

## N95MSU

Up to 95% AFUE, Single-Stage, Upflow/Horizontal,  
Ultra Low NOx Emissions, Multi 18-Speed ECM,  
Condensing Gas Furnace



## Product Data



Representative drawing only. Some product models may vary.

A200105

### ! 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 or outdoors. This furnace is not designed for use in manufactured (Mobile) homes.

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



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](http://www.ahridirectory.org).



ISO 9001  
Quality

A200326

### EASIER TO SELL

- Multi 18-speed, constant torque (MCT) ECM blower motor
- Enhanced diagnostics with easy to read 3 digit display for faults and status
- Up to 95% AFUE
- Approved for installations up to 5,400 ft.
- Supports two-stage cooling units
- Insulated heat exchanger and blower compartment
- 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

### TOUGHER

- Stainless steel tubular heat exchanger
- Stainless steel secondary heat exchanger
- Enclosed pre-mix burner with variable speed inducer
- Adjustable heating blower OFF delay
- Factory set blower ON delay
- High temperature limit control designed to prevent overheating
- Pilot free, hot surface igniter
- High quality, corrosion-resistant, prepainted steel cabinet

### EASIER TO INSTALL AND SERVICE

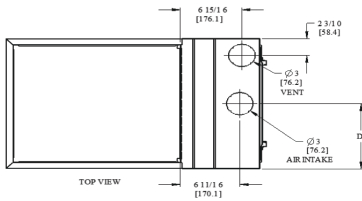
- Direct vent (2-pipe), single-pipe venting or ventilated combustion air
- Features a 6-3/8" condensate trap (7-3/8" service clearance recommended in horizontal applications)
- Quarter turn knobs for easy door removal and secure attachment
- Three position - upflow and horizontal (left/right) installation
- Factory configured to use with natural gas, not convertible to Liquid Propane
- Concentric vent available
- On-board NFC antenna makes setup a tap away when using the service technician app
- Slide out blower assembly with extra long harness

### LIMITED WARRANTY \*

- 20 year heat exchanger limited warranty
- 5 year parts limited warranty
  - With timely registration, an additional 5 year parts limited warranty

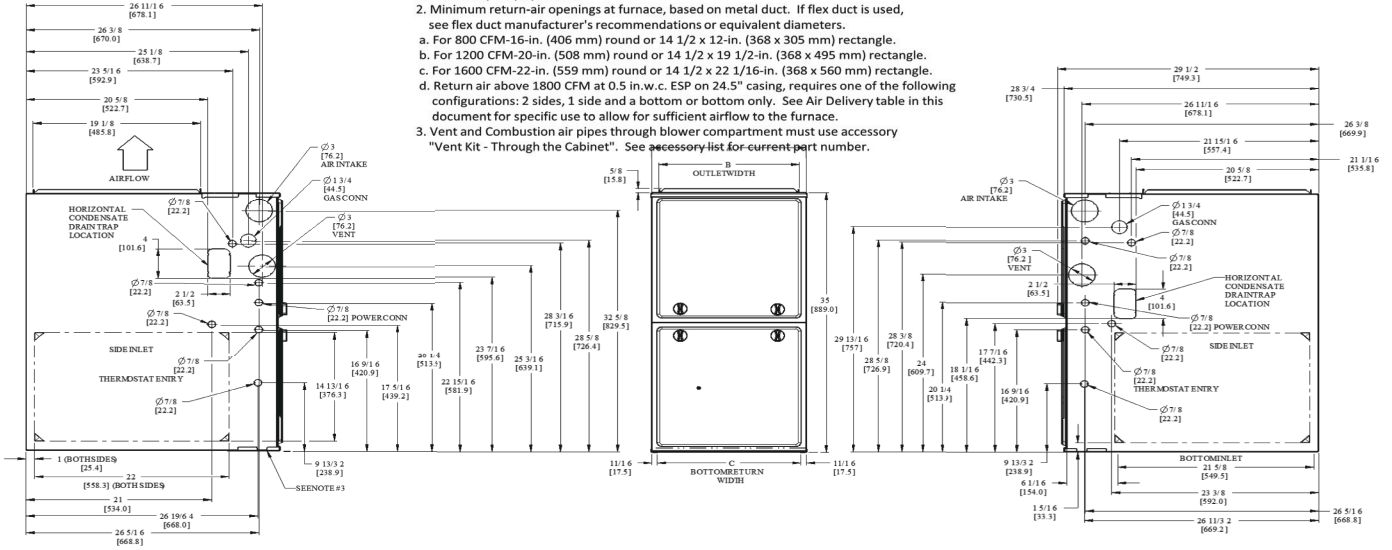
\* For residential applications only. See warranty certificate for complete details and restrictions, including warranty coverage for other applications.

