

INSTALLATION INSTRUCTIONS



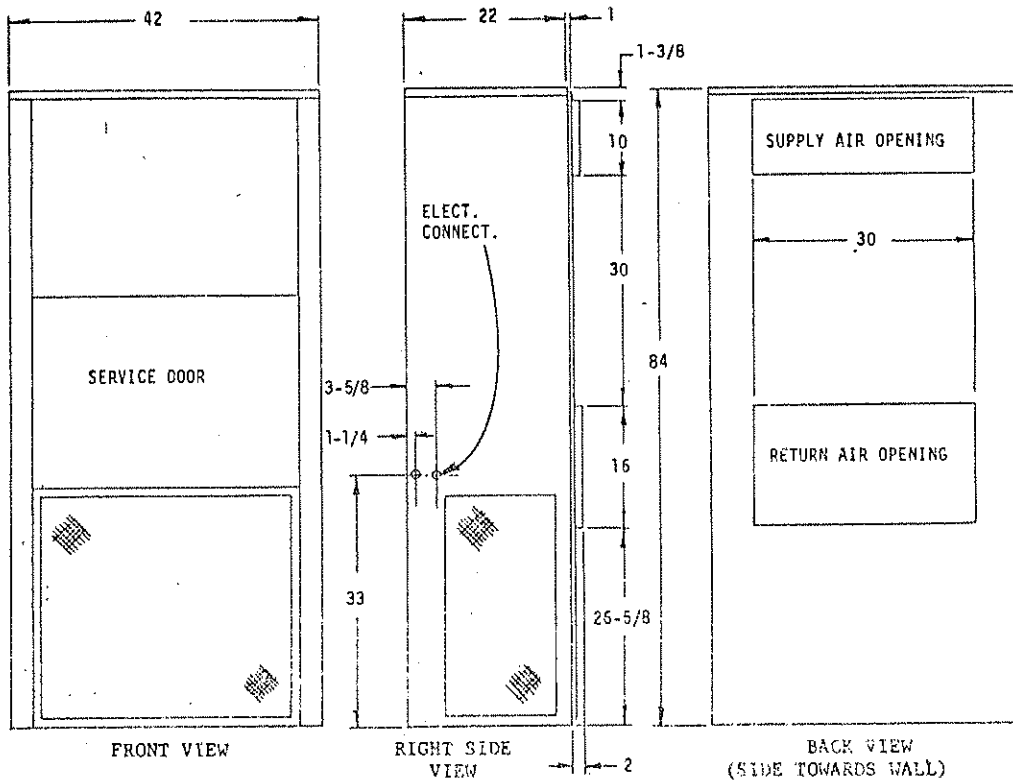
WALL MOUNTED PACKAGE AIR CONDITIONERS

MODELS

42WA

49WA

BARD MANUFACTURING COMPANY
P. O. Box 607 Bryan, Ohio 43506
(419) 636-1194



ELECTRICAL INFORMATION								WIRING INFORMATION **			
Model	Rated Volts & Ph	Operating Voltage Range	Heater* Kw	Max Unit Amps	No. Field Power Circuits	Internal Fuses	Req'd. Ext. Fuses	Min. Ckt. Ampacity	Field Power Wiring	Ground Wire Size	Wiring Diagram Number
42WA	230/208-1	197-253	0	26.9	1		50	33	8	10	4010-110C
			5	26.9	1		50	33	8	10	-120C
			10	44.7	1		60	56	4	10	-130C
			15	65.6	1	60/30	90	82	2	8	-140C
			20	86.4	1	60/60	110	108	1	6	-150C
	230/208-3	187-253	0	18.9	1		35	23	10	10	4010-210C
			9	24.8	1		35	31	8	10	-220C
			12	32	1		40	40	8	10	-230C
			15	39.3	1		50	50	6	10	-230C
	18	46.4	1		60	58	4	10	-240C		
	460-3	414-506	0	11	1		20	15	14	14	4010-310B
9			13.4	1		20	17	12	12	-320B	
12			17	1		25	22	10	10	-320B	
15			20.6	1		30	26	10	10	-320B	
18			24.3	1		35	31	8	10	-330B	
49WA	230/208-1	197-253	0	28.9	1		50	35	8	10	4010-110C
			5	28.9	1		50	35	8	10	-120C
			10	44.7	1		60	56	4	10	-130C
			15	65.6	1	60/30	90	82	2	8	-140C
			20	86.4	1	60/60	110	108	1	6	-150C
	230/208-3	187-253	0	21.9	1		40	26	10	10	4010-210C
			9	24.8	1		40	31	8	10	-220C
			12	32	1		40	40	8	10	-230C
			15	39.3	1		50	50	6	10	-230C
	18	46.4	1		60	58	4	10	-240C		
	460-3	414-506	0	11	1		20	15	14	14	4010-310B
9			13.4	1		20	17	12	12	-320B	
12			17	1		25	22	10	10	-320B	
15			20.6	1		30	26	10	10	-320B	
18			24.3	1		35	31	8	10	-330B	

*Electric heaters are nominal Kw @ 240V or 480V.
 **Based on using 60°C copper wire. Other wiring materials must be rated for marked minimum circuit ampacity or greater. Not all models approved for aluminum wire.

⚠ May be fuse or circuit breaker.

APPLICATION AND INSTALLATION INSTRUCTIONS

GENERAL

Units are shipped completely assembled and internally wired, requiring only duct connections, thermostat wiring and external 220-240 volt AC power supply. The refrigerant system is completely assembled and charged.

These instructions and any instructions packaged with any separate equipment should be carefully read before beginning the installation. Note particularly any tags and/or labels attached to the equipment.

While these instructions are intended as a general recommended guide, they do not supersede any national and/or local codes in any way. Authorities having jurisdiction should be consulted before the installation is made.

SHIPPING DAMAGE

Upon receipt of equipment, the carton should be checked for external signs of shipping damage. If damage is found, the receiving party must contact the last carrier immediately, preferably in writing, requesting inspection by the carrier's agent.

INSTALLATION

Size of unit for a proposed installation should be based on heat loss calculation made according to methods of National Warm Air Heating and Air Conditioning Association. The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type, NFPA No. 90A, and Residence Type Warm Air Heating and Air Conditioning Systems, NFPA No. 90B. Where local regulations are at a variance with instructions, installer should adhere to local codes.

