



FIELD CONTROLS
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CHOOSING THE RIGHT SIZE BAROMETRIC DRAFT CONTROL

Simple rules of thumb to guide size selections:

1. Use a draft control the same size as the flue pipe, that is, a 6" control for a 6" round pipe, a 12" control for a 12" pipe, etc.
2. For intermediate sizes of smoke pipe, use the next larger size draft control to provide ample capacity. It is a simple matter to install a round control on a pipe an inch or so larger or smaller than the control.
3. If the flue pipe or breeching is square, use the round equivalent. For example – on a 14" x 14" breeching use a 14" control. Little flow occurs in the corners of a square pipe so that its capacity is approximately the same as a round pipe of the same diameter.
4. If the breeching is rectangular or oval, compute its cross-sectional area and select a draft control having the same or a greater nominal cross-sectional area. A breeching 14" high x 10" wide would have a cross-sectional area of 140 square inches. From the table, select a 14" control with a cross-sectional area of 154 square inches.
5. Where a control larger than 32" is required, use more than one regulator with combined cross-sectional areas equal to or greater than that of the breeching. When chimneys are of an unusual height or if the draft to be maintained is either very high or very low, it is advisable to deviate from the rules of thumb outlined here. (*Refer to the larger table*).

CONTROL SIZE	NOMINAL CROSS-SECTIONAL AREA (SQ. IN.)	CONTROL SIZE	NOMINAL CROSS-SECTIONAL AREA (SQ. IN.)
6"	28	–	–
7"	38	16"	201
8"	50	18"	255
9"	63	20"	314
10"	78	24"	452
12"	113	28"	616
14"	154	32"	804

DIAMETER OF FLUE OR BREECHING	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL	IF CHIMNEY HEIGHT IS	USE THIS SIZE CONTROL
4	15' or less	4"	16' or more	5"	–	–
5	15' or less	5"	16' or more	6"	–	–
6	15' or less	6"	16' or more	7"	–	–
7	15' or less	7"	16' or more	8"	–	–
8	15' or less	8"	16' or more	9"	–	–
9	15' or less	9"	16' – 30'	10"	31' or more	12"
10	20' or less	10"	21' – 40'	12"	41' or more	14"
11	20' or less	12"	21' – 40'	12"	41' or more	14"
12	20' or less	12"	21' – 40'	14"	41' or more	16"
13	22' or less	14"	23' – 45'	16"	46' or more	18"
14	22' or less	14"	23' – 45'	16"	46' or more	18"
15	22' or less	16"	23' – 45'	16"	46' or more	18"
16	30' or less	16"	31' – 50'	18"	51' or more	20"
17	30' or less	18"	31' – 50'	20"	51' or more	20"
18	30' or less	18"	31' – 50'	20"	51' or more	20"
19	30' or less	20"	31' – 50'	20"	51' or more	24"
20	30' or less	20"	31' – 50'	20"	51' or more	24"
21	30' or less	20"	31' – 50'	24"	51' or more	24"
22	30' or less	24"	31' – 50'	24"	51' or more	24"
23	35' or less	24"	36' – 60'	24"	61' or more	28"
24	35' or less	24"	36' – 60'	24"	61' or more	28"
25	35' or less	28"	36' – 60'	28"	61' or more	28"
26	40' or less	28"	41' – 70'	28"	71' or more	28"
27	40' or less	28"	41' – 70'	28"	71' – 100'	28"
28	50' or less	32"	51' – 100'	28"	100' or more	32"
29	50' or less	32"	51' – 100'	32"	100' or more	32"
30	50' or less	32"	51' – 100'	32"	100' or more	32"
31	50' or less	32"	51' – 100'	32"	100' or more	Two 24"
32	50' or less	32"	51' – 100'	32"	100' or more	One 24" One 28"
33	50' or less	32"	51' – 100'	One 32" One 20"	100' or more	One 32" One 24"
34	50' or less	32"	51' – 100'	One 32" One 24"	100' or more	One 32" One 24"

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TYPICAL LOCATIONS FOR FIELD DRAFT CONTROLS

For gas fired equipment, the preferred location of the control is on the bull head tee. This location provides maximum relief of downdrafts with minimum positive pressure (see figure 1, diagrams A-C).

With oil or solid fuels, the bull head tee is not recommended, so instead, locate the control as shown (see figure 1, diagrams D-J). These locations are acceptable for gas units as well.

Except on forced draft systems, locate the control as close as possible to the furnace or boiler, at least 12" beyond a stack switch on oil fired units, and at least 18" from a combustible ceiling or wall.

Commercial and industrial furnaces and boilers are frequently installed in multiples (see figure 2).

Use a draft control for each boiler located on the uptake between the smoke outlet and the breeching (location "A"). When this uptake is too short to permit the installation of a control, locate a separate control for each boiler on the main breeching (location "B"). If neither of these locations is possible, use a single large control in the breeching between the chimney and the boiler nearest to it (location "C").

Where several units are vented into a common breeching the most draft-critical should vent highest in, or be placed closest to the chimney. Incinerators should generally be placed farthest from, or vented lowest in the chimney.

Figure 1

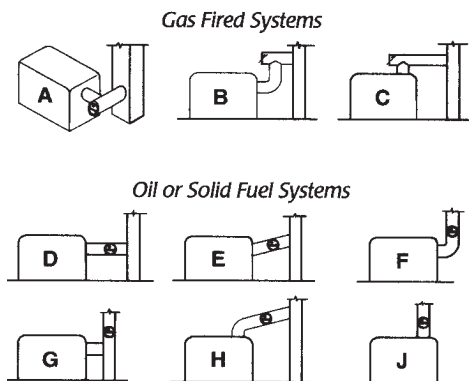
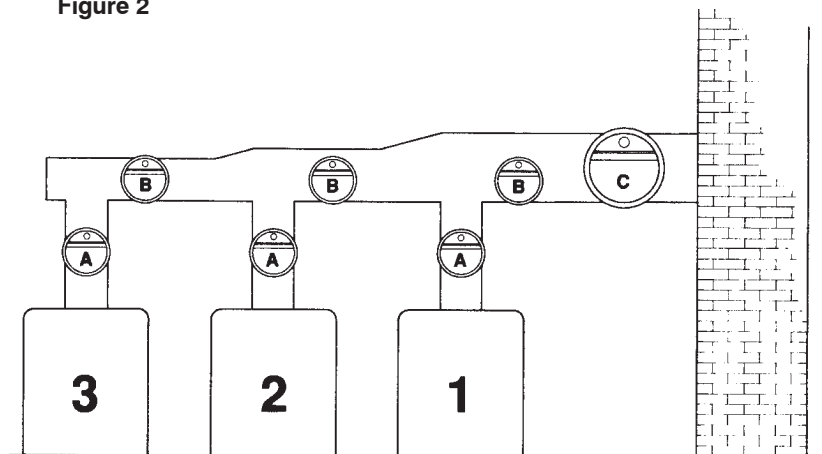


Figure 2



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DRAFT CONTROLS

For proper operation and efficient fuel consumption in oil, gas, and/or coal-fired heating appliances, draft must remain constant. When it is, combustion is more complete, fuels are utilized, and money is saved. Field Draft Controls maintain consistent draft by counteracting the negative forces caused by changes in temperature and barometric pressure, and the effects of wind.

When to use a Draft Control:

Draft Inducers/Power Venters

With these devices, draft is increased or created causing fluctuations in air flow through the combustion chamber. These fluctuations can be negated by the use of a barometric draft control located between the draft inducer or power venter and the furnace, boiler, or water heater it services.

Use a single acting control for oil and gas fired equipment with a power vented system. A single-acting control for oil and a double-acting control for gas fired equipment with a draft induced system.

Power Burners

A power burner is designed so that a fan delivers negative pressure air to the combustion chamber. A single-acting draft control for oil maintains that negative pressure.

A power burner designed to burn natural or LP gas operates in the same manner. While a draft hood (diverter) is often used on gas units fired with an atmospheric burner, a double-acting barometric draft control should be used for furnaces or boilers fired with power burners.

Forced Draft Burners

Forced Draft installed with a stack height in excess of 30' will probably develop excessive natural draft, reducing the amount of pressure within the furnace or boiler. A barometric draft control will help eliminate this undesirable stack action and permit the unit to be pressurized.

Dual Fuel Appliances

Burners capable of burning either gaseous fuels or oil should be equipped with a barometric draft control. We suggest using a double-acting control on units where fuels are frequently changed. The double-acting feature is important for gas firing appliances, it allows spillage of combustion products in case of blocked flues or downdrafts. To detect flue gas spillage on dual fuel installation, a Field Thermal Switch is recommended.

Gas Fired Appliances

Gas fired furnaces and boilers generally require a double-acting draft control. Like a single-acting control it opens inwardly to maintain a uniform draft. But, unlike a single-acting control, it is also free to open outwardly to spill the products of combustion in case of blocked flues or downdrafts.

National codes often mandate the use of a draft hood. Usage is generally limited to furnaces or boilers designed for use with power burners and incinerators. Draft controls are generally used when oil fired units are converted to gas.



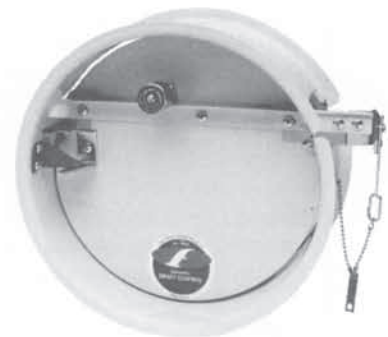
RC



M



MG-1



M+MG2

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FIELD CONTROLS

DRAFT CONTROLS (cont'd)

Type RC Single Acting (for Oil, and Coal) — Residential and Commercial

The Field RC is furnished as standard equipment on many leading brands of oil or coal fired heating equipment. It is calibrated to allow for easy adjustment to the furnace or boiler manufacturer's specifications. Designed for settings from .02" to .08", this control is so sensitive that instrumentation should be used when adjusting the unit during installation.

STOCK #	MODEL	PRICE
760567	4" RC	\$ 69.00
760568	5" RC	79.00
760563	6" RC	84.00
760564	7" RC	103.00
760565	8" RC	135.00
750000	9" RC	P.O.A.



