

F97CTN (Series A)

Two-Stage, Variable Speed, 4-Way Multipoise, Condensing Gas Furnace

TEMPSTAR®
Heating and Cooling Products

Product Data



Representative drawing only. Some product models may vary.

A200418F



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.

A200326A

TOUGHER

WARNING

CARBON MONOXIDE POISONING AND FIRE HAZARD

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

This furnace is not designed for use in recreation vehicles, manufactured (mobile) homes or outdoors.

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

- Flame roll-out sensors standard
- Adjustable heating blower OFF delay
- Factory set blower ON delay
- RPJ® primary heat exchanger
- Stainless steel secondary heat exchanger
- High temperature limit control designed to prevent overheating
- Direct ignition with Silicon Nitride ignitor

EASIER TO SELL

- Up to 97% AFUE in upflow position
- Two-stage heating operation
- Variable-speed, constant airflow ECM blower motor for extra SEER boost with select cooling equipment
- Supports single-stage, two-stage, and variable speed cooling units
- Dehumidification feature in cooling
- All sizes can be installed in air quality management districts with a 40 ng/J NOx emissions requirement
- 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

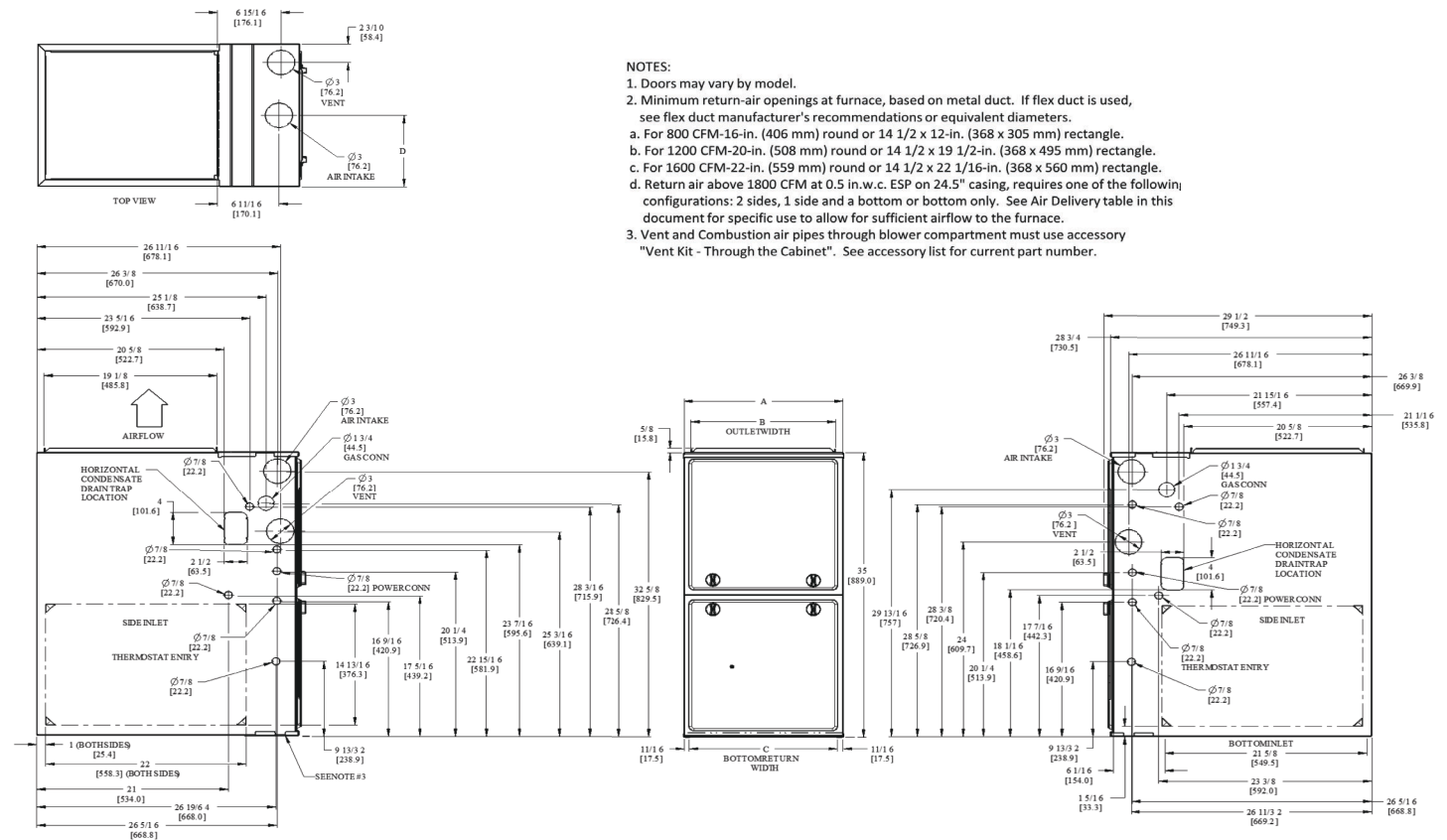
EASIER TO INSTALL AND SERVICE

- Direct vent (2-pipe), single-pipe venting or ventilated combustion air
- 24 VAC humidifier terminal
- 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
- At least twelve different venting configurations
- Through the casing flue pipe for counterflow or horizontal applications with accessory (order separately)
- Self-configuring and communicating control
- Concentric vent available
- Slide out heat exchanger assembly and blower assembly
- On-board NFC antenna makes setup a tap away when using the Service Technician App
- 3-digit display shows fault codes and furnace status.
- RAT and SAT thermistors can provide temperature rise.
- 4-way multipoise design for upflow, downflow or horizontal installation, with unique vent elbow and optional through-the-cabinet downflow venting capability.
- Ideal height 35-in. (889 mm) cabinet: short enough for taller coils, but still allows enough room for service.
- Direct-vent/sealed combustion, single-pipe venting or ventilated combustion air.

