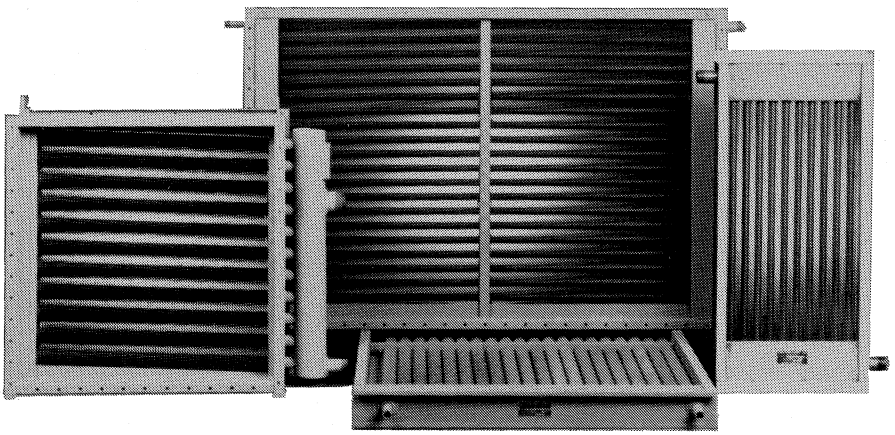
Bulletin No. AH-825-C

Armstrong®

Coils

Installation, Operation and Maintenance of Armstrong Series 6000 Coils



These installation, operation and technical instructions should be used by experienced personnel as a guide to ensure that Armstrong's Series 6000 Coils function in a correct manner. Selection or installation of equipment should always be accompanied by competent technical assistance. We encourage you to contact your local representative or Armstrong if further information is required.

Installation, Operation and Maintenance Instructions

In steam coils, successful operation and a long, trouble-free service life depend on:

1. The manner of installation, including the design of coil mounting and piping—with particular emphasis on trapping, air venting and avoidance of transferring piping loads and vibrations to the coil.

2. Operating conditions which are within design parameters.

3. The method of operation.

4. The thoroughness and frequency of cleaning required.

Following these simple guidelines will help you achieve maximum coil performance.

Receipt and Storage

1. Upon receipt, inspect coils and notify carrier immediately of any damage sustained in transit.

2. If coils are not installed immediately, store under cover in a heated area free of potential damage from personnel and/or equipment.

Installation

1. **Support coils and piping individually** to prevent undue strains on the steam and condensate connections. Use swing joints or flexible connections for freedom of movement.

2. Steam and condensate pipes should be the same size as coil connections. Maintain connection size from the coil back to the steam main and from the coil to the steam trap takeoff.

3. **Install a drip trap** prior to the coils (and before a control valve if there is one) to prevent the introduction of condensate.

4. **Install strainers with blowdown valves** before all control valves and traps.

5. To avoid hunting and maintain control, use only modified linear or equal percentage (vee-port) valves when a modulating control valve regulates the steam supply. Consult Armstrong for proper applications.

6. **Never oversize control valves. Bigger is *not* better.**

7. **Install a vacuum breaker** in the steam piping prior to the coil to prevent retention of condensate during shutdown. Also install a vacuum breaker on the downstream side of the coil when steam pressure is to be modulated.

8. **Vent non-condensable gases** individually on each coil to ensure maximum heat transfer and minimum internal corrosion. In order of effectiveness, venting can be with a fixed orifice bleed, independent thermostatic vent or by using a float and thermostatic steam trap.

9. Trap all coils individually. Otherwise, inadequate drainage and venting may damage the coil and/or interfere with effective heat transfer.

10. Use only traps such as the invented bucket or float and thermostatic which drain continuously. See Table 3 - 1 for selection guidelines.

11. **Install a dirt pocket** prior to the steam trap. You may also install a gate valve at the bottom of the dirt pocket to facilitate drainage during shutdown periods.

12. Use the same size trap on all coils when they are in parallel across the duct opening. Coils mounted in series (one behind the other in the direction of the air flow) typically have lower condensing rates at the downstream end of the system. Size traps to handle the maximum calculated load for individual coils using proper trap service factors. Avoid oversizing. Consult your Armstrong Representative if you need assistance.

13. Modulating control valves are best used with gravity flow vented condensate return systems. If the condensate return system is overhead or pressurized, the use of pumps, Armstrong pumping traps or the Armstrong Posi-Pressure Coil Controller System is highly recommended. If this is not possible a safety drain as illustrated on page 3 should be installed.

14. **Install air filters** at the coil inlet if possible. Simple filter systems permit easy cleaning or replacement and ensure efficient operation.

15. Refer to page 3 for an illustration of piping practices for steam heating coils.

Operation

Once coils are installed properly, their performance and service life depend on a few simple guidelines for maintenance and operation.

