HANSEN TECHNOLOGIES CORPORATION

Instructions S429a
Nov 2001

Installation Instructions

HS4A SOLENOID VALVES ¾" thru 6" PORT (20 thru 150 mm)

Flanged ¾" thru 4"
Weld End 5" & 6"
for refrigerants

APPLICATIONS

Ideal for use as standard, stock refrigerant solenoid valves to control the on-off flow of refrigerant, such as ammonia and R22, R134a and other approved reigerants and warm refrigeration oil.

- Use to automatically stop liquid feed to recirculating liquid overfeed evaporators, and as liquid makeup solenoid valve for pump recirculators.
- 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.)

For Ammonia, R22, R134a, and Other Approved Refrigerants

Max. Opening Pressure (MOPD): 300 psi (20.7 bar)
Safe Working Pressure: 400 psig (27 bar)
Operating Temperature:–60°F to +240°F (–50°C to +115°C); (Lower temperatures possible at pressure down-ratings)

INSTALLATION

Protect the interior of valve from dirt and moisture during storage and installation. Valve should be installed so that the arrow on the valve body is in direction of normal refrigerant flow. Valve will not prevent reverse flow; use check valves where necessary. System should be free from dirt, weld slag and rust particles. A 60 mesh, close-coupled strainer is available for installation at inlet of valve; no small internal screens are used. Pipe sizing, rating, anchoring, and similar prudent precautions should be taken to ensure "liquid hammer" will not occur when valves open or close.

For proper flange gasket sealing, care must be taken when threading or welding to assure flanges are parallel to each other and perpendicular to pipe. Also, gaskets should be lightly oiled and all bolts must be tightened evenly.

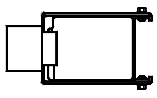
Valves in 5" and 6" size are Type HS4W with integral butt weld end only. These steel bodied solenoid valves are directly welded into the pipe line. During welding, the manual opening stem should be opened downward several turns to protect the teflon seat from weld heat.

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

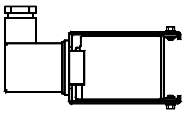
ELECTRICAL

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

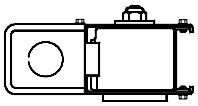
Watertight Solenoid Coil with 18" (450 mm) long wire pigtail leads and steel frame housing with ½" fitting for conduit is **standard**.



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



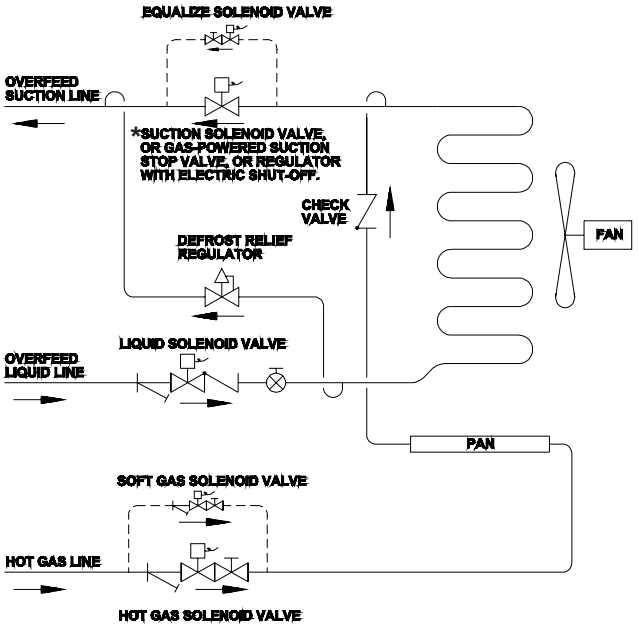
Coil with Junction Box, optional. These coils have integral, steel junction box for connection of the 18" (450 mm) long wire pigtail leads.



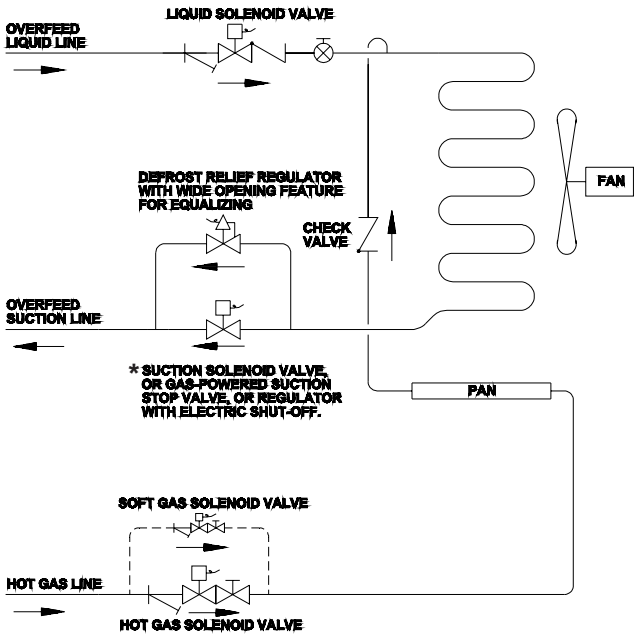
TYPICAL APPLICATIONS FOR HOT GAS DEFROST

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.

