

CX Series - 4" Tube Heater Installation, Operation, Maintenance and Parts Manual*

▲ WARNING: This heater must be installed and serviced by trained gas installation and service personnel only! Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Protect yourself and others by observing all safety information. Retain instructions for future reference.

* For complete installation instructions, see Generic IOM this piece was inserted within. Also available at www.reverberray.com.

CX Series

Project: _____ Date: _____

Location: _____

City: _____ State: _____ Zip: _____

Customer Name: _____

Local Representative: _____

Contractor: _____

Engineer: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone #: _____ Serial #: _____

Model #: _____ Date of Installation: _____

Notes: _____

Table of Contents	
	Page
Models	1
Warnings	2
Clearances to Combustibles	2
Product Summary	3
Product Instructions	3
Heater Requirements	4
Theory of Operation	4
Wiring Diagrams	5-7
Flowchart	8-9
Parts Listing	10-11
Series Kit Contents	12

Models

Qty.	Model #	Gas Type (circle one)	BTU's	Straight Length	U-Tube Length	Weight	Typical Mount Height	Combustion Chambers	Radiant Emitter Tube(s)	"Type" Tube Pkg #1	"Type" Tube Pkg. #2	Baffle Pieces
	CX 30-50	N or LP	50,000	31'-3"	*17'-8"	160 #	9' - 14'	Stainless/Alum	Coated Alum	30-4 SST-Alum	N/A	6
	CX 30-60	N or LP	60,000	31'-3"	*17'-8"	160 #	9' - 14'	Stainless/Alum	Coated Alum	30-4 SST-Alum	N/A	6
	CX 40-50	N or LP	50,000	40'-11"	22'-8"	190 #	9' - 14'	Stainless/Alum	Coated Alum	40-4 SST-Alum	N/A	6
	CX 40-60	N or LP	60,000	40'-11"	22'-8"	190 #	9' - 14'	Stainless/Alum	Coated Alum	40-4 SST-Alum	N/A	6
	CX 40-75	N or LP	75,000	40'-11"	22'-8"	190 #	10' - 15'	Stainless/Alum	Coated Alum	40-4 SST-Alum	N/A	5
	CX 40-80	N or LP	80,000	40'-11"	22'-8"	190 #	10' - 15'	Stainless/Alum	Coated Alum	40-4 SST-Alum	N/A	5
	CX 50-75	N or LP	75,000	50'-7"	*27'-4"	235 #	11' - 15'	Stainless/Alum	Coated Alum	40-4 SST-Alum	10-4 Alum	5
	CX 50-80	N or LP	80,000	50'-7"	*27'-4"	235 #	11' - 15'	Stainless/Alum	Coated Alum	40-4 SST-Alum	10-4 Alum	5
	CX 50-100	N or LP	100,000	50'-7"	*27'-4"	235 #	12' - 16'	Stainless/Alum	Coated Alum	40-4 SST-Alum	10-4 Alum	5

* Model requires 5EA-SUB accessory package.

Warranty registration options:

1. Register online at www.reverberray.com/warranty
2. Complete this page and fax to Detroit Radiant Products Co.
3. Complete this page and mail to Detroit Radiant Products Co.



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 21400 Hoover Rd., Warren, MI 48089
 T. (586) 756-0950 F. (586) 756-2626
 Form# LIOCX-1M-11/04 (MWG)



CX Series

Warnings and Clearances to Combustibles

▲WARNING!

NOT FOR RESIDENTIAL USE!

Do not use in the home, sleeping quarters, attached garages, etc.

▲WARNING!

This heater must be installed and serviced by trained gas installation and service personnel only. Read and understand these instructions thoroughly before attempting to install, operate or service this heater. Failure to comply could result in personal injury, asphyxiation, death, fire, and/or property damage. Retain these instructions for future reference.

▲WARNING!

This is not an explosion-proof heater. Where there is the possibility of exposure to flammable vapors, consult the local fire marshal, the fire insurance carrier and other authorities for approval of the proposed installation.

▲WARNING!

In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heater to the combustibles. Signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats in a conspicuous location.

▲WARNING!

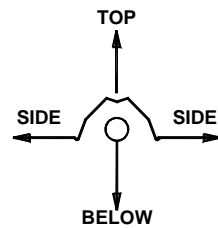
Failure to comply with the stated clearances to combustibles could result in personal injury, death and/or property damage.

▲WARNING!

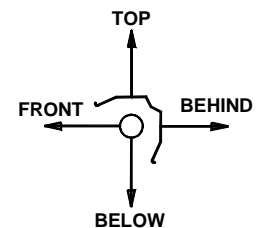
This heater should be installed so that the minimum clearances to vehicles, as marked on the heater, will be maintained. If vehicle lifts are present, ensure that these clearances will be maintained from the highest raised vehicle.

CLEARANCES TO COMBUSTIBLES (IN.)

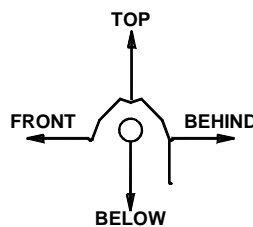
MODEL NO.	MOUNTING ANGLE	SIDE		TOP	BELOW	
		FRONT	BEHIND			
CX (30,40)-50 [N,P]	0°	11	11	3	25	
	45°	39	8	10	25	
	W/1 side shield	0°	29	8	3	25
	W/2 side shields 20 ft from burner	0°	9	9	3	25
CX (30,40,50)-60 [N,P]	0°	11	11	3	31	
	45°	39	8	10	31	
	W/1 side shield	0°	29	8	3	31
	W/2 side shields 20 ft from burner	0°	9	9	3	31
CX (40,50)-75 [N,P]	0°	11	11	3	29	
	45°	39	8	10	29	
	W/1 side shield	0°	29	8	3	29
	W/2 side shields 20 ft from burner	0°	9	9	3	29
CX (40,50)-80 [N,P]	0°	11	11	3	29	
	45°	39	8	10	29	
	W/1 side shield	0°	29	8	3	29
	W/2 side shields 20 ft from burner	0°	16	16	3	29
CX (50)-100 [N,P]	0°	11	11	3	34	
	45°	39	8	10	34	
	W/1 side shield	0°	29	8	3	34
	W/2 side shields 20 ft from burner	0°	16	16	3	34



