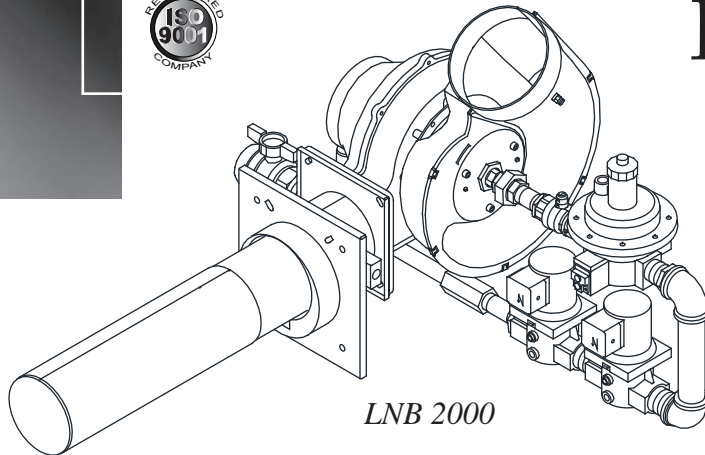


Installation and Service Instructions



★ MADE in the USA ★



LNB 2000

LNB 2000

Low NO_x Without Chamber Gas Burners

WARNING: If the information in these instructions is not followed exactly, a fire or explosion may result, causing property damage, personal injury or death.

- In the United States, installation must conform with local codes or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1-latest edition available from American National Standard Institute. Further reference should be made to the recommendation of your fuel supplier.
- WARNING:** Additions, changes, conversions and service must be performed by an authorized Midco representative, service agency or the fuel supplier. Use only MIDCO specified and approved parts.
- INSTALLER:** Inform and demonstrate to the user the correct operation and maintenance of the gas utilization equipment. Inform the user of the hazards of storing flammable liquids and vapors in the vicinity of this gas utilization equipment and remove such hazards. Affix this manual and associated literature to the burner or equipment.
- CODE COMPLIANCE IS THE SOLE RESPONSIBILITY OF THE INSTALLER.**
- USER:** Retain this manual for future reference. If other than routine service or maintenance as described in this manual and associated literature is required, contact a qualified service agency. DO NOT ATTEMPT REPAIRS. An inadvertent service error could result in a dangerous condition.

AVOID ERROR IN PARTS SELECTION. When ordering use complete MIDCO Part Number and Description. Furnish Burner Model Number, Bill of Material Number and Date Code (if available) from the specification plate found on the product

IMPORTANT: Availability of parts as well as specifications are subject to change without notice. Please consult factory for item availability.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WHAT TO DO IF YOU SMELL GAS:

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately phone your gas supplier from another building. Follow the gas supplier's instructions. If you cannot reach your gas supplier call the fire department.

Installation and service must be performed by a qualified installer, service agency or the gas supplier.

BURNER MODEL: _____

BILL OF MATERIAL NUMBER: _____

SERIAL NUMBER #: _____

WIRING DIAGRAM: _____

FOR SERVICE CONTACT

Name: _____

Address: _____

Phone: _____

Date of Installation: _____



Midco
INTERNATIONAL

Midco® International Inc.
4140 West Victoria Street
Chicago, Illinois 60646
tel 866.705.0514
fax 866.580.8700
web www.midcointernational.com
e-mail sales@midcointernational.com



SAFETY INFORMATION TERMS: The following terms are used to identify hazards, safety precaution of special notations and have standard meanings throughout this manual. They are printed in all capital letters using a bold type face as shown below, and preceded by the exclamation mark symbol. When you see the safety alert symbol and or the safety information terms as shown below, be aware of the hazard potential.



- DANGER:** Identifies the most serious hazards which will result in severe personal injury or death.
- WARNING:** Signifies a hazard that could result in personal injury or death.
- CAUTION:** Identifies unsafe practices which would result in minor personal injury or product and property damage.

Quality Designed for Proven Performance



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Part 1 - Installation

Specifications ¹

The LNB 2000 burner are adaptable to most ovens and after burners. The Midco LNB Series LOW NO_x gas burners were developed to meet the changing emission requirements required today.

