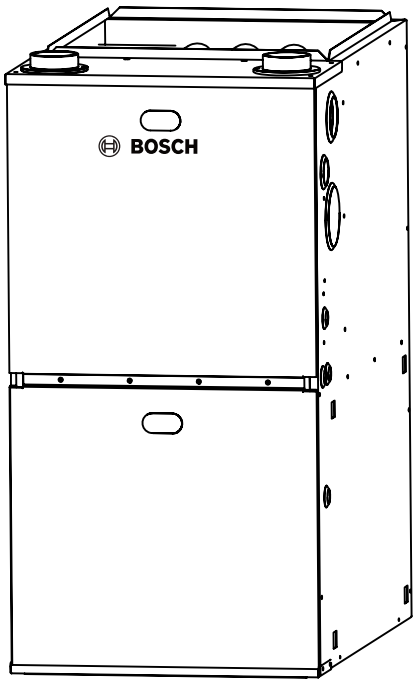
# Bosch 97% AFUE Gas Furnace
## BGH97 Model

Engineering Submittal Sheet

BOSCH

### Overview and Certifications




AHRI CERTIFIED® www.ahridirectory.org
Residential Furnaces DOE 10 CFR Part 430

ETL LISTED c US
Intertek
3124627

ENERGY STAR

### Product Features

#### Standard Features

- Up to 97% AFUE heating efficiency, ENERGY STAR rated
- 5-year parts limited warranty, 20 year heat exchanger limited warranty
- Reliable, proven two-stage design
- Compatibility with the Bosch Connected Control BCC Thermostat
- 3-way multipoise design allows for flexibility in multiple types of installations
- Field convertible gas type for hassle-free installation, all furnaces come standard with a natural gas to propane gas conversion kit
- Constant airflow ECM motors for all models for quiet and efficient operation
- Hot-surface ignition for dependable operation
- Durable aluminized steel tubular heat exchanger and stainless-steel secondary heat exchanger
- Pairs with Bosch IDS heat pump, reaching up to 18.5 SEER2, meeting heat pump ENERGY STAR requirements for some combinations
- LED fault diagnostics for quick and easy service calls

This product is not to be sold or installed in the State of California in the South Coast Air Quality Management District or San Joaquin Valley Air Basin territory.



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## Product Features continued..

### Cabinet Features

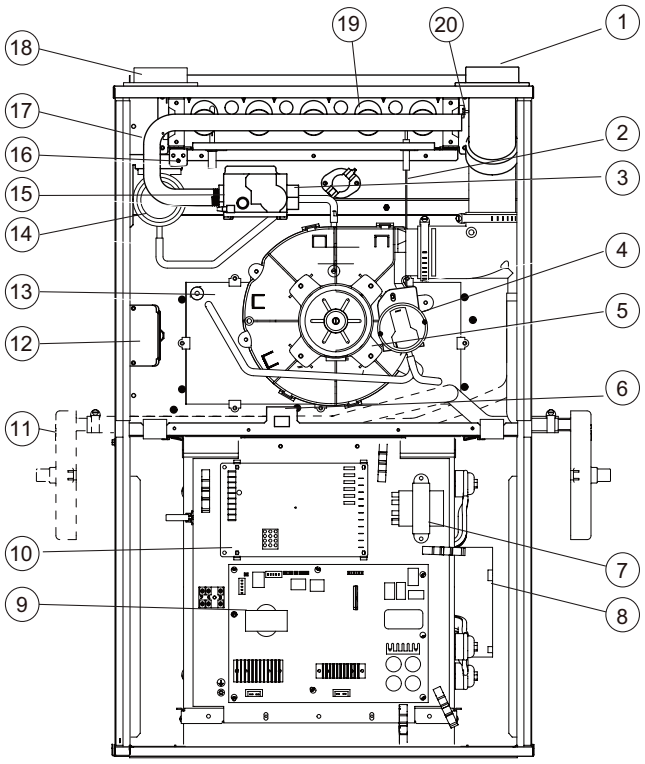
- Low profile (33.75”) cabinet can fit in tight spaces.
- Convenient left or right-hand connection for gas and electric service.
- Anti-rust: Painted, galvanized, 21 gauge steel cabinet, passes a 500 hours salt spray test
- Low noise: Fully insulated (fiberglass insulation) design helps minimize indoor noise levels
- 3-way multipoise design allows for flexibility in multiple types of installations
  - Upflow (side or bottom return)
  - Horizontal (left or right air discharge)

### Warranty*

All models installed in one or two family residential dwellings come standard with a 5 year limited warranty on parts and a 20 year limited warranty on primary & secondary heat exchangers. With registration of the product on bosch-climate.us, the 5 year limited warranty on parts shall be upgraded to 10 years, and the 20 year limited warranty on primary & secondary heat exchangers shall be upgraded to lifetime. Furnaces installed in applications other than one or two family residential dwellings will qualify for a 1 year limited warranty on parts and a 10 year limited warranty on the heat exchanger.

* For complete Warranty details please see: https://www.bosch-climate.us/support-center/product-warranty-library/gas-furnace-warranty.html

## Key Components




**COMPONENT IDENTIFICATION:**

1. Outlet Flue Vent
2. Flame Sensor
3. Primary Limit Switch
4. Condensate Overflow Switch
5. Inducer
6. Door Switch
7. Integrated Control Module
8. Blower
9. Transformer
10. Condensate Trap
11. Juction Box
12. Condensate Collector
13. Pressure Switch
14. Two-Stage Gas Valve
15. Hot Surface Ignitor
16. Gas Manifold
17. Air Inlet
18. Burner
19. Rollout Limit Switch
20. Blower Contol Module



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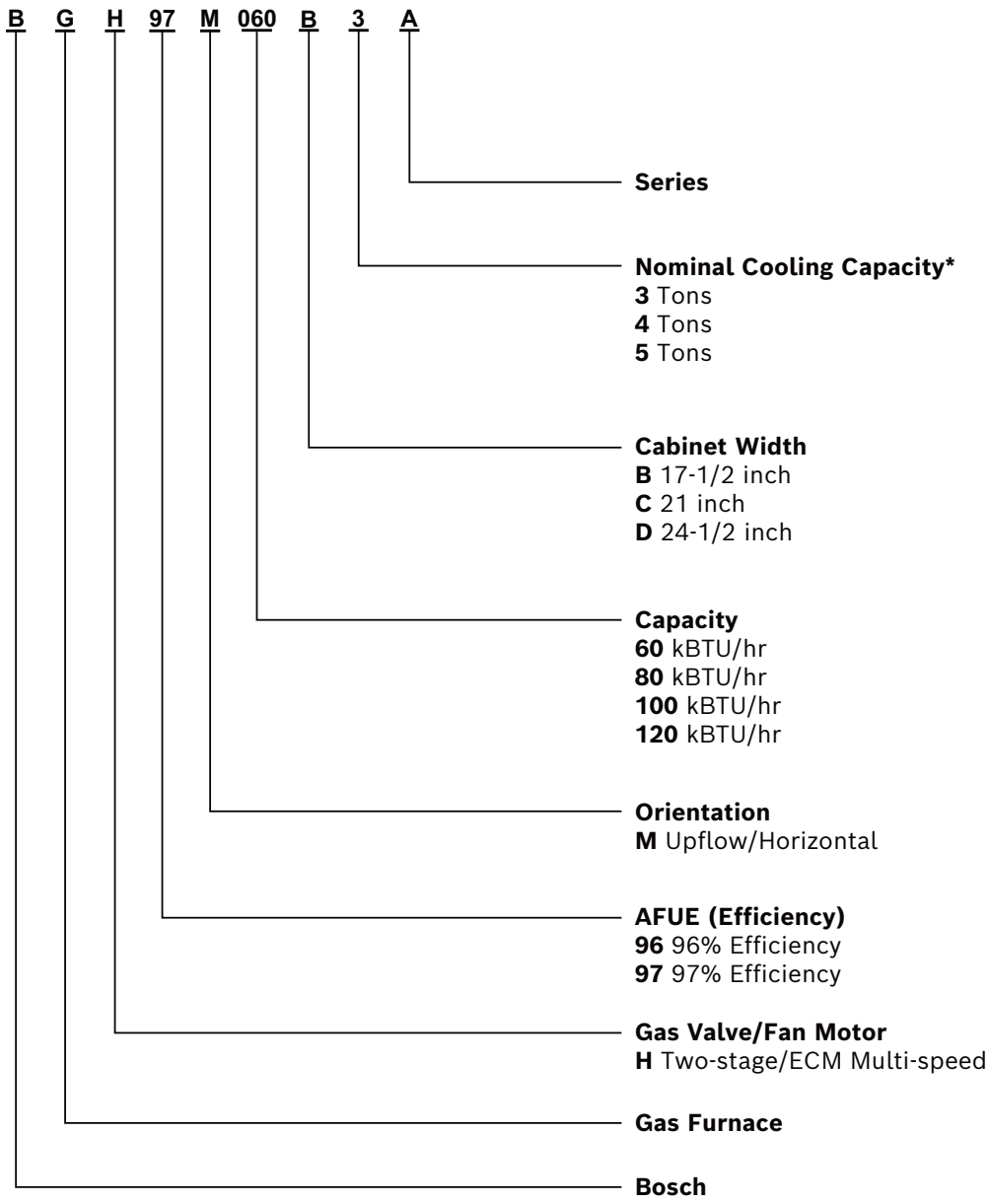
## Model Nomenclature




