OnTrack Outdoor Pty Ltd
www.ontrackoutdoor.com.au
info@ontrackoutdoor.com.au

DIESEL HEATER

INSTRUCTIONS MANUAL

OnTrack Outdoor Pty Ltd
www.ontrackoutdoor.com.au
info@ontrackoutdoor.com.au

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Introduction

Overview

Thank you for purchasing your new Diesel Air Heater! We are providing this instructions manual to assist you in the installation and operation of your heater. Please take the time to read this manual thoroughly, and take special note of all safety precautions involved in operating this equipment. Your new diesel heater has many features and benefits, providing you the utility and comfort of warm air in a variety of applications, when installed and operated properly. Please contact us if you have any questions or need support at any time across the long life of your heater!

Safety Instructions

The installation, operation, and ongoing maintenance involved with this diesel heater may present particular safety hazards which are the responsibility of the unit's installer(s), owner(s) and operator(s) to safely mitigate.

This manual does NOT cover all possible safety concerns associated with the use of this heater, due to the wide range of possible applications and installation schemes. Only experienced and knowledgeable individuals should install and operator this heater system.

The manufacturer and distributor of this heating system are NOT responsible for misuse, unintended installation schemes, or modifications made to the system or its components.

Safety Information

- Save these instructions in a safe place for future reference
- Read all instructions and details before installing or operating the heater
- Use personal protective equipment (gloves, eye protection, long sleeve shirt) when handling or working near diesel fuel
- During installation, notify others in the vicinity of any potential hazards (loud tool noises, presence of diesel fuel, etc)
- During operation, notify others in the vicinity of any potential hazards (location of hot air discharge duct, presence of fuel tank, etc)
- Disconnect electrical power before servicing the heater or the control panel
- If any welding work is to be performed on the vehicle where this heater is installed, disconnect power to the LCD screen and heater unit first. Transient voltage emitted by welding equipment can damage the heater's sensitivity electronic components

- Do not service the heater immediately after operation. Allow the heater to fully cool down prior to handling any of the system's components
- In the unlikely event of overheating, the heater body and air ducting can reach a surface temperature of up to 90*C and air temperature of up to 150*C. It is critical that any objects near the unit are properly separated from the heater, and constructed of temperature-resistant materials
- Do not smoke, use an open flame, or use any sparking tools around diesel fuel
- Do not inhale fuel vapors or exhaust fumes
- Do not allow fuel to contact exposed skin
- Clean up any spilled fuel immediately

Safety Symbols & Hazards

	**General Warning!** This equipment has the potential for multiple safety concerns due to heat, fuel, electricity, faulty installation, falling / moving components, and more! Proper care must be taken!
	**Fire Hazard!** Diesel fuel can spill and ignite, starting a fire! High temperature air and surfaces can start a fire!
	**Fuel Explosion Hazard!** Diesel fuel in the fuel tank can ignite and explode!
	**Electrical Shock Hazard!** Electricity from any wiring source or across metallic surfaces can lead to shock and electrocution!
	**High Temperature Hazard!** Hot air and hot surfaces can start a fire!
	**Hot Surface and Burn Hazard!** Hot surfaces can burn and scald when touched, and ignite a fire!
	**Rotation Components Hazard!** The hot air fan rotates at high speed and can cause injury!
	**Suffocation Hazard!** Combustion air and diesel fuel fumes can displace oxygen and lead to suffocation!

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Product Information

Applications

This heater uses liquid diesel fuel and a high-powered fan to generate and circulate hot air, for the purpose of warming a target object or space. The heater requires only external electrical power and diesel fuel to operate, and can be precisely controlled by using the provided LCD panel. Common applications of this heater include:

- Heating truck cabs or vehicle and ship cabins for human occupancy and comfort
- Heating parts of construction or agricultural equipment such as for defrosting windows or operator controls
- Heating any type of ancillary vehicle areas such as ship storage rooms, cargo holds, or crawlspaces

The heater is generally approved for use in vehicle space or component heating only, and must only be operated in these applications. Using the heater for any other applications risks damage or failure due to incompatibility with the fuel, temperature, air flow, or other elements of the heater.

In particular, the heater is NOT approved for use in:

- Continuous, long-term heating of residential spaces, habitable vehicles, work or hobby spaces, or storage spaces
- Direct drying or heating of a person, animal, material, or object
- Manufacturing or industrial uses involving hot air drying, molding, dehydrating, etc
- Use in large commercial vehicles with seating for more than (9) passengers

Technical Specifications

	Model	
	2.0 kW Heater	**5.0 kW Heater**
Power Rating (W)	2,000	5,000
Heating Media	Air	
Fuel Type	Liquid Diesel	
Fuel Consumption Rate (L/Hr)	0.12 to 0.24	0.18 to .048
Electrical Voltage (V)	12V / 24V DC	
Operating Temperature (*C)	-50*C to 45*C	
Weight (KG)	3.6	5.2
Heater Body Dimensions (L x W x H, mm)	320 x 125 x 157	380 x 145 x 177

Functional Description

The heater consists of multiple separate components that altogether operate cooperatively to safely produce hot air. Each component and its function should be fully understood before installation, so that location, access, clearance, and mounting can all be considered with future service and performance in mind. The main components and their functions are as follows:

Diesel Fuel Storage Tank

Liquid diesel fuel is the energy source used to power the heater unit, and is stored in a separate plastic storage tank and plumbed over to the heater body.

