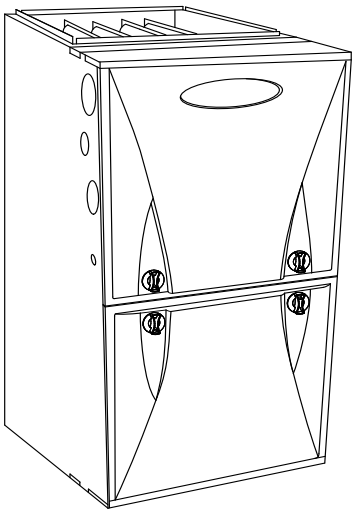
# 59CU5B
# Infinity® Single-Stage, Variable Speed Communicating, Ultra Low NOx Emissions 35-in. (889 mm) Tall, Condensing Gas Furnace

Carrier®
Turn to the experts

# 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 59CU5B Infinity® 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 Infinity Series 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 Infinity 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.

INFINITY SERIES IdealHumidity greenspeed 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 .

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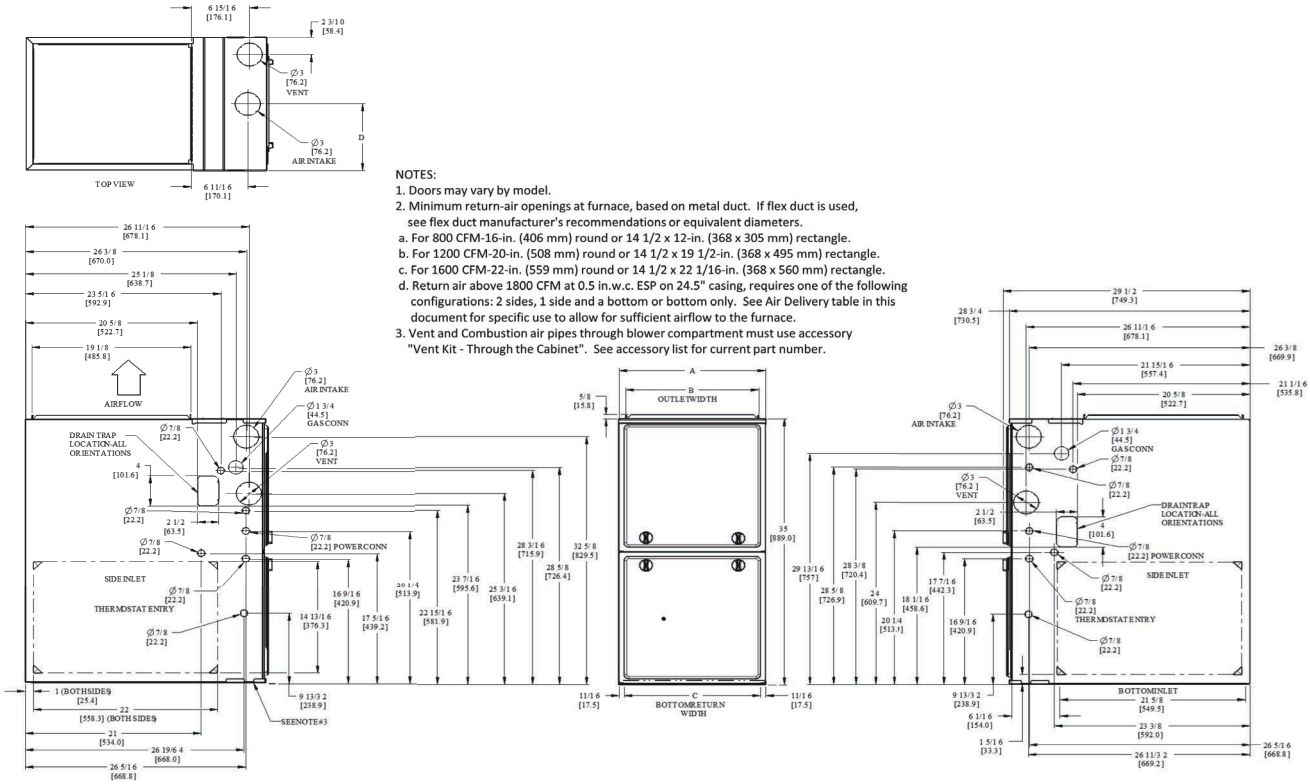
# DIMENSIONAL DRAWING




