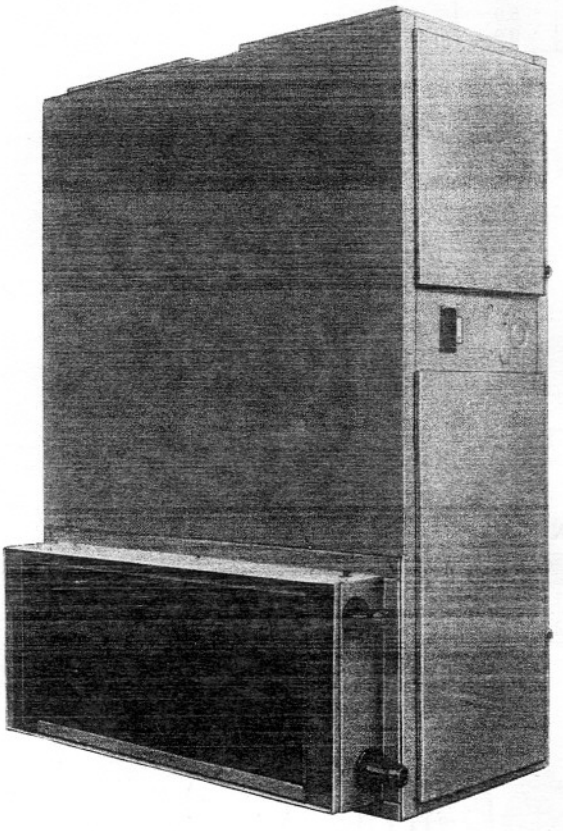
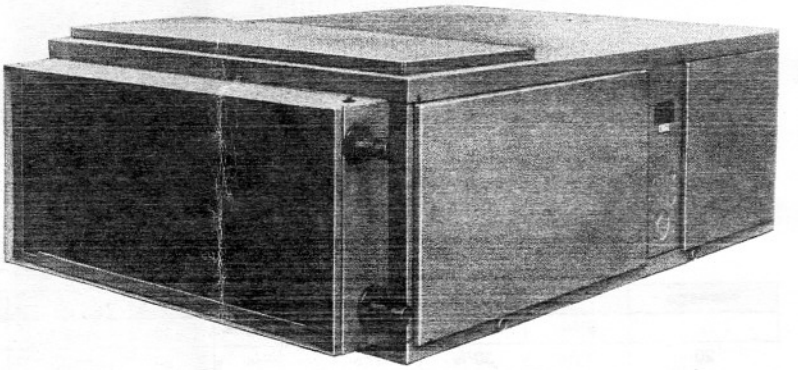
STEAM COIL AND HOT WATER COIL ACCESSORY FOR USE WITH 7.5-20 TON AIR HANDLERS





Four Models—185,000 to 540,000 BTU/HR

The Coils offer a convenient method of providing steam or hot water heating.

Both the steam and hot water coils are available in sizes, for use with 7.5 through 20 nominal ton air handling units.

The coils are designed to mount directly on the entering air end of the air handlers with mounting flanges provided to accept sheet metal screws for attaching the coil to the casing duct flanges. The air inlet side of the coil is designed to accept either duct work or an optional decorative inlet grille.

These coils are well suited for use in solar assisted heating systems.

Steam and Hot Water Coil Limitations

Coil Operating Pressure: All coils are factory tested to 300 PSI air. Steam coil should not be used with temperatures in excess of 275°F. Maximum working pressure for all coils 100 PSIG. Hot water temperature should not exceed 220°F.

Coil Water Velocity: Good heat transfer can be obtained with water velocity as low as 1.5 GPM (1.8 FPS) per circuit and pressure drops will generally be acceptable at flow rates as high as 6 GPM (7 FPS) per circuit.

Freeze Up Protection: On any system where the resultant air over the coil will be 32°F or lower provision should be made to protect the heating coil in the event of a control failure or excessively low entering air temperature.

