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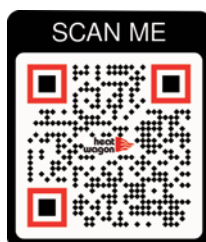
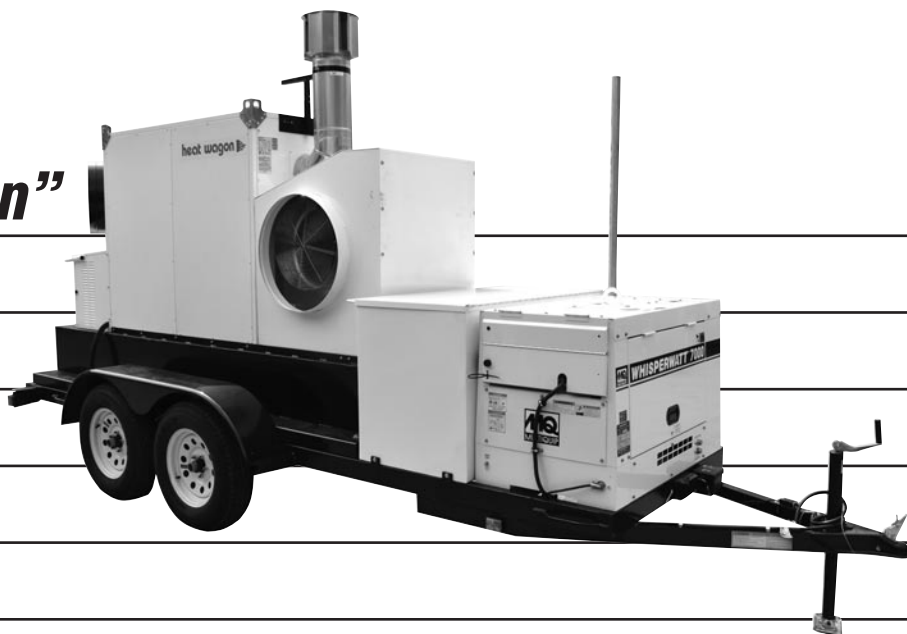
## Installation and Maintenance Manual

Please retain this manual for future reference.

# VF900SC

*The “Dragon Wagon”*

***Self-Contained  
Construction  
Heater***



***CAUTION: Do not use this heater in a space where gasoline or other liquids having flammable vapors are stored.***

## **CONSTRUCTION HEATER 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 instruction manual, labels, etc., contact your local Heat Wagon dealer or the manufacturer.

## **W A R N I N G**

Fire, burn, inhalation, and explosion hazard. Keep solid combustibles, such as 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.

**Not for home or recreational vehicle use!**

**Heater is not intended for use in pest remediation.**

### **CAUTION**

- 1). NEUTRAL BONDED TO FRAME
- 2). MACHINE TO BE GROUNDED IN ACCORDANCE WITH REQUIREMENTS AS OUTLINED BY LOCAL INSPECTIONS AUTHORITIES
- 3). TURN OFF ALL POWER BEFORE SERVICING
- 4). THE REQUIREMENTS OF LOCAL AUTHORITIES HAVING JURISDICTION SHALL BE FOLLOWED
- 5). DO NOT START THE HEATER WHEN EXCESS OIL HAS ACCUMULATED IN THE CHAMBER
- 6). DO NOT FILL THE TANK WHILE THE UNIT IS OPERATING
- 7). DO NOT TAMPER WITH THE UNIT. ONLY COMPETENT SERVICEMEN SHOULD MAKE ADJUSTMENTS
- 8). DO NOT OPERATE THE UNIT IN CLOSE PROXIMITY TO COMBUSTIBLE SURFACES OR MATERIALS

# Installation and Maintenance Manual

## Model VF900SC

### Construction Heater

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#### WARRANTY

All new Heat Wagon and Sure Flame heaters and fans are guaranteed against defective materials and workmanship for one (1) year from invoice date.

Warranty repairs may be made only by an authorized, trained and certified Heat Wagon dealer. Warranty repairs by other entities will not be considered. Warranty claims must include model number and serial number.

#### LIMITATIONS

Warrant claims for service parts (wear parts) such as spark plugs, igniters, flame rods will not be allowed. Diagnostic parts such as voltage meters and pressure gauges are not warrantable.

Evidence of improper fuel usage, fuel pressures outside of manufacturer's specification, poor fuel quality, and improper electric power, misapplication or evidence of abuse may be cause for rejection of warranty claims.

Travel time, mileage and shipping charges will not be allowed. Minor adjustments of heaters are dealers' responsibility. Defective parts must be tagged and held for possible return to the factory for 60 days from date of repair. The factory will provide a return goods authorization, (RGA) for defective parts to be returned.

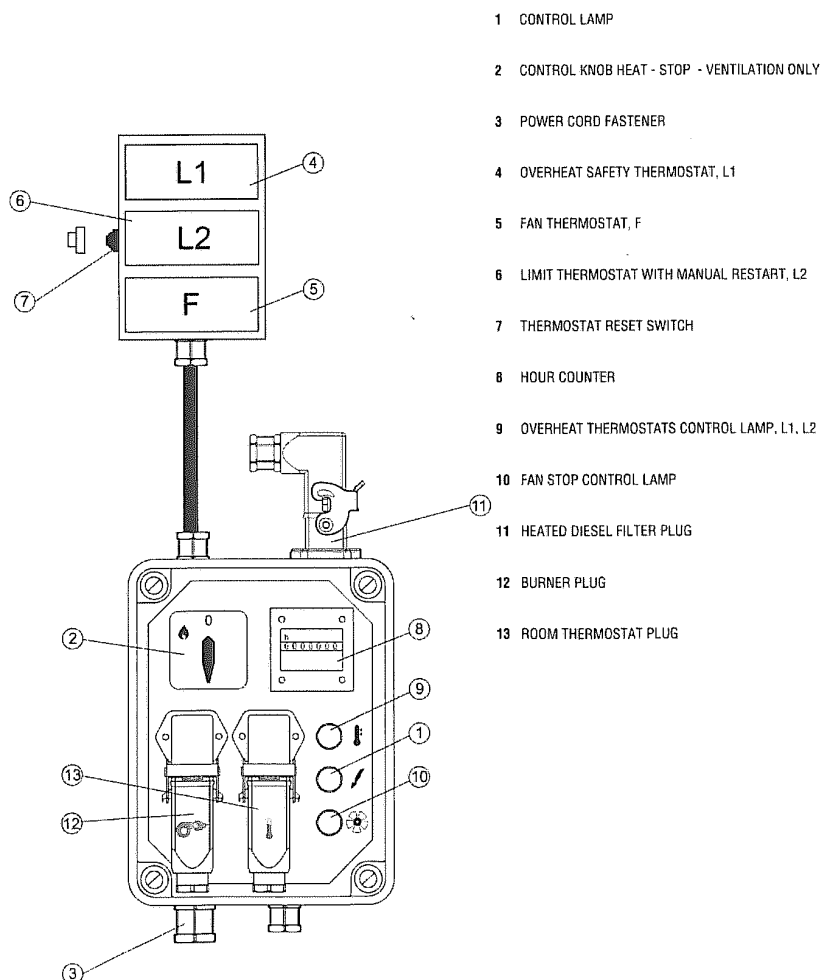
No warranty will be allowed for parts not purchased from Heat Wagon.



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TECHNICAL SPECIFICATIONS		VF900SC
Heat input	[kBtu/h]	900
Air flow	[cfm]	8.830
Heat output	[kBtu/h]	765
Oil N°2 Max fuel consumption	[GPH]	6.64
Power supply	Phase	1
	Voltage	240
	Frequency	60
Electric consumption	[kW]	2.120
	[A]	13.9
Diesel burner model		Riello 40F 20
Nozzle	[USgal/h]	4.5 GPH 60° B
Static pressure	[in WC]	4"
Flue diameter	[in]	7.9
Compulsory flue draft	[in WC]	0.05
Maximum air temperature	*F	250.0
Duct Outlet		2 - 20" Dia.
Return Air Inlet		2 - 24" Dia.
Thermostat (50' cord)		On/Off
Pump Pressure		160
Air Damper		3.5/5.0
Turbulator		4

## CONTROL BOARD



## SPECIFICATIONS

### Generator Set

Multiquip Model DA7000 SSA (Z482-E3)

7kW Max Power

6kW Continuous Power

3600 RPM, 60 Hz AC

Kubota 2 Cylinder Engine

Liquid Cooled

Hour Meter

(Review Kobota Operators Manual  
for Additional Information)

### Trailer

DOT Approved

2 x 3,500 Lbs. Dual Axle

4 x 15" Tires

Electric Brakes

Safety Chains, 2" Trailer Ball

Duct Storage Cabinet

Includes 2-25' sections of  
20" diameter duct

200 Gallon Fuel Cell with 1000 Watt  
Immersion Heater

Front Screw Jack

19' x 6'-8" x 9'-5"

3,740 Lbs. (Empty) Double Wall

# SET-UP INSPECTION & TOWING INSTRUCTION

## PREPARING THE VF900SC FOR DELIVERY OR RENTAL

The Heat Wagon VF900SC requires service as well as proper operation in order to provide the performance and safety for which it was designed. Never deliver or put a machine into service with known defects or missing instructions. Always instruct the customer in the proper operation and safety procedures as described in the operator's manual. Always provide the manual with the equipment for proper and safe operation.

