

N96MSM

Up to 97%, Single-Stage, 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 designed for use in manufactured (Mobile) homes when an optional Mobile Home accessory kit is installed.

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.



ISO 9001
Quality

EASIER TO SELL

- Up to 97.0% AFUE in upflow, horizontal, and up to 95% AFUE in downflow positions
- Multi 18-speed, constant torque (MCT) ECM blower motor
- Enhanced diagnostics with easy to read 3-digit display for faults and status.
- Supports single-stage cooling units
- Insulated heat exchanger compartment
- 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
- Approved for Twinning applications with manufacturer's approved accessory kit.
- Approved for Manufactured Housing/Mobile Home applications with accessory (order separately)
- All sizes can be installed in air quality management districts with a 40 ng/J NOx emissions requirement

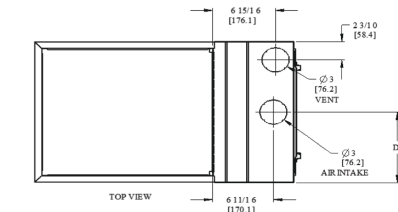
TOUGHER

- Flame roll-out sensors standard
- Adjustable heating blower OFF delay
- Factory set blower ON delay
- Stainless steel secondary heat exchanger
- High temperature limit control designed to prevent overheating
- Direct ignition with Silicon Nitride igniter
- High quality, corrosion-resistant, prepainted steel cabinet

EASIER TO INSTALL AND SERVICE

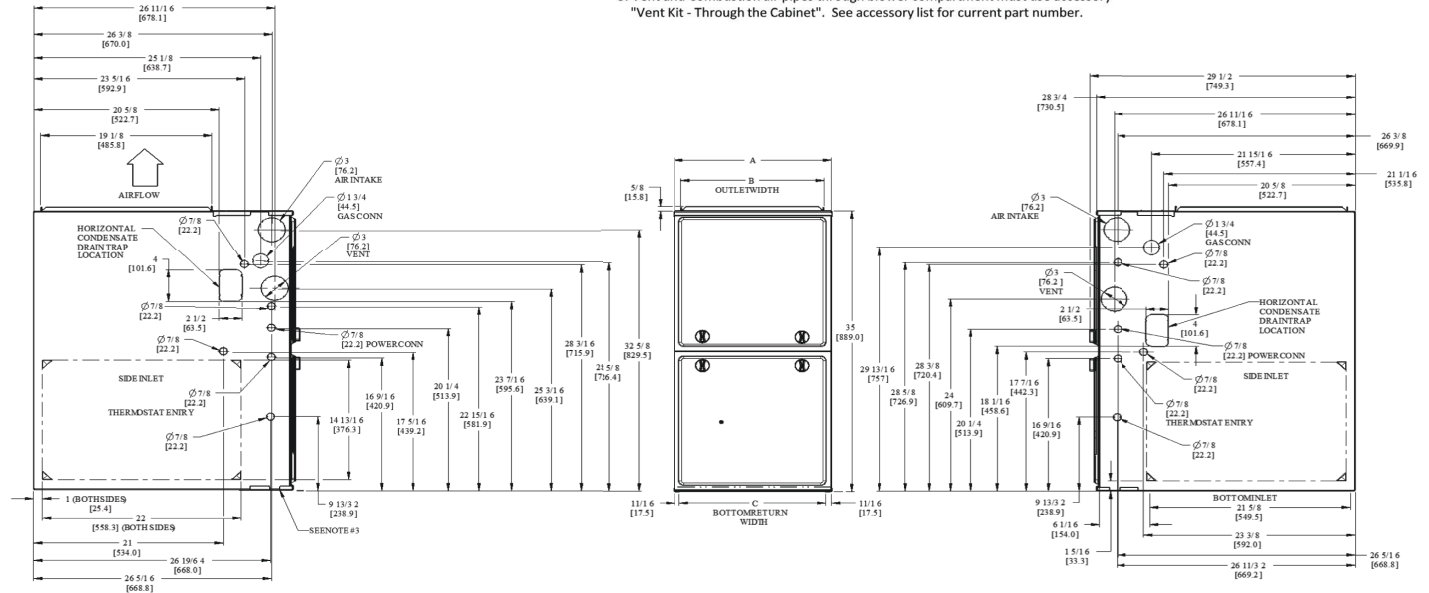
- On-board NFC antenna makes setup a tap away when using the service technician app.
- Direct vent (2-pipe), single-pipe venting or ventilated combustion air
- 24 VAC humidifier terminal and electronic air cleaner terminal
- 35" (889mm) high, for ease of installation
- Quarter turn knobs for easy door removal and secure attachment
- Convertible to propane with gas conversion accessory kit
- Four position - upflow/downflow/horizontal (left/right) installation
- Twelve different venting configurations
- Through the casing flue pipe for counterflow or horizontal applications with accessory (order separately)
- Concentric vent available
- Slide out heat exchanger and blower assembly

