

Installation, Start-Up and Service Instructions

→ Table 1 — Accessory Heating Coil Package Usage

BASE UNIT MODELS				HEATING COIL PACKAGES			PAGE
40		50		Hot Water	Steam Distributing		
RR	RS	BT,BU	BD	2-Row	1-Row	2-Row	
—	—	004,006	—	*50BA-900---091	—	—	7
008	008	008	008	38R8-114	38R8-304	—	3
—	010	012	012	—	—	—	—
012	012	—	—	38R12-114	38R12-304	—	4
—	014	—	—	—	—	—	—
RR	RS	BA,BB	BD	38RR900-061	38RR900-081	38RR900-091	2,3
014	016	016	016				
016	024	024	024				
024	—	—	—				
028	028	028	—	41E34-384	41E34-394	—	6
034	034	034	—	—	—	—	—

*One-row coil for use with steam or hot water.

NOTE Heating coil packages do not include tube and pipe fittings

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INSTALLATION

⚠ CAUTION

- A. Wear a hard hat and safety shoes when working in an area where there is danger of falling objects. Wear safety glasses to protect your eyes. When welding, brazing or cutting, wear gloves and goggles for personal protection.
- B. Follow safe rigging practices when handling larger coils.
- C. Refer to ANSI Z49.1-1973 (or latest edition) for American Welding Society Standards of safe welding and flame cutting practices.
- D. All field piping must conform to local codes.

General — Each heating coil package contains the coil assembly and a fastener package with required installation hardware. Base unit models and corresponding heating coil packages are shown in Table 1

Inspection — Check for transportation damage. File damage claim with transportation agency.

Layout and Cutting of Piping Holes — Refer to instructions for coil installation details as applicable to job. Then:

1. Lay out piping holes according to dimensions shown, provided recommended fittings are used.
2. With heating coil in place, check accuracy of layout.
3. Cut holes using Table 2 for reference.
4. Install coil as described in the section applicable to the coil.

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Table 2 — Hole Size for Standard Pipe

PIPE SIZE (in.)	HOLE SIZE (in. diam)
1¼ MPT	1¾
1½ MPT	2
2 MPT	2½
2½ MPT	3
3 MPT	3½

Steam Supply Valve — Install a steam supply valve to provide a positive method for shutting off steam to the steam distributing coils.

⚠ CAUTION

Operating the unit with discharge air temperatures above 140 F may cause the motor internal klixon to open or may cause eventual motor burnout.

Return Steam Trap

1. Install a steam trap of adequate size in the steam distributing coil return line.
2. Select a trap which passes at least twice the coil condensate rating at minimum steam line pressure. The float and thermostatic type of steam trap is recommended because of its ability to handle large volumes of condensate and prevent the flow of steam around the float valve. Do not use a plain thermostatic trap. The sudden arrival of cold weather will result in reduced steam line pressures.

Hot Water Coil Vent — Hot water coil may be vented by loosening the pipe plug located in the top end of the return manifold.

38RR Heating Coils

⚠ CAUTION

- A. When raising coils, wear hard hat, safety shoes and follow safe rigging practices.
- B. Before welding or brazing, refer to standards for details of safe welding/brazing practices; wear goggles and gloves.

The 38RR accessory heating coils are designed to be mounted on the top of the unit evaporator coils. They are designed to be used with fan-coil, self-contained or condenserless models.

The smaller size coils are shipped as one-piece coils and the larger coils are shipped in sets of 2 and 3 coils. All necessary fasteners, support assemblies and coil mounts are included in package.

The fan motors are mounted in the airstream and can be damaged if the discharge air temperature of the heating coil exceeds 140 F.

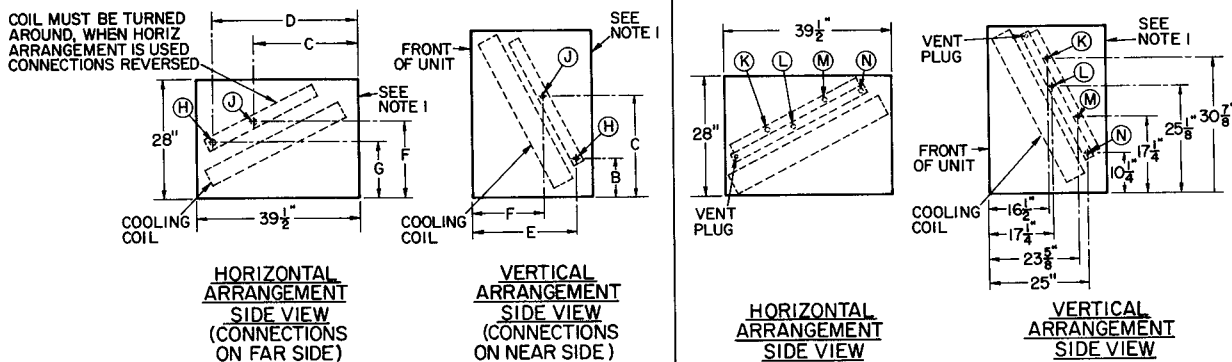
HOT WATER COILS

38RR900061 (Used on 40RR014,016,024; 40RS016, 024 and 50BA, BB, BD016 and 024 units.) — This 2-row hot water heating coil package consists of:

1. One assembly coil
2. One R.H. support angle
3. One L.H. support angle
4. One bag of fasteners which consists of twelve #10B x 1/2 lg hex head sheet metal screws.

