Stack Draft Regulator

(SDR)

—For Constant Flue Control—

Installation Manual

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Introduction

The Stack Draft Regulator (**SDR**) is a patented flue draft control device Marketed by ECMI to improve the efficiency of furnaces, heaters and boilers fueled by natural gas, liquid propane gas, oil or pulverized coal, thereby saving energy and reducing pollution.

The **SDR** is a stainless steel helical device that is installed in the flue. It is precisely designed to slow the velocity of flue gasses by channeling them through a spiral vane. This causes a constant control of excess draft and stack pressure that increases both combustion and thermal efficiency.

Field tests show that the **SDR**:

- Burns fuel more completely
- Delivers hotter air and water and more pounds of steam per hour
- Holds heat longer in the appliance
- Shortens startup and running times
- Allows less heat and unburned gas up the flue
- Energy savings typically range between 10% and 35%

The **SDR** has no moving parts and uses no electricity. Therefore, its design is failsafe, unlike mechanically and electronically activated devices. It works all the time, in both on and off cycles.

Conditions of Installation

Every installation of the **SDR** shall meet all of the following conditions.

The installation shall:

1. Be performed only by a contractor certified by **ECMI group** or its authorized agent.
2. Comply with whichever Code applies: Local Code or National Fuel Gas Code, ANSI Z223.1, 1974.
3. Comply with the installation Manual for the **SDR**.
4. Be completed only for an appliance free of detectable unsafe conditions.
5. Be recorded in a completed standard WARRANTY VALIDATION REPORT with the checklist filed with ECMI.

Installation: Simple But Exacting

Installing an **SDR** is usually a simple matter. It involves replacing a small section of the flue of an appliance with an **SDR** unit and making the joints tight and secure. There are no controls to hook up.

Although installation is simple, it is also exacting. That is why **ECMI** requires that the SDR be installed only by certified contractors, qualified to make original and modification installations of fueled appliance systems that are safe and efficient. That is why ECMI also requires a specified step-by-step installation procedure.

By far the steps in the **SDR** installation procedure deal primarily with safety and performance inspections of the furnace, water heater or boiler system prior to and after the **SDR** is mounted in place.

Competent contractor crews know these inspection procedures as part of their regular work, but the procedures are set forth in this Installation Manual in such sequence and detail as to make sure that the complete system performs safely and effectively.

These are generalized procedures for central furnace, water heater, and boiler installations. **ECMI** cannot anticipate all situations, so sometimes deviations may be necessary. Any deviations should conform to the equipment manufacturer's requirements and recommendations.

Proper installation of the **SDR** provides a controlled positive flow of flue gasses to save energy with no draft hood spillage on atmospheric heating equipment or excessive stack pressure on power boilers.

Whenever an inspection finds a condition that could result in unsafe operation, the appliance should be turned off and the owner advised of the unsafe condition.

In no case shall an SDR be installed until any unsafe condition is corrected.

The step-by-step procedures that follow must be done as specified.
BEFORE making any installation, read this entire instruction manual carefully.

As you install, use the CHECK LIST of the WARRANTY VALIDATION as a guide for doing all that is required, including filing the completed WARRANTY VALIDATION REPORT with **ECMI** immediately following installation. Call toll-free 866-964-0072
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How to Install: Step-by-Step

The following procedures assume that a pre-installation test has been completed and that the applicability of the **SDR** has been confirmed.

Equipment Characteristics

1. The **SDR** must be used only with standard vented appliances equipped with a non-modified draft hood if atmospherically vented. The equipment must not be of the pulse or condensing type.

2. The outlet area of the draft hood must be no larger than the inlet area of the **SDR**.

3. Each **SES** must be installed so as to serve only a single appliance. Energy savings will be maximized if all applicable appliances are equipped with an **SES**. For illustrations of proper installations for various situations, see pages 11-13 of this Installation Manual.

Safety and Performance Inspections — Prior to Installation

4. Venting System — Type B Vent:

   The venting system must conform to the requirements for Type B vents in the National Fuel Gas Code, ANSI Z223, 1-1974. For instructions, figures and tables for design and sizing of Type B vents in various situations, see sections of that Code that are reproduced in this Installation Manual on pages 14-23.

   Specifically, a venting system in which the **SDR** will be installed must meet these requirements:
   a. Minimum sizing must be as specified in the National Fuel Gas Code.
   b. There must be no blockage, restriction, leaks, or breaks from corrosion.
   c. Any horizontal flue duct run must have a rise of at least 1/4 inch per foot.
   d. Flue ducts must clear any combustible materials by at least 6 inches.

   Any deviation from the above requirements must be corrected before the **SDR** is installed.

5. Check to see that the appliance fuel shut-off valve operates properly.

6. Appliance Components
   Check the following parts:
   a. Make sure that the heat exchanger is free from cracks, openings, or excessive corrosion.
   b. Inspect the filter, replace if necessary.
   c. Check the blower for adjustment, proper operation and condition. Make any necessary adjustments or repairs.
   d. Check all other primary components to be sure they are in good condition and operating properly.

7. Combustion Air Supply Check
   Preliminary to determining whether the appliances in the space, singly and combined, have enough air for proper combustion. Proceed as follows:

SDR Installation

a. Insofar as possible, position all building doors and windows, as they would be normally during the operation of the appliance.

b. Turn on all exhaust fans — range hoods, bathroom exhausts and any other ventilators — to run at maximum speed, which would affect the operation of the appliance.

8. Fire up the appliance according to the manufacturer's instructions.

9. If the appliance is a water heater or furnace, set the thermostat so that the appliance will run continuously.

10. Ignition
    a. Determine that the pilot flame is burning properly.
    b. Test the pilot safety device for proper operation.
    c. Check the main burner for proper operation.

11. Determine that the burner flame pattern is proper. Adjust the air delivery controls as required.

12. For atmospherically drafted equipment, test for spillage at the draft hood relief opening after 5 minutes of main burner operation by using a match, candle or smoke. To correct any spillage, see Trouble Shooting Guide, page 10 of this Installation Manual. Any spillage must be eliminated or the SES cannot be installed.

13. Turn on all other fuel-burning appliances in the same space so hat they operate at full input.

14. If there appears to be an insufficient supply of combustion air, refer to the local Code or the National Fuel Gas Code, and correct the condition accordingly.

15. Check appliance limit controls for proper operation.

16. Check appliance fan controls for proper operation.

17. For Water Heaters and Boilers only:
    a. Inspect for water leaks.
    b. Determine that the water pump operates.
    c. Test low water cutoff, automatic feed control, high-pressure limit control, high temperature limit control, and relief valves for proper operation.

18. Take all applicable combustion and thermal readings and record on WARRANTY VALIDATION REPORT. Now that you are sure that the appliance systems are safe and working properly, you are ready to install the **SES**.

Installing the SDR

19. On power and/or induced draft furnaces, boilers and other heating equipment which has a barometric damper, draft inducer or other equipment installed in the vent system capable of flue gas leakage, the **SDR** must be installed in the vent system UPSTREAM (on the heating equipment side) of all such vent installed equipment, if a neutral or positive stack pressure will result from the installation and final adjustment of the **SDR**.

SDR Installation

In the case where a negative stack pressure will result from the installation and final adjustment of the **SDR,** the **SDR** may be installed at any point from the heating equipment to the end of the stack, regardless of the existence of other vent installed equipment, although to minimize ambient air loss via such vent installed equipment the **SDR** should be installed downstream from all such equipment unless the practicalities of the installation warrant otherwise.

The **SDR** must always be installed downstream from a draft hood or diverter one is existent (atmospherically drafted heating equipment only. See pages 11-14, illustrations).

20. If necessary, shut off the appliance burner to let the flue cool.

21. For each appliance to be equipped, mark a proper location for the **SDR**. Remove the marked section of pipe, cut to fit and insert the SES. This step is unnecessary if the **SDR** is to be installed on top of the flue stack.

22. Any horizontal run must rise at least 1/4 inch per foot (except on power drafted equipment).

23. Secure each new joint in the flue with at least three corrosion resistant sheet metal screws. If more support is needed, use more screws or band iron.

