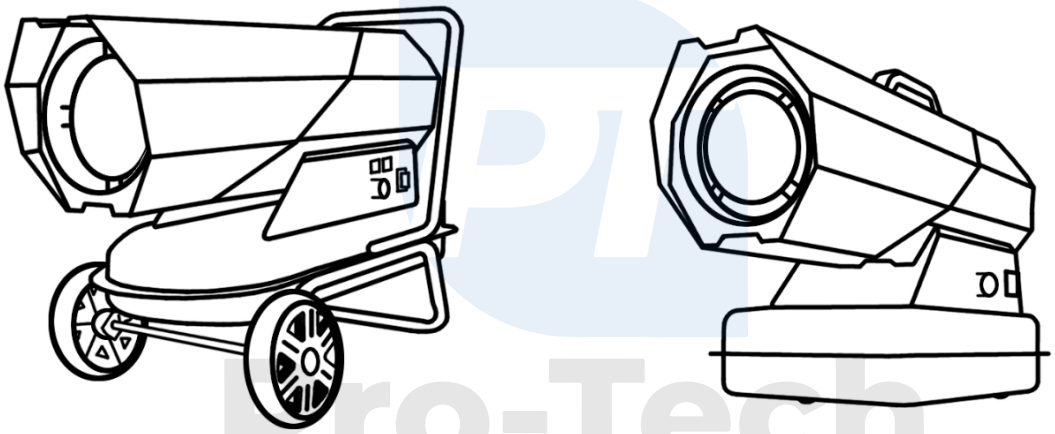
Pro-Tech TOOLS

Oil-fired direct combustion air heater



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Instructions for use

Translation of the original instructions

READ THE INSTRUCTIONS CAREFULLY BEFORE USE AND KEEP THEM WELL

Safety manual

For your own safety and the safety of others, please read and carefully follow this OPERATING MANUAL.

▲ Dangers

1. The use of gasoline is strictly prohibited; it is a highly volatile fuel that can cause explosions uncontrolled flames.

2. Never use the heater where flammable vapours may be present, there is a risk of explosion, fire and burns.

3. Always ensure sufficient ventilation during use. Only use the appliance in well-ventilated areas, the air must be changed regularly (twice an hour) during use, insufficient combustion caused by lack of oxygen can cause carbon monoxide poisoning.

▲ Notice

1. Do not use sprays where the heater is used, gas from the can can cause fire and explosion hazards.

2. Do not use the appliance in places with combustible dust (waste paper, wood fragments, fibre fragments), if this dust is sucked into the heater and heats up, flakes and sparks can be ejected and cause fire and burn hazards.

3. Never block the air inlet or heating section, it may cause abnormal combustion and fire.
4. Never modify the heater, changing it can cause malfunction and fire, it is very dangerous.
5. Do not expose the device to rain or snow, and never use it in wet places.

▲ Pay attention

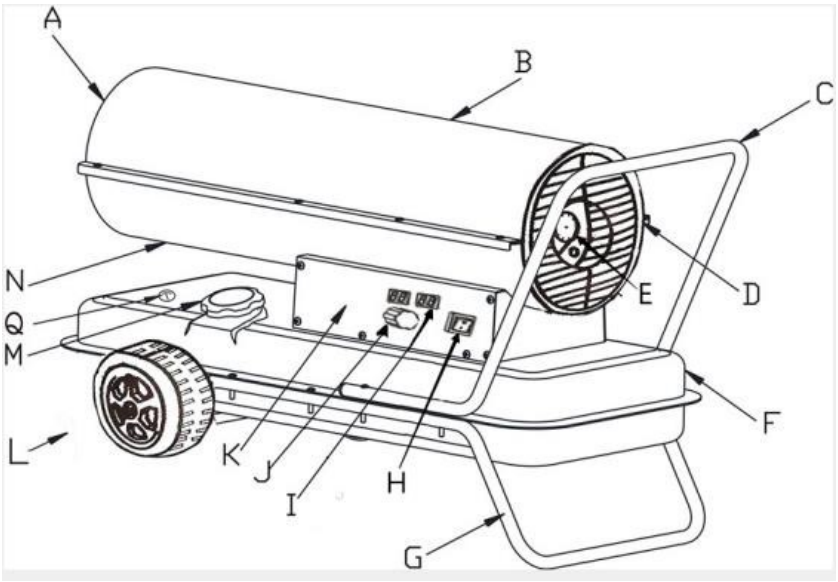
1. To prevent fire during , do not place objects on the heater. Keep all combustible materials away from the heater. Minimum clearances: outlet (front) 3M, air inlet (rear) 2M, top 2M, side 2M.

