AIR COOLED CONDENSING UNITS

MODELS:
- ☐ BLH7.5H2
- ☐ BLH10H2
- ☐ BLH15H2
- ☐ BLH20H2
- ☐ BLH25H2
- ☐ BLH30H2
- ☐ BLH35H2
- ☐ BLH40H2
- ☐ JLD50H2*
- ☐ JLD60H2*

*These units have two (2) compressors and are not supplied with fused disconnects

Cook/Chill Systems

ITEM NUMBER _____

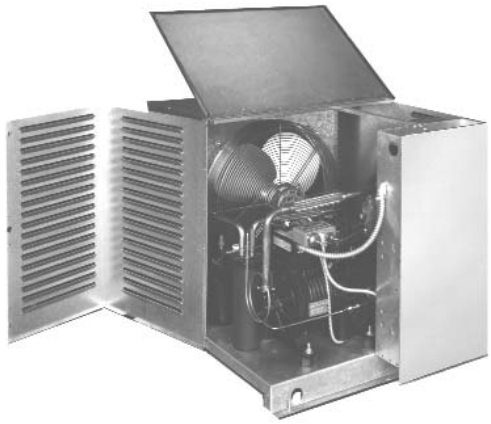
JOB NAME / NUMBER _____

Cleveland Standard Features

- Air cooled condensing unit for outdoor installation
- For operation with R-22, 404A or R507 refrigerant (please specify)
- Liquid line filter with replaceable core and sight glass
- High efficiency Copeland discus compressor
- Galvalume weather housing with raised base compressor
- Thermally protected
- Permanently lubricated condenser fan motor(s)
- Access panels for easy servicing of internal components
- Electrical controls are mounted in control box with hinged door
- Receivers include service valves
- Suction and discharge vibration eliminators
- 180 lbs. head pressure valve
- Crankcase heater for cold temperature operation
- Suction filter with replaceable core
- Suction accumulator
- Oil separator
- Low ambient kit
- Anti short cycle timer
- Liquid line solenoid valve (shipped loose)
- Dry contacts for compressor alarm

Options & Accessories

- ❒ Water Cooled Condensing Units
- ❒ Larger models available upon request
- ❒ Extended four (4) year compressor warranty (domestic only)
- ❒ Ice Water Control Panel for location in production area
- ❒ Ice Builders

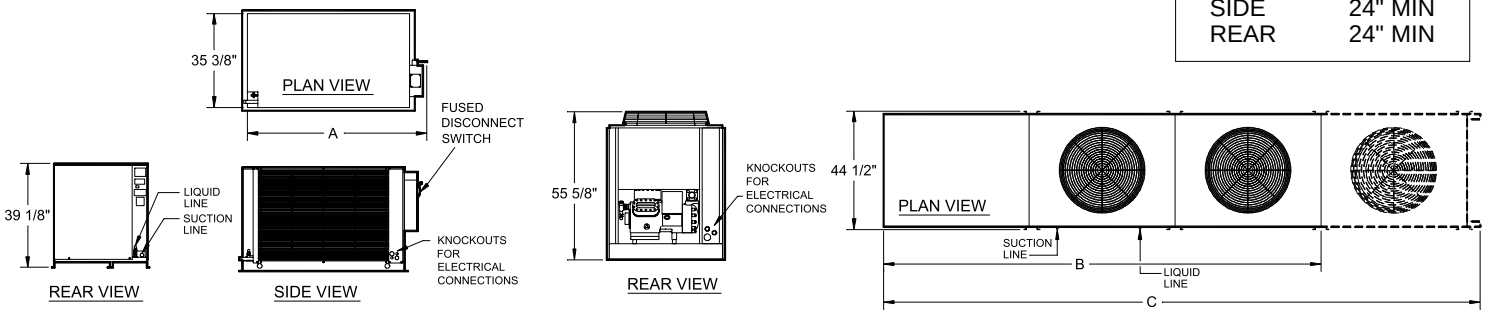


Short Form Specifications

Shall be CLEVELAND, Model BLH or JLD - _____- H2, Outdoor, ____ HP, AIR COOLED CONDENSING UNIT for Ice Builder. Weather housing with raised Base Compressor; Receiver with Discharge and Suction Line Vibration eliminators; Pressure Control; Drier//Sight Glass Kit; Liquid Line Solenoid Valve; replaceable Core Suction Line Filter, Suction Line Accumulator; Oil Separator and Oil Failure Safety Control; Head Pressure Control Valve; Control Panel with hinged door housing Low Ambient Kit, Compressor Contactor, and Control Circuit Fusing.

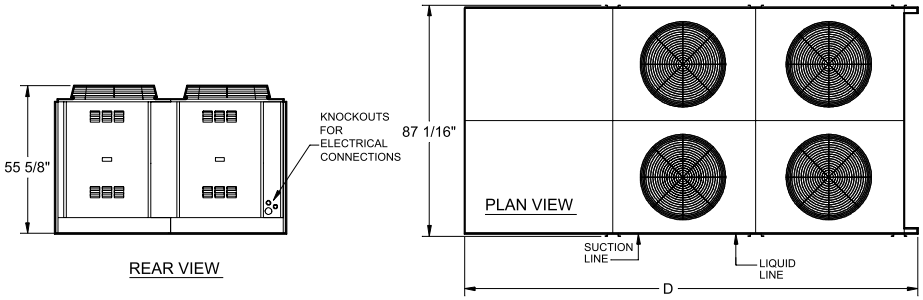
Cleveland Range Inc.
1333 East 179th St., Cleveland, Ohio, U.S.A. 44110
Ph: 1-216-481-4900 **Fx**: 1-216-481-3782
Visit our Web Site at **www.clevelandrange.com**