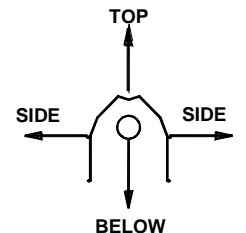
0° MOUNTING ANGLE



45° MOUNTING ANGLE



0° W/1 SIDE SHIELD



0° W/2 SIDE SHIELDS

CX Series Mechanical Instructions

This supplement is designed to address the specifics of the CX Series - See page 12 for specific product features.

Product Summary

CX Series heaters are available from 30 to 50 foot, 50,000 to 100,000 BTU's, natural or propane gas. CX Series are positive pressure, single stage heaters and feature coated aluminized steel for it's radiant heat exchangers. CX Series may also be upgraded to stainless steel for harsh environment applications.

Operational Features

CX Series heaters include a gas cock, flex connector and all hanging accessories. Most importantly, these heaters feature coated aluminized heat exchangers covered by highly polished aluminum reflectors for maximum efficiency. These heaters also feature operational indicator lights, potted circuit boards, hot surface ignition and turbulator baffles (for improved efficiencies).

Specific Mechanical Instructions

IMPORTANT: Be sure to identify the stainless steel combustion chamber and place as the first tube section directly following the burner box. The identification sticker found on the swagged end of the tubing will identify the stainless steel combustion chamber. Place the uncoated aluminized steel tube immediately following the stainless steel combustion chamber. All coated aluminized steel tubes must be installed downstream of the stainless steel and uncoated aluminized tubes. Note tube installation sequence below.

Note baffle quantities for your model and place baffles in the **last tube(s)** (farthest from the burner) as shown below and on pages 13-14 of the generic IOM.

Tube Installation Sequence

Critical. Tube sections must be installed in this order to properly maintain clearances to combustibles.

			B = Burner Location	* Baffle Location
Uncoated Stainless Steel (50-60 MBH)	Uncoated Aluminized Steel	Coated Aluminized Steel		
B <input type="text"/>	<input type="text"/>	<input type="text" value="*"/>		
Uncoated Stainless Steel (50-80 MBH)	Uncoated Aluminized Steel	Coated Aluminized Steel	Coated Aluminized Steel	
B <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="*"/>	
Uncoated Stainless Steel (75-100 MBH)	Uncoated Aluminized Steel	Coated Aluminized Steel	Coated Aluminized Steel	Coated Aluminized Steel
B <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="*"/>



CX Series

Electrical Requirements

- 120 Volt - 60 HZ
- Starting Current 4.8 Amps
- Running Current 1.1 Amps

Gas Requirements

- Manifold Pressure
 - Nat. 3.5" • LP. 10.0"
- Minimum Inlet Pressure
 - Nat. 5.0" • LP. 11.0"
- Maximum Inlet
 - Nat. 14.0" • LP. 14.0"

Ventilation Requirements

Consult the generic supplement for venting instructions and unvented operation.

For unvented operation, there must be a positive air displacement of at least 4.0 CFM per 1000 BTU/H for natural gas or 4.5 CFM per 1000 BTU/H for LP gas. WVE-4 termination cap must also be used.

Maximum vent length for all models is 20 ft.

Approved & Required Vent Caps

Sidewall Single

- 4" Duravent sidewall vent kit (4-DSK).
- 4" Vent terminal (SWD-4).

Sidewall Dual (sharing common t-stat)

- 6" Duravent sidewall vent kit (6-DSK).
- 6" Vent terminal (SWD-6).

Roof Single

- Approved 4" rooftop rain cap (RVC-4).

Roof Dual (sharing common t-stat)

- Approved 6" rooftop rain cap (RVC-6).

IMPORTANT: Do **not** use sidewall caps for roof venting and do not use roof caps for sidewall venting.

Theory of Operation

Starting Circuit

When voltage is applied to L1 and L2 (see diagram on right), a circuit is completed from L1 via the blower motor to L2. The blower fan is mounted in the control box and rated to supply sufficient air for combustion.

Air pressure generated by the blower will cause the normally open differential pressure switch to close. Another circuit is completed from L1 to the hot surface ignition control and back to L2. There is a five second delay, then the glo-bar is powered. After the glo-bar has been powered for 45 seconds, the control causes the gas valve to open and initiates the ignition trial.

Power to the glo-bar is shut off during the last two or three seconds of the ignition trial.