A200326



NOTES:

- Doors may vary by model.
- Minimum return-air openings at furnace, based on metal duct. If flex duct is used, see flex duct manufacturer's recommendations or equivalent diameters.
 - For 800 CFM-16-in. (406 mm) round or 14 1/2 x 12-in. (368 x 305 mm) rectangle.
 - For 1200 CFM-20-in. (508 mm) round or 14 1/2 x 19 1/2-in. (368 x 495 mm) rectangle.
 - For 1600 CFM-22-in. (559 mm) round or 14 1/2 x 22 1/16-in. (368 x 560 mm) rectangle.
- 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.
- 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)

SD/06/14 REV. -

Dimensional Drawing

A210796

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)	130 (59)
0601716	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	142 (64)
0802120	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	158 (72)

MODEL NUMBER NOMENCLATURE

DIGIT POSITION12,34567-910,1112,131415

F, G, N, RBRAND

80 - 80% AFUE
92 - 92% AFUE
95 - 95% AFUE
96 - 96% AFUE
97 - 97% AFUEEFFICIENCY

C = Constant Airflow
Variable-Speed
(VCA) ECM
V = Variable-Speed
(VCT) PWM
M = Multi 18-Speed Constant Torque
(MCT) ECM
MOTOR TYPE

M - Modulating
S - Single Stage
T - Two Stage
L = Low Nox
M = Mobile/Manufactured Home
N = Standard NOx
U = Ultra Low NoxHEATING STAGES

FEATURE

MAJOR SERIESMINOR SERIES1, 2, 3...
A, B, C...
08 = 800 CFM
10 = 1000 CFM
12 = 1200 CFM
14 = 1400 CFM
16 = 1600 CFM
20 = 2000 CFM
22 = 2200 CFM

COOLING CAPACITY

14 = 14.2"
17 = 17.5"
21 = 21.0"
24 = 24.5"

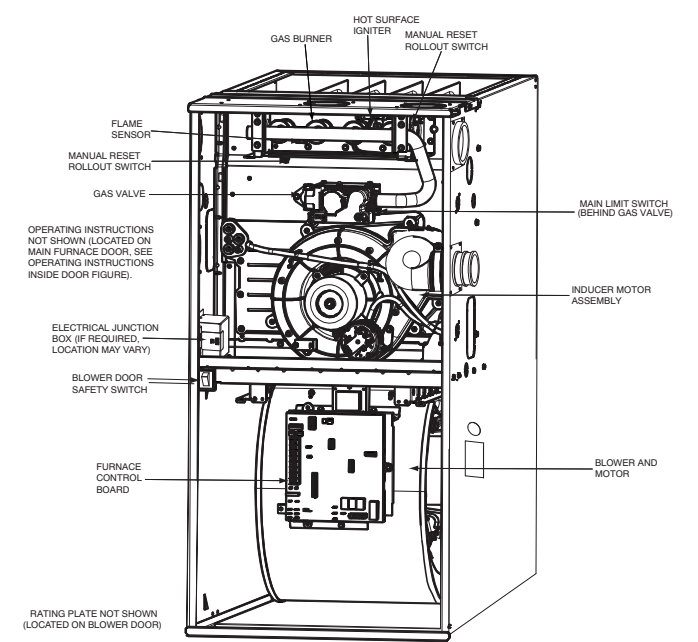
CABINET WIDTH

025 = 26,000 BTU/h
040 = 40,000 BTU/h
045 = 45,000 BTU/h
.....
155 = 155,000 BTU/h

HEATING INPUT

A221575

FURNACE COMPONENTS



A190145

For California Residents:

If installed with a manufactured (mobile) home conversion kit in SCAQMD: This furnace does not meet the SCAQMD Rule 1111 14 ng/J NOx emission limit, and thus is subject to a mitigation fee of up to \$450. This furnace is not eligible for the Clean Air Furnace Rebate Program: www.CleanAirFurnaceRebate.com

MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

POSITION	CLEARANCE
REAR	0
FRONT (Combustion air openings in furnace and in structure)	1 in. (25 mm)
Required for service	*24 in. (610 mm)
All Sides of Supply Plenum	*1 in. (25 mm)
Sides	0
Vent	0
Top of Furnace	1 in. (25 mm)