2. During operation, make sure that the surface under the heater does not overheat, overheating can cause a fire.

3. Do not fill the fuel tank when the heater is in , make sure the heater stops and the flame is extinguished. Filling during operation may cause a fire.

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Overview of the heater design



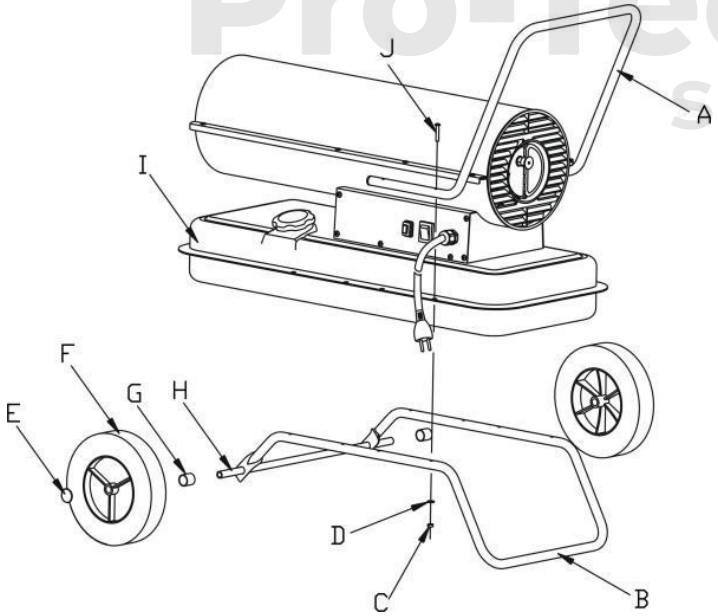
A. Hot air outlet
B. Top cover
C. Rear handle
D. Rear grille
E. Pressure gauge
F. Fuel tank
G. Bottom tube frame
H. Switch
I. Display window
J. Thermostat knob
K. Side panel
L. The Wheel
M. Fuel tank cap
N. Bottom cover
O. Fuel gauge

Installation, mounting of wheels and tubular frame

1. Insert the wheel lug into the corresponding hole of the downtube frame, adjust the bushing G at the two ends, slide the wheel F over the wheel axle H, put on the wheel cover E.

2. Fit the heater body onto the bottom tube frame B, making that the 4 holes of the handle frame are facing the corresponding 4 holes on the bottom tube frame.

3. Insert the screws J into the holes, place the flat washers D under the bottom frame B and tighten the hex bolt C.
4. Insert additional screws into the holes and tighten them in the same using a screwdriver.



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Technical parameters

Model	Power	Power	Air outlet	Fuel tank
DH-30D	220-240 V, 50 Hz	40 KW	720 m³/hr	19L
DH-20D	220-240 V, 50 Hz	30 KW	550 m³/hr	12L

Preparation before launch

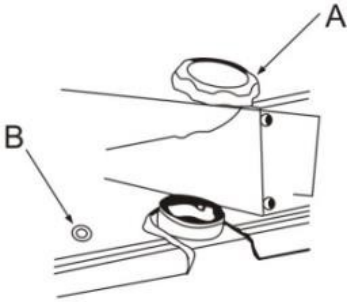
1. Never use highly volatile fuel such as petrol etc.;
2. Only fill the fuel tank when the heater stops running and the flame goes out；
3. Please do not use No.JIS1 kerosene or light diesel to protect against frostbite, never use degenerative impure kerosene；
4. When you fill the fuel tank, the tank filter must be installed；
5. When fuel oil or diesel touches the human body, wash immediately with soap to prevent possible skin inflammation；
6. The surface of the heater is very hot when the flame is extinguished, so never touch it with your hand or allow the oil pump to come into contact with the burner to prevent scalding or other injury.

- **When there is no fuel in the tank (light fuel oil or diesel):**

How to fill the tank:

1. Make sure the plug is disconnected from the power source and the power switch is in the OFF "0"；
2. Place the appliance on a stable and level surface, remove the fuel tank cap and fill the fuel tank with the fuel filter installed. Do not overfill the heater, refer to the position of the full fill level as shown in the figure；
3. Check the fuel tank for water or waste, clean the tank if it is dirty；
4、Fill fuel oil or diesel into the fuel tank with the oil pump only when the fuel is properly installed, turn the cap and tighten it after filling.

Picture (fuel)



A. Fuel tank cap

B. Fuel Meter

- When there is some fuel in the tank (light heating oil or diesel).

Pay attention!