Diesel Fuel Pump

An electric fuel pump is used to connect the fuel tank to the heater body, sending a steady flow of fuel into the heater for use in generating hot air.

Heater Body

The heater body is the plastic-encased housing that contains a heating element referred to as a glow plug. The glow plug uses electrical power to heat up its surface enough to ignite diesel fuel, beginning the combustion process. Once achieved, combustion will maintain continuous ignition, allowing the glow plug to de-energize and heat to be generated purely from the diesel fuel.

Combustion Air Intake

Combustion powered by liquid petroleum fuel needs oxygen in order to ignite, and so the heater body uses an air intake tube to pull in fresh combustion air from outside of the heated space.

Combustion Air Exhaust

Combustion heating has a byproduct of waste air similar to the exhaust on your automobile. The waste air from the heater body is vented safely to outside of the space via an air exhaust tube.

Hot Air Intake

The heater pulls in air from the space being heated to pass through the heater body, warming it as it's circulated via a fan.

Hot Air Discharge

Now hot, the air is blown back into the space and circulated continuously, warming the space until the desired temperature is achieved.

LCD Control Panel

Mounted nearby on the wall and serving to control the heater in a very similar way to how your home's thermostat controls your furnace, the LCD control panel is used to stop and stop the system, adjust settings, program timers, set the temperature, and read alerts and statuses messages.

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info@ontrackoutdoor.com.au

Parts Diagram and Parts List

General Components	Air Ducting Components	Fuel Components	Combustion Air Components
1– Heater Body	6 – Hot Air Intake Ducts	9 – Fuel Tank and screws	15 – Combustion Air Exhaust Duct
2 – LCD Control Screen	7 – Hot Air Intake Vents	10 – Fuel Line and clamps	16 – Fresh Air Intake Duct
3 – Key Fob / Remote	8 – T-Piece	11 – Fuel Pump	17 – Fresh Air Intake Filter
		12 – Fuel Filter	
Electrical Components		13 – Fuel Pump Mounting Bracket	**Others / Installation**
4 – Wiring Harness		14 – Fuel Pick Up Tube	18 – Silencer / Muffler
5 – Cable Ties			19 – Mounting Plate

Fuel Specification

Diesel fuel used in with this system shall be standard vehicle diesel fuel and shall be obtained from a normal commercial source where you purchase vehicle fuel.

Diesel fuel shall be clean and free of debris, particulates, additives, or other adulterations.

Diesel fuel mixes are often adjusted for varying ambient temperatures. Winter Diesel, for example, is a mix of diesel grades that accommodates extreme drops in temperature found in some geographic locations. Normally, these adjustments are made at the fuel station automatically during different times in the year. Purchase fuel grades for the location and temperatures you expect to experience, or consult with an automotive or fuel vendor for more information. Generally, the diesel grade purchased for use in a motor vehicle is equally suitable for use with this diesel heater.

The diesel heater can be used with normal vehicle-grade biodiesel alternative fuel.

For 100% Biodiesel:

The heater must be operated at minimum two times per year using standard diesel. This is to burn off any residues introduced from biodiesel fuel. For each 'clean diesel' run, operate the heater at max temperature for 30 minute on, 30 minute off intervals using standard diesel fuel, three times in a row.

For 50% Biodiesel Mix:

Intermittent 'clean diesel' runs are not necessary.

Installation

Be sure that the installer of this heater has these instructions, and has also checked any local regulations or requirements involved in the installation of this heater.

This heater kit is intended to be a stand-alone, self-contained system, independent of any existing air, fuel, or electrical control circuits that may be present in the vehicle. Do not connect this heater to any fuel delivery, fresh air makeup, hot air ventilation, combustion air, or temperature control systems.

Read all installation instructions entirely before beginning!

Getting Started

The following installation instructions are written for passenger vehicle applications.

Fully unpack and inspect all components in the heater system before starting installation. Should any part appear damaged or defective, stop installation and contact us right away.

Put on all necessary safety and personal protective equipment required for the tools and work you are about to perform. At minimum, eye protection, ear protection, and skin protection must be used.

General Considerations

Take a moment to familiarize yourself with the function of each component in the system. It is important that you understand how each piece works, so that your installation decisions consider safety and accessibility for each component as well as for the system as a whole.