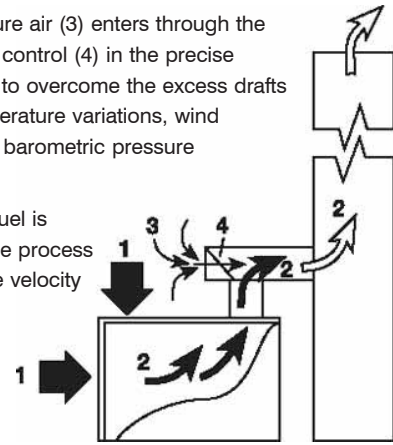
How Draft Controls Work

Static pressure of the cool air (1) exerts pressure on the outside of the furnace or boiler, the breaching, and stack.

The pressure difference between the room air and heated gas (air) causes products of combustion (2) to flow (draft) through the unit and rise through the breaching and chimney.

Room temperature air (3) enters through the barometric draft control (4) in the precise amount needed to overcome the excess drafts caused by temperature variations, wind fluctuations and barometric pressure changes.

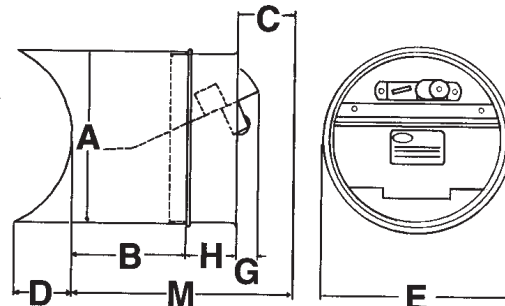
Combustion of fuel is complete and the process is stabilized. The velocity of combustion gases through the heat exchanger is slowed so more heat is extracted. The unit operates more efficiently, reliably, and requires less maintenance.



MODEL	CONTROL SIZE	NOMINAL CAPACITY SQ. IN.	RECOMMENDED PIPE SIZES (")		A	B	C	D	E	G	H	M
			DIA.	CIRCUM.								
4" RC	4	12.6	3-4-5	9-1/2 to 15-3/4	4	2-1/2	2	2-5/16	4-9/16	1	2-1/2	7
5" RC	5	19.6	4-5-6	12-1/2 to 19	5	2-1/2	2	2-5/16	5-9/16	1	2-1/2	7
6" RC	6	28.3	5-6-7	15-3/4 to 22	6	1-7/8	3	2	6-5/8	1	2-3/4	7-5/8
7" RC	7	38.5	6-7-8	19 to 25-1/4	7	2-5/8	3-1/2	2-1/2	7-5/8	1	2-3/4	8-5/8
8" RC	8	50.3	7-8-9	22 to 28-1/8	8	4-3/8	4	3-3/8	8-11/16	1-1/8	2-5/8	11
9" RC	9	63.6	8-9-10	25-1/4 to 31-1/2	9	5-1/8	4-1/2	3-3/4	9-11/16	1-1/2	2-5/8	12-1/4

Material Gauges

SIZE	4"	5"	6"	7"	8"	9"
Ring	22	24	24	22	20	20
Gate	24	24	24	24	20	20
Collar	26	26	26	26	26	26



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FIELD CONTROLS

DRAFT CONTROLS (cont'd)

Type M (for Oil or Coal) — Residential

The M control lends itself ideally to conditions requiring a great deal of stability and accuracy. Designed for settings from .01" to .1", the Field M Control is recommended for oil or coal fired residential heating applications. The Type M features an infinitely variable screw adjustment, permitting an extremely fine instrument setting. The M employs side wings to control air direction with gate curvatures designed to compensate for differences in horizontal and vertical settings.

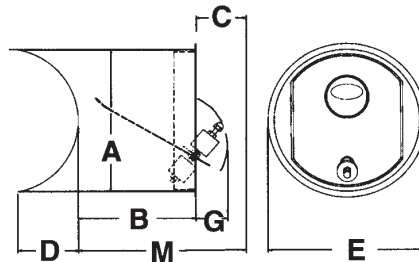


MODEL	CONTROL SIZE	NOMINAL CAPACITY SQ. IN.	RECOMMENDED PIPE SIZES (")		A	B	C	D	E	G	M
			DIA.	CIRCUM.							
6" M	6	28.3	5-6-7	15-3/4 to 22	6	5	3	3-1/4	16-17/32	2	8
7" M	7	38.5	6-7-8	19 to 25-1/4	7	5-1/4	3-1/2	3-3/4	7-3/8	2-1/4	8-3/4
8" M	8	50.3	7-8-9	22 to 28-1/4	8	6-3/8	4	3-3/8	8-5/8	3	10-3/8
9" M	9	63.6	8-9-10	25-1/4 to 31-1/2	9	7-1/4	4-1/2	3-3/4	9-5/8	1-29/32	11-3/4

Contact your local ECCO Sales Representative for prices and more information.

Material Gauges

SIZE	6"	7"	8"	9"
Ring	24	22	20	20
Gate	26	22	20	20
Collar	26	26	24	24



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FIELD CONTROLS

DRAFT CONTROLS (cont'd)

Type MG-1 Double Acting (for Gas)

A double-acting control for gas fired furnaces and boilers is widely used for conversion burner installations, gas draft-induced appliance operation with mechanical draft inducers or sidewall power venters. It is also recommended for use on gas atmospheric appliances where a draft hood cannot be installed, and can improve combustion stability and draft on many gas atmospheric installations with venting problems.

The MG-1 provides precise, accurate control of drafts at levels higher than permitted by a standard draft diverter which is a frequent requirement with gas. Because it is double-acting, it opens out to relieve positive vent system pressures as low as .001". Draft adjustments using weights are simple and accurate from .01" to .1".

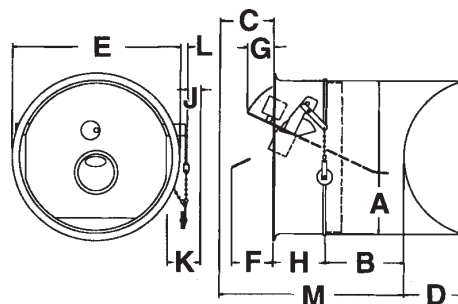


STOCK #	MODEL	PRICE
760558	4" MG1	\$ 152.00
760559	5" MG1	164.00
760560	6" MG1	172.00
760561	7" MG1	204.00
760562	8" MG1	238.00
750000	9" MG1	P.O.A.

MODEL	CON-TROL SIZE	NOMINAL CAPACITY SQ. IN.	RECOMMENDED PIPE SIZES (")		A	B	C	D	E	F	G	H	J	K	L	M
			DIA.	CIRCUM.												
4" MG1	4	12.6	3 - 4	9-1/2 to 12-1/2	4	2-1/2	2	2-5/16	4-9/16	1-1/2	1/4	2-1/2	1/2	1-1/4	3/8	7
5" MG1	5	19.6	4 - 5	12-1/2 to 15-3/4	5	2-1/2	2	2-5/16	5-9/16	2	5/8	2-1/2	1/2	1-1/4	1/2	7
6" MG1	6	28.3	5 - 6	15-3/4 to 19	6	2-11/16	3	3-1/4	6-5/8	2-1/8	13/16	2-3/4	3/4	1-3/4	5/8	8-7/16
7" MG1	7	38.5	6 - 7	19 to 22	7	3-3/8	3-1/2	3-3/4	7-5/8	2-3/8	1-1/8	2-3/4	3/4	2	1/4	9-5/8
8" MG1	8	50.3	7 - 8	22 to 25-1/4	8	4-3/8	4	3-3/8	8-11/16	3	1-1/2	2-5/8	3/4	2-1/4	3/8	11
9" MG1	9	63.6	8 - 9	25-1/4 to 28-1/4	9	5-1/8	4-1/2	3-3/4	9-11/16	3-1/2	1-3/4	2-5/8	3/4	2-1/2	3/8	12-1/4

Material Gauges

SIZE	4"	5"	6"	7"	8"	9"
Ring	24	24	24	22	20	20
Gate	24	24	24	22	20	20
Collar	26	26	26	26	26	26



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FIELD CONTROLS

DRAFT CONTROLS (cont'd)

Type M+MG2 Triple Fuel (for Oil, Gas, Wood, and Coal) — Commercial/Industrial

This is a series of compact, rugged, heavy duty controls for use on large residential, commercial, and industrial applications. The Field Type M+MG2 Draft Control provides precise draft regulations for solid fuels, oil, gas, or oil/gas appliances requiring only the simplest, on-the-job adjustments depending on which fuel is to be utilized. In a gas installation, the double-acting Type M+MG2 is specified instead of a draft hood to give the appliance the assistance of the chimney. For oil/gas, the M+MG2 double-acting with a Field Thermal Switch. For oil or solid fuel, the Type M+MG2 single-acting. For any installation with 10" or larger diameter smoke pipe, specify the standard M+MG2 Draft Control, the unit that can be adapted to any fuel.

The moving part (gate) rests on a long, thin, stainless steel knife edge which, in turn, is supported by self-aligning and self-cleaning bearings. When the heavy gauge gate moves, only the knife edge rests on the bearing for minimum friction and maximum sensitivity to draft changes.



10", 12", 14" models



STOCK #	MODEL	PRICE
760581	10" M and MG2	\$ 405.00
760582	12" M and MG2	529.00
750000	14" M and MG2	P.O.A.
750000	16" M and MG2	P.O.A.
750000	18" M and MG2	P.O.A.