MINIMUM CLEARANCE	
FRONT	24" MIN
SIDE	24" MIN
REAR	24" MIN



BLH-7.5-H2 thru BLH-10-H2

BLH-15-H2 thru BLH-40-H2



JDL-50-H2 thru JDL-60-H2

DIMENSIONS

MODEL	ICE BUILDER MODEL	A	B	C	D	SHIPPING WEIGHTS LBS / KG
BLH-7.5-H2	IBC-50	67 3/4"	-	-	-	1350 / 614
BLH-10-H2	IBC-75	67 3/4"	-	-	-	1650 / 750
BLH-15-H2	IBC-100	-	144"	-	-	1900 / 864
BLH-20-H2	IBC-125	-	144"	-	-	1980 / 900
BLH-25-H2	IBC-150	-	170 3/4"	-	-	2170 / 987
BLH-30-H2	IBC-175	-	170 3/4"	-	-	2260 / 1028
BLH-35-H2	IBC-200	-	-	225 3/4"	-	2760 / 1255
BLH-40-H2	IBC-250	-	-	225 3/4"	-	2860 / 1300
JLD-50-H2	IBC-300	-	-	-	171"	4060 / 1846
JLD-60-H2	IBC-350	-	-	-	171"	4520 / 2055

UTILITY CONNECTIONS

MODEL	RECEIVER CAPACITY LBS	LIQUID LINE	SUCTION LINE
BLH-7.5-H2	162	1/2"	1 1/8"
BLH-10-H2	227	7/8"	1 3/8"
BLH-15-H2	275	7/8"	1 5/8"
BLH-20-H2	444	7/8"	1 5/8"
BLH-25-H2	444	1 1/8"	2 1/8"
BLH-30-H2	444	1 1/8"	2 1/8"
BLH-35-H2	672	1 1/8"	2 1/8"
BLH-40-H2	672	1 1/8"	2 1/8"
JLD-50-H2	(2) 444	1 1/8"	2 1/8"
JLD-60-H2	(2) 444	1 1/8"	2 1/8"

ELECTRICAL 208/3PH

COMPRESSOR RATED LOAD AMPS	CONDENSER FAN MOTOR QTY	TOTAL AMP LOAD
28.3	2	38.1
39.1	2	54.3
59.9	2	82.5
66	2	90.5
82.8	2	116.8
94	2	131.5
107	3	154.8
142	3	198.5
*82.2	4	201.0
*94	4	239.5

***PER SIDES**

REFRIGERANT NOT SUPPLIED BY CLEVELAND RANGE.
AIR COOLED CONDENSING UNITS ARE FOR OUTDOOR INSTALLATION.

WATER COOLED CONDENSING UNITS

MODELS:
☐ WS05H2 ☐ WS15H2 ☐ WS30H2
☐ WS07H2 ☐ WS20H2 ☐ WS35H2*
☐ WS10H2 ☐ WS25H2 ☐ WS40H2*

*These units are not supplied with fused disconnects

Cook/Chill Systems

Cleveland Standard Features

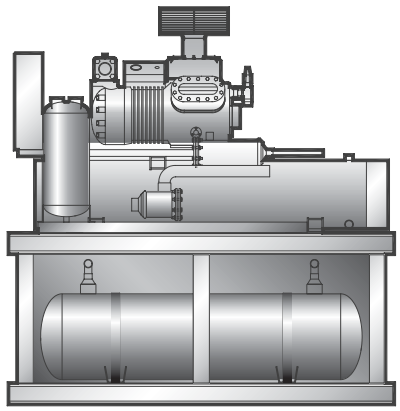
- Water cooled condensing unit for indoor installation
- For operation with R-22, 404A or 507 refrigerant (please specify)
- Liquid line filter with replaceable core and sight glass
- High efficiency Copeland discus compressor
- Spring isolation of compressor
- Shell and tube, cleanable, water cooled condenser with pressure relief valve
- Water regulating valve
- Pre-wired control panel with compressor contactor and control circuit fuse
- Liquid receivers with inlet and outlet valves and pressure relief
- Suction and discharge vibration eliminators
- Crankcase heater for cold temperature operation
- Suction filter with replaceable core
- Suction accumulator
- Oil separator
- Low ambient kit
- Anti short cycle timer
- Liquid solenoid valve (shipped loose)
- Dry contacts for compressor alarm

Options & Accessories

- ❒ Air Cooled Condensing Units
- ❒ Larger models available upon request
- ❒ Extended four (4) year compressor warranty (domestic only)
- ❒ Ice Water Control Panel for location in production area
- ❒ Ice Builders

ITEM NUMBER _____

JOB NAME / NUMBER _____



Short Form Specifications

Shall be CLEVELAND Model WS ____ H2, Indoor, ____ HP, WATER COOLED CONDENSING UNIT for Ice Builder. Compressor; Receiver with Discharge and Suction Line Vibration Eliminators; Pressure Control; Drier/Sight Glass Kit; Liquid Line Solenoid Valve; replaceable Core Suction Line Filter, Suction Line Accumulator; Oil Separator and Oil Failure Safety Control; Head Pressure Control Valve; Control Panel with hinged door housing Low Ambient Kit, Compressor Contactor and Control Circuit Fusing; Water Cooled Condenser is cleanable.

