

day & night

Day&Night  
Air Conditioning

Indianapolis, IN  
City of Industry, CA

## DELUXE DOWNFLOW CONDENSING FURNACE

Model 399AAZ  
Sizes 040 thru 100  
Series A



A87413

### Model 399AAZ

Using advanced technology and craftsmanship, BDP has reached its goal of developing a downflow gas-fired condensing furnace second to none in the market place.

The Model 399AAZ Deluxe Downflow Condensing Furnace is the result of an extensive, systematic, research and development project to build an affordable condensing furnace that exceeds a rating of 90% AFUE (Annual Fuel Utilization Efficiency). It is designed for reliability, high efficiency, and quiet operation. Its unique arrangement of gas controls, sealed combustion system, and direct venting, make this furnace an industry pacesetter.

#### FEATURES

**SEALED COMBUSTION (DIRECT VENT) SYSTEM**—Enclosed burner assembly isolates operating noise without the expense of sound deadening devices. With the sealed combustion (direct vent) system, outdoor air is brought directly into the combustion chamber. This cuts cold air infiltration into the structure and reduces heat loss. As an added benefit, the sealed combustion (direct vent) system protects the furnace from corrosive chloride fumes given off by laundry products and other household chemicals inside the structure.

**MONOPORT INSHOT BURNERS**—produce precise air-to-gas mixture which gives a clean burn.

The large monoport on the inshot (or injection-type) burners seldom, if ever, needs cleaning.

**FOUR-PASS HEAT EXCHANGERS**—This design accelerates heat transfer and extracts heat that conventional heat exchangers waste up the flue. The heat exchanger is aluminized steel for corrosion resistance.

The Everlastic™ condensing heat exchanger is also a four-pass design. The sheet metal cells are laminated with polypropylene for greater resistance to corrosion. This breakthrough in heating technology (Patent No. 4,738,307) helps extend the life of the furnace for years of trouble-free Plus 90 performance. The heat exchanger is positioned in the furnace to extract additional Btu's of heat from the combustion products as they move through its four passes.

**HEAT EXCHANGER WARRANTY**—Limited lifetime of original owner in single family residence; 20 years in other residential and commercial applications. Your Dealer has details.

**COMBUSTION AIR AND VENTILATION**—The 399AAZ design is so advanced that Schedule 40 PVC, PVC-DWV, SDR-21 PVC, SDR-26 PVC, ABS-DWV, or ABS-F628 Schedule 40 pipe can be used to bring outdoor air into the furnace for combustion. The heat extracted lowers the temperature of the combustion products (typically below 115°F) to a point that PVC pipe can also be used for venting combustion products outside the structure. The combustion air and vent pipes can terminate through a side wall or through the roof when using our approved vent termination kit.

**SAFETY**—The 399AAZ has three exclusive safety control features: (1) a self-checking draft control circuit that must reset before another burner cycle can begin, (2) a negative pressure condensate trap system that prevents combustion products from entering the drain system when the trap is not primed, (3) 100% shutoff of pilot and main burner gas if pilot does not light in 5 minutes.

**SOLID-STATE BLOWER CONTROL OFF-TIMING ADJUSTABLE**—Timed blower operation stops annoying recycling thermally activated blower controls. The off timing can be adjusted by turning a knob.

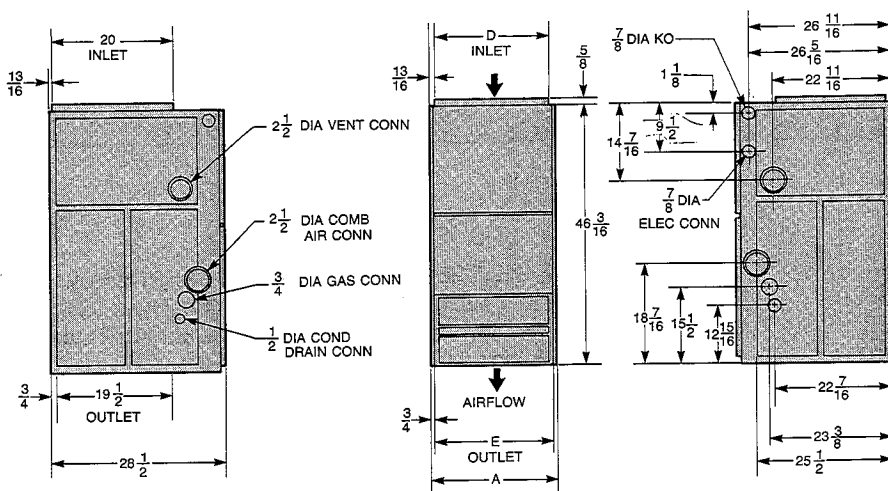
**PRINTED-CIRCUIT CONTROL CENTER**—The printed-circuit board and all internal wiring are factory installed. Screw terminals permit quick-connecting a humidifier, an air cleaner, and air conditioning control circuits.