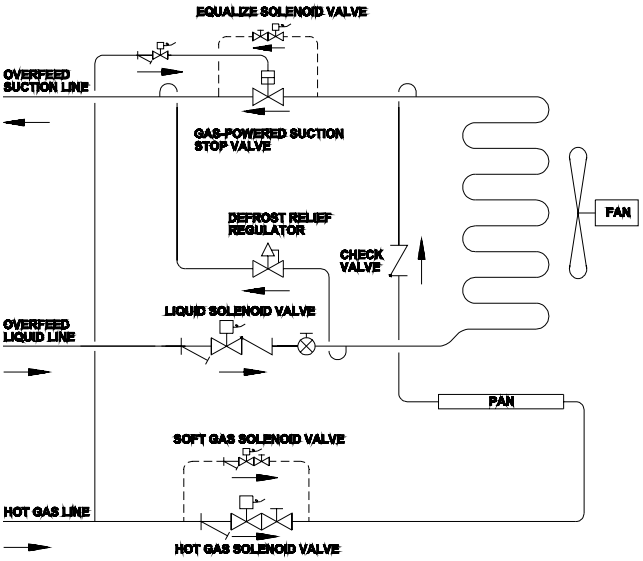
BOTTOM FEED EVAPORATOR



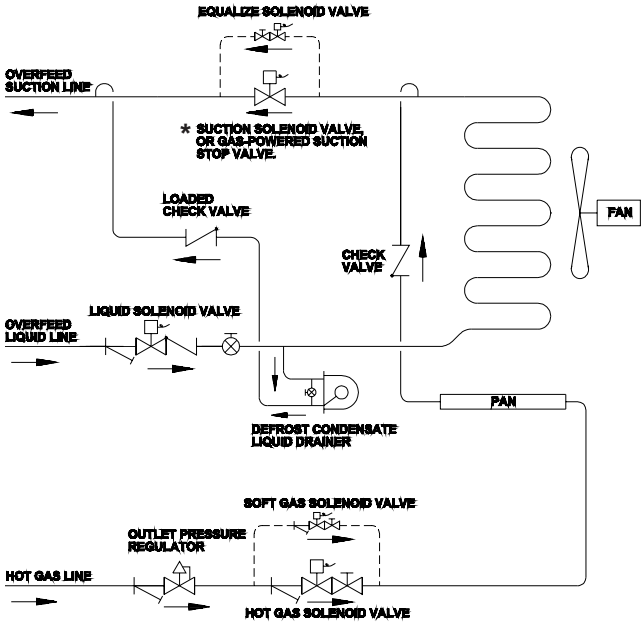
TOP FEED EVAPORATOR



EVAPORATOR WITH GAS-POWERED SUCTION STOP VALVE



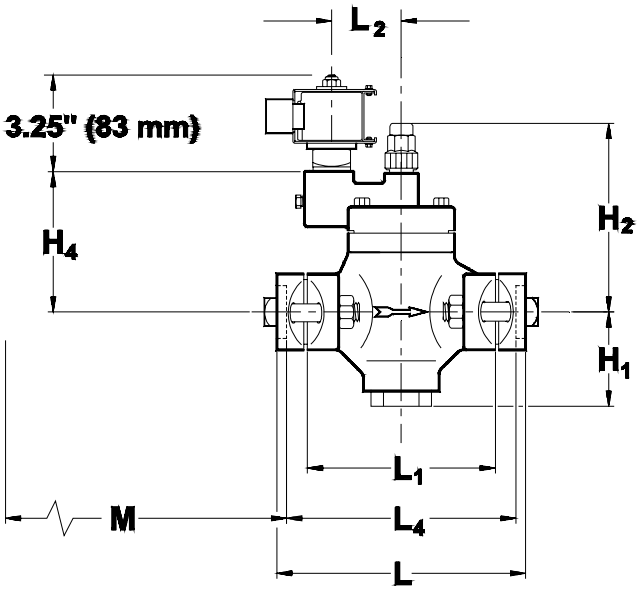
EVAPORATOR WITH DEFROST CONDENSATE LIQUID DRAINER



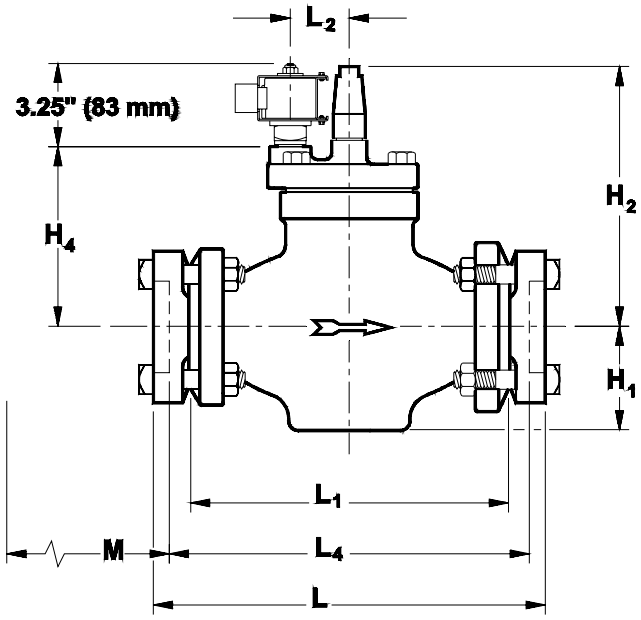
*For suction closure at temperatures below 0°F (–18°C) alternate low pressure drop valves are preferably used such as Hansen Gas-Powered Suction Stop Valve Type HCK2.

INSTALLATION DIMENSIONS

¾" THRU 1¼" (20 THRU 32 mm)



1½" THRU 4" (40 THRU 100 mm)



M= Additional length for close-coupled strainer.

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)	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)
1½", 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)
2½" (65)	3.62" (92)	9.69" (246)	6.53" (166)	13.01" (330)	14.03" (356)	9.88" (251)	2.35" (60)	11.01" (280)	9.83" (250)	5.62" (143)
3" (80)	4.06" (103)	10.00" (254)	6.88" (175)	15.38" (391)	16.40" (417)	12.25" (311)	2.35" (60)	13.38" (340)	12.20" (310)	6.50" (165)
4" (100)	4.69" (119)	10.56" (268)	7.46" (189)	17.01" (432)	20.51" (521)	14.12" (359)	2.56" (65)	15.01" (381)	14.07" (357)	8.06" (205)

*Maximum width of valve.

