



342 N. Co. Rd. 400 East
Valparaiso, IN 46383
219-464-8818 • Fax 219-462-7985
www.heatwagon.com

Installation and Maintenance Manual

Please retain this manual for future reference.

HRF115

**Infrared
Construction
Heater**



SN 96004001 and beyond



For your safety: 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.

Never Use The Heater In Spaces Which Are Not Sufficiently Sized Or Ventilated For The Heater Being Utilized.

Not for home or recreational vehicle use!

IMPORTANT INFORMATION! READ FIRST

The heater is designed for use as a construction heater under ANSI Z83.7a-1993. Heater is not intended for use in pest remediation. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration, or repair and to provide emergency heat. Properly used, the heater provides safe, economical heating. Products of combustion are vented into the area being heated.

The heater **IS NOT** designed as an Unvented Gas Fired Room Heater under ANSI-Z21.11.2 and **SHOULD NOT** be used in the home.

ANSI A119.2(NFPA 501C)-1987 Recreational Vehicle Standard prohibits the installation or storage of LP-gas containers even temporarily inside any recreational vehicle. The standard also prohibits the use of Unvented Heaters in such vehicles.

NFPA-58 1989 STANDARD FOR THE STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES AND THE NATURAL GAS AND PROPANE INSTALLATION CODE, CSA B149.1

Use of the heater must be in accordance with this Standard and in compliance with all governing state and local codes. Storage and handling of propane gas and propane cylinders must be in accordance with standard for the storage and handling of liquified petroleum gases, ANSI/NFPA 58 and CSA B149.1, natural gas and propane installation code and all local governing codes.

We cannot anticipate every use which may be made for our heaters. **CHECK WITH YOUR LOCAL FIRE SAFETY AUTHORITY IF YOU HAVE QUESTIONS ABOUT LOCAL REGULATIONS.**

Other standards govern the use of fuel gases and heat producing products in specific applications. Your local authority can advise you about these.

FOR YOUR SAFETY

DO NOT USE THIS HEATER IN A SPACE WHERE GASOLINE OR OTHER LIQUIDS HAVING FLAMMABLE VAPORS ARE STORED OR USED.

Installation and Maintenance Manual

Model HRF115

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.

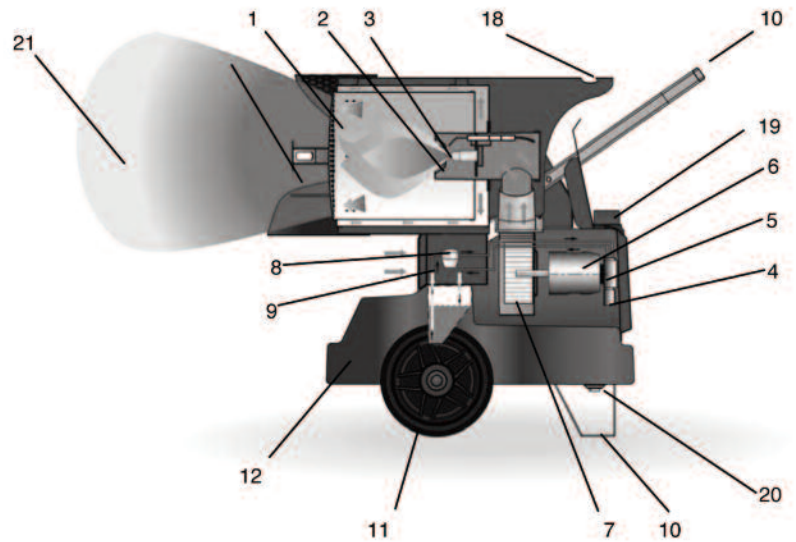
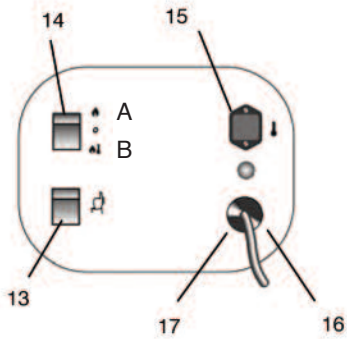
Travel time, mileage and shipping charges will not be allowed. Minor adjustments of heaters are dealers' responsibility. Defective parts must be tagged and held for possible return to the factory for 60 days from date of repair. The factory will provide a return goods authorization, (RGA) for defective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

