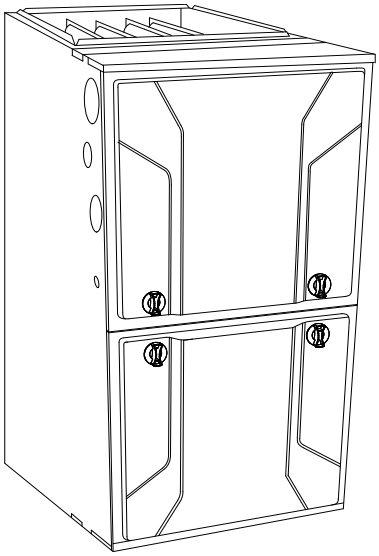
935CB
Evolution® Single-Stage, Variable Speed Communicating, Ultra Low NOx Emissions 35-in. (889 mm) Tall, Condensing Gas Furnace

Product Data



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Representative drawing only. Some product models may vary.

⚠ WARNING

CARBON MONOXIDE POISONING AND FIRE HAZARD

Failure to follow this warning could result in personal injury, death, and/or property damage.

This furnace is not designed for use in recreation vehicles, manufactured (mobile) homes or outdoors.

Failure to follow this warning could result in personal injury, death, and/or property damage.

The 935CB Evolution® Ultra-Low NOx gas furnace delivers consumer comfort in a unit that meets California's South Coast Air Quality Management District (SCAQMD) and San Joaquin Valley Air pollution Control District (SJVAPCD) NOx emissions limit of 14ng/J. Offering the performance and benefits of our Evolution Line gas furnaces, this furnace releases 65% less nitrogen oxides (NOx) than previous models. NOx contributes to the formation of smog and acid rain and the deterioration of water quality. Lower NOx emissions mean lower production of particulate matter and cleaner air for the environment. Energy efficiency is at the heart of this furnace with up to 95.0% AFUE gas efficiency and the electrically-efficient Evolution communicating variable-speed constant airflow ECM blower motor. This gas furnace also features Upflow/Horizontal installation flexibility, and is available in three model sizes. All sizes can be vented for direct vent/two-pipe, ventilated combustion air, or single-pipe applications.

PERFORMANCE

- Communicating Variable speed, Constant airflow (VCA) ECM blower motor for electrically efficient operation all year long in heating, cooling and continuous fan operation.
- Single-stage gas valve with pre-mix burner
- Pilot free, hot surface ignition
- Variable-speed inducer motor for consistent operation
- Supports single-stage, two-stage, and variable speed cooling units
- High temperature limit control designed to prevent overheating
- Adjustable blower speed for heating, cooling, continuous fan, and dehumidification
- Stainless-steel primary heat exchanger
- Fully-insulated casing including blower section
- Stainless-steel condensing secondary heat exchanger

INSTALLATION FLEXIBILITY

- Upflow/Horizontal design for upflow, horizontal right or horizontal left installation, with rotating vent elbow for exhaust venting flexibility
- Factory-configured ready for upflow applications.
- Features a condensate trap with 6-3/8" (7-3/8" recommended) clearance in horizontal applications
- Ideal height 35" (889 mm) cabinet: short enough for taller coils, but still allows enough room for service.
- Two-pipe venting, single-pipe venting or ventilated combustion air.

APPLICATIONS

- Factory-configured for Natural Gas; not convertible to Liquid Propane.
- Not approved for downflow installation
- Approved for installations up to 5,400 ft.

CERTIFICATES

- All sizes meet ENERGY STAR® Version 4.1 criteria for gas furnaces: 95%+ AFUE
- Ultra Low NOx – meets the nitrogen oxides (NOx) emission limit of 14 nanograms/joule for the South Coast Air Quality Management District and San Joaquin Valley Air Pollution Control District in California
- Cabinet air leakage less than 2.0% at 1.0 in. w.c. and cabinet air leakage less than 1.4% at 0.5 in. w.c. when tested in accordance with ASHRAE standard 193.

EVOLUTION SYSTEM Perfect Humidity™ Perfect Heat™ ENERGY STAR

Certified System ISO 9001 Quality

AHRI CERTIFIED www.ahridirectory.org

Use of the AHRI Certified TM Mark indicates a manufacturer's participation in the program. For verification of certification for individual products, go to www.ahridirectory.org .

CSA CERTIFIED DESIGN CERTIFIED

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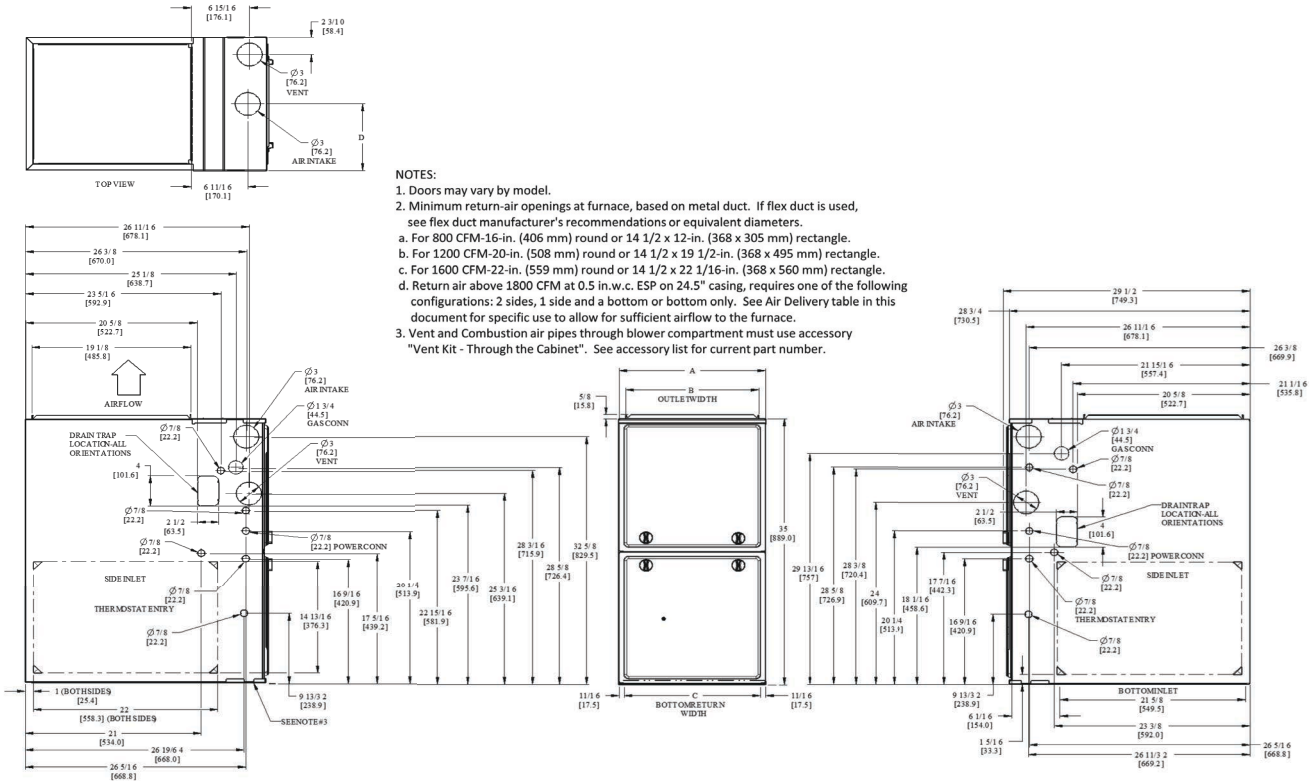
DIMENSIONAL DRAWING