Gross Coil Performance

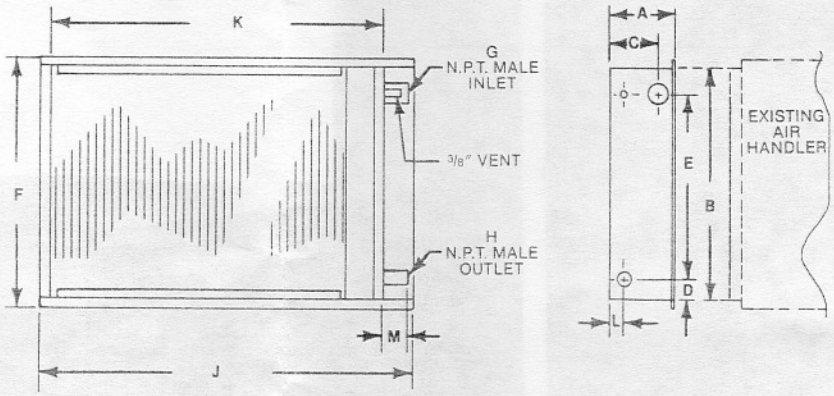
Nominal Tons	Nominal BTUH		Nominal CFM	Velocity FPM
	Steam	Water		
7 1/2	242,500	185,000	3000	600
10	285,000	240,000	4000	800
15	350,000	330,000	6000	1200
20	540,000	464,000	8000	888

1. Entering air temperature @ 60°F
2. Entering steam @ 5 PSIG
3. Entering water @ 200°F
4. Face velocity = $\frac{\text{CFM}}{\text{Face Area}}$

Physical Specifications

Nominal Tonnage	Finned Height—inches	Finned Length—inches	Face Area Ft²	Circuits & Tubes High
7 1/2	18	40	5.0	12
10	18	40	5.0	12
15	18	40	5.0	12
20	27	48	9.0	18

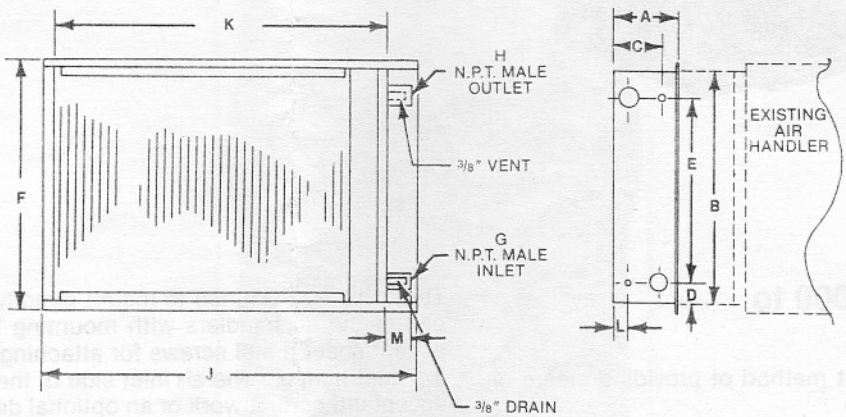
STEAM COIL



STEAM COIL DIMENSIONS—INCHES

Tonnage	A	B	C	D	E	F	G	H	J	K	L	M
7 1/2-15	9 1/16	21 3/8	5 3/8	3 3/16	15	24	1 1/2	1 1/4	51 1/2	47 5/8	2 13/16	3 1/4
20	9 1/16	30 7/8	5 3/8	3 3/16	24	35	2	1 1/2	59 1/2	55 5/8	2 13/16	3 1/2

HOT WATER COIL



HOT WATER COIL DIMENSIONS—INCHES

Tonnage	A	B	C	D	E	F	G	H	J	K	L	M
7 1/2-15	9 1/16	21 3/8	5 3/8	3 3/16	15	24	1 1/4	1 1/4	51 1/2	47 5/8	2 13/16	3
20	9 1/16	30 7/8	5 3/8	3 3/16	24	35	1 1/2	1 1/2	59 1/2	55 5/8	2 13/16	3 1/4