* Nominal 350-400 CFM per 12,000 BTU/hr



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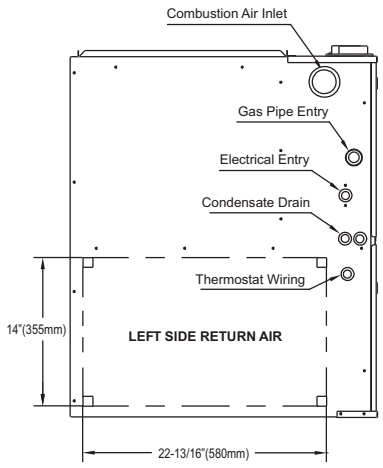
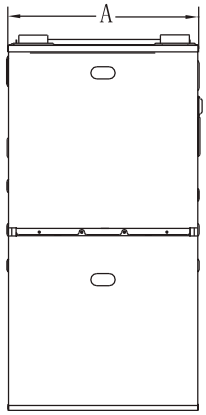
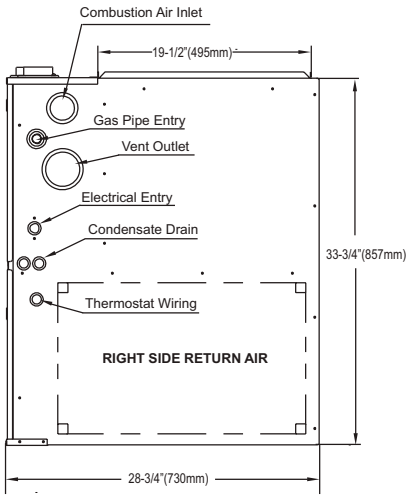
## Dimensions and Connections



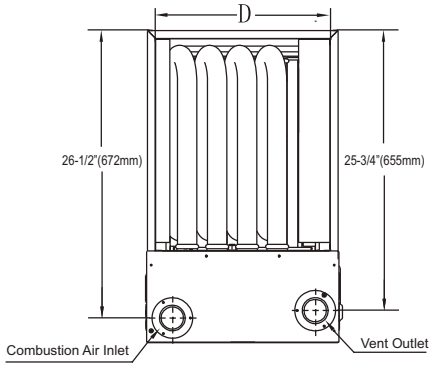

**(Left)**



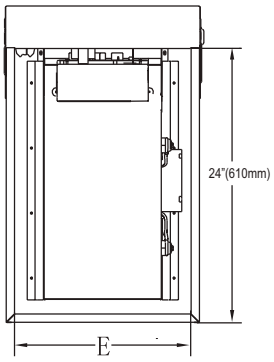

**(Front)**




**(Right)**




**(Top)**




**(Bottom with panel removed)**

| Furnace Model | "A" Cabinet Width In. (mm) | "D" Supply- Air Width In. (mm) | "E" Return- Air Width In. (mm) | Shipping Weight lbs (kgs) |
|---|---|---|---|---|
| **BGH97M060B3A** | 17.5 (445) | 16 (406) | 15-7/8 (402) | 147.5 (66.9) |
| **BGH97M080B3A** | 17.5 (445) | 16 (406) | 15-7/8 (402) | 152 (68.9) |
| **BGH97M080C4A** | 21 (533) | 19.5 (495) | 19-7/16 (493) | 165 (74.8) |
| **BGH97M100C5A** | 21 (533) | 19.5 (495) | 19-7/16 (493) | 170.5 (77.3) |
| **BGH97M100D5A** | 24.5 (622) | 23 (584) | 22-7/8 (580) | 181.5 (82.3) |
| **BGH97M120D5A** | 24.5 (622) | 23 (584) | 22-7/8 (580) | 187 (84.8) |



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## Technical Specifications

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Basic Product Information** | Model | | | **BGH97M060B3A** | **BGH97M080B3A** | **BGH97M080C4A** | **BGH97M100C5A** | **BGH97M100D5A** | **BGH97M120D5A** |
| | Bosch Part Number | | | 8733982246 | 8733982247 | 8733982248 | 8733982249 | 8733982250 | 8733982251 |
| | Fuel Type | | | Natural Gas/ Propane Gas* | Natural Gas/ Propane Gas* | Natural Gas/ Propane Gas* | Natural Gas/ Propane Gas* | Natural Gas/ Propane Gas* | Natural Gas/ Propane Gas* |
| **ENERGY STAR** | ENERGY STAR Certified | | Y/N | Y | Y | Y | Y | Y | Y |
| **Gas Heating Performance** | AFUE | | % | 97 | 97 | 97 | 97 | 97 | 97 |
| | Input (High fire) | Natural Gas/Propane Gas (LP) | Btu/h | 60000 | 80000 | 80000 | 100000 | 100000 | 120000 |
| | Input (Low fire) | Natural Gas/Propane Gas (LP) | Btu/h | 39000 | 52000 | 52000 | 65000 | 65000 | 78000 |
| | Output (High fire) | Natural Gas/Propane Gas (LP) | Btu/h | 58200 | 76000 | 76000 | 97000 | 97000 | 116400 |
| | Output (Low fire) | Natural Gas/Propane Gas (LP) | Btu/h | 37830 | 50440 | 50440 | 63050 | 63050 | 75660 |
| | Air Temperature Rise | | ℉ | 30-60 | 35-65 | 35-65 | 35-65 | 35-65 | 40-70 |
| | Design Max. Outlet Air Temperature | | ℉ | 170 | 170 | 170 | 170 | 170 | 170 |
| **Static Pressure** | Certified EXT static pressure | Heating | in. WC | 0.12 | 0.15 | 0.15 | 0.2 | 0.2 | 0.2 |
| | | Cooling | in. WC | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| **Circulating Blower Data** | Circulating Blower | Material | - | Metal | | | | | |
| | | Type | - | ECM | | | | | |
| | | Diameter blower wheel | Inch | 12 3/8 | | 12 3/4 | | | |
| | | Height blower wheel | Inch | 8 | | 11 1/4 | | | |
| | Tons AC @ 0.5" ESP | | tons | 1.5/2/2.5/3 | 2.5/3/3.5/4 | 2.5/3/3.5/4 | 3.5/4/4.5/5 | 3.5/4/4.5/5 | 3.5/4/4.5/5 |
| | Circuating Fan Motor | Motor Horsepower | HP | 1 | | | | | |
| | Air Flow (0.5 ESP in. WC) | High | CFM | 1321 | 1214 | 1289 | 1774 | 1936 | 1916 |
| | Air Flow (0.5 ESP in. WC) | Mid-High | CFM | 1096 | 1037 | 1135 | 1514 | 1749 | 1760 |
| | Air Flow (0.5 ESP in. WC) | Mid | CFM | 865 | 855 | 896 | 1387 | 1528 | 1507 |
| | Air Flow (0.5 ESP in. WC) | Mid-Low | CFM | 740 | 728 | 813 | 1185 | 1381 | 1382 |
| | Air Flow (0.5 ESP in. WC) | Low | CFM | 552 | 568 | 615 | 1032 | 1174 | 1158 |
| | Motor Speeds | | Speeds | 5** | | | | | |
| | | | settings | High/Mid-High/Mid/Mid-Low/Low | | | | | |
| | | | r/min | 1050 (rated) | | | | | |
| **Inducer Motor** | Power Input | (High) | W | 27.1 | 35 | 24 | 34 | 43 | 47 |
| | Power Input | (Low) | W | 15.5 | 15.4 | 11 | 16 | 19 | 26 |
| **Electrical Data** | Power supply | | V/Hz/PH | 115V/60HZ/1PH | | | | | |
| | Max Overcurrent Protection (MOP***) | | Amps | 15 | | | 20 | | |
| | Blower motor full load (FLA) | | Amps | 8 | 8 | 7.8 | 11.5 | 10.5 | 10.5 |

