



Type “S,” “D,” “V,” & “H” Steam Heating Coils

Standard Service/Installation/ Operation Manual

Please consult your local representative or the factory for warranty issues.

Customer Service

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Thank you for purchasing a DRS Marlo Coil steam coil. If you have any questions regarding the installation or operation of the product, please contact your local DRS Marlo Coil Sales Representative or DRS Marlo Coil.

WARNING

READ ALL INSTRUCTIONS CAREFULLY BEFORE INSTALLING. FOLLOW THE PROCEDURES FOR SAFE AND PROPER INSTALLATION, MAINTENANCE, AND OPERATION. IMPROPER INSTALLATION, MAINTENANCE, OR OPERATION MAY RESULT IN THE WARRANTY BEING VOIDED.

1.0 PRODUCT DESCRIPTION

The DRS Marlo Coil steam heating coil is a steam to air heat transfer device intended to be used in commercial, institutional, industrial, marine, or process use. The product is custom designed to be used only in the application for which it was originally designed. DRS Marlo Coil must be contacted for advice before any changes from the original, intended application of the product are made, including the supply utilities, the air volume, or the environment.

The coil is intended to be used with steam.

2.0 RECEIVING INSTRUCTIONS

2.1 INSPECTION

All coils are carefully inspected and packaged for shipment at the factory. Despite these precautions, rough handling enroute may cause damage.

Coils should be inspected upon receipt. Loose bolts and/or screws must be retightened. Any shortages, damage, or breakage should be indicated on the carrier's freight bill and signed by the driver or the carrier's representative. If damage is noted after delivery, it should be reported to the carrier and a claim filed at once.

For additional assistance, contact the sales representative from whom you purchased the coil, or the factory.

2.2 UNPACKING

All coils are packaged to prevent damage. Care should be taken when unpacking to avoid damage to the finned surface area. Gloves should be worn to avoid hand and finger injuries, as finned coils do have sharp edges.

3.0 HANDLING INSTRUCTIONS

The instructions contained in this section must be followed to avoid injury to personnel or damage to the coil.

- Do not lift or handle the coil by the face area, headers, tubes, or connections.
- Wear gloves when handling coils and be careful around fins and other edges of metal.

Rigging and lifting methods may include slings at both ends of the coil, which encompass both coil channels. Lifting devices deemed suitable by the user may be attached at each end of the top coil channel. All slings, devices, and apparatus should be of a rating suitable for the loads they will be subjected to, and ensure that no deformation of the coil casing occurs. DRS Marlo Coil assumes no responsibility for lifting apparatus, devices, and methods used by others for rigging and lifting.

4.0 STORAGE

In the event that the coil will not be put into service immediately, certain precautions should be taken. The coil should be stored indoors in a clean, dry location that is level and sturdy. Coil connections must be capped.

When placing coils into storage after being in service, coils must be completely free of condensate.

If it is necessary to store the coil outdoors, the coil should be stored off the ground and wrapped fully with a tarpaulin or plastic.

Periodically inspect the coil to be sure the finned surface area is free of accumulated dirt or dust, and to be sure no damage has occurred.

5.0 INSTALLATION & PIPING

IMPORTANT

In order to prevent coil damage from water hammer, unequal thermal stresses, freeze-up, and/or corrosion; provisions must be made to ensure that condensate flows freely from the coil at all times.

WARNING

DO NOT EXCEED THE MAXIMUM DESIGN TEMPERATURE, PRESSURE, OR FLOW RATE.

Standard DRS Marlo Coil steam coils are provided with special casings, which provide for the proper amount of coil pitch for positive condensate drainage. They should therefore be installed level.

The coil should be supported at a minimum with supports located at each end. Longer coils may require intermediate supports to prevent casing from bowing. Coils may also be supported by suitable ductwork by bolting or welding the entire casing perimeter to the duct on both sides. The entering side of the coil face should be safed-off (baffled) to ensure all airflows through the coil core. All duct and safe-off connections should be sealed to prevent air leakage. Failure to do so will result in loss of performance.

Do not exceed the maximum design temperature, pressure or flow rate.