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) |
| **060C17--16** | 17-1/2 (445) | 15-7/8 (403) | 16 (406) | 8-3/4 (222) | 142 (64) |
| **080C21--20** | 21 (533) | 19-3/8 (492) | 19-1/2 (495) | 10-1/2 (267) | 161 (73) |
| **100C21--22** | 21 (533) | 19-3/8 (492) | 19-1/2 (495) | 10-1/2 (267) | 169 (76) |

## MODEL NUMBER NOMENCLATURE

| 1, 2<br>Gas Furnace<br>59 | 3<br>Heating Stages<br>M | 4<br>Tier<br>N | 5<br>Min. AFUE/NOx<br>7 | 6<br>Major Series<br>B | 7, 8, 9<br>Heating Input<br>060 | 10<br>Motor Type<br>E | 11, 12<br>Width<br>17 | 13<br>Voltage (1-phase)<br>1 | 14<br>Minor Series<br>1 | 15, 16<br>Airflow<br>16 |
|---|---|---|---|---|---|---|---|---|---|---|
| 58 = 80% Non-Condensing<br>59 = 90%+ Condensing | M = Modulating<br>T = Two Stage<br>S = Single Stage<br>C = Single Stage Communicating | B = Base<br>C = Comfort<br>E = Export<br>N = Infinity<br>P = Performance<br>U = Ultra Low Nox | 0 = 80%<br>1 = 80% Low NOx (Not Ultra Low NOx)<br>2 = 92%<br>5 = 95%<br>6 = 96%<br>7 = 97%<br>8 = 98% | A<br>B<br>C<br>--- | 026 = 26,000 BTU<br>040 = 40,000 BTU<br>060 = 60,000 BTU<br>---<br>155 = 155,000 BTU | C = Constant Airflow Variable- Speed (VCA) ECM<br>V = Variable-Speed (VCT) PWM<br>M = Multi 18-Speed Constant Torque (MCT) ECM | 14 - 14.2"<br>17 - 17.5"<br>21 - 21.0"<br>24 - 24.5" | 1 = 110V/60Hz<br>2 = 230V/50Hz | 1<br>2<br>3<br>--- | 08 = 800 CFM<br>10 = 1000 CFM<br>12 =1200 CFM<br>14 = 1400 CFM<br>16 = 1600 CFM<br>20 = 2000 CFM<br>22 = 2200 CFM |

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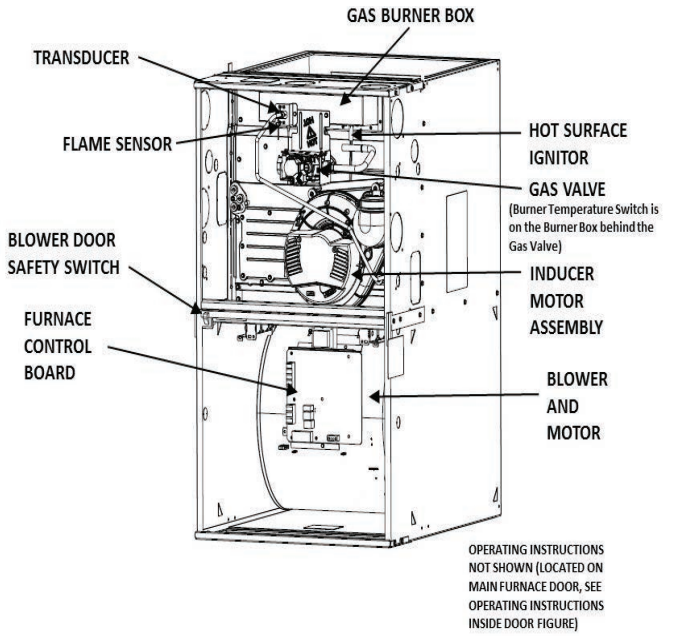
## FURNACE COMPONENTS

