Climate RENTAL SOLUTIONS

MC 5200 DRYVEX™ DEHUMIDIFICATION SYSTEM

OPERATOR'S MANUAL

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE

TABLE OF CONTENTS

FOREWORD

This manual provides information and procedures to safely operate and maintain this Ground Heaters®, Inc. model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact Ground Heaters®, Inc. This machine is built with user safety in mind; however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully! If you have questions about operating or servicing this equipment, please contact Ground Heaters®, Inc.

The information contained in this manual was based on machines in production at the time of publication. Ground Heaters®, Inc. reserves the right to change any portion of this information without notice.

SAFETY INFORMATION

This manual contains DANGER, WARNING, CAUTION, NOTICE and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Used without the safety alert symbol, **NOTICE** indicates a hazardous situation which, if not avoided, could result in property damage.

Note: Contains additional information important to a procedure.

OPERATING SAFETY

WARNING Familiarity and proper training are required for the safe operation of this machine. Machines operated improperly or by untrained personnel can be dangerous. Read the operating instructions contained in both this manual and the OEM manuals included with this machine. Familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the machine before being allowed to operate it.

1. ALWAYS be sure the machine is on a firm, level surface and will not tip, roll, slide, or fall while operating.
2. NEVER start a unit in need of repair.
3. Keep unauthorized personnel, children, and pets away from the machine.
4. ALWAYS operate machine with all safety devices and guards in place and in working order. DO NOT modify or defeat safety devices. DO NOT operate machine if any safety devices or guards are missing or inoperative.
5. NEVER run the machine indoors or in an enclosed area unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the genset and from the burner contains carbon monoxide, a deadly poision. Exposure to carbon monoxide WILL KILL YOU IN MINUTES.
6. DO NOT smoke while operating the machine.
7. ALWAYS refer to the applicable Department of Transportation regulations before towing.
8. NEVER transport people in or on the machine.
9. ALWAYS where gloves when handling duct work and hot components.
10. NEVER run the machine in areas that contain flammable objects, fuels, or products that produce flammable vapors.

OPERATOR SAFETY WHILE USING COMBUSTION BURNERS

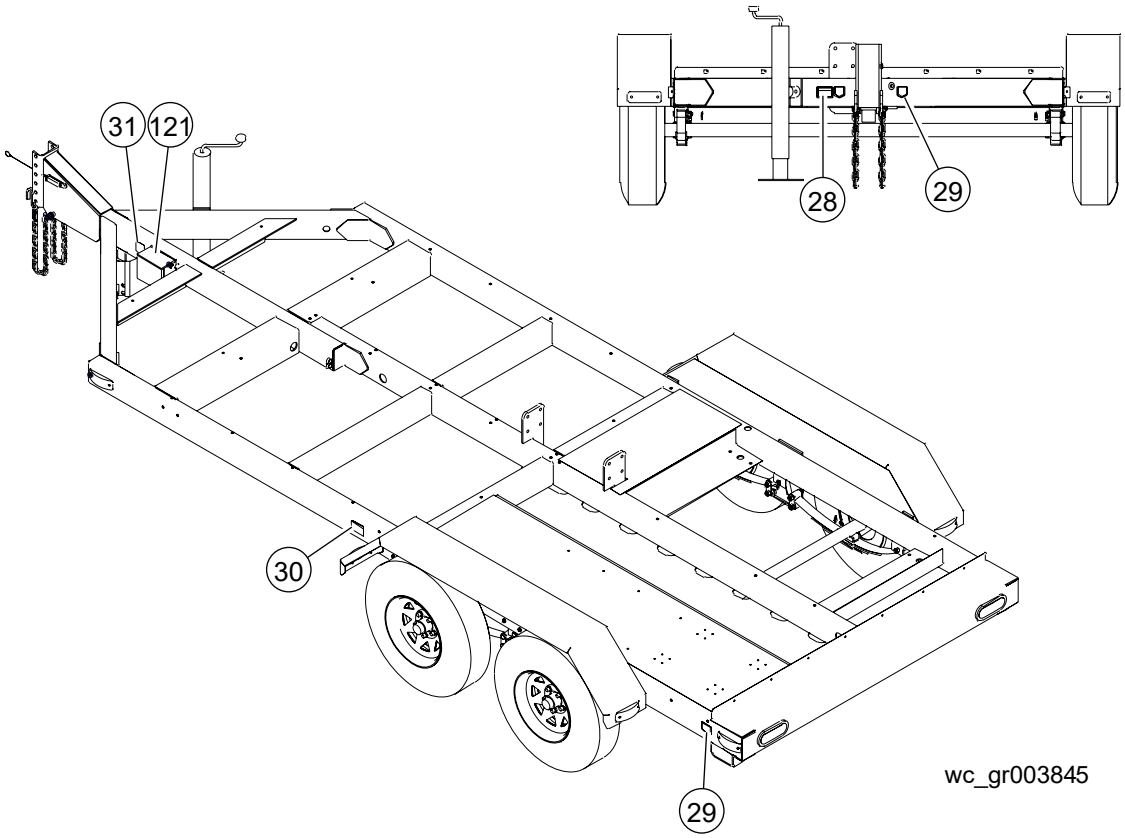
1. Combustion burners present special hazards during operation and fueling. Read and follow the warning instructions in the burner owner's manual and the safety guidelines below. Failure to follow the warnings and safety guidelines could result in severe injury or death.
2. NEVER operate the machine indoors unless exhaust fumes can be adequately ventilated.
3. DO NOT fill or drain the fuel tank near an open flame, while smoking, or while the engine is running.
4. ALWAYS refill the fuel tank in a well-ventilated area.
5. ALWAYS replace the fuel tank cap after refueling. DO NOT spill fuel when refueling the machine. Clean up spilt fuel immediately.
6. DO NOT smoke when refueling machine.
7. DO NOT refuel hot or running machine.

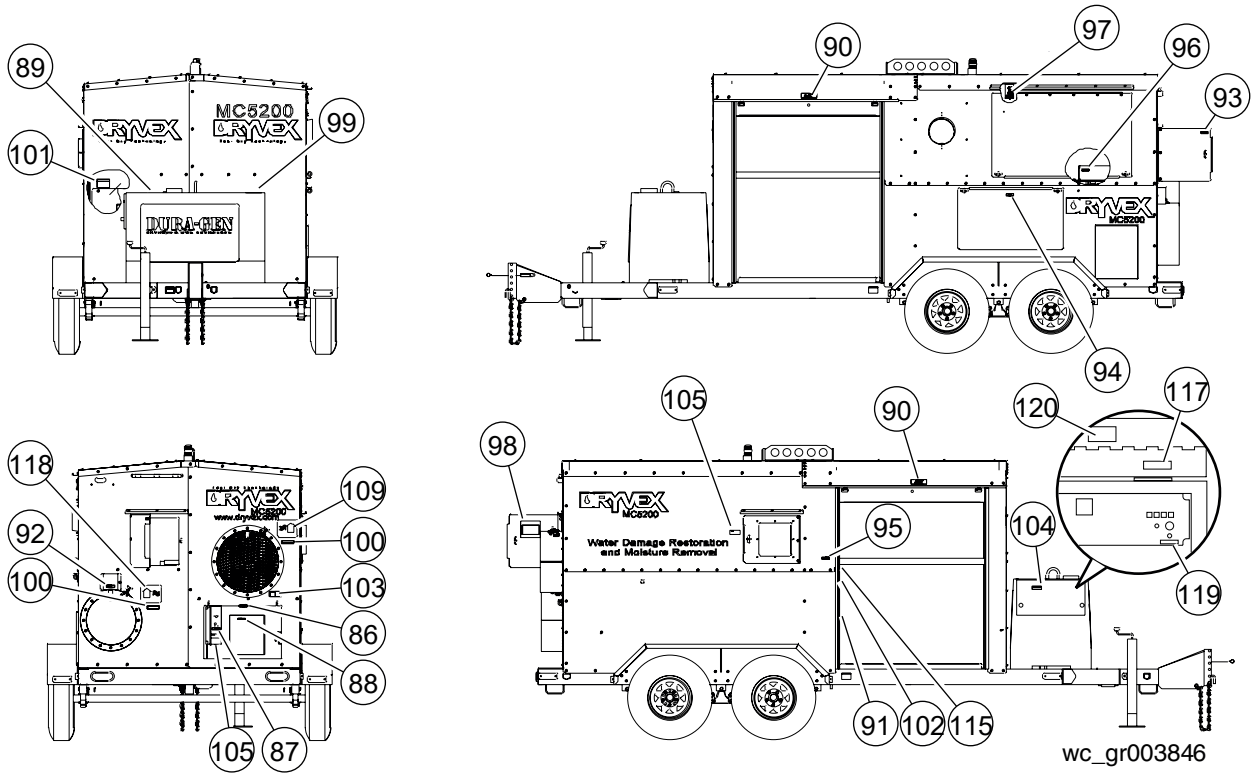
SERVICE SAFETY

WARNING HIGH VOLTAGE! This unit uses high voltage circuits capable of causing serious injury or death. Only a qualified electrician should troubleshoot or repair electrical problems occurring with this equipment.

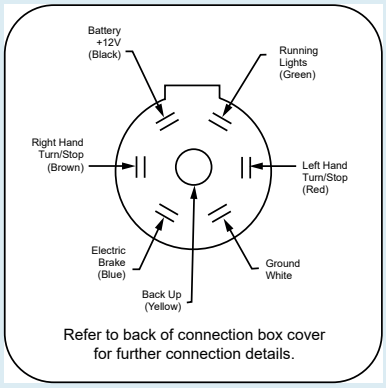
1. ALWAYS replace the safety devices and guards after repairs and maintenance.
2. ALWAYS keep the machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.
3. ALWAYS make sure slings, chains, hooks, ramps, jacks and other types of lifting devices are attached securely and have enough weightbearing capacity to lift or hold the machine safely. Always remain aware of the location of other people around when lifting the machine.
4. ALWAYS replace or repair electrical components with components that are identical in rating and performance as the original component.
5. DO NOT use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
6. ALWAYS check the tires on the trailer for tread wear, inflation, and condition. Replace worn tires.
7. ALWAYS connect the safety chains.
8. ALWAYS make sure directional and trailer lights are connected and working properly.
9. ALWAYS check that the lug nuts holding the wheels are tight and that none are missing.
10. DO NOT attempt tire repairs. Always have a qualified tire dealer or repair service perform tire repairs.

LABEL LOCATIONS





SAFETY AND OPERATING LABELS

Ref.	Label	Ref.	Label
28	**⚠ WARNING** Jack Should NOT be Deployed for Truck Bed Transport Properly Support Tongue with Wood Block and Retract Jack Before Tightening Chains or Straps Jack is not designed to take loads that ratcheting straps or load binded chains can deliver. Use jack for raising/lowering trailer tongue only. Failure to heed above warning could result in damage to personal propertly or cause serious injury or death.	29	**TIE DOWN**
30	**⚠ WARNING** LUGNUTS FACTORY TORQUED TO 110 LB-FT. VERIFY LUGNUTS ARE PROPERLY TORQUED BEFORE TRANSPORTING. Failure to heed above warning could result in wheel loss which can cause injury or death.	31	 Refer to back of connection box cover for further connection details.

