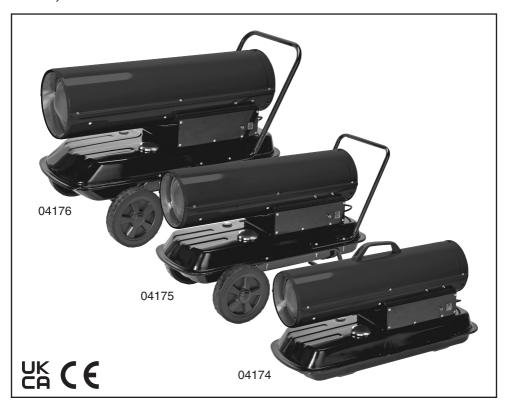




# **DIESEL HEATER**

04174, 04175 & 04176



These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

# TITLE PAGE

#### 1.1 INTRODUCTION:

**USER MANUAL FOR: DIESEL HEATERS** 

Stock nos. 04174, 04175, 04176. Part nos. DSH58, DSH68, DSH108

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Date first published June 2021.			

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: http://drapertools.com/manuals

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## 1.3 UNDERSTANDING THIS MANUAL'S SAFETY CONTENT:

Warning! - Information that draws attention to the risk of injury or death.

Caution! - Information that draws attention to the risk of damage to the product or surroundings.

## 1.4 COPYRIGHT © NOTICE:

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# 3. GUARANTEE

#### 3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact:

Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England. Telephone Sales Desk: (023) 8049 4333 or Product Helpline (023) 8049 4344.

A proof of purchase **must** be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase except where tools are hired out when the guarantee period is 90 days from the date of purchase. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

**Note:** If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights. **Draper Tools Limited.** 

## 4. INTRODUCTION

#### 4.1 SCOPE

This heater is designed to heat large, semi-open areas by means of combustion of Diesel or Kerosene fuel, and is electrically operated.

This product is suitable for the enthusiasts and tradespersons alike. Any application other than that it was intended for, is considered misuse.

#### 4.2 SPECIFICATION

Stock no	04174	04175	04176
Part no	DSH58	DSH68	DSH108
Motor:			
Rated voltage	220-240V~	220-240V~	220-240V~
Rated frequency	50Hz	50Hz	50Hz
Rated input	200W	220W	225W
Heat output	51,200BTU/15kW	68,250BTU/20kW	102,300BTU/30kW
Air flow	400m³/hr	450m³/hr	600m³/hr
Fuel	Diesel	Diesel	Diesel
Diesel consumption	1.4Ltrs/hr	1.87Ltrs/hr	2.8Ltrs/hr
Tank capacity	19Ltr	19Ltr	33Ltr
Weight	15kg	16.5kg	24kg
Dimensions (approx.)	. 700 × 310 × 430mm	840 × 390 × 490mm	950 × 480 × 590mm

### 4.3 HANDLING & STORAGE

- This machine should be stored in a dry location and in its box. Avoid storing this machine in areas prone to damp or humidity.
- Remove residual fuel from the fuel tank if storing for several months.

#### 5.1 GENERAL HEATER SAFETY WARNINGS

MARNING: Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. Save all warnings and instructions for future reference.

### 1. Work area safety

- Keep work area clean and well lit. Cluttered or dark areas invite accidents.
- Do not operate heaters in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Heaters create sparks which may ignite the dust or fumes.
- Keep children and bystanders away while operating a heater. Distractions can cause you to lose control.

#### 2. Electrical safety

- Heaters plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) heaters. Unmodified plugs and matching outlets will reduce risk of electric shock.
- Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.
- Do not expose heaters to rain or wet conditions. Water entering a heater will increase the risk of electric shock.
- Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the heater. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.
- When operating a heater outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.
- If operating a heater in a damp location is unavoidable, use a residual current device (RCD) protected supply. Use of an RCD reduces the risk of electric shock.

#### 3. Personal safety

- Stay alert, watch what you are doing and use common sense when operating a heater.
   Do not use a heater while you are tired or under the influence of drugs, alcohol or medication.
   A moment of inattention while operating heaters may result in serious personal injury.
- Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
- Prevent unintentional starting. Ensure the switch is in the off position before connecting to power source.
- Remove any adjusting key or wrench before turning the heater on. A wrench or a key left attached to a rotating part of the heater may result in personal injury.
- Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewellery or long hair can get sucked into the in moving parts of the heater.