1. Check the appliance only after the flame is extinguished and the plug is removed from the power supply；

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2. Make sure there is no leakage before lighting, when oil leaks, do not use the equipment and contact your dealer；

3. Check the inside of the fuel tank, clean the tank if there is water and waste in the tank.

Operation

Ignition warning:

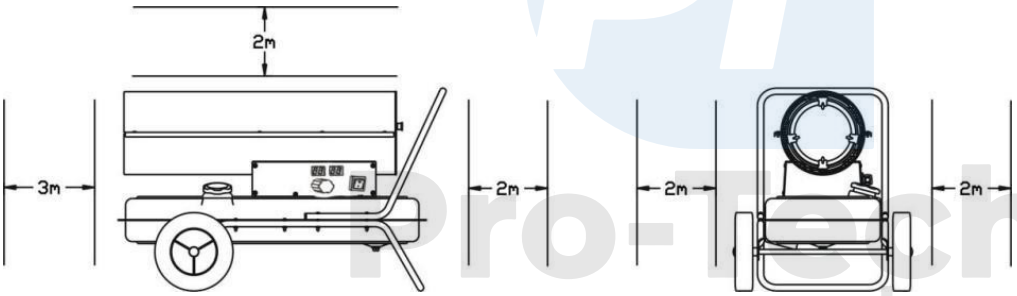
1. Check the fuel tank and make sure there is enough fuel in it;

2. After lighting, do not put your face near the heating part, keep a safe distance, min. 3 meters in front of hot air outlet, 2 meters from the top, more than 2 meters from the left and right sides. (see illustration).

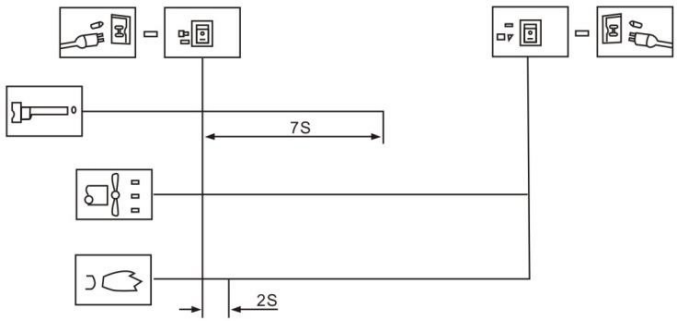
3. Stop using the appliance when smoke or a strange smell appears；

4. Before leaving the heater, make sure it is .

Safe distance



Ignition： insert **the** plug into the socket， switch the switch to "1" position, the indicator will light up, automatically light up when the set temperature is higher than the ambient temperature, on the digital LED temperature display.



If the heater does not start, turn the switch to position "0" and then to position "1". if the heater does not start after three attempts, contact your dealer.

Caution： when the heater is in , never allow the floor to overheat to avoid fire.

- Extinguishing the

flame Pay attention !

1. When turning off the heater, make sure the flame is out before leaving the appliance.

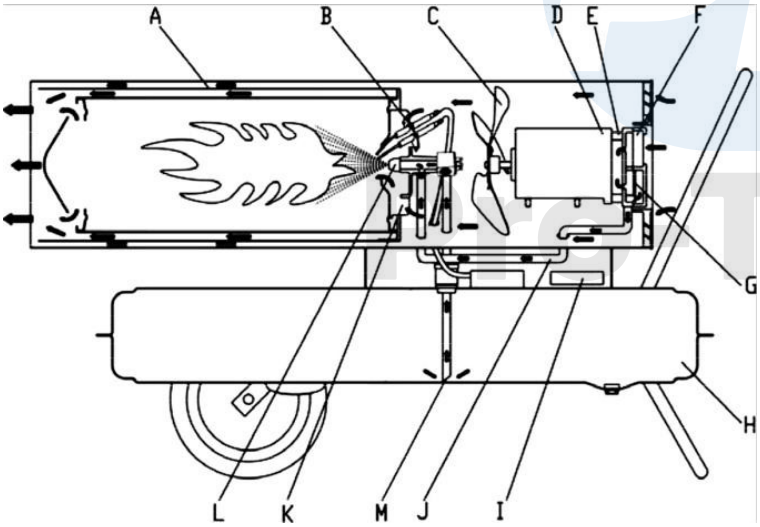
2. Switch the main switch to the "0" position, wait until the fan stops running and the indicator goes out, pull the plug from the socket.

- Safety equipment

Protection against burning/ignition: during normal operation, a photocell monitors the flame in the combustion chamber. The photosensitive resistor becomes infinitely large (thought to increase the resistance of the resistor), disconnects the Electrovalve Assy and automatically stops supplying oil .

failure protection: in the event of a power failure, the heater stops working without removing the plug from the socket. When the power is restored, the indicator will light up but the heater will not work. Press the main switch to start the heater.