86	BURNER ACCESS BURNER RESET 0170435	87	HIGH LIMIT RESET REMOVE CAP → 0170436
88	BURNER RESET 0170437	89	ENGINE OIL ONLY 0170438
90	ACCESSORY STORAGE WEIGHT NOT TO EXCEED 700 LBS 0170439	91	SUPPLY BLOWER ACCESS 0170440
92	TEMPERATURE AND RELATIVE HUMIDITY SENSORS 0170441	93	FUEL FILL CAP FUEL GAUGE 0170442
94	SPARE TIRE STORAGE 0170443	95	STARTUP/SHUTDOWN INSTRUCTIONS INSIDE → 0170444
96	RETURN BLOWER ACCESS 0170445	97	Outlet for Performance Monitoring Light and RMS 6000 Only 0170447
98	**DIESEL FUEL SELECTION** Low ambient temperatures cause diesel fuels to gel. Gelled fuel will cause burner ignition failure and/or burner fuel pump damage. ALWAYS USE THE PROPER FUEL FOR THE APPLICATION. LOWEST EXPECTED AMBIENT TEMPERATURE / GENERATOR POWERED / SHORE POWERED 5°F AND BELOW: 50-50 BLEND #2 TO #1 DIESEL (K1/KEROSENE) PLUS ADDITIVES / 100% #1 DIESEL (K1/KEROSENE) PLUS ADDITIVES 5°F TO 25°F: 70-30 BLEND #2 TO #1 DIESEL (K1/KEROSENE) PLUS ADDITIVES / 70-30 BLEND #2 TO #1 DIESEL (K1/KEROSENE) PLUS ADDITIVES ABOVE 25°F: WINTER BLEND DIESEL Require your fuel supplier to guarantee that the fuel supplied will not gel at the lowest temperature which will be experienced at your work site.	99	CAUTION OIL PRESENT IN THE EXTERNAL OIL RESERVOIR WILL NOT GUARANTEE THE NECESSARY CRANKCASE OIL LEVEL. CHECK GENERATOR ENGINE CRANKCASE OIL LEVEL REGULARLY AND REPLENISH DIRECTLY INTO ENGINE AS NEEDED. M101-113

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⚠ CAUTION

RETURN OR SUPPL Y FLEXIBLE DUC T
LENGTH NOT TO EXCEED 150 FEET

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Ground Heaters, Inc.
Spring Lake, Michigan USA

SERIAL NO. /SERE NO.
MC5200

MODEL NO. / MODELE NO.	FIRING RATE US GPH /TAUX CHAUFFE EU GPH	NOZZLE TYPE / TYPE CICLEUR	CAPACITY BTUH / CAPICITY BTUH	BURNER MODEL / BRULEUER MODELE	ELECTRICAL RATING / LA TAUX ELECTRIQUE
Dryvex MC5200	2 .71	2.0/60 B 3	80,000	Riello40 F10	115/230V/1 Ph

MINIMUM CLEARANCE TO COMBUSTIBLE MATERIALS (INCHES)
ESPACES LIBRES MINIMUM AUX MATERIAUX COMBUSTIBLE (POUCES) 12

FUEL NOT HEAVIER THAN NO. 2 FUEL OIL
COMBUSTIBLE PAS PLUS LOURDQUE DE L'HUILE A FOURNAISE NO 2

FOR OUTDOOR USE ONLY
POUR L'USAGE EXTÉRIEUR SEULEMENT

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MC5200 Operating Guide

NOTE: For shore power connecting, a NEMA L14-30 240 connector is required with 10/3 cable. The power source must be 115/230V 30 amps 10 no longer than 100 ft.

START UP

Pre Start
MC5200:
Ensure that there is sufficient fuel volume in the fuel tank (fuel gauge).
Ensure that all control switches are OFF (main control panel).
Generator:
Check the engine oil level; add oil if necessary.
Ensure that the reservoir for the Oilmate system is full.
Ensure that the 25 amp breaker and Idle Control switches are OFF.

Start Generator (Generator Control Panel)
Rotate the ignition key clockwise to the HEAT position.
After the HEAT lamp goes out, rotate the key to the START position.
Ensure that the Low Oil Level lamp is out and does not illuminate.
Turn the 25 amp breaker switch ON.

Connect Supply and Return Ducts
Connect the supply duct (black) to the MC5200 supply duct collar with the airflow tag pointing toward the structure. Lock into place.
Connect the supply duct outlet to the structure.
Connect the return duct (yellow) inlet to the structure with the airflow tag pointing toward the MC5200.
Connect the return flex duct outlet to the MC5200 return duct collar. Lock into place.

Start MC5200 (Main Control Panel)
Turn the Operation Mode switch to HEAT; the burner and supply air blower will start.

Set Temperature
The temperature control will maintain the return air temperature.
The green numbers represent the desired return air temperature (set point).
The red numbers indicate the current return air temperature.
Use the UP and DOWN arrow keys on the temperature control to adjust the return air temperature (125 F [51.7 C] is typical).

Start Return Air Blower
Operate the MC5200 in HEAT mode for at least ten minutes and then turn the Return Air Blower switch ON.

Monitor Operating Parameters
The Return Air RH, Supply, Return Air Temperature displays, and the strobe light should be monitored to ensure that the MC5200 is operating properly. After several days of operation, the temperature set point may be lowered to conserve fuel. Long term drying effect should be determined using Data Loggers.

SHUT DOWN

NOTE: DO NOT SHUT DOWN THE GENERATOR UNTIL THE MC5200 HAS COOLED.

Cooling the MC5200
Turn the Operation Mode switch to the OFF position. The Burner will shut down.
Operate the supply and return blowers until the structure has cooled.

Shutting Down the MC5200
NOTE: DO NOT SHUT DOWN THE MC5200 UNTIL THE SUPPLY AIR TEMPERATURE DISPLAY READS 100 F [37.8 C] OR LOWER.
Turn the Return Air Blower switch OFF.
Turn the Operations Mode switch OFF.

Disconnect Supply and Return Ducts
Release the duct collar clamps and remove the ducts from the MC5200.
Separate duct segments (if applicable).
Disconnect the ducts from the structure.
Neatly stow the ducts in the forward storage bay of the MC5200.

Shut Down Generator
Turn the 25 amp Breaker switch OFF.
Rotate the ignition key counter-clockwise to the OFF position.

Prepare the MC5200 for Transporting
Ensure that all ducts and AM3000 units are stowed in the forward storage bay.
Shut and lock all doors.

Questions Regarding Performance or Operation
Should the MC5200 malfunction in any manner, shut it down immediately and call your distributor to report the malfunction and to receive instructions.

M101-101

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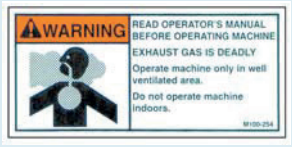

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CAUTION

8 Amp Max Accessory Load
During Machine Operation
M101-111

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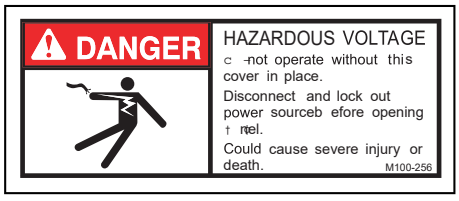

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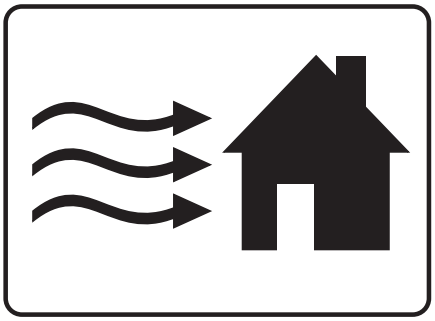

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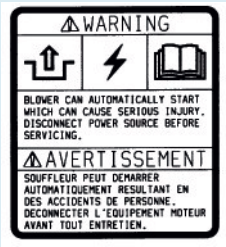

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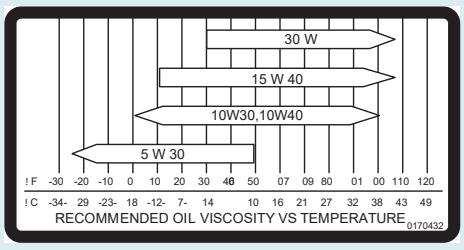

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CAUTION

DO NOT OPERATE THE GENERATOR IF THE LOW RESERVOIR OIL LEVEL LIGHT IS ON.
IF THE LIGHT IS ON, ADD OIL TO THE RESERVOIR.

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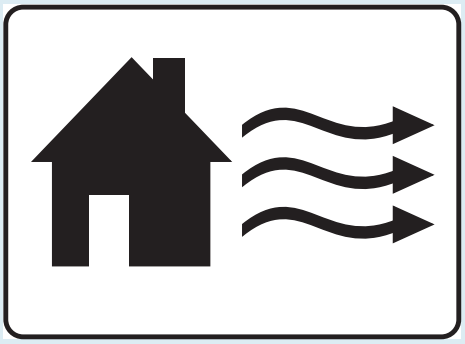

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LOW RESERVOIR OIL LEVEL LIGHT

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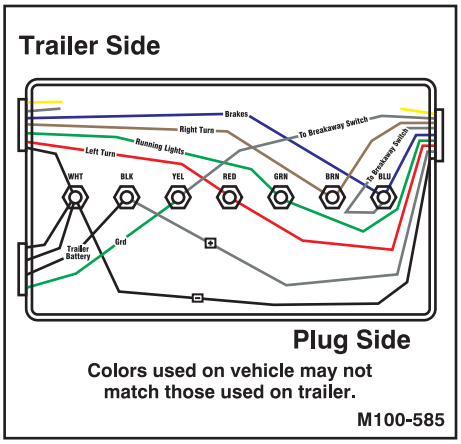

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OPERATING PROCEDURE

MULTIQUIP WhisperWatt
AC Generator

1C HECK the Oil level.
2C HECK the Water level.
3C HECK the Fuel level.
4T URN the Idle Control switch ON.
5T URN the AC CIRCUIT BREAKER OFF
5I NSERT the key into the Starter Switch.
6 TURN the key to RUN, the Battery and Oil pressure Warning lamps should illuminate.
7 TURN and HOLD the key at the HEAT position, the preheat lamp will illuminate. TURN the key to START after the HEAT lamp goes out.
NOTE: AVOID HIGH SPEEDS IMMEDIATELY AFTER STARTING
8 When the engine starts, the Oil pressure and Battery Warning lamp should go out.
9 Let the engine idle for at least 5 Minutes with the Idle Control switch in the ON position.
10 CHECK the engine for abnormal vibrations noise and oil leakage.
11 TURN the AC CIRCUIT BREAKER ON
12 TURN the Idle Control switch ON or OFF for full engine operation.
13 Prior to shut-down, TURN the AC CIRCUIT BREAKER OFF and let the engine idle for 5 minutes (Idle Control switch should be TURNED ON).
NEVER STOP THE ENGINE SUDDENLY EXCEPT IN AN EMERGENCY.
14 Stop the engine by turning the key in the Starter Switch to "STOP" and remove the key.

OPERATION

SYSTEM DESCRIPTION

The Dryvex™ MC 5200 is an open drying system that uses advanced technology to dry flooded structures. Dryvection™ technology uses outside air, rather than recirculated air, to dry flooded structures and their contents. The Dryvex™ MC 5200 system consists of:

- Trailer-mounted burner/blower assembly with 7 kW genset
- Four 25-foot sections of 20-inch yellow flex ducting
- Four 25-foot sections of 20-inch black flex ducting
- Six AM 3000 air movers

The Dryvex MC 5200 system draws in outside air, which is heatconditioned to 3%-15% relative humidity. This fresh, extremely dry air is then blown into the building through flex ductwork. As the dry air circulates throughout the building, it absorbs large quantities of moisture. A second blower accelerates the drying process by extracting moisture-laden air from the building.

The Dryvex™ MC 5200 system is designed to dry flooded structures. Do not use the Dryvex™ MC 5200 system for any other purpose.

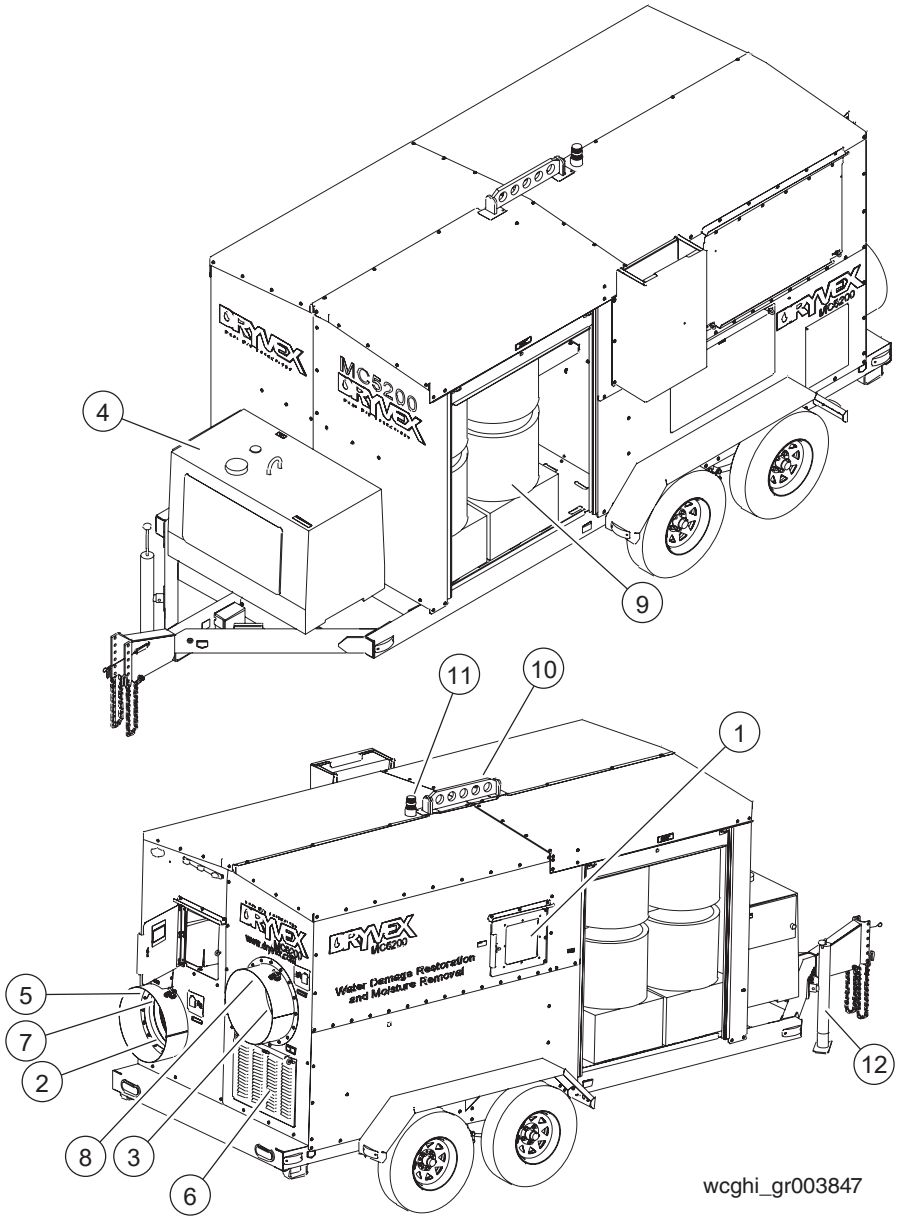
PREPARING THE STRUCTURE

Before operating the Dryvex MC 5200 system, remove all pressurized containers and materials that may be affected by high temperatures from the structure such as:

- Aerosol cans
- Carbonated beverage containers
- Wine bottles
- Perfume bottles
- Cleaning supplies
- Appliances with door seals
- Plastic blinds
- Candles
- Plants
- Pets
- Aquariums
- Plastic ceiling fans
- Plastic furniture

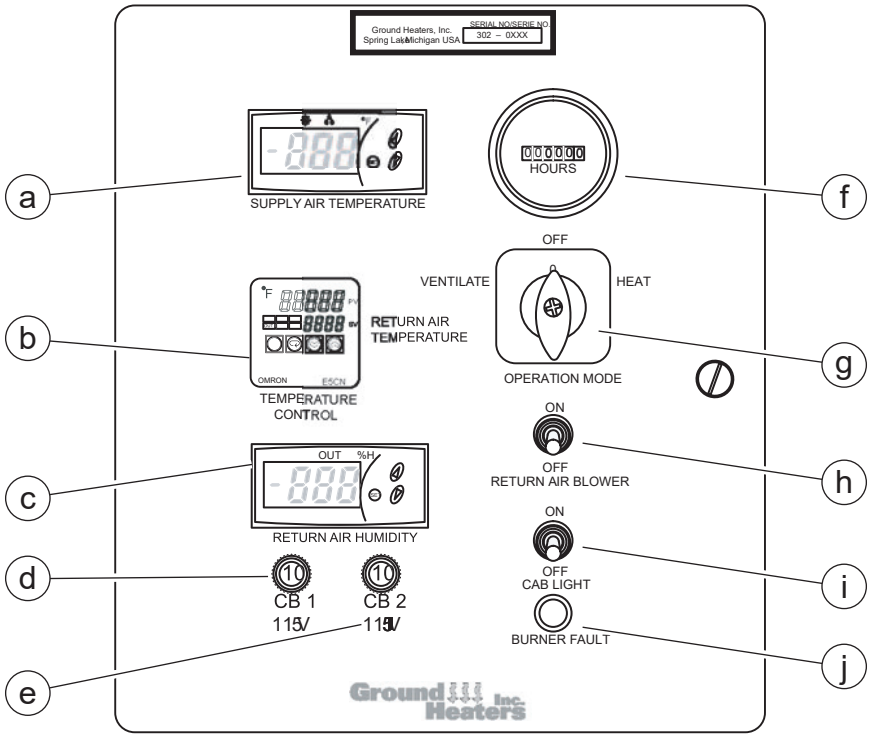
Note: Some wood trim may warp and latex caulk may shrink. These items may need to be replaced after drying.

SYSTEM COMPONENT LOCATIONS



Ref.	Description	Ref.	Description
1	Control panel	7	Return air temperature sensor
2	Return blower	8	Supply air temperature sensor
3	Supply blower	9	Duct and air mover storage
4	Generator	10	Crane lifting point
5	Humidity sensor	11	Strobe light
6	Diesel burner	12	Trailer jack

CONTROL PANEL



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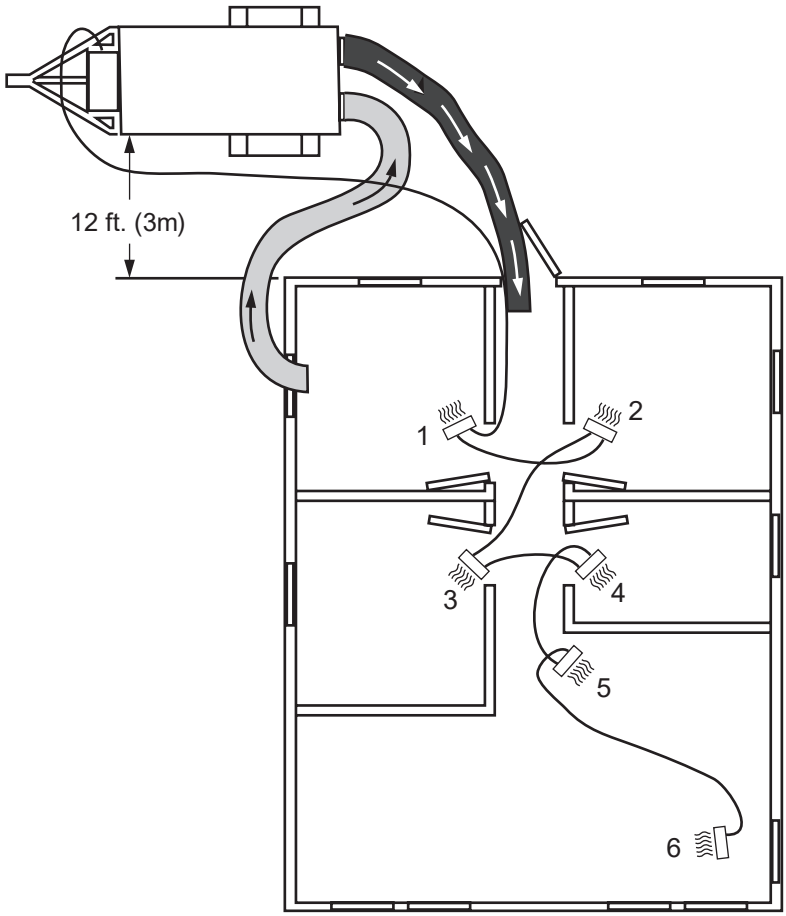
Ref.	Instrument/switch	Function.
a	Supply air temperature digital display	Displays temperature of supply air.
b	Main temperature controller	Sets desired temperature of supply air.
c	Relative humidity digital display	Displays relative humidity of return air.
d	Circuit breaker 1 (10A)	Controls power to the control circuit.
e	Circuit breaker 2 (10A)	Controls power to the burner circuit.
f	Hour meter	Meters usage of MC 5200.
g	Operation mode switch	3-position switch which switches power to one of three modes: • VENTILATE—power to blower only. • OFF—power to burner is off; power remains to blower until thermostat reads 104°F (40°C) or lower. • HEAT—power to burner and blower.
h	Return air blower ON-OFF switch	Switches power to return air blower.
i	Cab light ON-OFF switch	Switches power to cab light.
j	Burner fault indicator light	Signifies burner fault when lit.

POSITIONING THE MACHINE

WARNING The Dryvex MC 5200 trailer may be air lifted to the top of a structure for drying purposes. Use the lifting point to do so. Normal positioning and setup is as follows: Fire hazard! Do not position the Dryvex MC 5200 closer than 12 feet (4 m) to structure's walls.

1. Position the curb side of the Dryvex MC 5200 trailer close to the building to be treated, and near a doorway or window, but not closer than 12 feet (4 m).
2. Chock the wheels to prevent accidental rolling.
3. Level the trailer using the trailer jack.
4. Position the air movers within the building to be treated as indicated below (1 through 6).

Note: For air mover operation instructions, see section Positioning and Operating the Air Movers.



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PRELIMINARY CHECKS

Before starting the Dryvex MC 5200, check the following:

- Fuel supply
- Genset engine oil supply
-

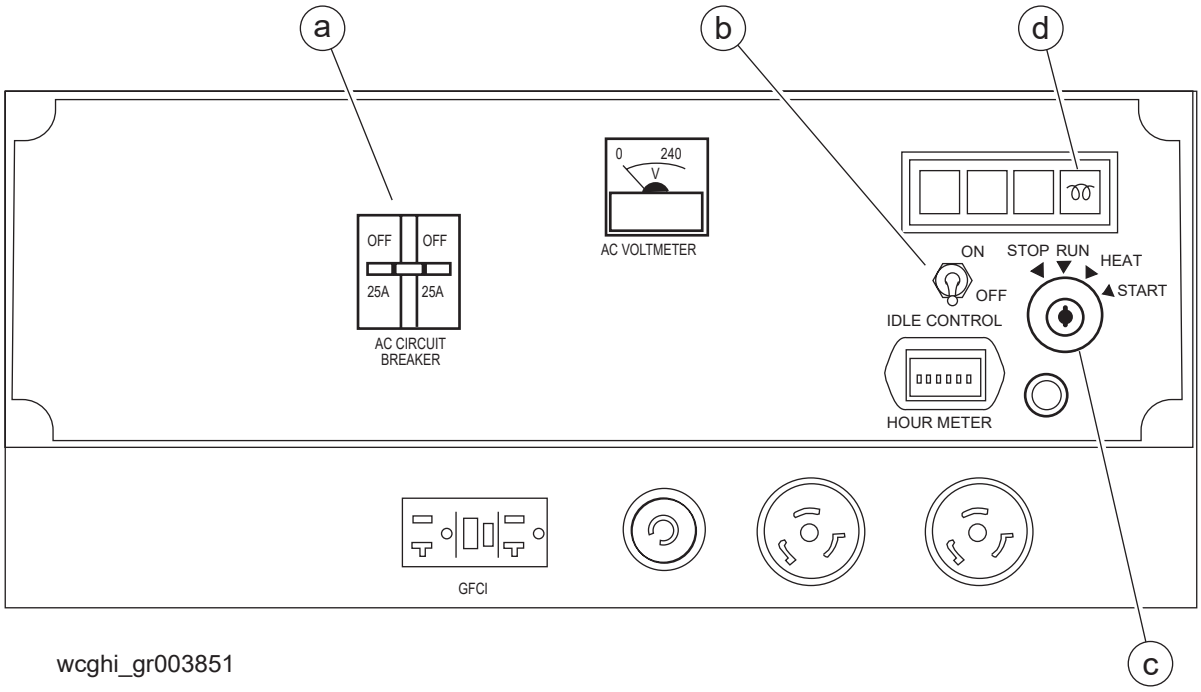
STARTING THE GENERATOR

To start the generator:

1. Place the 25A (a) circuit breakers in the OFF position.
2. Place the idle control switch (b) in the OFF position.
3. Turn the key switch (c) to the HEAT position and hold it there until the glow plug indicator lamp (d) goes out. Once the glow plug indicator lamp goes out, turn the key switch to the START position. Release the key when the engine starts.

NOTICE: Do not crank the engine for more than 20 seconds at a time. Damage to the starter may occur. Allow the starter to cool for approximately 30 seconds between cranking attempts.

4. Allow the engine to run for at least 30 seconds, then place the 25A circuit breaker in the ON position.
5. Place the idle control switch in the ON position.