MODEL	CON-TROL SIZE	NOMINAL CAPACITY SQ. IN.	RECOMMENDED PIPE SIZES (")		A	B	C	D	E	F	G	H	J	K	L	M
			DIA.	CIRCUM.												
10" M+MG2*	10	78.5	9-10	28-1/4 to 31-1/2	10	4-3/8	5	4-1/4	11	3-3/8	1-1/8	4-3/4	1	3-1/2	1	14-1/8
12" M+MG2*	12	113	11-12	34-1/2 to 37-3/4	12	5-3/4	6	5	13-1/4	4-5/8	1-3/4	4-3/4	1	3-1/2	7/8	16-1/2
14" M+MG2*	14	154	13-14	40-3/4 to 44	14	7-1/8	7	5-3/4	15-1/2	5-3/8	2-1/8	5-1/8	1	3-1/2	5/8	19-1/4
16" M+MG2	16	201	15-16	47 to 50-1/4	16	8-3/8	8	6-1/2	17-1/2	6-1/8	2-3/8	5-5/8	1-1/2	4	5/8	22
18" M+MG2	18	255	17-18	53-1/2 to 56-1/2	18	8-1/4	9	7-1/2	19-12	6-7/8	2-3/4	7-3/8	1-1/2	5-1/4	1-5/8	24-5/8
20" M+MG2**	20	314	19-21	59-3/4 to 66	20	9-5/8	10	8-1/8	22	7-5/8	3	7-3/4	1-1/2	6-1/4	1-1/4	27-3/8
24" M+MG2**	24	452	22-25	69 to 78-1/2	24	12-3/8	12	10-1/2	26	9-1/4	3-5/8	8-5/8	2	6-1/4	1-1/4	33
28" M+MG2**	28	616	26-30	81-3/4 to 94-1/4	28	13-1/8	14	•	30-1/2	10-3/4	4-1/8	11-3/8	2	6-1/4	7/8	38-1/2
32" M+MG2**	32	804	31-34	97-1/2 to 107	32	15-3/8	16	•	35	12-1/4	4-3/4	12-1/8	2	6-1/4	5/8	43-1/2

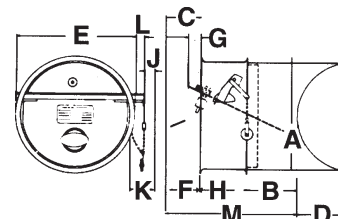
* CSA certified. ** An increaser or reducer may be necessary in order for the Barometric Draft Control to adapt to off-sized pipe.

Material Gauges

SIZE	10"	12"	14"	16"	18"	20"	24"	28"	32"
Ring	20	20	20	18	18	18	18	16	16
Gate	18	16	16	16	16	16	14	14	14
Collar	24*	24*	22*	20*	20*	18*	18*	14**	14**

* Galvanized. **H.R.P.O. with Enamel Finish.

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CHIMNEY TOP DRAFT INDUCERS (FOR WOOD/COAL FIREPLACES)

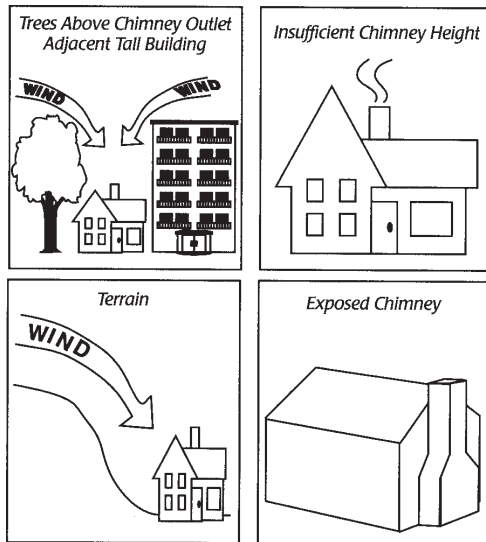
The Type C Chimney Top Draft Inducer provides negative pressure to overcome the effects of wind, cold chimneys, insufficient chimney height and downdraft. The Type C Draft Inducer is effective when venting standard fireplaces and free standing gas fireplaces.

The Type C Draft Inducer is available in four sizes: 6", 8", 10", and 13" and is designed to provide years of trouble-free operation. It is insulated to withstand peak temperatures up to 1300°F and operates continually at 900°F without overheating the motor windings or bearings.

It can operate with a standard, manual on-off switch or can be installed with the Field Controls variable speed motor control.

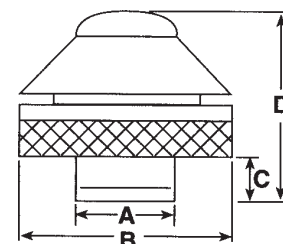
When to use a Chimney Top Draft Inducer:

- To provide additional air**
 A considerable amount of air is necessary to allow for good chimney draft. In many tightly constructed homes, this air is not readily available. The addition of a Type C Draft Inducer will compensate for lack of air by supplementing the chimney's natural draft.
- To create draft in cold chimneys**
 A chimney, especially on an outside wall, may be so cold prior to starting a fire that no draft exists. A Type C Draft Inducer switched on before starting the fire will provide draft until the chimney has become hot enough to generate a natural draft.
- To prevent occasional or continuous smoking**
 Occasional smoking may be the result of several factors including downdraft caused by adjacent buildings, terrain, or trees. Remodelling, new additions, or the addition of an exhaust fan can change air flows and result in poor draft. Or a fireplace design inadequacy such as an undersized flue may prevent adequate draft.



STOCK #	MODEL	DESCRIPTION	PRICE
750000	C6	6" Draft Inducer	P.O.A.
750000	C8	8" Draft Inducer	P.O.A.
750000	C10	10" Draft Inducer	P.O.A.
750000	C13	13" Draft Inducer	P.O.A.

MODEL NUMBER	A	B	C	D	MAX. HEARTH OPENING
6" C Draft Inducer	5-59/64"	16	3-15/32"	14-3/4"	3.5 sq. ft.
8" C Draft Inducer	7-15/16"	16	3-3/8"	14-3/4"	7 sq. ft.
10" C Draft Inducer	10	16	3-3/8"	14-3/4"	12 sq. ft.
13" C Draft Inducer	13	16	3	14-3/4"	30 sq. ft.



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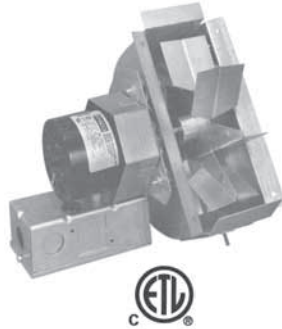


FIELD CONTROLS

DRAFT INDUCERS

Field Draft Inducers solve the drafting problems caused by short chimneys, undersized flue pipes and negative building pressures.

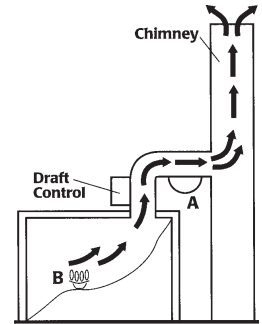
Draft Inducers are designed for easy installation in a wide variety of applications, including oil or gas fired furnaces, water heaters, and boilers.



For venting a single appliance or multiple appliance, use a Control Kit (see page 1164).

How Draft Inducers work:

1. Thermostat calls for heat.
2. The Inducer control is activated. This energizes the Draft Inducer (A) which creates negative pressure or draft.
3. The draft closes the negative pressure proving switch and starts the burner (B).
4. When the thermostat is satisfied, both the burner and Draft Inducer shut down.



When to use a Draft Inducer:

- Long horizontal vent runs
- Undersized flue pipes
- Short chimneys
- Outside exposed chimney

STOCK #	MODEL	PIPE DIA. (")	CFM	PRICE
813001	DI-1	3 – 6	47 – 82	\$ 380.00
813002	DI-2	5 – 8	190 – 240	537.00
813003	DI-3	8 – 12	355 – 568	1,142.00
813004	DI-4	10 – 16	612 – 1224	1,350.00
813005	DI-5	14 – 20	1224 – 1900	1,583.00
813006	DIP-1	Draft Inducer Proving Switch		243.00
813000	RJR-5	24 Volt Relay Kit SPDT		P.O.A.

Note: For control options, see page 1164.

Specifications Chart

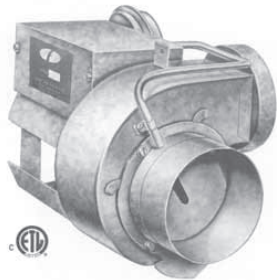
GAS FIRING WITH DRAFT HOOD					GAS FIRING WITH BAROMETRIC DRAFT CONTROL					OIL OR COAL FIRING WITH BAROMETRIC DRAFT CONTROL				
INPUT (BTU/HR)	PIPE DIA. (IN.)	DRAFT INDUCER (MODEL)	STATIC PRESSURE (IN W.C.)	FLOW (CFM)	INPUT (BTU/HR)	PIPE DIA. (IN.)	DRAFT INDUCER (MODEL)	STATIC PRESSURE (IN W.C.)	FLOW (CFM)	INPUT (BTU/HR)	PIPE DIA. (IN.)	DRAFT INDUCER (MODEL)	STATIC PRESSURE (IN W.C.)	FLOW (CFM)
69,000	3	DI-1	.04	47	69,000	3	DI-1	.05	36	72,000	3	DI-1	.05	36
105,000	4		.04	72	105,000	4		.05	55	96,000	4		.05	48
111,000	5		.06	75	118,000	5		.06	65	134,000	5		.05	67
120,000	6		.05	82	123,000	6		.05	68	136,000	6		.04	68
279,000	5	DI-2	.06	190	300,000	5	DI-2	.07	156	312,000	5	DI-2	.06	156
308,000	6		.07	210	340,000	6		.08	176	350,000	6		.07	175
330,000	7		.11	225	364,000	7		.09	189	400,000	7		.08	200
353,000	8		.07	240	390,000	8		.06	200	430,000	8		.05	215
522,000	8	DI-3	.18	355	683,000	8	DI-3	.15	355	710,000	8	DI-3	.13	355
674,000	9		.15	458	880,000	9		.13	458	916,000	9		.11	458
694,000	10		.12	472	908,000	10		.10	472	944,000	10		.09	472
835,000	12		.08	568	1,092,000	12		.06	568	1,136,000	12		.06	568
900,000	10	DI-4	.18	612	1,177,000	10	DI-4	.15	612	1,224,000	10	DI-4	.13	612
1,250,000	12		.20	850	1,635,000	12		.17	850	1,700,000	12		.14	850
1,400,000	14		.19	952	1,831,000	14		.16	952	1,900,000	14		.13	952
1,800,000	16		.15	1,224	2,300,000	16		.13	1,224	2,448,000	16		.10	1,224
2,000,000	14	DI-5	.14	1,224	2,350,000	14	DI-5	.12	1,224	2,450,000	14	DI-5	.10	1,224
2,200,000	16		.18	1,500	2,885,000	16		.14	1,500	3,000,000	16		.13	1,500
2,400,000	18		.10	1,632	3,140,000	18		.09	1,632	3,260,000	18		.07	1,632
2,800,000	20		.09	1,900	3,654,000	20		.08	1,900	3,800,000	20		.06	1,900

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PV POWER VENTERS (INDOOR MOUNTED POWER VENTERS FOR OIL AND GAS)

The indoor mounted PVG and PVO Power Venters provide an economical power venting system for gas and oil appliances. All controls are built into these units. A Vent Hood is required to terminate the vent system (see page 1157).