Install coil as follows:

1. Remove coil section rear panels.
2. Lay out and cut piping holes on right-hand end of coil section. See Fig. 1 for location of holes and pipe sizes.



STEAM DISTRIBUTING HEATING COILS (in.)

UNIT SIZE	COIL	B	C	D	E	F	G	SUPPLY	RETURN
40RR014,016 40RS016 50BA, BB, BD016	1-Row	10¾	23¾	36	24¾	18¾	6¾	(J) 1¼ MPT	(H) 1¼ MPT
	2-Row	12¾	24¾	36	24¾	18¾	6	(J) 1½ MPT	(H) 1½ MPT
40RR, RS024 50BA, BB, BD024	1-Row	9¾	12¾	35¾	25¾	19	12¾	(J) 1¼ MPT	(H) 1¼ MPT
	2-Row	11¾	23¾	25¾	25¾	19	12¾	(J) 1½ MPT	(H) 1½ MPT

2-ROW HOT WATER HEATING COILS (in.)

UNIT SIZE	SUPPLY	RETURN
40RR014,016 40RS016 50BA, BB, BD016	(K) 1½ MPT	(L) 1½ MPT
	(M) 1½ MPT	(N) 1½ MPT
40RR, RS024 50BA, BB, BD024	(K) 1½ MPT	(L) 1½ MPT
	(M) 1½ MPT	(N) 1½ MPT

NOTES.

1. Hole location dimensions are taken from the edge of the side panel, and do not include front, rear, or end panel thickness of 5/8 inch
2. For horizontal arrangement, connections may be made to left-hand side of unit
3. For vertical arrangement, connections may be made to right-hand side of unit.

Fig. 1 — Dimension Drawing

3. Fasten coil support angle to coil baffle with sheet metal screws included in bag of fasteners. See Fig. 2.
4. Lay the heating coil on top of the coil support angles with the manifolds on the same side as the evaporator coil manifolds.
5. Fasten coil to support angles with sheet metal screws included in bag of fasteners. See Fig. 3.

STEAM DISTRIBUTING COILS

38RR900-081 and 38RR900-091 (Used on 40RR014, 016,024; 40RS016,024 and 50BA,BB,BD016,024 units.)
— This 1-row or 2-row heating coil package contains:

1. One heating coil assembly
2. One R.H. support angle
3. One L.H. support angle
4. One bag of fasteners which consists of twelve #10B x 1/2 lg hex head sheet metal screws.

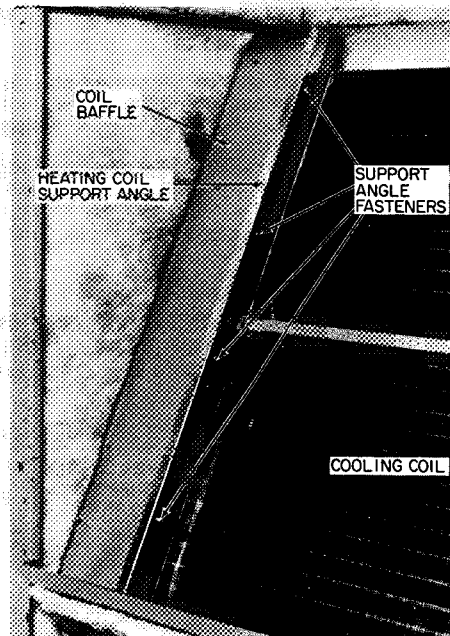


Fig. 2 — Left-Hand Coil Support Angle Mounted on Coil Baffle (Typical for 016 and 024 Sizes)

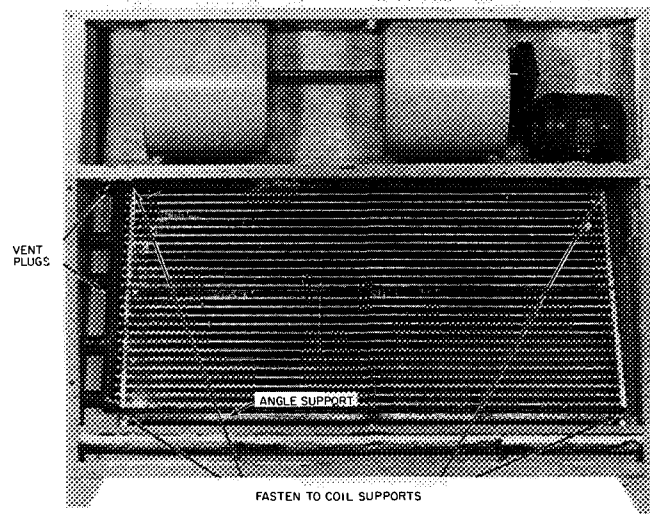


Fig. 3 — Hot Water Coil Mounted Unit with Back Panels Removed (Typical for 40RR016,024)

Procedures for installation of these coils is the same as for hot water coil installation in this book with the exception of dimension locations and holes to be cut. Refer to Fig. 1 for this information.

38R Heating Coils

⚠ CAUTION

- A. When raising coils, wear hard hat, safety shoes and follow safe rigging practices.
- B. Before welding or brazing, refer to standards for details of safe welding/brazing practices; wear goggles and gloves.