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



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OPERATING DIAGRAM



1 COMBUSTION CHAMBER

2 BURNER

3 NOZZLE

4 SOLENOID VALVE

5 DIESEL PUMP

6 MOTOR

7 FAN

8 FUEL FILTER

9 FUEL CIRCUIT

10 SUPPORT/HANDLE

11 WHEEL

12 FUEL TANK

13 RESET BUTTON WITH CONTROL LAMP

14 MAIN SWITCH
A - without thermostat
B - with thermostat

15 ROOM THERMOSTAT PLUG

16 CONTROL LAMP

17 POWER CORD

18 HANDLE

19 FUEL CAP

20 DRAIN PLUG

21 HEAT FLOW

| TECHNICAL SPECIFICATIONS | | HRF115 | |
|-----------------------------------|-----------|-----------------------|-----|
| Max heating output | [BTU/h] | 115.159 | |
| Fuel consumption | [gal/h] | 0.849 | |
| Power supply | Phase | 1 | |
| | Voltage | [V] | 120 |
| | Frequency | [Hz] | 60 |
| Power consumption | [W] | 175 | |
| Nozzle | [USgal/h] | 0.60 x 80 S | |
| Pump pressure | psi | 166 | |
| Adjustment of combustion air flap | [in] | 0.125 | |
| Tank capacity | [USgal] | 11.35 | |
| Noise level at 1 m | [dBA] | 69 | |
| Dimensions, L x W x H | [in] | 35.24 x 20.94 x 31.81 | |
| Weight | [lb] | 92.5 | |

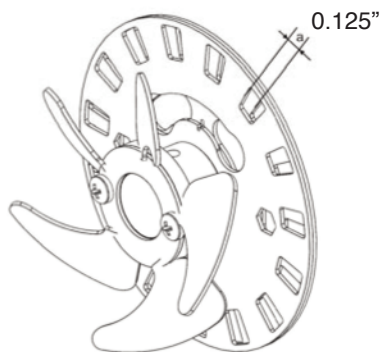


Fig 1

IMPORTANT

Before using the heater, read and understand all instructions and follow them carefully. The manufacturer is not responsible for damages to goods or persons due to improper use of units.

GENERAL RECOMMENDATIONS

The heater described in this manual is a portable oil-fueled infrared heat generator running on heating oil.

Its easy handling and large fuel tank allow it to be used locally and temporarily with complete stand-alone operation. The area to be heated is therefore hit by an even and uniform flow of heat, as can be seen by the shape of the irradiation cone (18), without air movement.

The unit is a direct combustion hot generator that works by sending both hot air and combustion products in the room you wish to heat: all the necessary precautions must therefore be taken to guarantee a sufficient exchange of air.

Always follow local ordinances and codes when using this heater:

- Read and follow this owner's manual before using the heater;
- THE INSTALLATION OF THE UNIT SHALL BE IN ACCORDANCE WITH THE REGULATIONS OF THE AUTHORITIES HAVING JURISDICTION. Also, as a recommended installation practice reference should be made to the current issue of CSA B139, Installation Code for Oil Burning Equipment in Canada and NFPA 31 Standard for the Installation of Oil-Burning Equipment In the USA;
- Use only in places free of flammable vapours or high dust content;
- Never use heater in immediate proximity of flammable materials (the minimum distance must be 10 feet);
- Make sure fire fighting equipment is readily available;
- Make sure sufficient fresh outside air is provided according to the heater requirements. Direct combustion heaters should only be used in well vented areas in order to avoid carbon monoxide poisoning;
- A rough estimate of opening required for each gallon (US) of capacity is three square foot at heater level, for direct-fired heaters;
- The heater is installed and connected to an electrical switchboard;
- Ensure that the machine resting surface or ground is not made of flammable material;
- Minimum clearances from combustible material must be:
 - 30" from side and rear (air inlet) of heater
 - 80" from ceiling
 - 40" on air outlet of heater.
- Never block air inlet (rear) or air outlet (front);
- In case of very low temperatures add kerosene to the heating oil;
- Before starting the heater always check free rotation of ventilator;
- Make sure heater is always under surveillance and keep children and animals away from it;
- Connect the power cord to the mains and wait 15 min at least before starting heater, to allow pre-heated filter warming heating oil inside the filter;
- Heater is not ductable.
- Unplug heater when not in use.

SAFETY DEVICES

The unit is fitted with an electronic flame control box. In case of malfunction this box will cut in and stop the heater, at the same time the pilot lamp in the control box reset button (13) will light up.

Warning



The reset push-button emits a different light, depending on the state of the machine:

- off, when the machine is running regularly;
- red, when the machine is in safety lock-out mode: to restart it, the reset button (13) must be pressed.

Heaters are also equipped with an overheat thermostat safety cut out which will stop the heater in case of overheating. This thermostat will reset automatically but you will have to depress button (13) on control box before being able to restart the heater.

OPERATION

Before any attempt of starting the heater is made, check that your electrical supply conforms to the data on the model plate.

Warning

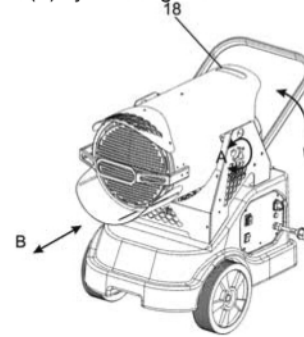


Mains must be fitted with a breaker switch.

Unit plug must be linked to a socket with a mains switch.

The hot generator must be placed on a flat, stable and level surface to avoid machine tipping and/or gas oil leakage from the tank fuel cap.

The flow of heat can be directed upward with an approximately 5° angle: loosen the two locking knobs (A) and tilt the combustion unit by pressing on the handle (18) until the desired angle is reached, then lock the knobs (A) by screwing them.



Warning




Before start-up, always ensure the guard (B) has been completely pulled out, so as to guarantee maximum protection of the machine resting surface.

You can run the generator in manual by setting switch (14) to ON. The heater can only work automatically when a control device, such as for example a thermostat is connected to the generator.

Connection to the heater is made by removing the socket cover (4) and inserting the thermostat plug.

To start the machine you must:

- if connected to the thermostat, turn the switch to (ON + );
- if not connected to the thermostat, turn the switch to (ON).

When unit is started for the first time or is started after the oil tank has been totally emptied, the flow of oil to the burner may be impaired by air in the circuit. In this case the control box will cut out the heater and it might be necessary to renew the starting procedure once or twice by depressing the reset button (13).

Should the heater not start, check that oil tank is full and depress reset button (1).

Should the heater still not work, please refer to chapter "OBSERVED FAULTS, CAUSES AND REMEDIES".

STOPPING THE HEATER

Set main switch (14) on "0" position or turn thermostat or other control device on lowest setting.

The flame goes out and the fan continues to work for approx. 90 sec. cooling the combustion chamber.

TRANSPORT

Before heater is moved, it must be stopped and unplugged. Before moving the heater wait till it has totally cooled off and make sure oil tank cap is securely fixed.

Warning



During handling and transport fuel may leak: the tank fuel cap cannot guarantee sealing to allow the introduction of air and tank emptying during machine operation.