LNB 2000 Low NO_x burners without chamber

MIN VELOCITY	500 FPM
MAX VELOCITY	2000 FPM
* MIN INSERTION DEPTH	4.0"
* MAX INSERTION DEPTH	26.0"
FIRING RATE (NATURAL) ²	
MIN MBH ³	500
MAX MBH ³	2,000
GAS SUPPLY PRESSURE REQUIRED	
NATURAL	Min 6.0" W.C. Max 14.0" W.C.
PROPANE	Contact factory
MOTOR HP	1.0 HP
BLOWER FLOW RATE	420 SCFM
ELECTRICAL SUPPLY.....	120 VAC/ 60 Hz / 25 AMPS
CONTROL VOLTAGE	120 VAC
IGNITION TRANSFORMER	120 VAC
FLAME SAFETY	
Electronic flame Safety with Direct Spark Ignition and 100% Shut-Off ⁴	

Table 1. Burner Specifications

¹ Standard burners are shipped as NATURAL gas models. Consult Midco for propane applications.

² All Ratings Based on 1000 BTU/Cu. Ft. NATURAL gas, at sea level.

³ 1 MBH = 1,000 BTU/hr. , Min MBH depends on system velocity.

⁴ See Section IV Burner Ignition Sequence.

Part 1- Installation

When installing the Midco LNB burner the following instructions must be followed.

The Midco LNB Burner must be installed per the equipment manufacturer's instructions. If not available take the following steps. To install the burner an opening on the side or top of the equipment must be provided. See Figure 1 for opening size and mounting information. For application information contact our sales engineering team. Clearance around the burner fiber head must be a minimum of 6" on all sides.

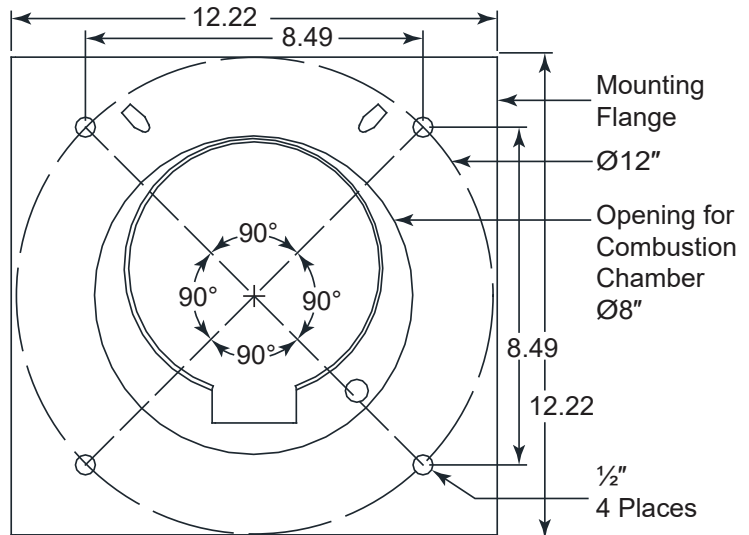


Figure 1 - LNB 2000 Mounting Flange

When installing the Midco LNB burner all safety and operating controls must be included and connected so if any safety fails the LNB burner will not operate. Do not bypass any safety or operating control or equipment might be damaged.