### Check List:

- Visually inspect the equipment to ensure that all instructions and decals are in place and legible.
- Check the hitch assembly and safety tow chains.
- Check the jack to make sure it operates properly.
- Inspect the tires to ensure good condition and proper inflation.
- Check lugnuts and torque to 80-90 ft. lbs. Lugnuts should be retorqued after first 100mi of towing.
- Check operation of brakes and brake lights.
- Make sure the battery is fully charged and the terminals are tight and clean. Ensure the electrolyte is at the correct level.
- Check the service intervals for oil filters, fuel filter, air cleaner and engine oil (see operator's manual for gen set heater).
- Check the oil, fuel and coolant levels.
- Start engine and turn heaters on to ensure proper operation. (see page 8)
- Check to make sure the operator's manual is with the equipment.
- Do not transport with full tank of fuel.

**NOTE:** See operator's manual for scheduled maintenance intervals.

### SAFETY WARNING!

**NEVER ALLOW ANYONE TO OPERATE THE EQUIPMENT WITHOUT PROPER TRAINING.  
ALWAYS READ THE INSTRUCTIONS FIRST.**

### TOWING INSTRUCTIONS

Before towing the Dragon Wagon the trailer should be inspected visually to assure that the following operations have been completed:

1. Hitch is securely attached to towing vehicle (safety chain secured).
2. Front jack retracted.
3. Ducting removed from heaters and stored.
4. Doors are closed and secure.
5. Check for adequate tire pressure.
6. Taillights are connected and operating.
7. Remove ground rod from earth and secure in trailer. (optional)

# GENERATOR STARTING PROCEDURES

## BEFORE STARTING:

1. Fill the engine with the specified grade and quantity of lubricating oil to correct level (check dipstick).
2. Ensure there is an adequate supply of fuel.
3. Ensure that the air cleaner is firmly attached and air joints are properly sealed. Air cleaner element should be checked and replaced if necessary.

## STARTING ENGINE (NORMAL)

1. Heater switches must be in OFF position.

## STARTING THE ENGINE(NORMAL)



### CAUTION

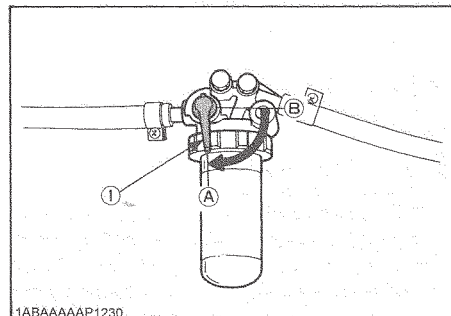
To avoid personal injury:

- Do not allow children to approach the machine while the engine is running.
- Be sure to install the machine on which the engine is installed, on a flat place.
- Do not run the engine on gradients.
- Do not run the engine in an enclosed area. Exhaust gas can cause air pollution and exhaust gas poisoning.
- Keep your hands away from rotating parts (such as fan, pulley, belt, flywheel etc.) during operation.
- Do not operate the machine while under the influence of alcohol or drugs.
- Do not wear loose, torn or bulky clothing around the machine. It may catch on moving parts or controls, leading to the risk of accident. Use additional safety items, e.g. hard hat, safety boots or shoes, eye and hearing protection, gloves, etc., as appropriate or required.
- Do not wear radio or music headphones while operating engine.
- Check to see if it is safe around the engine before starting.
- Reinstall safeguards and shields securely and clear all maintenance tools when starting the engine after maintenance.

### IMPORTANT :

- Do not use ether or any starting fluid for starting the engine, or a severe damage will occur.
- When starting the engine after a long storage (of more than 3 months), first set the stop lever to the "STOP" position and then activate the starter for about 10 seconds to allow oil to reach every engine part.

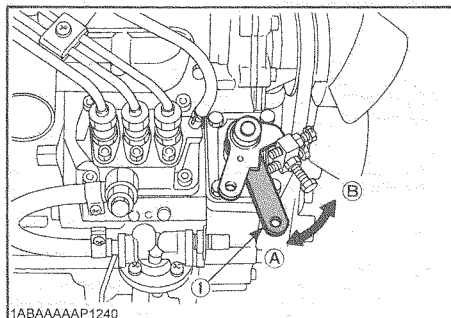
1. Set the fuel lever to the "ON" position.



(1) Fuel lever

(A) "ON"  
(B) "OFF"

2. Place the engine stop lever in the "START" position.
3. Place the speed control lever at more than half "OPERATION"

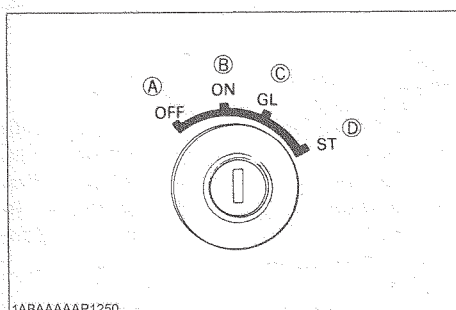


(1) Speed Control lever

(A) "OPERATION"  
(B) "IDLING"

# GENERATOR STARTING PROCEDURES

4. Insert the key into the key switch and turn it to the "OPERATION" position.



(A) "OFF" SWITCHED OFF  
(B) "ON" OPERATION  
(C) "GL" PREHEATING  
(D) "ST" STARTING

5. Turn the starter switch to the "PREHEATING" position to allow the glow lamp to redden.
6. Turn the key to the "STARTING" position and the engine should start. Release the key immediately when the engine starts.
7. Check to see that the oil pressure lamp and charge lamp are off. If the lamps are still on, immediately stop the engine, and determine the cause.  
(See "CHECKS DURING OPERATION" in "OPERATING THE ENGINE" section.)

#### NOTE :

- If the oil pressure lamp should be still on, immediately stop the engine and check;
  - if there is enough engine oil.
  - if the engine oil has dirt in it.
  - if the wiring is faulty.

8. Warm up the engine at medium speed without load.

#### IMPORTANT :

- If the glow lamp should redden too quickly or too slowly, immediately ask your KUBOTA dealer to check and repair it.
- If the engine does not catch or start at 10 seconds after the starter switch is set at "STARTING" position, wait for another 30 seconds and then begin the engine starting sequence again. Do not allow the starter motor to run continuously for more than 20 seconds.

## COLD WEATHER STARTING

If the ambient temperature is below\* -5°C (23°F) and the engine is very cold, start it in the following manner:  
Take steps (1) through (4) left.

5. Turn the key to the "PREHEATING" position and keep it there for a certain period mentioned below.

#### IMPORTANT :

- Shown below are the standard preheating times for various temperatures. This operation, however, is not required, when the engine is warmed up.

Ambient temperature	Preheating time	
	Ordinary heat type	With glow lamp timer
Above 10°C (50°F)	NO NEED	See NOTE:
10°C (50°F) to -5°C (23°F)	Approx. 5 seconds	
*Below -5°C (23°F)	Approx. 10 seconds	
Limit of continuous use	20 seconds	

#### NOTE :

- In case of installing standard glow lamp, glow lamp goes off after about 6 seconds, when the starter switch key is turned to the "PREHEATING" position. However if necessary, keep the starter switch key at the "PREHEATING" position for longer time, according to the left recommendation.

6. Turn the key to the "STARTING" position and the engine should start.

(If the engine fails to start after 10 seconds, turn off the key for 5 to 30 seconds. Then repeat steps (5) and (6).)

#### IMPORTANT :

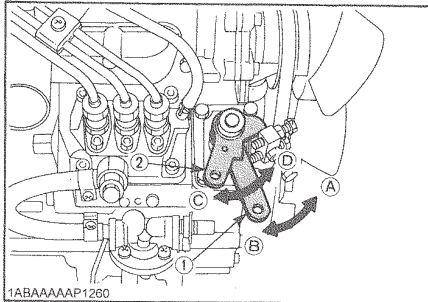
- Do not allow the starter motor to run continuously for more than 20 seconds.
- Be sure to warm up the engine, not only in winter, but also in warmer seasons. An insufficiently warmed-up engine can shorten its service life.
- When there is fear of temperature dropping below -15°C (5°F) detach the battery from the machine, and keep it indoors in a safe area, to be reinstalled just before the next operation.