Airflow

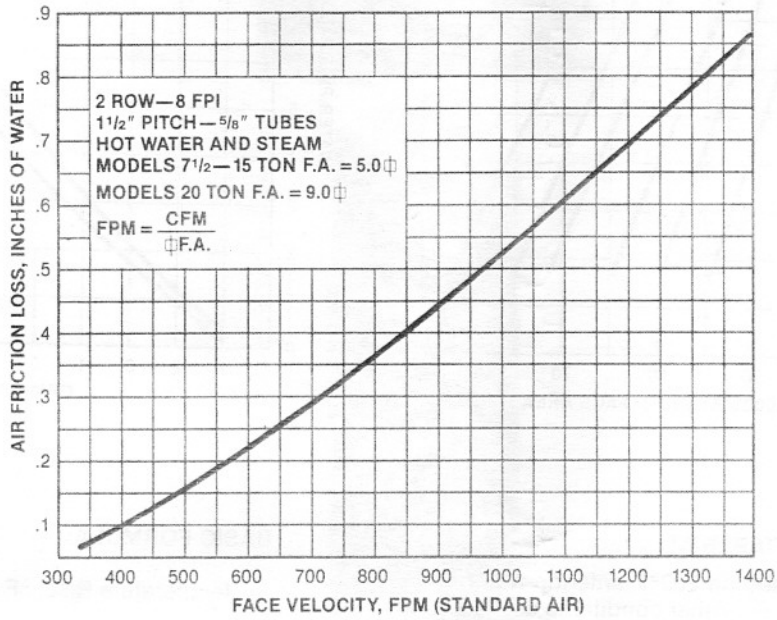
TABLE I
ALTITUDE AND TEMPERATURE CORRECTION FACTOR TABLE

Air Temp. (F)	Altitude in Feet Above Sea Level															
	0	500	1000	1500	2000	2500	3000	3500	4000	4500	5000	6000	7000	8000	9000	10,000
0	.87	.89	.91	.92	.94	.96	.98	.99	1.01	1.03	1.05	1.09	1.13	1.17	1.22	1.26
40	.94	.96	.98	1.00	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.19	1.23	1.28	1.32	1.36
70	1.00	1.02	1.04	1.06	1.08	1.10	1.12	1.14	1.19	1.18	1.20	1.25	1.30	1.35	1.40	1.45
100	1.06	1.08	1.10	1.12	1.14	1.16	1.19	1.21	1.23	1.25	1.28	1.33	1.38	1.43	1.48	1.54
120	1.09	1.12	1.14	1.16	1.18	1.20	1.23	1.25	1.28	1.30	1.32	1.38	1.43	1.48	1.53	1.58

EXAMPLE: Determine Equivalent "Standard Air" for use in System Performance Calculations:

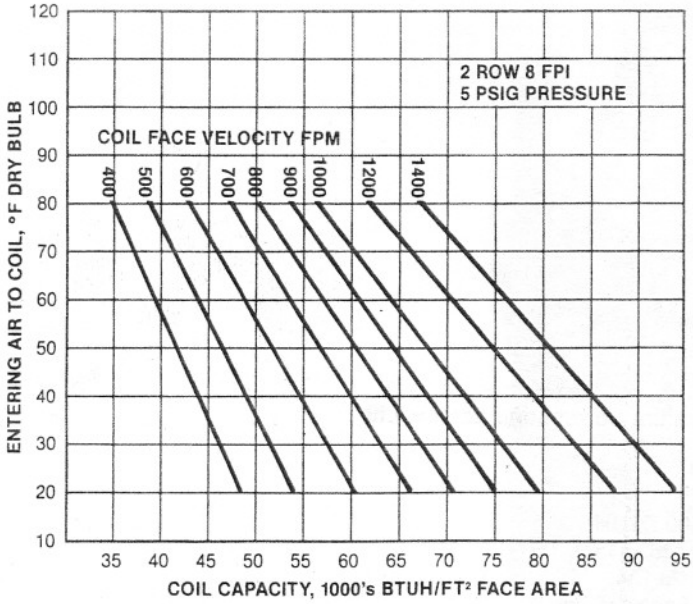
$$\text{Standard Air} = \frac{\text{Specified CFM}}{\text{Correction Factor}}$$

TABLE II
AIR FRICTION LOSS



Steam Coils

CURVE 1
STEAM COIL



TEMPERATURE OF STEAM AT VARIOUS PRESSURES

Approximate Gauge Pressure (lbs.)	2	5	10	15	20	30
Temperature °F	218	227	240	250	259	275

TABLE III

Steam Coil Capacity, Curve 1 is based on 5 PSIG Steam Pressure. For other conditions use the adjacent correction factors.

