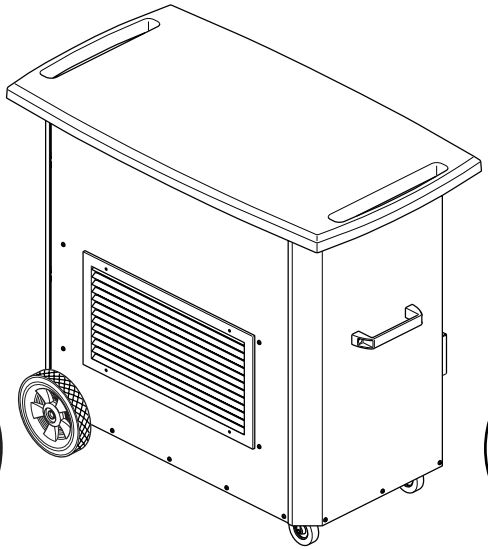
TENTEvent125
by MASTER PORTABLE HEATERS

PROPANE TENT EVENT FORCED AIR HEATER OWNER'S MANUAL



MODELS TB116, TB117 AND TB118
125,000 BTU/HR

IMPORTANT: Read and understand this manual before assembling, starting or servicing heater. Improper use of heater can cause serious injury. Keep this manual for future reference.

⚠ GENERAL HAZARD WARNING:

Failure to comply with the precautions and instructions provided with this heater, can result in death, serious bodily injury and property loss or damage from hazards of fire, explosion, burn, asphyxiation, carbon monoxide poisoning and/or electrical shock.

Only persons who can understand and follow the instructions should use or service this heater.

If you need assistance or heater information such as an instructions manual, labels, etc. contact the manufacturer.

Save this manual for future reference.
For more information, visit www.desatech.com

⚠ WARNING: If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

— 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 call your gas supplier from a neighbor's phone. 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.

If you smell gas, turn off gas supply at tank.

This is an unvented gas fired tent heater. It uses air (oxygen) from the tent in which it is installed. Provisions for adequate combustion and ventilation air must be provided. Provide at least 42 square inches of opening.

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⚠ WARNING: This product contains and/or generates chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.

⚠ WARNING: Fire, burn, inhalation and explosion hazard. Keep solid combustibles, such as tables, chairs, building materials, paper or cardboard, a safe distance away from the heater as recommended by the instructions. Never use the heater in spaces which do or may contain volatile or airborne combustibles or products such as gasoline, solvents, paint thinner, dust particles or unknown chemicals.

⚠ WARNING: Not for home or recreational vehicle use.

The heater is designed and approved for use as a tent heater in accordance with these instructions. CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT APPLICATIONS.

The heater is designed for use as a construction heater and as a vent-free tent heater. The heater is designed for use in the space being heated. The heater uses the air from within the space being heated for combustion and ventilation.

Applicable Standards:

For USA applications

ANSI Z83.7 - 2000
Gas Fired Construction Heaters
CGA 2.14 - 2000
Gas Fired Construction Heaters
CSA 3.06 - 2006
Portable Gas Fired Unvented Tent Heaters

For Canadian applications

ANSI Z83.7 - 2000
Gas Fired Construction Heaters
CGA 2.14 - 2000
Gas Fired Construction Heaters

General

ANSI/NFPA 102
Standard for Grandstands, Folding and telescopic Seating, Tents and Membrane Structures
ANSI/NFPA 58
Standard for Storage and Handling of Liquiefied Petroleum Gas Latest Edition
ANSI Z223.1/NFPA 54
National Fuel Gas Code Latest Edition
ANSI/NFPA 70
National Electric Code Latest Edition
CSA C22.1 Canadian Electrical Code Part 1

The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration or repair. Properly used, the heater provides safe economical heating. Products of combustion are vented into the area being heated.

We cannot foresee every use which may be made of our heaters. **Check with your local fire safety authority if you have questions about heater use.**

Other standards govern the use of fuel gases and heat producing products for specific uses. Your local authorities can advise you about these.

⚠ WARNING: When used without adequate combustion and ventilation air, heater may give off excessive carbon monoxide, an odorless, poisonous gas.

Do not install heater until all necessary provisions are made for combustion and ventilation air. Consult the written instructions provided with the heater for information concerning combustion and ventilation air. In the absence of instructions, refer to the national fuel gas code, ANS Z223.1, Section 5.3 or applicable local codes.

This heater is equipped with a an Oxygen Depletion Sensing (ODS) safety shutoff system designed to turn off the heater if not enough fresh air is available.

Do not tamper with oxygen depletion safety system!

If heater shuts off, do not relight until you provide fresh air. If heater keeps shutting off, have it serviced. Keep burner and control compartment clean.

SAFETY
Continued

Note: Fan will continue running if fuel supply is exhausted or thermal switch opens.

⚠ DANGER: Carbon monoxide poisoning may lead to death!

Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be working properly. **Get fresh air at once!** Check for proper ventilation and have heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, people with heart or lung disease or anemia, those under the influence of alcohol, and those at high altitudes.

Propane/LP Gas: Propane/LP gas is odorless. An odor-making agent is added to propane/LP gas. The odor helps you detect a propane/LP gas leak. However, the odor added to Propane/LP gas can fade. propane gas may be present even though no odor exists.

Make certain you read and understand all warnings. Keep this manual for reference. It is your guide to safe and proper operation of this heater.

⚠ WARNING: Do not place clothing or other flammable material on or near the appliance.

⚠ WARNING: Due to high temperatures, the appliance should be located out of traffic and away from furniture.

⚠ WARNING: Young children should be carefully supervised when they are in the same room with the appliance.

⚠ WARNING: Children and adults should be alerted to the hazard of high surface temperature and should stay away to avoid burns or clothing ignition.

⚠ CAUTION: Any safety screen or guard removed for servicing an appliance must be replaced prior to operating the heater.

1. Install and use heater with care. Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the *Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/NFPA 58*, the *Natural Gas and Propane Installation Code, CSA B149.1,* and *ANSI/NFPA 102 Standard for Grandstands, Folding and telescopic Seating, Tents and Membrane Structures*. This instructs on the safe storage and handling of propane/LP gases.
2. Use only the electrical voltage and frequency specified on model plate. The electrical connections and grounding of the heater shall follow the *National Electric Code, ANSI/NFPA 70* or the *Canadian Electrical Code, Part 1, CSA C22.1*.
3. Electrical Grounding Instructions - This appliance is equipped with a three-prong (grounding) plug for your protection against shock hazard and should be plugged directly into a properly grounded three-prong GFI receptacle or extension cord.
4. Use only the hose and factory preset regulator provided with the heater.
5. Use only propane/LP gas set up for vapor withdrawal.
6. This is an unvented gas-fired tent heater. It uses air (oxygen) from the tent in which it is installed. Provide adequate ventilation. Before using heater, provide at least a 42 in^2 (271 cm^2) opening of fresh, outside air.
7. For indoor and outdoor use.
8. Do not use heater in occupied dwellings or in living or sleeping quarters.
9. Do not use heater in basement or below ground level. Propane/LP gas is heavier than air. If a leak occurs, propane/LP gas will sink to the lowest poss ble level.
10. Keep appliance area clear and free from combustible materials, gasoline, paint thinner, and other flammable vapors and liquids. Dust is combust ble. Do not use heater in areas with high dust content.

SAFETY
Continued

11. Minimum heater clearances from combust ble materials: Outlet: 8 ft. (2.40 m), Sides: 1 ft. (30 cm), Top: 3 ft. (0.91 m), Rear: 1 ft. (30 cm)
12. Keep heater at least 6 ft. (1.83 m) from propane/LP tank(s). Do not point heater at propane/LP tank(s) within 20 ft. (6 m). In Canada keep heater at least 10 ft. (3 m) from propane/LP tank(s).
13. Keep propane/LP tank(s) below 100° F (38° C).
14. The minimum surrounding air temperature rating for this heater is -20º F (-29º C).
15. Check heater for damage before each use. Do not use a damaged heater.
16. Check hose before each use of heater. If highly worn or cut, replace with hose specified by manufacturer before using heater.
17. Locate heater on stable and level surface if heater is hot or operating.
18. Never block air inlet (rear) or air outlet (front) of heater.
19. Keep heater away from strong drafts, wind, water spray, rain, or dripping water.
20. Keep children and animals away from heater.
21. Never move, handle, or service a hot or operating heater. Severe burns may result. You must wait 15 minutes after turning heater off.
22. To prevent injury, wear gloves when handling heater.
23. Never attach duct work to heater.
24. Space heaters used in the vicinity of tarpaulins, canvas or similar enclosure materials shall be located a safe distance from such materials. These enclosure materials shall be of a fire retardant nature. These enclosure materials shall be securely fastened to prevent them from igniting or from upsetting the space heater due to wind action.
25. Do not alter heater. Keep heater in its original state.
26. Do not use heater if altered.
27. Turn off propane/LP supply to heater and unplug when not in use.
28. Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries.
29. The heater must be installed so that the location of the heater does not obstruct or interfere with normal or emergency exits and doors or walkways in the structure.
30. Only use lifting handles to pick up appliance (see Figure 1, page 6). Do not use plastic top hand holds for lifting.

