SEELEY INTERNATIONAL

INSTALLATION AND OPERATION

GDH

AIRA By SEELEY INTERNATIONAL

Original English Instructions

CONTENTS

SAFETY

1.0 INTRODUCTION

This Manual is for use with a Seeley International manufactured AIRA GDH Heater Only. This manual is updated without notification and it is the installer and customers responsibility to ensure the latest version is used. This Manual is intended to assist in the Installation, Commissioning and Service of Seeley International manufactured GDH units and DOES NOT take precedence over any Australian Standards or legislation.

This book should be retained with the unit or made easily accessible to installation and maintenance personnel.

AIRA GDH units are a direct fired heater. AIRA GDH units are produced in 5 different capacities to suit a wide variety of installation requirements and can be paired with AL coolers to provide a combined heating and cooling solution.

1.1 GENERAL SAFETY INFORMATION

THIS HEATER IS TO BE INSTALLED BY AN AUTHORISED PERSON ONLY

DO NOT Operate this appliance before reading the manual.

DO NOT Place articles on or against this appliance.

DO NOT Use or store flammable materials within 1200mm of this appliance.

DO NOT Operate this appliance with panels, covers or guards removed.

DO NOT Spray aerosols in the vicinity of this appliance while it is in operation.

DO NOT Remove markings and or labels from the unit.

DO NOT Remove warning labels from the unit.

DO NOT Restrict relief area

DO NOT Modify this Appliance

These AIRA GDH units must be installed in accordance with these instructions, local gas fitting regulations, municipal building codes, electrical wiring regulations, Australian Standard AS/NZS 5601 Gas Installations and any other relevant statutory requirements.

Employers and Employees Responsibility	**Risk Assessment**
The installation and maintenance of gas ducted heating units, particularly at height, has the potential to create Occupational Health and Safety (OH&S) issues for those involved. Installers are advised to ensure they are familiar with relevant State and Federal legislation, such as Acts, Regulations, approved Codes of Practice and Australian Standards, which offer practical guidance on these health and safety issues. Compliance with these regulations will require appropriate work practices, equipment, training and qualification of workers. Seeley International provides the following information as a guide to contractors and employees to assist in minimising risk..	A risk assessment of all hazardous tasks is required under legislation. A risk assessment is an essential element that should be conducted before the commencement of work, to identify and eliminate the risk of falls and other risks, or to minimise these risks by implementing control measures. This does not need to be a complicated process - it is a matter of assessing the job to be done and considering what actions are necessary so the person doing the job does not injure themselves. This should be considered in terms of: • What are the chances of an incident occurring? • What could the possible consequences be? • What can be done to reduce, or better still, eliminate the risk?

1.1.1 Handling the Heater

GDH units are to be handled as ductwork. The unit should be transported stored and handled so that the main enclosure is supported and not deformed, and care taken to place minimal strain upon the gas components.

1.1.2 Positioning the Heater

The unit should be installed so that it is level. GDH units may be installed vertically if custom ordered to do so. At least 1000mm clearance shall be left either side of the heater to allow sufficient access to the controls and to the access panel for maintenance purposes. Airflow across the heater is required for operation and ensuring emissions fall within the required limits therefore airflow shall not be obstructed at any time. GDH units should be installed so that the damper blades sit at least two times the width of the unit away from a blower or change in direction of ductwork on the upstream side of the unit. Bends in the ductwork should not be placed until 920mm on the downstream side of the dampers. Approval should be sought by Seeley for any installation encroaching on these limits. No modifications shall be made to the unit.

1.1.3 Combustibles

The heater should not be installed in contact with combustible materials. Radiant heat from the unit must also be considered.

SAFETY

1.1.4 Wiring Electrical

Connections must be in accordance with all relevant Australian Standards and applicable State regulations.

1.1.5 Occupational Health and Safety

Only safe working practices shall be employed when working on gas installations. The process of installing gas appliances shall take into consideration relevant OH&S requirements. There requirements pertain to all aspects of access, installation, operation and maintenance. Persons installing gas appliances shall be aware of their responsibilities and qualified in accordance with local OH&S requirements. Precautions shall be taken to avoid any electrical hazards present in the gas installation.

1.1.6 Gas Piping

Gas piping should be sized adequately, located, supported and protected in accordance with the Installation Standard AS/NZS 5601.

1.1.7 Commissioning, Recommissioning and Decommissioning

Every gas installation shall be commissioned according to the instructions in Section 4 of this Manual prior to use to ensure safe start and operation of the unit and shall include checks of safety and operating control. All GDH units are type B units and will require a type B certification before they can be operated.

Following maintenance work on any part of the unit, the affected part of the installation shall be re-commissioned by checking to ensure safe start-up and operation.

After a maintenance shutdown, isolation of the unit or interruption to the gas or electrical supply an appropriately qualified person shall conduct start up checks to confirm safe operation.

When a unit is being decommissioned it shall be physically disconnected from the gas supply, purged and sealed. Where possible components should be recycled, apart from the gas train and valves which should be disposed of in accordance with government regulations.

1.1.8 Operational Safety

AIRA GDH Heaters must not be operated until the unit has been commissioned by qualified persons. The unit should not be operated if any safeguards, panels or controls have been removed, damaged or bi-passed.

If the unit is not operating as intended turn off the unit at the rotary switch/BMS and then isolate the power and gas supply. The unit should remain isolated until a qualified service technician has inspected the unit and resolved any issues.

1.1.9 Gas Compliance

Aira GDH heaters are **NOT** Type A certified. **Type B certification is required**. AS/NZS 5601.1 states that the requirements of the standard are to be used in conjunction with, but do not take precedence over, statutory requirements that may apply in any area. Refer to your local state regulator for certification requirements. Where no requirement is given, good practice shall apply.

1.1.10 Safety Points to Consider

- What is the best and safest access to the roof and/or work areas?
- If a worker is alone, who knows they are there and if they get into difficulty, how can they summon help? (Call someone on the ground? Mobile phone? etc.)
- Has the roof section or structure been assessed to ensure that it can withstand the load of the appliance and workers.
- Does the worker have appropriate foot wear?
- Are all power cables / extension leads safe and appropriately rated?
- Are all ladders, tools and equipment suitable in good condition?
- Where ladders are to be used, is there a firm, stable base for them to stand on? Can they be tied or secured in some way at the top? Is the top of the ladder clear of electricity supply cables?
- Is there a roof anchor to attach a harness and lanyard to? If so, instruction should be issued for the use of an approved harness or only suitably trained people used.
- Are all tools and materials being used, prevented from slipping and falling onto a person at ground level? Is the area below the work area suitably protected to prevent persons walking in this area?
- Does the work schedule take into account weather conditions, allowing for work to be suspended in high winds, thunder storms/lightning or other types of weather giving wet, slippery surfaces?
- Is there an on-going safety check system of harnesses, ropes, ladders and access/lifting equipment and where they exist on roofs, anchor points before the commencement of work?
- Is there a system which prevents employees from working on roofs if they are unwell or under the influence of drugs or alcohol?
- Are there any special conditions to consider i.e. excessive roof pitch, limited ground area, fragile roof, electrical power lines?
- Is the person conducting the installation and maintenance appropriately qualified and familiar with local authority and AS/NZS5601

GENERAL INFORMATION

2.1 UNIT OVERVIEW

ARIA GDH units are direct gas fired heaters. The standard control system is a standalone control system utilising a room thermostat to control heat demand from the GDH. An optional is also available configured for integration with Building Management Systems (BMS). Each GDH unit is provided with a comprehensive control and wiring information package.

Gas rate modulation is provided to maintain a more consistent room temperature. Once the room set temperature is reached the unit will cease heating. Consequently, as the room temperature falls below the set point the unit will automatically resume heating.

GDH units require integration with a fan or blower to operate. The size of the unit will determine the airflow required. Seeley International can supply a blower/evaporative cooler to suit requirement of the GDH and provide integrated controls. If using a 3rd party blower or cooler it is the installers responsibility to ensure that there is sufficient air flow is provided across the unit and that the blower/fan is compatible with the GDH controls to ensure safe and compliant operation.

Units are not flued, and combustion gases will enter the space being heated. It is the installers responsibility to ensure that there is sufficient relief for the gases to escape the heated area. The area being heated should not be sealed.

Commissioning of GDH Type B units will require independent type B certification to local legislation.

2.2 EQUIPMENT RECEIPT

Inspect the unit for any damage caused in transit. Any such damage must be immediately reported to the shipper of the goods.

The unit has been factory tested to check for correct operation of all components. If any part is obviously missing or damaged, notify the supplier immediately.

Check the appliance to ensure that the GDH unit that has been supplied will operate with the available gas supply, i.e. Natural or LPG gas.