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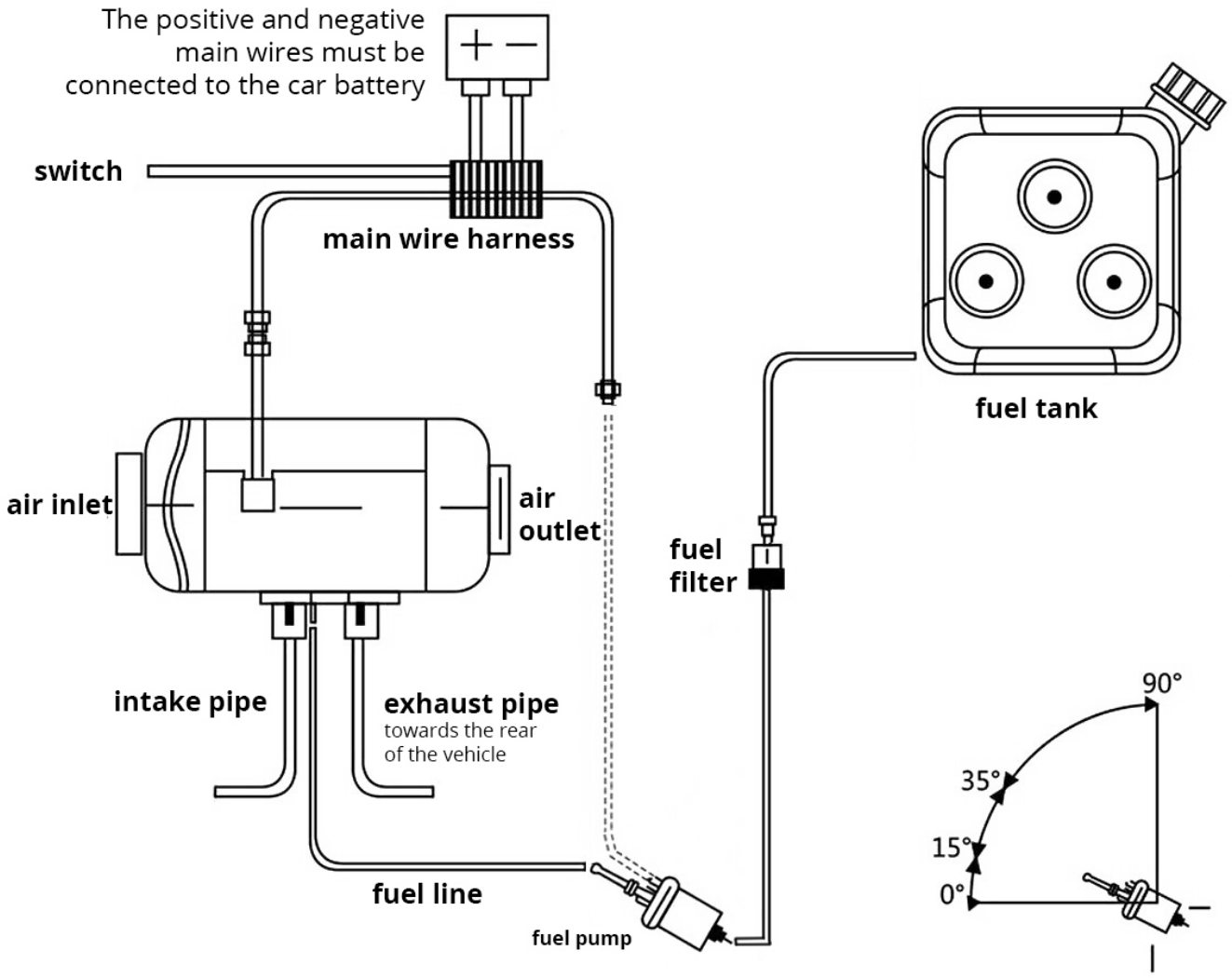
INSTALLATION DIAGRAM



NOTE: The **air inlet vent** and the **air outlet vent** must be installed with a clearance of at least 10cm for ventilation

The fuel pump is preferred to be installed in an angle between 15 and 35 degrees

Installation Location

The heater body should be located in a safe location away from road debris, passenger contact, vehicle engine heat, and impact from cargo. Ideal locations for the heater body include:

- In an open area inside of the passenger compartment
- Up high in a luggage compartment
- Inside a furniture void space
- Down low behind passenger seats

In some applications, the heater may be positioned underneath the vehicle floor, so long as it is fully protected from impact from road or other debris.