24. With the **SDR** properly in place, adjust for effective performance. (Note illustration on pages 11-14)
    a. Atmospheric-Vented Appliances - On atmospheric appliances the draft hood/diverter should be filled to approximately 90% of its volume with hot flue gases, leaving a margin to ensure against spillage. If weather is cold or wind is strong, more margin should be left to compensate for these factors. In no case should the draft hood/diverter be filled with less than 70% hot flue gases. It is recommended that a further test be made on a warm and calm day to readjust the margin if necessary for greater efficiency.
    b. Power-Vented Appliances - Generally the SDR should be adjusted so as to produce a near neutral total stack pressure in the predominant firing rate of the appliance. Stack gas velocity should be slowed to a minimum while maintaining proper combustion readings. Manufacturer's specifications should be consulted where there is doubt as to proper pressure ranges.
    c. In all cases adjustment of the SDR should be accomplished while adjusting the fuel delivery rate to achieve the most ideal fuel-air ratio for the highest efficiency. The oxygen percentage in the combustion gases should be as low as possible without the production of carbon monoxide in the steady-state operating condition.
    d. Adjustment of fuel-air ratios should be set for each firing rate on modulating appliances to ensure proper combustion and maintain high efficiency.

25. Return all other appliances, fans, etc. to their previous operating condition.

26. Fill in any blanks remaining in the Warranty Validation Report and file with ECMI
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Under no circumstance should either of the following conditions exist after any SDR installation.

1. **Venting restriction.**
2. **Draft hood spillage for any reason.**

Trouble Shooting Guide
In Case of Draft Hood Spillage

Problem	Flue obstruction
How to Correct	Remove obstruction. If it cannot be removed, do not install the SDR.
Problem	Improper use of whole-house ventilator.
How to Correct	Instruct customer not to use whole-house ventilator in heating season.
Problem	Unusual exhaust fan installation, as in commercial or industrial use where exhaust capacity exceeds makeup air intake.
How to Correct	Instruct customer on proper use, or on how to provide additional makeup air.
Problem	Inadequate source of combustion air.
How to Correct	Rectify any problem, or do not install the SDR.
Problem	Improper BTU input for flue pipe.
How to Correct	Check tables of National Fuel Gas Code, ANSI Z223. 1 -1974, reproduced in this manual on pages 14-23. Make changes to produce adequate draw, or do not install unit.

Under no circumstance shall either of the following conditions exist after any SDR installation.

1. **Venting restriction.**
2. **Draft hood spillage for any reason.**

Illustration: Right & Wrong

Single Appliance Installation

Cone-Type Draft Diverter

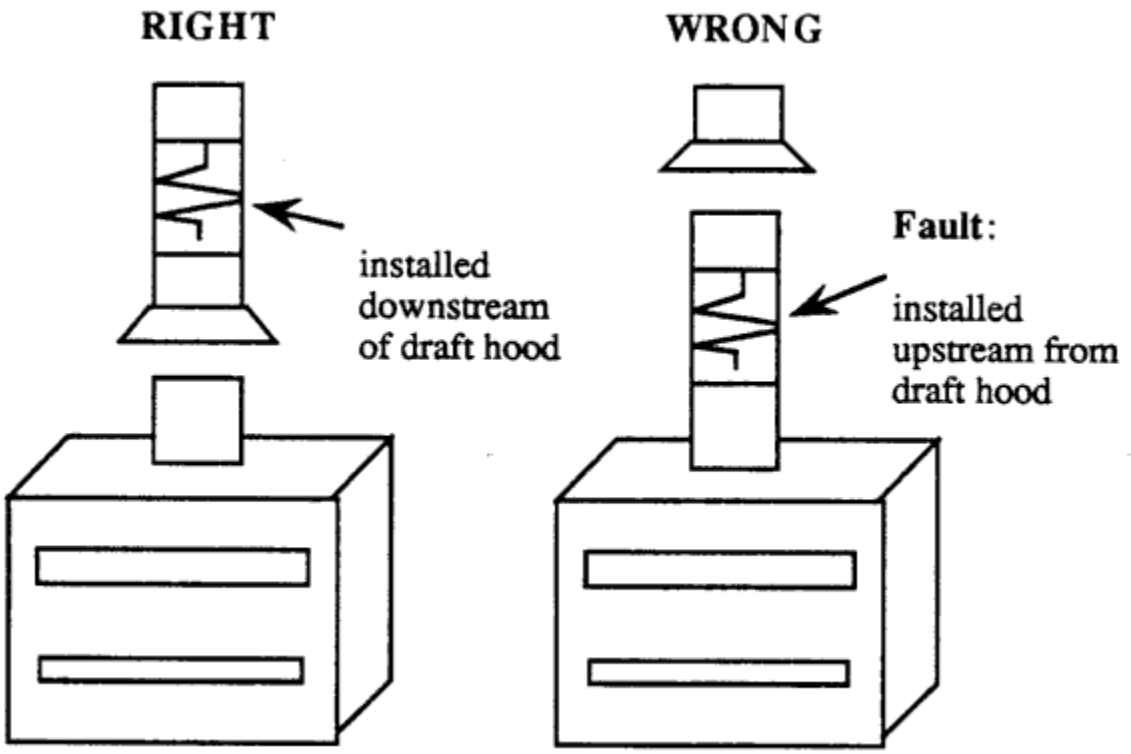


Illustration: Right and Wrong

Single Appliance Installation

Box-Type Draft Diverter

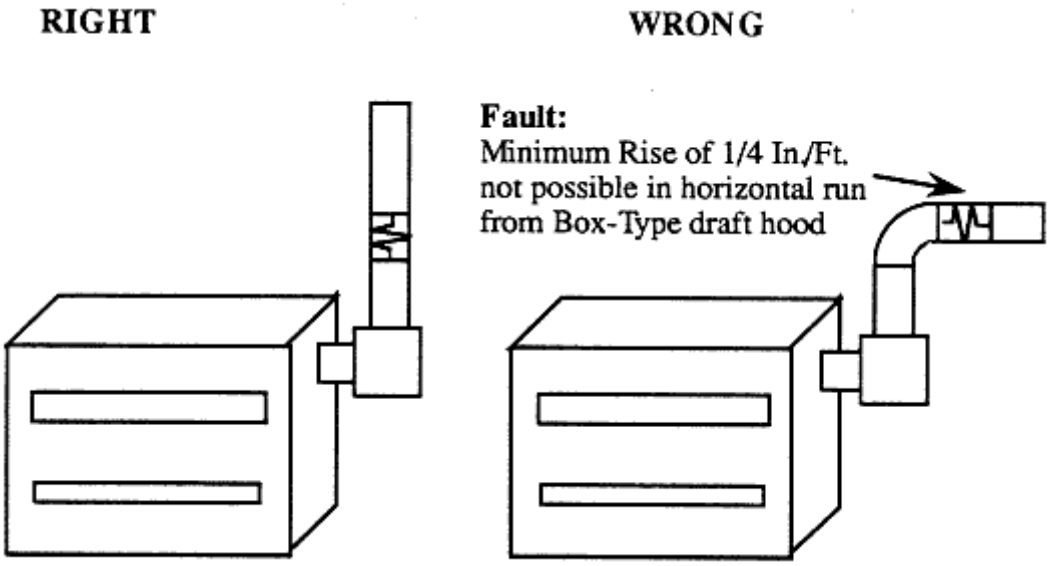
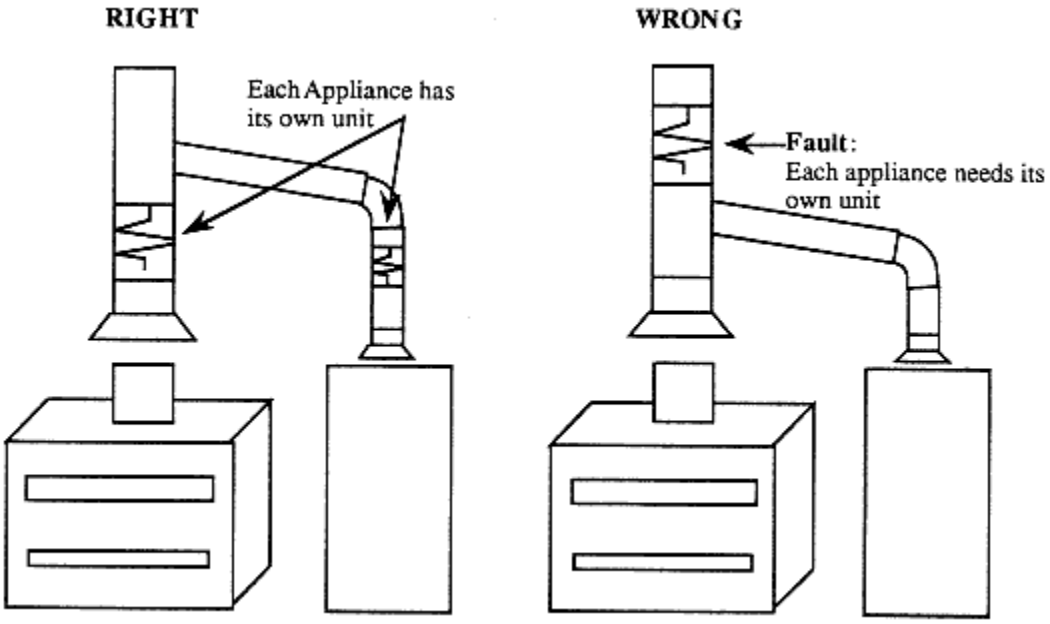
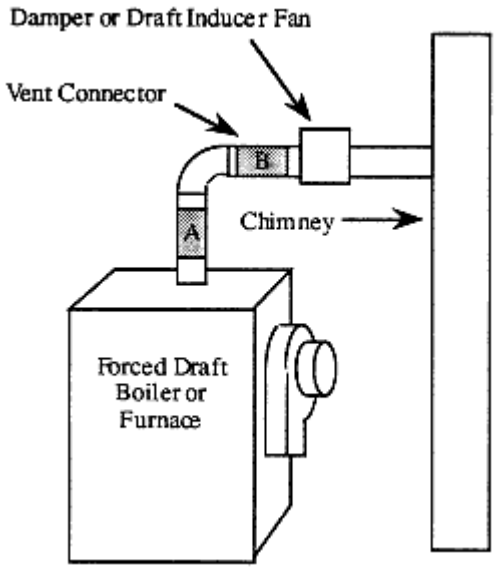


