A.O. SMITH

The A.O. Smith Piping Method For
Low Temperature Heating Systems

Ideal for:

- Closed Loop Water Source Heat Pump Systems
- Low Temperature Industrial and Manufacturing Applications
- Greenhouse Plant Bed Heating Systems
- Snow Melting and De-icing Systems
- Floor or Slab Heating
- Large Commercial Pools

A.O. Smith's low volume, high efficiency, copper tube boilers are ideal as heat generators for low temperature systems. Low temperature heating systems provide some of the most adverse conditions seen by modern boilers today. But, when appropriately installed and controlled, A.O. Smith copper tube boilers will provide many years of trouble free operation.

Prevents Condensation

Corrosive condensation will develop in boilers that are consistently operated at temperatures less than the manufacturer's recommended minimum operating temperature. The effects of corrosive condensation and the consequential sooting of the heat exchanger, can conspire to destroy a boiler in a short period of time.

Low Volume

A.O. Smith copper tube boilers are a low volume and low mass type of boilers, even the largest units have a capacity of only a few gallons of water. With only a few gallons of water to heat, when the boiler fires, heat is instantaneously added to the system, not the boiler. This not only means that the boiler quickly responds to the demands of the system, but the boiler rapidly reaches operating temperature.

No Thermal Shock

Wide temperature swings, often found in low temperature heating systems, can cause severe thermal shock problems to occur in steel and cast iron boilers. But, thanks to unique copper tube heat exchanger designs that allow the copper tubes to freely expand and contract, A.O. Smith copper tube boilers are virtually immune to thermal shock.

Operation of Low Temperature System

1. Open the Inlet, Outlet, and By-pass valves to full open. Then set the Remote Loop Stat to the desired loop operating temperature and start the heating systems.

2. After operating at full fire and monitoring the boiler inlet water temperature for a few moments, determine which of the following steps most closely applies.

   A. If the boiler inlet water temperature is less than 110°F (140°F for Legend High Efficiency Boilers).

      - Then slowly close the Outlet valve until the boiler inlet water temperature reaches 110°F (140°F for Legend Boilers)

   B. If the boiler inlet water temperature exceeds 110°F (140°F for Legend Boilers)

      - Then slowly close the By-pass valve until the boiler inlet water temperature stabilizes at 110°F (140°F for Legend Boilers)

3. Carefully monitor the complete heating system, until the system reaches the desired operating temperature. Make any final flow adjustments with the system operating at normal operating temperature.

4. After all final flow adjustments have been made and the system is operating as desired, it is important to make note of, and mark the current settings of the By-Pass and Outlet valve positions. This will make resetting the valves to the current positions easy, should these valves need to be closed for servicing the boiler.