2.3 FACTORY UNIT TEST

All AIRA GDH units are given a factory unit test which covers the function test and checks of the safety system including;

- Gas ignition and flame detection
- Gas valve modulation
- Operation of the High Limit Safety Switch
- Functional test for all units

GENERAL INFORMATION

2.4 TECHNICAL SPECIFICATION

2.4.1 Unit and Component Identification

Specification		GDH1055	GDH1585	GDH2110	GDH2500
Power Supply	Voltage/Phase/HZ	240/1/50 (415/3/50 Blower)	240/1/50 (415/3/50 Blower)	240/1/50 (415/3/50 Blower)	240/1/50 (415/3/50 Blower)
Power Consumption	Max Power	1.15	1.15	1.15	1.15
Controller	Type (standard)	Rotary Switch	Rotary Switch	Rotary Switch	Rotary Switch
	Type (Optional)	BMS	BMS	BMS	BMS
	Voltage/Phase/HZ	BMS (Customer supplied)	BMS (Customer supplied)	BMS (Customer supplied)	BMS (Customer supplied)
Gas Supply	Connecton (mm)	40	40	40	40
	Input (MJ/h)	1055	1585	2110	2500
	Output (kW)	293	440	586	694
Airflow L/s	for a 35/42/55 °C Temperature Rise	6379/5316/4059	9580/7983/6096	12759/10632/8119	15110/12592/9615
Cooler Match	AIRA AL	25	30	30	36
	Braemar RPB (Upon Request)	900	1300	1400/1500	N/A
Unit Size	Unit Weight	120	145	230/267	272
	Dimensions LxWxH (mm)	1500x990x990	1500x1150x1150	1500x1150x1150/ 1500x1400x1400	1500x1400x1400
Shipping	Shipping Weights	155	180	297	302
	Shipping Dimensions LxWxH (mm)	1700x1650x1200	1700x1650x1400x	2300x2300x1600	2300x2300x1600

Table 1: GDH Technical Data

2.4.2 Construction

- The main paneling and weatherproof casing enclosing the gas train and controls are made from galvanized steel.
- Duct mate is connected to both ends of the unit for connections to ductwork
- The burners are aluminium with a stainless steel baffle and end plates.

2.4.3 Blower/Fan

- GDH units require a fan or blower to operate. GDH units do not have an attached fan which must be ordered separately.
- GDH units are compatible with AIRA AL and Braemar RPB evaporative coolers creating a combined heating and cooling system.

2.4.4 Dampers

- All units are supplied with galvanized steel dampeners which are sized based on the airflow across the burner and the desired temperature rise.
- Adjustable damper models are available by special request allowing for additional airflow when combined with a 2 speed evaporative cooler.

2.4.5 Electrical Control

- All units are equipped with an electrical control box which controls the Gas Pilot, Main Valve, Modulating Valve and blower operation (when installed).
- All units are fitted with High Limit Safety Switches which are to be installed into the ductwork once the unit is installed. The switch is to be set to 80°C.
- Units are fitted with a flame controller which runs a pre-purge cycle. This will activate the connected fan/blower to run for 30 seconds before a 5 second ignition sequence begins.

INSTALLATION INFORMATION

3.0 INSTALLATION INFORMATION

The supplied units are to be installed in accordance to this manual, relevant local standards, acts and regulations.

GDH units are type B certified and will require a type B certifier to sign off the installation of the unit prior to use. All labeling required by AS5601.1, AS3814 and local regulations and requirements must be on display including the combustion product in accordance with section 5.7.7.1 of AS AS3814.

5.7.7.1 *Limits for combustion products*

A direct-fired air heater shall not produce carbon dioxide, carbon monoxide, formaldehyde or oxides of nitrogen in excess of the following values, with the heater handling the OEM's rated air throughput at nominal gas consumption and at the OEM's minimum gas consumption:

(a) CO_2 ..... 3000 ppm.

(b) CO..... 10 ppm.

(c) Formaldehyde..... 1 ppm.

(d) NO_X..... 0.5 ppm.

NOTES:

1 The ratio of CO to CO_2 should not exceed 0.003.

2 In some areas the ambient level of CO can cause the outlet level of CO from the heater to be higher. However, the level of CO in the heated air stream should not exceed 30 ppm at any time or 10 ppm averaged over an 8 h period.

Figure 1: AS3814 Section 5.7.7.1

Before installation of a direct fired heated the installer must notify the local gas supply authority and provide the following information

1. Burner Data
2. Purge and critical time calculations
3. Wiring Diagram
4. Valve Train Layout.

This information can be requested from Seeley international when ordering the unit.

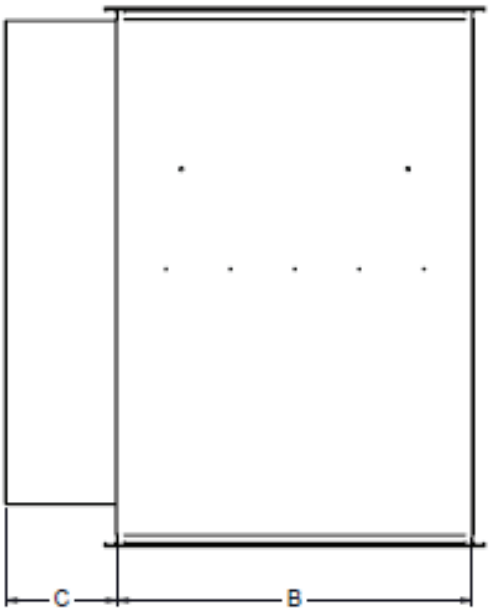
Isolation of the gas and electrical supplies to the units shall be accessible and identifiable at all times. GDH units must be supplied with fresh air only (Return air is not optional). The fresh air intake is to be clear of flues, exhaust outlets ect. Gas train schematic and wiring diagram have a location to fill in site specific data (address and contact).

3.1 MODEL VARIATIONS AND DIMENSIONS

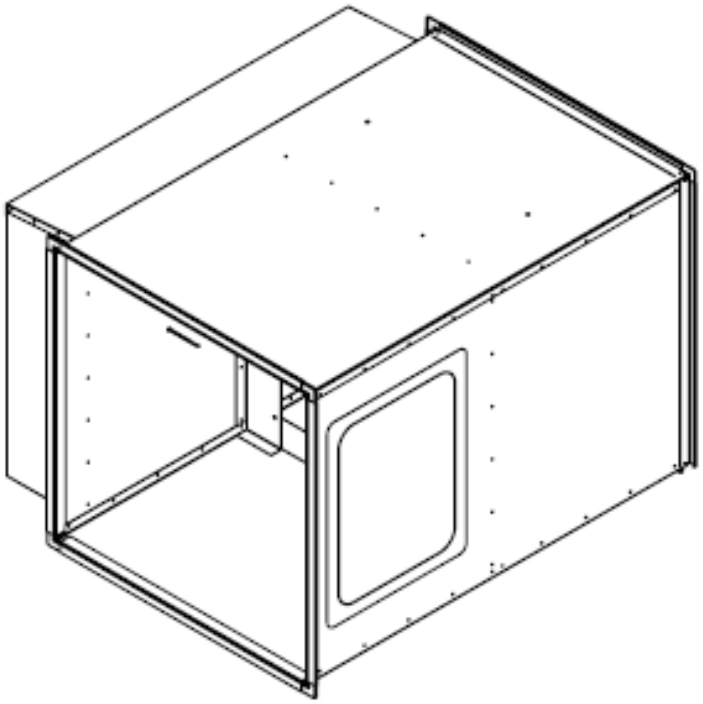
Unit	1055	1585	2110	2500
A	1500	1500	1500	1500
B	990	1150	1150/1400*	1400
C	310	310	310	310

Table 2: Dimensions

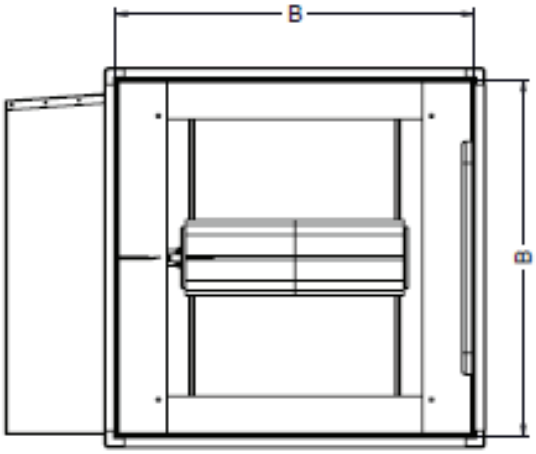
INSTALLATION INFORMATION



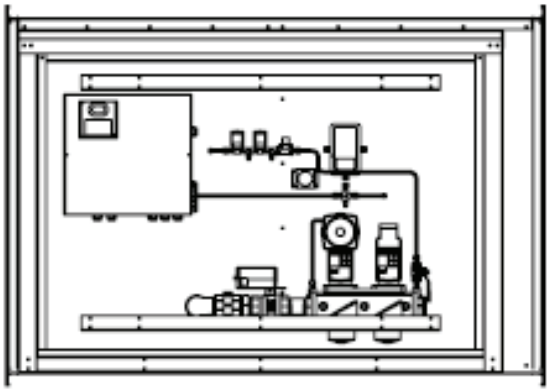
TOP VIEW



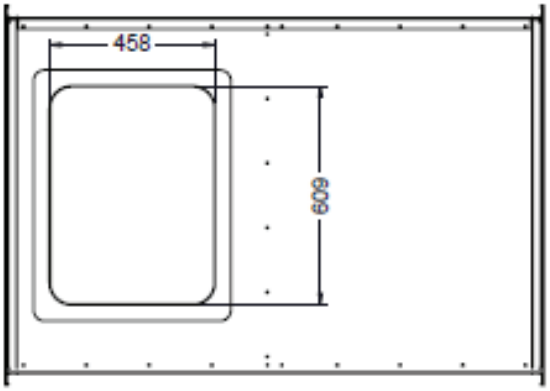
ISOMETRIC VIEW



FRONT VIEW



LEFT SIDE VIEW



RIGHT SIDE VIEW

Figure 2: GDH Units

INSTALLATION INFORMATION

3.2 INSTALLATION

The following recommendations are not intended to supplant or take precedence over relevant official regulations. AIRA GDH units are designed essentially as a roof top or external ground mount unit.

3.2.1 Location

This equipment is not designed for long and complex air distribution ductwork and as such the unit should be located as close as practicable to the points of air distribution. GDH units. Depending on large volumes of 100% fresh air, care must be taken to locate the unit clear of kitchen exhausts, heavy vehicle traffic, industrial fume discharge etc. that may allow odour or fume laden air to be drawn into the unit. The prime requisites for the correct location of a unit is an unrestricted supply of clean fresh air. The unit will push combustion gases from the burner into the heated area where adequate relief air must be supplied to prevent the buildup of harmful gases. **Failure to do so may result in fatalities.**

When selecting a location for the GDH unit the following shall be considered.