Illustration: Right and Wrong

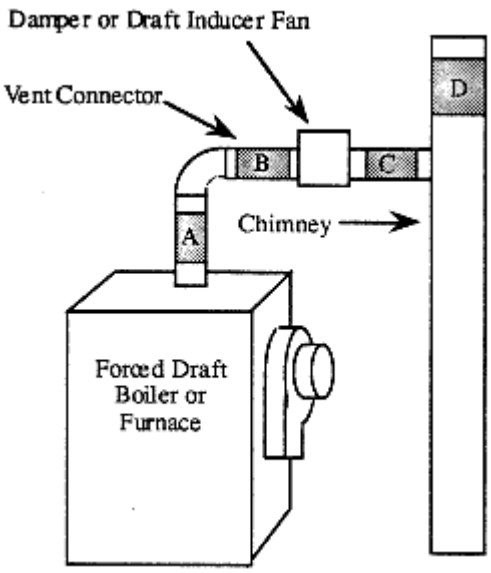
Multiple Appliance Installation



Installation on Power Boiler with Flue Damper or Draft Inducer Fan



If stack pressure upstream from SDR is neutral or positive after installation and adjustment, SDR should be installed at “A” or “B”.



If stack pressure upstream from SDR is negative after installation and adjustment, SDR should be installed at “A”, “B”, “C” or “D”.

Guide to Vent Design

From National Fuel Gas Code, Z223.1-1974

Sizing of venting systems serving appliances equipped with draft hoods and appliances listed for use with type b vents

(This Appendix is informative and is not a part of the Code)

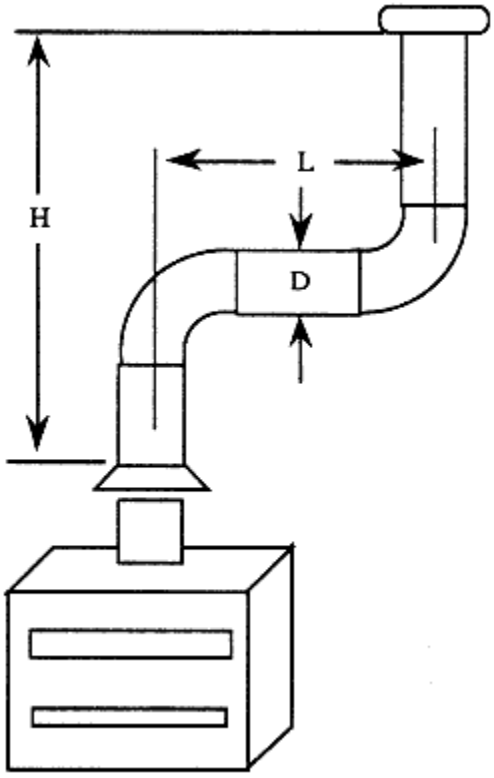


Figure 1 D-1
Double wall or asbestos cement Type B vents or Single-wall metal vents serving a single appliance. (See Tables 1-D1 and 1-D2)

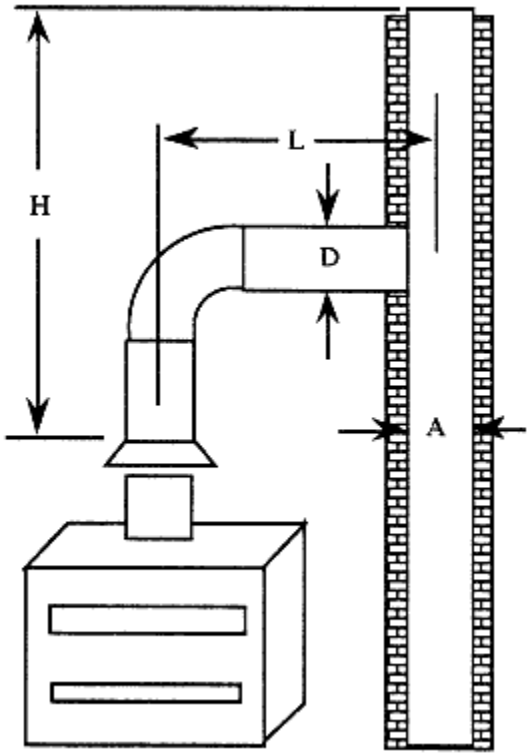


Figure 1-D2
Masonry Chimney serving a single appliance. (See Table 1-D3)

SDR Installation

Notes for Single Appliance Vents . (See Tables 1-D1, 1-D2 and I-D3)

1. For single-wall metal pipe, use Table 1-D2.

2. If the vent size determined from the Table is less than the size of the draft hood, the smaller sized vent may be used as long as the vent height "H" is at least 10 feet.

3. Vents for draft hoods 12 inches in diameter or less should not be reduced more than one size (12 inches to 10 inches is a one-size reduction). For larger gas-burning equipment, reductions of more than two sizes (24 inches to 20 inches is a two-size reduction) are not recommended.

4. Regardless of the vent size shown, do not connect any 4-inch draft hoods to 3-inch vents.

5. Zero (0) lateral "L" applies only to a straight vertical vent attached to a top outlet draft hood.

6. Use sea level input rating when calculating vent size for high altitude installation.

7. Designation "NR" in Tables 1 -D 1, 1 -D2 and 1 -D3 indicates not recommended.

8. Numbers followed by an asterisk (*) in Tables 1-D2 and 1-D3 indicate the possibility of continuous condensation, depending on locality. Consult local serving gas supplier and/or local codes.