NOTES:
1. Doors may vary by model.
2. Minimum return-air openings at furnace, based on metal duct. If flex duct is used, see flex duct manufacturer's recommendations or equivalent diameters.
   a. For 800 CFM-16-in. (406 mm) round or 14 1/2 x 12-in. (368 x 305 mm) rectangle.
   b. For 1200 CFM-20-in. (508 mm) round or 14 1/2 x 19 1/2-in. (368 x 495 mm) rectangle.
   c. For 1600 CFM-22-in. (559 mm) round or 14 1/2 x 22 1/16-in. (368 x 560 mm) rectangle.
   d. Return air above 1800 CFM at 0.5 in.w.c. ESP on 24.5" casing, requires one of the following configurations: 2 sides, 1 side and a bottom or bottom only. See Air Delivery table in this document for specific use to allow for sufficient airflow to the furnace.
3. Vent and Combustion air pipes through blower compartment must use accessory "Vent Kit - Through the Cabinet". See accessory list for current part number.

NOTE: ALL DIMENSIONS IN INCH (MM)

U.S. ECCN: Not Subject to Regulation (N.S.R.)

SD5591-4 REV. A

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FURNACE SIZE	A	B	C	D	SHIP WT.
	CABINET WIDTH	OUTLET WIDTH	BOTTOM INLET WIDTH	AIR INTAKE	LB (KG)
48060C17	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	142 (64)
60080C21	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	161 (73)
66100C21	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	169 (76)

MODEL NUMBER NOMENCLATURE

1 Heat Exchanger 9	2 Tier/NOx 8	3 AFUE/NOx 7	4 Heating Stages M	5 Major Series B	6, 7 Cooling Capacity (CFM) 42	8 - 10 Heat Input 060	11 Motor Type C	12 - 13 Width 17	14 Voltage (1-phase) A	15 Un-used -	16 Minor Series A
8 = 80% 9 = 90+%	0 = Base 1 = Legacy Line 2 = Preferred 3 = Ultra Low Nox 8 = Evolution	0 = 80% 1 = 80% Low NOx (Not Ultra Low NOx) 2 = 92% 5 = 95% 6 = 96% 7 = 97% 8 = 98%	M = Modulating T = Two Stage S = Single Stage C = Single Stage Communicating	A B C D ---	24 = 800 CFM 30 = 1000 CFM 36 = 1200 CFM 42 = 1400 CFM 48 = 1600 CFM 60 = 2000 CFM 66 = 2200 CFM	026 = 26,000 BTU/h 040 = 40,000 BTU/h 060 = 60,000 BTU/h ---	C = Constant Airflow Variable- Speed (VCA) ECM V = Variable-Speed (VCT) PWM M = Multi 18-Speed Constant Torque (MCT) ECM	14 = 14.2" 17 = 17.5" 21 = 21.0" 24 = 24.5"	A = 110V/60Hz B = 230V/50Hz	-	A B C ---

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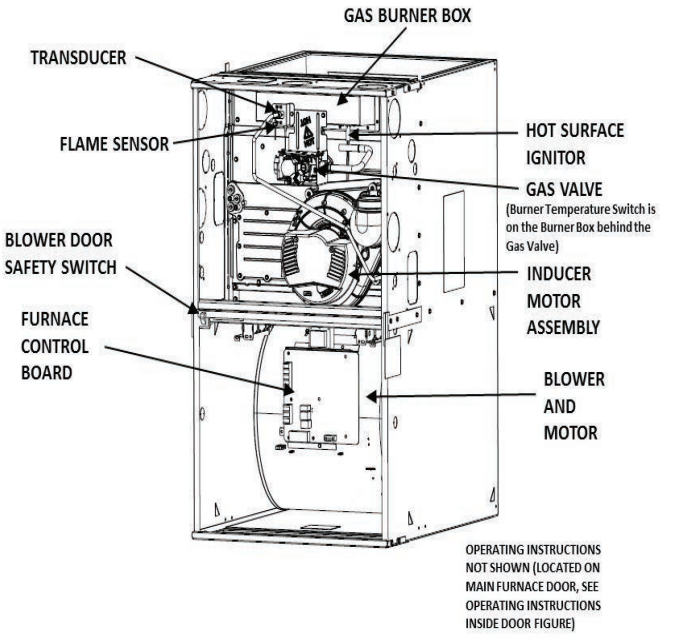
FURNACE COMPONENTS



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MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

POSITION	CLEARANCE
Rear	1 in.
Front (Combustion air openings in furnace and in structure)	1 in.
Required for service*	24 in.†
All Sides of Supply Plenum*	1 in.
Sides	1 in.*
Vent	0
Top of Furnace	1 in.

*. Additional clearance is required for condenstate trap installation.
†. Consult your local building codes.

The furnace should be sized to provide 100 percent of the design heating load requirement plus any margin that occurs because of furnace model size capacity increments. None of the furnace model sizes can be used if the heating load is less than half of the furnaces model's output capacity. Use Air Conditioning Contractors of America (Manual J and S); American Society of Heating, Refrigerating, and Air-Conditioning Engineers; or other approved engineering method to calculate heating load estimates and select the furnace. Excessive oversizing of the furnace may cause the furnace and/or vent to fail prematurely, customer discomfort and/or vent freezing.

Failure to follow these guidelines is considered faulty installation and/or misapplication of the furnace; and resulting failure, damage, or repairs may impact warranty coverage.

