

HANSEN TECHNOLOGIES CORPORATION



High Side Float: HT100
(Float Drain Regulator)

INTRODUCTION

These carefully designed and manufactured high-pressure float drain regulators are ideal for metering high-pressure refrigerant liquid to a lower-pressure vessel without allowing refrigerant gas to pass. These self-contained, nonelectrical float drain regulators provide a simple solution for many applications. Liquid and gas enter the valve inlet and collect in the valve body. As the liquid level rises, it lifts the float ball assembly exposing the slide valve orifice and metering liquid to the outlet.

APPLICATIONS

These float drain regulators are specifically designed for refrigeration systems. They are suitable for ammonia, R22, R134a, and other Hansen-approved refrigerants. They can be used as outlined below.

High Side Floats (See page 3)

The HT100, HT200, and HT300 high side floats (float drain regulators) are typically used to drain condensers to chillers, recirculators, controlled pressure receivers, or flooded evaporators; to drain hot gas supply mains; or to drain liquid condensate from heat reclaim coils.

Defrost Drainers (See page 12)

The HD101 defrost drainer, a variation of the HT100 high side float, has an adjustable vent valve bypass to fine-tune individual systems which may experience evaporator defrost gas binding. It is designed as a liquid condensate drain for an evaporator during hot gas defrost. It drains liquid while preventing most hot gas from flowing to the suction line. This process saves energy by eliminating artificial loading of the compressor.

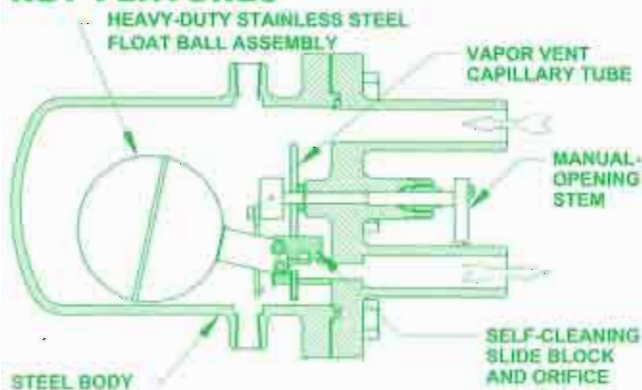
Specifications, Applications, Service Instructions & Parts

HT SERIES & HD101 REFRIGERANT FLOAT DRAIN REGULATORS

"HIGH SIDE FLOATS"
"DEFROST DRAINERS"

ISO 9002

KEY FEATURES



ADDITIONAL FEATURES

- Self-contained, no separate pilot.
- Low friction, self-cleaning slide block.
- Simple, reliable design.
- Manual-opening stem.
- Easy installation.
- Wide range of capacities.
- Modulates refrigerants over a wide range of flow.
- Oil and equalizer/purge connections standard.

TABLE OF CONTENTS

Operation	2
Installation	2
High Side Floats	3-11
Line Sizing	4
Typical Applications	4-5
Parts List	6
Capacity Charts	7-11
Defrost Drainers	12-14
Capacities	12
Typical Applications	12-13
Parts List	14
Ordering Information	16

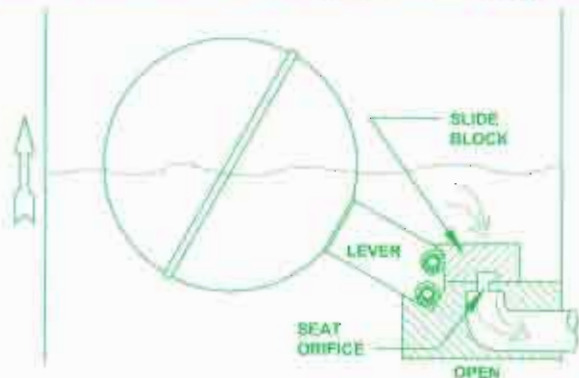
ADVANTAGES

The large, stainless steel float ball is of rugged construction and is supported by a reinforced float arm that provides stability during level fluctuations and liquid surges. The precisely-machined, low-friction composite slide block offers low wear, continuous self-cleaning of the orifice area, and provides excellent modulation characteristics over its operating range. The flanged regulator housing has a special O-ring seal design which permits the body to be removed for capacity modification or servicing.

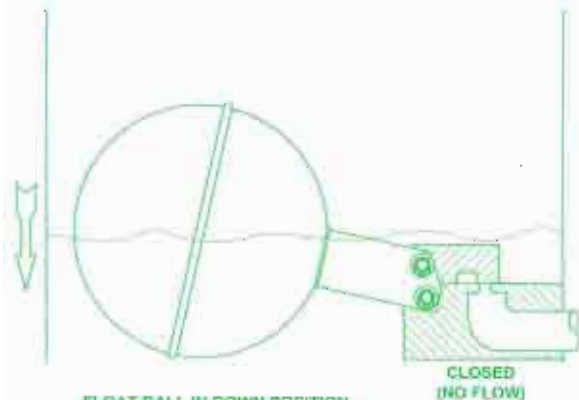
These float drain regulators replace pilot-operated float and float valve arrangements and associated pilot piping. They are also nonelectrical devices. This simplifies the control system and eliminates electrical controls. The nonelectrical aspect of these float drain regulators also makes them ideal for hazardous locations.

OPERATION

The Hansen high-pressure float drain regulator is a direct-float-operated valve which allows liquid to pass, but prevents gas from flowing through the valve. The float ball is attached by a lever to the low-friction composite slide block. The slide block moves across the mating seat orifice to regulate flow. As liquid refrigerant enters the body, the refrigerant level rises, lifting the float ball. The mechanical leverage through the float arm draws the slide block across the seat to expose more orifice area. As the liquid level drops, the slide block moves over the orifice to expose less area and slow the liquid flow. The surfaces seal tightly, virtually stopping the flow of liquid and preventing gas from passing through the orifice when the ball is down. An internal vapor vent capillary tube constantly bleeds a small amount of vapor to prevent stagnation.



FLOAT BALL IN UP POSITION



FLOAT BALL IN DOWN POSITION

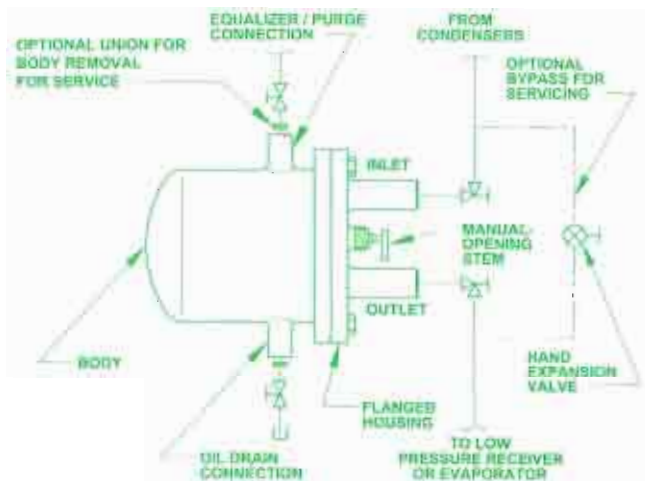
MATERIAL SPECIFICATIONS

Slide Block: Advanced composite material
Float Ball Assembly: Stainless steel
Safe Working Pressure: 400 psig (27 bar)
Operating Temperature: -60F to +240F
(-50°C to +115°C)

INSTALLATION

The float drain regulator must be installed using accepted refrigeration practices. Installation of the float drain regulator inlet follows the same piping considerations as applied to condenser drain piping. The line size from the condenser to the float drain regulator should be sized according to the chart on page 4. In most cases, the line size may be larger than the float drain regulator inlet connection. Generally, isolation service valves are installed on the inlet and outlet to facilitate maintenance and repair to the float drain regulator. An angle valve or globe valve with stem horizontal is recommended on the inlet connection for best free draining of the refrigerant liquid into the float drain regulator. Consideration should be given to installing a properly-sized hand expansion (regulator) valve in a bypass line. See the illustration below. This facilitates maintenance of the float drain regulator without shutting down the refrigeration system.

Equalizer/purge and oil drain connections are provided on the regulator body. During start-up of the system, the float drain regulator should be checked for accumulation of debris. The float drain regulator is often a low point in the system and may collect debris from the piping, condenser, and evaporator during defrost.



1. Install the float drain regulator horizontally as illustrated. The housing is stamped with "TOP" to indicate the upright position.
2. The top equalizer/purge and bottom oil drain connections should be plugged if not in use.
3. The handle on the manual-opening stem is normally in the down, automatic position. Turn up only for manual opening.

AIR PURGING

Air and other noncondensable gases can collect in the float drain regulator and cause the liquid refrigerant to back-up in the condenser. Since there is no liquid to lift the float ball, it may appear as though the float drain regulator is not functioning. A purge connection is located on top of the float drain regulator for connecting an AUTO-PURGER multipoint purger to remove air and other noncondensable gases.

According to the manufacturers of evaporative condensers, it is very important to trap each condenser circuit. This balances the pressure drop through each condenser circuit. The trap is also important to create a "seal" in the condenser drain line. This seal creates an area of low velocity at the outlet of the condenser where the noncondensable gases can easily be removed from an installed purge point by an AUTO-PURGER. Removing noncondensable gases reduces condensing pressure and results in lower energy costs associated with the refrigeration system.

SERVICE AND MAINTENANCE

Before attempting to open the float drain regulator or dismantling it for service, be sure it is isolated from the system and all refrigerant is removed. The bottom oil drain connection is useful for pump-out. Follow usual refrigeration system safe servicing procedure. Read the CAUTION section on page 16 of this bulletin.