Limited WARRANTY *

- 10-year No Hassle Replacement™ limited warranty
- Default 5-year parts limited warranty
- Default 20-year heat exchanger limited warranty
- 10-year parts and lifetime limited heat exchanger warranty with timely registration*
 - * Equipment must be registered within 90 days of original installation, except in jurisdictions where warranty benefits cannot be conditioned on registration.
 - * Applies to original purchaser/homeowner and not available to subsequent owners. See warranty certificate for complete details and restrictions, including warranty coverage of other applications.

DIMENSIONAL DRAWING



NOTE: ALL DIMENSIONS IN INCH (MM)

SD5663-4 REV.-

A210796

Dimensions

FURNACE SIZE	A	B	C	D	SHIP WT. LB (KG)
	CABINET WIDTH	OUTLET WIDTH	BOTTOM INLET WIDTH	AIR INTAKE	
0601716	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	151.0 (68.5)
0801716	17-1/2 (445)	15-7/8 (403)	16 (406)	8-3/4 (222)	152.5 (69.2)
0802120	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	171.5 (77.8)
1002122	21 (533)	19-3/8 (492)	19-1/2 (495)	10-1/2 (267)	179.0 (81.2)
1202422	24-1/2 (622)	22-7/8 (581)	23 (584)	12-1/4 (311)	195.0 (88.5)

A221575

For installation in SCAQMD only: 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

FURNACE COMPONENTS



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

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 20,000 BTU 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.

Table 1 – SPECIFICATIONS

UNIT SIZE			0601716	0801716	0802120	1002122	1202422
HEATING AND CAPACITY AND EFFICIENCY							
INPUT BTUH*	High Heat	(BTUH)	60,000	80,000	80,000	100,000	120,000
	Low Heat	(BTUH)	39,000	52,000	52,000	65,000	78,000
OUTPUT CAPACITY (BTUH)†	High Heat	(BTUH)	58,000	77,000	76,000	97,000	116,000
	Low Heat	(BTUH)	38,000	50,000	50,000	63,000	75,000
CERTIFIED TEMPERATURE RISE RANGE - °F (°C)		High Heat	40 - 70 (22 - 39)	40 - 70 (22 - 39)	40 - 70 (22 - 39)	40 - 70 (22 - 39)	40 - 70 (22 - 39)
		Low Heat	25 - 55 (14 - 31)	25 - 55 (14 - 31)	25 - 55 (14 - 31)	30 - 60 (17 - 33)	30 - 60 (17 - 33)
AFUE‡		Upflow	97.0	97.0	97.0	97.0	97.0
		Downflow	95	95	95	95	95
		Horizontal	96.3	96.2	96.7	96.2	96.7
AIRFLOW CAPACITY AND BLOWER DATA							
Rated Certified External Static Pres- sure, in. w.c.		Heating	0.12	0.15	0.15	0.2	0.2
		Cooling	0.5	0.5	0.5	0.5	0.5
Airflow CFM @ Rated ESP (CFM)‡		High Heat	1025	1305	1305	1665	2115
		Low Heat	935	1150	1150	1330	1575
		Cooling	1575	1640	2000	2170	2190
Cooling Capacity (tons)		400 CFM/ton	3.5	4	5	5	5.5
		350 CFM/ton	4.5	4.5	5.5	6	6
Direct Drive Motor Type			Electronically Commutated Motor (ECM)				
Direct Drive Motor HP			3/4	3/4	1	1	1
Motor Full Load Amps			8.8	9.2	11.5	11.5	11.0
RPM Range			300 - 1300				
Heating Blower Control (Htg Off-Delay)			Adjustable: 90, 120 (factory set), 150, 180 seconds				
Cooling Blower Control (Time Delay Relay)			Adjustable: 90 (factory-set), 5, 30, 60 seconds				
Blower Wheel Diameter x Width - In. (mm)			11 x 8	11 x 8	11 x 10	11 x 10	11 x 11
Air Filtration System			Field Supplied Filter				
Filter used for Certified Watt Data			325531-40**				
ELECTRICAL DATA							
Input voltage		Volts-Hz-Ph	115-60-1				
Operating Voltage Range		Min-Max	104-127				
Maximum Unit Amps			10.1	10	13.1	13.2	11.9
Unit Ampacity			13.5	13.4	17.3	17.4	15.7
Maximum Wire Length							
Measure 1 way in Ft		Feet	27	27	33	33	36
(M)		Meters	8.2	8.2	10.1	10.1	11
Minimum Wire Size		AWG	14	14	12	12	12
Max. Fuse/Circuit Breaker Size (Time-Delay Type Recommended)		Amps	15	15	20	20	20
Transformer Capacity (24 VAC output)			40VA				
External Control Power Available		Heating	24VA				
		Cooling	35VA				
GAS CONTROLS							
Burners			3	4	4	5	6
Gas Connection Size			1/2in. NPT				
Gas Valve (Redundant)		Mfr	WhiteRodgers™				
Min. inlet pressure		(in.w.c.)	4.5 (Natural Gas)				
Max. inlet pressure		(in.w.c.)	13.6 (Natural Gas)				
Manufactured (Mobile Home Kit)			See Accessory Listing				
Ignition Device			Silicon Nitride				
Factory installed orifice			44	44	44	44	44
CONNECTIONS							
Communication System			ION™ Communicating Control SYST0101CW				
Thermostat Connections			R, W/W1, W2, Y/Y2, Y1, G Com 24V, DHUM				
Accessory Connections			EAC-1 (115 VAC); HUM (24 VAC); 1-STG AC (via Y/Y2); 2-STG AC (cia Y/Y2 and Y1)				

