



Atwood Mobile Products LLC

DOMETIC CORPORATION

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Literature number 32367

hydro flame™

Furnaces Model

AFISD12111

Technical Installation Manual
Approval Certification AGA 8206 G

Revision A, 10/12/18

This instruction manual is for use by an authorized service technician to install an Atwood – *hydro flame*™ furnace. Should you require further information, contact your dealer or Atwood Mobile Products LLC or Aircommand
This furnace design complies with the requirements of AS4556 – 2011. This instruction manual should be followed to ensure safe operation of furnace. Failure to install furnace according to this installation instruction nullifies the furnace warranty.

TO THE INSTALLER: LEAVE THIS MANUAL
WITH THE APPLIANCE.
TO THE CONSUMER: RETAIN THIS MANUAL FOR
FUTURE REFERENCE.

SAFETY ALERT SYMBOLS

Safety Symbols alerting you to potential personal safety hazards obey all safety messages following these symbols



WARNING

Avoid possible injury or death



CAUTION

Avoid possible injury and/or property damage



WARNING FIRE OR EXPLOSION

If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

FOR YOUR SAFETY

WHAT TO DO IF YOU SMELL GAS:

- Extinguish any open flame.
- Evacuate all persons from the vehicle.
- Shut off the gas supply at the gas container or source.
- Do not touch any electrical switch, or use any phone or radio in the vehicle.
- Do not start the vehicle's engine or electric generator.
- Contact the nearest gas supplier or qualified service technician for repairs.
- If you cannot reach a gas supplier or qualified service technician, contact the nearest fire department or CFS.
- Do not turn on the gas supply until the gas leak(s) has been repaired.

A qualified Service Technician
Service Center or gas supplier must perform
installation and service.



WARNING

Installation of this appliance must be in accordance with the written instructions provided in this manual. No agent, representative or employee of Atwood or other person has the authority to change, modify or waive any provision of the instructions contained in this manual.



WARNING

Avoid possible injury or death

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Refer to the installation instructions and/or owner's manual provided with this appliance. A qualified installer, service agency or the gas supplier must perform installation and service.



FOR YOUR SAFETY

- Do not place articles on or against this appliance
- Do not store or use flammable materials near this appliance.
- Do not spray aerosols in the vicinity of this appliance while it is in operation.
- Do not modify this appliance



WARNING

Be sure the furnace and all ignition systems are "off" during any type of refueling and while vehicle is in motion or being towed.



CRITICAL INSTALLATION WARNINGS

- DO NOT install furnace on material that restricts return air, like carpet or any soft material such as vinyl.
- DO NOT install furnace where clearance to combustibles cannot be maintained.
- DO NOT modify furnace or intake or exhaust vents in any way.
- DO NOT alter furnace for a positive grounding system.
- DO NOT hi pot furnace unless electronic ignition system (circuit board) has been disconnected.
- DO NOT use battery charger to supply power to DC model furnace even when testing.
- DO NOT use 240-volt AC power with DC models.
- DO NOT use furnace cabinet area as a storage compartment.
- DO NOT vent furnace with venting system serving another appliance.
- DO NOT vent furnace to an outside enclosed porch or annex.
- DO NOT use for temporary heating of buildings or structures under construction.
- Protect installation materials from degrading air and flue exhaust systems.
- Protect furnace electrical components from water.
- Compartments must be closed when in operation.
- Should the gas supply fail to shut off during operation or overheating occurs, shut the gas valve off to the furnace before shutting off electrical supply.
- DO NOT use this furnace if any part has been under water.
- DO NOT use petroleum or citrus type cleaner on plastic parts, as damage may occur.

CAUTION
PERSONAL INJURY

All sheet metal edges are sharp. Care should be taken when handling or brushing up against them.

WARNING
CARBON MONOXIDE POISONING

Properly seal vent assembly to prevent carbon monoxide from entering coach.