1. Will the unit be suitably protected from the effects of corrosion and/ or dust laden environments and any likelihood of physical damage?
2. Can qualified personal perform functional adjustments and maintenance on the unit?
3. Does the chosen location prevent a hazard to the building or structure or to the contents of the building?
4. How to minimize the risks associated with storage, use or release of hazardous or flammable substances in the vicinity of the unit?
5. How to minimize risk of harm to persons?
6. Will the noise of the unit operating affect persons nearby? Units should be located so that quiet areas such as meetings rooms, offices etc. are not affected for both the premises that the unit is being installed and adjoining properties.
7. A structural engineer is to be engaged to prove that the supporting structure is suitable for a fully laden unit.
8. Ensure any skylights within 3m of the units have adequate fall protection installed

3.2.2 Clearance Around Unit

1000mm is the minimum recommended clearance around all sides for service access

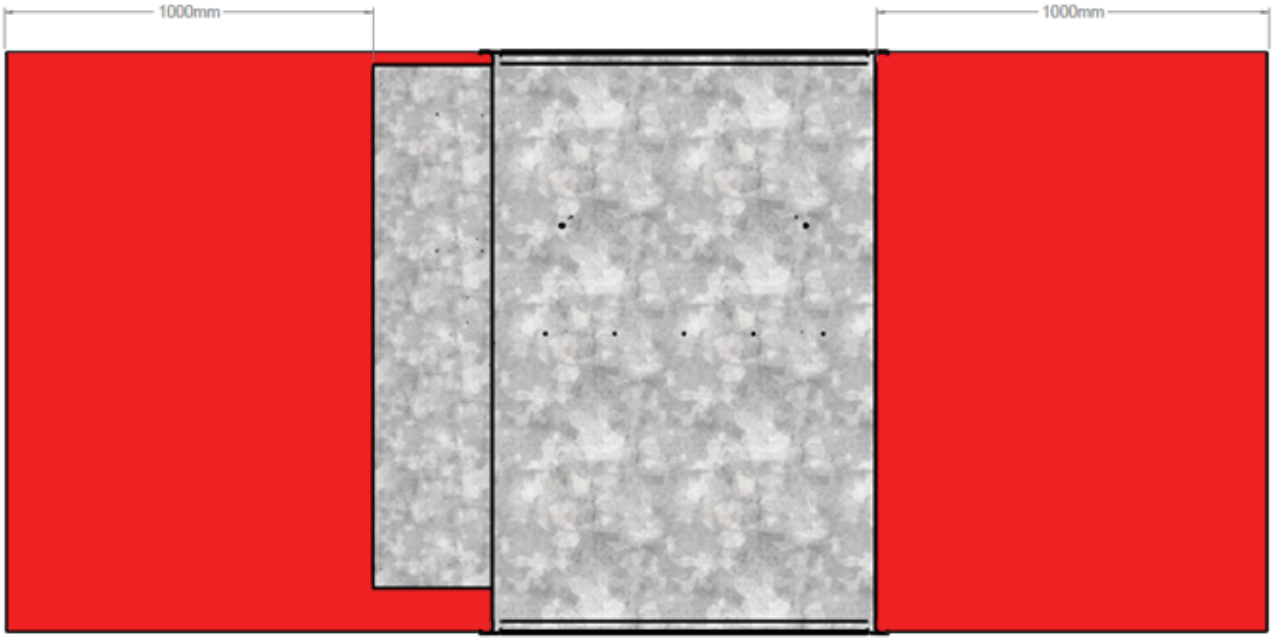


Figure 3: Unit Clearance

INSTALLATION INFORMATION

3.2.3 Weight And Location

For roof mounting, the building's roof must be adequately designed to support the unit weight and any service personnel. If in doubt a suitably qualified Civil or Structural Engineer should be engaged to conduct an assessment. The below figures and tables list the weights of the units.

MODEL	WEIGHT
GDH1055	120kg
GDH1585	145kg
GDH2110	230/267kg
GDH2500	272kg

Table 3: Weight

3.2.4 Lifting

GDH units may be lifted by passing straps or chains through the centre of the unit or by slinging underneath. Special care should be taken to avoid damaging gas connection, dampers and control box housing.

3.2.5 Positioning and Securing

GDH units are to be positioned so that the centre of the damper is 2 times the width of the duct from a bend or air source upstream and 915mm from a bend downstream as shown belo

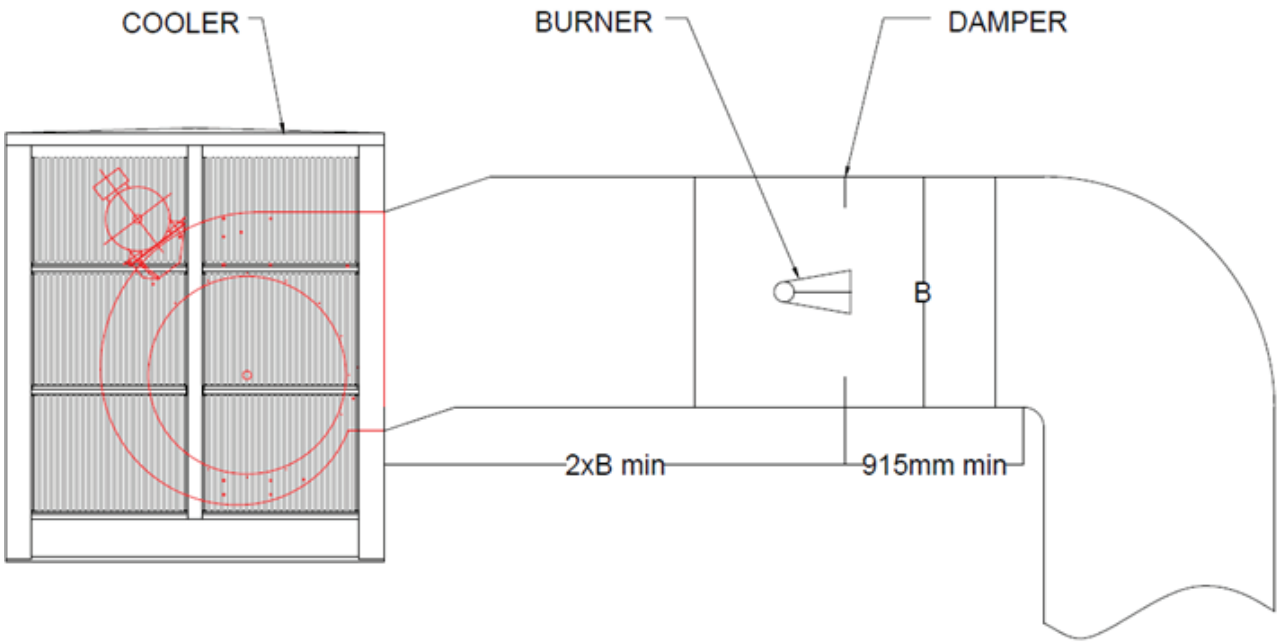


Figure 4: GDH Positioning

The GDH unit shall be supported to minimize deflection of the ductwork. Supports are the responsibility of the installer and should be done with reference to AS4254- Ductwork for air handling systems in buildings.

3.2.6 Duct Connections

The inlet and outlet of the unit is provided with a Ductmate® ductwork connection. An inspection and service panel is located above and below the duct connection flange. Duct connections shall be done in accordance with relevant standard.

INSTALLATION INFORMATION

3.3 ELECTRICAL CONNECTIONS

3.3.1 Electrial Supply

All electrical connections are to be as per AS3000. All electrical work shall be performed by a registered electrical contractor. AIRA GDH units are provided with an electrical wiring diagram with different diagrams for different control setups.

Electrical connections are to be made in the control box.

When wiring the unit:

- **DO NOT** run cables or conduit across the heater
- **DO NOT** wire directly into the control box except for control wires as per the wiring diagram
- **DO NOT** modify the control box wiring affecting the safety systems
- **DO NOT** bypass safety systems

3.3.2 User Control Configuration Optionsit

There are 2 primary control options for AIRA GDH units, Rotary switch and BMS. Units are specified with either a rotary switch or capability to be wired for BMS interface. Rotary switch units have a Siemens room thermostat supplied

Figure 5: Thermostat

Figure 6: Wall Switch

OFF	UNIT IF OFF
FAN LOW	VENTILATION ONLY, FAN ON LOW SPEED
FAN HIGH	VENTILATION ONLY, FAN ON HIGH SPEED
LOW COOL	FAN ON LOW, WATER SUPPLIED TO COOLING PADS (IF FITTED)
HIGH COOL	FAN ON HIGH, WATER SUPPLIED TO COOLING PADS (IF FITTED)
HEAT	FAN ON HIGH, GAS SUPPLIED TO UNIT IF THERMOSTAT IS SET ABOVE CURRENT ROOM TEMPERATURE

Table 4: User Controls

3.3.3 Blower / Fan Setup

GDH units are supplied with a pressure switch that only allows gas to flow once airflow is detected. The pressure switch is to be set during the commissioning of the unit.

Blowers/fan shall be installed in a location in accordance with 3.2.7 Positioning and Securing.

3.4 GAS CONNECTIONS

3.4.1 Gas Supply

This unit must be installed in accordance with AS/NZS 5601.1. Before connecting the unit to the gas line. The gas line must be fully purged and checked to ensure that they are free of dirt and foreign objects.

