Seat (HS8W)

MATERIAL SPECIFICATIONS

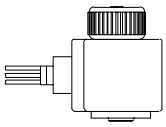
Body: HS8A - Cast ductile iron, corrosion-resistant coated
HS8W - Cast Steel, ASTM 32, grade LCB, painted
Bonnet Cartridge: Steel, plated
Piston: Stainless steel, Teflon seal
Plunger: Stainless steel
Pilot Orifice: Stainless Steel
Seats: Teflon, pilot and main
Valve Seats: HS8A - Integral, Ductile Iron
HS8W - Replaceable 303 Stainless steel
MOPD: 300 psi (20 bar) AC coils only
500 psi (34 bar) available
Safe Working Pressure: 400 psig (28 bar)
600 psig (42 bar) for CO2
Operating Temperature: -60°F to +240°F (-50°C to +115°C)

ELECTRICAL

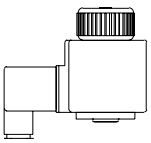
The coil draws 16 watts and will operate properly between 85% and 110% of rated voltage (24V coil draws 19 watts). Standard coil connection is a 1/2" fitting (NPSM) for conduit, with two 18" wire leads and ground wire. Coils with DIN plug or 1/2" NPSM quick disconnect plug are available. Contact the factory. All coils are totally encapsulated and meet NEMA 3R (rainproof) and NEMA 4 (splash proof, approx. IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from valve before connecting any electrical conduit. Pilot lights are available.

COIL OPTIONS

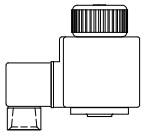
STANDARD



DIN PLUG COIL



QUICK DISCONNECT COIL



Voltage	Frequency (Hertz)	Inrush Amps	Holding Amps	Resistance at Room Temperature (Ohms)
115VAC	60	0.73	0.24	56± 6
	50	0.93	0.31	
208/230VAC	60 (208V)	0.32	0.11	226± 23
	60 (240V)	0.41	0.14	
	50 (230V)	0.47	0.16	
24VAC	60	3.42	1.14	2± .2
	50	4.56	1.52	
24VDC	DC	1.2	1.2	20± 2

OPTIONAL BEACON PILOT LIGHTS

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

Beacon Pilot Light Kits	
Color	Part No.
Red	70-1100
Amber	70-1101
Green	70-1102

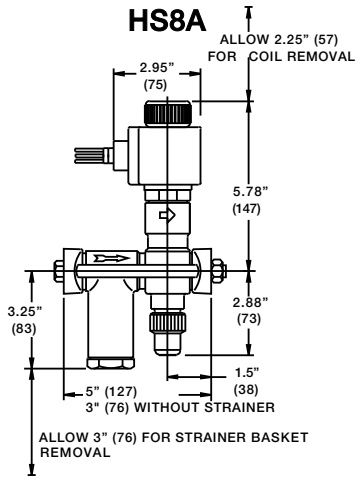
INSTALLATION

Protect the interior of the valve from dirt before and during installation. A close-coupled inlet strainer is normally installed and recommended. Allow 2.25" (57 mm) above the valve for coil removal and 3" (76 mm) below the strainer for screen removal. The arrow on the valve body must point in the direction of system flow. If a pressure reversal can occur use a check valve on the outlet side of the HS8A. The check valve can be close coupled directly to the HS8A outlet. 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. During welding, the manual opening stem should be opened upward several turns to protect the Teflon seat from weld heat.

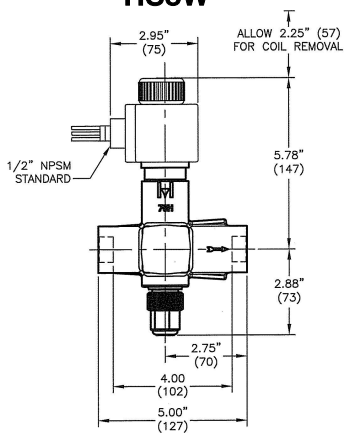
INSTALLATION DIMENSIONS

INCHES (MILLIMETERS)

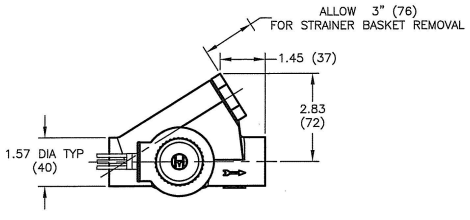
HS8A



HS8W



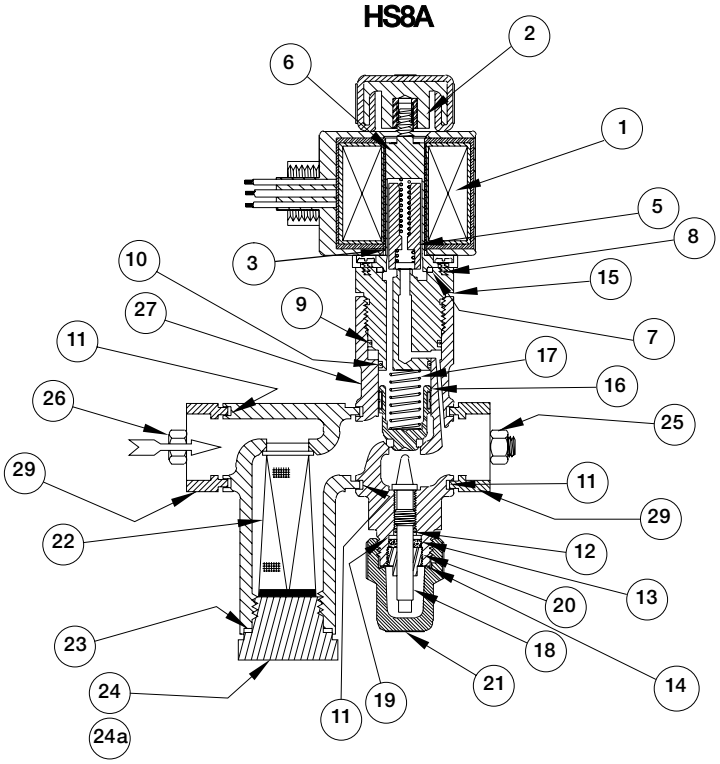
HS8W TOP VIEW



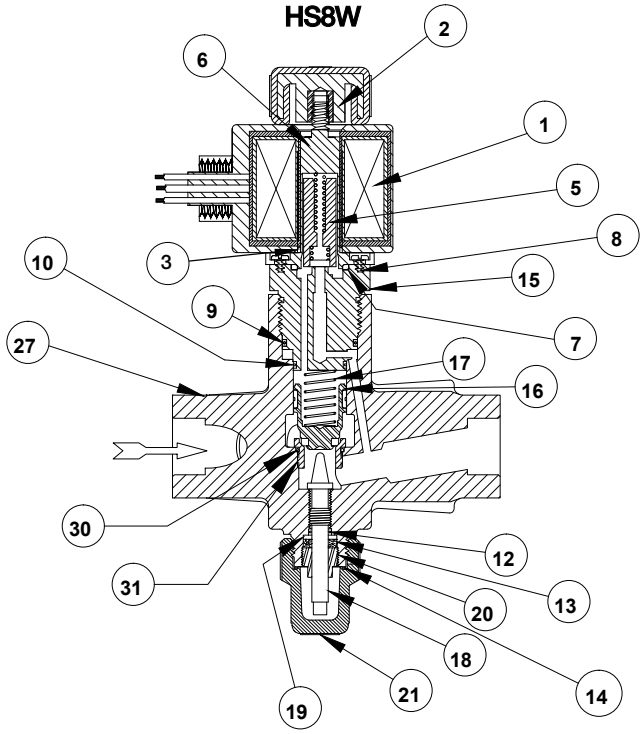
PARTS LIST

Item	Description	Qty	Part No.
1a	**Coil Kit (115V) 1/2" Fitting w/leads Coil Kit**	**1**	**70-1085**
1b	**(208/230V) 1/2" Fitting w/leads Coil Kit**	**1**	**70-1086**
1c	**(24V) 1/2" Fitting w/leads**	**1**	**70-1087**
	Coil Kit (Other Voltages / Connections)		**FACTORY**
	Above kits consist of:		
1	Bare Coil	1	
2	Coil Knob	1	
3	Coil O-Ring	1	
	Solenoid Tube/Plunger Kit	**1**	**70-1059**
	Above kit consists of:		
5	Plunger	1	
6	Solenoid Tube	1	
7	Solenoid Tube O-Ring	1	
8	Tube Screws	4	
2	Coil Knob	1	
3	Coil O-ring	1	
	Gasket Kit	**1**	**70-1005**
	Above kit consists of:		
7	Solenoid Tube O-Ring	1	
9	Upper Body O-Ring	1	
10	Lower Body O-Ring	1	
11	Flange Gasket Stem	3	
12	O-Ring Packing	1	
13	Packing	1	
14	Seal Cap O-Ring	1	
19	Packing Washer	1	
20	Packing Nut	1	
31	Seat O-Ring	1	
3	Coil O-Ring	1	
	Bonnet Cartridge Kit	**1**	**70-1001**
	Above kit consists of:		
15	Cartridge Assembly	1	
	Gasket Kit	1	
	Solenoid Tube/Plunger Kit	1	
	Piston Assembly Kit	**1**	**70-1002**
	Above kit consists of:		
16	Piston Assembly	1	
17	Closing Spring	1	
	Gasket Kit	1	
	Seat Kit (HS8W Only)	**1**	**70-1302**
	Above kit consists of:		
30	Seat Ring	1	
	Removal Tool	1	
	Seal Cap Kit	**1**	**70-1075**
	Above kit consists of:		
21	Seal Cap	1	
14	Seal Cap O-Ring	1	
	Strainer Screen Kit	**1**	**78-1001**
	Above kit consists of:		
22	Screen Assembly, 100 mesh	1	
23	Strainer Cap Gasket	1	
	Bolt and Nut Kit		
	For HS8A less Strainer (a)		**78-1006**
	For HS8A with Strainer (b)		**78-1007**
	Above kits consist of:		
25	Nut, 7/16-14	2	
26a	Bolt, 7/16-14x3 3/4	2	
26b	Bolt, 7/16-14x5 1/2	2	
18	Stem	1	
24	Strainer Cap	1	
27	Body	1	
29	Flanges	2	

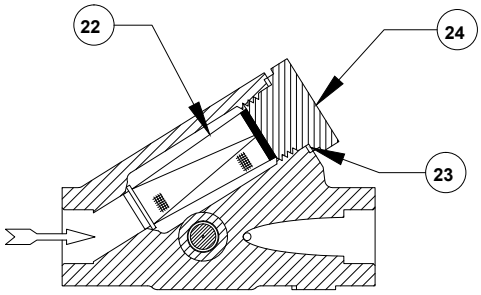
HS8A



HS8W



HS8W TOP VIEW



SERVICE AND MAINTENANCE

Failure to open: Wrong coil voltage; low line voltage; electric controlling device is not switching; coil is burned-out; inlet/outlet pressure differential is too high; piston or solenoid coil plunger is jammed closed with dirt.

Failure to close: Electric controlling device is not switching; manual-opening stem is turned in; piston or solenoid coil plunger is jammed open by dirt; damage or dirt at main valve seat or pilot valve seat.

Before opening the valve for service, be sure it is isolated from the system and all refrigerant is removed. Disconnect electrical power from coil. Remove the coils by unscrewing the coil knob. To remove internal parts, use a large wrench to slowly unscrew the bonnet cartridge (15), proceeding cautiously to detect any remaining refrigerant inside the valve. Then, remove the closing spring (17) and piston (16). Check for dirt on the piston (16), Teflon piston seal, and seat. Clean and reinstall or install new parts. Check the upper (9) and lower (10) body O-rings and replace if necessary. Use refrigerant oil or grease when installing the O-rings.

To check the pilot section of the valve, first loosen the four solenoid tube screws (8). Then, break the seal between the solenoid tube (6) and bonnet cartridge (15), being careful to avoid any refrigerant which may remain. Check the face of the Teflon seat in the plunger (5), the plunger spring, and the pilot seat orifice on the bonnet cartridge (15). Clean or replace parts as necessary. The pilot seat is integral with the bonnet cartridge. Install a new solenoid tube gasket (7) and oil lightly. Reassemble the bonnet cartridge (15) to the valve body (27), using 75 ft-lbs (102 N-m) torque to tighten the secondary, metal, knife-edge seal. Carefully check the valve for leaks before restoring to service.

CAUTION

Hansen valves are for refrigeration systems only. These instructions must be read completely and understood before selecting, using, or servicing these valves. Only knowledgeable, trained refrigeration technicians 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 the system has been evacuated to zero pressure. See also Safety Precautions in the current List Price Bulletin and the Safety Precautions sheet supplied with product. Escaping refrigerant can cause injury, especially 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.

ORDERING INFORMATION

Connection Style & Sizes Inches (Millimeters)			
	FPT, SW, WN		ODS
STYLE	STD	ALSO	STD
HS8A	1/2" (13)	3/4" (20) 3/8" (10)	5/8" (16)
HS8W	1/2" (13)	3/4" (20) 1" (25) BW	5/8" (16) 7/8" (22) 1-1/8" (28)

FPT: Female Pipe Thread (American National Standard)
SW: Socket Weld to accommodate American and API pipe
WN: Weld Neck to match American pipe
ODS: Outside Diameter Sweat, for American copper tubes

Standard encapsulated solenoid coil is included for 50/60Hz 208/230, 115, or 24 volts; other voltages offered. Standard coil connection is a 1/2" fitting (NPSM). Coils with DIN plug or 1/2" NPSM quick disconnect plug are available; please specify when ordering. Pilot lights are also available.

TO ORDER

Specify type, connection type and size, volts, and strainer if required. Unless otherwise specified, standard coil with 1/2" connection will be supplied.

TYPICAL SPECIFICATIONS

"Refrigerant solenoid valves shall have encapsulated, watertight coils, Teflon seats, steel or ductile iron bodies, spring closing pilot and main valve seats, and be suitable for a safe working pressure of 400 psig (28 bar), as manufactured by Hansen Technologies Corporation or approved equal."

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HANSEN TECHNOLOGIES

Bulletin S121c
NOV 2019

Specifications, Applications, Service Instructions & Parts

HS7 SOLENOID VALVE 3/4", 1", 1-1/4" PORT (20, 25, 32 mm)

Flanged 3/4" thru 1 1/4" FPT, SW, WN, ODS for refrigerants

HS7 Solenoid Valve

INTRODUCTION

This flanged, heavy duty, pilot-operated, industrial refrigeration solenoid valve controls the flow of refrigerant. When electrically energized, a slight pressure difference across the valve causes it to open wide; when de-energized, a spring promptly closes the main Teflon seat to stop all flow in the arrow direction on the valve body.