Steam Pr., PSIG	Factor
2	.96
5	1.00
10	1.06
15	1.11
20	1.16
30	1.24

BASIC FORMULA:

$$\text{Air Temperature Rise, °F} = \frac{\text{BTUH}}{1.08 \times \text{CFM}}$$

STEAM COIL SELECTION:

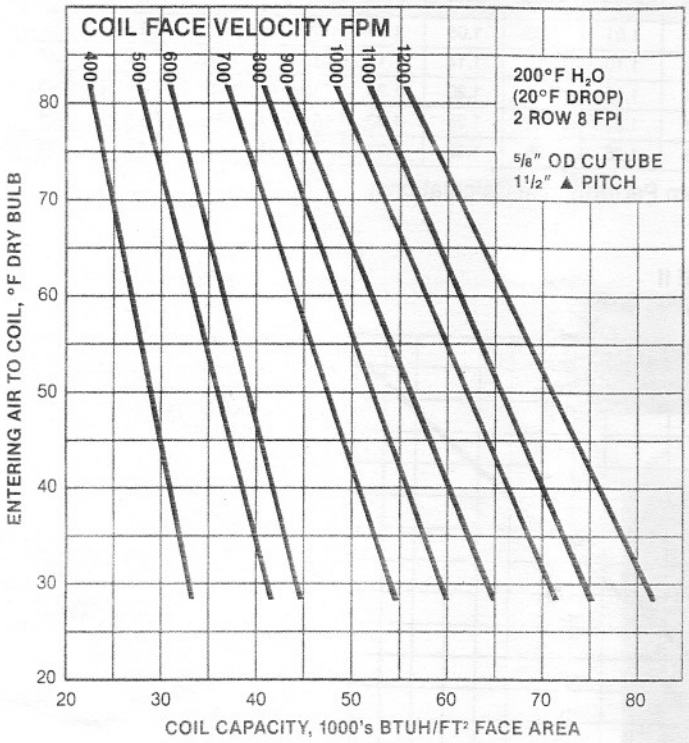
Specified:
Steam @ 30 PSIG
Entering Air Temp. @ 40°F
5000 CFM @ 6000 Ft. Elevation

Select 10 Ton Nominal Coil:
Face Area = 5 Ft^2
Circuits = 12

Determine Coil Performance:
From Table I, Altitude and Temperature Correction Factor = 1.19
Std. CFM = 5000/1.19 = 4202
Face Velocity = 4202/5 = 840 FPM
From Curve 1, BTUH/Ft = 65,000
Coil Capacity = 5 × 65,000 = 325,000 BTUH
From Table III, Steam Correction Factor = 1.24
Total Coil Capacity = 1.24 × 325,000 = 403,000 BTUH
Air Temp. Rise = 403,000/(1.08 × 4202) = 88.8°F
From Table II, Air Side Pressure Drop = .40" H_2O

Hot Water Coils

CURVE 2
HOT WATER COIL



CURVE 3
HOT WATER COIL WATER
PRESSURE DROP

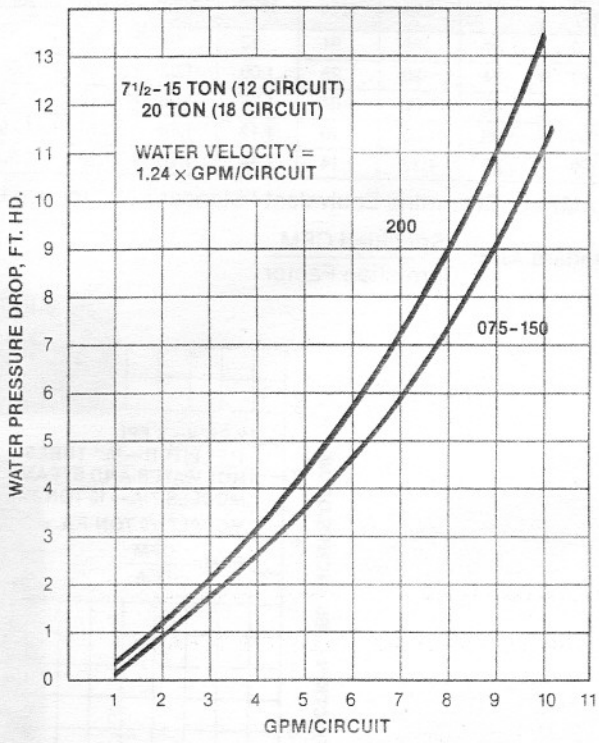


TABLE IV

Curve 2 ratings are based on 200°F entering water and 20°F temperature drop. For other conditions use the following correction factors:

Entering Water	Factor	Temperature Drop	Factor
220°F	1.14	10°F	.970
210°F	1.07	15°F	.985
200°F	1.00	20°F	1.000
190°F	.98	25°F	1.015
180°F	.93	30°F	1.030

BASIC FORMULA:

$$\text{Air Temperature Rise, °F} = \frac{\text{BTUH}}{1.08 \times \text{CFM}}$$

$$\text{Water Temperature Drop, °F} = \frac{\text{BTUH}}{500 \times \text{GPM}}$$

HOT WATER COIL SELECTION:

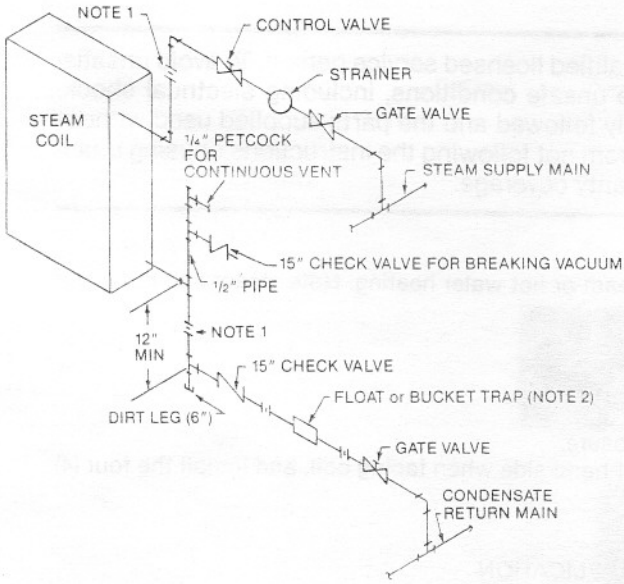
Specified:
Entering Air Temp. @ 40°F
5000 CFM @ 6000 Ft. Elevation
220°F Entering Water Temp. @ 36 GPM

Select 10 Ton Nominal Coil:
Face Area = 5 Ft²
Circuits = 12

Determine Coil Performance:
From Table I, Altitude and Temperature Correction Factor = 1.19
Std. CFM = 5000/1.19 = 4202
Face Velocity = 4202/5 = 840 FPM
From Curve 2, BTUH/Ft² = 57,500
Coil Capacity = 5 × 57,500 = 287,500 BTUH
Water Temp. Drop = 287,500/(500 × 36) = 15.97°F
From Table IV, Water Temp. Factor = 1.14
From Table IV, Water Temp. Drop Factor = .988
Total Capacity = 287,500 × 1.14 × .988 = 323,817 BTUH
From Curve 3, Water Pressure Drop = 1.6 FT. HD./Ckt.
Total Water Pressure Drop = 1.6 × 12 = 19.2 FT. HD.
From Table II, Air Side Pressure Drop = .40" H_2O

Typical Steam Piping

SINGLE COIL LOW PRESSURE STEAM PIPING GRAVITY



Low pressure steam piping for a single coil is illustrated at left. This diagram shows an open air relief located after the steam trap close to the unit. This arrangement permits non-condensable gases to vent into the atmosphere.

NOTES:

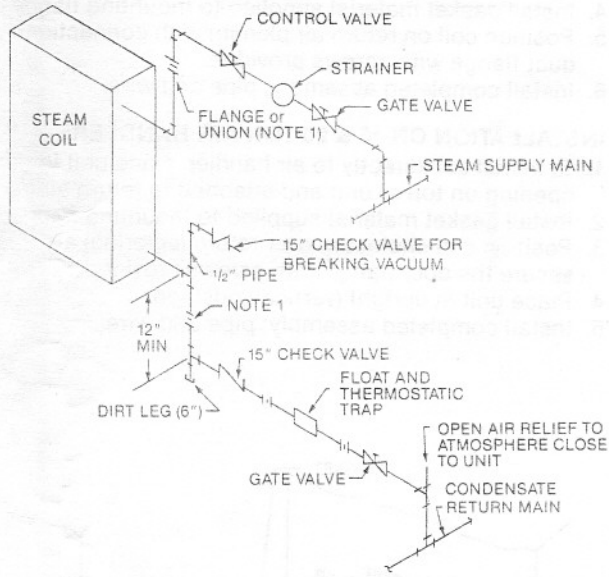
1. Flange or union is located to facilitate coil removal.
2. Flash trap may be used if pressure differential between steam and condensate return exceeds 5 psi.
3. Dirt leg may be replaced with a strainer. If so, tee on drop can be replaced by a reducing coupling.
4. The petcock is not necessary with a bucket trap or any trap which has provision for passing air. The great majority of high or medium pressure returns end in hot wells or deaerators which vent the air.