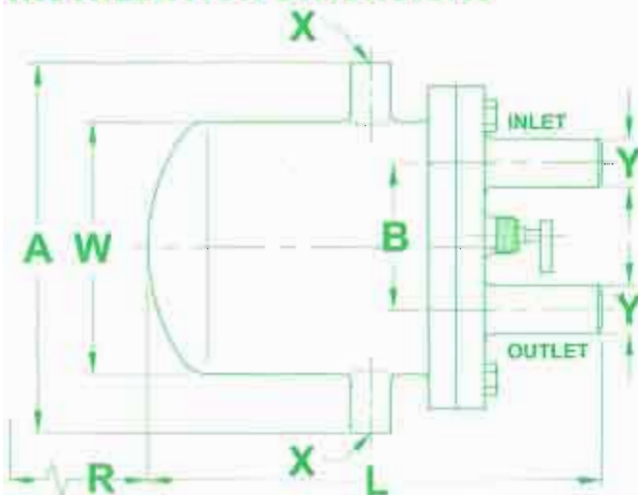
To gain access to working parts (float ball and seat assembly) for inspection, cleaning, or replacement, it is necessary to remove the body from the flanged housing after all refrigerant has been removed from the unit.

SIGHT GLASSES

Analyzing the proper operation of condensers, condenser piping, and float drain regulators can be greatly enhanced with the proper location of relatively inexpensive liquid indicators (sight glasses), such as the Hansen SEE-LEVEL®. Typical locations are shown in the Application Drawings section on pages 4 and 5 of this bulletin. The sight glasses can verify if liquid becomes lodged in the evaporative condensers, or if the float drain regulator is not allowing flow.

HIGH SIDE FLOATS

INSTALLATION DIMENSIONS



Cat. No.	Dimensions (mm)					X	Y
	A	B	L	R	W		
HT100	7.50" (191)	4.00" (102)	13.63" (346)	7.50" (191)	5.63" (143)	1/2" FPT	3/4" FPT/ 1" Weld
HT200	12.63" (321)	5.00" (127)	15.50" (391)	9.50" (241)	8.63" (219)	3/4" FPT	1 1/2" Weld
HT300	14.75" (375)	7.00" (178)	20.75" (527)	13.75" (349)	10.75" (273)	1/2" FPT	2" Weld

R dimension is allowance for removal of body.
W dimension is maximum diameter of body.
X dimension is the top equalizer/purge and bottom oil drain connection size.

Capacity charts for the HT series high side floats (float drain regulators) are shown on pages 8 through 11. Instructions for using these charts to correctly size the high side floats can be found on page 7. For assistance, contact the factory. Use the chart below for sizing based on nominal capacity.

NOMINAL CAPACITIES

REFRIGERANT	UNITS	HT100	HT200	HT300
Ammonia	Tons	20	125	360
	lbs/min	8.3	53	150
	kW	70	440	1266
	kg/hr	226	1442	4080
R22	Tons	5.5	33	100
	lbs/min	15.5	93	282
	kW	19	116	352
	kg/hr	422	2530	7670

Capacities are based on +86°F (+30°C) condensing temperature and +10°F (-12.2°C) evaporator temperature. Instantaneous capacities are shown: size high side floats about 20% greater to accommodate surges of liquid if appropriate. Consult the factory for other condensing or evaporator temperatures, refrigerants, or evaporator defrost or reheat sizing.

HIGH SIDE FLOAT INLET LINE SIZE CAPACITIES*

Nominal Inlet Line Size	Ammonia		R22	
	Internal Equalization 100 ft/min (0.5 m/sec)	External Equalization 150 ft/min (0.7 m/sec)	Internal Equalization 100 ft/min (0.5 m/sec)	External Equalization 150 ft/min (0.7 m/sec)
3/4"	25 Tons (88 kW)	38 Tons (134 kW)	6 Tons (21 kW)	9 Tons (32 kW)
1"	42 Tons (148 kW)	63 Tons (222 kW)	13 Tons (46 kW)	20 Tons (70 kW)
1 1/4"	75 Tons (264 kW)	113 Tons (397 kW)	23 Tons (81 kW)	35 Tons (123 kW)
1 1/2"	103 Tons (362 kW)	155 Tons (545 kW)	29 Tons (102 kW)	44 Tons (155 kW)
2"	194 Tons (682 kW)	290 Tons (1020 kW)	52 Tons (183 kW)	75 Tons (264 kW)
2 1/2"	276 Tons (971 kW)	414 Tons (1456 kW)	73 Tons (257 kW)	110 Tons (387 kW)
3"	425 Tons (1495 kW)	638 Tons (2244 kW)	113 Tons (397 kW)	170 Tons (598 kW)

The above table is based on US Schedule 80 steel pipe for 3/4" to 1 1/2" and US Schedule 40 steel pipe for 2" and above.

*The outlet line size should be one or two pipe sizes larger than the connection size, unless the high side float is located within 20 feet (6 meters) of the lower-pressure vessel.

APPLICATIONS—HIGH SIDE FLOATS (FLOAT DRAIN REGULATORS)

Evaporative Condensers—When one high side float is connected to two or more circuits of an individual condenser, the piping of the condenser outlet drain lines should be treated the same as if draining to a high-pressure receiver. Each drain leg of each condenser circuit must be trapped. A minimum height (H) of 4 to 8 feet (1.23 m to 1.83 m) for ammonia and 8 to 12 feet (2.46 m to 3.66 m) for halocarbon refrigerants is normally required. Consult the condenser manufacturer's installation manual for specific outlet drain line requirements. As with receivers, an equalizer line from the top of the high side float to the inlet of the condenser is required to facilitate free draining of liquid refrigerant into the high side float.

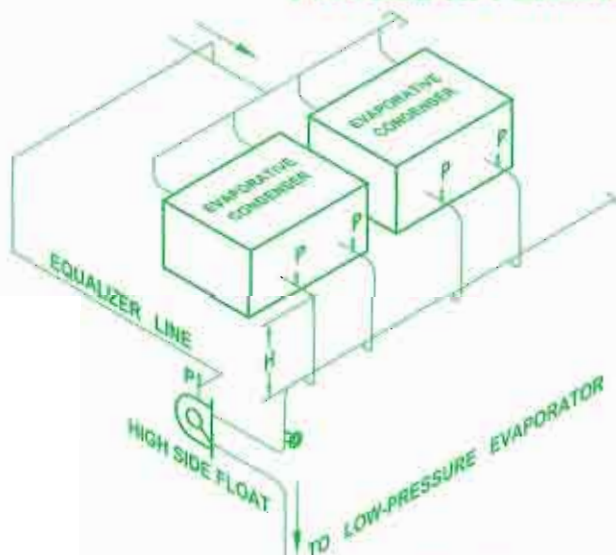
These high-pressure high side floats are suitable for metering high-pressure liquid from the condenser to a lower-pressure receiver, pump recirculator intercooler, or other vessel. However, they are not suitable for draining to a receiver at condensing pressure.

Thermo-Siphon Oil Cooler Drain—The high-pressure high side floats can be installed on thermo-siphon vessels to drain excess liquid from the thermo-siphon vessel to the lower-pressure receiver.

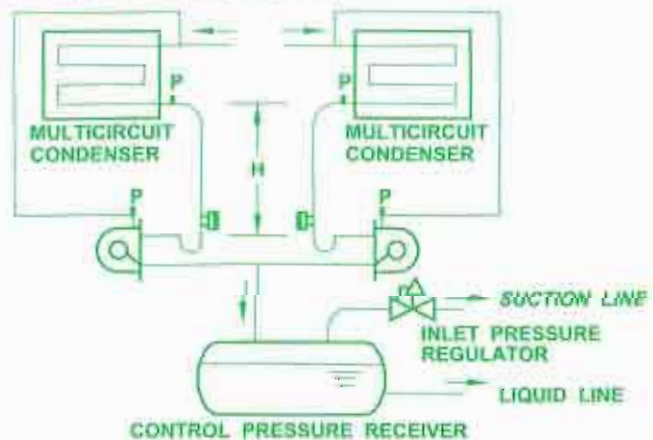
Heat Reclaim Coil—Heat reclaim coils operate very effectively when a liquid drain is incorporated in a proper design. Condensing liquid is drained from the condensing surfaces and metered via a high side float to a lower-pressure vessel. Heat transfer is thus maximized.

Hot Gas Main Drain—To prevent condensed liquid refrigerant from causing potential damage to the refrigerant system, a high side float should be installed in the low point of the hot gas main line. During defrost, the sudden flow of hot gas can propel a slug of liquid which can damage piping, evaporators, and valves in certain instances. The high side float continuously removes liquid from the hot gas mains and minimizes this possibility.