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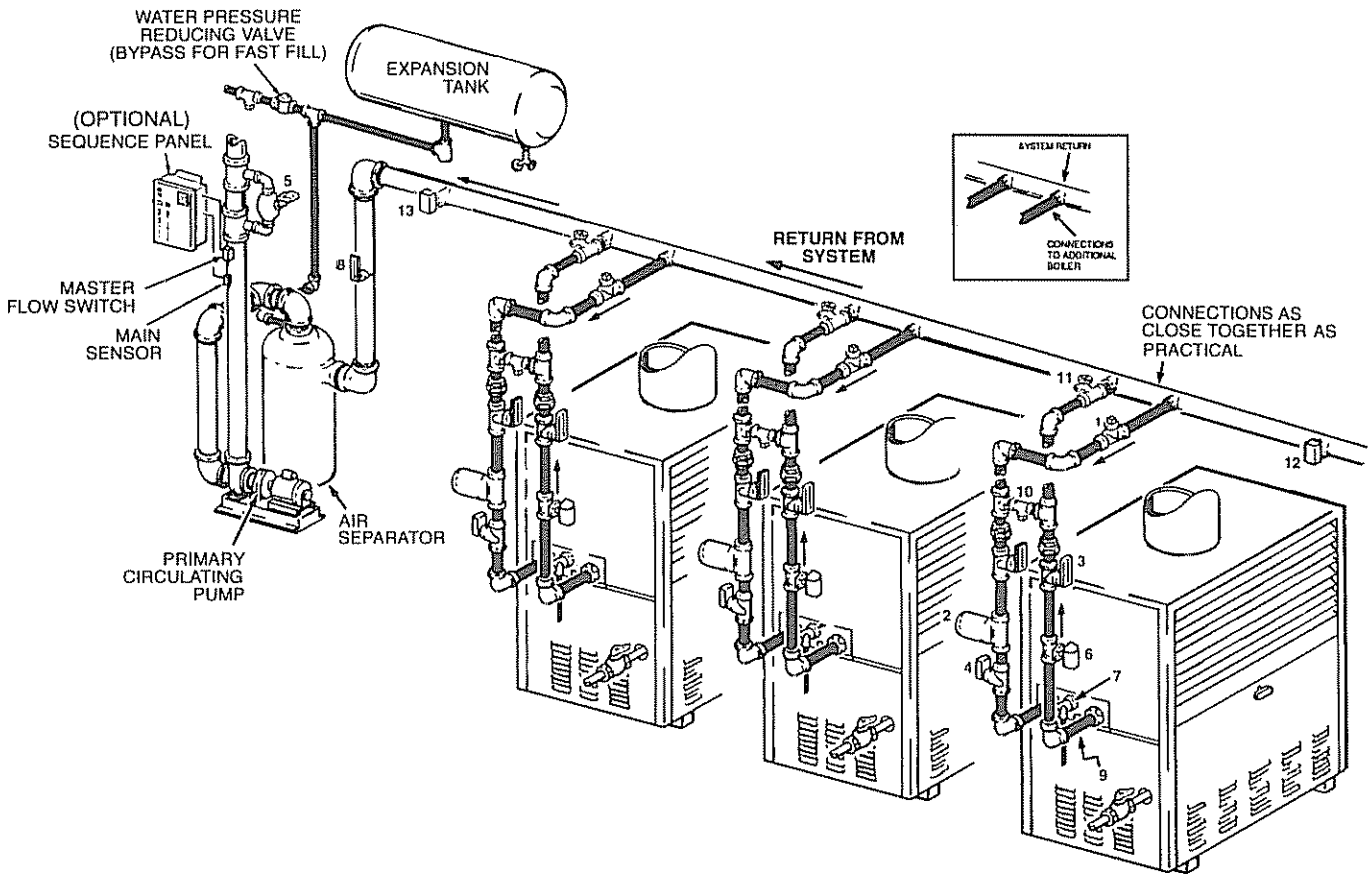
LOW TEMPERATURE SYSTEM
DB-720 THRU DB-1810
PRIMARY-SECONDARY PIPING

APPLICATION TYPE DIAGRAM
SEE INSTALLATION MANUAL FOR
COMPLETE INSTRUCTIONS

INSTALL IN ACCORDANCE WITH LOCAL CODES



1	STOP VALVE
2	BOILER CIRCULATING PUMP (SECONDARY)
3	THERMOMETER
4	THERALTIMETER
5	LOW WATER CUT-OFF (If Required)
6	SAFETY FLOW SWITCH
7	RELIEF VALVE
8	SYSTEM SUPPLY TEMP THERMOMETER
9	DRAIN or BLOW-DOWN VALVE
10	BY PASS
11	OUTLET VALVE
12	REMOTE LOOP STAT
13	PROBE TYPE LOW WATER CUTOFF (If Required)

SECONDARY PUMP AND PIPE SELECTION DATA FOR CONNECTIONS TO EACH PAIR OF BOILERS
ASSUMING THAT PRIMARY PUMPING IS SIZED FOR A 20° TEMPERATURE DROP

Model DB	Temp. Rise 20°(F)		Temp. Rise 30°(F)		Temp. Rise 40°(F)		Boiler Inlet & Outlet (inches)
	Flow (gpm)	Head Loss (feet)	Flow (gpm)	Head Loss (feet)	Flow (gpm)	Head Loss (feet)	
720	59	3.5	40	1.7	30	1.0	2"
840	69	4.8	46	2.1	35	1.5	2"
960	79	6.8	53	3.3	40	1.9	2"
1080	89	4.5	59	2.1	45	1.4	2.5"
1210	100	5.3	67	2.7	50	1.6	2.5"
1350	111	6.8	74	3.2	56	1.8	2.5"
1480	122	7.9	81	3.9	61	2.1	2.5"
1610	133	9.5	89	5.0	66	3.0	2.5"
1810	149	12.0	100	6.2	75	3.9	2.5"

Secondary flow rate should not create a temperature rise that will force boiler temperatures up to the 240° maximum setting of limit controls.