*. Consult 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 12,000 BTUh or lower. 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		0401712	0601716	0802120
HEATING AND CAPACITY AND EFFICIENCY				
Input BTUh*		40,000	60,000	80,000
Output Capacity (BTUh)†		39,000	58,000	78,000
Certified Temperature Rise Range - °F (°C)		40-70 (22-39)	40-70 (22-39)	40-70 (22-39)
AFUE	Upflow/Hz	96.7%	97.0%	97.0%
	Downflow	95%	95%	95%
AIRFLOW CAPACITY AND BLOWER DATA				
Rated Certified External Static Pressure	Heating	0.10	0.12	0.12
	Cooling	0.50	0.50	0.50
Airflow CFM @ Rated ESP (CFM)‡	Heating	700	1030	1310
	Cooling	160-1075	315-1580	225-2125
Direct Drive Motor HP		1/2	3/4	1
Motor Full Load Amps		6.7	8.8	11.5
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 seconds		
Blower Wheel Diameter x Width - In. (mm)		11x8 (279x203)	11x8 (279x203)	11x10 (279x254)
Air Filtration System		Field Supplied Filter		
Filter used for Certified Watt Data		325531-40**		
ELECTRICAL DATA				
Unit Volts-Hertz-Phase		115-60-1		
Operating Voltage Range	Min-Max	104-127		
Maximum Unit Amps		7.4	10.1	13.1
Unit Ampacity		10.2	13.6	17.3
Maximum Wire Length (Measure 1 way in Ft/M)		36/11.1	27/8.3	33/10.1
Minimum Wire Size	AWG	14	14	14
Max. Fuse/Ckt Bk Size (Time-Delay Type Recommended)	Amps	15	15	15
Transformer Capacity (24 VAC output)		40VA		
External Control Power Available	Heating	12VA		
	Cooling	35VA		
GAS CONTROLS				
Burners		3	4	4
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		None		
Thermostat Connections		G, C, W, Y, R		
Accessory Connections		EAC-1 (115 VAC); HUM (24 VAC); 1-STG AC (via Y)		

*. 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.

AIR DELIVERY (with filter)**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	Cont. Fan	415	350	290	230	160	105	-	-	-	-
	2		450	385	325	270	210	150	-	-	-	-
	3		480	420	360	310	260	195	140	-	-	-
	4		525	470	415	360	315	265	205	150	-	-
	5		565	515	460	410	360	315	265	210	160	-
	6		605	555	505	455	405	365	320	270	215	170
	7		655	605	560	510	465	420	385	340	290	240
	8	Heat	700	655	610	565	520	475	435	400	360	310
	9		740	695	655	610	570	525	485	450	415	380
	10		780	740	700	660	615	575	535	500	465	430
	11		830	790	750	715	675	635	595	560	520	490
	12		880	840	800	765	730	690	655	615	575	545
	13		930	895	860	825	790	750	715	680	645	610
	14		980	945	910	875	845	810	775	740	705	670
	15		1030	995	960	930	895	860	830	795	760	730
	16		1085	1050	1020	985	955	925	890	860	825	795
	17		1140	1105	1080	1045	1015	985	955	925	895	865
	18	Cooling	1220	1185	1150	1115	1075	1040	1005	965	925	885
0601716	1	Cont. Fan	590	520	455	380	315	250	185	120	-	-
	2		640	575	515	445	375	320	260	195	130	-
	3		710	650	595	535	470	410	355	305	245	175
	4		755	700	645	590	535	465	410	360	310	260
	5		835	780	730	680	630	580	515	465	420	370
	6		890	840	790	745	695	645	595	540	490	445
	7		960	915	870	825	780	735	690	635	580	535
	8		1010	965	920	875	835	790	745	705	650	605
	9	Heat	1040	995	950	910	870	825	785	745	700	650
	10		1095	1055	1015	975	935	895	855	815	775	730
	11		1165	1130	1090	1050	1010	975	940	900	865	830
	12		1235	1200	1160	1125	1090	1055	1020	985	945	915
	13		1315	1280	1245	1210	1175	1140	1110	1075	1045	1010
	14		1380	1345	1315	1280	1250	1215	1185	1150	1120	1090
	15		1455	1420	1390	1360	1330	1300	1270	1240	1210	1180
	16		1525	1495	1465	1435	1410	1380	1350	1325	1295	1270
	17		1605	1580	1550	1525	1500	1470	1445	1420	1395	1370
	18	Cooling	1720	1685	1650	1615	1580	1545	1505	1470	1430	1395
0802120	1	Cont. Fan	615	515	415	325	225	140	-	-	-	-
	2		695	610	515	430	340	255	165	-	-	-
	3		805	725	645	560	485	405	325	245	165	-
	4		870	795	720	640	560	490	415	345	270	195
	5		955	885	815	740	670	595	530	460	390	330
	6		1070	1005	935	870	805	740	675	615	545	485
	7		1150	1085	1025	960	900	835	775	710	650	590
	8		1245	1185	1125	1065	1005	950	890	835	775	720
	9	Heat	1325	1270	1215	1160	1105	1050	995	945	885	830
	10		1415	1360	1310	1255	1205	1150	1100	1045	995	945
	11		1535	1485	1435	1385	1335	1285	1240	1195	1145	1095
	12		1610	1560	1515	1465	1420	1375	1325	1280	1235	1190
	13		1715	1670	1625	1580	1535	1495	1450	1405	1360	1315
	14		1820	1775	1735	1690	1650	1610	1570	1530	1485	1445
	15		1915	1875	1835	1795	1760	1720	1680	1645	1605	1565
	16		1995	1960	1920	1885	1845	1810	1775	1740	1700	1665
	17	Cooling	2105	2070	2035	2000	1970	1935	1900	1870	1835	1805
	18		2305	2260	2215	2170	2125	2080	2030	1985	1935	1890