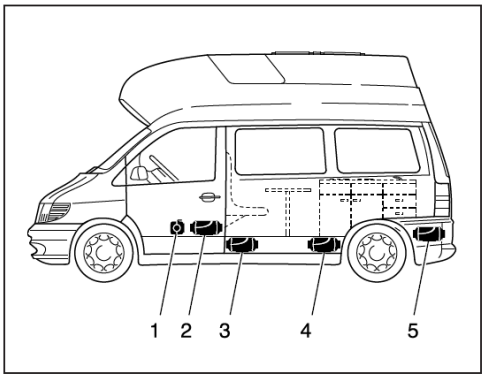
Clearances from body to other objects:

- 70mm on access cover side
- 30mm on all other sides

Once you have identified an installation location for the heater body, set the body in position and check that you have ample clearance on all sides, including space to route all ducting, wiring, and fuel tubing, as well as space to inspect and service both air ends and the unit's internals through the lid.

If the hot air intake duct is not to be used, assure a minimum clearance of 10cm on the intake end of the heater body for sufficient air flow.

Test fit the wiring harness, hot air ducting, and combustion air ducting to assure that each length can reach its destination before mounting the heater body.



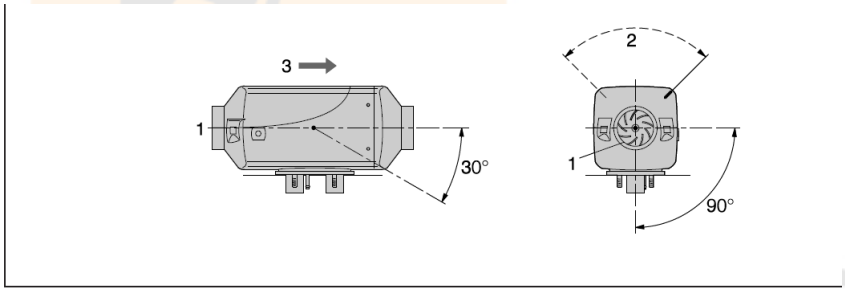
1 Heater in front of the passenger seat
2 Heater between the driver's seat and the passenger seat
3 Heater under the vehicle floor
4 Heater under the back seat
5 Heater in the boot

Installation Orientation

The heater body's preferred orientation is horizontal and level with the earth, with the fuel connections facing straight down.

When needed, the heater body may be rotated in the length direction up to 30º, with the hot air inlet being above and the body angling down towards the hot air outlet below.

From an end-view, the heater body may be rotated in the width direction up to 90º to either the left or right, positioning the fuel connections at either the left or right side.



1 Heater air intake opening (fan wheel)
2 Position of the glow plug
3 Direction of flow

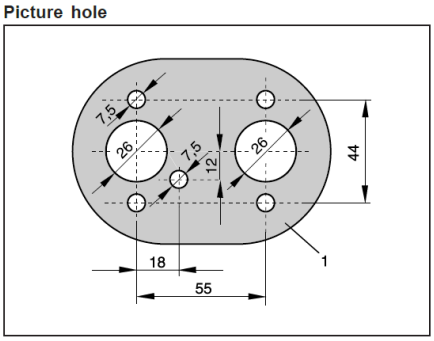
Mounting the Heater Body

The heater body mounts to the vehicle by penetrating the fuel and combustion air connections through the vehicle body, and using the mounting plate on the opposite side of the mounting surface to bolt through to the body. In other words, the vehicle's sidewall will become "sandwiched" between the heater body and the mounting plate.

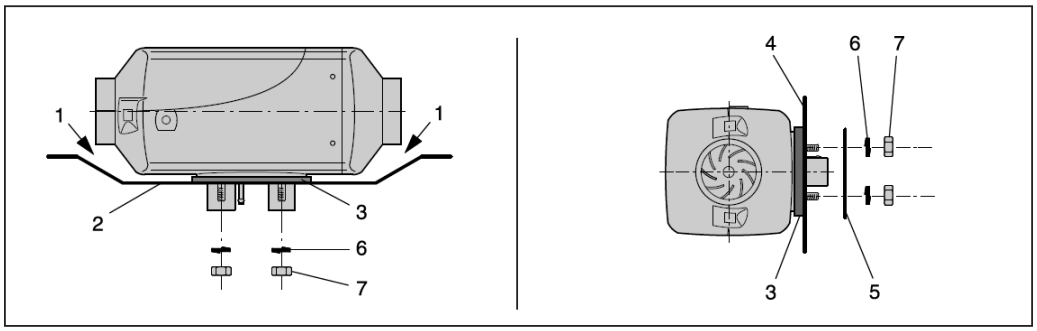
1) Select a mounting location according to the previous sections
2) Use the provided penetration template to mark the holes to be drilled through the vehicle's sidewall
3) Drill the marked holes
4) File each of the hole edges down to remove any burrs
5) Slide the heater body through the penetrations, checking alignment of all holes
6) Place the mounting plate on the opposite side
    a. You may need to block up the heater body in place inside of the vehicle, or a helper may holder the unit in place while you install the mounting plate outside of the vehicle
7) Insert the mounting screws through the plate and into the heater body, and tighten down evenly.