APPLICATIONS

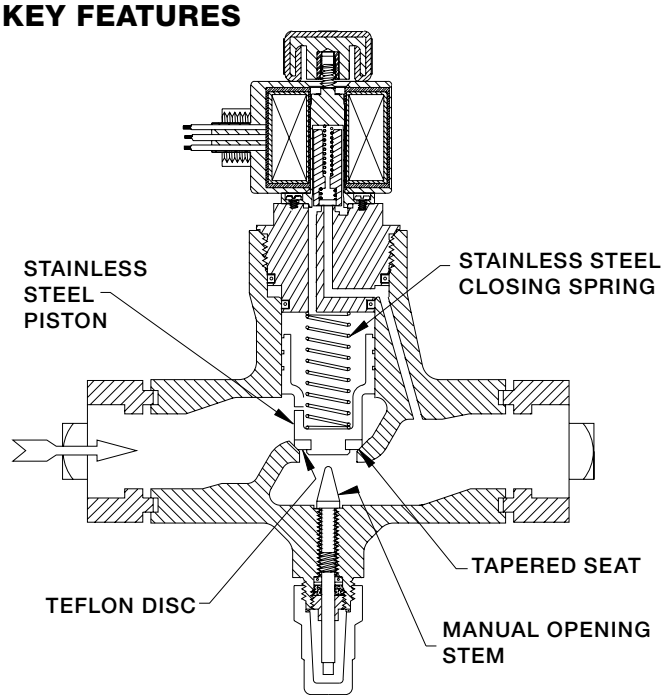
This advanced design valve is ideal as a standard, stock, ammonia liquid line solenoid valve. While primarily for ammonia, this valve is also suitable for R22, R134a, CO2 and other approved refrigerants. Most common use is to automatically stop liquid line feed to recirculating liquid overfeed evaporators, to float switch controlled accumulators, and to thermal expansion valves; it is also suitable for hot gas defrost, and evaporator suction. (Note: for gravity liquid drain or equalization applications use low pressure drop HCK2 gas-powered suction stop valve or HS9B gas-powered solenoid valve.)

MAXIMUM RATINGS, AMMONIA†

PORT SIZE	3/4" (20mm)	1" (25mm)	1 1/4" (32mm)
Liquid, Receiver Pressure Tons (kW), .2 bar Δ P	200 (765)	263 (983)	400 (1530)
Recirculation, 4 to 1 Tons (kW), .2 bar Δ P	45 (228)	63 (293)	90 (455)
Hot Gas, for 0°F Tons (kW)	21 (73)	27 (94)	40 (140)
Suction, 2 psi drop at 20°F Tons (kW), .15 drop at -7°C	12 (42)	16 (56)	24 (84)
Flow Factor Cv (Kv)	8.0 (7.0)	10.5 (9.0)	16.3 (14)

† For flow near maximum ratings, piping should be one size larger than port.

KEY FEATURES



ADDITIONAL FEATURES

- Encapsulated Hansen standard coil
- 300 psi (20 bar) MOPD, 500 psi (34 bar) for CO2
- Teflon main & pilot seats
- Manual opening stem
- Available close-coupled strainer
- Heavy duty, pilot-operation
- Vertical or horizontal installation
- CSA Certified Status
- Non-asbestos gaskets
- Wireless pilot lights
- CE Available

MATERIAL SPECIFICATIONS

Body: Ductile iron (Nodular Iron GGG-40)
Bonnet-Cartridge: Steel, plated
Piston: Stainless steel
Plunger: Stainless steel
Solenoid Tube: Stainless steel
Pilot Orifice: Stainless steel
Seat: Teflon
Safe Working Pressure: 400 psig (27 bar) 600 psig (41 bar) for CO2
Operating Temperature: –60°F to +240°F
(–50°C to +115°C)

ADVANTAGES

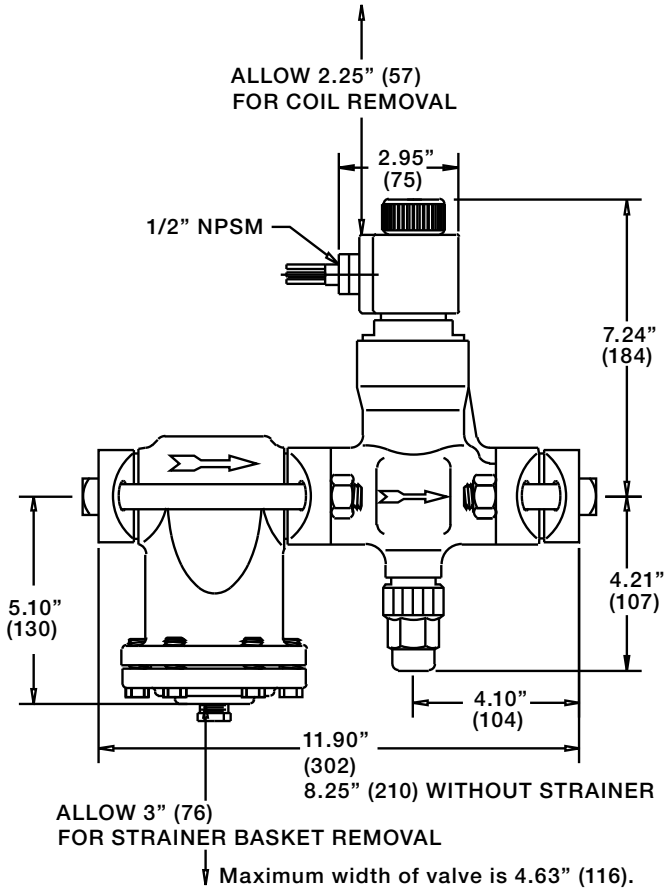
Power saving, low-wattage molded coil; Teflon seats; stainless steel trim including piston; spring-closing; double seal manual opening stem. One standard molded coil fits all Hansen valves.

INSTALLATION

Protect interior of valve from dirt during installation; normally use close-coupled inlet strainer. Allow 2.25" (57mm) above valve for coil removal, 3" (76 mm) below strainer for screen removal. Match arrow on body with system flow direction. If a pressure reversal can occur, as during hot gas defrost with liquid recirculation, use a check valve on the outlet side of the HS7. 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.

INSTALLATION DIMENSIONS

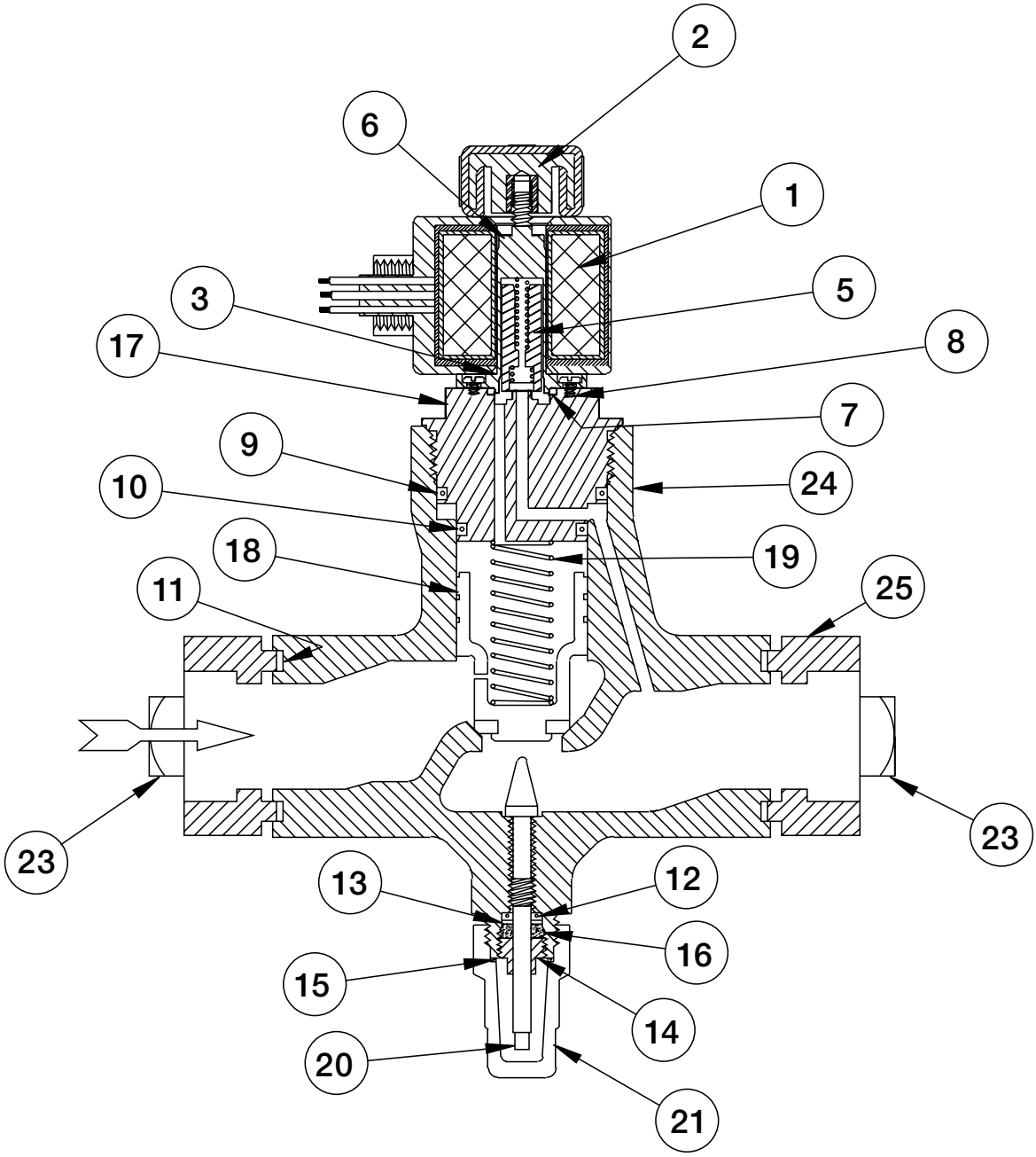
INCHES (MILLIMETERS)



Maximum width of valve is 4.63" (116).

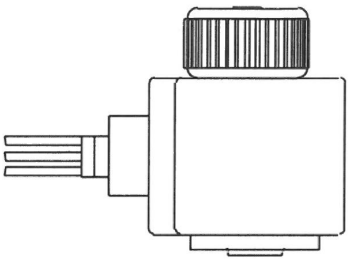
PARTS LIST

Item	Description	Qty	Part No.
1a	**Coil Kit (115V) 1/2" Fitting w/leads Coil**	**1**	**70-1085**
1b	**Kit (208/230V) 1/2" Fitting w/leads Coil**	**1**	**70-1086**
1c	**Kit (24V) 1/2" Fitting w/leads**	**1**	**70-1087**
	Coil Kit (Other Voltages / Connections)		**FACTORY**
	Above kits consist of:		
1	Bare Coil	1	
2	Coil Knob	1	
3	Coil O-Ring	1	
	Solenoid Tue/Plunger Kit	**1**	**70-1059**
	Above kit consists of:		
5	Plunger	1	
6	Solenoid Tube	1	
7	Solenoid Tube O-Ring	1	
8	Tube Screws	4	
2	Coil Knob	1	
3	Coil O-Ring	1	
	Gasket Kit	**1**	**70-1017**
	Above kit consists of:		
7	Solenoid Tube O-Ring	1	
9	Upper Body O-Ring	1	
10	Lower Body O-Ring	1	
11	Flange Gasket Stem	3	
12	O-Ring	1	
13	Stem Washer	1	
14	Packing Nut	1	
16	Stem Packing	1	
15	Seal Cap O-Ring	1	
	Bonnet Cartridge Kit	**1**	**70-1018**
	Above kit consists of:		
17	Cartridge Assembly	1	
	Gasket Kit	1	
	Solenoid Tube/Plunger Kit	1	
	Piston Assembly Kit 3/4"	**1**	**70-1019**
	Piston Assembly Kit 1"	**1**	**70-1020**
	Piston Assembly Kit 1 1/4"	**1**	**70-1021**
	Above kits consist of:		
18a	Piston Assembly 3/4"	1	
18b	Piston Assembly 1"	1	
18c	Piston Assembly 1 1/4"	1	
19	Closing Spring	1	
9	Upper Body O-Ring	1	
10	Lower Body O-Ring	1	
	Stem Kit	**1**	**70-1022**
	Above kit consists of:		
20	Stem	1	
	Gasket Kit	1	
	Seal Cap Kit	**1**	**70-1023**
	Above kit consists of:		
21	Seal Cap	1	
15	Seal Cap O-Ring	1	
	Bolt and Nut Kit		
	For HS7 less Strainer (a)		**70-1024**
	For HS7 with Strainer (b)		**70-1025**
	Above kits consist of:		
22	Nut	4	
23a	Bolt (less Strainer) 2.75"	4	
23b	Bolt (with Strainer) 2.75"	2	
23b	Bolt (with Strainer) 6.5"	2	
20	Stem	1	
24	Body	1	
25	Flanges	2	

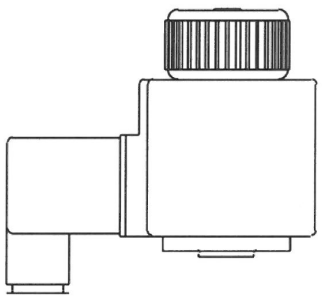


Voltage	Frequency (Hertz)	Inrush Amps	Holding Amps	Resistance at Room Temperature (Ohms)
115 VAC	60	0.73	0.24	56 ± 6
	50	0.93	0.31	
208/230 VAC	60 (208V)	0.32	0.11	226 ± 23
	60 (240V)	0.41	0.14	
	50 (230V)	0.47	0.16	
24 VAC	60	3.42	1.14	2 ± .2
	50	4.56	1.52	
24 VDC	DC	1.20	1.20	20 ± 2

STANDARD



DIN PLUG COIL



ELECTRICAL

The coil draws 16 watts and will operate properly between 85% and 110% of rated voltage (24V coil draws 19 watts). Standard coil connection is a 1/2" fitting (NPSM) for conduit, with two 18" wire leads and ground wire. Coils with DIN plug or 1/2" NPSM quick disconnect plug are available. Contact the factory. All coils are totally encapsulated and meet NEMA 3R (rainproof) and NEMA 4 (splashproof, approx. IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from valve before connecting any electrical conduit. Pilot lights are available.

SERVICE AND MAINTENANCE

Failure to open: wrong voltage coil; low line voltage; controlling switch or thermostat not contacting; coil is burned-out; inlet/outlet pressure differential too high; less than 2 psi (0.14 bar) pressure drop across valve; piston or plunger is jammed closed with dirt.

Failure to close: controlling switch or thermostat not opening contacts; manual opening stem is turned in; piston or plunger is jammed upward by dirt; damage or dirt at main valve seat or pilot valve seat.

Before opening the valve for service, be sure it is isolated from the system and all refrigerant is removed. Disconnect electrical power from coil. Remove the coil by unscrewing the coil knob. Use a large wrench to unscrew the bonnet-cartridge proceeding cautiously to avoid any refrigerant still remaining inside the valve. Remove closing spring and piston. Check for dirt on piston or seat. Polish with fine emery cloth and replace or else install new parts. Check and replace bonnet-cartridge O-rings if necessary, using refrigerant oil or grease.

To check pilot section of valve, loosen four solenoid tube screws, break seal between solenoid tube and bonnet-cartridge; being careful to avoid any refrigerant which may remain. Check face of Teflon seat in plunger, plunger spring, and pilot seat orifice on bonnet-cartridge. Clean, polish or replace parts as necessary. Always replace plunger and solenoid tube as a set. Pilot seat is integral with bonnet-cartridge. Install new solenoid tube gasket and oil lightly. Reassemble bonnet-cartridge to valve body, using 75 foot-pounds torque to tighten secondary, metal, knife edge seal. Carefully check the valve for leaks before restoring to service.

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.

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.

ORDERING INFORMATION

Flange Connection Style & Sizes Inches (Millimeters)		
FPT, SW, WN		ODS
STD	ALSO	STD
3/4" (20)	1" (25) 1 1/4" (32)	7/8" (22)
1" (25)	3/4" (20) 1 1/4" (32)	1 1/8" (28)
1 1/4" (32)	3/4" (20) 1" (25)	1 3/8" (35)

FPT: Female Pipe Thread (American National Standard)
SW: Socket Weld to accommodate American and API pipe
WN: Weld Neck to match American Schedule 40 pipe
ODS: Outside Diameter Sweat, for copper tube size

Standard encapsulated solenoid coil is included for 50/60Hz 208/230, 115, or 24 volts; other voltages offered. Standard coil connection is a 1/2" fitting (NPSM). Coils with DIN plug or 1/2" NPSM quick disconnect plug are available; please specify when ordering. Pilot lights are also available.

