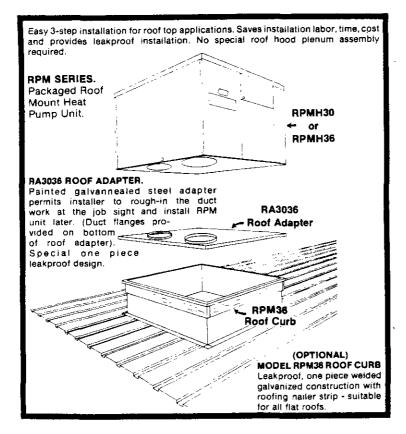
MODELS RPMH 30 and RPMH 36 ROOF MOUNT PACKAGED HEAT PUMP

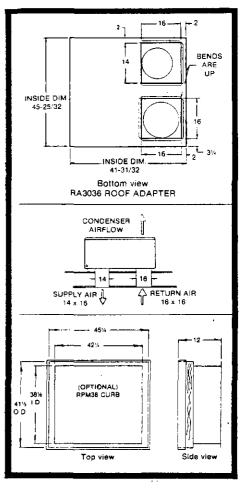
INSTALLATION INSTRUCTIONS

SPECIALLY DESIGNED FOR ROOFTOP HEATING / COOLING APPLICATIONS

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PRE-FABRICATED METAL ROOF CURB





IMPORTANT

The equipment covered in this manual is to be installed by trained, experienced service and installation technicians. Any heat pump is more critical of proper operating, charge and an adequate duct system than a straight air conditioning unit. All ductwork, supply and return, must be properly sized for the design air flow requirement of the equipment. NESCA is an excellent guide to proper sizing. All duct work or portions thereof not in the conditioned space should be properly insulated in order to both conserve energy and prevent condensation or moisture damage.

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.

GENERAL

The refrigerant system is completely assembled and charged. All internal wiring is complete.

These instructions and any instructions packaged with any separate equipment required to make up the entire air conditioning system should be carefully reed before beginning the installation. Note particularly "Starting Procedure" and 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.

<u>INSTALLATION</u>

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 duct work to the equipment in order to keep the noise transmission to a minimum.

LOCATING THE UNIT

A location on the roof must be chosen that will provide adequate support to the unit, while at the same time allowing clearance for the supply air and return air duct connections to the RA3036 roof adapter—see layout and dimensions. NOTE: The RA3036 Roof Adapter MUST BE USED to assure a leak-free installation, and the UL approval is contingent upon the use of this mating adapter.

ROOF CURB FABRICATION

The roof curb (extension section between actual roof and RA3036 roof adapter) could be fabricated from either sheet steel or nominal dimensional lumber. In either case, the O.' dimension of the extension section must be sized to fit RA3036 adapter dimensions as shown.

All corners, seams or joints must be sealed to assure a leak-free installation. The height of the curb section is determined by installation requirements such as degree slope of roof, direction that the outdoor (exposed) coil faces, and geographic location. The unit MUST SET LEVEL when installed, and should be high enough to provide proper defrost drainage from outdoor coil during heating cycle.

A suggested design for a wood frame type construction is shown below.

CONDENSATE AND DEFROST DRAINAGE

A $3/4^{\rm m}$ FPT coupling is provided to connect a condensate drain line to, and is located on side opposite outdoor coil. See illustration.

An optional accessory outdoor coil drain pan, DP3036, is available to collect normal condensate run-off and defrost cycle condensate in applications where it may not be desirable to drain on to mounting surface, or may not be permitted by local codes.

There is a space beneath the outdoor coil for the DP3036 to slide in without unit modification, and the DP3036 is also supplied with a $3/4^{\rm m}$ FPT coupling for drain line connection.

AIR FILTER

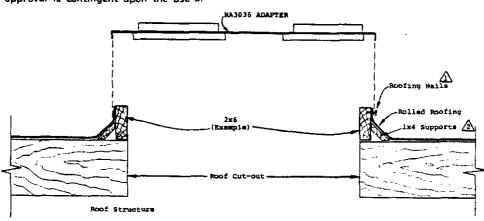
A 24 $^{\rm n}$ x 24 $^{\rm n}$ x 1 $^{\rm n}$ disposable fiberglass type filter is located inside the unit for air filtration of both return air from structure and for optional fresh air intake (see below).