- DO NOT draw combustion air from living area.
- DO NOT vent exhaust air into the living area or an enclosed porch.

WARNING
CARBON MONOXIDE POISONING

- Furnace must be installed and vented according to these instructions.
- Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage.
- Improper installation location may cause furnace to produce negative pressure, affecting combustion air or venting of other appliances.

WARNING
CARBON MONOXIDE POISONING

- Properly seal door to prevent carbon monoxide from entering coach.
- Properly adjust draft cap to prevent carbon monoxide from entering coach.

More information and installation information can be found on top of furnace and inside the front.

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MODEL Table 1

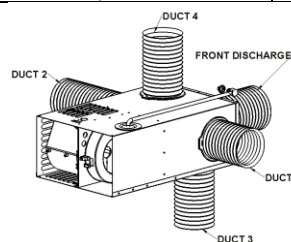
AF	IS	D	12	1	1	1	A
Atwood Furnace	Cabinet Size SI=small Australia	Voltage D=12 VDC	Input 12.6 MJ/hr	Gas Type 1=LP	Style 1=Door	Valve 1= single stage	Model Rev A

SPECIFICATIONS Table 2

Model	AFISD12111
Type of Gas	LP Propane
Input	12.6MJ/hr
Output	2.67kW
Duct Static Pressure	25 Pa
12 Volt Amperage (AMPS)	3.4
Power Supply (Volt DC)	12
Power	41 watts
Minimum Return Air	225 cm ²

DUCTING CONFIGURATION Table 3

Model	AFISD12111
Side Duct	2 Ducts 100mm dia.
Front with Side Ducting	1 Duct 127mm or 2 Ducts 100mm dia.
Front Only	1 Duct 127mm dia.

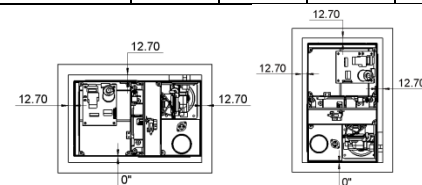


DIMENSION Table 4

Approx. Dim.	Height mm	Width mm	Depth mm	Weight
Casing	178	305	508	Furnace 10.4 kg Boxed 11.3 kg
Outside Door	251	378	19	
Interior Grill	216	318	25	
Trim Ring	260	356	3.2	

MINIMUM CLEARANCE TO COMBUSTIBLES Table 5

Clearances	Top	Sides	Rear	Bottom screw heads)	(to Blower cabinet opening)
	13mm	13mm	13mm	0	103 cm ²



INSTALLATION AND SAFETY CODES

This appliance must be installed in accordance with local authority requirements, and in accordance with the requirements of the installation standard AS/NZ 5601

The installer should refer to the following standards:

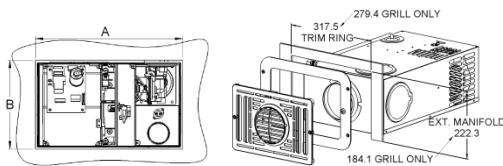
- AS NZS 5601 LP Gas Installations in caravans & boats for non-propulsive purposes.

LOCATION OF THE FURNACE

- The furnace may be installed horizontal or vertically.
- If installing vertically, the gas pipe entry **MUST** be on the LHS looking from inside van. This ensures that the fan entry remains clear.
- The unit must only be installed through an exterior wall.
- **DO NOT** install furnace near or beneath tilt outs, slide outs or other projection that might interfere with the dissipation of exhaust gases.
- Try locate the furnace near to the midpoint of van to help with even warm air distribution.
- The installer must allow for easy access for service and for easy decoupling should the unit need be removed.
- **DO NOT** install the unit such that the exhaust outlet is within 150mm of a door opening or a projection.
- Before making the cutout, check for the possibility of in wall wiring or pipe work that would interfere with the installation.
- **DO NOT** install furnace directly onto carpet or soft vinyl etc., as this may restrict the flow of return air. In such situations, install unit on cleats or provide a plywood or metal panel, the full length/width of the furnace on which the unit may lay or be affixed.
- **DO NOT** use petroleum or citrus type cleaners on any plastic componentry or panels.