Accessories

SWH Vent Hoods

Designed for standard vent pipe and class B type double-wall (B-Vent) connection. Provides proper clearance between flue gas stream and wall combustibles. Available in 3" through 8" sizes (see page 1157 for vent hoods).



MG-1 Series Draft Control

Required for 80+ draft induced system applications. Available in 4" through 9" sizes (see page 1151).

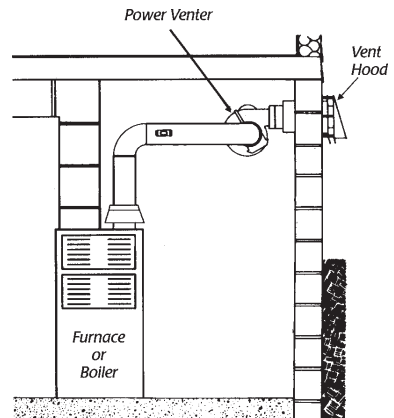
CK-20FV/FG Water Heater Control

(Required for co-venting residential water heaters.)

Provides all system control components required to utilize the Field Power Venter with natural gas or L.P. gas millivolt water heater, including safety interlock controls. This kit allows you to co-vent a residential water heater with a furnace or boiler (see page 1164).

How PV Series Venters work:

1. Thermostat or aquastat calls for heat and starts the Power Venter.
2. The Pressure Switch senses sufficient air flow and allows burner(s) to start.
3. The Power Venter draws combustion air through the system and forces gases outside through an external Vent Hood.
4. Draft Hood or Barometric Draft Control between the appliance(s) and the Power Venter maintains consistent air flow.
5. After the thermostat is satisfied, the burner shuts down and the Post Purge Control clears the venting system of combustion gases.
6. The Power Venter shuts down.



**Co-venting:
Use HWK or CK20F**

STOCK #	MODEL	PIPE DIA. (")	FUEL	PRICE
813009	PVG-100	3 - 4	For Gas	\$ 632.00
813010	PVG-300	4 - 6	For Gas	662.00
813011	PVG-600	5 - 8	For Gas	1,061.00
813012	PVE-1200	8 - 10	For Gas and Oil	2,218.00
813014	PVO-300	4 - 6	For Oil	814.00
813015	PVO-600	5 - 8	For Oil	1,220.00

Note: For control options, see page 1164.

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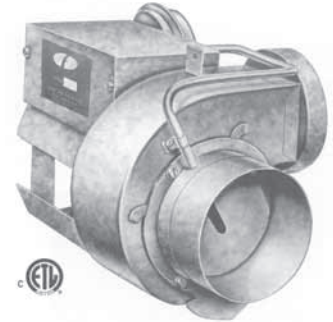


FIELD CONTROLS

PV POWER VENTERS (INDOOR MOUNTED POWER VENTERS FOR OIL AND GAS) (cont'd)

PVO — Oil

MAXIMUM EQUIVALENT HORIZONTAL PIPE LENGTH (FEET)†												
MODEL	DIA.	GPH INPUT										
		0.40	0.50	0.75	1.00	1.50	2.25	3.00	3.75	4.00	6.00	9.00
PVO-300	4"	-	-	287	150	75	-	-	-	-	-	-
	5"	-	-	-	257	120	51	-	-	-	-	-
	6"	-	-	-	346	172	70	-	-	-	-	-
PVO-600	5"	-	-	-	428	212	86	46	-	-	-	-
	6"	-	-	-	-	-	143	74	51	-	-	-
	8"	-	-	-	-	-	211	116	84	77	-	-
PVE-1200*	8"	-	-	-	-	-	-	-	436	385	208	-
	10"	-	-	-	-	-	-	-	-	407	311	74



† See Appendix for calculating equivalent feet on page 1167.

* PVE-1200 requires a CK-Kit. See page 1164.

Select venter according to the actual rated maximum GPH Input. GPH ratings at 100 PSI. Do not exceed maximum oil GPH Input.

PVG — Gas and PVG PAK

MAXIMUM EQUIVALENT HORIZONTAL PIPE LENGTH (FEET)†													
MODEL	DIA.	BTU/HR INPUT											
		25,000	55,000	70,000	100,000	145,000	220,000	310,000	400,000	520,000	610,000	900,000	1,250,000
PVG-100	3"	270	100	-	-	-	-	-	-	-	-	-	-
PVGPAK-100*	4"	455	169	144	100	-	-	-	-	-	-	-	-
PVG-300	4"	-	-	-	305	145	64	-	-	-	-	-	-
	5"	-	-	-	-	247	100	54	-	-	-	-	-
PVGPAK-300*	6"	-	-	-	-	334	147	74	-	-	-	-	-
	5"	-	-	-	-	413	181	91	54	-	-	-	-
PVG-600	6"	-	-	-	-	-	-	146	87	52	-	-	-
	8"	-	-	-	-	-	-	216	134	86	66	-	-
	8"	-	-	-	-	-	-	-	-	-	313	180	-
PVE-1200**	10"	-	-	-	-	-	-	-	-	-	390	290	80

† See Appendix for calculating equivalent feet on page 1167.

* PVG PAKs include a Power Venter, a 4" MG-1 Draft Control, and a 4" Vent Hood — P.O.A.

** PVE-1200 requires a CK-Kit. See page 1164.



VENT HOODS

All Field Vent Hoods are made of heavy gauge aluminum steel and can be used with natural gas, L.P. gas, or oil fired equipment. There are five diameters ranging from 3 to 8 inches.

The concentric pipe, angled outlet deflectors and spaced plate design allow for better heat dissipation. This type of construction minimizes the effects of heat on the outside wall. The angled hood design reduces the effects of wind on the venting system.

The inner and outer pipe are a continuous structure. This allows for easy installation to power venter or vent pipe and also eliminates possible positive pressure leaks in the wall section.

Field Vent Hoods meet the highest standards for safety and reliability. Built in accordance with guidelines from NFPA211, NFPA54, and ANSIZ21.47.

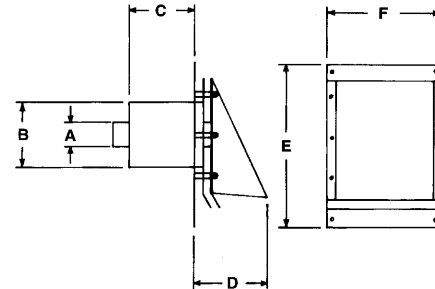


For use with:

- PVG Power Venters
- PVO Power Venters
- Forced Draft Systems

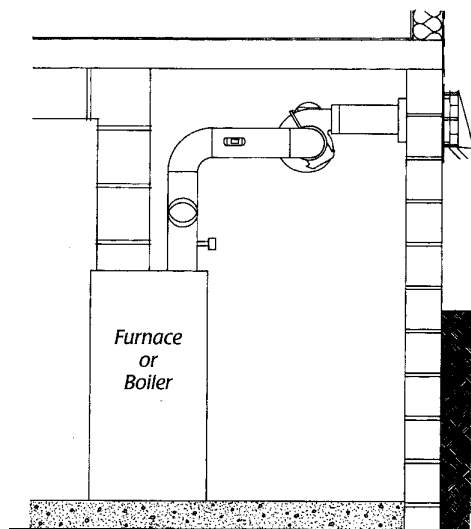
STOCK #	MODEL	PIPE DIA. (")	PRICE
813183	SWH-3	3	\$ 206.00
813184	SWH-4	4	275.00
813185	SWH-5	5	319.00
813186	SWH-6	6	324.00
813188	SWH-8	8	522.00

MODEL	A	B	C	D	E	F
SWH-3	3" Dia.	5" Dia.	8-1/2"	4-3/8"	8-7/8"	7-5/8"
SWH-4	4" Dia.	6" Dia.	8-1/2"	6-5/16"	12-5/8"	10-5/8"
SWH-5	5" Dia.	8" Dia.	8-1/2"	8"	12-5/8"	10-5/8"
SWH-6	6" Dia.	8" Dia.	8-1/2"	8-11/16"	12-5/8"	10-5/8"
SWH-8	8" Dia.	10" Dia.	8-1/2"	9-5/8"	15"	14"



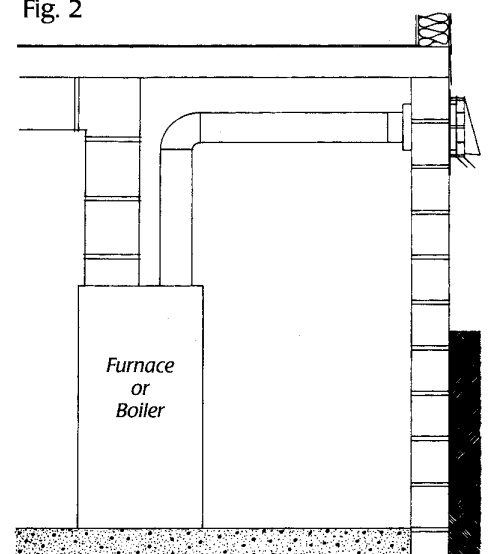
When to use a Vent Hood:

Fig. 1



Vent Hoods can be used in conjunction with PVG and PVO Power Venters (Fig. 1) or with forced draft systems (Fig. 2).

Fig. 2



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FIELD CONTROLS

SWG POWER VENTER (OUTDOOR MOUNTED POWER VENTERS FOR OIL AND GAS)

The SWG Power Venter is the safest, most efficient power venter available today.

Patented SWG Power Venters are ETL and cETL listed for all LP gas, natural gas, or oil-fired heating equipment. The SWG combines the motor, blower, and vent hood in one complete, easy to install unit. The SWG mounts on the outside of the building and pulls the combustion gas from the appliance through the outside wall utilizing 100% negative pressure.

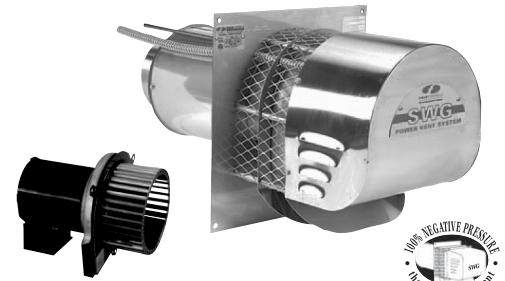
Benefits of the SWG Power Venter include:

- 100% negative pressure in the vent pipe for maximum safety.
- Standard galvanized pipe can be used instead of expensive stainless steel.
- No need to seal vent pipe joints, saving time and money.
- Significantly longer vent lengths than positive pressure, direct vent systems.
- The SWG is recommended by major heating appliance manufacturers.