* With factory supplied Natural Gas to LP Conversion Kit

** 5 selectable speeds via wiring, unit operates in two speeds in concert with HI/LOW fire operation

*** MOP refers to the maximum recommended fuse or breaker size.



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**Technical Specifications Continued**

| Model | | | | BGH97M060B3A | BGH97M080B3A | BGH97M080C4A | BGH97M100C5A | BGH97M100D5A | BGH97M120D5A |
|---|---|---|---|---|---|---|---|---|---|
| Combustion System Specifications | Max. Inlet Gas Press | Natural Gas | in. WC | 10.5 | | | | | |
| | | Propane Gas (LP) | in. WC | 13 | | | | | |
| | Min. Inlet Gas Press | Natural Gas | in. WC | 4.5 | | | | | |
| | | Propane Gas (LP) | in. WC | 11 | | | | | |
| | "Natural Gas Manifold Pressure (High fire)" | | in. WC | 3.5 | 3.6 | 3.6 | 3.6 | 3.6 | 3.6 |
| | "Natural Gas Manifold Pressure (Low fire)" | | in. WC | 1.6 | 1.6 | 1.6 | 1.7 | 1.7 | 1.7 |
| | "Propane Gas Manifold Pressure (High fire)" | | in. WC | 9.4 | 9.4 | 9.4 | 9.4 | 9.4 | 9.9 |
| | "Propane Gas Manifold Pressure (Low fire)" | | in. WC | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 | 4.1 |
| | "Natural Gas Factory Orifice (0-2000 feet)" | | # | 45 | | | | | |
| | "Propane Gas (LP) Factory Orifice (0-2000 feet)*" | | # | 55 | | | | | |
| | Gas Connection Size | | in. NPT | 1/2 | | | | | |
| | Igniton Device | | - | Hot surface | | | | | |
| | Number of Burners | | # | 3 | 4 | 4 | 5 | 5 | 6 |
| | Primary Heat Exchanger Diameter | | Inch | 1-3/4 | | | | | |
| | Primary Heat Exchanger | | # tubes | 3 | 4 | 4 | 5 | 5 | 6 |
| | Secondary Heat Exchanger Diameter | | Inch | 3/8 | | | | | |
| | Secondary Heat Exchanger | | # tubes | 33 | 33 | 39 | 39 | 48 | 48 |
| | Flue Vent Diameter | | Inch | 2“/3” | 2“/3” | 2“/3” | 2“/3” | 2“/3” | 3” |
| Dip Switches | Heating Blower Control (Heating Off-Delay) | | - | Adjustable: 90, 120, 150, 180 seconds | | | | | |
| | Cooling Blower Control (Cool Off-Delay) | | - | Adjustable: 60, 90, 120, 150 seconds | | | | | |
| | Upstage W1 to W2 Delay | | - | Adjustable: OFF, 10 minutes, AUTO, 20 minutes | | | | | |
| Cabinet Size | Cabinet Type | | - | B | B | C | C | D | D |
| | Cabinet Size | Width | Inch | 17.5 | 17.5 | 21 | 21 | 24.5 | 24.5 |
| | Cabinet Size (DxH) | (DxH) | Inch | 28-3/4 X 33-3/4 | | | | | |
| Shipping Data | Packing Dimension (with pallet) | (WxDxH) | Inch | 20*31*40-3/8 | 20*31*40-3/8 | 23-9/16*31*40-3/8 | 23-9/16*31*40-3/8 | 27-1/16*31*40-3/8 | 27-1/16*31*40-3/8 |
| | Net Weight (unit only) | | lbs | 130.0 | 139.5 | 151.0 | 153.0 | 160.5 | 166.0 |
| | Gross Weight (shipping weight with pallet & packaging) | | lbs | 157.5 | 167.5 | 184.0 | 186.5 | 196.0 | 201.5 |

*All Bosch 97% AFUE Gas Furnaces come standard with Natural Gas to LP Conversion Kits. These kits are only applicable for units installed at elevations between 0 and 2,000 feet.

For LP applications above 2000 ft elevation, the manifold and inlet gas pressure requirements remain the same as stated in this manual, the only change is to the orifices used. Refer Tables 14 & 15 in Section 9.2 of the Installation, Operation, and Maintenance Manual to determine which orifice to use based on your application.



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**IDS Premium Connected + Cased Coil + 97% Furnace AHRI 210/240 System Performance Data**