MAKING THE SIDE WALL CUTOUT

Figure 1



Standard Door requires 19mm radius corners for proper sealing.

Table 6	A	B
Exterior cut out for standard door	318mm	190mm
Interior grille (cabinet cutout)	280mm	184mm
Interior grille trim ring (cabinet cutout)	318mm	222mm

PROCEDURE

- Make the cut out through the outside wall (refer to table 6) the bottom edge being flush with the caravan floor.
- Box up the perimeter of the cut out.
- If the installation is to have a direct front discharge, then transfer the wall cutout position to the inside bulkhead or front of bulkhead. Normally one will mark out and cut an opening 280 x 184 to accommodate the TRIM RING. This cut out should be centered on the discharge hole of the furnace. If it is desired that the furnace be removed from the interior, then the 222 x 318 hole should be cut (refer to table 6) and see Fig 1.
- If the furnace is to have any side ducts, then remove the appropriate knockouts, before sliding unit through the exterior wall.
- With approx. 25mm of furnace casing protruding from the wall, affix the Bezel to the casing with 4 screws supplied. Apply sealant to bezel and casing per Fig. 2, push furnace back into van and secure to wall with 14 screws. See Fig. 5

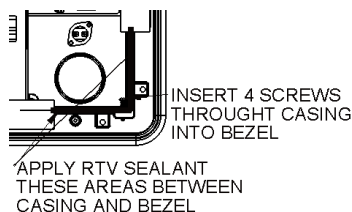


Figure 2

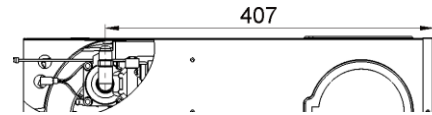


Figure 3

- Secure the front of the unit (inside) with the 2 angles supplied see Fig 4

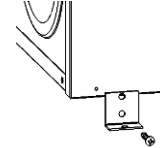


Figure 4

- The gas pipe connection can now be made. Refer Fig 5 for dimensions of point of entry. Use 3/8" annealed copper tube. The flare connection is 40mm below the top panel, so if the clearance at the top is limited, the 9.5 Dia. Tube should be bent to give 40mm of parallel. (see Fig. 3) Min. bending radius 20mm. Before flaring, feed the rubber grommet followed by the 3/8 flare nut onto the pipe. Start the nut onto the nipple with fingers, and tighten using two spanners one on the nut the other on the valve for support. Refit the rubber grommet, Ensure this joint is leak tested before commissioning.

- Make the electrical connections: Positive, Ground and 2 x thermostat

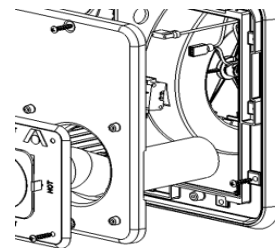


Figure 5

- Now fit the outside door 4 screws see Fig 5
- Now fit the outside exhaust vent 4 screws see Fig 5
- If duct work is to be fitted, then fit the Duct adaptors supplied and attach duct. If using flexible duct, ensure it is rated at 95°C continuous operation. Use the minimum length possible, have as few bends as is practical, and do not kink any bends.
- To fit the Discharge grille assembly, firstly remove the knockout at the front of the unit and fit the 127 mm duct adapter. Fit the GRILLE TRIM RING to the cut out with 4 screws. Fit the flexible duct provided and trim to length. Now fit duct to grille and screw grille to Trim Ring with 2 screws.

RETURN AIR

It is of the greatest of importance that the return air path is adequate. As a minimum, 225 cm² is required (typically 150mm X 150mm). If the combination discharge / return air grille as supplied, is not used, then provision for return air must be made elsewhere. Ensure that either an aperture totaling 225 cm² is provided in the partition opposite the blower entry, or a gap of 50mm is provided between the right side of the furnace and any partition, such that return air can flow from the front of the cabinet to the fan intake.