# GENERATOR STARTING PROCEDURES

## STOPPING THE ENGINE

1. Return the speed control lever to low idle, and run the engine under idling conditions.
2. Set the engine stop lever to the "STOP" position.
3. With the starter switch placed to the "SWITCHED OFF" position, remove the key. (Be sure to return the engine stop lever to the "START" position to be ready for the next start.)



- (1) Speed control lever (A) "IDLING"  
(2) Engine stop lever (B) "OPERATION"  
(C) "START"  
(D) "STOP"

## CHECKS DURING OPERATION

While running, make the following checks to see that all parts are working correctly.

### ■ Radiator Cooling water(Coolant)



#### WARNING

To avoid personal injury:

- Do not remove radiator cap until coolant temperature is well below its boiling point. Then loosen cap slightly to the stop position, to relieve any pressure, before removing cap completely.

If the coolant temperature warning lamp lights up or if steam or coolant does not stop squirting from the radiator overflow pipe, turn off the load and **keep the engine idling (COOLING-DOWN) for at least 5 minutes** to let it cool down gradually. Then stop the engine and take the following inspection and servicing.

1. Check to see if the coolant runs short or if there is any coolant leak;
2. Check to see if there is any obstacle around the cooling air inlet or outlet;
3. Check to see if there is any dirt or dust between radiator fin and tube;
4. Check to see if the fan belt is too loose; and
5. Check to see if radiator water pipe is clogged.

### ■ Oil pressure lamp

The lamp lights up to warn the operator that the engine oil pressure has dropped below the prescribed level. If this should happen during operation or should not go off even after the engine is accelerated more than 1000rpm, immediately stop the engine and check the following:

1. Engine oil level (See "ENGINE OIL" in "PERIODIC SERVICE" section.)

### ■ Fuel



#### CAUTION

To avoid personal injury:

- Fluid escaping from pinholes may be invisible. Do not use hands to search for suspected leaks; Use a piece of cardboard or wood, instead. If injured by escaping fluid, see a medical doctor at once. This fluid can produce gangrene or a severe allergic reaction.
- Check any leaks from fuel pipes or fuel injection pipes. Use eye protection when checking for leaks.

Be careful not to empty the fuel tank. Otherwise air may enter the fuel system, requiring fuel system bleeding. (See "FUEL" in "PERIODIC SERVICE" section.)

### ■ Color of exhaust

While the engine is run within the rated output range:

- The color of exhaust remains colorless.
- If the output slightly exceeds the rated level, exhaust may become a little colored with the output level kept constant.
- If the engine is run continuously with dark exhaust emission, it may lead to trouble with the engine.

### ■ Immediately stop the engine if;

- The engine suddenly slows down or accelerates.
- Unusual noises are suddenly heard.
- Exhaust fumes suddenly become very dark.
- The oil pressure lamp or the water temperature alarm lamp lights up.

## REVERSED ENGINE REVOLUTION AND REMEDIES



#### CAUTION

To avoid personal injury:

- Reversed engine operation can make the machine reverse and run it backwards. It may lead to serious trouble.
- Reversed engine operation may make exhaust gas gush out into the intake side and ignite the air cleaner; It could catch fire.

Reversed engine revolution must be stopped immediately since engine oil circulation is cut quickly, leading to serious trouble.

### ■ How to tell when the engine starts running backwards

1. Lubricating oil pressure drops sharply. Oil pressure warning light, if used, will light.
2. Since the intake and exhaust sides are reversed, the sound of the engine changes, and exhaust gas will come out of the air cleaner.
3. A louder knocking sound will be heard when the engine starts running backwards.

### ■ Remedies

1. Immediately set the engine stop lever to the "STOP" position to stop the engine.
2. After stopping the engine, check the air cleaner, intake rubber tube and other parts, and then replace parts as needed.



# HEATER STARTING PROCEDURES

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- CONFIRM THAT TRAILER IS POSITIONED CORRECTLY.
- TO OBTAIN MAXIMUM FUEL UTILIZATION FROM TANK, THE TONGUE OF THE TRAILER SHOULD BE TILTED SLIGHTLY TO THE GROUND.
- AFTER SUCCESSFUL STARTING OF THE GENERATOR PLUG IN FUEL TANK IMMERSION HEATER (LOCATED NEAR FRONT OF TANK)
- SET THE CONTROL KNOB TO ZERO POSITION (SEE ITEM 2, SPEC PAGE 3)  
SWITCH THE 220V BREAKER ON THE GENERATOR TO THE ON POSITION, THIS WILL SEND POWER TO THE FUEL FILTER PREHEATER.
- IF BELOW 30 F, WAIT AT LEAST 15 MINUTES FOR FUEL HEATERS TO WARM THE FUEL.
- ADJUST TEMPERATURE SETTING ON REMOTE THERMOSTAT TO DESIRED SET POINT.
- MAKE SURE INLET PORTS ARE FREE OF SNOW, ICE OR ANY DEBRIS
- TURN THE CONTROL KNOB TURN TO THE FLAME ICON
- BURNER BLOWER WILL START AND COMMENCE PRE PURGE SEQUENCE
- IF BURNER DOES NOT FIRE, PUSH RESET BUTTON ON BURNER
- AFTER THE BURNER FIRES UP, BLOWER FANS WILL START AFTER 2 TO 3 MINUTES.

**IF AFTER 3 ATTEMPTS TO START BURNER, DO NOT PUSH RESET AGAIN, THIS WILL CAUSE FUEL LOADING IN THE COMBUSTION CHAMBER.**

REVIEW TROUBLESHOOTING ON PAGE 12.

**TO STOP HEATER TURN CONTROL KNOB TO ZERO POSITION AND WAIT UNTIL BLOWER FAN COMPLETES COOLING DOWN THE COMBUSTION CHAMBER (10 MIN)  
DO NOT DISCONNECT POWER CORD, SWITCH BREAKER TO OFF POSITION OR SHUT DOWN GENERATOR WHILE FAN IS OPERATING**

## DESCRIPTION

These space heaters have been designed for use in small to medium-sized rooms and buildings where a fixed or mobile heating system is required.

Heat is produced by combustion and the heat from the smoke is transmitted to the fresh air through the metal walls of the combustion chamber and the heat exchanger. The combustion chamber is of the type where smoke circulates twice.

The air and smoke pass through separated ducts, both of which are welded and sealed. When, after combustion, the waste gases have cooled, they are expelled through a duct which must be connected to a chimney or chimney flue. The chimney or chimney flue must be big enough to guarantee that the smoke is expelled efficiently.

The air which is used in combustion is aspirated directly from the room or building which is being heated. It is therefore of utmost importance that the room or building be properly ventilated so that enough fresh air is circulating at all times.

The air outlet can be replaced by outlet panels with two or four openings, all of which must be kept open.

These heaters can operate with burners that are fuelled by diesel oil #2 max., natural gas or propane.

### Warning



**Only the burners which are chosen and supplied by the manufacturer can be used. If another type of burner is used the heater no longer complies with CSA / UL regulations.**

**Applied burners are listed in the final "TECHNICAL CHARACTERISTICS" sheet**

There are three safety devices which are activated in case of serious malfunction. The Burner Control Device, which is mounted on the burner and has a restart button, automatically stops the burner if the flame goes out. The Overheat Thermostat, L2, of the manual restart type, is activated if the temperature of the combustion chamber rises above the set maximum limit; the warning light (9) lights up and the heater stops working. The Thermal Relay, RM, is activated if the fan motor starts to use more electrical current than the maximum permitted limit; the warning light (10) lights up and the heater stops working.

If any of these safety devices are activated you should check carefully what the problem actually is before pressing the restart button and starting the heater off again ("OBSERVED FAULTS, CAUSES AND REMEDIES").

Overheat safety thermostat, L1, shuts down the heater if air flow is not sufficient to cool off combustion chamber: the heater will restart automatically as soon as the heater has cooled down enough (The lamp (9) lights up and then it cuts down).

## GENERAL ADVICES

The heater is designed and approved for use as a construction heater in accordance with Standard ANSI Z83.7 - CGA 2.14.

Intended use is the temporary heating of buildings or structures under construction, alteration or repair.

### Warning



**CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT APPLICATIONS.**

Here are a few general guidelines which should be followed:

- Follow the instructions in this booklet very carefully.
- Don't install the heater in places where there may be a risk of fire or explosion.
- Inflammable material should be kept at a safe distance from the heater (Minimum 6 feet).
- All fire prevention regulations must be adhered to.
- The room or building which is being heated must be sufficiently ventilated so that the heater has enough air to function properly.
- The heater must be near a chimney or chimney flue and a suitable electric switchboard.