VENTILATION

⚠ WARNING: Follow the minimum fresh, outside air ventilation requirements. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.

Provide a fresh air opening of at least 42 in^2 (271 cm^2) opening of fresh, outside air. *Example:* 3" high x 14" long = 42 in^2. Provide extra fresh air if more heaters are being used.

Determining Correct Heater Size

1. Determine volume of space to heat:
   Length x Width x Height
   50 feet x 30 feet x 15 feet = 22,500 ft^3
2. Determine desired temperature rise:
   Desired temperature 65° - 25° outside temperature = 40° rise
3. Multiply volume x rise: 22,500 x 40 = 900,000
4. To determine how many BTU's are needed multiply by 0.133
   900,000 x 0.133 = 119,000 Btu

The heater thermostat will cycle on and off to maintain the desired room temperature more often if the BTU/hr is oversized for the space being heated. The air infiltration and leakage of heated air through cracks, passageway openings, etc., will adjust the required BTU's needed for the desired temperature.

Ventilation Air Requirements - National Fuel Gas Code ANSI Z223.1/NFPA 54

1 inch^2 of opening per 3,000 BTU with outside air

1 inch^2 of opening per 1,000 BTU with non-outside air

Determine fresh air needed
Input Max. divided by 3,000
125,000 BTU/hr ÷ 3,000 = 41.66

Provide 42 inch^2 of opening to fresh, outside air
3" high x 14" long - 42 inches^2

PRODUCT IDENTIFICATION

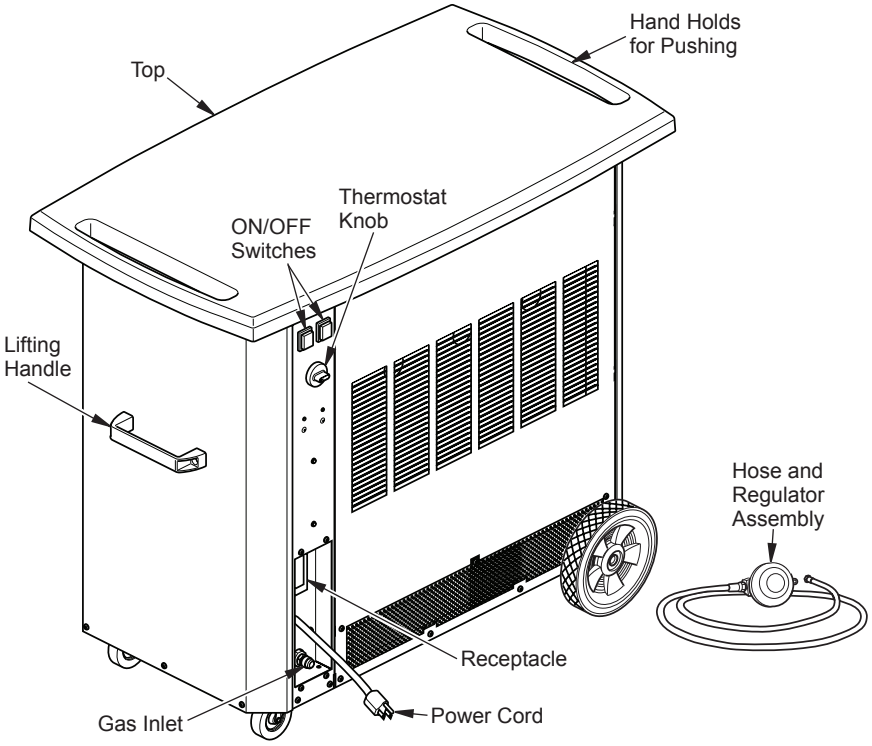


Figure 1 - Tent Heater

PROPANE SUPPLY

Propane/LP gas and propane tank(s) are to be furnished by the user.

Use this heater only with a propane vapor withdrawal supply system. See Chapter 5 of the *Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/NFPA 58* and the *Natural Gas and Propane Installation Code CSA B149.1*. Your local library or fire department will have this booklet.

Keep propane/LP tank(s) at least 5 ft away from the side of the tent.

The propane/LP tank(s) shall be protected from vehicles and secured in accordance with the *Standard for Grandstands, Folding and Telescopic Seating, Tents and Membrane Structures NFPA 102* and the *Standard for Storage and Handling of Liquiefied Petroleum Gases ANSI/NFPA 58*.

The amount of propane gas ready for use from propane tanks varies. Two factors decide this amount:

1. The amount of propane gas in tank(s)
2. The temperature of tank(s)

The following chart shows the number of 100 lb. (45 kg) tanks needed to run this heater.

Smaller tanks can be used for limited run times but it is recommended to use larger tanks for optimum performance.

Average Temperature At Tank	Number Of Tanks (100 lb/45 kg)
Above 20° F (-6.7° C)	2
20° F (-6.7° C) to 0° F (-18° C)	3
Below 0° F (-18° C)	Use larger tank

Less gas is vaporized at lower temperatures. You may need two or more 100 b. (45 kg) tanks or one larger tank in colder weather. Your local propane gas dealer will help you select the proper supply system. The minimum surrounding air temperature rating for each heater is -20° F (-29° C).

ELECTRICAL SUPPLY

This heater requires an electrical supply to be furnished by the user. The electrical outlet should have the following ratings:

120 volts (+/- 10%), 60 Hertz, 15 Amps
Ground Fault Interrupter (GFI)

The heater uses the ground circuit to prove the flame by sending a low voltage (40 mV DC) signal back to the DSI control. If the ground supply is not correctly wired or is missing, the heater will not work.

EXTENSION CORDS

Extension cords used to connect the heater must be 3 prong, grounded type of proper gauge. Extension cord requirements are as follows:

- Up to 100 feet (30 m), use 16 AWG rated cord
- 101 to 200 feet (32 to 60 m), use 14 AWG rated cord.

OPERATION WITH PORTABLE GENERATOR

⚠ WARNING: Before operating heater or any appliance from a portable generator, verify that generator has been properly connected to earth ground. Improper grounding or failure to ground generator can result in electrocution if a ground fault occurs. Refer to owner's manual supplied by generator manufacturer for proper grounding procedures.

The operating voltage range of the heater is 108 to 132 Volts (120 Volts +/- 10%). Prior to plugging heater into generator the output voltage should be verified (if generator is equipped with the automatic idle feature, the output voltage should be measured with the generator running at full speed). If the voltage does not measure in this range the heater should not be plugged into the generator.

UNPACKING

1. Remove all packing items applied to heater for shipment. Keep plastic cover caps (attached to inlet connector and hose/regulator assembly) for storage.
2. Remove all items from carton.
3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you bought heater.

THEORY OF OPERATION

The Fuel System: The hose/regulator assembly attaches to the propane gas supply. The propane gas moves through the automatic control valve and out the injector.

The Air System: The motor turns the fan. The fan pulls air into and around the combustion chamber. This air is heated and provides a stream of clean, hot air.

The Ignition System: The direct spark ignitor (DSI) sends voltage to the spark ignitor. The spark ignitor ignites the fuel and air mixture.

The Safety Control System: There are 4 independent systems:

1. **Flame Sensor:** This system causes the heater to shut down if the flame goes out.
2. **Thermal Switch:** This system causes the heater to shut down if the heater gets too hot (blocked openings).
3. **Air Pressure Switch:** The system will not allow the heater to start if there is not adequate air flow.
4. **ODS - Oxygen Depletion System:** This system shuts down the heater if the oxygen level drops below the specified level (18%).

ODS Operation: Burner porting "blows" out causing flame sensor to cool, shutting down heater.

