N80ESU
80% AFUE, Ultra-Low NOx, Multi-Speed ECM Single Stage Gas Furnace

Arcoaire®
Air Conditioning & Heating

Product Specifications

A200116

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 .

ISO 9001 Quality

A200115

⚠ WARNING

This furnace is not designed for use in mobile homes, trailers, or recreational vehicles. Such use could result in property damage and/or death.

EASIER TO SELL

- 80% AFUE
- Ultra-low NOx emissions - 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.
- Four-position furnace: Upflow, Horizontal Right, Horizontal Left, Downflow (6 different vent options)
- Versatile venting for tight-fit applications
- Category I venting
- 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

TOUGHER

- Fixed-speeds, constant torque ECM blower motor
- Stainless steel, tubular heat exchanger
- Pilot free, hot surface ignition
- High temperature limit control designed to prevent overheating
- Blocked vent switch

QUIETER

- Noise reduction combustion system, insulated blower compartment
- Variable speed inducer motor

EASIER TO INSTALL AND SERVICE

- Approved for installations up to 5,400 feet
- 33 1/4" (843.9mm) high, for ease of installation
- Quarter turn knobs for easy door removal and secure attachment
- Factory shipped for natural gas, not convertible to propane
- Flexible installation: Upflow, Downflow, Horizontal
- Two position vent elbow capability
- Common venting with other Category I appliances
- Self diagnostics
- Slide out blower assembly