8) Check that the heater body is firmly fastened, and that the body does not rock or move by hand.
   a. If the heater body is not firmly seated, shim the mounting surface as needed.

If the mounting surface is less than 1.5mm thick, add an additional reinforcement plate over the penetrations as needed to gain a minimum of 1.5mm thickness.



1 Contour of the bearing surface



1 There must be sufficient clearance between the heater and the vehicle floor – also check that the fan wheel runs freely.
2 The mounting surface must be flat and smooth.
3 The flange seal must be mounted.
4 The vehicle wall must be flat and smooth.
5 Reinforcement plate (if required, see above)
6 Spring washer
7 Hexagon nut M6 (torque 5^{+1} Nm)

Hot Air Intake and Exhaust

Air ducting pulls in fresh air to be heated, routes this air through the heater body, and discharges heated air towards the space to be heated.

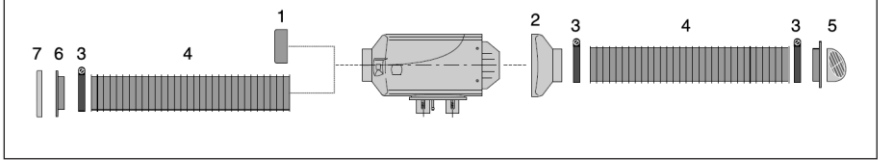
The hot air intake and exhaust duct ends should be placed as far away from each other as possible, so as to create maximum air turnover within the cabin. If the duct ends are placed very close to each other, the heater will 'short cycle', pulling hot air in directly as the heater pushes it out. This will reduce the lifespan of the heater, provide inconsistent heat distribution in the cabin, and potentially lead to damage and failure of the heater.

Hot air ducting will have elevated surface temperatures during normal use. Position all air ducting away from passenger, material, cargo, or pet areas.

1) Test fit the hot air ducting pieces between the heater unit and the desired end locations
    a. Trim ducting as needed to reduce unnecessary sagging or pinched sections
2) Select mounting locations for the inlet and outlet ducting grills
    a. Assure that the grills are more than 24" apart, so that the hot air is not pulled back into the intake
    b. Assure that the grills are pointing away from passenger, pet, or cargo areas such that the hot air dispelled will not cause damage or injury
3) Mark the holes for the grills
4) Drill or cut the holes for the drills and ducting
5) Install the grills through the holes and secure using the provided wood or sheet metal screws
6) Install the air ducting segments from each grill to the corresponding connection on the heater body
    a. Use the provided hose clamps to fasten the duct ends to the heater body
    b. Use the provided hose clamps to fasten the opposite duct ends to the grills
7) If needed, secure the air ducting with wire tires to hold it in place, and to protect it from contact with other objects

If the hot air intake hose is not used, install the intake safety grill directly on the heater's inlet in order to protect any objects from entering the heater's fan housing. The fan rotates at a high speed and may cause injury.

Heater air system (example)



1 Safety grid
2 Outflow hood
3 Hose clip
4 Flexible hose
5 Rotating outflow
6 Connection fitting
7 Safety grid

Combustion Air Intake and Exhaust

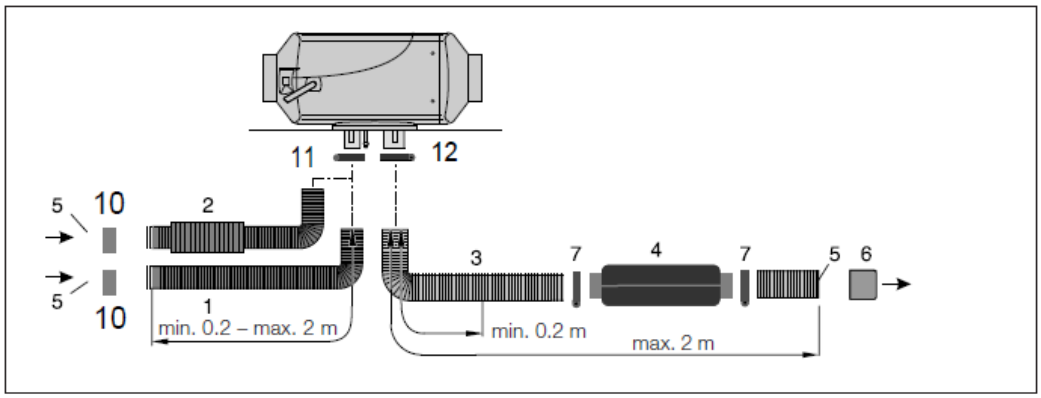
The combustion air circuit consists of a fresh air intake duct and a combustion air exhaust duct. Fresh air from outside of the vehicle is necessary for combustion to occur within the heater body, and the resulting volatile exhaust gas is then routed away from the heater body to outside of the vehicle.