II

Wiring

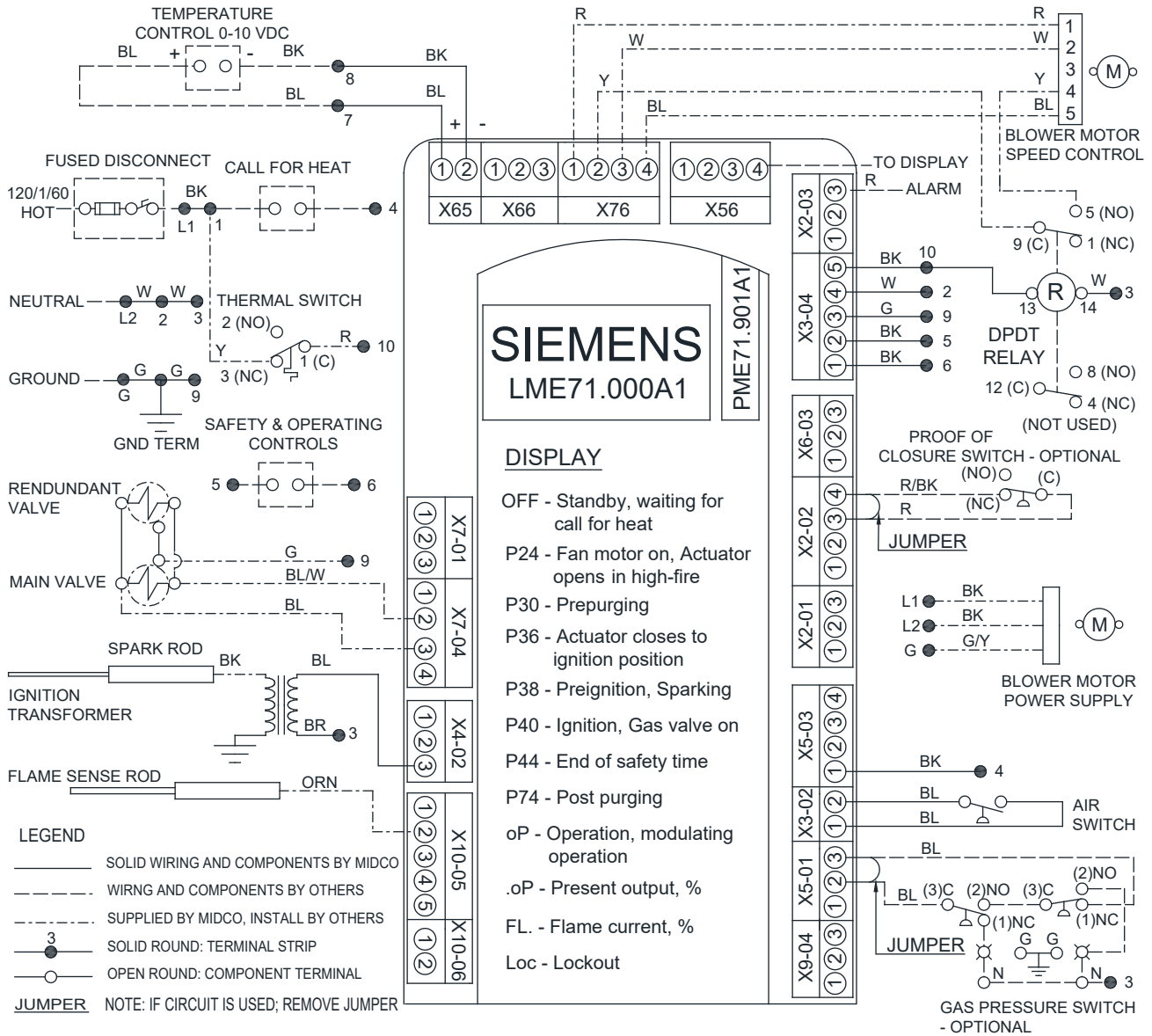


Figure 3 - Wiring Diagram

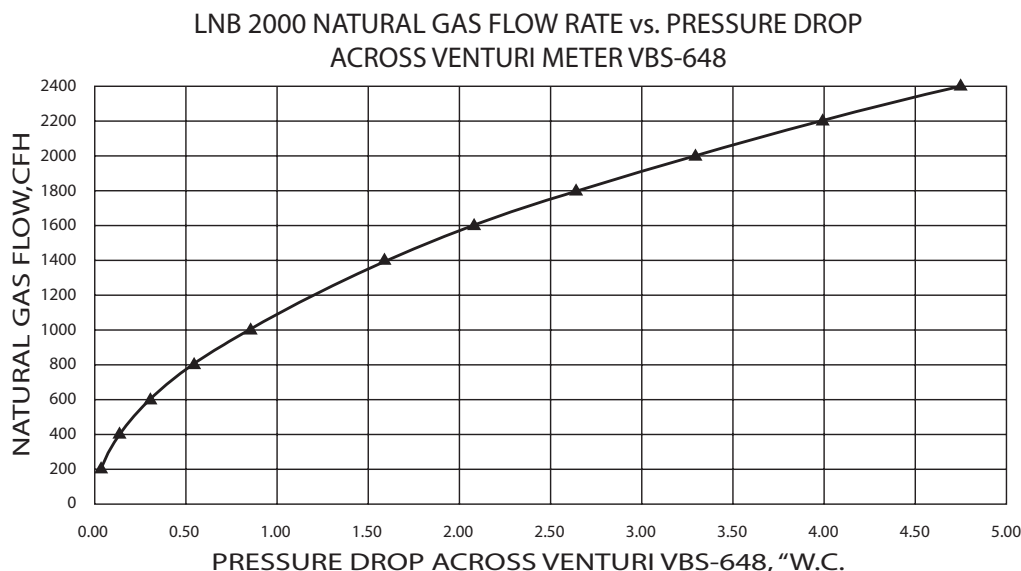


Chart 1 - LNB 2000 - Natural Gas Flow Rate vs. Pressure Drop - (Venturi VBS - 648)

The LNB Series of burners need to be set correctly to maintain Low NOx emissions.

LNB with Siemens Control

1. Burner should be prewired and installed on equipment.
2. To begin burner setup, remove 2-10V DC signal to Siemens control board.
3. Turn on power.
4. Do not turn on gas at this time.
5. Burner blower motor will ramp up to high fire purge.
6. Burner blower motor will ramp down to low fire.
7. Burner will lockout with no gas flow.
8. Reset Siemens control by pressing info button for 3 seconds.
9. Install a differential manometer.
10. Attach hose to pressure tap of VBS Venturi.
11. Attach second hose to pressure tap of VBS Venturi.
12. Turn on gas.
13. Check gas pressure on side inlet of first solenoid gas valve.
14. Gas pressure should be a minimum of 7" and a maximum of 14" WC. Adjust main gas pressure if required.
15. Turn on power.
16. Burner will go through sequencing and light.
17. Burner low fire flame should be mostly blue with slight orange tips.
18. Adjust low fire as required by turning Dungs valve top screw CW for more gas, CCW for less gas.
19. Differential pressure should be approximately 0.01" WC for Low fire.
20. Document minimum temperature rise at low fire.
21. Turn off power to equipment.
22. Reinstall DC Volt signal to Siemens control board.
23. Turn on power to equipment.
24. Set temperature control above operating temperature.
25. Burner lights and ramps up to high fire.
26. Check gas pressure on side inlet of first solenoid gas valve.
27. Inlet pressure to side inlet of first solenoid gas valve at high fire should be 6" WC minimum.
28. Readjust main gas pressure regulator if required.
29. Check differential gas pressure at Venturi.
30. Differential gas pressure should be 3.4" WC for high fire.