1. To prevent plugging of tubes, clean the piping system and blow down all strainers prior to initial startup.

2. On each startup, feed steam to the coils slowly to avoid thermal shock loadings.

3. Make sure the steam has been on for a minimum of 15 minutes prior to starting fans or opening dampers.

4. Make sure operating pressures are kept within design limits.

5. During initial startup, tighten all bolted connections once the system stabilizes at operating temperature.

6. To provide maximum freeze protection, maintain a minimum steam pressure of 5 psig to coils exposed to air temperature below 40ºF (5ºC). If this is impossible, consult your Armstrong Representative.

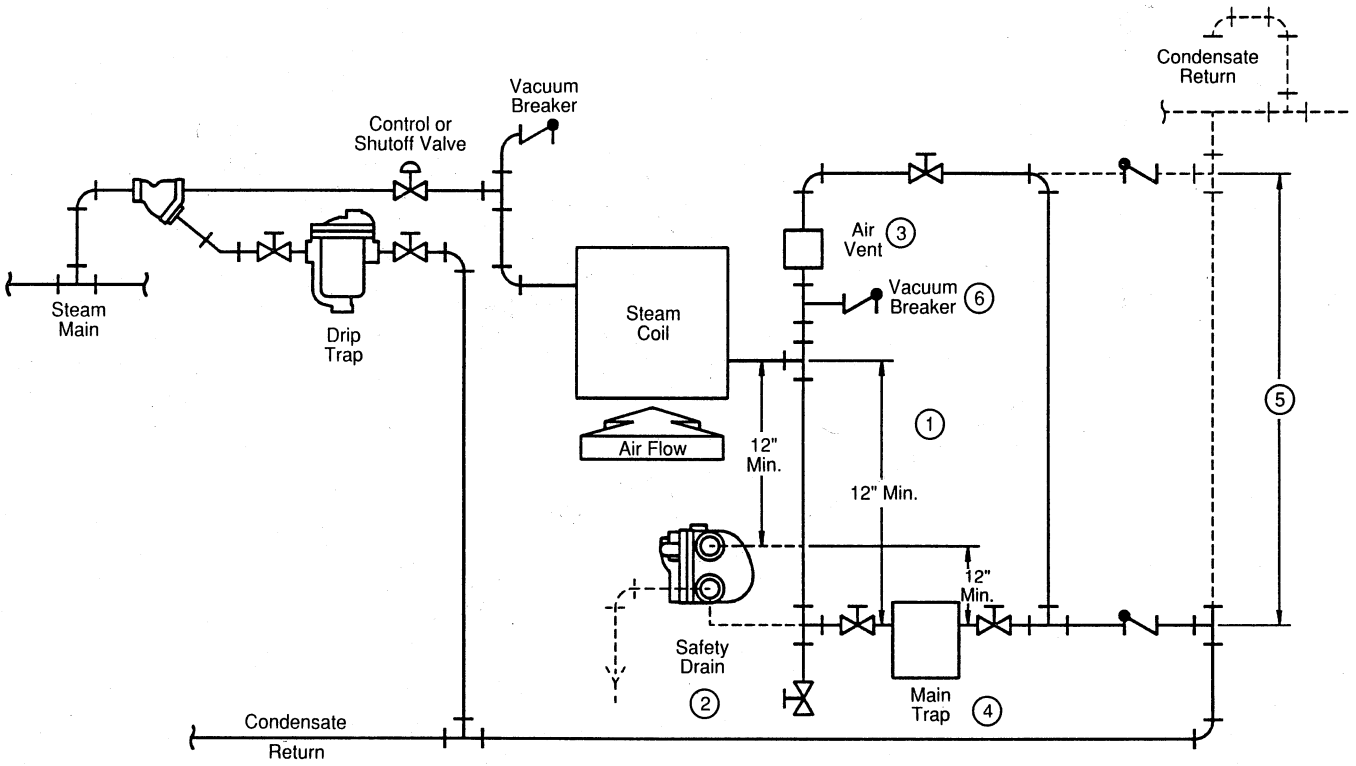
7. Drain during shutdown to prevent internal corrosion.

Maintenance

1. If air filters are installed, clean regularly to maintain adequate air flow across the coils and to keep fan loadings at design.

2. If air filters are not used, inspect and clean coils periodically. Clogged air filters and plugged coils have the same result.