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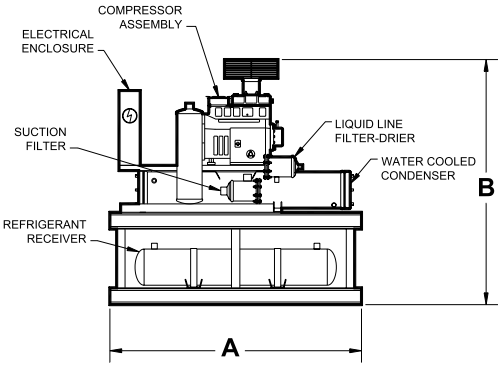
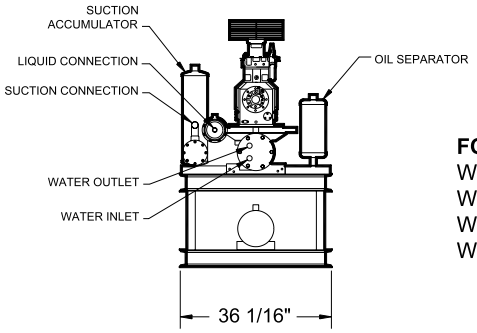
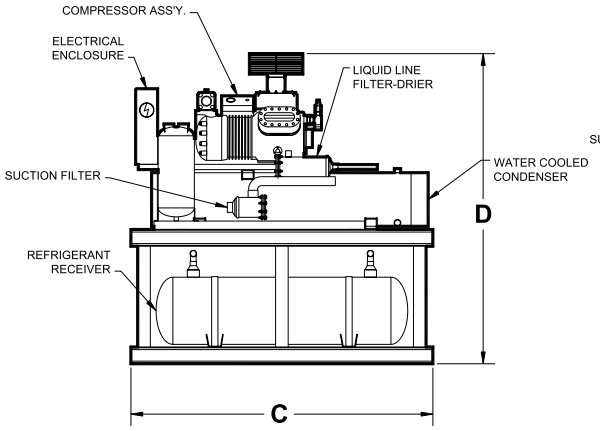
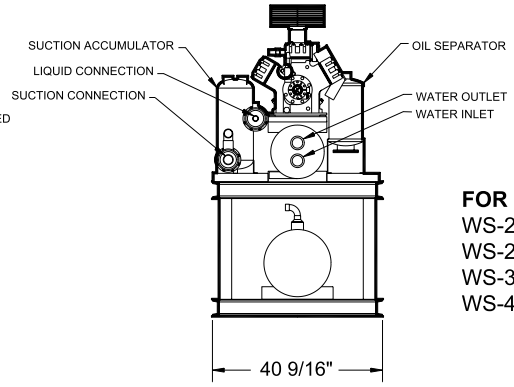




MINIMUM CLEARANCE	
FRONT	24"
SIDES	24"
REAR	24"

FOR MODELS:
WS-05-H2
WS-07-H2
WS-10-H2
WS-15-H2





FOR MODELS:
WS-20-H2
WS-25-H2
WS-35-H2
WS-40-H2

DIMENSIONS

MODEL		A	B	C	D	SHIPPING WEIGHTS LBS / KG
WS-05-H2	IBC-25	36"	60 7/8"	-	-	780 \ 355
WS-07-H2	IBC-50	52"	61 3/8"	-	-	780 \ 355
WS-10-H2	IBC-75	60"	58 3/8"	-	-	870 \ 386
WS-15-H2	IBC-100	60"	60 3/8"	-	-	1088 \ 495
WS-20-H2	IBC-125	-	-	75"	69 5/8"	1163 \ 529
WS-25-H2	IBC-150	-	-	72"	71 1/8"	1178 \ 536
WS-30-H2	IBC-175	-	-	72"	70 5/8"	1200 \ 546
WS-35-H2	IBC-200	-	-	72"	73 7/8"	1600 \ 728
WS-40-H2	IBC-250	-	-	72"	76 7/8"	1380 \ 628

UTILITY CONNECTIONS

MODEL	RECEIVER CAPACITY	LIQUID	COLD SUCTION	COMPRESSOR WATER
WS-05-H2	72 lbs	5/8"	1 3/8"	1 1/4"
WS-07-H2	137 lbs	5/8"	1 3/8"	1 1/4"
WS-10-H2	187 lbs	7/8"	1 3/8"	1 1/4"
WS-15-H2	239 lbs	7/8"	1 5/8"	1 1/2"
WS-20-H2	336 lbs	7/8"	1 5/8"	2"
WS-25-H2	385 lbs	1 1/8"	2 1/8"	2 1/2"
WS-30-H2	425 lbs	1 1/8"	2 1/8"	2 1/2"
WS-35-H2	557 lbs	1 1/8"	2 1/8"	2 1/2"
WS-40-H2	602 lbs	1 1/8"	2 1/8"	3"

⚡ ELECTRICAL 208/3PH

MODEL	UNIT RLA	MOPD
WS-05-H2	31.6	60
WS-07-H2	31.6	60
WS-10-H2	43.6	80
WS-15-H2	59.6	110
WS-20-H2	66	125
WS-25-H2	82.2	150
WS-30-H2	94	175
WS-35-H2	107	200
WS-40-H2	142	250

REFRIGERANT NOT SUPPLIED BY CLEVELAND RANGE.
AIR COOLED CONDENSING UNITS ARE FOR OUTDOOR INSTALLATION.

RLA – RATED LOAD AMPS
MOPD – MAX OVERCIRCUIT PROTECTION DEVICE

(NOT TO SCALE)