31. To adjust high fire final setting the manual valve downstream of Dungs valve can be closed slightly. If higher pressure required adjust main gas pressure regulator or inlet pressure from site regulator.

IV Burner Startup

Part 1 - Installation & Service

IV Burner Startup Continued

Procedure for technicians to program Siemens module when using the
Ametek N8.9 blower on LNB 2000 burner
Required Equipment: Siemens display unit # AZL23.00A9

SIEMENS (AZL23.00A9) - DISPLAY

- 1) Power unit with ON/OFF switch in off position.
- 2) Using Siemens display press & hold "F & A" together until "CODE" is displayed on screen. Enter password L 7 U N I _ by using the "-" or "+" buttons. Press Enter after each letter or number of password. After the last letter "I" is entered press Enter twice. The screen will show parameter 400 flashing.
- 3) Press Enter, display will show "Run", then press escape, display will show P0. Use "+" button to change to P1. Press & hold "A" button while also pressing "+" button to increase number to 1200 then press enter. Display will change to P2. Press & hold "A" button while also pressing "+" button to increase number from 6000 to 8000. Press Enter then press Escape to return to parameter 400 flashing.
- 4) Next press "+" button to get to parameter 500 then press Enter. Display will show parameter 503.00 then press Enter and .00 will be flashing. Press "+" button to advance to parameter 503.01 then press Enter. Use "+" button to increase to 8000 then press Enter then press Escape twice to get back to 503 flashing.
- 5) Next press "+" button to advance to parameter 519 then press Enter. Use the "+" button to advance number to 8400. Press Enter then Escape to get back to parameter 519 flashing.
- 6) Next use "+" button to advance to parameter 523 then press Enter. Use "+" button to increase number to 29.98 then press Enter then press Escape to return to parameter 500 flashing. Press Escape again to return display to OFF.