- Don't let animals or children near the heater.
  - Make sure heater is inspected before each use, and at least annually by a qualified service person.
  - After use make sure the disconnecting switch is off.
- When using any type of space heater it is obligatory:
- not to exceed the maximum level of heat output of the furnace ("TECHNICAL SPECIFICATION TABLE");
  - to make sure that there is adequate air circulation and air supply to the heater and that nothing is obstructing the aspiration and expulsion of air; movement of air may be obstructed in various ways including placing covers or other objects on the heater or positioning the heater too near a wall or other large object. If the airflow is not adequate, the combustion chamber will overheat and the overheat safety thermostat L1 will turn the burner off and on continuously ("OBSERVED FAULTS, CAUSES AND REMEDIES").

## INSTALLATION

### Warning

**The following operations must be carried out by qualified personnel only.**

### Electrical CONNECTIONS AND SETTINGS



The space heater is supplied along with the safety and control which are indispensable to the correct functioning of the unit. The electric switchboard, burner, the fan thermostat, overheat safety thermostat and the overheat thermostat with manual restart have already been connected.

### Warning

**Power supply cord of proper dimension shall be connected to the main switchboard and heater shall be grounded.**



**Electrical grounding shall be in compliance with the National Electrical Code ANSI/NFPA 70 or the CSA C22.1 Canadian Electrical Code, Part I.**

The following operations must now be carried out:

- Plug in the power cord having read the adhesive label which details electricity supply characteristics.
- The burner must be connected to the fuel supply (Burner Instruction Manual).
- Connect the burner to the electricity supply with the burner plug.
- Connect accessories such as the room thermostat or clock to the unit's electric switchboard with the thermostat plug.

Having completed all these operations check carefully that all electrical connections correspond to the wiring diagram. When the heater is first turned on you must check that the fan does not use more current than the maximum permitted limit.

Finally, to regulate the burner follow the instructions in the Burner Instruction Manual.

### CONNECTION TO HOT AIR DUCTS

The space heater provides heat by releasing and dispersing hot air. An air head is supplied with each unit but it can be replaced by other types of head with two or four openings which allow for flexible tubes in heat distribution. The screws which hold the original outlet in place should be removed and the new outlet should be screwed on in place of the old.

The new head may be connected to new air ducts if the user wishes to satisfy specific needs. In this case and in particular if the diameter and length of the ducts have been changed or if the number of bends has been modified, air output may vary. Consequently it is very important to check and regulate air output when any modification is made to air heads or air ducts. In all circumstances you must ensure

that:

- The fan motor does not absorb more current than the maximum permitted limit;
  - The volume of air flow corresponds to the recommended level.
- If the heater is equipped with centrifugal fan and if the volume of hot air differs from preset values proceed as follows (Fig. 1):

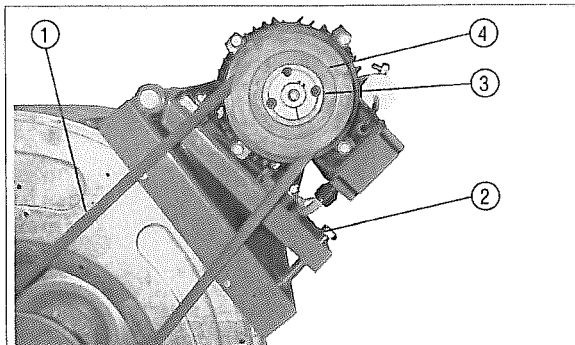


Fig. 1

- 1) Remove the aspiration grill which is on fan motor side of the unit.
- 2) Remove the screws (2) from the motor slide.
- 3) Remove the belt (1).
- 4) Loosen the bolts (3).
- 5) Turn the pulley clockwise and anti-clockwise in order to increase or reduce the volume of air.
- 6) Tighten the bolts (3).
- 7) Put back the aspirations grill
- 8) Repeat operations from (1) to (7) until the correct volume of air flow has been achieved.

#### DRAFT

The evacuation smoke flues shall be made with steel.

Efficient combustion and trouble-free working of the burner depend on efficient flue draft. The unit must be connected to the chimney flue in accordance with current legal regulations and in line with the following guidelines:

- The tube which carries the smoke should cover as short a distance as possible and should slant upwards.
- There should be no sharp bends in the tubes and the diameter of the tubes must never be reduced.
- Every heater must have its own chimney.
- Flue draft must at least correspond to the minimum compulsory level in the Technical Specifications.

#### ANALYSIS OF COMBUSTION WASTE PRODUCTS

The probes which check the composition of combustion waste products and smoke temperature must be positioned as indicated in Fig. 2.

When these tests have been completed the hole which was drilled for the probe must be sealed with a material which is resistant to high temperatures and which ensures that the tube remains airtight.

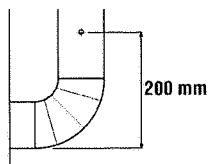


Fig. 2

#### REGULATION OF COMBUSTION - 1<sup>st</sup> OPERATION

After having checked the hermetic seal and of combustion waste products line, heater may be operated for the first time.

To perform regulation of combustion correctly, combustion waste products must be analyzed using appropriate instruments: values recommended by actual standards must be reached.

The regulation procedure has been on the Burner Instruction Manual; final values of CO<sub>2</sub> shall be correspondant to excess air factor of 1,2 (12,5 for gas-oil, 9,7% for G20, 9,6% for G25, 11,7% for G30 and 11,7% for G31) while CO level shall be less than 75 ppm.

#### INSTRUCTIONS FOR USE

##### SWITCHING ON

- Set the control knob (2) in position "0";
- Turn on the disconnecting switch on the electric switchboard;
- If the unit is operated manually turn the control knob to . The burner starts up, the combustion chamber heats up and then the fan starts;
- If the unit operates automatically set the room thermostat at the desired level and turn the control knob (2) to : the heater will now start and stop automatically.
- If the heater doesn't start after you have completed the above operations consult the Troubleshooting section of this manual.

##### TURNING OFF

In manual operation turn control knob (2) to "0" or turn off control thermostat in automatic operation.

The burner stops while the fan turns itself on and off until the combustion chamber has completely cooled down.

##### Warning



**Never stop the heater by simply turning off the disconnecting switch on the electric switchboard. The electrical supply must only be disconnected when the fan has come to a complete stop.**

#### VENTILATION

When the control knob is turned to the symbol the heater operates in continuous fan mode.

#### MAINTENANCE

##### Warning



**The following operations must be carried out by qualified personnel only. Before carrying out any maintenance operation the heater must be disconnected from the mains. Therefore:**

- Stop the machine as instructed above
- Turn off the disconnecting switch on the electric switchboard.
- Wait until the heater has cooled.

#### CLEANING THE HEAT EXCHANGER AND THE COMBUSTION CHAMBER

For the heater to operate efficiently the heat exchanger and combustion chamber must be cleaned after a period of prolonged use and more frequently if too much soot builds up. Soot builds up when there is not enough chimney draft, when the fuel is of very poor quality, when the burner is regulated incorrectly or when the heater is switched on and off too frequently. If the heater starts vibrating when it is turned on there is probably too much soot.

To get at the heat exchanger (1) take off the front panel (3) and then remove the smoke box panel (2) and remove baffle plates (7). To get at the combustion chamber (4) remove the burner (5).

#### CLEANING THE FAN

Remove any dirt or extraneous material from the mesh of the aspiration grill (6) and if necessary clean the propeller with an air-suction tool.

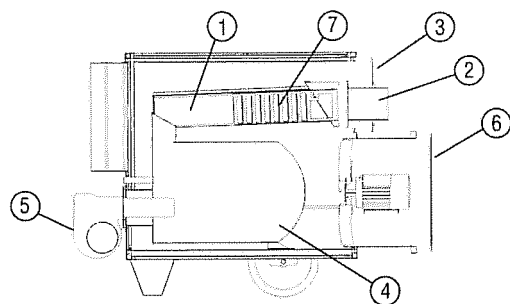


Fig. 3

#### CLEANING THE BURNER

For the heater to work efficiently the burner must be serviced regularly by an Authorized Service Technician. All cleaning, servicing and regulation operations must be carried out as indicated in the Burner Instruction Manual.

#### Warning



After every type of technical maintenance, please verify that the machine starting regularly.

## PREVENTATIVE MAINTENANCE

**NOTE:** DO NOT TAMPER WITH UNIT. HAVE A COMPETENT SERVICEMAN MAKE ANY ADJUSTMENTS.

**NOTE:** Service intervals have been established for operation under normal conditions. Where equipment is operated under severe conditions (very dusty, extreme cold, etc.) affected items should be serviced more frequently.

#### Fuel Filter:

Replace element at least every six months of normal usage, or more frequently in dirty conditions. (Part# HWP24390)

#### Flame Detector:

The flame detector is located in the burner housing below the transformer. Periodically clean cell detector face with a soft nonabrasive cloth.

