INSTALLATION
OPERATION
MAINTENANCE
AND PARTS
MANUAL

SYSTEM 2100

AIR COOLED (CAA)

COMPU-AIRE, INC.

8167 BYRON ROAD, WHITTER,, CA 90606

PHONE: (562) *945-8971 FAX:* (562) *696-0724*

Website: ***www.compu-aire.com*** ***E-mail: cs@compu-aire.com***

ISO 9002 REGISTERED COMPANY

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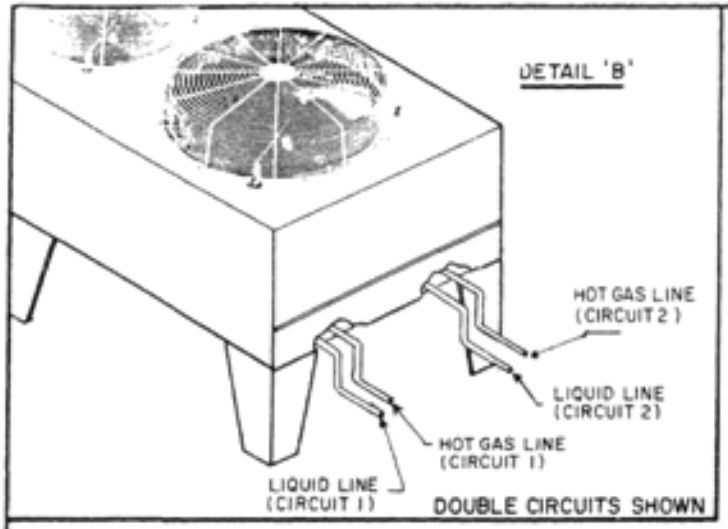
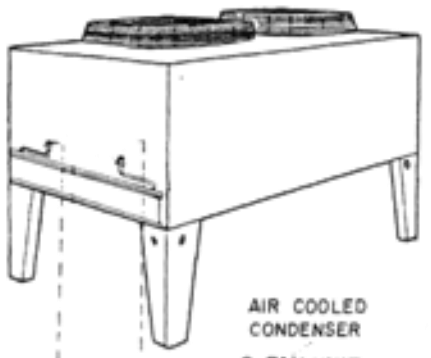
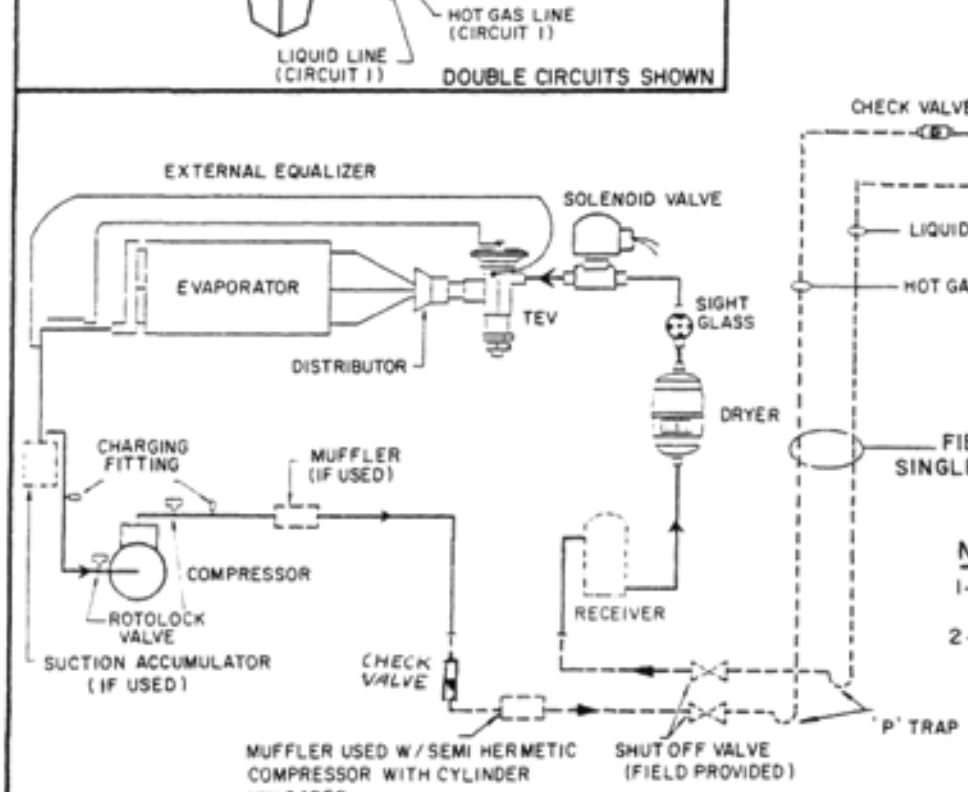
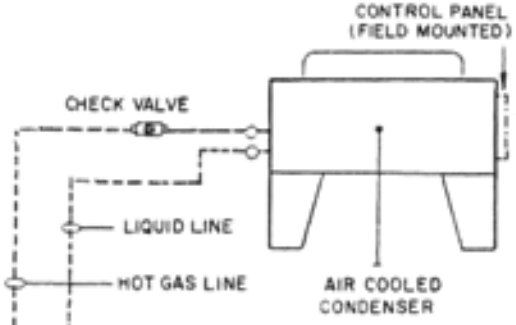
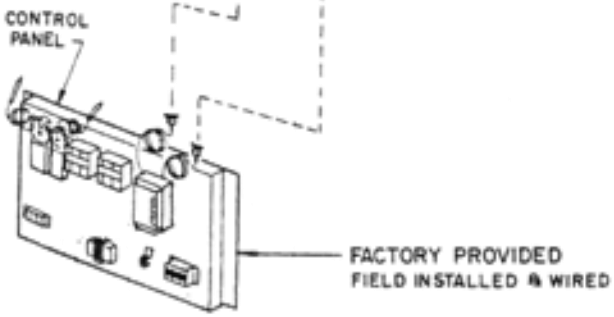










FIELD PIPING
SINGLE CIRCUIT SHOWN

NOTES:

1- COMPLY WITH ALL APPLICABLE PORTIONS OF N.E.C
2- ALL PIPING MUST BE PER ASHRAE STANDARD

COMPU-AIRE, INC.

NONE		T.N.
6-16-88		

FIELD PIPING AIR COOLED UNITS

700-625-030

SUBJECT TO CHANGE WITHOUT NOTICE

A D D E N D U M

CORRECT PHASING OF SCROLL COMPRESSORS:

The scroll compressor is a unidirectional compressor and will only compress refrigerant in one rotation direction. Therefore, the proper rotation of the scroll compressor must be checked. The scroll compressor will run in the reverse direction but it will not pump refrigerant and will draw substantially reduced current as compared to listed values, and will result in elevated sound levels. Scroll compressor will trip on internal protection after running for some time in the reverse direction.

Verification of the proper rotation of the scroll compressor is done by observing that suction pressure drops and discharge pressure rises when the compressor is energized.

WARNING:
EXTENDED IMPROPER ROTATION OPERATION MAY ALSO VOID COMPRESSOR **WARRANTY.**

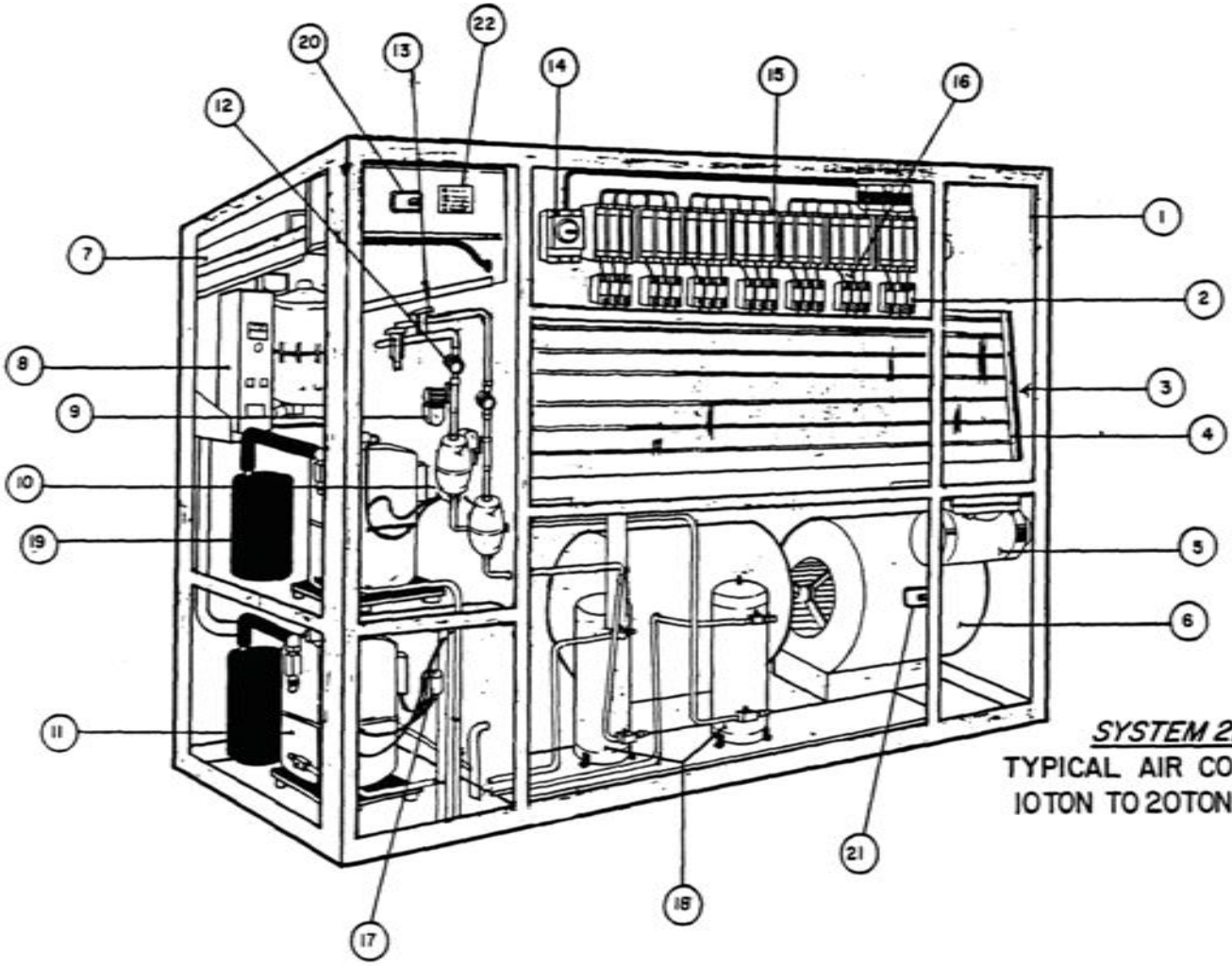
Contacting Compu-Aire for Technical Assistance

Compu-Aire, Inc. uses the latest in electronic and software technologies to develop some of the most reliable and cost efficient air conditioning systems in the world. Since many of our customer installations are sensitive to down time, we stock nearly all components for your system ready for same day shipment. In addition, our service departments can usually diagnose and repair the electronic components and return them to you within a few days.

Our customer support staff is available should you require assistance in diagnosing a problem or in setting up your air conditioning system. During usual business hours, you may call at (310) 945-8971 between 7:00 AM and 3:30 PM Pacific time, Monday through Friday except holidays. Or, you may send a facsimile message at (310) 696-0724 anytime_ Finally, you may write us at Compu-Aire, Inc., 8167 Byron Road, Whittier, California 90606.

Please, do not return system components without prior authorization from Compu-Aire. Whether repairing or replacement is required for in warranty or out of warranty parts, Compu-Aire must know what is being returned and why so that we may keep proper records of your parts. Call Compu-Aire's service center for a returned materials authorization number (RMA) and clearly mark all packages on the outside with the number before sending them to us.

When contacting the factory, please have information ready as to the model and size of the air conditioner system and most important, the job number. Compu-Aire keeps a file on each machine sold detailing system components using this latter number. All such information can be found on the Warranty Plate attached to each machine.



SYSTEM 2100
TYPICAL AIR COOLED UNIT
10TON TO 20TON MODULES

I. CONTROL MONITOR
2, CONTACTOR
3. REHEAT ASSEMBLY
4 COOLING COIL
Z. BLOWER MOTOR

6 BLOWER
7. FILTER RACK
6 NORTEC HUMIDIFIER
9 SOLENOID VALVE
10. DRIER

II. COMPRESSOR
12. SIGHT GLASS
13. EXPANSION
14 DISCONNECT SWITCH
15. FUSE BLOCK

IS_ POWER PANEL
17. PRESSURE SWITCH
18 RECEIVERS.
19. SUCTION ACCUMULATORS
20. CLOGGED FILTER SWITCH
21. NO AIR FLOW SWITCH
22. NAME PLATE

INTRODUCTION

Compu-Aire SYSTEM 2100 is specially designed to simultaneously cool, heat, humidify, de-humidify and filter the computer room air. These units are typically down discharge type supplying air in the computer raised floor.

Standard Air Cooled System 2100 Units are equipped with:

1) The Base Unit with dual refrigeration system.
2) Matching Air Cooled Condenser
3) Low Ambient Control-Variable Speed Type
4) Control Panel for the Air Cooled Condenser

Features of SYSTEM 2100 Air Conditioner include:

1) Stainless Steel Condensate Pan
2) Hermetic Compressors
3) Disposable Generator Type Humidifier
4) Disposable 2" filters
5) Microprocessor Based Control Monitor
6) Dual Belts Drive Set with an adjustable Motor pulley
7) Draw Thru Air Flow

OPTIONAL ITEMS WHEN ORDERED

1) Semi Hermetic Compressors
2) Up Flow Discharge
3) Mounting Stand
4) Hot Water, Steam, or hot Gas Reheat
5) Steam, Electric Immersion, or Infra Red Humidifier
6) Electromechanical Control Panel
7) Remote Control Panel
8) 4" Filters
9) 1" Pre-filters
10) Firestat
11) Smoke Detector
12) Molded Case Disconnect Switch
13) Condensate Pump
14) Low Ambient Control Below -20°F
15) Condensate Overflow
16) Low Voltage Drop Out

PRELIMINARY SURVEY

Prior to installing the unit verify the following requirements:

1) Door Openings
2) Elevator Size if needed to be used.
3) Electrical
    a) Voltage and Phase
    b) Amps
    c) Breaker Size
4) Floor Openings
5) Water Supply for the Humidifier
6) Condensate Drain Connection Point
7) Refrigerant Pipe Routing make sure it does not interfere with air flow.
8) Air Cooled Condenser
    a) Verify Electrical Service
    b) Location and Structural Integrity
    c) Space allocation for running 2 Liquid Lines and 2 Hot Gas Lines
    d) Flashing Requirements
    e) Space to Run Electrical Conduit for Interlocking conductors from the unit to the Air Cooled Condenser.