# DIMENSIONAL DATA



**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.
3. 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.
4. Vent and Combustion air pipes through blower compartment must use accessory "Vent Kit - Through the Cabinet". See necessary list for current part number.



NOTE: ALL DIMENSIONS IN INCH (MM)

SD9634 REV. -

A210784

## Dimensions

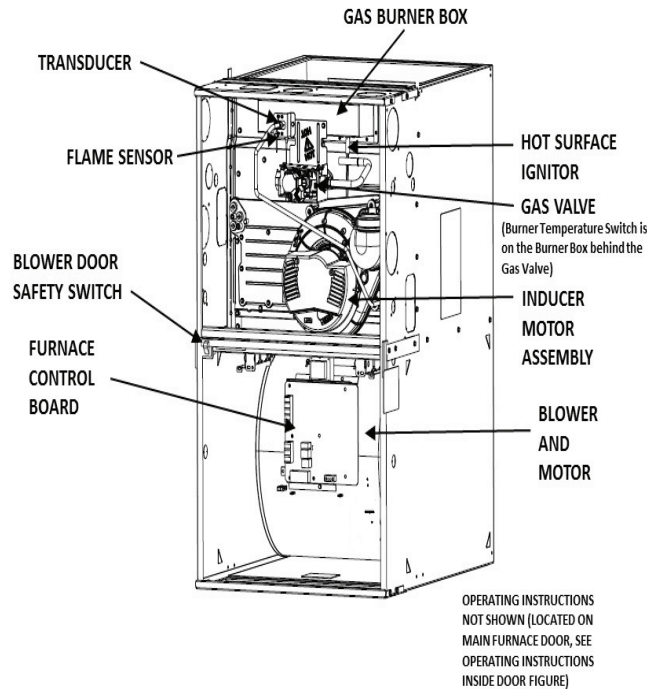
FURNACE SIZE	A	B	C	D	SHIP WT. LB (KG)
	CABINET WIDTH	OUTLET WIDTH	BOTTOM INLET WIDTH	AIR INTAKE	
0401712	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	136 (62)
0601716	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	141 (64)
0802120	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	161 (73)
1002120	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	167 (76)
1002122	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	170 (77)

## MODEL NUMBER NOMENCLATURE

DIGIT POSITION	1	2,3	4	5	6	7-9	10,11	12,13	14	15
F, G, N, R	BRAND								MAJOR SERIES	MINOR SERIES 1, 2, 3...
80 - 80% AFUE 92 - 92% AFUE 95 - 95% AFUE 96 - 96% AFUE 97 - 97% AFUE	EFFICIENCY									A, B, C...
C = Constant Airflow Variable-Speed (VCA) ECM V = Variable-Speed (VCT) PWM M = Multi 18-Speed Constant Torque (MCT) ECM	MOTOR TYPE									08 = 800 CFM 10 = 1000 CFM 12 = 1200 CFM 14 = 1400 CFM 16 = 1600 CFM 20 = 2000 CFM 22 = 2200 CFM
M - Modulating S - Single Stage T - Two Stage L = Low NOx M = Mobile/Manufactured Home N = Standard NOx U = Ultra Low NOx	HEATING STAGES									14 = 14.2" 17 = 17.5" 21 = 21.0" 24 = 24.5"
	FEATURE									026 = 26,000 BTU/h 040 = 40,000 BTU/h 045 = 45,000 BTU/h ..... 155 = 155,000 BTU/h
	CABINET WIDTH									
	HEATING INPUT									

A221575

## FURNACE COMPONENTS



A200121

## 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.

\*. Consult local building codes.

†. Additional clearance is required for condensate trap installation.