#### 4. Heater use and care

DO NOT move the heater when it is in operation or when plugged into the mains supply. Only move heater once it has cooled and it has been unplugged.

- Use the correct heater for your application. The correct heater will do the job better and safer at the rate for which it was designed.
- Do not use the heater if the switch does not turn it on and off. Any heater that cannot be controlled with the switch is dangerous and must be repaired.
- Disconnect the plug from the power source before making any adjustments. Such preventive

safety measures reduce the risk of starting the heater accidentally.

- Store idle heater out of the reach of children and do not allow persons unfamiliar with the heater or these instructions to operate the power tool. Heaters are dangerous in the hands of untrained users.
- Maintain heaters. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the heaters operation. If damaged, have the heater repaired before use. Many accidents are caused by poorly maintained heaters.
- Use the heater, in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the heater for operations different from those intended could result in a hazardous situation.

#### 5. Service

Have your heater serviced by a qualified repair person using only identical replacement parts.
 This will ensure that the safety of the heater is maintained.

**WARNING:** Diesel fuel is carcinogenic. Take care when transporting, refuelling and storage of diesel fuel. Always clean up fuel spills with regard to local legislative requirements.

**WARNING:** Before using this heater please read this OPERATING INSTRUCTION very carefully. This USER'S MANUAL has been designed to instruct you as to the proper manner in which to assemble, maintain, store, and most importantly, how to operate the heater in a safe and efficient manner.

♠ DANGER: Improper use of this heater can result in serious injury or death from burns, fire, explosion, electrical shock, and/or carbon monoxide poisoning.

**WARNING:** Risk of Burns/Fire/Explosion!

- NEVER use fuels such as petrol, benzene, paint thinners, or other oil compounds in this heater (RISK OF FIRE OR EXPLOSION)
- NEVER use this heater where flammable vapours may be present
- NEVER refill the heater's fuel tank while heater is operating or still hot. This heater is EXTREMELY HOT while in operation
- Keep all combustible materials away from this heater.

Use only diesel or kerosene fuel according to EN 267. For details please refer to your fuel supplier or contact your dealer.

**WARNING:** Never leave the heater unattended while burning!

MARNING: Risk of Indoor Air Pollution!

- Use this heater only in well ventilated areas!
- Provide at least a three square foot (2,800 sq cm) opening of outside air for every 25,000Kcal/hr of heater rating.
- People with breathing problems should consult a physician before using the heater.
- Carbon Monoxide Poisoning: Early signs of carbon monoxide poisoning resemble flu-like symptoms such as headaches, dizziness, and/or nausea. If you have these symptoms, your heater may not be working properly.
- Get fresh air at once! Have the heater serviced. Some people are more affected by carbon monoxide than others. These include pregnant women, those with heart or lung problems, anaemia, or those under the influence of alcohol, or at high altitudes.
- Never use this heater in living or sleeping areas.

## NARNING: Risk of Electric Shock!

- Use only the electrical power (voltage and frequency) specified on the model plate of the heater. Use only a three-prong, grounded outlet and extension cord.
- ALWAYS install the heater so that it is not directly exposed to water spray, rain, dripping water, or wind.
- ALWAYS unplug the heater when not in use.

Minimum Clearances

Outlet: 8 feet (250cm).

Sides, Top and Rear: 4 feet (125cm).

- NEVER block air inlet (rear) or air outlet (front) of heater.
- NEVER use duct work in front or at rear of.
- NEVER move or handle heater while still hot.
- NEVER transport heater with fuel in its tank.
- DO NOT use with any form of external thermostat or remote starting device.
- ALWAYS locate heater on a stable and level surface.
- ALWAYS keep children and animals away from heater.
- Use 1-K kerosene in this heater. #1 fuel oil is a suitable substitute.
- Bulk fuel storage should be a minimum of 25ft from heaters, torches, portable generators, or other sources of ignition. All fuel storage should be in accordance with National, state, or local authorities.

#### 5.2 CONNECTION TO THE POWER SUPPLY

CAUTION: Risk of electric shock. Do not open.