*. Gas input ratings are certified for elevations to 2000 ft. (610 M). In USA, For elevations above 2000 ft (610 M), reduce ratings 4 percent for each 1000 ft (305 M) above sea level. Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1 Table F.4 or furnace installation instructions.

†. Capacity in accordance with U.S. Government DOE test procedures.

‡. Airflow shown is for bottom only return-air supply for the as-shipped speed tap. For air delivery above 1800 CFM, see Air Delivery table for other options. A filter is required for each return-air supply. An airflow reduction of up to 7 percent may occur when using the factory-specified 4-5/16-in. (110 mm) wide, high efficiency media filter.

**. See Accessory List for part numbers available.

Air Delivery (CFM) with Filter

Table 2 – 0601716 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	450									
2	488									
3	525									
4	555									
5	600				†					
6	650									
7	700									
8	740									
9	800									
10	875									
11	925									
12	975									
13‡	1000									
14	1050									
15	1138									
16	1200									
17	1225									
18	1300									
19**	1400								1375	1340
20	1480						1450	1415	1375	1340
21	1600		1555	1525	1490	1450	1415	1375	1340	
Constant Fan Airflow (cfm)	Settings 1 - 9 (*450 - 800 cfm)									
	Settings above 9 are not recommended									
	Heat Stage									
Setting	Low					High				
Comfort 1	710					820				
Comfort 2††	795					898				
Efficiency 1	897					984				
Efficiency 2	958					1100				

*. Constant fan default

†. Operation in this range is not recommended because high heat operation will exceed 1.0" w.c. ESP.

‡. Low cooling default

**. High cooling default

††. Heating default

Table 3 – 0801716 Airflow in CFM

Setting	ESP (in.w.c.)										
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
1*	450										
2	488										
3	525										
4	555										
5	600	†									
6	650										
7	700										
8	740										
9	800										
10	875										
11	925										
12	975										
13‡	1000										
14	1050										
15	1138										
16	1200										
17	1225										
18	1300										
19**	1400	1375									
20	1480								1460	1415	1375
21	1600		1585	1540	1500	1460	1415	1375			
Constant Fan Airflow (cfm)	Settings 1 - 4 (*450 - 555 cfm)										
	Settings above 4 are not recommended										
	Heat Stage										
Setting	Low					High					
Comfort 1	888					1062					
Comfort 2††	1009					1160					
Efficiency 1	1111					1255					
Efficiency 2	1111					1408					

*. Constant fan default

†. Operation in this range is not recommended because high heat operation will exceed 1.0" w.c. ESP.

‡. Low cooling default

**. High cooling default

††. Heating default

Table 4 – 0802120 Airflow in CFM

Setting	ESP (in.w.c.)										
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	
1*	650										
2	700										
3	740				†						
4	800										
5	875										
6	925										
7	975										
8	1000										
9	1050										
10	1138										
11	1200										
12	1225										
13‡	1300										
14	1400										
15	1480										
16	1600										
17	1625										
18**	1750										
19	1850										
20	1910									1880	
21	2000							1965	1925	1880	
Constant Fan Airflow (cfm)	Settings 1 - 6 (*650 - 925 cfm)										
	Settings above 6 are not recommended										
	Heat Stage										
Setting	Low					High					
Comfort 1	853					1032					
Comfort 2††	950					1122					
Efficiency 1	1100					1250					
Efficiency 2	1100					1390					

* Constant fan default

† Operation in this range is not recommended because high heat operation will exceed 1.0" w.c. ESP.

‡ Low cooling default

** High cooling default

†† Heating default

Table 6 – 1202422 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	650									
2	700									
3	740									
4	800									
5	875									
6	925									
7	975									
8	1000									

Table 5 – 1002122 Airflow in CFM

Setting	ESP (in.w.c.)									
	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1*	650									
2	700									
3	740									
4	800									
5	875	†								
6	925									
7	975									
8	1000									
9	1050									
10	1138									
11	1200									
12	1225									
13	1300									
14‡	1400									
15	1480									
16	1600									
17	1625									
18	1750									
19	1850									
20**	1910	1865								
21	2000	1950 1910 1865								
22	2110	2075	2040	2000	1950	1910	1865			
Constant Fan Airflow (cfm)	Settings 1 - 9 (* 650 - 1050 cfm)									
	Settings above 9 are not recommended									
	Heat Stage									
Setting	Low					High				
Comfort 1	1011					1356				
Comfort 2††	1119					1489				
Efficiency 1	1280					1616				
Efficiency 2	1400					1820				

* Constant fan default

† Operation in this range is not recommended because high heat operation will exceed 1.0" w.c. ESP.

