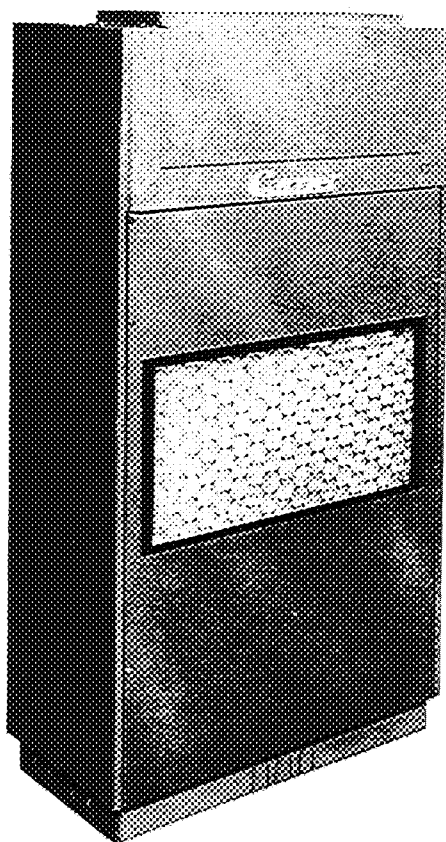


Carrier

COOLING 24,000 Btuh
HEATING 24,400 Btuh

50KQ



50KQ002

Water Source Heat Pump

DESCRIPTION

The 50KQ Water Source Heat Pump Package is designed for use in apartments and commercial buildings where individual temperature control is needed. It is used with a closed-loop water system which includes a boiler and an evaporative condenser to maintain the water temperature.

The unit can be conveniently installed in a closet, thru a hallway wall or similar interior location.

The unit is a water-to-air heat pump consisting of compressor, coils, water-cooled condenser-chiller and controls. Its removable front and rear panels provide easy installation and service.

A remote control thermostat operates on a 24-volt circuit, field wired to the control box in the unit. Nominal cooling capacity of 24,000 Btuh and heating capacity of 24,400 Btuh are provided.

FEATURES

- **Individual Temperature Control** — Each unit provides heating or cooling as desired by the occupant at any time of the year.
- **Low Sound Level** — Quiet centrifugal fan discharges air into fiber glass lined attenuation chamber.
- **Piping Costs Cut** — Only two uninsulated pipes are needed for the system. Requires 25% less circulated water than a typical central system.
- **Plug and Receptacle Connectors** — Provided in power and control wiring for easy service.
- **Chassis** — Includes the coil capillaries, condenser-chiller, reversing valve, compressor and controls. Readily serviced.
- **Flexible Hoses** — Connect supply and discharge water piping and condensate drain thru any side of unit base (knockouts provided).

PHYSICAL DATA

UNIT 50KQ	002
OPERATING WEIGHT (lb)	310
REFRIGERANT	R-22
Factory Charge (lb)	3.3
COMPRESSOR	6A23
EVAP FAN MOTOR	
Hp	$\frac{1}{5}$
Rpm, 60-Cycle	1075/950/825
EVAP FANS	
Double-Inlet, Centrifugal, No.	2
Cfm Range	500 - 900
EVAP COIL	
Plate Fins/In.	13
Face Area (sq ft)	1.92
Rows	3
FILTERS	
Number	1 throwaway
Size (in.)	14 x 25 x 1
DIMENSIONS (ft-in.)	
Length	A 2 - 5
Width	B 1 - 2
Height	C 4 - 6
OPENINGS (in.)	
Power Supply, Knockout	D $\frac{3}{4}$
Control Wiring, Knockout	E $\frac{3}{4}$
Supply Air	F 8 x 22
Return Air	G 13 x 25
CONNECTIONS (in.)	
Water Supply	H $\frac{1}{2}$ IPS
Water Return	J $\frac{1}{2}$ IPS
Condensate	K $\frac{3}{4}$ IPS

HEATING RATINGS*

INDOOR AIR Edb (F)	COND-CHILLER ENT WATER TEMP (F)									
	50		60		75		85		95	
	HC	KW	HC	KW	HC	KW	HC	KW	HC	KW
60	23	2.0	26	2.2	30	2.4	32	2.5	34	2.5
70	22	2.1	25	2.3	30	2.5	32	2.7	34	2.8
80	21	2.2	24	2.4	29	2.7	32	2.9	33	3.0

HC - Heating Capacity (1000 Btuh)

KW - Compressor Motor Power Input

*Based on nominal 3.2 gpm thru condenser-chiller and fan motor operating at high speed.