DUCTWORK

Design the ductwork according to methods given by the National Warm Air Heating and Air Conditioning Association. When duct runs through unheated spaces, it should be insulated with a minimum of two inches of insulation. Use insulation with a vapor barrier on the outside of the insulation. Flexible joints should be used to connect the ductwork to the equipment in order to keep the noise transmission to a minimum.

A one inch clearance to combustible material for the first three feet of duct attached to the outlet air frame is required. See page 4 for further details.

FILTER

A 1" throwaway filter is supplied with each unit. The filter slides into position making it easy to service. This filter can be serviced from the outside by removing the service door.

FRESH AIR INTAKE

All units are built with a fresh air inlet hole punched in the service panel. The fresh air damper assembly is shipped with each unit, and must be attached at the installation site. See Fig. 3 on page 7 for typical installation procedure.

The fresh air damper assembly is standard equipment with the unit because of the variety of state or local codes requiring fresh air capability.

All capacity, efficiency and cost of operation information as required for Department of Energy "Energyguide" Fact Sheets is based upon the fresh air blank off plate in place and is recommended for maximum energy efficiency.

The blank off plate is available upon request from the factory and is installed in place of the fresh air damper shipped with each unit.

WALL MOUNTING

1. Two holes, the size of the supply and return air openings must be cut through the wall as shown in Fig. 1 and 2 on page 5.
2. On wood-frame walls, the wall construction must be strong and rigid enough to carry the weight of the unit without transmitting any unit vibration.
3. Concrete block walls must be thoroughly inspected to insure that they are capable of carrying the weight of the installing unit.
4. Ducts through the walls must be insulated and all joints taped or sealed to prevent air or moisture entering the wall cavity.
5. Some installations may not require any return air duct. It is recommended that on this type of installation, a filter grille be located in the wall. Filters must be of sufficient size to allow a maximum velocity of 400 FPM.

WIRING - MAIN POWER

Refer to the unit rating plate for wiring size information and maximum fuse size. Each outdoor unit is marked with a "Minimum Circuit Ampacity." This means that the field wiring used must be sized to carry that amount of current. Depending on the installed Kw of electric heat, there may be two field power circuits required. If this is the case, the unit serial plate will so indicate. Some models are suitable only for connection with copper wire, while others can be wired with either copper or aluminum wire. Each unit and/or wiring diagram will be marked "Use Copper Conductors Only" or "Use Copper or Aluminum Conductors." These instructions MUST BE adhered to. Refer to the National Electrical Code for complete current carrying capacity data on the various insulation grades of wiring material.

The electrical specifications on page 1 lists fuse and wire sizes (60°F copper) for all models, including the most commonly used heater sizes. Also shown are the number of field power circuits required for the various models with heaters.

The unit rating plate lists a "Maximum Time Delay Fuse" that is to be used with the equipment. The correct size fuse must be used for proper circuit protection and also to assure that there will be no nuisance tripping due to the momentary high starting current of the compressor motor.

PRESSURE SERVICE PORTS

High and low pressure service ports are installed on all units so that the system operating pressures can be observed. Pressure curves can be found later in the manual covering all models on both cooling and heating cycles. It is imperative to match the correct pressure curve to the unit by model number.

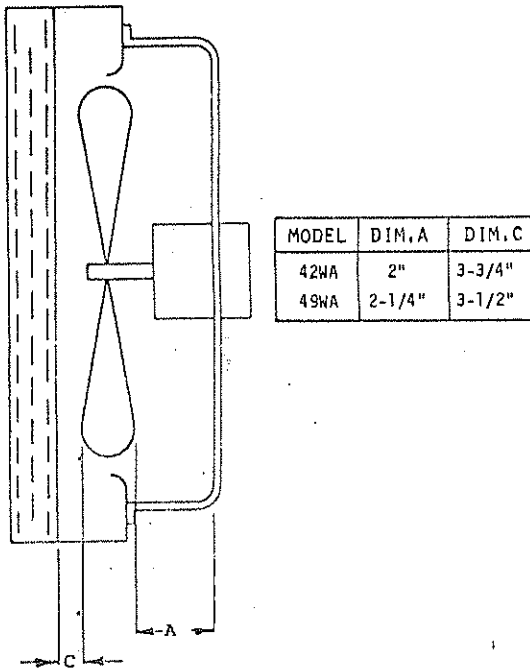
CONDENSATE DRAIN

A plastic drain hose extends from the drain pan at the top of the unit down to the unit base. There are openings in the unit base for the drain hose to pass through. In the event the drain hose is connected to a drain system of some type, it must be an open or vented type system to assure proper drainage.

FAN BLADE SETTING DIMENSIONS

Shown in the drawing below are the correct fan blade setting dimensions for proper air delivery across the outdoor coil.

Any service work requiring removal or adjustment in the fan and/or motor area will require that the dimensions below be checked and blade adjusted in or out on the motor shaft accordingly.