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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 | | 060C17–16 | 080C21–20 | 100C21–22 |
|---|---|---|---|---|
| **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** | | Infinity®; Infinity® 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

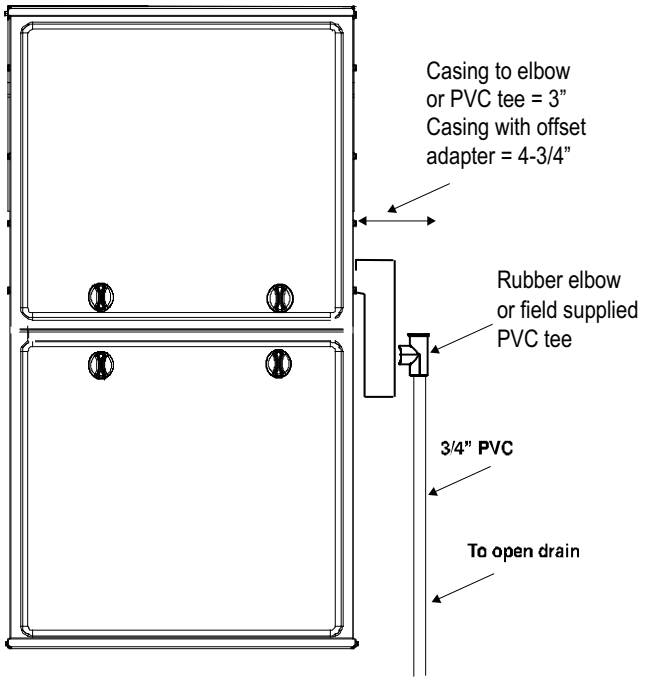


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**Fig. 1 – Trap Clearance in Upflow Application**

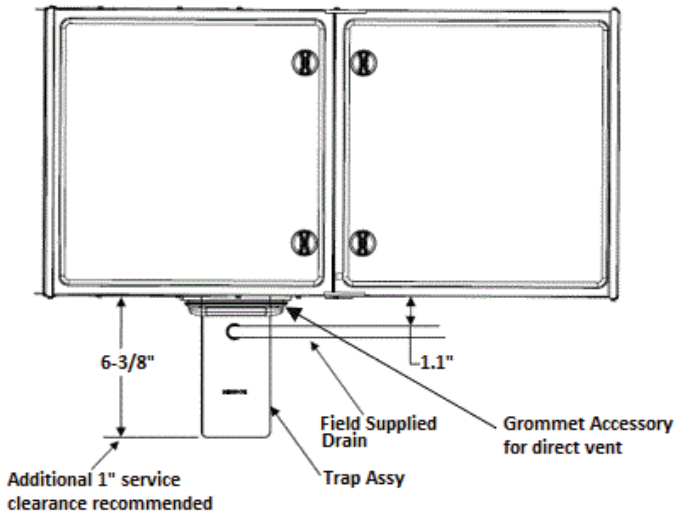


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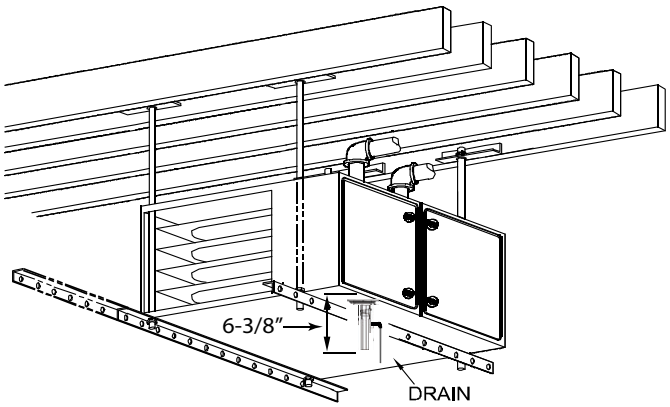
**Fig. 2 – Trap Clearance in Horizontal Application (Note: Drain line can be run horizontally or vertically)**