NOTE:

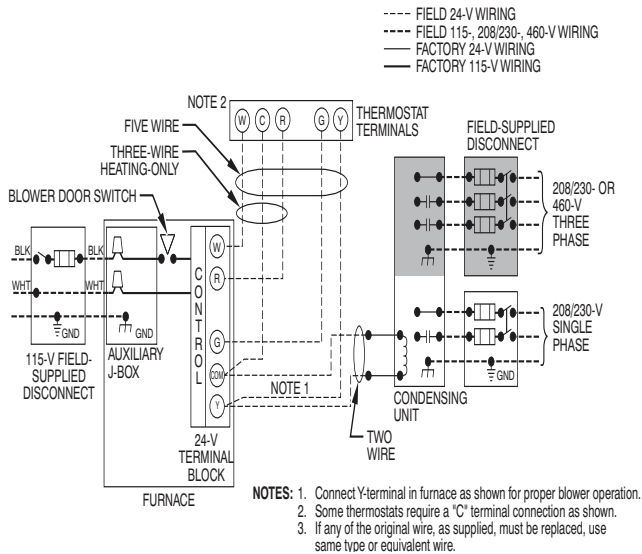
1. A filter is required for each return-air inlet. Airflow performance included 3/4-in. (19 mm) washable filter media such as contained in a factory - authorized accessory filter rack. See accessory list. To determine airflow performance without this filter, assume an additional 0.1 in. w.c. available 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

Airflow Settings

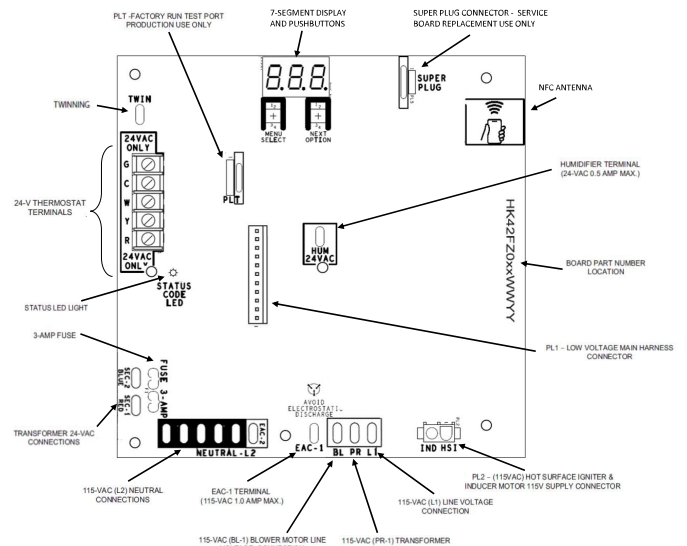
Unit Size	Default Airflow Settings*		Designated Airflow Settings	
	Heating	Cooling	Heating	Constant Fan
0401712	8	18	(5-9)	(1-5)
0601716	9	18	(5-10)	(1-7)
0802120	9	17	(5-11)	(1-8)

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

TYPICAL WIRING SCHEMATIC



FURNACE CONTROL BOARD



A190079

A210192

MAXIMUM ALLOWABLE EXPOSED VENT LENGTH

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

Winter Design Temp °F	Unit Size	26,000* BTUH					
		Uninsulated		3/8-in. Insulation		1/2-in. Insulation	
	Pipe Dia. in.	1 ½	2	1 ½	2	1 ½	2
20	20	20	20	50	45	60	50
0	5	5	5	25	20	30	25
-20				15	10	20	15
-40				10	5	15	10

Winter Design Temp °F	Unit Size	40,000* BTUH									60,000 BTUH							
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation			Uninsulated			3/8-in. Insulation			1/2-in. Insulation	
	Pipe Dia. in.	1 ½	2	2 ½	1 ½	2	2 ½	1 ½	2	2 ½	1 ½	2	2 ½	3	1 ½	2	2 ½	3
20	20	20	20	20	20	50	45	20	60	50	20	30	30	25	20	75	65	60
0	10	5	5	5	20	25	20	20	30	25	15	15	10	10	20	40	30	25
-20	5				20	15	10	20	20	15	10	5			20	25	20	15
-40					15	10	5	15	15	10	5				20	15	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
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										120,000 BTUH							
		Uninsulated				3/8-in. Insulation				1/2-in. Insulation		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	2 ½	3	4	2 ½	3	4	2 ½	3
20	20	50	40	35	20	80	95	80	20	80	105	90	10	50	40	10	75	95	10
0	20	20	15	10	20	55	45	35	20	65	55	45	10	20	15	10	55	45	10
-20	15	10	5		20	35	30	20	20	45	35	25	10	10		10	35	25	10
-40	10	5			20	25	20	10	20	30	25	15	10	5		10	25	15	10

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

Winter Design Temp °F	Unit Size	140,000* BTUH								
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation		
	Pipe Dia. in.	2 ½	3	4	2 ½	3	4	2 ½	3	4
	20	5	55	50	5	65	105	5	65	125
	0	5	25	15	5	65	50	5	65	60
	-20	5	10	5	5	45	30	5	50	40
	-40	5	5		5	30	20	5	35	25

*. Not all model families have this size.