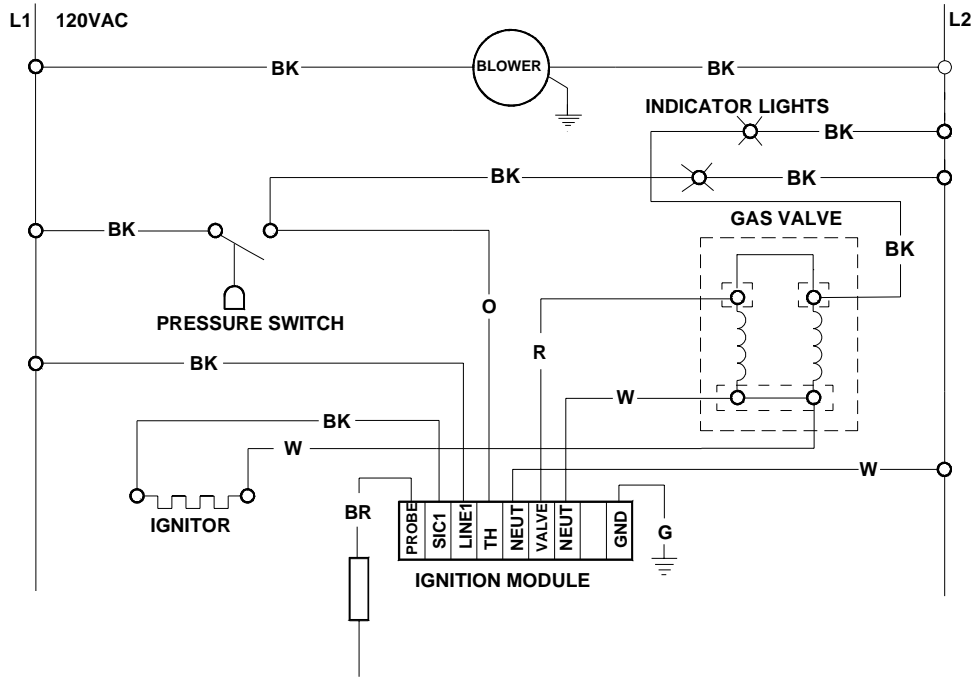
Running Circuit

After ignition, the flame rod monitors the flame. As long as a flame is present, the valve is held open. If the flame is lost, the control acts to close the valve within one second, and a new trial sequence identical to that at start-up is initiated. If proof of flame is not established within 8.5 seconds, the unit will lock out. If lockout occurs, the control can be reset by briefly interrupting the power source.

Internal Wiring Diagrams

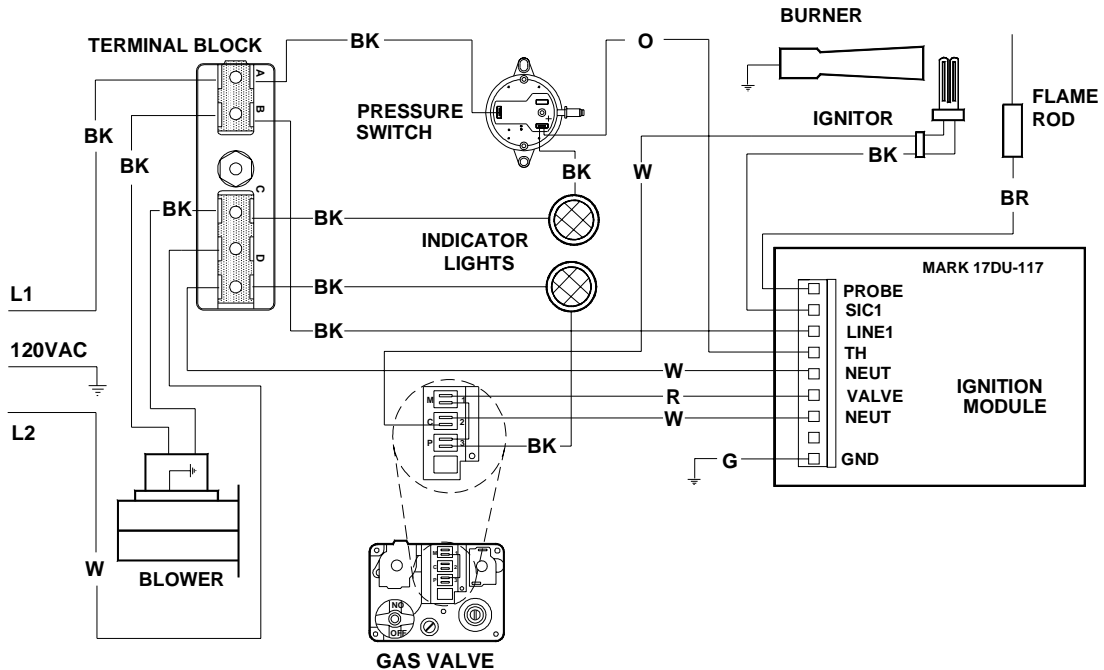
Standard Diagrams

LADDER DIAGRAM - MARK17DU-117 WITH LIGHTS



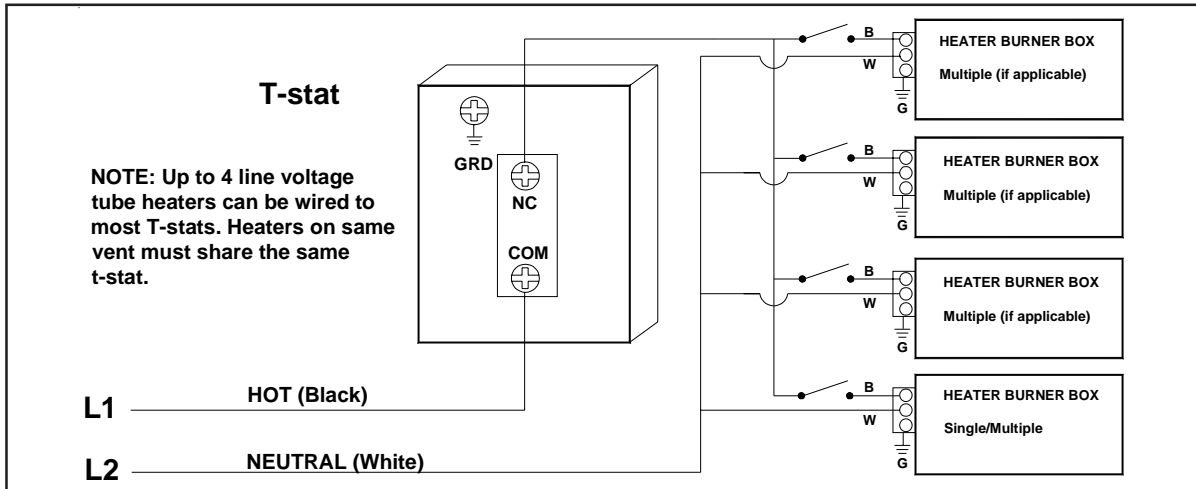
IF ANY OF THE ORIGINAL WIRE AS SUPPLIED WITH THE APPLIANCE MUST BE REPLACED, IT MUST BE REPLACED WITH WIRING MATERIAL HAVING A TEMPERATURE RATING OF AT LEAST 105 C.