INSTALLATION IN 40RR,RS UNITS

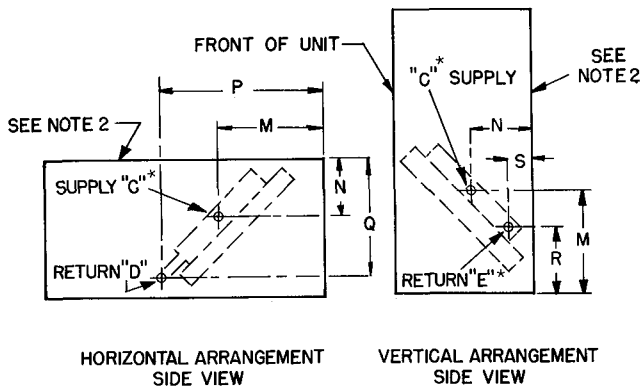
1. Remove the accessible front or back base section panel of 40RR,RS unit.
2. Snap the 4 Tinnerman speed nuts over the heating coil mounting holes. Two mounting holes are located in each lip of the evaporator coil tube sheet.
3. Remove coil from shipping skid.

38R8 and 38R12 One-Row Steam Distributing Coils

1. Coils are shipped for vertical unit installations. For horizontal unit installations, remove pipe cap at end of vertical pipe nipple and use it to cap the horizontal pipe nipple at the other end of the return manifold (Fig. 4).
2. Determine through which side of the unit coil piping is to run. Piping may be run through either side by turning over the coil.
3. Fasten the coil mounting spacer to the underside of the return bend tube sheet (Fig. 5). Spacers provide the pitch required for proper coil drainage to the manifold.
4. Lay the heating coil on top of the evaporator coil with the vertical pipe nipple up (unit standing upright).
5. Fasten the heating coil to the evaporator coil tube sheet with the provided screws.

38R8 and 38R12 Two-Row Hot Water Coils

1. Coils are shipped for vertical unit installation. For horizontal unit installation, remove pipe plug at end of the return manifold and use it to plug the return on the side of the return manifold. *The single plug at the other end of the return manifold is a vent plug only. Do not use it as a return.*
2. For vertical installations, lay the heating coil on top of the evaporator coil with the manifolds on the same side as the evaporator coil manifolds. For horizontal installations, rotate the heating coil 180 degrees (manifolds will be on return bend side of evaporator coil).
3. Fasten coil to evaporator coil tube sheet with the provided screws.
4. For horizontal installations, add pipe nipple and elbow to end of return manifold (Fig. 4).

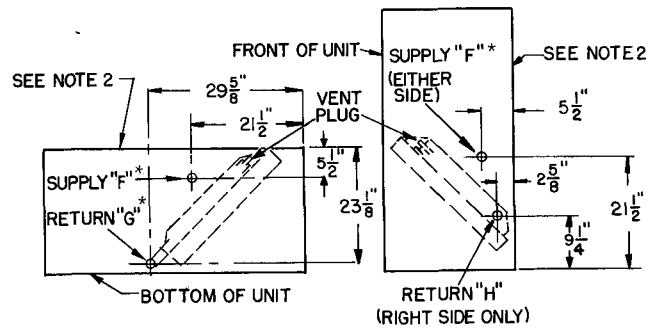


HORIZONTAL ARRANGEMENT SIDE VIEW VERTICAL ARRANGEMENT SIDE VIEW

STEAM DISTRIBUTING HEATING COILS
DIMENSIONS (in.)

COIL TYPE	M	N	P	Q	R	S
1-ROW	19%	12½	30%	23¼	10%	3%

COIL TYPE	SUPPLY	RETURN
1-ROW	C 1¼ MPT conn	D 1¼ FPT conn after adding 1¼ — 90° elbow. E 1¼ MPT



HORIZONTAL ARRANGEMENT SIDE VIEW VERTICAL ARRANGEMENT SIDE VIEW

2-ROW HOT WATER HEATING COIL
DIMENSIONS (in.)

SUPPLY	F	1¼ FPT conn after adding 1¼ — 90° elbow.
RETURN	G	1¼ FPT conn after adding 1¼ nipple, 7 in long, and 1¼ — 90° elbow
	H	1¼ FPT conn (right-hand side only)

*Coils may be installed with connections at either side of unit

NOTES

- Dimensions shown are for suggested hole locations, provided recommended fittings are used. Holes to fit piping must be cut in the field. Tube and pipe fittings indicated are not furnished by Carrier
- Hole location dimensions are taken from the edge of the side panel and do not include front or end panel thickness of ¼ inch

Fig. 4 — 38R Heating Coil Connections and Piping Holes (40RR,RS Unit)

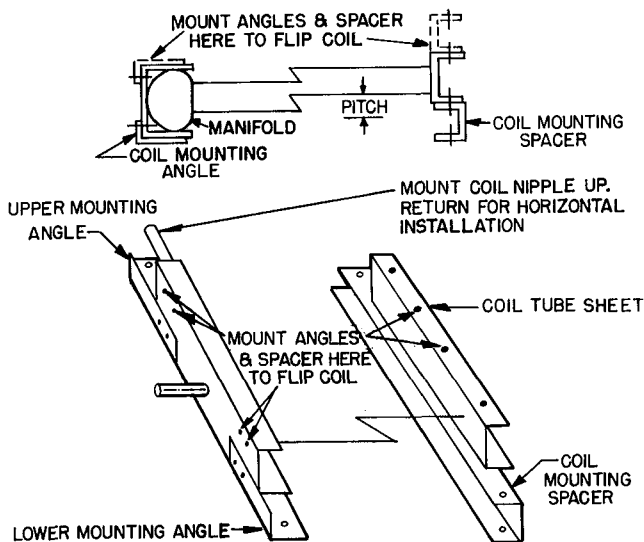


Fig. 5 — Coil Mounting Angles and Spacers

Heating Coil Baffle — Install heating coil baffle to reduce amount of air bypassing the coil. Locate baffle across the front of the unit under motor mounting channel (Fig. 6).