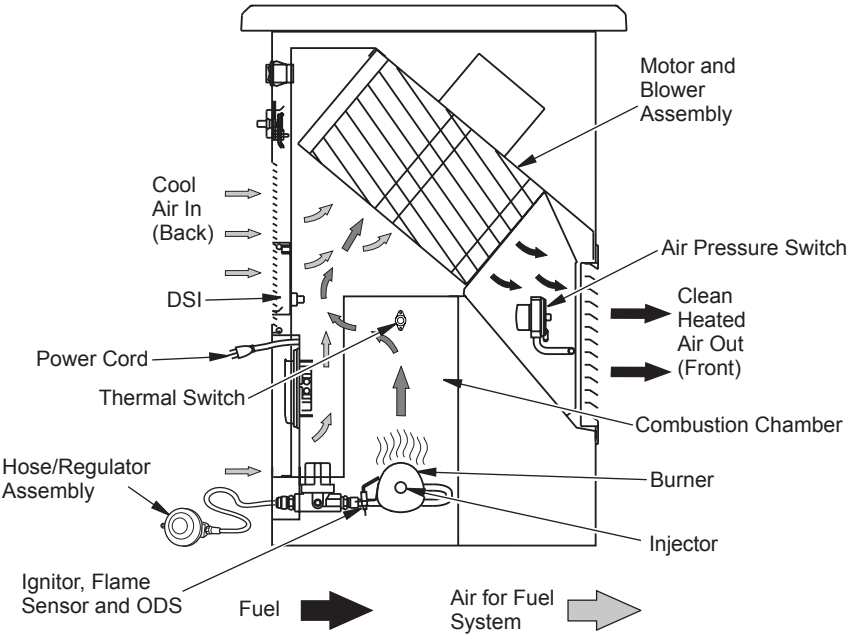


Figure 2 - Cross Section Operational View

ASSEMBLY

ASSEMBLY ITEMS

Before assembling heater, make sure you have the items listed below.

- Phillips head screwdriver
- Wrench
- Hardware packet
  Handles (2), 3/4" Screws (4), 1/4-20 Nuts (4), 1/4 Flat washers (4), 1/4 Lock washers (4)
  Casters (2), 3/8" Nut (2), 3/8 Lock washers (2), 3/8 Flat Washers (4)
  Wheels (2), Push Caps (2)
  Brackets (4), 1/2" black screws (8), 3/8" screws (8)

Note: Place metal parts on packaging during assembly to protect from scratches.

Side Handles

1. Remove handles, 3/4" screws, 1/4-20 nuts, 1/4 flat washers and 1/4 lock washers from hardware packet.
2. Attach each handle to side panels with 2 screws, 2 nuts, 2 flat washers and 2 lock washers. Insert screw from outside of heater and through handle. From inside of heater, attach a flat washer, then a lock washer then a nut as shown in Figure 3.

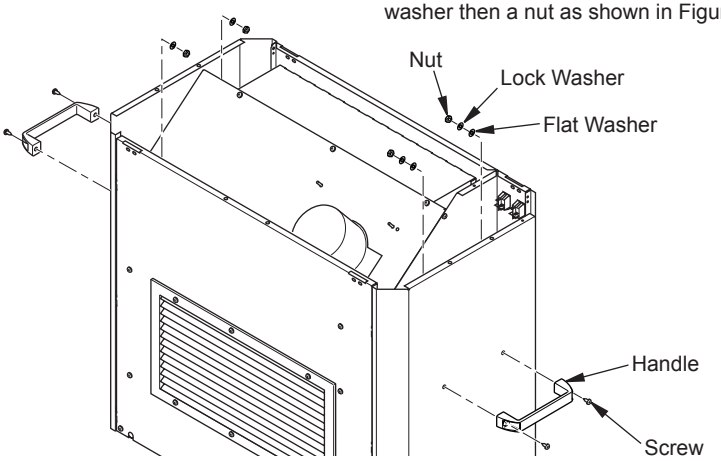


Figure 3 - Attaching Handles

Casters

1. Remove casters, 3/8 flat washers, 3/8 lock washers and 3/8 nuts from hardware packet.
2. You may wish to remove side panel from heater to make installing casters easier. If so, see *Top and Side Panel Removal* on page 14. Figure 4 shows side panel removed for clarity.
3. Use a spacer to prop end of heater up so holes in base can be accessed (the 2 wheels stacked on top of each other will accomplish this).
4. Place a flat washer onto threaded stem of caster. Insert caster stem through hole in cabinet base as shown in Figure 4.
5. Attach each caster to base with a flat washer, a lock washer and a nut as shown in Figure 4.

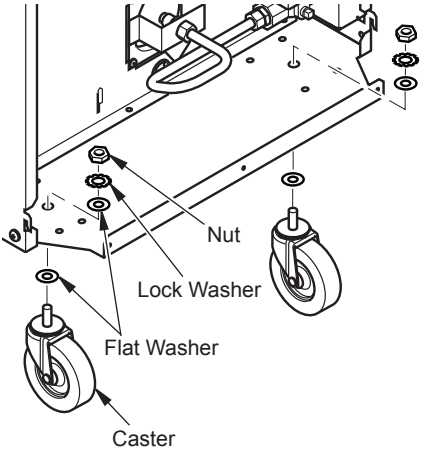


Figure 4 - Installing Casters

ASSEMBLY
Continued

Wheels and Axle

1. Locate wheels, spacers and axle in packaging. Remove 2 push caps from hardware packet.
2. Stand axle upright placing one end on the floor. Gently tap one push cap onto end of axle.
3. Slide one wheel and spacer onto axle then carefully slide axle through heater body as shown in Figure 5.
4. Slide second spacer and wheel onto axle from opposite side of heater.
5. Have another person secure wheel and axle from other side of heater while gently tapping second push cap onto end of axle.

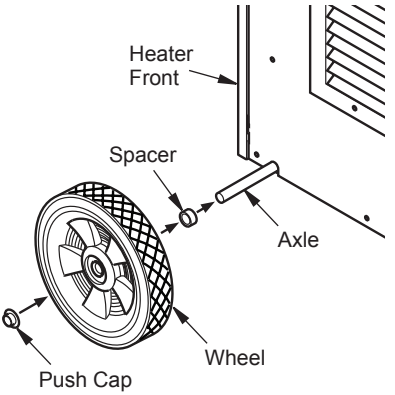


Figure 5 - Installing Axle, Spacers and Wheels

Top

1. Remove 4 brackets, (8) 1/2" black screws and (8) 3/8" screws from hardware packet.
2. Lay top upside down on a clean surface. Attach 4 brackets to top with 1/2" black screws.
3. Turn top over and carefully place over heater, positioning brackets through slots in heater front and rear panels.
4. Attach brackets to heater with 3/8" screws.

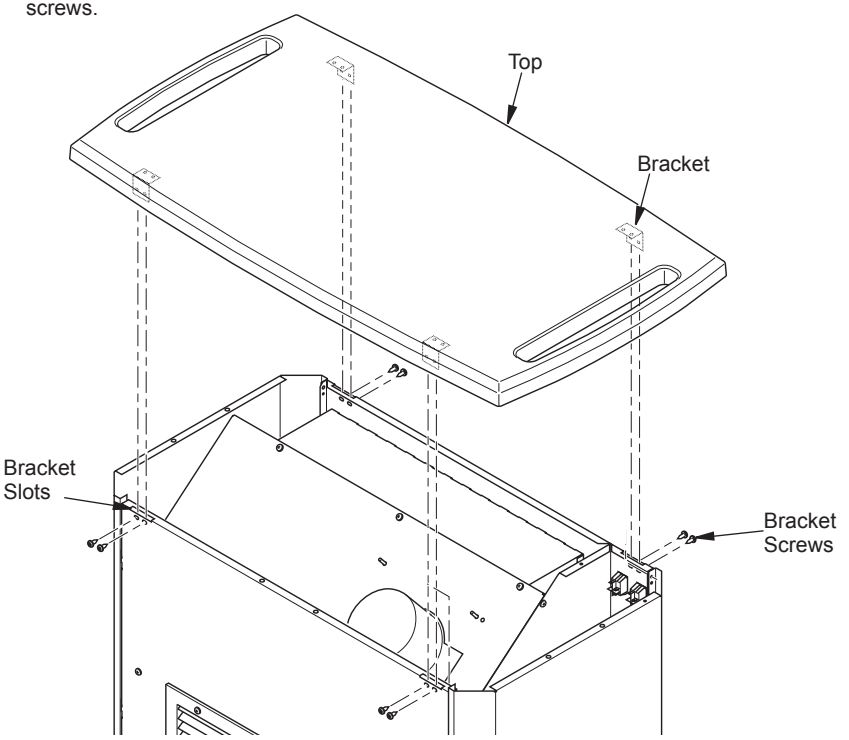


Figure 6 - Attaching Top

INSTALLATION

⚠ WARNING: Review and understand the warnings in the *Safety* section, page 2. They are needed to safely operate this heater. Follow all local codes or in the absence of local codes, with the *Standard for Grandstands, Folding and Telescopic Seating, Tents and Membrane Structures NFPA 102* and the *Standard for Storage and Handling of Liquiefied Petroleum Gases ANSI/NFPA 58*.

⚠ WARNING: Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a noncorrosive leak detection fluid to all joints (available at local plumbing supply stores). Bubbles forming show a leak. Correct all leaks at once.