| Nominal HP System Tonnage | Outdoor Unit Model | Indoor Unit Model | Furnace Model | Cooling Capacity (BTU/h) | | | Heating Capacity | | | CFM (High/Low) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Coils/Air Handlers | | Total (BTU/h) | EER2[2] | SEER2[1] | Hi (BTU/h) | HSPF2[3] | Low (BTU/h)[4] | | |
| **2T** | BOV*-36RTB-M20S | BMAC2430ABTA | BGH97M060B3A | 23800 | 11.7 | 18 | 24000 | 9 | 19600 | 750/550 | ❄ |
| | BOV*-36RTB-M20S | BMAC2430ABTA | BGH97M080B3A | 23800 | 11.7 | 18 | 24000 | 9 | 19600 | 750/550 | ❄ |
| | BOV*-36RTB-M20S | BMAC2430BBTA | BGH97M060B3A | 24000 | 12 | 18.5 | 24000 | 9 | 20000 | 750/550 | ❄ |
| | BOV*-36RTB-M20S | BMAC2430BBTA | BGH97M080B3A | 24000 | 12 | 18.5 | 24000 | 9 | 20000 | 750/550 | ❄ |
| **3T** | BOV*-36RTB-M20S | BMAC3036ABTA | BGH97M060B3A | 32800 | 10.6 | 17 | 34000 | 9 | 25000 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC3036ABTA | BGH97M080B3A | 32800 | 10.6 | 17 | 34000 | 9 | 25000 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC3036BBTA | BGH97M060B3A | 33600 | 11 | 17.5 | 34200 | 9 | 25000 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC3036BBTA | BGH97M080B3A | 33600 | 11 | 17.5 | 34200 | 9 | 25000 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC3036CBTA | BGH97M080C4A | 33600 | 11 | 17.5 | 34200 | 9 | 25000 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC3036CBTA | BGH97M100C5A | 33200 | 11 | 17.5 | 34200 | 9 | 25000 | 1100/1000 | ❄ |
| | BOV*-36RTB-M20S | BMAC4248BBTA | BGH97M080B3A | 33000 | 11 | 18 | 34200 | 9 | 25200 | 1100/800 | ❄ |
| | BOV*-36RTB-M20S | BMAC4248CBTA | BGH97M100C5A | 33000 | 11.7 | 18 | 34200 | 9 | 25600 | 1150/1000 | ❄ |
| **4T** | BOV*-60RTB-M20S | BMAC4248BBTA | BGH97M080B3A | 42500 | 11.7 | 16 | 43500 | 8.8 | 35000 | 1300/900 | ❄ |
| | BOV*-60RTB-M20S | BMAC4248CBTA | BGH97M080C4A | 42500 | 11.7 | 16 | 44500 | 8.8 | 35000 | 1300/900 | ❄ |
| | BOV*-60RTB-M20S | BMAC4248CBTA | BGH97M100C5A | 44000 | 11.7 | 16.5 | 46500 | 8.8 | 35600 | 1350/1150 | |
| | BOV*-60RTB-M20S | BMAC4248DBTA | BGH97M100D5A | 44500 | 11.7 | 16.5 | 47000 | 9 | 35600 | 1500/1150 | ❄ |
| | BOV*-60RTB-M20S | BMAC4248DBTA | BGH97M120D5A | 44500 | 11.7 | 17 | 47000 | 9 | 35600 | 1500/1150 | ❄ |
| **5T** | BOV*-60RTB-M20S | BMAC4860CBTA | BGH97M100C5A | 51500 | 11.4 | 17.5 | 53500 | 8.5 | 38000 | 1350/1150 | ❄ |
| | BOV*-60RTB-M20S | BMAC4860DBTA | BGH97M100D5A | 51500 | 11.7 | 18 | 54000 | 8.5 | 38500 | 1500/1150 | ❄ |
| | BOV*-60RTB-M20S | BMAC4860DBTA | BGH97M120D5A | 51500 | 11.7 | 18 | 54000 | 8.5 | 38500 | 1500/1150 | ❄ |

[1] Seasonal Energy Efficiency Ratio 2; Certified per AHRI 210/240

[2] Energy Efficiency Ratio 2; Certified per AHRI 210/240

[3] HSPF2 = Heating Seasonal Performance Factor; Certified per AHRI 210/240

[4] Jumper cut or dip switch off

Items in **bold** boxes meet the requirements for ENERGY STAR v6.1

❄ Items meet the requirements for ENERGY STAR V6.1 Cold Climate



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## Air Delivery

The duct system should be designed and sized according to accepted national standards such as those published by: Air Conditioning Contractors Association (ACCA), Sheet Metal and Air Conditioning Contractors National Association (SMACNA) or American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) or consult The Air Systems Design Guidelines reference tables available from your local distributor. The duct system should be sized to handle the required system design CFM at the design external static pressure. The furnace airflow rates are provided in the table below.

**Air Delivery - CFM (Without Filter) ****

| Furnace size | Return-air inlet | Speed | | External static pressure (in. WC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| **60B** | Bottom or Sides | H | CFM | 1339 | 1327 | 1338 | 1309 | 1321 | 1320 | 1342 | 1334 | 1316 | 1335 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 37 | 37.7 | 37.5 | 38.3 | 38.1 | 38.1 | 37.6 | 37.9 | 38.5 | 38.0 |
| | | Mid-H | CFM | 1124 | 1118 | 1102 | 1106 | 1096 | 1099 | 1102 | 1109 | 1089 | 1105 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 44.2 | 44.5 | 45 | 45.1 | 45.6 | 45.5 | 45.5 | 45.3 | 46 | 45.6 |
| | | Mid | CFM | 880 | 870 | 853 | 858 | 865 | 858 | 854 | 866 | 871 | 839 |
| | | | Temp Rise-1st stage °F | 36.7 | 37.2 | 37.9 | 37.8 | 37.6 | 38 | 38.2 | 37.8 | 37.6 | 39.1 |
| | | | Temp Rise-2nd stage °F | 56.3 | 57.0 | 58.1 | 58 | 57.5 | 58 | 58.4 | 57.7 | 57.4 | 59.7 |
| | | Mid-L | CFM | 779 | 768 | 762 | 756 | 740 | 753 | 757 | 747 | 785 | 766 |
| | | | Temp Rise-1st stage °F | 41.4 | 42.0 | 42.4 | 43 | 43.8 | 43.1 | 43.0 | 43.6 | 41.6 | 42.7 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Low | CFM | 553 | 586 | 543 | 569 | 552 | 562 | 584 | 572 | 575 | 567 |
| | | | Temp Rise-1st stage °F | 58.1 | 54.9 | 59 | 56.7 | 58.5 | 57.6 | 55.5 | 56.8 | 56.5 | 57.4 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **80B** | Bottom or Sides | H | CFM | 1230 | 1233 | 1222 | 1226 | 1214 | 1236 | 1255 | 1244 | 1249 | 1251 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 53.9 | 53.8 | 54.4 | 54.3 | 54.8 | 53.9 | 53.2 | 53.7 | 53.6 | 53.6 |
| | | Mid-H | CFM | 1052 | 1052 | 1041 | 1044 | 1037 | 1034 | 1048 | 1046 | 1024 | 1076 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 62.8 | 62.8 | 63.6 | 63.5 | 64 | 64.3 | 63.4 | 63.7 | 65.1 | 62.1 |
| | | Mid | CFM | 849 | 861 | 854 | 853 | 855 | 844 | 855 | 848 | 834 | 859 |
| | | | Temp Rise-1st stage °F | 50.6 | 50.0 | 50.4 | 50.5 | 50.5 | 51.2 | 50.6 | 51.2 | 52.1 | 50.7 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Mid-L | CFM | 754 | 771 | 765 | 764 | 728 | 761 | 782 | 739 | 758 | 758 |
| | | | Temp Rise-1st stage °F | 56.9 | 55.7 | 56.2 | 56.3 | 59.2 | 56.8 | 55.3 | 58.5 | 57.2 | 57.3 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Low | CFM | 569 | 554 | 571 | 572 | 568 | 572 | 598 | 594 | 572 | 548 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **80C** | Bottom or Sides | H | CFM | 1303 | 1301 | 1281 | 1291 | 1289 | 1291 | 1290 | 1295 | 1298 | 1253 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 50.8 | 50.9 | 51.8 | 51.5 | 51.6 | 51.6 | 51.7 | 51.6 | 51.6 | 53.5 |
| | | Mid-H | CFM | 1120 | 1127 | 1134 | 1130 | 1135 | 1138 | 1132 | 1143 | 1107 | 1112 |
| | | | Temp Rise-1st stage °F | 38.5 | 38.3 | 38.1 | 38.3 | 38.2 | 38.2 | 38.5 | 38.2 | 39.5 | 39.4 |
| | | | Temp Rise-2nd stage °F | 59.0 | 58.7 | 58.4 | 58.7 | 58.5 | 58.4 | 58.8 | 58.3 | 60.3 | 60.1 |
| | | Mid | CFM | 908 | 894 | 896 | 902 | 896 | 894 | 864 | 891 | 935 | 880 |
| | | | Temp Rise-1st stage °F | 47.3 | 48.1 | 48.0 | 47.8 | 48.2 | 48.4 | 50.1 | 48.7 | 46.5 | 49.5 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Mid-L | CFM | 818 | 819 | 825 | 800 | 813 | 803 | 831 | 838 | 791 | 802 |
| | | | Temp Rise-1st stage °F | 52.4 | 52.4 | 52.1 | 53.8 | 53.1 | 53.8 | 52.1 | 51.8 | 54.9 | 54.2 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Low | CFM | 577 | 628 | 605 | 624 | 615 | 601 | 628 | 573 | 590 | 588 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

* A filter is required for each return air inlet. This table shows the airflow performance without a filter. To determine airflow performance with a filter, if a 3/4 inch (19 mm) washable media filter is used, assume an additional 0.1 in. WC available external static pressure.

