Table 14. Pipe Sizes for Two-Pipe Vapor Heating Systems, where Equivalent Length of Run from Boiler or Source of Supply to Farthest Radiator Exceeds 200 Ft.

Capacity in Sq. Ft. of Equivalent Radiation

Based on 4 oz. Total Pressure Drop

Pipe Size Inches	Equivalent Length of Pipe from Boiler to Farthest Radiator, Including Main and Riser. (See *Note 6.*) Supply Main Dripped and Branches to Risers Dripped—Steam and Condensate flowing in same direction.						Maximum Capacities		
	100 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	Supply Risers Up-Feed	Branches to Supply Risers and Radiators Not Dripped	Return Risers
A	*B*	*C*	*D*	*E*	*F*	*G*	*H*	*Ia*	*J*
¾	----	----	----	----	----	----	30	----	190
1	111	79	65	56	49	46	56	26	450
1¼	245	173	141	122	110	100	122	58	990
1½	380	269	220	190	165	155	190	95	1500
2	771	546	446	386	345	315	386	195	3000
2½	1270	898	734	635	568	518	635	395	------
3	2326	1645	1342	1163	1040	948	1129	700	------
3½	3474	2457	2006	1737	1552	1419	1548	1150	------
4	4914	3475	2828	2457	2196	2011	2042	1700	------
5	9092	6429	5250	4546	4062	3712	------	3150	------
6	14,924	10,553	8618	7462	6669	6094			
8	31,066	21,967	17,935	15,533	13,880	12,682			
10	56,689	40,085	32,730	28,345	25,334	23,144			
12	90,985	64,336	52,530	45,492	40,660	37,145			

Different makes of supply and return valves, steam traps and other specialties vary as to capacity, therefore use size as recommended for any particular make. Vertical connections to be of same size as valve and trap used. Return horizontal runout to be not less than ¾ in.

Pipe Size Inches	Dry Return Main — Equivalent Length of Run from Boiler to Farthest Radiator in Feet						Wet Return Main — Equivalent Length of Run from Boiler to Farthest Radiator in Feet					
	100	200	300	400	500	600	100	200	300	400	500	600
K	*L*	*M*	*N*	*O*	*P*	*Q*	*R*	*S*	*T*	*U*	*V*	*W*
1	460	412	368	320	275	227	1400	1000	820	700	590	480
1¼	962	868	770	670	579	480	2400	1700	1420	1200	1020	860
1½	1512	1362	1210	1058	909	757	3800	2700	2260	1900	1560	1300
2	3300	2960	2640	2300	1980	1630	8000	5600	4500	4000	3360	2800
2½	5450	4900	4380	3800	3300	2770	13,400	9400	7600	6700	5700	4800
3	10,000	9000	8000	7000	6000	5000	21,400	15,000	12,300	10,700	9300	7800
3½	14,300	12,900	11,500	10,000	8600	7200	32,000	22,000	24,000	16,000	13,600	11,400
4	21,500	19,300	17,200	15,000	12,900	10,700	44,000	31,000	26,000	22,000	20,500	15,400

INSTRUCTIONS FOR USING TABLE 14

[a]1. Radiator branches more than 8 ft. in length should be one size larger than shown in Column *I*.

2. This table is for systems which are open to atmosphere or operate under slight pressure or partial vacuum without use of vacuum pumps.

3. These tables apply where pipes are properly reamed. No allowances for defective material or workmanship have been made. (Also see Tables 7 and 8).

4. Capacities based on ¼ lb. condensation per square foot per hour equivalent radiation and actual diameter of standard pipe.

5. Extra length to be added to straight run of pipe for various fittings and valves to determine equivalent length. (See Table 4).

6. Mains are to be proportioned according to the equivalent length of run from the boiler or source of supply to the farthest radiators supplied by the main.

Determine equivalent length of run then use figures in corresponding Columns (*B* to *G*) for supply mains; (*L* to *Q*) for dry-return mains; (*R* to *W*) for wet-return mains for sizing the entire run.

For example: If the distance from boiler or source of supply to the farthest radiator on the longest main should be 300 ft., all mains are to be sized from Column *D;* if 400 ft., Column *E;* if 600 ft. Column *G*.

Supply and return risers are to be proportioned according to the equivalent length of run from the boiler or source of supply to the farthest radiator on each riser.

For supply risers determine the distance from the boiler to the farthest radiator served by that riser then use the figures in the corresponding Columns (*B* to *G*) for sizing each supply riser; providing the amount of radiation for that riser does not exceed amounts shown in Column *H*. Where supply riser capacities are found to be in excess of amounts shown in Column *H*, step up to necessary size indicated in that column.

For example: If the distance from the boiler or source of supply to the farthest radiator on a supply riser is 300 ft., that riser is to be sized from Column *D*, providing the amount of radiation does not exceed the amount shown in Column *H*. If the amount exceeds that in Column *H*, use amounts shown in Column *H* for sizing that entire riser.

If another riser taken from the same main as the one indicated is only 200 ft., this riser should be sized from Column *C*, providing the amount of radiation does not exceed that as shown in Column *H*.

For return risers determine the equivalent length of run in feet from the top of each riser to the boiler then use the figures in the corresponding Columns (*L* to *Q*) for sizing each riser.

For example: If the distance from the boiler or source of supply to the farthest radiator on a return riser is 300 ft., that riser is to be sized from Column *N*, providing the amount of radiation does not exceed the amount shown in Column *J*. If the amount exceeds that in Column *J*, use amounts shown in Column *J* for sizing that entire return riser.

7. For practical purposes the pipe sizes on the usual heating system may be determined by using the pressure drop indicated by the longest main and riser on that system, neglecting the separate computations for each separate shorter run.

8. Where it is necessary to drip a supply main or a supply riser or a branch to a supply riser, same should drip separately into a wet return. The drip for a vapor or a vacuum system may be taken into a dry return through a steam trap.

9. Pitch of mains should be not less than ¼ in. in 10 ft.; on horizontal branches to radiators and risers at least ½ in. in 10 ft.

10. In general it is desirable not to have a supply main smaller than 2 in. in diameter. When the supply main is larger than 2½ in. at the beginning, it is desirable that it shall not be smaller than 2½ in. at the end.