1. Provide propane supply system (see *Propane Supply*, page 6).
2. Connect fuel gas connector fitting on hose/regulator assembly to propane tank(s) (see Figure 7). Turn counterclockwise into threads on tank valve. Tighten firmly using wrench.

   IMPORTANT: Tighten regulator with vent pointing down. Pointing vent down protects regulator from weather damage.
3. Connect hose to inlet connector (see Figure 8). Tighten firmly using a wrench.

   IMPORTANT: Extra hose or piping may be used if needed. Install extra hose or piping between hose/regulator assembly and propane tank. You must use the regulator supplied with heater.
4. Open propane supply valve on propane tank(s) slowly.

   Note: If not opened slowly, excess flow check valve on propane tank will stop gas flow. If this happens, close propane supply valve and open again slowly.
5. Check all connections for leaks. Correct all leaks.

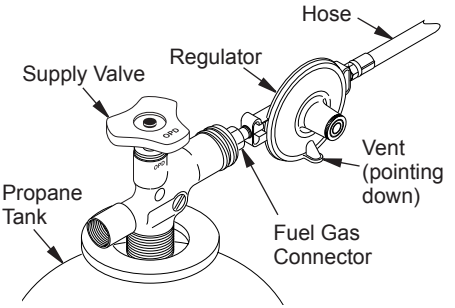


Figure 7 - Regulator With Vent Pointing Down

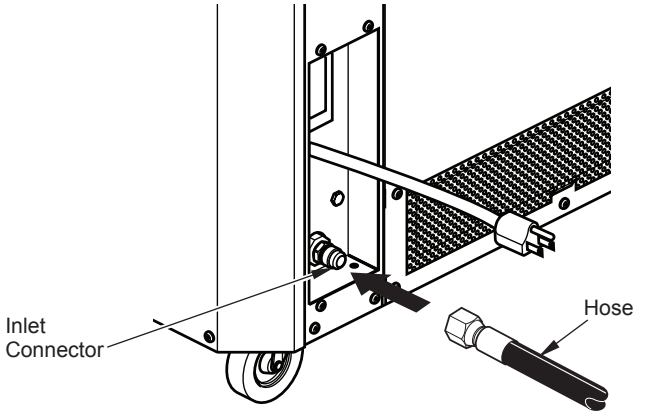


Figure 8 - Hose and Inlet Connector

OPERATION

⚠ WARNING: Review and understand the warnings in the *Safety* section, page 2. They are needed to safely operate this heater. Follow all local codes when using this heater.

TO START HEATER

1. Follow all installation, ventilation and safety information.
2. Connect regulator/hose assembly to gas supply.
3. Check for leaks using a noncorrosive leak detection fluid. Bubbles forming indicate a gas leak. Correct all leaks before attempting to operate heater.
4. Locate heater on a stable and level surface. Make sure strong drafts do not blow into front or rear of heater.
5. Plug power cord of heater into a three prong, grounded extension cord. Extension cord must be at least 6 feet (1.83 m) long, CSA listed and of proper size.

   Extension Cord Size Requirement
   Up to 100 ft. (30 m) long, use 16 AWG rated cord.

   101 to 200 ft. (31 to 60 m) long, use 14 AWG rated cord.
6. Plug extension cord into a 120v/60 hz, three hole, grounded GFI outlet.
7. Open gas supply valve slowly.

   Note: If heater burner does not ignite, turn gas supply off and open slowly. The hose/regulator assembly is equipped with an excess flow safety valve. An audible "click" is heard when opened too fast.
8. Choose desired function:

   THERMOSTAT OPERATION WITH HEAT
   1. Press Switch 1 to ON.
   2. Press Switch 2 to OFF.
   3. Adjust thermostat knob to desired comfort level.

Note: Fan will cycle on and off with burner.

CONTINUOUS FAN WITH HEAT

1. Press Switch 1 to ON.
2. Press Switch 2 to ON.
3. Adjust thermostat knob to desired comfort level.

Note: Fan will stay on when burner cycles off.

FAN ONLY WITH NO HEAT

1. Turn gas supply off.
2. Press Switch 1 to OFF.
3. Press Switch 2 to ON.
4. Adjust thermostat knob to Fan Only position.

TO STOP HEATER

1. Tightly close propane/LP supply valve on propane tank(s).
2. Wait a few seconds. Heater will burn gas left in supply hose.
3. Press on/off switches to the OFF position.
4. Unplug heater.

TO RESTART HEATER

1. Press on/off switches to the OFF position.
2. Reconnect extension cord.
3. Turn on gas supply valve.
4. Follow *To Start Heater* instructions, column 1.

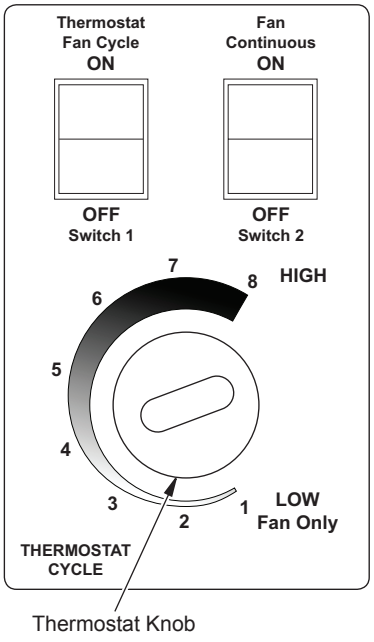


Figure 9 - Control Panel

STORAGE

⚠ CAUTION: Disconnect heater from propane supply tank(s).

1. Store propane tank(s) in safe manner. See Chapter 5 of S*tandard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58* and the *Natural Gas and Propane Installation Code CSA B149.1.* Follow all local codes. Always store propane tanks outdoors.
2. Place plastic cover caps over brass fittings on inlet connector and hose/regulator assembly.
3. Store in dry, clean, and safe place.
4. When taking heater out of storage, always check inside of heater. Insects and small animals may place foreign objects in heater. Keep inside of heater free from combustible and foreign objects.

MAINTENANCE

⚠ WARNINGS

- **Never service heater while it is plugged in, connected to propane supply, operating, or hot. Severe burns and electrical shock can occur.**
- **Keep heater clear and free from combustible materials, gasoline, and other flammable vapors and liquids.**
- **Do not block the flow of combustion or ventilation air.**

1. Keep heater clean. Clean heater annually or as needed to remove dust and debris. If heater is dirty or dusty, clean heater with a damp cloth. Use household cleaners on difficult spots. Slight odor may be present for a brief period following use of household cleaners.
2. Inspect heater before each use. Check connections for leaks. Apply a noncorrosive leak detection fluid to connections. Bubbles forming show a leak. Correct all leaks at once.
3. Inspect hose/regulator assembly before each use. If hose is highly worn or cut, replace with one specified by manufacturer.
4. Have heater inspected yearly by a qualified service agency.
5. Keep inside of heater free from combustible and foreign objects. Remove motor and other internal parts if needed to clean inside of heater (see S*ervice,* below).

Burner

Check burner air inlet after every 300 hours of operation to ensure burner air inlet is free of dust or debris. Use compressed air (30 PSI or less) to clean out burner air inlet.

SERVICE

⚠ WARNING: Never service heater while it is plugged in, connected to propane supply, operating, or hot. Severe burns and electrical shock can occur.

IMPORTANT: CHECK FOR GAS LEAKS. Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a noncorrosive leak detection fluid to all joints (available at local plumbing supply stores). Bubbles forming show a leak. Correct all leaks at once.

TOP AND SIDE PANEL REMOVAL

1. Remove 8 screws securing top brackets to body panels. Remove top and set aside (see Figure 10).
2. Remove 2 screws securing side panel at top edge. Remove 3 screws at lower outside edge (see Figure 10). Push down and lift out side panel.