#### Burner:

The electrode spacing must be checked and adjusted, if necessary, after every nozzle change. Nozzles should be replaced annually or sooner if burner cannot be set up to operate properly. Change after 400 hours of operation.

#### Motors:

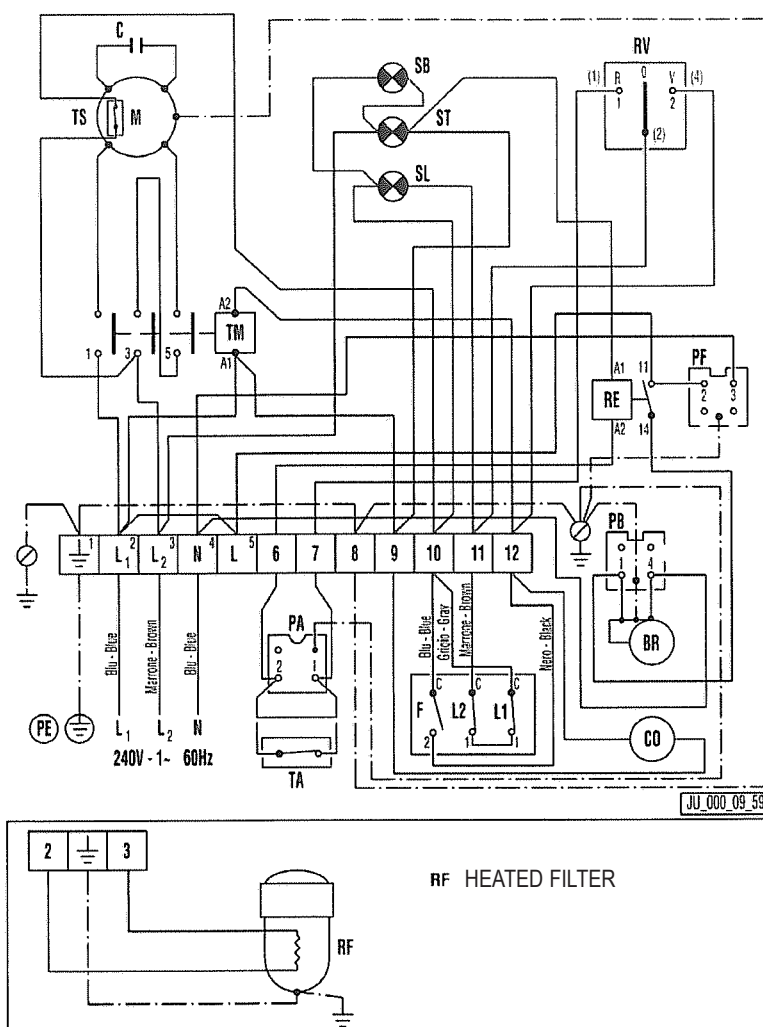
No lubrication is necessary since the bearings are the sealed type.

#### Fuel System:

Do not store unit containing fuel oil for long periods.

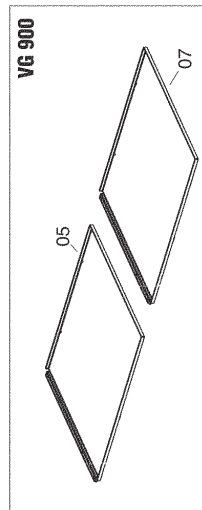
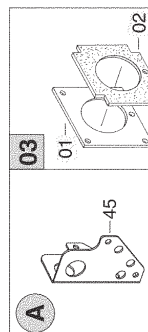
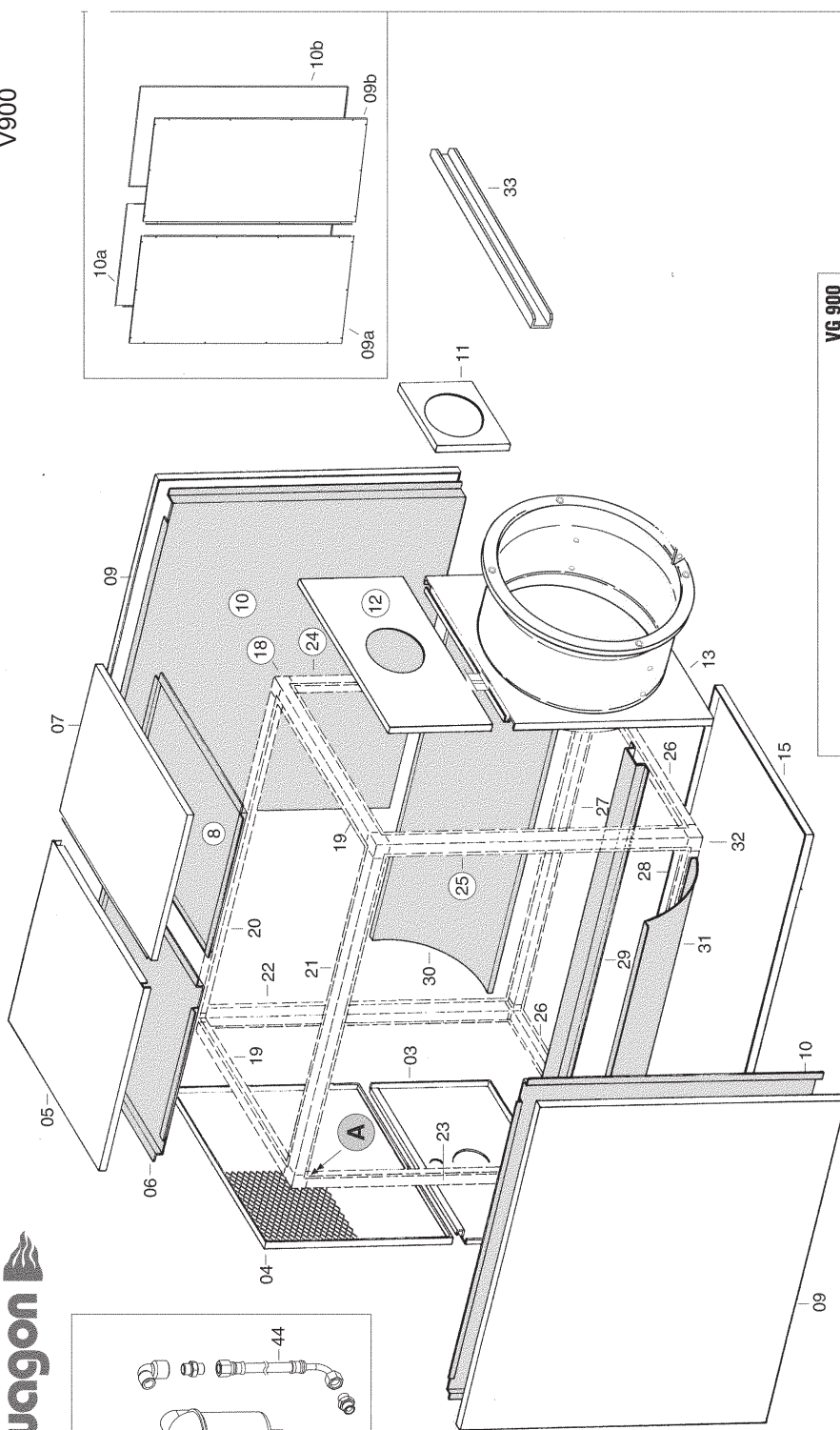
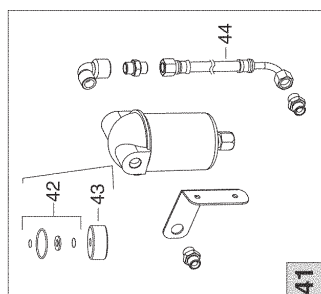
## Troubleshooting for Heating Unit