Heating Capacity and Kw Multiplier

For Other Than Nominal Gpm

GPM	1.5	2	3	4
MULTIPLIER	.875	.925	.985	1.100

COOLING RATINGS*

INDOOR AIR		CONDENSER-CHILLER ENT WATER TEMP (F)														
		50			60			75			85			95		
Cfm	Ewb	TC	SHC	KW	TC	SHC	KW	TC	SHC	KW	TC	SHC	KW	TC	SHC	KW
630	72	-	-	-	27	13	2.3	26	13	2.5	25	12	2.7	23	12	2.8
	67	26	17	2.0	25	16	2.1	24	16	2.4	22	15	2.5	21	15	2.7
	62	24	20	2.0	23	19	2.1	22	18	2.2	20	18	2.5	18	17	2.5
720	72	-	-	-	27	14	2.3	27	13	2.5	25	13	2.7	24	12	2.8
	67	26	17	2.0	26	17	2.1	25	17	2.4	23	16	2.5	21	15	2.7
	62	25	21	2.0	24	20	2.1	22	20	2.3	21	19	2.5	19	18	2.6
830	72	-	-	-	-	-	-	27	14	2.6	26	13	2.8	25	12	2.9
	67	27	18	2.1	26	18	2.2	25	17	2.4	24	17	2.6	22	16	2.8
	62	25	22	2.0	24	22	2.1	23	21	2.3	21	20	2.5	20	19	2.6

TC - Total Cooling Capacity (1000 Btuh)

SHC - Sensible Heat Capacity (1000 Btuh)

KW - Compressor Motor Power Input

*Based on nominal 3.2 gpm thru condenser-chiller.

Cooling Capacity and Kw Multipliers

For Other Than Nominal Gpm

GPM	1.5	2	3	4
CAPACITY MULTIPLIER	.875	.915	.985	1.05
KW MULTIPLIER	1.13	1.10	1.02	0.94

ARI RATINGS*

Standard Cooling Rating - 24,000 Btuh

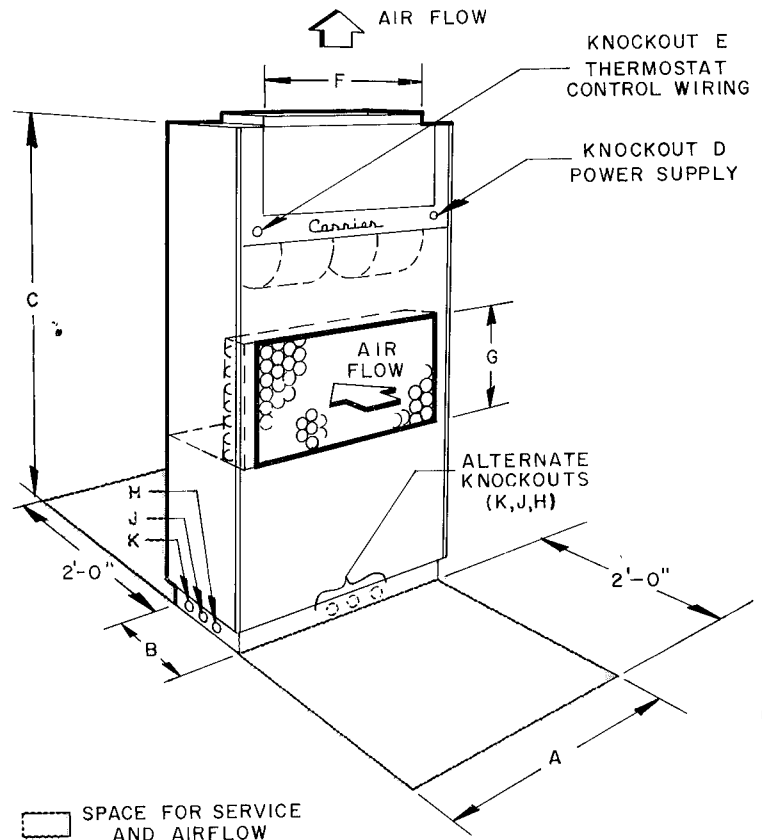
For air at 80 F db, 67 F wb entering indoor coil; 75 F water entering condenser; 95 F water leaving condenser.

Standard Heating Rating - 24,400 Btuh

For air at 70 F db entering indoor coil; 60 F water entering chiller; 45 F water leaving chiller.

*Rated in accordance with ARI Standard 240-64.

DIMENSIONS



SELECTION PROCEDURE

Determine the **cooling load** (Btuh), the entering air wet-bulb temperature (ewb), and the indoor air quantity (cfm).

Assuming nominal (3.2) gpm thru the condenser-chiller, enter Cooling Ratings and determine the total capacity which most closely approximates or is greater than the cooling load.

Apply a multiplier to the capacity or power input if other than nominal gpm is used.

Find entering water temperature needed to match the cooling load during cooling season at indoor design ewb.

Determine the **heating load** (Btuh) and the entering air dry-bulb temperature (edb).

