

SERVICE FACTS

Gas Furnace — Induced Draft — 1-Stage Heat

Model: *DD100C948B

* - First letter may be "A" or "T"

IMPORTANT -- This document contains a wiring diagram and service information. This is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

***DD100-SF-2A**
Dwg. No. 21X340487 P01

Library	Service Literature
Product Section	Unitary
Product	Furnace — Gas
Model	*DD
Literature Type	Service Facts
Sequence	2A
Date	August 1993
File No.	SV-UN-FURN-*DD100-SF-2A 8/93
Supersedes	New

B - FURNACES

WARNING: HAZARDOUS VOLTAGE - DISCONNECT POWER BEFORE SERVICING

PRODUCT SPECIFICATIONS ①

MODEL	*DD100C948B
TYPE	Hot Surface Ignition
RATINGS ②	
Input BTUH	100,000
Capacity BTUH (ICS) ③	80,000
Temp. rise (Min.-Max.) *F.	35 - 65
BLOWER DRIVE	DIRECT
Diameter-Width (In.)	10 x 8
No. Used	1
Speeds (No.)	4
CFM vs. in. w.g.	See Fan Performance Table
Motor HP	1/2
R.P.M.	1075
Volts/Ph/Hz	115/1/60
COMBUSTION FAN - Type	Centrifugal
Drive - No. speeds	Direct - 1
Motor HP - R.P.M.	1/50 - 3000
Volts/Ph/Hz	115/1/60
F.L. Amps	1.0
FILTER — Furnished?	Yes
Type Recommended	
Lo. Vel. (No.-Size-Thk.)	—
Hi Vel. (No.-Size-Thk.)	2 - 16x20 - 1in.
VENT COLLAR — Size (in.)	4 Round
HEAT EXCHANGER	
Type-Fired	Alum. Steel
-Unfired	
Gauge (Fired)	20
ORIFICES — Main	
Nat. Gas. Qty. — Drill Size	5 — 44
L.P. Gas Qty. — Drill Size	5 — 55
GAS VALVE	Redundant - Single Stage
PILOT SAFETY DEVICE	
Type	Hot Surface Ignition
BURNERS — Type	Multiport Inshot
Number	5
POWER CONN. — V/Ph/Hz ④	115/1/60
Ampacity (In Amps)	14.2
Overcurrent Protection — Max. (Amps)	15
PIPE CONN. SIZE (IN.)	1/2
DIMENSIONS	H x W x D
Uncrated (In.)	40 x 21 x 28
WEIGHT	
Shipping (Lbs.) / Net (Lbs)	166 / 154

- ① Central Furnace heating designs are certified by the American Gas Association Inc. Laboratories.
- ② Ratings shown are for elevations up to 2000 feet. For elevations above 2000 feet; Ratings should be reduced at the rate of 4% for each 1000 feet above sea level.
- ③ Based on U.S. government standards tests.
- ④ The above wiring specifications are in accordance with National Electrical Code; however, installations must comply with local codes.

SAFETY NOTICE

THIS INFORMATION IS INTENDED FOR USE BY INDIVIDUALS POSSESSING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

NOTICE: Since the manufacturer has a policy of continuous product improvement, it reserves the right to change specifications and design without notice.

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EMERGENCY SHUT-OFF INSTRUCTIONS

IF IT IS SUSPECTED THAT A FAILURE OF THE ELECTRICAL, FUEL, OR MECHANICAL SYSTEMS WITHIN THIS FURNACE HAS OCCURRED, THE GAS SUPPLY SHOULD IMMEDIATELY BE TURNED OFF AT THE MANUAL GAS VALVE, LOCATED IN THE BURNER COMPARTMENT AND/OR AT LEVER-HANDLED COCK, AND ELECTRICAL POWER TO THE FURNACE SHOULD BE DISCONNECTED. THE FAILURE MUST BE CORRECTED BY A QUALIFIED SERVICER BEFORE OPERATING THE FURNACE.

