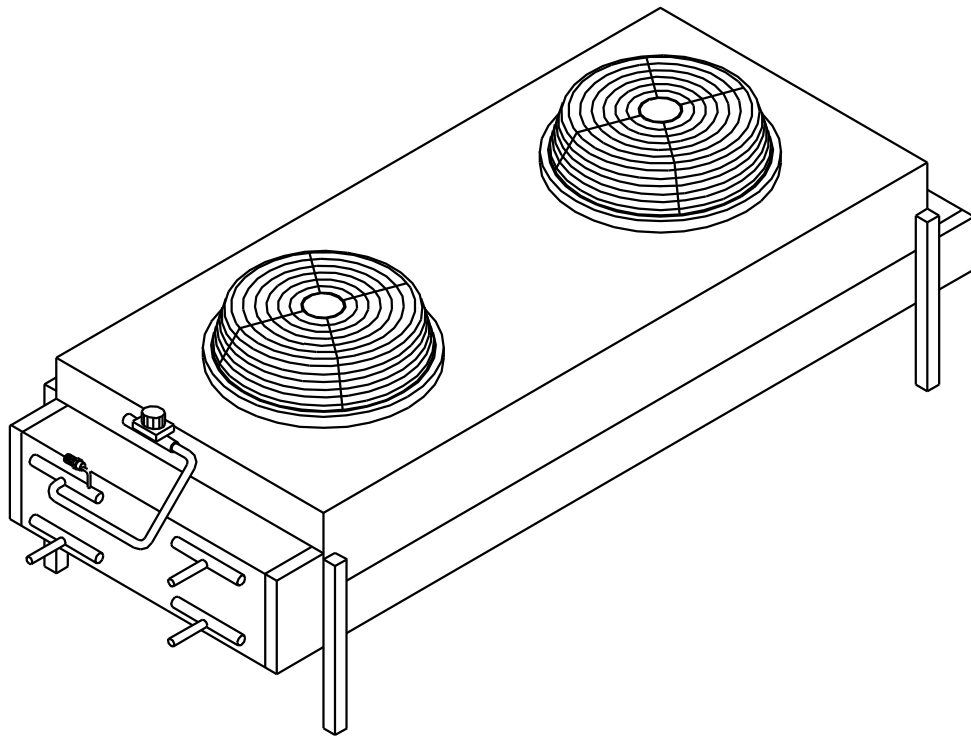


**Vogt**<sup>®</sup>

***Tube-Ice***<sup>®</sup>

# Air-Cooled Condenser



# Installation Instructions

**! WARNING !**

**These installation guidelines must be followed to obtain reliable operation from air-cooled ice machines. If these guidelines are not followed, the compressor warranty will not be honored.**

**! WARNING !**

1. Use only Vogt approved condensers. Any exceptions to this policy must be obtained in writing prior to installation and operation of the ice machine.
2. Outdoor condensers **must** be installed with vertical air flow. Indoor condensers used for heat recovery may be installed with either horizontal or vertical air flow.
3. The condenser **must** be mounted above the ice machine, with liquid refrigerant from the condenser outlet draining freely (1/4" per foot slope) in the direction of normal operating flow (back to the ice machine) with no traps in the liquid line.
4. Flooding head pressure controls such as Alco Headmaster are **not** to be used, since they cause excessive subcooling of the returned liquid refrigerant and interfere with reliable ice harvest.
5. The discharge and liquid lines must be insulated with 1/2" thick Armaflex insulation or equal.
6. **Horizontal runs in the discharge** line should slope 1/4" per foot in the normal direction of flow (away from the ice machine).
7. Traps must be installed in discharge lines at the base of all vertical risers. There should be no intentional traps in liquid lines. Trap volume should be kept to a minimum. Typical details are shown in FIGURE-10. Long vertical runs should have traps every 20 feet.
8. Use only ACR grade copper pipe, Type L. Recommended line sizes are shown in TABLE-3.
9. Distance between ice machine and condenser must not exceed 150 equivalent feet. Refer to Condenser Equivalent Line Size worksheet. (see TABLE-5)
10. Condensers must be provided with a cold weather valve kit per FIGURE-9A. These valves allow one-half of the condenser to be disabled in cold weather. Running the ice machine with one half the condenser in cold weather makes it easier to maintain minimum necessary condensing pressure, particularly in windy conditions. The coil thermostat should be set to close at 35°F. for multiple fan condensers or 50°F for single fan condensers.
11. Condensers with multiple fans must be provided with a thermostat to turn off unneeded fans in cold weather. Turning off unneeded fans reduces on-off cycling of the fan(s) and allows for a steadier condensing pressure. The fan thermostat should be set at 50°F.
12. When extreme cold conditions are expected or encountered (temperatures below 0°F and wind greater than 15 MPH), it may be necessary to install a protective enclosure around the condenser. Other apparatuses such as louvers may be used. Contact the factory for suggestions.