Threaded piping hook-ups should always be made using two pipe wrenches. Use one wrench to prevent movement of the coil connection, and the other to tighten the joint. *For typical piping arrangements, refer to "Figure 1 - Typical Steam Coil Piping," page 7 or "Figure 2 - Typical Steam Coil Piping," page 8.*

1. Install 1/2" - 15 degree swing check valve vacuum breaker at vertical rise extending from coil condensate connection.

Vacuum breaker should be installed as close as possible to coil. Vacuum breaker may be vented to atmosphere or connected to condensate return line at discharge side of trap. **Vacuum relief is extremely important when coil is controlled by steam modulating valve or automatic two-position on/off valve.**

2. Steam traps must be properly selected and installed to ensure adequate condensate removal from the coil under all operating conditions.

Traps should be sized based on the maximum possible condensate flow rate with appropriate safety factors, and at appropriate pressure differential.

NOTE

For a coil controlled by a modulated steam valve, the pressure at the inlet side of the trap will be limited to the hydrostatic head resulting from the vertical drop from the coil condensate connection to the trap discharge.

Locate the trap discharge a minimum of 12 inches below the coil condensate return connection. This will provide the hydrostatic head pressure necessary to overcome losses associated with a properly sized trap.

Float and thermostatic type traps are recommended for coils on systems utilizing gravity return at atmospheric pressure or for vacuum return systems. This type trap is preferred because of its continuous discharge characteristics and its high venting capacity.

Bucket traps should only be used when the supply steam is unmodulated and at a pressure of 15 psig or higher.

Always trap each coil separately to prevent condensate retention in one or more of the coils.

Install a strainer as close as possible to the inlet side of trap.

3. Type S & V coils should not be modulated when the temperature of the entering air stream is 32 degrees F or below. Use a two-position on/off steam supply control.

CAUTION

This type of valve should be opened slowly, in graduated steps, to prevent possible coil damage. Under freezing ambient conditions, when outdoor air is supplied to Type S or V coil, supply steam pressure should be a minimum of 5 psig.

If the coil is subjected to an air vs. steam delta temperature greater than 150°F, allow the coil to “heat soak” for 15 to 30 minutes before energizing the fan. This reduces the risk of damage to the coil due to thermal shock.

4. When coils are installed in series airflow arrangement, always control each bank separately.
5. Never use modulated or on/off supply steam control on systems with overhead or pressurized return mains, unless appropriate system design allowances have been made (e.g. condensate is drained by gravity to a vented receiver and pumped to condensate main).
6. Overhead or pressurized returns require a minimum of one psig pressure at the trap discharge for each two feet of elevation of return main to ensure that condensate is continuously discharged from the coil.
7. Entire pipe run from coil condensate connection to trap inlet should be at least the full size of the coil condensate connection. The piping run may be reduced only at the trap inlet, if required for smaller pipe size.
8. All piping should be supported independently of coils.
9. Pitch all supply and return steam piping down a minimum of one inch per ten feet of length, in the direction of steam flow.

10. Take-offs serving coils should be connected at the top of steam main.
11. Control valves should be located on horizontal pipe run and should be located at the highest point of the supply piping.
12. Coil supply piping should not be drained through the coil. Use a drip trap, which will allow lines to be drained ahead of the coil.
13. Swing joints or flexible fittings should be provided in all piping connections adjacent to heating coils, in order to absorb expansion and contraction strains.

6.0 MAINTENANCE

WARNING

PRIOR TO PERFORMING ANY MAINTENANCE, THE COIL SHOULD BE CHECKED TO BE SURE IT IS OUT OF SERVICE. GLOVES, PROTECTIVE CLOTHING, AND EYE PROTECTION SHOULD BE WORN AT ALL TIMES WHEN CLEANING THE COIL TO PREVENT CUTS TO THE HANDS AND FINGERS.

6.1 INSPECTION

The coil should be visually checked periodically to assure that finned surfaces are free of dirt, debris, and other airborne deposits.

The coil (and system) should also be checked periodically for any signs of leakage or malfunction.

6.2 CLEANING

1. External cleaning of the coils may be accomplished by employing either of the following methods:

Large debris may be removed by hand.

Dirt or dust may be removed by brushing or vacuuming the face of the coil on the air entering side.

A solution of warm water and soap, or detergent, may be used to remove severe dirt build-up. A soft bristle brush should be used to avoid damaging the finned surface area. Gently scrub dirt build-up from the air entering side of the coil face, the surrounding areas, and the air leaving side of the coil, as required. Rinse the area with clean water, being careful to avoid getting water into other equipment, especially electrical devices, filters, etc.