For handling in short to medium distances, it is enough to grab the generator by the handle and roll it on its wheels. In case of need, the generator can be lifted using ropes or chains secured to the hook (19) provided on the machine. In this case it is always best to ensure that the ropes and/or chains are securely hooked and that they are intact and stably in place before handling.

MAINTENANCE

Preventive and regular maintenance will ensure a long trouble free life to your heater.

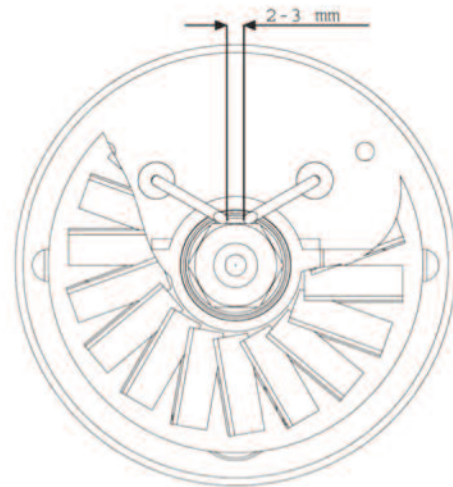
Warning



Never service heater while it is plugged in, operating or hot. Severe burns or electrical shock can occur.

Every 50 hours of operation: disassemble filter and wash with clean oil, remove upper body parts and clean inside and ventilator with compressed air, check correct attachment of H.T. connectors to the

electrodes and check H.T. cables, remove burner assembly, clean and check electrode settings, adjust according to the following scheme.



Troubleshooting

| OBSERVED FAULT | CAUSE | REMEDY | |
|---|--|---|---|
| • Motor does not start, no ignition | • No electrical current | • Check mains | |
| | | • Check proper positioning and functioning of switch | |
| | | • Check fuse (control board) | |
| | • Wrong setting of room thermostat or other control (thermostat) | • Thermostat or other control defective | • Check correct setting of heater control. If thermostat, make sure selected temperature is higher than room temperature |
| | | | • Replace control device |
| | | | • Replace electrical motor |
| | | | • Replace electrical motor |
| • Electrical motor bearings defective | • Replace electrical motor | | |
| • Burned out capacitor | • Replace capacitor | | |
| • Motor starts, no ignition or cuts out | • Electric ignitor defective | • Check connection of H.T. leads to electrodes and transformer | |
| | | • Check electrodes setting (see scheme Fig. 2) | |
| | | • Check electrodes for cleanliness | |
| | | • Replace H.T. transformer | |
| | • Flame control box defective | • Replace control box | |
| | • Photocell defective | • Clean or replace photocell | • Confirm that air flap(37), diffuser ring(38) and air adjustment disc(39) are clean and adjusted to provide an open line of sight for flame sensor |
| | | | • Check state of motor-pump plastic coupling |
| | • Not enough or no fuel at all at burner | • Check fuel line system including fuel filter for possible leaks | • Clean or replace oil nozzle |
| | | | • Check electrical connection |
| | | | • Clean or replace solenoid |
| • Solenoid defective | • Replace | | |
| • Motor starts, heater emits smoke | • Not enough combustion air | • Make sure air inlet and outlet are free | |
| | | • Check setting of combustion air flap (Fig1, pg. 5) | |
| | | • Clean burner disc | |
| | • Too much combustion air | • Check setting of combustion air flap (Fig1, pg. 5) | |
| | • Fuel contaminated or contains water | • Drain fuel in tank with clean fuel | • Clean or replace oil filter |
| | | | • Check fuel line and filter for possible leaks |
| | • Air leaks in fuel circuit | • Check pump pressure | |
| | • Not enough fuel at burner | • Clean or replace fuel nozzle | • Check pump pressure |
| • Replace nozzle | | | |
| • Too much fuel at burner | • Replace nozzle | | |
| • Heater does not stop | • Solenoid defective | • Replace solenoid coil or complete solenoid | |

If heater is still not working properly, please call Heat Wagon Tech Service.

