



INSTALLATION, OPERATION AND MAINTENANCE MANUAL

VERTICAL TUBE HEATING COILS MV & VIFB MODELS

ATTENTION: READ THIS MANUAL AND ALL LABELS ATTACHED TO THE UNIT CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THESE UNITS! CHECK UNIT DATA PLATE FOR STEAM OR HOT WATER REQUIREMENTS AND ELECTRICAL SPECIFICATIONS AND MAKE CERTAIN THAT THESE AGREE WITH THOSE AT POINT OF INSTALLATION. RECORD THE UNIT MODEL AND SERIAL No.(s) IN THE SPACE PROVIDED. RETAIN FOR FUTURE REFERENCE. THE APPLIANCE IS NOT TO BE USED BY PERSONS (INCLUDING CHILDREN) WITH REDUCED PHYSICAL, SENSORY OR MENTAL CAPABILITIES, OR LACK OF EXPERIENCE AND KNOWLEDGE, UNLESS THEY HAVE BEEN GIVEN SUPERVISION OR INSTRUCTION. CHILDREN SHOULD BE SUPERVISED TO ENSURE THAT THEY DO NOT PLAY WITH THE APPLIANCE.

WING Model No. _____ Serial No. _____

SAVE THIS MANUAL



Wing MV & VIFB coil performance is certified by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) under AHRI Standard 410 for maximum working pressures up to 200 PSIG and temperatures up to 400° F.



Wing MV & VIFB coils are listed by Engineering Test Laboratories (ETL) to Underwriter Laboratories (UL) Standard 1995. This standard assures that Wing coils are safe to operate up to a design pressure of 100 PSIG.

WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

INSTALLER'S RESPONSIBILITY

Installer Please Note: This equipment has been test fired and inspected. It has been shipped free from defects from our factory. However, during shipment and installation, problems such as loose wires, leaks or loose fasteners may occur. **It is the installer's responsibility to inspect and correct any problems that may be found.**

ATTENTION: READ CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE OR SERVICE THIS EQUIPMENT. RETAIN FOR FUTURE REFERENCE.

POST AND MAINTAIN THESE INSTRUCTIONS IN LEGIBLE CONDITION.



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SECTION I - FOREWORD

As is the case with any fine piece of equipment, care must be taken to provide the proper attention to the operation and maintenance details of this machine.

This manual of instructions has been prepared to help you become well-acquainted with those details, and in doing so, you will be able to give your Wing Heating Coil the care and attention any piece of equipment needs and deserves.

ETL Coil Operating Parameters:

Maximum elevation is 9,000 ft. (2,743.2m).
Maximum operating temperature is 250°F (121.1°C).
Minimum operating temperature is 0°F (-17.8°C).
Maximum operating pressure is 100 PSIG (689 kPa).
Minimum operating pressure is 2 PSIG (13.8 kPa).

SECTION II - GENERAL INFORMATION

PURPOSE

The purpose of this manual is to present a guide for proper installation, maintenance, and operation of the Wing Heating Coil, and supplement, **but not to replace**, the services of qualified field service personnel to supervise the initial start-up and adjustment of the unit. Persons without previous experience with large commercial and industrial heating equipment should not attempt the initial adjustment and checkout procedure which is essential before such installations may be considered ready for operation. This manual should be made readily available to all operating personnel as an aid in troubleshooting and proper maintenance.

SHIPPING

Base Wing coils are shipped completely assembled. Other large options or accessories are assembled and shipped mounted and wired whenever possible within limitations of shipping and handling. Any optional accessories shipped separately are shipped as assembled sections. Any wired accessories which have been disassembled for separate shipment require no additional conduit or wire for field reassembly. All wire leads will be tagged for ease of reconnection in the field.

Shipments are made F.O.B. Dallas, Texas. The unit is securely strapped, tied, and blocked to prevent shipping damage. All shipments are checked by an inspector before they are accepted by the carrier. Parts that are shipped unmounted are noted on the bill of lading. These parts, where feasible, are packaged and shipped with the units. Upon receipt of shipment, all units should be checked against the bill of lading to insure all items have been received. **All equipment (and any optional accessories) should be checked carefully for physical damage in the presence of the carrier's representative. If parts are missing or damage has occurred, a claim should be filed immediately with the carrier.**

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RECEIVING

All coils are crated at the factory for safe shipment. Check the unit carefully, and if damage has occurred, report it at once to the carrier. All claims must be made within 5 days of receipt of shipment. Upon receiving, inspect the following for damage:

1. Damper linkage
2. Damper motors and control linkage
3. Finned tubes and dampers
4. Casing, for distortion
5. Header pipe connections
6. Duct attachment flanges

Check the unit nameplate to insure size is correct as ordered.

If system tags have been used, check that proper size units have been tagged for correct system. (Wing will tag units for specific systems upon request.)

All Wing coils are given a complete operations test and control circuit checkout before shipment. A copy of the wiring diagram and bill of material is included with each unit shipped. If correspondence with the factory is necessary, please provide the unit model and serial number.

LIFTING AND HANDLING

Two angle lifting eyes are provided on the upper casing flanges on the Wing coil for lifting with overhead cranes. If a single chain lift is used, a "Tee" section spreader bar must be used to produce a vertical lift to prevent bending of casing flanges. **Do not wrap chain or cable around upper header to lift unit.**

All Wing coils are shipped bolted onto a wood skid so they can be handled by fork lift. Forks can be inserted under the wood skid for lifting and on site handling. **Do not lift coil by inserting forks under bottom header of coil.**

CAUTION - COIL MAY BE UNSTABLE ON FORKS AND SHOULD BE SECURED FROM TIPPING BY ATTACHING CABLES OR CHAINS FROM TOP OF UNIT TO VERTICAL TRACKS OF FORK LIFT.

E. Optional Factory Service

Periodic service on any piece of mechanical equipment is necessary for efficient operation. L.J. Wing has a nationwide service organization available

to provide quick and dependable servicing of heating coils. Wing also offers factory start-up service which includes the presence of a service engineer to supervise the initial start-up and adjustment of the equipment and provide instructions for the owner's maintenance personnel in proper operations and maintenance. Consult factory for quotations on periodic or start-up service.

SECTION III - INSTALLATION AND MOUNTING PROCEDURE

A. The Wing Coil must be installed with the tubes vertical for proper drainage. **The coils are designed for vertical mounting only** (horizontal air flow).

B. At least 6" clearance should be provided above and below coil for access to tubes and headers in the event that future tube replacement or repairs are necessary. 6" clearance should also be provided on the damper motor and control linkage side of the coil for service access.

C. The coils can be supported on the integral mounting flange or on angle iron legs attached to the duct mounting flanges. Additional supports may be required in the center for long coils.

D. The Wing coil must be installed with headers level for proper condensate drainage. To insure proper leveling, use a spirit level. **Do not level by measurement only.**

E. Return steam condensate or hot water header is securely bolted to the lower mounting bracket to prevent damage to the header and tubes during shipment. (See Figure 1.) **Shipping bolts must be removed before applying steam or hot water, but after all piping connections are made. Failure to do so will void factory warranty.**

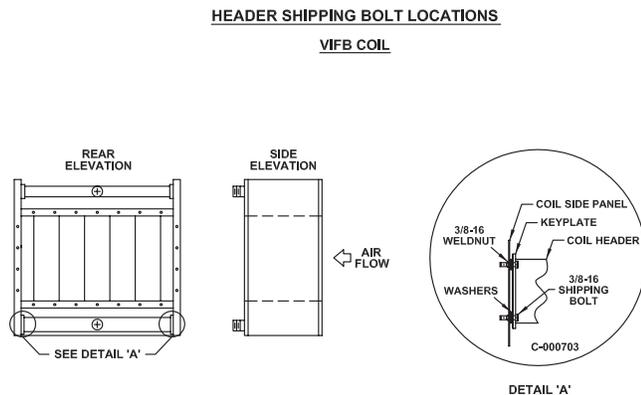
F. Remove shipping braces before attaching ductwork.

G. Ductwork can be attached to the coil flanges or the coil can stand in a duct with bulkhead plates blanking off spaces around the coil. The flanges must not be used to support the ductwork.

COIL INSTALLATION AND LOCATION

1. Sheet metal isolation plates should be installed on the top and bottom of the coil to eliminate air flow over the supply and return headers, top and bottom headers should be insulated and/or isolated on both sides of the coil.
2. Cooling coils should be located downstream at a distance no less than 36 inches from the outlet flange of the coil. Freezestat location should also follow this same guideline. Coils operating in VAV systems, or those operating at lower or higher than recommended air velocities, should be fitted with **anti-stratification** baffles.
3. The installation of humidifiers with steam manifolds internal of an air handler may provide a temperature override to the system. Internal steam manifolds and piping should be insulated.

Figure 1 - Shipping Bolt Locations (C-000703)



TEMPERATURE CONTROL

1. The airstream thermostat control to the coils should be located a minimum of 36" downstream. Each coil should have its own temperature control system.
2. Freezestats mounted on the face of the cooling coils should be located a minimum of 36" downstream of the coil flange. Optional anti-stratification baffles are available to reduce this spacing to 24".
3. Coils operating at lower or higher than recommended air velocities or in VAV systems should be fitted with optional anti-stratification baffles.

STEAM/HOT WATER COILS

1. Steam pipes must be sized to handle desired steam flows at the lowest pressures.
2. Inlet and outlet steam and hot water lines should be fully insulated.