The following warning complies with State of California law, Proposition 65.

WARNING: This product contains fiberglass wool insulation! Fiberglass dust and ceramic fibers are believed by the state of California to cause cancer through inhalation. Glasswool fibers may also cause respiratory, skin, or eye irritation.

PRECAUTIONARY MEASURES

- Avoid breathing fiberglass dust.
- Use a NIOSH approved dust/mist respirator.
- Avoid contact with the skin or eyes. Wear long-sleeved, loose fitting clothing, gloves, and eye protection.
- Wash clothes separately from other clothing; rinse washer thoroughly.
- Operations such as sawing, blowing, tear-out, and spraying may generate fiber concentrations requiring additional respiratory protection. Use the appropriate NIOSH approved respirator in these situations.

FIRST AID MEASURES

- Eye Contact** - Flush eyes with water to remove dust. If symptoms persist, seek medical attention.
- Skin Contact** - Wash affected areas gently with soap and warm water after handling.

SAFETY WARNING

ALL PARTS OF THIS PRODUCT CAPABLE OF CONDUCTING ELECTRICAL CURRENT ARE GROUNDED. IF GROUNDING WIRES, SCREWS, STRAPS, CLIPS, NUTS OR WASHERS USED TO COMPLETE A PATH TO GROUND ARE REMOVED FOR SERVICE, THEY MUST BE RETURNED TO THEIR ORIGINAL POSITION AND PROPERLY FASTENED.

B-492-301

P.I. 8/93

ABNORMAL CONDITIONS

1. EXCESSIVE COMBUSTION VENT PRESSURE OR FLUE BLOCKAGE

If pressure against induced draft blower outlet becomes excessive, the pressure switch will react and shut off the gas valve until acceptable combustion pressure is again available.

2. LOSS OF FLAME

If loss of flame occurs during a heating cycle, when flame is not present at the sensor, the flame control module will close the gas valve. The flame control module will then recycle the ignition sequence, then if ignition is not achieved, it will shut off the gas valve and lock out the system.

3. POWER FAILURE

If there is a power failure during a heating cycle, the system will restart the ignition sequence automatically when power is restored, if the thermostat still calls for heat.

4. GAS SUPPLY FAILURE

If loss of flame occurs during a heating cycle, the system flame control module will re-cycle the ignition sequence. If ignition is not achieved, the flame control module will shut off the gas valve and lock out the system.

5. RESET AFTER LOCKOUT

IMPORTANT: Before resetting the system, count and make note of the number of fault light blinks seen through the blower door view port.

If the system is locked out, a manual reset procedure may be tried. There are two ways to reset the system from the thermostat. The first is to turn the system switch to the "OFF" position then back "ON", then "OFF" and back on again within 30 seconds.

The second procedure is to lower the thermostat to a lower temperature then to a temperature higher than room temperature which creates a call for heat, then repeat again, (Quickly switch off-on-off-on within 30 seconds).

6. INDUCED DRAFT BLOWER FAILURE

If pressure is not sensed by the pressure switch, the contacts will remain open and not allow the gas valve to open, therefore the unit will not start. If failure occurs during a running cycle, the pressure switch contacts will open and the gas valve will close to shut the unit down.

SEQUENCE OF OPERATION

Thermostat call for heat

R and W thermostat contacts close signaling the control module to run its self-check routine. After the control module has verified that the pressure switch contacts are open and the limit switch(es) contacts are closed, the draft blower will be energized.

As the induced draft blower comes up to speed, the pressure switch contacts will close and the ignitor warm up period will begin. The ignitor will heat for approx. 17 seconds, then the gas valve is energized to permit gas flow to the burners. The flame sensor confirms that ignition has been achieved within the 6 second ignition trial period.

After the flame sensor confirms that ignition has been achieved, the delay to fan ON period begins timing and after approx. 45 seconds the indoor blower motor will be energized and will continue to run during the heating cycle.