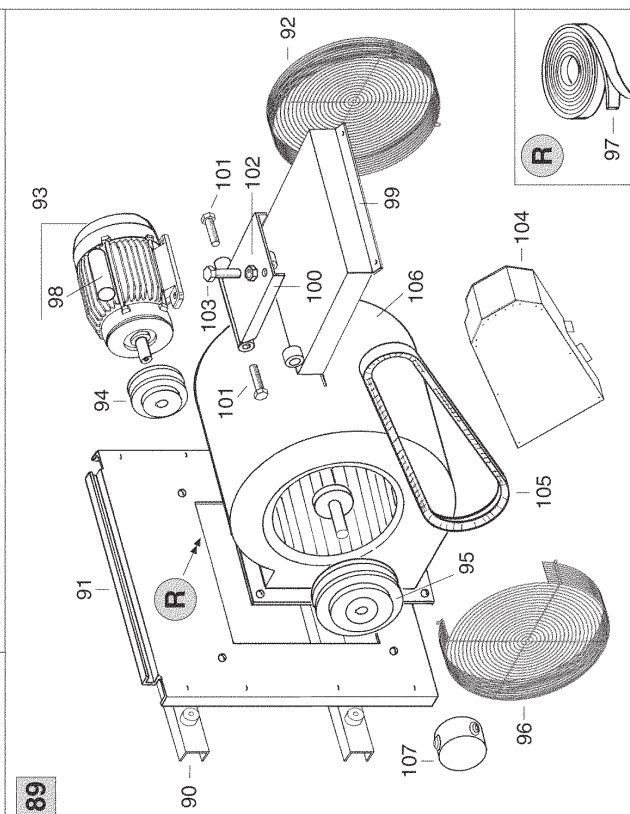
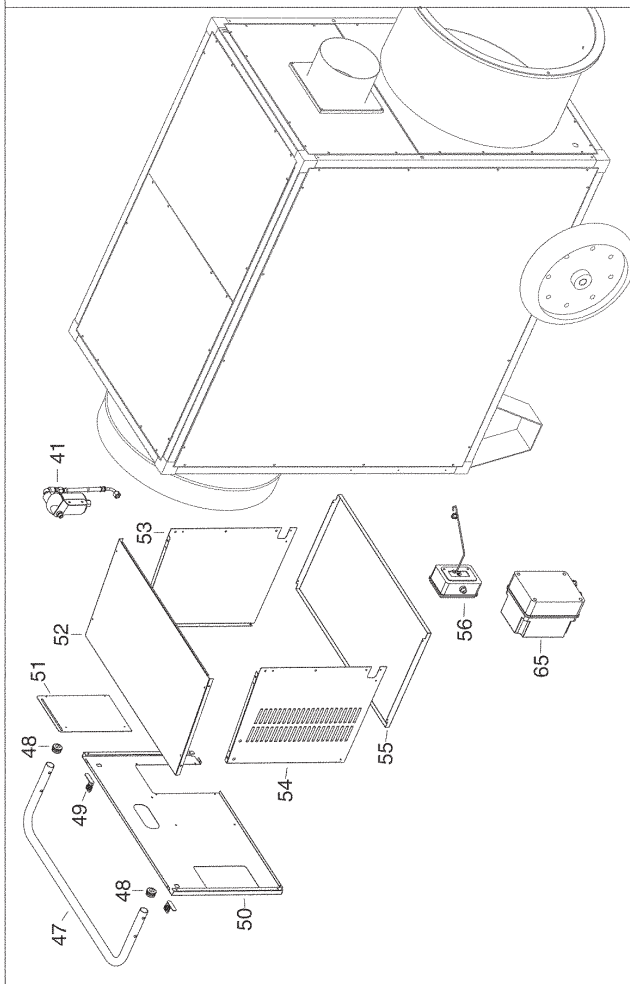
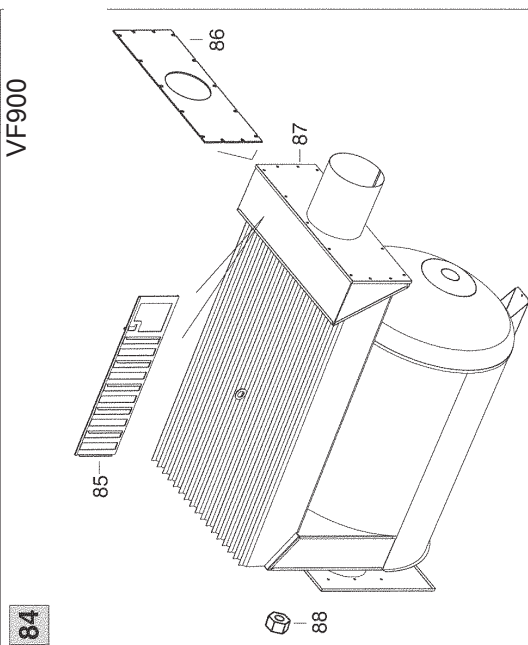
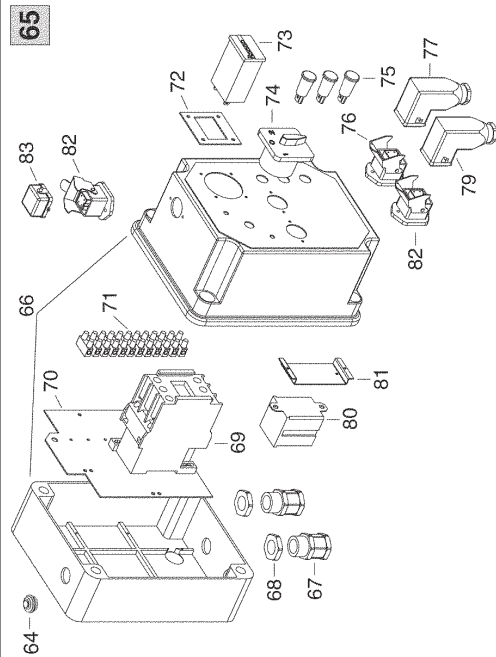
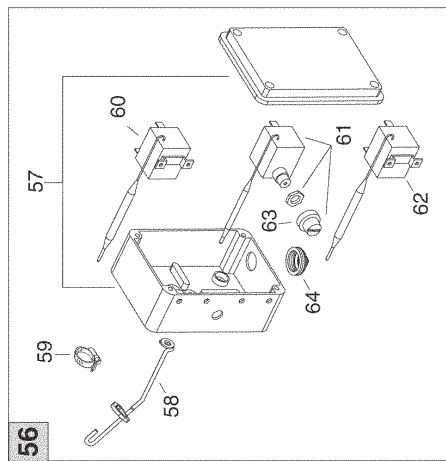
OBSERVED FAULT	CAUSE	REMEDY
• The heater won't start	• Faulty electrical supply	• Check function and positioning of main switch
		• Check power cord
	• Wrong positioning of main switch	• Check electrical connections
		• Check fuses
• Overheat safety thermostat L1 cuts out (the lamp (9) lights up and then it cuts down)	• Wrong setting of room thermostat	• Put main switch in correct position
		• Check setting of room thermostat
	• Safety device (burner, thermostat L2, fan thermal relay) not reset after repairs	• Check function of room thermo-stat
		• Press the appropriate restart button: • burner (button on control device) • thermostat (button (6)) • fan thermal relay (button (11))
• Limit thermostat L2 cuts out (warning lamp (9) lights up)	• The combustion chamber has overheated	• Check fuel flow
		• Check position registers, draw - holes, etc.
	• Excessive combustion chamber over heating	• Remove extraneous material from air ducts and ventilation grills
		• Check as indicated above
• Thermal relay TM cuts out (warning light (10) lights up)	• Fan motor current absorption is excessive	• If fault persists contact our Service Center
		• Heater with helicoidal ventilator: remove eventual debris preventing free flow of air on intake and outlet. Check length of air ducts, reduce if excessive.
	• Burner not working correctly	• Heater with centrifugal ventilator: check setting of transmission belt as indicated in chapter ("CONNECTION TO HOT AIR DUCTS").
		• Always check that current absorption remains below value indicated on motor manufacturer plate
• The burner starts up, the flame doesn't light up and the reset light on the control device comes on	• No electrical power	• Press the reset button to turn on the heater. If the same problem arises again call and Authorized Service Technician
		• Check fuses
	• F thermostat out of order	• Check electrical connections
		• Check the thermostat, set it and replace it if necessary
• The fan doesn't start up or starts up late	• Winding of motor burnt or interrupted	• Replace the fan motor
		• Replace the capacitor
	• Capacitor burnt (mod. "M")	• Replace the bearings
		• Replace the bearings
• The fan vibrates or makes unusual noise	• Motor bearings blocked	• Remove extraneous material
		• Remove obstacles to air circulation
	• Extraneous material on fan blades	• Call an Authorized Service Technician
• Not enough heat	• Not enough air circulation	
• Not enough heat	• Wrong burner set-up	



- |           |                      |           |                       |
|-----------|----------------------|-----------|-----------------------|
| <b>TS</b> | FANS THERMAL RELAY   | <b>SB</b> | FAN STOP CONTROL LAMP |
| <b>TM</b> | FANS TELE-CONTACTOR  | <b>PB</b> | STECKDOSE BURNER PLUG |
| <b>C</b>  | CONDENSER MOTOR      | <b>CO</b> | HOUR-COUNTER          |
| <b>PA</b> | ROOM THERMOSTAT PLUG | <b>PF</b> | HEATED FILTER PLUG    |
| <b>RE</b> | RELAY 220V/60Hz      |           |                       |