3. **Full steam pressure must be supplied at all times – modulating valves must not be used.**

A modulating steam valve on a preheat coil can actually cause the coil to retain the condensate due to a reduced pressure in the coil, thus exposing condensate in the tubes to freezing conditions. With modulating steam below 5 psig (near valve closure) the steam may not be fully distributed in all of the tubes in the coil, causing the outer tubes to cool abnormally. This will create thermal stress that can lead to possible “outer tube failure”. Slow-acting on/off steam valves may be used to close at desired set points. The minimum open to closed and closed to open time is three (3) minutes. Any time faster than three minutes is considered fast acting and is not allowed. If motorized steam valves are employed, they should be of the normally open type so that if the actuator fails, the valve will go to the open position, thereby keeping the steam supply to the coil.

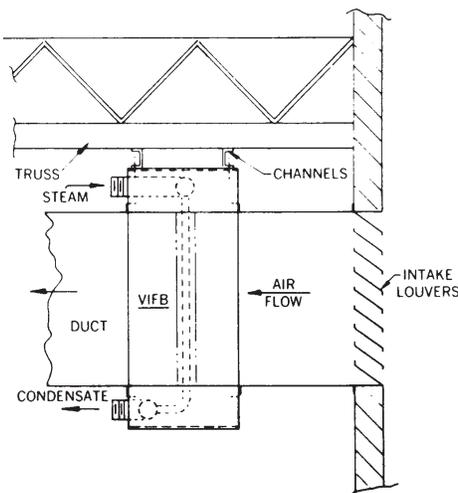
4. To isolate the coils in the off-season, slow acting on/off steam valves may be used. If motorized steam valves are employed, they should be of the normally open type so if the actuator fails, the valve will go to the open position.
5. The amount that the delivered air temperature exceeds the thermostat setting is called temperature override. To minimize temperature override:
 - (a) Insulate the top and bottom headers and/or at least isolate them on both sides of the coils. Eliminate airflow over the supply and return

- (b) Inlet and outlet mains should be fully insulated.
- (c) To eliminate coil temperature override, use slow – acting on/off valves to close at desired set points.
- (d) The installation of humidifiers with steam manifolds internal of an air handler may provide a temperature override to the system. Internal steam manifolds and piping should be insulated.

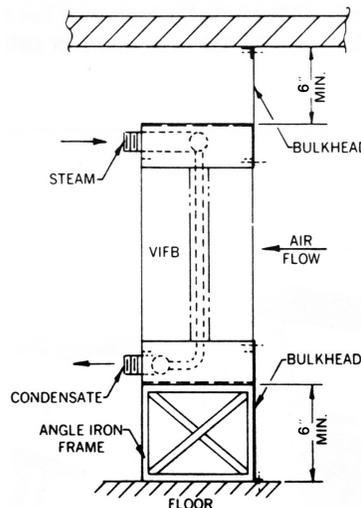
6. Return steam condensate headers and hot water supply headers must be free to float. A flexible connector **MUST** be installed parallel to the coil header, as close as possible to the coil connection and be able to provide a minimum of 3/8" free vertical and lateral movement of the headers.
7. Failure to install flexible connectors will restrict expansion of the headers. This can result in bowing of tubes, bending of fins, interference with damper operation, or eventually tube breakage.
8. Steam and hot water mains must be supported separately after the flexible connector to isolate piping strains and additional expansion from the coils
9. Where more than one coil is used, each coil should be piped independently.
10. Good engineering practices and procedures should be applied in the design of a condensate removal system. In particular, long piping runs to condensate pumps should be avoided.
11. To avoid freezing of pre-heat coils when applying steam or hot water in very cold locations, first raise the tube metal temperature above freezing by applying steam or hot water to the coil prior to passing airflow over it.

**Figure 2
Coil Supported
From Above**

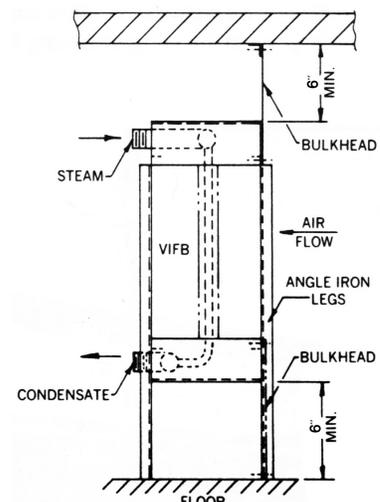
Note: Single row steam coil shown



**Figure 3
Coil Supported From
Bottom On Angle Iron Stand
And Bulkhead In A Duct**



**Figure 4
Coil Supported On Angle Iron
Legs And Bulkhead In A Duct**



SECTION IV - DUCTWORK AND TRANSITIONS

A. To obtain rated performance from the coils and to eliminate air temperature control problems due to improper duct design and/or installation, use the following suggestions as a guide in the design of ducts and transitions.

Angle "X" in Figure 5 should not exceed 15 degrees. Steeper angles in duct transitions will create low air velocities in one portion of a coil, and high air velocities in the other portion of the coil, resulting in poor downstream temperature control.

B. Turning vanes must be used to assure even distribution of air over the entire coil where elbows are used in the inlet and/or outlet side of a preheat coil. (See Figure 6.)

C. When the coil is used as a preheat coil in conjunction with a cooling coil located downstream of the heating coil, a minimum space of 36" should be allowed between this coil and the cooling coil, as shown in Figure 7. When the cooling coil is too close to this coil, the closed face (or by-pass) dampers on the coil during summer operation will partially block areas of the face of the cooling coil, reducing its effectiveness.

D000746

FIGURE 5 - DUCT TRANSITIONS

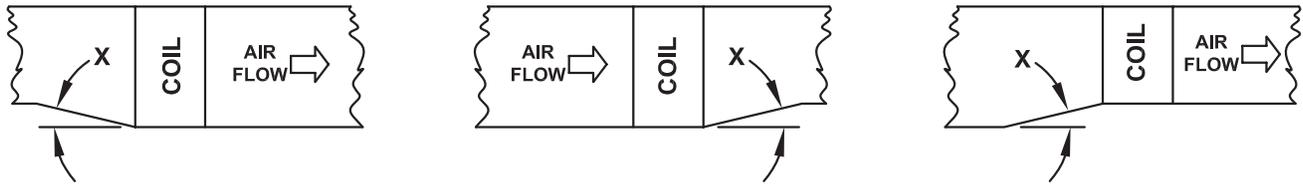


FIGURE 6 - ELBOWS IN DUCTS - TOP VIEW

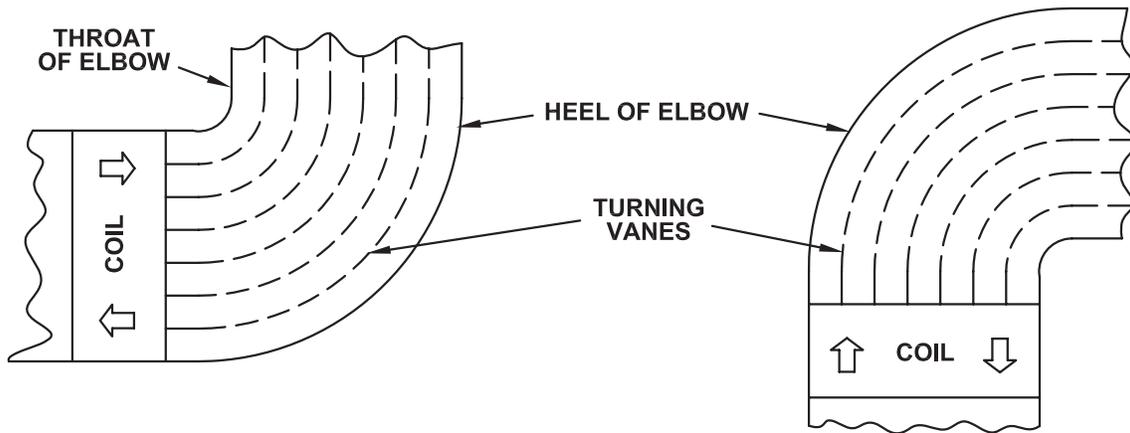
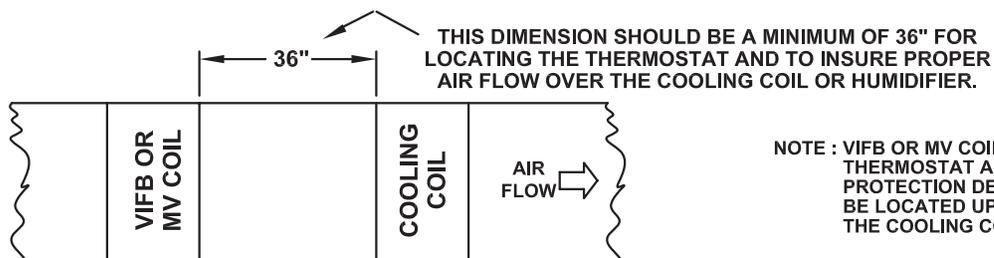


FIGURE 7 - VIFB OR MV COIL AND COOLING COIL SPACING



NOTE : VIFB OR MV COIL SENSING THERMOSTAT AND FREEZE PROTECTION DEVICES MUST BE LOCATED UPSTREAM OF THE COOLING COIL.