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

FURNACE SIZE		0401712	0601716	0802120	1002120	1002122
<b>HEATING AND CAPACITY AND EFFICIENCY</b>						
Input BTU <sup>h</sup> *		40,000	60,000	80,000	100,000	100,000
Output Capacity (BTU <sup>h</sup> ) <sup>†</sup>		39,000	58,000	78,000	96,000	97,000
Certified Temperature Rise Range - °F (°C)		30-60 (17-33)	30-60 (17-33)	30-60 (17-33)	35-65 (19-36)	35-65 (19-36)
AFUE		95%				
<b>AIRFLOW CAPACITY AND BLOWER DATA</b>						
Rated Certified External Static Pressure	Heating	0.10	0.12	0.15	0.20	0.20
	Cooling	0.50	0.50	0.50	0.50	0.50
Airflow CFM @ Rated ESP (CFM) <sup>‡</sup>	Heating	800	1195	1655	1825	1800
	Cooling	235-1255	315-1675	305-2080	290-1985	430-2255
Direct Drive Motor HP		1/2	3/4	1	1	1
Motor Full Load Amps		6.7	8.8	11.7	11.7	11.0
Heating Blower Control (Htg OFF-Delay)		Adjustable: 90, 120 (factory-set), 150, 180 seconds				
Cooling Blower Control (Clg OFF-Delay)		Adjustable: 90, (factory-set), 5, 30 seconds				
Blower Wheel Diameter x Width - In. (mm)		11x8 (279x203)	11x8 (279x203)	11x10 (279x254)	11x10 (279x254)	11x10 (279x254)
Air Filtration System		Field Supplied Filter				
Filter used for Certified Watt Data		325531-40*				
<b>ELECTRICAL DATA</b>						
Unit Volts-Hertz-Phase		115-60-1				
Operating Voltage Range		Min-Max		104-127		
Maximum Unit Amps		8.8	11.5	13.8	13.8	13.8
Unit Ampacity		11.5	14.8	17.7	17.7	17.7
Maximum Wire Length (Measure 1 way in Ft/M)		32/9.8	25/7.6	32/9.9	32/9.9	32/9.9
Minimum Wire Size		AWG		14	12	12
Max. Fuse/Ckt Bkr Size (Time-Delay Type Recommended)		Amps		15	20	20
Transformer Capacity (24 VAC output)		40VA				
External Control Power Available	Heating	12VA				
	Cooling	35VA				
<b>GAS CONTROLS</b>						
Burners		2	3	4	5	5
Gas Connection Size		1/2 in. NPT				
Gas Valve (Redundant)		Mfr		White Rodgers™		
Min. inlet pressure		(in.w.c.)		4.5 (Natural Gas)		
Ignition Device		Silicon Nitride				
Factory installed orifice		Size 3.35 mm	20	10	6	6
<b>CONNECTIONS</b>						
Communication System		None				
Thermostat Connections		Y1, G, C, W, Y/Y2, R				
Accessory Connections		EAC-1 (115 VAC); HUM (24 VAC); 1-STG AC or 2-STG (via Y/Y2, 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.

# AIR DELIVERY - CFM

Air Delivery - CFM (with filter)