This appliance is supplied with an approved plug and cable for your safety. The value of the fuse fitted is marked on the pin face of the plug. Should the fuse need replacing, ensure the substitute is of the correct rating, approved to BS1362 and ASTA or BS Kite marked.

ASTA ≪sta>

BSI ♥

The fuse cover is removable with a small plain slot screwdriver. Ensure the fuse cover is replaced before attempting to connect the plug to an electrical outlet. If the cover is missing, a replacement must be obtained or the plug replaced with a suitable type.

If a replacement plug is to be fitted this must be carried out by a qualified electrician.

The damaged or incomplete plug, when cut from the cable shall be disabled to prevent connection to a live electrical outlet.

This appliance is Class I<sup>†</sup> and is designed for connection to a power supply matching that detailed on the rating label and compatible with the plug fitted.

If an extension lead is required, use an approved and compatible lead rated for this appliance. Follow all the instruction supplied with the extension lead.

†Earthed \( \delta \): This product requires an earth connection to protect against electric shock from accessible conductive parts in the event of a failure of the basic insulation.

#### 6. **TECHNICAL DESCRIPTION**

#### 6.1 **IDENTIFICATION**



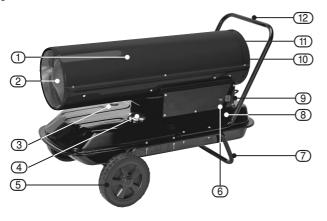
- Upper shell.
- 23456789 Hot air outlet.
- Fuel gauge.
- Fuel cap.
- Lamp.
- Fuel tank.
- ON/OFF switch.
- Pressure gauge.
- Fan guard.
- Handle.





- Upper shell.
- Hot air outlet.
- Fuel gauge.
- Fuel cap.
- 12345678 Wheel.
- Lamp.
- Wheel support frame.
- Fuel tank.
- ON/OFF switch.
- (10) Handle.

04176



- Upper shell.
- Hot air outlet.
- Fuel gauge.
- Fuel cap.
- Wheel.
- Lamp.
- Wheel support frame.
- Fuel tank.
- ON/OFF switch.
- 10 Pressure gauge.
- Fan guard. (11)
- Handle.

## 7. UNPACKING & CHECKING

## 7.1 PACKAGING

Carefully remove the product from the packaging and examine it for any sign of damage that may have happened during shipping. Lay the contents out and check them against the parts list provided. If any part is damaged or missing; please contact the Draper Helpline (the telephone number appears on the Title page) and do not attempt to use the product.

The packaging material should be retained at least during the guarantee period: in case the heater needs to be returned for repair.

Warning! Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.

If any of the packaging is to be thrown away, make sure they are disposed of correctly; according to local regulations.

## 8. ASSEMBLING THE HEATER

## 8.1 HANDLE (04174) - FIG.1

- Align the holes in the upper housing with the two holes in the handle.
- Insert and tighten screws securely with screw driver.

# 8.2 WHEEL AND HANDLE (04175 & 04176) – FIG.2

- Slide axle (6) through wheel support frame
   (8). Install wheel spacers (5) if provided.
   Install wheels (4) on axle (6).
- IMPORTANT: When installing wheels 4, point extended hub of wheels toward wheel support frame 8. Secure wheels onto axle using split pins.
- Place cap nuts (7) on axle ends. Gently tap with hammer to secure.
- Place heater on wheel support frame (8).
   Line up holes on fuel tank flange with holes on wheel support frame (8).
- Place handle(s) on top of fuel tank flange.
   Insert screws ① through handle(s) ②, fuel tank flange, and wheel support frame ⑧.
   Attach nut finger tight after each screw is inserted.
- After all screws are inserted, tighten nuts firmly.

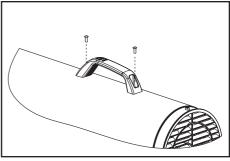


FIG.1

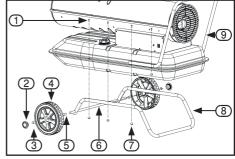


FIG.2

# 9. OPERATING THE HEATER

#### 9.1 STARTING HEATER – FIG.3

- Follow all ventilation and safety information.
- Locate heater to provide maximum circulation of the heated air. Follow all location requirements noted in Safety Information on page 6.
- Fill fuel tank with #1#2 diesel/fuel oil until fuel gauge points to "F".
- Attach fuel cap.
- Power supply. If using an extension cord, it MUST be suitable for the heater. Check with extension cord manufacturer if in doubt to confirm application.
- For heater with ON/OFF ① switch, push switch to ON(I) position and heater should start in 5 seconds.