13. After installation, the field-installed lines are to be evacuated to a vacuum of 500 microns or less and held for at least one hour. Use ¼” access connection located on compressor discharge line and liquid return line (32). After the vacuum pump is removed, vacuum should hold at 500 microns or less for at least 5 minutes and the lines pressurized with R-22 to 25 psig minimum.
14. The volume of refrigerant supplied with the machine is sufficient to fill the condenser and condenser lines when length of pipe (one way) is 75 feet or less. When the length of lines is longer than 75 feet, additional refrigerant must be added as noted below. Instructions for adding refrigerant are included further in these instructions.

<b>Liquid Line Size</b>	<b>75 ft.</b>	<b>100 ft.</b>	<b>125 ft.</b>	<b>150 ft.</b>
1/2”	none	None	None	2
5/8”	none	2	4	6
7/8”	none	4	8	12
1-1/8”	none	6	12	18

**TABLE - 3**  
**Pounds R-22 to Add Vs. Liquid Line Length**

15. All piping must be done in accordance with applicable local and national codes. Such codes may include “The Safety Code for Mechanical Refrigeration (ANSI B9.1), and “The Code for Refrigerant Piping” (ANSI B31.5).
16. The following installation guidelines are strongly suggested. While they do not affect the machine warranty, they may be required for safe operation, and to comply with all applicable electrical and mechanical codes.
17. Local electrical code must be checked for wiring method.
18. The installer must provide a lockable disconnect switch(s) adjacent to the condenser. The power is fused at the machine by a 15 amp breaker.
19. Electrical connections between the condenser and the Tube-Ice® machine require minimum 12 ga. wire. See FIGURE-11 &12.
20. All electrical fittings and components exposed to the weather must be suitable for outdoor installation.

The design total heat rejection for each Tube-Ice® machine, the recommended air-cooled condenser, and condenser physical and electrical data are shown in TABLE-2. Only the condensers shown are UL listed with the ice machines. Other condensers may be individually UL listed, but are not UL listed with the Tube-Ice® machines, and cannot be recommended by Vogt Tube-Ice. Catalog energy efficiency ratings of the ice machines are based on use of the recommended condenser.

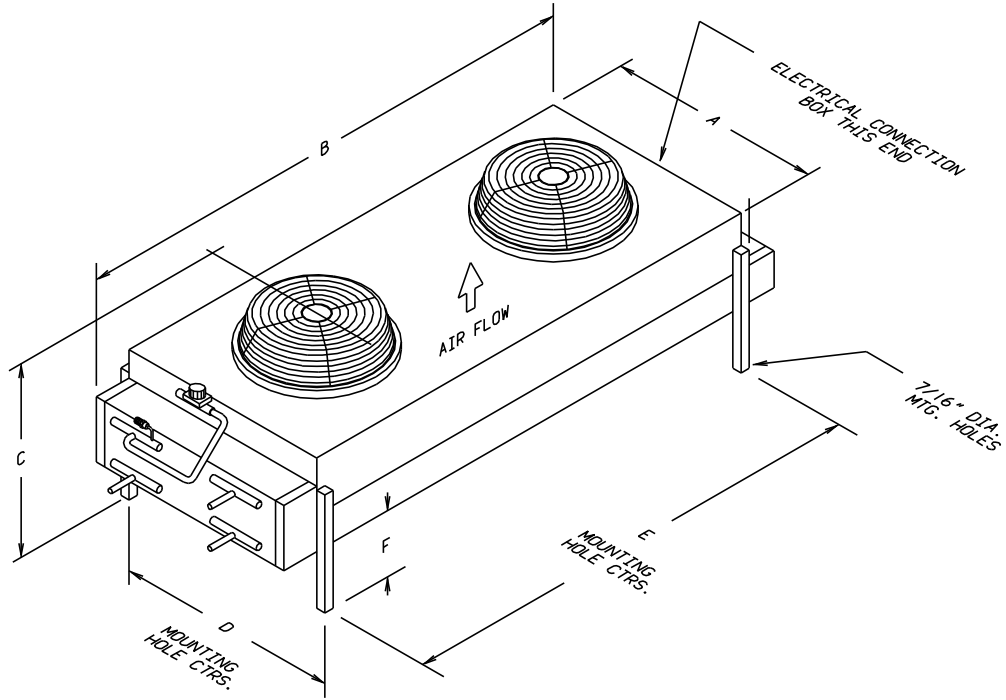
Condensers supplied by Vogt must be utilized. The use of non-Vogt condensers will void the compressor warranty. For continuous operation at ambient above 105°F, consult the factory about using a larger condenser.