- Cut out upper corner of baffle as shown in Fig. 6. To be effective, baffle must extend the full length of the evaporator coil.
- Loosen the screws holding the condensate deflector to the condensate trough. The trough is welded to the unit support angle running across the front of the unit.
- Baffle must be slipped between condensate trough and condensate deflector. Notch the baffle to permit it to slip around the screws which join the deflector and trough.

- Slip baffle into place with leading edge as close as possible to the heating coil. Secure by tightening the screws.

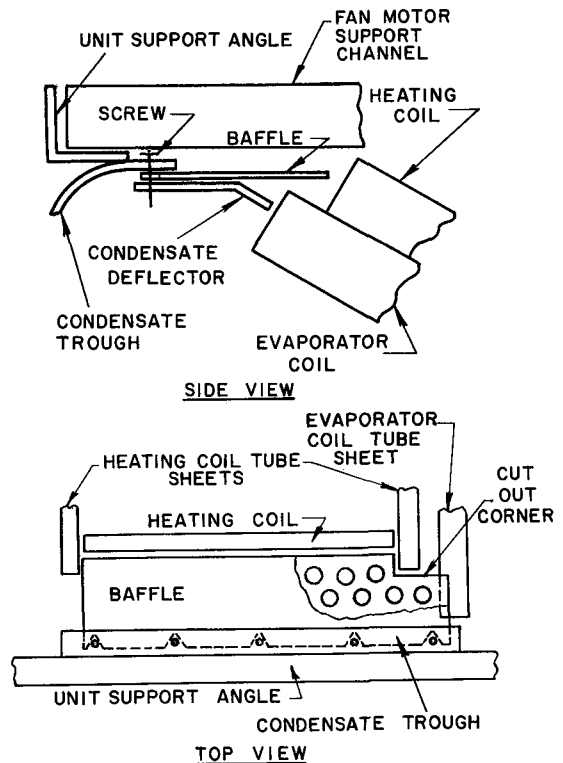


Fig. 6 — Heating Coil Baffle
(Used on 40RR,RS08,010,012,014 and 50BT,BU,BD08,012 Units)

INSTALLATION IN 50BT,BU,BD008,012 UNITS

1. Remove the front access panel from the unit.
2. Remove the coil from the skid.
3. Snap the 4 Tinnerman speed nuts over the heating coil mounting holes.
4. For nonfreeze coils, fasten the coil mounting spacer to the underside of the return bend tube sheet (Fig. 7). Spacer provides pitch necessary for proper coil drainage to the manifold.
5. When 2-row hot water coils are used, separate the tube sheets of the heating and evaporator coils with the felt gasket supplied.

Brackets For 50BT,BU,BD008 Units Only

1. Four brackets are supplied with the heating coil package. Mount 2 brackets on unit evaporator coil, using the bottom holes in the tube sheets (Fig. 7).
2. Mount the remaining 2 brackets on the upper portion of the evaporator coil tube sheets so that the distance between holes in the upper and lower brackets is 25 inches.
3. Mount the heating coil to the 4 brackets, using the screws provided, so that the coil clears the condensate pan.

For BT,BU,BD012 Units Only — Mount the heating coil (hot water) or heating coil and spacer (steam distributing) directly to the evaporator coil tube sheet, using the screws provided, so that coil clears the condensate pan. The brackets included in the coil package are not required.

Heating Coil Baffle — Install heating coil baffle to reduce the amount of air bypassing the heating coil. Install baffle on the upper portion of the evaporator coil, using the screws provided (Fig. 7).

Layout and Cutting of Piping Holes

1. Lay out piping holes according to dimensions shown in Fig. 8.
2. With heating coil in place, check accuracy of layout.
3. Cut holes using Table 2 for reference.