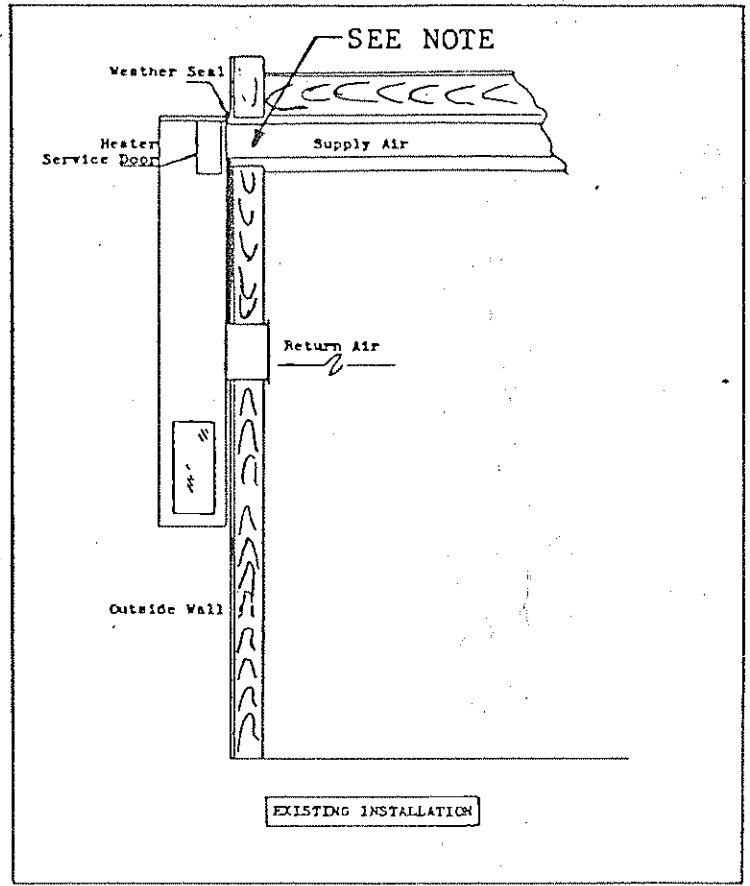
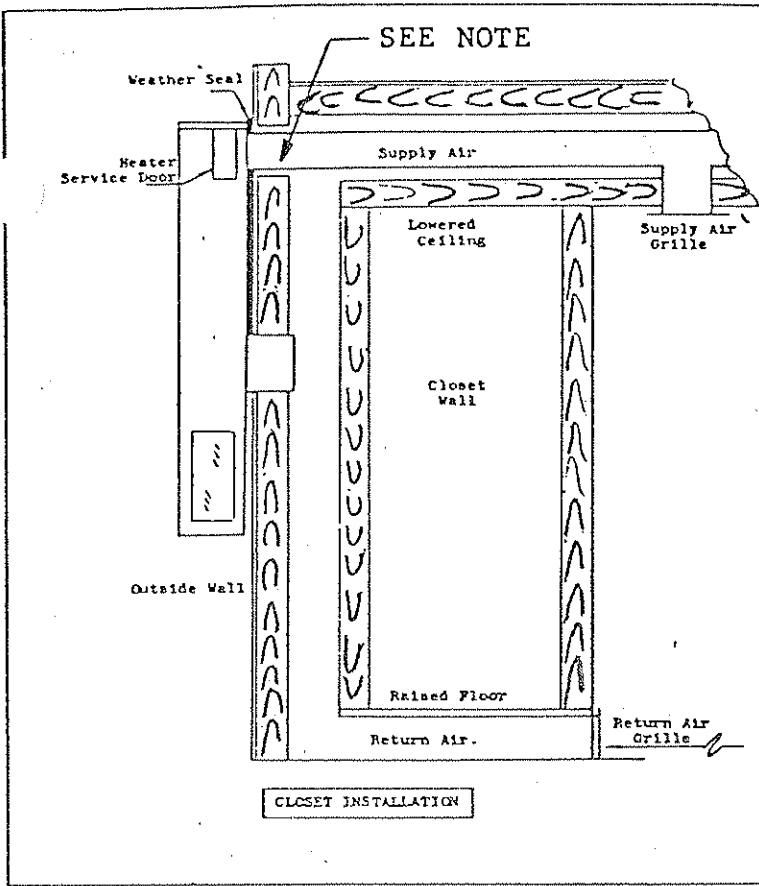


REFRIGERANT CHARGE

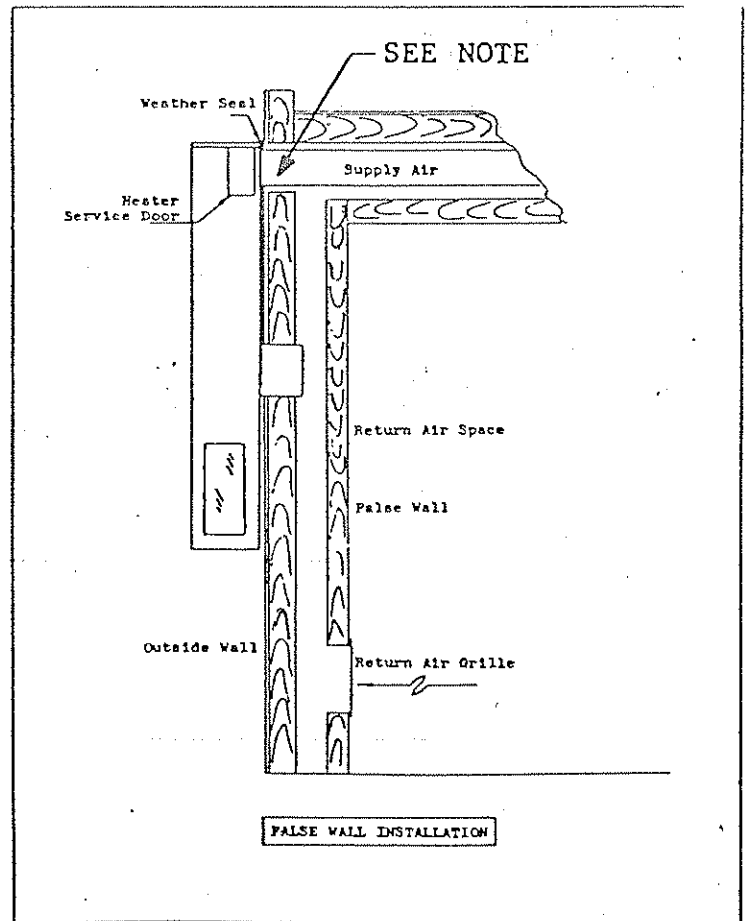
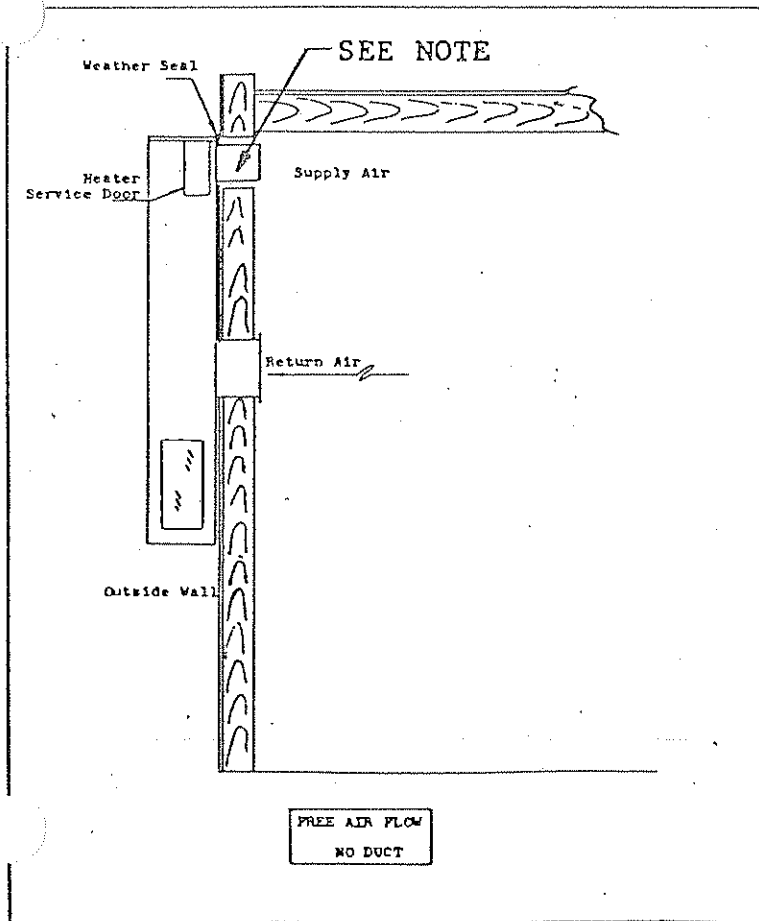
The correct system R-22 charge is shown on the unit rating plate. Optimum unit performance will occur with a refrigerant charge resulting in a suction line temperature (6" from compressor) as shown in the following table:

Model	Rated Airflow	95°F OD Temp.	82°F OD Temp.
42WA	1575	57-59	68-70
49WA	1725	60-62	68-70

The above suction line temperatures are based upon 80°F dry bulb/67°F wet bulb (50% R.H.) temperature and rated airflow across the evaporator during cooling cycle.



NOTE: 1" clearance to combustible materials required for first 3 feet of supply air duct system.



MOUNTING ON CONCRETE BLOCK WALL

These units are secured by wall mounting brackets which secure the unit to the outside wall surface at both sides and at the bottom (Fig. 5).

In a standard 8 x 16 in. block wall, saw or knock out two 30 in. sections of concrete blocks normally the 8th and 11th course of blocks above floor level. In both cases this should be two whole block.

On the wall, lay out approximately the position for the bottom and side brackets. Fasten these brackets to the wall firmly with 3/8 in. lag screws.

The side brackets should be located approximately 10 in. down from the top of the unit and fastened to both sides with metal screws. Before drilling into side of casing, check inside tubing for clearance. After mounting the unit on the wall, a metal weather stripping should be installed at the top to insure a water-tight application.

INSTALLATION SCHEMATIC

CONCRETE BLOCK WALL

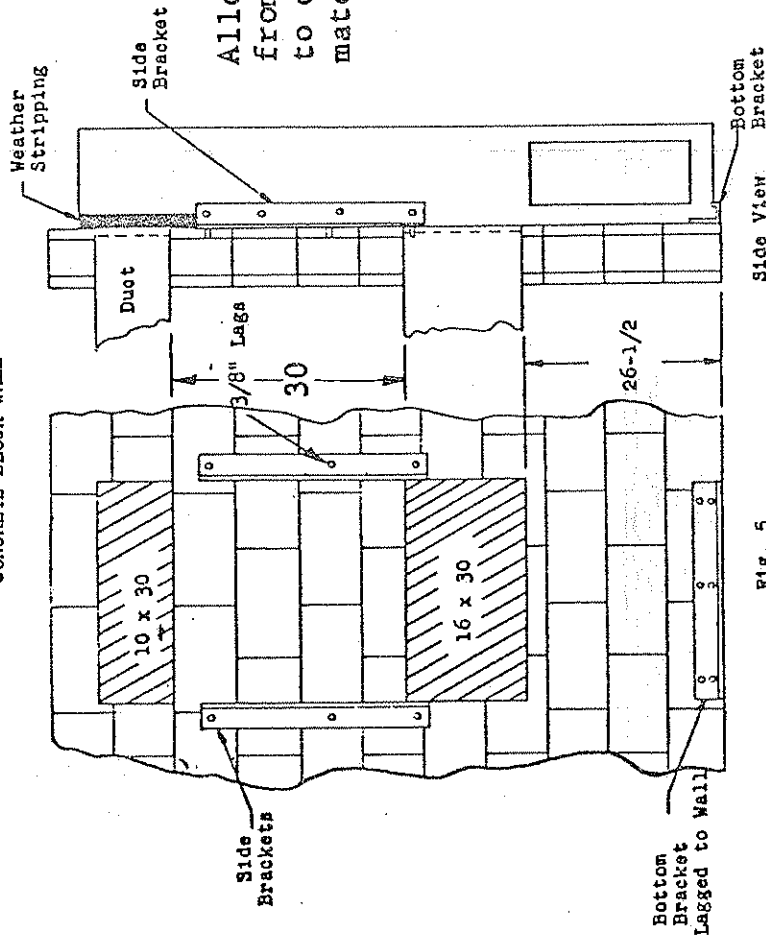


FIG. 5

Side View

MOUNTING ON WOOD FRAME WALLS

Locate and cut out two 8 x 28 in. (minimum) openings as shown in (Fig. 6). Cut away the outside siding to the depth of the sheathing. Install metal weather stripping at the top and caulk or otherwise seal joints between siding and sheathing. Frame in the openings between the wall studs as necessary for the particular wall involved with the plates at the bottom of each wall opening being sufficiently strong to carry the weight of the unit.

Install the two side brackets to the unit (10 in. down from the top). Before drilling into side of casing, check inside tubing for clearance. Mount unit on wall and pull in firmly using three - 3/8 in. lag screws through each of the wall mounting brackets.

For additional mounting rigidity, each air opening collar may be screwed to the plate at the bottom of each wall opening. Drill two 1/4 in. holes in the bottom flange of each collar before hanging the unit, then fasten to wall plate with No. 10 by 1-1/2 in. wood screws.