Unit Size	Airflow Setting	Default Setting	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
0401712	1	Const. Fan	505	435	360	300	235	170	-	-	-	-
	2		560	495	420	360	305	250	185	120	-	-
	3		610	550	480	415	365	310	255	200	135	-
	4		640	580	515	450	400	350	300	245	190	135
	5		695	640	590	525	465	420	375	325	275	225
	6		750	700	650	590	535	485	440	400	355	305
	7	Heating	800	750	705	655	595	545	500	460	420	375
	8		850	805	760	715	660	605	560	515	475	440
	9		895	850	805	765	715	660	615	570	530	495
	10		940	895	855	810	770	720	670	625	585	550
	11		995	950	910	870	830	785	735	690	650	610
	12		1055	1015	975	935	900	860	820	770	725	685
	13		1110	1070	1035	995	960	925	890	845	800	755
	14		1160	1125	1085	1050	1020	985	950	915	870	825
	15		1220	1180	1145	1115	1080	1045	1015	980	945	900
	16		1275	1240	1205	1175	1140	1105	1075	1045	1015	975
	17		1330	1295	1260	1230	1200	1165	1135	1105	1075	1045
	18	Cooling	1385	1355	1320	1290	1255	1225	1200	1170	1130	1085
0601716	1	Const. Fan	595	525	455	385	315	255	190	120	-	-
	2		680	615	550	490	425	360	300	245	180	-
	3		725	670	610	545	485	425	365	310	260	200
	4		795	740	685	630	575	515	460	405	355	305
	5		860	805	755	700	650	595	545	490	440	390
	6		940	890	840	795	745	695	645	595	545	495
	7		1010	965	920	875	830	785	740	690	645	600
	8		1080	1035	990	950	905	865	825	780	735	690
	9		1160	1120	1075	1035	995	955	920	880	840	795
	10	Heating	1205	1165	1125	1090	1050	1010	970	935	895	855
	11		1235	1195	1160	1120	1085	1045	1010	970	935	895
	12		1310	1270	1235	1195	1160	1125	1090	1055	1020	985
	13		1390	1355	1320	1285	1250	1215	1185	1150	1115	1085
	14		1465	1430	1400	1365	1335	1305	1270	1240	1210	1180
	15		1540	1505	1475	1445	1415	1385	1355	1330	1300	1270
	16		1615	1580	1550	1525	1495	1465	1440	1410	1385	1360
	17		1685	1655	1625	1600	1575	1550	1525	1495	1475	1450
	18	Cooling	1820	1785	1745	1710	1675	1640	1600	1565	1525	1485
0802120	1	Const. Fan	655	565	480	395	305	220	150	-	-	-
	2		760	675	600	525	450	370	290	220	155	-
	3		820	745	670	600	525	460	385	310	245	180
	4		910	840	770	705	640	575	510	440	370	305
	5		995	930	865	800	735	675	615	555	485	420
	6		1070	1010	950	885	825	770	705	650	595	530
	7		1160	1105	1050	990	935	875	825	770	715	665
	8		1250	1195	1145	1090	1035	980	930	880	825	775
	9		1355	1300	1255	1205	1155	1105	1050	1000	950	905
	10		1430	1380	1335	1285	1240	1195	1140	1095	1045	1000
	11		1525	1475	1430	1385	1340	1295	1250	1200	1155	1110
	12	Heating	1680	1635	1595	1550	1510	1470	1425	1385	1340	1295
	13		1725	1680	1635	1600	1560	1520	1480	1440	1395	1350
	14		1815	1775	1735	1695	1655	1620	1580	1540	1500	1460
	15		1900	1865	1825	1785	1750	1710	1675	1635	1600	1565
	16		1995	1955	1920	1885	1850	1815	1780	1745	1710	1670
	17		2100	2065	2030	1995	1960	1925	1890	1855	1825	1790
	18	Cooling	2265	2230	2180	2130	2080	2030	1975	1925	1875	1825

**Air Delivery - CFM (with filter) (Continued)**

Unit Size	Airflow Setting	Default Setting	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
1002120	1	Const. Fan	655	560	465	375	290	205	125	-	-	-
	2		725	640	550	465	390	310	230	155	-	-
	3		805	725	640	560	480	410	340	265	195	135
	4		885	810	735	660	585	510	445	380	310	245
	5		965	900	825	755	685	620	550	490	425	360
	6		1055	990	925	860	790	730	660	600	535	480
	7		1145	1080	1020	960	895	835	775	715	650	595
	8		1235	1175	1120	1060	1000	945	885	830	770	710
	9		1325	1270	1215	1160	1105	1050	995	940	890	835
	10		1415	1360	1310	1260	1210	1155	1100	1050	1000	950
	11		1505	1455	1405	1360	1310	1265	1215	1165	1115	1065
	12		1600	1550	1505	1460	1415	1370	1325	1275	1225	1180
	13		1690	1645	1600	1560	1515	1470	1425	1380	1335	1285
	14		1780	1735	1695	1650	1610	1570	1530	1485	1445	1400
	15	Heating	1865	1825	1785	1740	1700	1660	1620	1585	1540	1500
	16		1970	1925	1885	1845	1805	1770	1730	1690	1655	1615
	17		2055	2015	1980	1940	1900	1865	1825	1790	1755	1715
	18	Cooling	2135	2100	2060	2025	1985	1950	1915	1880	1845	1810
1002122	1	Const. Fan	835	725	625	535	430	330	245	120	-	-
	2		935	845	745	660	570	475	385	300	195	-
	3		1000	920	815	735	655	560	470	385	305	210
	4		1115	1040	955	870	795	720	640	550	465	395
	5		1195	1125	1050	960	890	815	745	670	590	510
	6		1295	1230	1165	1080	1010	940	875	805	730	655
	7		1395	1335	1275	1205	1125	1060	995	930	870	800
	8		1500	1445	1390	1330	1265	1190	1125	1070	1010	955
	9		1585	1530	1475	1420	1365	1290	1225	1170	1110	1055
	10		1680	1630	1580	1530	1475	1415	1345	1290	1235	1180
	11		1770	1725	1675	1630	1580	1525	1470	1400	1350	1295
	12	Heating	1845	1800	1755	1705	1660	1605	1555	1495	1440	1390
	13		1945	1905	1860	1815	1770	1725	1675	1630	1575	1515
	14		1980	1940	1900	1855	1810	1765	1720	1670	1620	1565
	15		2070	2030	1990	1950	1910	1870	1825	1780	1730	1685
	16	Cooling	2190	2150	2110	2075	2035	1995	1955	1915	1870	1830
	17		2300	2260	2225	2190	2155	2115	2080	2045	2010	1970
	18		2430	2385	2345	2300	2255	2205	2160	2115	2060	2010