<b>Ice Machine Model</b>	<b>HE20</b>	<b>HE30</b>	<b>HE40</b>
Recommended Condenser	HDD-61 (HDD-101)	HDD-101 (HDD-131)	HDD-131 (HDD-191)
<b>Note:</b> For continuous operation at ambients above 105 °F, use larger condenser shown in parenthesis			
Total Heat Rejection: BTU/hr at 60 Hz. BTU/hr at 50 Hz.	28,700 23,900	44,500 37,100	80,400 67,000
Fans: Number HP, Each Total, CFM	1 1/3 5,000	2 1/2 9,800	2 (3) 1/2 (1/2) 9,800 (15,500)
Full Load Amps: 1 ph., 208/230V, 60 Hz 3 ph., 208/230V, 60 Hz 3 ph., 460V, 60 Hz 1 ph., 200/220V, 50 Hz 3 ph., 200/220V, 50 Hz 3 ph., 400V, 50 Hz	2.5 N/A N/A 3.0 N/A N/A	8.0 N/A N/A 5.8 N/A N/A	8.0 (12) N/A N/A 5.8 (8.7) N/A N/A
Locked Rotor Amps: 1 ph., 208/230V, 60 Hz 3 ph., 208/230V, 60 Hz 3 ph., 460V, 60 Hz 1 ph., 200/220V, 50 Hz 3 ph., 200/220V, 50 Hz 3 ph., 400V, 50 Hz	7 N/A N/A 8.2 N/A N/A	15 N/A N/A 17.5 N/A N/A	15 (23) N/A N/A 17.5 (27) N/A N/A
Weight, lbs.: Net Shipping Operating (maximum flooded)	150 195 167	250 310 276	265 (370) 325 (440) 301 (405)
Condenser dimensions, inches: A (Width) B (Length) C (Height) D (Leg centerline) E (Leg centerline) F (Clearance below)	38-7/8" 45-1/2" 36-1/8" 37-7/8" 37" 16-1/8"	41-3/8" 66" 36-1/8" 40-3/8" 54" 16-1/8"	41-3/8" (41-3/8") 66" (105) 36-1/8" (36-1/8") 40-3/8" (40-3/8") 54" (94") 13-3/4" (13-3/4")
Recommended Line Sizes, OD: Liquid (All lengths and orientations) Discharge Gas Vertical Up, All lengths Horizontal Or Down, < 75 ft. Horizontal Or Down, > 75 ft.	1/2" 5/8" 5/8" 7/8"	5/8" 7/8" 7/8" 1-1/8"	7/8" (7/8") 1-1/8" (1-1/8") 1-1/8" (1-1/8") 1-3/8" (1-3/8")
Connections at Condenser: Liquid (ODC) Discharge Gas (ODC) Connections at Machine Liquid (ODC) Discharge Gas (ODC)	1/2" 5/8" 1-1/8" 1-1/8"	5/8" 7/8" 1-1/8" 1-1/8"	7/8" (7/8") 1-1/8" (1-3/8") 1-1/8" 1-1/8"

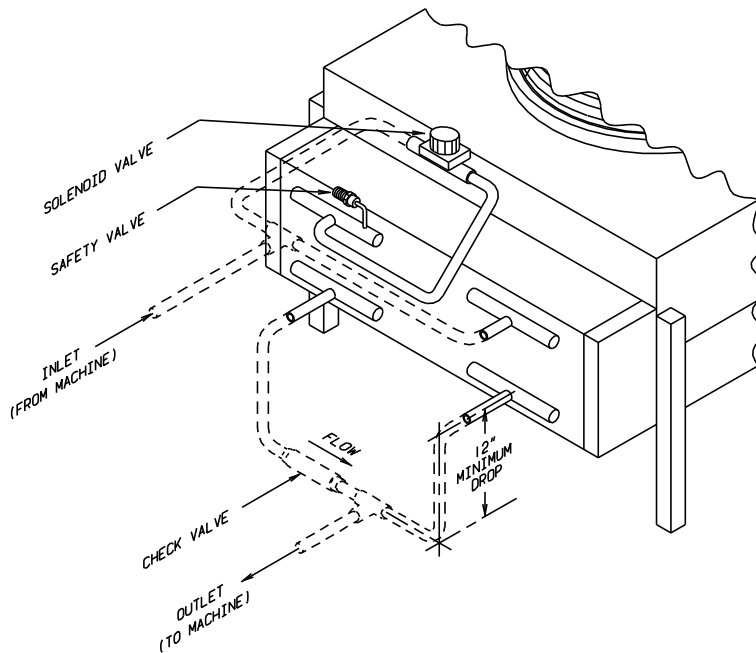
**TABLE - 4**  
**Air-Cooled Condenser Data**