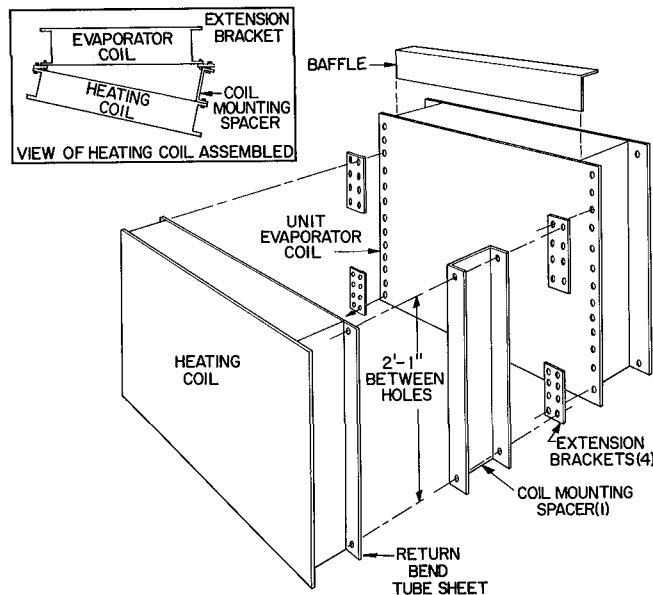
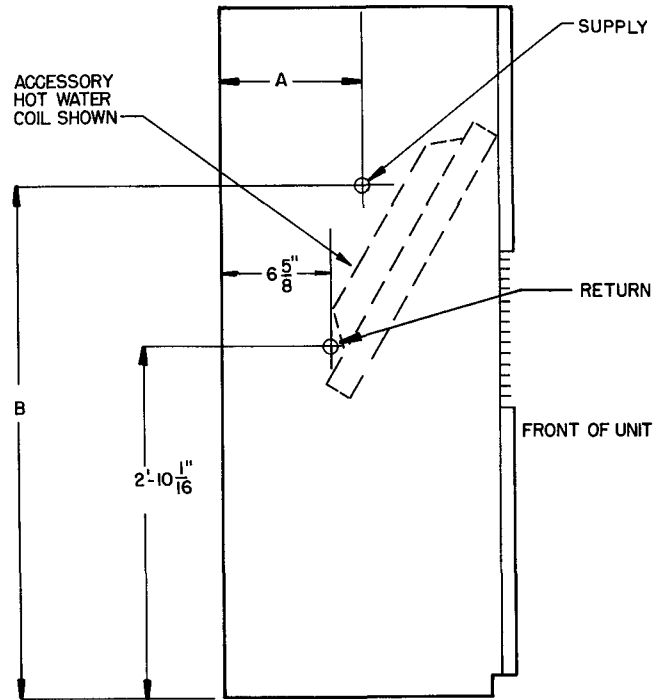


Fig. 7 — 38R8 Steam Distributing Coil Installation (50BA,BB)



DIMENSIONS (in.)

COIL TYPE	A	B
Two-Row Hot Water	0-8¼	4-1¼
One-Row Steam Distributing	1-1	3-8 ¹ / ₁₆

NOTES

1. Hole location dimensions are taken from edge of side panel and do not include front, rear or end panel thickness
2. Supply and return heating coil connections are ¼ in MPT

Fig. 8 — 38R Heating Coil Piping Holes (50BT,BU008 and 012)

41E34 Heating Coils

⚠ CAUTION

- A. When raising coils, wear hard hat, safety shoes and follow safe rigging practices.
- B. Before welding or brazing, refer to standards for details of safe welding/brazing practices; wear goggles and gloves.

Each coil package contains 2 coil assemblies, a fastener package containing the necessary hardware for coil installation, coil center support hook, and installation instructions.

Run the coil piping through the side of the unit opposite the unit fan motor to service the fan motor and drive easily.

Flip the steam distributing coils end for end and rotate the hot water coil 180 degrees to run the coil piping through either side of the base unit. If possible, install the heating coils in the unit before moving unit to its final location.

INSTALLATION IN 40RR,RS028,034 AND 50BA, BB028,034 UNITS

1. Remove unit end panels.
2. Check layout of holes in coil tube sheets for the respective coils as specified in Fig. 9.
3. If the layout does not check, lay out the 2 required holes in each end tube sheet. Each type of heating coil requires a different set of mounting holes, Fig. 9.
4. Drill the laid out holes using an 11/32-in. drill.

CAUTION

Exercise care when drilling coil mounting holes so as not to damage the evaporator coil tubing. Place a piece of wood between the tube sheet and the coil return bends.

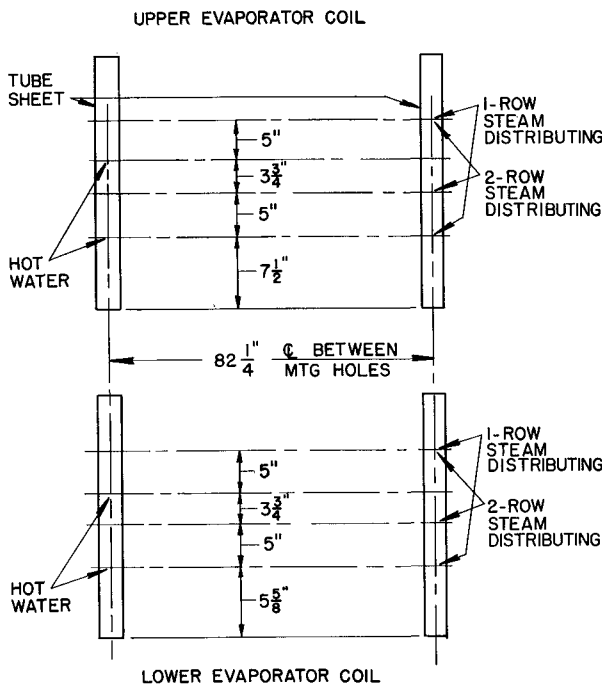


Fig. 9 — Layout for Coil Mounting Holes

Assemble Center Support Hook to Coil

1. Determine through which side of the unit the coil piping is to run and on which of the 2 evaporator coils it is to be installed.
2. The center support hook must be assembled at the top and to the underside of the coil clamp assembly.
3. Assemble the support hook to the tube sheet by means of the coil clamp bolt. See Fig. 10 for the proper hook mounting hole to be used for specific coil and installation location (top or bottom evaporator coil).