Maximum Allowable Exposed Vent Length in Unconditioned Space - Meters

Winter Design Temp °C	Unit Size	26,000* BTUH					
		Uninsulated		3/8-in. Insulation		1/2-in. Insulation	
	Pipe Dia. mm	38	51	38	51	38	51
	-7	6.1	6.1	15.2	13.7	18.3	15.2
	-18	1.5	1.5	7.6	6.1	9.1	7.6
	-29			4.6	3.0	6.1	4.6
	-40			3.0	1.5	4.6	3.0

Winter Design Temp °C	Unit Size	40,000 BTUH									60,000 BTUH											
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation			Uninsulated				3/8-in. Insulation				1/2-in. Insulation			
	Pipe Dia. mm	38	51	64	38	51	64	38	51	64	38	51	64	76	38	51	64	76	38	51	64	76
	-7	6.1	6.1	6.1	6.1	15.2	13.7	6.1	18.3	15.2	6.1	9.1	9.1	7.6	6.1	22.9	19.8	18.3	6.1	25.9	22.9	19.8
	-18	3.0	1.5	1.5	6.1	7.6	6.1	6.1	9.1	7.6	4.6	4.6	3.0	3.0	6.1	12.2	9.1	7.6	6.1	13.7	12.2	9.1
	-29	1.5			6.1	4.6	3.0	6.1	6.1	4.6	3.0	1.5			6.1	7.6	6.1	4.6	6.1	9.1	7.6	6.1
	-40				4.6	3.0	1.5	4.6	4.6	3.0	1.5				6.1	4.6	4.6	3.0	6.1	6.1	4.6	3.0

Winter Design Temp °C	Unit Size	80,000 BTUH														
		Uninsulated					3/8-in. Insulation					1/2-in. Insulation				
	Pipe Dia. mm	38	51	64	76	102	38	51	64	76	102	38	51	64	76	102
	-7	4.6	12.2	12.2	10.7	9.1	4.6	15.2	27.4	22.9	19.8	4.6	15.2	21.3	21.3	21.3
	-18	4.6	6.1	4.6	3.0	1.5	4.6	15.2	13.7	10.7	9.1	4.6	15.2	15.2	12.2	10.7
	-29	4.6	3.0	1.5			4.6	10.7	9.1	6.1	4.6	4.6	12.2	9.1	7.6	4.6
	-40	3.0	1.5				4.6	7.6	6.1	4.6	1.5	4.6	9.1	7.6	6.1	3.0

Winter Design Temp °C	Unit Size	100,000 BTUH												120,000 BTUH								
		Uninsulated				3/8-in. Insulation				1/2-in. Insulation				Uninsulated			3/8-in. Insulation			1/2-in. Insulation		
	Pipe Dia. mm	51	64	76	102	51	64	76	102	51	64	76	102	64	76	102	64	76	102	64	76	102
	-7	6.1	15.2	12.2	10.7	6.1	24.4	28.9	24.4	6.1	24.4	32.0	27.4	3.0	15.2	12.2	3.0	22.9	28.9	3.0	22.9	32.0
	-18	6.1	6.1	4.6	3.0	6.1	16.8	13.7	10.7	6.1	19.8	16.7	13.7	3.0	6.1	4.6	3.0	16.8	13.7	3.0	19.8	15.2
	-29	4.6	3.0	1.5		6.1	10.7	9.1	6.1	6.1	13.7	10.7	7.6	3.0	3.0		3.0	10.7	7.6	3.0	13.7	9.1
	-40	3.0	1.5			6.1	7.6	6.1	3.0	6.1	9.1	7.6	4.6	3.0	1.5		3.0	7.6	4.6	3.0	9.1	6.1

Winter Design Temp °C	Unit Size	140,000* BTUH*								
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation		
	Pipe Dia. mm	64	76	102	64	76	102	64	76	102
	-7	1.5	16.7	15.2	1.5	19.8	32.0	1.5	19.8	38.1
	-18	1.5	7.6	4.6	1.5	19.8	15.2	1.5	19.8	18.3
	-29	1.5	3.0	1.5	1.5	13.7	9.1	1.5	15.2	12.2
	-40	1.5	1.5		1.5	9.1	6.1	1.5	35	7.6

*. Not all model families have this size.