‡ Low cooling default

** High cooling default

†† Heating default

Table 6 – 1202422 Airflow in CFM (Continued)

9	1050	†								
10	1138									
11	1200									
12	1225									
13‡	1300									
14	1400									
15	1480									
16	1600									
17	1625									
18**	1750									

Table 6 – 1202422 Airflow in CFM (Continued)

19	1850					
20	1910					1860
21	2000			1960	1910	1860
22	2110	2065	2015	1960	1910	1860
Constant Fan Airflow (cfm)	Settings 1 - 3 (*650 - 740 cfm)					
	Settings above 3 are not recommended					
	Heat Stage					
Setting	Low		High			
Comfort 1	1185		1682			
Comfort 2††	1330		1851			
Efficiency 1	1495		2014			
Efficiency 2	1495		2110			

* Constant fan default

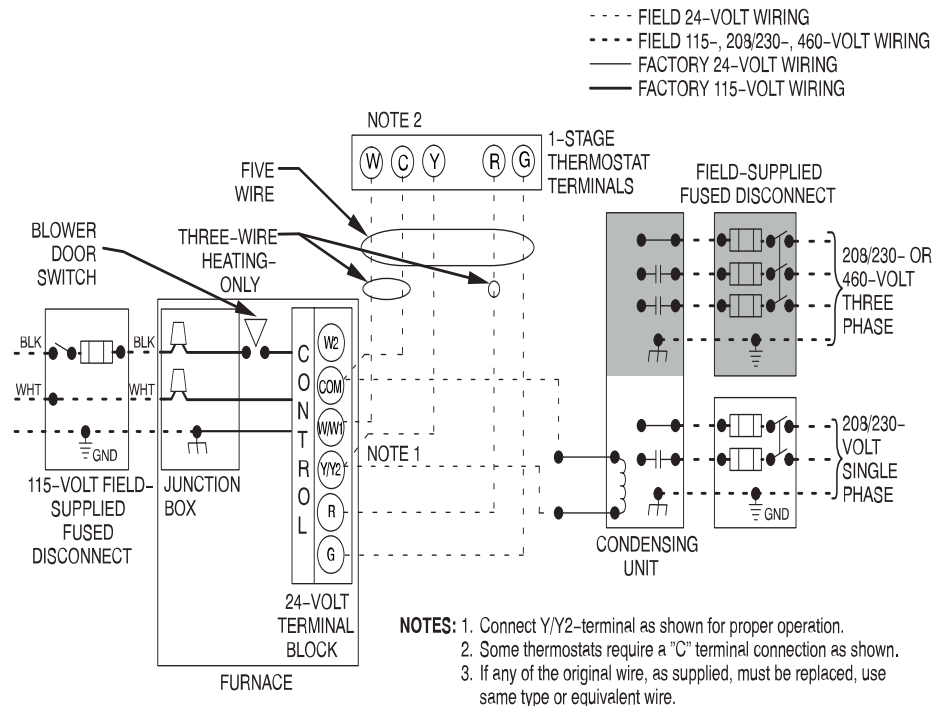
† Operation in this range is not recommended because high heat operation will exceed 1.0" w.c. ESP.