PRE-INSPECTION

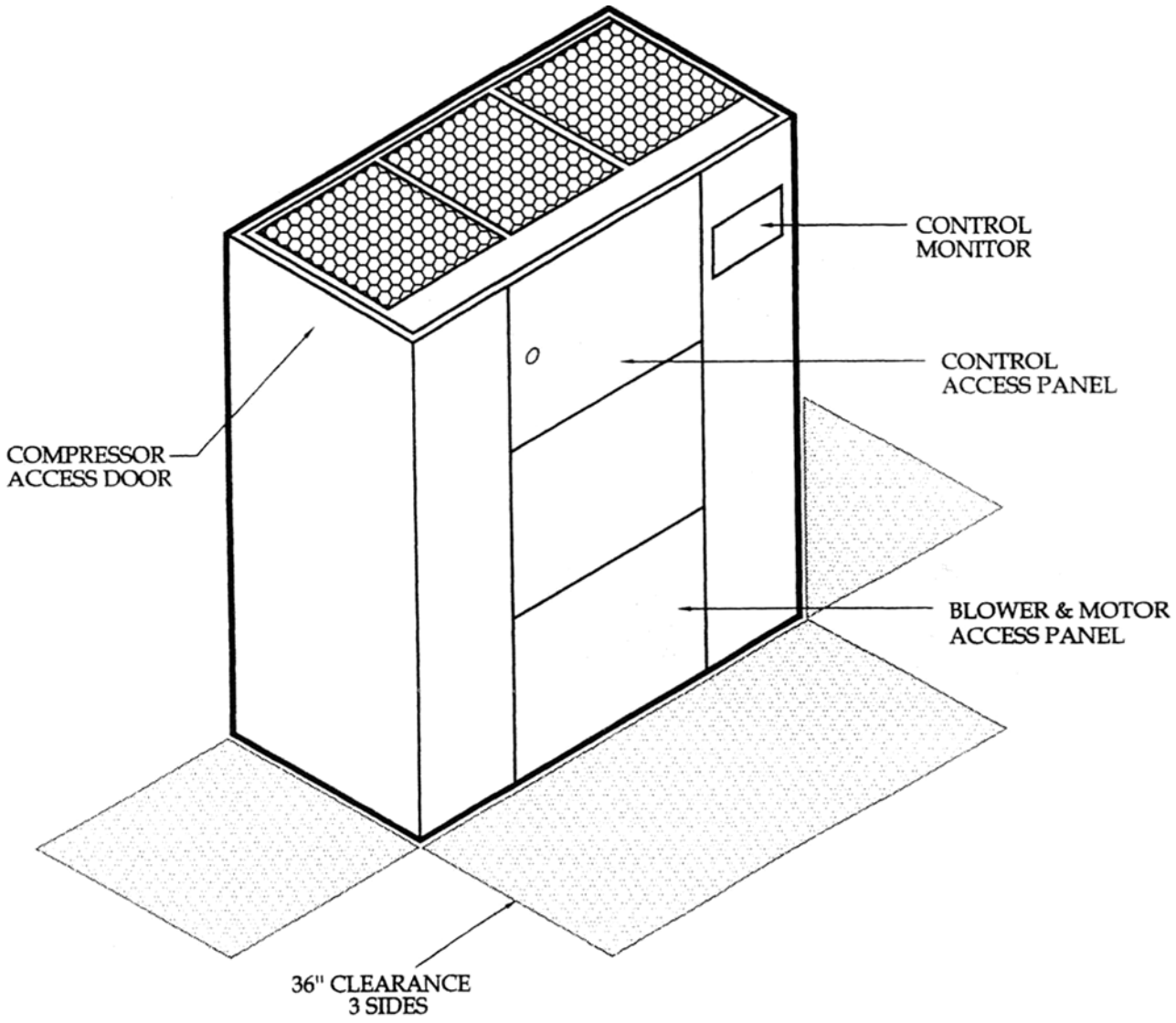
Upon receipt of the units, inspect the items for either visible or concealed damage.
REPORT ANY DAMAGE TO THE CARRIER. COMPU-AIRE IS NOT RESPONSIBLE FOR FILING OF ANY CLAIMS. ALL NEEDED INSPECTION AND CLAIM FILING IS THE RESPONSIBILITY OF THE RECEIVER.

LOCATING THE **AIR CONDITIONER**

Proper clearance is important for the unit function and access to various components for adjustment and repair or replacement.

Front*	36"
Left Side	36"
Right Side	36"

*Consult Electrical Codes and provide clearance



UNCRATING

The units are shipped as follows:

1) SYSTEM 2100 - wrapped with cardboard and wooden crated.
2) Air Cooled Condenser - wooden crated
3) Control Panel - corrugated box and shipped separately.
4) Optional items when ordered such as remote control panel, water detectors, floor stands, etc. are shipped separately in its own box.

Extreme care **should be exercised in handling these units. SYSTEM 2100 unit is specifically painted to match or contrast the computer equipment. Exercise care when removing the covers.**

Make sure the forks are under the entire unit and protruding on the far side prior to lifting.

TECHNICAL DATA
AIRCOOLED SYSTEMS

Table 1

MODEL	CAA-632 CAA-634 CAA-635	CAA-832 CAA-834 CAA-835	CAA-1032 CAA-1034 CAA-1035	CAA-1532 CAA-1534 CAA-1535	CAA-2032 CAA-2034 CAA-2035	CAA-2532 CAA-2534 CAA-2535	CAA-3032 CAA-3034 CAA-3035
NOMINAL TONNAGE	6	8	10	15	20	25	30
EER	**8.4**	**8.6**	**8.7**	**8.9**	**8.5**	**8.8**	**8.6**
CAPACITY DATA	80°F DB,67°F WB **(26.7°C DB, 19.4°C WB)**,50% RH Entering Air						
Total BTU/HR **(kW)**	80,100**(23.5)**	124,200**(36.4)**	136,100**(39.8)**	192,500**(56.4)**	248,500**(72.8)**	285,200**(83.5)**	379,800**(111.2)**
Sensible BTU/HR**(kW)**	65,200**(19.0)**	93,400**(27.4)**	116,200**(34.0)**	170,200**(49.8)**	210,500**(61.6)**	241,100**(70.6)**	315,000**(92.2)**
	75°F DB,62.5°F WB **(23.9°C DB, 16.9°C WB)** 50% RH Entering Air						
Total BTU/HR **(kW)**	76,500**(22.4)**	114,900**(33.6)**	125,600**(36.8)**	180,200**(52.8)**	232,200**(68.0)**	266,200**(78.0)**	366,900**(107.4)**
Sensible BTU/HR**(kW)**	63,500**(18.5)**	91,200**(26.7)**	112,400**(32.9)**	165,200**(48.4)**	203,500**(59.6)**	233,500**(68.4)**	305,000**(89.3)**
	72°F DB,60°F WB **(22.2°C DB, 15.5°C WB)** 50% RH Entering Air						
Total BTU/HR **(kW)**	72,100**(21.1)**	109,400**(32.0)**	120,500**(35.3)**	170,900**(50.0)**	218,100**(63.9)**	248,800**(72.9)**	341,800**(100.1)**
Sensible BTU/HR**(kW)**	62,200**(18.2)**	88,900**(26.0)**	109,800**(32.1)**	160,300**(46.9)**	197,200**(57.7)**	225,600**(66.1)**	297,500**(87.1)**
	72°F DB,58.6°F WB **(22.2°C DB, 14.8°C WB)** 45% RH Entering Air						
Total BTU/HR **(kW)**	69,950**(20.5)**	106,900**(31.3)**	122,300**(35.8)**	174,200**(51.0)**	221,300**(64.8)**	251,300**(73.6)**	339,400**(99.4)**
Sensible BTU/HR**(kW)**	66,100**(19.4)**	94,100**(27.6)**	122,300**(35.8)**	174,200**(51.0)**	221,300**(64.8)**	251,300**(73.6)**	339,400**(99.4)**
AIR DATA - Based on 0.5 inches external static pressure-variable pitch pulley							
CFM **(L/s)**	3400**(1604)**	4700**(2218)**	5750**(2714)**	8500**(4012)**	10600**(4956)**	12000**(5664)**	15400**(7268)**
Fan Motor HP	2.0	3.0	3.0	5.0	5.0	7.5	10.0
No. of Fans(Downflow)	1	2	2	3	3	2	2
No. of Fans(Upflow)	1	1	2	2	2	2	4
OPTIONAL AIR-for increased capacities or available static pressures: consult factory							
CFM **(L/s)**	4700**(2218)**	5700**(2690)**	6500**(3068)**	9500**(4484)**	12500**(5900)**	14500**(6844)**	N/A
Fan Motor HP	3.0	5.0	5.0	7.5	7.5	10.0	N/A
COMPRESSOR DATA - High Efficiency R-22							
Type	Hermetic	Hermetic	Hermetic	Hermetic	Hermetic	Hermetic	Hermetic
Quantity	2	2	2	2	2	2	2
EVAPORATOR COIL DATA - High Efficiency "A" configuration, Copper tube, Aluminum fins							
Face Area-FT²**(m²)**	15.3(**1.42**)	15.3(**1.42**)	15.3(**1.42**)	21.5**(2)**	24.0**(2.23)**	24.0(2.23)	29.5(**2.74**)
Rows	3	3	4	4	4	4	4
REHEAT - Electric							
kW	12	15	15	22.5	30	30	37.5
BTU/HR-includes fan motor	43,300	56,300	56,300	84,500	115,200	121,387	148,400
Stages	2	2	2	3	4	4	4
HUMIDIFIER - Electronic self generating steam type with disposable cylinder							
kW	6.8	6.8	6.8	10.2	10.2	10.2	10.2
Capacity-LB/HR**(KG/HR)**	17.5**(7.9)**	17.5**(7.9)**	17.5**(7.9)**	30**(13.6)**	30**(13.6)**	30**(13.6)**	30**(13.6)**
FILTERS(Downflow Units) - 30% Efficient ASHRAE standard 52-76							
16"x25"x2"	2	2	2	2	1	1	-
25"x20"x2"	2	2	2	3	4	4	6
Effective Area-2" FT²**(m²)**	56.0**(5.2)**	56.0**(5.2)**	56.0**(5.2)**	68.7**(6.3)**	73.9**(6.8)**	73.9**(6.8)**	91.8**(8.5)**
Effective Area-4" FT²**(m²)**	84.2**(7.8)**	84.2**(7.8)**	84.2**(7.8)**	107.7**(10.0)**	112.6**(10.5)**	112.6**(10.5)**	141**(13.1)**
FILTERS(Upflow Units) - 30% Efficient ASHRAE standard 52-76							
16"x20"x2"	2	2	2	2	1	1	-
20"x20"x2"	2	2	2	3	4	4	6
Effective Area - FT²**(m²)**	44.6**(4.1)**	44.6**(4.1)**	44.6**(4.1)**	56.8**(5.3)**	58.9**(5.5)**	58.9**(5.5)**	73.2**(6.8)**
PIPING DATA - All connections are Copper O.D.							
Condensate Drains	**(2)**3/4"	**(2)**3/4"	**(2)**3/4"	**(2)**3/4"	**(2)**3/4"	**(2)**3/4"	**(2)**3/4"
Liquid Line (2 req'd)	1/2"	1/2"	1/2"	1/2"	5/8"	5/8"	7/8"
Hot Gas Line (2 req'd)	5/8"	5/8"	5/8"	7/8"	1 1/8"	1 1/8"	1 1/8"
Humidifier Water Supply	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"	1/4"
WEIGHT LB**(kg)**	1490**(677)**	1650**(750)**	1750**(795)**	1900**(864)**	2200**(1000)**	2300**(1045)**	2760**(1254)**
*** AIR COOLED CONDENSER DATA** - Based on 95°F**(35°C)** ambient, selections for other conditions available, consult factory.							
Model	ACC-07	ACC-09	ACC-11	ACC-17	ACC-24	ACC-28	ACC-37
CFM	5000	4800	10400	9800	14750	14550	19500
MOTOR HP **(QTY)**	3/4(1)	3/4(1)	3/4(2)	3/4(2)	3/4(3)	3/4(3)	3/4(4)
Liquid Line**(2 Req'd)**	7/8"	7/8"	7/8"	7/8"	7/8"	7/8"	1 1/8"
Hot Gas Line**(2 Req'd)**	1 1/8"	1 1/8"	1 1/8"	1 3/8"	1 3/8"	1 3/8"	1 5/8"
Coil Face Area FT²**(m²)**	9.8**(0.91)**	9.8**(0.91)**	19.2**(1.8)**	19.2**(1.8)**	28.6**(2.6)**	28.6**(2.6)**	37.9**(3.5)**
Rows	3	4	2	4	4	5	4
WEIGHT LB**(kg)**	270**(123)**	305**(138)**	340**(154)**	400**(182)**	560**(245)**	**630(286)**	**740(336)**

Bold face data is in metric units.

ELECTRICAL DATA

System 2100 Air Conditioners with scroll compressors, electric reheat and electric humidifier
For electrical data using alternate compressors, alternate reheat, no reheat, alternate humidifier, no humidifier consult factory

Table 8

AIR COOLED - CAA WATER COOLED - CAW GLYCOL COOLED - CAG (DOWN FLOW)							
VOLTAGE@ 3 PH, 60 HZ	CAA-63* CAW-63* CAG-63*	CAA-83* CAW-83* CAG-83*	CAA-103* CAW-103* CAG-103*	CAA-153* CAW-153* CAG-153*	CAA-203* CAW-203* CAG-203*	CAA-253* CAA-253* CAG-253*	CAA-303* CAW-303* CAG-303*
208							
FLA	52.2	67.2	71.5	111.3	142.5	154.7	195.3
MCA	63.4	81.4	86.8	135.0	173.6	187.3	236.4
MFS	70A	100A	110A	175A	225A	250A	300A
460							
FLA	24.2	31.8	33.6	52.3	64.5	73.7	88.3
MCA	29.4	38.6	40.8	63.5	78.7	89.4	106.9
MFS	35A	45A	50A	80A	100A	110A	150A
575							
FLA	19.5	25.3	26.9	40.6	49.9	58.9	72.2
MCA	23.8	30.7	32.6	49.2	60.9	71.4	87.5
MFS	30A	40A	40A	60A	80A	90A	110A
CAA, CAW, CAG (UP FLOW) & ENERGY MISER SYSTEMS - CAG/EM							
VOLTAGE@ 3 PH, 60 HZ	CAG-63*	CAG-83*	CAG-103*	CAG-153*	CAG-203*	CAG-253*	CAG-253*
208							
FLA	55.2	73.4	77.7	118.8	149.6	161.3	197.9
MCA	66.4	87.6	93.0	142.5	181.1	193.9	239.0
MFS	80A	100A	110A	175A	225A	250A	300A
460							
FLA	25.6	34.6	36.4	55.7	67.9	76.3	89.1
MCA	30.8	41.4	43.6	66.9	82.1	92.6	108.1
MFS	40A	50A	60A	80A	100A	125A	150A
575							
FLA	20.7	27.5	29.1	43.5	52.8	60.9	73.4
MCA	24.9	32.9	34.8	52.1	64.0	73.4	88.7
MFS	30A	40A	45A	70A	80A	100A	110A

*** Denotes Voltage 2 = 208/230, 3 = 380/415, 4 = 460, 5 = 575**

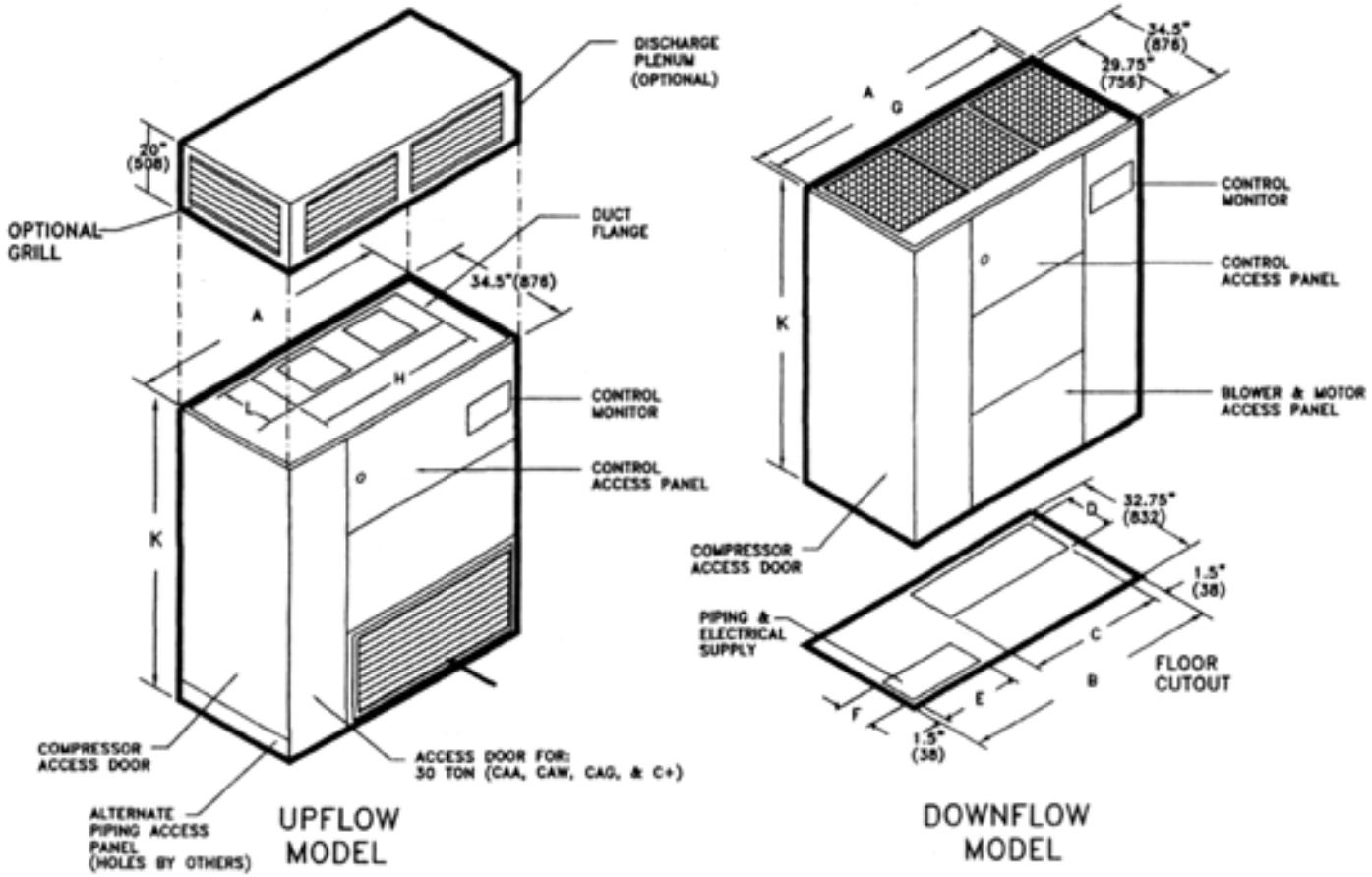
ELECTRICAL DATA
AIRCOOLED CONDENSER (ACC)