When the thermostat is satisfied, R and W thermostat contacts open, the gas valve will close, the flames will extinguish, and the induced draft blower will be de-energized. The indoor blower motor will continue to run for the fan off period (Field selectable at 90, 120, 150 or 210 seconds), then will be de-energized by the control module.

NOTE: The integrated furnace control requires 1.0 or more microamps for proper operation.

SCHEMATIC DIAGRAM

*DD100C9

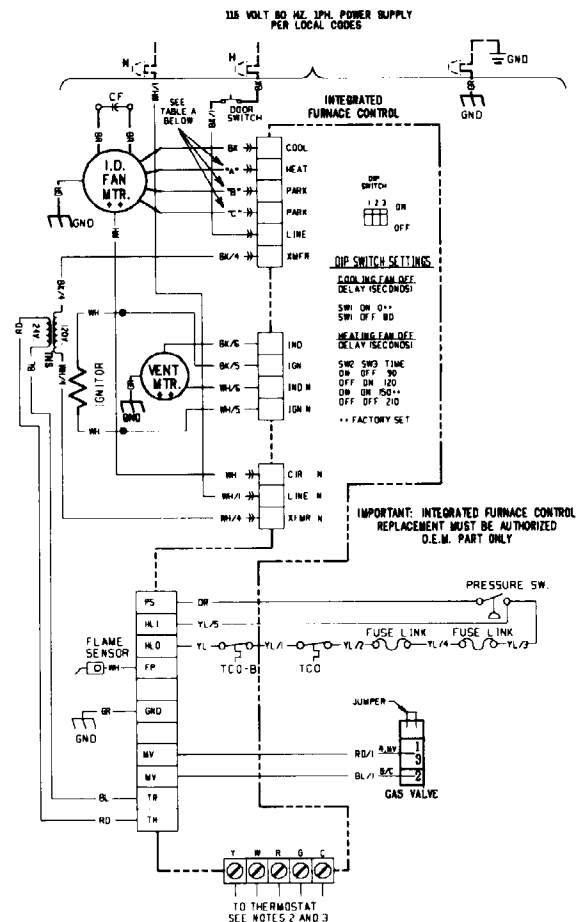


TABLE A			
SPEED TAPS FOR INDOOR FAN MOTOR			
MODELS	HEAT "A"	PARK "B"	PARK "C"
*DD100C948B	BL	YL	RD
(1) RED - LOW (2) YELLOW - MED. LOW (3) BLUE - MED. HIGH (4) BLACK - HIGH			

* - FIRST LETTER MAY BE 'A' OR 'T'

NOTES

- IF ANY OF THE ORIGINALS BE REPLACED WITH W/
- THERMOSTAT HEAT AP
- FOR PROPER OPERATIO ROOM THERMOSTAT.

Contacts for Electronic Air Cleaner are energized upon blower start in heating or cooling.

Contacts for a humidifier are energized upon blower start in heating only.

CONTROLS AND SAFETY SWITCH CHECKOUT

WARNING: On initial startup, limit switch operation must be checked.

LIMIT SWITCH CHECK OUT

To check for proper operation of the limit switches, set the thermostat to a temperature higher than the indicated temperature to bring on the gas valve. Restrict the airflow by blocking the return air, (The inducer limit located on the inducer housing may trip if the indoor motor is de-energized to perform the primary limit checkout). When the furnace reaches the maximum outlet temperature as shown on the rating plate, the burners must shut

off. If they heating is switch mu limit contr air inlet.

AIRFLOW

Check inle within the r the airflow diagram fo motor.