Table 1-D1

Capacity of Type B Double-Wall Vents with Type B Double-Wall Connectors Serving a Single Appliance

Height H (ft)	Lateral L (ft)	Vent Diameter – D: 3" FAN Min	3" FAN Max	3" NAT Max	4" FAN Min	4" FAN Max	4" NAT Max	5" FAN Min	5" FAN Max	5" NAT Max	6" FAN Min	6" FAN Max	6" NAT Max	7" FAN Min	7" FAN Max	7" NAT Max	8" FAN Min	8" FAN Max	8" NAT Max	9" FAN Min	9" FAN Max	9" NAT Max
6'	0'	0	78	46	0	152	86	0	251	141	0	375	205	0	524	285	0	698	370	0	897	470
	2'	13	51	36	18	97	67	27	157	105	32	232	157	44	321	217	53	425	285	63	543	370
	4'	21	49	34	30	94	64	39	153	103	50	227	153	66	316	211	79	419	279	93	536	362
	6'	25	46	32	36	91	61	47	149	100	59	223	149	78	310	205	93	413	273	110	530	354
8'	0'	0	84	50	0	165	94	0	276	155	0	415	235	0	583	320	0	780	415	0	1006	537
	2'	12	57	40	16	109	75	25	178	120	28	263	180	42	365	247	50	483	322	60	619	418
	5'	23	53	38	32	103	71	42	171	115	53	255	173	70	356	237	83	473	313	99	607	407
	8'	28	49	35	39	98	66	51	164	109	64	247	165	84	347	227	99	463	303	117	596	396
10'	0'	0	88	53	0	175	100	0	295	166	0	447	255	0	631	345	0	847	450	0	1096	585
	2'	12	61	42	17	116	81	23	194	129	26	289	195	40	402	273	48	533	355	57	684	457
	5'	23	57	40	32	113	77	41	187	124	52	280	188	68	392	263	81	522	346	95	671	446
	10'	30	51	36	41	104	70	54	176	115	67	267	175	88	376	245	104	504	330	122	651	427
15'	0'	0	94	58	0	191	112	0	327	187	0	502	285	0	716	390	0	970	525	0	1263	682
	2'	11	69	48	15	136	93	20	226	150	22	339	225	38	475	316	45	633	414	53	815	544
	5'	22	65	45	30	130	87	39	219	142	49	330	217	64	463	300	76	620	403	90	800	529
	10'	29	59	41	40	121	82	51	206	135	64	315	208	84	445	288	99	600	386	116	777	507
	15'	35	53	37	48	112	76	61	195	128	76	301	198	98	429	275	115	580	373	134	755	491
20'	0'	0	97	61	0	202	119	0	349	202	0	540	307	0	776	430	0	1057	575	0	1384	752
	2'	10	75	51	14	149	100	18	250	166	20	377	249	33	431	346	41	711	470	50	917	612
	5'	21	71	48	29	143	96	38	242	160	47	367	241	62	519	337	73	697	460	88	902	599
	10'	28	64	44	38	133	89	50	229	150	62	351	228	81	499	321	95	675	443	112	877	576
	15'	34	58	40	46	124	84	59	217	142	73	337	217	94	481	308	111	654	427	129	853	557
	20'	48	52	35	55	116	78	69	206	134	84	322	206	107	464	295	125	634	410	145	830	537
30'	0	0	100	64	0	213	128	0	374	220	0	587	336	0	853	475	0	1173	650	0	1548	855
	2'	9	81	56	13	166	112	14	283	185	18	432	280	27	613	394	33	826	535	42	1072	700
	5'	21	77	54	28	160	108	36	275	176	45	421	273	58	600	385	69	811	524	82	1055	688
	10'	27	70	50	37	150	102	48	262	171	59	405	261	77	580	371	91	788	507	107	1028	668
	15'	33	64	NR	44	141	96	57	249	163	70	389	249	90	560	357	105	765	490	124	1002	648
	20'	56	58	NR	53	132	90	66	237	154	80	374	237	102	542	343	119	743	473	139	977	628
	30'	NR	NR	NR	73	113	NR	88	214	NR	104	346	219	131	507	321	149	702	444	171	929	594
50'	0'	0	101	67	0	216	134	0	397	232	0	633	353	0	932	518	0	1297	708	0	1730	952
	2'	8	86	61	11	183	122	14	320	206	15	497	314	22	715	445	26	975	615	33	1276	813
	5'	20	82	NR	27	177	119	35	312	200	43	487	308	55	702	438	65	960	605	77	1259	798
	10'	26	76	NR	35	168	114	45	299	190	56	471	298	73	681	426	86	935	589	101	1230	773
	15'	59	70	NR	42	158	NR	54	287	180	66	455	288	85	662	413	100	911	572	117	1203	747
	20'	NR	NR	NR	50	149	NR	63	275	169	76	440	278	97	642	401	113	888	556	131	1176	722
	30'	NR	NR	NR	69	131	NR	84	250	NR	99	410	259	123	605	376	141	844	522	161	1125	670
100'	0'	NR	NR	NR	0	218	NR	0	407	NR	0	665	400	0	997	560	0	1411	770	0	1908	1040
	2'	NR	NR	NR	10	194	NR	12	354	NR	13	566	375	18	831	510	21	1155	700	25	1536	935
	5'	NR	NR	NR	26	189	NR	33	347	NR	40	557	369	52	820	504	60	1141	692	71	1519	926
	10'	NR	NR	NR	33	182	NR	43	335	NR	53	542	361	68	801	493	80	1118	679	94	1492	910
	15'	NR	NR	NR	40	174	NR	50	321	NR	62	528	353	80	782	482	93	1095	666	109	1465	895
	20'	NR	NR	NR	47	166	NR	59	311	NR	71	513	344	90	763	471	105	1073	653	122	1438	880
	30'	NR	NR	NR	NR	NR	NR	78	290	NR	92	483	NR	115	726	449	131	1029	627	149	1387	849
	50'	NR	NR	NR	NR	NR	NR	NR	NR	NR	147	428	NR	180	651	405	197	944	575	217	1288	787

Table 1-D1

Capacity of Type B Double-Wall Vents with Type B Double-Wall Connectors Serving a Single Appliance