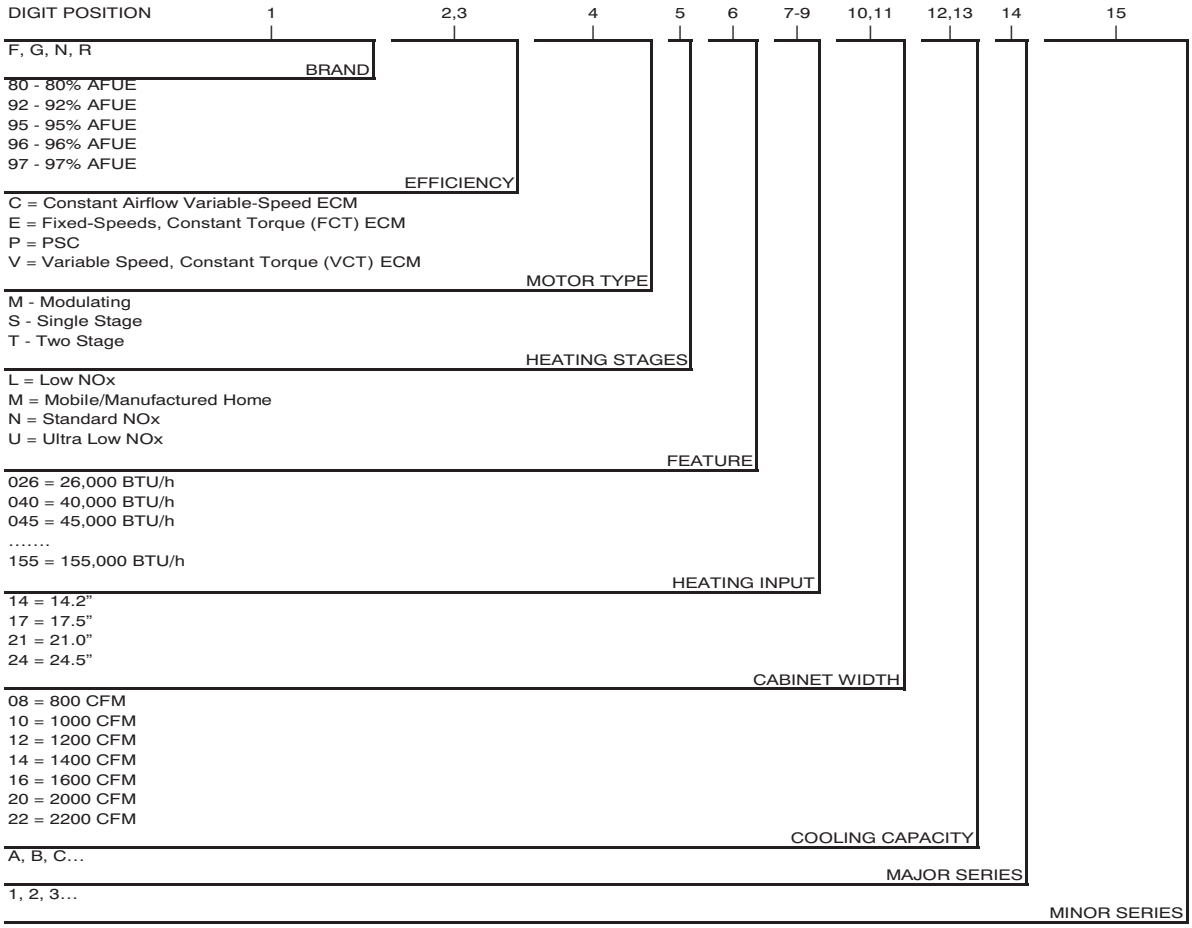
LIMITED WARRANTY *

- 20 year heat exchanger limited warranty
- 10 year parts limited warranty with timely registration
- 5 year parts limited warranty if not registered within 90 days of original installation

  * For residential applications only. See warranty certificate for complete details and restrictions, including warranty coverage for other applications.

Model Number	Input (BTUH)	Efficiency AFUE	Cooling Capacity CFM range @ .5 in. w.c. (125 Pa)	Dimensions H x W x D Inches (Millimeters)	Shipping Wt. Lbs (Kg)
N80ESU0401712	40,000	80%	250 - 1370	33-1/4 x 17-1/2 x 29 (844 x 445 x 737)	118 (54)
N80ESU0601716	60,000	80%	940 - 1545	33-1/4 x 17-1/2 x 29 (844 x 445 x 737)	126 (57)
N80ESU0802120	80,000	80%	815 - 1990	33-1/4 x 21 x 29 (844 x 533 x 737)	140 (64)
N80ESU1002120	100,000	80%	950 - 2005	33-1/4 x 21 x 29 (844 x 533 x 737)	150 (68)

MODEL NUMBER NOMENCLATURE



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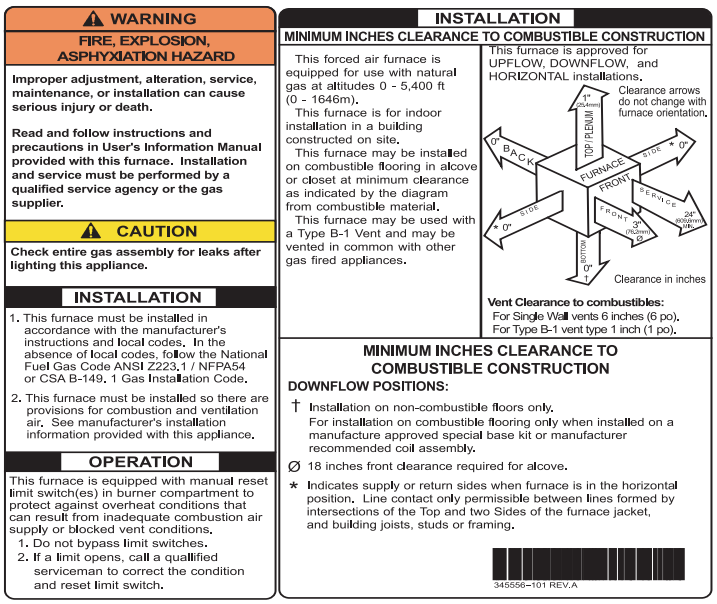
ECM - Electronically Commutated Motor

NOTE: Standard input rate for 80% is approximately 22.5K per heat exchanger.
Standard input for 90%+ is approximately 20K per heat exchanger.
Units can be developed with slight under rate or over rate to fine tune heating capacity.