NOTE: When flipping the coils, remove and reinstall the coil clamp bolts in the opposite direction. Otherwise, eventual coil sag may result in the coil clamp bolt rubbing against the tube, causing leakage in the tube.

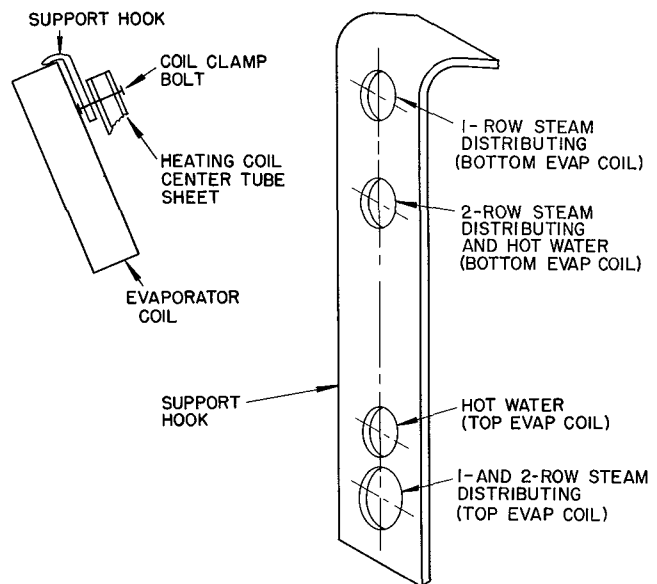


Fig. 10 — Mounting Holes for Support Hook and Assembly Sketch

Coil Installation

1. Lay a long board across the face of the evaporator coil to protect the coil fins during installation.
2. Snap Tinnerman U-bolts over the proper holes in the evaporator coil tube sheet.
3. Slide the heating coil into the unit and hook the center support hook over the top of the evaporator coil.
4. Remove board. Then fasten heating coil, side baffles, and evaporator coil together with hardware provided. *All mounting holes are laid out to provide proper pitch for coil drainage.*
5. The 2-row hot water coils have 2 outlets on the return manifold to permit the coil to be rotated. Cap the upper outlet with a 1-1/2 in. pipe cap.

50BA900091 Heating Coils for 50BT, BU004, 006 Units

Accessory heating coil model no. 50BA900090 (package no. 50BA900091) consists of the following items:

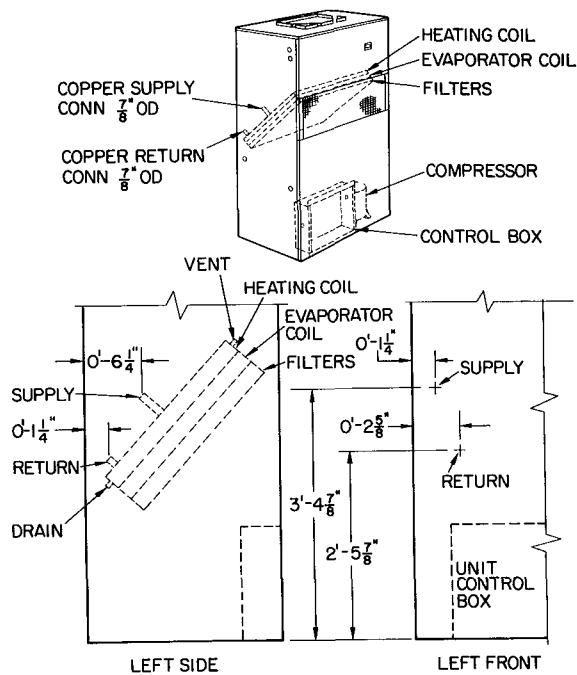
1. One coil assembly
2. One cloth bag containing:
 - a. Two seal strips
 - b. Four screws; no. 10—24 x 1/2-inch.

Check package for shipping damage. File damage claim with transportation agency.

BASE UNIT PREPARATION — Heating coil installs through back of unit. Remove back panel by removing sheet metal screws. If required, remove unit front panels and grille to expose unit interior as described in base unit instructions.

INSTALLING HEATING COIL — Install seal strip between heating coil tube sheet flanges and evaporator coil tube sheet flanges to prevent heat transfer. Position heating coil on evaporator coil as shown in Fig. 11. Supply and return connections are located as shown. Align holes of flanges and attach with screws provided.

PIPING — Cut supply and return connection openings in unit cabinet (Fig. 11) as required by job specifications. Install hot water or steam piping as required. Install a grommet in field-cut openings to prevent air leaks.



NOTE All dimensions shown are $\pm \frac{1}{8}$ inch.

Fig. 11 — Heating Coil Location Details (50BT, BU Units)

THERMOSTAT CONNECTIONS — Install heating thermostat or connect heating side of available heating/cooling thermostat to unit so that fan operates as desired (continuous or cycled with heater). Be sure heating cycle is not actuated during cooling cycle or vice versa. Refer to unit label diagram and Fig. 12. Unit has a built-in fan switch and cooling thermostat. See base unit instructions regarding remote thermostat connections.