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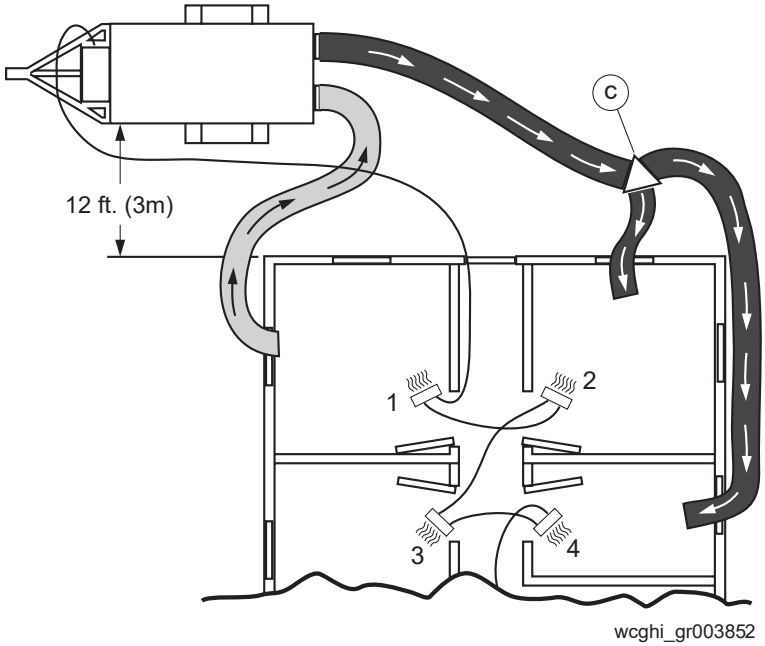
CONNECTING THE DUCTWORK

1. Connect the black supply duct (a) (with the airflow tag pointing toward the structure) to the MC 5200 supply duct collar (b). Clamp it into place.
2. Connect the black supply duct outlet to the structure. Seal the space between the duct and the window, doorway, or other hole in which the supply duct enters the structure.

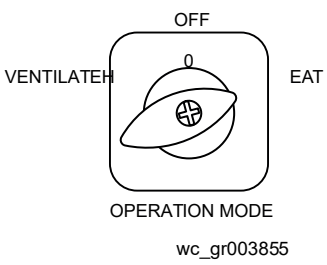
Note: Two- and three-way splitters are available. If using a splitter (c), connect the black supply duct outlet to the splitter. Connect 12-inch supply duct to the three-way splitter, and 20-inch supply duct to the two-way splitter. Then connect this additional duct to the structure.

3. Connect the yellow return duct inlet to the structure with the airflow tag pointing toward the Dryvex MC 5200. Seal the space between the duct and the window, doorway, or other hole in which the supply duct exits the structure.
4. Connect the yellow return flex duct outlet to the Dryvex MC 5200 return duct collar. Clamp it into place.



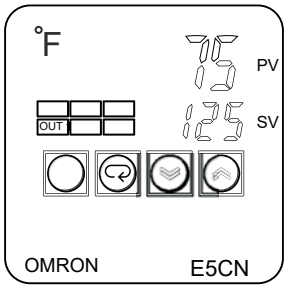
STARTING THE MACHINE

1. Start the generator. See section Starting the Generator.
2. Connect the ductwork. See section Connecting the Ductwork.
3. Turn the operation mode switch to HEAT. The burner and supply air blower will start.



4. Using the up and down arrows on the temperature controller, set the temperature (SV) of the return air to 125°F. This is the lower reading on the temperature controller. The upper reading (PV) displays the actual temperature of the return air.

   Note: After several days of operation, the temperature set point may be turned down to conserve fuel.



TEMPERATURE CONTROL

5. Run the machine in HEAT mode until the return air supply temperature is 55–75°F (approximately 10 minutes). Then, place the return air blower switch to the ON position.

RETURN AIR BLOWER

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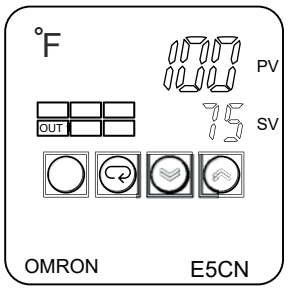
STOPPING THE MACHINE

NOTICE: Do not shut down the generator until the machine has cooled.

1. Using the up and down arrows on the temperature controller, set the temperature (SV) of the return air to 75°F. This is the lower reading on the temperature controller. The upper reading (PV) displays the actual temperature of the return air.

   NOTICE: Do not shut down the machine until the PV displays 100°F or lower.



TEMPERATURE CONTROL

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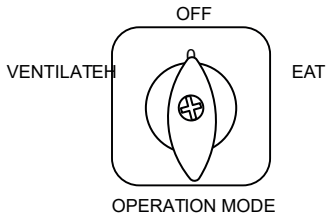
2. To cool the machine:

   Turn the operation mode switch to the OFF position. The burner will shut down but the supply air blower will run until the internal thermostat senses approximately 104°F (40°C).

   WARNING Electric shock and cutting injury hazard! At temperatures above 104°F (40°C), electric power is available at the supply blower even with the operation mode switch in the OFF position.



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3. When the structure has cooled (temperature controller reads 100°F or lower, and the supply air blower has shut itself off), place the return air blower switch in the OFF position.

RETURN AIR BLOWER

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4. Release the duct collar clamps and disconnect the supply and return ductwork from the machine and from the structure. Store the ducts neatly in the storage bay of the machine.
5. Place the generator's 25A circuit breaker in the OFF position.
6. Turn the generator's key switch to the OFF position.

POSITIONING AND OPERATING THE AIR MOVERS

Six air movers (model AM 3000) **(a)** are used with the Dryvex MC 5200 system. The air movers are available with optional casters **(b)** or wheeled cart **(c)**.

Each air mover includes: GFIC outlet **(d)**, ON-OFF switch **(e),** and 12A circuit breaker **(f).**

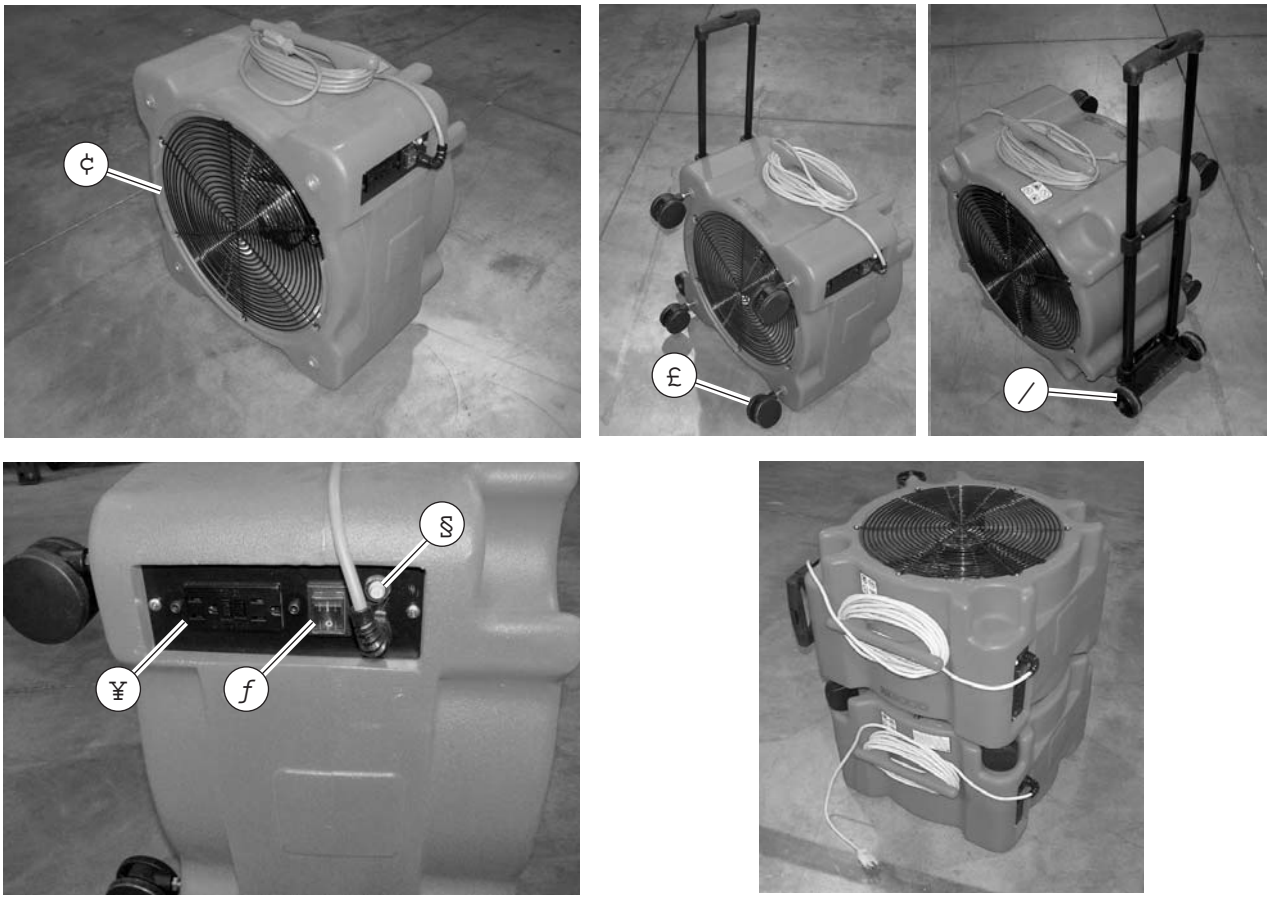
Position the air movers so that air will be circulated throughout the structure. Larger spaces will require two or more air movers. Position the air movers in the corners of the space, pointing in directions that will circulate the air in a common direction (e.g., both clockwise).

Note: ***The direction of air flow is over the motor.***

Plug one of the air movers into the generator. Plug a second air mover into the first. Plug a third air mover into the second, and so on. Up to six air movers may be daisy-chained together.

Turn each air mover on and off with the ON-OFF switch.

The air movers may be stacked when storing.



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MONITORING THE OPERATING PARAMETERS

The following parameters should be monitored every 8–24 hours:

- Fuel level

  Keep track of fuel consumption to plan a needed filling schedule.

- Generator

  Keep generator full of oil.

- Return air temperature

  Check temperature controller set point (SV). After several days of operation, the supply air temperature may be turned down to conserve fuel.

  Note: Data loggers should be used to validate the drying process.

- Strobe light (RMS 6000)

  The strobe (performance monitoring light) flashes when all systems are functioning properly. The strobe light will go out when there is a power failure or a burner fault.

RMS 6000

See Graphic: wcghi_gr003874

RMS 6000 (a) is an optional satellite-based transponder that is configured to send a general fault code to ground-based monitoring facilities should there be a burner fault or unexpected shut-down. The RMS 6000 uses GPS technology and can pinpoint its location any time it is switched on. The built-in battery will continue sending location and fault codes for up to four hours after power to the smart plug is lost. The RMS 6000 is portable but does require installing a roof-mounted antenna prior to use. The accessories outlet (b) inside the storage bay provides power to the RMS 6000.

Note: Before the RMS 6000 can be used, the RMS service must be activated through Micrologic Inc. See the instructions below to activate this service.

wcghi_gr003874

MAINTENANCE

PERIODIC MAINTENANCE SCHEDULE

	Every 50 hours or two weeks	Every 100 hours or monthly	Every 200 hours	Every 600 hours or 6 months	Every 1000 hours	Every 1200 hours or yearly
Clean genset engine air filter	▪					
Lubricate return air blower bearings		▪				
Clean genset engine fuel strainer			▪			
Check/adjust return air blower belt				▪		
Check/adjust supply blower belt				▪		
Clean storage cabinet interior				▪		
Change genset engine oil					▪	
Change genset engine oil filter					▪	
Change genset engine air filter					▪	▪
Replace burner nozzle						▪
Check/adjust burner electrodes						▪
Check /adjust burner fuel pressure						▪
Check/adjust burner air setting						▪
Replace oil heater filter						▪
Replace humidity sensor						▪
Check torque of trailer tire lug nuts						▪