SPECIFICATIONS

UNIT SIZE		48060C17	60080C21	66100C21
HEATING AND CAPACITY AND EFFICIENCY				
Input BTUh*		60,000	80,000	100,000
Output Capacity (BTUh)†)		59,000	78,000	97,000
Certified Temperature Rise Range - °F (°C)		30 - 60 (17 - 33)	35 - 65 (19 - 36)	35 - 65 (19 - 36)
AFUE	Upflow / Horizontal	95	95	95
AIRFLOW CAPACITY AND BLOWER DATA				
Rated Certified External Static Pressure	Heating	0.12	0.15	0.2
	Cooling	0.50	0.50	0.5
Airflow CFM @ Rated ESP (CFM)‡	Heating	990	1470	1605
	Cooling	1545	2010	2230
Direct Drive Motor HP		3/4	1	1
Motor Full Load Amps		8.8	11.7	11.0
RPM Range		300 — 1300		
Heating Blower Control (Htg OFF-Delay)		Adjustable: 90, 120 (factory-set), 150, 180 seconds		
Cooling Blower Control (Time Delay Relay)		Adjustable: 90, (factory-set), 5, 30, 60 seconds		
Blower Wheel Diameter x Width - In. (mm)		11 x 8	11 x 10	11 x 10
Air Filtration System		Field Supplied Filter		
Filter used for Certified Watt Data		325531-40**		
ELECTRICAL DATA				
Input	Volts-Hertz-Phase	115-60-1		
Operating Voltage Range	Min-Max	104-127		
Maximum Unit Amps		11.4	13.8	13.7
Unit Ampacity		14.8	17.8	13.7
Maximum Wire Length (Measure 1 way in Ft/M)		25/7.6	32/9.8	32/9.8
Minimum Wire Size	AWG	14	12	12
Max. Fuse/Ckt Bk Size (Time-Delay Type Recommended)	Amps	15	20	20
Transformer Capacity (24 VAC output)		40VA		
External Control Power Available	Heating	26VA		
	Cooling	35VA		
GAS CONTROLS				
Burners		2	3	3
Gas Connection Size		1/2 in. NPT		
Gas Valve (Redundant)	Mfr	White Rodgers™		
Min. inlet pressure	(in.w.c.)	4.5 (Natural Gas)		
Max. inlet pressure	(in.w.c.)	13.6 (Natural Gas)		
Ignition Device		Silicon Nitride		
Factory installed orifice		Size 44		
CONNECTIONS				
Communication System		Evolution®; Evolution® Zoning		
Thermostat Connections		R, W/W1, W2, Y/Y2, Y1, G, Com 24V, DHUM		
Accessory Connections		EAC-1 (115 VAC); HUM (24 VAC); 1-STG AC (via Y/Y2); 2-STG AC (via Y/Y2 and Y1)		

*. Gas input ratings are certified for elevations to 2000 ft. (610 M). In USA, For elevations above 2000 ft (610 M), reduce ratings 4 percent for each 1000 ft (305 M) above sea level. Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 Table F.4 or furnace installation instructions.

†. Capacity in accordance with U.S. Government DOE test procedures.

‡. Airflow shown is for bottom only return-air supply for the as-shipped speed tap. For air delivery above 1800 CFM, see Air Delivery table for other options. A filter is required for each return-air supply. An airflow reduction of up to 7 percent may occur when using the factory-specified 4-5/16-in. (110 mm) wide, high efficiency media filter.

**. See Accessory List for part numbers available.

INSTALLATION CONSIDERATIONS

Refer to Installation Instructions for complete installation requirements.

Evaporator Coil Spacer or Shield Requirements

Type of Coil	Install Flush to Furnace	Install with 8-in. Spacer	Install with Metal Shield
Furnace Manufacturer's N Coil	Allowed	Not Required	Not Required
Furnace Manufacturer's A Coil	Not Allowed	Allowed (Except 100k BTU size in Horizontal Right - MUST use shield)	Allowed (See Note 2)
3rd Party Coil - Factory Shielded (See Note 1)	Allowed	Not Required	Not Required
3rd Party Coil - Unshielded	Not Allowed	Allowed (Except 100k BTU size in Horizontal Right - MUST use shield)	Allowed (See Note 3)

NOTE:

1. 3rd Party Coils that are factory-supplied with a metallic shield over the plastic composite drain pan must completely shield all plastic composite materials from direct exposure to any part of the heat exchanger. Consult with 3rd Party Manufacturer to ensure coil is properly shielded. Coils that are only partially shielded should be treated as un-shielded and require a spacer.
2. Field-fabricated metallic shield must completely shield all plastic composite materials from direct exposure to any part of the heat exchanger. Coils that are only partially shielded should be treated as un-shielded and require a spacer.
3. For 3rd party unshielded coils, consult manufacturer for design of a field-fabricated shield that completely shields all plastic composite materials from direct exposure to any part of the heat exchanger.

6-3/8" CONDENSATE TRAP (7-3/8" RECOMMENDED) CLEARANCES

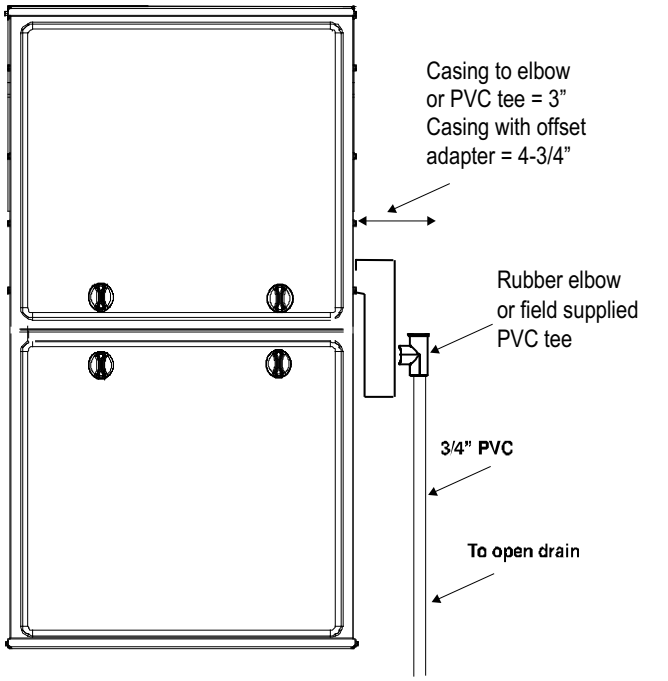

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Fig. 1 – Trap Clearance in Upflow Application

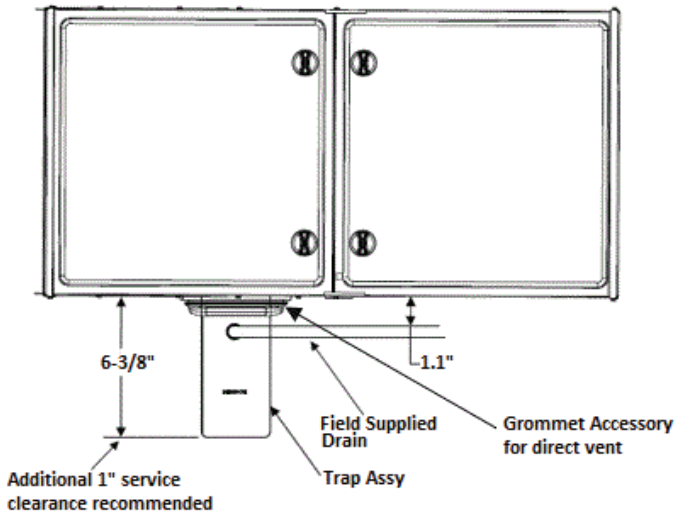

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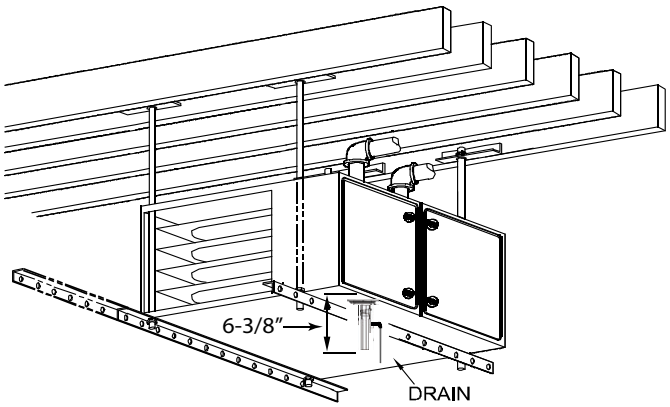
Fig. 2 – Trap Clearance in Horizontal Application (Note: Drain line can be run horizontally or vertically)