Low pressure steam may also be used to clean the coil. Cover any equipment, wiring, etc. that may be affected by the steam spray. Using a wand, spray the steam through the coil face in the direction opposite the airflow until all dirt is removed.

2. After cleaning, inspect the coil and repeat cleaning as necessary. When the area has been completely cleaned, dried, and inspected, re-install any filters, access panels, etc. that may have been removed for cleaning. Any disconnected electrical power may be reconnected at this time.

7.0 REPAIR

If it is believed that the coil is in need of repair, the DRS Marlo Coil sales representative from whom the coil was purchased, or the factory, should be called.

Unauthorized repair of the coil may void the warranty.

8.0 REMOVAL FROM SERVICE

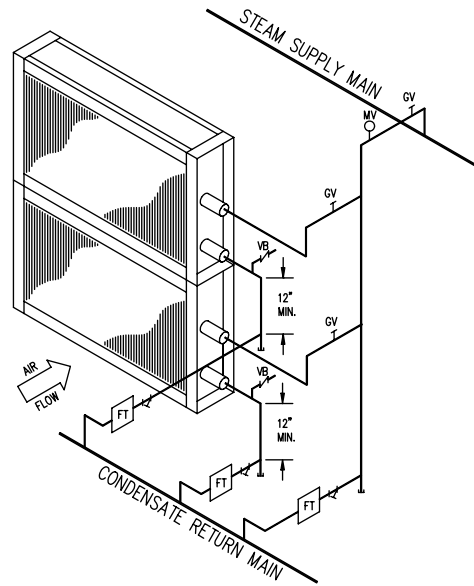
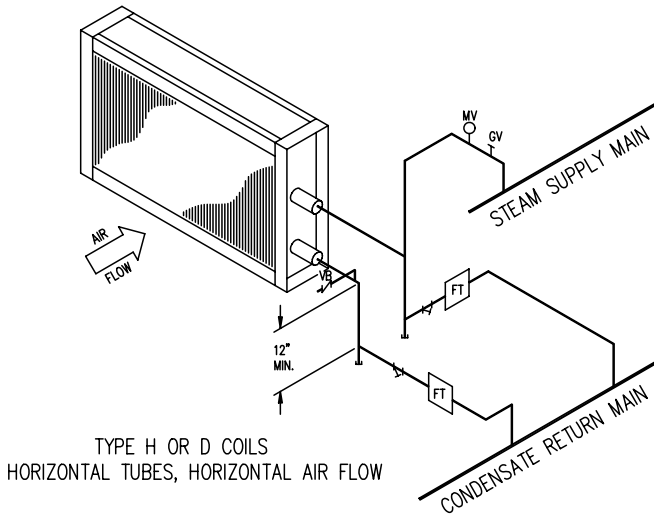
If the coil is removed from the installation, follow the storage instructions in Section 4.0.










9.0 TROUBLESHOOTING

Once a coil has been properly installed, it should provide the required heating conditions. Situations may arise which preclude normal functioning of the coil. The following chart should be consulted for troubleshooting.

PROBLEM	SITUATION	SOLUTION
Liquid leakage	Coil piping connection loose/leaking	Re-tighten connection. If unsuccessful, undo connection, apply thread sealant and reassemble.
	Damaged coil during shipment	Contact factory.
	Excessive expansion/contraction during operation	Contact factory.
	Corrosion of coil materials and/or joints	Contact factory.
	Coil freeze-up	Contact factory.
Air leakage at coil face connection	Bypass around coil face	Re-connect ductwork and/or safe-offs using proper sealing techniques.
Air pressure drop too high	Incorrect measurement technique or improperly balanced	Follow manufacturer's directions for devices being used. Consult SMACNA manual on testing, adjusting, and balancing.
	Restricted airflow entering or leaving ductwork	Allow adequate duct lengths for transitions to coil face.
	Coil fins are dirty	Clean coil core per maintenance instructions.
Coil not performing per specifications/water hammer.	Improper measurement technique or system improperly balanced	Make sure proper technique and devices are being used. Make sure manufacturer's directions for devices are being followed. Consult SMACNA manual on testing, adjusting, and balancing.
	Coil fins are dirty	Clean coil core per maintenance instructions.
	Condensate retention in coil due to improper installation/piping.	See installation and piping instructions.