HIGH OR MEDIUM PRESSURE STEAM COIL PIPING

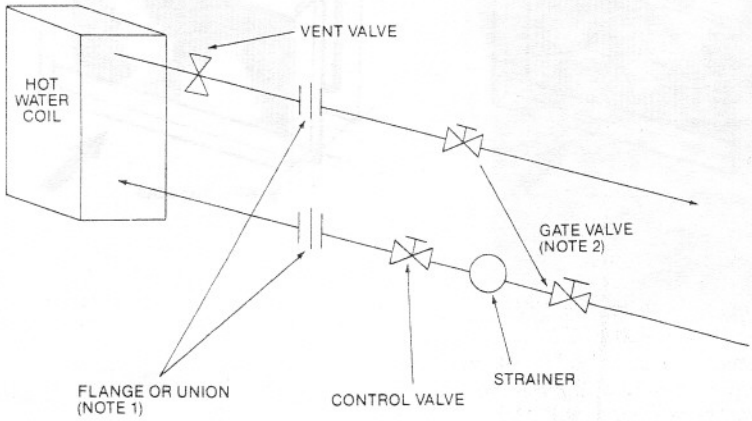
Illustrated at right is a typical steam piping diagram for coils used in either a high or medium pressure system. If the return line is designed for low pressure or vacuum conditions and for a pressure differential of 5 psi or greater from steam to condensate return, a flash trap may be used.

NOTES:

1. Flange or union is located to facilitate coil removal.
2. Check valve is necessary when more than one unit is connected to the return line.
3. Dirt pocket is the same size as unit outlet. If dirt pocket is replaced by a strainer, replace tee with a reducing ell from unit outlet to trap size.



Typical Hot Water Piping



Hot water piping for a single coil is illustrated at left. A vent valve is shown to allow air removal from the system.

NOTES:

1. Flange or union is located to facilitate coil removal.
2. Gate valves allow coil removal with a minimum of water loss from system.

WARNING: This accessory is intended for installation by a qualified licensed service person. To avoid unsatisfactory operation or damage to the accessory and possible unsafe conditions, including electrical shock, refrigerant leakage and fire, these instructions must be strictly followed and the parts supplied used without substitution. Damage to the accessory or property resulting from not following the instructions or using unauthorized parts is excluded from Manufacturer's product warranty coverage.

These coil accessories offer a convenient method of providing steam or hot water heating. Note steam and hot water coil limitations.

INSTALLATION ON ALL AIR HANDLERS—HORIZONTAL APPLICATION

1. Place air handler on flat, hard surface.
2. Remove four (4) 5/16 bolts on the return air (entering) end of the unit.
3. Install gasket material supplied to mounting flange of coil enclosure.
4. Position coil to return air end of unit with connections on right hand side when facing coil, and install the four (4) 5/16 bolts.
5. Install assembly (air handler and coil); pipe and wire.

INSTALLATION ON 7½ & 10 TON AIR HANDLERS—VERTICAL APPLICATION

1. Direct attachment of coil to air handlers requires use of return air plenum accessory.
2. Install return air plenum per instructions supplied with that accessory, for front or rear return air.
3. Place unit in vertical position.
4. Install gasket material supplied to mounting flange of coil enclosure.
5. Position coil on return air plenum with connections on right hand side when facing coil, and secure it to the plenum duct flange with screws provided.
6. Install completed assembly; pipe and wire.

INSTALLATION ON 15 & 20 TON AIR HANDLERS—VERTICAL APPLICATION

1. To install coil directly to air handler, place unit in horizontal position, remove cap panel covering return air (entering) opening on top of unit and attached to return air end opening.
2. Install gasket material supplied to mounting flange of coil enclosure.
3. Position coil enclosure over return (entering) air opening with connections on right hand side when facing coil, and secure the duct flange with screws provided.
4. Place unit in upright (vertical) position.
5. Install completed assembly; pipe and wire.