OUTSIDE FRAME WALL SCHEMATIC

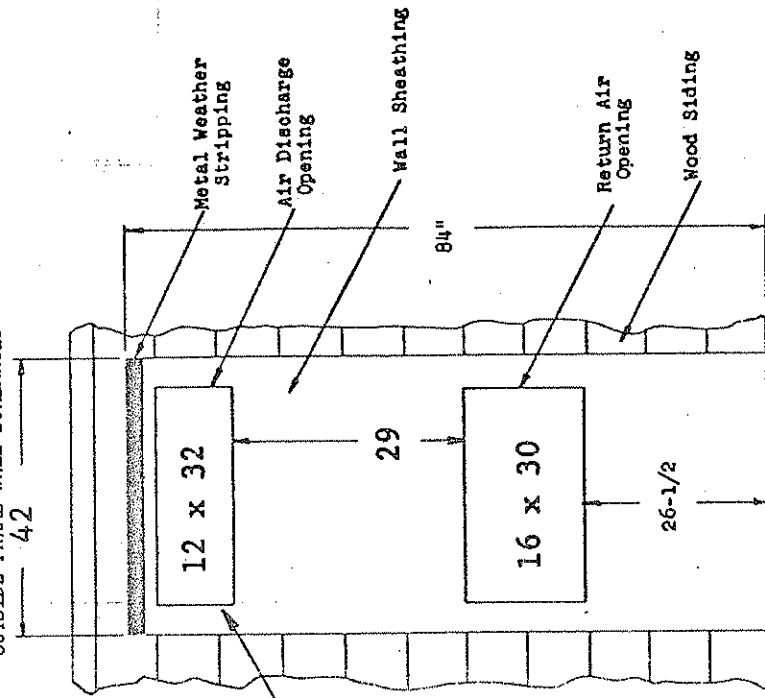


FIG. 6

Allows 1" clearance from supply air duct to combustible materials.

**SUPPLY AIR METAL DUCT LINER
MODELS WA AND WH**

The cabinets on all models, with or without electric heaters, are approved for 0" clearance to combustible material. The outlet duct on all models with electric heaters must have 1" clearance to combustible materials for at least the first 3 feet of duct.

Whenever a model WA or WH is installed, a galvanized metal duct liner must always be attached (Fig. 8). Before installing, determine the wall thickness. If the installation is free air flow, with no external duct, then the liner should be cut flush with the inside wall opening. In order to insure no sweating, the duct liner should be wrapped with a minimum of 1" insulation.

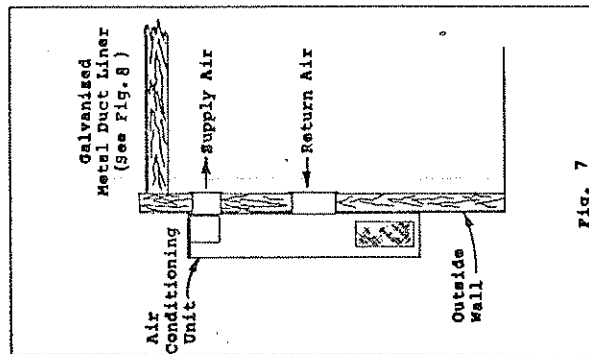


Fig. 7

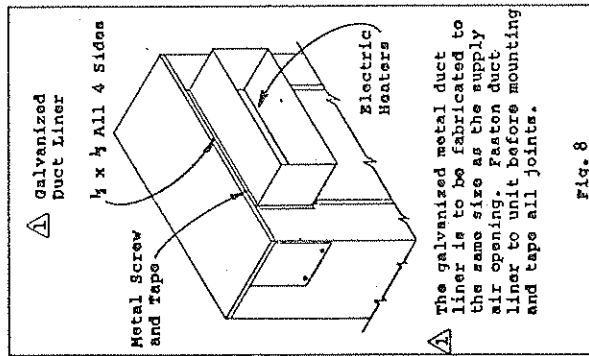


Fig. 8

**COOLING AND HEATING ANTICIPATION
FOR WALL THERMOSTATS**

All 24V wall thermostats are built with both cooling and heating anticipators. The purpose of these anticipators is to compensate the thermostat for various system controls and allow the best possible cycle rates.

The cooling anticipator for all thermostats, and the heating anticipator on a limited number, are fixed and require no adjustment. Most heating anticipators are adjustable and DO REQUIRE ADJUSTMENT to match the current rating of the relay, contactor or other control being cycled by that heating stage. In the case of a two stage heating thermostat there will be an anticipator for each stage, either both adjustable, one fixed and one adjustable, or both fixed.

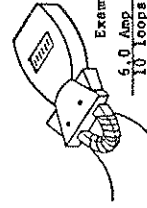
The fixed anticipators are rated for a maximum of 1.5A. The adjustable anticipators generally have a range of .2 - 1.2A, and MUST BE ADJUSTED. Failure to adjust the anticipator lever to correspond to the actual current draw passing through that stage mercury switch and anticipator will cause severe short cycling conditions if set too low and room temperature may never attain the thermostat set point, and if set too high, will cause room temperature over-shoot.