Table 9

VOLTAGE @ 3 PHASE, 60 HZ												
UNIT MODEL	AIR COOLED	MOTOR		208/230V			460V			575V		
CAA	CONDENSER	QTY	HP	FLA	MCA	MFS	FLA	MCA	MFS	FLA	MCA	MFS
6	ACC-07	1	0.75	4.5	5.6	15	2.3	2.9	15	2.0	2.5	10
8	ACC-09	1	0.75	4.5	5.6	15	2.3	2.9	15	2.0	2.5	10
10	ACC-11	2	0.75	8.7	9.8	17.5	4.4	5.0	15	4.0	4.5	10
15	ACC-17	2	0.75	8.7	9.8	17.5	4.4	5.0	15	4.0	4.5	10
20	ACC-24	3	0.75	12.9	14.0	25	6.5	7.1	15	6.0	6.5	10
25	ACC-28	3	0.75	12.9	14.0	25	6.5	7.1	15	6.0	6.5	10
30	ACC-37	4	0.75	18.2	18.2	35	8.6	9.2	17.5	8.0	8.5	15

DIMENSIONAL DATA

AIR COOLED & WATER/GLYCOL COOLED	ENERGY/MISER & DX/CHILLED WATER/GLYCOL COMBINATION	A	B	C	D	E	F	G	H	K	L
6,8, 10 TON		74.5 (1892)	72.0 (1829)	51.0 (1295)	14.0 (356)	16.5 (419)	10.0 (254)	70.0 (1778)	48.0 (1219)	74.0 (1880)	20.0 (508)
15 TON	6,8,10 TON	92.5 (2349)	90.0 (2286)	69.0 (1752)	14.0 (356)	16.5 (419)	10.0 (254)	88.0 (2235)	66.0 (1676)	74.0 (1880)	20.0 (508)
20,25 TON	15 TON	99.5 (2527)	97.0 (2464)	76.0 (1930)	14.0 (356)	16.5 (419)	10.0 (254)	95.0 (2413)	90.0 (2286)	74.0 (1880)	20.0 (508)
30 TON DOWN FLOW	20,25 TON	122.5 (3111)	120.0 (3048)	92.0 (2337)	14.0 (356)	16.5 (419)	10.0 (254)	118.0 (2997)	90.0 (2286)	74.0 (1880)	20.0 (508)
30 TON UP FLOW	30 TON	132.5 (3366)	130.0 (3302)	92.0 (2337)	14.0 (356)	16.5 (419)	10.0 (254)	127.0 (3226)	100.0 (2540)	74.0 (1880)	25 (635)



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
B	SEE ECO	12/20/00	BF

COMPU-AIRE, inc.

SYSTEM 2100

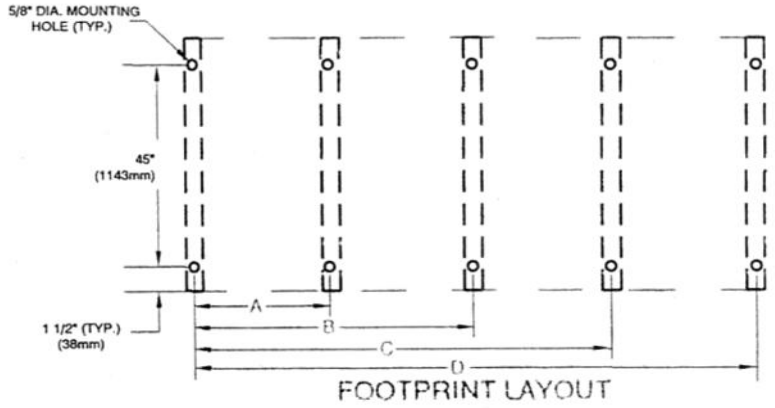
DRAWN BY B.FUNDERBURK/WHITE	DATE 6/28/00
APPROVED BY:	REVISED 12/20/00(B)
JOB NO.	DWG NO. 682-904-012

bill fun, compu-aire 9/21/00 3:11 PM 682-904-012.dwg

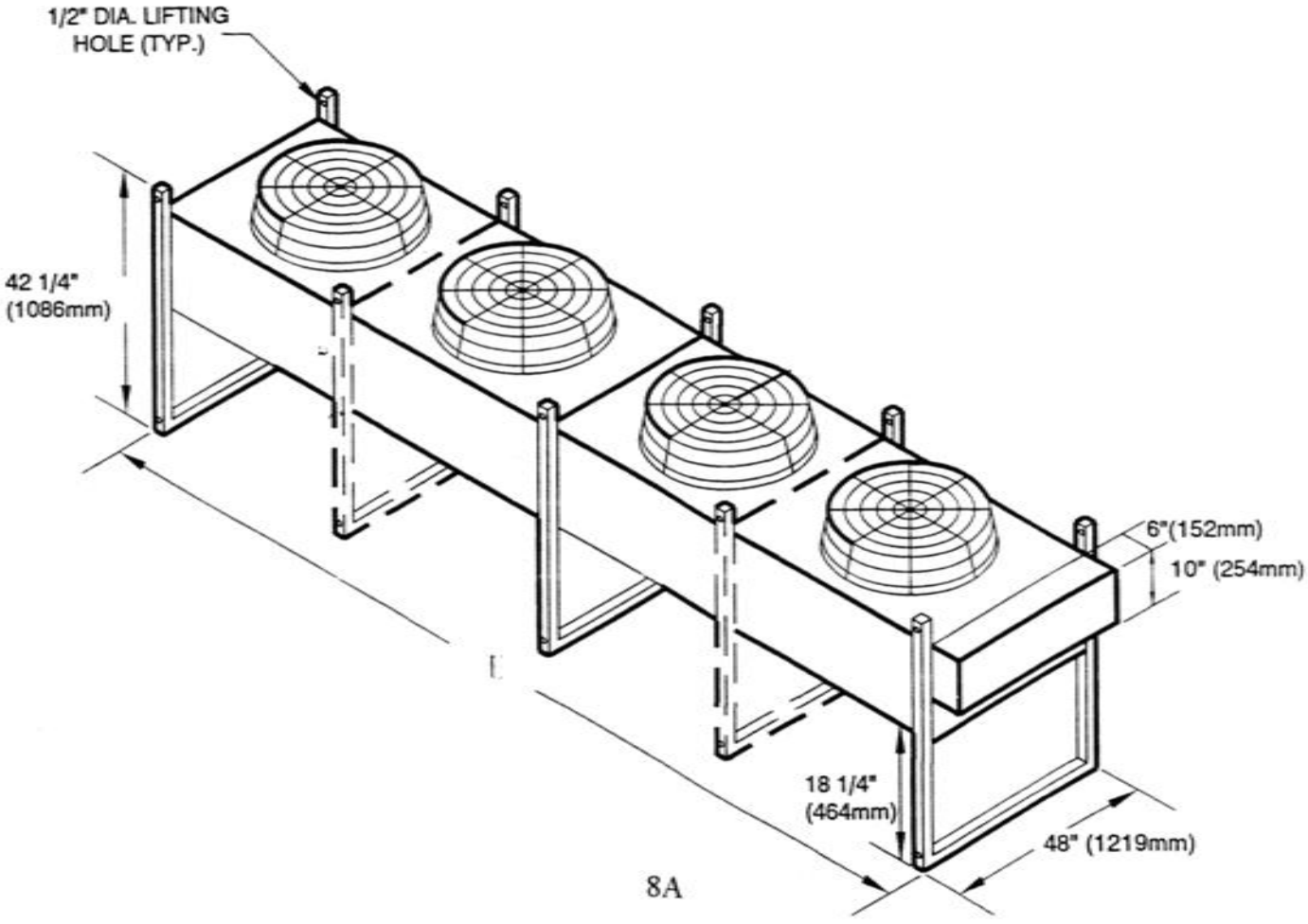
FORM NO. DVG-04A SUBJECT TO CHANGE WITHOUT INCURRING OBLIGATION
6-03-99

AIR COOLED CONDENSER -- DIMENSIONAL DATA *Table 6*

AIR COOLED CONDENSER - All selections based on 95°F ambient								
SYSTEM 2100	CONDENSER MODEL	A	B	C	D	E	FAN	OP WT.
CAA-6	ACC-07	30" (762mm)	-	-	-	32.25"(819mm)	1	270
CAA-8	ACC-09	30" (762mm)	-	-	-	32.25"(819mm)	2	305
CAA-10	ACC-11	-	60" (1524mm)	-	-	62.25"(1581mm)	2	340
CAA-15	ACC-17	-	60" (1524mm)	-	-	62.25"(1581mm)	2	400
CAA-20	ACC-24	30" (762mm)	-	90" (2286mm)	-	92.50"(2350mm)	3	560
CAA-25	ACC-28	30" (762mm)	-	90" (2286mm)	-	92.50"(2350mm)	3	630
CAA-30	ACC-37	-	60" (1524mm)	-	120" (3048mm)	122.25"(2350mm)	4	740



FOOTPRINT LAYOUT



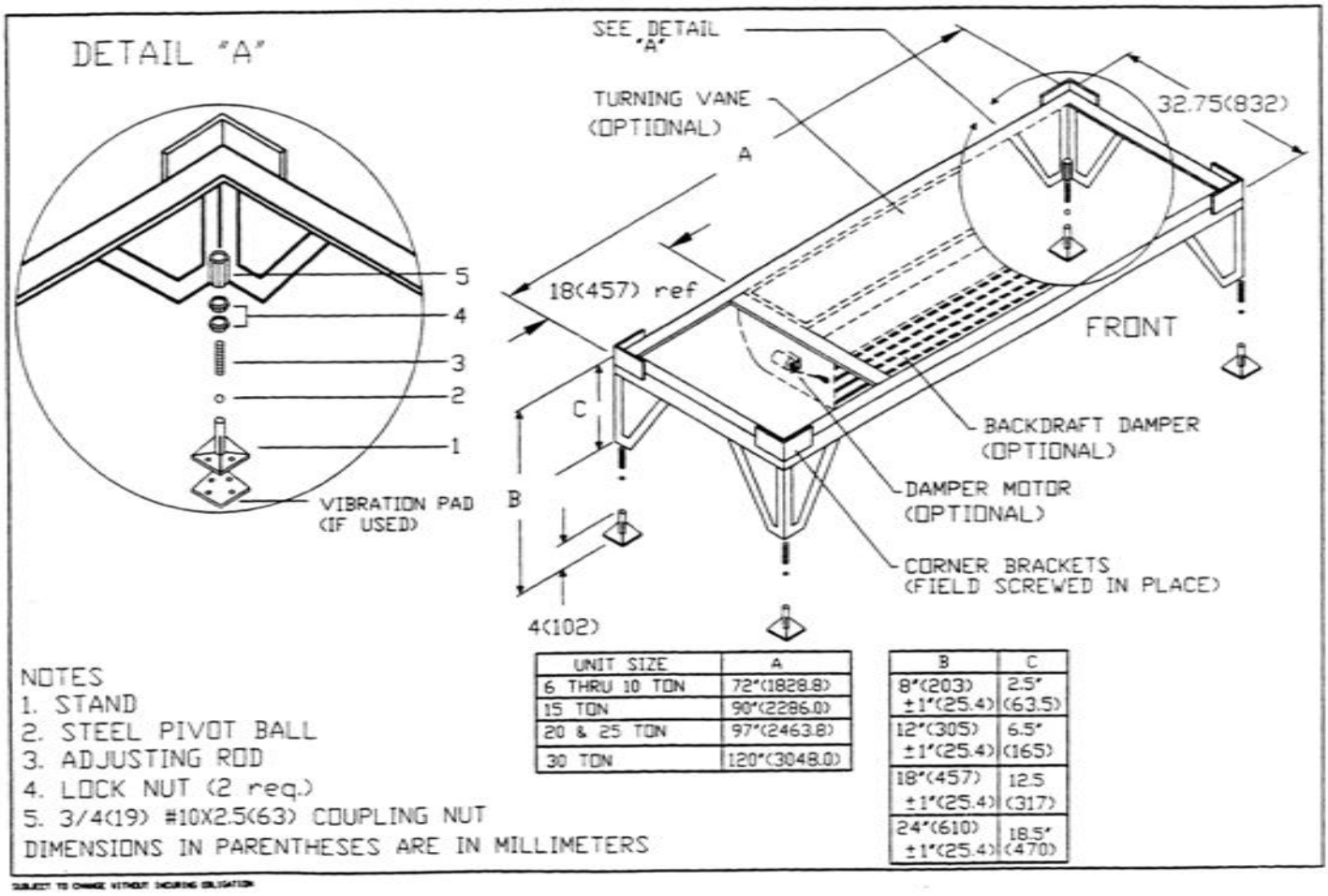
SETTING THE UNIT

If the raised floor is already installed use RUBBER TIRE DOLLIES to move unit to its location.

If the floor is not installed Mounting Stand may be used to install the unit.

An alternate method of setting the unit is with the use of leveling jack stands. The height of the unit can be raised or lowered through the use of the adjusting rods. The locknuts must be tightened to assure rigidity, as shown below.

UPFLOW UNITS - The unit may be placed directly on the sub floor. The upflow unit has an optional 20" high discharge plenum.



UNIT SIZE	A
6 THRU 10 TON	72"(1828.8)
15 TON	90"(2286.0)
20 & 25 TON	97"(2463.8)
30 TON	120"(3048.0)

B	C
8"(203) ±1"(25.4)	2.5" (63.5)
12"(305) ±1"(25.4)	6.5" (165)
18"(457) ±1"(25.4)	12.5 (317)
24"(610) ±1"(25.4)	18.5" (470)

NOTES
1. STAND
2. STEEL PIVOT BALL
3. ADJUSTING ROD
4. LOCK NUT (2 req.)
5. 3/4(19) #10X2.5(63) COUPLING NUT

DIMENSIONS IN PARENTHESES ARE IN MILLIMETERS

SETTING THE AIR COOLED CONDENSER

Rigging: Move the unit to the installation location using a crane or fork lift. Each fan section has heavy leg supports with lifting holes at the top. Do not lift with a choke sling around the unit. Spreader bars are recommended for lifting multiple fan units. Under no circumstances should the coil headers or piping be used for lifting the unit.

Leg Assembly: The legs must be unbolted from the shipping position and extended prior to placing the unit on it's pad. Each leg extends down approximately 18 inches and reattaches using same bolts.

LOCATING THE CONDENSER

The remote heat exchangers must be located in an area that will ensure free air flow into and out of the unit. The unit should not be placed closer than 36 inches from any wall or other obstruction. When two or more units are used in the same area, space them apart by a minimum of 48 inches.

Heat exchanger piping connections: Piping must be supported within 36 inches of the inlet and outlet connections.

The inlet connection is located on the top header on all units. The outlet connection is located on the bottom header of all unit.

INSTALLING THE CONTROL PANEL

Control Panel is shipped separately for field mounting in the control box. The control panel consists of:

1) Power Terminal Block
2) Low Voltage Interlock Terminal Block
3) Contactors
4) Control Transformer
5) Ambient Thermostats

Follow the following steps to install this Control Panel inside **this Control Box :**

1) Remove wires from the terminal block in the Control Box , tag them so they do not get mixed up.

2) Install the control panel with sheet metal screws.

3) Install wires from each conductor as shown on the diagram.

4) Attach the refrigerant fitting from the SCR controller to the factory installed schraeder fitting on the liquid lines. Exercise extreme care so the capillary line is not kinked.

5) Install the bulb(s) of the ambient stats on the side of the Air Cooled Condenser. Make sure to shield this bulb from direct sun light.

Standard Air cooled condenser is provided with Fan Speed control type low ambient control

FAN SPEED CONTROL

Fan speed control provides an infinite number of speed variations on specially designed permanent split-capacitor motors. Control varies the quantity of passing air through the air cooled condenser by directly sensing the refrigerant head pressure.

OPERATION

Fan Speed Control provides air delivery in direct proportion to heat rejection requirements of the system. This is to maintain optimum system capacities and pressures in widely varying operating ambient.

As the ambient temperature drops, the head pressure will also drop. As the head pressure drops, this will sensed by the pressure transducer and the air quantity will be reduced thereby raising the head pressure and maintaining the fixed condensing point.