ADDITIONAL 1" CLEARANCE BELOW TRAP RECOMMENDED FOR SERVICE

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Fig. 3 – Trap Clearance in Horizontal Application

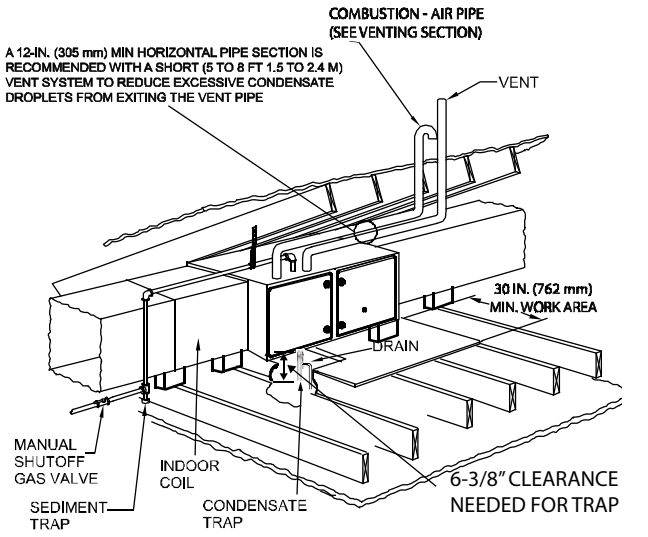

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Fig. 4 – Working Platform for Attic Installation

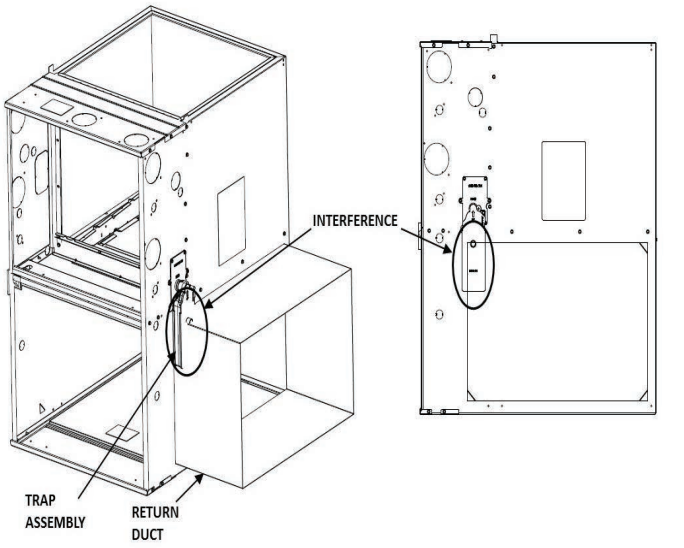

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Fig. 5 – Upflow Right Side Return Configuration - Trap Interference

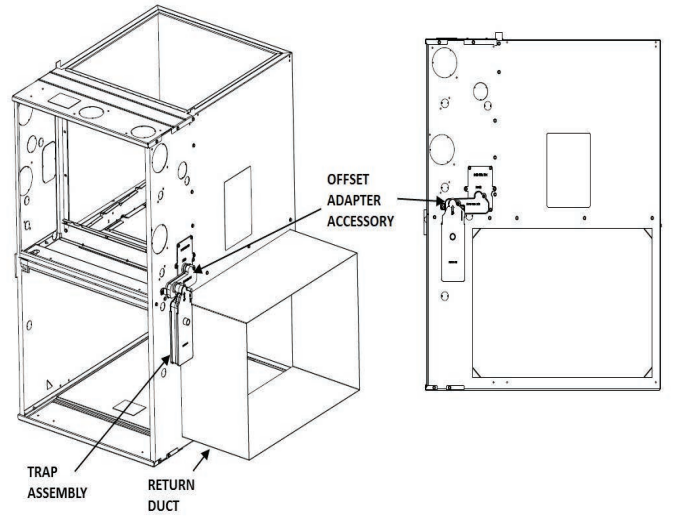

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Fig. 6 – Upflow Right Side Return Configuration - Required Upflow Offset Installation

AIR DELIVERY

Table 1 – 48060C17 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	488									
2	525									
3	555									
4	600				†					
5	650									
6	700									
7	740									
8	800									
9	875									
10	925									
11	975									
12	1000									
13‡	1050									
14	1138									
15	1200									
16	1225									
17	1300									
18**	1400									
19	1450								1430	1400
Constant Fan Airflow (cfm)	Settings 1 - 9 (*488 - 875)									
	Settings above 9 are not recommended									

Setting	Heat Stage
	High
Comfort 1	900
Comfort 2††	1000
Efficiency 1	1100
Efficiency 2	1180

*. Constant Fan Default
†. Operation in this range is not recommended because heat operation will exceed 1.0"w.c. ESP.
‡. Low Cooling Default
**. High Cooling Default
††. Heating Default

Table 2 – 60080C21 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	650									
2	700									
3	740									
4	800									
5	875					†				
6	925									
7	975									
8	1000									
9	1050									
10	1138									
11	1200									
12	1225									
13‡	1300									
14	1400									
15	1480									
16	1600									
17	1625									
18**	1750									
19	1850									
20	1910									
21	2000							1950	1900	1845
Constant Fan Airflow (cfm)	Settings 1 -5 (*650 - 875)									
	Settings above 5 are not recommended									

Setting	Heat Stage
	High
Comfort 1	1175
Comfort 2††	1290
Efficiency 1	1470
Efficiency 2	1470

*. Constant Fan Default
†. Operation in this range is not recommended because heat operation will exceed 1.0"w.c. ESP.
‡. Low Cooling Default
**. High Cooling Default
††. Heating Default

Table 3 – 66100C21 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	650									
2	700									
3	740									
4	800									
5	875					†				
6	925									
7	975									
8	1000									
9	1050									
10	1138									
11	1200									
12	1225									
13‡	1300									
14	1400									
15	1480									
16	1600									
17	1625									
18**	1750									
19	1850									
20	1910									
21	2000									
22	2110							2070	2020	1975
Constant Fan Airflow (cfm)	Settings 1 - 6 (*650 - 925)									
	Settings above 6 are not recommended									

Setting	Heat Stage
	High
Comfort 1	1480
Comfort 2††	1600
Efficiency 1	1800
Efficiency 2	1800