FLEXIBLE DUCT SYSTEMS

The furnace requires a total of 145 cm² of discharge area. This is provided with two 100mm dia. Duct. If only one duct is used, then the direct discharge grille **MUST** be used as well.
If 60mm dia. Duct is used, either single or dual outlet, then the direct discharge grille must be used as well.

WARNING **FIRE OR EXPLOSION**

Never check for leaks with an open flame. Turn on the gas and apply soapy water or leak detect solution to all joints to see if bubbles are formed.

PROPANE GAS CONNECTION

Propane Gas Pressure Test

The furnace and any individual shut-off valve must be disconnected from the gas supply piping system during pressure testing of the system at test pressures of more than 3 kPa.

Before the furnace is connected, the piping system must be tested to be leak free. The test must maintain air pressure at 20 kPa for at least 10 minutes.

The entire piping system is to be maintained at 2.5 to 3.2 kPa when all appliances are in operation.

Test gas connections for leakage with soapy water or a test solution.

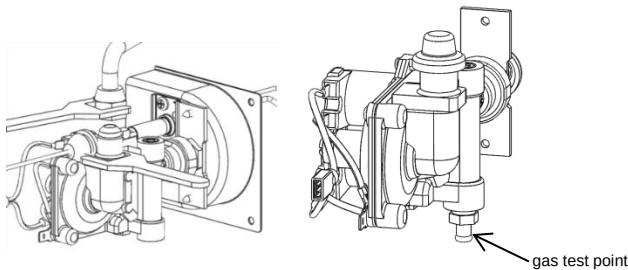


Figure 6

- The gas connection is located on the RHS and beneath the top panel. This connection is a male 3/8" male nipple. See Fig. 6
- Assemble the sealing grommet onto the pipe before the flare nut and flare. **DO NOT USE SEALING COMPOUND ON A FLARE JOINT.**
- Use two wrenches to support the fitting when tighten the nut on the valve. **DO NOT TWIST THE GAS VALVE.**
- A pressure test point is accessible for testing gas press attach gauge to test point shown in see Fig 6
- The gas supply lines to the furnace must be capable of maintaining 2.7 kPa pressure at the furnace with all other appliances running.

WARNING **INJURY OR PROPERTY DAMAGE**

- Label all wires before disconnecting for servicing. Wiring errors can cause improper and dangerous operation. Verify proper operation after servicing.
- Disconnect electrical power before servicing.

CAUTION **PROPERTY DAMAGE**

This connection is for low-voltage battery or filtered DC supply only. **DO NOT CONNECT MAINS POWER, 240V AC.**

POWER SUPPLY

The power supply to the furnace should preferably be from a storage battery.

If a converter is used, it should be an electronic solid state converter with a filtered output, to provide clean DC output.

CONDUCTOR WIRING SIZE

Total length of conductor up to 12 meters: MIN. 1.0 mm²

Total length of conductor up to 20 meters: MIN. 1.5 mm²

- This furnace is designed for Negative ground 12 Volts DC only. Do Not attempt to alter the furnace for a positive grounding, OR connect the furnace to Mains power.

DISCHARGE AIR FLOW CHECK

Because of differing duct layouts, lengths and discharge nozzles, the air flow can vary from installation to installation.

The higher the airflow, the smaller is the temperature rise and conversely, low flow rates result in higher discharge temperatures.

This furnace is designed for temperature rises of 55 °c to 72 °c.

DISCHARGE TEMP. = RETURN AIR TEMP + TEMP. RISE

As the maximum discharge temp. from the furnace is 90°C , and typical return air temp is 25°C (represented by the thermostat setting) then the temperature rise should be about 65°C.