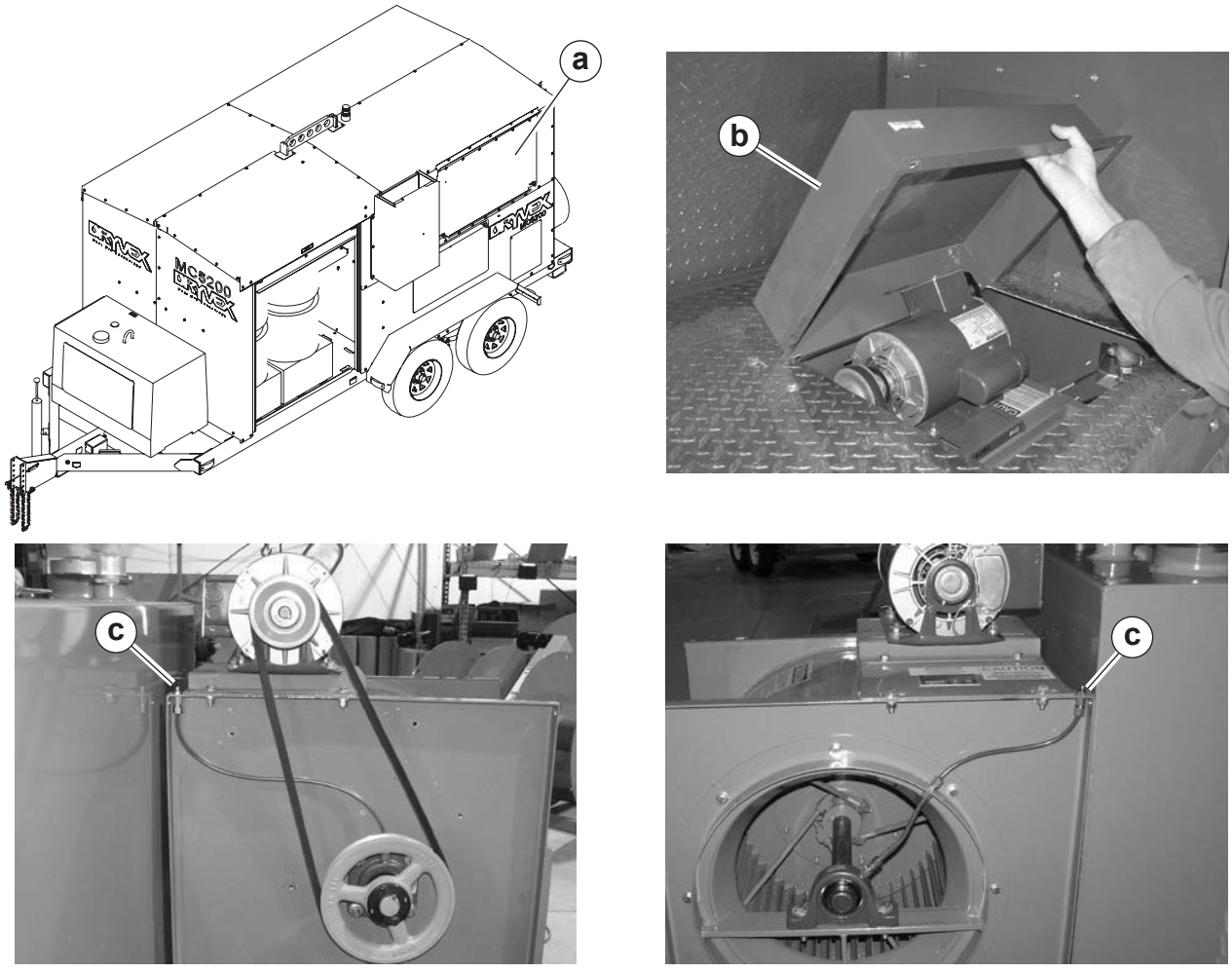
LUBRICATING THE RETURN BLOWER BEARINGS

See Graphic: wcghi_gr003863

The return air blower is located on the left as you face the rear of the machine. To lubricate the return air blower bearings, carry out the following procedure.

Removal:

1. Open the access door (a).
2. Remove the screws that secure the access panel (b) and remove the access panel.
3. There are two grease fittings (c), one for each bearing. Use Shell Alvania RL 2 grease.
4. Secure the access panel (b) to the machine.



wcghi_gr003863

CHANGING AND ADJUSTING THE RETURN BLOWER BELT

See Graphic: wcghi_gr003861

The return air blower is located on the left as you face the rear of the machine. Replace glazed, worn, or cracked belts. To change and adjust the return air blower belt, carry out the following procedure.

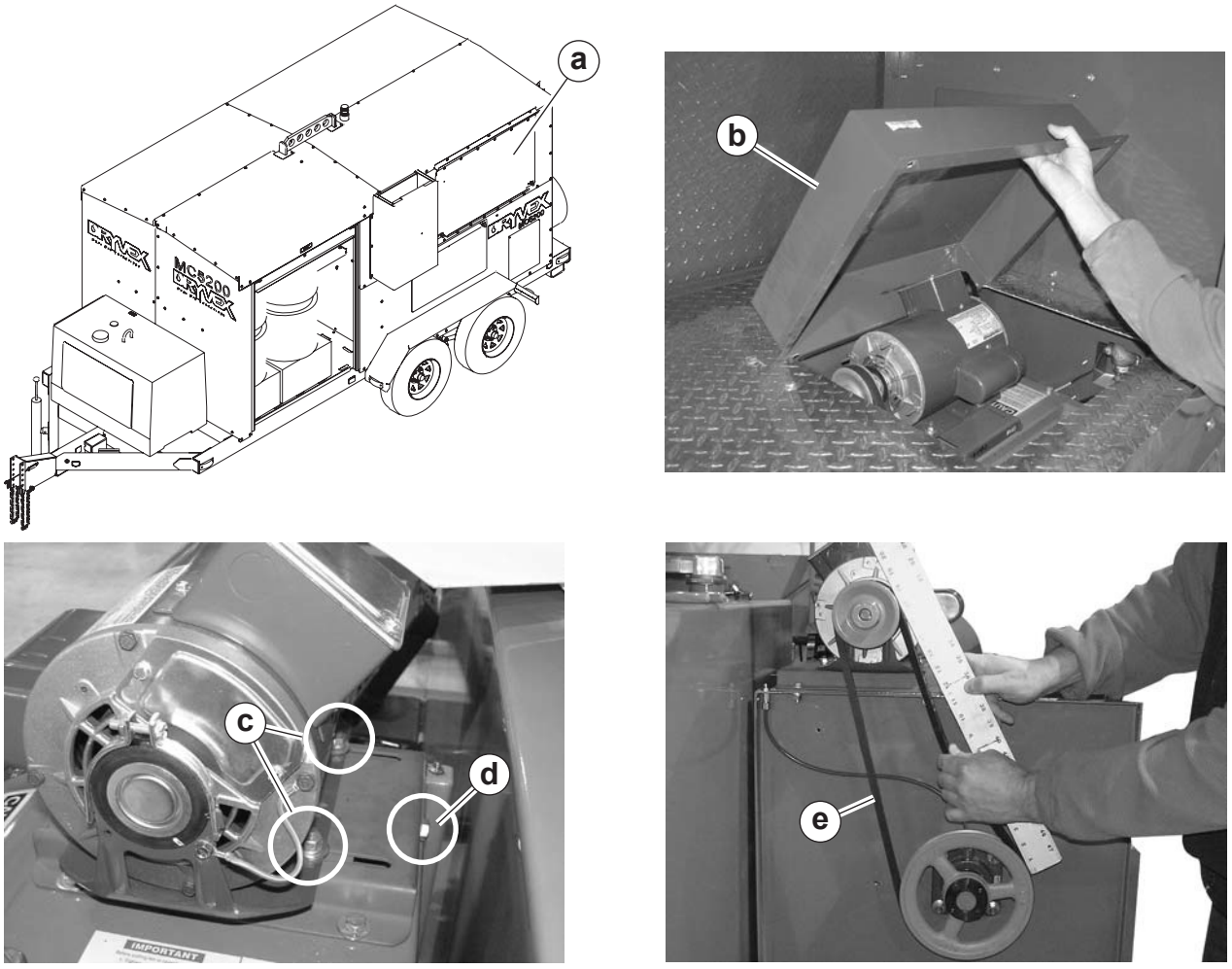
Removal:

WARNING Cutting injury hazard! Shut down the generator before servicing the return air blower.

1. Open the access door (a).
2. Remove the screws that secure the access panel (b) and remove the access panel.
3. Loosen the four screws (c) that secure the motor plate to the mounting flange.
4. Turn the tensioning screw (d) to release tension on the belt.
5. Roll the belt off of the pulleys.

Installation:

6. Roll a new belt onto the pulleys.
7. Turn the tensioning screw (d) to apply tension to the belt. A properly adjusted belt will have approximately 3/4 inches (19 mm) of deflection at the center of the belt when pressed with moderate pressure.
8. Tighten the four screws (c) that secure the motor plate to the mounting flange.
9. Secure the access panel (b) to the machine.



wcghi_gr003861

CHANGING AND ADJUSTING THE SUPPLY BLOWER BELT

See Graphic: wcghi_gr003862

The supply blower is located on the right as you face the rear of the machine. To change and adjust the supply blower belt, carry out the following procedure. Replace glazed, worn, or cracked belts.

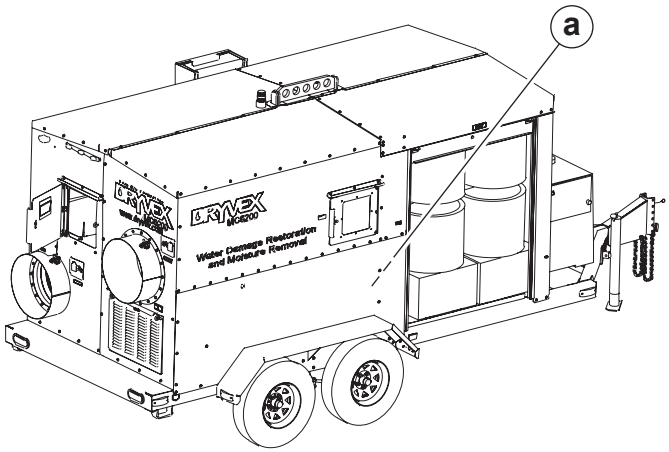
Removal:

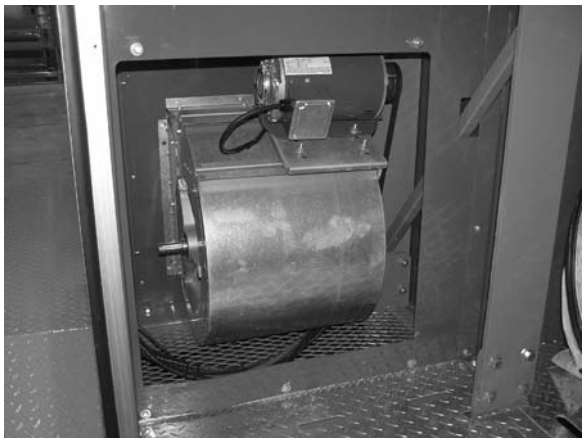
WARNING Electric shock and cutting injury hazard! Shut down the generator before servicing the supply blower.

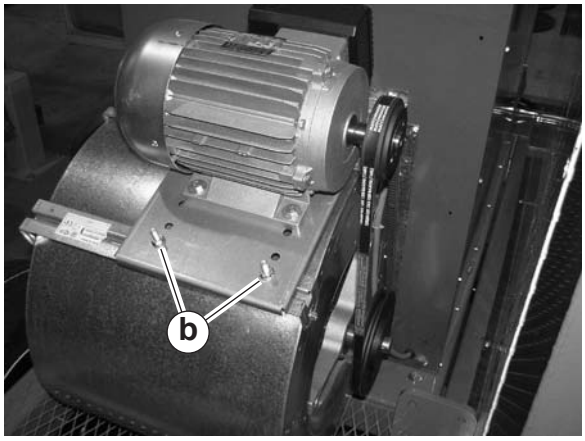
1. Open the access door (a).
2. Remove the screws that secure the access panel and remove the access panel.
3. Loosen the nuts on the four screws (b) that secure the motor plate to the mounting flange.
4. Rotate the motor plate to release tension on the belt.
5. Roll the belt off of the pulleys.