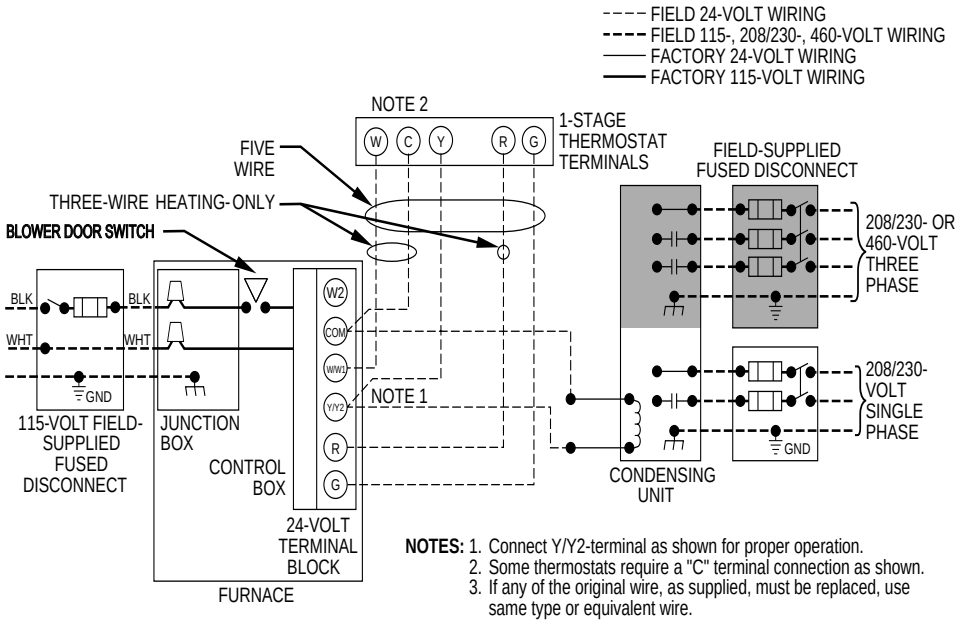
*. Constant Fan Default
†. Operation in this range is not recommended because heat operation will exceed 1.0"w.c. ESP.
‡. Low Cooling Default
**. High Cooling Default
††. Heating Default

Table 4 – Airflow Settings

	Default Airflow Settings*		Designated Airflow Settings	
Unit Size	Heating	Cooling	Heating	Constant Fan
48060C17	7	16	3 - 11	1 - 8
60080C21	9	16	5 - 14	1 - 8
66100C21	13	17	7 - 15	1 - 7

*. Setting #1 is the default setting for Constant Fan

TYPICAL WIRING SCHEMATIC



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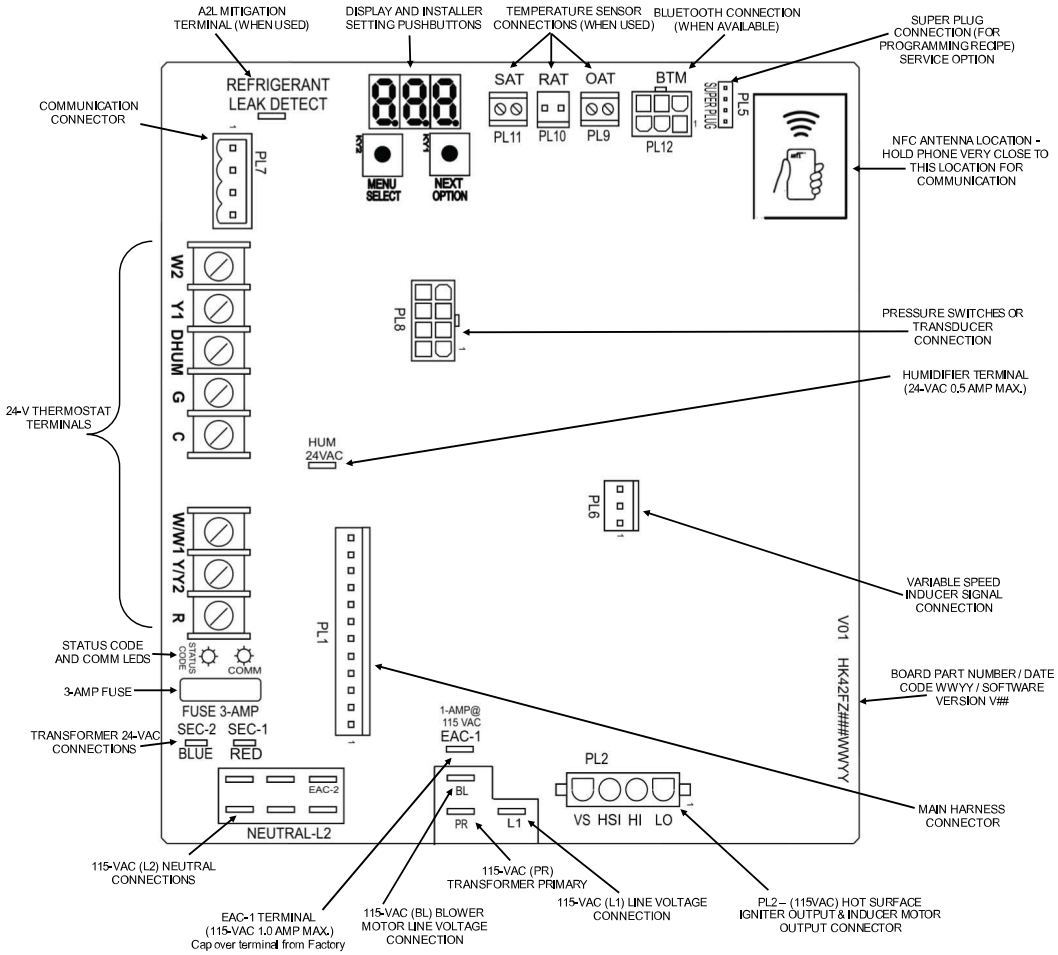
FURNACE CONTROL BOARD



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MAXIMUM ALLOWABLE EXPOSED VENT LENGTH

Maximum Allowable Exposed Vent Lengths in Unconditioned Space Insulation Table - Ft.