TYPICAL APPLICATIONS—HIGH SIDE FLOATS



Multiple Condenser Circuits

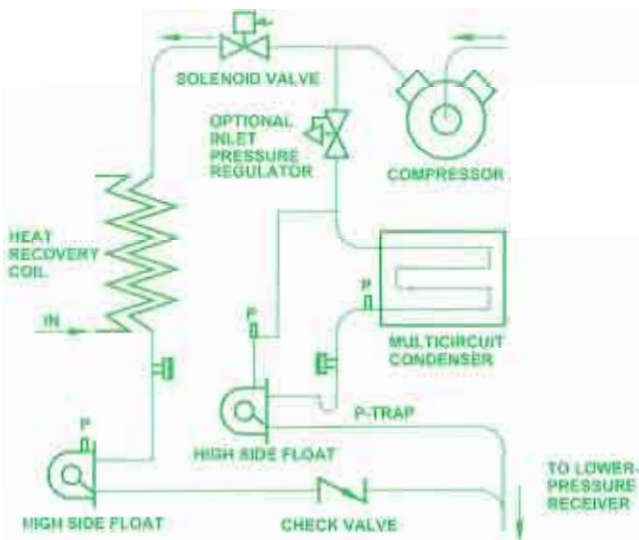
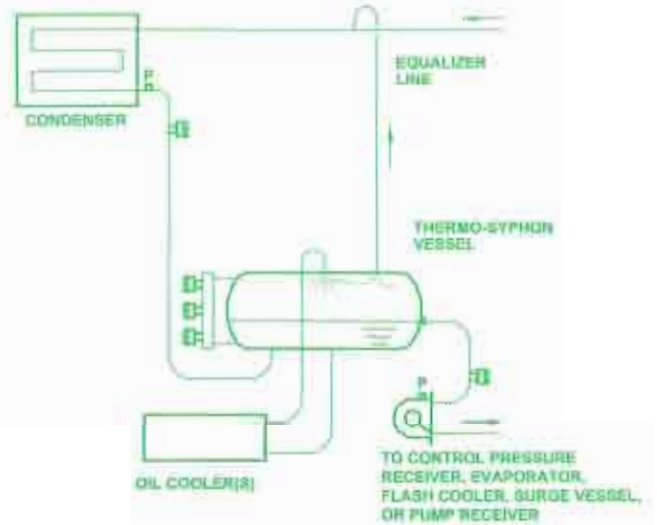
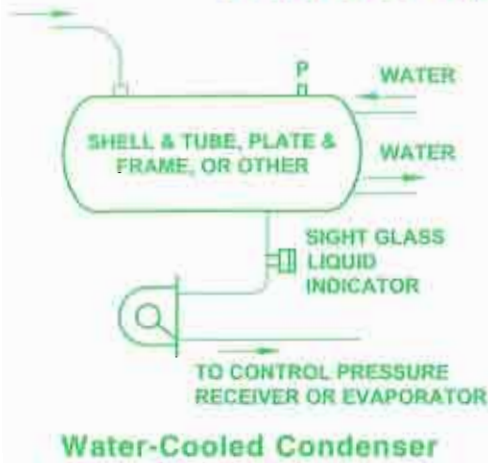


Condenser Piping Using Separate High Side Floats in Parallel (Shown with a Control Pressure Receiver)

Note: All diagrams, schematics, and installation drawings in this bulletin are representations for illustration purposes only and should not be used for actual engineering or design purposes.

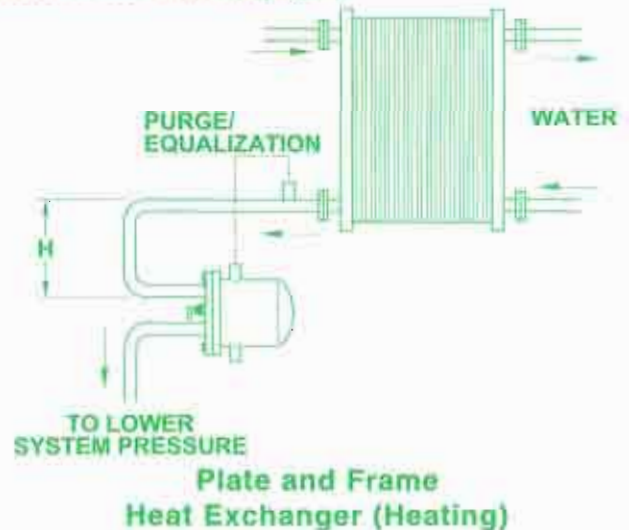
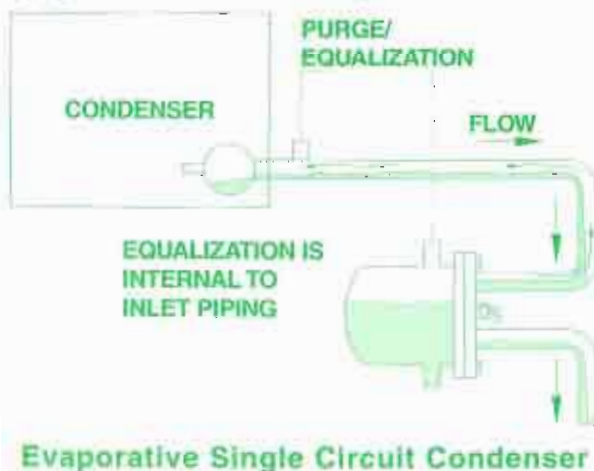
H = Height specified by the condenser manufacturer
P = Purge Point

TYPICAL APPLICATIONS—HIGH SIDE FLOATS

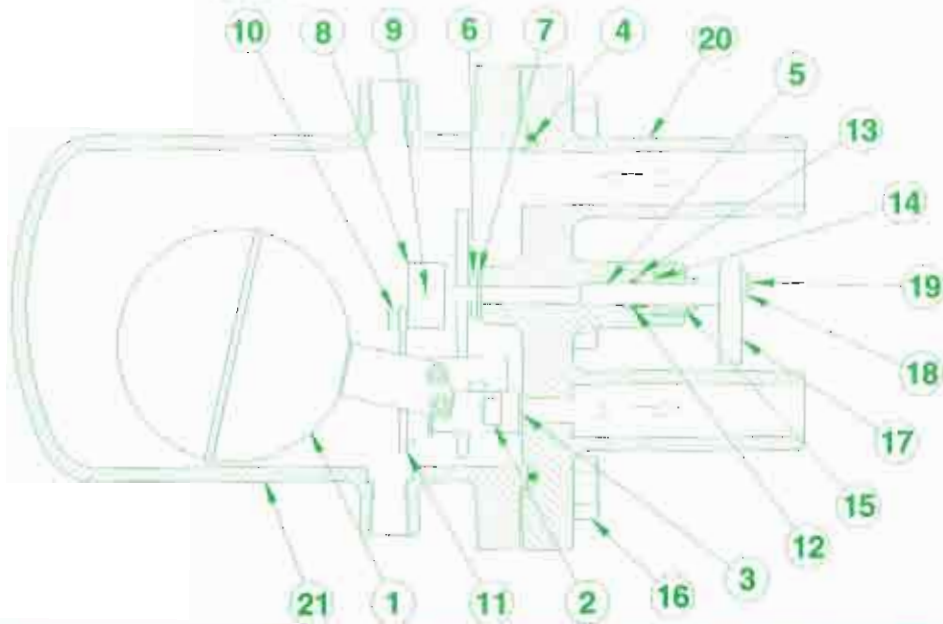


Where the "H" dimension cannot be met or the high side float is installed close to the condenser outlet, the down-pitched inlet line to the high side float must be generously oversized to allow for internal equalization. Liquid refrigerant velocity should be limited to 100 ft/min (0.5 m/sec). Refer to the chart on page 4 for inlet line size capacities.

If the line size is not increased or the line is trapped, external equalization to the outlet of the condenser is required. The maximum liquid refrigerant velocity for external equalization is 150 ft/min (0.7 m/sec). Refer to the chart on page 4.