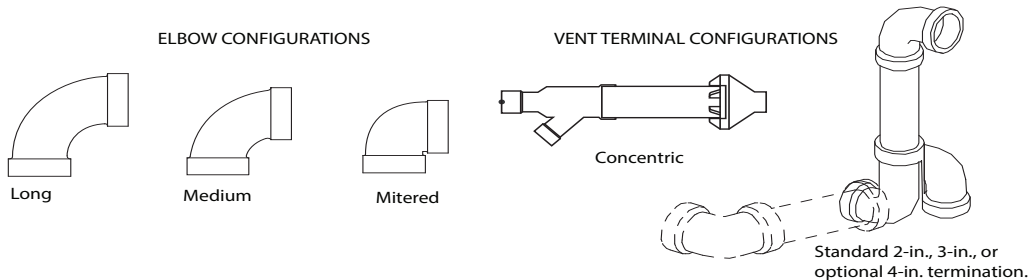
MAXIMUM EQUIVALENT VENT LENGTH - Ft. (M)

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		26,000 ²		40,000 ¹			60,000 ²				80,000					100,000 ³				120,000			140,000 ³		
Altitude (feet)	Pipe Dia. (in)	1 ½	2	1 ½	2	2 ½	1 ½	2	2 ½	3	1 ½	2	2 ½	3	4	2	2 ½	3	4	2 ½	3	4	2 ½	3	4
	0-2000	70	200	40	155	185	20	100	175	200	15	55	130	175	200	20	80	175	200	10	75	185	5	65	155
	2001-3000	65	190	35	150	175		95	165	185	10	49	125	165	185	15	75	165	185		70	175	N/A	60	140
	3001-4000	60	175	30	135	160	16	90	155	175		10		115	155	175	10		155	175	5	65		165	120
	4001-4500	55	160	25	130	155	15	85	150	170	10		44	110	150	165		10	70	150	170	5		60	160
	4501-5000				125	145		80	145	165				145	160	65	150		165	60	155			160	45
	5001-6000	50	145	20	120	130		75	140	155		41	100	135	150		65	140	155		155	35		80	
	6001-7000	45	135	15	110	120	13	70	130	145	N/A	38	90	125	140	N/A	60	135	145	N/A	50	140		30	65
	7001-8000	40	120	10	100	110	10	65	120	135		36		120	125		55	125	135		46	130		25	45
	8001-9000	35	110		90	95	5	60	115	125		33	80	110	115		50	115	125		43	120		15	30
9001-10000	30	95	5	80	85	N/A	55	105	115		30	75	100	105		45	100	115		39	115			10	15

Maximum Equivalent Vent Length - Meters																																		
Unit Size		26,000 ²		40,000 ¹			60,000 ²				80,000					100,000 ³				120,000			140,000 ³											
Altitude (meters)	Pipe Dia. (mm)	38	51	38	51	64	38	51	64	76	38	51	64	76	102	51	64	76	102	64	76	102	64	76	102									
	0-610	21.3	60.9	12.1	47.2	56.3	6.0	30.4	53.3	60.9	4.5	16.7	39.6	53.3	60.9	6.0	24.3	53.3	60.9	3.0	22.8	56.3	1.5	19.8	47.2									
	611-914	19.8	57.9	10.6	45.7	53.3		28.9	50.2	56.3		14.9	38.1	50.2	56.3	4.5	22.8	50.2	56.3		21.3	53.3		18.2	42.6									
	915-1219	18.2	53.3	9.1	41.1	48.7	4.8	27.4	47.2	53.3	3.0	13.4	33.5	44.1	48.7	3.0	19.8	45.7	50.2	18.2	48.7	NA		10.6	24.3									
	1220-1370	16.7	48.7	7.6	39.6	47.2	25.9	45.7	51.8	47.2																51.8								
	1371-1524				38.1	44.1	4.5	24.3	44.1	50.2																42.6	47.2							
	1525-1829	15.2	44.1	6.0	36.5	39.6		22.8	42.6	47.2		12.4	30.4	41.1	45.7	3.0	19.8	42.6	47.2	NA	15.2	42.6		NA	9.1	19.8								
	1830-2134	13.7	41.1	4.5	33.5	36.5	3.9	21.3	39.6	44.1	NA	10.9	27.4	36.5	38.1												NA	16.7	38.1	41.1	14.0	39.6	7.6	13.7
	2135-2438	12.1	36.5	3.0	30.4	33.5	3.0	19.8	36.5	41.1																								
2439-2743	10.6	33.5	27.4		28.9	1.5	18.2	35.0	38.1	9.1						22.8	30.4	32.0	13.7	30.4	35.0	11.8		35.0	3.0	4.5								
2744-3048	9.1	28.9	1.5	24.3	25.9	NA	16.7	32.0	35.0																									

1. 40K Inducer Outlet Restrictor disk (P/N 337683-401; 1.25-in. (32 mm) Dia.) shipped in the loose parts bag or available through Replacement Components required under 10-ft. (3 M) TEVL in all orientations. Required for installations from 0 - 2000 ft. (0 to 610 M) above sea level. Failure to use an outlet restrictor may result in flame disturbances or flame sense lock-out.
2. 26K (shipped in loose parts bag) & 60K Inducer Outlet Restrictor disk (P/N 337683-401; 1.25-in. (32 mm) Dia. available through Replacement Components) required for less than 5-ft. (1.5 M) TEVL in downflow and horizontal orientations only. Required for installations from 0 - 2000 ft. (0 to 610 M) above sea level.
3. 120K & 140K Inducer Outlet Restrictor disk (P/N 337683-402; 1.50-in. (38 mm) Dia. available through Replacement Components) required for less than 5-ft. (1.5 M) TEVL in downflow and horizontal orientations only. Required for installations from 0 - 2000 ft. (0 to 610 M) above sea level.