The SWG must be sized to match the appliance or appliances input firing rate (see next page). Most firing rates are published in the manufacturer's installation manual. SWG's must be installed with a CK Control Kit to ensure proper listing and safe, efficient venting. For selecting control kits, see page 1164.

When to use the SWG:

- Use with gas or oil furnaces, boilers, and water heaters.
- New construction.
- When converting from electric to gas or oil.
- To avoid relining a chimney.
- When installing an additional heating appliance.
- When co-venting a water heater with a furnace.



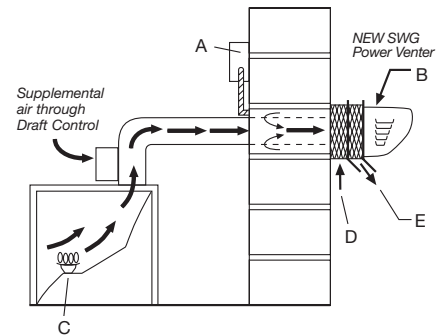
Replacement Motor Kit and Stainless Steel Model shown.

Note: SWG-4HD, 5, and 6 Motor Kits include a stainless steel blower wheel for better performance and extended life.



How the SWG works:

1. Thermostat calls for heat.
2. The Control Kit (A) is activated. This energizes the SWG venter (B) which creates negative pressure in the vent system and starts the burner (C).
3. Outside air is drawn into the vent system between the inner and outer pipe (D), reducing heat buildup. The gases then exit the venter (E).
4. After the thermostat is satisfied and the burner shuts off, a post purge control operates the venter to vent any remaining combustion gases and then deactivates the venter.



The SWG pulls combustion gases to the outside, creating 100% negative pressure in the vent pipe.

STOCK #	MODEL	PIPE SIZE (")	PRICE
813000	SWG-3-CSA	3/4	P.O.A.
813149	SWG-4HD-CSA	4/5/6/7	\$ 919.00
813000	SWG-5-CSA	4/5/6/7	P.O.A.
813000	SWG-6-CSA	5/6/7	P.O.A.
813000	SWG-8-CSA	7/8/9	P.O.A.
813000	SWG-10-CSA	8/10/12	P.O.A.
813000	SWG-12-CSA	10/12/14	P.O.A.
813000	SWG-14-CSA	12/14/16	P.O.A.

Note: Control kits are required for operation of the SWG, see page 1164 .

(cont'd on next page)

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SWG POWER VENTER

(OUTDOOR MOUNTED POWER VENTERS FOR OIL AND GAS) (cont'd)

Extension Kits

The standard SWG Power Venter is designed for walls up to 8" thick. PEK extension kits allow the SWG to be installed in walls up to 16" thick. The PEK kit includes the inner/outer pipe extension, air flow damper and one foot of 1/4" aluminum tubing. It is available for models SWG-4HD through SWG-8.

STOCK #	EXTENSION KIT MODEL	FOR USE WITH POWER VENTER MODEL	PRICE
813174	PEK-4HD	SWG-4HD	\$ 145.00
813000	PEK-4	SWG-4HDS	P.O.A.
813175	PEK-5	SWG-5	164.00
813000	PEK-5	SWG-5S	P.O.A.
813176	PEK-6	SWG-6	191.00
813000	PEK-6	SWG-6S	P.O.A.
813178	PEK-8	SWG-8	235.00



SWG Power Venter Extension Kit

Sizing the Venter

Size the SWG venter based on the input firing rate of the appliance. If the power venter is being used to vent multiple appliances, add the input firing rates for each appliance and use that total to size the venter. Knowing the total input BTU/hr. for gas or GPH for oil, the venter can be sized from table 1 (see next page). Select the venter rated closest to the total input BTU or GPH for installation. If the input of the appliance is higher than the maximum allowable for that size SWG, move to the next larger size SWG.

Do not select a venter with a maximum BTU/hr. or GPH lower than the appliance.

The equivalent feet of vent pipe for the installation must be calculated (see appendix page 1167). Based on the vent pipe diameter to be used, compare the calculated equivalent feet of vent pipe with the maximum equivalent feet allowable for the venter (see Table 1 on next page). If the calculated equivalent feet is greater than that allowed for the venter, increase the diameter of the vent pipe to be used and refer to the table or use the next larger size SWG venter.

(cont'd on next page)



SWG POWER VENTER

(OUTDOOR MOUNTED POWER VENTERS FOR OIL AND GAS) (cont'd)

Sizing the Venter (Table 1 – Uses Maximum BTU or GPH Input) (cont'd)

MODEL	MAX* OIL GPH INPUT	MAX** GAS BTU/HR. INPUT	MAXIMUM EQUIVALENT FEET OF VENT PIPE		VENT PIPE SIZE (")
			AT MAX BTU/HR. INPUT	AT 60% OF MAX BTU/HR. INPUT	
SWG-3	N/A	70,000	21	80	3
			50	100	4
SWG-4HD, 4HDs	1.10	170,000	35	100	4
			65	100	5
			100	100	6
			100	100	7
SWG-5, 5s	1.85	290,000	16	44	4
			51	100	5
			95	100	6
			100	100	7
SWG-6, 6s	2.65	416,000	28	78	5
			68	100	6
			100	100	7
SWG-8	4.75	740,000	26	72	7
			51	100	8
			70	100	9
SWG-10	9	1,300,000	10	100	8
			30	100	10
			75	100	12
SWG-12	13.5	1,900,000	16	100	10
			40	100	12
			86	100	14
SWG-14	21	3,000,000	8	85	12
			18	100	14
			35	100	16

In this table, the maximum equivalent footage allowable for the vent pipe is given for two points, the maximum BTU/hr. venting capacity and at 60% of the maximum. This allows for estimating values between the two given points.

** Oil: Select venter according to the actual rated maximum GPH input. SWG GPH ratings at 100 psi. Do not exceed maximum oil GPH input.*

*** Gas: Do not exceed maximum BTU/hr. input rating. For multiple venting system applications add the input for each appliance. Category III gas-fired draft induced systems require an SWG-5 or larger.*

Unit sizing may vary depending on specific application. Consult your local ECCO Sales Branch for the proper sizing for your particular application.

Note: Control kits are required for operation of the SWG (see page 1164). See next page for calculating equivalent feet of vent pipe.

Specifications (Table 2)

Model	Volts	Hz	Amps	Watts	RPM	Thermal Protect.	A (")	B (")	C (")	D (")	E (")	F (")
SWG-3	115	60	0.6	40	3000	Yes	3	5	9-1/16	8-1/2	7-5/8	9-3/16
SWG-4HD	115	60	1.7	138	3000	Yes	4	6	11-3/4	9-1/2	9	9
SWG-4HDs	115	60	1.7	138	3000	Yes	4	6	11-3/4	9-1/2	11	11-1/2
SWG-5	115	60	1.3	144	3100	Yes	5	7	11-3/4	10-3/4	12	12-1/4
SWG-5s	115	60	1.3	144	3100	Yes	5	7	11-3/4	10-1/2	12	12-1/2
SWG-6	115	60	2.1	228	3100	Yes	6	8	11-3/4	10-3/4	12	12-1/4
SWG-6s	115	60	2.1	228	3100	Yes	6	8	11-3/4	10-1/2	12	12-1/2
SWG-8	115	60	4.37	478	3100	Yes	8	10	11-3/4	11-7/8	13	14-1/4
SWG-10	115/230	60	11.4/5.7	1311	1725	Yes	10	14	19-1/2	24	20	21
SWG-12	115/230	60	13.6/6.8	1564	1725	Yes	12	16	19-1/2	25	22	23
SWG-14	115/230	60	14.0/7.0	1610	1725	Yes	14	18	19-1/2	26	24	25

Note: "s" Designates stainless steel model.

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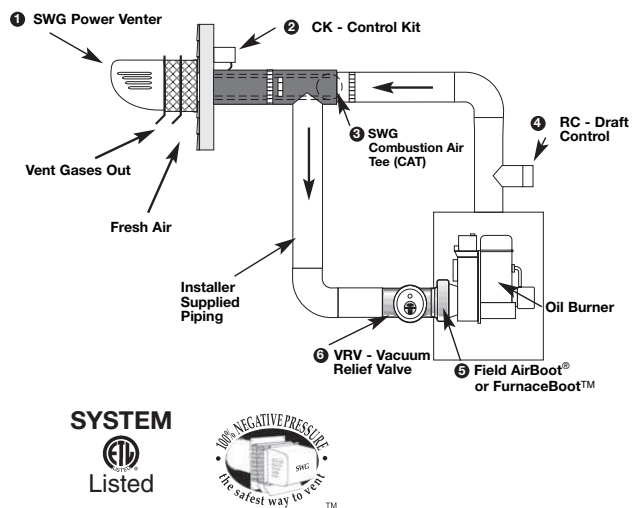
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SWG SEALED COMBUSTION SYSTEM

For New Installation or Upgrade of Existing SWG Systems

- SWG Power Venter:** Provides 100% negative pressure to prevent CO leakage and maintain consistent air flow through the system.
- CK-Control Kit:** Operates the venter and burner motor simultaneously for shorter post purge times, cooling the nozzle and reducing oil drips and odours.
- Combustion Air Tee (CAT):** Provides a middle pipe to insulate between hot exhaust gases and cooler combustion air, reducing potential for condensation formation and allowing for connection to standard SWG power venters.
- RC Draft Control:** Maintains manufacturer's over fire draft specifications for standard oil burning equipment.
- Field AirBoot®/FurnaceBoot™:** Allows for direct connection and quick setup on standard oil burners. Patented design provides accurate combustion airflow control for optimal operation of the burner.
- Vacuum Relief Valve (VRV):** Ensures safe operation in case combustion air inlet becomes blocked for any reason, and can be used to temper intake air.



Follow steps 1 through 4 to select the proper components for the SWG Sealed Combustion System. If an SWG is already installed, start at step 2.

Step 1 — Size the Venter

(Choose the model that matches GPH Intake.)