SECTION V - EQUIPMENT PHOTOS

Photo of Indirect-Coupled VIFB (Entering Air Side)



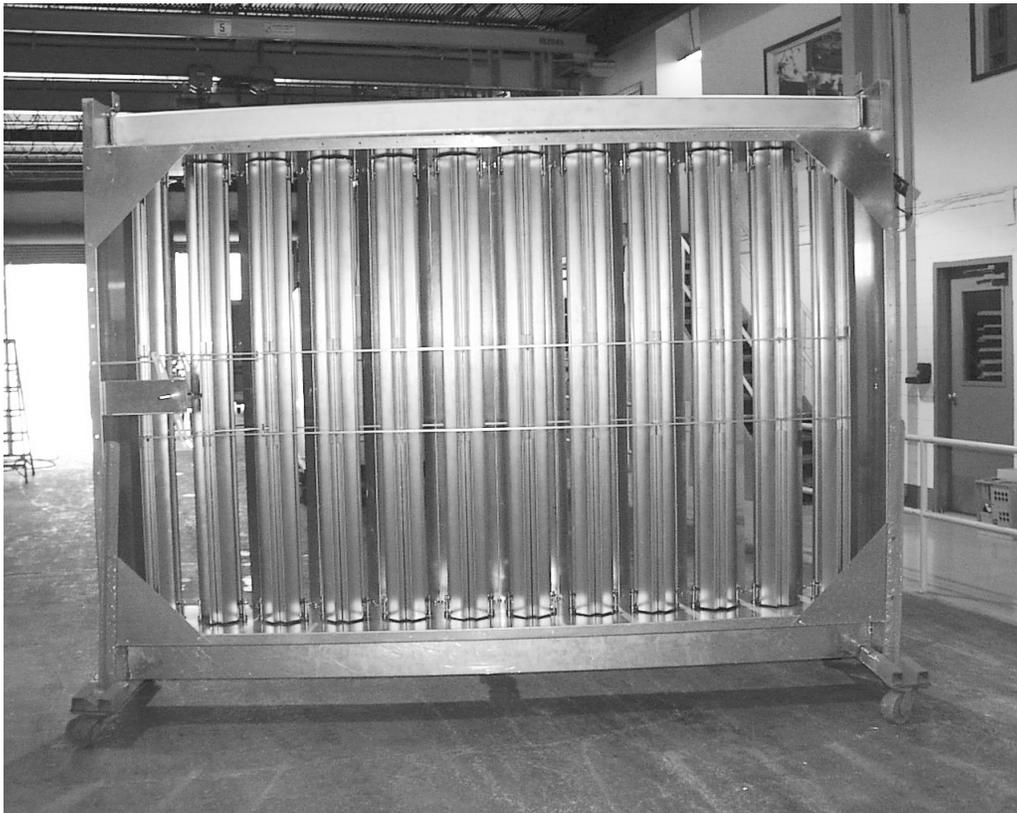
Photo of Indirect-Coupled VIFB (Leaving Air Side)



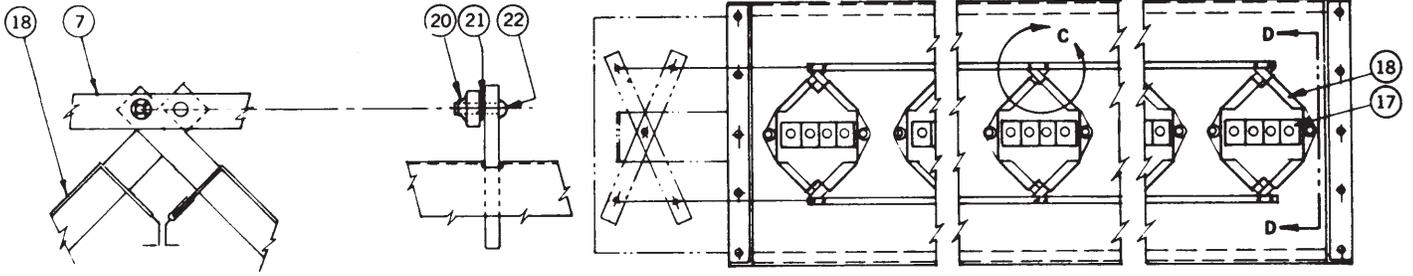
Photo of Direct-Coupled VIFB (Leaving Air Side)



Photo of Direct-Coupled VIFB (Entering Air Side)