BURNER CONTROL (LME71) - DISPLAY

- 7) Back up the new programming by pressing Escape. Hold down Escape until the display flashes. Next use "+" or "-" button to show BAC on display then press Enter. Press Enter again to get display to OFF.

Error code		Clear text	Possible cause
AZL2...	7-segment		
Loc: 2	Loc 2	No establishment of flame at the end of safety time	- Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner, no fuel - Faulty ignition equipment
Loc: 3	Loc 3	Air pressure faulty (air pressure switch welded in no-load position, decrease to specified time (air pressure switch flame-on response time))	Air pressure switch faulty - Loss of air pressure signal after specified time - Air pressure switch has welded in no-load position
Loc: 4	Loc 4	Extraneous light	Extraneous light during burner startup
Loc: 5	Loc 5	Air pressure faulty, air pressure switch welded in working position	Time supervision air pressure switch - Air pressure switch has welded in working position
Loc: 7	Loc 7	Loss of flame	Too many losses of flame during operation (limitation of repetitions) - Faulty or soiled fuel valves - Faulty or soiled flame detector - Poor adjustment of burner
Loc: 10	Loc 10	Error not relatable (application), internal error	Wiring error or internal error, output contacts, other faults
Loc: 12	Loc 12	Valve proving	Fuel valve 1 leak
Loc: 13	Loc 13	Valve proving	Fuel valve 2 leak
Loc: 14	Loc 14	POC error	Error valve closure control POC
Loc: 22	Loc 22	Safety loop open	- Gas pressure switch-max open - Safety limit thermostat cut out
Loc: 60	Loc 60	Analog power source 4...20 mA, I <4 mA	Wire breakage
Loc: 83	Loc 83	Faulty PWM fan	- PWM fan does not reach the target speed within the preset period of time, or - After reaching the target speed, the PWM fan leaves the tolerance band again (parameter 650) for a time exceeding the tolerance time speed deviation (parameter 660)
Loc: 138	Loc 138	Restore process successful	Restore process successful
Loc: 139	Loc 139	No program module detected	No program module plugged in
Loc: 167	Loc 167	Manual locking	Manual locking
Loc: 206	Loc 206	AZL2... incompatible	Use the latest version
Loc: 225	Loc 225	Faulty PWM fan	- Fan speed dropped below the minimum prepurge PWM (parameter 675.00) after reaching the prepurge speed, or - After reaching the ignition load speed, the maximum ignition load PWM (parameter 675.01) was exceeded
Loc: 226	Loc 226	Faulty PWM fan	Parameterization error: - Speed low-fire > speed high-fire, or - Low-fire = 0 rpm, or - Maximum speed = 0 rpm
Loc: 227	Loc 227	Faulty PWM fan	One or several parameters violate the minimum/maximum limit

Chart 1 - Siemens Control - Lock Codes - Error Code List





Part 1 - Installation, Service


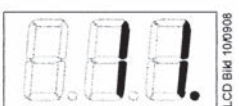


IV Burner Startup Continued Siemens Control Flame Current


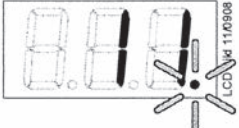




Note:





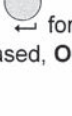

This display is only possible in operating mode or standby!

			Press  for display of the flame signal amplifier. Signal lamp blinks green. Display shows FL.1 .
---	---	---	---

 1...3 s			When pressing  (1...3 seconds), the flame signal current is displayed. Signal lamp blinks green. Example: 11 .
--	---	---	--

 >3 s			When pressing  (>3 seconds), the point after the number begins to blink. When the button is released, the value is displayed for 2 minutes. Signal lamp blinks green. Then, the normal display appears. Display: Point . blinks, value 11 does not.
---	---	---	---

14.4.3 Reset

  >1 s		 	For reset the unit, press  for 1...3 seconds. When the button is released, OFF is displayed. The basic unit is reset.
--	---	--	---