1201
Litho in USA

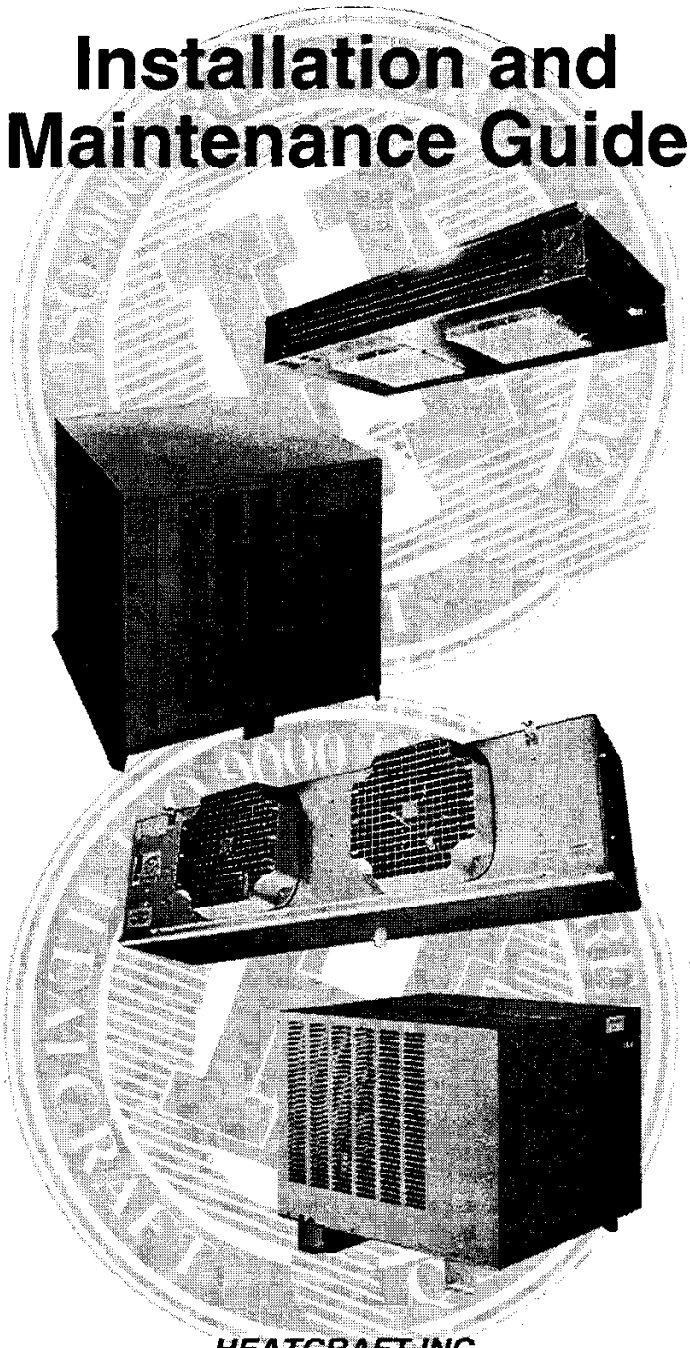
HEATCRAFT® Refrigeration Products

Refrigeration System Installation

H-IM-64C | August 1996 | Part No. 25001201

Replaces H-IM-64B (12/95)

Installation and Maintenance Guide



HEATCRAFT INC.
REFRIGERATION PRODUCTS DIVISION
2175 West Park Place Blvd., Stone Mountain, GA 30087
(770) 939-4450 • FAX: (770) 908-5480

Table of Contents

General Safety Information

1. Installation and maintenance to be performed only by qualified personnel who are familiar with this type of equipment.
2. Make sure that all field wiring conforms to the requirements of the equipment and all applicable national and local codes.
3. Avoid contact with sharp edges and coil surfaces. They are a potential injury hazard.
4. Make sure all power sources are disconnected before any service work is done on units.

Inspection

Responsibility should be assigned to a dependable individual at the job site to receive material. Each shipment should be carefully checked against the bill of lading. The shipping receipt should not be signed until all items listed on the bill of lading have been accounted for. Check carefully for concealed damage. Any shortage or damages should be reported to the delivering carrier. Damaged material becomes the delivering carrier's responsibility, and should not be returned to the manufacturer unless prior approval is given to do so. When uncrating, care should be taken to prevent damage. Heavy equipment should be left on its shipping base until it has been moved to the final location.

Warranty Statement

Heatcraft warrants to its direct purchasers that products, except Service Parts, manufactured by Heatcraft shall be of a merchantable quality, free of defects in material or workmanship, under normal use and service for a period of one (1) year from date of original installation, or eighteen (18) months from date of shipment by Heatcraft, whichever first occurs. Service Parts, for product out of original warranty, should be so warranted for a period of ninety (90) days from date of installation, or twelve (12) months from date of shipment whichever may first occur. Any product covered by this order found to Heatcraft's satisfaction to be defective upon examination at Heatcraft's factory will, at Heatcraft's option, be repaired or replaced and returned to Buyer via lowest common carrier, or Heatcraft may at its option grant Buyer a credit for the purchase price of the defective article. Upon return of a defective product to Heatcraft's plant, freight prepaid, by Buyer, correction of such defect by repair or replacement, and return freight via lowest common carrier, shall constitute full performance by Heatcraft of its obligations hereunder.

Hermetic compressors furnished by Heatcraft are subject to the standard warranty terms set forth above, except that motor compressor replacements or exchanges shall be made through the nearest authorized wholesaler of the motor compressor manufacturer (not at Heatcraft's factory) and no freight shall be allowed for transportation of the motor compressor to and from the wholesaler. The replacement motor compressor shall be identical to the model of the motor compressor being replaced. Additional charges which may be incurred throughout the substitution of other than identical replacements are not covered by this warranty.

The foregoing is in lieu of all other warranties, express or implied, notwithstanding the provisions of the uniform commercial code, the Magnuson-Moss Warranty-Federal Trade Commission Improvement Act, or any other statutory or common law, federal or state.

Heatcraft makes no warranty expressed or implied, of fitness for any particular purpose, or of any other nature whatsoever, with respect to products manufactured or sold by Heatcraft hereunder, except as specifically set forth above and on the face hereof. It is expressly understood and agreed that Heatcraft shall not be liable to buyer, or any customer of Buyer, for direct or indirect, special, incidental, consequential or penal damages, or for any expenses incurred by reason of the use or misuse by Buyer or third parties of said products. To the extent said products may be considered "Consumer Products,' as defined in Section 101 of the Magnuson-Moss warranty-Federal Trade Commission Improvement Act, Heatcraft makes no warranty of any kind, express or implied, to "Consumers," except as specifically set forth above and on the face hereof.

This equipment is designed to operate properly and produce the rated capacity when installed in accordance with good refrigeration practice.

The following conditions should be adhered to when installing this unit to maintain the manufacturers warranty:

(a) System piping must be in accordance with good refrigeration practices.

(b) **Inert gas must be charged into the piping during brazing.**

(c) The power supply to the unit must meet the following conditions:
   A. Three phase voltages must be +/- 10% of nameplate ratings. Single phase must be within +10% or -5% of nameplate ratings.
   B. Phase imbalance cannot exceed 2%.

(d) All control and safety switch circuits must be properly connected according to the wiring diagram.

(e) The factory installed wiring must not be changed without written factory approval.

Four-Year Extended Warranty

The Equipment Dealer may purchase for the Owner at the time of the original invoice of the equipment a Four-Year Limited Replacement Compressor Warranty. This entitles the owner to be reimbursed for the cost of a replacement compressor, less salvage credit, during the second through fifth year of the life of the compressor.