**NOTE:**

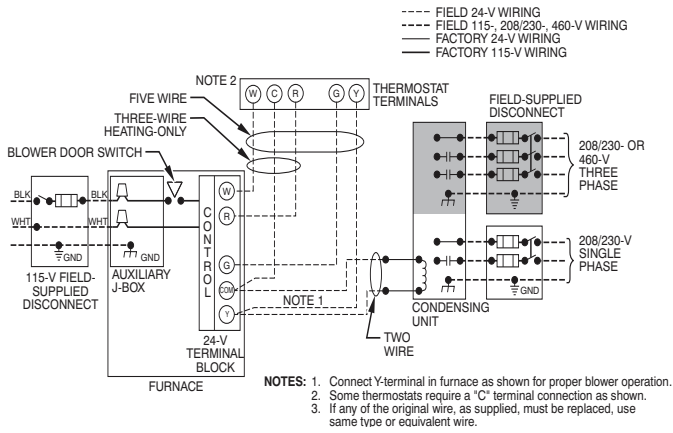
1. A filter is required for each return-air inlet. Airflow performance included 3/4-in. (19 mm) washable filter media such as contained in a factory - authorized accessory filter rack. See accessory list. To determine airflow performance without this filter, assume an additional 0.1 in. w.c. available external static pressure.
2. **Adjust the blower airflow setting as necessary for the proper air temperature rise for each installation.**
3. Airflows over 1800 CFM require bottom return, two-side return, or bottom and side return. A minimum filter size of 20" x 25" (508 x 635 mm) is required.
4. For upflow applications, air entering from one side into both the side of the furnace and a return air base counts as a side and bottom return
5. .The -- entry indicates unstable operating conditions

**Table 1 – Airflow Settings**

Unit Size	Default Airflow Settings*		Designated Airflow Settings	
	Heating	Cooling	Heating	Const. Fan
0401712	7	18	(4-11)	(1-7)
0601716	10	18	(6-13)	(1-7)
0802120	12	18	(8-12)	(1-1)
1002120	15	18	(10-15)	(1-2)
1002122	12	16	(8-13)	(1-7)

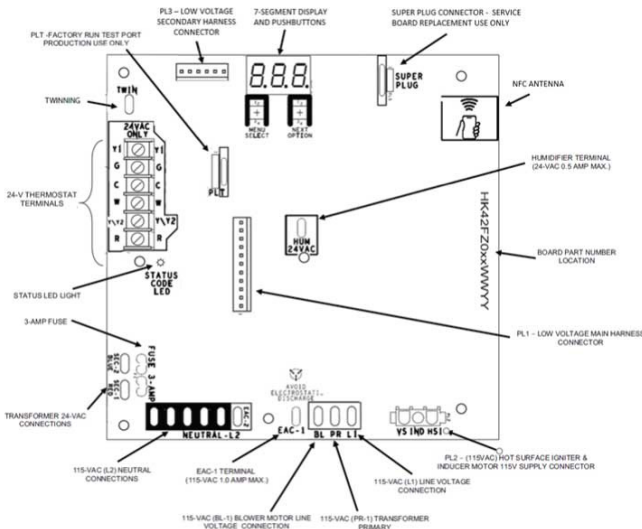
\*. Setting #1 is the default setting for Constant Fan

## TYPICAL WIRING SCHEMATIC



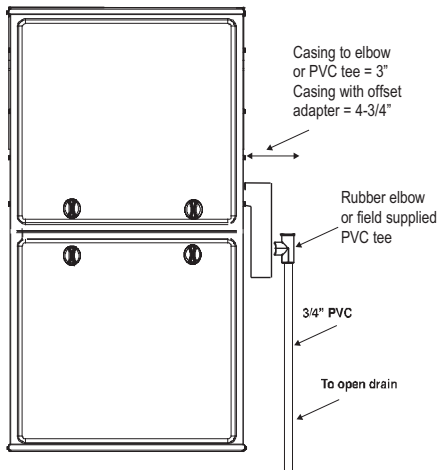
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## FURNACE CONTROL BOARD