The gas supply pipe must be of adequate size to the heater and all gas appliances onsite. The screwed inlet connection to the heater **"Must Not"** be used as an indication of the gas line's sizing required. Units are fitted with a 40mm Gas valve this doesn't indicate the line diameter size. Gas lines must be sized to consider the length of the pipe and any other attached appliances to ensure adequate flow and pressure are supplied to the unit. Gas line size will be dependent upon flow rate required and line length. Refer to AS 5601.1 Appendix F for sizing of supply gas line.

The gas supply line must bear no load and be adequately supported and align with the units gas train. Do not overtighten gas valve connection. A cracked body on inlet side of gas valve will not be covered by warranty. Check all gas connections for leaks using soap solution or suitable gas leak detection fluid.

Gas pressure for both Natural Gas and LPG is listed below in Table 5. If the pressure is greater than 7kPA an over pressure shut off regulator is required.

GAS PRESSURE	NG	LPG
Maximum kPa	7.0	7.0
Minimum kPa	1.12	1.12

Table 5: Gas Pressure

If the inlet test pressure is not at least 1.12kPa for Natural Gas the following may have occurred;

- Gas pipe to the unit may be undersized and/or restricted
- The Gas meter may be undersized
- The Gas regulator may be set too low

If you suspect that the gas pressure is too low contact the Gas Supply authority

DO NOT Attempt to adjust the main supply regulator where the gas enters the premises

3.4.2 LPG

Adequate sizing and the number of LPG bottles is of high importance when considering an LPG unit. Pressures can dramatically drop as the bottles become empty. This can affect the combustion process within the unit causing light back and poor combustion leading to excessive emissions.

3.4.3 Gas Train Information

The Gas Train as pictured in Figure 7 is installed as part of the unit. It is the responsibility of the installer to provide the pipework to the gas train and ensure that the supply pipework is of adequate size and pressure.

1. When connecting the gas pipe, there may be an accumulation of condensates and other deposits in the gas pipe. These must be cleared before connecting the gas pipe to the unit.
2. Purge all air from the gas pipe and check for leaks using a soap and water solution or approved leak test method. The connections along the gas train should also be checked to ensure that there was no damage caused during transportation and installation of the unit.

Note: All gas operating pressure tests must be completed with all gas appliances operating at full capacity.

INSTALLATION INFORMATION

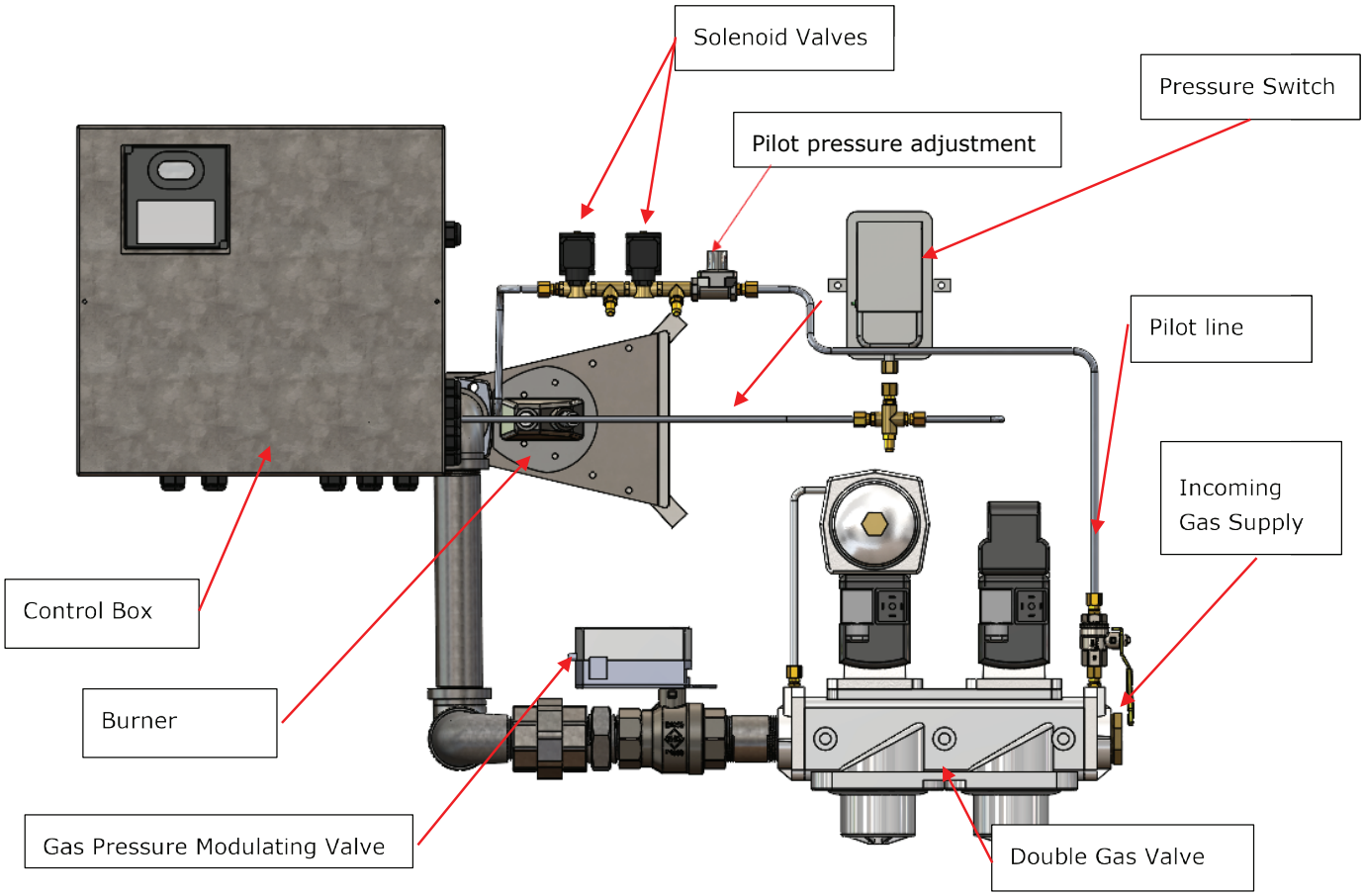


Figure 7: Gas Train

3.4.4 Gas Valve

The double gas valve supplied with the GDH unit is the same for both LPG and natural gas. The gas valve has a 40mm inlet.

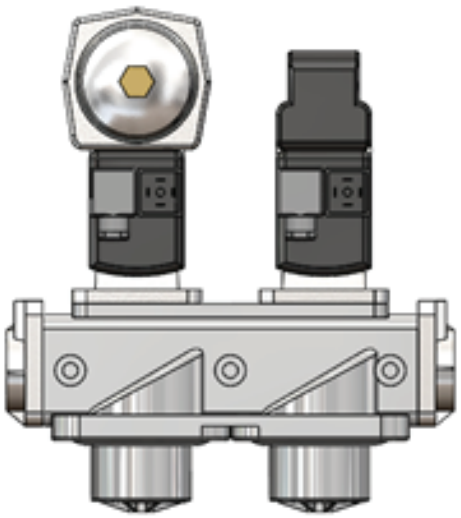


Figure 8: Gas Valve

3.4.5 Standard Operating Pressure of the Gas Valve

Unit	Gas Type	High Pressure (kPA)	Low Pressure (kPA)
GDH1055	Natural Gas	0.875	0.5
	LPG	0.35	0.25
GDH1585	Natural Gas	0.875	0.5
	LPG	0.35	0.25
GDH2110	Natural Gas	0.875	0.5
	LPG	0.35	0.25
GDH2500	Natural Gas	0.78	0.5
	LPG	0.3	0.23

Note: Gas pressure outside of the specified range are to be confirmed with Seeley International. Gas pressures will require adjustment on site to ensure that the combustion gases are below the allowable limits.

Table 6: Gas Pressure

3.4.6 Setting Gas Valve Pressure

The regulated valve pressure is to be set based of the ranges in Table 6.

To set the regulated pressure follow the steps below.

1. Connect a manometer to the double gas valve pressure test point.
2. Measure the incoming gas pressure to ensure that it less than 7kPa. If found to be greater than 7kpA the gas valve may be in a locked state. A pressure regulator will need to be installed upstream of the gas valve to provide the correct gas supply pressure in accordance with Table 3. If the gas valve is a locked state the line will need to be bled between the regulator and the valve to relieve excess pressure.
3. Ensure gas pressure test point has been closed.
4. Check gas train for leaks.

3.4.7 Setting the Modulating Valve Motor

The ball valve to motor alignment and limits are factory preset. Site gas pressure may differ to factory settings therefore requiring modulating motor limit adjustment.

Aligning the Motor and Valve Shaft

1. Open gas valve fully with motor removed. (This is indicated by the valve shaft flat facing outwards) Removal of the adaptor shaft may be required to identify the shaft flat.
2. Reinstall adaptor shaft ensuring grub screws are tight.
3. Set modulating motor to 90° and install over the adaptor shaft. Tighten no.9 SHCS in Figure 19: Modulating Motor onto Adaptor Shaft.