NOTE: If the heater still does not start, push Power Switch to "OFF", then back to "ON". If heater still does not fire, see Troubleshooting Guide

NOTE: The electrical components of this heater are protected by a fuse mounted in the PC board. If the heater fails to fire, check this fuse first, and replace if necessary. Also check the power source to be sure that the proper voltage is being provided to the heater.

## 9.2 TO STOP HEATER - FIG.3

Simply turn the Power switch to "OFF" position and unplug the Power Cord.

#### 9.3 TO RESTART THE HEATER

- Wait ten seconds after shutting off heater.
- Turn the Power Switch to "ON" position.
- Be sure to follow all starting procedure precautions.

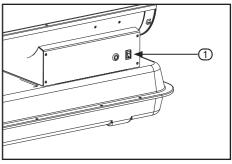


FIG.3

## 10. STORING & TRANSPORTING THE HEATER

# 10.1 STORING & TRANSPORTING THE HEATER – FIG.4

If shipping, transport companies require fuel tanks to be empty.

- Drain fuel tank. Note: Drain plug on underside of fuel tank. Remove drain plug to drain all fuel.
- Replace drain plug ①.
- If any debris is noted in old fuel, add 1 or 2 quarts of clean kerosene to tank, stir, and drain again. This will prevent excess debris from clogging filters during future use.
- Replace fuel cap or drain plug ①. Properly dispose of old and dirty fuel. Check with local automotive service stations that recycle oil.
- If storing, store heater in dry place. Make sure storage place is free of dust and corrosive fumes.

IMPORTANT: Do not store kerosene over summer months for use during next heating season. Using old fuel could damage heater.

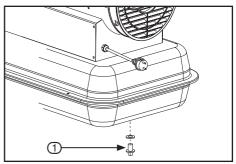


FIG.4

Use only original equipment replacement parts. The use of alternate or third party components can cause unsafe operating conditions, and will void your warranty. We suggest following a maintenance schedule as follows.

WARNING: ENSURE HEATER HAS FULLY COOLED AND DISCONNECT FROM POWER SUPPLY BEFORE CONDUCTING ANY MAINTENANCE.

#### 11.1 FUEL/FUEL TANK

 Flush every 200 hours of operation or as needed. Do not use water to flush the tank. Use fresh Diesel or Kerosene ONLY.

### 11.2 AIR FILTERS - FIG.5

- The Air Intake Filter ③ should be replaced or washed with soap and water and dried thoroughly every 500 hours of operation, or less, depending on conditions.
- The Output ② and Lint ① Filters should be replaced every 500 hours of operation or less, depending on conditions.

NOTE: Use of diesel may require additional maintenance.

#### 11.3 FAN BLADES - FIG.6

- Blades should be cleaned at least once per heating season, depending on conditions.
- Remove all accumulated dust and dirt with a damp cloth, taking care not to bend any of the fan blades.
- Be sure fan blades are dry before re-starting the heater.

#### 11.4 NOZZLES - FIGS.7-8

- Nozzles should be cleaned or replaced at least once per heating season. Contaminated fuel could make this necessary immediately.
- To clean dirt from nozzle, blow compressed air through nozzle front. It may be necessary to soak nozzle in clean Diesel or Kerosene ONLY to help loosen any particles.

NOTE: Use of diesel may require additional maintenance. Using this heater without proper maintenance or with contaminated or old fuel may lead to improper combustion and possible soot production. BE SURE FUEL USED IS APPROVED.