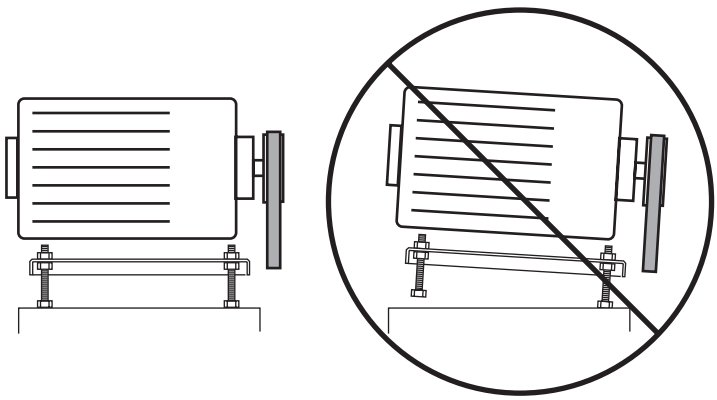
Installation:

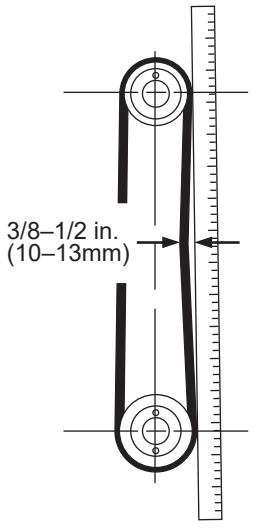
6. Roll a new belt onto the pulleys.
7. Rotate the motor plate to apply tension to the belt. A properly adjusted belt will have approximately 3/8–1/2 inches (10–13 mm) of deflection at the center of the belt when pressed with moderate pressure.
8. Tighten the nuts on the four screws (b) that secure the motor plate to the mounting flange. When tightening the nuts be sure to keep the motor plate parallel with the blower housing.
9. Secure the access panel to the machine.











wcghi_gr003862

REMOVING THE BURNER

See Graphic: wcghi_gr003864

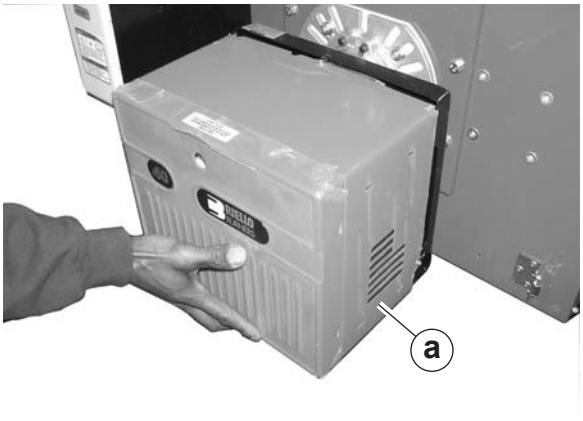
To remove the burner, carry out the following procedure.

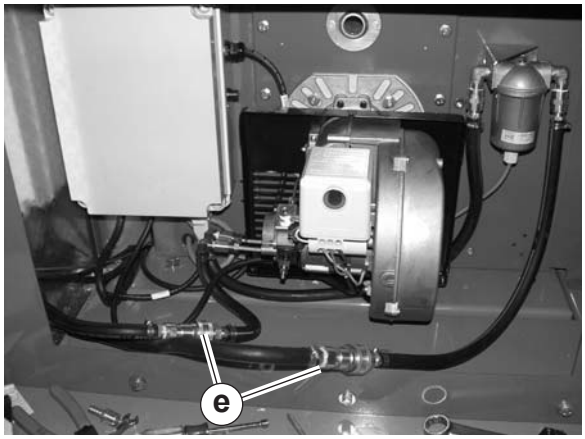
Removal:

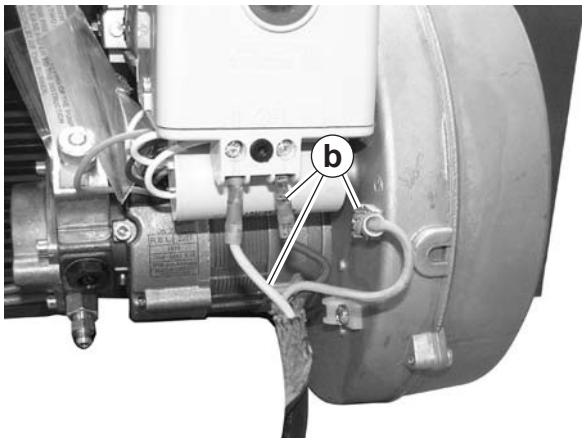
1. Shut down the generator.
2. Remove the cover (a) from the burner unit.
3. Disconnect the burner fuel supply and return quick disconnects (e).
4. Disconnect the fuel inlet and outlet hoses from the fuel pump.
5. Disconnect the wiring (b).
6. Remove the two nuts (c) that secure the burner unit to the machine.
7. Remove the burner unit (d).

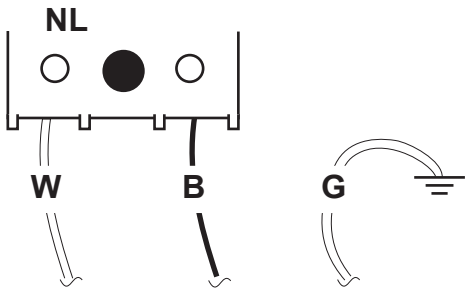
Installation:

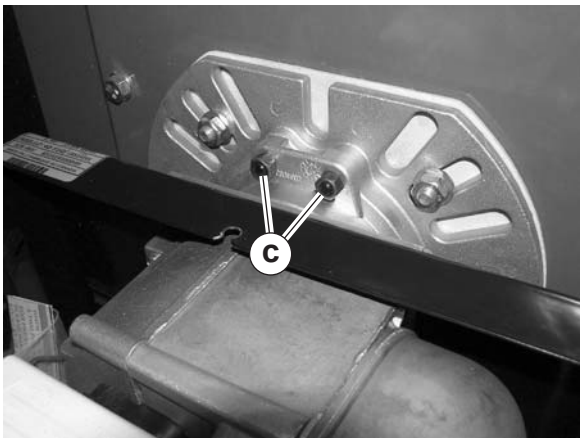
8. Position the burner unit (d) into the machine.
9. Install the two nuts (c) that secure the burner unit to the machine.
10. Connect the wiring (b).
11. Connect the fuel inlet and outlet hoses to the fuel pump.
12. Reconnect the burner fuel supply and return quick disconnects (e).
13. Install the cover (a) to the burner unit.

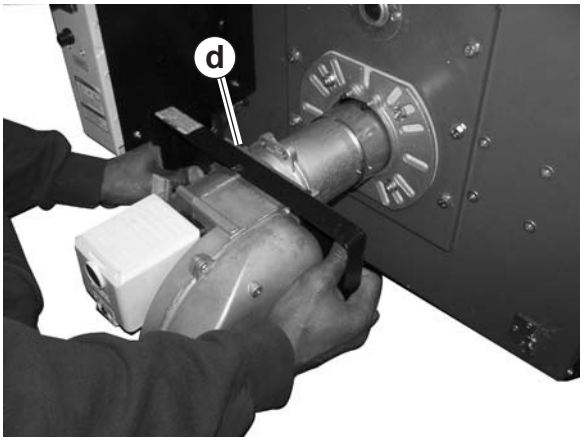












wcghi_gr003864

REPLACING THE BURNER NOZZLE

Se Graphic: wcghi_gr003865

To replace the burner nozzle, carry out the following procedure.

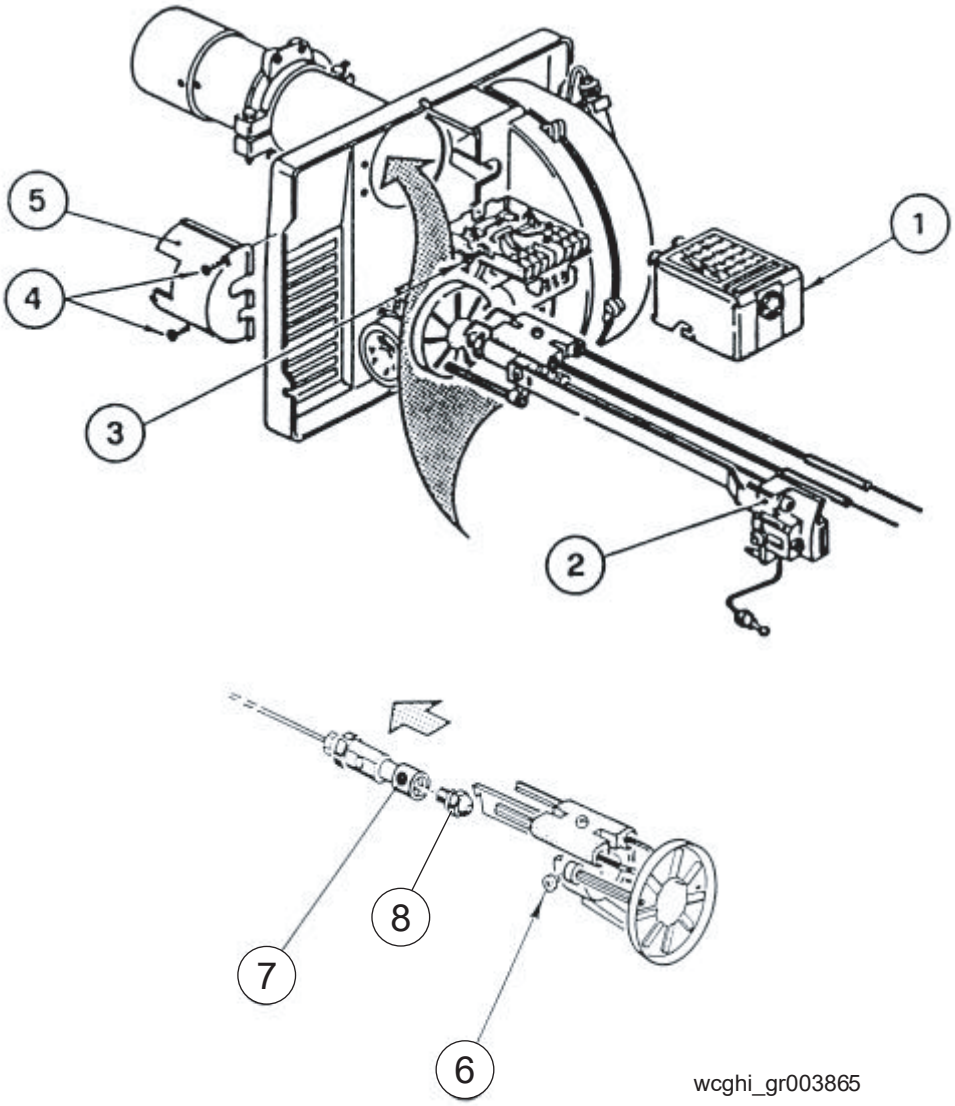
1. Shut down the generator.

Removal:

2. Remove the burner. See section Removing the Burner.
3. Loosen screw (3).
4. Carefully pull the control box (1) back, then up and away from the burner assembly.
5. Remove the two screws (4) that secure the air tube cover plate (5) and remove the air tube cover plate.
6. Loosen screw (2), then slide the complete drawer assembly out of the combustion head.
7. Loosen screw (6), then remove the nozzle adapter (7) from the drawer assembly.
8. Remove the nozzle (8) from the nozzle adapter.

Installation:

9. Install the nozzle (8) into the nozzle adapter (7).
10. Install the nozzle adapter into the drawer and secure it with screw (6).
11. Install the drawer assembly into the combustion head and secure it with screw (2).
12. Install the air tube cover plate (5) with two screws (4).
13. Install the control box (1).
14. Tighten screw (3).



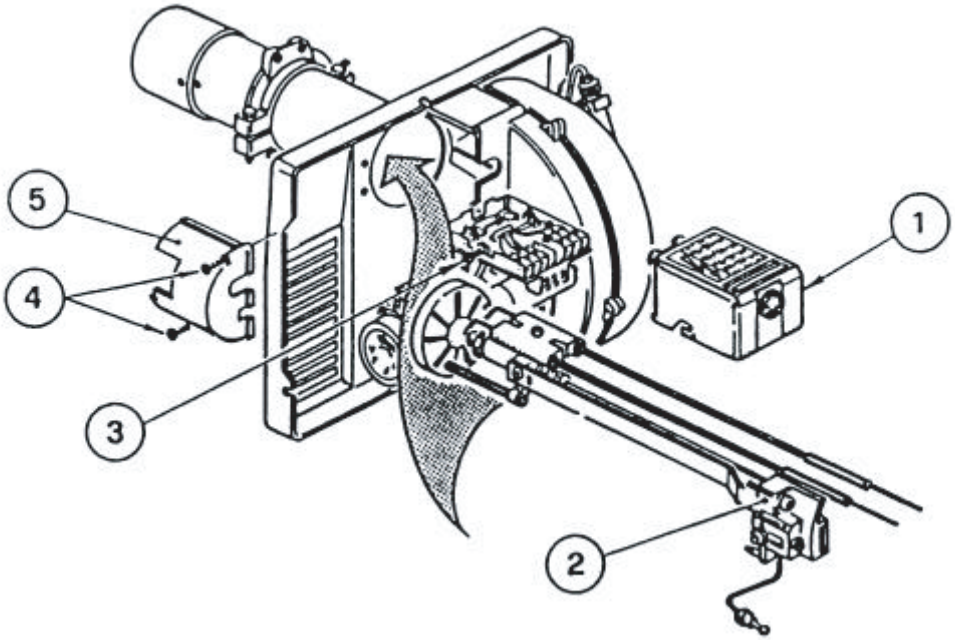
CHEKING AND ADJUSTING THE BURNER ELECTRODES

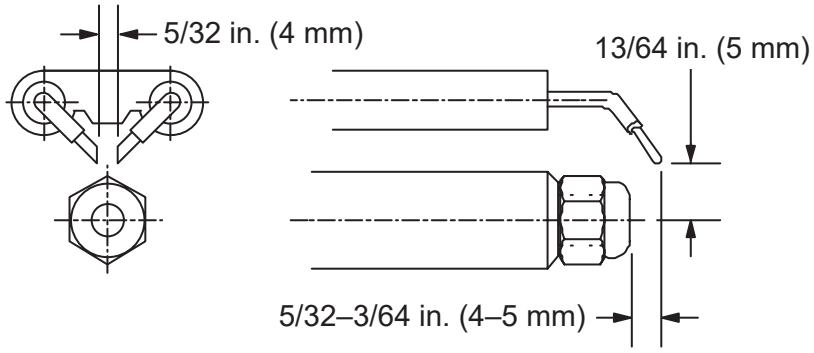
See Graphic: wcghi_gr003866

To check and adjust the burner electrodes, carry out the following procedure.