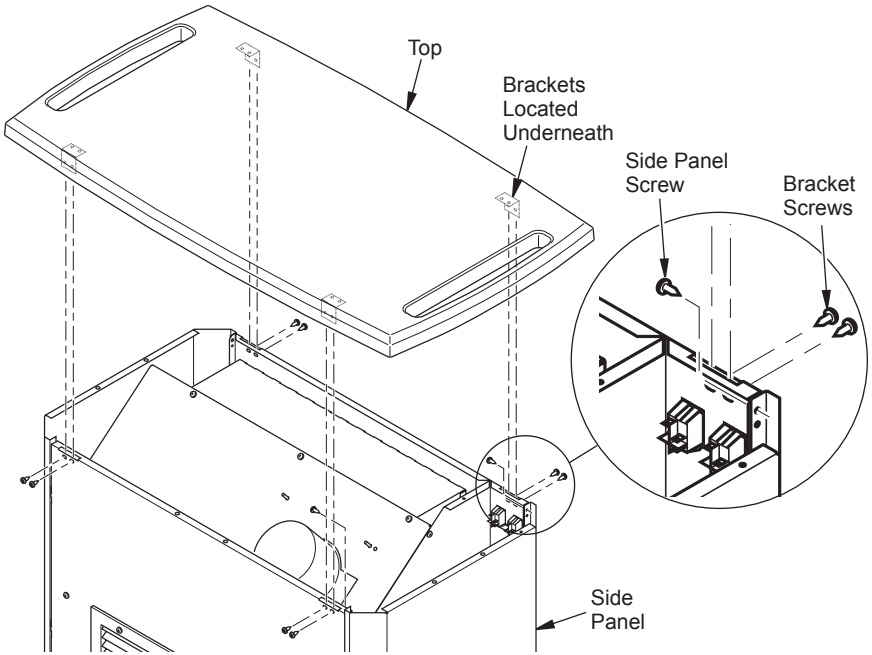


Figure 10 - Removing Top and Side Panel

ELECTRICAL AND GAS TRAIN COMPONENT ACCESS

1. Remove top and side panel (see *Top and Side Panel Removal*, above).
2. Locate wiring diagram on inside of side panel or go to page 20.
3. Check that all wiring terminals are securely connected.
4. Check for gas leaks around fittings and tubing of plumbing connections. See page 11.

MOTOR AND BLOWER ASSEMBLY

1. Remove top and side panel (see *Top and Side Panel Removal*, above).
2. Remove 4 screws securing outlet louver to front panel (see Figure 11, page 15).
3. Follow wires from blower/motor and disconnect from terminal blocks. Pull wires out and coil excess to prevent damage to insulation.
4. Carefully remove 9 screws securing blower mounting panel (see Figure 11, page 15). Slide baffle top up and carefully lift entire assembly out of heater. Assembly is heavy. Removal may require assistance.
5. Remove 4 nuts securing blower/motor to mounting panel.
6. Attach new blower/motor to mounting panel and reinstall in reverse order. Insert blower mounting panel under lip of baffle top. Use care when removing or installing blower to mounting panel to avoid damage to wiring. Reattach wiring referring to *Wiring Diagram* on page 20.

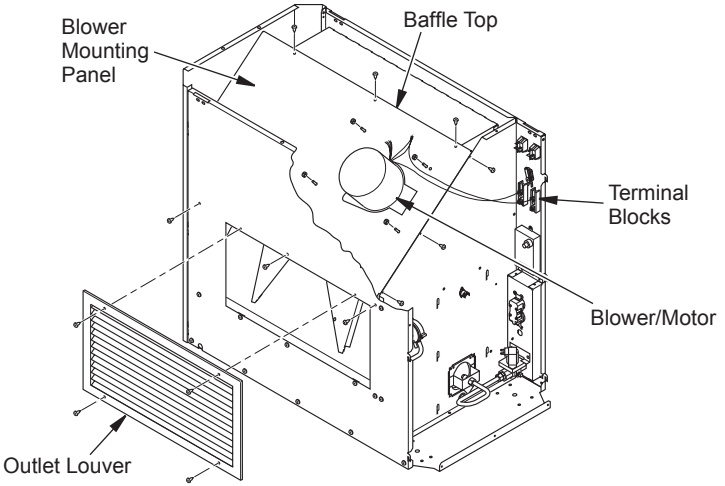


Figure 11 - Removing Blower/Motor Assembly

BURNER, IGNITOR AND GAS ORIFICE

⚠ WARNING: Make sure heater is disconnected from propane and electrical supply. Heater could ignite causing severe burns.

Remove top and side panel (see *Top and Side Panel Removal*, see page 14).

Replacing Burner

1. Remove all vis ble screws from lower section of back panel and screen (see Figure 12). Pull back panel out to gain access to screen. Push screen up and over flange, then slide out.
2. Disconnect orange ignitor wire from ignitor. Ignitor is attached to back of burner.
3. Disconnect gas line at solenoid valve and at orifice using a 5/8" wrench. Avoid bending and set aside.
4. Remove 3 screws securing burner to partition (see Figure 13). Rotate burner clockwise and pull out of chamber.
   Note: There is a cutout on the partition that allows the ignitor and bracket to slide out as a complete assembly. Use caution when removing or installing burner to avoid damaging or dislocating ignitor electrode.
5. After all service is complete, reinstall burner in reverse order. Support burner while inserting burner locator pin into hole in chamber end panel. Replace screen and back panel.

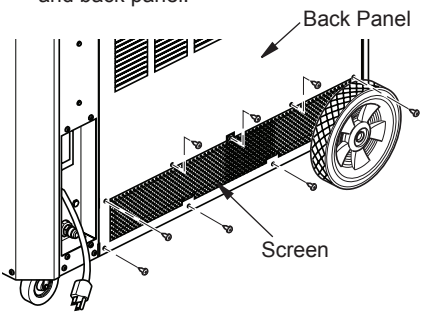


Figure 12 - Back Panel and Screen

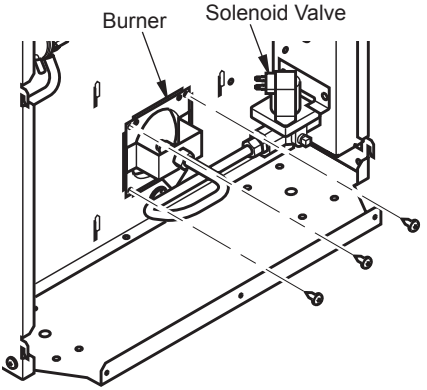


Figure 13 - Removing Burner

Replacing Ignitor

1. To loosen back panel and gain access to ignitor, follow step 1 under *Replacing Burner*, page 15. Due to lack of working area, burner assembly may be removed to gain access to ignitor electrode, see *Replacing Burner*, page 15.
2. Remove ignitor bracket screw and lift ignitor.
3. Attach new ignitor with ignitor mounting screw removed in step 2.
4. Install new ignitor. Ignitor gap between ignitor electrode and burner deck is 0.13"/0.15" (3.3/3.8 mm).
5. With gas supply shut off, test for spark. Plug into extension cord and watch for spark between ignitor electrode and burner deck.

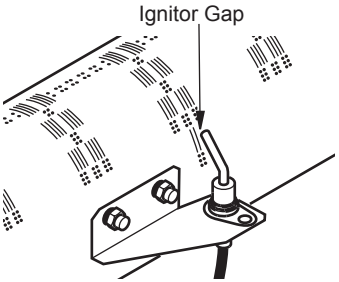


Figure 14 - Ignitor Gap

Replacing Gas Orifice

1. Hold burner flange and rotate orifice counterclockwise to remove.
2. Install new orifice

IMPORTANT: CHECK FOR GAS LEAKS. Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a noncorrosive leak detection fluid to all joints (available at local plumbing supply stores). Bubbles forming show a leak. Correct all leaks at once.

REPLACING DSI CONTROL

1. Remove top and side panel (see *Top Panel Removal,* page 14).
2. Disconnect orange ignitor wire.
3. Remove white wire connector.
4. Remove 2 screws and nuts securing DSI control.
5. Install new DSI control. Reconnect wiring.

REPLACING GAS VALVE

1. Remove top and side panel (see *Top and Side Panel Removal,* page 14).
2. Disconnect 2 blue wires.
3. Remove gas line.
4. Remove 2 screws and nuts holding valve to mounting plate.
5. Remove brass fittings from old gas valve. If damaged replace with new fittings. Install fittings into new gas valve. Use pipe joint sealant that is resistant to liquid petroleum (LP) gas. Tighten all fittings.
6. Install new gas valve using screws and nuts from step 4.
7. Connect blue wires to new gas valve.
8. Reconnect gas line.

IMPORTANT: CHECK FOR GAS LEAKS. Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a noncorrosive leak detection fluid to all joints (available at local plumbing supply stores). Bubbles forming show a leak. Correct all leaks at once.

CHECKING REGULATOR PRESSURE

1. Remove top and side panel (see *Top Panel Removal,* page 14).
2. Locate pressure tap on solenoid valve and remove (retain plug for later installation). See Figure 15, page 17.
3. Install 1/8 NPT barb fitting with sealant on threads into solenoid valve.
4. Connect to manometer or pressure gauge that measures in inches of water.
5. Connect hose and regulator to heater and tank.
6. Plug in and turn on.