‡ Low cooling default

** High cooling default

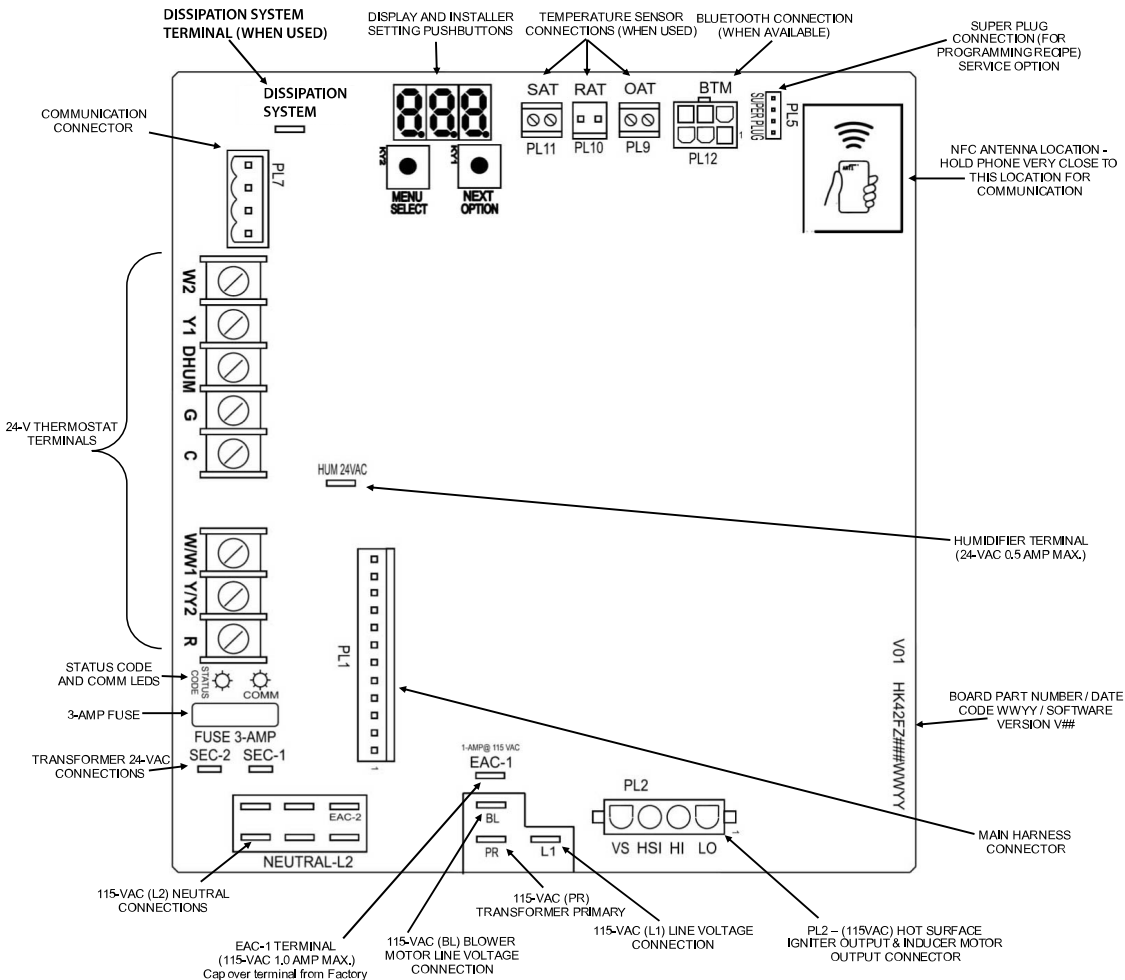
†† Heating default

TYPICAL WIRING SCHEMATIC



A11401

FURNACE CONTROL BOARD



A230451

MAXIMUM ALLOWABLE EXPOSED VENT LENGTHS INSULATION TABLE

Maximum Allowable Exposed Vent Length in Unconditioned Space - Ft.

Winter Design Temp °F	60,000 BTUH												
	Uninsulated					3/8-in. Insulation				1/2-in. Insulation			
	1 ½	2	2 ½	3	1 ½	2	2 ½	3	1 ½	2	2 ½	3	
	20	30	30	25	20	75	65	60	20	85	75	65	
	15	15	10	10	20	40	30	25	20	45	40	30	
	10	5			20	25	20	15	20	30	25	20	
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	

Winter Design Temp °F	Unit Size	120,000 BTUH									140,000* BTUH								
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation			Uninsulated			3/8-in. Insulation			1/2-in. Insulation		
	Pipe Dia. in.	2 ½	3	4	2 ½	3	4	2 ½	3	4	2 ½	3	4	2 ½	3	4	2 ½	3	4
	20	10	50	40	10	75	95	10	75	105	5	55	50	5	65	105	5	65	125
	0	10	20	15	10	55	45	10	65	50	5	25	15	5	65	50	5	65	60
	-20	10	10		10	35	25	10	45	30	5	10	5	5	45	30	5	50	40
-40	10	5		10	25	15	10	30	20	5	5		5	30	20	5	35	25	

Maximum Allowable Exposed Vent Length in Unconditioned Space - Meters

Winter Design Temp °C	60,000 BTUH												
	Uninsulated				3/8-in. Insulation				1/2-in. Insulation				
	38	51	64	76	38	51	64	76	38	51	64	76	
	6.1	9.1	9.1	7.6	6.1	22.9	19.8	18.3	6.1	25.9	22.9	19.8	
	4.6	4.6	3.0	3.0	6.1	12.2	9.1	7.6	6.1	13.7	12.2	9.1	
	3.0	1.5			6.1	7.6	6.1	4.6	6.1	9.1	7.6	6.1	
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											
		Uninsulated				3/8-in. Insulation				1/2-in. Insulation			
	Pipe Dia. mm	51	64	76	102	51	64	76	102	51	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
	-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
	-29	4.6	3.0	1.5		6.1	10.7	9.1	6.1	6.1	13.7	10.7	7.6
-40	3.0	1.5			6.1	7.6	6.1	3.0	6.1	9.1	7.6	4.6	

Winter Design Temp °C	Unit Size	120,000 BTUH									140,000* BTUH								
		Uninsulated			3/8-in. Insulation			1/2-in. Insulation			Uninsulated			3/8-in. Insulation			1/2-in. Insulation		
	Pipe Dia. mm	64	76	102	64	76	102	64	76	102	64	76	102	64	76	102	64	76	102
	-7	3.0	15.2	12.2	3.0	22.9	28.9	3.0	22.9	32.0	1.5	16.7	15.2	1.5	19.8	32.0	1.5	19.8	38.1
	-18	3.0	6.1	4.6	3.0	16.8	13.7	3.0	19.8	15.2	1.5	7.6	4.6	1.5	19.8	15.2	1.5	19.8	18.3
	-29	3.0	3.0		3.0	10.7	7.6	3.0	13.7	9.1	1.5	3.0	1.5	1.5	13.7	9.1	1.5	15.2	12.2
-40	3.0	1.5		3.0	7.6	4.6	3.0	9.1	6.1	1.5	1.5		1.5	9.1	6.1	1.5	35	7.6	