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS FOR ALL UNITS



WARNING

FIRE, EXPLOSION, ASPHYXIATION HAZARD

Improper adjustment, alteration, service, maintenance, or installation can cause serious injury or death.

Read and follow instructions and precautions in User's Information Manual provided with this furnace. Installation and service must be performed by a qualified service agency or the gas supplier.

CAUTION

Check entire gas assembly for leaks after lighting this appliance.

INSTALLATION

1. This furnace must be installed in accordance with the manufacturer's instructions and local codes. In the absence of local codes, follow the National Fuel Gas Code ANSI Z223.1 / NFPA54 or CSA B-149. 1 Gas Installation Code.
2. This furnace must be installed so there are provisions for combustion and ventilation air. See manufacturer's installation information provided with this appliance.

OPERATION

This furnace is equipped with manual reset limit switch(es) in burner compartment to protect against overheat conditions that can result from inadequate combustion air supply or blocked vent conditions.

1. Do not bypass limit switches.
2. If a limit opens, call a qualified serviceman to correct the condition and reset limit switch.

INSTALLATION

MINIMUM INCHES CLEARANCE TO COMBUSTIBLE CONSTRUCTION

This forced air furnace is equipped for use with natural gas at altitudes 0 - 5,400 ft (0 - 1646m).

This furnace is for indoor installation in a building constructed on site.

This furnace may be installed on combustible flooring in alcove or closet at minimum clearance as indicated by the diagram from combustible material.

This furnace may be used with a Type B-1 Vent and may be vented in common with other gas fired appliances.

This furnace is approved for UPFLOW, DOWNFLOW, and HORIZONTAL installations.

Vent Clearance to combustibles:
For Single Wall vents 6 inches (6 po).
For Type B-1 vent type 1 inch (1 po).

MINIMUM INCHES CLEARANCE TO COMBUSTIBLE CONSTRUCTION

DOWNFLOW POSITIONS:

† Installation on non-combustible floors only.
For installation on combustible flooring only when installed on a manufacture approved special base kit or manufacturer recommended coil assembly.

Ø 18 inches front clearance required for alcove.

* Indicates supply or return sides when furnace is in the horizontal position. Line contact only permissible between lines formed by intersections of the Top and two Sides of the furnace jacket, and building joists, studs or framing.