WARNING

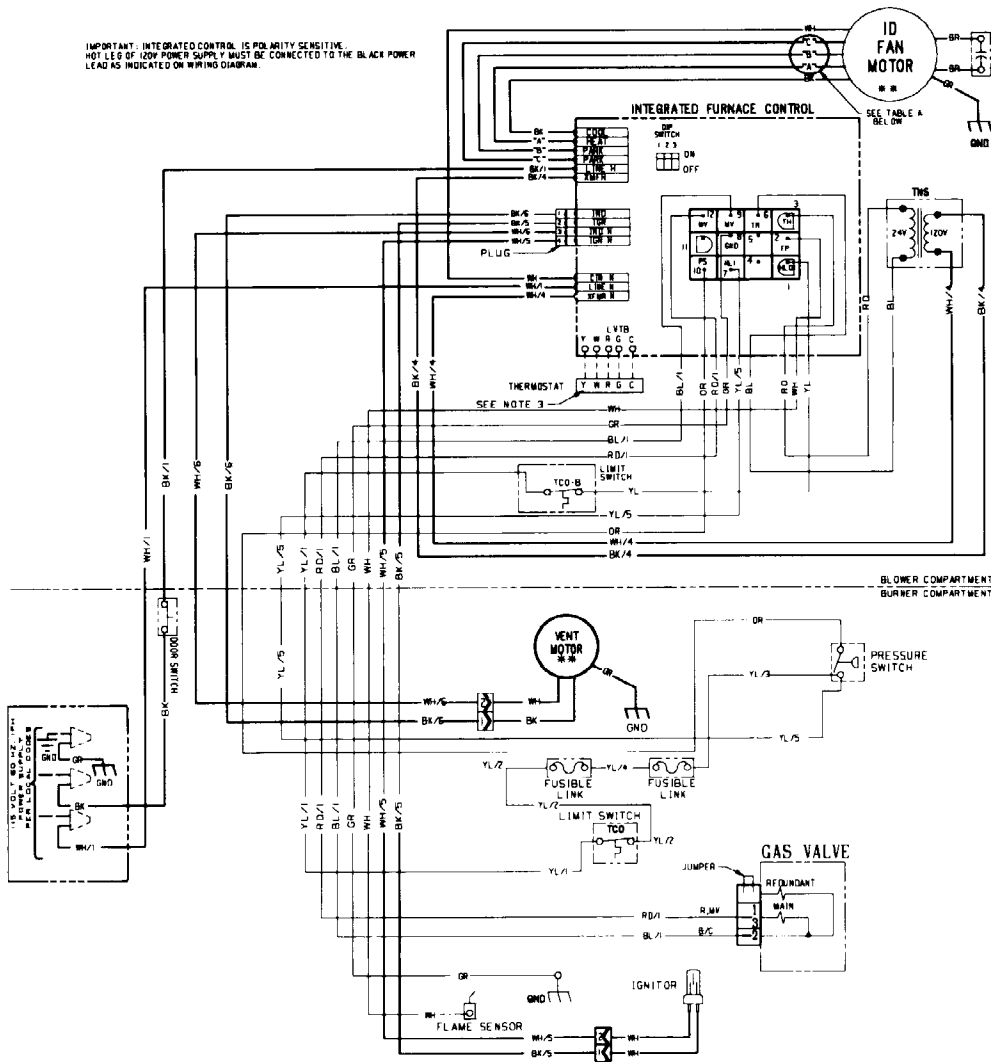
the blowe

This unit i power to th

***DD100C948B**

WIRING DIAGRAM

LEGEND



- 24 V } FACTORY WIRING
 - LINE V }
 - 24 V } FIELD WIRING
 - LINE V }
 - ⊕ EARTH GROUND
 - ⊕ CHASSIS GROUND
 - JUNCTION
 - WIRE NUT OR CONNECTOR
 - ⊖ COIL
 - ⊖ CAPACITOR
 - ⊖ TRANSFORMER
 - CONNECTOR
 - ⊖ TEMP ACTUATED SWITCH
 - ⊖ PRESS ACTUATED SWITCH
 - ⊖ DOOR SWITCH
 - ⊖ FUSIBLE LINK
 - TERMINAL
 - TERMINAL BOARD
-
- COLOR OF WIRE
- BK/BL BLACK WIRE WITH BLUE MARKER
- COLOR OF MARKER
- | | | | | | |
|----|-------|----|--------|----|--------|
| BK | BLACK | OR | ORANGE | YL | YELLOW |
| BL | BLUE | RD | RED | GR | GREEN |
| BR | BROWN | WH | WHITE | PR | PURPLE |
-
- | | |
|------|-------------------------------|
| GV | GAS VALVE |
| CF | FAN CAPACITOR |
| GND | GROUND |
| L | LINE |
| LVTB | LOW VOLTAGE TERMINAL BOARD |
| MTR | MOTOR |
| N | NEUTRAL |
| TCO | HIGH TEMPERATURE LIMIT SWITCH |
| TNS | TRANSFORMER |
| B/C | COMMON |
| PS | PRES SWITCH INPUT |
| H/L | HIGH LIMIT INPUT |
| H/O | HIGH LIMIT OUTPUT |
| FP | FLAME SENSOR PROBE |
| MV | GAS VALVE |
| TR | 24V AC TRANS COMMON SIDE |
| TH | 24V AC TRANS HOT SIDE |
| R | REDUNDANT |
- **THERMALLY PROTECTED INTERNALLY

- NOTES**
- IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE FURNACE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 C
 - THERMOSTAT HEAT ANTICIPATOR SETTING: 3B AMPS.
 - FOR PROPER OPERATION OF COOLING FAN SPEED, "Y" TERMINAL MUST BE CONNECTED TO ROOM THERMOSTAT.

From Dwg. 21D340103 P10

MOTOR
PARK "C"
RD

zed upon blower
 n blower start in
OUT
 eration must be
 witches, set the
 dicated tempera-
 w by blocking the
 ncer housing may
 n the primary limit
 maximum outlet
 urners must shut