* Not all model families have these sizes

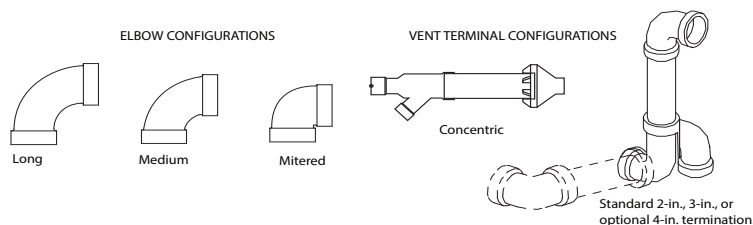
MAXIMUM EQUIVALENT VENT LENGTH

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.

Maximum Equivalent Vent Length

Maximum Equivalent Vent Length - Feet																			
Unit Size		60,000 *				80,000 †					100,000 ‡				120,000				
Altitude (feet)	Pipe Dia. (in)	1 ½	2	2 ½	3	1 ½	2	2 ½	3	4	2	2 ½	3	4	2 ½	3	4		
	0-2000	20	100	175	200	15	55	130	175	200	20	80	175	200	10	75	185		
	2001-3000		95	165	185	10	49	125	165	185	15	75	165	185		70	175		
	3001-4000		16	90	155			175	115	155			175	155		175	5	65	165
	4001-4500	15	85	150	170		44	110	150	165	10	70	170	N/A	60	160			
	4501-5000		80	145	165				145	160			150				165		
	5001-6000		75	140	155				41	100			135				150	65	140
	6001-7000	13	70	130	145	N/A	38	90	125	140	N/A	60	135		145	N/A	50	140	
	7001-8000	10	65	120	135				36	120			125		55		125	135	46
	8001-9000	5	60	115	125				33	80			110	115	50		115	125	43
9001-10000	N/A	55	105	115	30		75	100	105	45		100	115	39	115				
Maximum Equivalent Vent Length - Meters																			
Unit Size		60,000 *				80,000 †					100,000 ‡				120,000				
Altitude (meters)	Pipe Dia. (mm)	38	51	64	76	38	51	64	76	102	51	64	76	102	64	76	102		
	0-610	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		
	611-914		28.9	50.2	56.3	3.0	14.9	38.1	50.2	56.3	4.5	22.8	50.2	56.3		21.3	53.3		
	915-1219		4.8	27.4	47.2			53.3	35.0	47.2			53.3	47.2		53.3	1.5	19.8	50.2
	1220-1370	4.5	25.9	45.7	51.8		13.4	33.5	45.7	50.2	3.0	21.3	51.8	NA	18.2	48.7			
	1371-1524		24.3	44.1	50.2				44.1	48.7			45.7				50.2		
	1525-1829		22.8	42.6	47.2				41.1	45.7			42.6				47.2	47.2	
	1830-2134	3.9	21.3	39.6	44.1	NA	11.5	27.4	38.1	42.6	NA	18.2	41.1		44.1	NA	15.2	42.6	
	2135-2438	3.0	19.8	36.5	41.1				36.5	38.1			38.1		41.1		14.0	39.6	
	2439-2743	1.5	18.2	35.0	38.1				10.0	24.3			33.5	35.0	15.2		35.0	38.1	13.1
2744-3048	NA	16.7	32.0	35.0	9.1		22.8	30.4	32.0	13.7		30.4	35.0	11.8	35.0				

- *. 60K Inducer Outlet Restrictor disk (P/N ; 1.25-in. (32 mm) diameter - available through) is required in all orientations for installations from 0–2000 ft (0–610 M) above sea level and where TEVL is no greater than 5-ft. (1.5 M).
- †. 80K Inducer Outlet Restrictor disk (P/N ; 1.25-in. (32 mm) diameter - available through) is required in upflow orientation for installations from 0–2000 ft (0–610 M) above sea level and where TEVL is no greater than 5-ft. (1.5 M).
- ‡. 100K Inducer Outlet Restrictor disk (P/N ; 1.50-in. (38 mm) diameter - available through) is required in all orientations for installations from 0–2000 ft (0–610 M) above sea level and where TEVL is no greater than 5-ft. (1.5 M).



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)

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 switch 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.
- A running Tee in the Combustion Air Pipe adds 0 ft. to the TEVL of the vent length.

Venting System Length Calculations

The Total Equivalent Vent Length (TEVL) for **EACH** combustion air or vent pipe equals the length of the venting system, plus the equivalent length of elbows used in the venting system from Maximum Equivalent Vent Length.

Standard vent terminations or factory accessory concentric vent terminations count for zero deduction.

See vent system manufacturer's data for equivalent lengths of flexible vent pipe or other termination systems. **DO NOT ASSUME** that one foot of flexible vent pipe equals one foot of straight PVC/ABS DWV vent pipe.

Compare the Total Equivalent Vent Length to the Maximum Equivalent Vent Lengths 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.