Winter Design Temp °F	Unit Size	60,000 BTUH											
		Uninsulated				3/8-in. Insulation				1/2-in. Insulation			
	Pipe Dia. in.	1 ½	2	2 ½	3	1 ½	2	2 ½	3	1 ½	2	2 ½	3
	20	20	30	30	25	20	75	65	60	20	85	75	65
	0	15	15	10	10	20	40	30	25	20	45	40	30
	-20	10	5			20	25	20	15	20	30	25	20
	-40	5				20	15	15	10	20	20	15	10

Winter Design Temp °F	Unit Size	80,000 BTUH													
		Uninsulated					3/8-in. Insulation					1/2-in. Insulation				
	Pipe Dia. in.	1 ½	2	2 ½	3	4	1 ½	2	2 ½	3	4	1 ½	2	2 ½	3	4
	20	15	40	40	35	30	15	50	90	75	65	15	50	70	70	70
	0	15	20	15	10	5	15	50	45	35	30	15	50	50	40	35
	-20	15	10	5			15	35	30	20	15	15	40	30	25	15
	-40	10	5				15	25	20	15	5	15	30	25	20	10

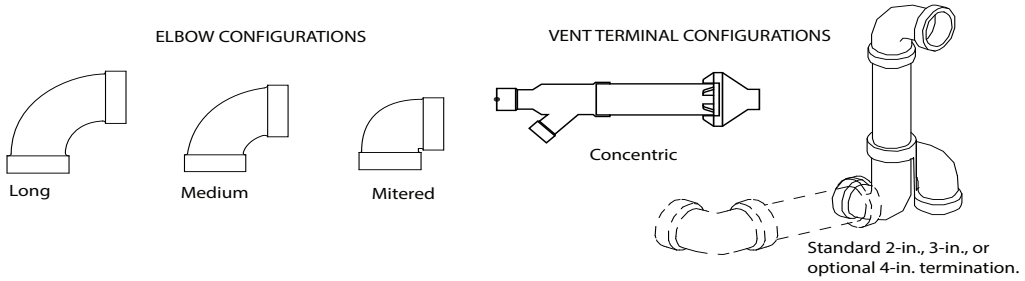
Winter Design Temp °F	Unit Size	100,000 BTUH											
		Uninsulated				3/8-in. Insulation				1/2-in. Insulation			
	Pipe Dia. in.	2	2 ½	3	4	2	2 ½	3	4	2	2 ½	3	4
	20	20	50	40	35	20	80	95	80	20	80	105	90
	0	20	20	15	10	20	55	45	35	20	65	55	45
	-20	15	10	5		20	35	30	20	20	45	35	25
	-40	10	5			20	25	20	10	20	30	25	15

Insulation thickness based on R value of 3.5 per in.

MAXIMUM EQUIVALENT VENT LENGTH - FT.

NOTE: *Maximum Equivalent Vent Length (MEVL) includes standard and concentric vent termination and does NOT include elbows. Use Deductions from Maximum Equivalent Vent Length to determine allowable vent length for each application.*

Unit Size		60,000				80,000					100,000			
Altitude (feet)	Pipe Dia. (in)	1 ½	2	2 ½	3	1 ½	2	2 ½	3	4	2	2 ½	3	4
	0-2000	20	100	175	200	15	55	130	175	200	20	80	175	200
	2001-3000		95	165	185	10	49	125	165	185	15	75	165	185
	3001-4000	16	90	155	175			115	155	175			155	175
	4001-4500	15	85	150	170		44	110	150	165	10	70		170
	4501-5000		80	145	165				145	160		65	150	165
	5001-5400		75	140	155		41	100	135	150			140	155



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Deductions from Maximum Equivalent Vent Length - Ft.

Pipe Diameter (in):	1-1/2		2		2-1/2		3		4	
Mitered 90º Elbow	8	(2.4)	8	(2.4)	8	(2.4)	8	(2.4)	8	(2.4)
Medium Radius 90º Elbow	5	(1.5)	5	(1.5)	5	(1.5)	5	(1.5)	5	(1.5)
Long Radius 90º Elbow	3	(0.9)	3	(0.9)	3	(0.9)	3	(0.9)	3	(0.9)
Mitered 45º Elbow	4	(1.2)	4	(1.2)	4	(1.2)	4	(1.2)	4	(1.2)
Medium Radius 45º Elbow	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)
Long Radius 45º Elbow	1.5	(0.5)	1.5	(0.5)	1.5	(0.5)	1.5	(0.5)	1.5	(0.5)
Tee	16	(4.9)	16	(4.9)	16	(4.9)	16	(4.9)	16	(4.9)
Concentric Vent Termination	NA		0	(0.0)	NA		0	(0.0)	NA	
Standard Vent Termination	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)

NOTE:

1. Use only the smallest diameter pipe possible for venting. Over-sizing may cause flame disturbance or excessive vent terminal icing or freeze-up.
2. NA - Not allowed. Pressure switch will not close, or flame disturbance may result.
3. Vent sizing for Canadian installations over 4500 ft (1370 M) above sea level are subject to acceptance by local authorities having jurisdiction.
4. Size both the combustion air and vent pipe independently, then use the larger size for both pipes.
5. Assume the two 45° elbows equal one 90° elbow. Wide radius elbows are desirable and may be required in some cases.
6. Elbow and pipe sections within the furnace casing and at the vent termination should not be included in vent length or elbow count.
7. The minimum pipe length is 5 ft. (2 M) linear feet (meters) for all applications.
8. Use 3-in. (76 mm) diameter vent termination kit for installations requiring 4-in. (102 mm) diameter pipe.

Venting System Length Calculations

The Total Equivalent Vent Length (TEVL) for **EACH** combustion air or vent pipe equals the length of the venting system, plus the equivalent length of elbows used in the venting system from Maximum Equivalent Vent Length..

Standard vent terminations or factory accessory concentric vent terminations count for zero deduction.

See vent system manufacturer's data for equivalent lengths of flexible vent pipe or other termination systems. **DO NOT ASSUME** that one foot of flexible vent pipe equals one foot of straight PVC/ABS DWV vent pipe.

Compare the Total Equivalent Vent Length to the Maximum Equivalent Vent Lengths in Deductions from Maximum Equivalent Vent Length Table

Example 1

A direct-vent 60,000 BTUH furnace installed at 2100 ft. (640M). Venting system includes **FOR EACH PIPE:** 70 feet (22 M) of vent pipe, 65 feet (20 M) of combustion air inlet pipe, (3) 90º long-radius elbows, (2) 45º long-radius elbows, and a factory accessory concentric vent kit.

Can this application use 2" (50 mm ND) PVC/ABS DWV vent piping?

Measure the required linear length of air inlet and vent pipe; insert the longest of the two here					70 ft. (22 M)	Use length of the longer of the vent or air inlet piping system
Add equiv length of (3) 90º long-radius elbows (use the highest number of elbows for either the vent or inlet pipe)	3	x	3 ft. (0.9 M)	=	9 ft. (2.7 M)	From Deductions from Maximum Equivalent Vent Length Table.
Add equiv length of (2) 45º long-radius elbows (use the highest number of elbows for either the vent or inlet pipe)	2	x	1.5 ft. (0.5 M)	=	3 ft. (0.9 M)	From Deductions from Maximum Equivalent Vent Length Table.
Add equiv length of factory concentric vent term					0 ft.	From Deductions from Maximum Equivalent Vent Length Table.
Add correction for flexible vent pipe, if any					0 ft.	From Vent Manufacturer's instructions; zero for PVC/ABS DWV
Total Equivalent Vent Length (TEVL)					82 ft. (25 M)	Add all of the above lines
Maximum Equivalent Vent Length (MEVL)					95 ft. (29 M)	For 2" pipe from Maximum Equivalent Vent Length Table.
Is TEVL less than MEVL?					YES	Therefore, 2" pipe MAY be used

Example 2

A direct-vent 60,000 BTUH furnace installed at 2100 ft. (640M). Venting system includes **FOR EACH PIPE:** 100 feet (30 M) of vent pipe, 95 feet (29 M) of combustion air inlet pipe, (3) 90º long-radius elbows, and a polypropylene concentric vent kit. Also includes 20 feet (6.1 M) of flexible polypropylene vent pipe, included within the 100 feet (30 M) of vent pipe.