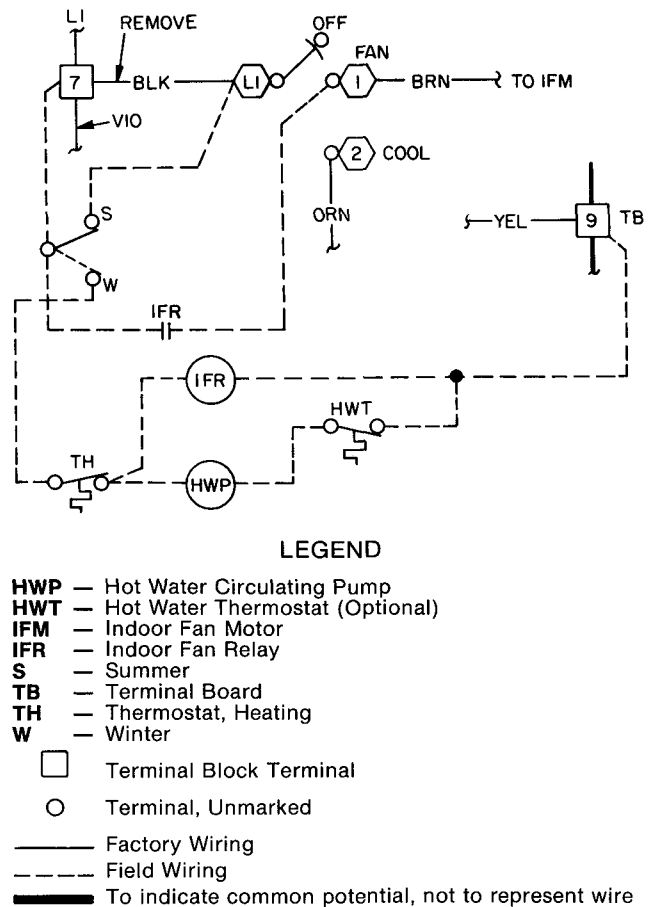
START-UP

1. Turn on unit power.
2. Set fan switch at ON position to energize indoor air fan.
3. Turn on hot water or steam supply.
4. Set heating thermostat to activate heating coil.
5. Check heating effect at air outlet(s).

SERVICE

⚠ CAUTION

- A. Before servicing the unit piping, shut off and tag the steam and hot water valves.
- B. See Cautions under Installation on page 1.
- C. Disconnect power to base unit to avoid electrical shock when servicing.



NOTE For complete wiring refer to unit label diagram

Fig. 12 — Typical Control Wiring for Heating Coil (Hot Water Shown, Steam Similar)

Refer to base unit instructions regarding unit panel removal for coil access. Clean coil fins with a stiff brush, vacuum cleaner or compressed air. Use a fin comb with teeth of correct spacing (15 fins/in.) when straightening mashed or bent coil fins. Procedure and precautions for cleaning heating coil are similar to those regarding cleaning of evaporator coil as described in base unit instructions.

Vent and Drain — Coil may be vented or drained if required by removing plug from vent or drain shown in Fig. 11.

Special Piping Fixtures Used for Freeze Protection — Any coil that may be subject to freezing temperatures should have vacuum breaker check valves in order to eliminate residual condensate from the coil before it can freeze. Suggested location of the check valves for atmospheric or vacuum return systems are shown in Fig. 13 and 14.

NOTE: Use only 15 degree swing check valves for this purpose.

The vacuum-return system is recommended in consideration of heating coil freeze-up protection. (See Heating Coil Freeze-Up Protection.)

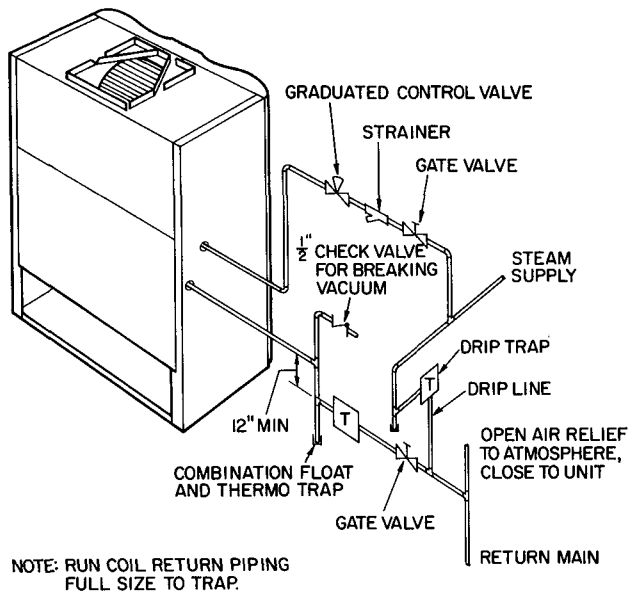


Fig. 13 — Typical Steam Distributing Coil Piping for Open Gravity Systems with Steam Pressure Below 10 Psig