BLOCK DIAGRAM - MARK17DU-117 WITH LIGHTS

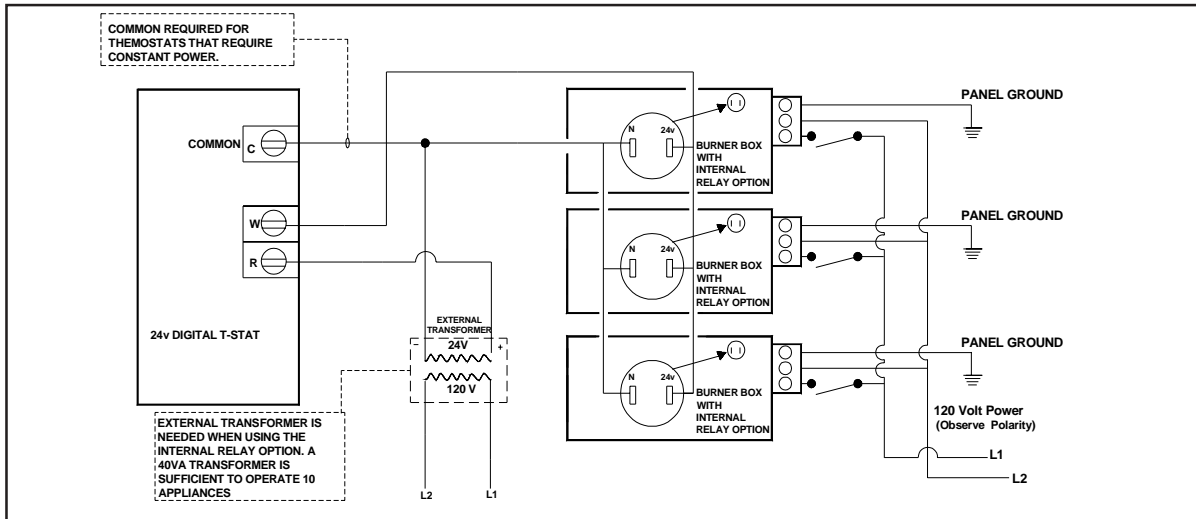


CX Series

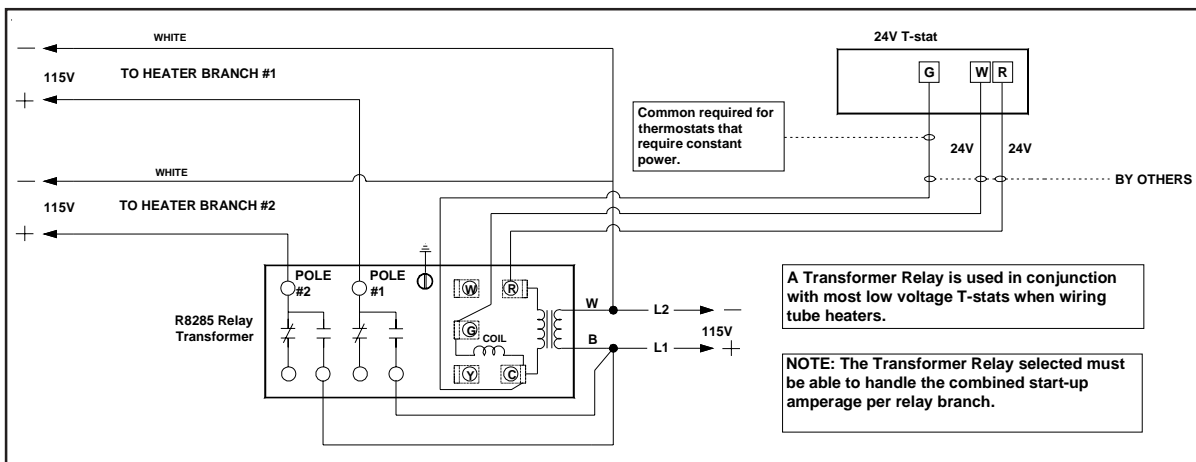
Field Wiring Diagrams



120V Field Wiring for Single/Multiple Line Voltage Heaters



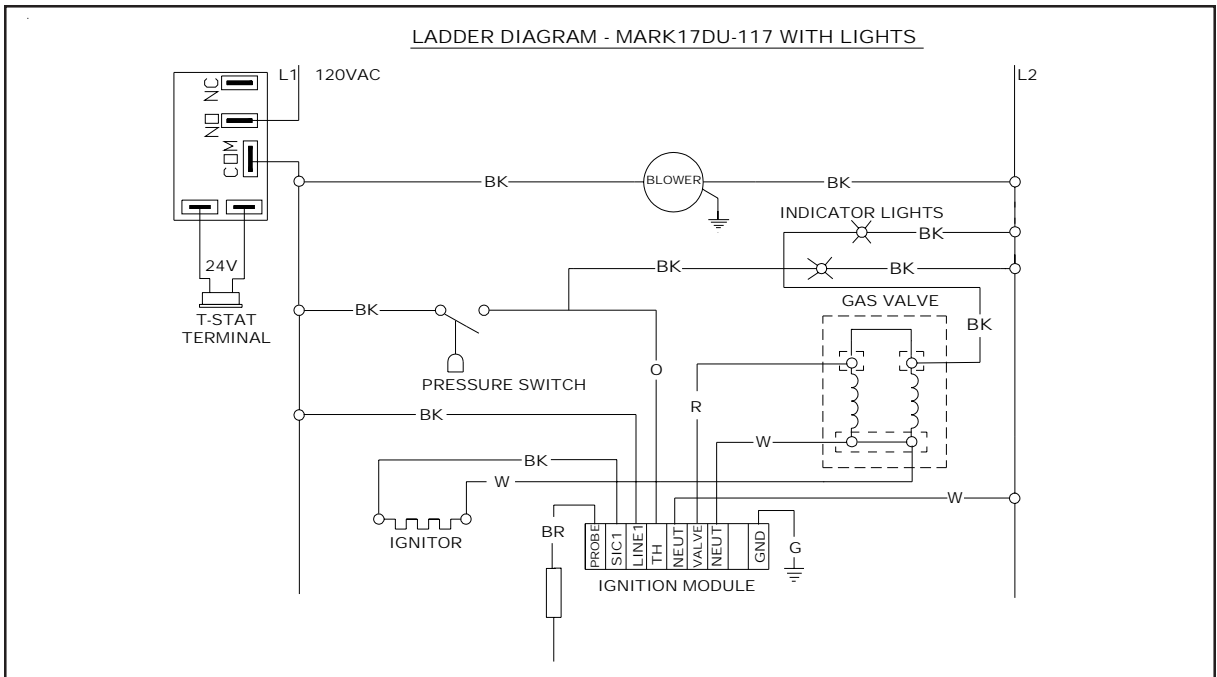