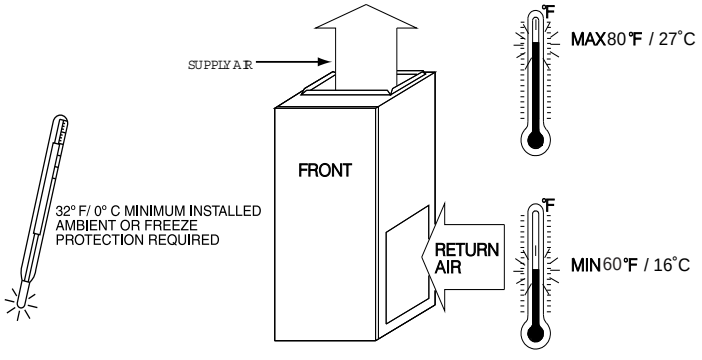
VERIFY FROM POLYPROPYLENE VENT MANUFACTURER'S INSTRUCTIONS for the multiplier correction for flexible vent pipe.

Can this application use 60mm o.d. (2") polypropylene vent piping? If not, what size piping can be used?

Measure the required linear length of **RIGID** air inlet and vent pipe; insert the longest of the two here: 100 ft. Of rigid pipe - 20 ft. Of flexible pipe				=	80 ft. (24 M)	Use length of the longer of the vent or air inlet piping system
Add equiv length of (3) 90º long-radius elbows (use the highest number of elbows for either the vent or inlet pipe)	3	x	5 ft. (1.5 M)	=	15 ft. (4.6 M)	Example from polypropylene vent manufacturer's instructions, Verify from vent manufacturer's instructions.
Add equiv length of 45º long-radius elbows (use the highest number of elbows for either the vent or inlet pipe)	0	x		=	0 ft. (0 M)	
Add equiv length of factory concentric vent term	9	x	3.3 ft (0.9 M)	=	30 ft. (9 M)	
Add correction for flexible vent pipe, if any	2*	x	20 ft. (6.1 M)	=	40 ft. (12.2 M)	
* VERIFY FROM VENT MANUFACTURER'S INSTRUCTIONS; For example only, assume 1 meter of flexible 60mm (2") or 80mm (3") polypropylene pipe equals 2.0 meters (6.5 ft.) of PVC/ABS pipe.						
Total Equivalent Vent Length (TEVL)					165 ft. (50 M)	Add all of the above lines
Maximum Equivalent Vent Length (MEVL)					95 ft. (29 M)	For 2" pipe from Maximum Equivalent Vent Length Table.
Is TEVL less than MEVL?					NO	Therefore, 60mm (2") pipe may NOT be used; try 80mm (3")
Maximum Equivalent Vent Length (MEVL)					185 ft. (57 M)	For 3" pipe from Maximum Equivalent Vent Length Table.
Is TEVL less than MEVL?					YES	Therefore, 80mm (3") pipe MAY be used

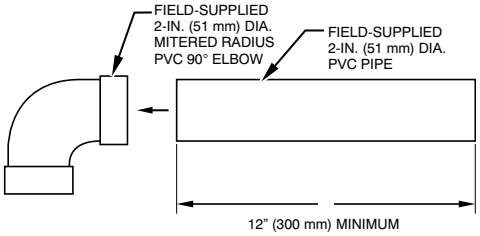
RETURN AIR TEMPERATURE

This furnace is designed for continuous return-air minimum temperature of 60°F (15°C) db or intermittent operation down to 55°F (13°C) db such as when used with a night setback thermometer. Return-air temperature must not exceed 80°F (27°C) db. Failure to follow these return air limits may affect reliability of heat exchangers, motors and controls.



A10490

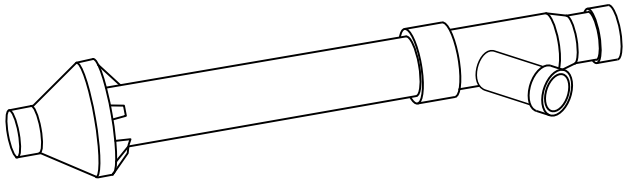
COMBUSTION-AIR PIPE FOR NON-DIRECT (1-PIPE) VENT APPLICATION



A12376

NOTE: See Installation Instructions for specific venting configurations.

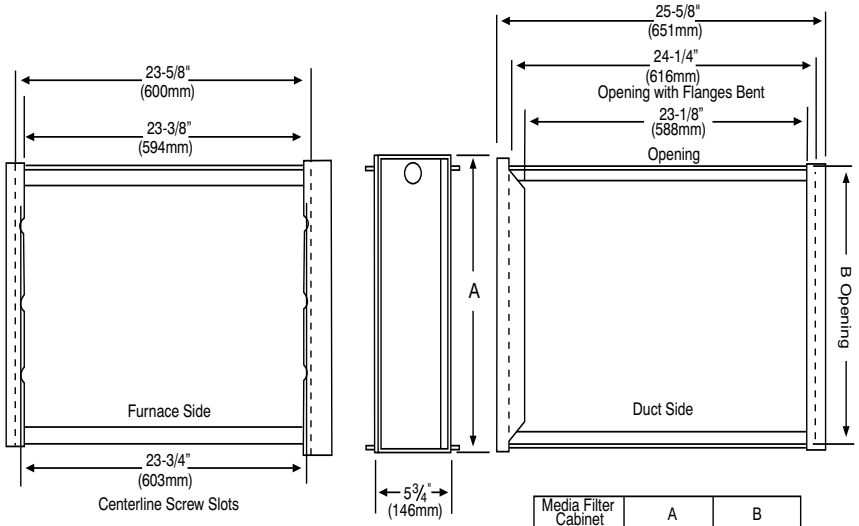
CONCENTRIC VENT KIT



A93086

A concentric vent kit allows vent and combustion-air pipes to terminate through a single exit in a roof or side wall. One pipe runs inside the other allowing venting through the inner pipe and combustion air to be drawn in through the outer pipe.

MEDIA FILTER CABINET (OPTIONAL ACCESSORY)



Media Filter Cabinet	A	B
16" (406mm)	17" (432mm)	16" (406mm)
20" (508mm)	21" (533mm)	20" (508mm)
24" (610mm)	25" (635mm)	24" (610mm)

NOTE: Media cabinet is matched to the bottom opening on furnace. May also be used for side return.