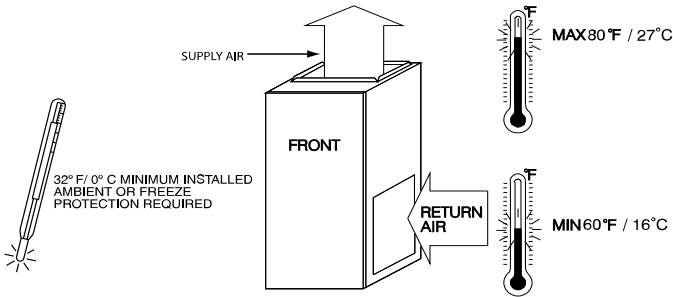
VERIFY FROM POLYPROPYLENE VENT MANUFACTURER'S INSTRUCTIONS for the multiplier correction for flexible vent pipe.

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 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
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

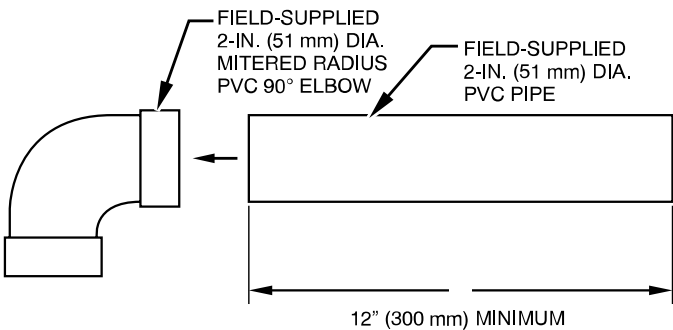
RETURN AIR TEMPERATURE

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

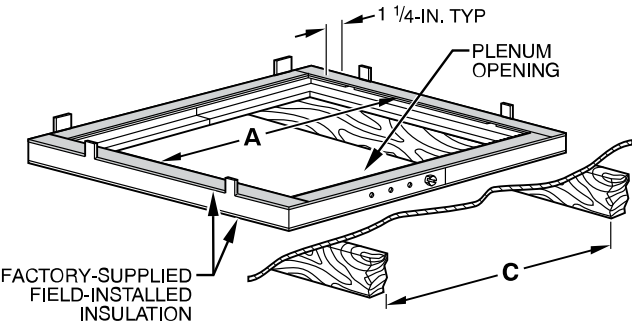
COMBUSTION-AIR PIPE FOR NON-DIRECT (1-PIPE) VENT APPLICATION



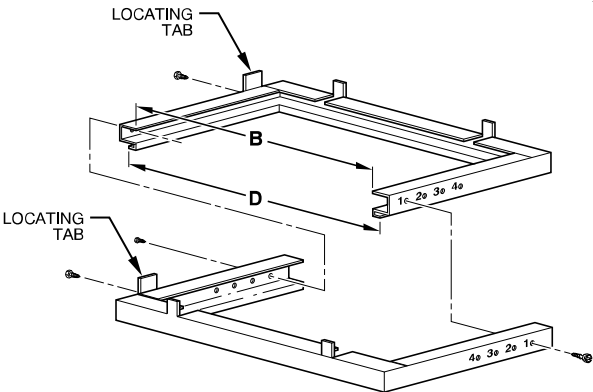
A12376

NOTE: See Installation Instructions for specific venting configurations.

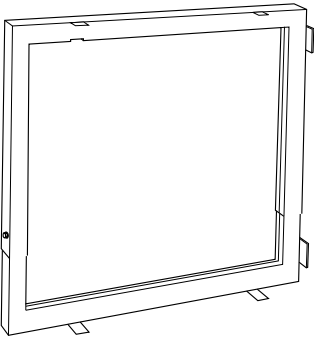
DOWNFLOW SUBBASE



A97427



A88207



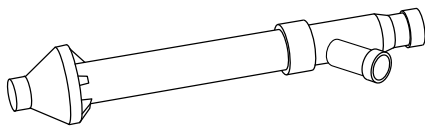
Downflow Subbase

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 the manufacturer's cased coil is used. It is CSA design certified for use with the manufacturer's branded furnaces when installed in downflow applications.

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.



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

ICP has a wide variety of thermostats for your system; please visit Tempstar.com to see all thermostats and IAQ products.