Alternative Field Wiring Diagram for 24VAO (Internal Relay Option).



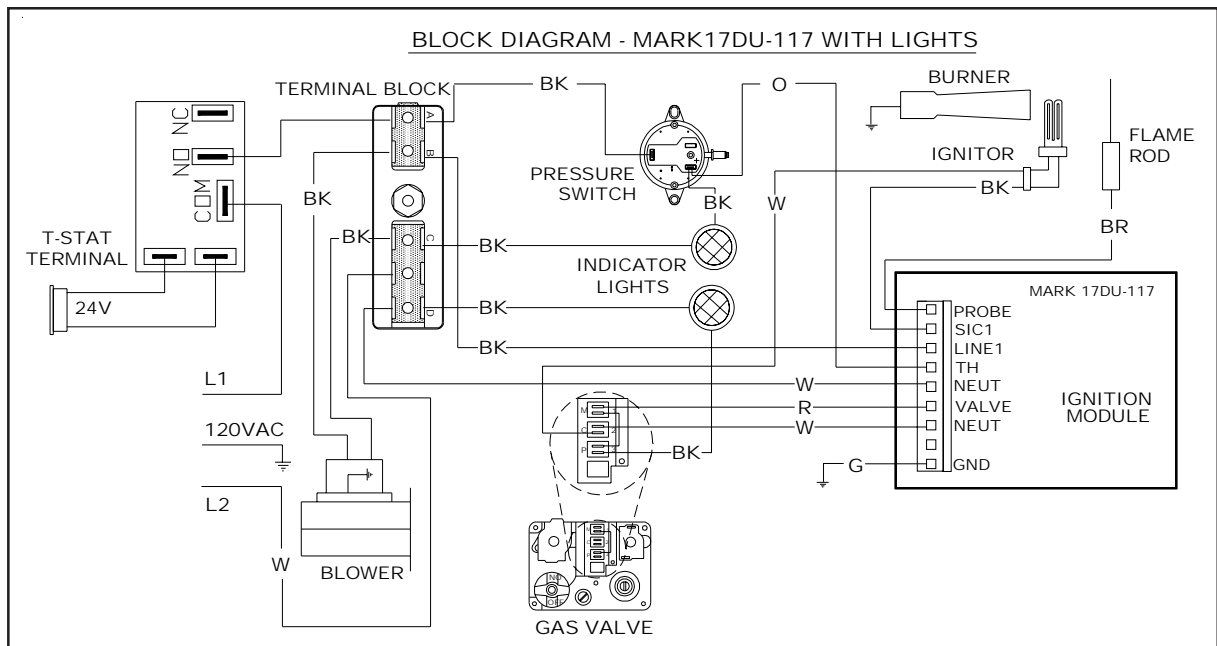
24V T-Stat & Connection for Single/Multiple Heaters - Relay Transformer Required

Alternative Wiring Diagrams

For 24VAO (Internal Relay Option)