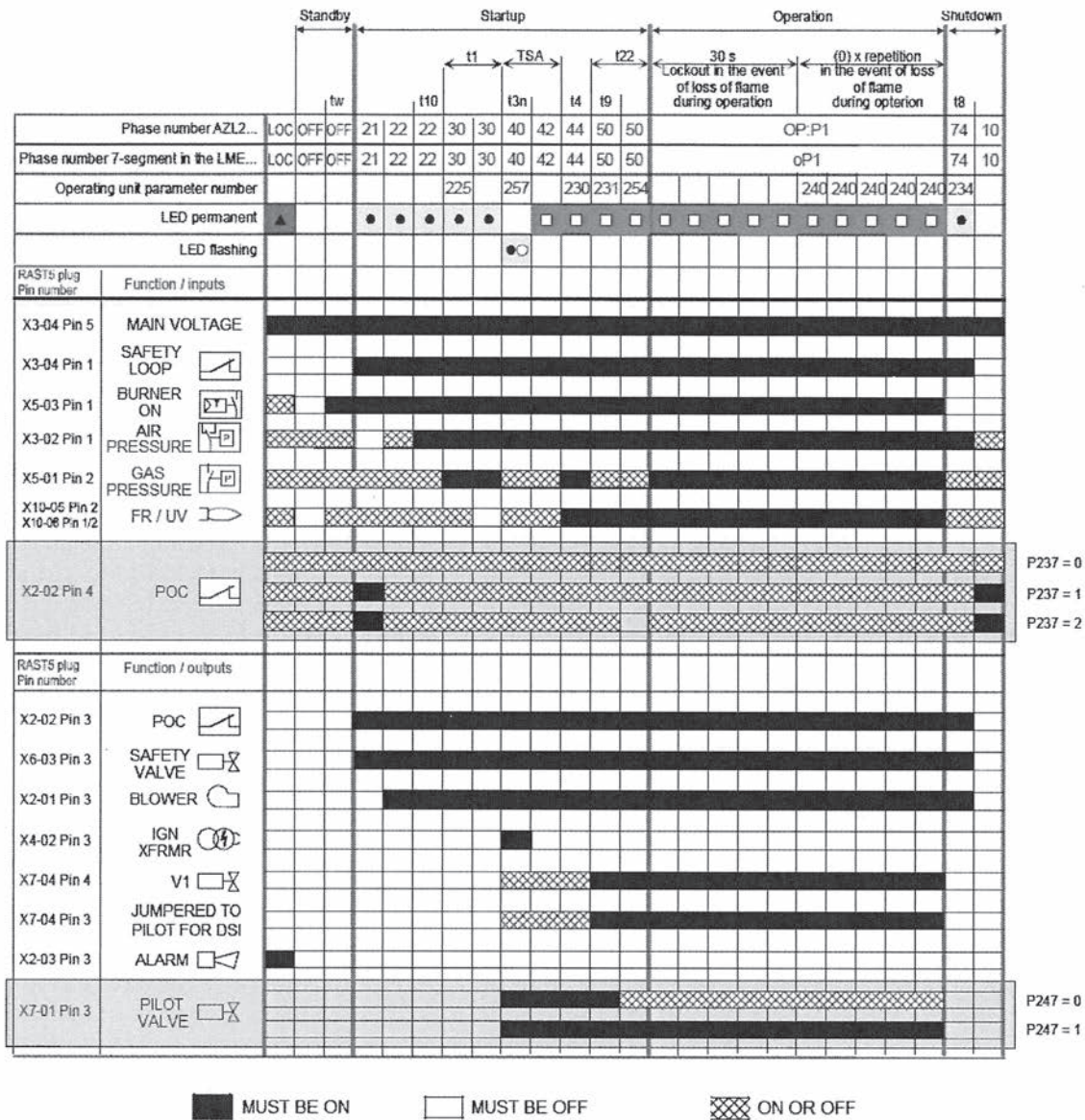


Note:

For meaning of the error and diagnostic codes, see chapter *Error code list...*(Chart 1)