**FULLY INSULATED CASING**—Foil-faced insulation in the heat exchanger section cuts the heat loss and insulation in the blower section reduces noise levels. The casing also has the required openings for left- or right-side connection of gas, drain, and vent connections.

**OLD FURNACE REPLACEMENT**—The 46-3/16-inch casing height makes the Model 399AAZ Furnace ideal for replacement applications.

**CERTIFICATIONS**—The 399AAZ units are A.G.A. design certified for use with natural or propane gas. Field conversion to propane is required. The efficiency is GAMA efficiency rating certified. The Model 399AAZ exceeds California minimum seasonal efficiency requirements by a wide margin, and meets the oxides of nitrogen (NO<sub>x</sub>) emission levels set by South Coast and Bay Area Air Quality Management Districts in California.

Form No. PDS 399A.40.4D



### DIMENSIONS (in Inches)

SIZE	A	D	E	Approx Shipping Weight
036040	17-1/2	15-7/8	16	179
036060	17-1/2	15-7/8	16	187
048080	21	19-3/8	19-1/2	202
060100	24-1/2	22-7/8	23	241

A87297

### SPECIFICATIONS

SIZE	036040	036060	048080	060100
<b>RATINGS AND PERFORMANCE</b>				
Input Btuh*	44,000	66,000	88,000	110,000
Capacity†	Nonweatherized ICS‡ 40,000		80,000	100,000
AFUE %†	Nonweatherized ICS‡ 90.3		90.3	90.3
California Seasonal Efficiencies (CSE)†	84.9		86.6	85.8
Certified Temperature Rise Range °F	20—50		40—70	40—70
Certified External Static Pressure	Heating	0.10	0.12	0.15
	Cooling	0.50	0.50	0.50
Airflow Cfm	Heating	1335	1275	1590
	Cooling	1265	1170	1565
<b>ELECTRICAL</b>				
Unit Volts—Hertz—Phase	115—60—1			
Minimum Wire Size	14			12
Maximum Wire Length (feet)**	41	42	36	42
Maximum Unit Amps	8.7	8.2	10.1	13.6
Operating Voltage Range Min—Max	104—127			
Maximum Fuse Size or HACR-Type Ckt Bkr Amps††	15			20
Transformer (24-V)	40VA			
External Control	Heating	21VA		
	Cooling	36VA		
Air Conditioning Blower Relay	Standard			
<b>CONTROLS</b>				
Limit Control	SPST			
Secondary Limit Control	Manual Reset			
Heating Blower Control	Solid-State Time Operation			
Burners (Monoport)	2	3	4	5
Gas Connection Size	1/2-inch NPT			
<b>GAS CONTROLS</b>				
Gas Valve (Redundant)	Manufacturer	White-Rodgers		
	Minimum Inlet Pressure	4.5 inches wc		
	Maximum Inlet Pressure	13.6 inches wc		
Pilot Safety	Model	740A		
<b>BLOWER DATA</b>				
Direct-Drive Motor HP—Type	1/3—PSC	1/3—PSC	1/2—PSC	3/4—PSC
Motor Full Load Amps	5.8	5.8	7.9	11.1
RPM (Nominal)—Speeds	1075—4	1075—4	1075—4	1075—4
Blower Wheel Diameter x Width	10 x 7	10 x 7	10 x 8	11 x 10
Filter Size—Permanent Washable	(2) 16 x 20 x 1			
<b>FACTORY-AUTHORIZED AND LISTED, DEALER-INSTALLED OPTIONS</b>				
Downflow Furnace Subbase	313512-70101			
Gas Conversion Kit—Natural-to-Propane	315784-70101			
Gas Conversion Kit—Propane-to-Natural	315784-70201			

\*Gas input ratings are certified for elevations to 2000 feet. For elevations above 2000 feet, reduce input 4% for each 1000 feet above sea level.