MODEL	MAX. OIL GPH INTAKE	MAX. 30 FT. OF PIPE AND THREE 90° ELBOWS FOR EACH: INTAKE AND EXHAUST	
		VENT PIPE	INTAKE PIPE
SWG-4 HD SWG-4 HDs	1.10	4"	4"
SWG-5 SWG-5s	1.85	5"	4"

Step 2 — Select the CAT

(Select the CAT to match the Power Venter)

Model	Part#	Description
CAT-4HD	46335601	Fits SWG-4HD,HDS
CAT-5	46335602	Fits SWG-5,5S

NOTE: Control Kits are required for operation of the SWG. Do not exceed maximum oil GPH input.

Step 3 — Select the Control Kit (Select the control kit to match the application.)

MODEL	APPLICATION AND DESCRIPTION
CK-62	Any oil appliance / Thermal post purge
CK-63*	Any oil appliance / Electronic post purge or operates the venter and burner motor simultaneously with optional delay oil valve

* Recommended for best performance.

(cont'd on next page)

Ventilation Products

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FIELD CONTROLS

SWG SEALED COMBUSTION SYSTEM *(cont'd)*

Step 4 — Select the Combustion Air System *(Select the model that matches the burner.)*

MODEL	BURNER	APPLIANCE INPUT	COMPONENTS
CAS-1	Beckett AFII Burners	Up to 2 gph	4" Intake Air Hood 4" Vacuum Relief Valve
CAS-2 A CAS-2 B CAS-2 C CAS-2 W	Aero FAFC, HF-US, HF-AFC, (S) SV Beckett AFG or AF Burners Carlin EZ-1, CRD, FRD Wayne MSR	Up to 2 gph	4" Intake Air Hood 4" Vacuum Relief Valve Field AirBoot™
CAS-2 B90E CAS-2 C90E	Beckett AFG and AF Warm Air Furnaces Carlin EZ-1, CRD, FRC	Up to 1.5 gph	4" Intake Air Hood 4" Vacuum Relief Valve Furnace Boot™



SWG VENT KITS (COMPLETE VENTING PACKAGES)

Gas Furnace Vent Kits

STOCK #	MODEL	APPLICATION	PRICE
813000	SWG-4G	24V Gas Furnaces	P.O.A.

SWG-4G Kits includes:



SWG Power Venter



4" MG-1 Draft Control



CK-43F Control Kit

The SWG-4G can be used with all 80+ gas draft induced furnaces, including those manufactured by the following companies: *Amana, Armstrong, Bard, Carrier, Consolidated, Dunkirk, ICP, Lennox, Rheem, Trane, and York.*

Gas Water Heater Vent Kits

STOCK #	MODEL	APPLICATION	PRICE
813000	SWG-3WH	30mV Gas Water Heater up to 70,000 BTU	P.O.A.
813000	SWG-4WH	30mV Gas Water Heater up to 170,000 BTU	P.O.A.

Water Heater Vent Kits includes:



SWG Power Venter

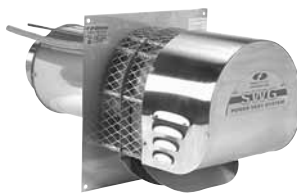


CK-20FV/FG Control Kit

Oil Fired System Stainless Vent Kits

STOCK #	MODEL	APPLICATION	PRICE
813000	SWG-40s	120V Oil-Fired Appliance up to 1.10 gph	P.O.A.
813000	SWG-50s	120V Oil-Fired Appliance up to 1.85 gph	P.O.A.
813000	SWG-60s	120V Oil-Fired Appliance up to 2.65 gph	P.O.A.

Stainless Oil Vent Kits includes:



Stainless Steel
SWG Power Venter



CK-63 Control Kit

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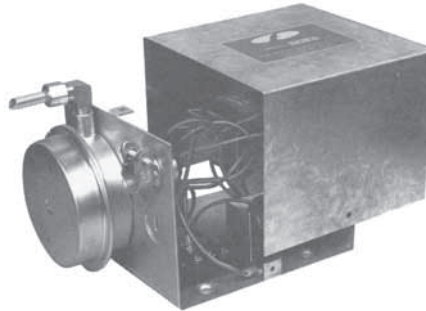


FIELD CONTROLS

CONTROL KITS

(Required to Operate SWG Power Venters and Draft Inducers)

Control Kits (CK) control the operation of SWG Power Venters. See the chart below to select the proper kit for your application. Control Kits can also control the operation of Field Draft Inducers (see page 1153).



			Draft Proving Switch	Gas Pressure Switch	Secondary Switch	Thermal Safety Switch	Adjustable Electronic Post Purge	Fixed Post Purge	Draft Control
OIL		CK-62	All oil-fired systems. Has thermally activated post purge.	•	•	•			
		CK-63	All oil-fired systems. (May require optional delay oil valve for simultaneous burner operation.)	•	•		•		
GAS	30 mV	CK-20FV CK-20FG	30 millivolt gas-fired water heaters and gas-fired pool or spa heaters with a manual or internally mounted thermostat.		•	•		•	
		CK-21	Gas-fired instantaneous water heaters with pressure tap port in the burner manifold.		•	•			
	24V	CK-41F CK-41P*	Furnaces, boilers, unit heaters, and water heaters operating with a 24 VAC gas valve without factory mounted spillage switches.	•		•		•	
		CK-43	Draft induced 24 VAC gas valve systems. Includes a 4" MG-1 draft control and post purge.	•			•		•
		CK-43F		•			•	•	
	750 mV	CK-81	750 millivolt operated boilers, furnaces, water heaters, pool, or spa heaters and gas-fired fireplaces when operated with a remote mounted thermostat or on/off switch. Operated off a 24 VAC circuit.	•				•	
	Co-venting Multiple Appliances	CK-91FV CK-91FG	Gas-fired draft induced 24 VAC gas valve systems and a 30 millivolt operated water heater. Includes a 4" MG-1 draft control and post purge.	•	•	•		•	•
		CK-92FV CK-92FG	Gas-fired furnace or boiler and a 30 millivolt operated water heater. Includes post purge.	•	•	•		•	
CK-92FVP CK-92FGP									

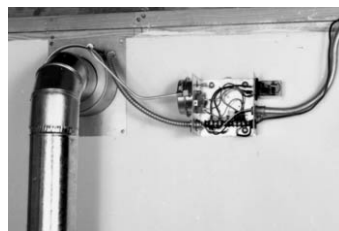
Note: Control Kits are ETL approved accessories when used in conjunction with the SWG Power Venter.

*CK-41P= Plugs into 24v electric damper

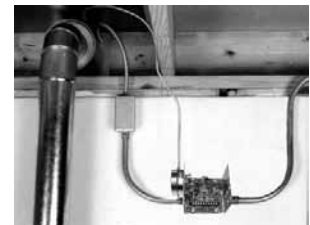
F= Fixed Post Purge; FV = right hand threaded TCA Safety Switch; FG= left hand threaded TCA Safety Switch

Control Kit Installation

CK-41F mounted at venter. For use with a 24 VAC, gas-fired system (shown with cover off).



CK-63 remote mounted (up to 100 feet from venter). For use with 120 VAC oil-fired systems. Electronic post purge is included (shown with cover off).



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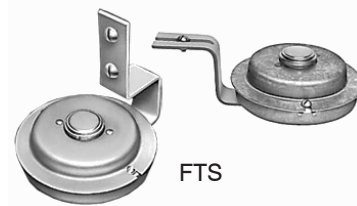
THERMAL SAFETY SWITCHES

Field thermal safety switches efficiently detect flue gas spillage due to a blocked flue, continuous down drafting or inadequate draft condition. With the safety switch wired in series with the burner circuit, the switch will de-energize the system's burner or burner control once it senses the spillage of hot flue gases. Available for gas-fired and oil-fired applications.

Typical Switch Applications

- **FTS-4 and FTS-6**

Manual Reset Type: designed for use on large gas furnaces and boilers. Can be mounted on Draft Hood or double-acting Barometric Draft Control (both brackets included).



- **GSK-3 and GSK-4**

Gold Contacts Manual Reset Type: designed for use on residential and light commercial millivolt or 24 VAC gas furnaces, boilers, and water heaters. Generally used with sidewall venting applications. TCA-1 Thermocouple Adapter required for 30 millivolt applications.



- **SSK-1 and SSK-3**

Kit form of GSK-3 or GSK-4 generally used on millivolt water heaters. Can also be used with 24 VAC gas furnaces or boilers. Kit includes (2) GSK style Thermal Safety Switches, (1) 12-gauge Jumper Wire, and (1) 6 ft. length 12-gauge Lead Wire. SSK-3 switches not supplied with switch enclosures. TCA-1 Thermocouple Adapter required for 30 millivolt applications.



- **TCA-1 and TCA-2**

Thermocouple Adapter for use on 30 millivolt gas thermocouple powered valves, for splicing into thermocouple circuit.



- **WMO-1**

Manual Reset Type: designed for use with power venting and chimney vented systems for oil-fired applications.



How Thermal Safety Switches work

The Thermal Safety Switch detects the increased heat generated by the flue gas spillage and deactivates the furnace or boiler. It will not allow the burner to restart until the switch has been manually reset.

When to use a Thermal Safety Switch

On Barometric Draft Controls and Draft Hoods to detect flue gas spillage and deactivate oil and gas burners.

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FIELD CONTROLS

THERMAL SAFETY SWITCHES (cont'd)

MODEL	FIELD PART NO.	CONTACT MATERIAL	LOAD-RATING		NORMALLY CLOSED SWITCH		SWITCH TYPE	APPLICATION
			AMP	VOLTS	OPENS	CLOSES		
FTS-4	01170004	Silver	12 6	120 AC 240 AC	140°F	M	S.P.D.T.	Draft Control or Draft Hood mounting. Manual reset. Quicker response time than FTS-6.
FTS-6	01170006	Silver	12 6	120 AC 240 AC	180°F	M	S.P.D.T.	Draft Control or Draft Hood mounting. Manual reset. For use on 24/120/240 Volt equipment over 400,000 BTU/HR.
GSK-3	46086400	Gold	– 24 VA	Millivolt 24 AC	180°F	M	S.P.D.T.	Standard Gold Contact Manual Reset Switch. For gas fired millivolt or 24 VAC application.
GSK-4	46086402	Gold	– 24 VA	Millivolt 24 AC	200°F	M	S.P.D.T.	Manual Reset Switch, same as GSK-3. Where slower response time is a requirement.
SSK-1	46111501	Gold	– 24 VA	Millivolt 24 AC	180°F	M	S.P.D.T.	Kit includes (2) GSK-3 switches (1) 6 ft. length of 12 GA wire and Switch Jumper Wire.
SSK-3	46111503	Gold	– 24 VA	Millivolt 24 AC	200°F	M	S.P.D.T.	Kit includes (2) GSK-3 switches (1) 6 ft. length of 12 GA wire and Switch Jumper Wire. Switches not enclosed in Electrical Box.
TCA-1	46082700	–	–	–	–	–	–	Required adapter for operation of Gold Contact Thermal Safety Switches with 30 millivolt systems.
WMO-1	46086900	Silver	10	120 AC	200°F	M	S.P.D.T.	Manual reset. Designed for use with power venting and chimney vented systems for oil fired applications.