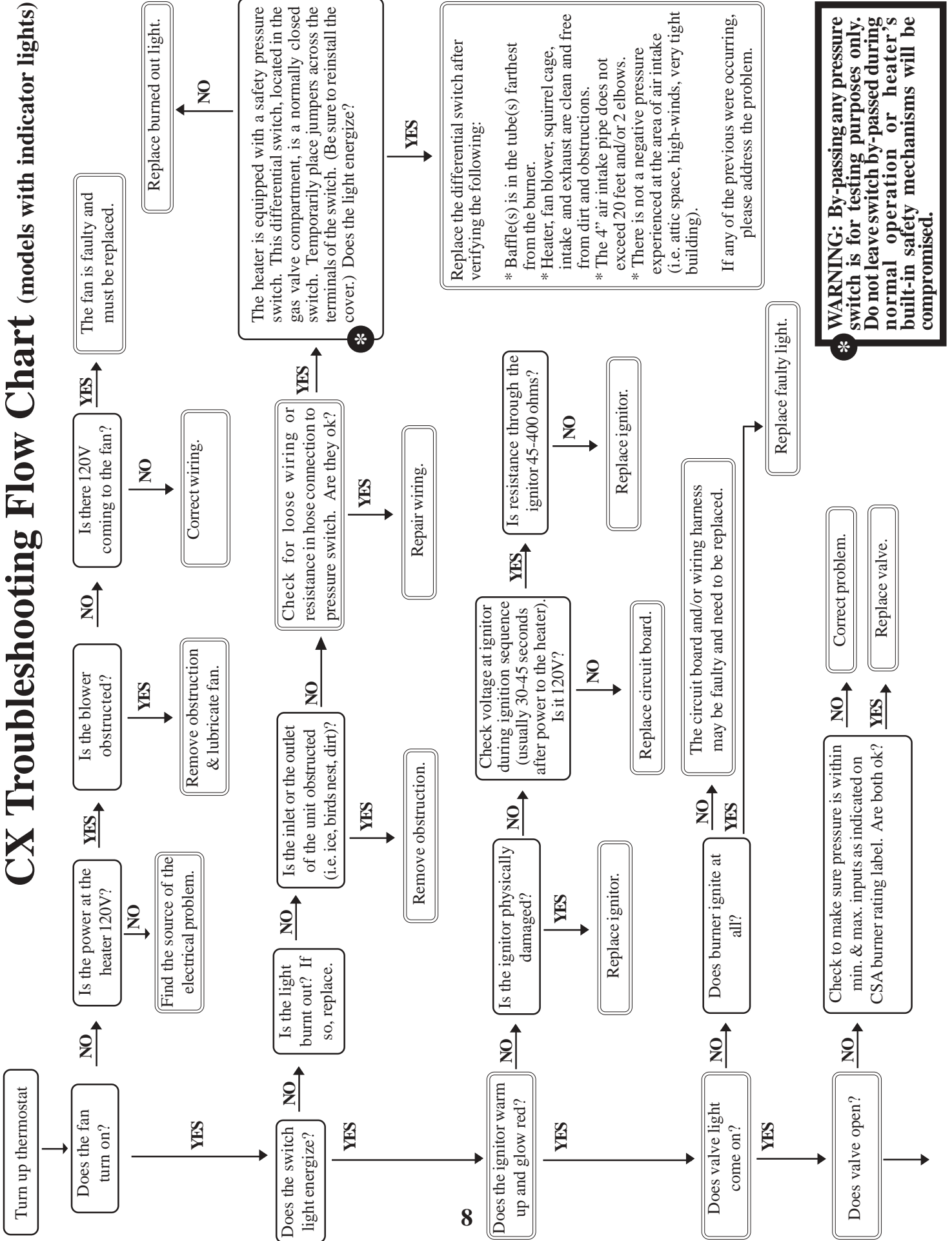
CX Series Ladder Diagram (with optional 24VAO relay installed)



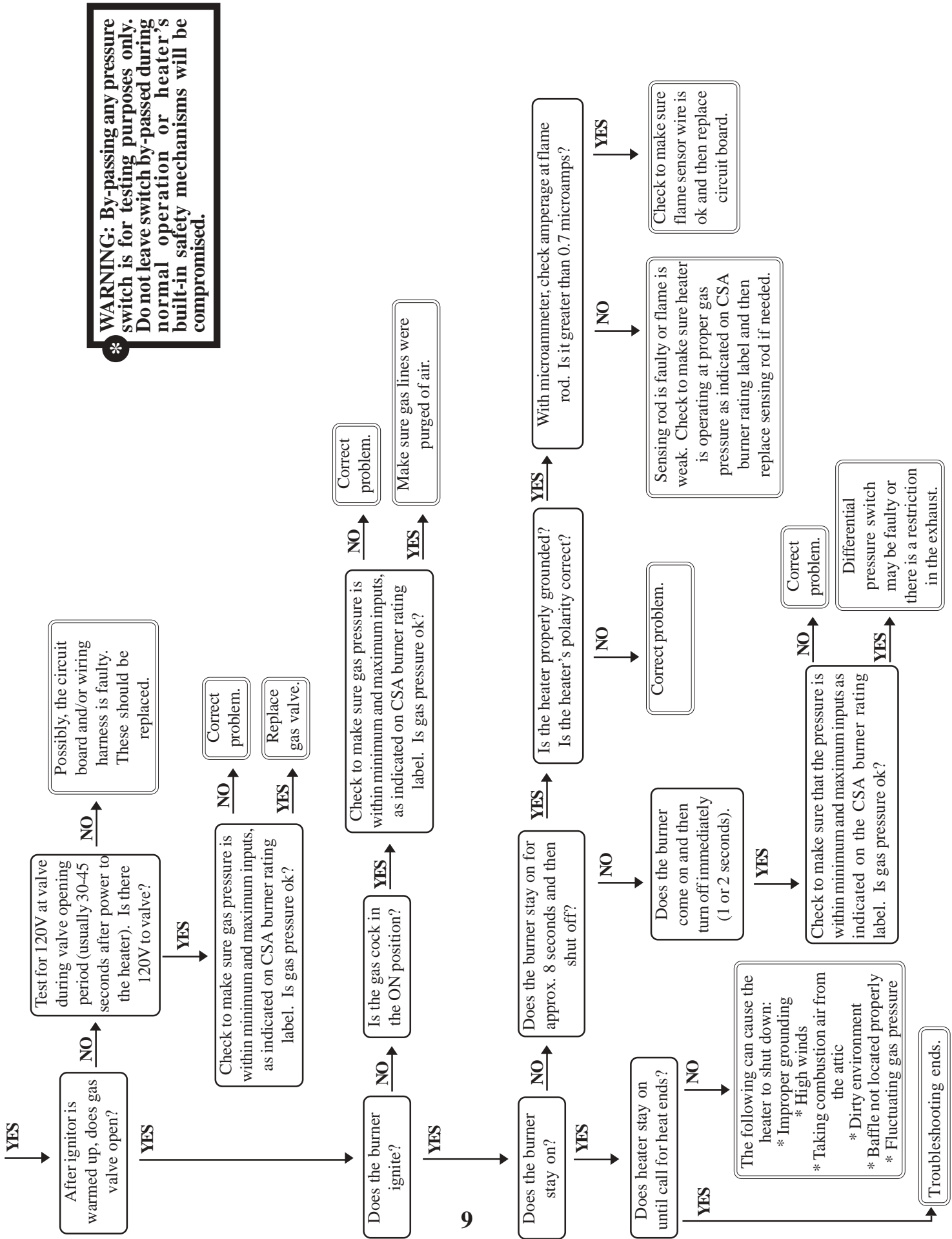
CX Series Block Diagram (with optional 24VAO relay installed)