Access to the filter is by removing the corner panel where either the fresh air blank off panel or fresh air intake hood is located.

FRESH AIR INTAKE

The fresh air intake cover is a manual damper operated device to allow intake of fresh air whenever indoor blower is operating. The damper position can be manually set and locked in position with a wing nut. It is held in place by two screws and has a hardware cloth screen to prevent entry of birds or rodents. An optional cover plate is available if fresh air intake is not used.

TYPICAL CONSTRUCTION FOR DIMENSIONAL LUMBER EXTENSION CONSTRUCTION



A Hail 3/4" from top.

A Provides support to roofing material, prevents sharp bends and cracking.

WIRING - MAIN POWER

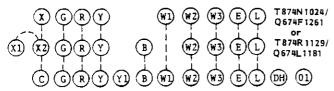
Refer to the unit rating plate for wire sizing information and maximum fuse or "HACR Type" circuit breaker size. Each outdoor unit is marked with a "Minimum Circuit Ampacity." This means that the field wiring used must be sized to carry that amount of current. Depending on the installed Kw of electric 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 data lists fuse and wire sizes (60°C 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" or "HACR Type" circuit breaker that is to be used with the equipment. The correct size 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.

WIRING - 24V CONTROL CIRCUIT

Nine (9) wires should be run from thermostat subbase to the 24V terminal board in the unit. A nine conductor, 18 gauge copper, color-coded thermostat cable is recommended. The connection points are shown on most of the wiring diagrams and are also shown below.



Unit 24V Terminal Board

IMPORTANT NOTE: Only the thermostat and subbase combinations as shown above will work with this equipment. The stat and subbase MUST be matched, and correct operation can be assured only by proper selection and application of these parts.

COMPRESSOR MALFUNCTION RELAY (1-Phase Models Only)

Actuation of the green "check" lamp is accomplished by a voltage type relay which is factory installed. Any condition such as loss of charge, idefective capacitor, defective contactor, etc., that will prevent compressor from operating will cause green lamp to activate. This is a signal to the operator of the equipment to place system in emergency heat position.

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.

THERMOSTAT INDICATOR LAMPS

The red lamp marked "EM.HT." comes on and stays on whenever the system switch is placed in the Em. Ht. position. The green lamp marked "check" will come on if there is any problem that prevents the compressor from running when it is supposed to be.

EMERGENCY HEAT POSITION

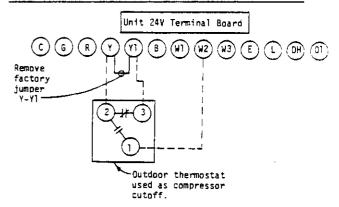
The operator of the equipment must manually place the system switch in this position. This is done when there is a known problem with the outdoor section, or when the green "check" lamp comes on indicating a problem.

COMPRESSOR CUT-OFF THERMOSTAT AND OUTDOOR THERMOSTAT

Heat pump compressor operation at outdoor temperatures below 0°F are neither desirable nor advantageous in terms of efficiency. Since most equipment at time of manufacture is not designated for any specific destination of the country, and most of the equipment is installed in areas not approaching the lower outdoor temperature range, the compressor cut-offs are not factory installed.

NOTE: Maximum amount of electric heat which can be operated in conjunction with the compressor during heating mode is 10Kw on 1 phase and 12Kw on 3 phase. The balance of the electric heat can be operated only during compressor cut off or emergency heat mode.

COMPRESSOR CUT-OFF & OUTDOOR THERMOSTAT WIRING



HEAT ANTICIPATION

Both of the thermostats shown below have a fixed heat anticipator for stage 1 with no adjustment required. Stage 2 has an adjustable anticipator for the W2 connection and fixed for the W3 connection. Both the W2 and W3 circuits are controlled by the stage 2 bulb. The only heat anticipator that needs to be checked is stage 2 and it should be set to match the load carried by the W2 circuit. The normal factory wiring provides for only one electric heat contactor to be controlled by W2, and the anticipator should be set at .40A. If special field wiring is done, it is best to actually measure the load but a good rule is .40A for each heat contactor controlled by W2.