Note: M=Manual Reset, SPDT=Single Pole Double Throw.



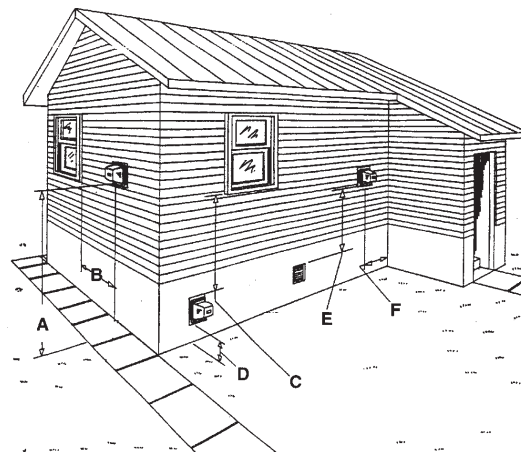
APPENDIX

Planning a Venting System

After determining the type(s) and size(s) of heating equipment, the vent termination location must be selected.

Location of the termination of the venting system should comply with the National Fuel Gas Code, A.N.S.I. Z223.1, manufacturer's recommendations and/or applicable local codes. See diagram for typical terminal locations.

- A. The exit termination of a mechanical draft system must not be less than 7' above grade when located adjacent to a public walkway.*
- B. The venting systems with the exception of direct vent appliances, must terminate at least 4' below, 4' horizontally, or 1' above any door, window, or gravity air inlet into the building.
- C. A venting system must terminate at least 3' above any forced air inlet located within 10'.
- D. The bottom of the vent terminal must be located at least 1' above finished grade.**
- E. The vent termination should not be mounted directly above or within 3' horizontally from an oil tank vent or gas meter (not shown).
- F. The vent termination point must not be installed closer than 3' from an inside corner of an L-shaped structure.



* 10" or larger should be 10 ft. minimum above public walkway. ** 10" or larger should be 4 ft. above finished grade.

Calculating Equivalent Feet of a Vent System

Procedure

1. Calculate the total equivalent feet for each type of fitting used in the venting system from Table 1.
2. Calculate the total amount of feet for the straight lengths of vent pipe.
3. Add the equivalent feet of the fittings with the total amount of feet of straight length pipe. This will approximate the total equivalent feet of the vent system.

Example:

System Pipe Size = 4"

Step 1 – 2-90° Elbows (4") = 14 Ft.

Step 2 – 10-2 Ft. Lengths of 4" Pipe = 20 Ft.

Step 3 – Total Equivalent Feet = 14 Ft. + 20 Ft. = 34 Ft.

To calculate the footage, add the lengths of all the straight lengths of vent pipe to the equivalent feet of all the vent pipe fittings, such as tees, elbows, and reducers.

Using a Reducer/Increaser

LARGE PIPE SIZE	SMALL PIPE SIZE									
	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"
3"	0									
4"	2	0								
5"	4	2	0							
6"	5	4	2	0						
7"	6	5	4	1	0					
8"	7	7	6	3	2	0				
9"	7	8	7	5	4	2	0			
10"	8	8	8	6	6	4	2	0		
12"	8	10	10	8	9	8	6	4	0	
14"	9	10	12	10	12	11	9	8	3	0
16"	9	11	12	11	14	13	13	11	8	3
18"	9	11	13	12	15	15	15	14	11	7
20"	9	12	14	13	16	17	17	17	15	11

To estimate the equivalent foot length of the Reducer/Increaser chart, find the figure at the intersection of the small pipe size and the large pipe size.

Table 1

	VENT PIPE DIAMETER									
Vent Pipe Fittings	3"	4"	5"	6"	7"	8"	9"	10"	12"	14"
Tee	19	25	31	38	44	50	56	63	75	89
90° Elbow	5	7	9	11	12	14	16	18	21	25
45° Elbow	3	4	4	5	6	7	8	9	10	13

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APPENDIX (cont'd)

Clearance to Combustible Materials

If mounting venting system near combustible materials, refer to **Diagram C** for allowable installation clearances. Clearances are based on an installation using single wall galvanized steel vent pipe. If manufactured double wall vent pipe is required or used for the installation, clearance should be based on the vent pipe's rated clearance. Always check local code requirements for code restrictions.

Routing of the vent system and clearances for the vent pipe can be planned once the termination location is determined. Route the vent pipe from the appliance to the venter using as few elbows as possible. The horizontal section of the vent pipe should have a slight upward slope from the appliance to the venter. The vent pipe size (diameter) can be smaller than a typical chimney vented system and still overcome the higher pressure losses because the power venter mechanically creates the required draft or air flow to vent the system.

For estimating the minimum vent pipe diameter for a gas system, divide the BTU/hr. input of the heating equipment by 12,600 BTU/sq. in. For oil systems, multiply GPH by 140,000 BTU/gal. then divide by 12,600 BTU/sq. in. This will give the minimum cross sectional area required (See Table 1 for area to diameter conversion). For multiple equipment venting systems, divide the total BTU/hr. input for all appliances by 9,300 BTU/sq. in. This will give you the minimum vent pipe diameter needed for the common breaching of the vent system. As a rule of thumb, size the vent pipe to the outlet diameter of the heating equipment for a single appliance venting system. For multiple appliance venting systems, use the outlet diameter of the largest unit and add 50%.

Diagram C

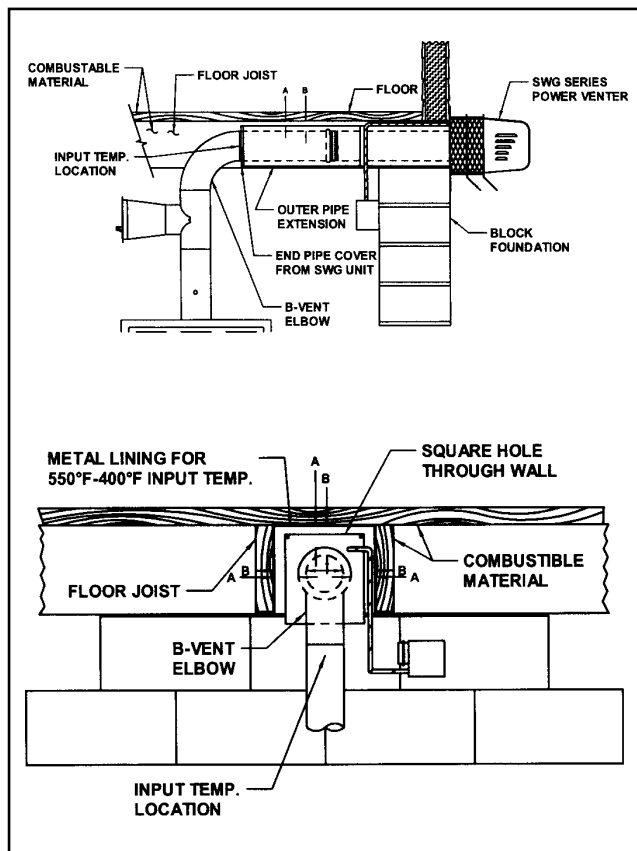


Table 1

PIPE SIZE	NOMINAL CROSS-SECTIONAL AREA (SQ. IN.)
3"	7
4"	13
5"	20
6"	28
7"	38
8"	50
9"	64
10"	79
12"	113
14"	154

SINGLE PIPE SYSTEM	
ALLOWABLE INLET TEMPERATURE	CLEARANCE (B)
400°F or less	3" min.
550°F or less	4" min.
550°F or less	3" min.*
DOUBLE PIPE SYSTEM	
ALLOWABLE INLET TEMPERATURE	CLEARANCE (A)
400°F or less	.5" min.
550°F or less	1" min.
550°F or less	.5" min.*

* With galvanized sheet metal liner or equivalent.

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UV-AIRE® AIR PURIFICATION SYSTEMS

How The UV-Aire Works

UV-Aire uses the energy from a specially designed, high-intensity UV-C lamp to reduce microorganisms in the entire home as they cycle through the HVAC system. Mounted inside the ductwork, the UV-Aire sterilizes or kills most contaminants as they pass the lamp. The process requires very little maintenance and costs just pennies a day to operate. The UV-Aire could be one of the best health and comfort investments a homeowner ever makes.

Indoor Air Treatment With UV

UV's effectiveness in killing bacteria is directly related to a microorganism's exposure time. Indoor air in a typical residential forced-air HVAC system will be recirculated 40-75 times a day. With a UV generating lamp mounted in the HVAC duct, cumulative exposure can be very effective in controlling indoor bacteria.

UV rays will also kill germs that breed in drain pans and A-coils. Properly positioned, an ultraviolet system can significantly reduce indoor air contamination and prevent the growth of new microorganisms.