ADDITIONAL 1" CLEARANCE BELOW TRAP RECOMMENDED FOR SERVICE

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**Fig. 3 – Trap Clearance in Horizontal Application**

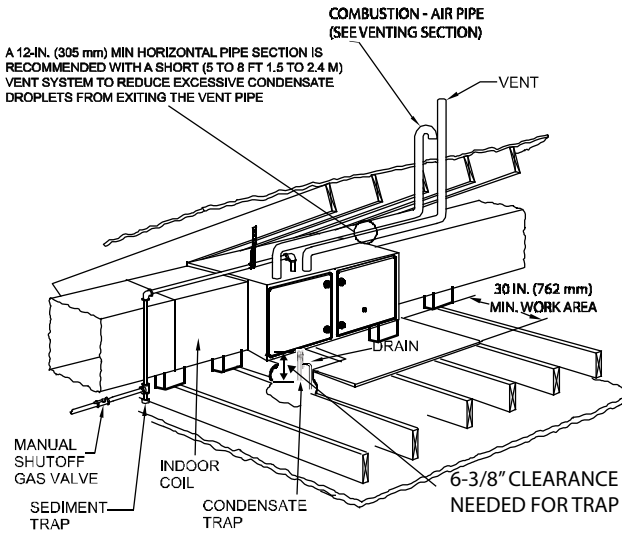


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**Fig. 4 – Working Platform for Attic Installation**

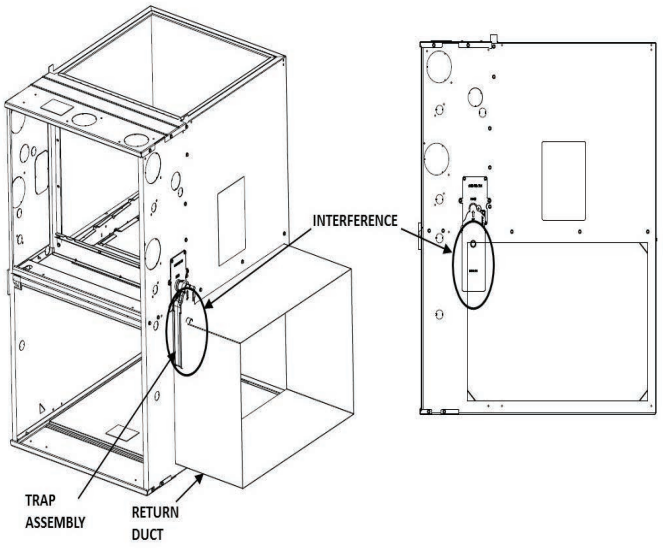


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**Fig. 5 – Upflow Right Side Return Configuration - Trap Interference**

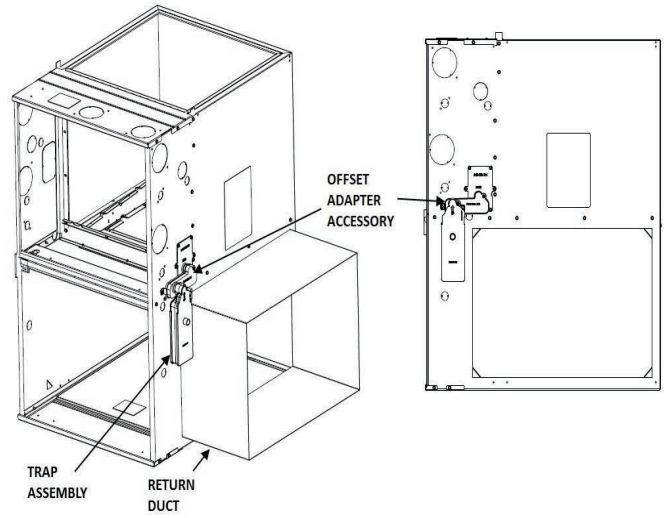


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**Fig. 6 – Upflow Right Side Return Configuration - Required Upflow Offset Installation**

# AIR DELIVERY

**Table 1 – 060C17–16 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 – 080C21–20 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 – 100C21–22 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 |