1. Shut down the generator.
2. Remove the burner. See section Removing the Burner.
3. Loosen screw (3).
4. Carefully pull the control box (1) back, then up and away from the burner assembly.
5. Remove the two screws (4) that secure the air tube cover plate (5) and remove the air tube cover plate.
6. Loosen screw (2), then slide the complete drawer assembly out of the combustion head.
7. Loosen the electrodes and adjust them as shown.
8. Install the drawer assembly into the combustion head and secure it with screw (2).

9. Install the air tube cover plate (5) with two screws (4).
10. Install the control box (1).
11. Tighten screw (3).
12. Reinstall the burner.





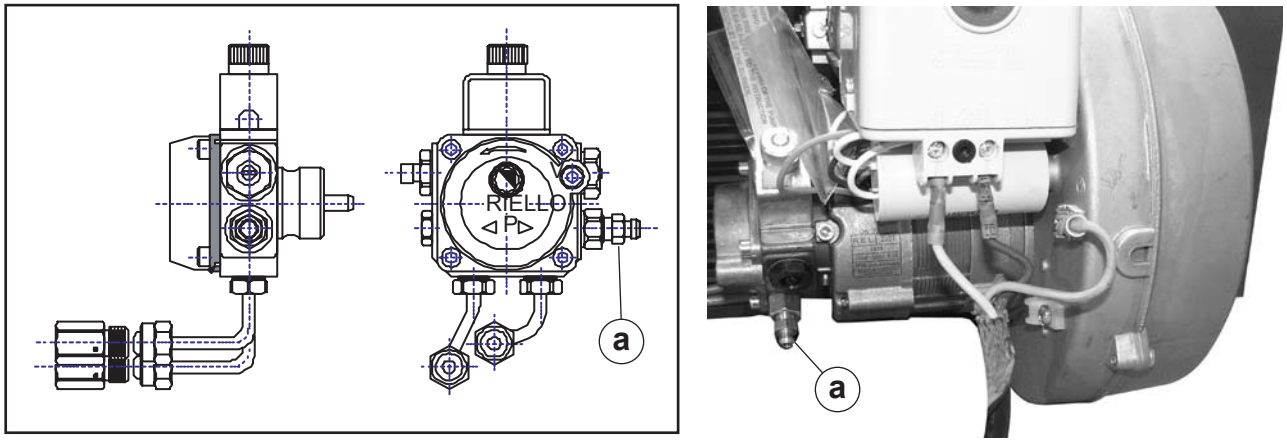
wcghi_gr003866

CHECKING THE FUEL PRESSURE

See Graphic: wcghi_gr003867

To check fuel pressure, carry out the following procedure.

1. Shut down the generator.
2. Remove the bleeder valve (a) from the fuel pump.
3. All pump ports are British Parallel thread design. A gauge with like threads must be used, or an appropriate adapter. Insert the gauge or adapter in place of the bleeder valve.
4. Start the generator.
5. Turn the operation mode switch to HEAT. The burner and supply air blower will start.
6. Check the pump pressure. The fuel pump's range is 145–200 psi (10–13.8 bar). The nominal setting is 184 psig (12.7 bar) at sea level.



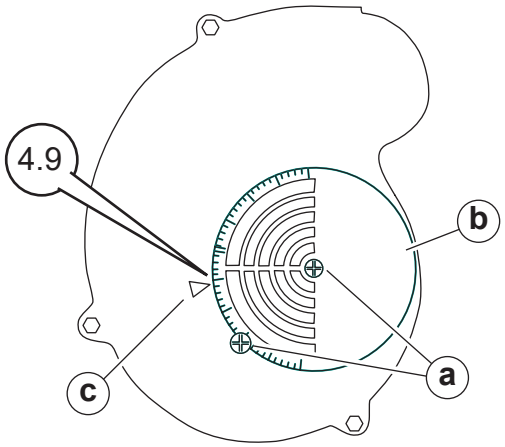
wcghi_gr003867

CHECKING THE BURNER AIR SETTING

See Graphic: wcghi_gr003868

To check burner air setting, carry out the following procedure.

1. Shut down the generator.
2. Loosen the two screws (a) that secure the air adjustment plate (b).
3. Rotate the air adjustment plate so that the proper number on the air adjustment plate lines up with the setting indicator (c). See the burner set-up chart.
4. Once the air adjustment plate is set, tighten the two screws (a).



wcghi_gr003868

REPLACING THE HUMIDITY SENSOR

See Graphic: wcghi_gr003869

The humidity sensor (a) is located in the return air supply duct. To replace the humidity sensor, carry out the following procedure.

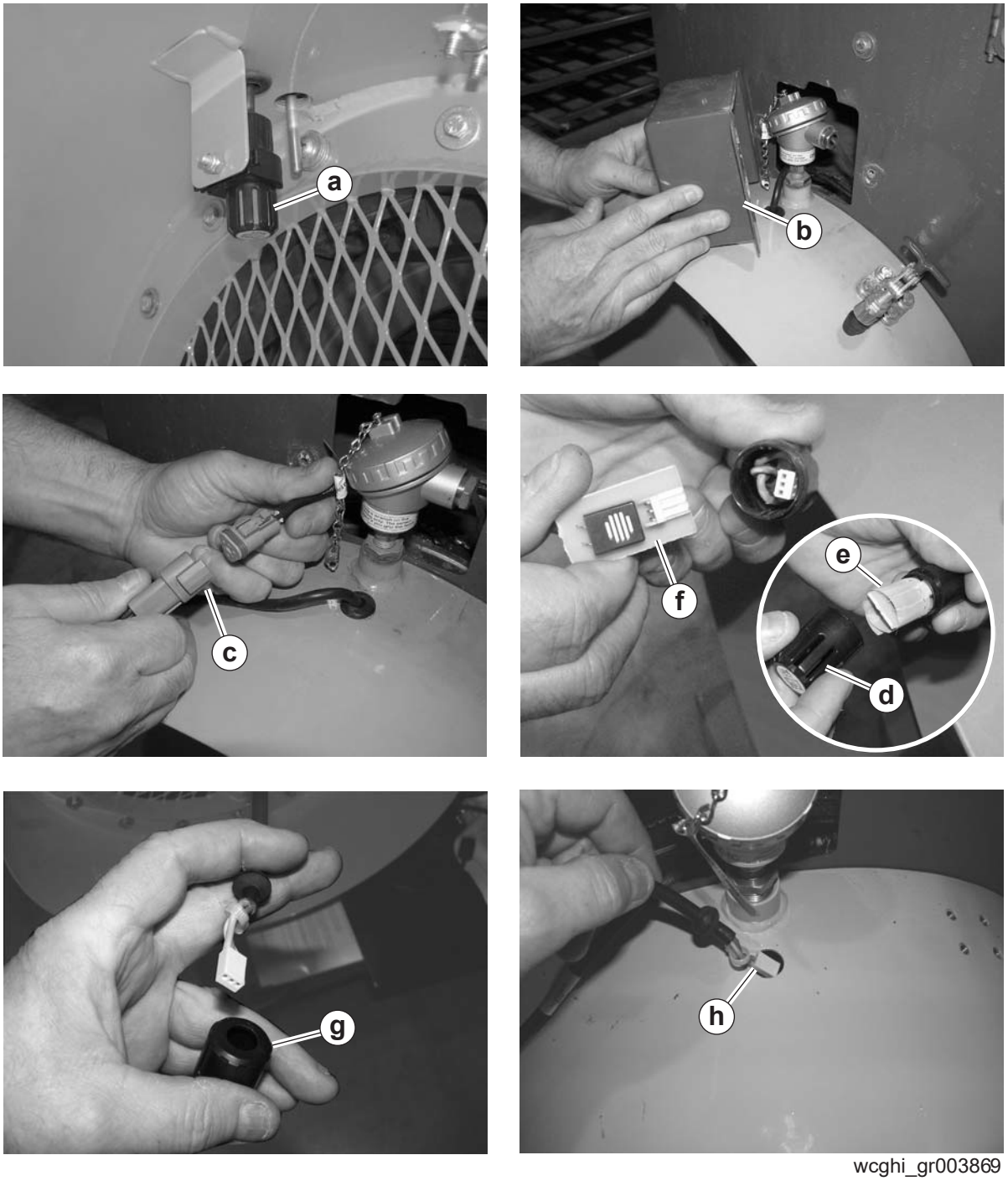
Removal:

1. Shut down the generator.
2. Remove the screws that secure the protective cover (b) and remove the protective cover.
3. Pull the wiring from inside the machine until the connector is revealed.
4. Disconnect the wiring at the connector (c).
5. For improved access, pull the humidity sensor from its holder and away from the machine.
6. Remove the cover (d) from the body of the humidity sensor.
7. Remove the screen (e).
8. Disconnect the sensor (f) from the wiring.
9. Separate the sensor body (g) from the wiring.

10. Pull the wiring (h) through the duct and out from the machine.

Installation:

11. Remove the cover (d) from the body of the humidity sensor.
12. Remove the screen (e).
13. Disconnect the sensor (f) from the wiring.
14. Separate the sensor body (g) from the wiring.
15. Thread the wiring (sensor side) (h) down through the return air supply duct.
16. Reattach the sensor body to the wiring.
17. Reconnect the wiring to the sensor.
18. Reinstall the screen (e) and the cover (d).
19. Install the humidity sensor (a) into the holder.
20. Connect the wiring at the connector (c).
21. Reinstall the protective cover (b).



wcghi_gr003869

CHANGING THE FUEL HEATER FILTER

See Graphic: wcghi_gr003870

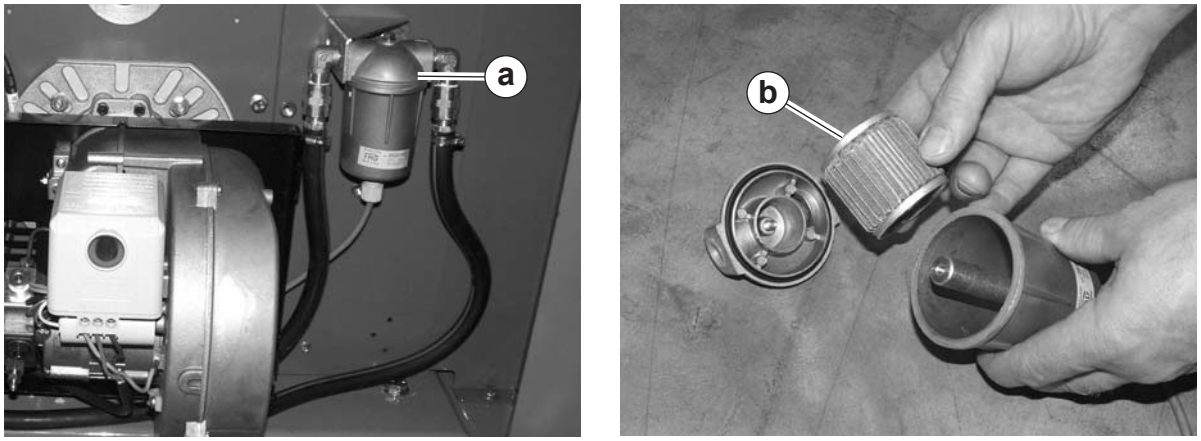
The fuel heater assembly (a) is located near the burner. To replace the fuel heater filter, carry out the following procedure.