| 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 |



1. DIAGNOSTICS

If the control unit is in lockout status, by keeping the reset push-button pressed for about 5 seconds, the diagnostics routine will be activated and the cause leading to the lockout condition will be displayed. Pressing the reset push-button again enables to reset the device and to terminate the diagnostics routine. The following table shows a description of the diagnostics messages provided by the red LED blinking:

| No. blinks of red LED | Description |
|-----------------------|---|
| 2 | Flame failure at the end of TS |
| 4 | Extraneous light / Flame simulation at start-up |
| 7 | Flame failure in running status |
| 8-14 | Internal failure |

FOR 2 RED BLINKS CAUSE MAY BE:

- No flame at 1st start up (review page 12 and 13)
- Other causes may be defective over heat limit switch (check for continuity)

FOR 4 RED BLINKS CAUSE MAY BE:

- Photocell senses light before start- up (make sure cover is on and photocell installed properly)

FOR 7 RED BLINKS CAUSE MAY BE:

- Out of fuel
- Filter or nozzle blocked
- Broken fuel line (intake sucking air)
- Bad photocell
- Overheat limit switch tripped

2. SIGNALLING DURING OPERATION

In the various operating conditions, the device can signal its operating status by means of a multicolour LED located on the on-board lockout signal. The meaning of the colours is the following:







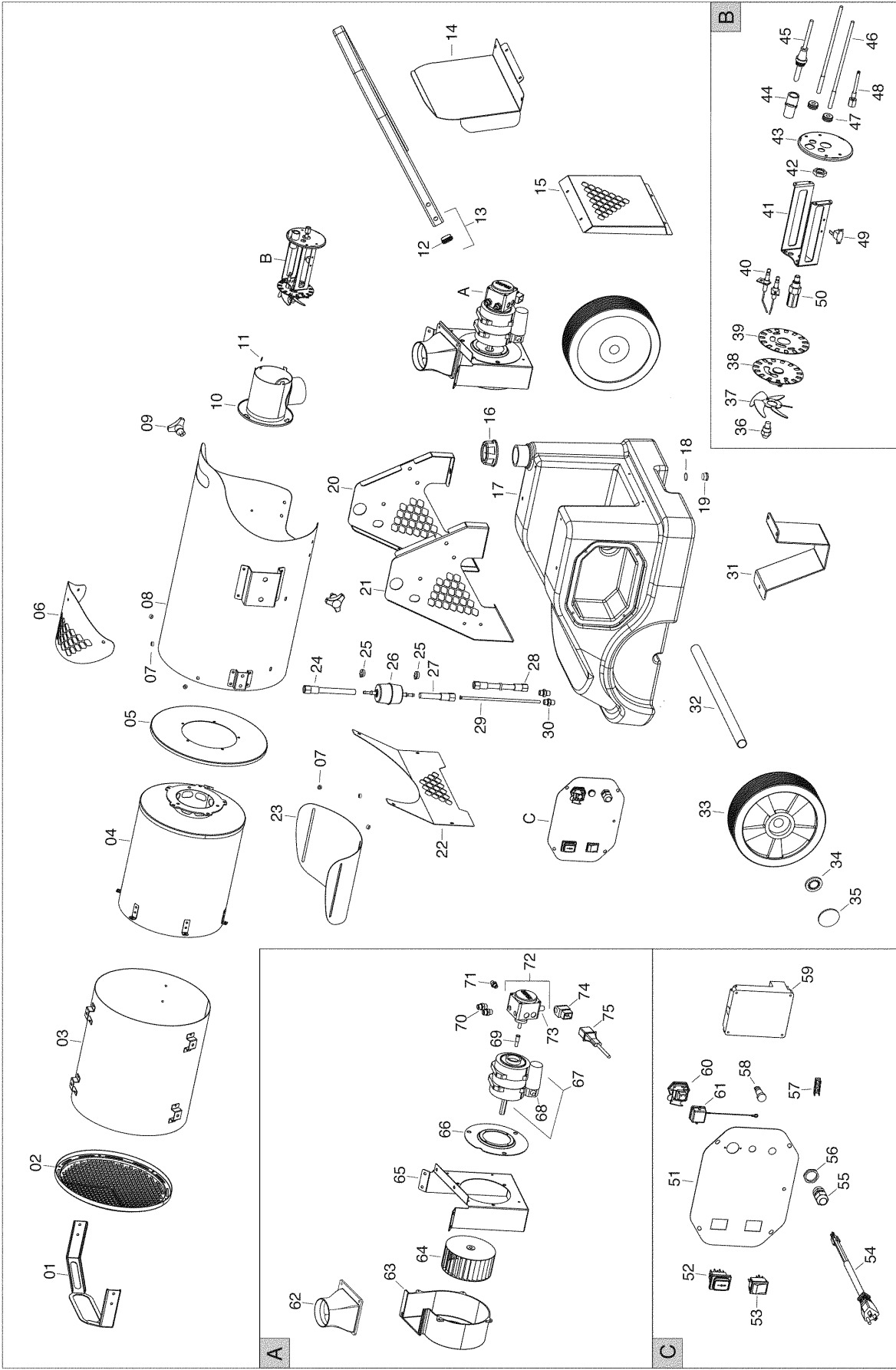
| | |
|---|---|
|  | Green: Prepurge time (TP) – Ignition (TS) - Operating (RP) |
|  | Orange: Cooling of the transformer |
|  | Red: Lockout position (LO) |
|  | Flashing Green: Stand-by position (SY) |
|  | Flashing Orange: Stand-by position (SY) with presence of spurious flame |
|  | Green + Flashing Orange: Prepurge time (TP) with presence of spurious flame |