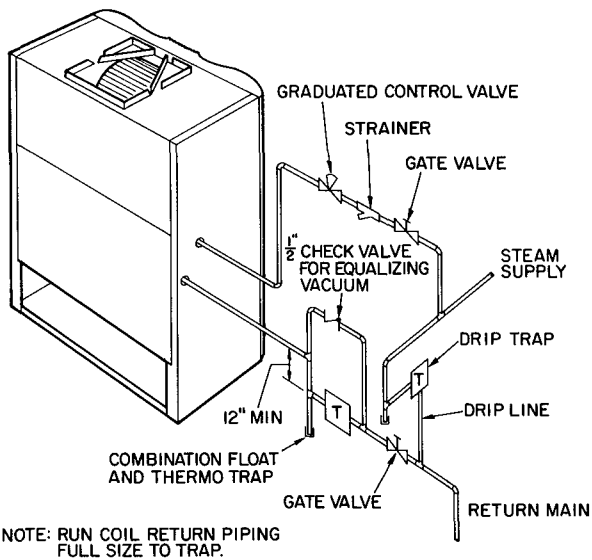
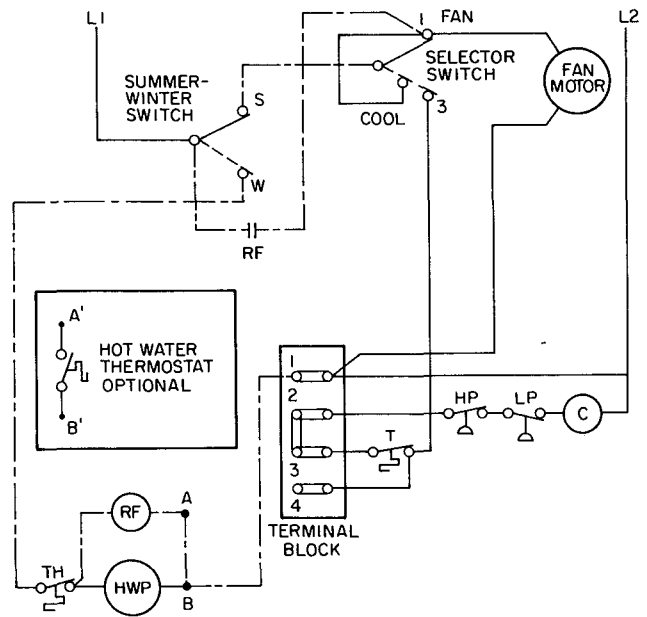


Fig. 14 — Typical Steam Distributing Coil Piping for Vacuum-Return Systems with Steam Pressure Below 10 Psig

CONTROL SUGGESTIONS

Several methods of control are possible depending on the heating medium to be used, location and type of thermostatic control, and whether or not a modulating or ON-OFF type of control is used. Figure 15 shows a typical control scheme for a hot water heating coil in a typical 50 Series unit. The use of a manual changeover summer-winter (cooling-heating) switch is recommended. A line voltage heating-cooling thermostat can be used, the heating thermostat being wired as shown in Fig. 15. A remote cooling thermostat could be wired between terminals 2 and 4, if jumper between 2 and 3 is removed.

For control variations of the base unit, see the unit Installation Instructions.



LEGEND

- C — Compressor Contactor Coil
- HP — High Pressurestat
- HWP — Hot Water Circulating Pump
- LP — Low Pressurestat
- T — Unit Thermostat
- TH — Remote Heating Thermostat
- RF — Relay, Fan

- Base Unit Wiring
- - - Heating Control Wiring

NOTE For control suggestions using a remote cooling thermostat or cooling tower pump, see the unit installation instructions

Fig. 15 — Typical Control Wiring for Hot Water Heating Coil and City Water Condensing

HEATING COIL FREEZE-UP PROTECTION

Whenever a steam or hot water heating coil is subjected to freezing temperatures, some means of adequate freeze protection must be considered. A heating coil may be subjected to freezing temperatures by outside air during the winter, or by its proximity to the cooling coil during the summer.

Hot Water Coils — During winter operation, either the outside air supply must be closed off or a minimum water flow must be maintained if outside air is admitted. For summer operation, it is recommended that the hot water coil be closed off, drained, and any residual water blown out. If the residual water cannot be practically blown out, an inhibited glycol antifreeze should be added to the coil.

Steam Distributing Coils — For summer operation, the same general precautions should be taken for steam coils as for hot water coils.

During heating operation, the vacuum-return system is considered preferable since it helps eliminate any residual condensate from staying in a coil. In general, the specific installation recommendations with regard to coil pitch, drainage, and condensate return will greatly reduce the possibility of steam coil freezing.

The steam distributing coils have significantly reduced the possibility of freeze-ups; however, they are still susceptible to freezing, if a minimum steam quantity is not maintained where air over the coil approaches 32 F, or if they are not properly pitched, drained, trapped, and controlled.

Aside from the installation recommendations, the following points should be considered for the freeze protection of steam distributing coils.

1. In cases where outside air is admitted to the unit, it should be sufficiently mixed with return air before reaching the coil in order to avoid cold spots on the

coil. It is important in these cases that a minimum steam quantity is maintained when heat is called for to prevent water remaining in the tubes and possibly freezing. ON-OFF type of steam control is preferred over a modulating control where air over coil temperatures may approach 32 F. Make sure that supposedly "closed" outside air dampers are sufficiently sealed to prevent air leakage.

2. Make sure that the coil is properly pitched, drained, and trapped so that condensate will drain out of the coil whenever the control valve shuts off the steam supply.





Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

Book | 1 | 1 | 1 | 4 | 4 | 4
Tab | 2a | 2b | 3c | 2e | 7a | 7b

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