PARTS LIST HIGH SIDE FLOATS

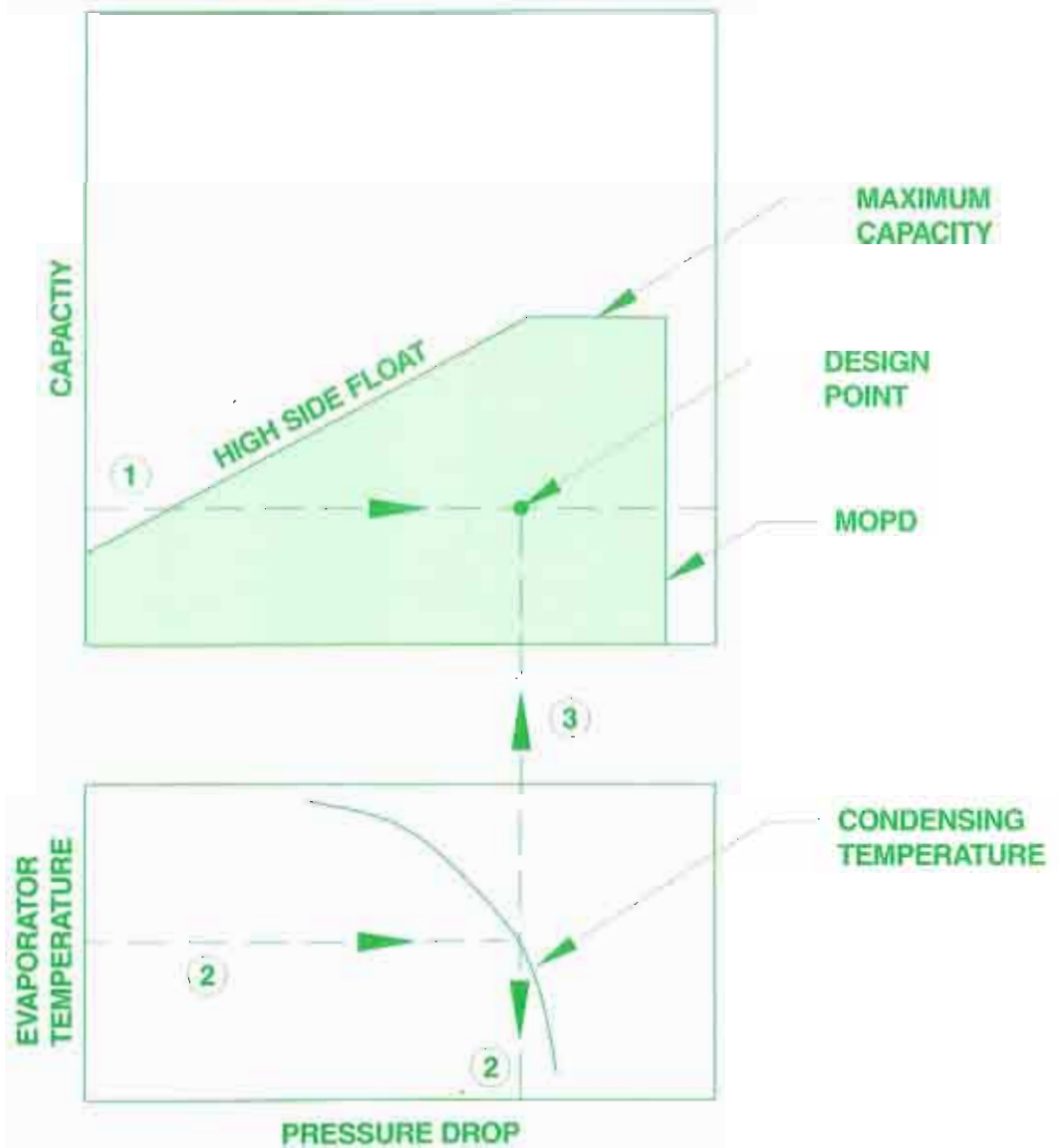


ITEM	DESCRIPTION	QTY.	HT100	HT200	HT300	FLOAT BALL REPLACEMENT KITS		
						HT100	HT200	HT300
1	Float Ball Assembly *	—	—	—	—	HT100	HT200	HT300
	R717, 120 PSID (LN)	1	65-0112	65-0197	65-0148	65-1027	65-1021	65-1032
	R717, 200 PSID (MN)-Standard	1	65-0113	65-0198	65-0149	65-1003	65-1018	65-1023
	R717, 360 PSID (HN)	1	—	65-0199	65-0150	—	65-1022	65-1024
	R22, 120 PSID (LF)	1	65-0166	—	—	65-1028	—	—
	R22, 160 PSID (MF)-Standard	1	65-0165	65-0107	65-0124	65-1014	65-1004	65-1001
	R22, 300 PSID (HF)	1	65-0164	65-0108	65-0125	65-1029	65-1030	65-1031
2	Seat Screw	2	65-0024	65-0066	65-0066	The above Float Ball Replacement Kits include the Float Ball Assembly, Seat Screw, Seat Gasket, Housing O-ring, Cam Screw, and Manual-Opening Lifting Tee.		
3	Seat Gasket	1	65-0094	65-0094	65-0121			
4	Housing O-Ring	1	65-0022	65-0055	65-0056			
5	Stem	1	65-0073	65-0073	65-0073			
6	Stem Pin	1	65-0032	65-0032	65-0032			
7	Stem Washer	1	65-0034	65-0034	65-0034			
8	Cam	1	65-0074	65-0074	65-0074			
9	Cam Pin	1	65-0031	65-0031	65-0031			
10	Cam Screw	1	65-0067	65-0067	65-0067			
11	Manual-Opening Lifting Tee	1	65-0037	65-0088	65-0076			
12	Stem O-Ring	1	50-0179	50-0179	50-0179			
13	Packing Washer	1	50-0046	50-0046	50-0046			
14	Stem Packing	1	50-0045	50-0045	50-0045			
15	Packing Nut	1	50-0013	50-0013	50-0013			
16	Housing Screw for HT100	6	65-0023	—	—			
	Housing Screw for HT200	8	—	65-0057	—			
	Housing Screw for HT300	12	—	—	65-0058			
17	Manual-opening Handle	1	65-0035	65-0035	65-0092			
18	Washer	1	50-0129	50-0129	50-0129			
19	Screw	1	50-0028	50-0028	50-0028			
20	Flanged Housing	1	65-0039	65-0086	65-0084			
21	Body	1	65-0038	65-0083	65-0082			

* Float Ball Assembly includes the float ball plus replacement slide valve.

USING CAPACITY CHARTS

(PAGES 8 THROUGH 11)



SELECTING HT100, HT200, OR HT300 HIGH SIDE FLOAT WHEN THE CAPACITY, EVAPORATOR TEMPERATURE, AND CONDENSING TEMPERATURE (OR PRESSURE DROP) ARE KNOWN:

1. Find the needed capacity value on the left side of the upper chart. Draw a horizontal line across the chart.
2. Find the evaporator temperature along the left side of the lower chart. Draw a horizontal line to the right until it intersects the line representing the condensing temperature. If the evaporator

temperature is not known but the pressure drop is, locate the pressure drop value on the bottom line of the lower chart.

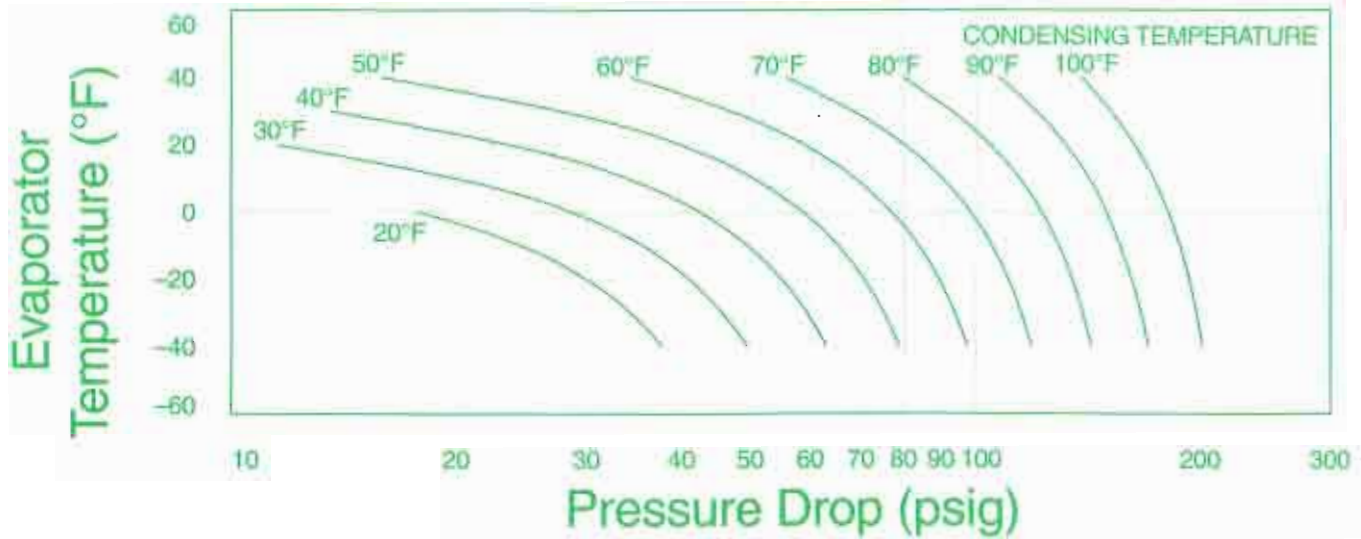
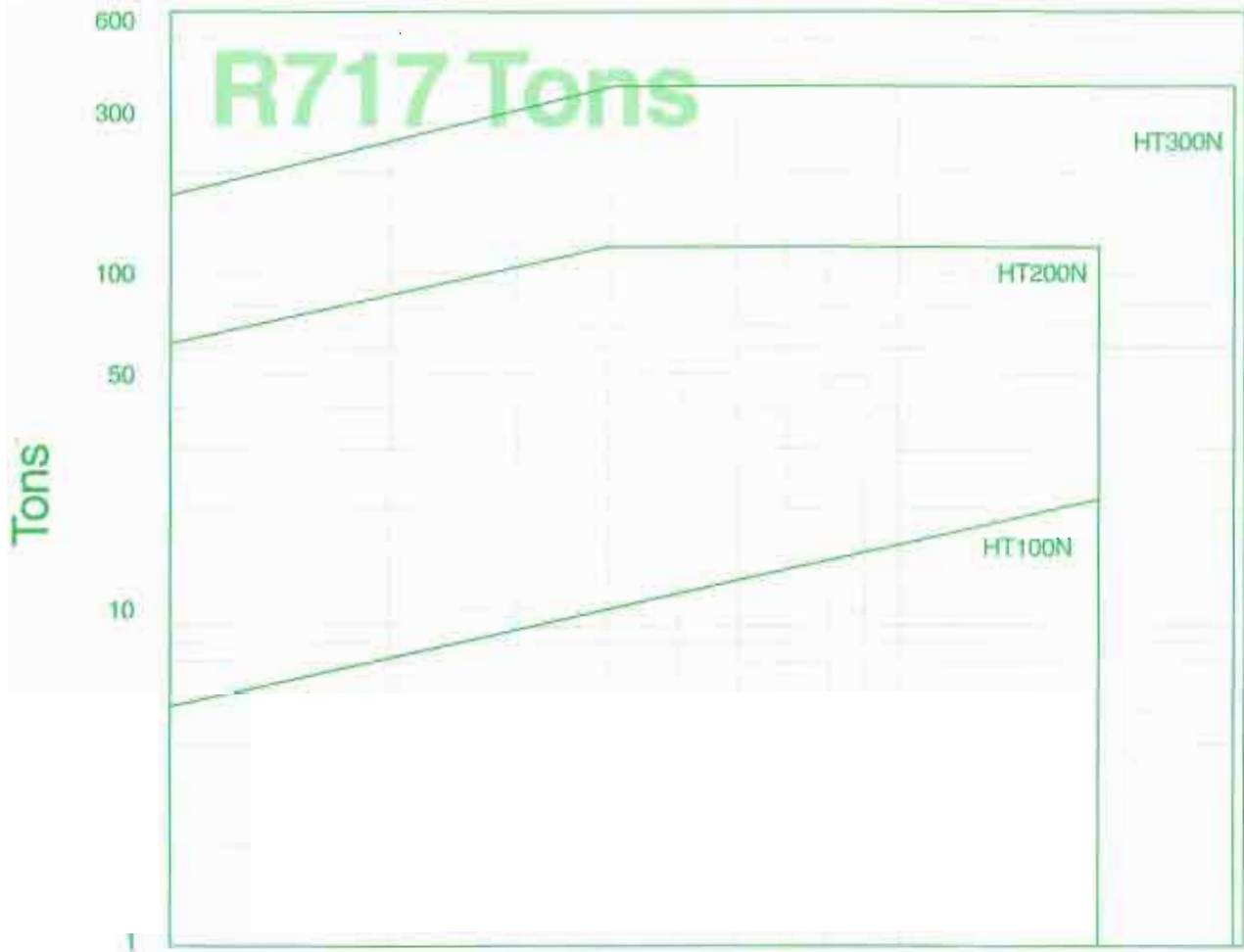
3. Draw a vertical line until it intersects the needed horizontal "capacity line."
4. The intersection should be within the area enclosed by the line representing the desired high side float.