OPTIONAL BEACON PILOT LIGHTS

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

Beacon Pilot Light Kits	
Color	Part No.
Red	70-1100
Amber	70-1101
Green	70-1102

TO ORDER:

Specify type, connection type and size, volts, and strainer if required. Unless otherwise specified, standard coil with 1/2" connection will be supplied.

TYPICAL SPECIFICATIONS

"Refrigerant solenoid valves shall have encapsulated, watertight coils, Teflon seats, steel or ductile iron bodies, spring closing pilot and main valve seats, and be suitable for a safe working pressure of 400 psig (27 bar), as manufactured by Hansen Technologies Corporation or approved equal."

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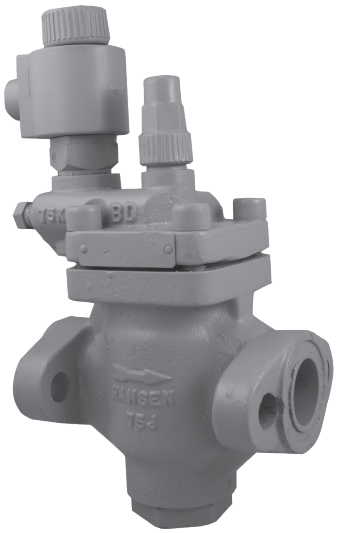
HANSEN TECHNOLOGIES

Bulletin S429c
NOV 2019

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**



1 1/4" (32 mm) HS4A Solenoid Valve

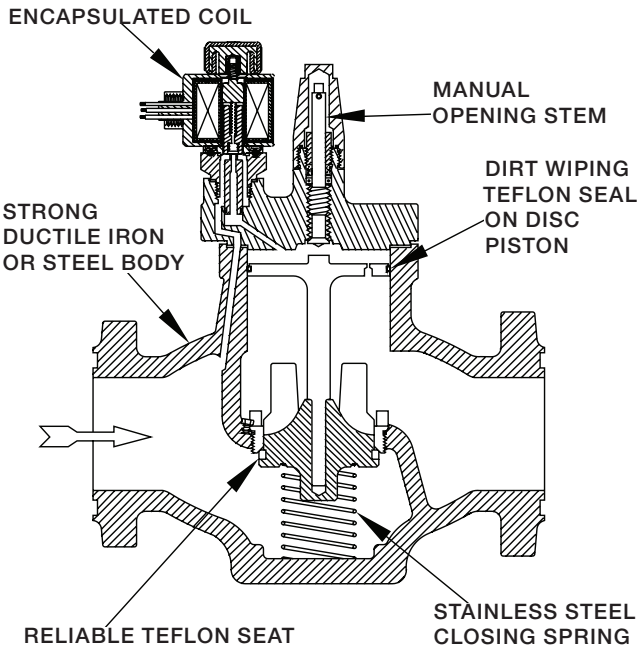
INTRODUCTION

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, CO2 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.)

KEY FEATURES



ADDITIONAL FEATURES

Tolerant of dry systems
Teflon main & pilot seats
Encapsulated Hansen standard coil
Heavy duty, pilot operation
300 psi MOPD (20.7 bar), 500 psi (34 bar) for CO2
Simple serviceable design
Available close-coupled strainer/check valve
Non-asbestos gaskets
CSA certified status
CE available for 1¼" (32mm) and larger
Wireless pilot lights

MATERIAL SPECIFICATIONS

Body:

¾"-4" (20–100mm): Ductile iron, ASTM A536

5" & 6" (125 & 150mm): Cast steel, ASTM A352 LCB

Adapter: Ductile iron, ASTM A536

Piston: Steel, disc type, spring energized teflon seal

V-Port/Seat:

¾"-1¼" (20-32mm): Steel, plated, with teflon seat

1½"-6" (40-150mm): Ductile iron with teflon seat

Main Seat:

¾"-1¼" (20-32mm): Integral ductile iron

1½"-6" (40-150mm): 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 (20 bar), 500 psi (34 bar) for CO2

Safe Working Pressure: 400 psig (27 bar), 600 psig (40 bar) for CO2

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 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.

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.

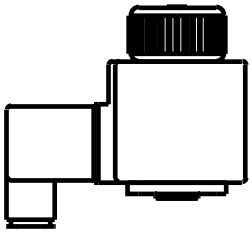
Valves in 5" and 6" size are Type HS4W with integral butt weld end only. These steel bodied solenoid valves are directly welded into the pipe line. During welding, the manual opening stem should be opened downward several turns to protect the teflon seat from weld heat.

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.

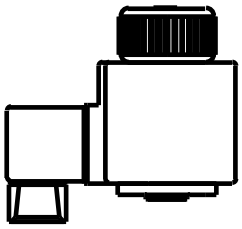
ELECTRICAL

The coils draw 16 watts and will operate properly between 85% and 110% of rated voltage (24V coil draws 19 watts). Standard coil connection is a 1/2" fitting (NPSM) for conduit, with two 18" wire leads and ground wire. Coils with DIN plug or 1/2" NPSM quick disconnect plug are available. Contact the factory. All coils are totally encapsulated and meet NEMA 3R (rainproof) and NEMA 4 (splashproof, approx. IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from valve before connecting any electrical conduit. Wireless pilot lights are available.

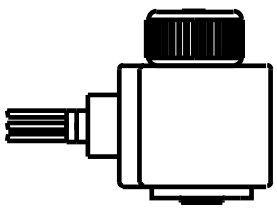
COIL OPTIONS AVAILABLE



DIN PLUG COIL



QUICK DISCONNECT COIL



STANDARD COIL

LIQUID CAPACITIES (TONS)

Port Size Inches (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 Inches (Millimeters)		Cv (Kv)		Pressure Drop Across Valve	R717				R22			
					Evaporating Temperature				Evaporating Temperature			
					-20°F† (-28°C)	0°F (-17.8°C)	+20°F (-6.7°F)	+40°F (4.4°C)	-20°F† (-28.9°C)	0°F (-17.8°C)	+20°F (-6.7°F)	+40°F (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	478	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 m3/hr of water at 1 bar differential.

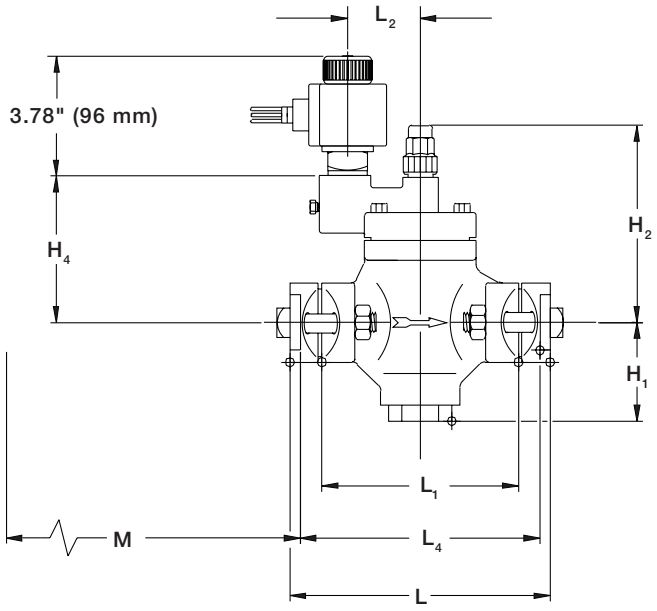
†–20°F (–28°C) capacities are based on a two stage system. For suction closure at temperatures below 0°F (–18°C) alternate low pressure drop valves are preferably used such as Hansen Gas-Powered Suction Stop Valve Type HCK2 or Gas-Powered Solenoid Valve Type HS9B.

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%).

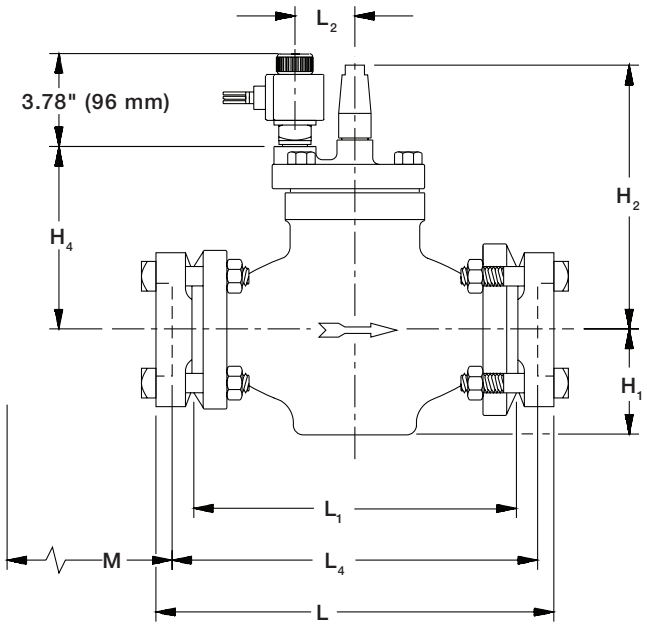
For liquid overfeed evaporator suction between normal 2:1 to 5:1 rate, add 20% to the evaporator load or use the next larger port size to accommodate liquid volume accompanying the suction gas and to reduce impact velocities.

INSTALLATION DIMENSIONS

3/4" THRU 1 1/4" (20 THRU 32 MM)



1 1/2" THRU 4" (40 THRU 100 MM)



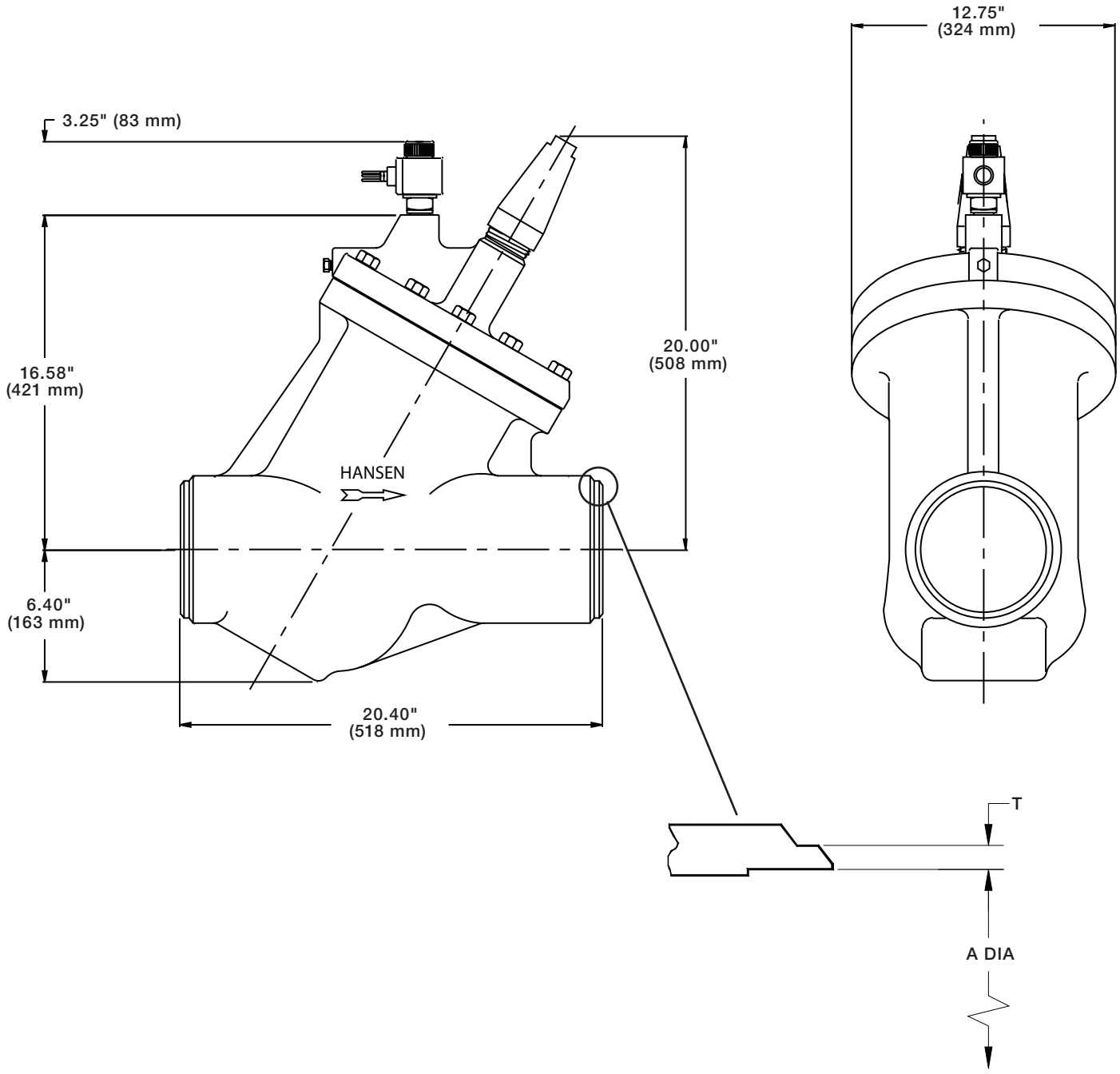
M = ADDITIONAL LENGTH FOR CLOSE-COUPLED STRAINER

Port Size Inches (mm)	H1	H2	H4	L		L1	L2	L4	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 valves.

† Alternate special 1 1/4" 4-bolt version is available to replace existing 4-bolt flanged valves.

INSTALLATION DIMENSIONS 5" AND 6" (125 AND 150 MM)



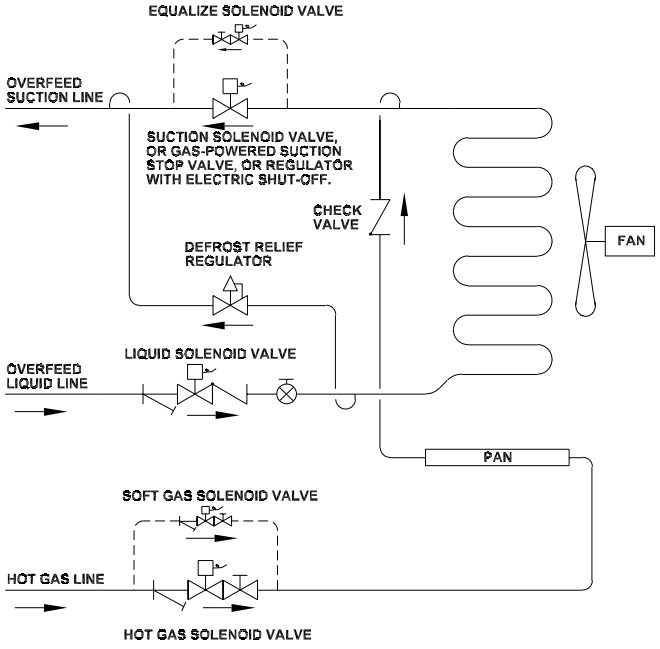
WELD END DIMENSIONS

Port Size Inches (mm)	A	T
5" (125)	5.05" (128)	0.26" (6.6)
6" (150)	6.06" (154)	0.28" (7.1)

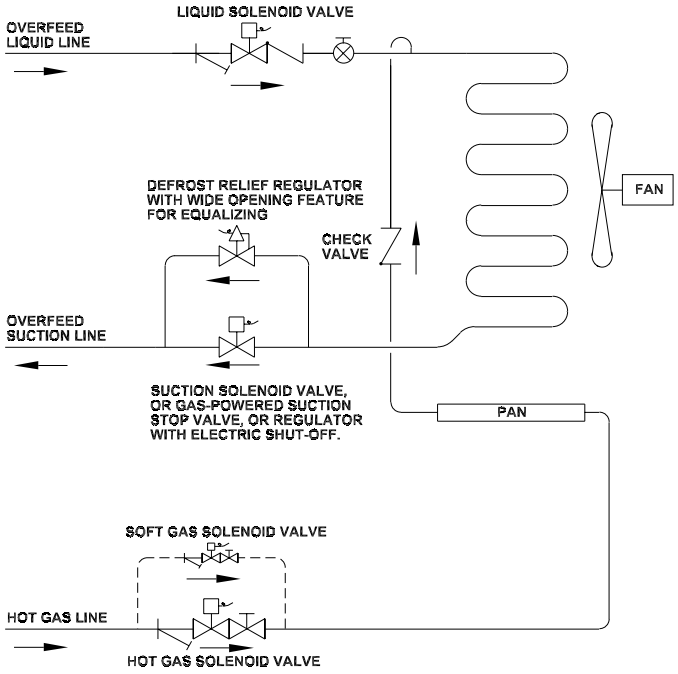
TYPICAL APPLICATIONS FOR HOT GAS DEFROST

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.