The completed installation should be checked for temperature rise by firing up the furnace, adjust thermostat so system runs uninterrupted, and measure both the return air temperature and the discharge temp from one of the discharge grilles.

A temperature rise greater than 72°C will result in unsatisfactory performance as the safety limit switch will interrupt the heating. If a temperature rise greater than 72°C is measured, then the system must be modified to gain more air flow.

Examine:

- Is the flexible duct stretched out. (less resistance)
- Can the duct length be reduced?
- Are the bends not kinked?
- Are the discharge nozzles too restrictive?

THERMOSTAT INSTALLATION

- If supplying own thermostat, ensure it is rated to switch minimum 1 Amp @ 12V DC.
- Install thermostat 1200 to 1400 mm off floor.
- Ideal location is on an inside wall, in a well-ventilated area, away from sources of direct heat, direct sunlight, not subject to air discharge grilles etc.
- If the thermostat has to be sighted on an exterior wall, then it must be stood off from the wall by 20mm.
- Be sure to disconnect all power from the furnace when making the electrical connection to the thermo.

OPERATING INSTRUCTIONS

WARNING **FIRE OR EXPLOSION**

Do not operate furnace while vehicle is in motion or being towed

- During initial firing of this furnace, a burn-off of excess oils remaining from manufacturing process may cause smoking or fumes for 5-10 minutes.
- NOTE: if furnace should lock out, the blower will go off in 90 seconds and remain off until unit is reset by reactivating the thermostat.

STOP! READ USERS INFORMATION MANUAL SUPPLIED WITH FURNACE.

1. This furnace is equipped with a valve shut-off switch. This switch is located behind the outside door, center panel and must be ON for the furnace to operate.

- Set thermostat to a setting above the room temperature, after a slight delay, the blower will start. Allow the blower to run for 1 minute to ensure the combustion chamber is purged. If the blower does not run or stops before a minute, shut down system (close isolating valves at Propane tank) and call a technician to investigate a fault.
- After a minute, adjust thermostat to below room temperature. The blower will continue to run. Allow approx. 2 minutes and the blower will stop.
- Turn on the isolating gas valve at the Propane bottle and if fitted, the isolating valve adjacent to the furnace.
- Set thermostat to below room temperature. The blower will come on and within 30 seconds, the burner will light. The ignition cycle is automatic, DO NOT attempt to light the burner manually.
- If burner does not light, then repeat the above from 1 to 5.
- If after 3 attempts, the burner will not light, then shut down system and contact a technician.

TO SHUT DOWN UNIT

- Set the thermostat to "OFF" position.
- Turn "OFF" manual isolating valves.

SYSTEM CHECKS

PROPANE GAS PRESSURE TEST

The furnace and any individual shut-off valve must be disconnected from the gas supply piping system during any pressure testing of the system at a test pressure of more than 3.5 kPa.

Before furnace connected, piping systems must be tested to be leak free. The test must maintain air pressure of at least 20 kPa for at least 10 minutes

IGNITION CONTROL DIAGNOSTIC CODES

The following charts give the diagnostic codes given by the ignition control when faults are present.

- A soft lockout is a timed condition that will make additional attempts to correct the problem. A hard lockout requires resetting of the thermostat or turning the power switch off, then back on.