The warranty program functions similarly to the standard warranty offered. When a compressor failure occurs and the unit is exchanged "over the counter" at the authorized wholesaler outlet a salvage credit is issued along with the invoice for the new compressor. Return copies of both the credit and invoice to the Equipment Dealer along with the model and serial number of the condensing unit. The Equipment Dealer will process this claim with the Manufacturer and subsequently reimburse the Owner for the cost of the new compressor.

This warranty covers the actual compressor only and does not extend to any labor, trip charges, crane rental, taxes or additional parts, refrigerant or processing/handling charges required to make the unit operational.

Space and Location Requirements

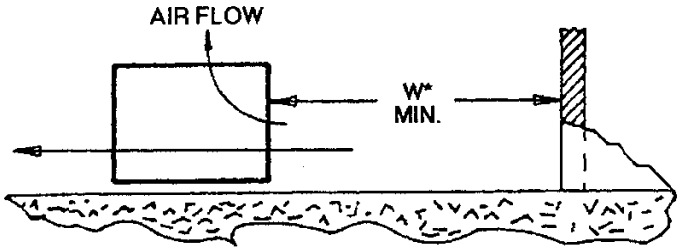
The most important consideration which must be taken into account when deciding upon the location of air-cooled equipment is the provision for a supply of ambient air to the condenser, and removal of heated air from the condensing unit or remote condenser area. Where this essential requirement is not adhered to, it will result in higher head pressures, which cause poor operation and potential failure of equipment. Units must not be located in the vicinity of steam, hot air or fume exhausts. Corrosive atmospheres require custom designed condensers.

Another consideration which must be taken is that the unit should be mounted away from noise sensitive spaces and must have adequate support to avoid vibration and noise transmission into the building. Units should be mounted over corridors, utility areas, rest rooms and other auxiliary areas where high levels of sound are not an important factor. Sound and structural consultants should be retained for recommendations.

Figure 1. Space and Location Requirements for Condensing Units and Remote Condensers

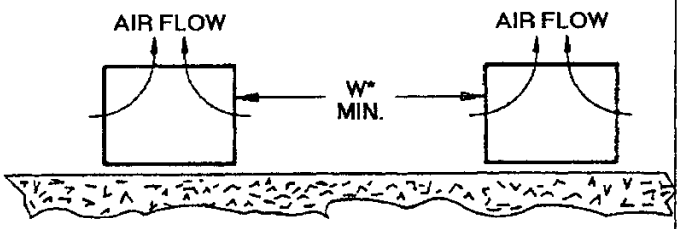
Walls or Obstructions

The unit should be located so that air may circulate freely and not be recirculated. For proper air flow and access all sides of the unit should be a minimum of "W" away from any wall or obstruction. It is preferred that this distance be increased whenever possible. Care should be taken to see that ample room is left for maintenance work through access doors and panels. Overhead obstructions are not permitted. When the unit is in an area where it is enclosed by three walls the unit must be installed as indicated for units in a pit.



Multiple Units

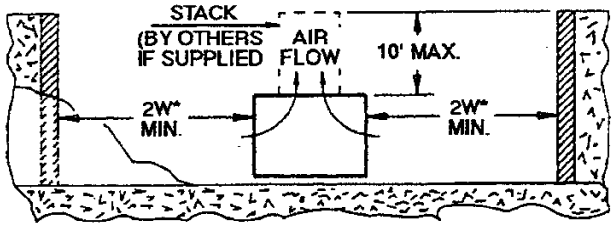
For units placed side by side, the minimum distance between units is the width of the largest unit. If units are placed end to end, the minimum distance between units is 4 feet.



Units in Pits

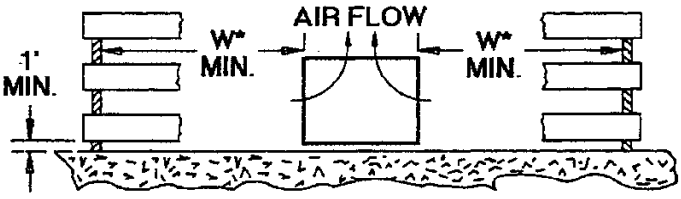
The top of the unit should be level with the top of the pit, and side distance increased to "2W".

If the top of the unit is not level with the top of pit, discharge cones or stacks must be used to raise discharge air to the top of the pit. This is a minimum requirement.

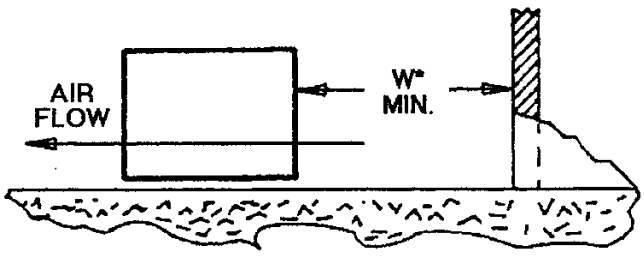


Decorative Fences

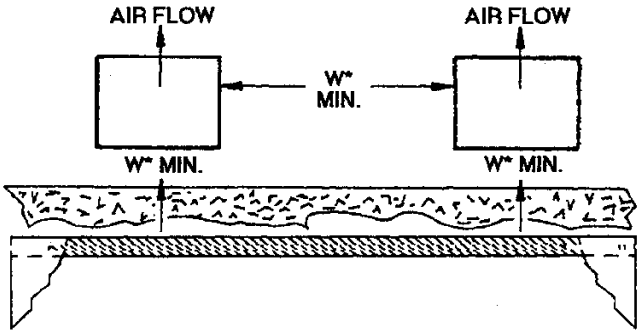
Fences must have 50% free area, with 1 foot undercut, a "W" minimum clearance, and must not exceed the top of unit. If these requirements are not met, unit must be installed as indicated for "Units in pits".



Walls or Obstructions for Horizontal Air Flow



Multiple Units with Horizontal Air Flow



* "W" = Total width of the condensing unit or condenser.