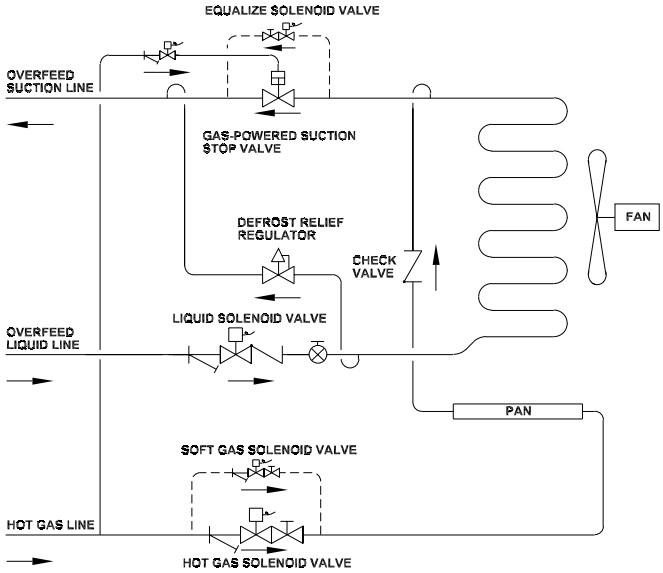
BOTTOM FEED EVAPORATOR



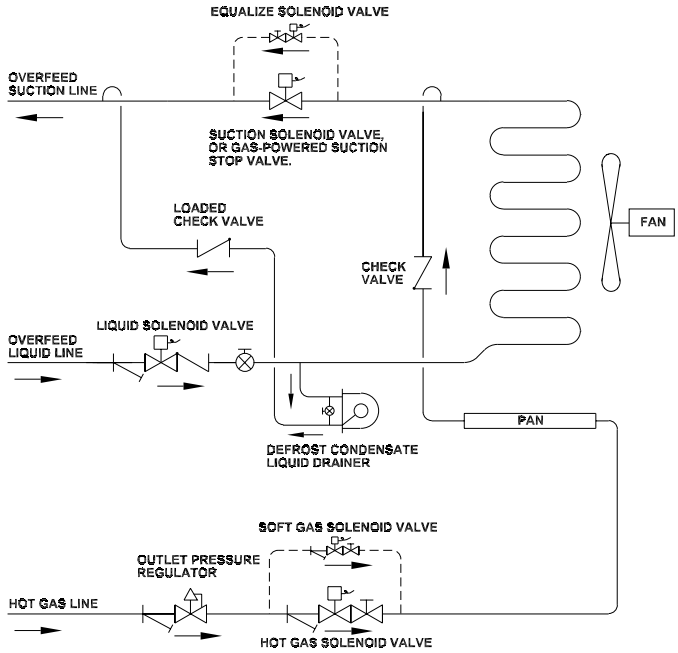
TOP FEED EVAPORATOR



EVAPORATOR WITH GAS-POWERED SUCTION STOP VALVE

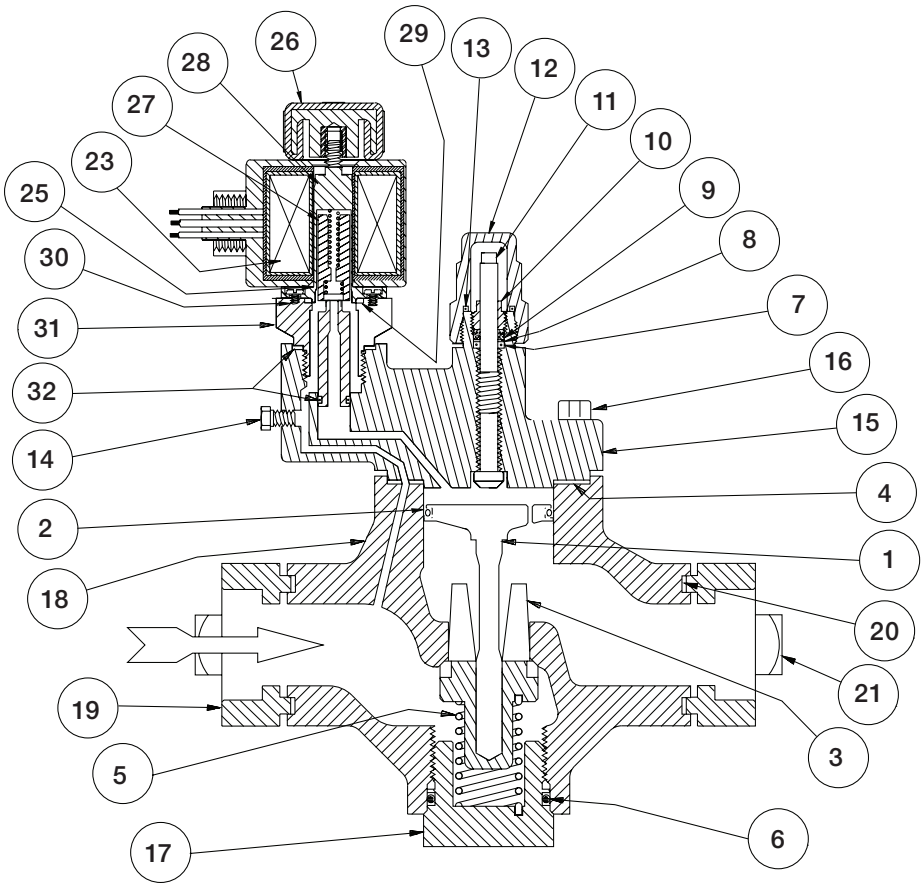


EVAPORATOR WITH DEFROST CONDENSATE LIQUID DRAINER



*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	KIT NO
	Gasket Kit consists of:		75-1023
4	Adapter Gasket	1	
6	Bottom Cap O-ring	1	
7	Stem O-ring	1	
8	Stem Washer	1	
9	Stem Packing	1	
10	Packing Nut	1	
13	Seal Cap O-ring	1	
20	Flange Gasket	2	
29	Solenoid Tube O-ring	1	
32	Port Gasket/O-ring Kit	3	
	Piston Kit consists of:		75-1019
1	Piston	1	
2	Piston Seal	1	
4	Adapter Gasket	1	
20	Flange Gasket	2	
	3/4" V-port Kit consists of:		75-1020
	1" V-port Kit consists of:		75-1021
	1-1/4" V-port Kit consists of:		75-1022
3	V-port	1	
4	Adapter Gasket	1	
5	Closing Spring	1	
6	Bottom Cap O-ring	1	
	Seal Cap Kit consists of:		70-1042
12	Seal Cap	1	
13	Seal Cap O-ring	1	

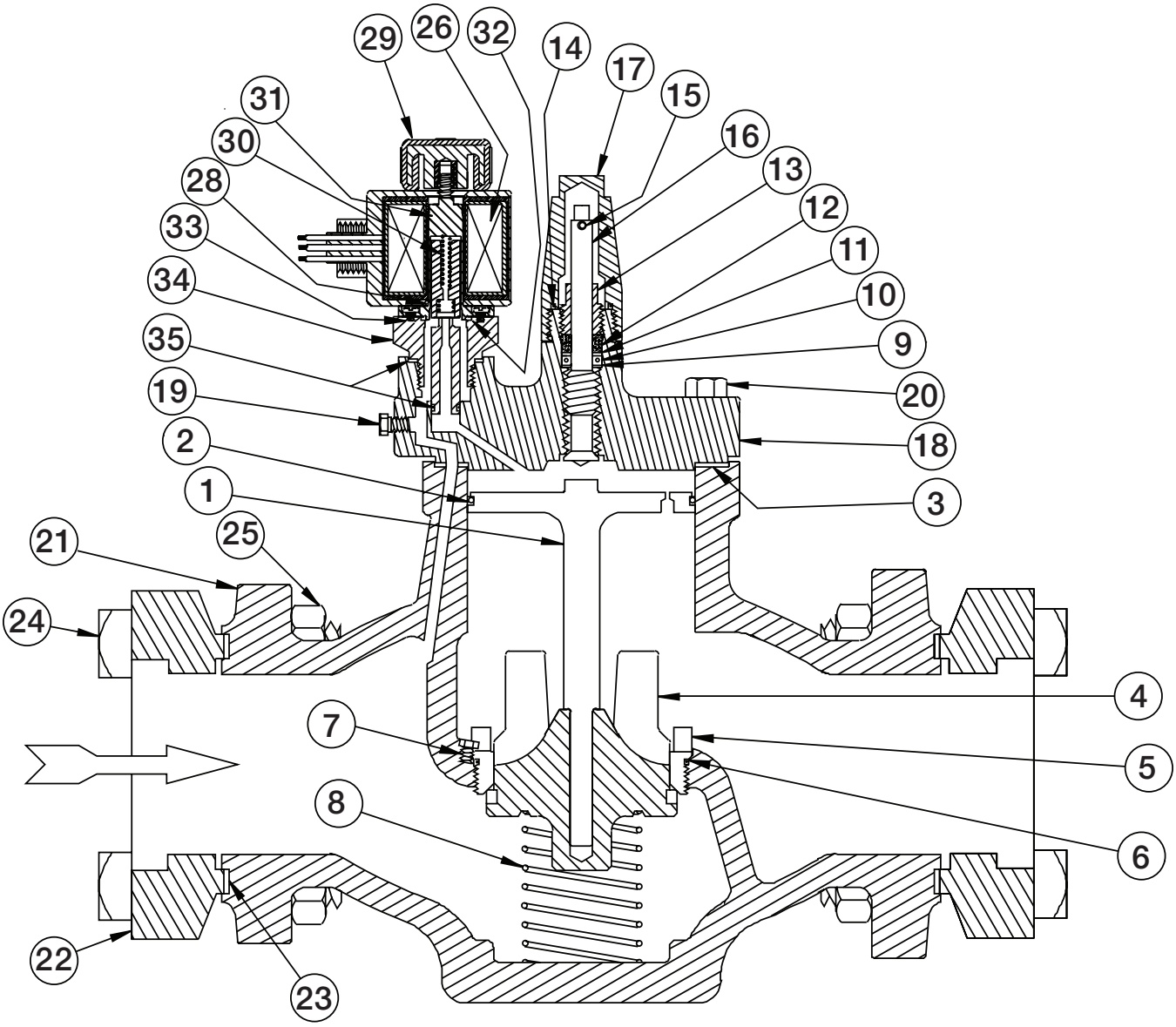
ITEM	DESCRIPTION	QTY	KIT NO
	Coil Kit (115V), 1/2" Fitting, 18" leads		70-1085
	Coil Kit (208/230V), 1/2" Fitting, 18" leads		70-1086
	Coil Kit (24VAC), 1/2" Fitting, 18" leads		70-1087
	Coil Kit (Other Voltage/Connections)		FACTORY
23	Bare Coil	1	
25	Coil O-ring	1	
26	Coil Knob	1	
	Solenoid Tube/Plunger Kit consists of:		70-1059
25	Coil O-ring	1	
26	Coil Knob	1	
27	Plunger	1	
28	Solenoid Tube	1	
29	Solenoid Tube O-ring	1	
30	Tube Screws	4	
31	**Solenoid Contol Module (MS)**		70-1052
	Adapter Kit consists of:		75-1047
15	Adapter	1	
4	Adapter Gasket	1	
7	Stem O-ring	1	
8	Stem Washer	1	
9	Stem Packing	1	
10	Packing Nut	1	
11	Manual Open Stem	1	
12	Seal Cap Kit	1	
14	Gauge Port Plug (1/4" NPT)	1	
16	Adapter Hex Screws (1/2"-13 x 1-1/2")	4	
17	Bottom Cap	1	
18	Body	1	
19	Flange (Various)	2	
21	Flange Bolt (5/8"-11 x 2-3/4")	4	70-0339
	Flange Nut (5/8"-11)	4	70-0136

PARTS LIST 1 1/2" THRU 4" (40 THRU 100 MM)