CX Troubleshooting Flow Chart (models with indicator lights)

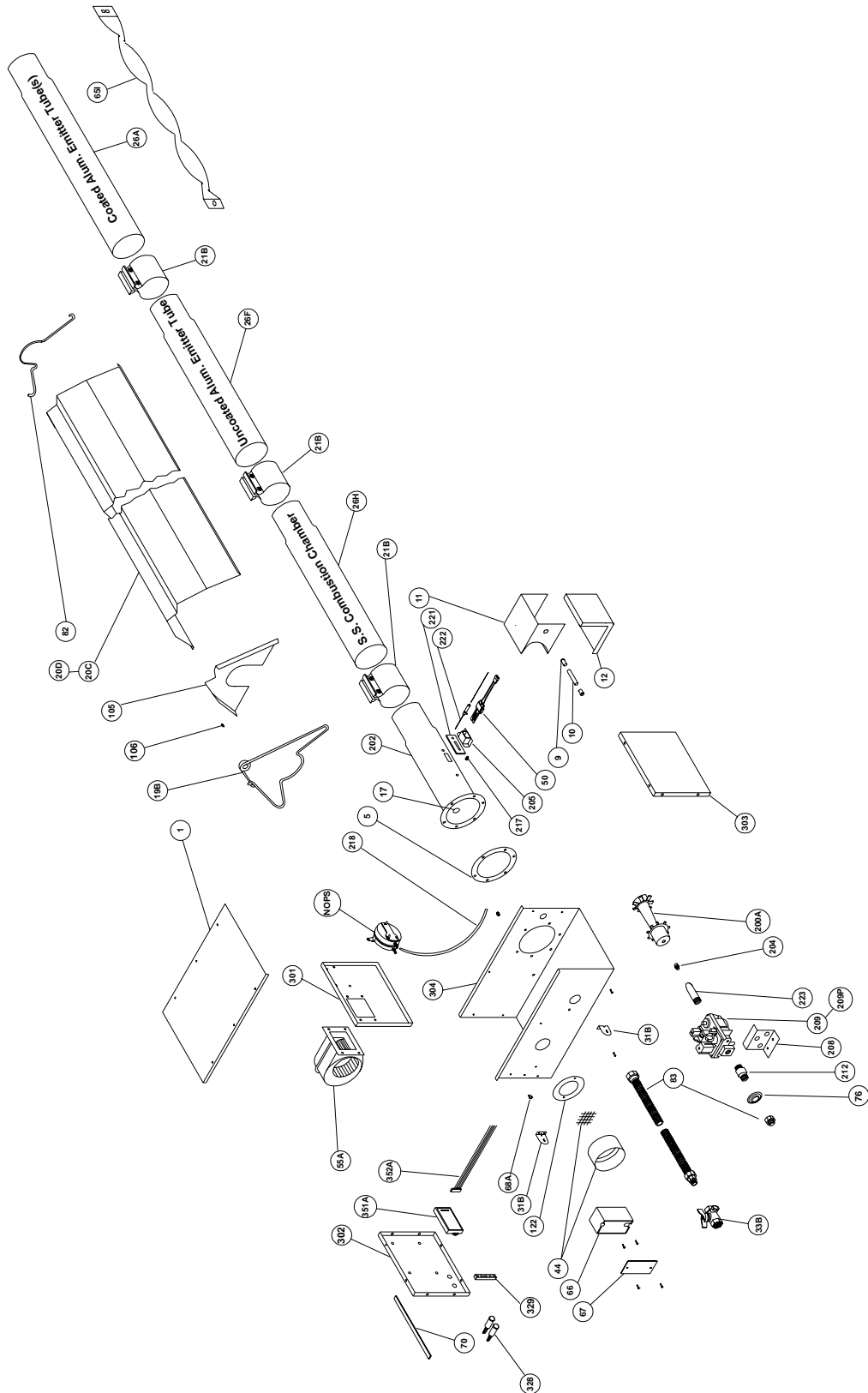


***WARNING: By-passing any pressure switch is for testing purposes only. Do not leave switch by-passed during normal operation or heater's built-in safety mechanisms will be compromised.**