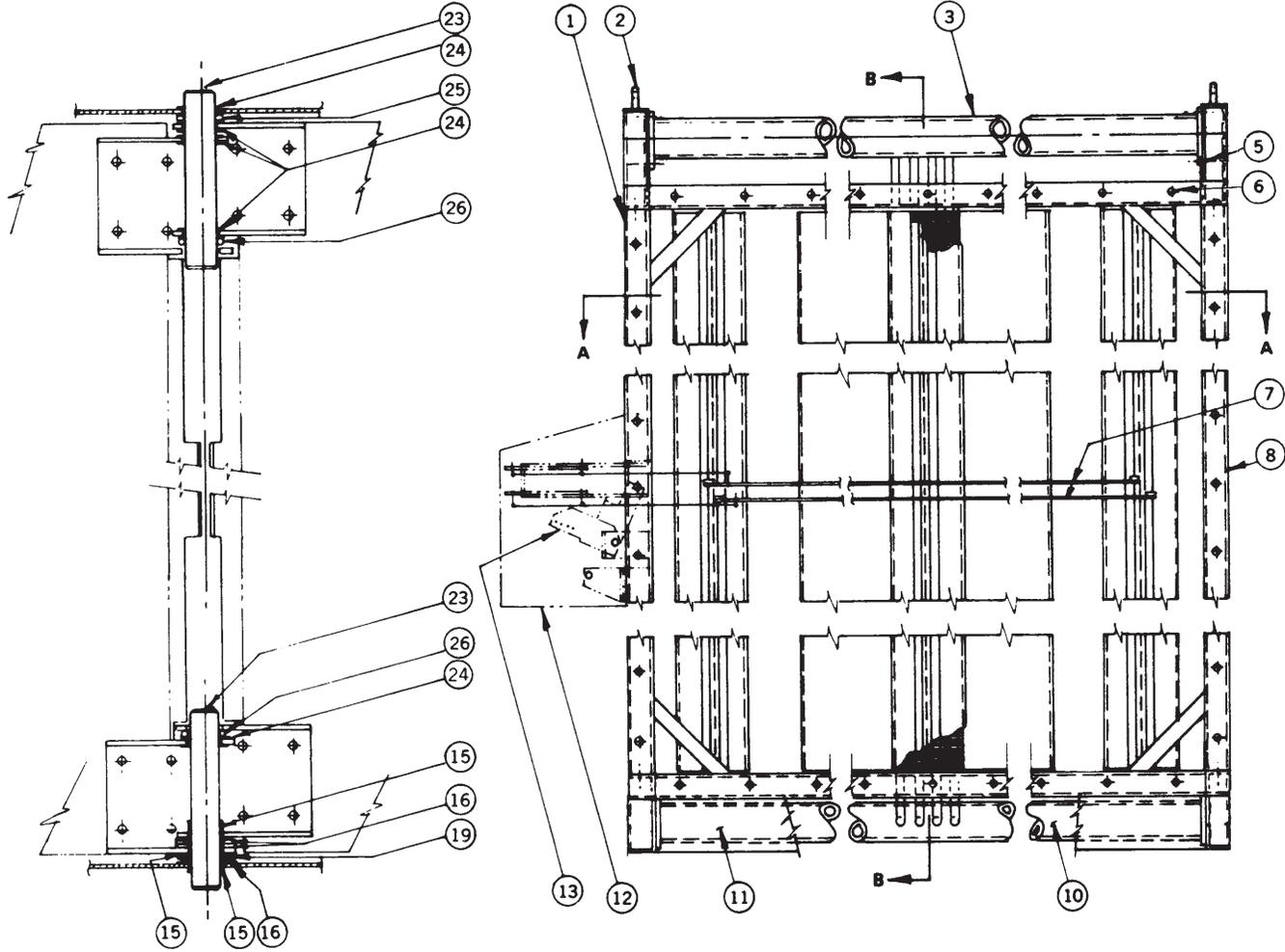


SECTION VI - PARTS DRAWING



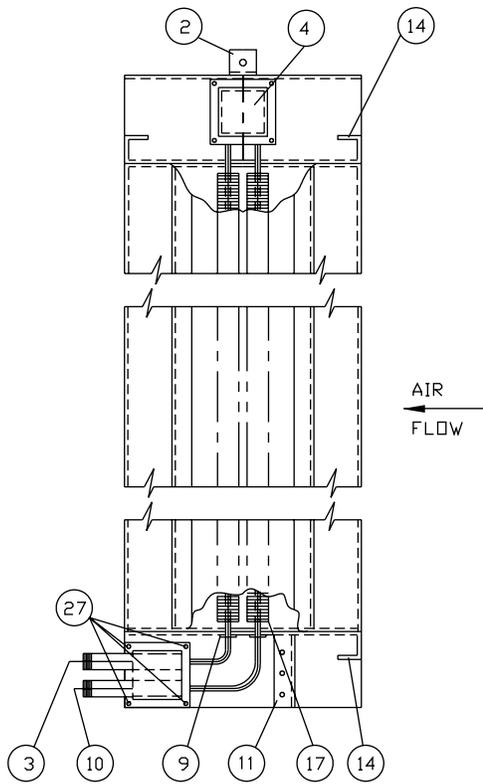
Enlarged View C

Section A-A

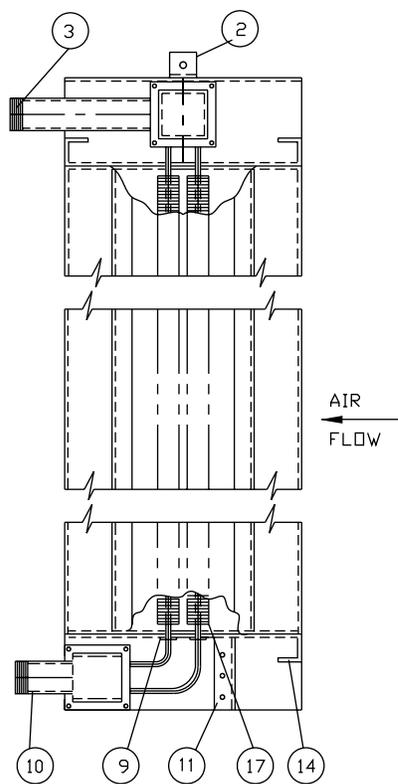


Section D-D

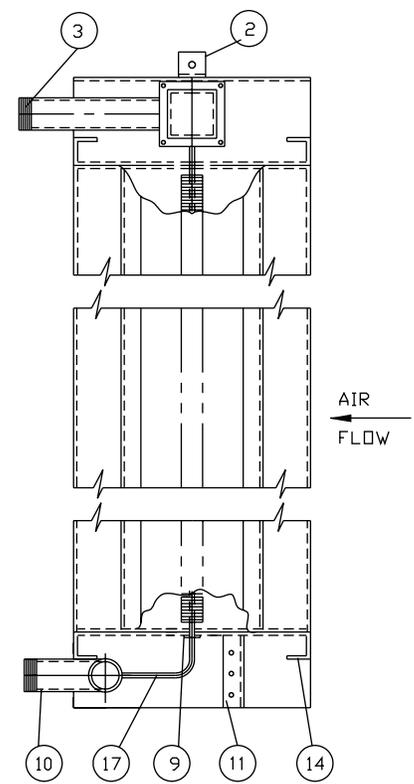
Elevation



**Section B-B
2 Row Hot Water**



**Section B-B
2 Row Steam**



**Section B-B
1 Row Steam or Hot Water**

No.	Description
1	Side Panel Drive Side
2	Angle Lifting Eye
3	Supply Header
4	Closed-Circuit Header
5	Plain Washer – 3/8"
6	5/16" Diameter Hole For Duct or Safing Attachment
7	Connecting Bar
8	Side Panel
9	Snap-Bushing
10	Return Header
11	Casing Support Channel
12	Optional Weather Proof Control Housing
13	Drive Assembly
14	Top and Bottom Panel

No.	Description
15	Bearing Nylon
16	Washer - Special
17	Finned 5/8" Tube
18	Damper
19	Washer – 1" O.D.
20	Palnut-Fastener
21	Plain Washer – 3/16"
22	Rivet – Brass
23	Damper Rod
24	Bearing Nylon
25	Washer – 1/2"
26	Retaining Clip
27	Shipping Bolts to be removed before applying Steam or Hot Water

SECTION VII - PIPING

The integrity of the system depends in part on proper piping. The following recommendations should be diligently observed:

Steam Systems

1. All piping in contact with airflow or inside an air handler should be insulated.
2. Install casing level; tubes must be vertical.
3. Full steam pressure must be supplied to the coil at all times; modulating valves must not be used.
4. Steam mains, return mains and traps should be anchored and supported independently of the steam coil. Traps and condensate piping must be supported on spring-loaded hangers or pads to isolate forces from the return header.
5. Each return piping must incorporate a flexible connector to insure at least 3/8" tube expansion and contraction, and to allow the return header to float.
6. A drip trap should be installed in the steam supply line and drip into the return main. This will prevent steam line condensate from entering the unit with the steam. Avoid dripping steam mains into the steam coil or into the line between the steam coil and traps.
7. Use only bucket or thermostatic float traps for condensate removal. Thermostatic traps should be used for venting only.
8. Steam traps should be sized for three times the calculated condensate loading at the coil design conditions, based on the pressure differential across the trap rather than the boiler pressure. Each trap should be selected for the actual pressure differential across the trap, not the boiler pressure. Pressure differential is herein defined as the gauge pressure at the trap minus the pressure in the return main.
9. The return connection should be full size of the coil header and reduced at the trap. Use of a reducing bushing on the coil return connection is not recommended. (If shutoff valve, strainer and trap are piped together with pipe nipples, then the pipe can be reduced to the trap inlet size at the shutoff valve).
10. Strainers should be installed ahead of traps to prevent dirt and sludge from affecting trap operation. When the "closed circuit gravity return system" leads directly to the boiler, the coil traps should be located at least two feet above the water line of the boiler.
11. Risers should not be installed in condensate return lines.
12. Each coil in a coil bank or in series should be individually trapped and vented. MV coils require two traps.
13. The steam trap should have provisions for air venting. If the trap is non-venting, proper air vents should be provided for each coil section to eliminate condensable gases. All air vent lines should be minimum one-inch diameter and properly pitched to assure free venting of air. The venting device should be located at least 12 inches above the bottom of the coil casing. In low-pressure steam systems (15 psig and below) in which a non-venting trap is used for condensate removal, a thermostatic air trap should be installed in a one-inch diameter air line bypassing the condensate trap to the atmospheric return main. An automatic air vent should be installed in a one-inch diameter air line before the condensate trap on systems with a vacuum return system. In high-pressure steam systems (above 15 psig) in which a non-venting trap is used for condensate removal, an automatic air vent should be installed in a one-inch diameter air line before the condensate trap. Do not return vented air to the condensate return main.
14. A bypass line with valve should be installed around the trap to permit operation of the coil during trap maintenance. This feature will also provide better coil start-up conditions when temperatures are below freezing.
15. If condensate must be lifted above the coil return level into overhead mains or if return mains are pressurized, then a pump and receiver should be installed between the condensate traps and return mains.
16. Proper vacuum breakers should be furnished as shown on the piping diagrams.
17. Swing check valves of 15-degree type should be utilized to prevent condensate backup in the case of steam system failure. Vertical lift check valves or 45-degree swing check valves should not be used as they require a higher head pressure of water for opening.

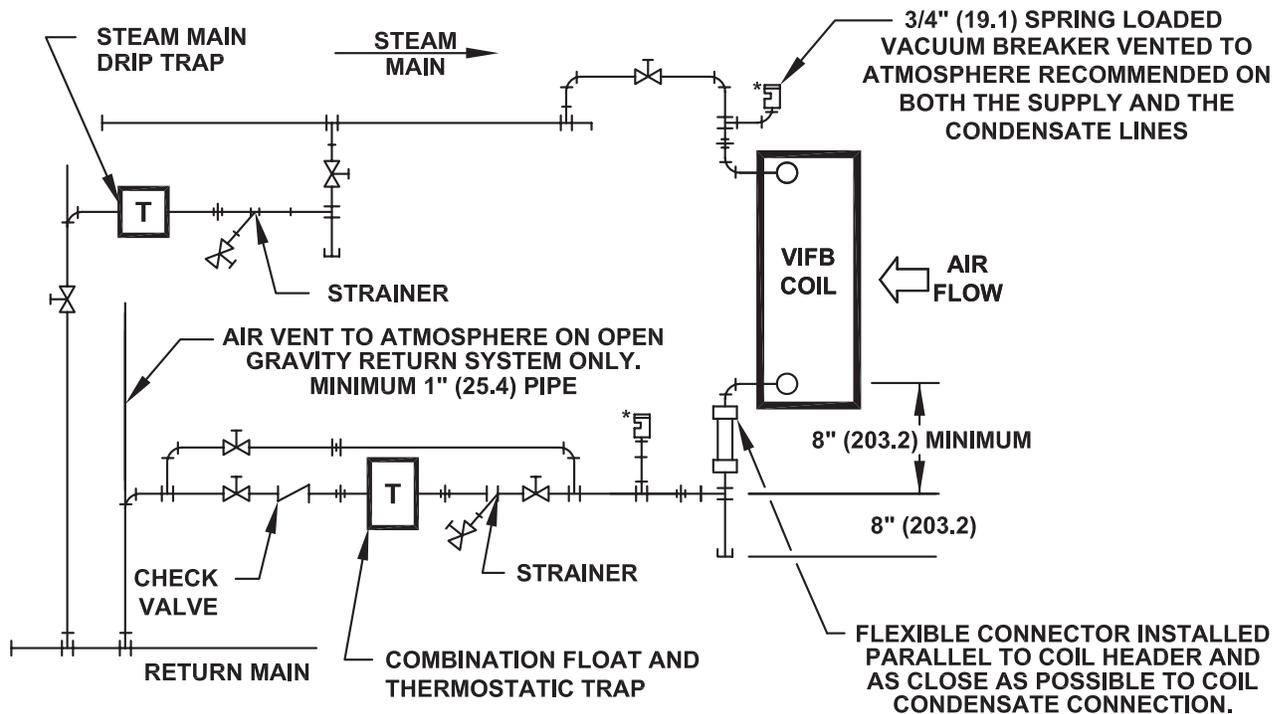
Hot Water Systems

1. Install the casing level; tubes must be vertical.
2. Inlet and outlet mains should be anchored and supported independently of the Wing coil.
3. Inlet piping must incorporate a flexible connector to provide for at least 3/8" tube expansion and contraction, and to allow the return header to float.