Fig. 6 – Meaning of LED signals

3. RESETTING THE CONTROL UNIT

When the control unit goes to non-volatile lockout, to reset the system press the reset push-button till the lockout signal turns off (< 5 seconds).

- Non-volatile lockout (manual reset), in order to reset the system, the reset button must be pressed (less than 5 seconds).
- Volatile lockout, turn selector switch to OFF position, hold reset button for a least one minute, red light should go out, let control board “reboot” for at least another minute before attempting to start again.



G11089

| POS | P/N | DESCRIPTION |
|-----|-----------------|----------------------------|
| 01 | BIE G11089 | Bumper |
| 02 | BIE G11052 | Front disc |
| 03 | BIE G11053 | Insulating panel |
| 04 | BIE G11054 | Combustion chamber |
| 05 | BIE G11055 | Rear disc |
| 06 | BIE G11056-N500 | Upper protective panel |
| 07 | BIE M20820 | Spacer |
| 08 | BIE G11057-9010 | Body |
| 09 | BIE C10714 | Handwheel |
| 10 | BIE G11058 | Blast tube |
| 11 | BIE E20671 | Terminal board |
| 12 | BIE C30361 | Pipe cap |
| 13 | BIE P20304-9005 | Handle |
| 14 | BIE G11059-9010 | Panel |
| 15 | BIE G11060-9010 | Panel |
| 16 | BIE C30383 | Tank cap |
| 17 | BIE P50150 | Fuel tank |
| 18 | BIE C30375 | O-ring |
| 19 | BIE I25020 | Drain cap |
| 20 | BIE G11061-9010 | Panel |
| 21 | BIE G11062-9010 | Panel |
| 22 | BIE G11063-9010 | Panel |
| 23 | BIE G11064-N500 | Lower protective panel |
| 24 | BIE I40347 | Flex diesel pipe 14" |
| 25 | BIE C30729 | Clip |
| 26 | BIE I30414 | Filter |
| 27 | BIE I40327 | Flex diesel pipe 7" |
| 28 | BIE I40348 | Flex diesel pipe 11.8" |
| 29 | BIE I30696 | Suction pipe |
| 30 | BIE I30737 | Brass fitting |
| 31 | BIE G11065-9005 | Support |
| 32 | BIE G11066-9005 | Wheel axle |
| 33 | BIE C10504 | Wheel |
| 34 | BIE M20204 | Elastic washer |
| 35 | BIE C10513-N | Black wheel cover |
| 36 | BIE T20339 | .60 x 80° S |
| 37 | BIE G11069 | Air flap |
| 38 | BIE G11068 | Diffuser ring |
| 39 | BIE G11070 | Air adjustment disc |
| 40 | BIE E10248 | Ignition electrode |
| 41 | BIE G11020 | Electrodes support stirrup |
| 42 | BIE I31034 | Brass lock nut |
| 43 | BIE G11071 | Burner support disc |