FAN SPEED CONTROL PACKAGE MOUNTING

The Fan Speed Control is provided in a single enclosure package. This package contains thermostats and a FSC device. The thermostats switches the condenser fans off on a drop in ambient temperature. The Fan Speed Control device modulates the speed of the motor closest to the header end of the condenser.

The FSC package is to be mounted on the right hand side of the condenser facing the header end. The leads to the motors are brought out to junction box on the right hand side of the condenser facing the header end. The leads at this point should be connected to the proper components in the Pan Speed Control enclosure. (Check the electrical wiring diagram shipped with the Fan Speed Control enclosure). The thermostat's bulbs are to be mounted on the exterior of the box so that a representative ambient temperature is sensed by the bulbs.

FAN SPEED CONTROL REFRIGERANT CONNECTION

The Fan Speed Control requires that the capillary be connected to the hot gas header through the shraeder fitting provided.

Also enclosed in the Fan Speed Control package are thermostats for each condenser motor with the exception of the control motor. The thermostats should be set in accordance with wiring diagram provided with the unit.

NOTE: Fans are numbered starting at the header end of the condenser.

HEAD PRESSURE CONTROL **VALVE (OPTIONAL) Low ambient** Control Below **20°F**

This type of low ambient control includes head pressure control valves and the receiver package. **The receivers are installed in the air conditioner and the valves are shipped separately for field installation on the air** cooled **condenser.** Upon receipt of this package, these items should be checked against the packing list and stored inside the building until they are ready to be installed.

OPERATION OF HEAD PRESSURE CONTROL VALVE

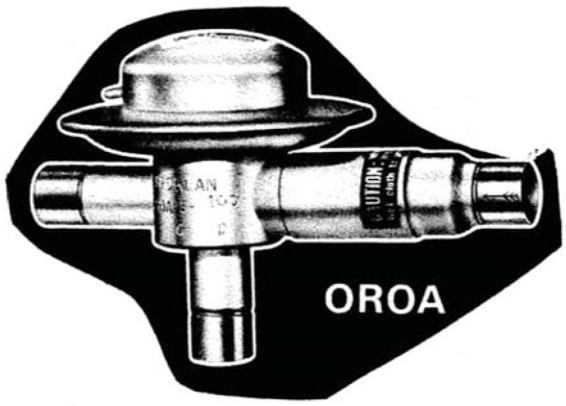
During periods of low ambient temperatures the condensing temperature falls until it approaches the setting of the head pressure control valve, which throttles towards a closed setting, thus restricting the flow of the liquid from the condenser. This causes the refrigerant to back up in the condenser and reduces the effective condenser surface. The check valve opens after the head pressure control has offered enough restriction and then causes the differential between the condensing pressure and the receiver pressure to exceed 20 psig. The hot gas flowing through the check valve serves to heat the cold liquid being passed by the limitizer valve. Thus, the liquid reaches the receiver warm and with sufficient pressure to assure proper expansion valve operation. The check valve and limitizer valves modulate the flow automatically to maintain proper condensing pressures.

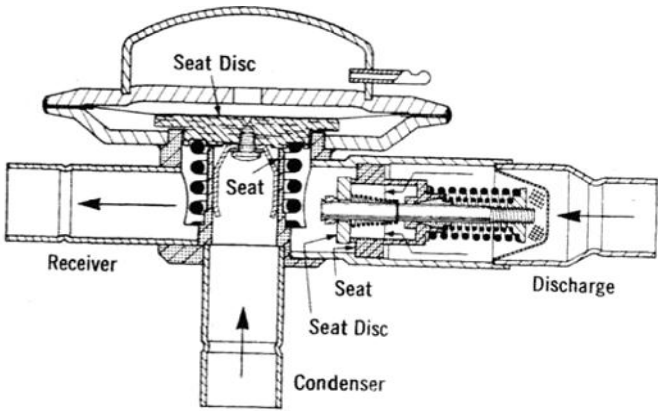
INSTALLATION OF HEAD PRESSURE CONTROL VALVE

There is one head pressure control valve on each of the limitizer system. These control valves, or limitizer valves as they are called, can be installed in a horizontal or a vertical line, whichever application permits easy adjustment and accessibility to either valves. Care should be taken to install the valves with the flow in the proper direction. **To insure fast system start-up, the receiver is mounted inside the air**

conditioner. A time delay relay is used to assist start-up in colder climate. It bypasses the low pressure control valve during start-up. It is important that head pressure control valve be protected by wrapping the valve with **a** wet cloth to keep the body of the valve at a temperature below 250 degrees F. It is important to keep the flame away from the valve body, to insure that no-body damage is done to the valve. The valve should not be subjected to pressures in excess of 250 psig during the leak testing procedures. The limitizer valves are factory set to maintain 180 psig. The HEAD PRESSURE CONTROL VALVES are hermetically sealed, therefore, when a valve comes inoperative, it must be replaced. There are two types of malfunctions that may occur. Failure to open or failure to close.

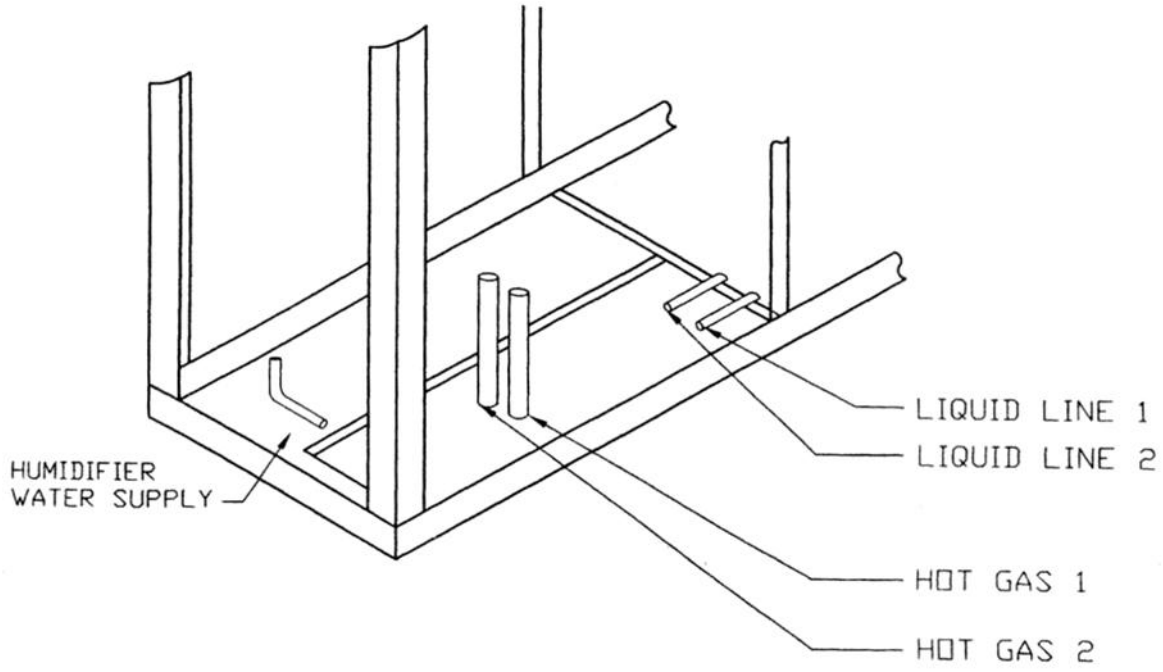
If particles of solder are in the system, they can restrict the orifice of the valve and cause the valve to malfunction. If this occurs, gently tap the valve, this will possibly allow the particles to flow through the valve. Since a synthetic material is used in the construction of the valve, damage to this will cause hot gas to leak constantly. If this occurs, the valve must be replaced.





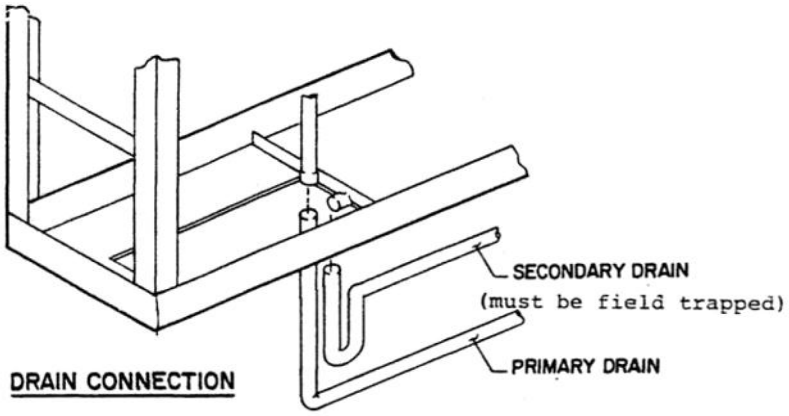
PIPING CONNECTIONS

All plumbing field piping is brought to the unit through the bottom from the left hand side of the unit as shown below:



CONDENSATE DRAIN CONNECTION

Two 3/4" copper stubs are provided on each unit for condensate removal. Primary drain is internally trapped, but the secondary drain must be field trapped. It is recommended that unions be installed in each line to permit ready disconnection from the unit for easy cleaning. Where local codes permit, PVC pipe may be used for drain lines. It is important that the drain line be installed with sufficient slope to permit easy draining. Drain lines should have a pitch away from the unit not less than 1/4" for each 10 feet of run. DO NOT REDUCE THE SIZE OF THE DRAIN LINE.



A secondary drain connection must be made to the bottom of the unit. The drain connection is 3/4" stub.

On some applications were a floor sink or other means of condensate disposal is not available, a condensate pump of adequate size should be used. There are several small pumps available, complete with built-in floats for automatic condensate removal. The correct choice of pump depends greatly on the pressure head(vertical riser) that must be overcome. In some instances, where the head is higher than pump head capacity, two pumps piped in series may be necessary.

A check valve must be **installed at the discharge side of all condensate pumps to** reduce **short cycling.**

NOTE: For units having an automatic flush cycle on the humidifier, a condensate pump with high temperature plastic sump tank should be used, due to the high temperature of the water being flushed. POWER SUPPLY FOR CONDENSATE PUMP SHOULD BE FROM A SEPARATE SOURCE, USUALLY 115 VOLT OUTLETS, AND MUST NOT IN ANY WAY BE CONNECTED WITH THE AIR CONDITIONING UNIT.

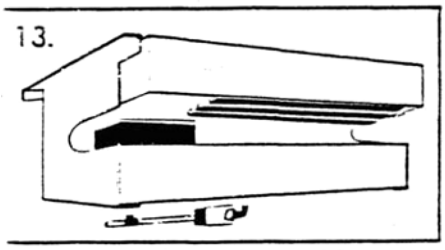
HUMIDIFIER PIPING CONNECTION

The standard humidifier supplied with Compu-Aire units is a disposable generator type humidifier. A 1/4" compression fitting is provided for the water supply, a 1/4" O.D. copper tubing should be used for make-up water.

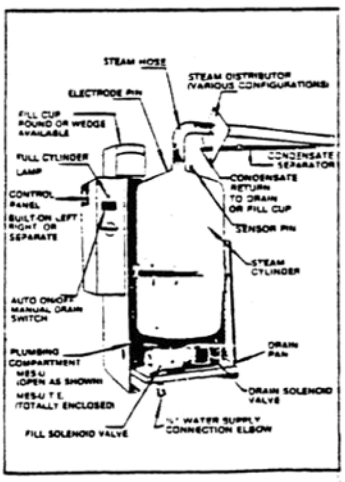
For the optional infra-red humidifier or the electric immersion, piping connections are identical to the standard humidifier. All require a 1/4" O.D. tubing.

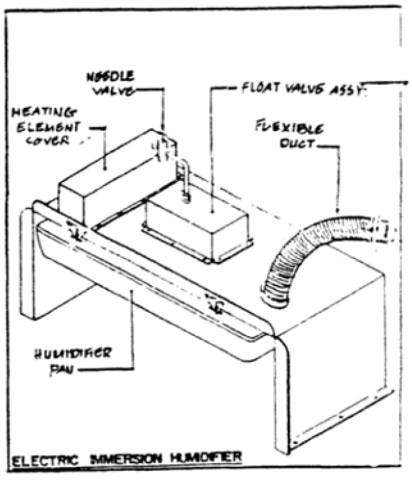
A water line shut off valve MUST be provided outside the air conditioner for future disconnection and service. In addition, an in line water pressure regulator and a strainer should be installed in the make-up water line. Water pressure should be set between 30 and 50 psig.

For infra-red and electric immersion the float is factory adjusted to maintain minimum water in the humidifier where the elements are just submersed in water. For field adjustment, loosen the float arm, or slightly bend the arm.



Infra-Red Humidifier





REFRIGERANT PIPING

It is of the greatest importance that all refrigerant piping be cleaned and free from dirt and moisture_ One drop of water in a refrigerant system will greatly deter the operation and efficiency of the system. Upon installation, all open ends of piping should be sealed to prevent condensation from accumulating inside. (If it is not to be completed during the day). This avoids future problems, malfunctions and corrosion.

It is suggested that hot gas and liquid return lines be silver soldered, using one of the many types, such as silfoss, etc. Absolutely avoid soft solders such as 50/50 or 95/5. Use a flow of dry nitrogen through the piping while being soldered. (To eliminate formation of a copper oxide scale on the inside of the piping).

To reduce noise and pulsations, the air cooled systems are to be field provided with hot gas mufflers. Extreme care and planning must be exercised in running the refrigerant lines; they must be provided with proper isolation by the use of an Arma-Glex or rubber bushing on the supports. Under no circumstances should hot gas lines be laid on steel ceilings, or metal supports without a type of isolation or protection from vibration, which can possibly cause damage to the refrigerant lines.

EVACUATION PROCEDURES-

CAUTION: PULL ALL FUSES EXCEPT MAIN FAN AND TRANSFORMER FUSES. To reduce the possibility of non-condensables in the refrigerant system during charging, the solenoid valves must be open and a vacuum must be pulled on both the suction side and the discharge side of the compressor.

PROCEDURE FOR DEHYDRATION - METHODS #1

1) Open all disconnect switches.
2) Pull all fuses except main fan and transformer fuses.
3) Turn disconnect ON
4) Start the main fan by pushing the main fan switch.
5) Check amperage on main fan and make sure it does not exceed FLA (full load amps).
6) Check fan rotation and correct if necessary.
7) Set thermostat at 40°F.
8) Proceed with paragraph #4 in procedure #2.

PROCEDURE FOR DEHYDRATION - METHOD #2

By using a separate control voltage transformer having an output of 24 volts at 40 VA, the solenoid can be energized without starting the unit.

1) Turn all power OFF to the unit.
2) Remove all fuses including main fan and transformer fuses.
3) Connect the external transformer to the solenoid valves.
4) Evacuate the system in accordance with the following procedure:

Connect the refrigeration gauges on circuits #1 & #2 at both the suction and discharge service valves.

Start with circuit #1 and open all service valves. Place in circuit #1, 150 psig of DRY NITROGEN with a tracer of freon for the purpose of leak checking. With pressure in circuit #1, open the discharge and suction valve on compressor #2. It pressure increases in #2, the system is cross circuited and must be re-checked for proper piping_ If there is no pressure increase, place 150 psig of DRY NITROGEN with a tracer of freon in circuit #2 and leak test.

After completion of leak testing, release test pressure & pull a vacuum on the system. Leave this pulled down for approximately 4 hours and re-check the gauge reading. If it has not changed purge with Freon, pull another vacuum of 250 microns, leave on for 2 hours and re-check the gauge readings. Purge with Freon and re-pull the vacuum of 250 microns (9.842 in. hg.) or less. After the completion of this step, fill the system with Freon vapor until pressures have equalized in the liquid and discharge lines.

CHARGING PROCEDURE

Remove the reheat and humidifier fuses. Check to insure that all shipping blocks from the compressors, all tags from the electrical panel, and all tags in the evaporator fan section have been removed, and that all debris is clear of the unit so that nothing can be damaged during start-up_

Turn the disconnect "ON" and check the evaporator fan for proper rotation.

Set the thermostat to 40°F to insure that the solenoid valves are open during the charging procedure. Connect the refrigerant gauges to the refrigerant drum purging the hoses to remove non-condensable.

Add refrigerant vapor to the suction side of the compressor to eliminate short cycling of the compressor. The low pressure switch can be manually energized to expedite the charging.

As the system builds head pressure, the condenser fan will start rotating slowly. The Fan Speed Control motor will not be energized until a sufficient head pressure has been developed during the charging of the unit.

Charge the unit until the sight glasses on the liquid lines in the compressor section clear_ Watch the sight glasses for a period of 10 minutes to insure that no bubbles re-appear.