Condensate Drain Lines

Either copper or steel drain lines should be used and properly protected from freezing. In running drain lines, provide a minimum 4 inches per foot pitch for proper drainage. All plumbing connections should be made in accordance with local plumbing codes. All condensate drain lines must be trapped, and run to an open drain. They must never be connected directly to the sewer system. Traps in the drain line must be located in a warm ambient. We recommend a trap on all evaporators. Traps located outside, or extensive outside runs of drain line must be wrapped with a drain line heater. The heater should be connected so that it is continuously on. It is recommended that the drain line be insulated to prevent heat loss. A heat input of 20 watts per lineal foot of drain line for 0°F (-18°C) room applications and 30 watts per lineal foot for -20°F (-29°C) rooms is satisfactory.

Inspect drain pan periodically to insure free drainage of condensate. If drain pan contains standing water, check for proper installation. The drain pan should be cleaned regularly with warm soapy water.

WARNING: All power must be disconnected before cleaning. Drain pan also serves as cover of hazardous moving parts. Operation of unit without drain pan constitutes a hazard.

Figure 2. Condensate Drain Lines

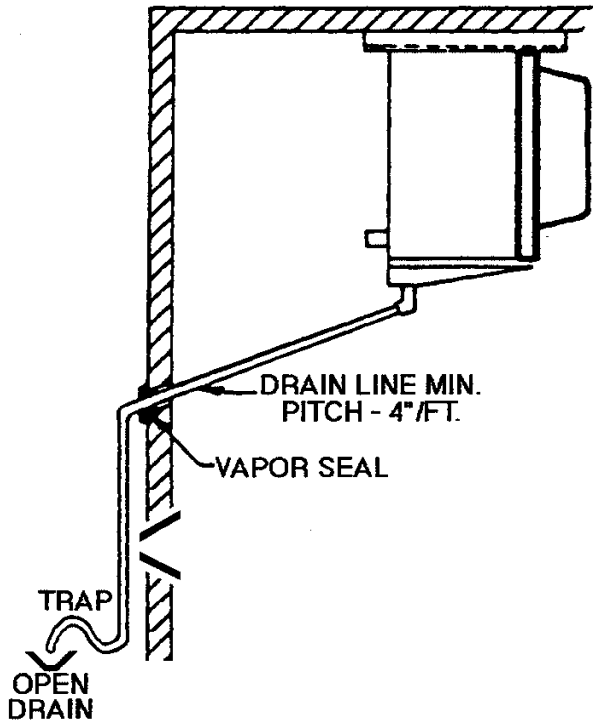


Table 1. Expansion Valve Selection For 100# Head Pressure Valve

BTUH at about 10° T.D.	R-502/R-507/R404A -20°F/-29°C Evap.		R-502/R-507/R404A +25°F/-4°C Evap.		R-22 -20°F/-29°C Evap.		R-22 +25°F/-4°C Evap.	
	Sporlan	ALCO	Sporlan	ALCO	Sporlan	ALCO	Sporlan	ALCO
3,000-5,000	FRE ½ ZP	HFESC ½ RWZ	FRE ½ C	HFESC ½ RW	FVE ½ Z	HFESC ½ HWZ	FVE ½ C	HFESC ½ HW
5,500-7,000	FRE ½ ZP	HFESC ½ RWZ	FRE 1 C	HFESC 1 RW	FVE 1 ZP	HFESC 1 HWZ	FVE 1 C	HFESC 1 HW
7,500-8,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1 C	HFESC 1 RW	FVE 1 ZP	HFESC 1 HWZ	FVE 1 C	HFESC 1 HW
8,500-10,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1½ C	HFESC 1½ RW	FVE 1½ ZP	HFESC 1½ HWZ	FVE 1 C	HFESC 1 HW
10,500-11,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1½ C	HFESC 1½ RW	FVE 1½ ZP	HFESC 1½ HWZ	FVE 1½ C	HFESC 1½ HW
11,500-13,000	FRE 1½ ZP	HFESC 1½ RWZ	FRE 1½ C	HFESC 1½ RW	FVE 1½ ZP	HFESC 1½ HWZ	FVE 1½ C	HFESC 1½ HW
13,500-15,000	FRE 1½ ZP	HFESC 1½ RWZ	FRE 2 C	HFESC 2 RW	FVE 2 ZP	HFESC 2 HWZ	FVE 1½ C	HFESC 1½ HW
15,500-17,000	FRE 2 ZP	HFESC 2 RWZ	FRE 2 C	HFESC 2 RW	FVE 2 ZP	HFESC 2 HWZ	FVE 2 C	HFESC 2 HW
17,500-20,000	FRE 2 ZP	HFESC 2 RWZ	SRE 3 C	HFESC 3 RW	FVE 3 ZP	HFESC 3 HWZ	FVE 2 C	HFESC 2HW
20,500-24,000	SRE 3 ZP	HFESC 2 RWZ	SRE 3 C	HFESC 3 RW	SVE 3 ZP	TCLE 3 HWZ	SVE 3 C	HFESC 3 HW
24,500-28,000	SRE 3 ZP	HFESC 3 RWZ	SRE 4 C	HFESC 3 RW	SVE 4 ZP	TCLE 5 HWZ	SVE 3 C	HFESC 3 HW
28,500-34,000	SRE 4 ZP	HFESC 3 RWZ	SRE 4 C	TCLE 4½ RW	SVE 5 ZP	TCLE 7½ HWZ	SVE 4 C	TCLE 3 HW
34,500-40,000	ORE 6 ZP	TCLE 4½ RWZ	ORE 6 C	TCLE 4½ RW	SVE 8 ZP	TCLE 7½ HWZ	SVE 4 C	TCLE 5 HW
40,500-50,000	ORE 8 ZP	TCLE 4½ RWZ	ORE 8 C	TCLE 7 RW	SVE 10 ZP	TCLE 10 HWZ	SVE 5 C	TCLE 7½ HW
50,500-60,000	ORE 9 ZP	TCLE 7½ RWZ	ORE 9 C	TCLE 8 RW	SVE 10 ZP	TCLE 10 HWZ	SVE 8 C	TCLE 7½ HW
60,500-70,000	ORE 9 ZP	TCLE 7½ RWZ	ORE 9 C	TCLE 8 RW	OVE 15 ZP	TCLE 10 HWZ	SVE 8 C	TCLE 7½ HW
70,500-80,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TCLE 8 RW	OVE 15 ZP	TCLE 10 HWZ	OVE 10 C	TCLE 10 HW
80,500-90,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TJRE 12 RW	OVE 15 ZP	TCLE 10 HWZ	OVE 10 C	TCLE 10 HW
90,500-100,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TJRE 12 RW	OVE 15 ZP	TCLE 10 HWZ	OVE 15 C	TCLE 12 HW
100,500-110,000	ORE 21 ZP	TJRE 12 RWZ	ORE 21 C	TJRE 16 RW	OVE 20 ZP	TJRE 14 HWZ	OVE 15 C	TCLE 12 HW
110,500-120,000	ORE 21 ZP	TJRE 12 RWZ	ORE 21 C	TJRE 16 RW	OVE 20 ZP	TJRE 18 HWZ	OVE 15 C	TJRE 14 HW
120,500-130,000	ORE 21 ZP	TJRE 12 RWZ	ORE 21 C	TJRE 16 RW	OVE 20 ZP	TJRE 18 HWZ	OVE 15 C	TJRE 14 HW