Chart 2 - Siemens Control - Display of Flame Current

IV Burner Startup Continued Siemens Control Sequence of Operation



DISPLAY

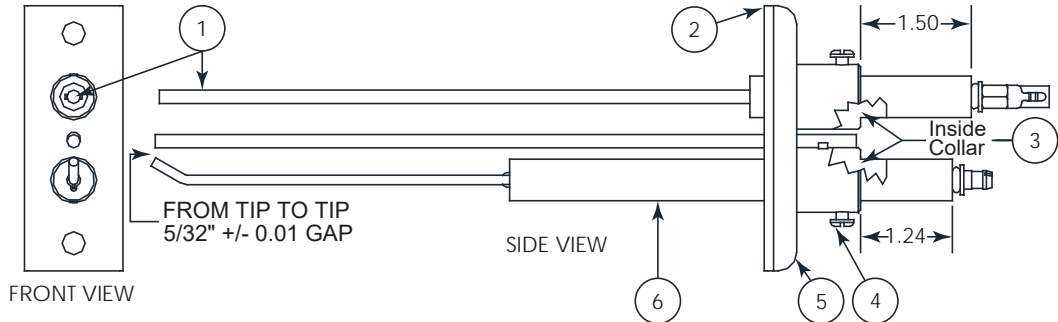
1. OFF - Standby, waiting for call for heat
2. P21 - Test; combustion air switch open, POC closed
3. P22 - Combustion air blower on, Test; combustion air switch closed
4. P30 - Purge (parameter 225), Test; gas pressure switches closed
5. P40 - Trial for ignition (parameter 257)
6. P42 - Flame detection (spark off, pilot stands alone)
7. P44 - Pilot stabilize time (parameter 230)
8. P50 - Main and pilot overlap time (parameter 231)
9. oP1 - Operate, main on, pilot off

Chart 3 - Siemens Control - Sequence of Operation

Part 2 - Maintenance

V Maintenance

The LNB burner will require maintenance every 12-18 months depending on usage. Inspect blower, ignition and flame sensing assembly, burner head should be inspected. Turn off the main gas manual valve and main panel disconnect to insure unit will not start. Remove the flame sensor wire, spark cable and wiring harness attached to the blower. To inspect the blower inlet loosen the union between the Ratio Regulator Zero Governor valve and blower. Loosen the four (4) 1/2" bolts attaching the burner to the heater. This will allow removal of the Midco LNB burner. Visually inspect the burner head if any issue are found contact Midco for replacement. The flame sensor and spark rod can be removed by loosening two nuts holding the ignition and flame sensing assembly. To clean the sensor and spark rod use steel wool or sand paper. If the porcelain is cracked then the sensor or igniter needs replacing. Reinstall the LNB burner and make sure gas union and wiring were reinstalled. Open manual gas valve and reenergize heater and cycle as shown in section IV - Burner Startup.



ITEM	PART NUMBER	DESCRIPTION	QTY
1	5247-35	Flame Rod Assembly LNB 7"	1
2	5247-11	Igniter Flange Gasket 7"	1
3	8451-06	9/16" I.D. Electrode Bushing (inside)	2
4	HARDWARE	#8-32 X 1/4" Slotted Pan Head Screw	2
5	5247-10	Ignition Assembly Weldment 7"	1
6	5247-12	Spark Rod Assembly LNB 7"	1

Figure 5 - LNB 2000 Spark Ignitor Assembly
(For re-order Kit # 5247-09R)

VI Direct Spark Ignitor Assembly

The Midco LNB burner uses a direct spark ignition. The LNB direct spark ignition is factory set. The spark gap should be set at 5/32" from center ground rod. Inspect porcelain on the flame rod and spark rod. Any signs of a crack the rods should be replaced. For proper parts selection contact Midco International as shown on the front page. When re-installing a direct spark ignition the flame rod should be installed on the right side of the unit.



Keep for your records

Model Number _____

Purchased from - Name: _____

Serial Number _____

Address _____

Installation Date _____

City, State, Zip _____

Call the factory for instructions on returned goods. No equipment may be returned without written authorization from MIDCO.
Returned goods must be shipped prepaid to the factory.

⚠ WARNING: Improper installation and use of this product could result in personal or property injury.

**TO VALIDATE WARRANTY:
FILL OUT THE FORM ON THE LAST PAGES AND RETURN TO MIDCO INTERNATIONAL, INC.**

**Warranty
Midco® International Inc Limited Warranty Policy
Exclusions Terms, Customer Requirements and Instructions**

Products manufactured by Midco International Inc. (hereinafter Midco) are guaranteed to be free from defects in workmanship and materials, under normal use and service, **for a period of twelve (12) months from the date of installation, or 18 months from date of manufacture or whichever occurs first.**

If a part is defective due to workmanship or materials and the part is removed from the product within the applicable warranty period and returned to Midco in accordance with the procedure described below, Midco will at its option either repair or replace the part. This warranty extends only to persons or organizations who purchase products for resale. The warranty does not cover labor and/or freight.