Assuming nominal (3.2) gpm thru the condenser-chiller, enter the Heating Ratings with edb and find the nearest heating capacity equal to or greater than the heating load.

Apply a multiplier to capacity or power input if other than nominal gpm is used.

Determine entering water temperature needed to match the heating load during heating season at indoor design edb.

Enter Fan Performance table at design air quantity (cfm) to determine available **external static pressure**.

From Condenser-Chiller Water Pressure Drop table, determine **pressure drop** at selected gpm.

FAN PERFORMANCE

CFM	EXTERNAL STATIC PRESS. (in. wg)			
	Fan Speed			
	Cooling			Heating
	High	Medium	Low	High
500	.40	.35	.29	—
550	.37	.32	.25	—
600	.35	.27	.17	—
650	.31	.22	.05	.43
700	.27	.13	—	.38
750	.21	.03	—	.34
800	.15	—	—	.27
850	.07	—	—	.20
900	—	—	—	.12
950	—	—	—	.02

NOTE: Evaporator fan motor factory-wired for high speed. Wire in field for lower speeds.

CONDENSER-CHILLER WATER PRESSURE DROP

WATER QUANTITY- THRU CONDENSER- CHILLER (gpm)	1.5	2.0	2.5	3.0	3.2	3.5	4.0
PRESS. DROP (ft water)	3.4	5.8	8.7	12.0	13.5	16.0	20.5

ELECTRICAL DATA (60-cycle)

VOLTS	COMPRESSOR		BRANCH CIRCUIT*		
PHASE	Locked Rotor (amp)	Full Load (amp)	Wire, Max Ft AWG No.	Fuse† (amp)	
230	60	16.8	65	100	25
3			10	8	

*Branch circuit wire size and corresponding max wire lengths tabulated results in a 1% voltage drop at nameplate full load amperage.

†Dual element fuse and wire size per National Electric Code.

NOTES: 1. Minimum low voltage control circuit wire size is No. 18.

2. Power supply voltage must be within $\pm 10\%$ of nameplate voltage. Extended operation at the extremes is not recommended.

CONTROL SEQUENCE

Cooling

With power to the unit, selector switch on COOL, and fan switch on AUTO:

When room thermostat calls for cooling, compressor starts, indoor fan motor starts, and reversing valve solenoid is energized. When thermostat is satisfied, compressor and indoor fan motor stop, while reversing valve solenoid remains energized as long as selector switch is on COOL. If any compressor safety device opens, compressor is de-energized while indoor fan motor continues to run.

Continuous fan operation can be accomplished by placing fan switch in FAN position.

Heating

With power to the unit, selector switch on HEAT, and fan switch on AUTO:

When room thermostat calls for heat, compressor starts, indoor fan motor starts, and reversing valve solenoid remains de-energized, causing evaporator coil to function as a condenser. When thermostat is satisfied, compressor and indoor fan motor stop, and reversing valve solenoid remains de-energized.

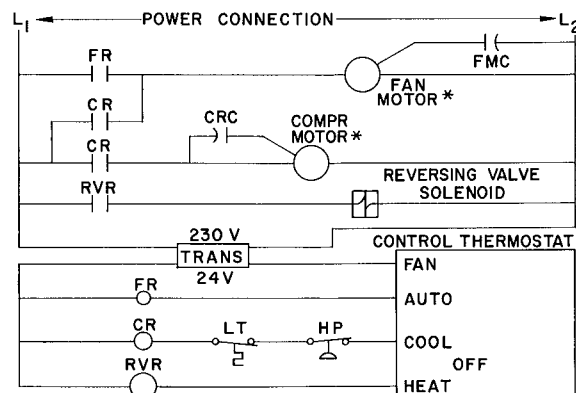
Safety Controls

The compressor motor has an internal line break overload. Fan motor is also internally protected.

A high pressure control shuts off the compressor in response to high condensing pressure.

A safety thermostat shuts off the compressor in response to low water temperature.