A220965

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



Trap Clearance in Upflow Application

A200084

## INSTALLATION CONSIDERATIONS

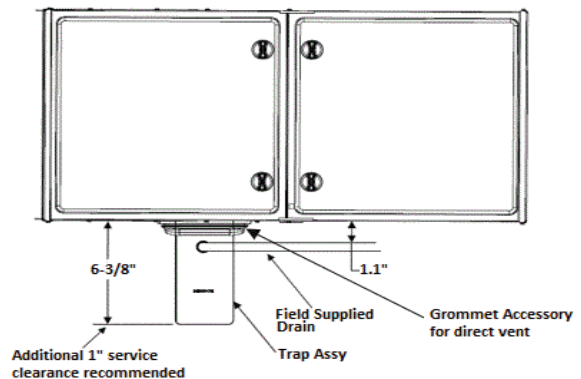
Refer to Installation Instructions for complete installation requirements.

### 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 Shielded (Examples: N-Coil, V-Coil, Sloped Coil)	Allowed	Not Required	Not Required
Furnace Manufacturer's Unshielded (Example: 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)

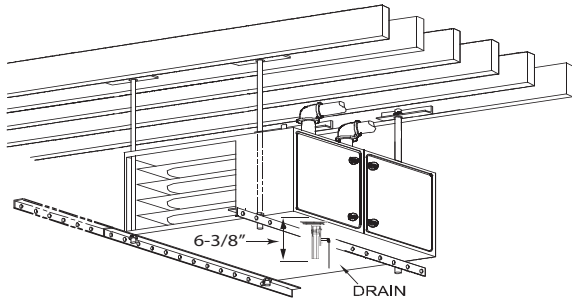
#### NOTE:

- 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.
- 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.
- 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.



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

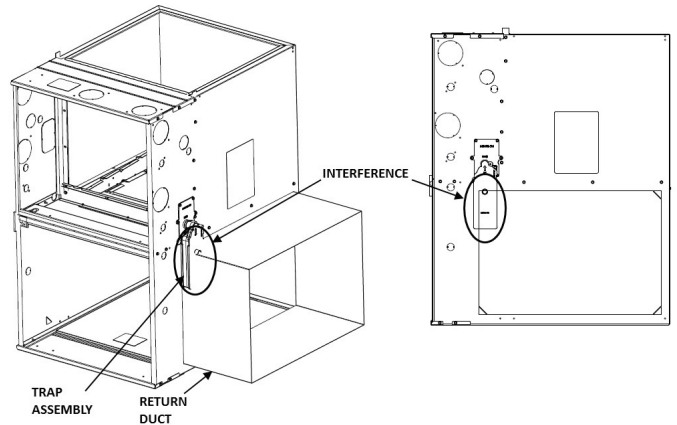
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ADDITIONAL 1" CLEARANCE BELOW TRAP RECOMMENDED FOR SERVICE

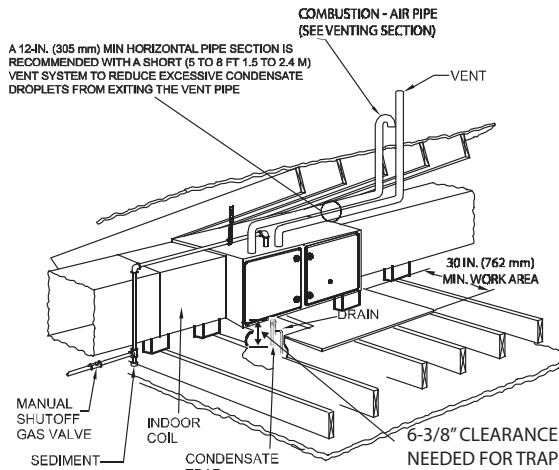
Trap Clearance in Horizontal Application

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Upflow Right Side Return Configuration - Trap Interference