Flow rates through unequal models must be adjusted to establish equal temperature rise

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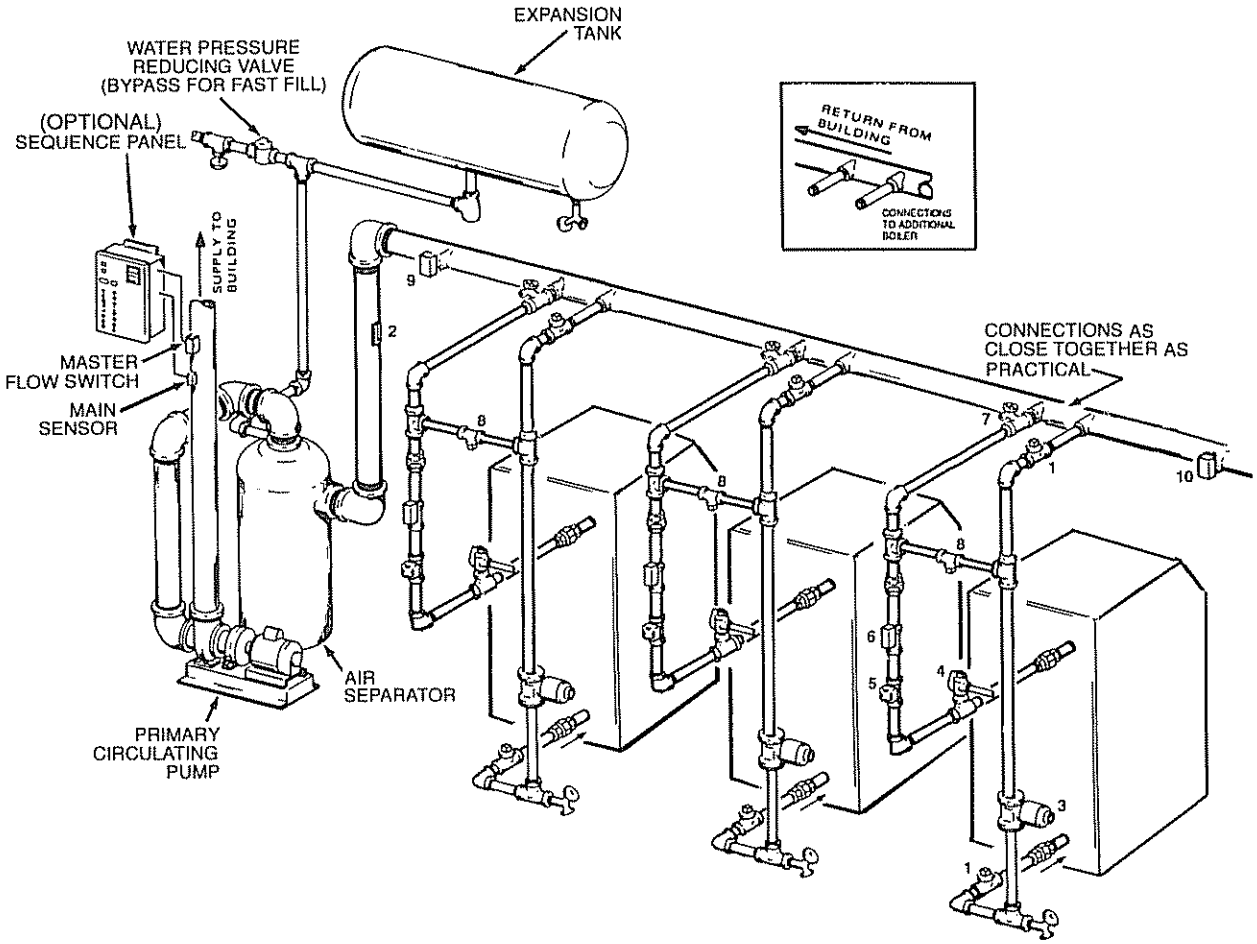
APPLICATION TYPE DIAGRAM
SEE INSTALLATION MANUAL FOR
COMPLETE INSTRUCTIONS

INSTALL IN ACCORDANCE WITH LOCAL CODES

LOW TEMPERATURE SYSTEM
LB-720 THRU LB-1000
PRIMARY-SECONDARY PIPING



1	STOP VALVE
2	THERMOMETER
3	BOILER CIRCULATING PUMP (Secondary)
4	RELIEF VALVE
5	THERALTIMETER
6	SAFETY LIMIT CONTROL (If Required)
7	OUTLET VALVE
8	BY-PASS
9	PROBE TYPE LOW WATER CUTOFF (If Required)
10	REMOTE LOOP STAT

SECONDARY PUMP AND PIPE SELECTION DATA FOR CONNECTIONS TO EACH PAIR OF BOILERS
ASSUMING THAT PRIMARY PUMPING IS SIZED FOR A 20° TEMPERATURE DROP

Model LB	Flow Rate @ 20° (F)Temp. Rise		Boiler Inlet & Outlet (inches)
	Flow (gpm)	Head Loss (feet)	
500	44	9.6	2"
750	66	10.0	2"
1000	88	8.6	2"

Secondary flow rate should not create a temperature rise that will force boiler temperatures up to the 240° maximum setting of limit controls.

Flow rates through unequal models must be adjusted to establish equal temperature rise.