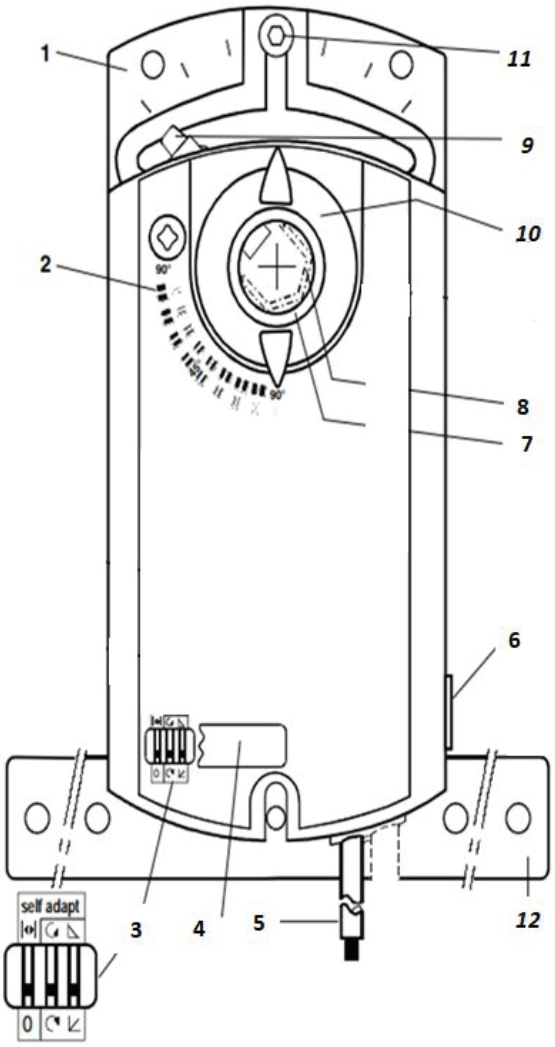
Setting Modulating Motor

The minimum low fire rate must not be less than 59% of full fire rate.

To set the fire rate follow the steps below;

1. Engage the slider (5) to disengage the gear train, set the modulating ball valve to 100% open
2. Check the test point pressure against the full gas setting
3. Low fire may be adjusted by limiting the travel of the modulating valve, utilizing adjusting screw (11) to ensure the gas cuts off before the rate is reduced too far

INSTALLATION INFORMATION



1. *BASE PLATE AND MOUNTING*
2. *ROTATIONAL ANGLE SCALES*
   0°...90° / 90°...0°
3. *DIL SWITCHES FOR*
   - *SELF ADAPTION*
   - *ROTATIONAL MOVEMENT DIRECTION*
   - *INVERTED OR NON INVERTED OUTPUT VOLTAGE OPERATING FUNCTION*
4. *COVER FOR DIL SWITCHES*
5. *CONNECTING CABLE FOR POWER, CONTROL SIGNAL, AND POSITION INDICATION*
6. *SLIDER TO DISENGAGE THE GEAR TRAIN*
7. *COUPLING BUSHING*
8. *CENTERING ELEMENT FOR GLB...1E (SHAFT DIAMETER 8....10MM)*
9. *POSITION INDICATOR*
10. *ADJUSTMENT LEVER WITH SHAFT FASTENING SCREW*
11. *ADJUSTING SCREW FOR ROTATIONAL ANGLE LIMITATION*
12. *MOUNTING BRACKET*

Figure 9: Modulating Motor

Correct adjustment MUST be made, too low gas pressure will result in a "light-back" condition, damaging the burner's ports and result in a buildup of soot and replacement of burners.

3.4.8 Pilot Injector Setup

The pilot mounts to a bracket attached to the side of the burner. The burner with the pilot attached should be in the center of the burner chamber.

The Pilot Ignitor, Spark Ignitor and Flame Rod comes as an assembly. Care must be taken when working on the pilot system not to damage the aluminum gas hard line. Natural gas and LPG units have different assembly

DO NOT modify the position of the pilot in relation to the burner. Altering the pilot can cause explosive ignition. Ensure that the pilot is secured in position.

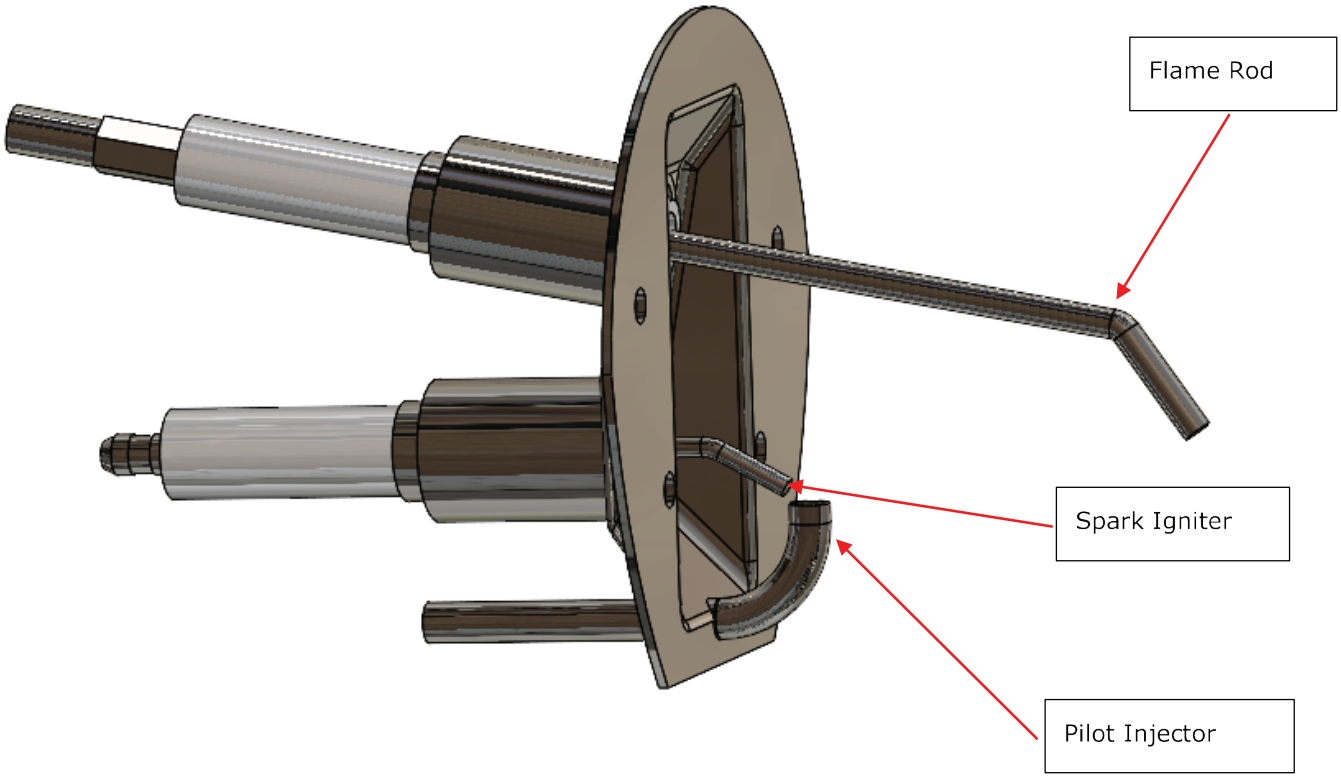


Figure 10: Pilot Injector

3.4.9 Leaving Air Temperature Sensor

GDH units have a leaving air temperature that comes wound up inside the control box. It is the installers responsibility to run the leaving air temperature sensor 1000mm downstream of the burner.

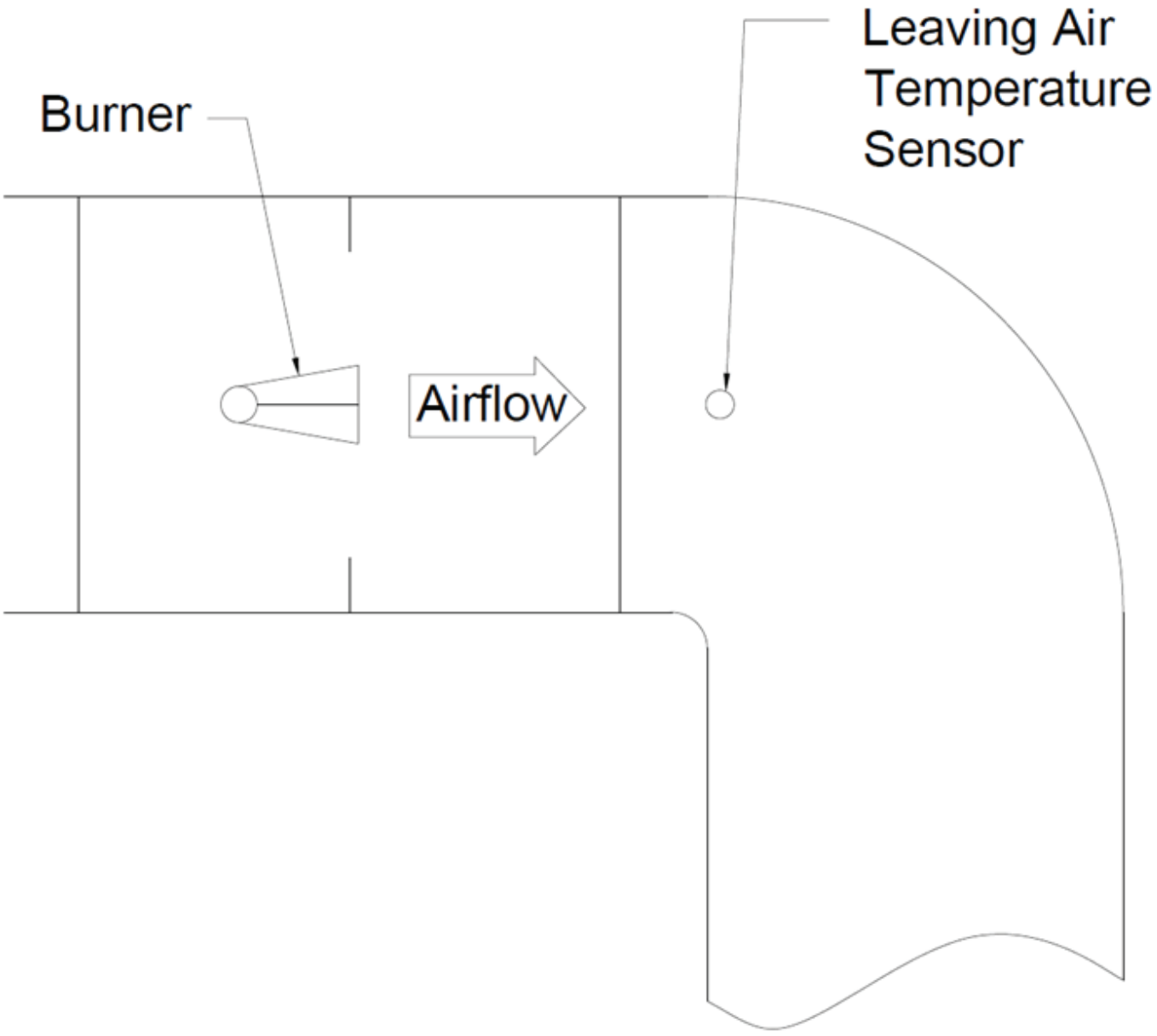


Figure 11: Air Temperature Sensor

COMMISSIONING INFORMATION

4.0 COMMISSIONING

Prior to commencement ensure Main Isolator Switch is OFF and correct electrical Lock Out Tag Out (LOTO) procedures are followed. **Failure to do so may result in Injury or Death.**

A commissioning report template is available in Appendix D of this document. AS5601.1 Appendix O provides additional guidelines for commissioning.