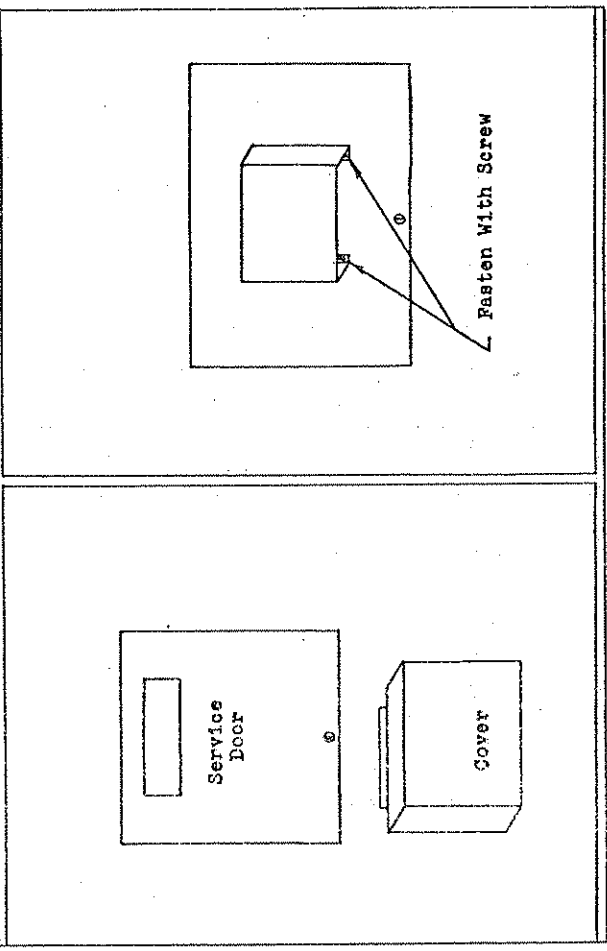
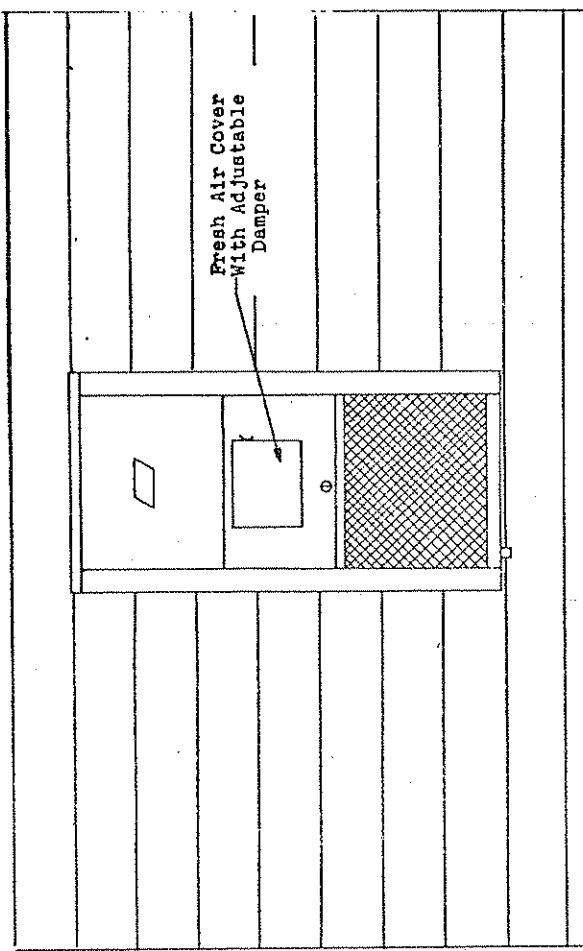
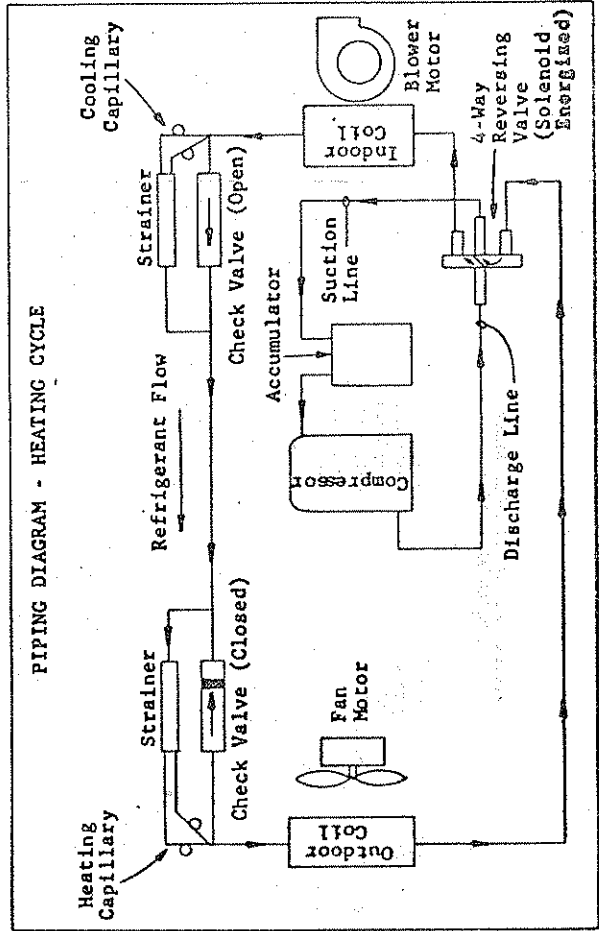
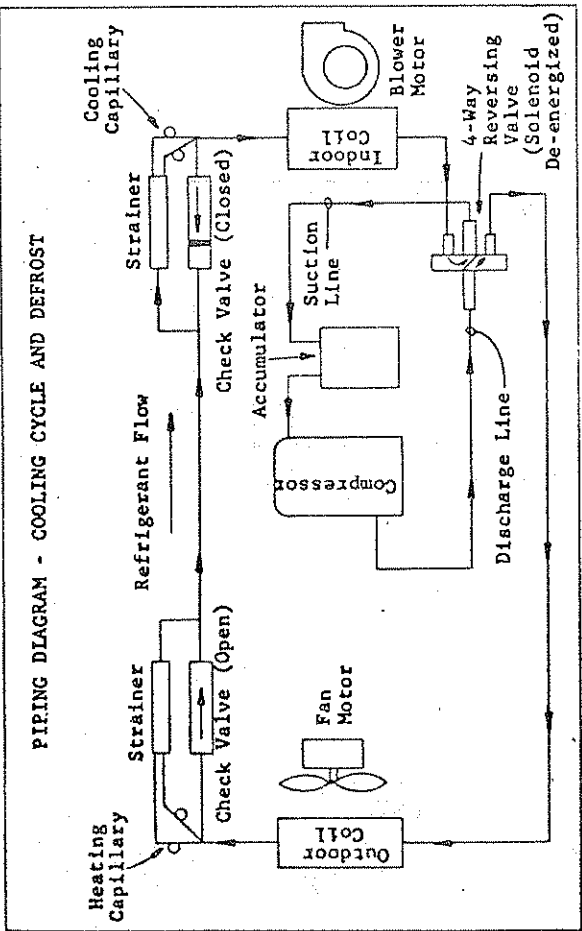
While oil burner primary controls and gas valves are normally marked with the nominal current rating, the contactors and relays installed in air conditioners and heat pumps are not. Listed below are some of the more popularly used controls and their nominal current ratings.