Height H (ft)	Lateral L (ft)	Vent Diameter – D: 10" FAN Min	10" FAN Max	10" NAT Max	12" FAN Min	12" FAN Max	12" NAT Max	14" FAN Min	14" FAN Max	14" NAT Max	16" FAN Min	16" FAN Max	16" NAT Max	18" FAN Min	18" FAN Max	18" NAT Max	20" FAN Min	20" FAN Max	20" NAT Max	22" FAN Min	22" FAN Max	22" NAT Max	24" FAN Min	24" FAN Max	24" NAT Max
6'	0'	0	1121	570	0	1645	850	0	2267	1170	0	2983	1530	0	3802	1960	0	4721	2430	0	5737	2950	0	6853	3520
	2'	75	675	455	103	982	650	138	1345	890	178	1769	1170	225	2250	1480	296	2782	1850	360	3377	2220	426	4030	2670
	4'	110	668	445	147	975	640	191	1338	880	242	1761	1160	300	2242	1475	390	2774	1835	469	3370	2215	555	4023	2660
	6'	128	661	435	171	967	630	219	1330	870	276	1753	1150	341	2235	1470	437	2767	1820	523	3363	2210	618	4017	2650
8'	0'	0	1261	660	0	1858	970	0	2571	1320	0	3399	1740	0	4333	2220	0	5387	2750	0	6555	3360	0	7838	4010
	2'	71	770	515	98	1124	745	130	1543	1020	168	2030	1340	212	2584	1700	278	3196	2110	336	3882	2560	401	4634	3050
	5'	115	758	503	154	1110	733	199	1526	1010	251	2013	1330	311	2563	1685	388	3160	2090	476	3863	2545	562	4612	3040
	8'	137	746	490	180	1097	720	231	1514	1000	289	2000	1320	354	2552	1670	450	3163	2070	537	3850	2530	630	4602	3030
10'	0'	0	1377	720	0	2036	1060	0	2825	1450	0	3742	1925	0	4782	2450	0	5955	3050	0	7254	3710	0	8682	4450
	2'	68	852	560	93	1244	850	124	1713	1130	161	2256	1480	202	2868	1890	264	3556	2340	319	4322	2840	378	5153	3390
	5'	112	839	547	149	1229	829	192	1696	1105	243	2238	1461	300	2849	1871	382	3596	2318	458	4301	2818	540	5132	3371
	10'	142	817	525	187	1204	795	238	1669	1080	298	2209	1430	364	2818	1840	459	3504	2280	546	4268	2780	641	5099	3340
15'	0'	0	1596	840	0	2380	1240	0	3323	1720	0	4423	2270	0	5678	2900	0	7099	3620	0	8685	4410	0	10393	5300
	2'	63	1019	675	86	1495	985	114	2062	1350	147	2719	1770	186	3467	2260	239	4304	2800	290	5232	3410	348	6251	4080
	5'	105	1003	660	140	1496	967	182	2041	1327	229	2696	1748	283	3442	2235	355	4278	2777	426	5204	3385	501	6222	4057
	10'	135	977	635	177	1446	936	227	2009	1289	283	2659	1712	346	3402	2193	432	4234	2739	510	5159	3343	599	6175	4019
	15'	155	953	610	202	1418	905	257	1976	1250	318	2623	1675	385	3363	2150	479	4192	2700	564	5115	3300	665	6129	3980
20'	0'	0	1756	930	0	2637	1350	0	3701	1900	0	4948	2520	0	6378	3250	0	7988	4060	0	9785	4980	0	11753	6000
	2'	59	1150	955	81	1694	1100	107	2343	1520	139	3097	2000	175	3955	2570	220	4916	3200	269	5983	3910	321	7154	4700
	5'	101	1133	738	135	1674	1079	174	2320	1498	219	3071	1978	270	3926	2544	337	4885	3174	403	5950	3880	475	7119	4662
	10'	130	1105	710	172	1641	1045	220	2282	1460	273	3029	1940	334	3880	2500	413	4835	3130	489	5896	3830	573	7063	4600
	15'	150	1078	688	195	1609	1018	248	2245	1425	306	2988	1910	372	3835	2465	459	4786	3090	541	5844	3795	631	7007	4575
	20'	167	1052	665	217	1578	990	273	2210	1390	335	2948	1880	404	3791	2430	495	4737	3050	585	5792	3760	689	6953	4550
30'	0'	0	1977	1060	0	3004	1550	0	4252	2170	0	5725	2920	0	7420	3770	0	9341	4750	0	11483	5850	0	13848	7060
	2'	54	1351	865	74	2004	1310	98	2786	1800	127	3696	2380	159	4734	3050	199	5900	3810	241	7194	4650	285	8617	5600
	5'	96	1332	851	127	1981	1289	164	2759	1775	208	3668	2350	252	4701	3020	312	5863	3783	373	7155	4622	439	8574	5552
	10'	125	1301	829	164	1944	1254	209	2716	1733	259	3617	2300	316	4647	2970	386	5803	3739	456	7090	4574	535	8505	5471
	15'	143	1272	807	187	1908	1220	237	2674	1892	292	3570	2250	354	4594	2920	431	5744	3695	507	7026	4527	590	8437	5391
	20'	160	1243	784	207	1873	1185	260	2633	1650	319	3523	2200	384	4542	2870	467	5686	3850	548	6964	4480	639	8370	5310
	30'	195	1189	745	246	1807	1130	305	2555	1585	369	3433	2130	440	4442	2785	540	5574	3565	635	6842	4375	739	8239	5225
50'	0'	0	2231	1195	0	3441	1825	0	4934	2550	0	6711	3440	0	8774	4460	0	11129	5835	0	13767	6940	0	16694	8430
	2'	41	1620	1010	66	2431	1513	86	3409	2125	113	4554	2840	141	5864	3670	171	7339	4630	209	8980	5695	251	10788	6860
	5'	90	1600	996	118	2406	1495	151	3380	2102	191	4520	2813	234	5826	3639	283	7295	4597	336	8933	5654	394	10737	6818
	10'	118	1567	972	154	2366	1466	196	3332	2064	243	4464	2767	295	5763	3585	355	7224	4542	419	8855	5585	491	10652	6749
	15'	136	1538	948	177	2327	1437	222	3285	2026	274	4409	2721	330	5701	3534	396	7155	4511	465	8779	5546	542	10570	6710
	20'	151	1505	924	195	2288	1408	244	3239	1967	300	4358	2675	381	5641	3481	433	7086	4479	506	8704	5505	586	10488	6670
	30'	183	1446	876	232	2214	1349	287	3150	1910	347	4253	2631	412	5523	3431	494	6953	4421	577	8557	5444	672	10328	6603
100'	0'	0	2491	1310	0	3925	2050	0	5729	2950	0	7914	4050	0	10495	5300	0	13454	6700	0	16817	8500	0	20588	10300
	2'	30	1975	1170	44	3027	1820	72	4313	2550	95	5834	3500	120	7591	4600	138	9577	5800	169	11803	7200	204	14264	8800
	5'	82	1955	1159	107	3002	1803	136	4282	2531	172	5797	3475	208	7548	4566	245	9528	5769	293	11748	7162	341	14204	8756
	10'	108	1923	1142	142	2961	1775	180	4231	2500	223	5737	3434	268	7478	4509	318	9447	5717	374	11658	7100	436	14105	8683
	15'	126	1892	1124	163	2920	1747	206	4182	2469	252	5678	3392	304	7409	4451	358	9367	5665	418	11569	7037	487	14007	8610
	20'	141	1861	1107	181	2880	1719	226	4133	2438	277	5619	3351	330	7341	4394	387	9289	5613	452	11482	6975	523	13910	8537
	30'	170	1802	1071	215	2803	1683	265	4037	2375	319	5505	3267	378	7209	4279	448	9136	5509	514	11310	6850	592	13720	8391
	50'	241	1688	1000	292	2657	1550	350	3856	2250	415	5289	3100	486	6956	4050	572	8841	5300	659	10979	6600	752	13354	8100

SDR Installation

Table 1-D2

Capacity of Single-Wall Metal Pipe or Type B Asbestos Cement Vents Serving a Single Appliance

Height	Lateral	Vent Diameter – D							
		3"	4"	5"	6"	7"	8"	10"	12
H	L	Maximum Appliance Input Rating in Thousands of BTU Per Hour							
6'	0	39	70	116	170	232	312	500	75
	2'	31	55	94	141	194	260	415	62
	5'	28	51	88	128	177	242	390	60
8'	0	42	76	126	185	252	340	542	81
	2'	32	61	102	154	210	284	451	68
	5'	29	56	95	141	194	264	430	64
	10'	24*	49	86	131	180	250	406	62
10'	0	45	84	138	202	279	372	606	91
	2'	35	67	111	168	233	311	505	76
	5'	32	61	104	153	215	289	480	72
	10'	27*	54	94	143	200	274	455	70
	15'	NR	46*	84	130	186	258	432	66
15'	0	49	91	151	223	312	420	684	104
	2'	39	72	122	186	260	350	570	86
	5'	35*	67	110	170	240	325	540	82
	10'	30*	58*	103	158	223	308	514	79
	15'	NR	50*	93*	144	207	291	488	76
	20'	NR	NR	82*	132*	195	273	466	72
20'	0	53*	101	163	252	342	470	770	119
	2'	42*	80	136	210	286	392	641	99
	5'	38*	74*	123	192	264	364	610	94
	10'	32*	65*	115*	178	246	345	571	91
	15'	NR	55*	104*	163	228	326	550	87
	20'	NR	NR	91*	149*	214*	306	525	83
30'	0	56*	108*	183	276	384	529	878	137
	2'	44*	84*	148*	230	320	441	730	114
	5'	NR	78*	137*	210	296	410	694	108
	10'	NR	68*	125*	196*	274	388	656	105
	15'	NR	NR	113*	177*	258*	366	625	100
	20'	NR	NR	99*	163*	240*	344	596	96
	30'	NR	NR	NR	NR	192*	295*	540	89
50'	0	NR	120*	210*	310*	443*	590	980	155
	2'	NR	95*	171*	260*	370*	492	820	129
	5'	NR	NR	159*	234*	342*	474	780	123
	10'	NR	NR	146*	221*	318*	456*	730	119
	15'	NR	NR	NR	200*	292*	407*	705	113
	20'	NR	NR	NR	185*	276*	384*	670*	108
	30'	NR	NR	NR	NR	222*	330*	605*	101

See Figure 1–D1 and Notes for Single Appliance Vents

Table 1-D3

Capacity of Masonry Chimneys and Single-Wall Vent Connectors Serving a Single Appliance