WARNING! GDH units require a fresh air supply that may not be isolated by isolating power to the GDH unit. Ensure that the power to any cooler/blower/fan is isolated before working on the GDH unit.

4.1 UNIT DETAILS

1. Record unit details on the Commissioning Sheet including Model Number and Serial number which can be found on the control box.
2. A copy of the commissioning document should be kept inside the document pocket.
3. The following information is to be recorded on the appliance in clear, permanent marking that are readily accessible and easy to read when the appliance is installed.
   a) OEM's Name
   b) Model Identification
   c) Nominal Gas Consumption
   d) Gas Type
   e) Maximum and minimum gas supply pressure (kPa)
   f) Purge Times
   g) Gas pressure at burner head for the nominal gas consumption (kPa)
   h) The combustion chamber volume (m^3)
   i) The maximum appliance process design temperature (°C)
   j) The total volume swept by the combustion products in passing from the burner to the flue connection (m^3)
   k) The serial number
   l) Date of manufacture
   m) Purge volume
   n) The wording DIRECT-FIRED AIR HEATER
   o) The air flow proving device trip setting, in Pa
   p) The setting of the temperature limit device (°C)
   q) The RPM of the heater fan, the related air flow in L/s and the external static pressure in Pa
   r) A statement that includes the following words

   THIS HEATER SHALL BE TESTED EVERY SIX MONTHS OF OPERATION TO SHOW THAT THE CONCENTRATION OF THE FOLLOWING GASES AT THE HEATER OUTLET DOES NOT EXCEED THE FOLLOWING VALUES
   i) Carbon Monoxide (CO)…….……10ppm
   ii) Carbon Dioxide (CO2)…….....……0.3%v/v (3000ppm)
   iii) Formaldehyde (CHOH) ……....……1ppm
   iv) Oxides of nitrogen (NOx) ……0.5ppm

   s) Label attached in a permanent label in a prominent position that includes the following wording, in letters of at least 8mm height.

   THIS HEATER SHALL NOT BE INSTALLED IN DOMESTIC OR RESIDENTIAL PREMISES. FOR ALL OTHER APPLICATIONS THE APPROVAL OF THE GAS TECHNICAL REGULATOR SHALL BE OBTAINED.
4. Customer to fill in minimum ventilation space required sticker with volume calculated in accordance with AS5263.1.10.

4.2 GENERAL INSTALLATION CHECK

1. Confirm that safe access is available to unit. If the unit is located on a roof, ensure that a certified anchoring system is installed and that the appropriate harness is available for use during commissioning.
2. Confirm the unit casing is in good condition and free from damage.
3. Check that the unit is sufficiently secured and level.
4. Check that ductwork from the unit is correctly installed and secured by a qualified person.
5. Confirm that the fan/blower/cooler that will be supplying air to the unit has been installed and commissioned.
6. Removable services panel reinstated after power and gas are connected.

COMMISSIONING INFORMATION

4.3 ELECTRICAL CHECKS

4.3.1 Electrical Installation Checks

1. Turn OFF main isolator and follow LOTO procedures.
2. The electrical connections are to be completed by a licensed and experienced person.
3. Check that the isolator is fitted and operational. If the isolator is damaged the unit must not be commissioned or operated until the issue is resolved.
4. Check that all wiring is secure and terminated. All cable protection is in good condition.
5. Check that the single phase power is connected to the unit. Test supply connection and record voltage.
6. Confirm that the thermostat is connected and operational. Refer to Section 4.5 for further details.
7. Confirm that the rotary switch/BMS wiring is complete and ready for commissioning.

4.4 GAS CHECKS

4.4 1 Incoming Gas Supply Checks

1. Turn OFF main isolator and follow LOTO procedures.
2. The gas connections are to be completed by a licensed and experienced person.
3. Confirm that incoming gas lines where purged with all dirt and condensation removed prior to installation.
4. Confirm that the gas train is connected as specified in Section 3.4.4 Gas Train.
5. Check that the pilot assembly is secured to the main burner and that the pilot gas line is attached to the assembly.
6. Purge all air from the pipeline and check for leaks by using a soap solution or leak detector.
7. Check the supply gas pressure is between 1.12-7kPa. Record result.

4.4.2 Gas Train Check

Once the incoming gas supply is connected to the unit the gas train can be commissioned.

1. Confirm that the gas valve is set up for type of gas being supplied to the unit. GDH units will have different operation pressures for natural gas and LPG. Refer to the label supplied on the unit. If the gas type does not match the label contact Seeley International.
2. Confirm that main burner is free from obstruction.
3. Visually inspect pipework for damage. Apply a leak detection solution to all connections to confirm that there are no leaks. Confirm that the barrel union has not come lose during transportation or installation.
4. All gas leaks cannot be confirmed until gas has been supplied to the main burner

COMMISSIONING INFORMATION

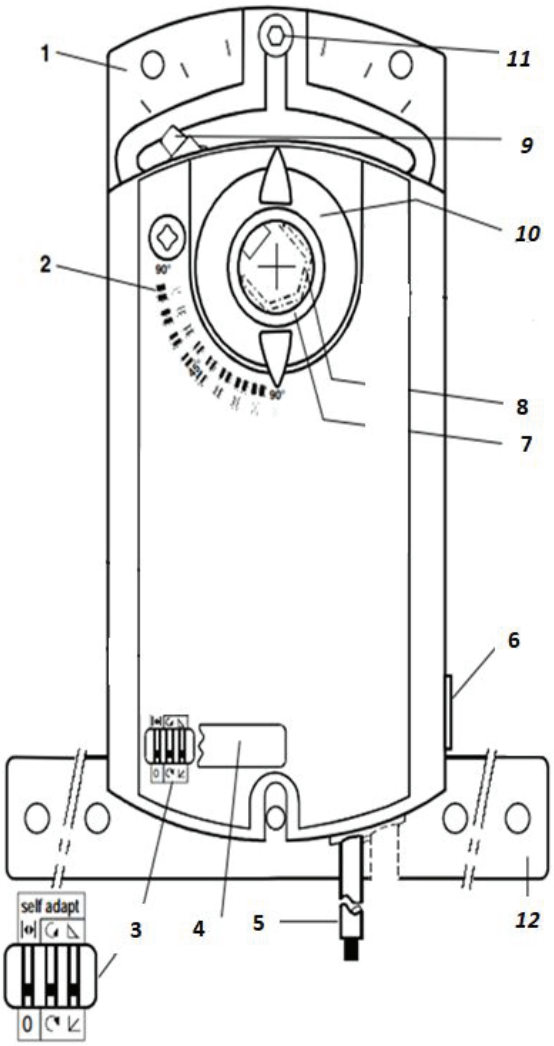
4.4.3 Setting the Modulating Valve Motor

Valve to motor alignment and limits are factory preset. Site gas pressure may differ to factory requiring modulating motor limit adjustment.

The minimum low fire rate shall be within the limits specified in 3.4.6 Standard operating pressure of the gas valve

To set the fire rate follow the steps below;

1. Engage the slider (5) to disengage the gear train, set the modulating ball valve to 100% open
2. Check the test point pressure against the full gas setting
3. Low fire may be adjusted by limiting the travel of the modulating valve, utilizing adjusting screw (11) to ensure the gas cuts off before the rate is reduced too far.



1. *BASE PLATE AND MOUNTING*
2. *ROTATIONAL ANGLE SCALES 0°...90° / 90°...0°*
3. *DIL SWITCHES FOR*
   - *SELF ADAPTION*
   - *ROTATIONAL MOVEMENT DIRECTION*
   - *INVERTED OR NON INVERTED OUTPUT VOLTAGE OPERATING FUNCTION*
4. *COVER FOR DIL SWITCHES*
5. *CONNECTING CABLE FOR POWER, CONTROL SIGNAL, AND POSITION INDICATION*
6. *SLIDER TO DISENGAGE THE GEAR TRAIN*
7. *COUPLING BUSHING*
8. *CENTERING ELEMENT FOR GLB...1E (SHAFT DIAMETER 8....10MM)*
9. *POSITION INDICATOR*
10. *ADJUSTMENT LEVER WITH SHAFT FASTENING SCREW*
11. *ADJUSTING SCREW FOR ROTATIONAL ANGLE LIMITATION*
12. *MOUNTING BRACKET*

Figure 12: Modulating Motor

4.4.4 Modulating Motor Operational Check

After adjustments are made for site gas pressure. Checking the function of modulating motor is required.