STEAM PIPING

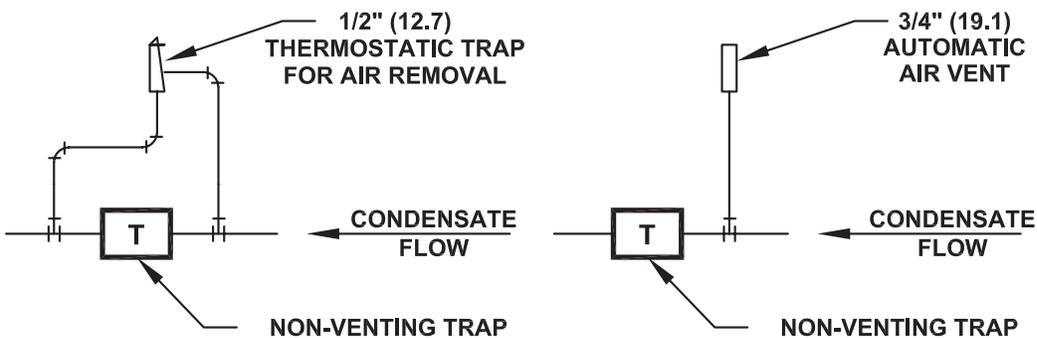
VIFB Coil Piping Diagram – 15 psig and below

W12A



NOTE : THESE GUIDELINES ARE TYPICAL AND NOT INTENDED TO ADDRESS ALL SITUATIONS OR POSSIBLE ALTERNATIVES NEEDED TO MEET INDIVIDUAL SITE REQUIREMENTS.

Additional Piping Required For Non-Venting Type Steam Traps

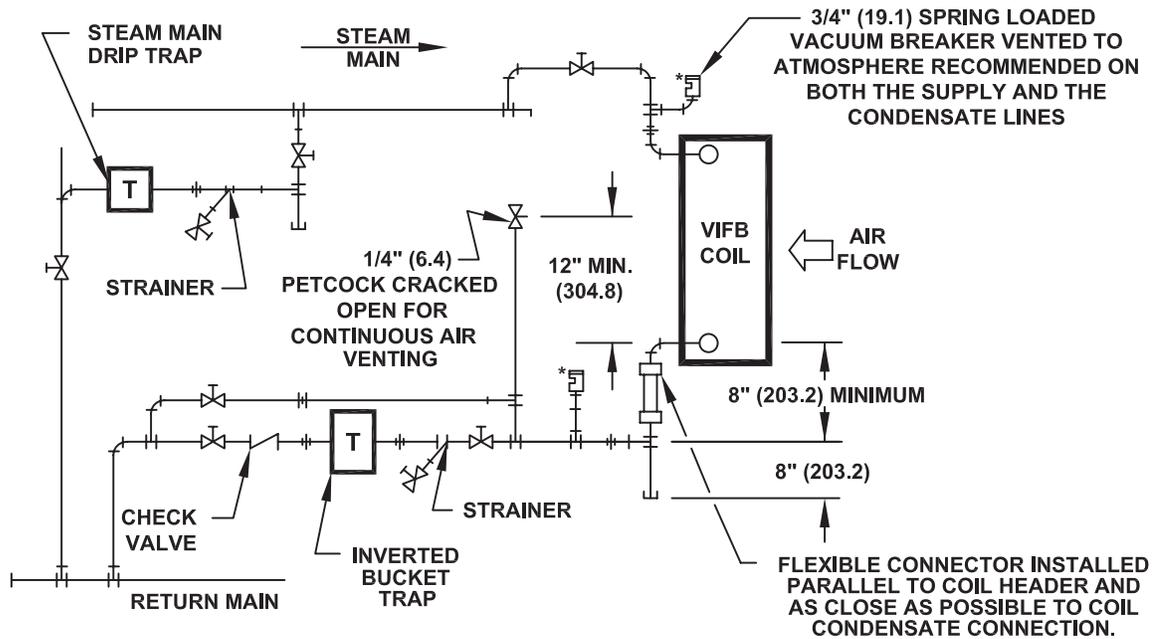


NOTE : DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

STEAM PIPING

VIFB Coil Piping Diagram – Above 15 psig

W33B



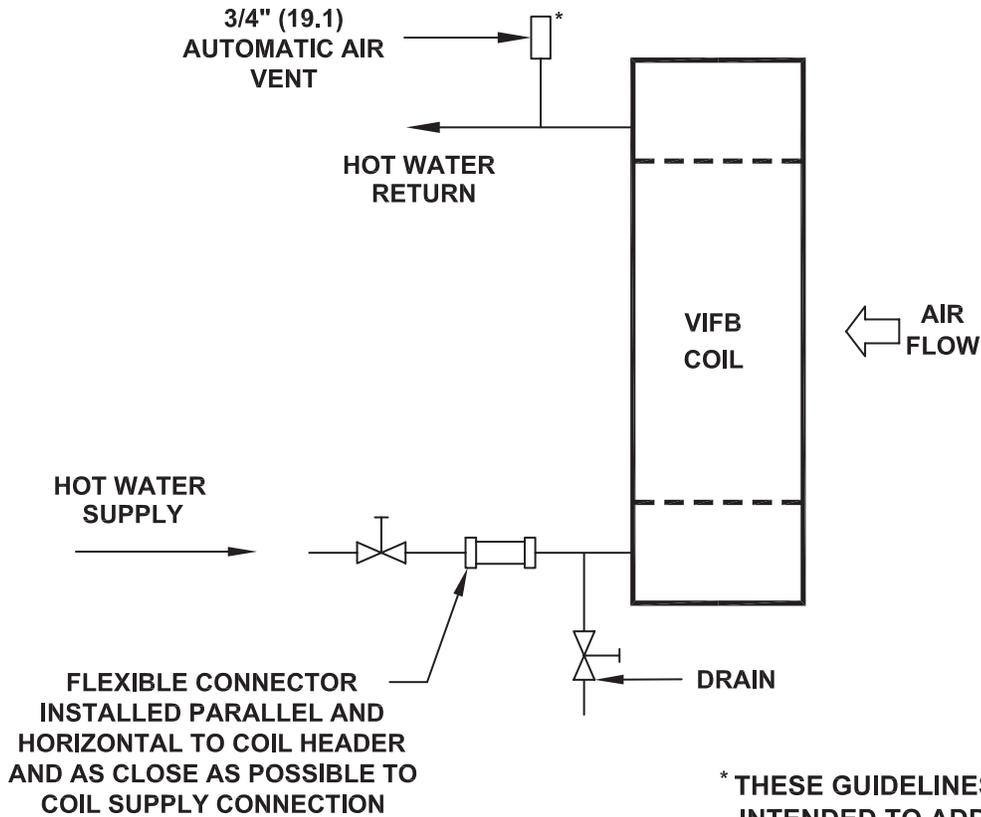
NOTE : THESE GUIDELINES ARE TYPICAL AND NOT INTENDED TO ADDRESS ALL SITUATIONS OR POSSIBLE ALTERNATIVES NEEDED TO MEET INDIVIDUAL SITE REQUIREMENTS.

DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

HOT WATER PIPING

VIFB Coil Piping Diagram – One or Three Row Coils

W13B



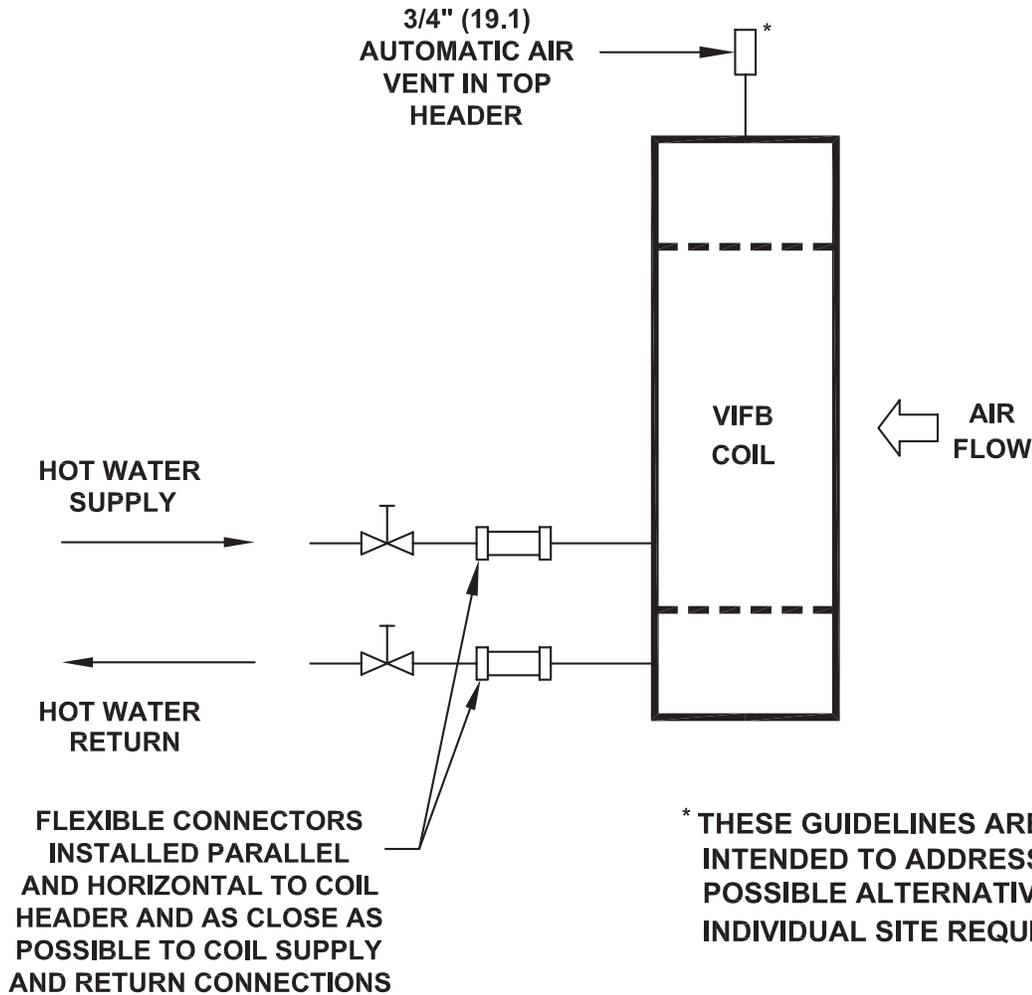
* THESE GUIDELINES ARE TYPICAL AND NOT INTENDED TO ADDRESS ALL SITUATIONS OR POSSIBLE ALTERNATIVES NEEDED TO MEET INDIVIDUAL SITE REQUIREMENTS.