Removal:

1. Shut down the generator.
2. Remove the screw that secures the cover to the housing.
3. Remove the filter (b).

Installation:

4. Install the new filter (b).
5. Install the cover.



wcghi_gr003870

BURNER ADJUSTMENTS

The machine should be operated with standard diesel/fuel oil (OIL) DIESEL.

Note: All burners are test fired at Ground Heaters, Inc.'s factory located 600 ft.(180 m) above sea level (asl) using 70/30% blend of #2 diesel with additives (70%) and #1 (K1) diesel (30%) with additives.

The use of a high quality combustion analyzer and fuel pressure test gauge is mandatory. All adjustments must be accomplished by a licensed professional and must conform to the requirements of local, state and federal codes and authorities. A qualified technician must recalibrate the burner air and fuel settings to obtain proper combustion at your work site.

To ensure proper burner performance and to avoid machine downtime due to heater sooting, burner combustion verification and adjustment must be performed:

- Before operating at elevations 1,000 ft (305 m) above or below the last adjustment.
- Before starting at a new job site.
- After any burner maintenance has been performed.
- If burner performance is in question for any reason.

Fuel Pressure Adjustment:

1. Remove the bleeder valve. Install an adapter with British Parallel threads to accept a 0–300 psi fuel pressure gauge. Do not use joint compound (pipe dope) on the adapter.
2. Turn the operation mode switch to HEAT. The burner will begin a 15- second pre-purge. Monitor the fuel pressure during the pre-purge and make adjustments using the fuel pressure adjusting screw.
3. Turn the adjusting screw (located on the side of the fuel pump) clockwise to increase fuel pressure or counterclockwise to decrease fuel pressure until it is stable.

Once the fuel pressure is set, proceed with air setting and adjustment.

O2 Content:

A Combustion Analyzer, Smoke True Spot Tester and common hand tools will be required for O2 content sampling.

4. Follow the combustion analyzer manufacturer's instructions for prepurge and exhaust sampling.
5. Sample the exhaust gas. Exhaust O2 content must be 5.5 to 6.0% for optimum performance and minimum soot production. Several samples should be taken as the heater warms. The final sample should be taken just before the heater reaches 160°F. Smoke Spot Sampling:
6. Follow the smoke spot tester manufacturer's instructions for accurate exhaust sampling.
7. Sample the burner exhaust for smoke. Smoke spot production must be 1 or less. Several samples should be taken as the heater warms. The final sample should be taken just before the heater reaches 160°F.

Note: Higher O2 percentage (excess air settings) lowers soot production but raises stack temperature and reduces efficiency. Lower O2 percentage (inadequate air settings) increases efficiency and lowers stack temperature but may cause soot build-up. A burner optimized for clean and efficient operation will have O2 levels of 5.5 to 6.0% and a smoke spot value of 1 or less.

8. Loosen the air damper locking screws enough to provide movement for adjustment.
9. Turn the operation mode switch to HEAT. The burner will begin a 15- second pre-purge followed by the ignition

sequence.

10. Once the burner lights, sample the exhaust as outlined above. Adjust the air damper until combustion parameters fall within the above outlined values.
11. Lock the air damper in place by tightening the locking screws.

Factory settings:

1		2	3		4	5
Actual firing rate ± 5%		**Nozzle size**	**Pump pressure**		**Turbulator setting** (head setting)	**Air damper setting**
gph	kg/h	gph	psi	bar		
2.71	8.3	2.00 x 60°	184	12.7	4.0	4.9

ENGINE AIR CLEANER

The engine used in the generator has a dry-type filter element. Do not oil the filter element.

To clean the filter element:

1. Release the locking levers, remove the cover of the air cleaner, and remove the filter element from the air cleaner body.
2. Wipe the inside of the air cleaner body.
3. Using compressed air, blow the filter element from the inside out. Rotate the filter element while cleaning it.

ENGINE FUEL STRAINER

1. Clean the fuel strainer with a non-explosive solvent.
2. Remove all dirt and water that may have accumulated in the strainer cap.
3. Connect the fuel strainer cap securely so that no fuel will leak.

FUEL BLEND GUIDE

Fuel Blend Guide	
Temperature Range	Fuel Blend
15° to 30°F	80% #2 : 20% #1
0° to 15°F	70% #2 : 30% #1
–15° to 0°F	50% #2 : 50% #1
below –15°F	30% #2 : 70% #1

STORAGE

1. Allow heater to cool sufficiently. Cover the chimney and the burner with plastic wrap or other waterproof material. This will prevent corrosive moisture build-up and blockages caused by animal nests.
2. Remove the emergency break-away battery and store the battery in a cool, dry place. Connect battery to a trickle charger once every 30 days to maintain full charge.
3. Shut and lock all doors.
4. Protect the tires from direct sunlight.

LIST OF ABBREVIATIONS

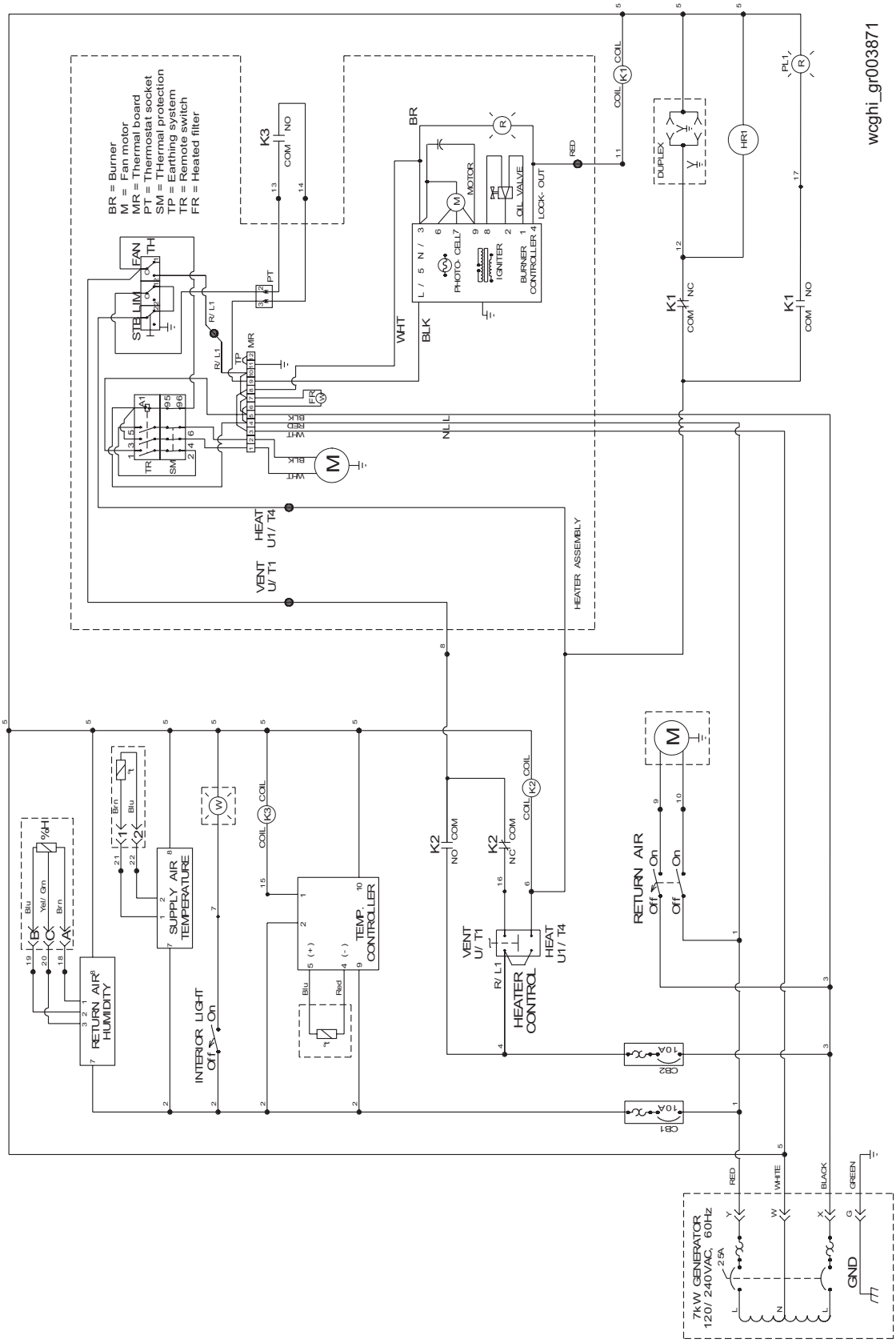
Amp	ampere (unit of electrical current)
asl	above sea level
BTU	British Thermal Unit
°C	Celsius (metric unit of temperature)
°F	Fahrenheit (unit of temperature)
ft2	square foot/square feet (measurement of area)
ft.lbs.	foot pounds (unit of torque)
gph	gallons per hour (unit of liquid flow)
GFI	Ground Fault Interrupt(er) (protection device)
GVWR	Gross Vehicle Weight Rating
Hz	Hertz (unit of frequency)
ID	inner diameter
in.	inch
kg	kilogram
kilo-cal	kilo-calorie (1000 calories) (metric unit of heat energy

kPal	kilo-Pascals (metric unit of pressure)
kW	kilowatt (unit of electrical power)
lb.	pound
m	meter
mm	millimeter (1/1000 of a meter)
psig	pounds per square inch gauge (unit of pressure)
TC	Temperature control
NHTSA	National Highway Transportation Safety Administration
VAC	Volts, alternating current
VDC	Volts, direct current
HTH	Heat transfer hose
HTF	Heat transfer fluid
wc	water column (unit of pressure)

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	RECOMMENDED SOLUTION
The burner does not start	• The remote thermostat or thermostat plug is not inserted correctly. • Faulty cable or power supply • The over temperature limit has tripped	• Insert the remote thermostat or thermostat plug. Check cable and power supply • Call Ground Heaters for service assistance
The burner starts, the flame does not ignite	• No fuel • Worn burner nozzle • Faulty electrodes • Cad cell defective • Burner control defective	• Fill fuel tank • Replace burner nozzle • Replace electrodes • Call Ground Heaters for service assistance
The burner starts, flame ignites, but the unit locks out	• Incorrect fuel pressure • Worn burner nozzle • Incorrect air adjustment • Cad cell defective • Burner control defective	• Increase fuel pressure • Replace burner nozzle • Readjust air supply • Call Ground Heaters for service assistance
Combustion is poor or noisy	• Lack of fresh air to burner	• Ensure there is an adequate air supply • Call Ground Heaters for service assistance
Excessive blower noise	• Defective motor bearings • Mounting base not secure • Misaligned pulleys • Damaged wheel	• Replace motor bearings • Tighten mounting hardware • Correct alignment • Replace wheel
Fan inoperative	• Open circuit breaker • Loose or disconnected wiring • Defective motor • Broken belt(s)	• Reset circuit breaker • Check wiring and repair as needed • Replace motor • Replace belt(s)
Motor overheating	• Belt slippage • Over or under voltage	• Adjust belt tension • Check generator

WIRING SCHEMATIC



TECHNICAL DATA

MACHINE

Item Number:		0620232, 0620201
Machine		
Dimensions LxHxW	in (cm)	222 x 93 x 92 (564 x 236 x 234)
Weight with fuel without fuel	lbs. (kg) lbs. (kg)	5540 (2513) 6330 (2994)
Supply air blower @ 2-in. wc	cfm (m^3/m)	5200 (147)
Supply air temperature range	°F (°C)	ambient to 182 (ambient to 90)
Return blower @ 2-in. wc	cfm (m^3/m)	4100 (116)
On-board diesel generator	kw	7
Fuel tank capacity	gals. (liters)	125 (473)
Fuel type		diesel
Run time	hrs.	40–48
Fuel consumption (average)	gals./hr. (l/hr.)	2.71 (10.3)

HEATER

Item Number:		0620232, 0620201
Heater		
Output temperature range	°F (°C)	ambient to 210 (100)
Fuel type		diesel
Maximum firing rate	gph (l/min.)	2.7 (10.2)
Maximum heat output	BTU/hr (MJ/hr)	380,000 (400.9)

AIR MOVER

Item Number:		0620201
Air mover		
Current draw	Amp	2
Airflow rating @ 1-in. wc. (249 Pa)	cfm (m^3/m)	3000 (85)
Fan size	in. (cm)	16 (41)
Weight	lbs. (kg)	20 (9.1)
Dimensions HxWxD	in. (cm)	24x18x22 (61x46x56)


Climate
RENTAL SOLUTIONS