PART NUMBER	DESCRIPTION	0601716	0801716	0802120	1002122	1002422
NAHA001NK	Condensate Neutralizer Kit	X	X	X	X	X
1188594*	Gas Valve Tower Port Adapter Kit	X	X	X	X	X
ACG1425NCB*	External Filter Rack, 14-1/2" x 25"	—	—	—	—	—
ACG1625NCF*	External Filter Rack, 16" x 25"	X	X	—	—	—
ACG2025NCJ*	External Filter Rack, 20" x 25"	—	—	X	X	—
ACG2424NCL*	External Filter Rack, 24-1/2" x 24"	—	—	—	—	X
325531-402*	Washable filter, 3/4" x 16" x 25"	X	X	—	—	—
325531-403*	Washable filter, 3/4" x 20" x 25"	—	—	X	X	—
325531-404*	Washable filter, 3/4" x 24" x 25"	—	—	—	—	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
NAHA01401RA	Return Air Base (Upflow Applications) 14-3/16" wide	—	—	—	—	—
NAHA01701RA	Return Air Base (Upflow Applications) 17-1/2" wide	X	X	—	—	—
NAHA02101RA	Return Air Base (Upflow Applications) 21" wide	—	—	X	X	—
NAHA02401RA	Return Air Base (Upflow Applications) 24-1/2" wide	—	—	—	—	X
NAHA002CV	Vent Terminal - Concentric - 2" (51 mm)					
NAHA001CV	Vent Terminal - Concentric - 3" (76 mm)	See Venting Tables				
NAHA00301VT	Vent Terminal Bracket - 2" (51 mm)					
NAHA00401VT	Vent Terminal Bracket - 3" (76 mm)					
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
NAHA00101HH	Freeze Protect Kit - Condensate Drain Line Tape	X	X	X	X	X
NAHA00201HH	Freeze Protect Kit - Condensate Trap with Heat Pad	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
NAHB00101CT	External Trap Kit	X	X	X	X	X
NAHA00101HV	Horizontal Trap Grommet - Direct Vent	All 2-Pipe Horizontal				
NAHA01101SB	Downflow Furnace Base Kit for Combustible Floors	X	X	X	X	X
AGAGC9NPS01E*	Gas Conversion Kit - Nat to LP†	X	X	X	X	X
AGAGC9PNS01E*	Gas Conversion Kit - LP to Nat†	X	X	X	X	X

*. Order through FAST Parts.

†. Factory authorized and filed installed. Gas conversion kits are CSA recognized.

X = Accessory available

ORIFICES

DESCRIPTION		See Installation Instructions for model, altitude, and heat value usages.
Gas Orifice Kit - #42 (Nat Gas)	1185612	
Gas Orifice Kit - #43 (Nat Gas)	1176928	
Gas Orifice Kit - #44 (Nat Gas)	1185574	
Gas Orifice Kit - #45 (Nat Gas)	1177213	
Gas Orifice Kit - #46 (Nat Gas)	1183809	
Gas Orifice Kit - #47 (Nat Gas)	1185613	
Gas Orifice Kit - #48 (Nat Gas)	1185614	
Gas Orifice Kit - 1.25mm (LP)	1185617	

GUIDE SPECIFICATIONS

General

System Description

Furnish a _____ 4-way multipoise gas-fired condensing furnace for use with natural gas or propane (factory-authorized conversion kit required for propane).

Quality Assurance

Unit will be designed, tested and constructed to the current ANSI Z 21.47/CSA 2.3 design standard for gas-fired central furnaces.

Unit will be third party certified by CSA to the current ANSI Z 21.47/CSA 2.3 design standard for gas-fired central furnaces. Unit will carry the CSA Blue Star® and Blue Flame® labels. Unit efficiency testing will be performed per the current DOE test procedure as listed in the Federal Register.

Unit will be certified for capacity and efficiency and listed in the latest AHRI Consumer's Directory of Certified Efficiency Ratings.

Unit will carry the current Federal Trade Commission Energy Guide efficiency label.

Delivery, Storage, and Handling

Unit will be shipped as single package only and is stored and handled per unit manufacturer's recommendations.

Warranty (for inclusion by specifying engineer)

U.S. and Canada only. Warranty certificate available upon request.

Equipment

Blower Wheel and ECM Blower Motor

Galvanized blower wheel shall be centrifugal type, statically and dynamically balanced. Blower motor of ECM type shall be permanently lubricated with sealed ball bearings, of _____ HP, and have multiple speeds from 600-1200 RPM operating only when 24-VAC motor inputs are provided. Blower motor shall be direct drive and soft mounted to the blower housing to reduce vibration transmission.

Filters

Furnace shall have reusable-type filters.

Filter shall be _____ in. (mm) x _____ in. (mm).

An accessory highly efficient Media Filter is available as an option.
_____ Media Filter.

Casing

Casing shall be of 0.030 in. thickness minimum, pre-painted steel.

Draft Inducer Motor

Draft inducer motor shall be single-speed PSC design.

Primary Heat Exchangers

Primary heat exchangers shall be 3-Pass corrosion-resistant aluminized steel of fold-and-crimp sectional design and applied operating under negative pressure.

Secondary Heat Exchangers

Secondary heat exchangers shall be of a stainless steel flow-through of fin-and-tube design and applied operating under negative pressure.

Controls

Controls shall include a micro-processor-based integrated electronic control board with at least 16 service troubleshooting codes displayed via diagnostic flashing LED light on the control, a self-test feature that checks all major functions of the furnace, and a replaceable automotive-type circuit protection fuse. Multiple operational settings available, including blower speeds for heating and cooling.

Operating Characteristics

Heating capacity shall be _____ Btuh input;
_____ Btuh output capacity.

Fuel Gas Efficiency shall be _____ AFUE.

Air delivery shall be _____ cfm minimum at 0.50 in. W.C. external static pressure.

Dimensions shall be: depth _____ in. (mm); width _____ in. (mm); height _____ in. (mm) (casing only).

Height shall be _____ in. (mm) with A/C coil and _____ in. (mm) overall with plenum.

Electrical Requirements

Electrical supply shall be 115 volts, 60 Hz, single-phase (nominal). Minimum wire size shall be _____ AWG; maximum fuse size of HACR-type designated circuit breaker shall be _____ amps.

Special Features

Refer to section of the product data identifying accessories and descriptions for specific features and available enhancements.