TYPICAL STEAM COIL PIPING



-  FLOAT AND THERMOSTATIC TRAP
-  BUCKET TRAP
-  1/2"-15' SWING CHECK VACUUM BREAKER
-  GATE VALVE
-  STEAM MODULATING VALVE
-  ON/OFF STEAM VALVE
-  CHECK VALVE
-  STRAINER
-  CLEANOUT

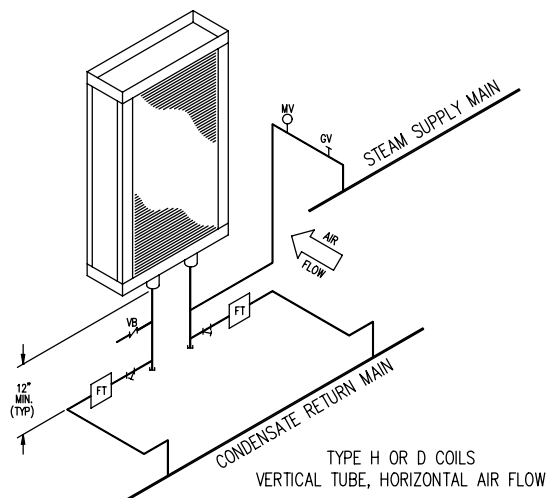
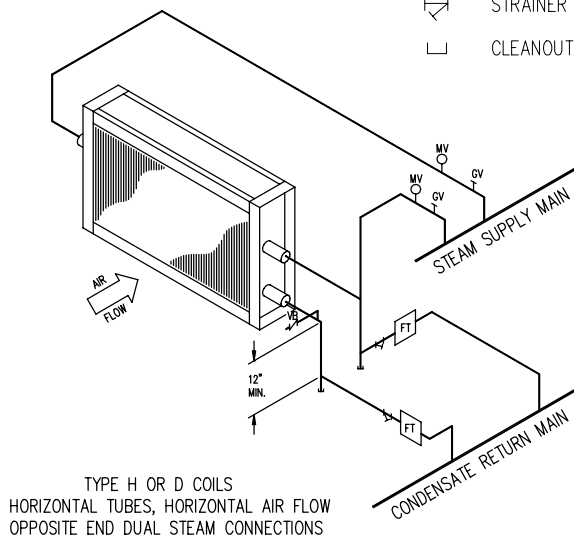
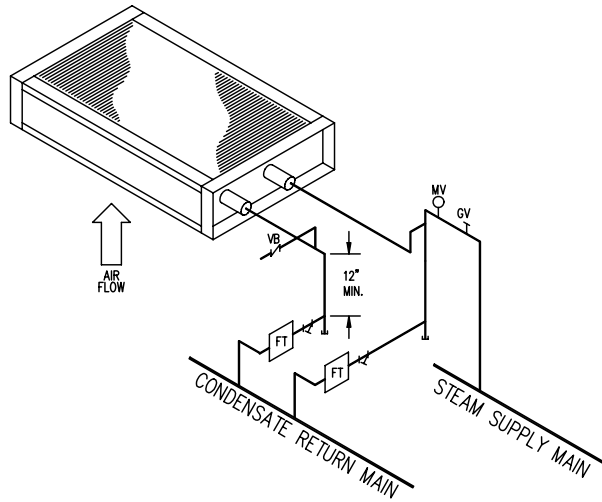
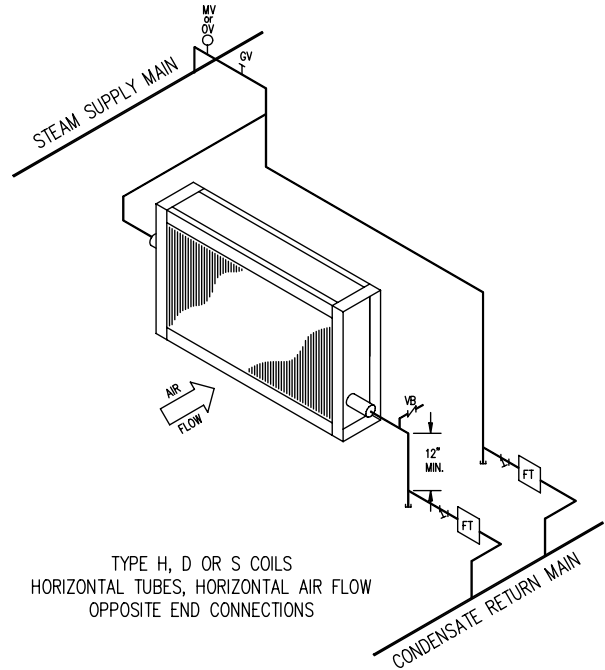