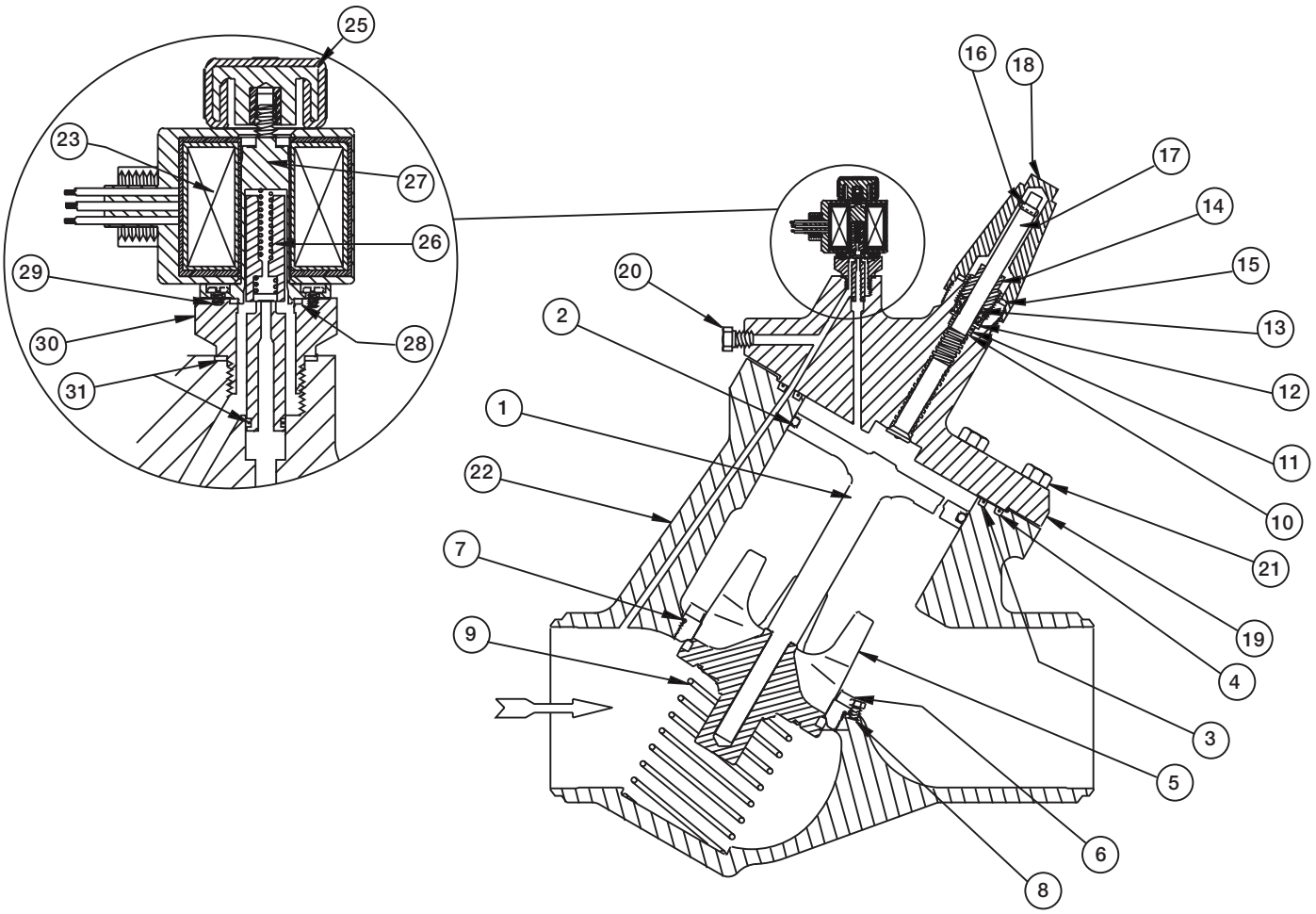
ITEM	DESCRIPTION	QTY	KIT NO
	1-1/2", 2" Gasket Kit consists of:		**75-1039**
	2-1/2" Gasket Kit consists of:		**75-1040**
	3" Gasket Kit consists of:		**75-1041**
	4" Gasket Kit consists of:		**75-1042**
3	Adapter Gasket	1	
6	Seat Seal O-ring	1	
9	Back-up Washer	1	
10	Stem O-ring	1	
11	Stem Washer	1	
12	Stem Packing	1	
13	Packing Nut	1	
14	Seal Cap O-ring/Gasket	1	
15	Stem Pin	1	
23	Flange Gasket	2	
32	Solenoid Tube O-ring	1	
35	Port Gasket/O-ring Kit	3	
	1-1/2", 2" Piston Kit consists of:		**75-1025**
	2-1/2" Piston Kit consists of:		**75-1026**
	3" Piston Kit consists of:		**75-1027**
	4" Piston Kit consists of:		**75-1028**
1	Piston	1	
2	Piston Seal	1	
3	Adapter Gasket	1	
23	Flange Gasket	2	
	1-1/2" V-port Kit consists of:		**75-1029**
	2" V-port Kit consists of:		**75-1030**
	2-1/2" V-port Kit consists of:		**75-1031**
	3" V-port Kit consists of:		**75-1032**
	4" V-port Kit consists of:		**75-1033**
4	V-port	1	
3	Adapter Gasket	1	
6	Seal Seal O-ring	1	
7	Set Screw	1	
8	Closing Spring	1	
	1-1/2" thru 3" Seal Cap Kit consists of:		**70-1042**
	4" Seal Cap Kit consists of:		**75-1015**
17	Seal Cap	1	
14	Seal Cap O-ring/Gasket	1	

ITEM	DESCRIPTION	QTY	KIT NO
	Coil Kit (115V), 1/2" Fitting, 18" leads		**70-1085**
	Coil Kit (208/230V), 1/2" Fitting, 18" leads		**70-1086**
	Coil Kit (24VAC), 1/2" Fitting, 18" leads		**70-1087**
	Coil Kit (Other Voltage/Connections)		**FACTORY**
26	Bare Coil	1	
28	Coil O-ring	1	
29	Coil Knob	1	
	Solenoid Tube/Plunger Kit consists of:		**70-1059**
28	Coil O-ring	1	
29	Coil Knob	1	
30	Plunger	1	
31	Solenoid Tube	1	
32	Solenoid Tube O-ring	1	
33	Tube Screws	4	
34	**Solenoid Contol Module (MS)**		**70-1052**
	1-1/2", 2" Adapter Kit consists of:		**75-1049**
	3" Adapter Kit consists of:		**75-1051**
	4" Adapter Kit consists of:		**75-1053**
18	Adapter	1	
3	Adapter Gasket	1	
9	Back-up Washer	1	
10	Stem O-ring	1	
11	Stem Washer	1	
12	Stem Packing	1	
13	Packing Nut	1	
14	Seal Cap O-ring/Gasket	1	
15	Stem Pin	1	
16	Manual Open Stem	1	
17	Seal Cap	1	
19	Gauge Port Plug (1/4" NPT)	1	
20	Adapter Hex Screws (1/2"-13 x 1-1/2")	4	
5	Seat Ring	1	
21	Body	1	
22	Flange (Various)	2	
24a	Flange Bolt 1-1/2", 2" (5/8"-11 x 3-1/4")	8	70-0135
25a	Flange Nut 1-1/2", 2" (5/8"-11)	8	70-0136
24a	Flange Bolt 3" (3/4"-10 x 3-3/4")	8	75-0202
25a	Flange Nut 3" (3/4"-10)	8	75-0210
24a	Flange Bolt 4" (7/8"-9 x 4")	8	75-0279
25a	Flange Nut 4" (7/8"-9)	8	75-0280

PARTS LIST 1 1/2" THRU 4" (40 THRU 100 MM)



PARTS LIST 5" AND 6" (125 AND 150 MM)



ITEM	DESCRIPTION	QTY	KIT NO
	Gasket Kit consists of:		**75-1111**
3	Adapter Inner O-ring	1	
4	Adapter Outer O-ring	1	
7	Seat Seal O-ring	1	
10	Back-up Washer	1	
11	Stem O-ring	1	
12	Stem Washer	1	
13	Stem Packing	1	
14	Packing Nut	1	
15	Seal Cap Gasket	1	
16	Manual Open Stem Pin	1	
28	Solenoid Tube O-ring	1	
31	Port Gasket/O-ring Kit	3	
	Piston Kit consists of:		**75-1110**
1	Piston	1	
2	Piston Seal	1	
3	Adapter Inner O-ring	1	
4	AdapterOuter O-ring	1	
	5" V-port Kit consists of:		**75-1112**
	6" V-port Kit consists of:		**75-1113**
5	V-port	1	
3	Adapter Inner O-ring	1	
4	Adapter Outer O-ring	1	
7	Seat Seal O-ring	1	
8	Seat Screw (1/4"-20 x 1/2")	1	
9	Closing Spring	1	
	Seal Cap Kit consists of:		**50-1038**
18	Seal Cap	1	
15	Seal Cap O-ring	1	

ITEM	DESCRIPTION	QTY	KIT NO
	Coil Kit (115V), 1/2" Fitting, 18" leads		**70-1085**
	Coil Kit (208/230V), 1/2" Fitting, 18" leads		**70-1086**
	Coil Kit (24VAC), 1/2" Fitting, 18" leads		**70-1087**
	Coil Kit (Other Voltage/Connections)		**FACTORY**
26	Bare Coil	1	
28	Coil O-ring	1	
29	Coil Knob	1	
	Solenoid Tube/Plunger Kit consists of:		**70-1059**
28	Coil O-ring	1	
29	Coil Knob	1	
30	Plunger	1	
31	Solenoid Tube	1	
32	Solenoid Tube O-ring	1	
33	Tube Screws	4	
34	**Solenoid Contol Module (MS)**		**70-1052**
	5", 6"Adapter Kit consists of:		**75-1288**
19	Adapter	1	
3	Adapter Inner O-ring	1	
4	Adapter Outer O-ring	1	
10	Back-up Washer	1	
11	Stem O-ring	1	
12	Stem Washer	1	
13	Stem Packing	1	
14	Packing Nut	1	
15	Seal Cap Gasket	1	
16	Manual Open Stem Pin	1	
17	Manual Open Stem	1	
18	Seal Cap	1	
20	Gauge Port Plug (1/4" NPT)	1	
21	Adapter Hex Screws (7/8"-9 x 3")	8	
6	Seat Ring	1	
22	Body	1	

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 electrical power from coil. Remove the coil by unscrewing the coil knob. 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. Always replace plunger and solenoid tube together. 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.

¾˝ thru 1¼˝ (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.

1½˝ 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 ¼"-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 valves are for refrigeration systems only. These instructions must be read completely and understood before selecting, using, or servicing these valves. Only knowledgeable, trained refrigeration technicians 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 the system has been evacuated to zero pressure. See also Safety Precautions in the current List Price Bulletin and the Safety Precautions sheet supplied with product. Escaping refrigerant can cause injury, especially 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.

ORDERING INFORMATION

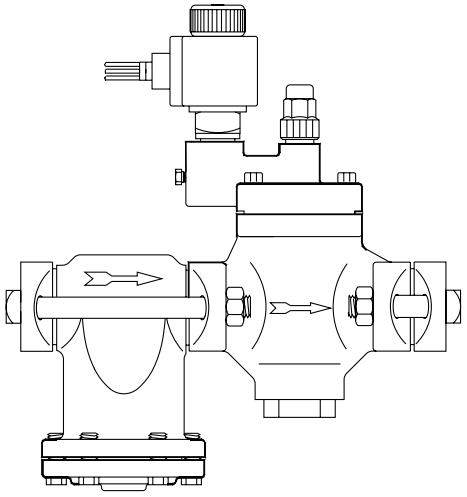
Flange Connection Style & Sizes Inches (Millimeters)		
FPT, SW, WN		ODS
STD	ALSO	STD
3/4" (20)	1" (25), 1 1/4" (32)	7/8" (22)
1" (25)	3/4" (20), 1 1/4" (32)	1 1/8" (28)
1 1/4" (32)	3/4" (20), 1" (25)	1 3/8" (35)
1 1/2" (40)	2" (50)	1 5/8" (42)
2" (50)	1 1/4" (32)	2 1/8" (54)
2 1/2" (65)	3" (80)	2 5/8" (67)
3" (80)	—	3 1/8" (79)
4" (100)	—	4 1/8" (105)
5" (125) BW	—	—
6" (150) BW	—	—

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

*1¼" port valve is standard 2-bolt flange design; 4-bolt flange style available upon request to field replace existing 4-bolt flange.

OPTIONAL STRAINERS

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



HS4A WITH CLOSE-COUPLED STRAINER

OPTIONAL BEACON PILOT LIGHTS

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

Beacon Pilot Light Kits	
Color	Part No.
Red	70-1100
Amber	70-1101
Green	70-1102

TO ORDER:

Specify type, connection type and size, volts, and strainer if required. Specify voltage and color of optional Beacon Pilot Light if required. Unless otherwise specified, standard coil with 1/2" connection will be supplied.

TYPICAL SPECIFICATIONS

"Refrigerant solenoid valves shall have encapsulated, watertight coils, Teflon seats, steel or ductile iron bodies, spring closing pilot and main valve seats, and be suitable for a safe working pressure of 400 psig (27 bar), as manufactured by Hansen Technologies Corporation or approved equal."

HANSEN TECHNOLOGIES
Hansen Technologies Corporation
681 Commerce St
Burr Ridge, Illinois 60527 USA
Tel: 630.325.1565 Fax: 630.325.1572 Toll: 800.426.7368
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USA · Asia · Europe · India · Latin America · Middle East

HANSEN TECHNOLOGIES

Bulletin S439
NOV 2019

Specifications, Applications, Service Instructions & Parts

HS4D TWO STEP SOLENOID VALVES

Flanged and Weld-in 3/4" thru 4" Port (20 mm thru 100 mm) for Refrigerants

2˝ (50 mm) HS4D with Optional Beacon Pilot Lights and Optional DIN Connector

INTRODUCTION

The HS4D Two Step Solenoid Valve is based on the same strength, reliability, design principles and craftsmanship as the standard Hansen HS4A Solenoid Valve—with added versatility and safety. The use of two step solenoid valves may help to reduce the potential for hydraulic shock. Please refer to IIAR bulletin number 116.

The two step solenoid design provides two opening positions for the valve: soft opening/soft closing position (10% rated flow) and fully open. These valves are normally closed and will revert to the closed position in the event of a power failure. Full flow capacity is the same as the standard Hansen HS4A. This makes it ideal for drop-in replacement of existing solenoid valves. Similar to the standard HS4A, the HS4D is superior in its ability to overcome dirt and sticky oil during opening, as well as function in an oil-free “dry” system.

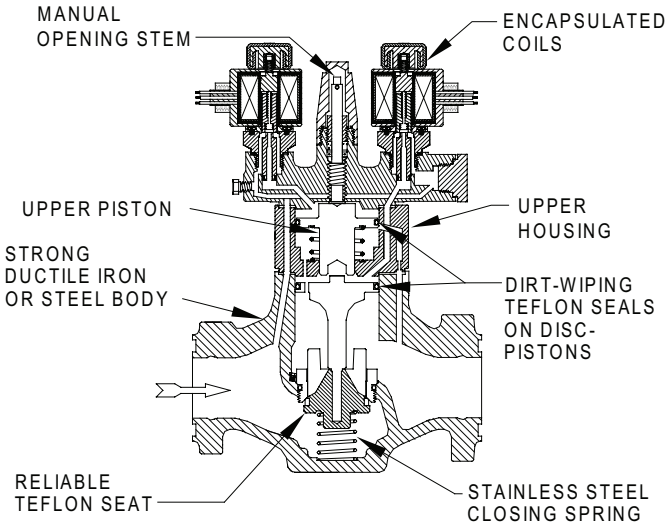
APPLICATIONS

The Hansen HS4D is a reliable, rugged-bodied valve that can be used anywhere a soft opening or closing solenoid valve is desired. The HS4D should not be applied as a two capacity valve for liquid feed applications, but rather as a soft opening/soft closing valve. The partially open position is designed to gradually introduce liquid flow before switching to the fully open position. Additionally, the two step solenoid valve can be used to gradually slow liquid flow prior to fully closing the valve to minimize hydraulic shock. When used as a hot gas defrost valve, the partially open position allows gradual equalization of hot gas during defrost before fully opening the valve.

The HS4D can also be used as a suction solenoid and equalizing valve. After the conclusion of defrost, the partially open valve position can equalize (bleed) gas from the evaporator. After proper bleed time, the valve can be placed in the Full Open position.

C US

KEY FEATURES



ADDITIONAL FEATURES

- “Soft” opening and closing
- Tolerant of dry systems
- Teflon main & pilot seats
- Heavy duty, pilot operation
- 300 psi MOPD (20 bar), 500 psi (34 bar) for CO2
- Simple serviceable design
- Available close-coupled strainer/check valve
- CSA certified
- CE available
- Beacon pilot lights available
- Flange-to-flange drop-in replacement for standard HS4A
- Flanged or weld-in valve body available
- All Hansen manual opening stems are “OUT” for automatic operation

MATERIAL SPECIFICATIONS

Body: Ductile iron, ASTM A536 (Flanged valves)
Steel, ASTM A352 LCB (Weld-in valves)
Adapter: Ductile iron, ASTM A536
Upper Piston: Ductile iron, ASTM A536, disc type, spring energized teflon seal
Main Piston: Steel, disc type, spring energized teflon seal
V-Port/Seat:
Ductile iron with teflon seat
Main Seat:
Stainless steel, removable (integral ductile iron for flanged 3/4" thru 1¼")
Upper Housing: Ductile iron, ASTM A536
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 Differential (MOPD):
300 psi (20 bar), 500 psi (34 bar) for CO2
Safe Working Pressure: 400 psig (28 bar), 600 psig (40 bar) for CO2
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 materials with advanced manufacturing techniques and quality control to offer a significantly superior and reliable product. Their ductile iron or steel bodies are stronger and more rugged than common cast iron, including semi-steel (class B iron) valves. They are more dirt resistant than full skirted piston designed valves. They use standard, power saving, low wattage coils that can be used on all valve sizes. All valves incorporate reliable teflon seating and stainless steel spring closing. 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 and sealed for valve interior cleanliness and ease of storage until ready for use.