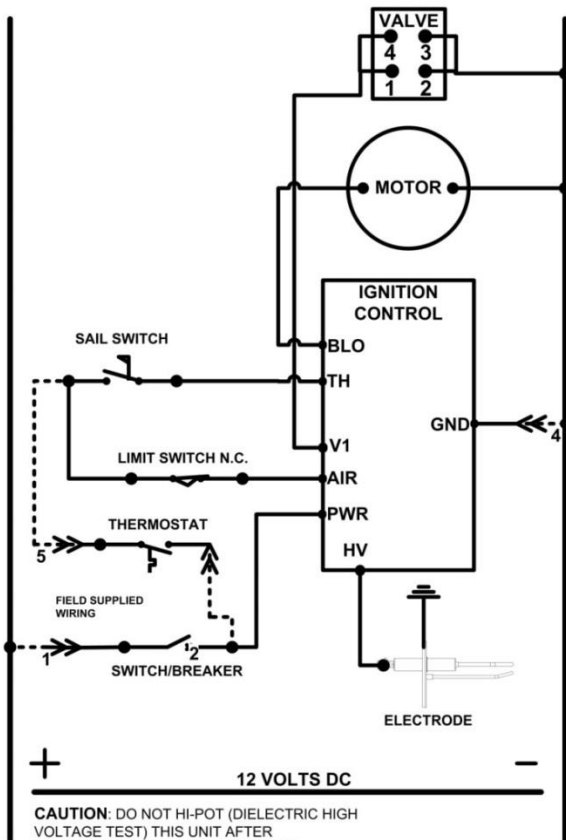
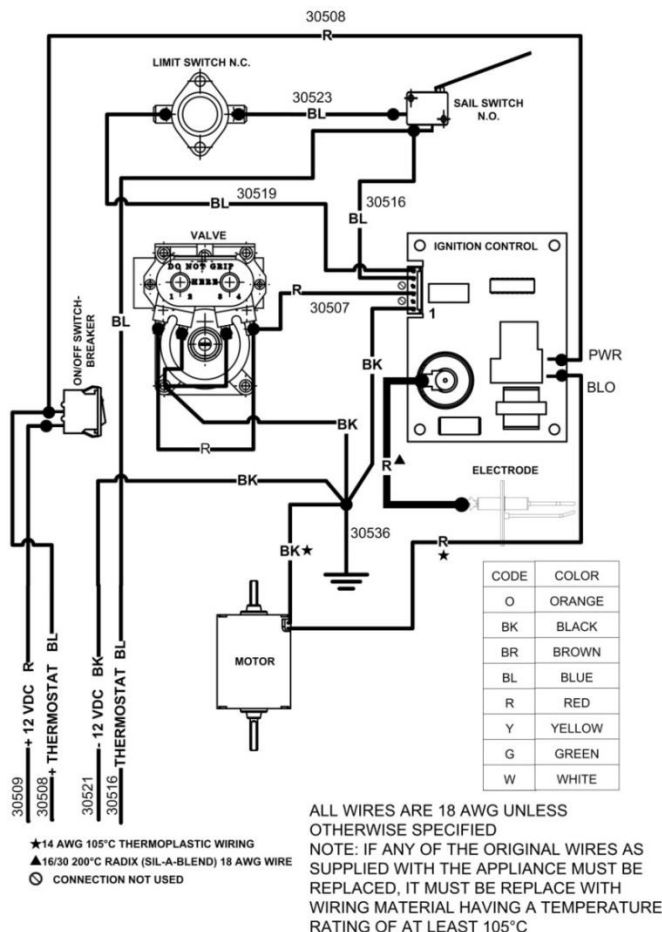
Standard 3 tries for Ignition Controls

DIAGNOSTICS CHART		
FAULT	LED INDICATION	LOCKOUT
Internal Circuit Board Failure	Steady On, No Flashing	Hard
Limit Switch/Airflow Problems	1-Flash With 3-Second Pause	Soft
Flame Sense Fault	2-Flashes With 3-Second Pause	Hard
Ignition Lockout Fault	3-Flashes With 3-Second Pause	Soft (1 hr. retry)