Contactor or Relay	Nominal Current Rating
Honeywell - R850B Series	.55
- R8210 Series	.40
- R8212 Series	.40
- R8214 Series	.40
- R8222 Series	.38
- R8228 Series	.38
- R8242 Series	.38
- R8243 Series	.38
RBM - Type 84	.12
- Type 91	.34
- Type 112	.34
- Type 143	.34
- Type 154	.26
- Type 184	.12
Elwood - 30B020	.39
- 30C020	.39
- 30C020	.39
- 30F020	.21
- 30B030	.21
- 30E030	.21

Below is a procedure which allows accurate low amperage current measurements with a standard clamp-on ammeter with a 0-6A range. It is actually recommended that this measurement always be taken, since variations in voltage, thermostat wire length, etc. can all cause some change in current draw.

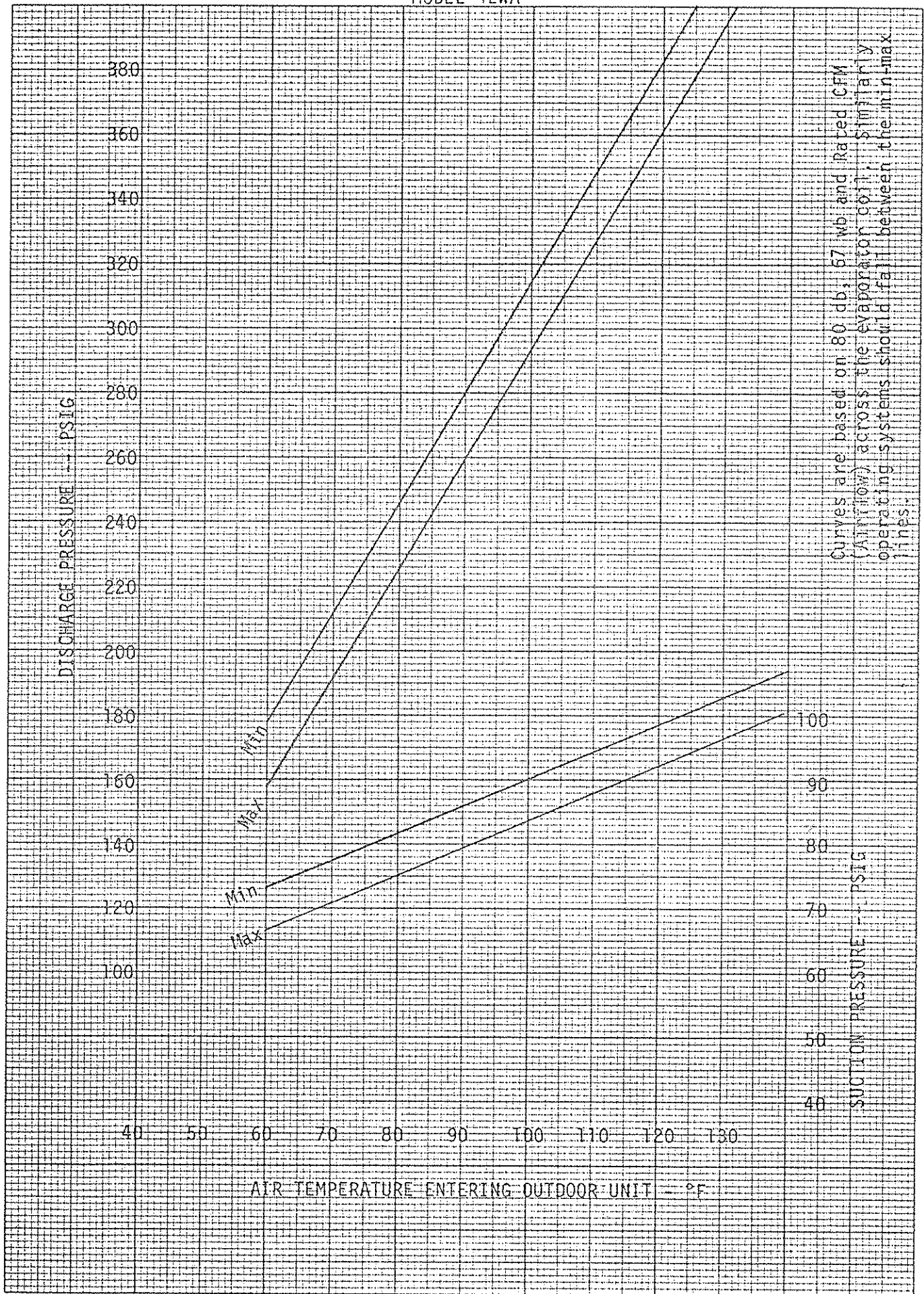
1. Wrap exactly 10 loops of thermostat wire (W1) around the prongs of an Amprobe.
2. Let the heating system operate for one minute before reading the W1 or W2 current draw.
3. Divide the reading obtained in Step 2 by 10.
4. Use the value calculated in step 3 to set the heat anticipator.
5. Repeat the procedure for (W2) if 2-stage heat.