<b>Ice Machine Model</b>	<b>HE60 / P112F</b>	<b>HE100 / P118F</b>	<b>P18FXT</b>
Recommended Condenser	HDD-231(HDD-261)	HDD-311 (HDD-361)	HDD-591 (HDD-661)
<b>Note:</b> For continuous operation at ambients above 105 °F, use larger condenser shown in parenthesis			
Total Heat Rejection: BTU/hr at 60 Hz. BTU/hr at 50 Hz.	122,000 101,700	181,200 151,000	249,900 278,250
Fans: Number HP, Each Total, CFM	3 (3) 1/2 (1/2) 15,000 (14,000)	5 (5) 1/2 (1/2) 22,500 (22,000)	5 (5) 3/4 (3/4) 33,000 (32,500)
Full Load Amps: 1 ph., 208/230V, 60 Hz 3 ph., 208/230V, 60 Hz 3 ph., 460V, 60 Hz 1 ph., 200/220V, 50 Hz 3 ph., 200/220V, 50 Hz 3 ph., 400V, 50 Hz	N/A 6.0 (6.0) 2.7 (2.7) N/A 6.0 (6.0) 3.0 (3.0)	N/A 10.0 (10.0) 4.5 (4.5) N/A 10.0 (10.0) 5.0 (5.0)	N/A 17.0 (17.0) 8.5 (8.5) N/A 17.0 (17.0) 8.5 (8.5)
Locked Rotor Amps: 1 ph., 208/230V, 60 Hz 3 ph., 208/230V, 60 Hz 3 ph., 460V, 60 Hz 1 ph., 200/220V, 50 Hz 3 ph., 200/220V, 50 Hz 3 ph., 400V, 50 Hz	N/A 19.8 (19.8) 9.9 (9.9) N/A 19.8 (19.8) 9.9 (9.9)	N/A 33 (33) 16.5 (16.5) N/A 33 (33) 16.5 (16.5)	N/A 60 (60) 30 (30) N/A 60 (60) 30 (30)
Weight, lbs.: Net Shipping Operating (maximum flooded)	400 (520) 475 (595) 436 (566)	610 (660) 700 (770) 667 (726)	1175 (1200) 1325 (1350) 1221 (1258)
Condenser dimensions, inches: A (Width) B (Length) C (Height) D (Leg centerline) E (Leg centerline) F (Clearance below)	41-3/8" (41-3/8") 105" (105") 36-1/8" (36-1/8") 40-3/8" (40-3/8") 94" (94") 13-3/4" (11-3/4")	28-3/4" (28-3/4") 180-1/8" (180-1/8") 41-5/8" (41-5/8") 27" (27") 147-5/8" (147-5/8") 14-5/8" (14-5/8")	57" (57") 180-1/8" (180-1/8") 45-5/8" (45-5/8") 55-1/4" (55-1/4") 147-5/8" (147-5/8") 14-5/8" (14-5/8")
Recommended Line Sizes, OD: Liquid (All lengths and orientations) Discharge Gas Vertical Up, All lengths Horizontal Or Down, < 75 ft. Horizontal Or Down, > 75 ft.	1-1/8" (1-1/8")  1-1/8" (1-1/8") 1-1/8" (1-1/8") 1-3/8" (1-3/8")	1-1/8" (1-1/8")  1-3/8" (1-3/8") 1-3/8" (1-3/8") 1-5/8" (1-5/8")	1-3/8" (1-3/8")  1-3/8" (1-3/8") 1-3/8" (1-3/8") 1-5/8" (1-5/8")
Connections at Condenser: Liquid (ODC) Discharge Gas (ODC) Connections at Machine: Liquid (ODC) Discharge Gas (ODC)	1-1/8" (1-1/8") 1-3/8" (1-5/8")  1-1/8" 1-1/8"	1-1/8" (1-5/8") 1-5/8" (1-5/8")  1-1/8" 1-3/8"	1-3/8" (1-3/8") 2-1/8" (2-1/8")  1-1/8" 1-3/8"

**TABLE – 4A**  
**Air-Cooled Condenser Data**



**FIGURE - 9**  
**Condenser Dimensions (Condenser pictured: DD-101 or DD-131)**



**Note:** Dash lines indicate customer supplied piping. The Check Valve in the return line (labeled “Output To Machine”) is supplied with the condenser.