Pos.	Cod.	€	V 900/C	PART LIST
01	G04230-9005		•	Burner support
02	T10634		•	Burner plate seal 210x210x5
03	G04018-9010		•	Burner panel
04	G04019-9010		•	Outlet air panel
05	G04175-9010		•	Front upper panel
06	G01086-9010		•	Inner front upper panel
07	G01716-9010		•	Rear upper panel
08	G01718		•	Inner rear upper panel
09	G01720-9010		•	Side panel
09a	G01683-9010		•	Side front panel
09b	G01685-9010		•	Side rear panel
10	G01722		•	Inner side panel
10a	G01684		•	Inner panel front panel
10b	G01686		•	Inner panel rear panel
11	G01687-9010		•	Chimney flange Ø150
12	G01724-9010		•	Chimney panel
13	G01726-9010		•	Fan support panel
14	G01728		•	Motor support plate
15	G01730-9010		•	Bottom panel
16	G01732-9010		•	Wheel axle
17	G01691-9010		•	Front support
18	U10103-9010		•	Aluminum joint
19	G01734-9010		•	Upper front short angle steel
20	G01736-9010		•	Upper long SX angle steel
21	G01738-9010		•	Upper long DX angle steel
22	G01740-9010		•	Vertical front SX angle steel
23	G01742-9010		•	Vertical front DX angle steel
24	G01744-9010		•	Vertical back SX angle steel
25	G01746-9010		•	Vertical back DX angle steel
26	G04184-9010		•	Lower short angle steel
27	G01750-9010		•	Lower long SX angle steel
28	G01752-9010		•	Lower long DX angle steel
29	G01754		•	Comb. chamber support
30	G01703		•	Comb. chamber SX support
31	G01704		•	Comb. chamber DX support
32	G01705		•	Aluminum joint
33	U10101-9010		•	Reinforced frame
34	G01908-9010		•	Inlet grill

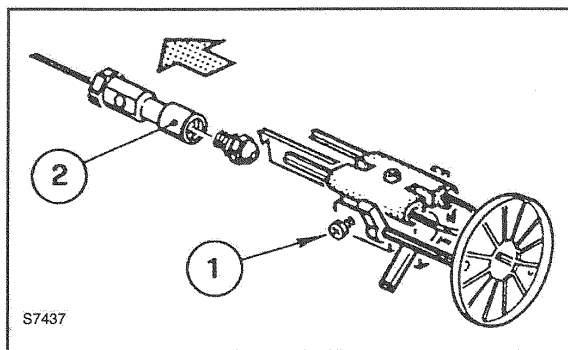
Pos.	Cod.	€	V 900/C	PART LIST
35	E10682-220		•	Motor HP 1 110/60 mono
36	E11235		•	Capacitor 70 µF
37	E11236		•	Capacitor 25 µF
38	T10230-1		•	Fan Ø300 23"
39	M20111		•	Washer Ø26xØ4x4
40	G10545		•	Wheel holder
41	M20202		•	Wheel Ø300 - Ø25
42	O2AC550		•	Kit Oil pre-heaters filter 1/4"
43	T20241		•	OR KIT Oil filter
44	B98012		•	Filter cartridge
45	G04152		•	Hoses
46	G04181-9010		•	Flask
47	G04182-9010		•	Upper back short angle steel
48	G04050-9010		•	Handle
49	G04188-9010		•	Plug
50	C30328		•	Wing nut lock
51	M20418		•	Casing front panel
52	G04190-9010		•	Flap door
53	G04191-9010		•	Burner casing top cover
54	G04194-9010		•	Burner casing SX cover
55	G04202-9010		•	Burner casing DX cover
56	G04203-9010		•	Tank casing lower panel
57	G00218		•	El. control box
58	E20719-02		•	Electrical components box
59	P30159		•	Bulbs holder
60	C30712		•	Clip
61	E50748		•	Thermo stat TV95 30/60 °C Campini
62	E50749		•	Thermos t TV95H 120 °C Campini
63	E50747		•	Thermos t TV95 0/60 °C Campini
64	E50750		•	Safety thermostat plastic profile
65	C30343		•	Cable protection Ø19
66	G00221		•	El. control box
67	G00222		•	Electrical components box
68	G00223		•	Cable fastener PG 13.5
69	E20707-55		•	Ring nut PG13.5
70	E20949		•	Contacto Wmex KN22-00 V110-60
71	E20950		•	Contacto Wmex KN16-10 V230
72	E10419		•	Plate for electrical components
73	E10446		•	Terminal board 12 el. rmmq 10
74	G04042		•	Hour-counter support plate
75	E20301		•	Hour-counter
76	G04041		•	Control knob
77	S10104		•	Red pilot lamp Ø12 V230
78	E11019		•	Thermostat plug 3P + T
79	E20640		•	Plate plug 3P + T
80	E20677		•	Plate plug 4P + T
81	E20678		•	Relay Finder 65.31 AC
82	E11120		•	Relay flange
83	G04207		•	Thermostat plug 4P + T
84	E20639		•	Drain plug

Pos.	Cod.	€	V 900/C	PART LIST
84	G01773		•	Combustion chamber
85	G01672		•	Baffle plate
86	G01673		•	Chimney seal 438x248x5
87	T10635		•	Chimney sea 551x248x5
88	G01760		•	Chimney cover
89	I25001		•	Female plug 1"
90	G04209		•	Centrifuge air fan
91	G04210		•	Reinforced frame
92	G01767-9010		•	Fan panel
93	G01675-9010		•	Protection grille
94	G01769-9010		•	Motor HP 2 220/60 mono
95	P30137		•	Motor HP 3 220/60 mono
96	E10683-220		•	Sheaves Ø105 Var. Ø24
97	E10684-220		•	Sheave Ø160 1B Ø25
98	C10904		•	Protection grille
99	P30141		•	Seal 3x15
100	C30401		•	Capacitor 70 µF
101	E11237		•	Capacitor 50 µF
102	E11236		•	Mounting plate on fan case
103	G02001		•	Motor support plate
104	G01998		•	Screw TE M12x55
105	M10234		•	Nut M12
106	M10221		•	Screw TE M12x55
107	G04214-9005		•	Crankcase
108	G04215-9005		•	Belt B43
109	C10923		•	Belt B50
110	C10930		•	Fan AT 12/12
111	AN007-1		•	Fan AT 15/15
112	AN008-1		•	El. components box 80x80

## Not Shown

HWP 110121 - Wix Fuel Filter  
HWP 24390 - Replacement Element

## NOZZLE PLACEMENT



**A)** Remove the NOZZLE ADAPTER (2) from the DRAWER ASSEMBLY by loosening the SCREW (1).

**B)** Insert the proper NOZZLE into the NOZZLE ADAPTER and tighten securely (Do not overtighten).

**C)** Replace adapter, with nozzle installed, into drawer assembly and secure with screw (1).

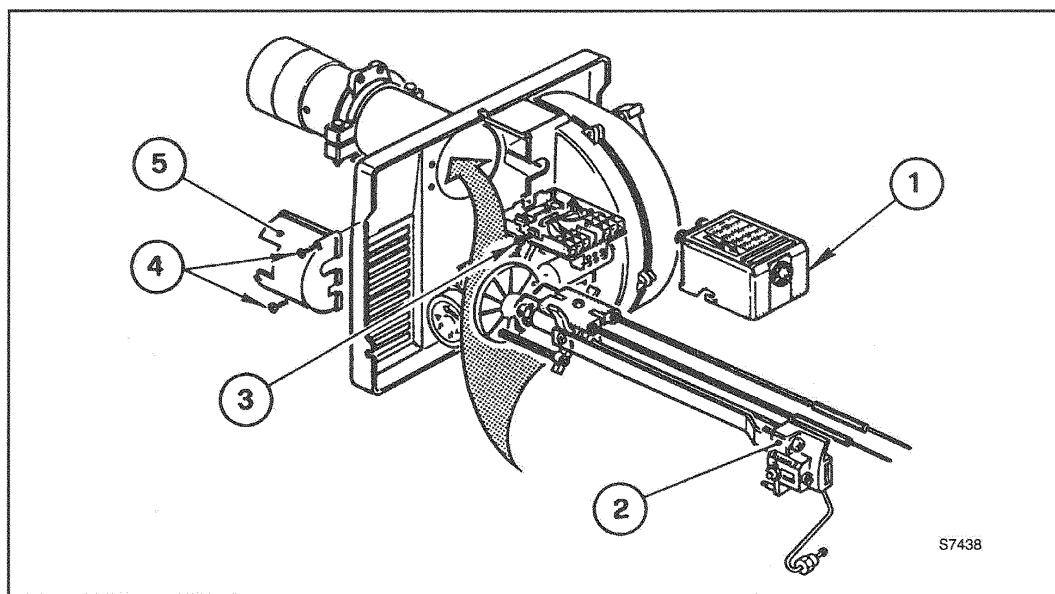
## INSERTION/REMOVAL OF DRAWER ASSEMBLY

To remove drawer assembly, loosen SCREW (3), then unplug CONTROL BOX (1) by carefully pulling it back and then up.