An inlet filter is provided on the combustion air intake that will protect against pulling liquid, dust, and particulates into the heater. This filter should be installed and secured to the vehicle in a way to protect it from impact or excessive exposure to road debris. This air inlet should be pointed towards the rear of the vehicle, and distanced from any vehicle engine exhaust, brake, fuel, or moving parts.

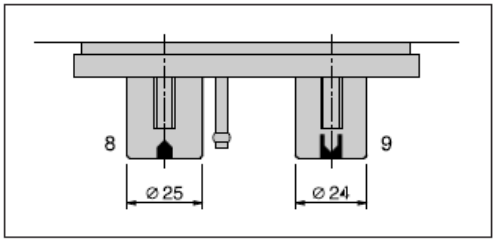
The combustion air exhaust line will reach elevated temperatures, and should be routed away from cargo or materials that can be damaged by high temperatures.

All combustion air exhaust line connections must be completed sealed, and routed to outside of the vehicle. Combustion air is toxic, and must not be discharged inside of the passenger cabin.

1) Identify the combustion air intake and exhaust components using the below diagram, noting the flow arrows marked on the components
2) Install the combustion air intake duct to the heater body
    a. Secure with a hose clamp
3) Route the intake duct to the desired termination location
    a. Secure with pipe clips or cable ties to rigid surfaces along the vehicle
4) Install the intake filter on the open end of the intake duct
    a. Secure with a hose clamp
5) Install the combustion air exhaust duct to the heater body
    a. Secure with a hose clamp
6) Route the exhaust duct to the desired termination location, away from the intake duct outlet and any vehicle exhaust
7) Mount the exhaust silencer to the vehicle body using sheet metal screws
8) Connect the exhaust duct from the heater body to the inlet of the exhaust silencer
    a. Secure both ends with hose clamps
9) Install the small exhaust duct spool to the exhaust silencer outlet
10) Install the exhaust end sleeve onto the end of the small exhaust duct spool
11) Secure both exhaust duct spool ends with hose clamps
12) Secure both segments of exhaust ducting with pipe clips or cable ties to rigid surfaces along the vehicle



1 Combustion air hose, di = 25 mm
2 Combustion air silencer,
– included in scope of supply for *AIRTRONIC* camper heaters
– optional (**not** included in scope of supply for *AIRTRONIC* and *AIRTRONIC* M heaters)
3 Exhaust pipe, de = 24 mm
4 Exhaust silencer
5 Intake / outlet opening – protect from wind, snow, dirt and water.
6 End sleeve, combustion air
7 End sleeve, exhaust
8 Combustion air connection
9 Exhaust connection
10 Conbustion Air End Housing
11 Hose Clamp
12 Hose Clamp



Fuel Tank, Pump and Line

An electrical fuel pump is used to pump diesel fuel from the fuel tank into the heater body. The fuel pump, fuel line tubing, fuel filter, fuel tank, and all other fuel components must be located, installed, and protected so as to minimize the risk of any punctures, leaks, spills, impact, or other types of damage.

Fuel lines and components must be placed far from any heat source, such as vehicle exhaust piping, the engine compartment, any other heating equipment, any braking systems, any rotating components (such as a drive shaft), etc. This includes mounting the fuel pump and tubing away from the heater's combustion air exhaust.

In the event of a fuel leak, dripping fuel that contacts hot surfaces has the chance to ignite. Route your fuel line in such a way that it is not directly above or near any hot surfaces.

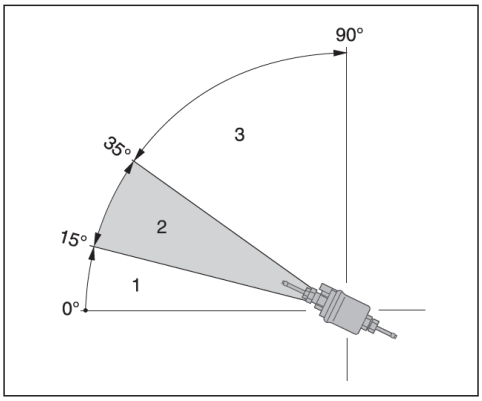
Heat deflector plates, insulation, or other means may be necessary to properly protect the fuel system from heat sources.

The fuel tank and components should be installed outside of the passenger cabin.

Take special note of the location of vehicle exits when determining the location of your fuel components. Any potential fire from these components should not obstruct or pose a danger along exit routes out of the vehicle.