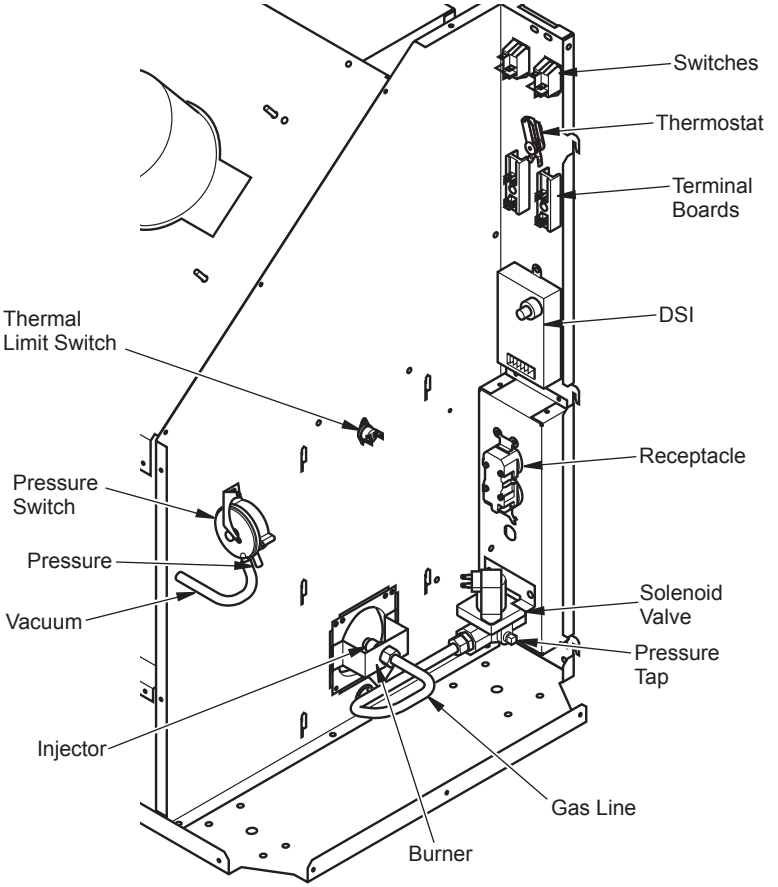


Figure 15 - Tent Heater Parts

SPECIFICATIONS

- Output Rating - 125,000 Btu/Hr (131,882 kJ/Hr)
- Fuel Consumption - 1.4 Gal/Hr (5.2 Liters/Hr), 5.8 lb/Hr (2.6 kg/Hr)
- Propane Vapor Fuel Only
- Manifold Pressure - 10" (25.4 cm) WC
- Supply Pressure To Regulator: Minimum (for purposes of input adjustment) 10 psi (69 kPa), Maximum - Tank Pressure
- Regulator Outlet Pressure - 11" wc
- Electric Input - 120 V/60 Hz
- Amperage - Start 7, Run 3.5
- Load - 10 amps on receptacle
- Hot Air Output (Approx) - 1000 CFM (28.3 m^3/min)
- Motor - 1,100 RPM, 1/4 HP
- Ignition - Electronic Direct Spark Ignition (D.S.I.)
- Ignitor Gap - 0.12"/0.15" (3.1/3.8 mm)

TROUBLESHOOTING

⚠ WARNING: Never service heater while it is plugged in, connected to propane supply, operating, or hot. Severe burns and electrical shock can occur.

OBSERVED FAULT	POSSIBLE CAUSE	REMEDY
Fan does not turn when switch(s) 1 or 2 are pressed to ON	1. No electrical power to heater	1. Check voltage to electrical outlet. If voltage is good, check heater power cord for breaks
	2. Thermostat set too low	2. Adjust thermostat to higher setting
	3. Ambient temperature is too high. Thermostat is satisfied	3. Wait for ambient temperature to decrease
	4. Defective motor	4. Replace motor. See *Motor and Blower Assembly*, page 14
	5. Loose wiring connections	5. Check wiring for loose connections or damage
Heater will not ignite	1. No fuel flow	1. Check gas supply, connections and hoses
	2. User did not follow installation or operation instructions properly	2. Repeat installation and operation instructions. See *Installation*, page 11 and *Operation*, page 12
	3. No spark at ignitor. To test for spark, follow step 5 under *Replacing Ignitor*, page 16. If you see spark at ignitor, have heater serviced by qualified service person. If no spark seen:	3.
	A) Loose or disconnected ignitor wire	A) Check ignitor wire. Tighten or reattach loose ignitor wire.
	B) Wrong spark gap	B) Assure gap between ignitor electrode and burner deck is 0.13"/0.15" (3.3/3.8 mm). Do not bend electrode. Doing so may cause it to break
	C) Bad ignitor electrode	C) Replace ignitor electrode. See *Replacing Ignitor*, page 16
	D) Bad spark DSI	D) Replace spark transformer. See *Replacing DSI Control*, page 16
	3. Air proving switch blocked	3. Clean tubing

TROUBLESHOOTING

Continued

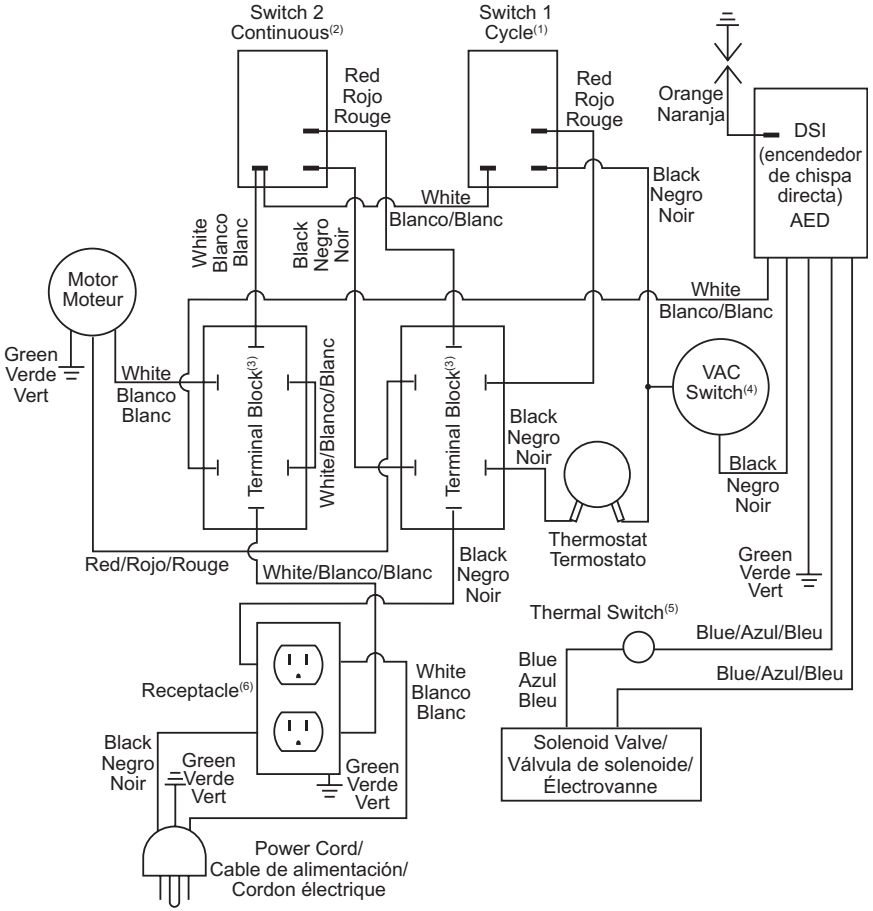
OBSERVED FAULT	POSSIBLE CAUSE	REMEDY
Heater shuts down while running	1. Propane supply may be inadequate	1. A) Refill tank B) Provide additional and/or larger tanks. See *Propane Supply*, page 6
	2. High surrounding air temperature causing thermal limit device to shut down heater	2. This can happen when running heater in temperatures above 85° F (29° C). Run heater in cooler temperatures
	3. Restricted air flow	3. Check heater inlet and outlet. Remove any obstructions
	4. Damaged fan	4. Replace motor and blower assembly. See page 13
	5. Excessive dust or debris in surrounding area	5. Clean heater. See *Maintenance*, page 13
	⚠ WARNING: Use only in areas free of high dust content.	
Heater producing odor	1. Gas leak	1. Check all connections for leaks. Apply noncorrosive leak detection fluid to gas joints. Bubbles forming show a leak that must be corrected
	2. Heater operating on a 20 b. propane/LP cylinder. Insufficient propane/LP gas will be supplied by a 20 b. cylinder resulting in odor	2. To obtain correct mixture of propane/LP gas and air, use a larger cylinder size, i.e. 100 lb. See *Propane Supply*, page 6
	3. Propane/LP supply tank is "freezing up". Evaporation and consumption rate of propane/LP from supply tank is to great for the size of the tank and air temperature	3. Use a larger supply cylinder size, i.e. 100 lb.

TECHNICAL SERVICE

You may have further questions about this heater. If so, contact DESA Heating Products' Technical Service Department at 1-866-672-6040. When calling, please have your model and serial numbers of your heater ready.

