

TABLE 4. BTUH CAPACITIES AND CFM OF INDIVIDUAL DUCTS IN PERIMETER SYSTEMS USED IN CRAWL-SPACE OR BASEMENT CONSTRUCTION

SECTION A. FOR 5-INCH INDIVIDUAL ROUND PIPE AND FOR SIDEWALL, FLOOR, AND BASEBOARD DIFFUSERS

Bonnet Pressure 0.15 in. Static Bonnet Temperature 170 F

No. of Elbows		ACTUAL LENGTH OF PIPE FROM BONNET TO DIFFUSER—FEET															
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0	Btuh Cfm				8700 100.5	7900 96.2	7150 92.7	6450 89.7	5800 87.0	5230 84.6	4700 82.5	4230 80.4	3830 78.4	3470 76.5	3150 74.8	2860 73.2	2600 71.7
1	Btuh Cfm			8620 95.8	7800 91.7	7100 88.7	6470 86.0	5830 83.8	5350 81.6	4850 79.7	4370 77.7	3960 76.0	3600 74.2	3260 72.5	2950 71.2	2650 69.8	2360 68.5
2	Btuh Cfm		8700 90.8	7900 87.9	7180 85.2	6530 82.7	5950 80.7	5400 78.9	4920 77.1	4430 75.4	4050 73.6	3680 72.0	3350 70.5	3040 69.2	2750 67.9	2480 66.7	2220 65.6
3	Btuh Cfm	8800 86.6	8000 84.0	7300 81.5	6650 79.3	6070 77.5	5530 75.8	5050 74.3	4600 72.8	4180 71.3	3800 70.0	3440 68.7	3120 67.5	2830 66.3	2550 65.2	2300 64.1	2060 63.0
4	Btuh Cfm	8250 81.0	7520 78.8	6850 77.0	6230 75.3	5680 73.7	5180 72.2	4720 70.8	4300 69.5	3900 68.2	3550 67.2	3220 66.0	2900 65.0	2630 63.6	2360 62.5	2120 61.5	1880 60.5
5	Btuh Cfm	7720 76.4	7050 74.5	6420 73.0	5840 71.6	5330 70.3	4850 69.0	4430 67.8	4030 66.6	3650 65.5	3320 64.4	3020 63.2	2730 62.0	2460 61.2	2200 60.2	1950 59.2	1730 58.1
6	Btuh Cfm	7280 72.5	6630 71.2	6070 69.8	5530 68.5	5050 67.3	4600 66.0	4180 64.7	3800 63.5	3470 62.4	3150 61.4	2850 60.5	2550 59.5	2280 58.1	2050 57.8	1820 57.0	1600 56.3

The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 35 ft; Plenum Takeoff = 15 ft; Each Elbow = 12 ft. For each additional 12 ft equivalent length of boot and diffuser count one additional elbow.

All cfm values are based on standard air.

SECTION B. FOR 6-INCH INDIVIDUAL ROUND PIPE AND FOR SIDEWALL AND FLOOR DIFFUSERS

Bonnet Pressure 0.15 in. Static

Bonnet Temperature 170 F

No. of Elbows		ACTUAL LENGTH OF PIPE FROM BONNET TO DIFFUSER—FEET															
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0	Btuh Cfm										8700 127.7	8060 124.8	7460 122.3	6920 119.7	6430 117.4	5960 115.0	5550 113.0
1	Btuh Cfm									8620 122.8	8000 120.0	7430 117.6	6900 115.3	6400 113.0	5930 111.0	5500 109.0	5100 107.3
2	Btuh Cfm									8600 118.5	7980 116.2	7390 114.0	6860 112.0	6380 110.0	5940 107.8	5530 106.0	5150 104.5
3	Btuh Cfm								8640 114.0	8020 112.0	7450 110.0	6950 108.2	6460 106.5	6020 104.7	5600 103.0	5200 101.4	4850 99.6
4	Btuh Cfm							8760 110.2	8160 108.4	7580 106.6	7050 105.0	6540 103.0	6080 101.5	5640 100.2	5250 99.0	4880 97.5	4550 96.0
5	Btuh Cfm					8850 106.8	8250 105.0	7670 103.5	7140 102.0	6640 100.5	6170 99.0	5740 97.5	5340 96.0	4960 94.5	4630 93.4	4290 92.0	3990 91.0
6	Btuh Cfm				9050 104.0	8420 102.5	7840 100.7	7290 99.2	6750 97.8	6300 96.5	5850 95.2	5440 94.0	5060 92.8	4700 91.4	4370 90.0	4060 88.7	3760 87.5

The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 40 ft; Plenum Takeoff = 20 ft; Each Elbow = 14 ft. For each additional 14 ft. equivalent length of boot and diffuser count one additional elbow.