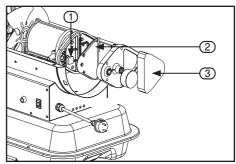


FIG.5

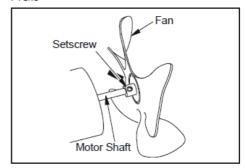


FIG.6

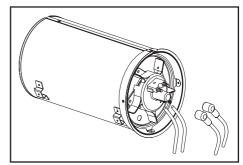


FIG.7

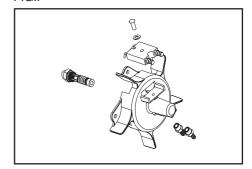


FIG.8

### 11.5 SPARK PLUG - FIG.9

 Clean and re-gap every 600 hours of operation, or replace as needed. After removing the Spark Plug ②, clean the terminals with a wire brush. Re-gap (1) the terminals to 3.5mm.

### 11.6 PHOTOCELL - FIGS.10-11

- The Photocell ① should be cleaned at least once per heating season or more depending on conditions. Use a cotton swap dipped in water or alcohol to clean the lens ② of the Photocell.
- Reposition the photocell correctly Fig.11.
  - (3) Photocell bracket.
  - (4) Photocell.
  - (5) PC board.

### 11.7 FUEL FILTER – FIG.12

- The Fuel Filter should be cleaned at least twice per heating season by rinsing it in clean Diesel or Kerosene.
- Contaminated fuel could make this necessary immediately
- 1. Remove side cover screws using nut-driver.
- 2. Remove side cover (2).
- 3. Pull upper fuel line off fuel filter neck
- 4. Carefully pry bushing, fuel filter ①, and lower fuel line out of fuel tank
- 5. Wash fuel filter with clean fuel and replace in tank
- 6. Attach upper fuel line to fuel filter neck.
- 7. Replace side cover.

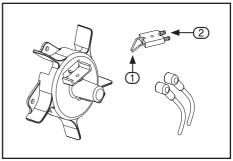


FIG.9

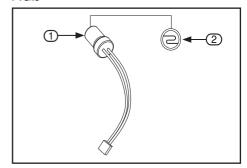


FIG.10

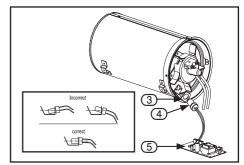


FIG.11

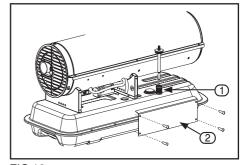


FIG.12

### 11.8 PUMP ROTOR - FIGS.13-14

- (Procedure if Rotor is Binding)
- 1. Remove upper shell
- 2. Remove filter end cover screws using nut driver
- 3. Remove filter end cover and air filters.
- 4. Remove pump plate screws using nut-driver.
- 5. Remove pump plate.
- 6. Remove rotor (2), insert (1), and blades (3).
- 7. Check for debris in pump. If debris is found, blow out with compressed air.
- 8. Install insert (1) and rotor.
- 9. Check gap on rotor (FIG.14). Adjust to 0.08/0.12mm if needed using gap adjust screw 4. Note: Rotate rotor 2 one full turn to ensure the gap is 0.08/0.12mm at tightest position. Adjust if needed.
- 10. Install blades ③, pump plate, air filters, and filter end cover.
- 11. Replace fan guard and upper shell
- 12. Adjust pump pressure. Note: If rotor is still binding, proceed as follows.
- 13. Perform steps 1 through 6.
- 14. Place fine grade sandpaper on flat surface.
   Sand rotor lightly in "figure 8" motion four times
- 15. Reinstall insert 1 and rotor 2.
- 16. Perform steps 10 through 12.

# 11.9 PUMP PRESSURE ADJUSTMENT – FIG.15

 While heater is operating, turn relief valve clockwise to increase, counter-clockwise to decrease Use flat blade screwdriver to turn valve. Correct pump pressure is as follows:

Stock number	Pump Pressure (bar)	
04174	0.33	
04175	0.35	
04176	0.37	
Tolerance ± 10%		

 For best measurement of pressure, test with full tank of fuel. Optimum pressure occurs when the nose cone is cherry red and there are no extending flames from the heater.