†Alternate special 1¼" 4-bolt version is available with face-to-face (L_1) same dimension as R/S 1¼" for replacements.

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.

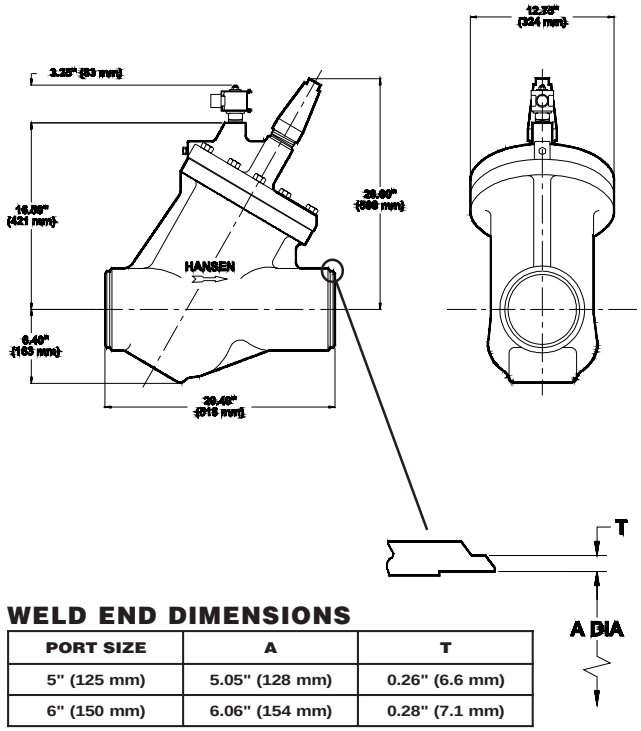
Failure to Close: controlling switch or thermostat not opening contacts; manual opening stem is turned in; valve installed in wrong direction; damage or dirt at main valve seat or pilot seat; piston bleed hole plugged.

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 4.

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

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



WELD END DIMENSIONS

PORT SIZE	A	T
5" (125 mm)	5.05" (128 mm)	0.26" (6.6 mm)
6" (150 mm)	6.06" (154 mm)	0.28" (7.1 mm)

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

WARRANTY

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

Refer to the following HANSEN solenoid valve bulletins for more details and sizing information:
S429a — HS4A ¾" thru 6" port, flanged
S121 — HS7 ¾" thru 1¼" port, pilot operated, flanged S119 — HS8 ½" port, pilot operated, flanged
S117 — HS6 5/32" port, direct lift, flanged
S114 — HS2 5/32" port, direct lift, screwed end

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