Working principles



A. Combustion chamber
B. Spark plug
C. Fan blade
D. Engine
E. Pump
F. Air intake filter
G. Air outlet filter
H. Fuel tank
I. Driver
J. Air supply pipe
K. Flame stabilisation plate
L. Fuel nozzle
M. Fuel suction pipe

Description of the principles of operation:

Open the fuel filler cap and add diesel to the tank. Replace the fuel filler cap and plug the power cord into the power outlet. Turn the main switch to "1", the engine will start and the digital temperature display will light up. The left window of the display sets the temperature and the right window is the room temperature. It will automatically light when the set temperature is higher than the room temperature. It starts to operate, the spark plug will light. This heater is equipped with an electric air pump that pushes air through an air line connected to the fuel supply and then through a nozzle in the burner head. As the air passes in front of the fuel supply, fuel rises from the tank into the burner nozzle. This mixture of fuel and air is then sprayed into the combustion chamber in a fine mist. The air is blown in by the rapidly rotating fan blades:

1. enters the flame stabilization plate and the burner, adds additional oxygen to the combustion and the combustion more efficient and transfers heat from the inside of the burner to the outside

2. enters the thermal insulation layer A, removes heat from the insulation layer，so that the burner surface does not overheat. The spark plug stops working after 12 seconds of sparking.

Maintenance

Note

1. Before servicing, turn off the heater and pull the plug from the socket.
2. Never perform maintenance on the heater when fuel is in the tank.

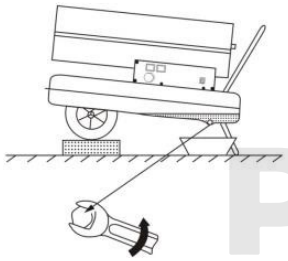
- check the fuel tank

When there is waste and water in the tank, clean and drain the fuel tank.

How to drain the fuel tank (see picture below):

1. Place the heater on the workbench and place the oil container under the fuel tank**.**
2. Use a wrench to loosen the drain screw to release the water and waste inside the tank.
3. After draining, retighten the drain screw and clean off any remaining water and oil.

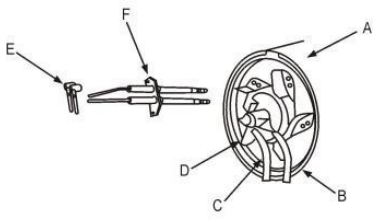
Draining the fuel tank



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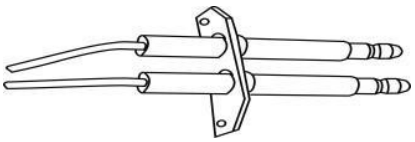
Design

- Burner head

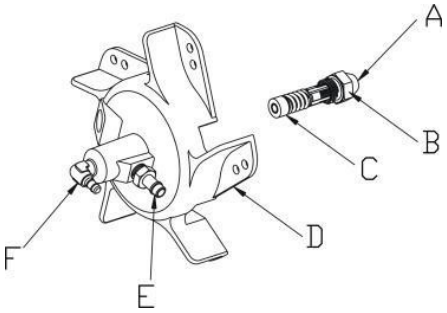


A. Burner assembly
B. Air supply pipe
C. Oil supply pipe
D. Stable flame plate
E. High voltage wiring
F. Spark plug

Spark plug - the distance between the electrodes should be in the range of 4-5 mm to achieve the best ignition result.



- Oil nozzle assembly



A. Oil nozzle

B. Nozzle core

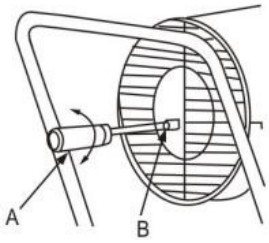
C. Sealing ring

D. Stable flame plate

E. Air pipe fittings

F. Oil pipe fittings

- Pressure setting

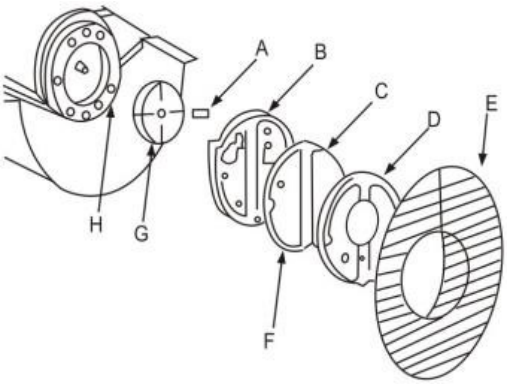


A. Screwdriver

B. Screw for pressure adjustment

- Air pump

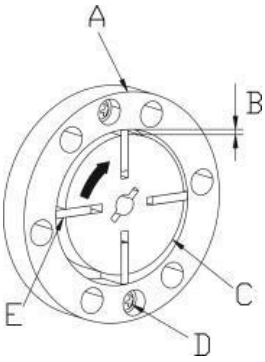
During maintenance, the air pump must be properly assembled to prevent low air pressure or air leakage.