**FIGURE – 9A**  
**Condenser Field Piping**

## CONDENSER EQUIVALENT LINE SIZE WORKSHEET

**Discharge Gas Line O.D.** \_\_\_\_\_

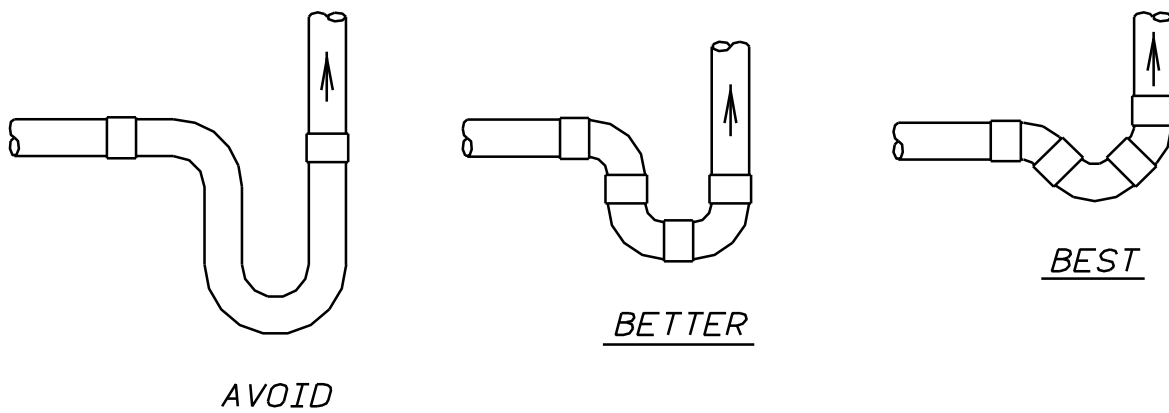
Fitting Type	Number Used	Factor	Total
Globe Valve (open)			
Angle Valve (open)			
45° Elbow			
90° Elbow			

Feet of Straight Copper Used	
Total Fitting Factor	
<b><u>Total Equivalent Feet</u></b>	

### Fitting Factors

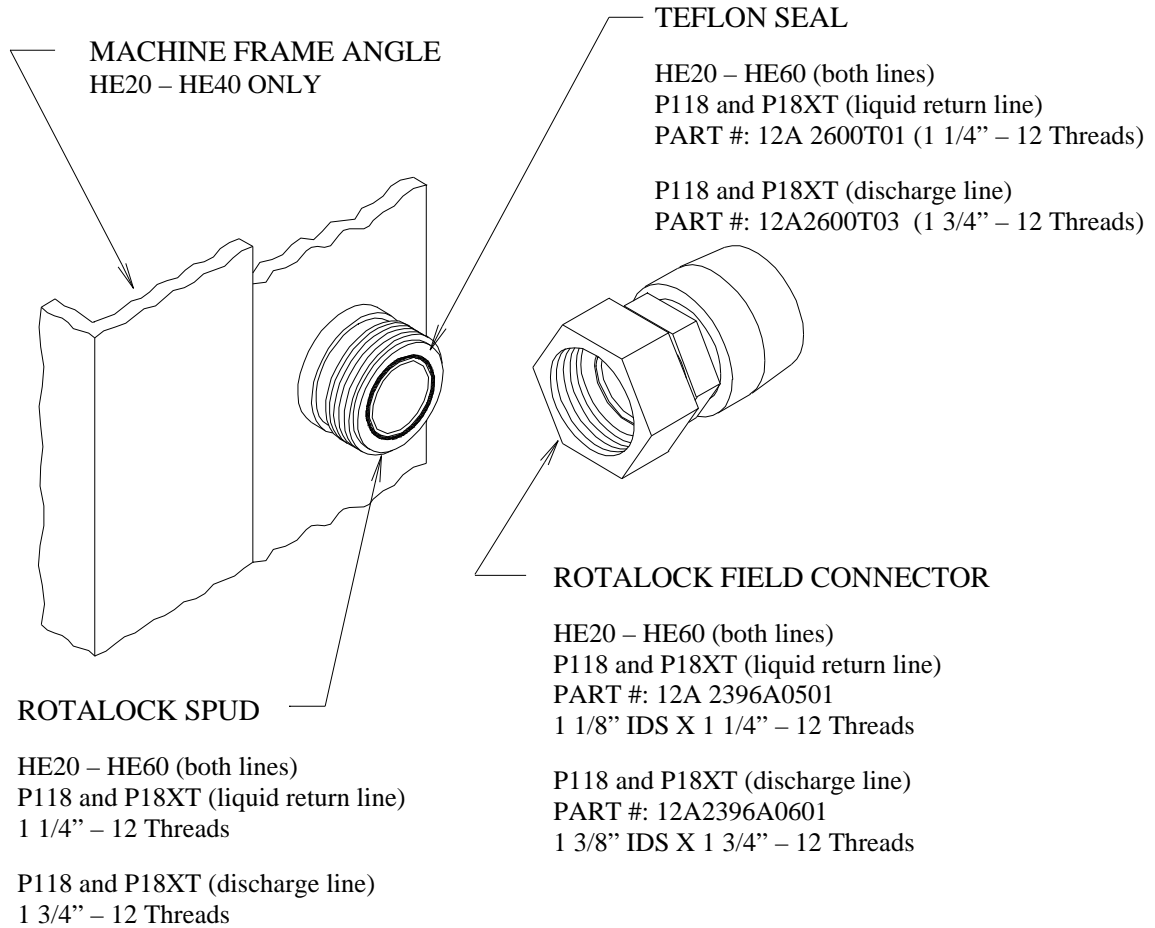
Copper Tube O.D. Type "L"	1/2"	5/8"	7/8"	1 1/8"
Globe Valve (open)	14	16	22	28
Angle Valve (open)	7	9	12	15
45° Elbow	.5	1	1	1.5
90° Elbow	1	2	2	3