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	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)

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 Deductions from Maximum Equivalent Vent Length - Ft. (M) 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 - Ft. (M) Table.
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 - Ft. (M) Table.
Add equiv length of factory concentric vent term					0 ft.	From Deductions from Maximum Equivalent Vent Length - Ft. (M) 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) 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.

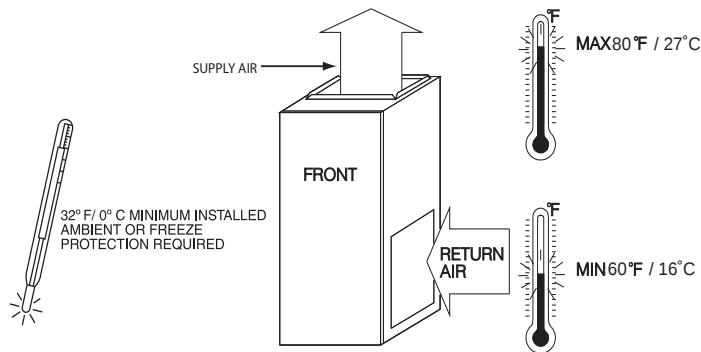
VERIFY FROM POLYPROPYLENE VENT MANUFACTURER'S INSTRUCTIONS for the multiplier correction for flexible vent pipe.

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 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) 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 Table.
Is TEVL less than MEVL?					NO	Therefore, 60mm (2") pipe may NOT be used; try 80mm (3")
Maximum Equivalent Vent Length (MEVL)					185 ft. (57 M)	For 3" pipe from Maximum Equivalent Vent Length Table.
Is TEVL less than MEVL?					YES	Therefore, 80mm (3") pipe MAY be used

RETURN AIR TEMPERATURE

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



A10490

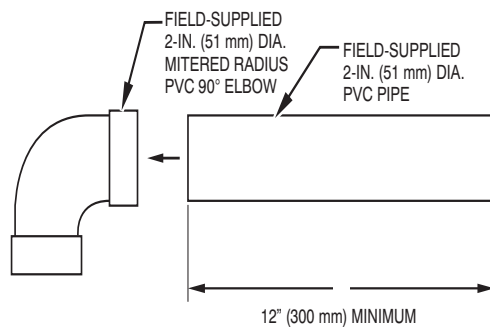
MINIMUM CLEARANCES TO COMBUSTIBLE MATERIALS

POSITION	CLEARANCE
Rear	0 (0 mm)
Front (Combustion air openings in furnace and in structure)	1 in. (25 mm)
Required for service*	24 in. (610 mm) [†]
All Sides of Supply Plenum*	1 in. (25 mm)
Sides	0 (0 mm)
Vent	0 (0 mm)
Top of Furnace	1 in. (25 mm)

* Consult your local building codes

[†] Recommended

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



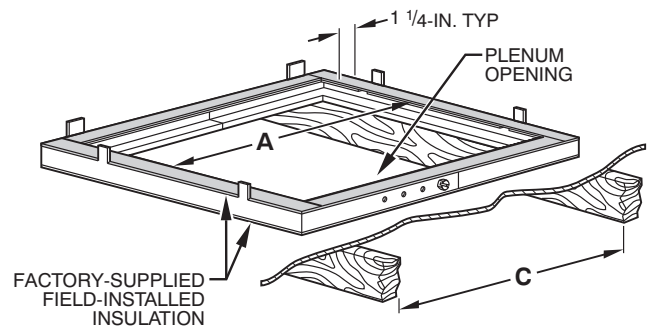
A12376

NOTE: See Installation Instructions for specific venting configurations.