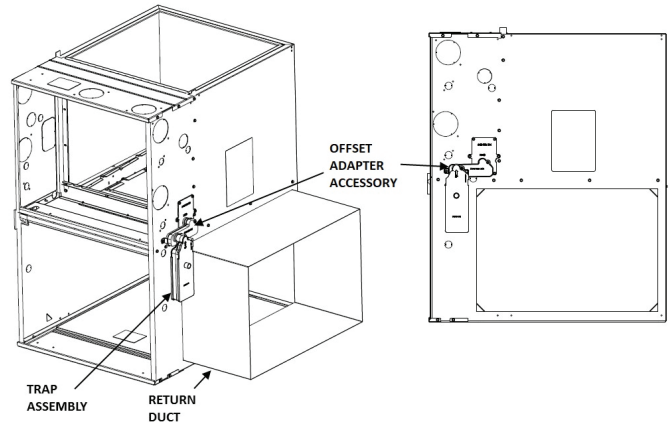
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ADDITIONAL 1" CLEARANCE BELOW TRAP RECOMMENDED FOR SERVICE

Working Platform for Attic Installation

A200088



Upflow Right Side Return Configuration - Required Upflow Offset Installation

A200120



## MAXIMUM ALLOWABLE EXPOSED VENT LENGTH IN UNCONDITIONED SPACE - 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	20	30	30	25	20	75	65	60	20	85	75	65
0	15	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

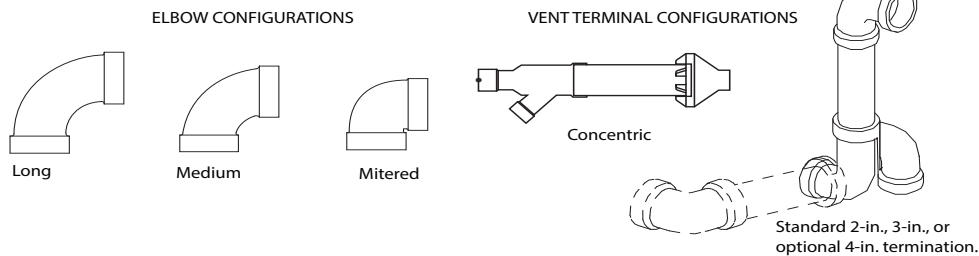
Winter Design Temp °F	Unit Size	80,000 BTUH															
		Uninsulated					3/8-in. Insulation					1/2-in. Insulation					
	Pipe Dia. (in.)	1 ½	2	2 ½	3	4	1 ½	2	2 ½	3	4	1 ½	2	2 ½	3	4	
20	15	40	40	35	30	15	50	90	75	65	15	50	70	70	70		
0	15	20	15	10	5	15	50	45	35	30	15	50	50	40	35		
-20	15	10	5			15	35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

## 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.

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



A13110

## DEDUCTIONS FROM MAXIMUM EQUIVALENT VENT LENGTH - FT. (M)

Pipe Diameter (in):	1-1/2		2		2-1/2		3		4	
Mitered 90° Elbow	8	(2.4)	8	(2.4)	8	(2.4)	8	(2.4)	8	(2.4)
Medium Radius 90° Elbow	5	(1.5)	5	(1.5)	5	(1.5)	5	(1.5)	5	(1.5)
Long Radius 90° Elbow	1.3	(0.9)	3	(0.9)	3	(0.9)	3	(0.9)	3	(0.9)
Mitered 45° Elbow	4	(1.2)	4	(1.2)	4	(1.2)	4	(1.2)	4	(1.2)
Medium Radius 45° Elbow	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)	2.5	(0.8)
Long Radius 45° 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)

**NOTES:**

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

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 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) 90° long-radius elbows, (2) 45° 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) 90° 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
Add equiv length of (2) 45° 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
Add equiv length of factory concentric vent term					0 ft.	From Deductions from Maximum Equivalent Vent Length
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
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) 90° 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.

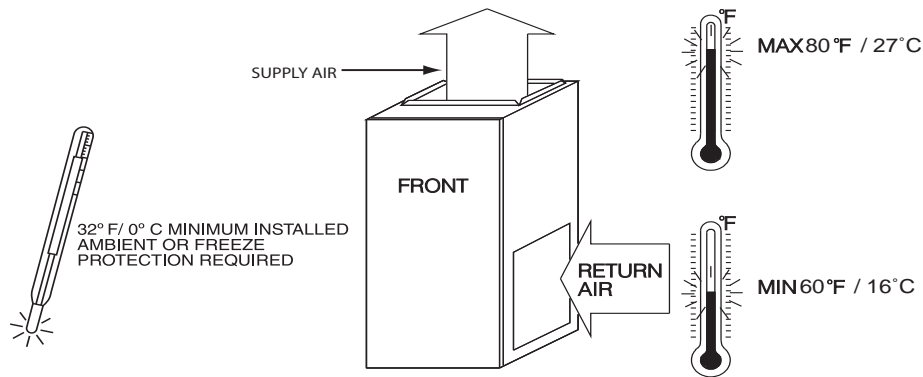
VERIFY FROM POLYPROPYLENE VENT MANUFACTURER'S INSTRUCTIONS for the multiplier correction for flexible vent pipe.