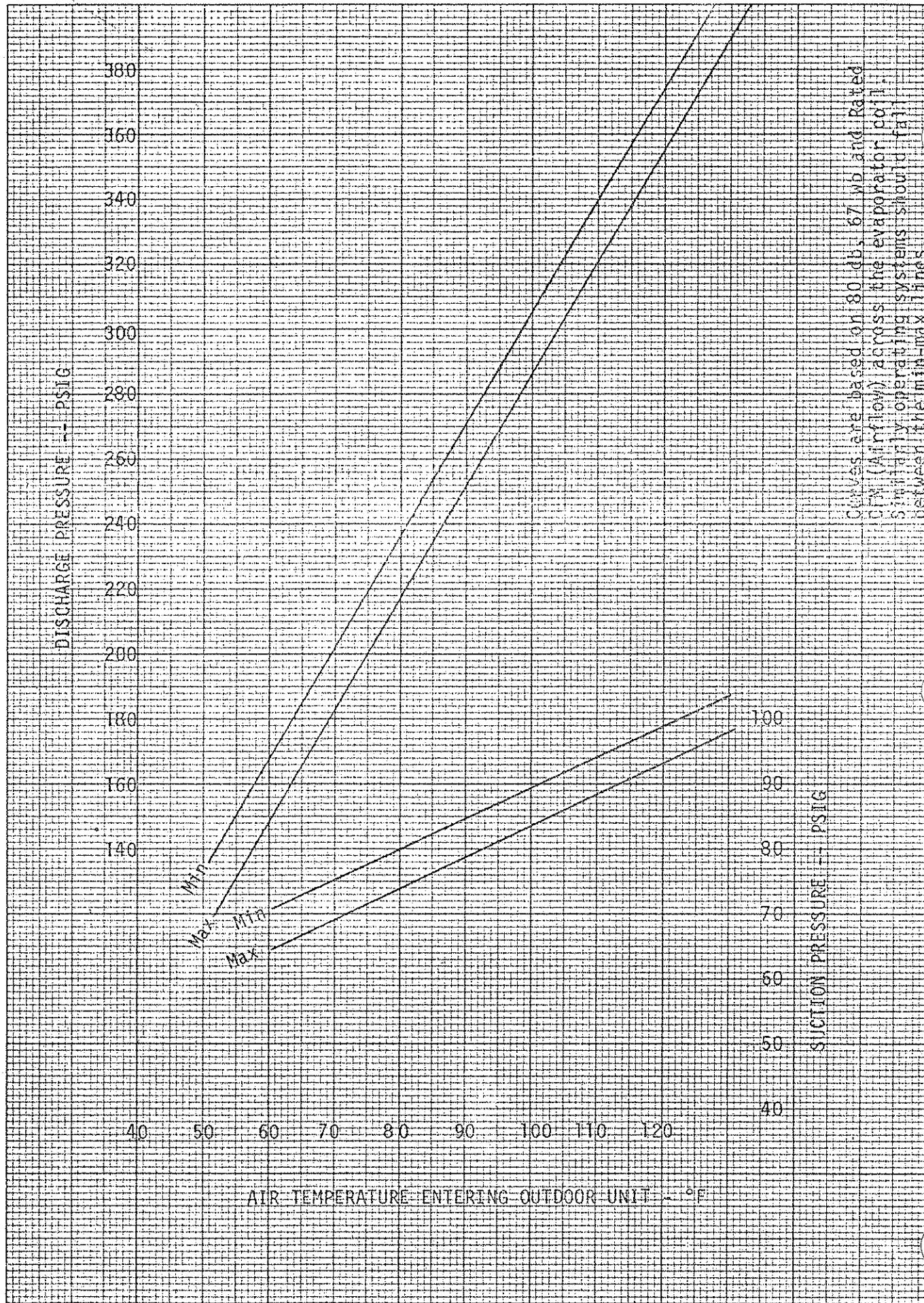


DIETZEN CORPORATION
MADE IN U.S.A.

NO. 340-20 DIETZEN GRAPH PAPER
20 X 20 PER INCH



Curves are based on 80 db, 57 wb and Rated CFM. (Airflow) across the evaporator coil. Similarly operating systems should fall between the min-max lines.



Curves are based on 80 db, 67 wb and Rated CFM (Airflow) across the evaporator coil. Similarly, operating systems should fall between the min-max lines.

PARTS LIST

SINGLE PACKAGE AIR CONDITIONERS

Effective 1/1/80
Supersedes 1/1/79

PART NO.	DESCRIPTION	42WA	42WA-3	49WA	49WA-3	42WA-3 460V	49WA-3 460V
*	Blower Housing	x	x	x	x	x	x
5152-011	Blower Wheel DD10-8A	x	x	x	x	x	x
5152-012	Blower Wheel DD10-8A	x	x	x	x	x	x
8552-012	Capacitor - Comp. 35/440V	x					
8552-005	Capacitor - Blower	x	x	x	x	x	x
8552-026	Capacitor - Fan	x	x	x	x	x	x
8552-016	Capacitor - Comp.			x			
5811-021	Capillary Tube - Cool	(2)	(2)			(2)	
5811-020	Capillary Tube - Cool			(2)	(2)		(2)
8000-058	Compressor CRJ1-0300-PFV-270	x					
8000-059	Compressor CRJ1-0300-TF5-270		x				
8000-063	Compressor CRK1-0325-PFV-270			x			
8000-064	Compressor CRK1-0325-TF5-270				x		
8000-060	Compressor CRJ1-0300-TFD-270					x	
8000-065	Compressor CRK1-0325-TFD-270						x
5051-027	Condenser Coil	x	x			x	
5051-028	Condenser Coil			x	x		x
8401-007	Contactora - Comp. 25A	x					
8401-002	Contactora - 25A		x		x	x	x
8401-006	Contactora - Heater 24V	x	x	x	x		
8401-003	Contactora - Comp. 30A			x			
5060-025	Evaporator Coil	x	x	x	x	x	x
5151-021	Fan Blade B2430-4 ccw	x	x	x	x	x	x
7004-010	Filter 16x20	x	x	x	x	x	x
8614-017	Fuse Block 15Kw	x		x			
8614-013	Fuse Block 20Kw	x		x			
8614-022	Fuse 60A	x		x			
8614-006	Fuse 30A	x		x			
8614-007	Fuse 60A	x		x			
8604-042	Heat Strip 5Kw	x		x			
8604-044	Heat Strip 10Kw	x		x			
8604-047	Heat Strip 15Kw	x	x	x	x		
8604-048	Heat Strip 9Kw		x		x		
8604-046	Heat Strip 12Kw		x		x		
8604-050	Heat Strip 9Kw					x	x
8604-051	Heat Strip 12Kw					x	x
8402-029	Limit Switch L160-2.5	x	x	x	x	x	x
8106-014	Motor - Blower 1/2 hp	x	x	x	x	x	x
8105-021	Motor - Fan 1/3 hp	x	x	x	x	x	x
8201-009	Relay - Blower	x	x	x	x		
8201-008	Relay - Blower Heat/Cool					x	x
8200-004	Motor Mount - Fan	x	x	x	x	x	x
5210-005	Strainer	x	x	x	x	x	x
8607-005	Terminal Board 24V	x	x	x	x	x	x
8607-001	Terminal Block 230V	x		x		x	x
8607-002	Terminal Block 230V		x		x	x	x
8402-032	Thermal Cuf-off	x	x	x	x	x	x
8407-007	Transformer 40VA	x		x			
8407-015	Transformer 55VA		x		x	x	x
8407-004	Transformer - Stepdown					x	x



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