**B)** Remove the AIR TUBE COVER PLATE (5) by loosening the two retaining SCREWS (4).

**C)** Loosen SCREW (2), then slide the complete drawer assembly out of the combustion head as shown.

**D)** To insert drawer assembly, reverse the procedure in items A to C above, then attach fuel line to the pump.

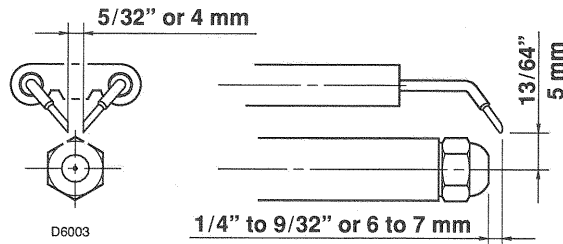




## ELECTRODE SETTING

### IMPORTANT:

THESE DIMENSIONS MUST BE OBSERVED AND VERIFIED.

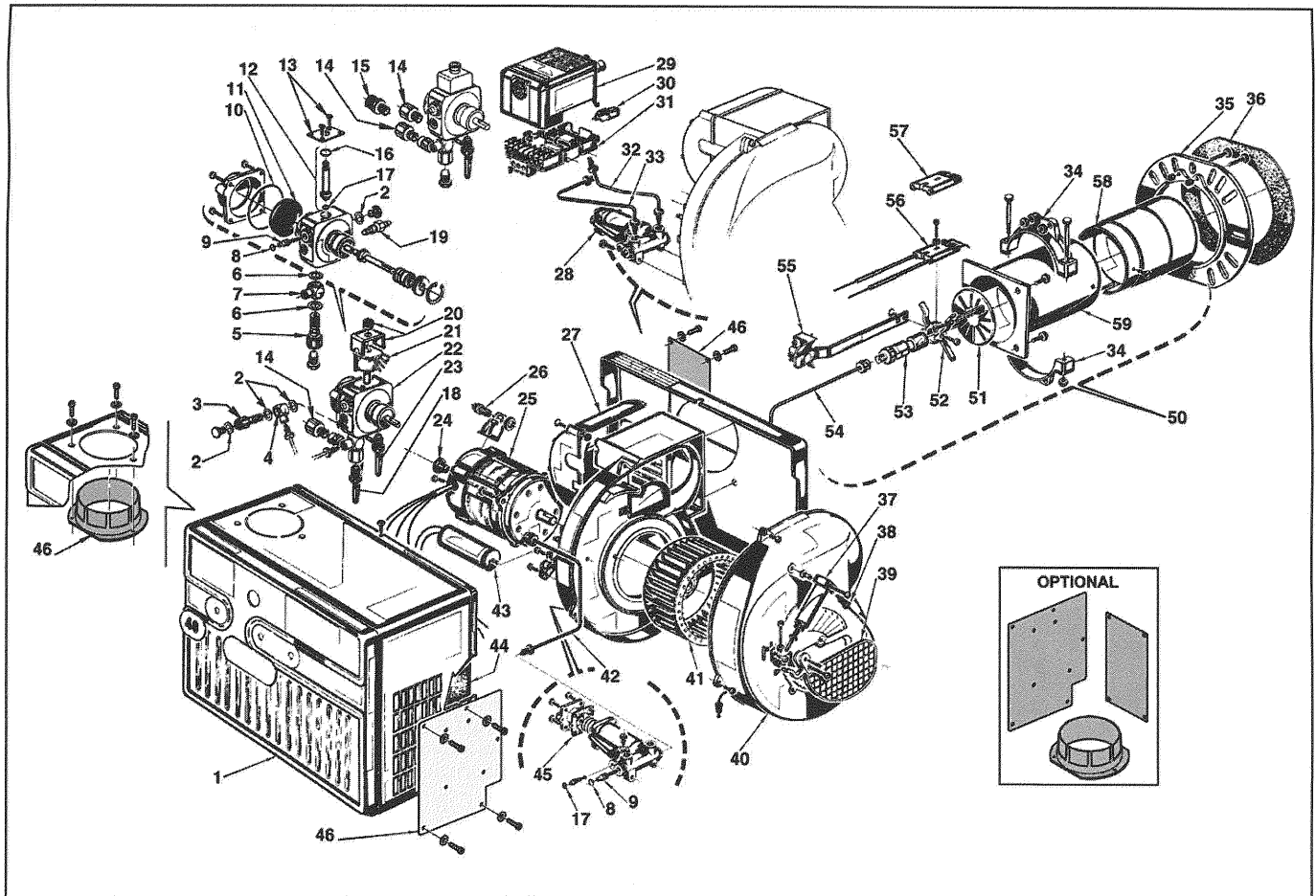
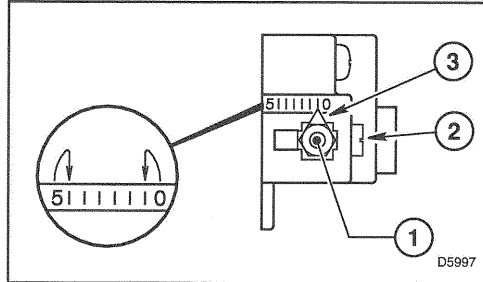


## TURBULATOR SETTING

A) Loosen NUT (1), then turn SCREW (2) until the INDEX MARKER (3) is aligned with the correct index number as per the Burner Set-up chart, on page 12.

B) Retighten the RETAINING NUT (1).

**NOTE:** Zero and five are scale indicators only. From left to right, the first line is 5 and the last line 0.



## SPARE PARTS LIST

No.	CODE SPARE PARTS	DESCRIPTION	No.	CODE SPARE PARTS	DESCRIPTION
1	3020510	Burner Back Cover	38	3008050	Capillary Tube
2	3007077	Crushable Metal Washer	39	3000645	Hydraulic Air Shutter
3	3005771	Banjo Core Adapter - Pressure Port	40	3007211	Air Intake Housing
4	3005803	Banjo Fitting - Pressure Port	41	3005799	Fan
5	3005804	Banjo Core Adapter - Return Line	42	3005857	Nozzle Oil Tube Extension
6	3007079	Crushable Metal Washer	43	3005846	Capacitor 16 $\mu$ F
7	3005805	Banjo Fitting - Return	44	3007358	Acoustic Liner
8	3007028	O-Ring - Pump Pressure Regulator	45	3005801	Gasket
9	3007202	Regulator Screw			<b>OPTIONAL</b>
10	3007162	O-Ring - Pump Cover	46	3002762	Ducted Combustion Air Intake Kit
11	3005719	Pump Screen			
12	3006925	Valve Stem			
13	3007203	Valve Stem Plate			
14	3005847	1/4" NPT/ Metric Adapter - Female	50	3949271	<b>Short Combustion Head 5" (275T1)</b>
15	3006571	3/8" NPT/Metric Adapter - Male			
16	3007029	O-Ring - Valve Stem Upper	51	3005897	Turbulator Disc
17	3007156	O-Ring - Valve Stem Lower	52	3005896	Cross - casting
18	3006995	Pipe connector - Return	53	3006965	Nozzle Adapter
19	3007893	Bleeder	54	3006987	Nozzle Oil Tube - Short
20	3006553	Coil U-Bracket and Knurled Nut	55	3005900	Regulator assembly - Short
21	3002279	Coil	56	3005902	Electrode assembly - Short
22	3007806	Pump	57	3005869	Electrode Porcelain
23	3006994	Pipe connector - Supply	58	3005894	End Cone
24	3000443	Pump Drive Key	59	3005892	Short Air Tube
25	3005845	Motor			
26	3005858	Union - Nozzle Tube / Extension	50	3949272	<b>Long Combustion Head 10" (275T2)</b>
27	3007318	Air Tube Cover			
28	3006500	Hi Fire Delay Valve	51	3005897	Turbulator Disc
29	3001157	Primary Control 530SE/C	52	3005896	Cross - casting
30	3002280	Photo-cell	53	3006965	Nozzle Adapter
31	3002278	Primary Control Sub Base	54	3006988	Nozzle Oil Tube - Long
32	3005809	Oil Pressure Tube	55	3005901	Regulator assembly - Long
33	3005808	Oil Return Tube	56	3005903	Electrode assembly - Long
34	3005849	Semi Flange	57	3005869	Electrode Porcelain
35	3005851	Universal Mounting Flange	58	3005894	End Cone
36	3005852	Mounting Gasket	59	3005893	Long Air Tube
37	3006499	Hydraulic Jack			

## ACCESSORIES



**DUCTING**

#WD2025 - 20" x 25'



**PUMP PRESSURE GAUGE**

#99AM003