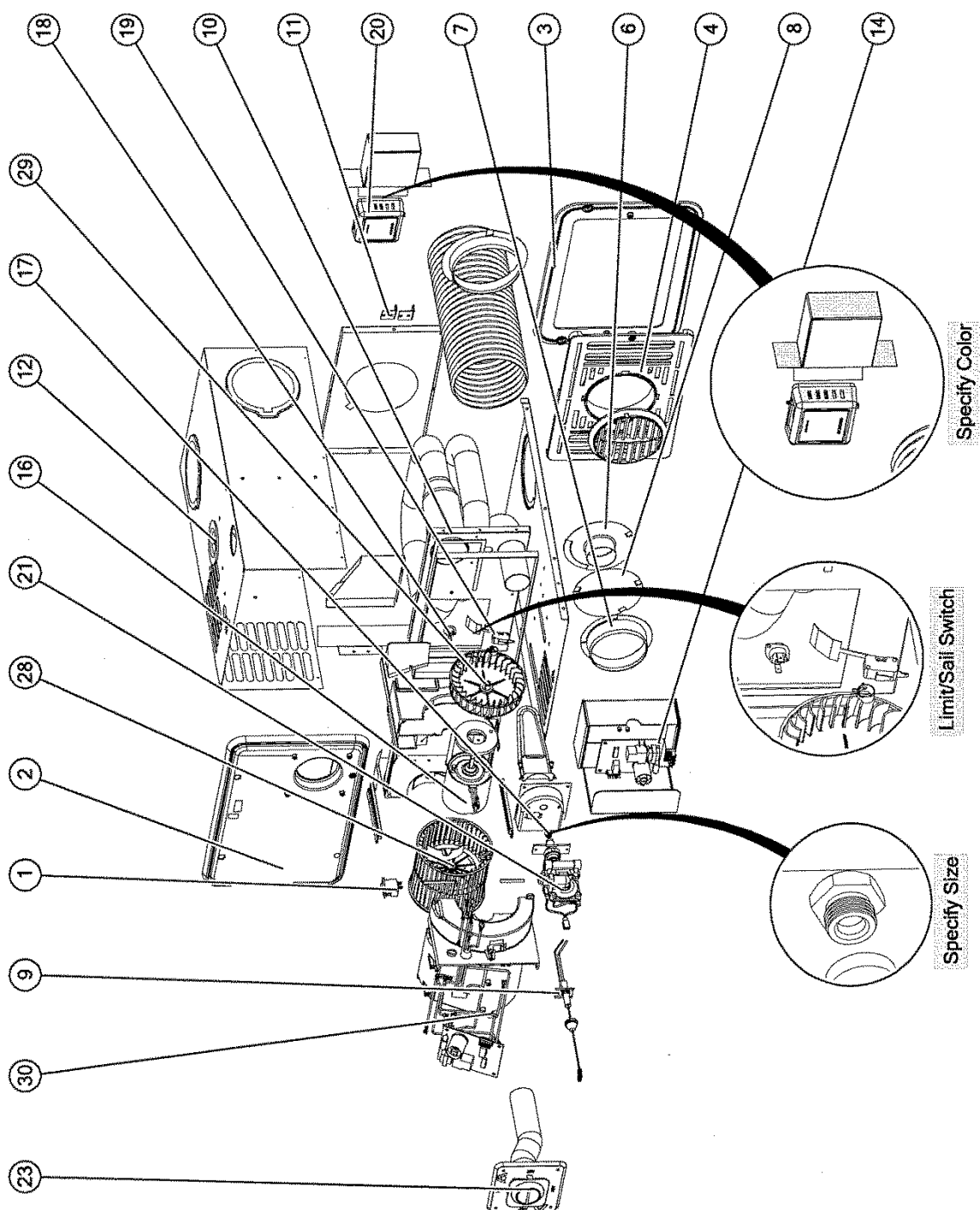
FOR SERVICE AND SPARE PARTS, CONTACT

AIRCOMMAND AUSTRALIA P/L
 954 PORT ROAD, ALBERT PARK, SA 5014
 P: 08 8345 8444
 F: 08 8243 0628
 EMAIL: sales@aircommand.com.au
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WIRING AND LADDER DIAGRAM