** The manufacturer default fan settings are based on model

-- Indicates unstable operating conditions.



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**Air Delivery - CFM (Without Filter) * ****

| Furnace size | Return-air inlet | Speed | | External static pressure (in. WC) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| **100C** | Bottom or Sides | H | CFM | 1752 | 1764 | 1768 | 1781 | 1774 | 1786 | 1762 | 1802 | 1792 | 1786 |
| | | | Temp Rise-1st stage °F | | | | | | | | | | |
| | | | Temp Rise-2nd stage °F | 47.5 | 47.3 | 47.3 | 47.0 | 47.3 | 47.0 | 47.7 | 46.8 | 47.2 | 47.4 |
| | | Mid-H | CFM | 1512 | 1506 | 1536 | 1523 | 1514 | 1509 | 1529 | 1551 | 1565 | 1532 |
| | | | Temp Rise-1st stage °F | 38.6 | 38.8 | 38.1 | 38.5 | 38.8 | 39 | 38.6 | 38.1 | 37.9 | 38.8 |
| | | | Temp Rise-2nd stage °F | 54.8 | 55.1 | 54.1 | 54.6 | 55.1 | 55.3 | 54.7 | 54.0 | 53.6 | 54.8 |
| | | Mid | CFM | 1354 | 1354 | 1362 | 1370 | 1357 | 1381 | 1389 | 1394 | 1416 | 1383 |
| | | | Temp Rise-1st stage °F | 42.9 | 43 | 42.8 | 42.6 | 43.1 | 42.4 | 42.3 | 42.2 | 41.7 | 42.7 |
| | | | Temp Rise-2nd stage °F | 61.1 | 61.1 | 60.8 | 60.6 | 61.2 | 60.3 | 60.0 | 59.9 | 59.0 | 60.5 |
| | | Mid-L | CFM | 1165 | 1165 | 1176 | 1164 | 1185 | 1190 | 1186 | 1205 | 1174 | 1199 |
| | | | Temp Rise-1st stage °F | 49.7 | 49.7 | 49.3 | 49.9 | 49.2 | 49.0 | 49.2 | 48.6 | 49.9 | 49.0 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Low | CFM | 994 | 1025 | 1018 | 1024 | 1032 | 1026 | 1035 | 988 | 1005 | 1041 |
| | | | Temp Rise-1st stage °F | 58.1 | 56.4 | 56.9 | 56.6 | 56.3 | 56.7 | 56.3 | 59 | 58.1 | 56.2 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **100D** | Bottom or Sides | H | CFM | 1926 | 1926 | 1931 | 1943 | 1936 | 1941 | 1960 | 1974 | 2015 | 2043 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 43.2 | 43.3 | 43.2 | 43.1 | 43.3 | 43.3 | 42.9 | 42.7 | 42.0 | 41.6 |
| | | Mid-H | CFM | 1746 | 1752 | 1749 | 1748 | 1749 | 1763 | 1771 | 1776 | 1794 | 1791 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 47.5 | 47.4 | 47.6 | 47.7 | 47.7 | 47.4 | 47.3 | 47.2 | 46.9 | 47.0 |
| | | Mid | CFM | 1488 | 1525 | 1525 | 1515 | 1528 | 1546 | 1501 | 1525 | 1546 | 1544 |
| | | | Temp Rise-1st stage °F | 39 | 38.2 | 38.2 | 38.6 | 38.3 | 37.9 | 39.1 | 38.6 | 38.2 | 38.3 |
| | | | Temp Rise-2nd stage °F | 55.6 | 54.3 | 54.4 | 54.8 | 54.4 | 53.9 | 55.5 | 54.7 | 54.1 | 54.2 |
| | | Mid-L | CFM | 1348 | 1374 | 1341 | 1383 | 1381 | 1385 | 1408 | 1404 | 1400 | 1401 |
| | | | Temp Rise-1st stage °F | 43.0 | 42.3 | 43.3 | 42.1 | 42.2 | 42.2 | 41.6 | 41.8 | 42.0 | 42.0 |
| | | | Temp Rise-2nd stage °F | 61.2 | 60.2 | 61.7 | 59.9 | 60.1 | 60 | 59.1 | 59.3 | 59.6 | 59.6 |
| | | Low | CFM | 1163 | 1186 | 1164 | 1167 | 1174 | 1178 | 1182 | 1129 | 1163 | 1172 |
| | | | Temp Rise-1st stage °F | 49.7 | 48.8 | 49.8 | 49.7 | 49.5 | 49.4 | 49.3 | 51.7 | 50.3 | 50 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **120D** | Bottom or Sides | H | CFM | 1926 | 1933 | 1915 | 1923 | 1916 | 1929 | 1971 | 1941 | 2036 | 1998 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 51.8 | 51.7 | 52.2 | 52.1 | 52.4 | 52.1 | 51.1 | 52.0 | 49.8 | 50.7 |
| | | Mid-H | CFM | 1721 | 1747 | 1716 | 1749 | 1760 | 1768 | 1778 | 1783 | 1747 | 1788 |
| | | | Temp Rise-1st stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | | Temp Rise-2nd stage °F | 57.8 | 57.0 | 58.1 | 57.1 | 56.8 | 56.6 | 56.4 | 56.3 | 57.5 | 56.4 |
| | | Mid | CFM | 1489 | 1497 | 1503 | 1504 | 1507 | 1488 | 1496 | 1518 | 1519 | 1568 |
| | | | Temp Rise-1st stage °F | 46.7 | 46.6 | 46.4 | 46.5 | 46.5 | 47.1 | 47.0 | 46.4 | 46.4 | 45.1 |
| | | | Temp Rise-2nd stage °F | 66.5 | 66.3 | 66.1 | 66.1 | 66.1 | 67.0 | 66.7 | 65.8 | 65.9 | 64 |
| | | Mid-L | CFM | 1384 | 1360 | 1365 | 1384 | 1382 | 1383 | 1379 | 1401 | 1421 | 1414 |
| | | | Temp Rise-1st stage °F | 50.2 | 51.1 | 51.0 | 50.4 | 50.6 | 50.6 | 50.8 | 50.1 | 49.5 | 49.9 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | | Low | CFM | 1165 | 1175 | 1162 | 1158 | 1158 | 1184 | 1186 | 1204 | 1201 | 1185 |
| | | | Temp Rise-1st stage °F | 59.5 | 59.0 | 59.8 | 60 | 60.1 | 58.9 | 58.9 | 58.1 | 58.4 | 59.2 |
| | | | Temp Rise-2nd stage °F | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

* A filter is required for each return air inlet. This table shows the airflow performance without a filter. To determine airflow performance with a filter, if a 3/4 inch (19 mm) washable media filter is used, assume an additional 0.1 in. WC available external static pressure.