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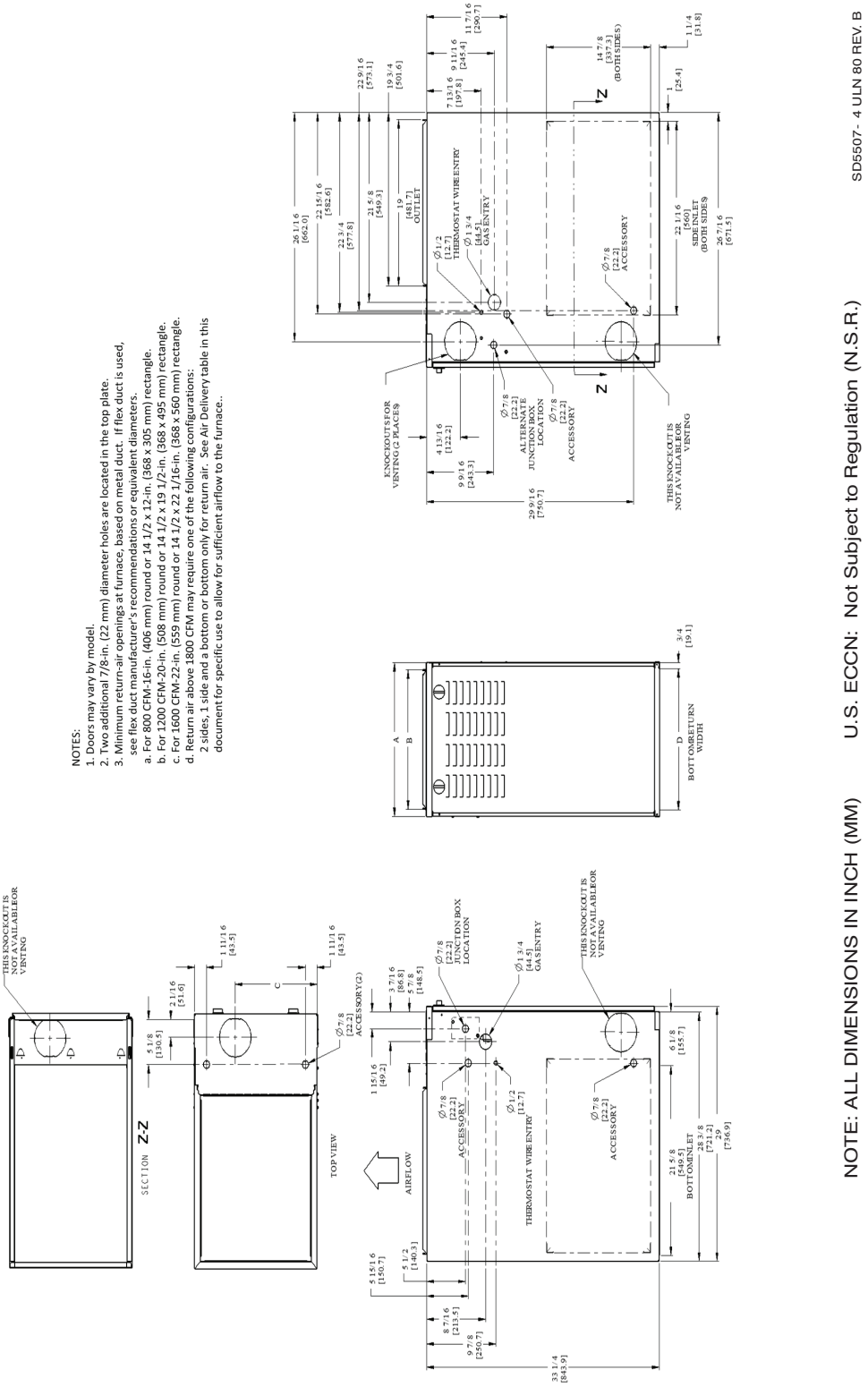
UNIT DIMENSIONS



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FURNACE SIZE	A CABINET WIDTH IN (MM)	B OUTLET WIDTH IN (MM)	C TOP OUTLET IN (MM)	D BOTTOM INLET WIDTH IN (MM)	VENT CONNECTION SIZE IN. (MM)	SHIP WT LB (KG)
N80ESU0401712	17-1/2 (445)	15-7/8 (403)	11-9/16 (294)	16 (406)	4 (102)	118 (54)
N80ESU0601716	17-1/2 (445)	15-7/8 (403)	11-9/16 (294)	16 (406)	4 (102)	126 (57)
N80ESU0802120	21 (533)	19-3/8 (492)	13-5/16 (338)	19-1/2 (495)	4 (102)	140 (64)
N80ESU1002120	21 (533)	19-3/8 (492)	13-5/16 (338)	19-1/2 (495)	4 (102)	150 (68)

Manufacturer reserves the right to change, at any time, specifications and designs without notice and without obligations.