WALL THERMOSTAT AND SUBBASE COMBINATIONS

Group	Thermostat	Subbase	Predominant Feature
А	8403-017 (T 874R 1129)	8404-009 (Q674L1181)	Heat or Cool 1
В	8403-018 (T 874N 1024	8404-010 (Q674F1261)	Automatic Heat-Cool Changeover Position

No automatic changeover position--must manually place in heat or cool. Reversing valve remains energized at all times system switch is in heat position (except during defrost cycle). No pressure equalization noise when thermostat is satisfied on either heating or cooling.

Allows thermostat to control both heating and cooling operation when set in "AUTO" position. Reversing valve de-energizes at end of each "ON" heating cycle.

IMPORTANT NOTE: Both thermostat and subbase combinations shown above incorporate the following features: Man-Auto fan switch, Off-Heat-Cool-Em.Heat Switch, and two (2) indicator lamps-one for emergency heat and one for compressor maifunction.

SEQUENCE OF OPERATION

<u>Cooling</u> - Circuit R-Y makes at thermostat pulling in compressor contactor starting the compressor and outdoor motor. The G (indoor motor) circuit is automatically completed on any call for cooling operation, or can be energized by manual fan switch on subbase for constant air circulation.

Heating - A 24V solenoid coil on reversing valve controls heating cycle operation. Two thermostat options, one allowing "Auto" changeover from cycle to cycle and the other constantly energizing solenoid coil during heating season and thus eliminating pressure equalization noise except during defrost, are to be used. On "Auto" option, a circuit is completed from R-W1 and R-Y on each heating "on" cycle, energizing reversing valve solenoid and pulling in compressor contactor starting compressor and outdoor motor. R-G also make starting indoor blower motor. Heat pump heating cycle now in operation. The second option has no "Auto" changeover position, but instead energizes the reversing valve solenoid constantly whenever the system switch on subbase is placed in "Heat" position, the "B" terminal being constantly energized from R. A thermostat demand for heat completes R-Y circuit, pulling in compressor contactor starting compressor and outdoor motor. R-C also make starting indoor blower motor.

CRANKCASE HEATERS

All units are provided with some form of compressor crankcase heat. Some single phase units utilize the compressor motor start winding in series with a portion of the run capacitor to generate heat within the compressor shell to prevent liquid refrigerant migration.

Some three phase units utilize a wraparound type of crankcase heater that warms the compressor oil from the outside.

Some single and three phase models have an insertion well-type heater located in the lower section of the compressor housing. This is a self-regulating type heater that draws only enough power to maintain the compressor at a safe temperature.

Some form of crankcase heat is essential to prevent liquid refrigerant from migrating to the compressor, causing oil pump out on compressor start-up and possible valve fallure due to compressing a liquid.

Refer to unit wiring diagram to find exact type of crankcase heater used.

The following decal is affixed to all outdoor units detailing start-up procedure. This is very important. Please read carefully.

IMPORTANT

THESE PROCEDURES MUST BE FOLLOWED AT INITIAL START-UP AND AT ANY TIME POWER HAS BEEN REMOVED FOR 12 HOURS OR LONGER.

TO PREVENT COMPRESSOR DAMAGE WHICH MAY RESULT FROM THE PRES-ENCE OF LIQUID REFRIGERANT IN THE COMPRESSOR CRANKCASE

- MAKE CERTAIN THE ROOM THERMO-STAT IS IN THE "OFF" POSITION (THE COMPRESSOR IS NOTTO OPERATE).
- 2. APPLY POWER BY CLOSING THE SYS-TEM DISCONNECT SWITCH THIS ENER-GIZES THE COMPRESSOR HEATER WHICH EVAPORATES THE LIDID RE-FRIGERANT IN THE CRANKCASE.
- 3. ALLOW 4 HOURS OR 60 MINUTES PER POUND OF REFRIGERANT IN THE SYS-TEM AS NOTED ON THE UNIT RATING PLATE, WHICHEVER IS GREATER
- 4. AFTER PROPERLY ELAPSED TIME THE THERMOSTAT MAY BE SET TO OPER-THE COMPRESSOR
- 5. EXCEPT AS REQUIRED FOR SAFETY WHILE SERVICING DO NOT OPEN SYSTEM DISCONNECT SWITCH