Recommended Piping Practices for Steam Heating Coils



NOTES:

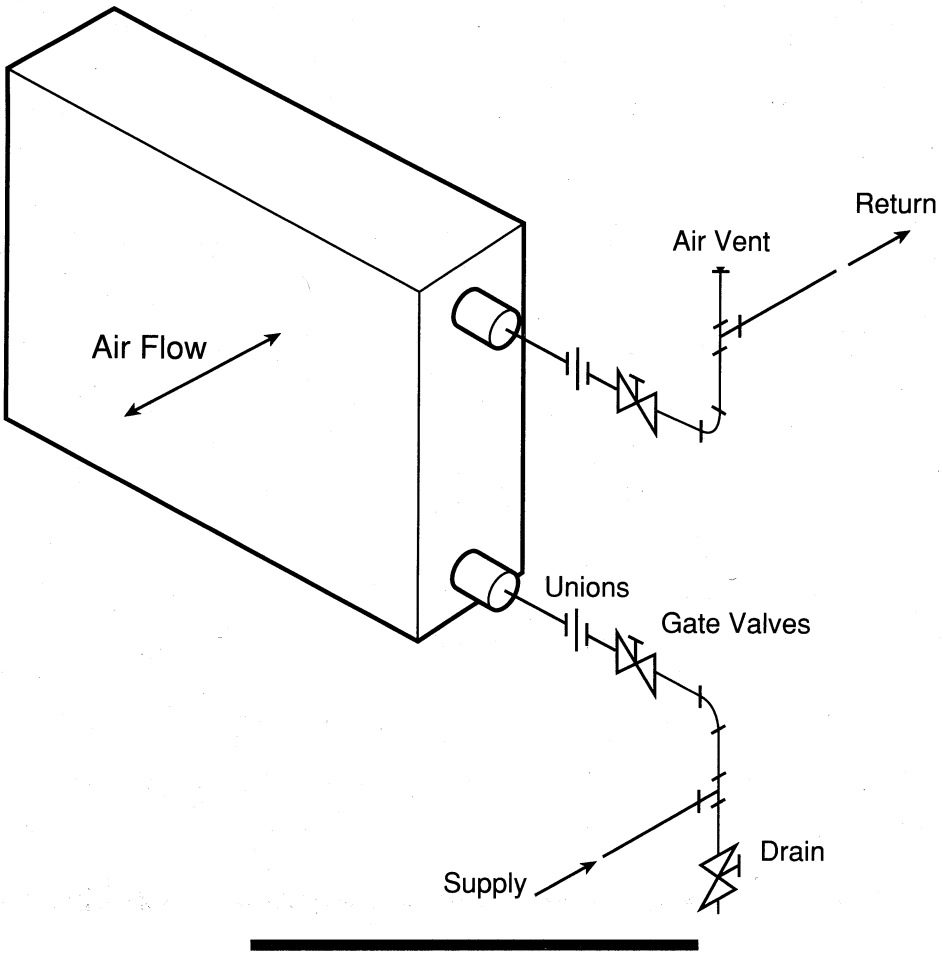
1. 24" minimum if safety drain is used.
2. Safety drain is used if steam supply is modulated and the condensate system is pressurized or overhead. Armstrong's pumping traps or Posi-Pressure Control system provides additional protection.
3. The air vent may be either an orifice bleed or a thermostatically operated element.
4. The main trap may be either an Inverted Bucket or a Float & Thermostatic type depending upon the service conditions. See the chart below for recommendations. Inverted bucket type steam trap required with Posi-Pressure Control system.
5. Overhead condensate return.
6. Required only on a modulated system.

Table 3-1. Armstrong Steam Trap Selection Guide

Equipment	Selections	Constant Pressure		Modulated Pressure*	
		0-30 psig	Above 30	0-30 psig	Above 30
Unit Heaters	1st Choice	IBLV	IBLV	F&T	F&T
	2nd Choice	F&T	F&T	IBLV	IBLV
Air Handlers	1st Choice	IBLV	IBLV	F&T	F&T
	2nd Choice	F&T	F&T	IBLV	IBLV
		0-250 psig	Above 250	0-30 psig	Above 30
Process Coils	1st Choice	IBLV	IBLV	F&T	F&T
	2nd Choice	F&T	IBLV	IBLV	IBLV

*See Note 4 Above.

Piping Diagram for Water and Ethylene Glycol



1. Install coils level to assure complete drainage.
2. Supply water to the bottom connection and return through the top connection.
3. Carefully vent coils, either individually or through an air manifold.
4. Armstrong recommends that coil isolation valves be fitted to take out coils without disturbing the whole system.
5. Ensure that water supply to coils is as clean as possible to avoid potential blockage and excessive fouling. Settling tanks and strainers can be used for this purpose.
6. Do not support piping from the coils. Install adequate hangers and expansion joints to prevent undue stresses.
7. Armstrong recommends the use of low pressure air or flushing with ethylene glycol to prevent freeze damage when draining.
8. Do not use throttling controls in hot water heating service if there is a possibility of below-freezing air passing through the coil. Use an air by-pass system at full water flow rate for control.
9. Ensure that liquid and air, flow in opposite directions through the coil unless instructed otherwise in writing.

NOTE: Keep finned tube surface clean and free of all foreign matter in order to maintain the design heat transfer and pressure drop ratings. Install filters upstream of the coils to keep actual coil maintenance to a minimum.

Armstrong®

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