NOTE : DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.
HEATING SPECIALTIES PROVIDED BY OTHERS.

HOT WATER PIPING

VIFB Coil Piping Diagram – Two Row Coil

W32B

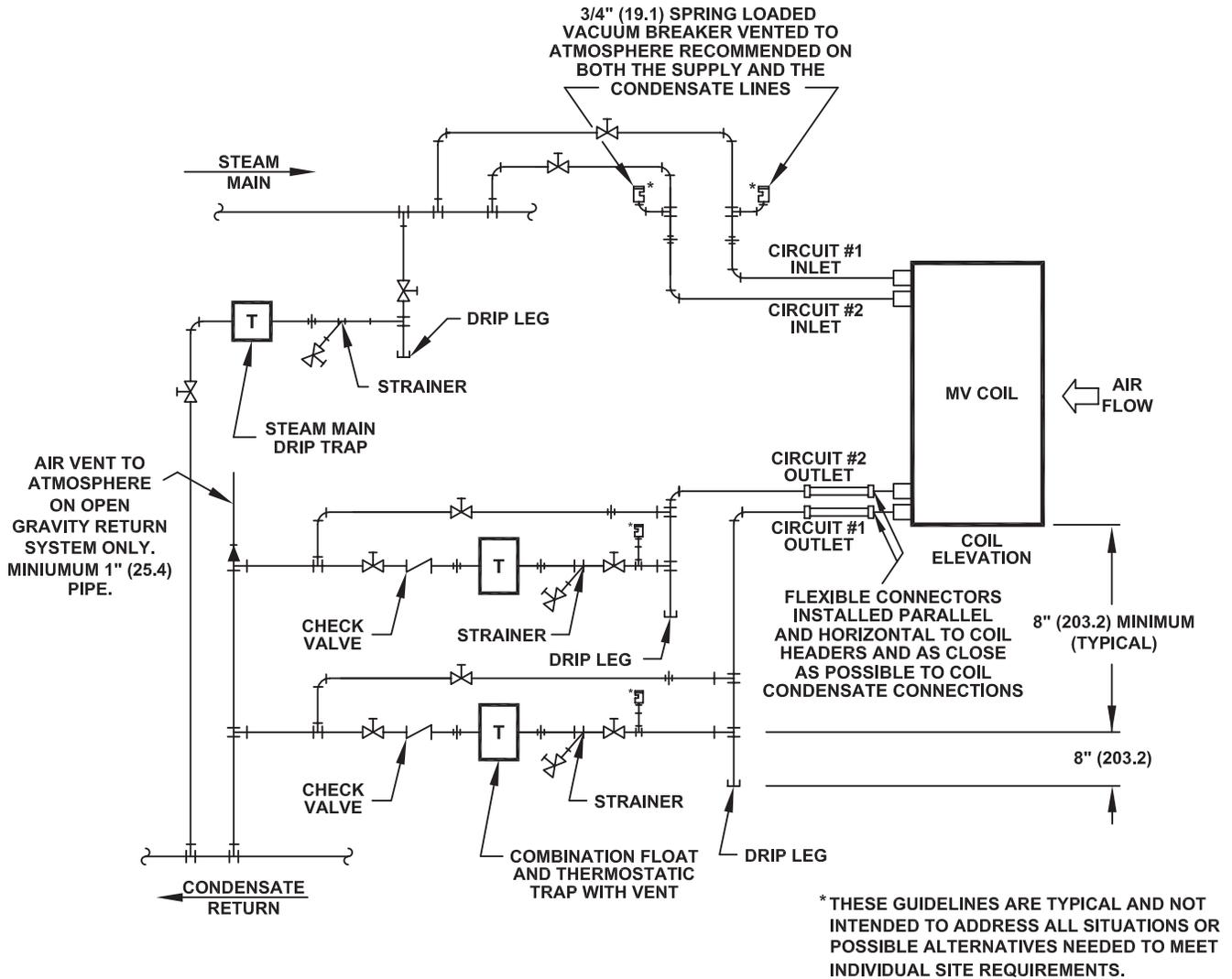


NOTE : DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

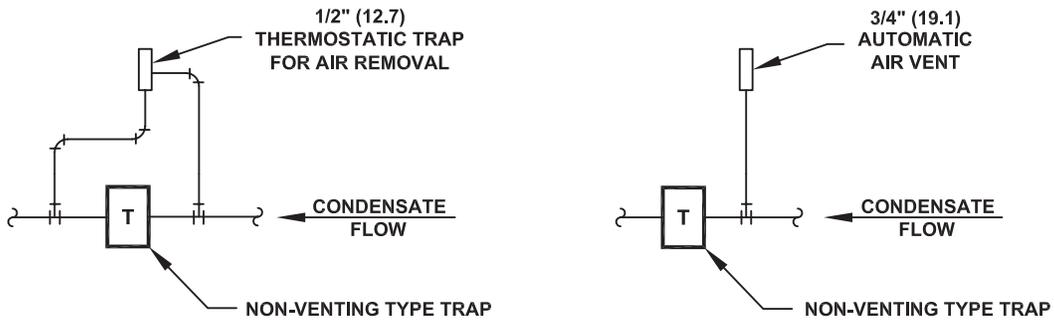
STEAM PIPING

MV Coil Piping Diagram – 15 psig and below

W27A



Additional Piping Required For Non-Venting Type Steam Traps



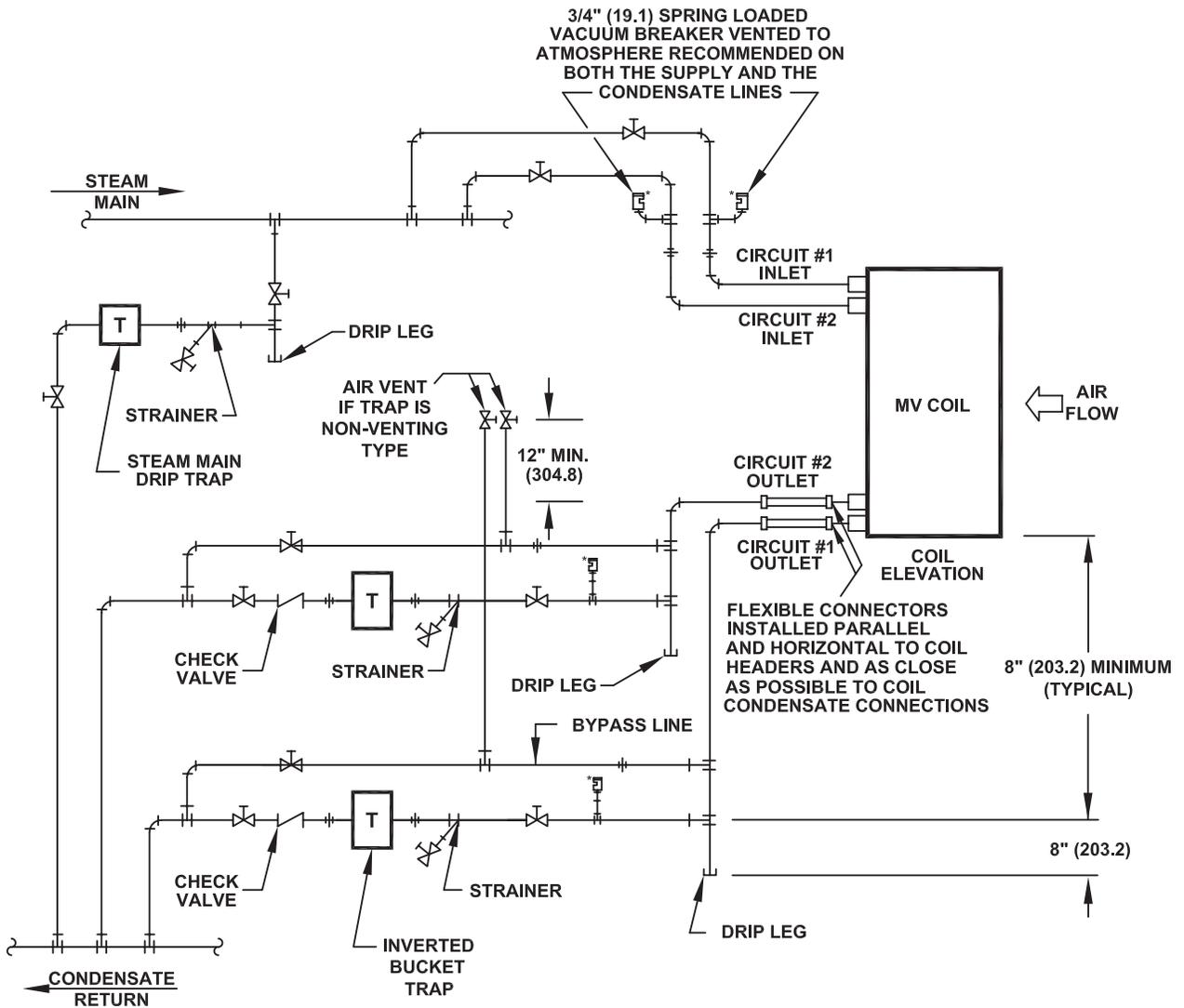
NOTES :