** The manufacturer default fan settings are based on model

-- Indicates unstable operating conditions.

## Filters

Bosch does not supply filters or filter racks with furnace units. All filters must be field supplied according to the Manufacturer recommended high velocity filter sizes and specifications shown below.

| Furnace cabinet width | Filter size | | Filter type |
|---|---|---|---|
| | Side return | Bottom return | |
| 17-1/2 | 16X25 | 16X25 | High Velocity (600 FPM) |
| 21 | 16X25 | 20X25 | High Velocity (600 FPM) |
| 24.5 | 16X25 | 24X25 | High Velocity (600 FPM) |

*Dimension in inches*

## High Altitude Derating

In high altitude applications, a standard derate for altitude from National Fuel Gas Code ANSI Z223.1 of 4% per 1000 feet above sea level must be taken. Refer to the most recent version of ANSI Z223.1 for correct gas orifice based on your specific application. The orifices must be selected using the specifications listed in the table below. The furnace derate is 4% for each 1,000 feet above sea level. For Canada applications, regulation requires 10% derating between 2000-4500 ft. When an appliance is installed at elevations above 4500 ft, the certified high altitude input rating shall be reduced at the rate of 4% for each additional 1000 ft.

The table below is based upon a heating value of approximately 1,000 Btu/ft$^3$. In some areas the gas supplier may artificially derate the gas in an effort to compensate for the effects of altitude. If the gas is artificially derated, the appropriate orifice size must be determined based upon the BTU/ft$^3$ content of the derated gas and the altitude. Refer to the latest version of NFPA54/ANSI Z223.1 and information provided by the gas supplier to determine the proper orifice size.

**High Altitude Derate Orifice Size Chart (Natural and LP Gas*)**

| Input Rate KBTU/H | Number of burners | Elevation (Ft) 0-2000 | | Elevation (Ft) 2000-4000 | | Elevation (Ft) 4000-6000 | | Elevation (Ft) 6000-8000 | | Elevation (Ft) 8000-10000 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | NG** | LP | NG** | LP | NG** | LP | NG** | LP | NG** | LP |
| 60 | 3 | 45 | 55 | 47 | 56 | 48 | 57 | 49 | 58 | 50 | 59 |
| 80 | 4 | 45 | 55 | 47 | 56 | 48 | 57 | 49 | 58 | 50 | 59 |
| 100 | 5 | 45 | 55 | 47 | 56 | 48 | 57 | 49 | 58 | 50 | 59 |
| 120 | 6 | 45 | 55 | 47 | 56 | 48 | 57 | 49 | 58 | 50 | 59 |

* LP orifice based on 10 in. WC manifold pressure
** NG denotes natural gas

The input to the furnace must be checked AFTER reorificing.

Units installed with natural gas at altitudes up to 2000 ft. above sea level may be installed without any modifications. Units installed above 2000 ft. of elevation must use orifices as specified in the above table.

For Canada applications, regulation requires 10% derating between 2000-4500 ft. When an appliance is installed at elevations above 4500 ft, the certified high altitude input rating shall be reduced at the rate of 4% for each additional 1000 ft.



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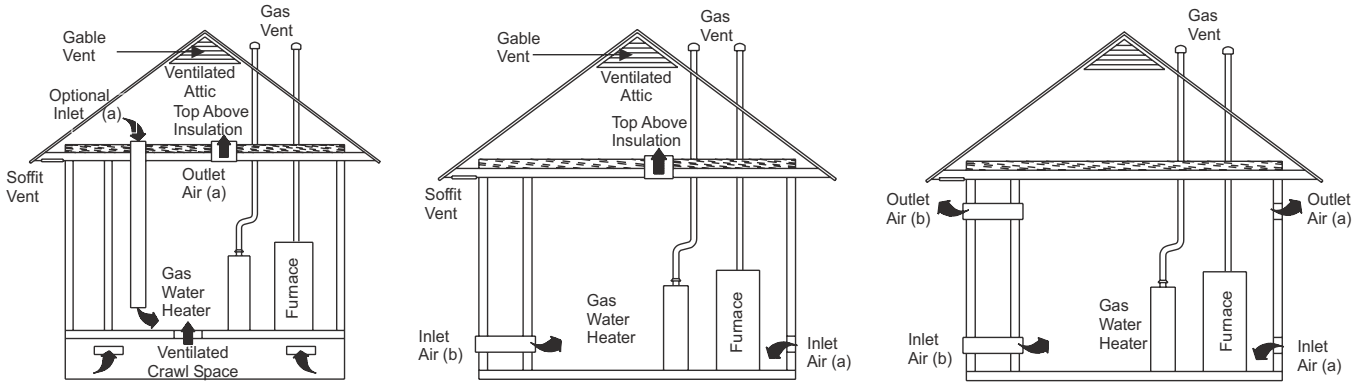
## Venting

This Category IV, dual certified (AHRI and ETL) direct vent furnace is designed for residential applications. It may be installed without modification to the condensate system in a basement, garage, equipment room, alcove, attic or any other indoor location where all required clearance to combustibles and other restrictions are met*. The combustion air and the venting system must be installed in accordance with Section 5.3, Air for Combustion and Ventilation, of the National Fuel Gas Code Z223.1/NFPA 54 (latest edition), or Sections 7.2, 7.3 or 7.4 of CSA B149.1, National Gas and Propane Codes (latest edition) or applicable provisions of the local building code and these instructions.

This furnace requires a special venting system. This furnace is for use with schedule-40 PVC, PVC-DWV, CPVC, or ABS-DWV pipe, and **must not be vented in common with other gas-fired appliances.** Construction through which vent/air intake pipes may be installed is maximum 24 inches (610 mm), minimum 3/4 inches (19 mm) thickness (including roofing materials). Refer to Section 8 "Vent System" of the Installation, Operation, and Maintenance Manual, for installation instructions related to venting.

* The condensate from this unit is acidic, adhere to all local and national codes when draining condensate. If proper procedures are not followed, this may lead to property damage.

## Outside and Ambient Combustion Air



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**Equivalent Pipe Length**

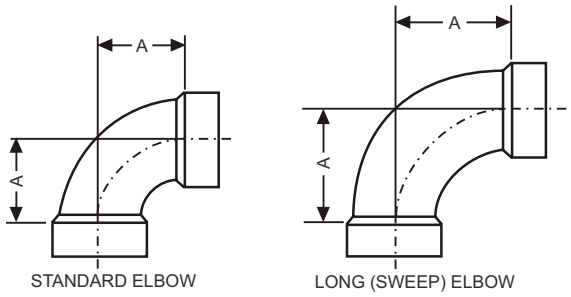
| Maximum Equivalent Pipe Length | | |
|---|---|---|
| Model Input kBTU/H (kW) | Pipe Size Inches (cm) | Maximum Equivalent Length Feet (m) |
| 60B (17.6) | 2 (5.1) | 65 (19.8) |
| 60B (17.6) | 3 (7.6) | 105 (32) |
| 80B (23.4) | 2 (5.1) | 35 (10.6) |
| 80B (23.4) | 3 (7.6) | 105 (32) |
| 80C (23.4) | 2 (5.1) | 18(5.4) |
| 80C (23.4) | 3 (7.6) | 105 (32) |
| 100C (29.3) | 2 (5.1) | 18 (5.4) |
| 100C (29.3) | 3 (7.6) | 105 (32) |
| 100D (29.3) | 2 (5.1) | 35 (10.6) |
| 100D (29.3) | 3 (7.6) | 105 (32) |
| 120 (35.1) | 2 (5.1) | 18 (5.4) |
| 120 (35.1) | 3 (7.6) | 105 (32) |