The expressed warranty above constitutes the entire warranty of Midco with respect to the products in its publications and is IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL MIDCO BE RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY NATURE WHATSOEVER.

Instructions for returned goods are as follows: The following will apply to the return of any products to Midco International Inc. under this warranty:

Parts must be:

- a. Identified with Midco's *Return Authorization Number -(RAN) *(Available only directly from Midco. Contact Customer Service to obtain a tag.)
- b. Protected from shipping damage.
- c. Received transportation pre-paid at:
Midco International Inc.
Return Goods Dept.
4140 West Victoria Street
Chicago, Illinois 60646-6727
- d. Found by Midco's inspection to be defective in workmanship or materials under normal use and service.
- e. Handled in accordance with one of the two following procedures, as specified by the customer making the return:
 1. **Credit Procedure.** If replacement part was purchased from Midco, credit will be issued at the net price in effect at the time of purchase with presentation of Midco's invoice number and date.

2. **Repair or Replacement Procedure.** Midco will, at its option, either repair or replace the part free of charge and return it or its replacement lowest cost transportation pre-paid. The replacement will be, at Midco's option, either a functionally equivalent new or replacement product. Premium transportation will be used at customer's request and expense.

Note: All Midco burners have a specification plate showing Model, Bill of Material and Serial No./Date Code numbers. All three (3) numbers must be shown on your Midco Return Goods Tag. The Serial No./Date Code is necessary to determine Warranty coverage. For example: 2898 indicates that the unit was manufactured in the 28th week of 1998. If the Date Code is beyond the Warranty period, a receipt or invoice showing purchase, delivery or installation date is required.

Final disposition of any warranty claim will be determined solely by Midco. If an inspection by Midco does not disclose any defect covered by this warranty, the product will be returned, scrapped, repaired, or replaced as instructed by the customer. Products returned to the customer will be sent shipping charges collect.

If you have any questions relative to product returns to Midco, call, write or e-mail:

Midco International Inc.
Warranty Returns/Customer Service Manager
4140 West Victoria Street
Chicago, Illinois 60646-6727
tel 773.604.8700
fax 773.604.4070
email returns@midcointernational.com
web www.midcointernational.com



★ MADE in the USA ★

As an ISO 9001 certified company, we proudly design, manufacture and assemble our products in Chicago, Illinois, USA.

Midco® International Inc. - 4140 West Victoria Street - Chicago, Illinois 60646 - toll free: 866 705 0514
tel: 773.604.8700 - fax: 866.580.8700 - web: www.midcointernational.com - e-mail: sales@midcointernational.com



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Warranty

Midco® International Inc Limited Warranty Policy
Exclusions Terms, Customer Requirements and Instructions

Final disposition of any warranty claim will be determined solely by Midco.

If an inspection by Midco does not disclose any defect covered by this warranty, the product will be returned, scrapped, repaired, or replaced as instructed by the customer. Products returned to the customer will be sent shipping charges collect.

Call factory for information (866 705 0514)

Fill out form and fax to 866 580 8700 or copy and mail to: Midco International Inc
4140 West Victoria Street
Chicago, Illinois 60646

Date of Purchase _____

End User Name _____

Company Name _____

Street & Apt. No. _____

City, State, Zip _____

E-mail Address _____

Web Address _____

Telephone _____

Fax _____

Burner [] HMA [] Low NOx []

Model Number _____

Serial Number _____

Installation Date _____

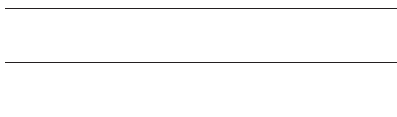
Purchased from - Name: _____

Address _____

City, State, Zip _____



FOLD LINE



PLACE
STAMP
HERE

Midco International Inc.

Attn: Warranty Department
4140 West Victoria Street
Chicago, Illinois 60646

FOLD LINE