- A. STANDARD MV COIL STEAM INLET AND CONDENSATE LINE SIZE IS 3" (76.2) NPT.
- B. STEAM MAIN NEEDS TO BE SIZED TO HANDLE THE STEAM FLOW RATE FOR THE TWO CIRCUITS TO BE PIPED IN PARALLEL.
- C. CONDENSATE LINE NEEDS TO BE SIZED TO HANDLE THE CONDENSATE FLOW RATE FOR THE TWO CIRCUITS TO BE PIPED IN PARALLEL.
- D. DIMENSIONS ARE IN INCHES. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

STEAM PIPING

MV Coil Piping Diagram – Above 15 psig

W28A



*** THESE GUIDELINES ARE TYPICAL AND NOT INTENDED TO ADDRESS ALL SITUATIONS OR POSSIBLE ALTERNATIVES NEEDED TO MEET INDIVIDUAL SITE REQUIREMENTS.**

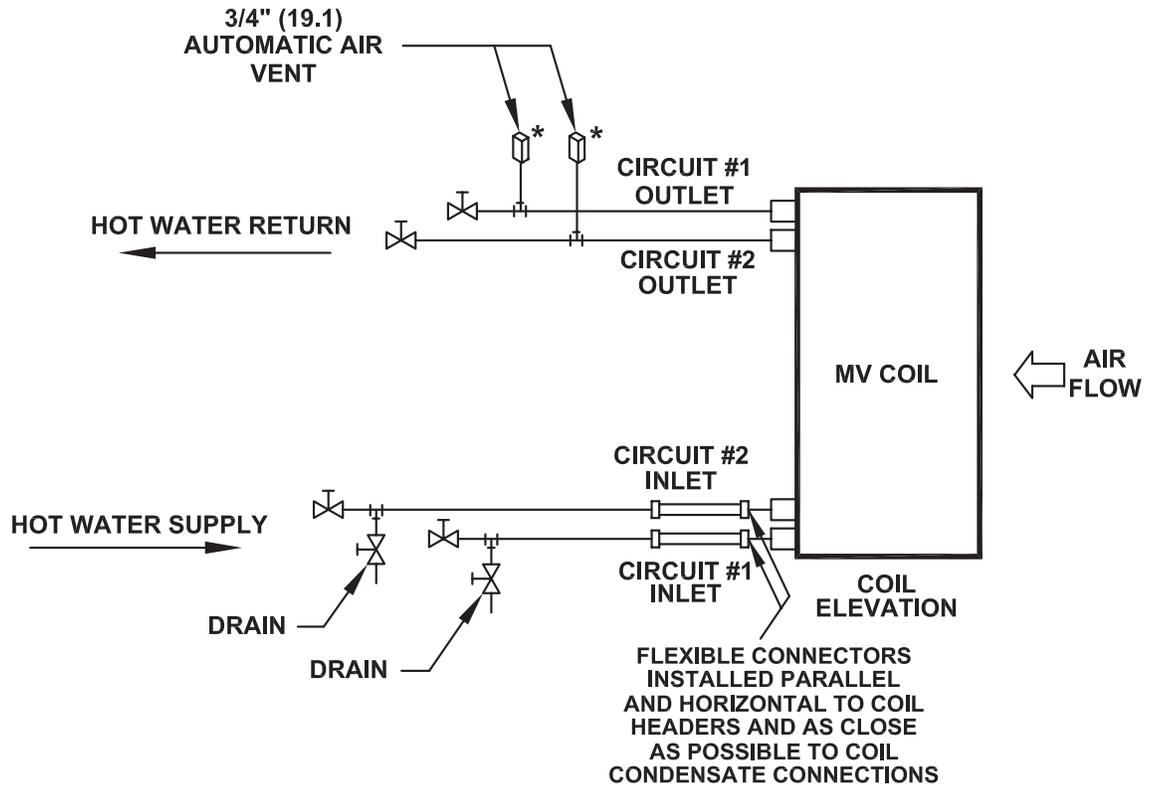
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- A. STANDARD MV COIL STEAM INLET AND CONDENSATE LINE SIZE IS 3" (76.2) NPT.
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- C. CONDENSATE LINE NEEDS TO BE SIZED TO HANDLE THE CONDENSATE FLOW RATE FOR THE TWO CIRCUITS TO BE PIPED IN PARALLEL.
- D. DIMENSIONS ARE IN INCHES. DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.

HOT WATER PIPING

MV Coil Piping Diagram – Two Row Coil

W29A



*** THESE GUIDELINES ARE TYPICAL AND NOT INTENDED TO ADDRESS ALL SITUATIONS OR POSSIBLE ALTERNATIVES NEEDED TO MEET INDIVIDUAL SITE REQUIREMENTS.**

**NOTE : DIMENSIONS ARE IN INCHES.
DIMENSIONS IN PARENTHESIS ARE IN MILLIMETERS.**

SECTION VIII - CONTROL INSTALLATION AND ADJUSTMENT

A. The Wing coil controls airstream temperature by changing face and by-pass damper positions in response to the signal produced by an airstream thermostat in the downstream ductwork. Coils may be furnished with or without controls. When controls are factory furnished, the damper motors are installed and adjusted for the correct stroke at the factory; no field adjustments are required.

B. The airstream thermostat must be located in the downstream ductwork a minimum of 3 ft. away from the coil. The thermostat element must be positioned across both face and by-pass sections of the coil (parallel to the header).

C. Control installation instructions, including diagrams, are enclosed in the instruction envelope when special controls and control arrangements are ordered. Typical electric and pneumatic control arrangements are indicated in drawing #D000756A. A variety of control manufacturers may be used. Please contact the factory for individual control specifications.

D. Means for disconnection must be incorporated in the fixed wiring in accordance with the national wiring regulations (the NEC and/or CEC).

FIGURE 9
Typical Side Mounted Electric Control
(Belimo Standard - 0 To 20 mA)

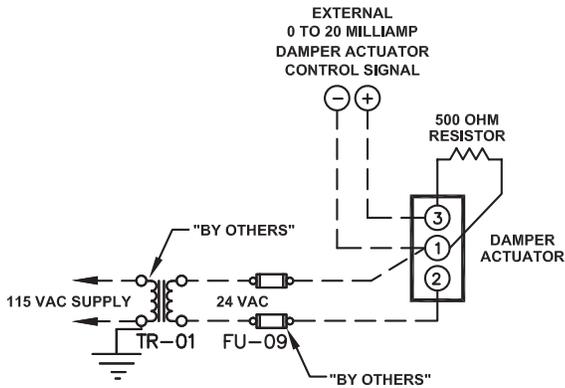


FIGURE 10
Typical Side Mounted Electric Control
(Belimo Standard - 2 To 10 VDC)

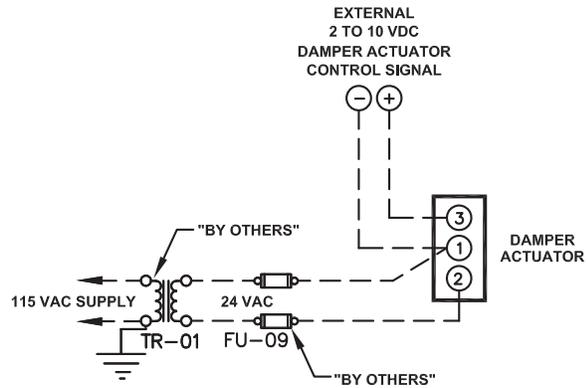


FIGURE 11
Typical Side Mounted Electric Control
(Honeywell Standard - 0 To 135 Ohm)