Height H	Lateral L	Single-Wall Vent Connector Diameter – D							
		To be used with chimney areas not less than those at bottom							
		3"	4"	5"	6"	7"	8"	10"	12"
		Maximum Appliance Input Rating In Thousands of BTU Per Hour							
	2'	28	52	86	130	180	247	400	580
6'	5'	25*	48	81	118	164	230	375	560
	2'	29	55	93	145	197	265	445	650
8'	5'	26*	51	87	133	182	246	422	638
	10'	22*	44*	79*	123	169	233	400	598
	2'	31	61	102	161	220	297	490	722
10'	5'	28*	56	95	147	203	276	465	710
	10'	24*	49*	86	137	189	261	441	665
	15'	NR	42*	79	125	175	246	421	634
	2'	35*	67	113	178	249	335	560	840
	5'	32*	61	106	163	230	312	531	825
15'	10'	27*	54*	96	151	214	294	504	774
	15'	NR	46*	87*	138	198	278	481	738
	20'	NR	NR	73*	128*	184	261	459	706
	2'	38*	73	123	200	273	374	625	950
	5'	35*	67*	115	183	252	348	594	930
20'	10'	NR	59*	105*	170	235	330	562	875
	15'	NR	NR	95*	156	217	311	536	835
	20'	NR	NR	80*	144*	202	292	510	800
	2'	41*	81*	136	215	302	420	715	1110
	5'	NR	75*	127*	196	279	391	680	1090
30'	10'	NR	66*	113*	182*	260	370	644	1020
	15'	NR	NR	105*	168*	240*	349	615	975
	20'	NR	NR	88*	155*	223*	327	585	932
	30'	NR	NR	NR	NR	182*	281*	544	865
	2'	NR	91*	160*	250*	350*	475	810	1240
	5'	NR	NR	149*	228*	321*	442	770	1220
50'	10"	NR	NR	136*	212*	301*	420*	728	1140
	15'	NR	NR	124*	195*	278*	395*	695	1090
	20'	NR	NR	NR	180*	258*	370*	660*	1040
	30'	NR	NR	NR	NR	NR	318*	610*	970
Minimum Internal Area of Chimney – A Square Inches		19	19	28	38	50	63	95	132

See Table 1–D7 for Masonry Chimney Liner Sizes.
See Figure 1–D2 and Notes for Single Appliance Vents.

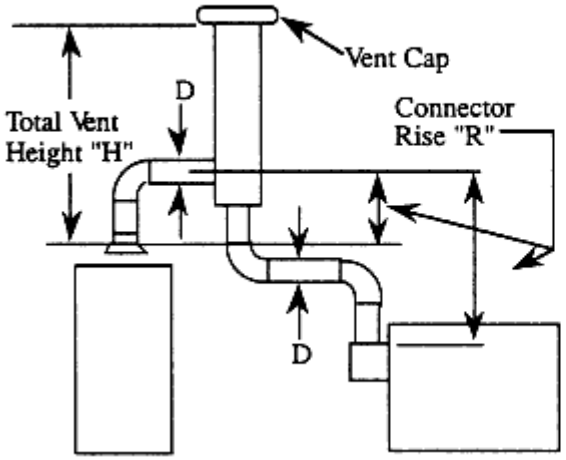


Figure 1-D3
Double-Wall or Asbestos Cement Type B Vents or Single- Wall Metal Vents Serving Two or More Appliances.
(See Tables 1-D4 and 1D5.)

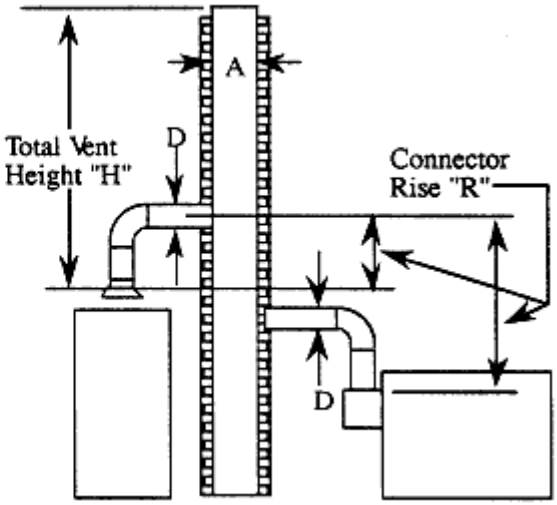


Figure 1-D4
Masonry Chimney Serving Two or more Appliances.
(See Table I -D6.

Notes for Multiple Appliance Vents. (See Tables 1-D4, 1-D5 and 1-D6.)

1 . For single-wall metal pipe connectors, use Table 1-D5.

2. Maximum Vent Connector Length: 11/2 feet for every inch of connector diameter. Greater lengths require increase in size, rise or total vent height, to obtain full capacity.

3. Each 90-degree turn in excess of the first two reduces the connector capacity by 10 percent.

4. Each 90-degree turn in the common vent reduces capacity by 10 percent.

5. Where possible, locate vent closer to or directly over smaller appliance connector.

6. Connectors must be equal to or larger than draft hood outlets.

7. If both connectors are same size, common vent must be at least one size larger, regardless of tabulated capacity.

8. Common vent must be equal to or larger than largest connector.

9. Interconnection fittings must be same size as common vent.

10. Use sea level input rating when calculating vent size for high altitude installation.
11. Designation "NR" in Tables I -D4, 1 -D5 and 1 -D6 indicates not recommended.

Table 1-D4

Capacity of Type B Double-Wall Vents with Type B Double-Wall Connectors Serving Two or More Appliances

Vent Connector Capacity

Total Vent Height "H"	Connector Rise "R"	Vent Connector Diameter – D													
		3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	22"	24"
		Maximum Appliance Input Rating in Thousands of BTU Per Hour													
6'	1'	26	46	72	104	142	185	289	416	577	755	955	1180	1425	1700
	2'	31	55	86	124	168	220	345	496	653	853	1080	1335	1610	1920
	3'	35	62	96	139	189	248	386	556	740	967	1225	1510	1830	2180
8'	1'	27	48	76	109	148	194	303	439	601	805	1015	1255	1520	1810
	2'	32	57	90	129	175	230	358	516	696	910	1150	1420	1720	2050
	3'	36	64	101	145	198	258	402	580	790	1030	1305	1610	1950	2320
10'	1'	28	50	78	113	154	200	314	452	642	840	1060	1310	1585	1890
	2'	33	59	93	134	182	238	372	536	730	955	1205	1490	1800	2150
	3'	37	67	104	150	205	268	417	600	827	1080	1370	1690	2040	2430
15'	1'	30	53	83	120	163	214	333	480	697	910	1150	1420	1720	2050
	2'	35	63	99	142	193	253	394	568	790	1030	1305	1610	1950	2320
	3'	40	71	111	160	218	286	444	640	898	1175	1485	1835	2220	2640
20'	1'	31	56	87	125	171	224	347	500	740	965	1225	1510	1830	2190
	2'	37	66	104	149	202	265	414	596	840	1095	1385	1710	2070	2470
	3'	42	74	116	168	228	300	466	672	952	1245	1575	1945	2350	2800
30'	1'	33	59	93	134	182	238	372	536	805	1050	1330	1645	1990	2370
	2'	39	70	110	158	215	282	439	632	910	1190	1500	1855	2240	2670
	3'	44	79	124	178	242	317	494	712	1035	1350	1710	2110	2550	3040
40'	1'	35	62	97	140	190	248	389	560	850	1110	1405	1735	2100	2500
	2'	41	73	115	166	225	295	461	665	964	1260	1590	1965	2380	2830
	3'	46	83	129	187	253	331	520	748	1100	1435	1820	2240	2710	3230
60' to 100'	1'	37	66	104	150	204	266	417	600	926	1210	1530	1890	2280	2720
	2'	44	79	123	178	242	316	494	712	1050	1370	1740	2150	2590	3090
	3'	50	89	138	200	272	355	555	800	1198	1565	1980	2450	2960	3520

Common Vent Capacity

Total Vent Height "H"	Common Vent Diameter													
	3"	4"	5"	6"	7"	8"	10"	12"	14"	16"	18"	20"	22"	24"
	Combined Appliance Input Rating in Thousands of BTU Per Hour													
6'	-	65	103	147	200	260	410	588	815	1065	1345	1660	1970	2390
8'	-	73	114	163	223	290	465	652	912	1190	1510	1860	2200	2680
10'	-	79	124	178	242	315	495	712	995	1300	1645	2030	2400	2920
15'	-	91	144	206	280	365	565	825	1158	1510	1910	2360	2790	3400
20'	-	102	160	229	310	405	640	916	1290	1690	2140	2640	3120	3800
30'	-	118	185	266	360	470	740	1025	1525	1990	2520	3110	3680	4480
40'	-	131	203	295	405	525	820	1180	1715	2240	2830	3500	4150	5050
60'	-	NR	224	324	440	575	900	1380	2010	2620	3320	4100	4850	5900
80'	-	NR	NR	344	468	610	955	1540	2250	2930	3710	4590	5420	6600
100'	-	NR	NR	NR	479	625	975	1670	2450	3200	4050	5000	5920	7200

See Figure 1–D3 and Notes for Multiple Appliance Vents.