off. If they do not shut off after a reasonable time and over-
 heating is evident, a faulty limit switch is probable and the limit
 switch must be replaced. After checking the operation of the
 limit control, be sure to remove the restriction from the return
 air inlet.

AIRFLOW ADJUSTMENT
 Check inlet and outlet air temperatures to make sure they are
 within the ranges specified on the furnace rating nameplate. If
 the airflow needs to be increased or decreased, see the wiring
 diagram for information on changing the speed of the blower
 motor.

**WARNING: Disconnect power to the unit before removing
 the blower door.**
 This unit is equipped with a blower door switch which cuts
 power to the blower and gas valve causing shutdown when the

door is removed. Operation with the door removed or ajar can permit
 the escape of dangerous fumes. All panels must be securely closed at
 all times for safe operation of the furnace.

INDOOR BLOWER TIMING
Heating: The control module controls the indoor blower. The blower
 start is fixed at 45 seconds after ignition. The FAN-OFF period is field
 selectable by dip switches at 90, 120, 150, or 210 seconds. The factory
 setting is 150 seconds, (See unit wiring diagram above).

Cooling: The fan delay off period is factory set at 0 seconds. The option
 for 80 second delay off is field selectable, (See unit wiring diagram
 above).

ROOM AIR THERMOSTAT HEAT ANTICIPATOR ADJUSTMENT
 Set the thermostat heat anticipator according to the current flow
 measured, or the settings found in the notes on the furnace wiring
 diagram.

FLAME ROLL-OUT DEVICE

All models are equipped with a fusible link on the burner cover. In case of flame roll-out, the link will open (melt) and cause the circuit to open which shuts off all flow of gas.