You can also visit DESA Heating Products' Technical Service web site at **www.desatech.com**.

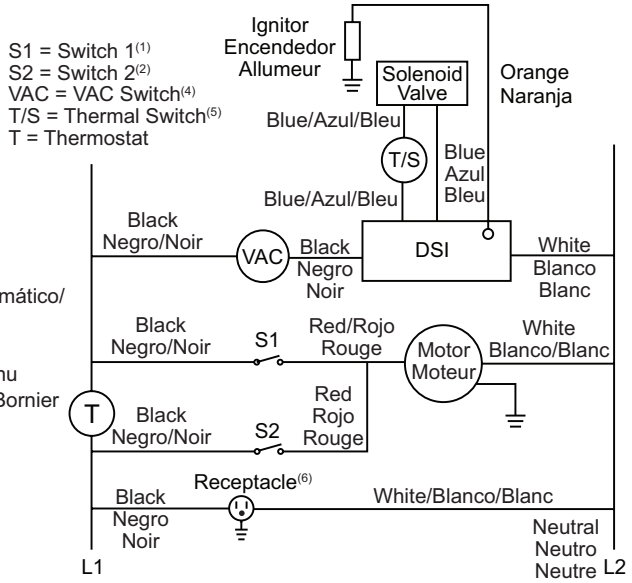
WIRING DIAGRAM



Electrical Connection Diagram

WIRING DIAGRAM

Continued



(1) Interruptor 1 ciclo automático/ Interrupteur 1 en cycle
(2) Interruptor 2 continuo/ Interrupteur 2 en continu
(3) Bloque de terminales/Bornier
(4) Interruptor de VCA/ Interrupteur V c.a.
(5) Interruptor térmico/ Interrupteur thermique
(6) Enchufe/Prise

Ladder Diagram

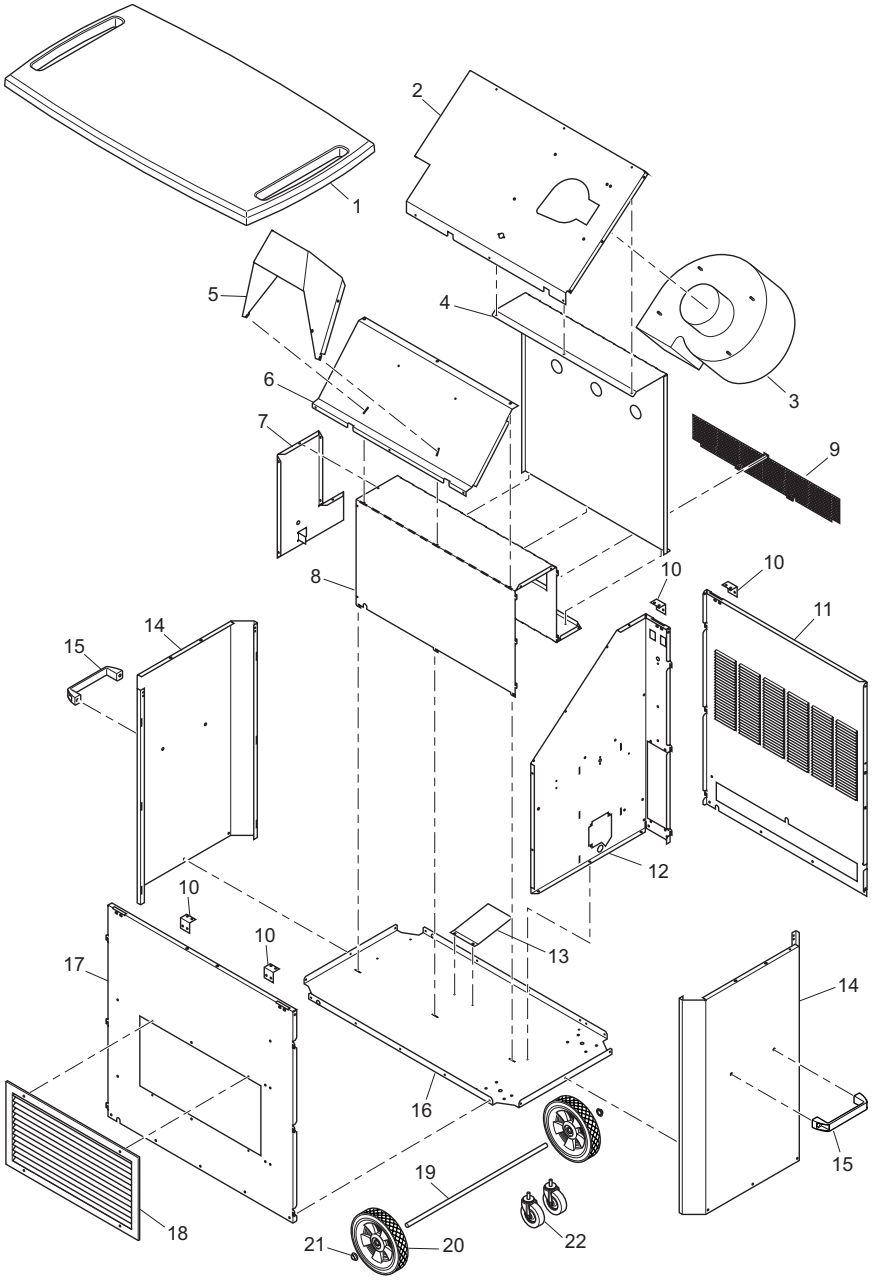
⚠ WARNING: Never attempt to service heater while it is plugged in, operating, or hot. Burns and electrical shock could result. Only a qualified service person should service or repair heater.

If any of the original wire as supplied with the appliance must be replaced, it must be replaced with 105° C wire or it's equivalent.

⚠ WARNING: Label all wires prior to disconnection when servicing controls. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.

PARTS

CABINET
MODELS TB116, TB117 AND TB118



PARTS

CABINET

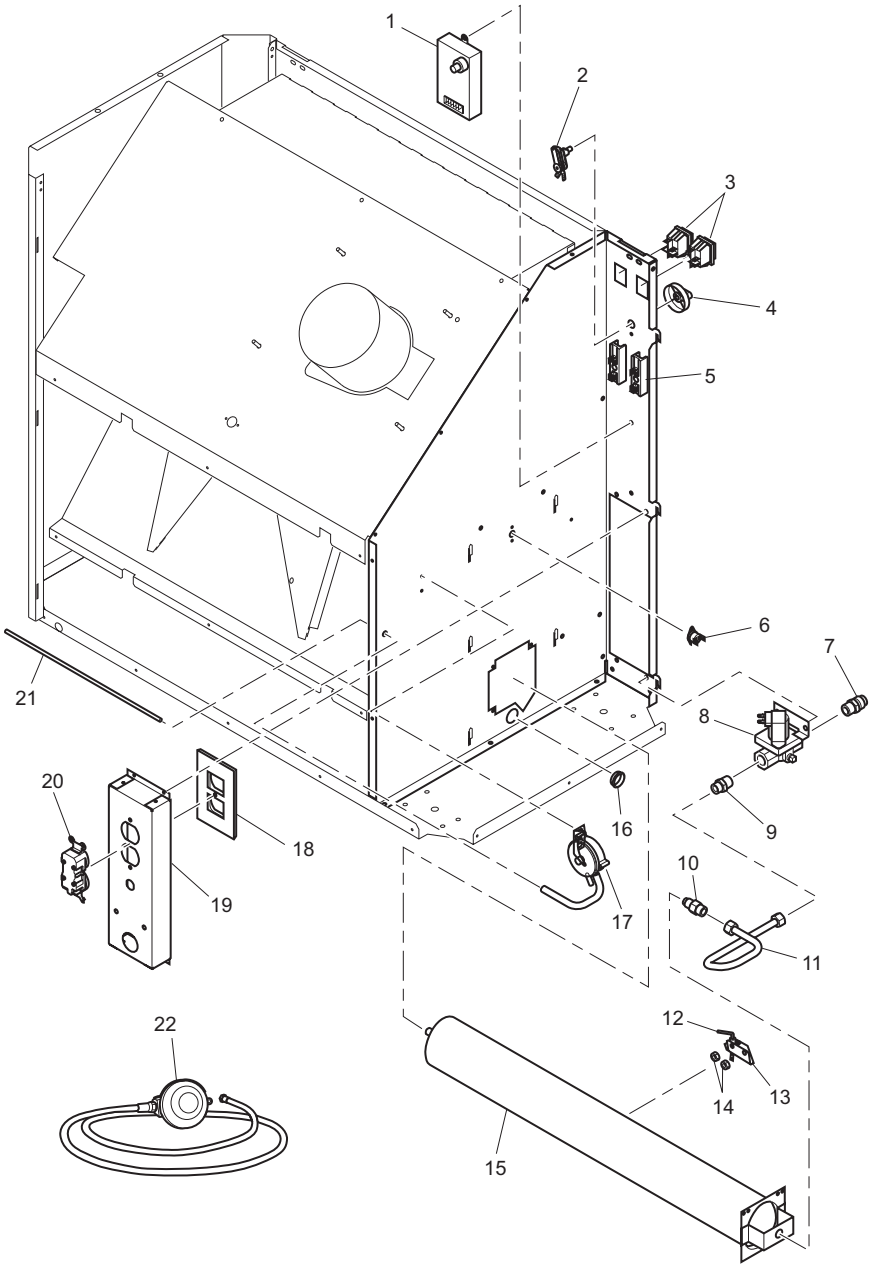
This list contains replaceable parts used in your heater. When ordering parts, follow the instructions listed under *Replacement Parts* on page 26 of this manual.