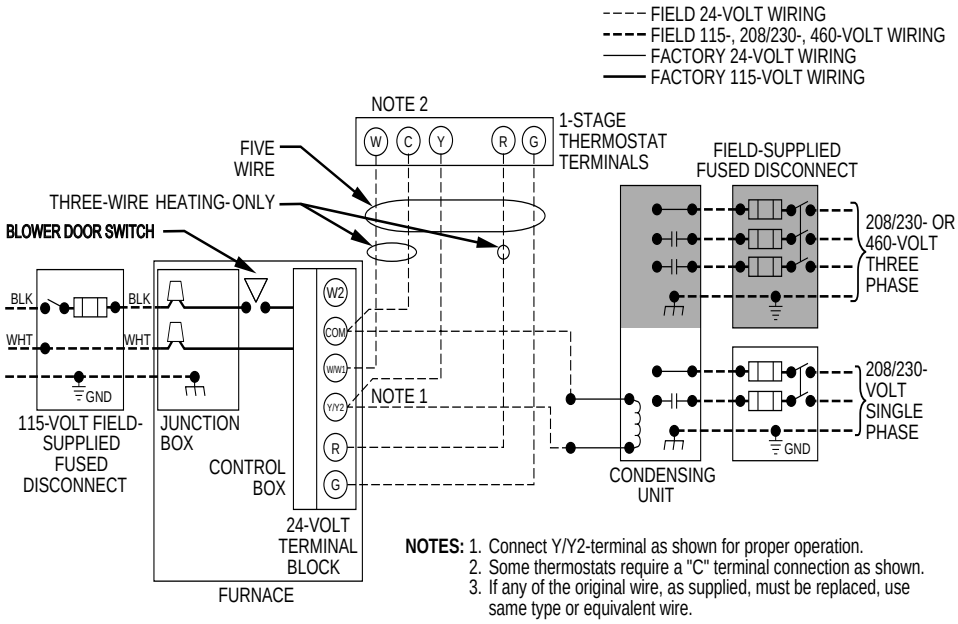
*. Constant Fan Default
†. Operation in this range is not recommended because heat operation will exceed 1.0"w.c. ESP.
‡. Low Cooling Default
**. High Cooling Default
††. Heating Default

**Table 4 – Airflow Settings**

| | Default Airflow Settings* | | Designated Airflow Settings | |
|---|---|---|---|---|
| Unit Size | Heating | Cooling | Heating | Constant Fan |
| 060C17--16 | 7 | 16 | 3 - 11 | 1 - 8 |
| 080C21--20 | 9 | 16 | 5 - 14 | 1 - 8 |
| 100C21--22 | 13 | 17 | 7 - 15 | 1 - 7 |