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 close-coupled 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. Optional 100 mesh screen available; 3/4" thru 2½".

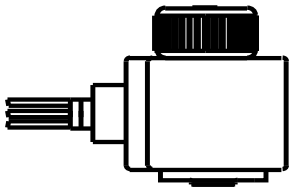
Pipe sizing, rating, anchoring, and similar prudent precautions should be taken to ensure “liquid hammer” will not occur when valves open or close. For proper flange gasket sealing, care must be taken when threading or welding to ensure flanges are parallel to each other and perpendicular to pipe. Also, gaskets should be lightly oiled and all bolts must be tightened evenly. Weld-in-line valves can be installed without disassembly, with manual opening stem in open position. Cover the solenoid coils to prevent weld splatter from damaging the over-molding.

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.

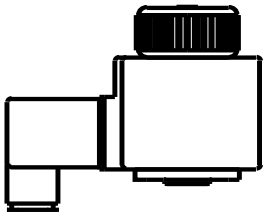
ELECTRICAL

The coils draw 16 watts and will operate properly between 85% and 110% of rated voltage (24V coil draws 19 watts). Standard coil connection is a ½" fitting (NPSM) for conduit, with two 18" wire leads and ground wire. Coils with combination DIN plug with NPSM thread and cable clamp are available; contact factory. All coils are totally encapsulated and meet NEMA4 (splash proof, IP65) requirements. The coil should only be energized while on the solenoid tube. Otherwise, immediate coil burnout may occur. To avoid bending the solenoid tube, remove the coil from valve before connecting any electrical conduit. Wireless Beacon pilot lights are available. (See page 16).

COIL OPTIONS AVAILABLE

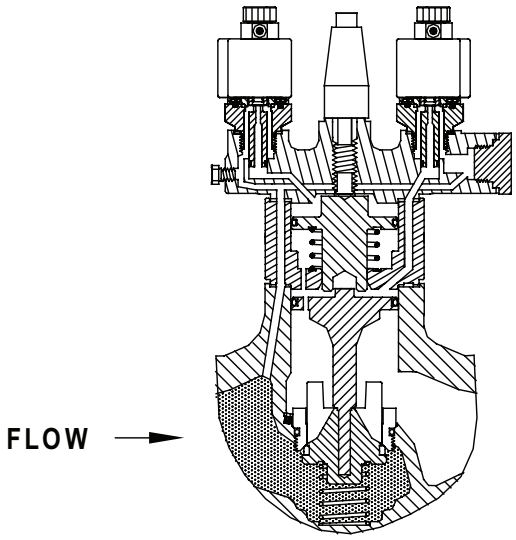


STANDARD LEADED WIRE WITH ½" NPSM CONNECTION

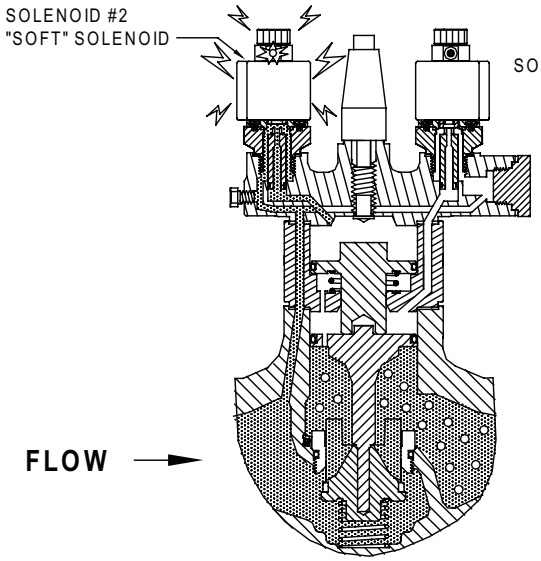


PLUG-IN COIL WITH DIN CONNECTOR FOR CABLE OR ½” NPSM CONNECTION

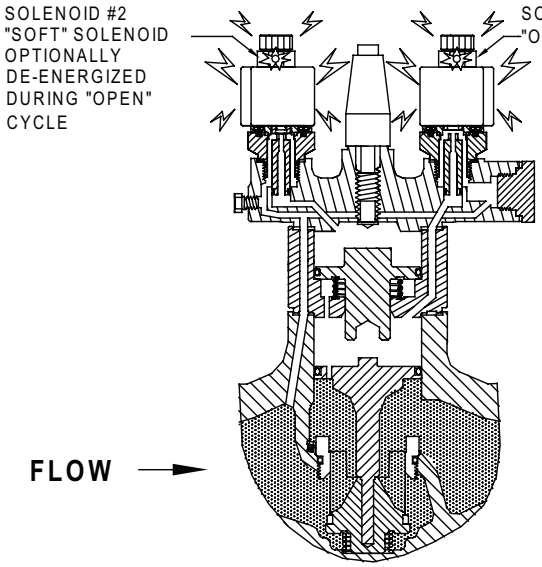
HS4D TWO STEP SOLENOID PRINCIPLES OF OPERATION



VALVE CLOSED

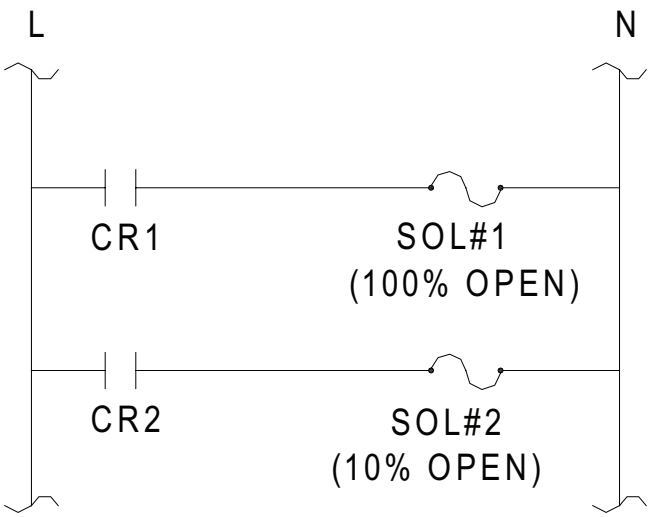


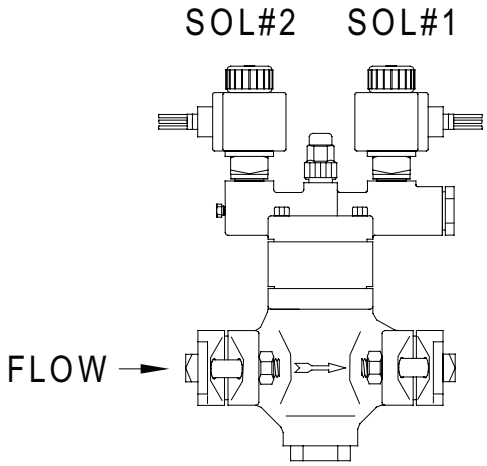
“SOFT” OPEN/SOFT CLOSE



FULLY OPEN

HS4D TYPICAL WIRING DIAGRAM





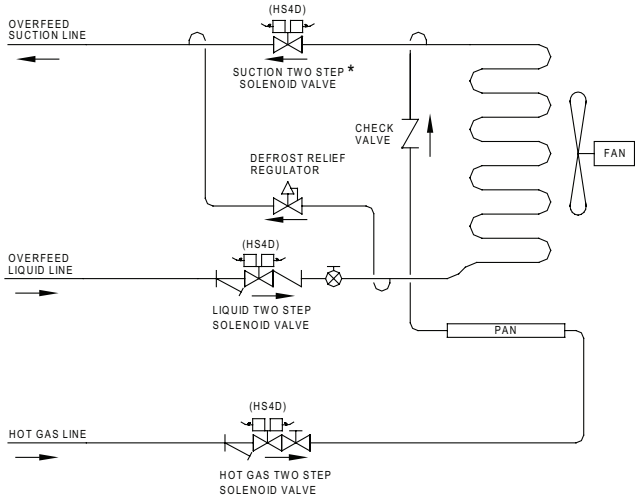
NOTES:

1. SOLENOID COIL #2 OPENS VALVE 10%.
2. SOLENOID COIL #2 IS ALWAYS MOUNTED ON THE INLET SIDE OF VALVE.
3. SOLENOID COIL #1 OPENS VALVE FULLY.
4. SOLENOID COIL #2 DOES NOT HAVE TO BE ENERGIZED FOR COIL #1 TO FULLY OPEN VALVE.

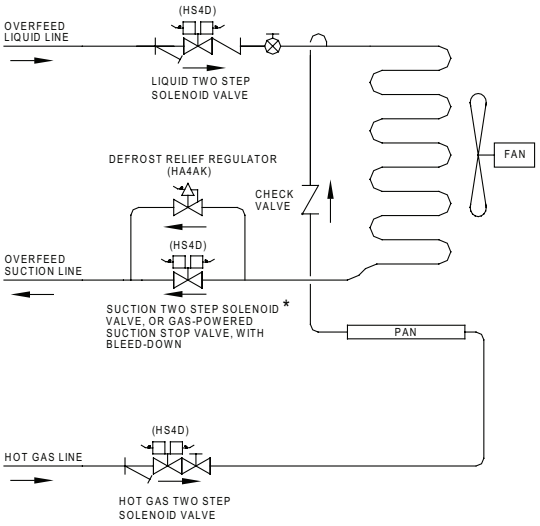
TYPICAL APPLICATIONS FOR HOT GAS DEFROST WITH TWO STEP SOLENOID VALVES AND SELF-EQUALIZING SUCTION STOP VALVES

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.

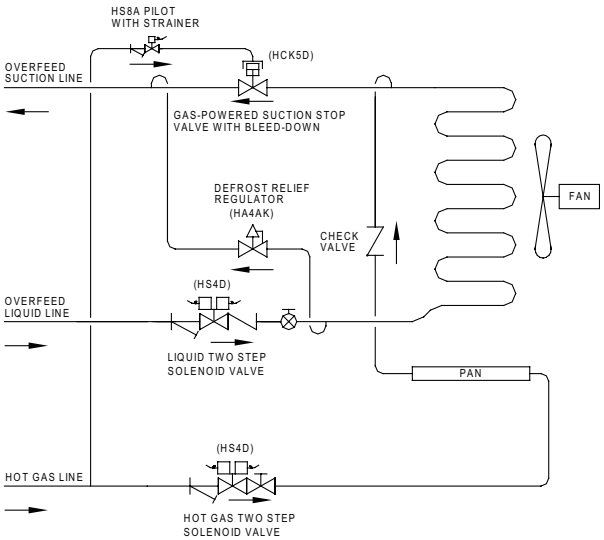
BOTTOM FEED EVAPORATOR



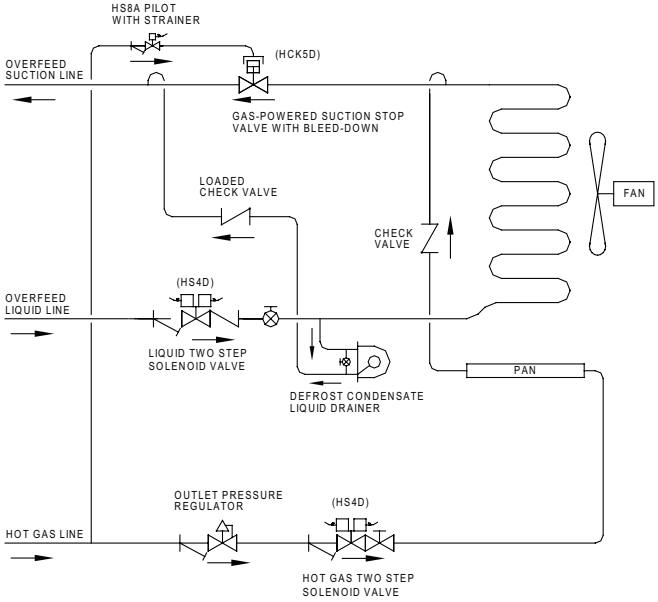
TOP FEED EVAPORATOR



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, HCK5, HCK5D and HS9B.

HIGH PRESSURE LIQUID VALVE CAPACITIES - TONS

PORT SIZE INCHES	R717		R22		R134A		R507	
	Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID	
	2	4	2	4	2	4	2	4
¾"	139	197	28	39	26	36	17	24
1"	255	360	51	72	47	66	32	45
1¼"	357	505	71	101	65	93	44	63
1½"	762	1078	152	215	140	198	95	134
2"	1023	1447	204	289	180	265	127	180
2½"	1676	2371	335	474	308	435	208	295
3"	2264	3202	452	640	415	587	281	398
4"	3614	5111	722	1021	663	938	449	635

Note: Ammonia capacities are based on 86°F liquid temperature, 20°F evaporator temperature, and no flashing through the valve. Halocarbon capacities are based on 95°F saturated liquid temperatures and 20°F evaporator temperature.

PUMPED LIQUID VALVE CAPACITIES - TONS - 1:1 RECIRCULATION

PORT SIZE INCHES	R717		R22		R134A		R507	
	Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID		Pressure Drop (ΔP) PSID	
	2	4	2	4	2	4	2	4
¾"	176	248	41	58	40	56	32	45
1"	320	452	75	107	73	103	58	82
1¼"	448	636	106	149	102	144	81	115
1½"	960	1356	225	319	218	308	173	244
2"	1288	1824	303	428	293	414	232	328
2½"	2112	2984	496	701	480	678	380	538
3"	2852	4032	670	947	648	916	514	726
4"	4552	6436	1069	1511	1034	1462	820	1159

Note: Pumped liquid line capacities are based on 0°F liquid temperature and 0°F evaporator temperature. For evaporator temperatures between -40°F and 40°F, capacities are within 5% for ammonia and ±10% for halocarbon refrigerants.

Sizing Valve Based on Recirculation Rate

Table is for 1:1 recirculation rate. For higher recirculation rates, multiply required capacity by the recirculation rate and select port size from table. (ie. for a 30 ton ammonia evaporator coil and 4:1 recirculation rate, multiply 4x30=120 tons and select closest port size; 3/4" port with 2 psid pressure drop)

HOT GAS DEFROST NOMINAL VALVE SIZING CAPACITIES - TONS

(Defrosting Evaporator Size Tons)

APPLICATION	REFRIGERANT	PORT SIZE INCHES					
		¾"	1"	1¼"	1½"	2"	2½"
Hot Gas Solenoid*	R717	9 to 15	15 to 28	28 to 39	39 to 73	73 to 106	106 to 165
	R22, R134a, R507	6 to 8	8 to 15	15 to 20	20 to 32	32 to 47	47 to 75

* Or an outlet pressure regulator with electric shut-off (HA4AOS).

Evaporator tons at 10°F TD (temperature differential), valve capacities are conservative. These capacities can be modified up or down depending on type of evaporator, temperature, mass, frost thickness, defrosting time, etc. Typical for -20°F evaporator.