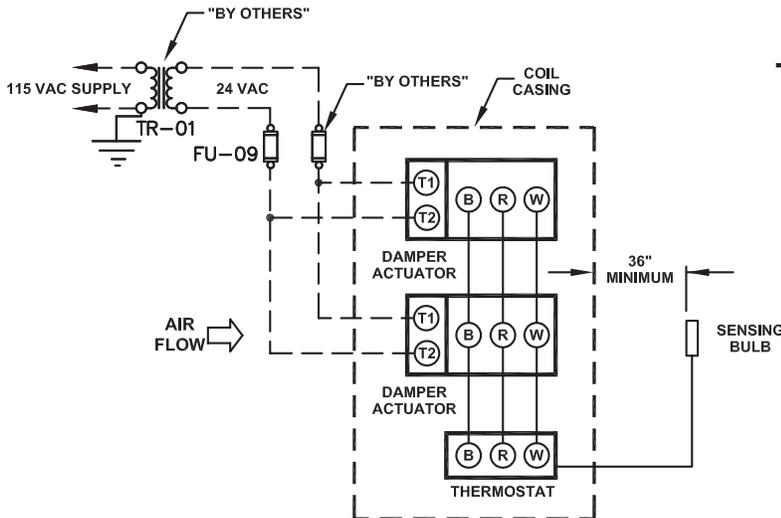
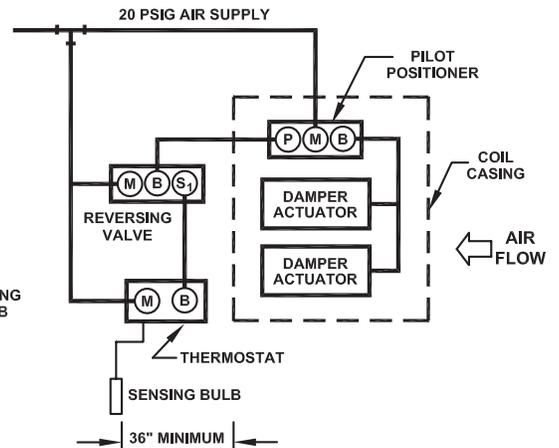


FIGURE 12
Typical Side Mounted
Pneumatic Control
(Barber Colman Standard -
8 To 13 PSIG Control)



D. Adjustment Procedure for Damper Linkage of Coils with Side-Mounted Actuators:

1. Disconnect damper motor rod at ball joints.
2. Loosen all ball joints on scissor saddle (base pan) assembly.
3. Place scissor saddle (base pan) in an "X" configuration. (Photo 1)
4. Adjust one end of each scissor lever to a point 11" from casing, and clamp in that position.
5. Move damper lever arm to a position 4-1/2" from casing. (Photo 2)
6. Tighten ball joints (one on each arm) connecting scissor saddle (base pan) arms to damper lever arm.
7. With assembly now set, release clamps and rotate damper lever arm until it reaches a point 1-1/2" from casing, and clamp in this position. (Photo 3)
8. Manually check to make sure that all dampers are fully closed around the coil.
9. Tighten ball joints (two on each side) connecting base assembly to dampers.
10. Remove clamps.
11. Manually move scissor saddle (base pan) to check for proper opening and closing of dampers.
12. Connect motor(s).

NOTE: Direct-coupled drive system should not require field adjustment.

Photo 1

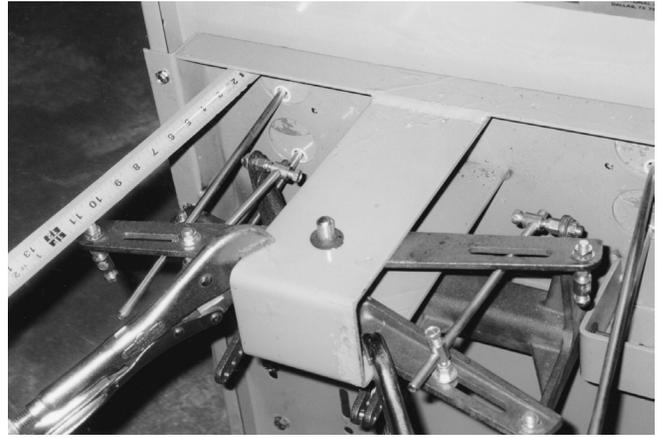
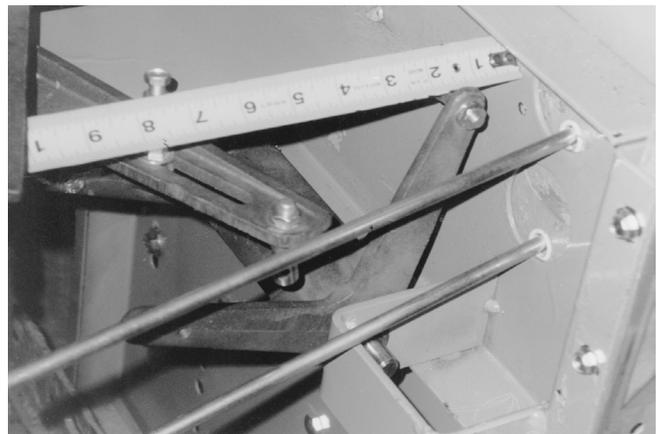


Photo 2



Photo 3



SECTION IX - START UP

A. Control Checks

- On units with **PNEUMATIC CONTROLS**, take all air pressure off. Dampers should go to full face open position. Application of full air pressure will close the dampers in the opposite direction. Adjust the thermostat setting to be sure that when the thermostat is calling for heat, the face opens and the by-pass closes.
- On units with **electric controls**, follow control manufacturer's instructions for shorting out thermostat contacts to move the damper to close the face one way, and then the by-pass. Adjust thermostat setting to be sure operation is correct so that when thermostat is calling for heat, the face opens and the by-pass closes.

NOTE: On electric control units, since motors are not spring return, dampers will remain in their last operating position if the power is turned off.

B. Turning Steam On Unit

(Be sure lower header shipping bolts are removed)

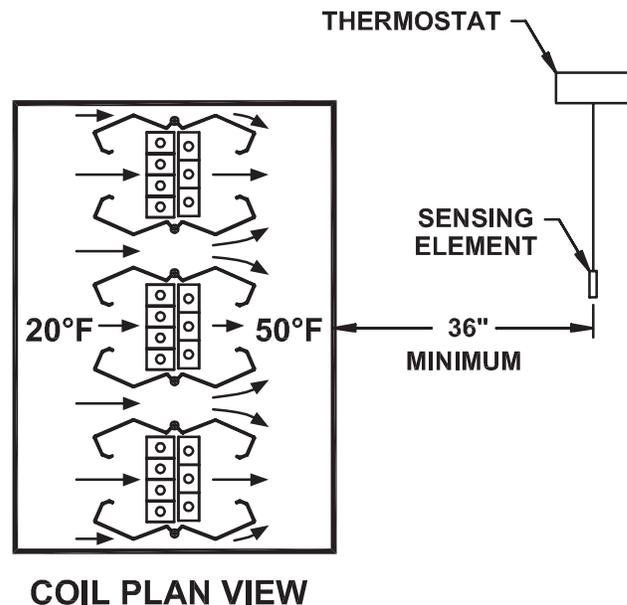
- Open all valves on return lines, including trap valves and by-pass line around trap, to insure full flow of condensate and steam from the coil.
- Open all valves in drip trap line from steam main before the coil to remove condensate and insure dry steam in the main.
- Open steam supply line to coil and blow through coil with steam to purge coil of air and condensate.
- Feel tube surfaces to assure even heating of all surfaces before starting fans or opening outside shutoff dampers.
- Allow unit to "heat soak" at least 15 minutes as in step #4.
- Open dampers on the heating surface all the way by adjusting thermostats or control air pressure to units.
- Open outside dampers.
- Check coil surface for even heating as in step #4.
- Slowly close by-pass around traps and check for trap operation.
- Adjust thermostat or control air pressure to normal operating condition and start fan.
- Set thermostat for desired temperature. Dampers should position to produce required temperature rise. Check traps for proper operation.

C. Turning Hot Water On Unit

(Be sure lower header(s) shipping bolts are removed)

- Open return valve and supply valve. Purge all air from coil and lines.
- Feel surface to make sure unit is heating evenly and that all air is purged from the coils.
- Allow unit to "soak" for at least 10 minutes before turning fan on.
- Open outside air dampers and start fan.
- Feel surface again to check for even heating as in step #2.
- Adjust balancing valve for desired GPM flow through coil.
- Set thermostat for desired temperature. Dampers should position to produce required temperature rise.

Figure 12 - Thermostat Location (C000677A)



SECTION X - SHUT DOWN

- A. Shut off system air fan.
- B. Close system outside air shutters or otherwise prevent air leakage into system. Open strainer blowdown valve and close valve after the trap.
- C. Shut off steam or water supply after circulation fan has stopped and air in the inlet ductwork is above 35 degrees.
- D. As soon as possible, open drip leg in return main (on steam units), or drain and air valves (on hot water units), and allow water to drain.
- E. **Do not expose a coil which has been shut down to sub-freezing air flow as water droplets in tubes may freeze, resulting in coil freeze-up when coil is restarted. (See starting instructions.)**

SECTION XI - MAINTENANCE

- A. The Wing heating coil should be periodically inspected for continuous satisfactory operation. Loose nuts, bolts, screws and damper linkage should be tightened. Crank arm pivots, control linkage, and damper rods should be checked for wear and replaced if worn.
- B. Steam traps should be checked for proper operation. Strainers, dirt pockets and drip legs should be cleaned periodically.



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