

GROUP 7. REGISTERS (INCLUDING LOSSES IN STACKHEAD AND VELOCITY PRESSURE).

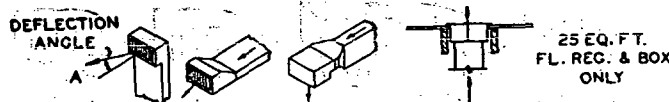


TABLE 4A. EQUIVALENT LENGTH FOR REGISTERS

Deflection Angle A	0°	15°	22°	30°	45°
Baseboard, High or Low Sidewall Registers	Eq. Ft. 35	40	45	60	115
Floor Registers with Box only	25				

For 2-way deflection registers, add the vertical and horizontal deflection angles together and multiply by 0.7. Select closest angle A in Table 4A. For diffuser type registers see manufacturers' catalogs.

FIG. 4. EQUIVALENT LENGTH OF FITTINGS (Concluded)

bonnet pressure is not high enough to accommodate the pressure loss through the registers, use a higher bonnet pressure. If the register pressure is critically large, it may be necessary to reduce it by either using two registers in place of one, or using smaller deflection angles.

- Obtain actual duct loss by subtracting total register pressure loss, as determined from Tables 5 or 6, from maximum bonnet pressure.
- Obtain the pressure drop in each duct per 100 ft by use of Table 8.
- Determine duct size by means of air friction chart (such as Fig. 1, or Fig. 2, Chapter 32), volume (cfm), and pressure drop per 100 ft of duct.

B. Return air branches.

- Select a low value of actual duct loss obtained from step b under item A for the suction loss of return duct system.
- Proceed in sizing return air branches by the same method described for the warm air branches.

C. Trunk ducts for warm air and return air sides of system.

- Add air volumes of branches to be handled by each trunk duct.
- The friction loss per 100 ft of trunk duct is determined by taking the smaller of the two values for friction loss for the two ducts meeting at the junction.
- Determine trunk duct size by using an air friction chart, volume (cfm), and pressure drop per 100 ft of trunk duct.

8. Selection of Blower.

- Determine total cfm air delivery (the sum of all branch cfm values).
- Determine static pressure requirement.
 - For furnace-blower combination units it is the sum of bonnet pressure and suction pressure.
 - For blowers separately selected from the furnace it is the sum of bonnet pressure, suction pressure, filter loss, casing loss, losses through air washers, coils, and other devices.

9. Selection of Furnace.

- Determine register delivery (the sum of room Btu losses).
- Determine bonnet capacity.
Bonnet capacity = (total cfm) × (temperature rise) × 1.089.
- Determine allowance for pick-up load. For buildings which are heated intermittently, such as churches and auditoriums, it is customary to add from 10 to 25 percent extra furnace capacity for warming of the structure.

TABLE 3. SELECTION OF BONNET TEMPERATURE, REGISTER TEMPERATURE AND REGISTER DELIVERY (CFM)^{a, b} (For Buildings Having a Heat Loss between 120,000 and 560,000 BTU/Hr.)

TEMP. OF BOX, °F	LINEAR DISTANCE FROM BONNET TO REGISTER, IN FEET																			
	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200
110	108 ^a	107	106	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	89	88
120	118	116	114	112	111	109	108	106	105	103	102	101	100	99	98	97	96	95	94	93
130	128	126	123	121	119	117	115	113	111	109	107	105	103	101	99	97	95	93	91	89
140	137	134	131	129	126	124	122	120	118	116	114	112	110	109	107	105	103	101	99	97
150	147	143	140	137	134	131	129	127	124	122	120	118	116	114	112	110	109	107	105	103
160	156	152	149	145	142	139	136	133	130	128	126	123	121	119	117	115	113	111	109	107
170	166	161	157	153	150	146	143	140	137	134	131	128	126	124	122	120	118	116	114	112
180	175	170	166	161	157	153	150	146	143	140	137	134	131	128	126	124	122	120	118	116
190	184	179	174	169	165	160	156	153	149	145	142	139	136	133	130	128	126	124	122	120
200	193	187	182	178	173	167	163	158	154	151	147	144	140	138	135	132	129	127	125	122
210	202	196	191	186	181	176	171	167	162	157	152	147	142	138	134	130	126	122	118	114
220	211	205	200	195	189	184	179	174	169	164	159	154	149	144	139	134	129	124	119	114
230	220	214	209	204	198	193	188	183	178	173	168	163	158	153	148	143	138	133	128	123
240	229	223	218	213	207	202	197	192	187	182	177	172	167	162	157	152	147	142	137	132

^a Register temperature, Fahrenheit. (Use upper value in each group).

^b Register delivery volume in cubic feet per minute per 1000 Btu. (Use lower value in each group).

^c Register delivery volumes in column 1 for zero length of duct.