PRODUCT SPECIFICATIONS

FURNACE SIZE		0401712	0601716	0802120	1002120
RATINGS AND PERFORMANCE					
Input Btuh*		40,000	60,000	80,000	100,000
Output Capacity (Btuh)†		31,000	48,000	64,000	81,000
AFUE†		80.0	80.0	80.0	80.0
Certified Temperature Rise Range - °F (°C)		25 (14)- 55 (30)	30 (16) - 60 (33)	25 (14)- 55 (30)	25 (14)- 55 (30)
External Static Pressure‡	Heating	.10	.12	.15	.20
	Cooling	.50	.50	.50	.50
Airflow Delivery @ ESP Listed Above (CFM)	Heating	695	1020	1330	1885
	Cooling	250-1370	940-1545	815-1990	950-2005
ELECTRICAL					
Unit Volts-Hertz-Phase		115-60-1	115-60-1		115-60-1
Operating Voltage Range	Min-Max	104-127	104-127		104-127
Maximum Unit Amps		8.2	10.6	13.3	13.3
Unit Ampacity		10.9	13.9	17.3	17.3
Maximum Wire Length - Measure one way in Ft (M)		33 (10)	26 (8)	33 (10)	33 (10)
Minimum Wire Size		14	14	12	12
Maximum Fuse or Ckt Bkr Size (Amps)**		15	15	20	20
Transformer (24v)		40 VA			
External Control Power Available	Heating	12 VA			
	Cooling	35 VA			
Air Conditioning Blower Relay		Standard			
CONTROLS					
Limit Control		SPST			
Heating Blower Control		Solid-State Time Operation			
Gas Connection Size		1/2-in. NPT			
Gas Control					
Gas Valve (Redundant)	Mfr.	White Rodgers			
	Min. inlet pressure (In. W.C.)	3.5 Natural Gas			
	Max. inlet pressure (In. W.C.)	13.6 Natural Gas			
Ignition Device		Hot Surface Igniter			
Factory-installed orifice		3.35mm	#18	#10	#6
BLOWER DATA					
Direct-Drive Motor HP		1/2	3/4	1	1
Motor Full Load Amps		6.40	8.8	11.5	11.50
Nominal RPM (Speeds)		1050 (5)	1050 (5)	1050 (5)	1050 (5)
Blower Wheel Diameter x Width - In. (mm)		11 (279) x 8 (203)	11 (279) x 8 (203)	11 (279) x 11 (279)	11 (279) x 11 (279)

*. Gas input ratings are certified for elevations to 5,400 ft. (1646 M). In USA, for elevations above 2,000 ft. (610 M), reduce ratings 2 percent for each 1,000 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.