SUCTION VAPOR CAPACITIES - TONS

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

PORT SIZE INCHES	CV	PRESSURE DROP ACROSS VALVE	R717				R22			
			EVAPORATING TEMPERATURE				EVAPORATING TEMPERATURE			
			-20°F†	0°F	+20°F	+40°F	-20°F	0°F	+20°F	+40°F
¾"	6.4	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"	11.7	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
1¼"	16.4	2 psi	16	19	24	31	7.2	7.2	9.1	11.3
		5 psi	25	22	38	48	11	11	14	18
1½"	35	2 psi	35	40	52	65	15	15	19	24
		5 psi	53	48	81	102	24	24	30	38
2"	47	2 psi	47	54	70	87	21	21	26	32
		5 psi	71	64	108	137	32	32	41	51
2½"	77	2 psi	77	89	114	143	34	34	43	53
		5 psi	116	105	177	224	52	53	67	83
3"	104	2 psi	104	120	154	193	46	46	58	71
		5 psi	157	187	239	303	70	71	90	112
4"	166	2 psi	166	191	246	309	73	73	92	114
		5 psi	251	298	382	483	112	114	144	179

PORT SIZE INCHES	CV	PRESSURE DROP ACROSS VALVE	R134A				R507			
			EVAPORATING TEMPERATURE				EVAPORATING TEMPERATURE			
			-20°F	0°F	+20°F	+40°F	-20°F	0°F	+20°F	+40°F
¾"	6.4	2 psi	1.5	2.1	3.2	3.6	1.9	2.5	3.3	4.2
		5 psi	2.1	3.1	4.8	5.5	2.8	4.0	5.1	6.6
1"	11.7	2 psi	2.8	3.8	5.8	6.6	3.0	5.0	6.0	7.7
		5 psi	3.9	5.6	8.3	10	5.0	7.0	9.3	12
1¼"	16.4	2 psi	3.9	5.4	8.1	9.2	5.0	6.0	8.4	11
		5 psi	5.5	7.3	12	14	7.0	10	13	17
1½"	35	2 psi	8.3	11	17	20	10	14	18	23
		5 psi	12	17	26	30	16	21	28	36
2"	47	2 psi	11	15	23	26	14	18	24	31
		5 psi	16	23	36	41	21	28	37	48
2½"	77	2 psi	18	25	38	43	23	30	39	51
		5 psi	26	37	58	67	34	46	61	79
3"	104	2 psi	25	34	52	59	31	41	53	68
		5 psi	35	50	73	30	46	63	82	106
4"	166	2 psi	39	54	82	93	49	65	85	109
		5 psi	55	80	126	144	74	100	132	170

Conditions: Capacities based on evaporator temperatures shown and 86°F liquid. R717: For each 10°F lower liquid temperature, increase above table capacity by 3%. R22, R134a, R507: For each 10°F lower liquid temperature, increase above table capacity by 5%.

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.

† –20°F capacities are based on a two stage system. For suction stop valves at temperatures below 0°F, alternate low pressure drop valves are preferably used such as Hansen Two-Step Gas-Powered Suction Stop Valve Type HCK5D or Gas-Powered Solenoid Valve Type HS9B.

HIGH PRESSURE LIQUID VALVE CAPACITIES - KILOWATTS

PORT SIZE MM	R717		R22		R134A		R507	
	Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR	
	.15	.3	.15	.3	.15	.3	.15	.3
20	452	630	127	151	100	141	64	90
25	822	1162	195	275	181	256	116	163
32	1151	1627	272	385	254	359	162	229
40	2466	3487	584	825	544	769	347	490
50	3287	4649	778	1101	725	1025	462	654
65	5424	7671	1284	1816	1196	1691	763	1079
80	7314	10,344	1732	2449	1612	2280	1029	1455
100	11,670	16,500	2763	3907	2573	3638	1642	2321

Note: Ammonia capacities are based on 30°C liquid temperature, -5°C evaporator temperature, and no flashing through the valve. Halocarbon capacities are based on 35°C saturated liquid temperatures and -5°C evaporator temperature.

PUMPED LIQUID VALVE CAPACITIES - KILOWATTS - 1:1 RECIRCULATION

PORT SIZE MM	R717		R22		R134A		R507	
	Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR		Pressure Drop (ΔP) BAR	
	.15	.3	.15	.3	.15	.3	.15	.3
20	621	879	145	205	141	199	103	146
25	1130	1598	263	372	256	362	187	265
32	1582	2237	369	521	359	507	262	371
40	3389	4793	790	1117	769	1087	562	795
50	4519	6391	1053	1490	1025	1449	750	1061
65	7457	10,546	1738	2458	1691	2391	1237	1750
80	10,055	14,221	2344	3315	2280	3225	1669	2360
100	16,044	22,689	3740	5289	3638	5145	2662	3765

Note: Pumped liquid line capacities are based on -10°C liquid temperature and -10°C evaporator temperature. For evaporator temperatures between -40°C and 10°C, capacities are within 5% for ammonia and ±10% for halocarbon refrigerants.

Sizing Valve Based on Recirculation Rate

Table is for 1:1 recirculation rate. For higher recirculation rates, multiply required capacity by the recirculation rate and select port size from table. (ie. for a 100 kW ammonia evaporator coil and 4:1 recirculation rate, multiply 4x100=400 kW and select closest port size; 3/4" (20mm) port with 2 psid (.15 bar) pressure drop)

HOT GAS DEFROST NOMINAL VALVE SIZING CAPACITIES - KILOWATTS

(Defrosting Evaporator Size Kilowatts)

APPLICATION	REFRIGERANT	PORT SIZE (MM)					
		20	25	32	40	50	65
Hot Gas Solenoid*	R717	32—53	53—99	99—137	137—257	257—373	373—580
	R22, R134a, R507	21—28	28—53	53—70	70—113	113—165	165—264

* Or an outlet pressure regulator with electric shut-off (HA4AOS).

Evaporator kW at 5°C TD (temperature differential), valve capacities are conservative. These capacities can be modified up or down depending on type of evaporator, temperature, mass, frost thickness, defrosting time, etc. Typical for -25°C evaporator.

SUCTION VAPOR CAPACITIES - KILOWATTS

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

PORT SIZE MM	Kv	PRESSURE DROP ACROSS VALVE	R717				R22			
			EVAPORATING TEMPERATURE				EVAPORATING TEMPERATURE			
			-25°C†	-15°C	-5°C	5°C	-25°C	-15°C	-5°C	5°C
20	5.5	.15 bar	27	30	37	45	9.0	11	14	17
		.30 bar	36	41	51	63	12	16	20	24
25	10	.15 bar	49	54	67	82	17	21	26	31
		.30 bar	66	74	93	115	23	29	36	44
32	14	.15 bar	68	76	94	115	23	29	36	44
		.30 bar	92	104	131	161	32	40	50	61
40	30	.15 bar	146	162	202	247	50	63	77	94
		.30 bar	197	223	280	345	68	87	108	132
50	40	.15 bar	195	216	270	330	66	84	103	126
		.30 bar	263	297	374	460	91	115	144	176
65	66	.15 bar	322	357	445	544	110	138	170	207
		.30 bar	434	490	617	759	150	190	237	290
80	89	.15 bar	435	481	600	734	148	186	230	280
		.30 bar	586	661	832	1024	202	257	319	391
100	142	.15 bar	693	768	957	1171	236	297	366	446
		.30 bar	934	1054	1327	1634	322	410	510	624

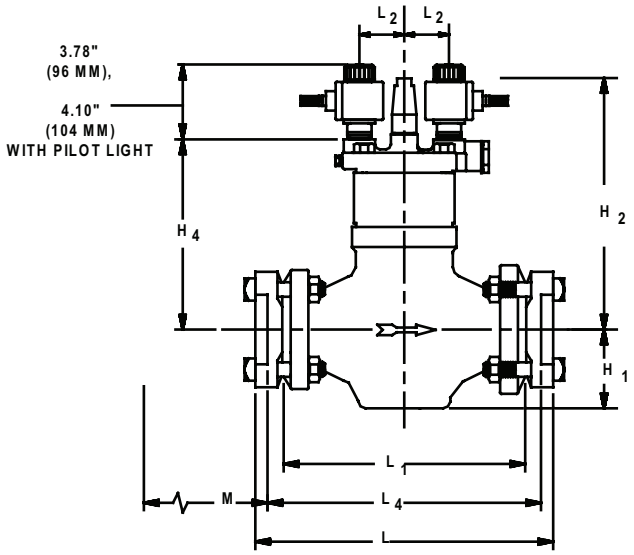
PORT SIZE MM	Kv	PRESSURE DROP ACROSS VALVE	R134A				R507			
			EVAPORATING TEMPERATURE				EVAPORATING TEMPERATURE			
			-25°C	-15°C	-5°C	5°C	-25°C	-15°C	-5°C	5°C
20	5.5	.15 bar	8.2	11	14	18	8.0	10	13	16
		.30 bar	11	15	19	24	11	14	18	22
25	10	.15 bar	11	14	18	23	14	18	23	29
		.30 bar	14	19	25	31	19	25	32	40
32	14	.15 bar	16	22	28	35	20	25	32	40
		.30 bar	22	29	38	49	27	35	45	57
40	30	.15 bar	35	47	60	75	42	54	69	86
		.30 bar	47	63	82	105	58	74	96	121
50	40	.15 bar	47	62	80	101	56	71	91	115
		.30 bar	62	84	110	139	77	99	128	162
65	66	.15 bar	78	102	132	166	93	118	151	190
		.30 bar	102	139	181	230	128	163	211	267
80	89	.15 bar	105	138	177	224	125	159	204	257
		.30 bar	158	187	244	310	172	220	284	359
100	142	.15 bar	167	220	283	357	199	253	325	409
		.30 bar	220	298	389	495	274	352	453	573

Conditions: Capacities based on evaporator temperatures shown and 30°C liquid. R717: For each 5°C lower liquid temperature, increase above table capacity by 3%. R22, R134a, R507: For each 5°C lower liquid temperature, increase above table capacity by 5%.

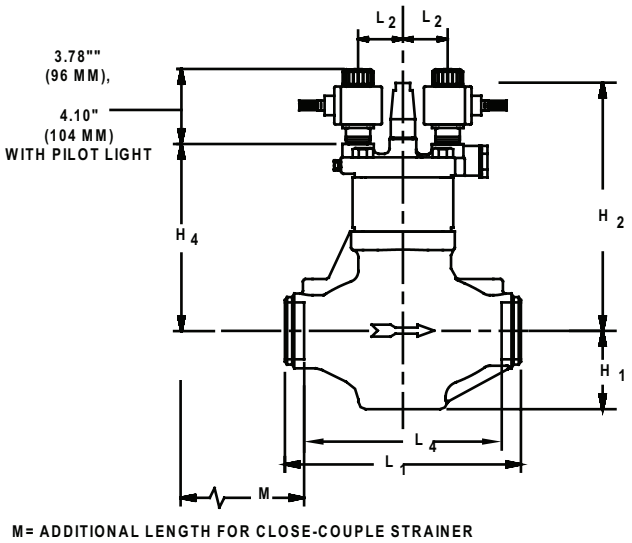
For liquid overfeed evaporator suction between normal 2:1 to 5:1 rate, add 20% to the evaporator load or use the next larger port size to accommodate liquid volume accompanying the suction gas and to reduce impact velocities.

† –25°C capacities are based on a two stage system. For suction stop valves at temperatures below –15°C, alternate low pressure drop valves are preferably used such as Hansen Two-Step Gas-Powered Suction Stop Valve Type HCK5D or Gas-Powered Solenoid Valve Type HS9B.

INSTALLATION DIMENSIONS 3/4" THRU 4" HS4D/HS4DW



HS4D FLANGED VALVE



M= ADDITIONAL LENGTH FOR CLOSE-COUPLE STRAINER

HS4DW WELD-IN VALVE

INSTALLATION DIMENSIONS, HS4D FLANGED VALVE

INCHES (MM)

PORT SIZE (MM)	H_1	H_2	H_4	L		L_1	L_2	L_4	M	W*
				FPT,SW	WN,ODS					
¾", 1", 1¼" (20, 25, 32)	3.09 (78)	8.45 (215)	6.31 (160)	8.20 (208)	8.94 (227)	6.19 (157)	2.38 (60)	7.20 (183)	3.70 (94)	4.50 (114)
1½", 2" (40, 50)	2.87 (73)	11.0 (279)	7.88 (200)	12.39 (315)	13.39 (340)	9.88 (251)	2.35 (60)	10.89 (277)	9.83 (250)	4.50 (114)
2½" (65)	3.62 (92)	12.45 (316)	9.29 (236)	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)	12.76 (324)	9.64 (245)	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)	13.65 (347)	10.55 (268)	17.01 (432)	20.51 (521)	14.12 (359)	2.69 (68)	15.01 (381)	14.07 (357)	8.06 (205)

*Maximum width of valve. M = additional length for close-coupled strainer

INSTALLATION DIMENSIONS, HS4DW WELD-IN VALVE

INCHES (MM)

PORT SIZE (MM)	H_1	H_2	H_4	L_1	L_2	L_4	M	W*
¾", 1", 1¼" (20, 25, 32)	3.07 (78)	8.45 (215)	6.31 (160)	10.44 (265)	2.38 (60)	9.00 (229)	10.44 (265)	3.56 (90)
1½", 2" (40, 50)	2.87 (73)	11.0 (279)	7.88 (200)	10.38 (264)	2.35 (60)	8.94 (227)	10.38 (264)	4.64 (118)
2½" (65)	3.62 (92)	12.45 (316)	9.29 (236)	11.38 (289)	2.35 (60)	9.38 (238)	11.38 (289)	5.62 (143)
3" (80)	4.06 (103)	12.76 (324)	9.64 (245)	12.25 (311)	2.35 (60)	—	12.25 (311)	6.50 (165)
4" (100)	4.69 (119)	13.65 (347)	10.55 (268)	14.12 (359)	2.69 (68)	—	14.12 (359)	8.06 (205)

*Maximum width of valve. M = additional length for close-coupled strainer

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 holes not aligned with holes in body and adapter; dirt packed under teflon seal rings 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 one of the pilot seats; main piston bleed hole plugged.

Before opening valve or disassembling pilot(s) 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 16.

To check a solenoid pilot section of valve, disconnect electrical power from coil. Remove the coil by unscrewing the coil knob. Slowly loosen, then 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. Plunger should move smoothly in solenoid tube. If plunger is damaged or "peened" over on the end, or makes excessive "buzzing" noise, replace plunger and solenoid tube as a set. Clean, polish or replace parts as necessary. Lightly oil solenoid tube gasket, reassemble pilot section of valve and replace coil knob.

3/4" thru 1¼" (20 thru 32 mm)

Use a 3/8" (9 mm) male hexagon wrench to loosen the four adapter bolts. Carefully break gasket seals before removing bolts; proceed slowly to avoid any refrigerant which may still remain in the valve. Remove piston housing and inspect. If any of the upper piston parts are stuck, inspect disc and piston bore for burrs, nicks or other damage. Inspect the remainder of the valve, including the main piston. If main piston parts are stuck, remove the 2" hex bottom cap to facilitate separation of the valve V-port/seat from the disc piston (flanged valve only). Inspect disc and piston bore for burrs, nicks and other damage. Remove burrs and nicks, clean or replace disc pistons as necessary. Long-life seals on disc pistons 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 holes in valve body, adapter gaskets, piston housing, and adapter to assure proper operation. Re-assemble valve. Carefully check entire valve for leaks before restoring it to service.