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 <b>RIGID</b> 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) 90° 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 45° 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
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
Is TEVL less than MEVL?					YES	Therefore, 80mm (3") pipe MAY be used

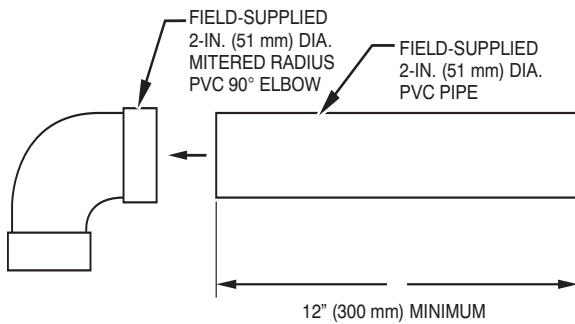
## RETURN AIR TEMPERATURE

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

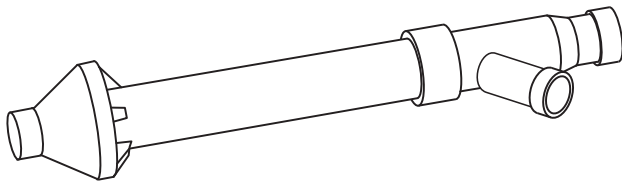


A10490

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



**NOTE:** See Installation Instructions for specific venting configurations. A12376



Concentric Vent Kit

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. A93086

**ACCESSORIES**

<b>PART NUMBER</b>	<b>DESCRIPTION</b>	<b>0401712</b>	<b>0601716</b>	<b>0802120</b>	<b>1002120</b>	<b>1002122</b>
1188594*	Gas Valve Tower Port Adapter Kit	X	X	X	X	X
ACG1625NCF*	External Filter Rack, 16 x 25"	X	X	-	-	-
ACG2025NCJ*	External Filter Rack, 20 x 25"	-	-	X	X	X
325531-402*	Washable filter, 3/4" x 16" x 25"	X	X	-	-	-
325531-403*	Washable filter, 3/4" x 21" x 25"	-	-	X	X	X
NAHB00101CA	Coil Adapter Kits - No Offset	X	X	X	X	X
NAHB00201CA	Coil Adapter Kits - Single Offset	X	X	X	X	X
NAHB00301CA	Coil Adapter Kits - Double Offset	X	X	X	X	X
NAHA01701RA	Return Air Base (Upflow Applications) 17-1/2" wide	X	X	-	-	-
NAHA02101RA	Return Air Base (Upflow Applications) 21" wide	-	-	X	X	X
NAHA002CV	Vent Terminal - Concentric - 2" (51 mm)	X	X	X	X	X
NAHA001CV	Vent Terminal - Concentric - 3" (76 mm)	X	X	X	X	X
NAHA00301VT	Vent Terminal Bracket - 2" (51 mm)	X	X	X	X	X
NAHA00401VT	Vent Terminal Bracket - 3" (76 mm)	X	X	X	X	X
NAHA00101VC	Vent Kit - Through the Cabinet for HZ left/right ONLY	X	X	X	X	X
NAHA00101CK	Polypropylene Inlet Air Pipe Coupling	X	X	X	X	X
NAHA00101HV	Horizontal Trap Grommet - Direct Vent	X	X	X	X	X
AGACDKTUA10A	Trap Offset Adapter Kit - Upflow with Right Side Return	X	X	X	X	X
NAHA00101HH	Freeze Protect Kit - Condensate Drain Line Tape	X	X	X	X	X
NAHA00110DA	CPVC to PVC Drain Adapters - 1/2" CPVC to 3/4" PVC (10 Pack)	X	X	X	X	X
NAHA001NK	Condensate Neutralizer Kit	X	X	X	X	X

\*. Purchased through FAST Parts  
X = Accessory available