All cfm values are based on standard air.

calculate its heat loss. Information in Manual 3 supplements* that contained in Chapter 12, particularly with respect to crawl space heat losses.

2. Determine the required furnace-bonnet capacity from the heat loss of the building.

3. Locate the diffusers on the plan. Allow at least one diffuser for each exposed

TABLE 4. BTUH CAPACITIES AND CFM OF INDIVIDUAL DUCTS IN PERIMETER SYSTEMS USED IN CRAWL-SPACE OR BASEMENT CONSTRUCTION (Concluded)

SECTION C. FOR 6-INCH INDIVIDUAL ROUND PIPE AND FOR BASEBOARD DIFFUSERS ONLY

Bonnet Pressure 0.15 in. Static Bonnet Temperature 170 F

No. of Elbows		ACTUAL LENGTH OF PIPE FROM BONNET TO DIFFUSER—FEET															
		5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0	Btuh Cfm						8570 109.0	8000 107.2	7450 105.5	6910 103.7	6420 102.0	5960 100.4	5560 98.8	5150 97.5	4800 96.1	4450 94.8	4160 93.5
1	Btuh Cfm					8700 105.5	8100 104.0	7550 102.3	7000 100.7	6520 99.2	6060 97.6	5630 96.2	5250 95.0	4860 93.6	4530 92.3	4220 91.1	3930 90.0
2	Btuh Cfm				8890 102.8	8270 101.3	7700 99.8	7160 98.2	6660 96.7	6200 95.3	5750 94.0	5350 92.7	4980 91.5	4620 90.2	4300 89.0	4000 87.8	3700 86.5
3	Btuh Cfm				8440 98.4	7870 96.8	7320 95.3	6820 93.9	6350 92.5	5880 91.3	5460 90.0	5070 89.0	4700 88.0	4350 86.9	4020 85.8	3710 84.7	3440 83.5
4	Btuh Cfm			8690 95.8	8080 94.4	7500 93.0	6980 91.6	6500 90.3	6030 89.0	5580 87.8	5180 86.7	4800 85.7	4450 84.6	4120 83.7	3820 82.6	3520 81.6	3250 80.5
5	Btuh Cfm	8940 93.4	8320 92.2	7740 91.0	7200 89.8	6680 88.5	6190 87.3	5720 86.2	5320 85.0	4920 83.8	4550 82.8	4220 81.7	3890 80.9	3560 79.9	3300 79.0	3100 78.0	
6	Btuh Cfm	8580 90.0	7960 89.8	7380 87.6	6850 86.5	6350 85.5	5880 84.2	5440 83.1	5040 82.0	4660 80.9	4320 80.0	4000 79.0	3670 78.0	3400 77.3	3150 76.5	2930 76.0	

The Equivalent Length Values used and included in calculating this table are: Diffuser and Boot = 100 ft; Plenum Takeoff = 20 ft; Each Elbow = 14 ft. For each additional 14 ft equivalent length of boot and diffuser count one additional elbow.

All cfm values are based on standard air.

wall in each room or area of building, and locate them preferably beneath window areas. For residential installations limit each diffuser to a maximum of 7,000 Btuh.

4. Determine the required Btuh delivery of each diffuser. Where more than one diffuser is used per room, proportion the heat loss equally among all diffusers.

5. Measure length and count number of elbows in each duct. From Table 4, determine the duct size (5 or 6-in. diameter) needed. Section A is for 5-in. duct, Section B is for 6-in. duct using sidewall or floor diffusers, and Section C is for 6-in. duct using baseboard diffusers.

Perimeter Extended Plenum Systems in Crawl Space or Basement Construction

The considerations involved in the design of extended plenum systems are essentially the same as those of the individual pipe system. A simplified design procedure is summarized as follows:

1. Calculate the heat loss of each room or area using the method explained in Chapter 12. Consider the basement or crawl space as a part of the structure and calculate its heat loss. Information in Manual 3 supplements* that contained in Chapter 12, particularly with respect to crawl space heat losses.

2. Determine the required furnace-bonnet capacity from the heat loss of the building.

3. Locate the diffusers on the plan. Allow at least one diffuser for each exposed wall in each room or area of building, and preferably beneath window areas. For residential installations limit each diffuser to a maximum of 7,000 Btuh.

4. Determine the required Btuh delivery of each diffuser. Where more than one diffuser is used per room, proportion the heat loss equally among all diffusers.

5. Measure the length of each duct and count number of elbows from the extended plenum to the diffuser. Note whether top or side plenum take-offs are to be used. From Table 5, determine the duct size needed. (Note: Use that section of Table 5 (Sections A to F) which applies both to the type of plenum take-off and diffuser to be used.)

6. The cfm values in Table 5 are used with Table 6 for sizing the extended plenum system. No one extended plenum should exceed 35 ft in length.