‡. DOE Minimum External Static Pressure

**. Time-delay type is recommended.

ICS - Isolated Combustion System

AIR DELIVERY

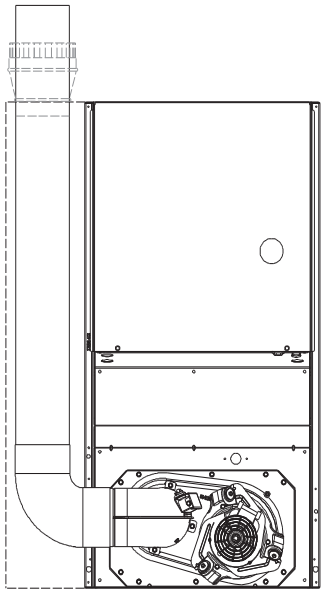
AIR DELIVERY - CFM (with filter)*												
Furnace	Wire Lead Color[2]	Function	Airflow Delivery @ Various External Static Pressures									
			External Static Pressure (IN. W.C.)									
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0401712	Gray	Cooling. Do not use for heating	1535	1495	1455	1415	1370	1320	1280	1235	1190	1145
	Yellow	Alt Cooling or alt Heating	1100	1055	1005	955	905	855	800	740	680	625
	Orange	Heating or alt cooling	695	645	585	510	450	390	325	270	215	155
	Blue	Alt Cooling or alt Heating	935	885	830	775	720	655	595	540	490	430
	Red	Alt Cooling or alt Heating	570	455	380	310	250	180	110	-	-	-
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0601716	Gray	Cooling. Do not use for heating	1720	1680	1635	1585	1545	1505	1455	1405	1355	1305
	Yellow	Alt Cooling or alt Heating	1470	1425	1385	1335	1290	1245	1200	1160	1110	1060
	Orange	Alt Cooling or alt Heating	1305	1255	1215	1160	1115	1070	1025	975	925	870
	Blue	Heating or alt cooling	1040	940	890	835	790	740	675	620	565	525
	Red	Alt Cooling or alt Heating	1135	1090	1035	985	940	895	845	790	730	675
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0802120	Gray	Cooling. Do not use for heating	2185	2135	2085	2035	1990	1935	1880	1825	1770	1715
	Yellow	Alt Cooling or alt Heating	1885	1830	1780	1730	1675	1625	1575	1520	1470	1420
	Orange	Alt Cooling or alt Heating	1565	1500	1440	1385	1330	1275	1220	1170	1115	1055
	Blue	Heating or alt cooling	1365	1295	1230	1165	1100	1045	985	925	845	780
	Red	Alt Heating or alt cooling	1205	1045	965	895	815	745	650	595	540	480
			0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
1002120	Gray	Cooling. Do not use for heating	2230	2180	2120	2060	2005	1945	1880	1815	1755	1700
	Blue	Heating or alt cooling	1945	1885	1830	1770	1715	1650	1585	1525	1465	1405
	Yellow	Alt Cooling or alt Heating	1835	1775	1720	1655	1595	1530	1470	1410	1350	1285
	Orange	Alt cooling or alt Heating	1535	1470	1395	1325	1265	1205	1140	1080	1015	955
	Red	Alt cooling. Do not use for heating	1095	1060	1020	985	950	915	880	845	805	770

NOTE:

1. A filter is required for each return-air inlet. Airflow performance includes a 3/4 in. (19 mm) washable filter media such as contained in factory-authorized accessory filter rack. See accessory list. To determine airflow performance without this filter, assume an additional 0.1 in. W.C. available external static pressure.
2. ADJUST THE BLOWER SPEED TAPS AS NECESSARY FOR THE PROPER AIR TEMPERATURE RISE FOR EACH INSTALLATION.

-- Indicates unstable operating conditions.

VENTING CONFIGURATIONS



SEE NOTES: 1,2,4,5,6,7,8,9

Downflow Vent Configurations

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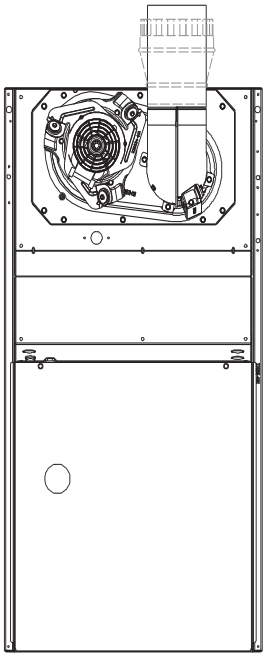
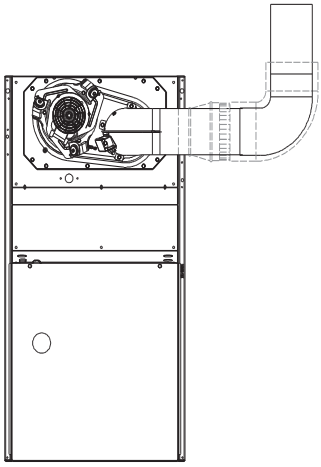