7961-061

DEFROST CYCLE

The defrost cycle is controlled by time and temperature. The 240 volt timer motor runs all the time the compressor is operation. When the outdoor temperature is in the lower 4 temperature range or colder, the outdoor coll temperature 32°F or below. This temperature is sensed by the defrost thermostat mounted near the bottom of the outdoor coil on a return bend. The defrost thermostat closes at approximately 32°F. Every 60 (or 30) minutes that the compressor is running, contacts 3–5 close for 7 minutes, with contacts 3–4 closed for the first 40 seconds of that 7 minutes. If the defrost thermostat is closed, the defrost relay energizes and places the system in defrost mode. An interlocking circuit is created with timer contact 3–5 and defrost relay contact 7–9 in series.

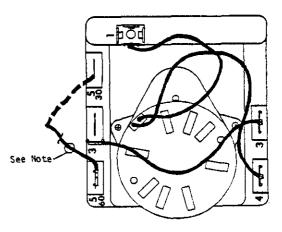
During the defrost mode, the refrigerant cycle switches back to the cooling cycle, the outdoor motor stops, electric heaters are energized, and hot gas passing through the outdoor coil melts any accumulated frost. When the temperature rises to approximately 57°F, the defrost thermostat opens, de-energizing the defrost relay and returning the system to heating operation.

If some abnormal or temporary condition such as a high wind causes the heat pump to have a prolonged defrost cycle, contacts 3-5 of the defrost timer will open after 7 minutes and restore the system to heating operations automatically.

There are two time settings on the defrost timer--30 minutes and 60 minutes. Most models are shipped wired on the 60 minute setting for greatest operating economy. If special circumstances require a change to the shorter time, remove wire connected to terminal 5/60 and reconnect to terminal 5/30.

There is a manual advance knob located on the timer. This can be used to advance timer to contact closure point if it is desired to check out defrost cycle operation, without waiting for time to elapse.

DEFROST TIMER WIRING



NOTE: All models are connected to 5/60 terminal (60 minute).

Any model can be changed from 60 minutes to 30 minutes by unplugging from 5/60 terminal and reconnecting to 5/30 terminal as shown by dotted line.

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 ($6^{\rm H}$ from compressor) as shown in the following table:

Model	Rated Airflow	95°F O.D. Temp.	82°F O.D. Temp.
RPMH30	1100	59 - 61	69 - 71
RPMH 36	1275	58 - 60	70 - 72

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.

SERVICE HINTS

- Caution homeowner to maintain clean air filters at all times. Also, not to needlessly close off supply and return air registers. This reduces air flow through the system, which shortens equipment service life as well as increasing operating costs.
- Switching to heating cycle at 75°F or higher outside temperature may cause a nuisance trip of the manual reset high pressure switch.
- The heat pump wall thermostats perform multiple functions.
 Be sure that all function switches are correctly set for the desired operating mode before trying to diagnose any reported service problems.
- Check all power fuses or circuit breakers to be sure that they are the correct rating.
- Periodic cleaning of the outdoor coil to permit full and unrestricted airflow circulation is essential.

INDOOR BLOWER PERFORMANCE CFM - Dry Coil With Filter							
660	RPMH30 and RPMH36						
E.S.P. In H ₂ 0	High Speed	Medium Speed	Low Speed				
. 0	1425	1225	1130				
.10	1385	1190	1115				
. 20	1330	1150	1085				
, 30	1275	1100	1050				
. 40	1205	1050	1005				
. 50	1130	995	950				
. 60	1060	935	890				

IMPORTANT INSTALLER NOTES

 For improved start-up performance, wash the indoor coil with a dishwasher detergent.