**TABLE - 5**



**FIGURE - 10  
Minimum Traps for Discharge Lines**

## Refrigerant Connections to Air-Cooled Condenser.



**FIGURE - 11**  
**Field Attachment, Air Cooled Condenser Refrigerant Tubing**

FOLLOW THESE PROCEDURES TO MAKE A TIGHT JOINT

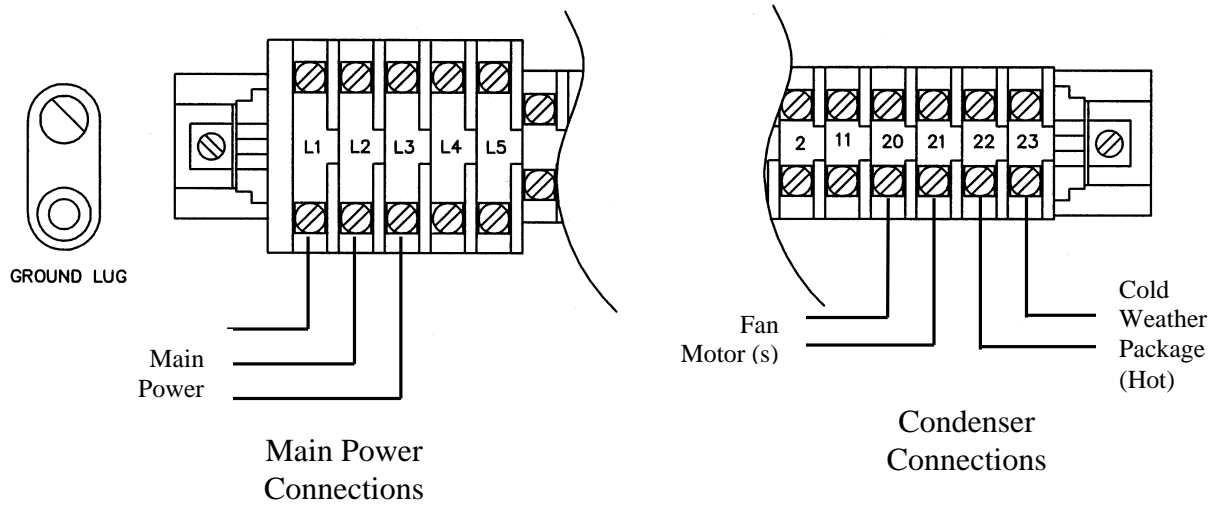
1. Solder or braze condenser tubing ends to the female Rotalock connectors.
2. Remove dust caps if used, making sure that component plastic seals are intact.
3. Wipe off connector and spud threaded surfaces with a clean cloth to prevent the inclusion of dirt, or any foreign material in the system.
4. Connector coupling nut should be screwed onto Rotalock spud using the proper amount of torque (See TABLE-6).

Spud Size	Amount of Torque
1/2" - 5/8"	30-40 FT LBS
7/8"	50-60 FT LBS
1 1/8"	80-100 FT LBS