COMBUSTION AND INPUT CHECK

1. Make sure all gas appliances are off except the furnace.
2. Clock the gas meter with the furnace operating (determine the dial rating of the meter) for one revolution.
3. Match the "Sec" column in the gas flow (in cfh) Table 3 with the time clocked.
4. Read the "Flow" column opposite the number of seconds clocked.
5. Use the following factors if necessary:
 For 1 Cu. Ft. Dial Gas Flow CFH = Chart Flow Reading ÷ 2
 For 1/2 Cu Ft. Dial Gas Flow CFH = Chart Flow Reading ÷ 4
 For 5 Cu. Ft. Dial Gas Flow CFH = 10 X Chart Flow Reading ÷ 4
6. Multiply the final figure by the heating value of the gas obtained from the utility company and compare to the nameplate rating. This must not exceed the nameplate rating.
7. Changes can be made by adjusting the manifold pressure or changing orifices (orifice change may not always be required).
 - a. Attach a manifold pressure gauge.
 - b. Remove the slot screw on top of the gas valve for manifold pressure adjustment.
 - c. Turn the adjustment nut in to increase the gas flow rate, and out to decrease the gas flow rate.
 - d. The final manifold pressure setting shall be no less than 3.0" W.C. and no more than 3.5" W.C. with an input of no more than nameplate rating and no less than 93 % of the nameplate rating, unless the unit is derated for high altitude.

For LP gases, the final manifold pressure shall be no less than 10.0" W.C. and no more than 10.5" W.C. with an input of no more than the nameplate rating and no less than 93 % of the nameplate rating, unless the unit is derated for altitude.

Input Rating BTUH (000)	No. of Burners	Main Burner Orifice	
		Drill Size	
		Nat. Gas	Propane
100	5	44	55

The following warning complies with State of California law, Proposition 65.

WARNING: Hazardous Gasses!
 Exposure to fuel substances or by-products of incomplete fuel combustion is believed by the state of California to cause cancer, birth defects, or other reproductive harm.

TABLE 3

GAS FLOW IN CUBIC FEET PER HOUR 2 CUBIC FOOT DIAL							
Sec.	Flow	Sec.	Flow	Sec.	Flow	Sec.	Flow
8	900	29	248	50	144	82	88
9	800	30	240	51	141	84	86
10	720	31	232	52	138	86	84
11	655	32	225	53	136	88	82
12	600	33	218	54	133	90	80
13	555	34	212	55	131	92	78
14	514	35	206	56	129	94	76
15	480	36	200	57	126	96	75
16	450	37	195	58	124	98	73
17	424	38	189	59	122	100	72
18	400	39	185	60	120	104	69
19	379	40	180	62	116	108	67
20	360	41	176	64	112	112	64
21	343	42	172	66	109	116	62
22	327	43	167	68	106	120	60
23	313	44	164	70	103	124	58
24	300	45	160	72	100	128	56
25	288	46	157	74	97	132	54
26	277	47	153	76	95	136	53
27	267	48	150	78	92	140	51
28	257	49	147	80	90	144	50

INTEGRATED CONTROL DIAGNOSTIC INDICATOR

FLASHING SLOW	NORMAL. NO CALL FOR HEAT
FLASHING FAST	NORMAL. CALL FOR HEAT
CONTINUOUS ON	REPLACE CONTROL
CONTINUOUS OFF	CHECK POWER
2 FLASHES	SYSTEM LOCKOUT (NO FLAME)
3 FLASHES	PRESSURE SWITCH PROBLEM
4 FLASHES	THERMAL PROTECTION DEVICE OPEN
5 FLASHES	FLAME SENSED WITH GAS VALVE OFF

FURNACE AIRFLOW (CFM) VS. STATIC PRESSURE (ins. w.g.)

MODEL	SPEED TAP	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90
*DD100C948B	4 - HIGH	1789	1743	1684	1614	1532	1439	1333	1216	1087
	3 - MED.-HIGH	1619	1588	1545	1489	1421	1340	1247	1142	1024
	2 - MED.- LOW	1459	1439	1406	1359	1300	1227	1142	1043	931
	1 - LOW	1285	1278	1258	1224	1177	1116	1042	955	854

* - First letter may be "A" or "T"

CFM VS. TEMPERATURE RISE

MODEL	CFM (CUBIC FEET PER MINUTE)									
	1200	1300	1400	1500	1600	1700	1800	1900	2000	
*DD100C948B	62	57	53	49	46	44	41	39	37	

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