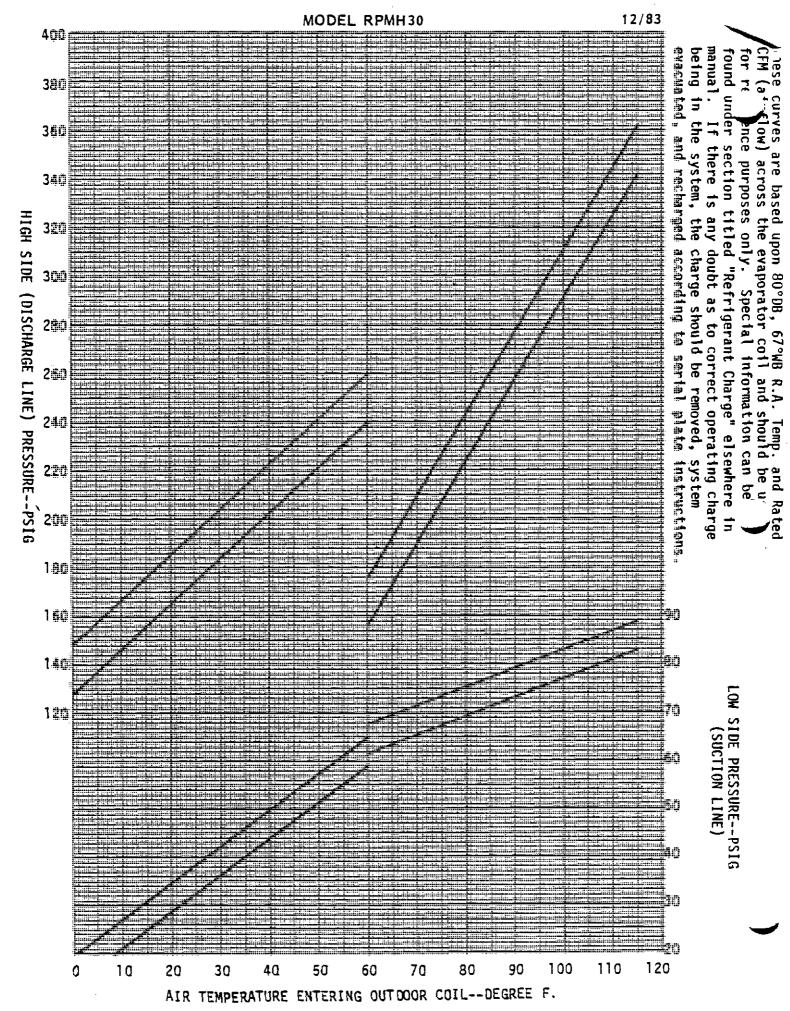
*Time Delay Fuses or "HACR Type" circuit breakers must be used for 60A and smaller sizes. Standard fuses or circuit breakers suitable for sizes 70A and larger.

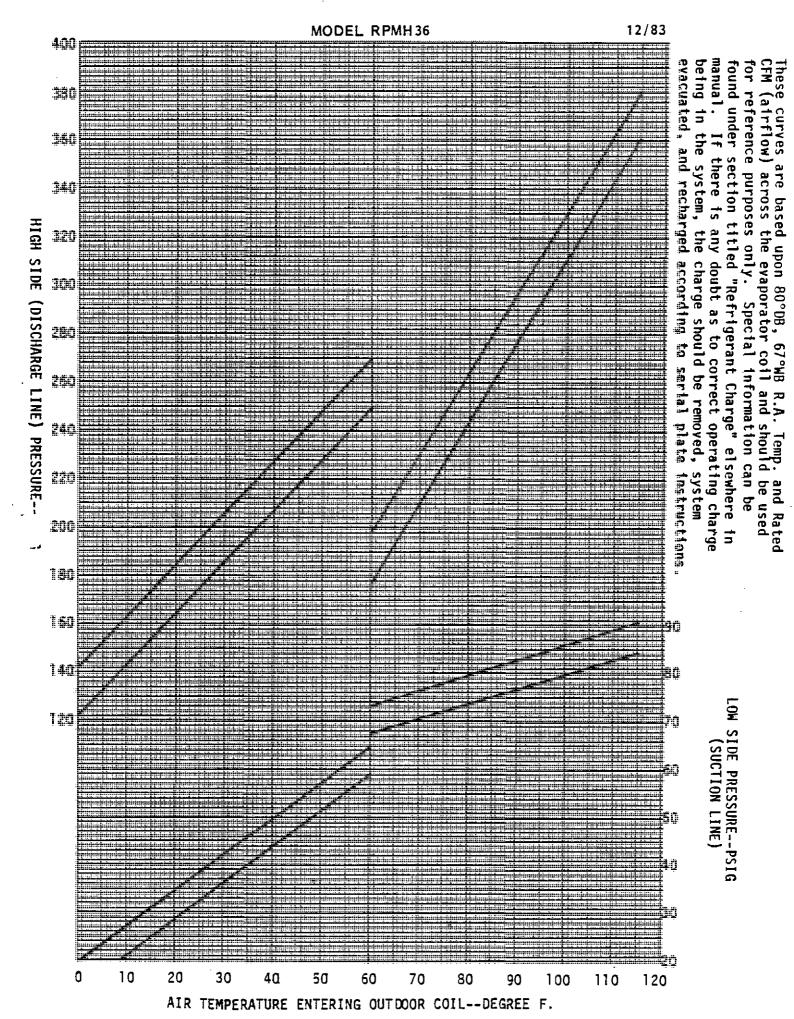
""Max amount of electric heat which can be operated in conjunction with the compressor during heating mode is 10Kw on 1 phase and 12Kw on 3 phase. The balance of the electric heat can be operated only during compressor cut off or emergency heat mode.