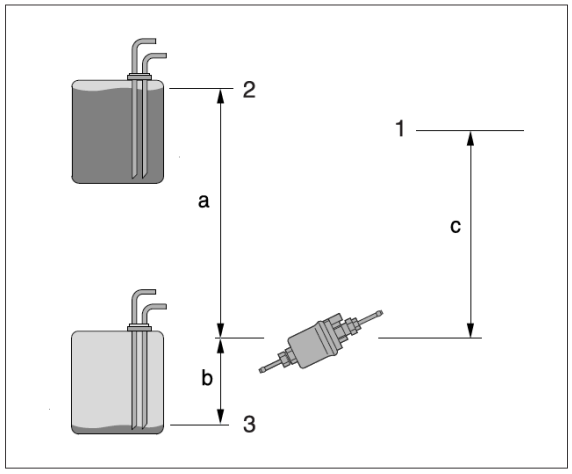
Your state's Department of Transportation and other authorities may have additional requirements for fuel systems – it is the installer's responsibility to confirm check.

The fuel pump should be installed at an incline, with the discharge end rising up at an angle of 15* to 35* above the inlet. If needed the fuel pump may be inclined further, up to 90*.



1 Installation position between 0° and 15° is not allowed.
2 Preferred installation position in range 15° to 35°.
3 Installation position in range 35° to 90° is allowed.

The fuel pump is sized to provide ample fuel to the heater so long as the suction and discharge tubing lengths and heights are within the below limitations. Installing suction or discharge lines beyond these limitations will result in low fuel flow and pressure.



1 Connection to heater
2 Max. fuel level
3 Min. fuel level

Possible suction and pressure height of the dosing pump

Pressure height from vehicle tank to dosing pump:
a = max. 3000 mm

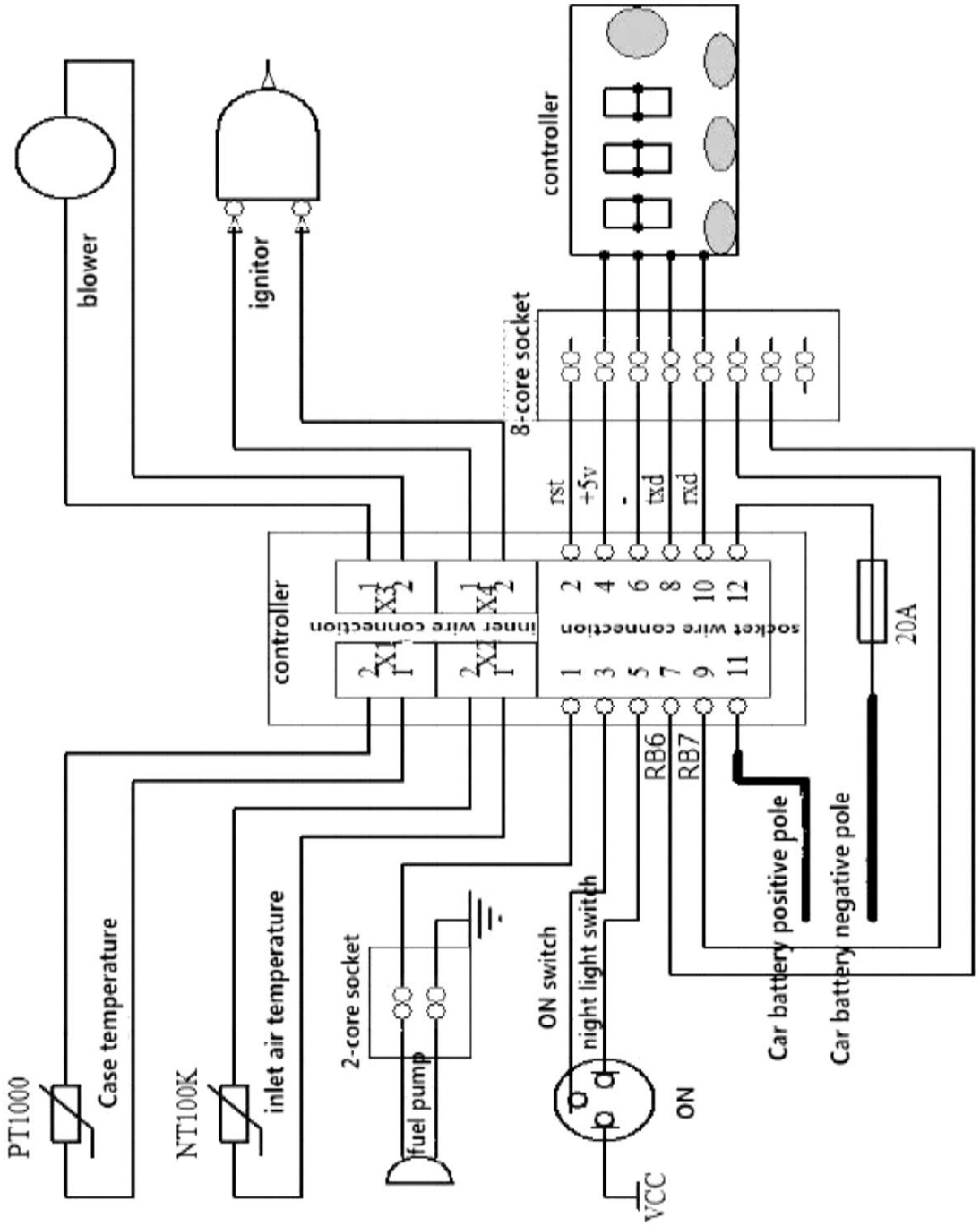
Intake height in pressure-less vehicle tank:
b = max. 1000 mm for diesel
b = max. 500 mm for petrol