FINDING THE PRESSURE DROP WHEN THE EVAPORATOR TEMPERATURE AND CONDENSING TEMPERATURE ARE KNOWN:

1. Find the evaporator temperature on the left side of the lower chart. Draw a horizontal line to the right until it intersects the line representing the condensing temperature.

2. At that intersection, draw a vertical line down to find the pressure drop at the given evaporator and condensing temperatures.

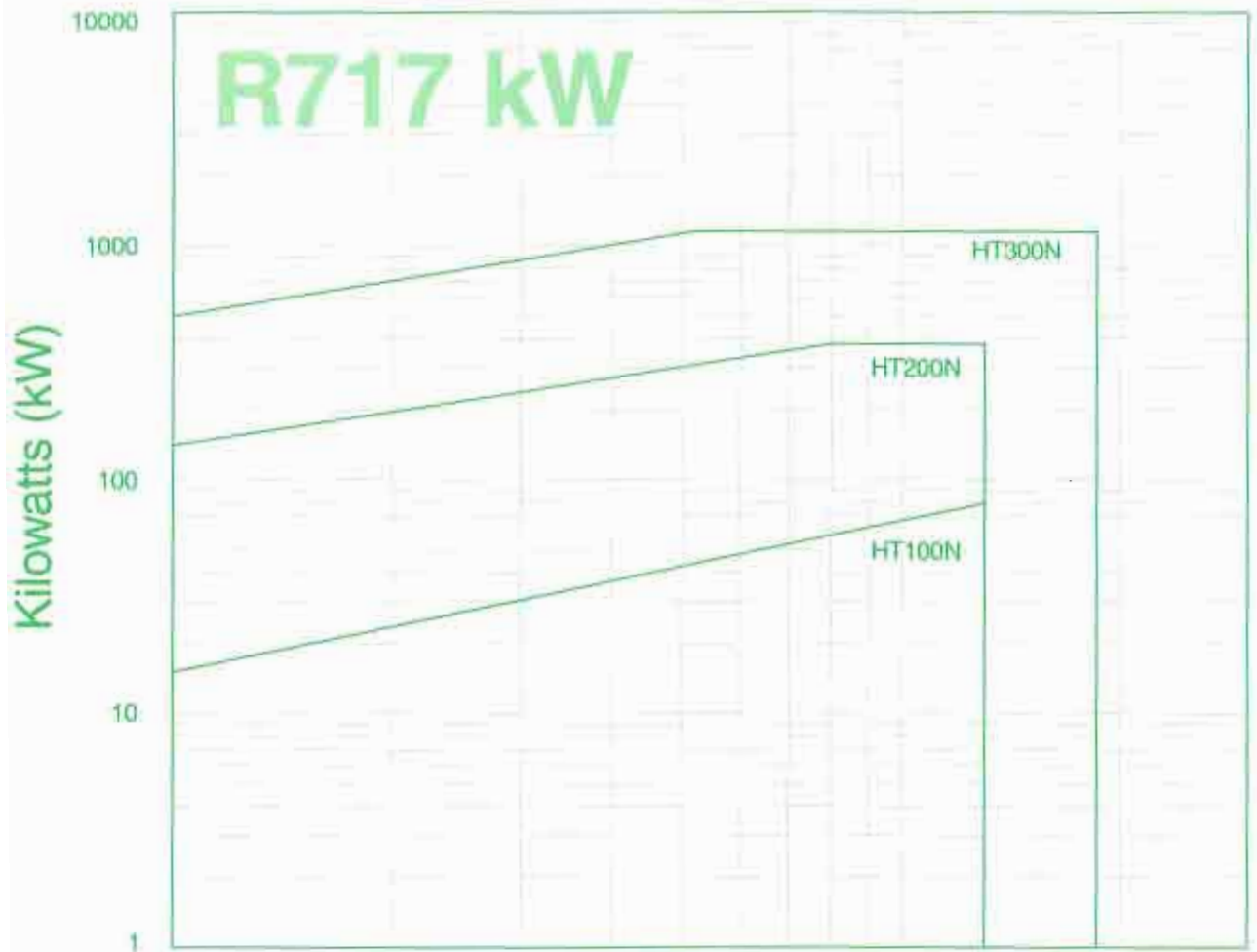
**HIGH SIDE FLOATS (FLOAT DRAIN REGULATORS)
FOR USE WITH LIQUID AMMONIA**



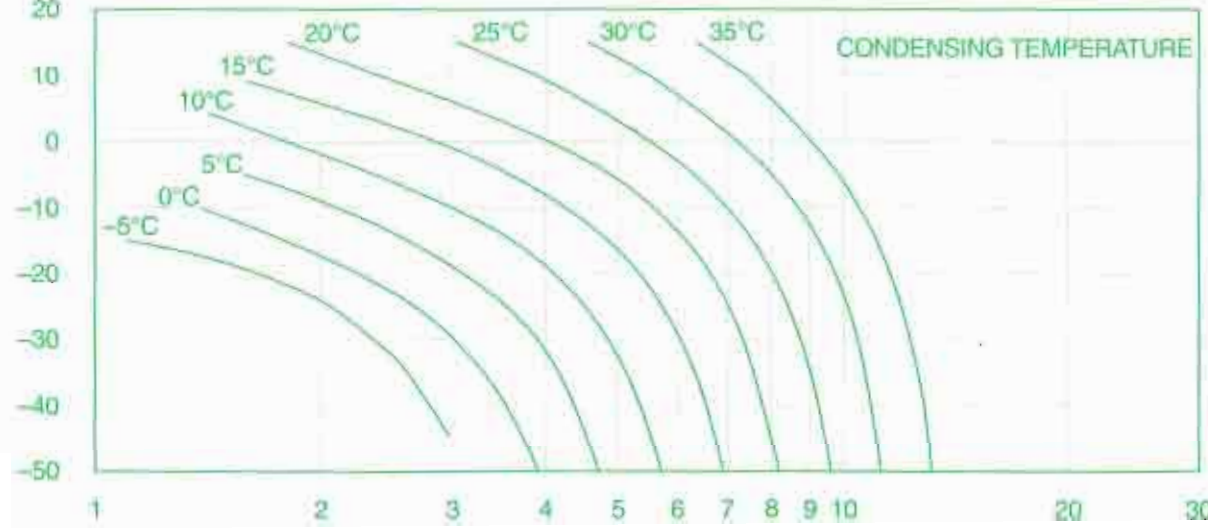
When sizing high side floats for a pressure drop below 10 psig, consult the factory.

**HIGH SIDE FLOATS (FLOAT DRAIN REGULATORS)
FOR USE WITH LIQUID AMMONIA**

R717 kW



**Evaporator
Temperature (°C)**

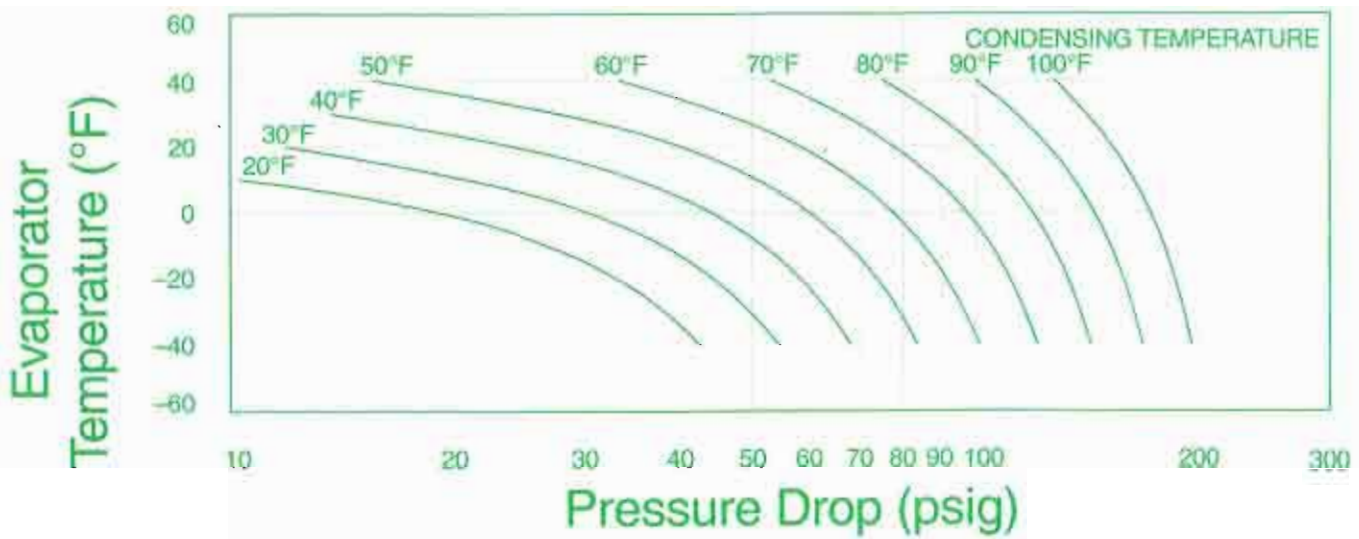


Pressure Drop (bar)

When sizing high side floats for a pressure drop below 1 bar, consult the factory.