Table 2. Expansion Valve Selection 180# Head Pressure Valve

BTUH at about 10° T.D.	R-502/R-507/R404A -20°F/-29°C Evap.		R-502/R-507/R404A +25°F/-4°C Evap.		R-22 -20°F/-29°C Evap.		R-22 +25°F/-4°C Evap.	
	Sporlan	ALCO	Sporlan	ALCO	Sporlan	ALCO	Sporlan	ALCO
3,000-5,000	FRE ½ ZP	HFESC ½ RWZ	FRE ½ C	HFESC ½ RW	FVE ½ ZP	HFESC ½ HWZ	FVE ½ C	HFESC ½ HW
5,500-7,000	FRE ½ ZP	HFESC ½ RWZ	FRE 1 C	HFESC 1 RW	FVE 1 ZP	HFESC 1 HWZ	FVE ½ C	HFESC 1 HW
7,500-8,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1 C	HFESC 1 RW	FVE 1 ZP	HFESC 1 HWZ	FVE 1 C	HFESC 1 HW
8,500-10,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1 C	HFESC 1 RW	FVE1½ ZP	HFESC 1½ HWZ	FVE 1 C	HFESC 1 HW
10,500-11,000	FRE 1 ZP	HFESC 1 RWZ	FRE 1½ C	HFESC 1½ RW	FVE 1½ ZP	HFESC 1½ HWZ	FVE 1 C	HFESC 1 HW
11,500-13,000	FRE 1½ ZP	HFESC 1½ RWZ	FRE 1½ C	HFESC 1½ RW	FVE 1½ ZP	HFESC 2 HWZ	FVE 1 C	HFESC 1½ HW
13,500-15,000	FRE 2 ZP	HFESC 2 RWZ	FRE 1½ C	HFESC 1½ RW	FVE 2 ZP	HFESC 2 HWZ	FVE 1½ C	HFESC 1½ HW
15,500-17,000	FRE 2 ZP	HFESC 2 RWZ	FRE 2 C	HFESC 2 RW	FVE 2 ZP	HFESC 3 HWZ	FVE 1½ C	HFESC 1½ HW
17,500-20,000	FRE 2 ZP	HFESC 2 RWZ	FRE 2 C	HFESC 2 RW	FVE 3 ZP	HFESC 3 HWZ	FVE 1½ C	HFESC 2 HW
20,500-24,000	SRE 3 ZP	TCLE 3 RWZ	SRE 3 C	TCLE 3 RW	SVE 3 ZP	TCLE 3 HWZ	SVE 2 C	TCLE 2 HW
24,500-28,000	SRE 4 ZP	TCLE 3 RWZ	SRE 3 C	TCLE 3 RW	SVE 4 ZP	TCLE 3 HWZ	SVE 3 C	TCLE 3 HW
28,500-34,000	SRE 4 ZP	TCLE 3 RWZ	SRE 4 C	TCLE 3 RW	SVE 4 ZP	TCLE 5 HWZ	SVE 3 C	TCLE 3 HW
34,500-40,000	SRE 6 ZP	TCLE 4½ RWZ	SRE 6 C	TCLE 4½ RW	SVE 5 ZP	TCLE 5 HWZ	SVE 3 C	TCLE 3 HW
40,500-50,000	ORE 9 ZP	TCLE 4½ RWZ	SRE 6 C	TCLE 4½ RW	SVE 8 ZP	TCLE 7½ HWZ	SVE 4 C	TCLE 5 HW
50,500-60,000	ORE 9 ZP	TCLE 7 RWZ	ORE 9 C	TCLE 7 RW	SVE 10 ZP	TCLE 7½ HWZ	SVE 5 C	TCLE 5 HW
60,500-70,000	ORE 9 ZP	TCLE 7 RWZ	ORE 9 C	TCLE 8 RW	OVE 15 ZP	TCLE 10 HWZ	SVE 5 C	TCLE 7½ HW
70,500-80,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TCLE 8 RW	OVE 15 ZP	TCLE 10 HWZ	SVE 8 C	TCLE 7½ HW
80,500-90,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TCLE 8 RW	OVE 15 ZP	TCLE 10 HWZ	SVE 8 C	TCLE 7½ HW
90,500-100,000	ORE 12 ZP	TCLE 8 RWZ	ORE 12 C	TJRE 12 RW	OVE 15 ZP	TCLE 10 HWZ	OVE 10 C	TCLE 10 HW
100,500-120,000	ORE 12 ZP	TJRE 12 RWZ	ORE 12 C	TJRE 12 RW	OVE 20 ZP	TJRE 14 HWZ	OVE 10 C	TCLE 10 HW
120,500-130,000	ORE 21 ZP	TJRE 12 RWZ	ORE 12 C	TJRE 12 RW	OVE 20 ZP	TJRE 14 HWZ	OVE 15 C	TCLE 12 HW