A. LIQUID CHARGE

After the final vacuum has been pulled on the systems, liquid refrigerant may be placed in the receivers. This is accomplished by the following procedure:

1) Make sure the unit is off and that the solenoids are closed.
2) Connect a set of manifold gauges to the refrigerant drum and to the receiver at the rotolock adapter.
3) Purge the refrigerant hoses so that no non-condensable will enter the systems.
4) Open the refrigerant drum so that the liquid will flow from the drum to receiver.
5) Open the roto-lock valve and allow the refrigerant to flow into the receiver.
6) Close the roto lock valve and disconnect gauges.
7) Start the compressor.

B. VAPOR CHARGE

1) After the dehydration procedures have been followed, replace the fuses in the condenser fan compressors and transformer circuits.
2) Connect hose from drum to suction port of the compressor, purge hose so that no non-condensable are in the hose.
3) Start the compressors check the level in the sight glass. If the level has lowered, add additional Freon to maintain the sight clear.

After charging is complete, reset the high pressure switch.

Approximate charge required per circuit:
As recommended by ASHRAE MANUAL.

Total Charge = Basic Charge Liquid Line Based on Hermetic Compressor Line and Refrigerated Liquid at 100°F.

LEAK TESTING

No installation is complete until the entire system has been thoroughly checked for leaks. This includes water tubing, humidifier make-up water, and condensate lines.

HOW TO SAVE REFRIGERANT CHARGE

The process of opening a refrigerant circuit of the Compu-Aire System 2100 and saving the refrigerant charge of the system to be opened, requires only a few more minutes than does blowing the refrigerant charge. **Intentionally blowing the charge is illegal.**

The procedure for saving the refrigerant charge. is as follows:

1) Open disconnect switch.
2) Pull fuses on system not to be opened.
3) Install manifold on the receiver at each rotolock valve, using the high pressure gauge and the charging hose.
4) Purge the hoses to remove any con-condensable.
5) Start the unit and set the thermostat at 40 degrees F; this will start the compressor.
6) Return to the receivers.
7) Backseat the rotolock valves on the system being pumped down. Open gauge and rotolock valve on the other system.
8) During this procedure, watch the gauge pressure to prevent the receiver from over-filling. If the gauge pressure starts to rise, do not let the pressure exceed setting on pressure relief device located on the receiver.
9) Open the rotolock valve of the system, release vapor pressure present and make necessary repairs.
10) Evacuate the system. After evacuation is complete, the liquid can be transferred back into the proper system, through the manifold gauge.

HUMIDIFIER

The Compu-Aire Humidifier provides the proper amount of humidification needed through electronic sensing of computer rooms air moisture content. The humidifier itself is constructed with a disposable cylinder.

Before starting the unit, be sure that the water supply valve is in the open position and there is water in the humidifier cylinder. Periodic checks are required to insure against built up deposits. The frequency of these checks depends on the hardness of the water. Under normal conditions these checks should be made at least every fourth week. An automatic flush system is standard to eliminate the need for periodic replacement of the humidifier cylinder.

It is important that the humidifier be kept clean for proper operation. This will provide a long life and efficient operation of the humidifier.

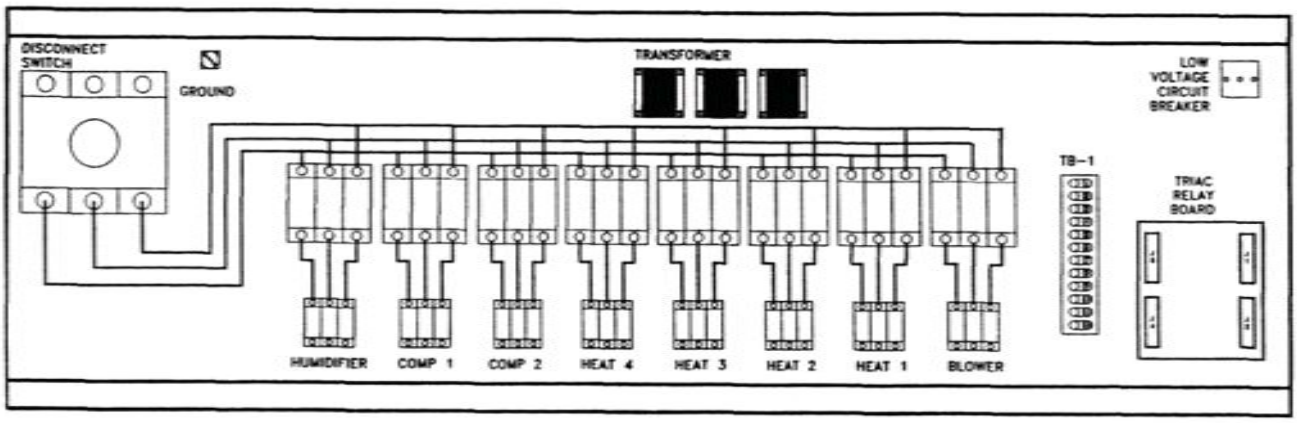
HUMIDITY CONTROL

This control is pre-set at the factory for 45% and no adjustment should be necessary, however field adjustment can be made. Refer to the humidifier section for further details.

ELECTRICAL CONNECTION

The unit is completely factory wired with self-contained controls.

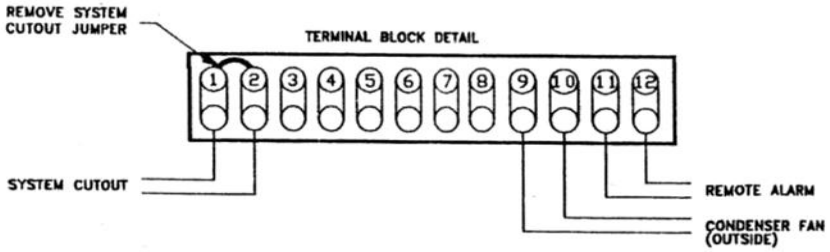
IMPORTANT - Before proceeding with the electrical connections, make certain that the volts, hertz and phase correspond to that specified on the unit rating plate. Also, check to be sure that service provided by the utility is sufficient to handle the additional load imposed by this equipment. Refer to the unit rating plate for equipment electrical requirements. The attached wiring diagram shows the proper high and low voltage field wiring.



Make all electrical connections in accordance with National Electrical Code and any local code ordinances that may apply. USE COPPER CONDUCTORS ONLY.

WARNING -- The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. It is important that an electrical ground wire of adequate size can be connected to the ground lug provided inside the control box.

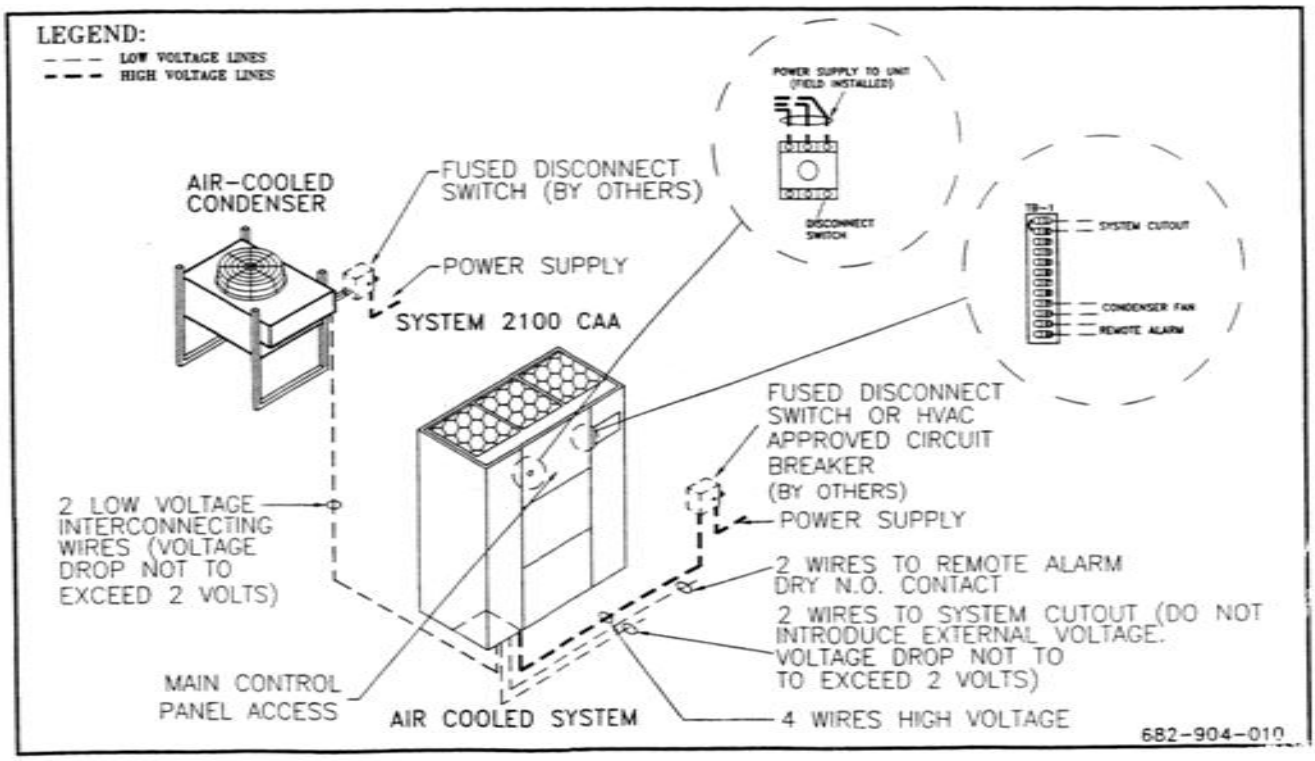
Supply voltage at the unit must be within + 10% of the voltage indicated on the nameplate for a dual voltage rating, supply voltage must be within 5% from the lower nameplate rating and within 10% from the higher rating. Phase to phase imbalance must not exceed 3%. Contact your local utility company for correction of improper line voltage. Improper electrical power supply may cause premature failures and void unit warranties.



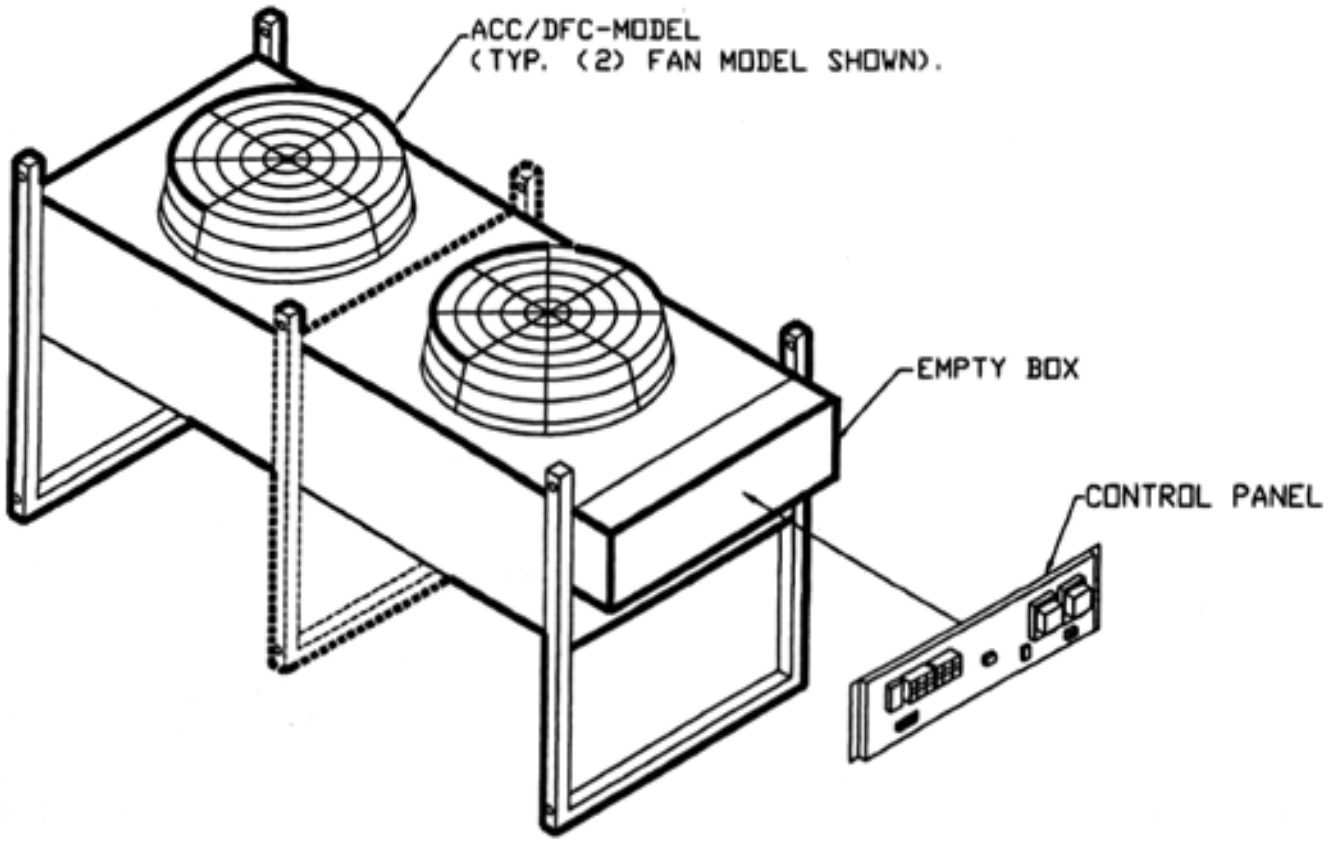
The system cutout terminals on the terminal strip are for connection to a "panic button" or remote shut-off if required. This should only be connected to a switch and NO EXTERNAL SOURCE OF POWER SHOULD BE INTRODUCED AT THIS POINT. The conductors should be sized depending on the length of run and the number of control transformers used in the unit. **Maximum voltage drop must not exceed 1 volt.** Each control **transformer** draws approximately 3 amps @ 24 V. For long runs where the conductor size becomes too large, an interlocking relay (field provided) should be used.

A **dry contact (24 volts rating) is provided for terminals for a remote alarm connection.**

If the control panel includes a condensate probe, make sure it is mounted below the unit against the floor area where water may collect. To check the operation of the probe, submerse it in a cup of water. The condensate alarm should energize.



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	NEW RELEASE	11/03/99	BF



INSTRUCTIONS:

(1) INSTALL THE CONTROL PANEL WITH SHEET METAL SCREWS INSIDE THE BOX ON SIDE AS SHOWN.

(2) CONNECT WIRES TO THE CONTROL PANEL AS PER THE INSTRUCTION ON THE WIRING DIA.

(3) INSTALL THE BULB(S) OF THE AMBIENT STAT(S) ON THE SIDE OF CONDENSER/DRYFLUID COOLER. MAKE SURE TO SHIELD THE BULB(S) FROM DIRECT SUNLIGHT.

COMPU-AIRE,inc.	
CONDENSER/DRY FLUID COOLER CONTROL PANEL	
DRAWN BY BJ/UNDERWHITE	DATE 11/03/99
APPROVED BY Heetae	REVISED
JOB NO.	DWG NO. 720-900-005

START-UP AND TEST PROCEDURE

A) With All Power to Unit OFF - Check that All **Wiring is Correct**

Check that properly sized fuses are installed in the disconnect switch. Correct fuse size and minimum circuit ampacity are listed on the unit nameplate. Now, check the wiring connections in the Main Control Panel to see if they are tight. It is best that this be checked prior to operating the machine. After checking, close the Main Control Panel cover and proceed as follows:

Solid-State Control Panel - With the system switch in the "OFF" position, apply power to the unit. The "Power On" light should illuminate.

B)Check for Correct Phasing

The equipment should now be checked for correct phasing required to make the blower motor turn in the correct directions. For this test it is necessary to open the front access panel or the right side doors of the unit to observe the blower and blower motor. Now, momentarily switch the system switch to the "ON" position and then back to "OFF". The blower motor will have started and it is therefore possible to determine rotation. On Compu-Aire units, the blower should be rotating in a CLOCKWISE direction in downflow units and COUNTER CLOCKWISE in upflow units, looking in the right side of the unit. Heaters and humidifiers are not affected by phasing.