Intake height in vehicle tanks with withdrawal by negative pressure (valve with 0.03 bar in tank cap):
b = max. 400 mm

Pressure height of the dosing pump to the heater:
c = max. 2000 mm

1) Identify a location for the fuel tank to be installed, with a rigid surface to mount against
2) Test fit the included fuel line tubing between the fuel tank location and the heater body, to assure you have enough fuel line
3) Install the fuel tank onto the mounting surface using long sheet metal screws
    a. Test that the tank is mounted firmly by pulling on the tank sides
4) Install the fuel pump below the fuel tank using (2) sheet metal screws
    a. Be sure to angle the fuel pump up a minimum of 15*
5) Install the fuel pickup adaptor or fuel nozzle into the fuel tank
6) Install the tank vent into the fuel tank
7) Install the fuel suction tubing from the outlet of the fuel tank pickup adaptor, including the fuel filter mid-way between the tank and the pump
    a. Secure the hose ends with hose clamps
    b. Secure the fuel line to the vehicle with pipe clips or cable ties
8) Install the fuel discharge tubing from the outlet of the fuel pump into the heater body
    a. Secure the hose ends with hose clamps
    b. Secure the fuel line to the vehicle with pipe clips or cable ties

Electrical Wiring



Maintenance

With a minor amount of ongoing maintenance, your diesel airspace heater will provide many years of reliable operation. Maintenance of the heater consists primarily of simple inspection and cleaning. Follow the below steps regularly to assure that your heater is safe and ready to operate at any time.

At Each Use

- Visually inspect the heater body, air ducting, fuel system, and LCD panel for any physical signs of damage or malfunction
- Check the air ducting inlet and outlet for any debris or blockage
- Check that there are no flammable, combustible, or heat-sensitive objects near the hot air ducting outlet, heater body, or combustion air ducting
- Check the fuel tubing for any leaks
- Check the fuel tank cap to be properly secured
- Check the LCD panel for any warning symbols
- Check the combustion air inlet and outlet for debris or blockage

Monthly

- Operate the heater for 10 minutes at full heat and fan speed
- Visually inspect the heater body, air ducting, fuel system, and LCD panel for any physical signs of damage or malfunction
- Using a damp rag, wipe off the heater body and air ducting to clean away dust and debris
    - Do not use cleaning solvents that may damage rubber and plastic materials!

Annually / Long Term Storage

- Disconnect the inlet and outlet air ducting from the heater body, and using a damp rag, clean the inside of the heater body and air ducting of any residual dust or particulates. If left uncleaned, accumulated dust can create a fire hazard.
- With a bright flashlight or in open sunlight, visually inspect the entire fuel line, fuel tank, pump, pump mounting, and any bulkhead penetrations thoroughly. Potential concerns which may lead to fuel leaks and / or fire risks include:
    - Loose pump mounts
    - Abrased fuel tubing through any bulkhead penetrations
    - Loose fuel tank mounts
    - Loose fuel line hose clamps
- Inspect for localized discoloration on all hot air and combustion air ducting, which may indicate a ‘hot spot’ that can lead to failure

- For systems that will not be operated for an extended period of time:
    - Drain the diesel fuel from the fuel tank and delivery line entirely, and safely store in an approved container
    - Assure that the LCD screen is powered down or disconnected from electrical power, such that it may drain a vehicle battery if left powered
        - If disconnecting power by unwiring the power circuit, be sure to also isolate supply power by switching the circuit breaker off or removing the supply fuse, so that the disconnected power wires are not left 'live'
    - In locations where rodents or insects may be present, tape off or otherwise cover ducting openings – heater ducting and the heater body can be attractive burrows for small critters
        - Make a note to uncover these duct openings before the next use!
    - Follow the 'First Start' procedures listed in the Installation section of this manual upon next use

For More Information

OnTrack Outdoor Pty Ltd

ABN: 88 6451 69222

info@ontrackoutdoor.com.au

www.ontrackoutdoor.com.au

Contact Us Form: www.ontrackoutdoor.com.au/pages/contact-us

Returns, Refunds, and Cancellations: www.ontrackoutdoor.com.au/pages/returns-policy