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

# TYPICAL WIRING SCHEMATIC

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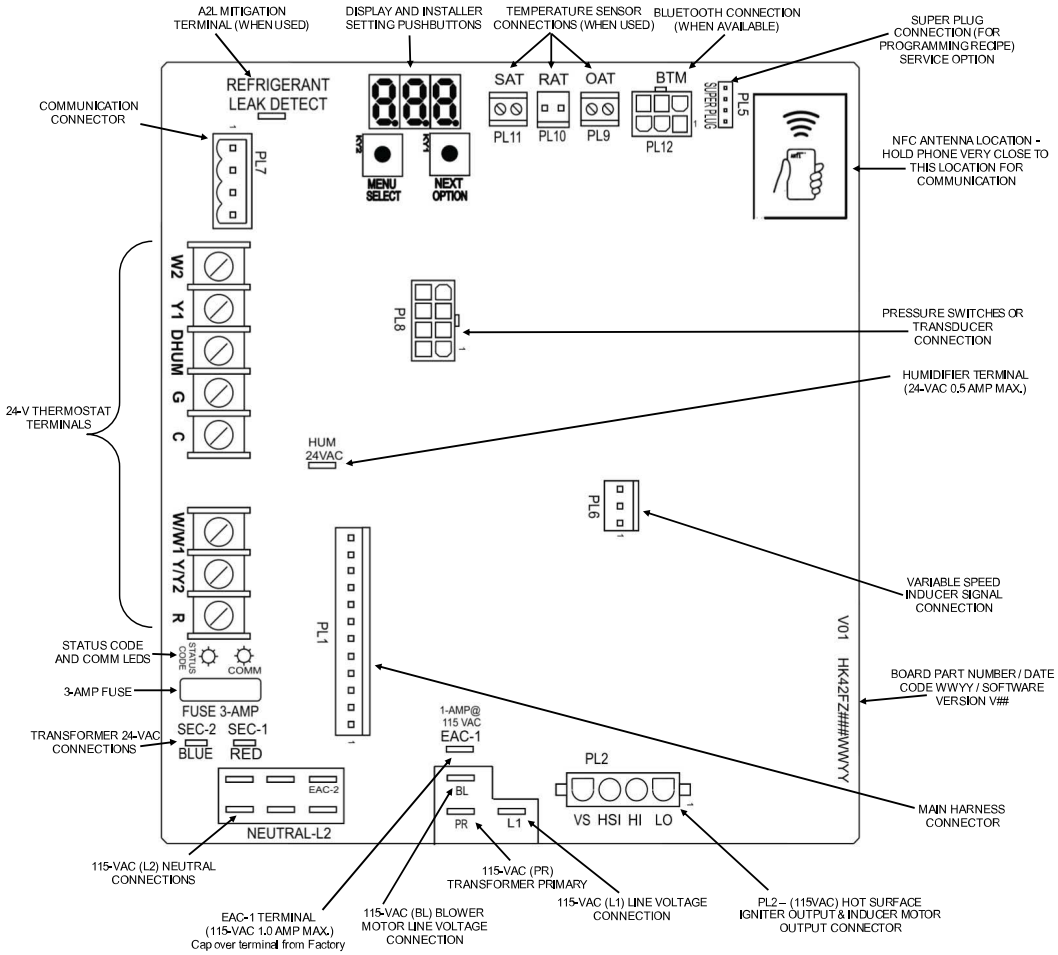
# FURNACE CONTROL BOARD

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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 |

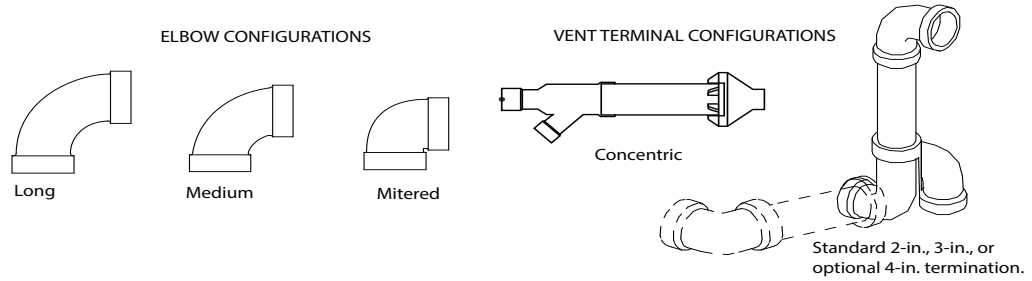
| Winter Design Temp °F | Unit Size | 100,000 BTUH | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Uninsulated | | | | 3/8-in. Insulation | | | | 1/2-in. Insulation | | | |
| | Pipe Dia. in. | 2 | 2 ½ | 3 | 4 | 2 | 2 ½ | 3 | 4 | 2 | 2 ½ | 3 | 4 |
| | 20 | 20 | 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 |




A13110

## 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.

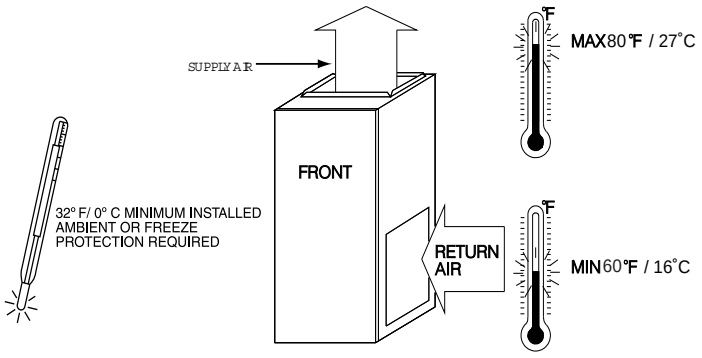
VERIFY FROM POLYPROPYLENE VENT MANUFACTURER'S INSTRUCTIONS for the multiplier correction for flexible vent pipe.