**HIGH SIDE FLOATS (FLOAT DRAIN REGULATORS)
FOR USE WITH LIQUID R22**

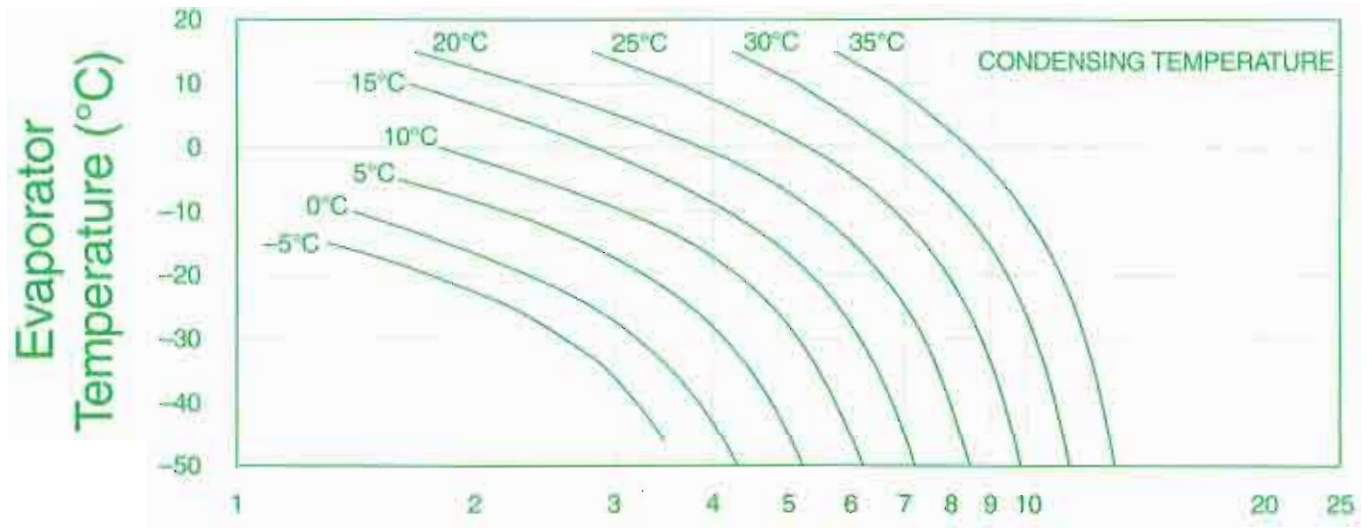
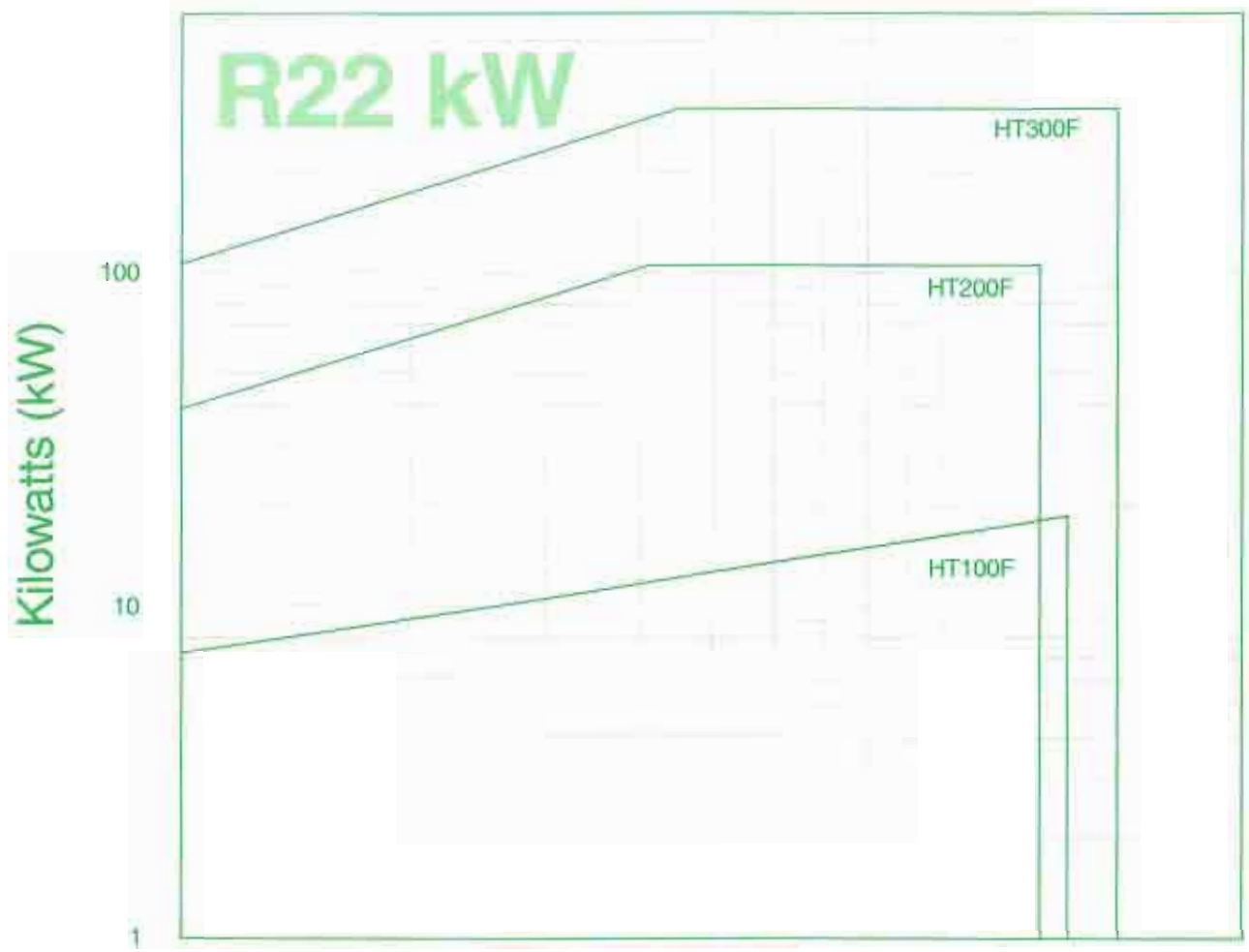
R22 Tons



When sizing high side floats for a pressure drop below 10 psig, consult the factory.

R134a tons = R22 tons X .73 (accuracy within 8%)

**HIGH SIDE FLOATS (FLOAT DRAIN REGULATORS)
FOR USE WITH LIQUID R22**



Pressure Drop (bar)

When sizing high side floats for a pressure drop below 1 bar, consult the factory.

R134a kilowatts = R22 kilowatts X .73 (accuracy within 8%)

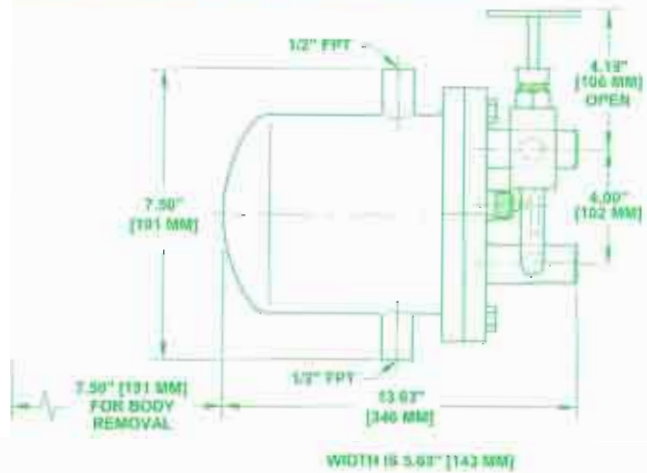
DEFROST DRAINERS



Defrost Drainer: HD101

The HD101 defrost drainer (float drain regulator) is designed specifically for removing liquid condensate from evaporators during the defrost period. The oversize seat orifice is designed to quickly remove liquid. As hot gas is introduced into the evaporator, the gas is condensed and drains to the lower coil row of the evaporator and into the defrost drainer. The defrost drainer meters the liquid and a minimal amount of gas back to the intercooler or low-pressure receiver. The defrost drainer offers the advantage of higher energy efficiency by not allowing unneeded hot gas to return to the suction and the unnecessary increase in compressor capacity and operation, and corresponding increase in suction pressures.

INSTALLATION DIMENSIONS



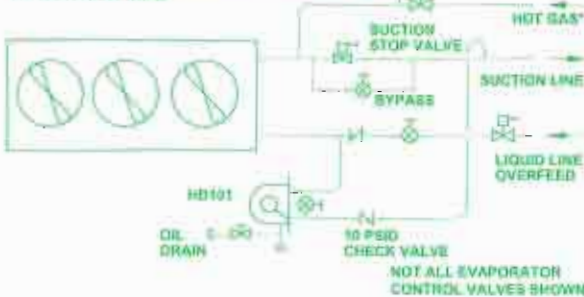
MAXIMUM CAPACITIES

HD101N AMMONIA	HD101F R22	CONNECTIONS
42 tons (147 kW)	11 tons (39 kW)	3/4" FPT / 1" Weld

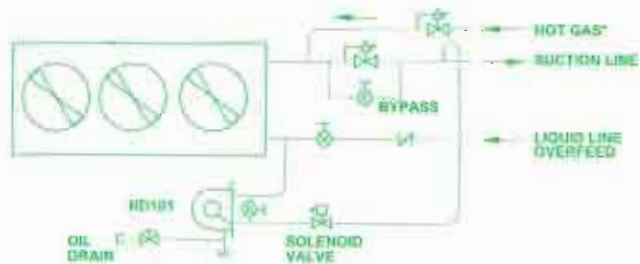
The maximum operating pressure differential is 100 psi (6.8 bar). For higher capacities, the HT200 and HT300 can be used by adding the bypass valve (customer supplied) in the field.