A. Pump blade
B. Pump cover
C. Air intake filter
D. Pressure cover
E. Air inlet protective cover
F. Air outlet filter
G. Pump core
H. Connecting part
I. Pressure gauge

- Conformity between pump body and pump core

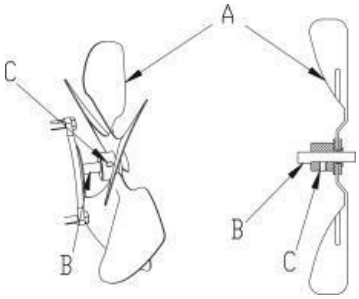
The four pump vanes were inserted into the four grooves of the pump core, which move centrifugally in the pump in , the co-operation gap between the pump casing and the pump core should be kept within 06~0.08mm to ensure that the air pump can generate sufficient pressure.



A. Pump body
B. Gap 0.06~ 0.08 mm
C. Pump core
D. Screw
E. Pump blade

- Fixing the fan blades

Install the fan blades on the motor shaft and tighten them firmly using the set screw



A. Fan blade
B. Motor shaft
C. Adjusting screw

Analysis of problems

Before sending the heater in for repair, please check the following points first, they are not errors:

The problem	Reason
Odour, smoke, or sparking on first use	It's normal. In the beginning, air and dust are mixed into the combustion. Wait for some time and the phenomenon will disappear.
Ignition on first use or when fuel is exhausted, strange noises, smell, white smoke	The air in the duct is mixed, the phenomenon disappears when the air in the duct is pushed out.
Strange sound when igniting or extinguishing the flame	The metal parts of the heater expand and contract, causing noise that is normal.
When ignited, a fire appears. Spark.	The fuel and air from the last time remained in the oil pipe of the nozzle, so the air and fuel are not mixed properly, the combustion is not smooth. Sparking is caused by carbon powder left behind, which is normal

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Troubleshooting guide - reason and solution

The problem	Possible reason	Solution
The heater stops working after a short time of operation , the screen displays E1	1. The pressure is not right 2. The inlet, outlet, or substance of the air filter is dirty 3. Diesel filter is dirty 4. Fuel oil nozzle is dirty 5. The lens of the photocell is dirty 6. Incorrect installation of the photocell 7. Damage to the photocell 8. Abnormal connection between the main circuit board and the photocell .	1. Adjust the pump pressure 2. Clean or replace the air filter with a new one 3. Clean or replace the fuel with a new one 4. Clean or replace the nozzle 5. Clean or replace the photocell with a new one 6. Adjusting the position of the photocell 7. Replace the photocell 8. Check all electrical connections
The heater does not work or the motor stops working after a short time, E1 appears on the screen.	1. Depleted fuel 2. Incorrect pressure 3. Spark plug or air fuse is corroded 4. The fuel filter is dirty 5. Fuel nozzle is dirty 6. Fuel and fuel tank are wet 7. The connection between the PCB circuit and the transformer is abnormal 8. The ignition pin and the ignition transformer are not connected 9. Faulty lighter	1. Fill the fuel tank 2. Adjust the pump pressure 3. Clean or replace the spark plug 4. Clean and replace the fuel filter 5. Clean or replace the nozzle 6. Flush the fuel tank with fresh kerosene 7. Check all electrical connections 8. Connect the ignition pin and spark plug 9. Replace the lighter
The LED display will show "E2"	Damage or dropping of the temperature probe	Replacing the temperature probe
Bad combustion / Too much smoke	1. The outlet or inlet of the air filter is dirty 2. The fuel filter is dirty 3. Poor fuel quality 4. Air pressure too high or too low	1. Clean or replace the air filter 2. Clean or replace the fuel filter 3. Make the fuel is not dirty and old 4. Adjust the air pressure
The heater cannot be switched on and the LED display shows "- - -"	1. The temperature sensor has overheated. 2. Printed circuit board fuse is blown 3. Temperature sensor is not well connected to the circuit board panel	1. Switch off the appliance and switch it on again after 10 minutes, after the heater has cooled down. 2. Check and replace the fuse 3. Check all electrical connections .

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