CX Series

Parts Breakdown



Basic Parts List

CX SERIES PARTS LISTING

Part #	Description	Part #	Description
TP-1	CONTROL BOX COVER	TP-112	5' REFLECTOR
TP-5	FLANGE GASKET	TP-122	GASKET FOR AIR ORIFICE & AIR COLLAR
TP-9	CONDUIT COUPLING	TP-200A	BURNER (50 TO 100 MBTU/H)
TP-10	CONDUIT 4" X 1/2"	TP-202	16" BURNER TUBE WITH FLANGE
TP-11	GLO-BAR IGNITOR BOX	TP-204	GAS ORIFICE - CONSULT FACTORY
TP-12	GLO-BAR IGNITOR BOX COVER	TP-205	GLO-BAR HOLDER
TP-17	SIGHT GLASS KIT	TP-208	"Z" MOUNTING BRACKET
TP-19B	WIRE HANGER W/ SPRING CLIP	TP-209	36E36A-246 GAS VALVE - NAT GAS ASSY
TP-20C	120" ALUMINUM REFLECTOR	TP-209P	36E36A-240 GAS VALVE - LP GAS ASSY
TP-20D	120" STAINLESS STEEL REFLECTOR	TP-212	1/2" X 3" PIPE NIPPLE
TP-21B	TUBE CLAMP	TP-217	PRESSURE BARB FITTING
TP-26A	10' X 4' COATED ALUMINIZED RADIANT EMITTER TUBE	TP-218	PRESSURE SENSE TUBE (VINYL)
TP-26F	10' X 4' UNCOATED ALUMINIZED COMBUSTION/RADIANT TUBE	TP-221	GLO-BAR HOLDER GASKET
TP-26H	10' X 4' UNCOATED 304 STAINLESS STEEL COMBUSTION TUBE	TP-222	FLAME ROD
TP-31B	CONTROL BOX BRACKET	TP-223	GAS MANIFOLD
TP-33B	1/2" GAS COCK	TP-301	DIVIDER PANEL W/ P.S. MOUNTING TABS
TP-44	AIR ORIFICE W/SCREEN - CONSULT FACTORY	TP-302	LEFT END PANEL W/ LIGHT HOLES
TP-50	GLO-BAR IGNITOR	TP-303	RIGHT END PANELS - NO HOLES
TP-55A	FAN BLOWER	TP-304	CONTROL BOX
TP-65I	INTERLOCKING 33" BAFFLE SECTION	TP-328	120V INDICATOR LIGHT
TP-66	2" X 4" OUTLET BOX	TP-329	1/4" NEUTRAL TERMINAL BLOCK
TP-67	2" X 4" OUTLET BOX COVER	TP-330	DIVIDER GROMMET
TP-68A	STRAIN RELIEF BUSHING	TP-331	GREEN SELF TAP GROUND SCREW
TP-70	CONTROL BOX COVER GASKET (PER FOOT**)	TP-351A	MARK 17DU-117 POTTED CIRCUIT BOARD
TP-76	RUBBER GROMMET	TP-352A	LONG WIRING HARNESS FOR 17DU-117
TP-82	REFLECTOR CENTER SUPPORT		
TP-83	STAINLESS STEEL FLEX CONNECTOR	TP-NOPS	N.O. Pressure Switch (Select switch below, BTU Dependent)
TP-105	REFLECTOR END CAP	(TP-264B)	DIFFERENTIAL PRESSURE SWITCH - 50 - 65 MBTU/H
TP-106	REFLECTOR CLIP	(TP-264E)	DIFFERENTIAL PRESSURE SWITCH - 75 - 100 MBTU/H
TP-111	5' ALUM. TUBE, PAINTED WITH ONE CLAMP		

**6' TOTAL NEEDED TO COVER OUTER EDGES OF BURNER BOX (TP-70)






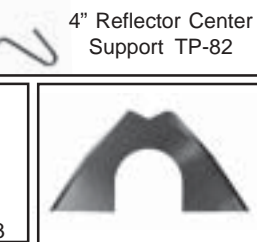
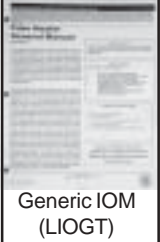
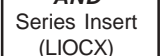


Kit Contents & Product Features

Kit contents for the CX Series are shown below. Reference the proper column for your particular models length.

FILLED BY:		CX SERIES KIT CONTENTS		
TP#	DESCRIPTION	30 FOOT	40 FOOT	50 FOOT
TP-19B	4" Hangers	4	5	6
TP-21B	4" Tube Clamps	3	4*	5*
TP-33B	1/2" Gas Cock	1	1	1
TP-82	4" Refl. Cntr. Sprt.	3	4	5
TP-83	24" SS Flex Line	1	1	1
TP-105	Reflector Endcaps	2	2	2
TP-106	Reflector Endcap Clips	8	8	8
IOM	Install / Op Manual	1	1	1
SS ADD ON	When Applicable			

Stainless Steel upgrades are noted in the bottom row when applicable.
 *175, 200 Models to have one TP-21B upgraded to Stainless Steel

 4" Hanger TP-19B	 4" Butt Clamp TP-21B	 1/2" Gas Cock TP-33B	 Bag of Reflector End Cap Clips. TP-106	 24" SS Flex Connect TP-83	 4" Reflector Center Support TP-82	 Reflector End Caps TP-105	 Generic IOM (LIOGT) AND Series Insert (LIOCX)
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Product Features

APPROVALS

- CSA.
- Indoor/Outdoor approval.
- Commercial/Industrial approval.

BURNER SIGHT GLASS

- For burner inspection.

COMBUSTION AIR INLET & VENT

- 4" Male duct.

ENAMELED CONTROL BOX

- Outside air collar (4") attached.
- Totally enclosed components.

RADIANT SURFACE AREA (SQ. FT.)

- 30' Models – 30.4
- 40' Models – 40.5
- 50' Models – 50.6

CONTROLS

- 100% safety shut off.
- Moisture and corrosion resistant ignition module.
- Differential pressure sensing switch.
- Silicon carbide hot surface igniter.
- Flame rod sensing.
- Pre-purge controls.

EMMITER & COMBUSTION TUBES

- 16ga. 4" O.D. Stainless steel combustion chamber
- 16ga. 4" O.D. Uncoated aluminized steel radiant tube (second tube downstream).
- 16ga. 4" O.D. Aluminized steel radiant emitter tubes coated with high temperature, corrosion resistant black coating .95 emissivity.
- Slip fit connection.

GAS CONNECTION

- 1/2" gas cock included.
- 7/8" flare-2' S.S. flex included.

WARRANTY *

- 1 year - Burner box components.
 - 5 years - Combustion and radiant tubes.
 - 10 years - Stainless steel burner.
- * See cover for warranty registration information.

OTHER

- Stainless steel upgrade available for harsh environments.
- One reflector center support per reflector.
- Turbulator baffle included.
- Visit www.reverberray.com
- Made in U.S.A.