SEE NOTES: 1,2,4,7,8,9

A02058

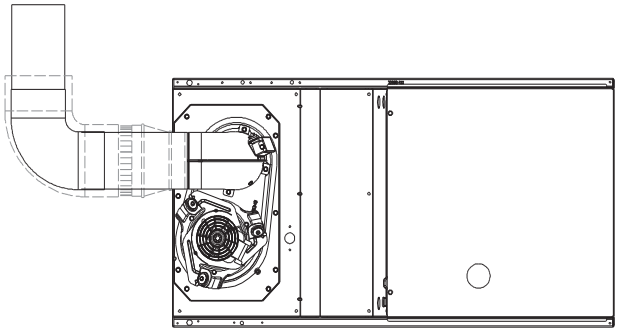
Upflow Vent Configurations



SEE NOTES: 1,2,3,4,7,8,9

A02059

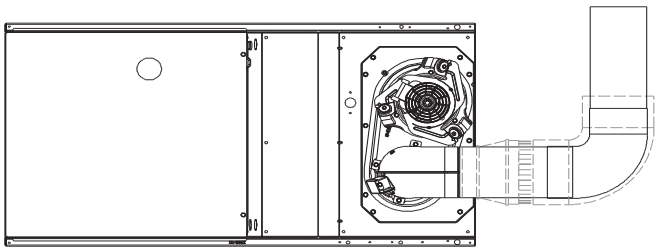
Upflow Vent Configurations



SEE NOTES: 1,2,4,7,8,9

A02064

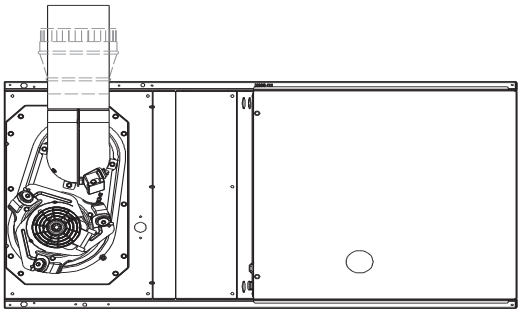
Horizontal Left Vent Configurations



SEE NOTES: 1,2,4,7,8,9

A02069

Horizontal Right Vent Configurations



SEE NOTES: 1,2,4,5,7,8,9

A02066

Horizontal Left Vent Configurations

Venting Notes

1. For common vent, vent connector sizing and vent material: United States-use the NFGC.
2. Immediately increase to 5 inch (127 mm) or 6-inch (152 mm) vent connector outside furnace casing when 5 inch (127 mm) vent connector is required, refer to Note 1 above.
3. Side outlet vent for upflow and downflow installations must use Type B vent immediately after exiting the furnace, except when Downflow Vent Guard Kit, is used in the downflow position.
4. Type-B vent where required, refer to Note 1 above.
5. 4 inch single-wall (26 ga. min.) vent must be used inside furnace casing and when the Downflow Vent Guard Kit is used external to the furnace.
6. Accessory Downflow Vent Guard Kit, required in downflow installations with lower vent configuration.
7. Secure vent connector to furnace elbow with (2) corrosion-resistant sheet metal screws, spaced approximately 180° apart.
8. Secure all other single wall vent connector joints with (3) corrosion resistant screws spaced approximately 120° apart.
9. Secure Type-B vent connectors per vent connector manufacturer's recommendations.

ACCESSORIES

PART NUMBER	DESCRIPTION	0401712	0601716	0802120	1002120
FHG1625-2*	Bottom Filter Rack, 17 inch	X	X	-	-
FHG2025-2*	Bottom Filter Rack, 21 inch	-	-	X	X
325531-402*	Washable filter, 3/4 inch 16 X 25	X	X	-	-
325531-403*	Washable filter, 3/4 inch 21 X 25	-	-	X	X
NAHA01701RA	Return Air Kit, 17" Wide	X	X	-	-
NAHA02101RA	Return Air Kit, 21" Wide	-	-	X	X
NAHB00101CA	Coil Adapter Kit	X	X	X	X
NAHB00201CA		X	X	X	X
NAHB00301CA		X	X	X	X
NAHA01101SB	Combustible Floor Base (Not required when evaporator coil case is used for downflow)	X	X	X	X
NAHB00301VC	Downflow Vent Guard (Not required when vent is routed through cabinet)	X	X	X	X

*. Purchased through FAST Parts
X = Accessory available

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