1. Set the modulating motor to the low fire condition by manually manipulating the shaft (9)
2. Set the room temperature to the highest possible set temperature.
3. Turn on the unit.
4. Watch the modulating motor angle indicator dial. The motor should modulate from closed to fully open. A monometer should be connected to the manifold pressure test port to ensure that the correct pressure is achieved at full open.
5. Reduce the room set temperature just below the current room temperature. This operation causes the unit to reduce the gas rate as the set temperature reaches the room temp
6. The modulating motor should begin to modulate the burner pressure down to the set low gas rate
7. The unit should then switch off the main burner and pilot.

COMMISSIONING INFORMATION

4.5 SETTING CONTROLS

4.5.1 Leaving Air Temperature Control

GDH units have a leaving air temperature which can be found in the top right-hand corner of the control box. The unit sensor will come from the factory set as 80°C as this is the maximum allowable temperature under AS3814 Section 5.7 Direct fired air heaters and curtains. If the unit is being used for another purpose it is the installers responsibility to ensure that it meets the applicable standards.

4.5.2 Thermostat and User Controls

1. Check that the thermostat and wall switch are installed and wired back to the unit.
2. Check supplied wiring diagram for connections

4.5.3 Setting Air Pressure Switch

The main gas valve will not open unless the pressure switch is activated. The pressure switch differential may be adjusted by removing the cover and turning the adjustment screw.

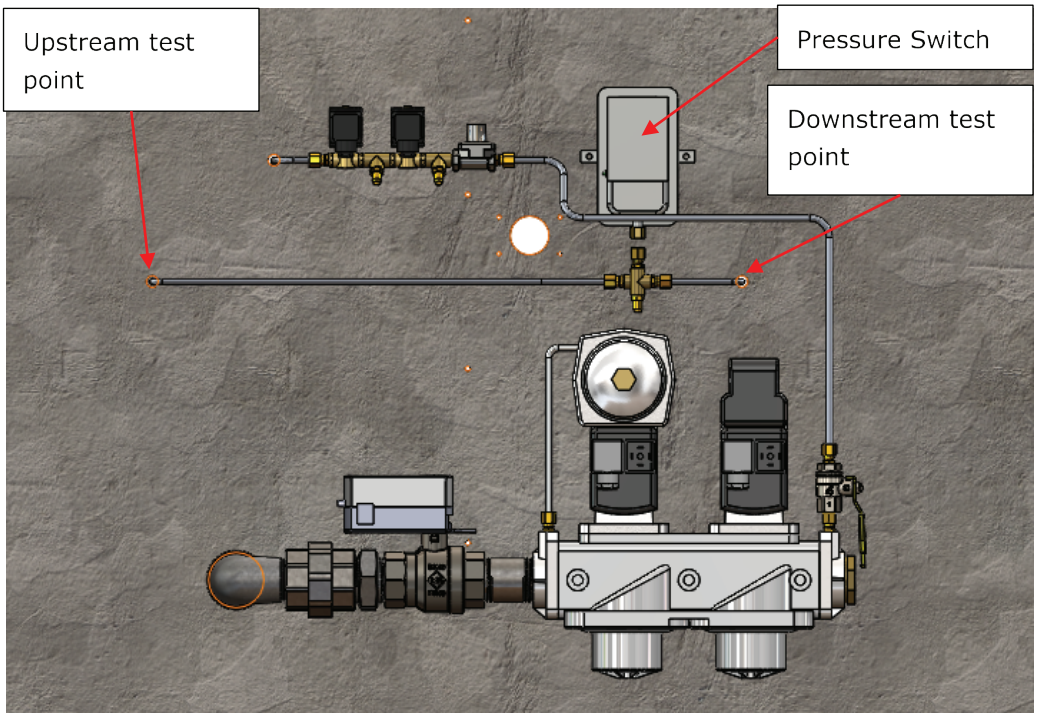


Figure 13: Air Pressure Switch

COMMISSIONING INFORMATION

4.6 GENERAL OPERATION

1. Remove all foreign objects from blower casing and ensure that all access panels are installed and secured.
2. Connect manometers to confirm the main burner and supply pressures.
3. Isolate main gas valve. Deisolate gas and electrical supply to the heater.
4. Set rotary switch to “Heat” **WARNING!** Blower will begin to rotate. Ensure access panels are correctly installed and no tools are present within the blower box section of the unit. The unit will begin the purge sequence and run for 30 seconds.
5. With power and gas to the unit and switched to heat and fan the pilot will attempt to ignite. The spark igniter should be heard briefly (5 seconds) until the pilot is established. When pilot ignites, the flame should be blue and should extend approximately half the burner end plate. Check the flame signal is operating. Should be between 2-5UA or 2-5VDC. If not, the pilot flame may be adjusted by the small adjusting screw located on the pilot regulator. Note it may take several attempts for the pilot to light especially on LPG unit due to the long pilot gas line and small orifice size. Cold weather commissioning may also increase the pilot light time. If the pilot does not ignite refer to section 6.3 for possible causes.
6. Deisolate the main gas valve and attempt ignition. The flame rod will sense the pilot and open the main gas valve. The main burners will ignite. Ensure that the entire burner is lit by examining through. Operate the unit continuously for a minimum of 45min to confirm correct operation.
7. Check operating pilot and manifold pressures against the specified pressures and adjust accordingly. Record results. Refer to Section 3.4.7 Setting Gas Valve Pressure. If correct pressure at the burner cannot be obtained by adjusting the main gas regulator in the unit, check pressure at inlet of unit stop cock. If inlet pressure is less than minimum specified on the label, either gas supply line to the unit is undersized and/or restricted or the meter outlet pressure is too low.
   WARNING: If the gas pressure is lower than specified it may result in burner light back, potentially causing damage to the burners and increased soot buildup in the heat exchanger and flue
   Contact the local gas authority – DO NOT attempt to adjust main gas regulator where gas enters premises or at meter unless authorized to do so.
8. When the unit is turned to “HEAT” the temperature rise across the burner will ideally be within the range of 35°C to 55°C on full flame. The rise in temperature can be controlled by changing the airflow across the burner. The air flow across the burner may require adjustment if the combustion gases exceed the allowable limits.
9. Perform modulating motor check as per Section 4.4.4. As the room temperature approaches the set temperature the modulating motor should modulate down to low gas fire. Once the modulating motor reaches the lower set limit the main manifold pressure should be the low pressure.
10. Once the room temperature reaches the set limit and modulation has occurred the unit will shut off the gas to the main burner or the modulating motor will perform fine adjustments to maintain a consistent temperature.
11. When the unit is operational cut power to the unit externally at an isolator and note that the flame goes out and that the gas valve shuts. After 1 minute restore power to the unit and confirm that the unit restarts and begins normal operation.

COMMISSIONING INFORMATION

4.7 COMBUSTION PRODUCT TESTING

Once the unit operation has been confirmed the combustion products produced are to be tested and recorded.

5.7.7.1 *Limits for combustion products*

A direct-fired air heater shall not produce carbon dioxide, carbon monoxide, formaldehyde or oxides of nitrogen in excess of the following values, with the heater handling the OEM's rated air throughput at nominal gas consumption and at the OEM's minimum gas consumption:

(a) CO_2 ..... 3000 ppm.

(b) CO..... 10 ppm.

(c) Formaldehyde..... 1 ppm.

(d) NO_X..... 0.5 ppm.

NOTES:

1 The ratio of CO to CO_2 should not exceed 0.003.

2 In some areas the ambient level of CO can cause the outlet level of CO from the heater to be higher. However, the level of CO in the heated air stream should not exceed 30 ppm at any time or 10 ppm averaged over an 8 h period.

Figure 14: AS3814 Section 5.7.7.1

To ensure the requirements of Clause 5.7.7.1 are met samples of the heated discharge air shall be taken from the discharge duct work, before the first discharge outlet, far enough downstream to ensure that combustion products are uniformly mixed with the heated air.

4.8 COMMISSIONING RESULTS

All commissioning results should be recorded with a copy to be stored in the control box for reference during maintenance

OPERATING INSTRUCTIONS

5.0 OPERATING INSTRUCTIONS

5.0.1 STARTUP – ROTARY SWITH UNITS TO PROVIDE HEAT

1. Set Thermostat to desired temperature.
2. Switch Rotary Switch to HEAT

5.0.2 STARTUP - ROTARY SWITCH UNITS TO PROVIDE VENTILATION

1. Switch Rotary Switch to LOW FAN or HIGH FAN

5.0.3 STARTUP -ROTARY SWITCH UNITS TO PROVIDE COOLING

1. Switch Rotary Switch to LOW COOL or HIGH COOL

5.0.4 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING HEAT

1. Switch Rotary Switch to OFF

5.0.5 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING VENTILATION

1. Switch Rotary Switch to OFF

5.0.6 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING COOLING

1. Switch Rotary Switch to OFF

5.1 BMS STARTUP AND SHUTDOWN

It is the responsibility of the BMS installer to provide instruction and training on the operation of the interface.