Figure 3. Bulb and Contact Location

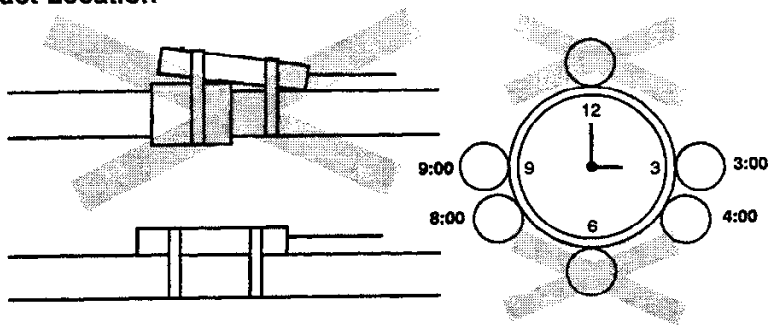
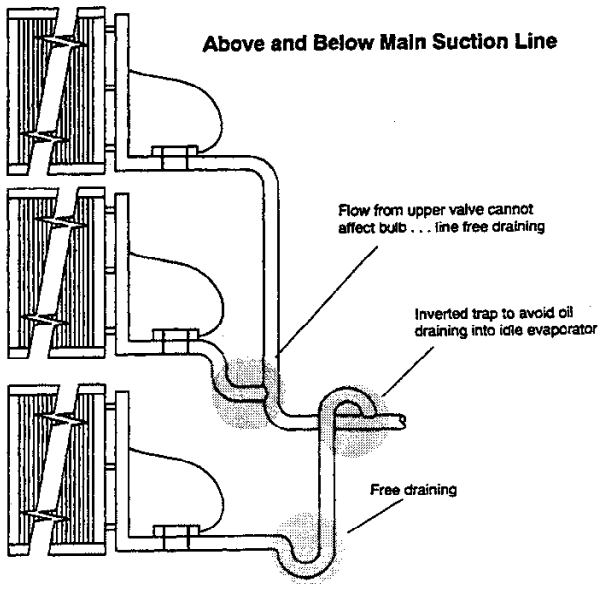


Figure 4. Multiple Evaporators



Distributor Nozzles

Nozzles supplied with unit coolers are selected for numerous refrigerants at cataloged operating conditions and 80°F liquid entering the expansion valve. If mechanical or another method of subcooling is used, the nozzle and expansion valve selection should be checked. For conditions outside those cataloged, use the charts to select a proper nozzle. Nozzle capacity should be within 110% to 180% of unit operating condition for optimum coil performance. Nozzles are available from Sporlan Wholesalers or from Heatcraft Refrigeration Products. A small nozzle can be drilled larger using the I.D. column. The hole must be accurately centered in the nozzle. A lathe is preferred for accurate drilling.

Expansion Valves and Distributor Nozzles

Before installing the expansion valve on the distributor of the evaporator, the proper distributor nozzle must be installed. Two nozzles are normally shipped with each evaporator for different refrigerants. Select the nozzle for the refrigerant that will be used. The size of the nozzles shipped with each evaporator is based on ordinary conditions, usually 80°F liquid temperatures and a maximum of 15°F evaporator TD's. If a mechanical subcooler is to be used in your system, consult the factory or a representative for distributor nozzle sizing. This is very important as the nominal capacity of the nozzle increases as the liquid refrigerant temperature is lowered. If the correct size nozzle is not installed, poor refrigerant distribution may occur and poor evaporator operation may be experienced.

For peak performance, it is important to select an expansion valve with the correct capacity and selective charge. Thermostatic expansion valves may be mounted in any position, but they should be installed as close to the evaporator as possible. For best performance, the outlet of the expansion valve should be installed directly to the distributor body. If this is not possible, the distance between the valve outlet and distributor should not exceed 24 inches and not contain any ells or bends or refrigerant distribution problems may occur. The tube connecting the valve outlet and distributor can be sized smaller to maintain refrigerant velocities and better distribution. Elbows located between the expansion valve and distributor will hinder proper distribution and therefore, are not recommended. Some accessories may, however, necessitate the use of elbows.

Locate the expansion valve bulb on a horizontal length of suction line as close to the suction header as possible. The bulb should be clamped tightly on the suction line and insulated with a waterproof type of insulation. The bulb should never be placed on a coupling or other obstruction so as to not make 100 % contact with the suction line. The bulb should never be placed in a trap or downstream of a trap in a suction line. Locating the bulb on the bottom of a suction line is not recommended. The bulb should be installed at the 3, 4 or 8, 9 o'clock position on the suction line. See Figure 3 on page 5.

Selecting Distributor Nozzle at the Jobsite

You must know 4 things:

1. Refrigerant
2. Evaporating Temperature
3. Tons or BTUH
4. Highest Liquid Temperature

EXAMPLE: Select a nozzle for R22, 20°F suction; 67,000 BTUH, 100°F liquid entering TXV.

$$\frac{67{,}000}{12{,}000} = 5.58 \text{ Tons}$$

From Table 3 on page 7 select Size 5 rated at 4.80 tons. We prefer selecting at 100% + of nominal rating. We therefore selected the smaller size nozzle.

$$\frac{5.58}{4.80} = 116\% \text{ of Nominal Rating - okay.}$$

EXAMPLE: Select a nozzle for R404A, -20°F suction; 9,400 BTUH, 60°F liquid entering TXV.

$$\frac{9{,}400}{12{,}000} = .78 \text{ Tons}$$ [1.98 Factor for 60°F Liquid]

$$\frac{0.78}{1.98} = .39 \text{ Corrected Tons}$$

From Table 3 on page 7 select Size 1 rated at 0.35 tons.

$$\frac{0.39}{0.35} = 111\% \text{ of Nominal Rating - okay.}$$

Typical selections would be between 110% and 180%.