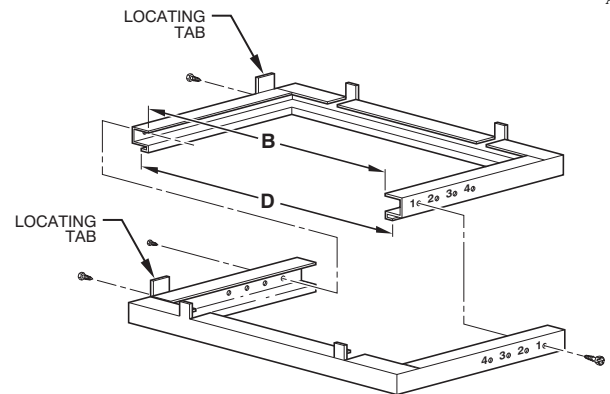
DIMENSIONS (IN. / MM)						
FURNACE CASING WIDTH	FURNACE IN DOWNFLOW APPLICATION	PLENUM OPENING*		FLOOR OPENING		HOLE NO. FOR WIDTH ADJUSTMENT
		A	B	C	D	
14-3/16 (360)	Furnace with or without Cased Coil Assembly or Coil Box	11-3/16 (322)	19 (483)	13-7/16 (341)	20-5/8 (600)	4
17-1/2 (445)	Furnace with or without Cased Coil Assembly or Coil Box	15-1/8 (384)	19 (483)	16-3/4 (426)	20-5/8 (600)	3
21 (533)	Furnace with or without Cased Coil Assembly or Coil Box	18-5/8 (396)	19 (483)	20-1/4 (514)	20-5/8 (600)	2
24-1/2 (622)	Furnace with or without Cased Coil Assembly or Coil Box	22-1/8 (562)	19 (483)	23-3/4 (603)	20-5/8 (600)	1

* The plenum should be constructed 1/4-in. (6 mm) smaller in width and depth than the plenum dimensions shown above.

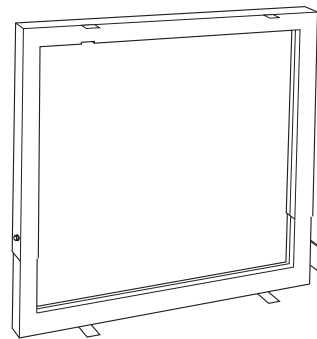
DOWNFLOW SUBBASE



A97427



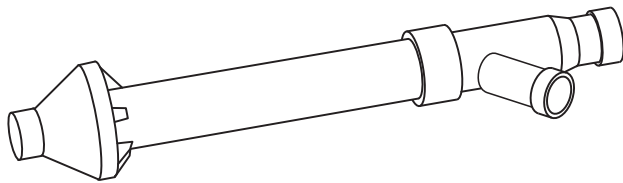
A88207



Downflow Subbase

A88202

One base fits all furnace sizes. The base is designed to be installed between the furnace and a combustible floor when no coil box is used or when a coil box other than a manufacturer's cased coil is used. It is CSA design certified for use with manufacturer's branded furnaces when installed in downflow applications.



Concentric Vent Kit

A93086

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

ACCESSORIES

PART NUMBER	DESCRIPTION	0401712	0601716	0802120
1188594*	Gas Valve Tower Port Adapter Kit	X	X	X
ACG1625NCF*	External Filter Rack, 16 x 25"	X	X	-
ACG2025NCJ*	External Filter Rack, 20 x 25"	-	-	X
325531-402*	Washable filter, 3/4" x 16" x 25"	X	X	-
325531-403*	Washable filter, 3/4" x 21" x 25"	-	-	X
NAHB00101CA	Coil Adapter Kits - No Offset	-	-	X
NAHB00201CA	Coil Adapter Kits - Single Offset	X	X	X
NAHB00301CA	Coil Adapter Kits - Double Offset	X	X	X
NAHA01701RA	Return Air Base (Upflow Applications) 17-1/2" wide	X	X	-
NAHA02101RA	Return Air Base (Upflow Applications) 21" wide	-	-	X
NAHA00101VC	Vent Kit - Through the Cabinet	X	X	X
NAHB00101CT	External Trap Kit	X	X	X
NAHA00110DA	CPVC to PVC Drain Adapters - 1/2" CPVC to 3/4" PVC (10 Pack)	X	X	X
NAHA002CV	Vent Terminal - Concentric - 2" (51 mm)	X	X	X
NAHA001CV	Vent Terminal - Concentric - 3" (76 mm)	-	X	X
NAHA00301VT	Vent Terminal Bracket - 2" (51 mm)	X	X	X
NAHA00401VT	Vent Terminal Bracket - 3" (76 mm)	-	X	X
NAHA00101CK	Polypropylene Inlet Air Pipe Coupling	X	X	X
NAHA00101HV	Horizontal Trap Grommet - Direct Vent	X	X	X
NAHA00101HH	Freeze Protect Kit - Condensate Drain Line Tape	X	X	X
NAHA00201HH	Freeze Protect Kit - Condensate Trap with Heat Pad	X	X	X
NAHA01101SB	Downflow Furnace Base Kit for Combustible Floors	X	X	X
AGAGC9NPS01B*	Gas Conversion Kit - Nat to LP†	X	X	X
AGAGC9PNS01B*	Gas Conversion Kit - LP to Nat†	X	X	X
AGAGCAMHC01A	Manufactured Home Kit - Gas Conversion†	X	X	X
AGATWNDTE01C	Twinning Kit - (MCT) ECM Motor	-	X	X
NAHA001NK	Condensate Neutralizer Kit	X	X	X

*. Order through FAST Parts.