**TABLE - 6**  
**Torque Ratings**

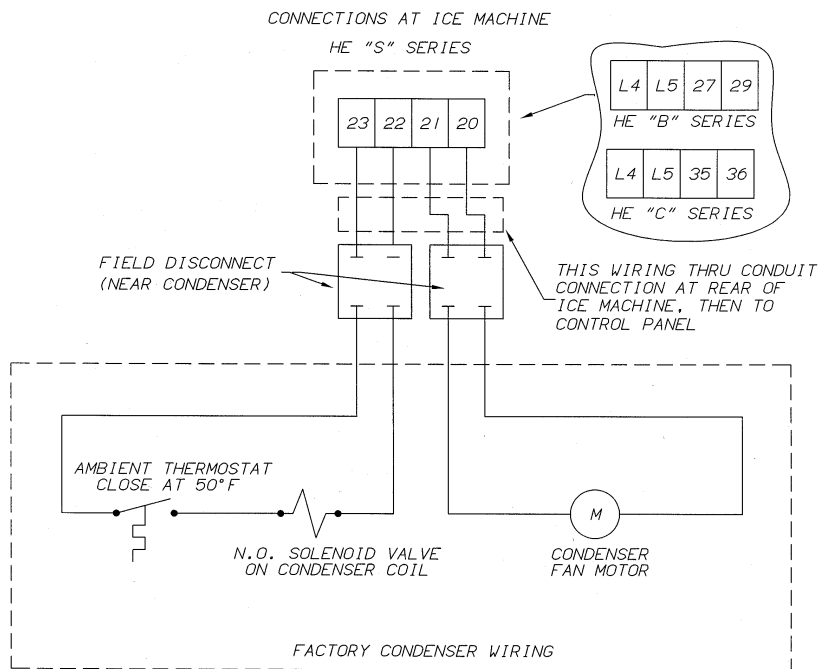
## Wiring Connections to Air-Cooled Condenser.

Air cooled condenser should be wired to terminals 20,21,22 and 23 (see FIGURE - 12).



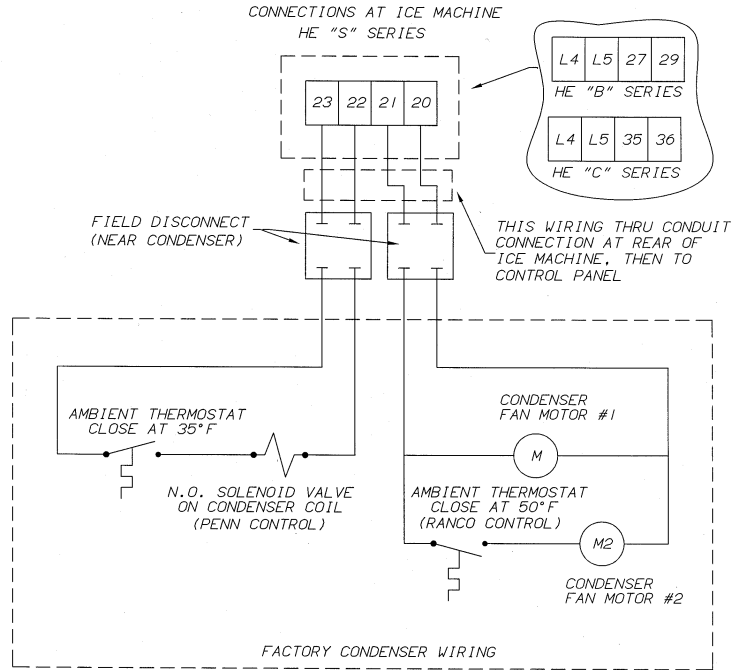
**NOTE:** All four wires must be run from the ice machine to the remote air cooled condenser.

**FIGURE - 12**  
**Ice Machine Terminal Block Connections**



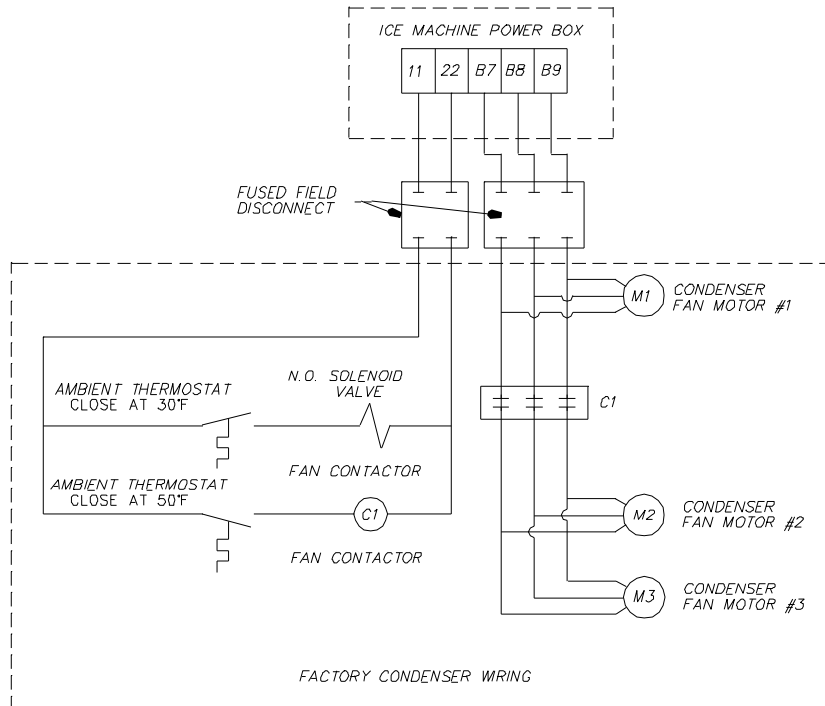
**FIGURE - 13**  
**Wiring For HDD-61 With Cold Weather Valve and Single Fan**