Table 1-D5

Capacity of Single-Wall Metal Pipe or Type B Asbestos Cement Vent Serving Two or More Appliances

Vent Connector Capacity

Total Vent Height "H"	Connector Rise "R"	Vent Connector Diameter – D Maximum Appliance Input Rating in Thousands of BTU Per Hour					
		3"	4"	5"	6"	7"	8"
6'-8'	1'	21	40	68	102	146	205
	2'	28	53	86	124	178	235
	3'	34	61	98	147	204	275
15'	1'	23	44	77	117	179	240
	2'	30	56	92	134	194	265
	3'	35	64	102	155	216	298
30' and up	1'	25	49	84	129	190	270
	2'	31	58	97	145	211	295
	3'	36	68	107	164	232	321

Common Vent Capacity

Total Vent Height "H"	Common Vent Diameter						
	4"	5"	6"	7"	8"	10"	12"
	Combined Appliance Input Rating in Thousands of BTU Per Hour						
6'	48	78	111	155	205	320	NR
8'	55	89	128	175	234	365	505
10'	59	95	136	190	250	395	560
15'	71	115	168	228	305	480	690
20'	80	129	186	260	340	550	790
30'	NR	147	215	300	400	650	940
50'	NR	NR	NR	360	490	810	190

See Figure 1–D3 and Notes for Multiple Appliance Vents.

Table 1-D6

Capacity of Masonry Chimneys and Single-Wall Vent Connectors Serving Two or More Appliances

Single-Wall Vent Connector Capacity

Total Vent Height "H"	Rise Connector "R"	Vent Connector Diameter – D					
		3"	4"	5"	6"	7"	8"
		Maximum Appliance Input Rating in Thousands of BTU Per Hour					
6'-8'	1'	21	39	66	100	140	200
	2'	28	52	84	123	172	231
	3'	34	61	97	142	202	269
15'	1'	23	43	73	112	171	225
	2'	30	54	88	132	189	256
	3'	34	63	101	151	213	289
30' and up	1'	24	47	80	124	183	250
	2'	31	57	93	142	205	282
	3'	35	65	105	160	229	312

Common Chimney Capacity

Total Vent Height "H"	Minimum Internal Area of Chimney – "A" Square Inches					
	19	28	38	50	78	113
	Combined Appliance Input Rating in Thousands of BTU Per Hour					
6'	45	71	102	142	245	NR
8'	52	81	118	162	277	405
10'	56	89	129	175	300	450
15'	66	105	150	210	360	540
20'	74	120	170	240	415	640
30'	NR	135	195	275	490	740
50'	NR	NR	NR	325	600	910

See Table 1–D7 for Masonry Chimney Liner Sizes.
See Figure 1–D4 and Notes for Multiple Appliance Vents.

Example of Multiple Vent Design Using Table 1-D4 Double Wall Type B Vent

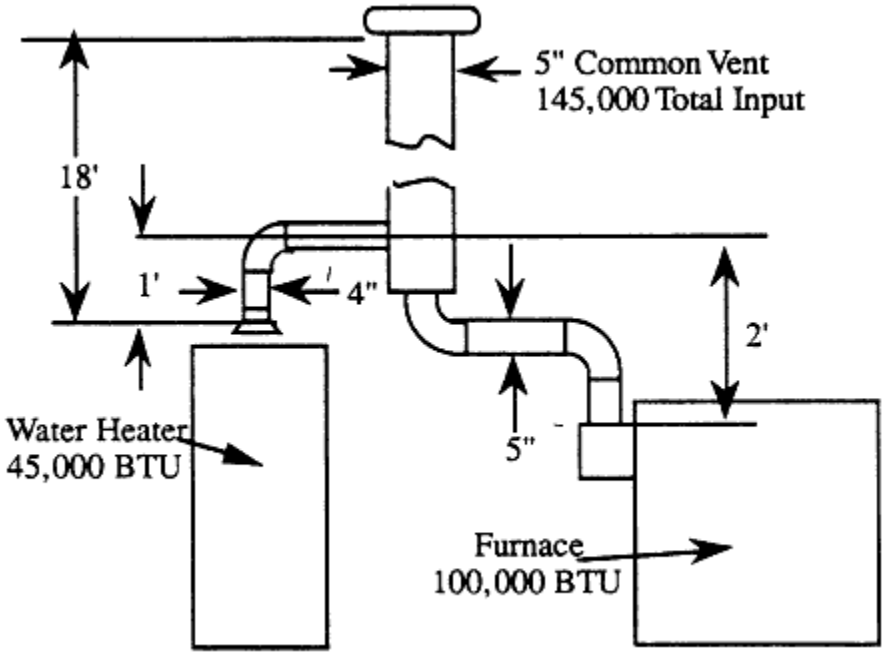


Figure 1 -D5 Example: Connect a 45 000 BTU water heater with a 1 foot connector rise "R" and a 100000 BTU furnace with a 2 foot connector rise "R" to a common Vent with a minimum total vent height "H" of 18 feet.

1. **WATER BEATER VENT CONNECTOR SIZE.** Using Table 1-D4, read down Total Vent Height "IF' column to 15 feet and read across 1 foot connector rise "R" line to Btu rating equal to or higher than water heater input rating. This figure shows 53,000 Btu and is in the column for 4-inch connector. Since this is in excess of the water heater input it is not necessary to find the maximum input for an 18 foot minimum total vent height. Use a 4-inch connector.
2. **FURNACE VENT CONNECTOR SIZE.** Under Vent Connector Tables read down Total Vent Height "H" column to 15 foot and read across 2 foot Connector Rise "R" line. Note 5-inch vent size shows 99,000 Btu per hour or less than furnace input. However, with 20 foot Total Height read across 2-foot connector rise line. Note 5-inch vent size shows 104,000 Btu per hour. Since 18-foot height is 3/5th of difference between 15 and 20-foot heights, take difference between 99,000 and 104,000 or 5,000 and add 3/5 of this to 15 foot figure of 99,000, 99,000 + 3,000 = 102,000 which is maximum input for 18-foot Total Vent Height. Therefore a 5-inch connector would be the correct size for the furnace, providing the furnace had a 5-inch or smaller draft hood outlet.
3. **COMMON VENT SIZE.** Total input to Common Vent is 145,000 Btu. Note that for 15-foot Total Vent Height "H" maximum Btu for 5-inch vent is 144,000. For 20-foot Total Vent Height "IT' maximum Btu for 5-inch vent is 160,000. Therefore for 18-foot Total Vent Height maximum allowable input would be 3/5 of difference between 144,000 and 160,000 = 3/5 x 16,000 or 9,600; 144,000 + 9,600 = 153,000 which is greater than total input to common vent. Therefore common vent can be 5-inch-diameter pipe.

Limited Warranty

1. There are no warranties, express or implied, written or oral, including but not limited to any implied warranty of merchantability, of fitness for use or for a particular purpose, with respect to any device manufactured or sold by Stanlin Group Inc. except as herein set forth.

1. This warranty is extended only to purchasers of Stanlin Group Inc. products, who purchase the same directly from Stanlin Group Inc.. It is not extended to any other purchaser or consumer.

1. Only devices manufactured or sold by Stanlin Group Inc. and bearing the SES nameplate are covered by this warranty.

1. If any device so manufactured or sold by Stanlin Group Inc. is claimed to have any defect in workmanship or material under normal use and service during the period covered by this Warranty, and after inspection by Stanlin Group Inc. is found to be defective, Stanlin Group Inc. will, at its option, either repair or replace such device free of charge, F.O.B. Stanlin Group Inc.'s factory. Within the meaning of this Warranty, a defect which is capable of being repaired or replaced in any part of any such device shall not make the entire device or any part thereof deemed defective.

1. The period of this Warranty commences on the date of shipment from Stanlin Group Inc.'s factory to the purchaser and shall continue for ten (10) years from such date of shipment.

1. To obtain performance of Stanlin Group Inc.'s Warranty obligations, the purchaser must, within the time period set forth above, return any device or part claimed to be defective to: Stanlin Group Inc., Attention: Return Goods Department, transportation charges prepaid, together with a legibly written description of the claimed defect and such purchaser's name, address and telephone number.

1. Stanlin Group Inc. assumes no liability for consequential, special or other damages, or loss of profits, and the purchaser, by acceptance of any such device assumes all liability for the consequences of its use or misuse by the purchaser, its employees or others.