The following rules must also be followed:

1. Long radius (sweep) elbows are recommended. Standard elbows may be used, but since they have a longer equivalent length, they will reduce the total length of pipe that will be allowed. Short radius (plumbing vent) elbows are not allowed. The standard dimensions of the acceptable elbows are shown below.
2. The maximum equivalent length listed in Table 5, "Maximum Equivalent Pipe Length" is for the vent piping and the air intake piping separately. For example, if the table allows 60 equivalent feet for a particular model, then the vent can have 60 equivalent feet of pipe, AND the combustion air intake can have another 60 equivalent feet of pipe.
3. Three vent terminal elbows (two for the vent and one for the combustion air intake) are already accounted for and need not be included in the equivalent length calculation.
4. All combustion air and vent pipes and fittings must conform to American National Standards Institute (ANSI) and American Society for Testing and Materials (ASTM) standards, D1785 (Schedule 40 PVC), F441 (Schedule 40 CPVC), D2665 (PVC-DWV), F891 (PVC-DWV Cellular Core), D2661 (ABS-DWV) or D1527 (Schedule 40 ABS). Pipe cement and primer must conform to ASTM Standard D2564 (PVC), F493 (CPVC) or D2235 (ABS). If ABS pipe is to be used, any joint where ABS pipe is joined to PVC pipe must be glued with cement that is approved for use with BOTH materials. As an alternate, use all purpose cement, to bond ABS, PVC, or CPVC pipe when using fittings and pipe made of the same materials. Metallic materials must not be used for venting or air intake.
5. If a flexible connector is used in the vent system, it must be made of a material that is resistant to acidic exposure and to at least 225° F temperature. Flexible connectors are also allowed in the combustion air pipe.
6. All models are supplied with 2" vent connections. When the pipe must be increased to 3" diameter, the transition from 2" to 3" must be done as close to the furnace as possible. For upflow models, the transition from 2" to 3" should be done immediately above the furnace. For downflow or horizontal models, the transition from 2" to 3" pipe should be done immediately after exiting the furnace.
7. In Canada, vents shall be certified to ULC S636, Standard for Type BH Gas Venting Systems. IPEX System 636 PVC is certified to this standard.
8. In Canada, the first three feet (900 mm) of the vent must be readily accessible for inspection.
9. Minimum vent length for all models is 5 feet.

The equivalent length of the vent system is the total length of straight pipe PLUS the equivalent length of all of the elbows.

**Elbow Dimensions**




| Elbow Dimensions | |
|---|---|
| Elbow | "A" Dimension |
| 2" Standard | 2-5/16" |
| 3" Standard | 3-1/16" |
| 2" Sweep | 3-1/4" |
| 3" Sweep | 4-1/16" |

| Equivalent Length of Fittings | |
|---|---|
| Fitting | Equivalent Length |
| 2" 90º sweep elbow | 5 feet of 2" pipe |
| 2" 45º sweep elbow | 2-1/2 feet of 2" pipe |
| 2" 90º standard elbow | 10 feet of 2" pipe |
| 2" 45º standard elbow | 5 feet of 2" pipe |
| 3" 90º sweep elbow | 5 feet of 3" pipe |
| 3" 45º sweep elbow | 2-1/2 feet of 3" pipe |
| 3" 90º standard elbow | 10 feet of 3" pipe |
| 3" 45º standard elbow | 5 feet of 3" pipe |
| 2" corrugated connector | 10 feet of 2" pipe |
| 3" corrugated connector | 10 feet of 3" pipe |

| Combustion Air Intake & Vent Connection Size (All Models) | |
|---|---|
| Connection Type | Size - Inches (cm) |
| Intake Pipe | 2" (5.1) |
| Vent Pipe | 2" (5.1) |

Furnace vent pipe connections are sized for 2" (5.1 cm) pipe. Any pipe size change must be made outside the furnace cabinet in a vertical pipe section to allow proper drainage of condensate. An offset using two 45º (degree) elbows will be required for plenum clearance when the vent is increased to 3" (7.6 cm).

**Example:**

A 60,000 BTUH furnace requires 32 feet of pipe and four 90º elbows. Using 2" pipe and standard elbows, the total equivalent length will be:

| | |
|---|---|
| 32 feet of 2" pipe = | 32 equivalent feet |
| 4 - 90º standard 2" elbows = | (4 x10) = 40 equivalent feet |
| Total = | 72 equivalent feet of 2" pipe |

This exceeds the 65 foot maximum equivalent length of 2" pipe allowed for that model and is thus not acceptable.

By using sweep elbows, the total equivalent length will be:

| | |
|---|---|
| 32 feet of 2" pipe = | 32 equivalent feet |
| 4 - 90º sweep 2" elbows = | (4x5) = 20 equivalent feet |
| Total = | 52 equivalent feet of 2" pipe |

This is less than the 65 foot maximum equivalent length of 2" pipe allowed for that model and is thus acceptable.

Alternatively, using 3" pipe and standard elbows, the total equivalent length will be:

| | |
|---|---|
| 32 feet of 3" pipe = | 32 equivalent feet |
| 4 - 90º standard 3" elbows = | (4x10))= 40 equivalent feet |
| Total = | 72 equivalent feet of 3" pipe |

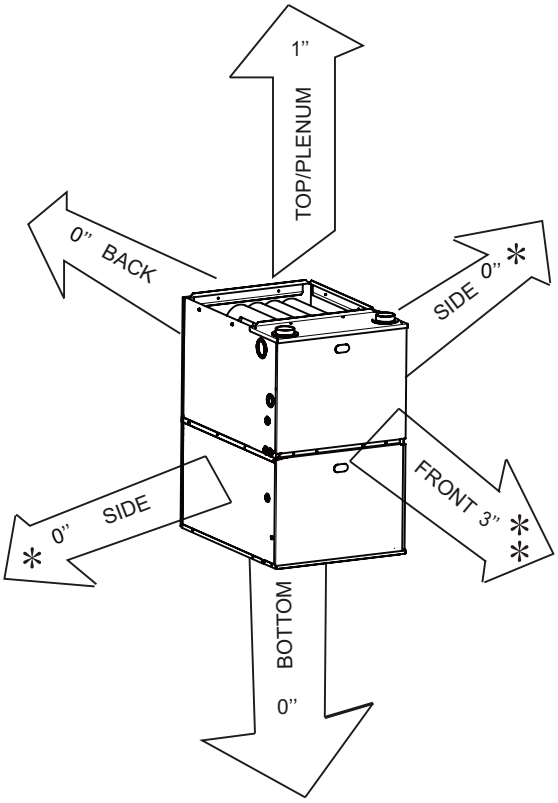
This is less than the 105 foot maximum equivalent length of 3" pipe allowed for that model and is thus acceptable.

## Required Clearance to Combustibles

This furnace may be installed on combustible flooring in an alcove or closet at minimum clearance as indicated below.

## Minimum clearance from combustible construction

Clearance arrows do not change with furnace orientation




| SIDES* | FRONT | BACK | TOP (PLENUM) |
|---|---|---|---|
| 0" | 3" | 0" | 1" |

* When the unit is installed in the horizontal orientation, there must be 7" clearance in order to install the externally mounted drain trap.

** If installed in an alcove or closet, 24" is required for service and maintenance.

**Horizontal installation in attic or crawl space**

* Indicates supply or return sides when furnace is in the horizontal position. Line contact only permissible between lines formed by intersections of the side and back of the furnace cabinet and building joists, studs or frame.

Horizontal applications require a solid, supportive structure for installation (refer to the Installation, Operation & Maintenance Manual Section 7.2 "Horizontal Installation").