DRAWING AND PARTS



AFIS Service Parts

AFIS12111

Category	P/N	Description	NS=PART NOT SHOWN	2111	Service Bl:
Breaker, Circuit					
	30320	KIT, BREAKER CIRUCIT 5AMP	☒		1
Burners					
	30268	KIT, BURNER HEAD LP GAS	☒		13
Doors					
	32343	KIT, DOOR ASM S #34 WHITE	☒		2
	32344	KIT, DOOR ASM S #44 BLACK	☒		
	30641	KIT, DOOR S #34 ARCTIC WHITE	☒		
	30259	KIT, FRONT GRILL OD	☒		3
Ducting					
	36688	ADAPTER,DUCT,2 INCH	☒		6
	31474	ADAPTER,DUCT,4 INCH	☒		7
	31361	PLATE, DUCT COVER, 4 INCH	☒		8
Electrode					
	35100	KIT, ELECTRODE ASM SML	☒		9
Elements					
	35711	KIT, HEAT EXCHANGER S	☒		10
General Parts					
	32262	FERRITE BEAD, 0444176451	☒		NS
	31244	KIT, CASING LEG	☒		11
	35706	KIT, GAS LINE GROMMET	☒		12
Igniton, Controls					
	31501	KIT,UNIVERSAL IGNITION DC	☒		14
	32353	KIT,UNIVERSAL IGNITION DC SMT	☒		14
Motors					
	30758	KIT, MOTOR S12-16	☒		16
Orifices					
	31086	KIT, ORIFICE #60 LP	☒		17
Switches, Limit					
	31091	KIT, LIMIT SWITCH 190	☒		18
Switches, Sail					
	31093	KIT, SAIL SWITCH SM	☒		19
Thermostats					
	32300	THERMOSTAT,HEAT ONLY,BLACK	☒		20
	38452	THERMOSTAT,HEAT ONLY,BROWN	☒		
	38453	THERMOSTAT,HEAT ONLY,WHITE	☒		
Valves					
	31098	KIT, VALVE 12VDC TOP SML	☒		21

AFIS Service Parts

AFIS12111

Category P/N Description NS=PART NOT SHOWN Service.BI:

Vent, Exhaust

30611	VENT PANEL EXTENSION SML V4	☒	NS
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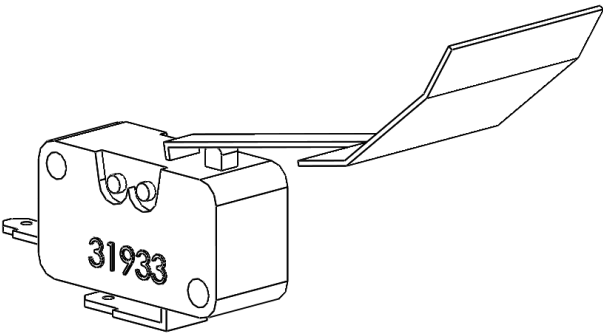
Wheels

31113	KIT, BLOWER WHEEL S	☒	28
33128	KIT, COMBUSTION WHEEL	☒	29

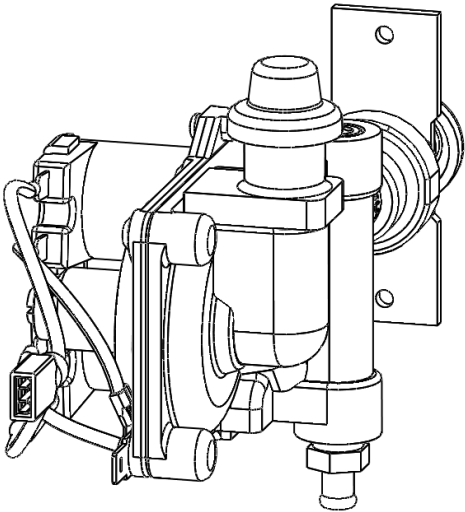
Wiring

31114	KIT, DC WIRING HARNESS	☒	34
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Large Paddle Kit 31093



Valve Kit 31098



Electrode Adjustment