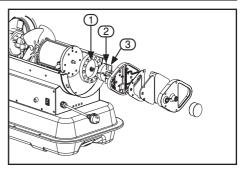


FIG.13

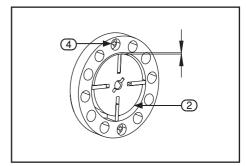


FIG.14

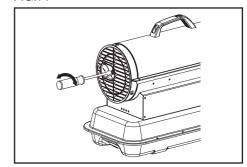
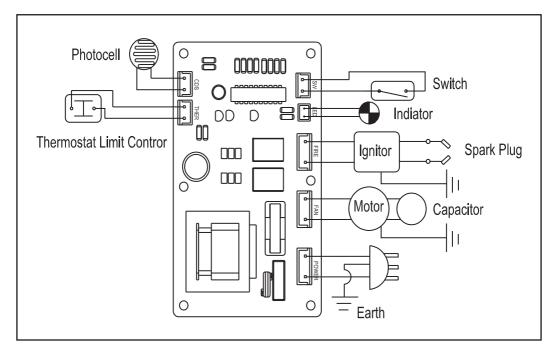


FIG.15

## 11.10 WIRING DIAGRAM - FIG.16



# 12. TROUBLESHOOTING

## 12.1 TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
	1. Incorrect pump pressure.	Adjust Pump Pressure (page 17).
	Dirty Input, Output or     Lint Filter.	Clean/replace Air Filter (page 15).
	3. Dirty Fuel Filter .	3. Clean/replace Fuel Filter (page 16).
Heater fires, but Main PCB shuts heater off after a short	4. Nozzle is Dirty.	4. Clean/replace Nozzle (page 15).
period of time. Lamp is flickering.	5. Photocell lens is Dirty.	5. Clean/replace Photocell (page 16).
	Photocell not installed properly.	6. Adjust Photocell position (page 16).
	7. Photocell Defective.	7. Replace Photocell (page 16).
	Improper electrical connection between Main PCB and Photocell.	8. Check wiring connections (page 18).
	1. No fuel in fuel tank.	Fill tank with fresh kerosene.
	2. Incorrect pump pressure.	2. Adjust Pump Pressure (page 17).
	Corroded Spark Plug or incorrect plug gap.	3. Clean/replace Spark Plug (page 16).
	4. Dirty Fuel Filter.	4. Clean/replace Fuel Filter (page 16).
Heater will not operate, or motor runs for short time.	5. Dirty Nozzle.	5. Clean/replace Nozzle (page 15).
Lamp flickers.	6. Moisture in Fuel/Fuel Tank.	6. Rinse out fuel tank with clean fresh kerosene.
	7. Improper electrical connection between Transformer and Circuit Board.	7. Inspect all electrical connections. See Wiring Diagrams (page 18).
	Ignitor Wire not connected to Spark Plug.	8. Re-attach Ignitor wire to Spark Plug (page 16).
	9. Defective Ignitor.	9. Replace Ignitor.

# 12. TROUBLESHOOTING

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	Broken electrical     connection between     Main PCB and motor.	Inspect all electrical connections. See Wiring Diagrams (page 18).
Fan does not operate when heater is plugged in and Power Switch is in the "ON"	Temperature limit has overheated.	2.1 Push Power Switch to "OFF" and allow heater to cool for 10 minutes. Push Power Switch to back to "ON".
position. The lamp is flickering.		2.2 Clean/replace Fan (page 15).
	To stop heater operation mistake or electrical power stop.	3. Push Power Switch to "OFF" and allow heater to cool for 10 minutes. Push Power Switch to back to "ON".
	Dirty Input, Output or Lint Filter.	Clean/replace Air Filter     (page 15).
Poor Combustion and / or	2. Dirty Fuel Filter.	Clean/replace Fuel Filter (page 16).
excess soot production.	3. Poor quality of fuel.	Be sure fuel is not contaminated or old.
	4. PSI is too high or too low.	4. Use proper pressure (page 17).
	No electrical power.	Check power cord and extension cord to insure of proper connection. Test power supply.
Heater does not turn on.	2. Fuse Blown.	2. Check/replace Fuse.
	Improper electrical connection between Temperature Limit Sensor and Circuit Board.	Inspect all electrical connections. Wiring Diagrams (page 18).

# 13. DISPOSAL

## 13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- · Do not incinerate.
- Do not dispose of WEEE\* as unsorted municipal waste.



<sup>\*</sup> Waste Electrical & Electronic Equipment.

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# **CONTACTS**

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YOUR DRAPER STOCKIST

For aftersales servicing or warranty repairs, please contact the Draper Tools Help Line for details of an agent in your local area.

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