TYPICAL APPLICATIONS—DEFROST DRAINERS

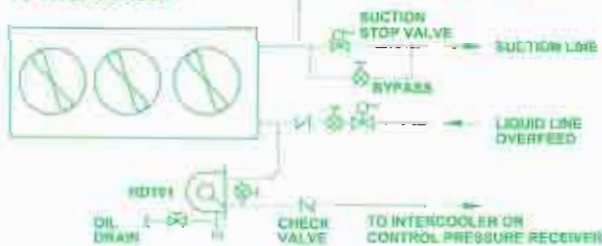
CONDENSATE DRAINER INSTALLATION TO SUCTION LINE



DEFROST DRAINER WITH BACK PRESSURE REGULATOR WITH ELECTRIC SHUT-OFF CONTROLLING EVAPORATOR PRESSURE

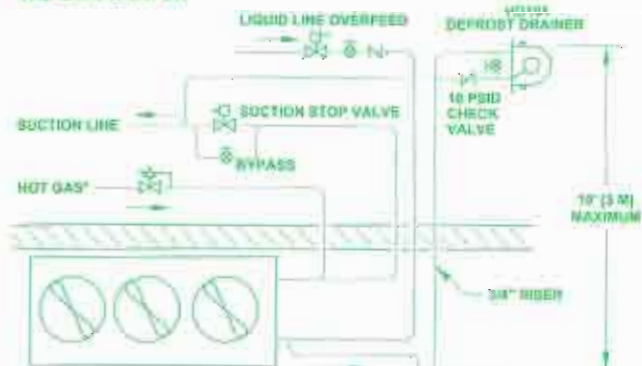


CONDENSATE DRAINER INSTALLATION TO INTERCOOLER



*An outlet regulator with electric shut-off (HA4AOS) is required to maintain hot gas pressure at a reasonable defrost pressure, as recommended by the evaporator manufacturer.

DEFROST DRAINER ABOVE THE EVAPORATOR



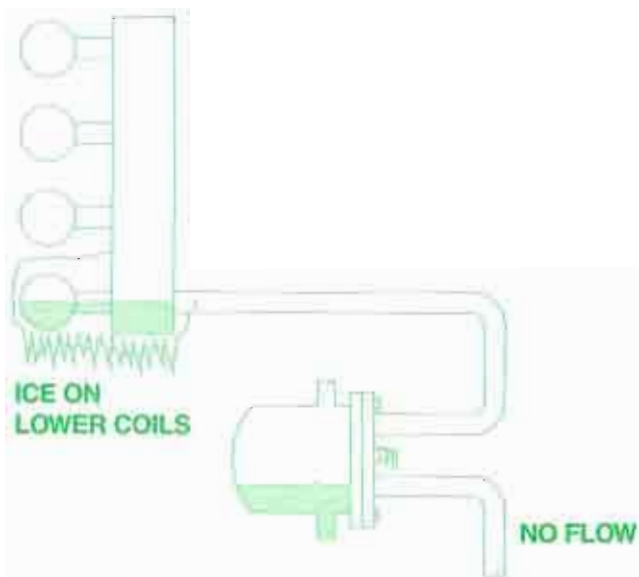
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BUILT-IN BYPASS

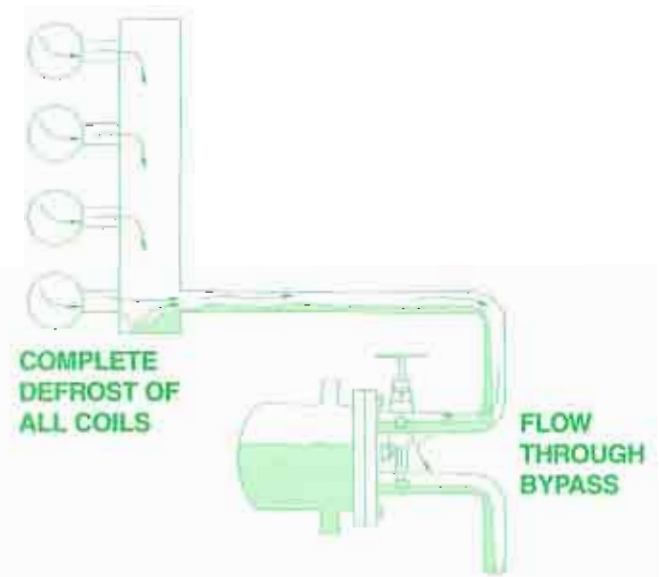
The key to efficient defrost is the complete removal of liquid from all coils of the evaporator. To prevent subcooled liquid from accumulating in the lower coils and hindering defrost, it is critical to maintain a constant flow of hot gas through the evaporator, even when the defrost drainer slide valve is closed. To achieve this, the HD101 has a hand expansion valve incorporated as a built-in bypass valve. The bypass valve allows a continuous flow of hot gas through the evaporator when the defrost drainer slide valve is closed by bleeding a small amount of hot gas around the defrost drainer. This constant flow prevents subcooled liquid from accumulating in the lower coils and blocking the flow from the evaporator outlet. Free-draining coils may not require any bypass gas.

The bypass valve on the HD101 is factory set at 1 1/2 turns open. This setting should provide a nominal flow of hot gas through the bypass valve when the defrost drainer slide valve is closed. However, it may be necessary to "fine tune" the bypass valve setting to match the specific conditions of a system. If the system is experiencing incomplete defrost of the lower evaporator coils, the bypass valve needs to be opened additional turns. If the evaporator is completely defrosting but there is excessive gas blow by, the bypass valve may need to be open fewer turns. After making any adjustments, observe system operation before making further adjustments.

Without Bypass



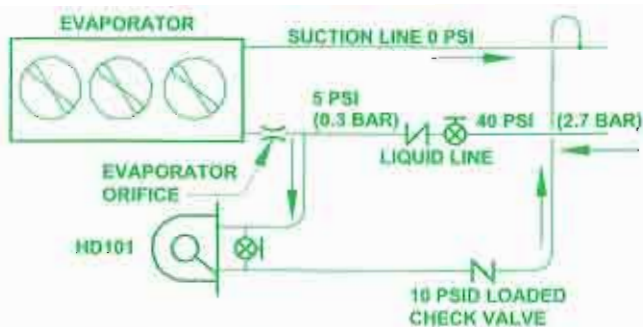
With Bypass



LOADED CHECK VALVES

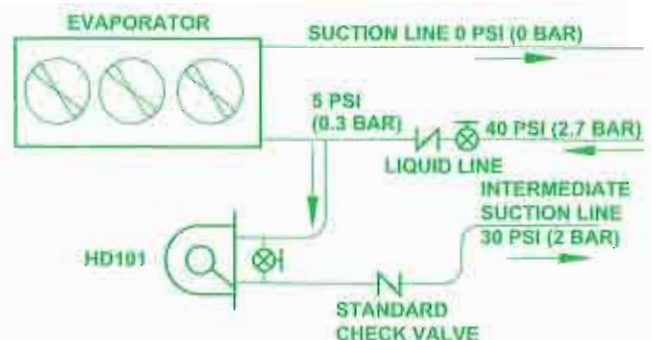
If the outlet of the defrost drainer is piped to a suction line with a lower pressure than the pressure at the inlet of the defrost drainer during the normal refrigeration cycle, a loaded check valve, typically 10 psid, must be installed. This check valve prevents flow of refrigerant through the defrost drainer to the

suction line during the normal refrigeration cycle. If the outlet of the defrost drainer is piped to an intermediate suction line, a standard check valve can be used if the pressure of the intermediate suction line is higher than the pressure at the inlet of the defrost drainer during the normal refrigeration cycle.



Hot gas defrost condition not shown.

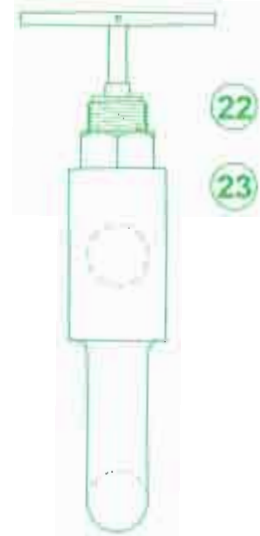
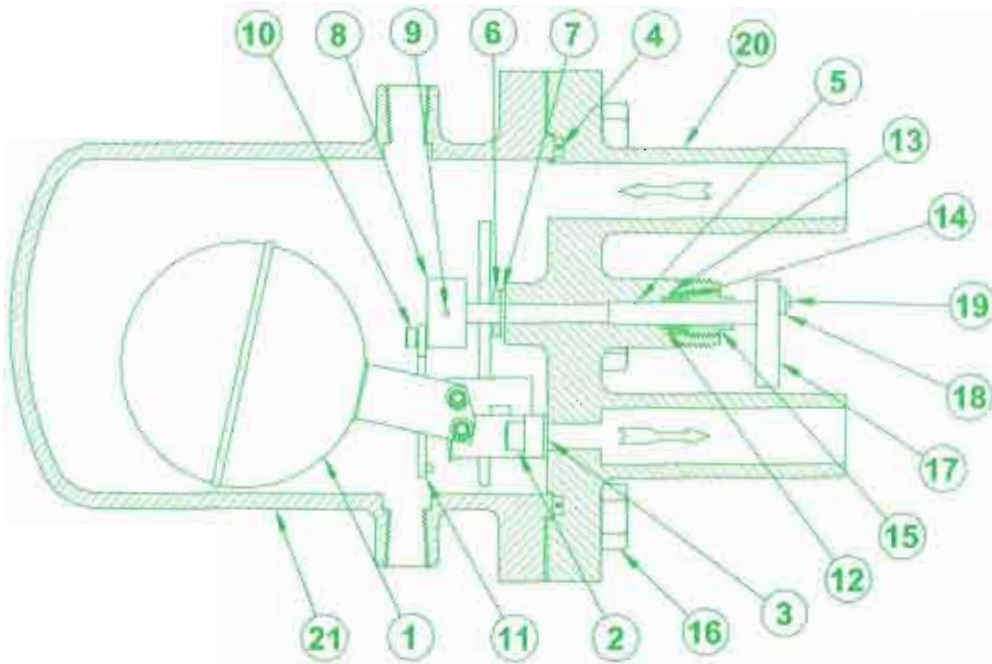
A loaded check valve is required for this configuration.