C)Blower Speed Adjustment

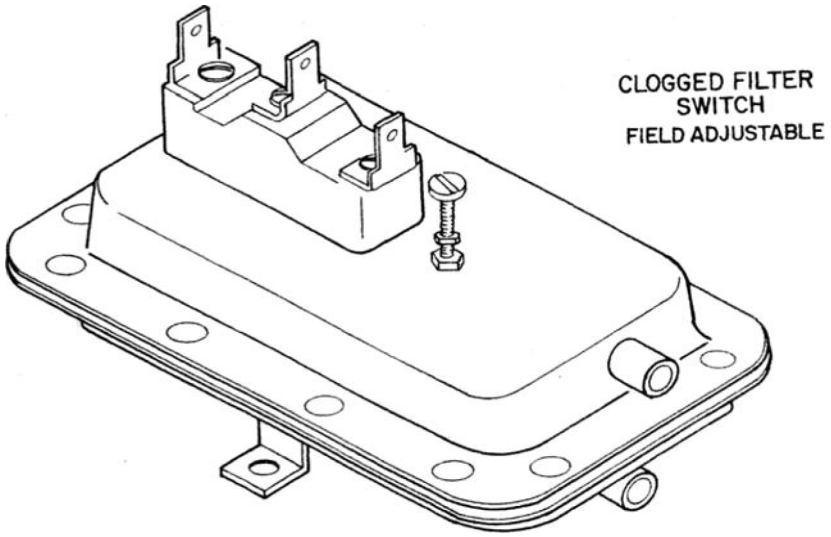
Adjustment of the air flow may be desired. The air flow can be readily adjusted with the variable pitch pulley provided on the blower motor. After the unit has been started and the air flow properly adjusted, check the blower motor current to ensure that the motor is not overloaded. Any time the blower speed is increased, the blower motor current should be checked. If a field adjustment is made, the motor should run for at least one hour at maximum design room temperature to see if motor trips on internal overload.

D)No Air Flow & Clogged Filter Adjustment

The "No Air Flow" light and alarm should be checked prior to the completion of the installation. Although the control is adjusted at the factory, varying local conditions make it impossible to provide accurate pressure adjustments.

To check the filter pressure switch, let the unit operate on cooling for about 30 minutes. This will allow the evaporator

Coil surface to become wet. With the cooling unit filters in place, block off approximately 75% of the air intake. If the sensing device is correctly adjusted, the "Clogged Filter" alarm should energize; the sensing device should have JUST turned on the alarm at the 75% blocked inlet condition. An Air Flow switch is also provided at the discharge side of the blower and will activate the No Air Flow malfunction light and alarm.



E) Humidifier Operation

Check to see that the unit is securely mounted on a level surface with the proper drain and water supply. Check for correct voltage with appropriately sized service. Check that the steam distributor, steam supply hose and condensate line are correctly installed and routed back to the unit. Ensure that the external control humidistat is located in an area to properly sense the relative humidity to be maintained by the humidifier, and that the inter-connecting low voltage wires between the humidistat and unit's control terminal strip are in accordance with the wiring diagram.

Check all electrical connections for wires which may have been become loose in shipping. Components burnt due to lose connection are NOT under warranty.

Check electrode plugs to ensure they are pressed firmly onto the electrode pins. Important: Loose connections will cause overheating of the cylinder plugs and probably melting of the plugs and/or cylinder.

Open the isolating gate valve in the feed water line to the unit.

Make sure the humidistat is set high enough to call for humidification.

Turn on the main disconnects in the primary service feeding the unit and check that unit has power at the primary terminal block.

Water will start to enter the cylinder through its bottom port and rise in the cylinder to a point determined by the solid state control circuitry.

It is not unusual upon initial start-up for the water to fill the cylinder an cycle on the red high water level indicator light.

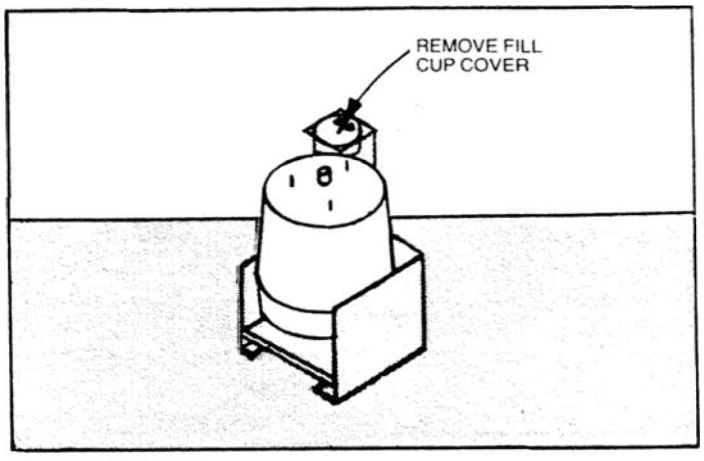
The red light simply acts as a safety to shut off the fill valve and prevent over fitting. With the red light on, the water in the cylinder will continue to heat an after a few minutes start to boil. After the boiling action of the water has lowered the water level go out and fill solenoid will again open until the cylinder is again full.

This cycling of the red light and fill valve will continue until the unit's full output capacity is reached after which the water level will automatically lower itself in the cylinder. (The increased concentration allows for lower electrode coverage while maintaining the same output). When a stabilized condition is reached the waster will be boiling close to the cylinder seam level. The solid state circuitry will maintain the proper concentration in the cylinder by introducing short drains only when necessary.

If the cylinder is manually drained, the above process will repeat itself.

LOW WATER CONDUCTIVITY

Should normalization of the unit be required immediately after start-up, the installer may speed up the process by artificially increasing water conductivity. The installer should dissolve half a teaspoon of table salt(no more) in a cup of water and add it to the cylinder by means of the fill cup attached to the plumbing section, during a fill cycle.

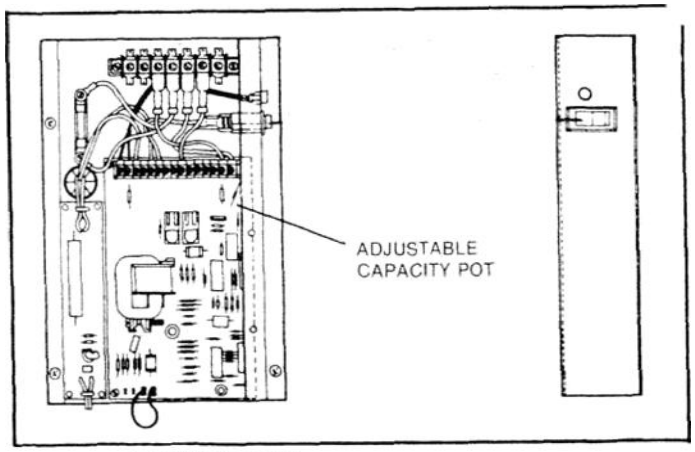


FILL CUP

To obtain access to this fill cup simply pry open the fill cup cover plate. (Do not displace the splash diverter underneath). Excessive amounts of salt will result in erratic operation of the unit; however, normalization of the unit will be corrected automatically through the solid state control sequence.

CAPACITY ADJUSTMENT

The M.E.S. series of humidifiers are factory set to cover most normal conditions. If an extreme situation is encountered notify the factory for instructions.



ADJUSTABLE POT

SYSTEM 2200 PROGRAMMABLE CONTROLLER:

The System 2200 is a programmable solid state control with 4 Row, 40 Character, back lit, super-twist Liquid Crystal Display (LCD). Information is displayed and presented in a format that is viewed and understood.

For detail operational instructions see:

Compu-Aire
System 2200
Programmable Controller
User Guide

SERVICE AND MAINTENANCE INSTRUCTIONS

A. Filters

1) The filters should be checked and changed periodically. When they become dirty, an alarm is activated by the filter pressure switch. If the filters are dirty, they must be changed for efficient operation of your system. To check the alarm indicator, cover approximately 75% of the return air opening; the alarm should energize.

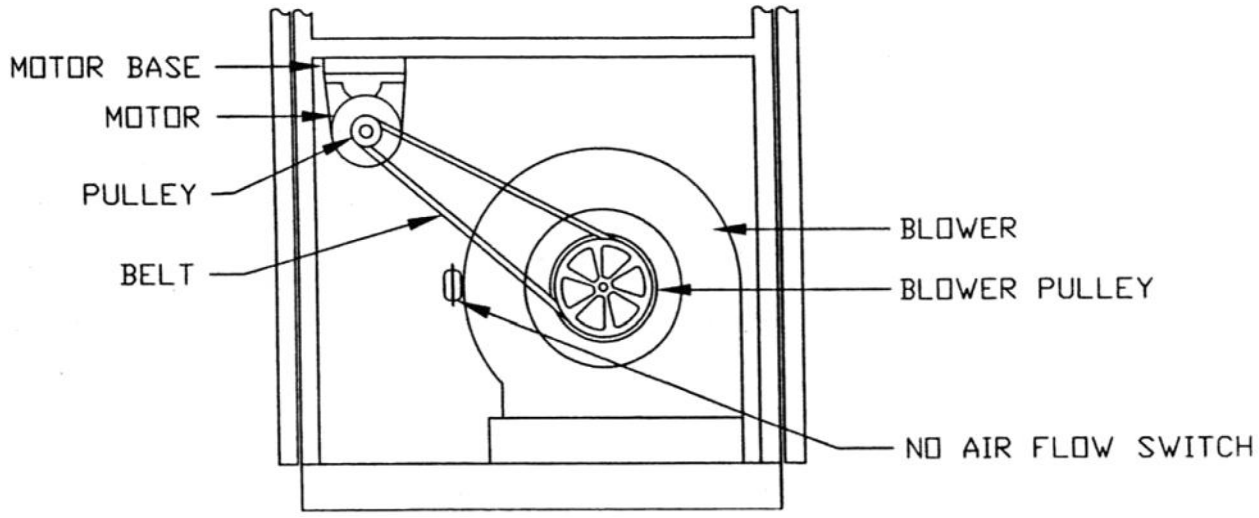
   If the alarm energizes prematurely or does not energize when it should, adjust the filter switch. All doors to machine should remain closed before determining whether an adjustment is necessary.

2) Spare filters should be kept in stock. Filters should be checked monthly and replaced if necessary.

B. BLOWER DRIVE

Easy access can be made to the drive set by opening the front right door. This gives a full view of the motor and the drive set.

Belt tension should be checked every month to assure proper, efficient operation. If tightening is needed, slightly loosen the four motor mounting bolts. Then turn the adjusting screw (located in the front of the motor mounting channel), until the belt is properly adjusted. RE-TIGHTEN THE FOUR MOUNTING BOLTS.

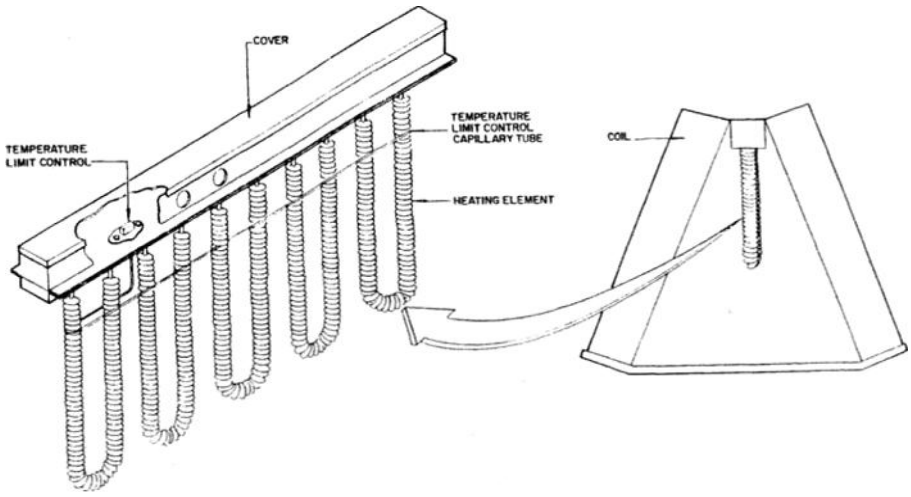


C. BLOWER BEARINGS

Blower bearings are permanently lubricated and do not require any maintenance. However, in special cases, some units have bearings that require lubrication at least every six months.

D. HEATING ELEMENTS

The heating elements are finned **type**, and there is no maintenance required. Access to the heater box can be obtained from the right hand side of the unit.



E. HUMIDIFIER

Four kinds of humidifiers are used in Compu-Aire Units: Electric Immersion, Infra-Red, Dry Steam, and Replaceable Generator.

1. ELECTRIC IMMERSION

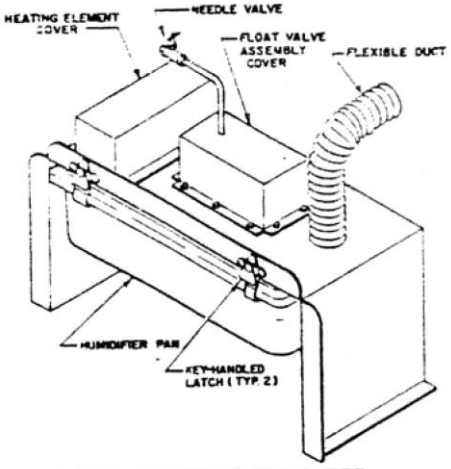
This type humidifier will probably require the most maintenance. If is necessary to thoroughly clean out the humidifier pan at regular intervals. The frequency tor this depends entirely on the nature of the water used, and the frequency at which the humidifier is called into operation. To begin with, it is recommended that the humidifier be checked every two weeks. When excessive scale has formed in the lower pan and on the heating elements, it will be necessary to thoroughly clean this pan.

To inspect the humidifier, de-energizes the power to the unit at the disconnect switch. Open the left front access door. The humidifier is now fully exposed. Visually inspect the pan and the heating elements.

If cleaning of the humidifier is required, shut off the water supply at the valve located on the side of humidifier assembly. Disconnect the humidifier electrical plug, release the front pan latch, disconnect the auto flush hose(if used) and overflow drain connections. Remove the whole humidifier assembly to a nearby sink for thorough cleaning.

To remove the scale, sulfamic acid scale remover is recommended (check with your local supply house). Flush out all free scale, then add scale remover as noted by the manufacturer of the scale remover to the humidifier pan filled with water. Empty the pan and rinse. If necessary, repeat the de-scaling procedure until the pan is clean. NOTE: DO NOT EMPTY THE RESIDUE FROM EITHER OF THESE OPERATIONS INTO THE UNIT DRAIN SYSTEM. After cleaning, re-install the humidifier. Check to ensure that the drain valve is shut, push the humidifier assembly back into place firmly, engage the latch, re-connect the electrical plug and piping hoses, then open the water supply valve.

If the humidifier is equipped with automatic flush cycle, draining the humidifier can be accomplished by moving the lever on the flush valve to the manual position. Make sure that the lever is returned to the auto position when the cleaning operation is completed.



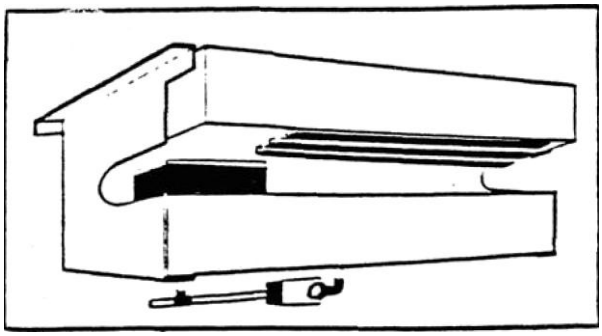
ELECTRIC IMMERSION HUMIDIFIER

2. **INFRA-RED HUMIDIFIER**

The inspection procedure for the infra-red humidifier is the same as for the Electric Immersion type described below. If cleaning is required, remove the humidifier assembly to a nearby sink for cleaning.

Clean the pan using the method described in I below, again, using care not to allow scale to clog the drain in the pan or the unit. Carefully clean the reflector and lamps of any scale

or deposits. BEFORE REPLACING THE LAMPS, WIPE OFF ALL GREASE, OIL, ETC. WITH A CLEAN DRY CLOTH. ANY GREASE OR OIL MAY CAUSE A HOT SPOT AND LAMP FAILURE. REMEMBER LAMPS ARE NOT COVERED IN THE UNIT WARRANTY.



Infra-Red Humidifier

3. **DRY STEAM**

When units are equipped with dry steam type humidifiers, the necessary steam connections are made through additional connections.

a) The operation of a steam humidifier is explained below:
1) The steam supply is taken from the top of the steam main.

2) Steam passes through a strainer to prevent dirt or scale from reaching the humidifier.
3) Incoming steam strikes a baffle to divert any condensate to the drain.
4) Steam fills the body and cap castings. Casting temperature will approximate the steam temperature (approximately 240°F at 10 psig), preventing condensation and dripping at the outlet when the steam passes through at atmospheric pressure.

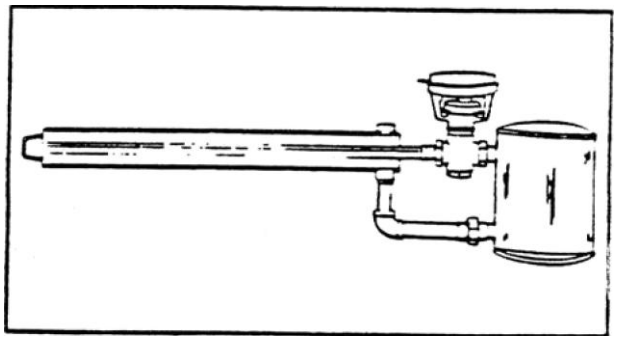
5) The humidistat actuates the operator to open the valve for humidity.