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## Electrical & Controls

**Ratings & Physical / Electrical Data**

| Input | | Output | | Nominal Airflow | MAX. Unit Amps | AFUE | Air Temp. Rise | | Max.Over-Current Protection | Min. Wire Size (AWG) @ 75 ft | Max. Outlet Air Temp | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MBH | kW | MBH | kW | CFM | | | °F | °C | Amps | | °F | °C |
| 60B | 17.6 | 57 | 16.4 | 1200 | 8 | 97.1 | 30-60 | 17-33 | 15 | 14 | 160 | 71 |
| 80B | 23.4 | 76 | 22.3 | 1200 | 8 | 97.1 | 35-65 | 19-36 | 15 | 14 | 165 | 74 |
| 80C | 23.4 | 76 | 22.3 | 1600 | 8 | 97.1 | 35-65 | 19-36 | 15 | 14 | 165 | 74 |
| 100C | 29.3 | 95 | 27.8 | 2000 | 14 | 97.1 | 35-65 | 19-36 | 20 | 12 | 165 | 74 |
| 100D | 23.4 | 95 | 27.8 | 2000 | 14 | 97.1 | 35-65 | 19-36 | 20 | 12 | 165 | 74 |
| 120D | 35.2 | 106.5 | 33.7 | 2000 | 14 | 97.1 | 40-70 | 22-39 | 20 | 12 | 170 | 77 |

Annual Fuel Utilization Efficiency (AFUE) numbers are determined in accordance with DOE Test procedures.

National Electrical Code (NFPA-70-latest edition) and all local codes.

The furnace shall be installed so that the electrical components are protected from water.

## Sequence of Operations

**1. Heating mode**

In a typical system, a call for first stage heat is initiated by closing the W1 thermostat contacts. The inducer blower is energized at high speed and the control waits for the low pressure switch contacts to close. The humidifier (optional) is also energized at this time. Once the low pressure switch contacts close, a 15-second pre-purge is initiated. Then the inducer changes to low speed and the 115V ignitor is powered. At the end of the ignitor warm-up time, the first stage of the two-stage manifold gas valve is energized (low fire). Flame must be detected within 4 seconds. If flame is detected, the 30-second HEAT delay-to-fan-on period begins. After the delay-to-fan-on period ends, the control will energize the circulator fan at low heat speed. The electronic air cleaner (optional) will also energize at this time. For a two-stage thermostat, a call for second stage heat (W1 and W2) after a call for first stage heat will energize the inducer at high speed and the circulator at high heat speed. The second stage pressure switch contacts will close and energize the second stage gas valve (high fire). For a single-stage thermostat, when a call for heat occurs (W1), a 10, 20 minute or auto mode heat staging timer will be activated (timing is selectable with option switches S1-1 and S1-2 positions). Following this delay, the second stage heat is energized as above.

When the second stage of the thermostat is satisfied, the inducer motor is reduced to low speed and the second stage gas valve is de-energized. On the control, the circulator will remain at high heat speed for 30 seconds following the opening of the second stage gas valve and then is reduced to low heat speed. When the first stage of the thermostat is satisfied, the first stage gas valve is de-energized and the HEAT delay-to-fan-off begins timing. The inducer will postpurge for an additional 15 seconds, then the inducer and humidifier will turn off. Upon completion of the HEAT delay-to-fan-off period, the circulator is turned off. The electronic air cleaner on the control is also de-energized at this time.

If flame is not detected during the trial-for-ignition period or if the flame is detected/sensed and then lost before completion of 10 seconds of establishment, the gas valve is de-energized, the ignitor is turned off, and the control goes into the “retry” sequence. The “retry” sequence provides a 60-second wait with the inducer interpurge following an unsuccessful ignition attempt (flame not detected). After this wait, the ignition attempt is restarted. Two retries will be attempted before the control goes into system lockout. If flame is established for more than 10 seconds after ignition, the controller will clear the ignition attempt (or retry) counter. If flame is lost after 10 seconds, the control will restart the ignition sequence.

A momentary loss of gas supply, flame blowout, or a shorted or open condition in the flame probe circuit will be sensed within 2 seconds. The gas valve will de-energize and the control will restart the ignition sequence. Recycles will begin and the burner will operate normally if the gas supply returns, or the fault condition is corrected, before the last ignition attempt. Otherwise, the control will go into system lockout. If the control has gone into system lockout, it may be possible to reset the control by a momentary power interruption of 10 seconds or longer.



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**Timing specifications**

| Event | Definition | Time |
|---|---|---|
| Pre-purge Time | The period of time intended to allow for the dissipation of any unburned gas or residual products of combustion at the beginning of a furnace operating cycle prior to initiating ignition | 15 seconds |
| Ignitor Warm-up Time | The length of time allowed for the ingiter to heat up prior to the initiation of gas flow | 17 seconds |
| Trial for ignition Period (TFI) | The period of time between initiation of gas flow and the action to shut off the gas flow in the event of failure to establish proof of the supervised ignition source or the supervised main burner flame | 4 seconds |
| Ignition Activation Period (IAP) | The period of time between energizing the main gas valve and deactivation of the igniter prior to the end of TFI | 3 seconds |
| Retries | The additional attempts within the same thermostat cycle for ignition when the supervised main burner flame is not proven within the first TFI | 2 times |
| Valve Sequence period | Valve sequence period = 4 seconds (TFI) x (1 initial try + 2 retries) | 12 seconds |
| Inter-purge | The period of time intended to allow for the dissipation of any unburned gas or residual products of combustion between the failed TFI and the retry period | 60 seconds |
| Post-purge Time | The period of time intended to allow for the dissipation of any unburned gas or residual products of combustion at the end of a furnace burner operating cycle. Post-purge begins at the loss of flame sense | 15 seconds |
| Lock-Out Time | ANSI standard rated module timing | 300 seconds |
| Heat Delay- To-Fan-On | The period of time between proof of the supervised main burner flame and the activation of the blower motor at heating speed | 30 seconds |
| Heat Delay- To-Fan-Off* | The period of time between the loss of a call for heat and the deactivation of the blower motor at heating speed | *90/120/150/180 seconds |
| Cool Delay- To-Fan-On | The period of time after a thermostat demand for cool before energizing the circulator blower motor at cooling speed | 1 second |
| Cool Delay- To-Fan-Off | The period of time between the loss of a call of cool and the deactivation of the blower motor at cooling speed | *60/90/120/150 seconds |
| Automatic Reset Time | After one (1) hour of internal or external lockout, the control will automatically reset itself and go into an auto restart purge for 60 seconds | 60 minutes |

* These times will vary depending on option switch position.

**Optional Switch Positions**

| W2 Delay | | |
|---|---|---|
| DIP Switch | | NOMINAL (MINUTES) |
| S1-1 | S1-2 | |
| OFF | OFF | OFF* |
| ON | OFF | 10 |
| OFF | ON | AUTO |
| ON | ON | 20 |

* The factory default settings

| Heat Off Delay | | |
|---|---|---|
| DIP Switch | | NOMINAL (SECONDS) |
| S2-1 | S2-2 | |
| OFF | OFF | 90* |
| ON | OFF | 120 |
| OFF | ON | 150 |
| ON | ON | 180 |

* The factory default settings

| Cool Off Delay | | |
|---|---|---|
| DIP Switch (SW) | | NOMINAL (SECONDS) |
| S2-3 | S2-4 | |
| OFF | OFF | 60* |
| ON | OFF | 90 |
| OFF | ON | 120 |
| ON | ON | 150 |

* The factory default settings

When using a single stage thermostat, second stage delay is based on the setting of switch S1-1& S1-2 dip switches.



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