Figure 1 - Typical Steam Coil Piping










TYPICAL STEAM COIL PIPING

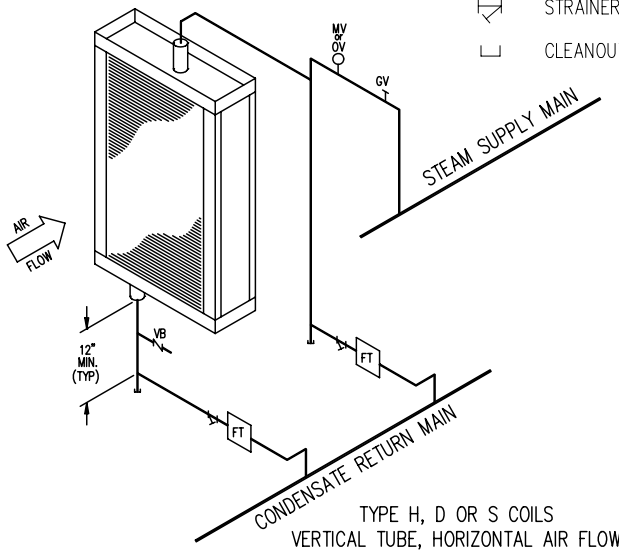


TYPE H OR D COILS
HORIZONTAL TUBE, VERTICAL AIR FLOW

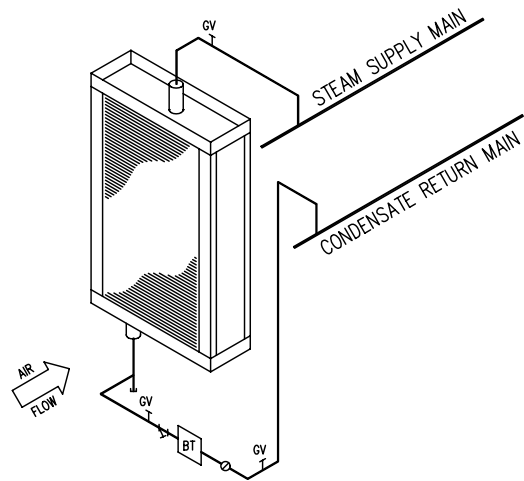


TYPE H, D OR S COILS
HORIZONTAL TUBES, HORIZONTAL AIR FLOW
OPPOSITE END CONNECTIONS

-  FT FLOAT AND THERMOSTATIC TRAP
-  BT BUCKET TRAP
-  VB 1/2"–15" SWING CHECK VACUUM BREAKER
-  GV GATE VALVE
-  MV STEAM MODULATING VALVE
-  OV ON/OFF STEAM VALVE
-  CV CHECK VALVE
-  S STRAINER
-  C CLEANOUT



TYPE H, D OR S COILS
VERTICAL TUBE, HORIZONTAL AIR FLOW



TYPE S COIL
VERTICAL TUBE, HORIZONTAL AIR FLOW
HIGH PRESSURE W/ NO STEAM SIDE CONTROL

Figure 2 - Typical Steam Coil Piping

Steam Coil Start-Up Check List



Job Name: _____

Date: _____

DRS Marlo Coil Model Number: _____

By: _____

Serial Number: _____

Tag: _____

- Check Overall Appearance of Coil.
- Coil Installation Level. (Pitched in casing)
- Coil Supported at Each End or Around Full Face Perimeter on Both Sides.
- Duct Connection Sealed to Prevent Leakage.
- Piping Supported at Locations Other than Coil.
- Piping Connections Tight and Leak Free.
- Coil Piped and Installed Correctly. *Refer to "Installation & Piping," page 3.*