†Capacity and AFUE in accordance with U.S. Government DOE test procedures. California Seasonal Efficiencies based on California-specified procedures.

‡ICS—Isolated Combustion System

\*\*Length shown is measured one way along wire path between unit and service panel for maximum 2% voltage drop.

††Time-delay fuse is recommended.

**MAXIMUM ALLOWABLE COMBUSTION-AIR AND VENT PIPE LENGTH (In Feet)**

Altitude (feet) above sea level)	Furnace Size	Pipe Dia.	Number of 90-Degree Elbows				
			1	2	3	4	5
0 to 2000	036040	1-1/2	20	15	10	10	5
		2	35	35	35	35	35
	036060	1-1/2	10	5	5	—	—
		2	35	30	20	15	10
2001 to 3000	036040	1-1/2	17	12	7	6	—
		2	31	30	30	29	29
	036060	1-1/2	8	—	—	—	—
		2	31	25	16	11	6
3001 to 4000	036040	1-1/2	15	10	—	—	—
		2	28	27	26	25	24
	036060	1-1/2	6	—	—	—	—
		2	28	22	13	8	—
4001 to 5000	036040	1-1/2	13	9	—	—	—
		2	26	25	24	23	22
	036060	1-1/2	5	—	—	—	—
		2	26	20	11	7	—
5001 to 6000	036040	1-1/2	11	7	—	—	—
		2	24	22	21	19	18
	036060	1-1/2	5	—	—	—	—
		2	26	20	11	7	—
6001 to 7000	036040	1-1/2	10	6	—	—	—
		2	22	20	19	17	16
	036060	1-1/2	2	—	—	—	—
		2	22	15	7	—	—
7001 to 8000	036040	1-1/2	8	—	—	—	—
		2	19	17	15	13	11
	036060	1-1/2	2	—	—	—	—
		2	19	12	—	—	—
8001 to 9000	036040	1-1/2	6	—	—	—	—
		2	17	15	13	11	9
	036060	1-1/2	2	—	—	—	—
		2	17	10	—	—	—
9001 to 10,000	036040	1-1/2	15	12	10	7	5
		2	15	7	—	—	—
	036060	1-1/2	2	—	—	—	—
		2	15	12	10	7	5
9001 to 10,000	048080	2-1/2	15	12	10	7	—
		3	—	—	—	—	—
	060100	2-1/2	15	12	10	7	—
		3	15	12	10	7	5

**NOTES:**

1. Size both the combustion-air and vent pipe independently, then use the larger diameter for both pipes.
2. Assume two 45-degree elbows equal one 90-degree elbow. Long radius elbows are desirable.
3. Elbows and pipe sections within the furnace casing and at the vent termination should not be included in count.
4. The installer may use one larger pipe size than what is specified above (up to 3-inch diameter maximum).
5. The minimum pipe length is 5 feet for all applications.

Before purchasing this appliance, read important energy cost and efficiency information available from your retailer.



**MEETS DOE RESIDENTIAL CONSERVATION SERVICES PROGRAM STANDARDS.**

### AIR DELIVERY—CFM (With Filter)

Furnace Size	Blower Motor HP	Speed	External Static Pressure in. wc						
			0.1	0.2	0.3	0.4	0.5	0.6	0.7
036040	1/3 PSC	High	1500	1455	1395	1335	1265	1190	1110
		Med-High	1335	1305	1265	1210	1155	1090	1010
		Med-Low	1140	1115	1090	1060	1020	955	875
		Low	965	955	935	900	865	810	700
036060	1/3 PSC	High	1395	1340	1290	1230	1170	1100	1025
		Med-High	1285	1235	1185	1140	1080	1015	935
		Med-Low	1130	1105	1065	1025	970	920	840
		Low	940	930	920	885	835	785	715
048080	1/2 PSC	High	1860	1785	1720	1645	1565	1470	1370
		Med-High	1605	1575	1535	1475	1400	1330	1240
		Med-Low	1380	1360	1335	1290	1240	1190	1110
		Low	1230	1225	1210	1190	1145	1110	1020
060100	3/4 PSC	High	2265	2255	2180	2090	2035	1945	1855
		Med-High	2050	2000	1970	1930	1845	1775	1695
		Med-Low	1720	1705	1655	1630	1605	1550	1475
		Low	1480	1470	1455	1450	1420	1395	1335



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

UNIT MUST BE INSTALLED IN ACCORDANCE  
WITH INSTALLATION INSTRUCTIONS