| POS | P/N | DESCRIPTION |
|-----|-----------------|-----------------------|
| 44 | BIE E50327-40 | Photoresistor support |
| 45 | BIE E50335 | Phototransistor |
| 46 | BIE G02089 | H.T. Cable connect. |
| 47 | BIE C30368 | Cable protection |
| 48 | BIE I40339 | Micropipe 18" |
| 49 | BIE E50109 | Safety thermostat |
| 50 | BIE I33007 | Nozzle support |
| 51 | BIE G11072-9010 | El. control box panel |
| 52 | BIE E10102-P | Switch |
| 53 | BIE E10140 | Reset button |
| 54 | BIE E30443-1 | Power cord |
| 55 | BIE E20964 | Cable fastener |
| 56 | BIE E20965 | Cable fastener nut |
| 57 | BIE E20319 | Ground terminal board |
| 58 | BIE E11033 | Lamp |
| 59 | BIE E40125 | Flame control box |
| 60 | BIE E20640 | Thermostat plug |
| 61 | BIE E20665 | Thermostat plug cover |
| 62 | BIE C10331 | Elbow connection |
| 63 | BIE C10323 | Scroll |
| 64 | BIE T10296 | Fan |
| 65 | BIE G11073-9010 | Fan support bracket |
| 66 | BIE G11074-9010 | Motor support bracket |
| 67 | BIE E10769 | Motor |
| 68 | BIE E10769-1 | Capacitor 14 uF |
| 69 | BIE E10698 | Motor-pump coupling |
| 70 | BIE I20104 | Iron fitting |
| 71 | BIE I20115 | Iron fitting |
| 72 | BIE T20448 | Diesel pump |
| 73 | BIE T20117 | Solenoid valve body |
| 74 | BIE T20118 | Solenoid coil |
| 75 | BIE T20442 | Solenoid valve cable |