***Based on 60°C copper wire.

ELECTRICAL DATA									
	Rated Voits	Heater Kw G	Max. Unit	No. Field Power	Internal Fuses	Maximum Fuse or Circuit Breaker*	Minimum Circuit Ampacity	Field*** Power Wiring	Ground*** Wire Size
Model	& Ph	240V Ar	Amps	Circuits	Ckt.A/B	Ckt.A	Ckt.A	Ckt.A	Ckt.A
RPMH30	230/208-1	0	22.3	1		40	27	10	10
)	5	43, 1	1		60	53	6	10
]	10	63.9	1	60/30	80	79	2	8
	1	**15	65, 3	1	60/60	90	82	2	8
		**20	86	1	60/60	110	108	1	_ 6
RPMH 30-3	230/208-3	0	16.3	1		30	19	12	12
	}	6	30.7	1		45	37	8	10
		9	38	1		50	46	6	10
		12	45.2	1	}	60	55	6	10
		**18	46. 2			60	58	4	10
R PMH 30- 3	460-3	0	8. 2	1		15	15	14	14
		6	15.4	1		20	19	12	12
		9	19	1		25	23	10	10
	1	12	22.6	1	\	30	28	10	10
		* ≐ 18	23.1	1	<u>. </u>	30	29	10	10
RPMH 36	230/208-1	0	24.3	1		45	29	10	10
		5	45.1	1	i	60	55	6	10
		10	65.9	1	60/30	90	82	2	8
	i	**15	65. 9	1	60/60	90	82	2	8
	ļ	**20	86	ī	60/60	110	108	1	- 6
RPMH 36-3	230/208-3	0	17.3	1		30	21	12	14
	1	6	31.7	1 .		45	39	8	10
]	9	39	1	1	50	48	6	10
		12	46.2	1		60	57	4	10
	<u> </u>	**18	46.2	1		60	58	4	10
RPMH 36-3	460-3	0	9,2	1		15	15	14	14
	1	6	16.4	1	i	25	20	10	10
		9	20	1		25	25	10	10
		12	23.6	1	ļ	30	29	10	10
	,	**18	23.6	3	}	j 3 0	29	10	10

†See footnotes above.