Hot gas defrost condition not shown.

A standard check valve is adequate for this configuration.

PARTS LIST DEFROST DRAINERS HD101



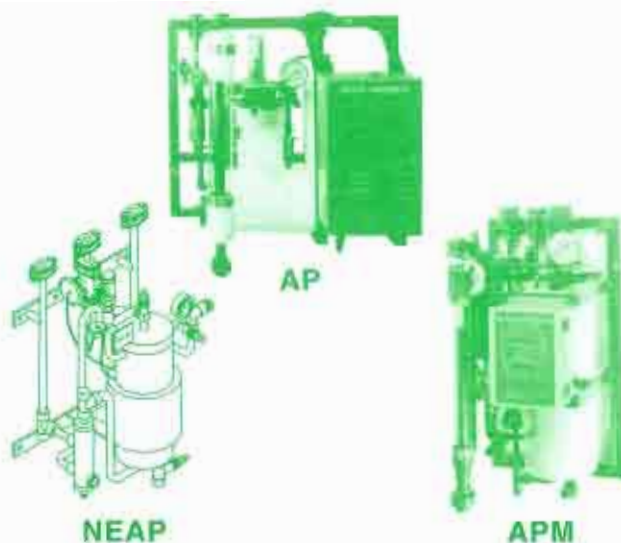
ITEM	DESCRIPTION	QTY.	HD101	HD101 FLOAT BALL REPLACEMENT KITS
1	R717, Float Ball Assembly *	1	65-0222	65-1025
	Halocarbon, Float Ball Assembly *	1	65-0212	65-1026
2	Seat Screw	2	65-0024	The above Float Ball Replacement Kits include the Float Ball Assembly, Seat Screw, Seat Gasket, Housing O-ring, Cam Screw, and Manual-Opening Lifting Tee.
3	Seat Gasket	1	65-0094	
4	Housing O-Ring	1	65-0022	
5	Stem	1	65-0073	
6	Stem Pin	1	65-0032	
7	Stem Washer	1	65-0034	
8	Cam	1	65-0074	
9	Cam Pin	1	65-0031	
10	Cam Screw	1	65-0067	
11	Manual-Opening Lifting Tee	1	65-0037	
12	Stem O-Ring	1	50-0179	
13	Packing Washer	1	50-0046	
14	Stem Packing	1	50-0045	
15	Packing Nut	1	50-0013	
16	Housing Screw for HD101	6	65-0023	
17	Manual-Opening Handle	1	65-0035	
18	Washer	1	50-0129	
19	Screw	1	50-0028	
20	Flanged Housing	1	65-0227	
21	Body	1	65-0039	
22	Shut-off valve gasket kit	1	50-1040	
23	Shut-off valve plug kit	1	50-1053	

* Float Ball Assembly includes the float ball plus replacement slide valve.

OTHER HIGH-QUALITY PRODUCTS FROM HANSEN TECHNOLOGIES...

The Hansen Technologies AUTO-PURGERS are noncondensable gas (air) refrigerant purgers. These purgers reduce the energy costs associated with a refrigeration system by removing noncondensable gases. These gases remain in vapor form throughout the system and increase head pressure. This, in turn, increases the load on the compressor and results in excessive energy costs.

There are three AUTO-PURGERS to choose from. The AUTO-PURGER AP is a multipoint purger capable of handling systems up to 1500 tons ammonia and is available to purge 1, 8, 16, or 24 purge points. The AUTO-PURGER APM is a smaller version with a capacity up to 200 tons ammonia. It can control up to 4 purge points. The Nonelectric AUTO-PURGER (NEAP) is completely nonelectric, yet has self-controlled start-up. It is capable of handling systems up to 100 tons ammonia.



GS200H



AW300H

Hansen Technologies offers a wide range of high-quality shut-off valves. These valves are ideal for shut-off of liquid, suction, discharge, recirculating liquid, hot gas, and oil lines in ammonia refrigeration systems. When used with seal caps, they are also suitable for use in R22, R134a, and other Hansen-approved refrigerant systems.

A bypass shut-off valve can be used in conjunction with the HT200 or HT300 high side floats to create a defrost drainer with higher capacity than the HD101. Contact our sales engineers for details and assistance in selecting the appropriate shut-off valve for this application.

Hansen SEE-LEVEL liquid indicators provide simple indication of true liquid levels in industrial and large commercial refrigeration systems. When liquid is present, the distinctive reflex lens appears dark. When vapor is present, the lens is light. The long universal housing provides adequate length for easy welding and insulation clearance for low-temperature applications. An optional frost shield facilitates clear viewing of liquid level under frosting conditions.

SEE-LEVEL liquid indicators are suitable for ammonia, R22, and other Hansen-approved refrigerants. Typical uses include refrigerant receivers, level columns, accumulators, intercoolers, suction lines, oil lines, and liquid lines. See pages 4 and 5 for applications in conjunction with the Hansen float drain regulators.



SEE-LEVEL

HCK4



Hansen's HCK4 series of in-line check valves are dependable, rugged, disc-type nonreturn valves. They are ideally suited for refrigerant flow control applications, such as in conjunction with the HD101 float drain regulator. These valves open wide for flow in the direction of the arrow on the valve body. The valve closes quickly and reliably when flow reversals occur. Model HCK4-2 is a standard 1 psid check valve. The HCK4-2-10 is a special 10 psid loaded check valve. Refer to pages 12 and 13 for application drawings in conjunction with the HD101.

The Frost Master® is an easy-to-use defrost controller that provides for more efficient removal of frost accumulation on evaporator coil surfaces. This controller uses reliable solid-state electronics with a precision quartz time clock with battery backup and time adjusting slide knobs to sequentially operate through logical defrost steps for smooth, but complete and effective, defrosting. The Frost Master® Plus has a defrost terminate feature built in. When the terminate temperature is satisfied, the hot gas step ceases and the equalize step begins. By ending the hot gas step as soon as the coil is clean, a quick and efficient defrost occurs.



FM-71

CAUTION

These float drain regulators are for refrigeration systems only. These instructions and related safety precautions must be read completely and understood before selecting, using, or servicing these float drain regulators. Only knowledgeable, trained refrigeration technicians should install, operate, or service these float drain regulators. Stated temperature and pressure limits should not be exceeded. Float drain regulators should not be opened 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 the product. Escaping refrigerant can cause injury, especially to the eyes and lungs.

WARRANTY

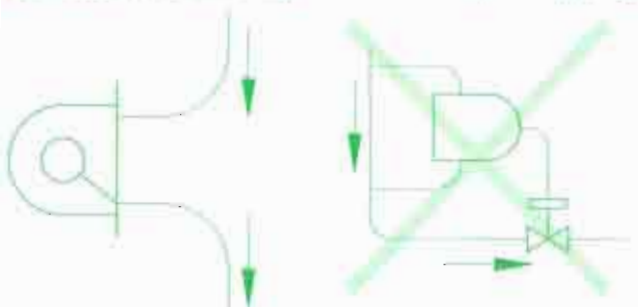
These valves are guaranteed against defective materials or workmanship for one year F.O.B. our plant. No consequential damages or field labor is included.

TYPICAL SPECIFICATIONS

"Float drain regulators shall be direct operated with steel bodies, flanged housing for servicing, precision-guided stainless steel float ball assembly, low-friction composite slide valve, manual-opening stem, and connections for oil drain and equalizer/purge lines, as manufactured by Hansen Technologies Corporation or approved equal."

REPLACEMENT

Hansen's direct-operated float drain regulator (high side float) is a self-contained unit. It replaces pilot-operated float drain regulators and simplifies piping.



HANSEN FLOAT
DRAIN REGULATOR

PILOT-OPERATED
LIQUID DRAINER

OTHER PRODUCTS

Refrigerant Pressure Regulators
Thermostatic Expansion Valves (TXV)
Hand Expansion Valves (Regulators)
Refrigerant Solenoid Valves
Small Pressure Regulators and Reliefs
Refrigerant Check Valves
Liquid Refrigerant Filter System
Strainers
Gas-Powered Valves
Refrigerant Float Switches
Vari-Level® Adjustable Level Controls
Techni-Level® Transducer Probes
Refrigerant Liquid Pumps
Pump Guardian Pump Controllers

ORDERING INFORMATION, FLOAT DRAIN REGULATORS

Refrigerant	Catalog Number	Inlet & Outlet Connections
R717	HT100N HT200N HT300N	3/4" FPT/1" Weld 1 1/2" Weld 2" Weld
	HD101N	3/4" FPT/1" Weld
R22	HT100F HT200F HT300F	3/4" FPT/1" Weld 1 1/2" Weld 2" Weld
	HD101F	3/4" FPT/1" Weld

Connections are butt weld to match U.S. Schedule 80 to 1 1/4"; Schedule 40 over 1 1/2".

TO ORDER: Specify catalog number, refrigerant, refrigeration capacity, inlet pressure, outlet pressure, refrigerant temperature, and application details. Assistance with selection is available.

To help when placing your order, fill out the following form before contacting Hansen.

Refrigerant: _____

Capacity: _____

Inlet Liquid Temperature: _____

Inlet Pressure: _____

Outlet Pressure: _____

Description and Sketch of Float Drain Regulator Application: _____

HANSEN TECHNOLOGIES CORPORATION

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