TYPICAL CONTROL SCHEMATIC



CR - Compressor Relay

CRC - Compressor Run Capacitor

FMC - Fan Motor Capacitor

FR - Fan Relay

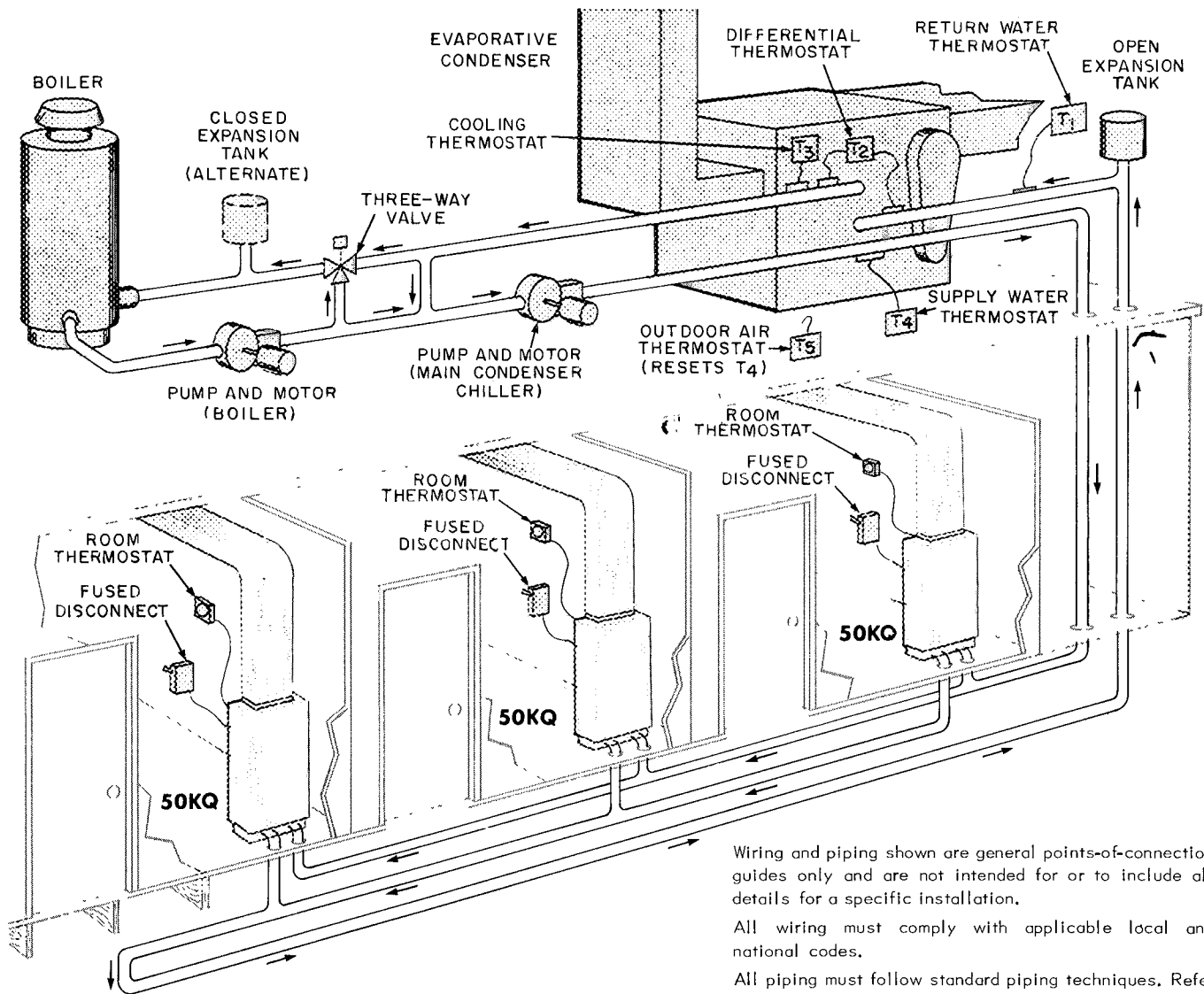
HP - High Pressure Switch

LT - Low Temperature Switch

RVR - Reversing Valve Relay

*Compressor motor and fan motor internally protected.

TYPICAL PIPING AND WIRING DIAGRAM



GUIDE SPECIFICATIONS

Furnish and install _____ single-package water-to-air heat pump(s) in a closed-loop water system. The water system shall consist of an evaporative condenser and a boiler for maintaining water temperature.

The heat pump unit shall include a compressor, coil, water-cooled condenser-chiller and controls.

Cooling capacity of the unit shall be _____ Btuh or more with an indoor air quantity of _____ cfm, entering wet-bulb temperature of _____ F, and a _____ F temperature of water entering condenser-chiller coil.

Heating capacity of the unit shall be _____ Btuh or more with an indoor air temperature of _____ F and a _____ F temperature of water entering condenser-chiller coil.

The unit shall contain a welded hermetic compressor with internal spring vibration isolators and an internal line break overload.

Evaporator coils shall be of nonferrous construction with

aluminum plate fins mechanically bonded to a seamless copper tube with all joints brazed.

Condenser-chiller coils shall be all copper, concentric, double tube.

The air-moving device shall be a propeller fan direct driven by a heavy duty, permanently lubricated motor of 1/5 hp.

The cabinet shall be constructed of galvanized steel, bonderized and finished with baked enamel. Optional openings shall be provided for power and wiring connections. Removable front and rear panels shall permit easy access for servicing.

The control assembly shall contain a 230/24-volt transformer wired in the control box, furnishing low-voltage power to the wall thermostat.

The unit shall have a length of _____ in. or less, a width of _____ in. or less, and a height of _____ in. or less.