NOTE: Not shown

ACC-THIDF Optional remote thermostat w/50' cord

BIE E10325 Slow fuse 6.3A

FOOT / HANDLE ASSEMBLY INSTRUCTION

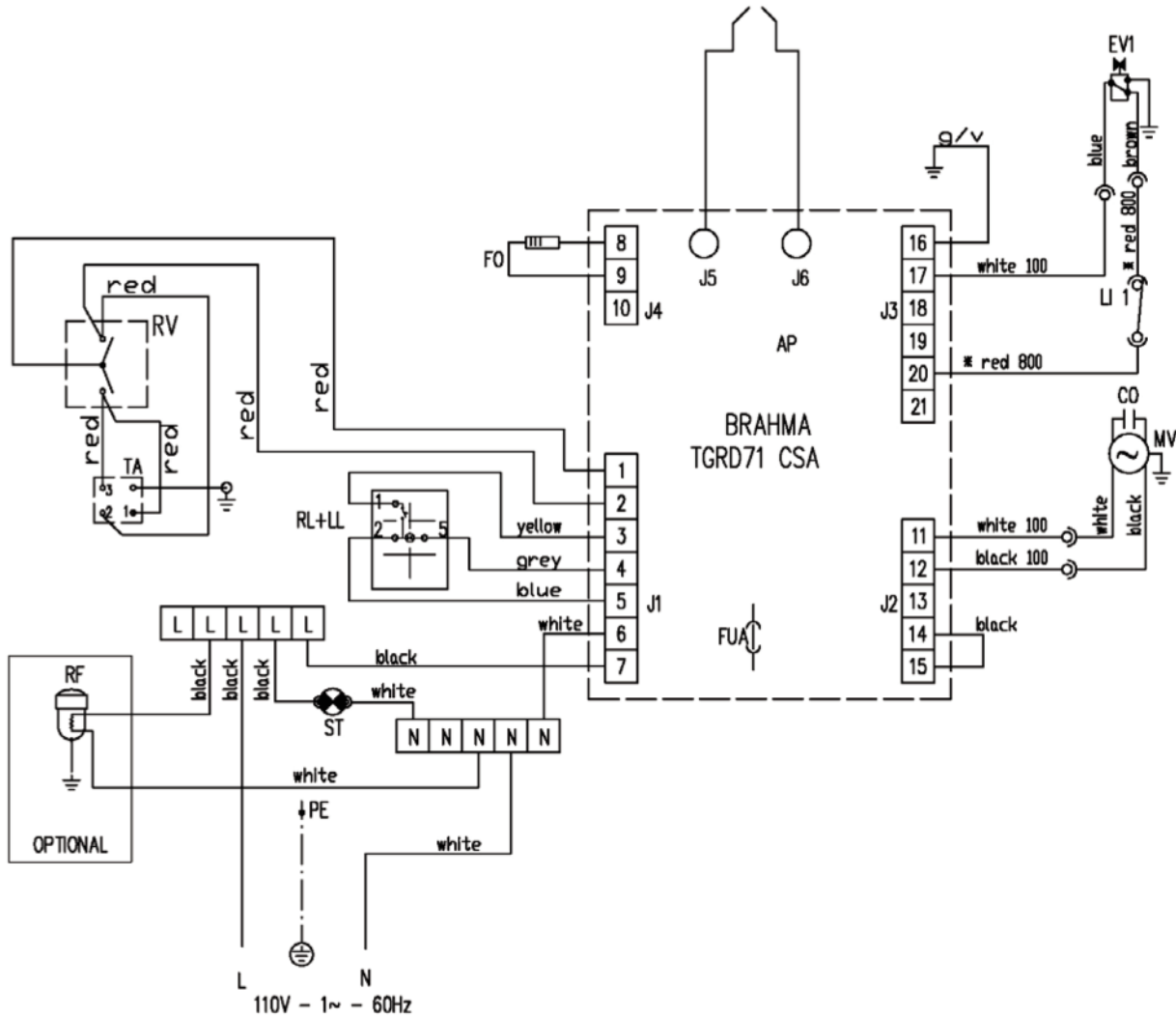
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| | | | N° |
|---|--|------------------------|----|
| A | | TE M5x12 | 4 |
| B | | TBEI M8x25 | 4 |
| C | | TE M5x20 | 3 |
| D | | Ø8xØ17x1,5 | 4 |
| E | | TE M8x16 | 3 |
| F | | Metal wheel holder Ø25 | 2 |
| G | | Plastic plug | 2 |

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WIRING DIAGRAM



AP CONTROL BOX

TA ROOM THERMOSTAT PLUG

LI1 OVERHEAT THERMOSTAT

EV1 SOLENOID VALVE

FO PHOTOCCELL

CO CAPACITOR

MV BURNER MOTOR

FUA FUSE BIE E10325

RV SWITCH

ST ELECTRIC PILOT

RF HEATED FILTER >> OPTIONAL

RL RESET BUTTON

LL LOCK OUT INDICATOR LIGHT

RV1 SWITCH

TD TRANSFORMER H.V.