## Wiring Connections to Air-Cooled Condenser (Cont.)



**FIGURE - 14**

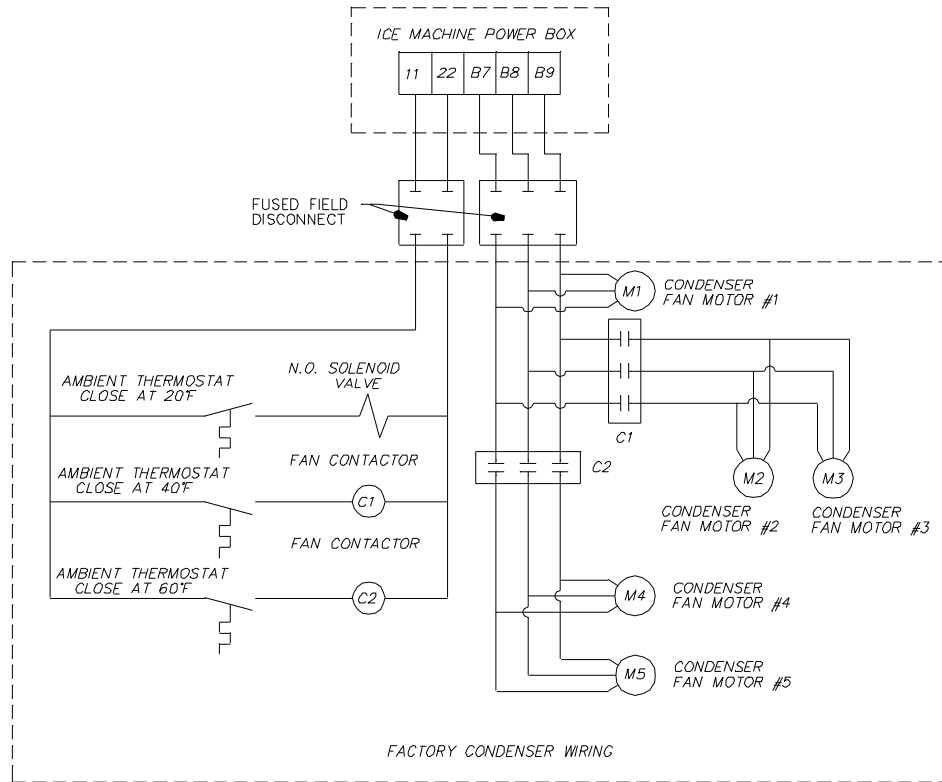
### Wiring For HDD-101 & HDD-131 With Cold Weather Valve And Dual Fans



**FIGURE - 15**

### Wiring For HDD-191, HDD-231 & HDD-261 With Cold Weather Valve And Three Fans

## Wiring Connections to Air-Cooled Condenser (Cont.)



**FIGURE - 16**

### Wiring For HDD-311, HDD-361, HDD-591 & HDD-661 With Cold Weather Valve And Five Fans

Condenser	Description	Solenoid Valve			Thermostats	
		Valve	Valve Rebuild Kit	Replacement Coil	Penn (fan)	Ranco (solenoid)
HDD-61	5/8" N.O. Solenoid	12A4200A0503	12A4199V42	12A2105C04	12A2117G05	N/A
HDD-101	7/8" N.O. Solenoid	12A4200A0704	12A4199V44	12A2105C04	12A2117G05	12A2117G06
HDD-131	1 1/8" N.O. Solenoid	12A4200A0902	12A4199V45	12A2105C04	12A2117G05	12A2117G06
HDD-191 HDD-231 HDD-261 HDD-311 HDD-361	1 3/8" N.O. Solenoid	12A4200A1102	12A4199V45	12A2105C04	12A2117G05	12A2117G06
HDD-591 HDD-661	1 5/8" N.O. Solenoid	12A4200A1104	12A4199V47	12A2105C04	12A2117G05	12A2117G06

**Note:** Sporlan Solenoid Valves

**TABLE - 7**  
**Kramer Cold Weather Kit Replacement Parts**