6) Steam enters the re-evaporating chamber through a tube. Any condensate droplets will fall and evaporate on contact with hot metal.
7) Dry steam passes up and out through muffling asbestos wicking on stainless steel.
8) The steam is discharged directly in the unit.

b. Maintenance of a dry steam humidifier is as follows:

1) Clean the strainer in the supply a few days after operation, and thereafter at least twice a year or as required.

2) If the solenoid valve should stick, touch up the plunge with fine emery cloth and wipe out the plunger tube.



Steam Humidifier

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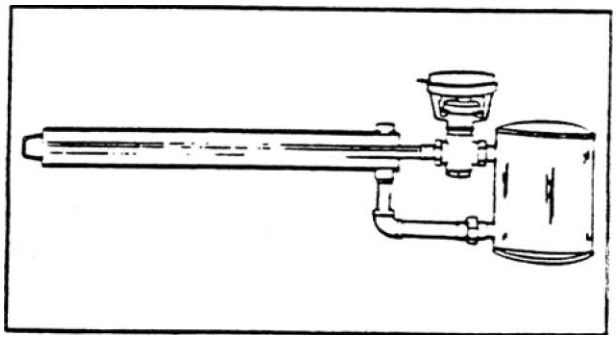


Steam Humidifier

If the water reaches top of cylinder before 110% F.L.A. the fill valve shuts off via the sensor and fill-boil-fill-boil cycle continues, cycling off the red full cylinder light until the concentration becomes high enough to reach 100% F.L.A. Then the following described control process takes over.

WATER SUPPLY AND PLUMBING

1) The orifice in the fill valve(s) is sized for an extended water pressure range of 30 to 85 psi.

2) For water pressure between 15 and 30 psi, notify the factory and the next larger size of fill valve will be supplied.

3) For cases below 15 psi, notify the factory and fill valve with largely oversized orifice will be supplied.

4) For cases above 85 psi, install a pressure reducing valve in the water feed line to the unit. Otherwise insufficient cylinder water will drain when fill and drain mix during the automatic dilution cycle.

5) With extremely dirty or muddy water sources, e.g. some well sources, ensure proper filtration by adding and external filter to the water line entering the unit. (Consult factory for accessories such as filters).

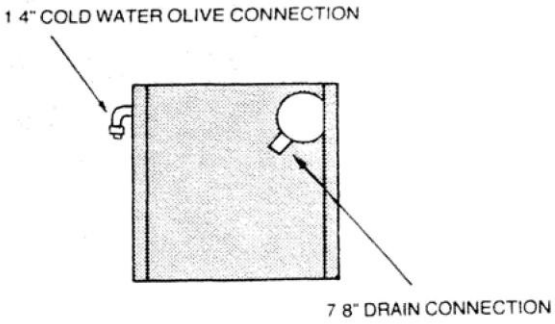
6) DO NOT soften water with Condair unit because it is much too conductive.

7) DO NOT *use* completely de-mineralized water with the Condair unit as it is the minerals that allow the electrode principle to work.

8) DO NOT use a hot water source as it will cause deposits to eventually block the fill valve orifice.

Water Connection

1) A copper compression olive type coupling for 1/4" soft copper tubing is provided with unit and requires no soldering for the water connection to the unit.



2) An isolating gate valve should ALWAYS be placed in feed water line allowing service of the fill valve.

3) Each unit is fitted with a fill solenoid valve located on the base drain pan. Flow orifices ar designed for water pressures from 30-85 psi and are protected by the built-in strainer.

4) For inlet water pressure outside this range, the factory should be contacted. (See also water supply section)

The Inlet Water Strainer

The fill solenoid is equipped with a built-in serviceable strainer to prevent foreign particles, such as sand or solder from blocking the fill orifice.

1) To clean the strainer, first turn off the unit, close the gate valve on the water supply line, remove the locking bar located in the fill solenoid and slide out the strainer.

2) Rinse the strainer and back flush it thoroughly with tap water to ensure the removal of all debris.

3) To re-install strainer, reverse procedure.

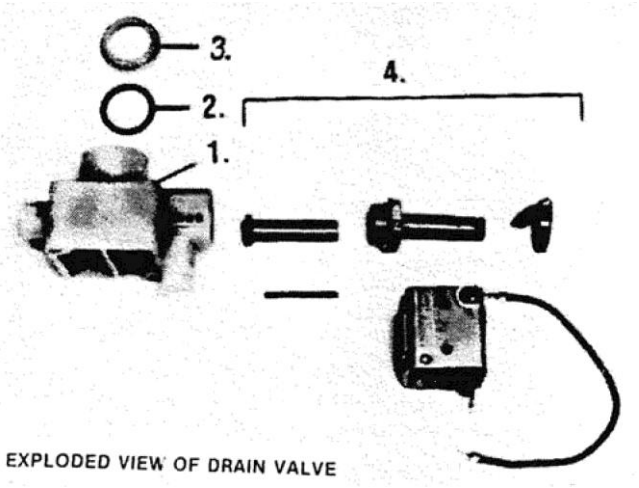
STRAINER

Drain Connection

1) Unit is equipped with a 7/8" O.D. unthreaded drain outlet on the underside of the base drain pan. Cut a few inches of steam supply hose, available from the factory, and connect from drain outlet to 3/4" nominal diameter copper pipe and route to closest (floor) drain.

2) Where municipalities, counties or cities require an air gap to isolate unit from sanitary drainage system, a funnel drain under the unit should be incorporated.

3) Drain canal on bottom of unit must be removed and cleaned at least once a year. Ensure that rubber gasket is re-installed properly.



EXPLODED VIEW OF DRAIN VALVE

ITEM NO.	DESCRIPTION	NORTEC P/N
1	VALVE BODY (Small)	132-4042
1	VALVE BODY (Large)	132-4041
2	O-RING	132-5014
3	STUFFING BLOCK	132-1042
4	COIL ASSEMBLY COMPLETE	132-6002

4) Drain valve must be disassembled and cleaned each time a cylinder is replaced. (These three components, i.e. drain canal, drain valve and cylinder are continually exposed to concentrated mineral water.

REPLACEMENT OF THE STEAM CYLINDER

Consult factory or agent for replacement. Quote the cylinder model form the white 3-digit label on the cylinder or quote model, voltage and serial number from unit specification label.

After an extended period of operation in accordance with life expectancy information, see Figure 24, the cylinder is completely used as indicated by a red light illuminated on the face of the cabinet. When this condition is reached, a new replacement cylinder is to be installed.

NOTE: Red light may come on during initial start-up but does not mean cylinder replacement.

Any time that the unit is going to be shut down for an extended period of time, including summer shutdown, ALWAYS drain down the cylinder before disconnecting power. Otherwise, the electrodes are subject to harmful corrosion.

REMOVING THE CYLINDER

1) Turn off the water supply to the unit.

2) The old cylinder must be drained completely before removing. This is done by pushing the auto on/off drain switch to the "drain" position,

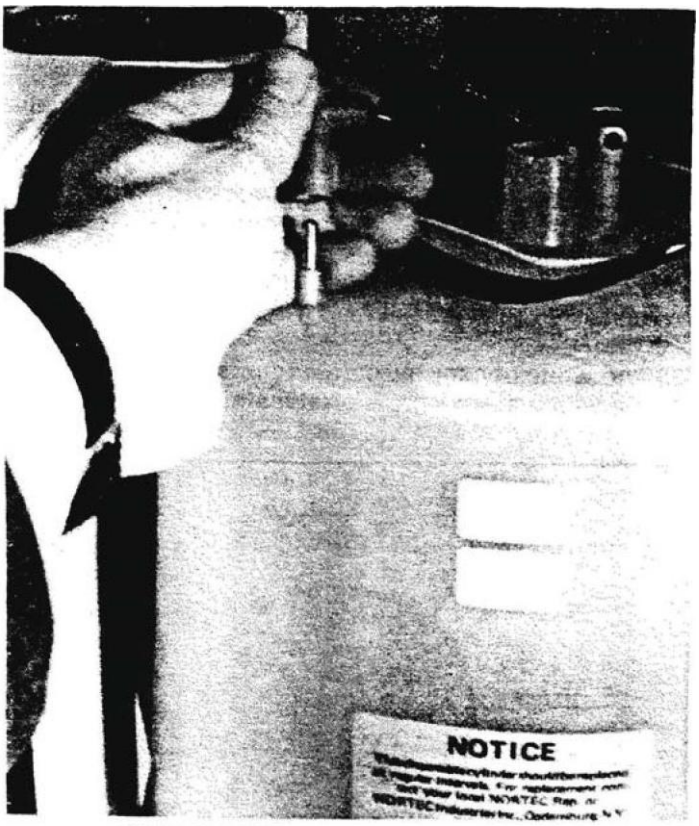
3) When completely drained, push the auto/on/off drain switch to the "off" position.

4) Open the main disconnect during the entire cylinder change operation.

5) The power wires to the cylinder are attached by cylinder plugs to the electrode pins on top of the cylinder. Pull these plugs vertically off the pins.

6) Using slot screw driver, loosen the steam hose clamp(s) and pull steam hose off vertically.

7) The cylinder is' now ready to be lifted out of the unit.



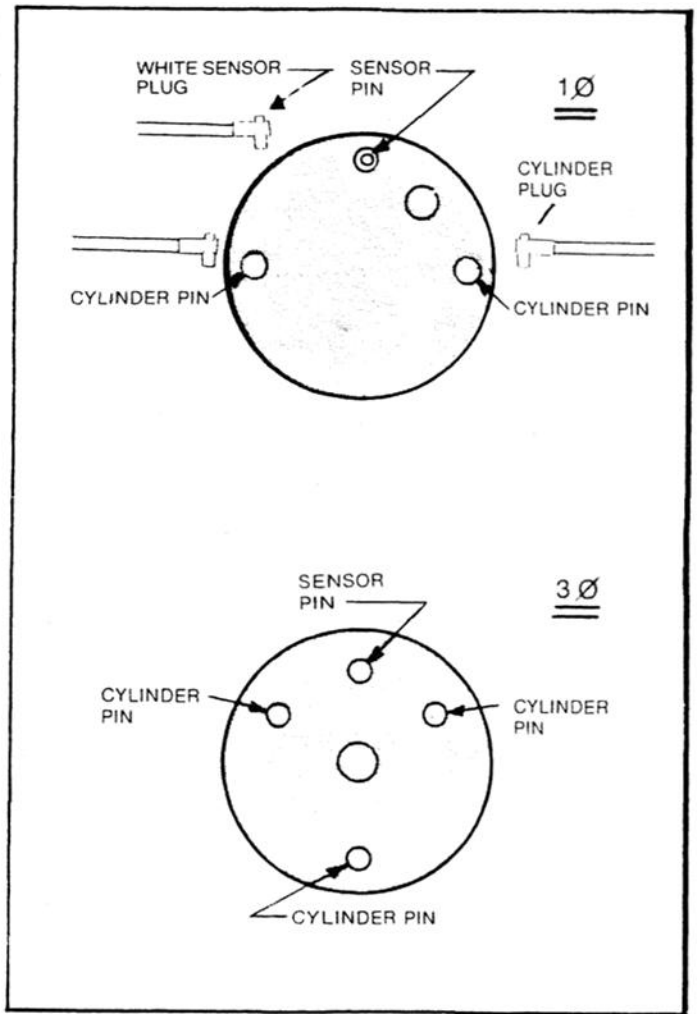
CYLINDER REMOVAL

INSTALLING THE NEW CYLINDER

1) The reverse procedure should be followed to install a new cylinder. The main disconnect is to be left open until the cylinder is completely installed an reconnected.

2) Ensure that the cylinder mounting stubs are seated properly in the allotted side mounting slots within the unit.

3) The white cylinder plug on all units is for the sensor electrode which always goes on the single pin offset from the others.



NAJGS

4) Ensure that cylinder plugs are very snug on the pins.

5) For loose fitting plugs, squeeze with a pliers before installing, since loose plugs may generate enough heat to melt and destroy the plug and cylinder.

TROUBLE-SHOOTING HUMIDIFIER

Auto on/off/drain switch **in "on" position-unit will** not **fill:**

When the on/off control circuit is made and the "auto on/off/drain" switch is pushed to "on", the 24 volt holding coil of the primary contactor should energize. The resulting magnetic pull closes the high voltage contacts with a distinct and audible "clunk". If the contactor will not make, then inspect the following while referring to the wiring diagram.

1) Check for 24VAC across pins 33 and 39.
2) Jumper contacts 1 & 2 on external control terminal strip. If contactor operates then control system is at fault.
3) The low voltage 3 amp fuse located on front of the unit.
4) The "on/off" jumper plug connection on the basic unit.
5) The wire ribbon connecting the basic unit to the current transformer board.
6) The contactor holding coil could be open of shorted.

Recheck that the "auto/on/off drain" switch is still at "on". if it is, then shut off the main disconnect and check fuses or breaker of the main disconnect. If they are serviceable, turn power back on.

To test for a defective "auto/on/off drain" switch, disconnect the red wire from pin 38 on the main p.c. board (basic unit) and touch it to pin 39. If the contactor activates, the "on" side of the switch is defective. If the contactor does not activate, then the basic unit p.c. board could be defective.

If the 3 amp control fuses blow when the red wire form pin 38 is touched to pin 39, contactor holding coil could be shorted. After contactor has been replaced and contactor still will not activate then the basic unit "on/off" jumper circuit could be burnt. This can be temporarily bypassed by placing a jumper between terminals 35 and 39 until replacement of the basic unit. Return the red wire to pin 38.

After the necessary components have been replaced and the contactors pull in, there is high voltage to the cylinder(s) and the control sequence can begin.

Approximately 30 seconds after the contactor pulls in, the fill valve coil should energize. There is also a visible fill relay on the basic printed circuit board. It is physically located in line with pin 36. The points on this relay must be touching in order for the fill valve could be energized.

If the points will not touch after the built-in time delay, then the sensor input may be interfering. To confirm, remove the red and black wire sensor input from the male connector on the basic p.c.

board. (It is located 1/2" from the right hand side of the board.) wait 30 seconds and if the fill relay point now touch, then sensor should be replaced. If they do not touch, then the basic p.c. board could be faulty. To confirm, disconnect the red wire from pin 38 and touch it to pin 36. If the fill valve coil activates then the basic p.c. board should be replaced. If it still does not activate then the fill valve coil should be replaced.

Having changed the necessary components, water starts filling the cylinder and begins to submerge the electrodes. Because of the high voltage across the electrodes, the water can now conduct electricity.

red Light on- Water at top of cylinder:

- Common occurrence on start-up - See previous pages
- water level should be at the top of the cylinder - if cylinder is new this is normal
- if cylinder is old, it indicates replacement time (can be ordered from factory

red light on - water NOT **at top** of **cylinder:**

- water foaming to top of cylinder to activate red light, also may be accompanied by arcing (flashing) inside cylinder
- indicates abnormal water condition(softened) or over concentration of contained water in the cylinder caused by:

1) Blocked water filter(clean)
2) Inoperative fill valve(check)
3) Inoperative drain valve(check)
4) Blocked drain valve(disassemble and clean)
5) Blocked screen at bottom of cylinder(remove and back flush)
6) Faulty sensor really (remove sensor concentration from p.c. board and wait 60 seconds)
7) White sensor plug interchanged with power plug at top of cylinder (white plug should be on terminal offset from the others).

Water remains at high level and won't concentrate:

- Normal on cold start-up can be accelerated by adding maximum 1 tsp. of salt to the cylinder (thorough the plastic fill cup on fill cycle. See page 9).
- If the unit has been operating extensively, observe for normal fill, boil, fill, boil, cycle; no drain should be occurring.

Water beyond top of cylinder up into spout:

- red light not on and fill still activated; jump across connection of sensor on basic unit p.c. board, if fill shuts off, then sensor was faulty.
- If fill remains on when connection is jumped, then basic unit is faulty.
- Consult factory for new part and replacement instructions.

Unit drains continually:

- if cylinder almost empty check for magnetic pull on drain solenoid indicating miss-wiring. If no pull drain actuator is blocked open, remove, disassemble and clean.
- if drain is occurring thorough activated drain valve, valve id miss-wired or electronics is faulty-consult factory.
- if drain is occurring through the overflow on the fill cup, this is due to an abnormal restriction on the steam line and back pressure forces water out of the cylinder; therefore water cannot concentrate and level must stay high; review installation of steam line to ensure no blockages or excessive static pressure in air system.

To make service simpler and to check on its normal electronic functions, an optional solid state plug-in check adapter is available from the factory at cost by ordering BMF-9513.

F. Refrigeration Cycle

1) All systems, except CAA models are factory charged with a holding charge. After checking system at start-up against possible shipping and rigging damage, no irregularities should be experienced except for normal wear.