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.

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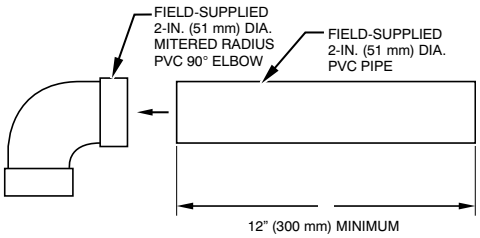
## COMBUSTION-AIR PIPE FOR NON-DIRECT (1-PIPE) VENT APPLICATION

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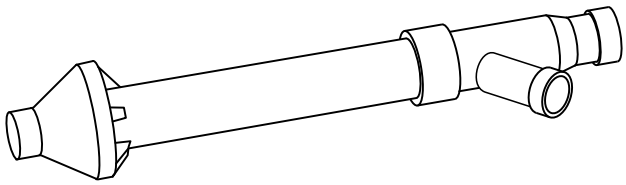
**NOTE:** See Installation Instructions for specific venting configurations.

## CONCENTRIC VENT KIT



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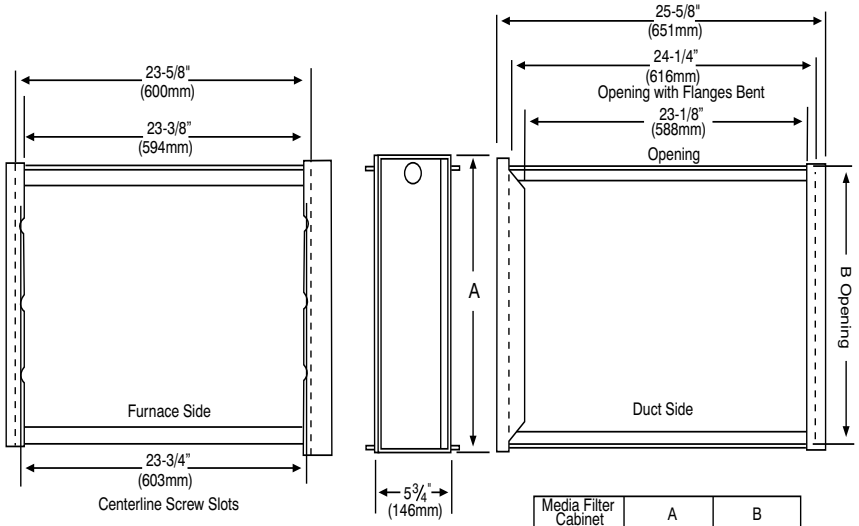
A concentric vent kit allows vent and combustion-air pipes to terminate through a single exit in a roof or side wall. One pipe runs inside the other allowing venting through the inner pipe and combustion air to be drawn in through the outer pipe.

# 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 | 060C17–16 | 080C21–20 | 100C21–22 |
|---|---|---|---|---|
| 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 |

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

| DESCRIPTION | ACCESSORY | 17” | 21” |
|---|---|---|---|
| Carrier Carbon Monoxide Alarm (10 pack) | COALMCCNRB02-A10 | X | X |
| Carrier Infinity Air Purifier - 16" x 25" (407 x 635 mm) | DGAPAXX1625 | X | |
| Carrier Infinity Air Purifier - 20" x 25" (508 x 635 mm) | DGAPAXX2025 | | X |
| Carrier Infinity Air Purifier Repl. Filter- 16" x 25" (407 x 635 mm) | PGAPXCAR1625A02 | X | |
| Carrier Infinity Air Purifier Repl. Filter- 20" x 25" (508 x 635 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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