1. A completed Warranty Report for Stanlin Group Inc. with a Warranty Checklist must be filed with Stanlin Group Inc. to make this Warranty applicable.

Flue Products Table

From Research Buletin 68, American Gas Association Laboratories

Type of Appliance	Appliance Input Rates 1000 BTU/Hr.		Weight Flow Lb./ Hr.		Volume Flow, Cu. Ft./Hr.		Per Cent CO 2	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.*	Max.*
Central Heating								
Gravity Floor Furnace	20.0	85.0	20.2	110.0	274.0	1,480.0	6.5	8.8
Gravity Furnace	20.0	300.0	20.2	338.0	274.0	4,566.0	7.8	8.8
Forced Air Furnace	35.0	900.0	33.5	1,013.0	454.0	13,680.0	7.8	8.8
Boiler	39.4	4,800.0	41.0	5,580.0	552.0	75,200.0	7.5	8.5
Recessed Heater	16.0	65.0	15.7	80.0	212.0	1,080.0	7.0	9.0
Duct Furnace	45.0	660.0	45.0	740.0	610.0	9,980.0	7.8	8.8
Unit Heater	25.0	250.0	25.0	2,820.0	339.0	38,000.0	7.8	8.8
Room Heaters								
Wall Heater	5.0	70.0	16.3	375.0	216.0	4,960.0	1.5	2.5
Radiant Heater	9.0	34.0	15.0	139.0	200.0	1,840.0	2.0	5.0
Vented Circulator	12.0	85.0	13.2	144.0	178.0	1,928.0	5.0	8.0
Fireplace Insert	17.5	33.6	29.6	138.0	396.0	1,830.0	2.0	5.0
Vented Wall Circulator	10.0	68.0	9.9	70.0	134.0	948.0	8.5	9.0
Gas-Steam Radiator	12.0	49.0	13.2	60.8	178.0	819.0	7.0	8.0
Vented Overhead Heater	62.5	125.0	61.0	137.4	825.0	1,854.0	8.0	9.0
Water Heaters								
Auto. Inst.	40.0	330.0	46.0	471.0	620.0	6,330.0	6.0	7.5
Auto. Stg. (Int. Flue)	5.0	363.0	5.5	519.0	74.3	6,980.0	6.0	8.0
Auto. Circ. Tank	20.0	510.0	22.0	729.0	297.0	9,800.0	6.0	8.0
Circ. Tank	18.0	420.0	19.5	600.0	263.0	8,060.0	6.0	8.0
Attachable	16.0	16.0	16.5	19.6	222.5	264.0	7.0	8.0
Conversion Burner	45.0	400.0	49.0	435.0	661.0	5,870.0	8.0**	8.0**
Incinerator	1.7	25.0	9.2	201.0	122.0	2,660.0	1.0	1.5
Clothes Dryer	15.0	20.0	171.3	266.5	2,255.0	3,510.0	0.6	0.7

* Approximate range of per cent CO2 while maintaining complete combustion

** Flue gas CO2 content specified for approval testing by A.G.A. requirements.

Actual field values vary widely according to installation practices employed.

Definitions

From Research Bulletin 68, American Gas Association Laboratories

APPLIANCE (GAS) - A gas appliance is any device which utilizes gas fuel to produce light, heat or power.

APPLIANCE FLUE - The flue passages within the appliance.

BAFFLE -An object placed in an appliance to change the direction of or retard the flow of air, air-gas mixtures, or flue gases.

BTU - Abbreviation for British Thermal Unit, which is the quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit.

CENTRAL HEATING GAS APPLIANCE - A gas appliance normally used as the primary means of heating premises. Ordinarily this includes gas boilers, warm air furnaces and floor furnaces, but does not include unit heaters, room or space heaters, or industrial gas boilers.

CHIMNEY - A vertical masonry or reinforced concrete shaft containing one or more flues and vents.

COMBUSTIBLE CONSTRUCTION - A combustible wall or combustible surface constructed of wood, composition, or wooden studding and lath and plaster.

COMBUSTION - Combustion, as used herein, refers to the rapid oxidation of fuel gases accompanied by the production of heat, or heat and light. Complete combustion of fuel is possible only in the presence of an adequate supply of oxygen.

COMBUSTION CHAMBER - The portion of an appliance in which combustion occurs.

COMBUSTION PRODUCTS - Constituents resulting from the combustion of a fuel with the oxygen of the air, including the inerts but excluding excess air.

CONDENSATE (CONDENSATION) - The liquid which separates from a gas (including flue gas) due to a reduction in temperature.

CONVERSION BURNER - A burner designed to supply gaseous fuel to an appliance originally designed to utilize another fuel.

CUBIC FOOT (CU. FT.) OF GAS - The amount of gas which would occupy 1 cu. ft. when at a temperature of 60*F., saturated with water vapor, and under a pressure equivalent to that of 30 in. of mercury.

DRAFT HOOD - A device built into an appliance or made a part of the flue or vent connector from an appliance, which is designed to: (1) insure the ready escape of the products of combustion in the event of no draft, back draft, or stoppage beyond the draft hood; (2) prevent a back draft from entering the appliance; and (3) neutralize the effect of stack action of the flue or vent upon the operation of the appliance.

DRAFT INDUCER - (see "Fan Assisted Combustion System")

EXCESS AIR - Air which passes through the combustion chamber and the appliance flues in excess of that which is theoretically required for complete combustion.

FAN ASSISTED COMBUSTION SYSTEM -An appliance equipped with an integral mechanical means to either draw or force products of combustion through the combustion chamber and/or heat exchanger.

FLUE OR VENT - A conduit or passageway, vertical or nearly so, for conveying flue gases to the outer air.
FLUE COLLAR - That portion of an appliance designed for the attachment of the draft hood or flue of vent connector.

FLUE GASES - Products of combustion and excess air.

FURNACE - A self-contained gas-burning appliance for heating air by secondary transfer of heat from the flue gases through metal to the air, usually located outside of the room or rooms being heated.

a. Gravity Type Warm Air Furnace A furnace depending primarily upon circulation of air by gravity. This classification shall also include furnaces equipped with booster-type fans which do not materially restrict free circulation of air by gravity flow when such fans are not in operation.

a. Forced Air Type Warm Air Furnace A furnace equipped with a fan which provides the primary means for circulation of air and of sufficient capacity to deliver air at a temperature rise of not more than 100* F. above room temperature when operating against an imposed static pressure of 0.2 in. equivalent water column with the furnace operating at its rated BTU input capacity.

HEATING VALUE (TOTAL) - The number of British Thermal Units produced by the combustion at constant pressure of 1 cu. ft. of gas when the products of combustion are cooled to the initial temperature of the gas and air, when the water vapor formed during combustion is condensed, and when all the necessary corrections have been applied.

INCINERATOR - An appliance used to reduce refuse material to ashes, and which is sold as a complete unit.
a. Portable Incinerator An incinerator which is a complete unit in itself, and which does not become an integral part of the structure in which it is installed.
b. Wall Incinerator An incinerator which is a complete unit in itself, designed to be installed in a fireproof wall or chimney, thereby becoming an integral part of the structure in which it is installed.

RELIEF OPENING - The opening provided in a draft hood to permit the ready escape to the atmosphere of the flue products from the draft hood in the event of no draft, back draft, or stoppage beyond the draft hood, and to permit inspiration of air into the draft hood in the event of a strong chimney updraft.

ROOM OR SPACE HEATER - A self-contained gas-burning appliance installed in and for heating rooms. This definition shall not include unit heaters, central heating gas appliances, or garage heaters.

SECONDARY AIR - The air externally supplied to the flame at the point of combustion.

SMOKE PIPE - See Flue or Vent Connector definition.

SPECIFIC GRAVITY - As applied to gas, specific gravity is the ratio of the weight of a given volume to that of the same volume of air, both measured under the same conditions.

TYPE ‘A’ FLUE OR VENT - Flue or vent of masonry or reinforced concrete, or metal smoke stack.

TYPE 'B' GAS FLUE OR VENT - Vent piping of non-combustible, corrosion-resistant material of sufficient thickness, cross-sectional area, and heat insulating quality to avoid excess temperature on adjacent combustible material, and certified by a nationally recognized testing agency.

TYPE 'C' GAS FLUE OR VENT - Flue or vent piping of sheet copper of not less than No. 24 U.S. Standard gauge or of other approved corrosion-resistant material.

VENT - See Flue or Vent definition.