PARTS LIST SINGLE PACKAGE HEAT PUMPS

		_				1	
			m		ښ	m	6
1		0	Ģ	9	R P/MH 36-	RPMH 30- 460V	RPMH36-3 460V
1				RPMH 36	Ξ	± 6	∓ 9
PART NO.	DESCRIPTION	R PMH 30	R PMH 30-	₽	E E	_ ₹	₹ 3
1		~	₹	~	×	~	ď
5202-003	A a			-			
5202-003	Accumulator Accumulator	×	х	×			
\$202-004	Blower Housing 10-8	×	×	×	×	X	X
5152-010	Blower Wheel DD10-7A	×	x		X,	×	×
8552-035	Capacitor 40/370V	x	^	×	^	^	^
8552-019	Capacitor 5/440V	×	×	×	×	×	×
8552-002	Capacitor 5/370V	×	×	×	×	×	×
5811-033	Capillary Tube - Cool	(2)	(2)	(2)	(2)	(2)	(2)
5811-020	Capillary Tube - Heat	х	×	×	×	х	×
5651-036	Check Valve	×	×	×	×	×	×
8000-052	Compressor CRG1-0250-PFV-270	×					
8000-053	Compressor CRG1-0250-TF5-270		×				
8000-054 8000-055	Compressor CRG1-0250-TFD-270					×	
8000-056	Compressor CRH 1-0275-PFV-270 Compressor CRH 1-0275-TF 5-270			X	L.		
8000-057	Compressor CRH1-0275-TFD-270	+			×	1	×
5051-003	Condenser Coil	×	x	×	×	×	X
8401-007	Contactor 1P25A	Î	^	x	• •	^	^
8401-002	Contactor 3P25A	1	×		X	×	х
8401-006	Contactor 2P20	×	×	×	×		
8408-004	Defrost Mounting Plate	×	×	×	×	×	×
8408-002	Defrost Thermostat	х	×	×	×	×	×
5060-022	Evaporator Coil	×	×	×	×	x	×
5151-024	Fan Blade A-1831-5	X	×	×	×	×	×
7051-014	Fan Guard	×	×	×	×	×	X
8614-006	Fuse OT30	×		×			
8614-007 8614-022	Fuse OT 60 Fuse TR 60	×		×		ļ	
8614-022	Fuse Block	×		×		[
8614-018	Fuse Block	×		x			
8604-023	Heat Strip SKw	+ 2 +		$\frac{\hat{x}}{x}$		 	
8604-024	Heat Strip 10Kw	×		×			
8604-025	Heat Strip 15Kw	×	- 1	x			
8604-064	Heat Strip 6Kw	1 1	×		x		
8604-035	Heat Strip 9K w		×	1	×	ĺ	
8604-036	Heat Strip 12Kw	1	×		x		
8604-065	Heat Strip 6Kw			-		×	×
8604-032	Heat Strip 9Kw	1 1				X	X
8604-033	Heat Strip 12Kw	1				X	X
8406-011 8402-020	High Pressure Switch Limit Switch 135°-120°	×	×	×	×	×	×
8105-010	Motor - Blower 1/3 hp	×	×	×	×	X	×
8103-010	Motor - Fan 1/5 hp	×	- ^	- x	 	X	_ <u>^</u>
8200-003	Motor Mount - Blower	x	â	x	x	x	x
8200-022	Motor Mount - Fan	×	×	×	×	x	x
5451-011	Motor Mounting Parts	×	×	×	×	х	х
5451-009	Motor Mounting Parts ~ Fan	×	×	×	×	×	×
5153-022	Rain Shield	x	×	×	×	×	×
8201-009	Relay - Blower	×	×	×	×	×	×
8201-013 8201-023	Relay - Emergency Heat	×	×	Š	×	×	X
8201-023	Relay - Defrost Relay - Compressor Fault	X	×	×	<u>x</u>	×	<u>x</u> _
5650-005	Reversing Valve	X	_ x	^ }		×	
5650-006	Reversing Valve	^	^	×	×	^	x
5650-008	Solenoid Coil	×	×	×	×	x	
5210-004	Strainer	×	×	×	×	×	x
5210-002	Strainer	×	x	×	x	х	x
8607-010	Terminal Board	×	×	X	×	X	х
8607-001	Terminal Block	x		×			
8607-002	Terminal Block	1	x		×	X	X
8402-030	Thermal Cutoff	X	×	×	×	×	X
8612-011 8407-015	Timer w/7 Minute Time Safe Transformer	×	×	X X	x x	x x	×
8407-013	Transformer - Stepdown 1.5 KVA	_ ×	^	^	^	×	×
440,-003	Transformer propagati 113 KAM	1 1		<u> </u>			

^{*}Please order by model number.