1½" thru 4" (40 thru 100 mm)

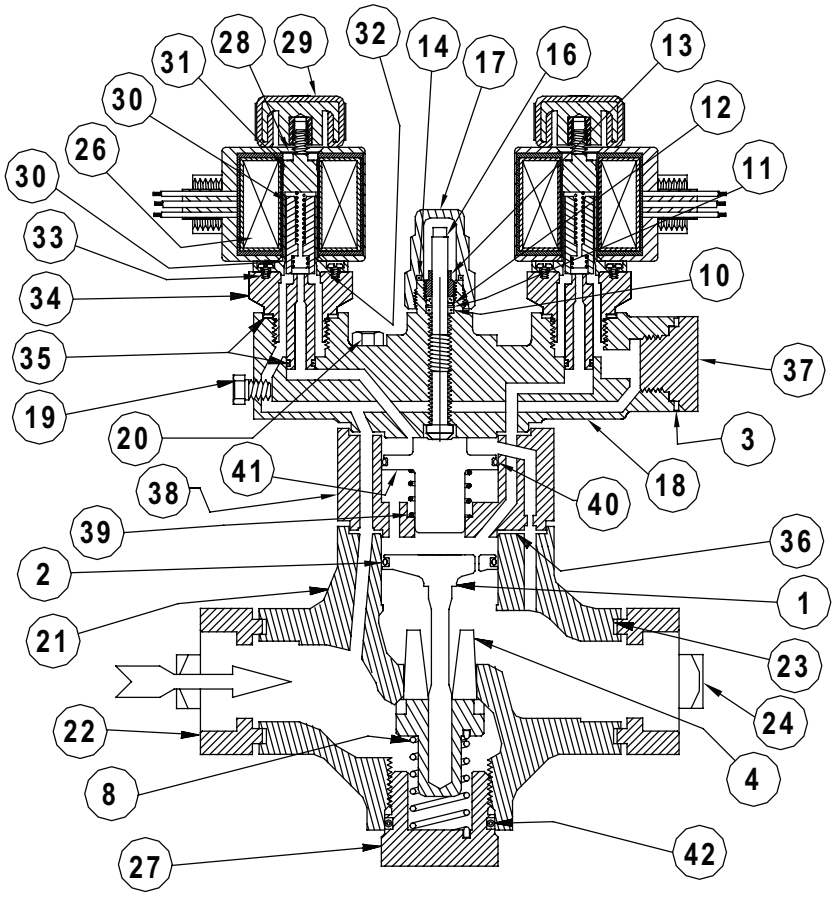
Loosen adapter bolts using a 12" adjustable wrench. Carefully break gasket seals before removing bolts; proceed slowly to avoid any refrigerant which may still remain in the valve. Remove upper piston housing and inspect. If any of the upper piston parts are stuck, inspect disc and upper piston bore for burrs, nicks or other damage. Inspect the remainder of the valve, including the main piston. If disc piston is difficult to remove, insert a ¼"-20 threaded screw 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 seals 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 gaskets, piston housing, and adapter to assure proper operation. 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; this will open valve to 10% capacity position. Turn stem out, counter-clockwise to return valve to automatic operation.

PARTS LIST ¾" THRU 1¼"

(20 mm thru 32 mm)



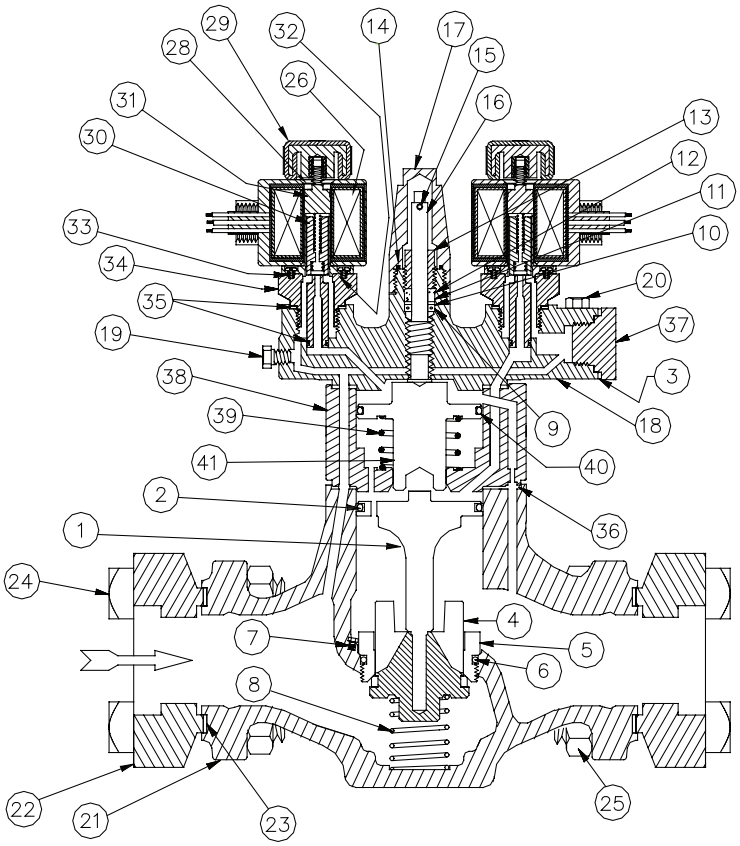
FLANGED VALVE SHOWN. WELD IN LINE PARTS LIST IS THE SAME.

ITEM	DESCRIPTION	QTY	KIT NO
	3/4" thru 1-1/4" Gasket Kit consists of:		**75-1023**
36	Adapter Gasket	1	
42	Bottom Cap O-ring (flanged Valve)	1	
	Seat Ring O-ring (weld-in valve not shown)	1	
10	Stem O-ring	1	
11	Stem washer	1	
12	Packing	1	
13	Packing Nut	1	
14	Seal Cap O-ring/Gasket	1	
23	Flange Gasket	2	
32	Solenoid Tube O-ring	1	
35	Port Gasket/O-ring Kit	3	
	3/4" V-port Kit consists of:		**75-1020**
	1" V-port Kit consists of:		**75-1021**
	1-1/4" V-port Kit consists of:		**75-1022**
4	V-port	1	
8	Closing Spring	1	
42	Bottom Cap O-ring (flanged Valve)	1	
	Seat Ring O-ring (weld-in valve not shown)	1	
36	Adapter Gasket	1	
	3/4" thru 1-1/4" Main Piston Kit consists of:		**75-1019**
1	Main Piston	1	
2	Piston Seal	1	
36	Adapter Gasket	1	
23	Flange Gasket	2	
	3/4" thru 1-1/4" Upper Piston Kit consists of:		**70-1109**
41	Upper Piston	1	
40	Upper Piston Seal	1	
39	Upper Spring	1	
36	Adapter Gasket	2	

ITEM	DESCRIPTION	QTY	KIT NO
	Coil Kit (115V), 1/2" Fitting, 18" leads		**70-1085**
	Coil Kit (208/230V), 1/2" Fitting, 18" leads		**70-1086**
	Coil Kit (24V), 1/2" Fitting, 18" leads		**70-1087**
	Coil Kit (Other Voltages/Connection)		**FACTORY**
26	Bare Coil	1	
29	Coil Knob	1	
	Solenoid Tube/Plunger Kit consists of:		**70-1059**
29	Coil Knob	1	
30	Plunger	1	
31	Solenoid Tube	1	
32	Solenoid Tube O-ring	1	
33	Tube Screws	4	
	Solenoid Control Module (MS)		**70-1052**
	3/4" thru 1-1/4" Seal Cap Kit consists of:		**50-1071**
17	Seal Cap	1	
14	Seal Cap O-ring	1	
16	Stem	1	
18	Adapter	1	
19	Gauge Port Plug (1/4" NPT)	1	
20	Adapter Hex Screws	4	
21	Body	1	
22	Flanges	2	
24	3/4" thru 1-1/4" Flange Bolt (5/8"-11 x 2-3/4")	4	70-0339
25	3/4" thru 1-1/4" Flange Nut (5/8"-11)	4	70-0136
27	Bottom Cap (flanged valve)	1	
	Seat Ring (weld-in valve not shown)	1	
38	Upper Piston Housing	1	

PARTS LIST 1½" THRU 4"

(40 mm thru 100 MM)



FLANGED VALVE SHOWN. WELD IN LINE PARTS LIST IS THE SAME.

ITEM	DESCRIPTION	QTY	KIT NO
	1-1/2", 2" Gasket Kit consists of:		**75-1039**
	2-1/2" Gasket Kit consists of:		**75-1040**
	3" Gasket Kit consists of:		**75-1041**
	4" Gasket Kit consists of:		**75-1042**
36	Adapter Gasket	1	
6	Seat Ring O-ring	1	
9	Back-up washer	1	
10	Stem O-ring	1	
11	Stem washer	1	
12	Packing	1	
13	Packing Nut	1	
14	Seal Cap O-ring/Gasket	1	
15	Stem pin	1	
23	Flange Gasket	2	
32	Solenoid Tube O-ring	1	
35/37	Port Gasket/O-ring Kit	3	
	1-1/2" V-port Kit consists of:		**75-1029**
	2" V-port Kit consists of:		**75-1030**
	2-1/2" V-port Kit consists of:		**75-1031**
	3" V-port Kit consists of:		**75-1032**
	4" V-port Kit consists of:		**75-1033**
4	V-port	1	
6	Seat Ring O-ring	1	
7	Seat set screw	1	
8	Closing Spring	1	
36	Adapter Gasket	1	
	1-1/2", 2" Main Piston Kit consists of:		**75-1025**
	2-1/2" Main Piston Kit consists of:		**75-1026**
	3" Main Piston Kit consists of:		**75-1027**
	4" Main Piston Kit consists of:		**75-1028**
1	Main Piston	1	
2	Piston Seal	1	
36	Adapter Gasket	1	
23	Flange Gasket	2	
	1-1/2", 2" Upper Piston Kit consists of:		**70-1110**
	2-1/2", 3" Upper Piston Kit consists of:		**70-1111**
	4" Upper Piston Kit consists of:		**70-1112**
41	Upper Piston	1	
40	Piston Seal	1	
36	Adapter Gasket	1	
39	Upper Spring	1	

ITEM	DESCRIPTION	QTY	KIT NO
	Coil Kit (115V), 1/2" Fitting, 18" leads		**70-1085**
	Coil Kit (208/230V), 1/2" Fitting, 18" leads		**70-1086**
	Coil Kit (24V), 1/2" Fitting, 18" leads		**70-1087**
	Coil Kit (Other Voltages/Connection)		**FACTORY**
26	Bare Coil	1	
29	Coil Knob	1	
	Solenoid Tube/Plunger Kit consists of:		**70-1059**
29	Coil Knob	1	
30	Plunger	1	
31	Solenoid Tube	1	
32	Solenoid Tube O-ring	1	
33	Tube Screws	4	
	Solenoid Control Module (MS)		**70-1052**
	1-1/2" thru 3" Seal Cap Kit consists of:		**70-1014**
	4" Seal Cap Kit consists of:		**50-1027**
17	Seal Cap	1	
14	Seal Cap O-ring/Gasket	1	
5	Seat Ring	1	
16	Stem	1	
18	Adapter	1	
19	Gauge Port Plug (1/4" NPT)	1	
20	Adapter Hex Screws	4	
21	Body	1	
22	Flanges	2	
24a	1-1/2", 2"" Flange Bolt (5/8"-11 x 3-1/4")	8	70-0135
25a	1-1/2", 2" Flange Nut (5/8"-11)	8	70-0136
24b	2-1/2", 3" Flange Bolt (3/4"-10 x 3-3/4")	8	75-0202
25b	2-1/2", 3" Flange Nut (3/4"-10)	8	75-0210
24c	4" Flange Bolt (7/8"-9 x 4")	8	75-0279
25c	4" Flange Nut (7/8"-9)	8	75-0280
27	Bottom Cap (flanged valve)	1	
38	Upper Piston Housing	1	

ORDERING INFORMATION

FLANGE VALVE CONNECTION STYLE AND SIZES INCHES (MM)			
PORT SIZE	FPT,SW,WN		ODS
	STD	ALSO	STD
¾" (20)	¾"	1", 1¼"	⅞"(22), 1⅛" (28), 1⅜"(35)
1" (25)	1"	1¼"	1⅛" (28), 1⅜" (35)
1¼" (32)	1¼"		1⅜" (35)
1½" (40)	1½"	2"	1⅝" (42), 2⅛" (54)
2" (50)	2"		2⅛" (54)
2½" (65)	2½"	3"	2⅝" (67)
3" (80)	3"	—	3⅛" (79)
4" (100	4"	—	4⅛" (105)

WELD-IN VALVE CONNECTION STYLE AND SIZES INCHES (MM)		
PORT SIZE	SW	WN
¾" (20)	¾", 1", 1¼"	—
1" (25)	1", 1¼"	—
1¼" (32)	1¼"	—
1½" (40)	1½", 2"	—
2" (50)	2"	—
2½" (65)	2½"	—
3" (80)	—	3"
4" (100	—	4"

TO ORDER

Specify type, flanged or weld-in, connection type and size, and strainer if required. Specify voltage and color of optional Beacon Pilot Light if required. Unless otherwise specified, standard coil with ½" wire lead connection will be supplied. Plug-in DIN connector is optional.

OPTIONAL STRAINERS

Generous capacity strainer is a separate, close-coupled, 60 mesh (233 micron rating) unit with optional 100 mesh (150 micron) available in 3/4" to 2-1/2".

OPTIONAL BEACON PILOT LIGHTS

Pilot Light Kit includes Beacon pilot light, knob and o-ring. A/C Coils Only.

BEACON PILOT LIGHT KITS	
Color	Part No.
Red	70-1100
Amber	70-1101
Green	70-1102

TYPICAL SPECIFICATIONS

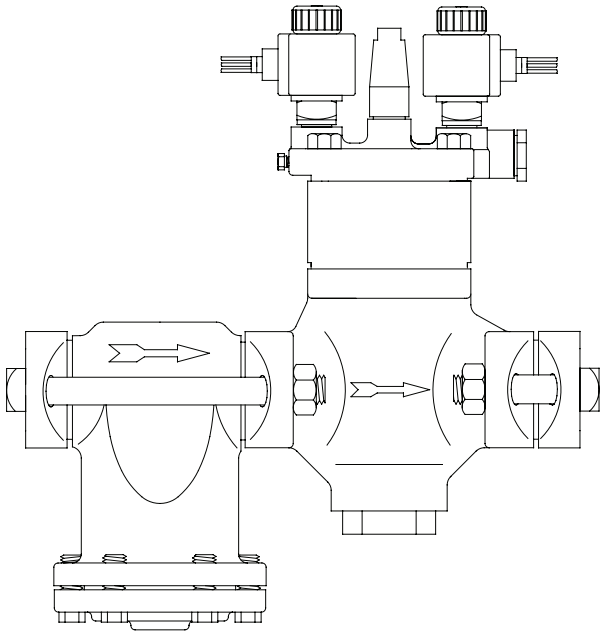
"Two step refrigerant solenoid valves shall provide for two automated valve positions, partial and full flow. Valves shall have encapsulated, watertight coils, Teflon seats, carbon steel or ductile iron bodies, spring closing pilot and main valve seats, and be suitable for a safe working pressure of 400 psig (28 bar), as manufactured by Hansen Technologies Corporation or approved equal."

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.

WARRANTY

All Hansen products, except electronics, are guaranteed against defective materials or workmanship for one year F.O.B. factory. Electronics/electrical are guaranteed against defective materials or workmanship for 90 days F.O.B. factory. No consequential damages or field labor is included.



1-1/4" HS4D WITH CLOSE-COUPLED STRAINER

HANSEN TECHNOLOGIES
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