A12428

ACCESSORIES

PART NUMBER	DESCRIPTION	48060C17	60080C21	66100C21
P908-0001*	Condensate Neutralizer Kit	X	X	X
92-1003*	Gas Valve Tower Port Adapter Kit	X	X	X
ACG1625NCF*	External Filter Rack, 16" x 25"	X	-	-
ACG2025NCJ*	External Filter Rack, 20" x 25"	-	X	X
325531-402*	Washable filter, 3/4" x 16" x 25"	X	-	-
325531-403*	Washable filter, 3/4" x 20" x 25"	-	X	X
KGADA0101ALL	Coil Adapter Kits - No Offset	X	X	X
KGADA0201ALL	Coil Adapter Kits - Single Offset	X	X	X
KGADA0301ALL	Coil Adapter Kits - Double Offset	X	X	X
KGARP0301B17	Return Air Base (Upflow Applications) 17-1/2" wide	X	-	-
KGARP0301B21	Return Air Base (Upflow Applications) 21" wide	-	X	X
KGAVT0701CVT	Vent Terminal - Concentric - 2" (51 mm)	See Venting Tables		
KGAVT0801CVT	Vent Terminal - Concentric - 3" (76 mm)			
KGAVT0101BRA	Vent Terminal Bracket - 2" (51 mm)			
KGAVT0201BRA	Vent Terminal Bracket - 3" (76 mm)			
KGADC0101BVC	Vent Kit - Through the Cabinet for HZ left/right ONLY	X	X	X
KGAAC0101RVC	Polypropylene Inlet Air Pipe Coupling	X	X	X
KGAAD0101MEC	IAQ Device Duct Adapters 20.0" IAQ to 16" Side Return	20" x 25" IAQ Devices		
KGAAD0201MEC	IAQ Device Duct Adapters 24.0" IAQ to 16" Side Return	24" x 25" IAQ Devices		

*. Purchased through Replacement Components

DESCRIPTION	ACCESSORY
HUMIDIFIER	Model HUM
HEAT RECOVERY VENTILATOR	Model HRV
ENERGY RECOVERY VENTILATOR	Model ERV
UV LIGHTS	Model UVL

Bryant has a wide variety of thermostats for your system, please visit **www.Bryant.com** to see all thermostat and IAQ products.

DESCRIPTION	ACCESSORY	17”	21”
Bryant Carbon Monoxide Alarm (10 pack)	COALMBBNRB02-A10	X	X
Bryant Evolution Air Purifier - 16x25 (407x635 mm)	DGAPAXX1625	X	-
Bryant Evolution Air Purifier - 20x25 (508x635 mm)	DGAPAXX2025	-	X
Bryant Evolution Air Purifier Repl. Filter- 16x25 (407x635 mm)	PGAPXCAR1625A02	X	-
Bryant Evolution Air Purifier Repl. Filter- 20x25 (508x635 mm)	PGAPXCAR2025A02	-	X
Cartridge Media Filter - 16" (407 mm) (MERV 11)	FILXXCAR0116	X	-
Cartridge Media Filter - 16" (407 mm) (MERV 8)	FILXXCAR0016	X	-
Cartridge Media Filter - 20" (508 mm) (MERV 8)	FILXXCAR0020	-	X
Cartridge Media Filter - 20" (508 mm) (MERV11)	FILXXCAR0120	-	X
EZ Flex Cabinet Side or Bottom - 16"	EZXCAB--0016	X	-
EZ Flex Cabinet Side or Bottom - 20"	EZXCAB--0020	-	X
EZ Flex Replacement Filters 16" MERV 10	EXPXXFIL0016	X	-
EZ Flex Replacement Filters 16" MERV 13	EXPXXFIL0316	X	-
EZ Flex Replacement Filters 20" MERV 10	EXPXXFIL0020	-	X
EZ Flex Replacement Filters 20" MERV 13	EXPXXFIL0320	-	X
EZ-Flex Filter with End Caps - 16" (407 mm) (MERV 10)	EXPXXUNV0016	X	-
EZ-Flex Filter with End Caps - 16" (407 mm) (MERV 13)	EXPXXUNV0316	X	-
EZ-Flex Filter with End Caps - 20" (508 mm) (MERV 10)	EXPXXUNV0020	-	X
EZ-Flex Filter with End Caps - 20" (508 mm) (MERV 13)	EXPXXUNV0320	-	X
Media Filter Cabinet - 20"	FILCABXL0020	-	X
Media Filter Cabinet -16"	FILCABXL0016	X	-

GUIDE SPECIFICATIONS

General

System Description

Furnish a _____ 4-way multipoise gas-fired condensing furnace for use with natural gas or propane (factory-authorized conversion kit required for propane).

Quality Assurance

Unit will be designed, tested and constructed to the current ANSI Z 21.47/CSA 2.3 design standard for gas-fired central furnaces.

Unit will be third party certified by CSA to the current ANSI Z 21.47/CSA 2.3 design standard for gas-fired central furnaces. Unit will carry the CSA Blue Star® and Blue Flame® labels. Unit efficiency testing will be performed per the current DOE test procedure as listed in the Federal Register.

Unit will be certified for capacity and efficiency and listed in the latest AHRI Consumer's Directory of Certified Efficiency Ratings.

Unit will carry the current Federal Trade Commission Energy Guide efficiency label.

Delivery, Storage, and Handling

Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

U.S. and Canada only. Warranty certificate available upon request.

Equipment

Blower Wheel and ECM Blower Motor

Galvanized blower wheel shall be centrifugal type, statically and dynamically balanced. Blower motor of ECM type shall be permanently lubricated with sealed ball bearings, of _____HP, and have multiple speeds from 600-1200 RPM operating only when 24-VAC motor inputs are provided. Blower motor shall be direct drive and soft mounted to the blower housing to reduce vibration transmission.

Filters

Furnace shall have reusable-type filters.

Filter shall be _____ in. (mm) x_____ in. (mm).

An accessory highly efficient Media Filter is available as an option. _____ Media Filter.

Casing

Casing shall be of 0.030 in. thickness minimum, pre-painted steel.

Draft Inducer Motor

Draft inducer motor shall be single-speed PSC design.

Primary Heat Exchangers

Primary heat exchangers shall be 3-Pass corrosion-resistant aluminized steel of fold-and-crimp sectional design and applied operating under negative pressure.

Secondary Heat Exchangers

Secondary heat exchangers shall be of a stainless steel flow-through of fin-and-tube design and applied operating under negative pressure.

Controls

Controls shall include a micro-processor-based integrated electronic control board with at least 16 service troubleshooting codes displayed via diagnostic flashing LED light on the control, a self-test feature that checks all major functions of the furnace, and a replaceable automotive-type circuit protection fuse. Multiple operational settings available, including blower speeds for heating and cooling.

Operating Characteristics

Heating capacity shall be _____ Btuh input; _____ Btuh output capacity.

Fuel Gas Efficiency shall be _____AFUE.

Air delivery shall be _____ cfm minimum at 0.50 in. W.C. external static pressure.

Dimensions shall be: depth_____in. (mm); width _____in. (mm); height_____in. (mm) (casing only).

Height shall be_____in. (mm) with A/C coil and _____in. (mm) overall with plenum.

Electrical Requirements

Electrical supply shall be 115 volts, 60 Hz, single-phase (nominal). Minimum wire size shall be _____AWG; maximum fuse size of HACR-type designated circuit breaker shall be _____ amps.

Special Features

Refer to section of the product data identifying accessories and descriptions for specific features and available enhancements.

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