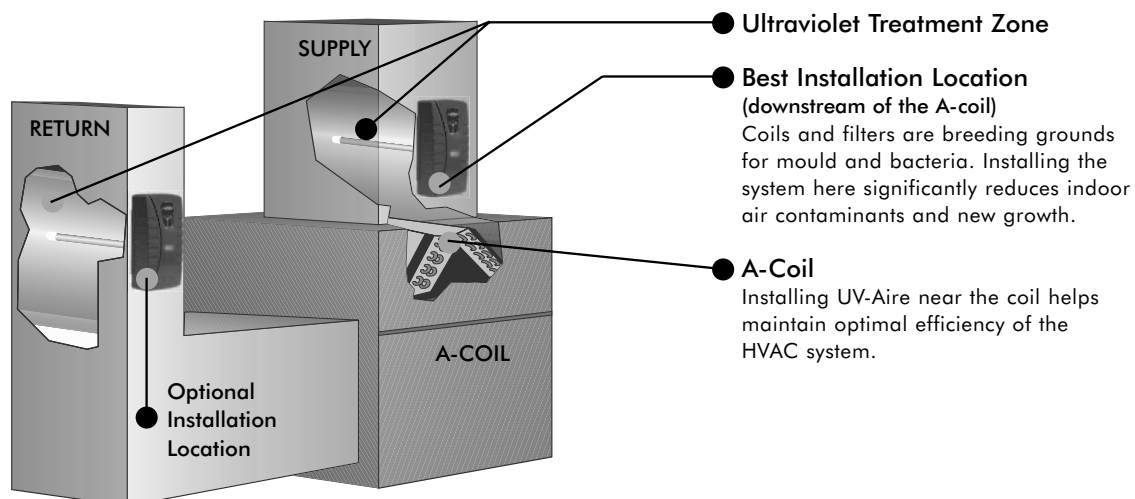
The treatment of indoor air with ultraviolet radiation has been successful in health care facilities, food processing plants, schools, laboratories and other applications. It is safe, silent, and proven.

Since direct exposure to UV light can cause skin cancer and blindness, the most practical application of UV light in the home or office is in the main air distribution (heating and/or air conditioning) system. As UV light will not pass through metal, glass, or plastic, a UV light can be installed in the main supply or return duct of your central heating or air system without concern for direct exposure to eyes or skin. This is an ideal location since the air in the home or office will pass through the HVAC system 40 – 75 times per day during normal operation and as many as 150 times per day in continuous fan mode.

Filter Systems Alone Don't Solve the Problem

The majority of indoor air is conditioned by forced-air heating and cooling (HVAC) systems. Standard fiber air filters are entirely ineffective in trapping germs, as most particles are simply too small, passing through the porous filter. New, high efficiency style filters will only capture airborne bacteria down to a certain size. These high efficiency filters are nominally effective, trapping small airborne contaminants on the filter, creating a breeding ground where germs can continue to grow and multiply.

HVAC systems are a dark and damp breeding ground for mould and bacteria, particularly at the system filter and air conditioning A-coil. The buildup of matter on the A-coil and filter can significantly reduce the efficiency of the appliance by constricting and reducing air flow. This means increased cost to the homeowner in addition to the risk of airborne pollutants.



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UV-AIRE® AIR PURIFICATION SYSTEMS (cont'd)

For maximum square footage and other details, see Model and Specifications table on last page.



Standard Models

UV-12, UV-18, UV-28, UV-12HP, UV-18HP, UV-28HP

- New design incorporates a hinged cover for easy accessibility
- Includes patented angle bracket and duct board mounting kit
- Installs easily and plugs into a standard 120V outlet
- All UV-HP (heat pump) models are 240V



Dual Lamp Model

UV-18X

- Double lamp maximizes intensity and effectiveness
- Handles up to 4,000 sq. ft.
- Includes patented angle bracket and duct board mounting kit
- Installs easily and plugs into a standard 120V outlet



Circuit Board Models

UV-12C, UV-18C, UV-28C, UV-12HPC, UV-18HPC, UV-28HPC

- Electronically monitors lamp life
- Audible and visual lamp replacement alerts
- Can wire into the thermostat to extend lamp life
- Can link to existing security system
- Includes all features of standard models
- All UV-HPC (heat pump) models are 240V



External Models

UV-12E, UV-18E, UV-28E

- For outdoor installations
- Ideal for any external package systems
- For rooftop applications
- Hard wired for 120V, 208V, or 240V



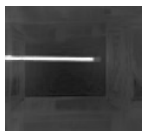
All units are UL listed.

Unique Features



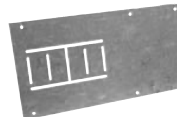
Angle Bracket With Swivel Arm

- Angle allows longer lamps to fit into smaller ducts, maximizing effectiveness
- Ensures the entire cross section of the duct is irradiated
- Swivel arm allows for easy lamp replacement
- Patented



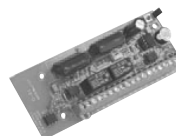
Improved Lamp Output

- Technical enhancement improves intensity output over the life of the lamp



Duct Board Mounting Kit

- Makes mounting to duct board simple
- Designed to increase stability on the duct board



Circuit Board Technology

- Monitors performance and lamp life
- Audible and visual lamp replacement alerts
- Can link with existing security system
- Can wire into the thermostat circuit

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UV-AIRE® AIR PURIFICATION SYSTEMS (cont'd)

Portable Solutions



UV-500C PORTABLE MODEL

- Purifies air in areas up to 500 square feet
- Plugs into any standard 120V outlet
- Attractive, compact design
- 15"h x 12"w x 12"d




UV-500C Features

- 1 8" germicidal UV lamp
- 2 10"x10" high-efficiency/carbon filter
- 3 Heavy-duty three speed fan
- 4 Visual lamp and filter condition alert
- 5 Adjustable fan control
- 6 Built-in handles for easy portability
- 7 Non-skid rubber feet

Replacement Kit


- 4 high-efficiency/carbon filters
- 1 UV lamp





UV-1500C PORTABLE MODEL

- Purifies air in areas up to 1500 square feet
- Plugs into any standard 120V outlet
- Sits on the floor, hangs on the wall, or installs in drop ceiling
- 24"h x 18"w x 6"d




UV-1500C Features

- 1 12" germicidal UV lamp
- 2 12" x 12" high-efficiency/carbon filter
- 3 Secondary carbon filter reduces odors
- 4 Heavy-duty fan
- 5 Visual and audible lamp condition alert
- 6 Adjustable fan control
- 7 Recessed handle
- 8 Non-skid rubber feet

Replacement Kit

- 1 carbon filter
- 4 high-efficiency/carbon filters
- 1 UV lamp





Drop ceiling installation
(side panels adapt unit to fit standard 2' x 2' grid)

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FIELD CONTROLS

UV-AIRE® AIR PURIFICATION SYSTEMS (cont'd)

Cleaning

The UV-Aire intensity output is at optimal levels when the UV lamp is clean. As buildup of dust increases, the lamp's intensity decreases. To maintain maximum benefits, lamps should be cleaned regularly.

Lamps should be wiped with a clean cloth dampened with alcohol or ammonia and water in order to eliminate oil, dirt, and fingerprints. Conditions of the application will dictate how often lamps need to be cleaned.

It is recommended to clean the lamps at least every six months.

Replacement

It is important that lamps be replaced when the ultraviolet output falls below minimum requirements for protection. Even though a lamp will appear to be operating effectively because it still maintains the visible blue glow, the ultraviolet output will be significantly reduced after 9,000 hours of use.

To maintain maximum benefits, lamps should be replaced annually.

STOCK #	MODEL	PRICE
756106	UV-500RK Replacement Kit <i>Includes: 4 high-efficiency/ carbon filters and 1 UV lamp</i>	\$ 221.00
756108	UV-1500RK Replacement Kit <i>Includes: 1 carbon filter, 4 high-efficiency/carbon filters, and 1 UV lamp</i>	221.00



UV-500RK



UV-1500RK

Models and Specifications

STOCK #	MODEL	MINIMUM DUCT WIDTH	VOLTAGE	AMPS	Hz	WATTS	CIRCUIT BOARD	RECOMMENDED MAX SQ. FEET	LAMP INTENSITY AT 1 METER $\mu\text{W}/\text{CM}^2$	PRODUCT WARRANTY	PRICE	DISTANCE FROM LAMP	INTENSITY FACTOR
760550	UV-12	9	120	0.5	60	30	no	1500	37	5 yr	\$ 588.00	0	354
760552	UV-18	14	120	0.5	60	30	no	2000	73	5 yr	686.00	1	127
750000	UV-28	22	120	1.1	60	60	no	3000	105	5 yr	P.O.A.	2	69
750000	UV-12E**	9	120/208/240	0.5	60	30	no	1500	37	5 yr	P.O.A.	4	32
750000	UV-18E**	14	120/208/240	0.5	60	30	no	2000	73	5 yr	P.O.A.	6	20
750000	UV-28E**	22	120/208/240	1.1	60	60	no	3000	105	5 yr	P.O.A.	8	14
750000	UV-12HP	9	240	0.5	60	30	no	1500	37	5 yr	P.O.A.	10	14
750000	UV-18HP	14	240	0.5	60	30	no	2000	73	5 yr	P.O.A.	15	6
750000	UV-28HP	22	240	1.1	60	60	no	3000	105	5 yr	P.O.A.	20	4
750000	UV-12C	9	120	0.5	60	30	yes	1500	37	1 yr	P.O.A.	25	3
750000	UV-18C	14	120	0.5	60	30	yes	2000	73	1 yr	P.O.A.	30	2
750000	UV-28C	22	120	1.1	60	60	yes	3000	105	1 yr	P.O.A.	35	1.4
750000	UV-12HPC	9	240	0.5	60	30	yes	1500	37	1 yr	P.O.A.	39.97	1
750000	UV-18HPC	14	240	0.5	60	30	yes	2000	73	1 yr	P.O.A.		
750000	UV-28HPC	22	240	1.1	60	60	yes	3000	105	1 yr	P.O.A.		
750000	UV-18X*	14	120	1.0	60	60	no	4000	2@73	5 yr	P.O.A.		
756102	UV-500C	N/A	120	0.4	60	36	yes	500	24	1 yr	1,041.00		
756104	UV-1500C	N/A	120	0.5	60	30	yes	1500	37	1 yr	1,642.00		

*UV-18X includes two lamps.

**UV-E series includes aluminum NEMA 3 enclosures for external, outdoor installation.

Note: All lamps are warranted for 90 days after installation. A UV-Aire counter display is available. For more information, contact your local ECCO Sales Representative.

UV lamp intensity is rated at a distance of one meter (see chart at left). To determine the intensity of ultraviolet radiation at different distances from the lamp, multiply the intensity of the lamp by the intensity factor shown in the chart above. Example: To determine the ultraviolet intensity of the UV-18 at a distance of six inches, multiply 73 by .20 to yield 1,460 $\mu\text{W}/\text{CM}^2$

- E.&O.E. - May not be in stock at all branches, if so please allow 10 days for delivery. -

- All Prices F.O.B. Our Warehouse - Subject to Change Without Notice - All Taxes Extra -