KEY NO.	PART NO.	DESCRIPTION	TB116	TB117	TB118	QTY
1	119551-01	Cabinet Top, White	•			1
	119551-02	Cabinet Top, Black		•		1
	119551-03	Cabinet Top, Tan			•	1
2	119555-01	Blower Mounting Panel	•	•	•	1
3	119753-01	Motor and Blower Assembly	•	•	•	1
4	119640-01	Baffle	•	•	•	1
5	118295-01	Outlet Duct	•	•	•	1
6	119558-01	Lower Baffle	•	•	•	1
7	120043-01	Chamber End Panel	•	•	•	1
8	120042-01	Top Chamber	•	•	•	1
9	120123-01	Screen	•	•	•	1
10	120116-01	Bracket	•	•	•	4
11	118287-01AC	Back Panel, White	•	•		1
	118287-02DG	Back Panel, Tan			•	1
12	118289-01	Partition Panel	•	•	•	1
13	120126-01	Ignitor Reflector	•	•	•	1
14	119926-01AC	End Panel, White	•	•		2
	119926-02DG	End Panel, Tan			•	2
15	120111-01	Handle	•	•	•	2
16	118286-01	Cabinet Base	•	•	•	1
17	118294-01AC	Front Panel, White	•	•		1
	118294-02DG	Front Panel, Tan			•	1
18	119553-01	Louvered Outlet Duct	•	•	•	1
19	M16801-12	Plated Axle	•	•	•	1
20	120469-01	Wheel	•	•	•	2
21	M28526	Push cap	•	•	•	2
22	120201-01	Caster	•	•	•	2
		PARTS AVAILABLE - NOT SHOWN				
		Decals Available	•	•	•	
	110267-01	D.S.I. Wire Harness	•	•	•	1
	120173-01	Wire Assembly	•	•	•	1
	120173-02	Wire Assembly	•	•	•	1
	097806-04	Ignitor Cable	•	•	•	1
	098219-44	Power Cord	•	•	•	1
	120425-01	Hardware Bag	•	•	•	1
	120192-01	3/4" Screw	•	•	•	4
	NPC 4C	1/4-20 Nut	•	•	•	4
	WP 4C	1/4" Flat Washer	•	•	•	4
	WLE 4C	1/4" Lock Washer	•	•	•	4
	NPC 6C	3/8" Nut	•	•	•	2
	WLE 6C	3/8" Lock Washer	•	•	•	2
	WP 6C	3/8" Flat Washer	•	•	•	4
	118775-02	1/2" Black Screws	•	•	•	8
	098304-08	3/8" Screw	•	•	•	8
	113497-01	Wheel Spacer	•	•	•	2

** Not a field replaceable part.

PARTS

MODELS TB116, TB117 AND TB118



PARTS

MODELS TB116, TB117 AND TB118

This list contains replaceable parts used in your heater. When ordering parts, follow the instructions listed under *Replacement Parts* on page 26 of this manual.

KEY NO.	PART NO.	DESCRIPTION	TB116	TB117	TB118	QTY
1	M51605-05	D.S.I. Control	•	•	•	1
2	104458-01	Thermostat	•	•	•	1
3	108394-01	ON/Off Switch	•	•	•	2
4	104460-01	Thermostat Knob	•	•	•	1
5	099125-01	Terminal Board	•	•	•	2
6	101481-12	Thermal Limit Switch	•	•	•	1
7	M51572-02	Male Connector	•	•	•	1
8	103015-01	Solenoid Valve	•	•	•	1
9	098264-02	Male Connector	•	•	•	1
10	103845-15	Injector	•	•	•	1
11	120127-01	Fuel Tube	•	•	•	1
12	103934-01	Ignitor	•	•	•	1
13	119884-01	Ignitor Bracket	•	•	•	1
14	098249-01	ODS Nut	•	•	•	2
15	118254-01	Burner	•	•	•	1
16	M50104-02	Shorty Bushing	•	•	•	2
17	120095-01	Pressure Switch Assembly	•	•	•	1
18	120276-01	Duplex Cover	•	•	•	1
19	119618-01	Recessed Valve Plate	•	•	•	1
20	103769-01	Duplex Outlet	•	•	•	1
21	120096-01	Air Switch Tube	•	•	•	1
22	078923-04	Regulator and Hose Assembly	•	•	•	1

** Not a field replaceable part.

REPLACEMENT PARTS

⚠ WARNING: Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries. This will also protect your warranty coverage for parts replaced under warranty.

PARTS UNDER WARRANTY

Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA Heating Products at 1-866-672-6040.

When calling DESA Heating Products, have ready

- your name
- your address
- model number of your heater
- how heater was malfunctioning
- purchase date

In most cases, we will ask you to return the part to the factory.

PARTS NOT UNDER WARRANTY

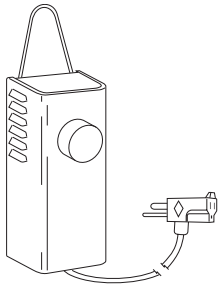
Contact authorized dealers of this product. If they can't supply original replacement part(s), call DESA Heating Products at 1-866-672-6040.

When calling DESA Heating Products, have ready:

- model number of your heater
- the replacement part number

ACCESSORY

Purchase accessories and parts from your nearest dealer or service center. If your dealer or service center can not supply an accessory or part, call DESA Heating Products' Parts Department at 1-866-672-6040. You can also write to the address listed on the back page of this manual.



THERMOSTAT KIT - PP235

Keeps your building at the temperature you select day and night. Helps economize on fuel. Includes 25 ft. cord.

NOTES

WARRANTY

KEEP THIS WARRANTY

Model _____

Serial No. _____

Date of Purchase _____

LIMITED WARRANTIES FOR NEW AND FACTORY RECONDITIONED PRODUCTS

New Products: DESA Heating, LLC warrants this heater and any parts thereof, to be free of defects in materials and workmanship for one (1) year from the date of first purchase, when operated and maintained in accordance with the manufacturer's instructions. These warranties are extended only to the original retail purchaser, when proof of purchase is provided.

Factory Reconditioned Heaters: DESA Heating, LLC warrants this factory reconditioned heater and any parts thereof, to be free of defects in materials and workmanship for thirty (30) days from the date of first purchase, when operated and maintained in accordance with the manufacturer's instructions. These warranties are extended only to the original retail purchaser, when proof of purchase is provided.

This warranty covers only the cost of parts and labor required to restore the product to proper operating condition. Transportation and incidental costs associated with warranty repairs are not reimbursable under this warranty.

Warranty service is available only through authorized dealers and service centers.

This warranty does not cover defects resulting from misuse, abuse, negligence, accidents, lack of proper maintenance, alteration, modification, tampering, contaminated fuels, repair using improper parts, or repair by anyone other than an authorized dealer or service center. Routine maintenance is the responsibility of the owner.

THIS EXPRESS WARRANTY IS GIVEN IN LIEU OF ANY OTHER WARRANTY EITHER EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

DESA Heating, LLC assumes no responsibility for indirect, incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, or limitations or exclusions may not apply to you. This Limited Warranty gives you specific legal rights and you may also have other rights which vary from state to state.

The only warranty applicable is our standard written warranty. We make no other warranty, expressed or implied.

WARRANTY SERVICE

Should your heater require service, return it to your nearest authorized service center. Proof of purchase must be presented with the heater. The heater will be inspected. A defect may be caused by faulty materials or workmanship. If so, DESA Heating, LLC will repair or replace the heater without charge.

REPAIR SERVICE

Return your heater to your nearest authorized service center. Repairs not covered by the warranty will be billed at standard prices. Each Service Center is independently owned and operated.

DESA
2701 Industrial Drive
P.O. Box 90004
Bowling Green, KY 42102-9004
1-866-672-6040

DESA INDUSTRIES OF CANADA, INC.
82 Akron Road
Toronto, Canada M8W 1T2
416-255-5333

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