2) The system should be checked periodically for leaks, oil charge and dryness of Freon. Bubbles in the sight glass are generally an indication of a leak except during the pump down cycle.

3) Any deviation from the above or any head pressure or short cycling compressor problem should be repaired by a qualified refrigeration man.

Gr. Cleaning

For cleaning of the panels, a common all-purpose household cleaner may be used. DO NOT USE SOLVENTS.

H. Touch-Up

For touch-up of texture vinyl paints, surface should be lightly sanded, then wiped with a clean cloth saturated with any good lacquer thinner. Apply touch-up lacquer by spray or brush.

SPARE PARTS LIST

SYSTEM 2100

AIR COOLED MODELS

PART NUMBER	DESCRIPTION	63*			83*			103*			153*		
		2	4	5	2	4	5	2	4	5	2	4	5
201-030-001	COMPRESSOR 3 TON 208/3	2	-	-	-	-	-	-	-	-	-	-	-
201-030-002	COMPRESSOR 3 TON 460/3	-	2	-	-	-	-	-	-	-	-	-	-
201-030-005	COMPRESSOR 3 TON 575/3	-	-	2	-	-	-	-	-	-	-	-	-
201-040-001	COMPRESSOR 4 TON 208/3	-	-	-	2	-	-	-	-	-	-	-	-
201-040-002	COMPRESSOR 4 TON 460/3	-	-	-	-	2	-	-	-	-	-	-	-
201-040-003	COMPRESSOR 4 TON 575/3	-	-	-	-	-	2	-	-	-	-	-	-
201-050-001	COMPRESSOR 5 TON 208/3	-	-	-	-	-	-	2	-	-	-	-	-
201-050-002	COMPRESSOR 5 TON 460/3	-	-	-	-	-	-	-	2	-	-	-	-
201-050-003	COMPRESSOR 5 TON 575/3	-	-	-	-	-	-	-	-	2	-	-	-
201-075-001	COMPRESSOR 7.5 TON 208/3	-	-	-	-	-	-	-	-	-	2	-	-
201-075-002	COMPRESSOR 7.5 TON 460/3	-	-	-	-	-	-	-	-	-	-	2	-
201-075-003	COMPRESSOR 7.5 TON 575/3	-	-	-	-	-	-	-	-	-	-	-	2
239-030-003	EXPANSION VALVE SVE-3	2	2	2	-	-	-	-	-	-	-	-	-
239-040-001	EXPANSION VALVE SVE-4	-	-	-	2	2	2	-	-	-	-	-	-
239-050-001	EXPANSION VALVE SVE-5	-	-	-	-	-	-	2	2	2	-	-	-
239-080-001	EXPANSION VALVE SVE-8	-	-	-	-	-	-	-	-	-	2	2	2
236-223-002	HP SWITCH MG-201229	2	2	2	2	2	2	2	2	2	2	2	2
236-122-002	LP SWITCH MG-212060	2	2	2	2	2	2	2	2	2	2	2	2
233-075-001	DRIER 1/2"	2	2	2	2	2	2	2	2	2	-	-	-
233-100-001	DRIER 5/8"	-	-	-	-	-	-	-	-	-	2	2	2
230-006-001	RECEIVER 5 X 12	2	2	2	2	2	2	2	2	2	-	-	-
230-010-001	RECEIVER 6 X 12	-	-	-	-	-	-	-	-	-	2	2	2

SPARE PARTS LIST
SYSTEM 2100
AIR COOLED MODELS

PART NUMBER	DESCRIPTION	63*			83*			103*			153*		
		2	4	5	2	4	5	2	4	5	2	4	5
229-060-032	SUCTION ACCUMULATOR- 6 LBS.	2	2	2	2	2	2	-	-	-	-	-	-
229-095-042	SUCTION ACCUMULATOR- 9.5 LBS.	-	-	-	-	-	-	2	2	2	2	2	2
AIR MOVING PARTS													
208-012-010	BLOWER 12 X 12- 1 3/16" BORGE	1	1	1	-	-	-	2	2	2	-	-	-
208-012-003	BLOWER 12 X 9	-	-	-	2	2	2	-	-	-	3	3	3
206-020-005	MOTOR 2 HP 56T	1	1	-	-	-	-	-	-	-	-	-	-
206-020-006	MOTOR 2 HP 575/3	-	-	1	-	-	-	-	-	-	-	-	-
206-030-003	MOTOR 3.5 HP 182T	-	-	-	1	1	-	1	1	-	-	-	-
206-030-004	MOTOR 3.5 HP 575/3	-	-	-	-	-	1	-	-	1	-	-	-
206-050-003	MOTOR 5 HP 182T	-	-	-	-	-	-	-	-	-	1	1	-
206-050-004	MOTOR 5 HP 575/3	-	-	-	-	-	-	-	-	-	-	-	1
211-184-001	PULLEY BLOWER AK-84	1	1	1	-	-	-	-	-	-	-	-	-
210-150-003	PULLEY MOTOR 1VP62	1	1	1	-	-	-	-	-	-	-	-	-
211-274-001	PULLEY BLOWER 2AK84H	-	-	-	-	-	-	1	1	1	1	1	1
210-250-003	PULLEY MOTOR 2VP62-1-1/8	-	-	-	1	1	1	1	1	1	1	1	1
214-001-045	BELT A 45	-	-	-	2	2	2	-	-	-	-	-	-
214-001-054	BELT A 54	1	1	1	-	-	-	2	2	2	2	2	2
217-115-001	BUSHING H-1	1	1	1	1	1	1	1	1	1	1	1	1
212-106-422	SHAFT 1 O.D. X 23	1	1	1	-	-	-	-	-	-	-	-	-
212-207-442	SHAFT 1 O.D. X 42	-	-	-	1	1	1	-	-	-	-	-	-
212-212-445	SHAFT 1 O.D. X 45	-	-	-	-	-	-	1	1	1	-	-	-
212-317-666	SHAFT 1.187 O.D. X 66	-	-	-	-	-	-	-	-	-	1	1	1

SPARE PARTS LIST
SYSTEM 2100
AIR COOLED MODELS

PART NUMBER	DESCRIPTION	63*			83*			103*			153*		
		2	4	5	2	4	5	2	4	5	2	4	5
215-002-001	BEARING	2	2	2	3	3	3	3	3	3	-	-	-
216-108-191	BEARING PB VPL-219	-	-	-	-	-	-	-	-	-	3	3	3
222-100-011	AIR FLOW SWITCH	1	1	1	1	1	1	1	1	1	1	1	1
REHEAT													
259-202-001	REHEAT ELEMENT 2.0/220	6	-	-	-	-	-	-	-	-	-	-	-
259-207-001	REHEAT ELEMENT 2.0/277	-	6	-	-	-	-	-	-	-	-	-	-
259-203-001	REHEAT ELEMENT 2.0/346	-	-	6	-	-	-	-	-	-	-	-	-
259-252-001	REHEAT ELEMENT 2.5/220	-	-	-	6	-	-	6	-	-	9	-	-
259-257-001	REHEAT ELEMENT 2.5/277	-	-	-	-	6	-	-	6	-	-	9	-
259-253-001	REHEAT ELEMENT 2.5/346	-	-	-	-	-	6	-	-	6	-	-	9
260-200-012	TEMP. LIMIT 10H11	2	2	2	2	2	2	2	2	2	2	2	2
260-100-011	FUSABLE LINK	4	4	4	4	4	4	4	4	4	6	6	6
HUMIDIFIER													
262-120-238	NORTEC MESU-20 6.8/208	1	-	-	1	-	-	1	-	-	-	-	-
262-120-338	NORTEC MESU-20 6.8/440	-	1	-	-	1	-	-	1	-	-	-	-
262-130-231	NORTEC MESU-30 10/208	-	-	-	-	-	-	-	-	-	1	-	-
262-130-331	NORTEC MESU-30 10/440	-	-	-	-	-	-	-	-	-	-	1	-

SPARE PARTS LIST

SYSTEM 2100

AIR COOLED MODELS

PART NUMBER	DESCRIPTION	63*			83*			103*			153*		
		2	4	5	2	4	5	2	4	5	2	4	5
ELECTRICAL													
274-030-323	CONTACTOR 30 AMP	6	6	6	6	6	6	6	6	6	7	7	7
271-225-315	FUSE FRN-15	3	-	-	3	-	-	3	-	-	-	-	-
271-255-320	FUSE FRN-20	3	-	-	-	-	-	-	-	-	3	-	-
271-225-325	FUSE FRN-25	9	-	-	9	-	-	9	-	-	12	-	-
271-225-330	FUSE FRN-30	6	-	-	6	-	-	6	-	-	-	-	-
271-225-345	FUSE FRN-45	-	-	-	-	-	-	-	-	-	6	-	-
271-160-215	FUSE KTK-15	-	12	-	-	12	-	-	12	-	-	15	-
271-160-220	FUSE KTK-20	-	6	-	-	6	-	-	6	-	-	-	-
271-160-230	FUSE KTK-30	-	-	-	-	-	-	-	-	-	-	6	-
275-675-012	TRANSFORMER 75 VA	3	-	-	3	-	-	3	-	-	3	-	-
275-675-012	TRANSFORMER 75 VA	-	3	-	-	3	-	-	3	-	-	3	-
275-075-033	TRANSFORMER 75 VA	-	-	3	-	-	3	-	-	3	-	-	3
269-021-323	CIRCUIT BREAKER 3.2	3	3	3	3	3	3	3	3	3	3	3	3
FILTERS													
220-116-252	2" 30% 16x25	2	2	2	2	2	2	2	2	2	-	-	-
220-120-252	2" 30% 25x20	2	2	2	2	2	2	2	2	2	1	1	1
222-100-011	2" 30% 25x25	-	-	-	-	-	-	-	-	-	3	3	3
MICROPROCESSOR CONTROLS													
254-231-001	MICROPROCESSOR PANEL	1	1	1	1	1	1	1	1	1	1	1	1
254-233-001	TEMPERATURE BOARD	1	1	1	1	1	1	1	1	1	1	1	1
254-232-001	TRIAC BOARD	1	1	1	1	1	1	1	1	1	1	1	1

NOTES:
2- 208V3PH/60HZ
4- 460V/3PH/60HZ
5- 575V/3PH/60HZ

SPARE PARTS LIST
SYSTEM 2100
AIR COOLED MODELS

PART NUMBER	DESCRIPTION	203*			253*			303*		
		2	4	5	2	4	5	2	4	5
201-100-001	COMPRESSOR 10 TON 208/3	2	-	-	-	-	-	-	-	-
201-100-002	COMPRESSOR 10 TON 460/3	-	2	-	-	-	-	-	-	-
201-100-003	COMPRESSOR 10 TON 575/3	-	-	2	-	-	-	-	-	-
202-150-001	SEMI HERMETIC 15 TON 208	-	-	-	-	-	-	2	-	-
202-150-002	SEMI HERMETIC 15 TON 460	-	-	-	-	-	-	-	2	-
202-150-003	SEMI HERMETIC 15 TON 575	-	-	-	-	-	-	-	-	2
239-100-001	EXPANSION VALVE SVE-10	2	2	2	2	2	2	-	-	-
239-150-002	EXPANSION VALVE SVE-15	-	-	-	-	-	-	2	2	2
236-223-002	HP SWITCH MG-201229	2	2	2	2	2	2	2	2	2
236-121-002	LP SWITCH MG-212060	2	2	2	2	2	2	2	2	2
233-100-001	DRIER 5/8"	2	2	2	2	2	2	2	2	2
233-150-001	DRIER 7/8"	-	-	-	-	-	-	-	-	-
230-010-001	RECEIVER 6 X 12	2	2	2	2	2	2	-	-	-
230-026-002	RECEIVER 6 X 18	-	-	-	-	-	-	-	-	-
229-095-042	SUCTION ACCUMULATOR	2	2	2	2	2	2	-	-	-

SPARE PARTS LIST
SYSTEM 2100
AIR COOLED MODELS

PART NUMBER	DESCRIPTION	203*			253*			303*		
		2	4	5	2	4	5	2	4	5
AIR MOVING PARTS										
208-012-010	BLOWER 12 X 12	3	3	3	-	-	-	-	-	-
208-015-013	BLOWER 15 X 15	-	-	-	3	3	3	-	-	-
208-018-007	BLOWER 18 X 18	-	-	-	-	-	-	2	2	2
206-075-002	MOTOR 7.5 HP 184T	1	1	-	-	-	-	-	-	-
206-075-005	MOTOR 7.5 HP 575/3	-	-	1	-	-	-	-	-	-
206-100-001	MOTOR 10 HP 215T	-	-	-	1	1	-	1	1	-
206-100-002	MOTOR 10 HP 575/3	-	-	-	-	-	1	-	-	1
211-274-001	PULLEY BLOWER 2AK44H	1	1	1	1	1	1	-	-	-
211-296-001	PULLEY BLOWER 2AK104H	-	-	-	1	1	1	1	1	1
210-256-003	PULLEY MOTOR 2VP56-1-1/8	1	1	1	-	-	-	-	-	-
210-262-002	PULLEY MOTOR 2VP62-1-1/8	-	-	-	1	1	1	-	-	-
214-001-045	BELT A 45	-	-	-	2	2	2	-	-	-
214-001-054	BELT A 54	2	2	2	-	-	-	-	-	-
217-115-001	BUSHING H-1	1	1	1	1	1	1	-	-	-
212-318-674	SHAFT 1.187 O.D. X 72	1	1	1	-	-	-	-	-	-
216-108-191	BEARING PB VPL-219	3	3	3	3	3	3	-	-	-
222-100-011	AIR FLOW SWITCH	1	1	1	1	1	1	1	1	1

SPARE PARTS LIST
SYSTEM 2100
AIR COOLED MODELS

PART NUMBER	DESCRIPTION	203*			253*			303*		
		2	4	5	2	4	5	2	4	5
REHEAT										
259-252-001	REHEAT ELEMENT 2.5/220	12	-	-	12	-	-	15	-	-
259-253-001	REHEAT ELEMENT 2.5/277	-	12	-	-	12	-	-	15	-
250-010-012	REHEAT ELEMENT 2.5/346	-	-	12	-	-	12	-	-	15
260-200-012	TEMP. LIMIT 10H11	2	2	2	2	2	2	2	2	2
260-100-011	FUSABLE LINK	8	8	8	8	8	8	10	10	10
HUMIDIFIER										
262-130-231	NORTEC MESU-30 10/208	1	-	-	1	-	-	1	-	-
262-130-331	NORTEC MESU-30 10/440	-	1	-	-	1	-	-	1	-
ELECTRICAL										
274-030-323	CONTACTOR 30 AMP	8	8	8	8	8	8	9	9	9
271-225-320	FUSE FRN-20	3	-	-	-	-	-	-	-	-
271-225-325	FUSE FRN-25	12	-	-	12	-	-	-	-	-
271-225-330	FUSE FRN-30	-	-	-	-	-	-	15	-	-
271-225-340	FUSE FRN-40	-	-	-	-	-	-	3	-	-
271-225-345	FUSE FRN-45	-	-	-	-	-	-	3	-	-
271-225-360	FUSE FRN-60	6	-	-	6	-	-	6	-	-
271-260-415	FUSE FRS-15	-	18	-	-	18	-	-	15	-
271-260-420	FUSE FRS-20	-	-	-	-	-	-	-	-	-
271-260-430	FUSE FRS-30	-	6	-	-	6	-	-	6	-
271-260-445	FUSE FRS-45	-	-	-	-	-	-	-	6	-
275-675-012	TRANSFORMER 75 VA	3	-	-	3	-	-	3	-	-
275-675-012	TRANSFORMER 75 VA	-	3	-	-	3	-	-	3	-
275-075-033	TRANSFORMER 75 VA	-	-	3	-	-	3	-	-	3
269-021-323	CIRCUIT BREAKER 3.2	3	3	3	3	3	3	3	3	3

SPARE PARTS LIST

SYSTEM 2100

AIR COOLED MODELS

PART NUMBER	DESCRIPTION	203*			253*			303*		
		2	4	5	2	4	5	2	4	5
FILTERS										
220-116-252	2" 30% 25x20	1	1	1	1	1	1	1	1	1
220-120-252	2" 30% 25x25	4	4	4	4	4	4	4	4	4
220-125-252	CLOG FILTER SWITCH	1	1	1	1	1	1	1	1	1
MICROPROCESSOR CONTROLS										
254-231-001	MICROPROCESSOR PANEL	1	1	1	1	1	1	1	1	1
254-233-001	TEMPERATURE BOARD	1	1	1	1	1	1	1	1	1
254-232-001	TRIAC BOARD	1	1	1	1	1	1	1	1	1

NOTES:
2- 208V3PH/60HZ
4- 460V/3PH/60HZ
5- 575V/3PH/60HZ