Note:

1. BMS wiring should be done in accordance with supplied wiring diagram. No changes should be made to the internal control box wiring.
2. For initial startup, or for startup after a long break, the pilot may take several attempts to light due to the pilot gas line needing to prime

OPERATING INSTRUCTIONS

5.2 OPERATIONAL FLOWCHART

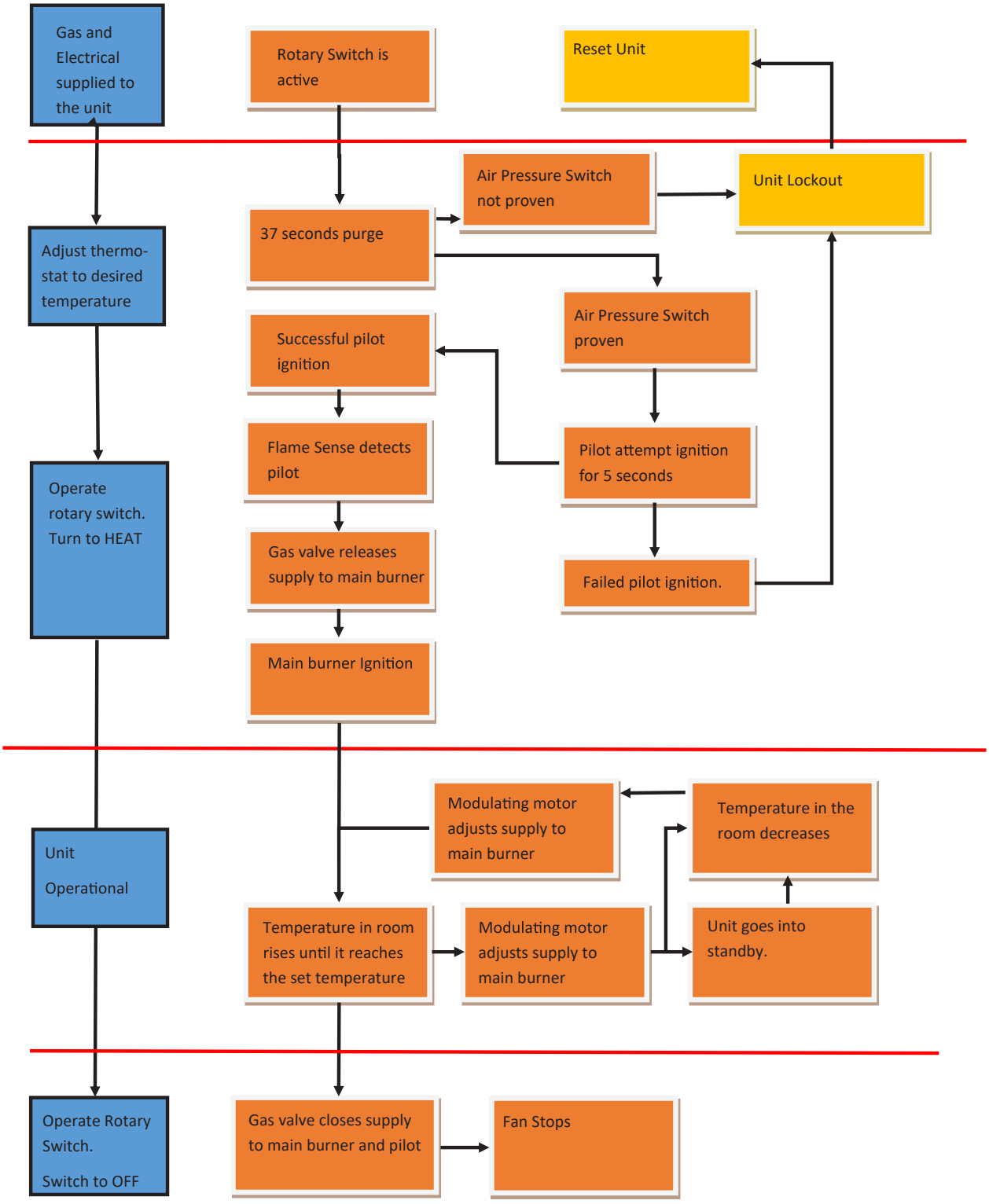


Figure 15: Operational Flow Chart

UNIT MAINTENANCE

6.0 SERVICE AND MAINTENANCE

Aira GDH units require electrical and gas fitting knowledge to service the unit. Servicing should be carried out by a qualified Seeley International Service Technician, appointed Aira service agent or appropriately qualified trades persons. If unsure about any servicing or maintenance aspect of the unit, immediately stop work and contact Seeley International for assistance.

Aira units are often manufactured to exact customer specifications. When ordering spare parts, the unit serial number must be used to ensure the correct components are supplied.

When working on the burner section care must be taken to ensure all parts have sufficiently cooled before commencing any service or maintenance activities.

Appropriate PPE should always be worn which includes but is not limited to safety glasses, hearing protection and gloves. Additional site requirements may require additional PPE, especially when working on roof tops or in commercial/industrial facilities.

Maintenance shall be carried at a minimum of every six months in accordance with AS3814. If the unit is not operational over the warmer months maintenance should be performed at the start of the heating season. Contact Seeley International Service for servicing support. This manual does not override any local legislative requirements.

6.1 BURNER MAINTENANCE

This work should be carried out by authorized personnel.

1. Check air supply source and ensure the proper amount of air is going through the heater.
2. Turn off power and gas supply and remove service panel at rear of heater. Check and clean main burner as necessary. Check and clean pilot burner assemblies. Clean observation port glass. Refit service panel.
3. Fit manometer to valve train and pressure test in the following stages:
   - 3.1 Fit manometer to test point between isolating vale and heater valve train. Leave valve closed – No pressure means isolating vale is not leaking.
   - 3.2 Pressure test between isolating valve and first safety shut off valve.
   - 3.3 Pressure test between safety shut-off valves.
4. Turn power and gas supplies on and start heater. With soap and water leak test all fittings and valves.
5. Fit manometer to burner pressure test point. Turn heater on and while burner is in pre-purge period, zero manometer to the new liquid level created by positive air pressure exerted on the burner. When burner starts, check and if necessary set burner pressure as stated on data plate.
6. Check all safety controls.
   - 6.1 Turn all gas off at isolating valve. Burner must stop. Burner control must go to flame failure de-energising all safety shut-off valves.
   - 6.2 Check and ensure high limit control breaks, locking out burner at a maximum temperature of 80°C.
   - 6.3 Fit low scale manometer to pressure test points on air pressure switch. A differential pressure of between 110 to 160 Pa will indicate sufficient air velocity across the burner.
     Using a suitable combustion test kit, take a CO-CO2 reading from a warm air register. Heater must not produce more than 10 ppm CO and 3000 ppm CO2. CO-CO2 ratio must no exceed .003.
     Note that in some industrial locations background air may contain detectable amounts of CO and CO2. These amounts must be deducted from those generated by the heater.
   - 6.4 Allow air volume to reach normal capacity. Recheck CO2.
   - 6.5 Record CO-CO2 readings on combustion check card. Sign and date entry.
7. Ensure all pressure test point screws are firmly secured.
8. Check remote controls and ensure correct operation e.g. Thermostat and selector switch.
9. Check that there is sufficient air relief for combustion products to escape.

UNIT MAINTENANCE

6.2 MAJOR SERVICE/COMPONENT REPLACEMENT PROCESS

6.2.1 Electrical Components

6.2.1.1 Electrical Wiring

The electrical wiring of the unit should be visually inspected every 6 months and pre-season to ensure that it is free from damage. If visible damage is noted, all damaged wiring should be replaced with reference to the wiring diagrams found in Appendix B.

The following are the recommended steps for replacing damaged electrical wiring.

1. Electrically isolate unit
2. Remove control box cover
3. Inspect electrical wiring for damage
4. Remove damaged wiring and replace.
5. Replace control box cover and test unit operation

6.2.1.2 Isolator Fitted and Operational

Check that the isolator is present and free from damage. Isolate unit and confirm that power is not available at the unit.

6.2.1.3 Single PhasePower Test

A qualified electrician is to test the incoming power supply to the unit. The supply is to be tagged with available voltage and date of test.

6.2.1.4 Leaving Air Temperature Sensor

Check that the leaving air temp is fitted properly and free from damage. If there is no physical evident the overtempt switches are to be tested preseason.

6.2.1.5 Thermostat Fitted and Operational

Check that the thermostat is fitted and free from damage. Refer to BMS manual or manufacturers' literature to confirm calibration of thermostat.

6.2.1.6 Air Pressure Switch

Confirm that pressure switch activates when air flows across the burner. Check that the air probe lines are free of obstruction.

UNIT MAINTENANCE

6.2.2 Gas Components

6.2.2.1 Gas Controls

Gas controls and gas valve shall not be dismantled or serviced in the field. If necessary, faulty units should be replaced with reconditioned or new units. Check before re-assembly that gas lines are clean and free from dirt and deposits.

After maintenance work has been carried out and the gas burner and gas controls have been re-assembled, check all gas lines for leaks and check that all electrical terminals are secure.

NOTE: All wiring must be done in accordance with applicable local codes. If any of the original wiring as supplied with the appliance requires replacement, it must be replaced with wire with a temperature rating of at least 105°C.

6.2.2.2 Gas Connection Visual Inspection

The incoming gas supply is to be visually inspected for damage and leaks. If visual damage is evident or gas can be smelt, the supply is to be isolated and location of the leak to be identified and fixed. If any corrosion is present the gas line is to be replaced.

6.2.2.3 Gas Isolation Fitted and in Good Working Condition

The gas isolation valve is to be examined to make sure that it is present and in good working condition.

6.2.2.4 Gas Supply Pressure

The gas supply pressure is to be read at the unit gas valve and checked against table 4 to ensure that it falls within the required range.

6.2.2.5 Gas Burner Pressure (High/Low)

The regulated gas pressure is to be checked at both the high and low points of the operating ranges. If the main burner is not lighting or back burning check that the following.

1. The pilot is lit and in the correct position.
2. The correct gas injectors are installed for the type of gas (#44 for Natural Gas, #55 for LPG).
3. Sufficient supply pressure is available.

6.2.2.6 Gas Burners

Access the burners through the removable access panel door. Annual maintenance of the burner is recommended to ensure trouble free operation.

1. Clean the burner plates
2. Clear the burner gas and air ports
3. Change the spark rod igniter
4. Insure the flame sensor is in good condition.

Use a stiff wire brush to clean the burner plates. Scrub both sides of the stainless-steel burner plates to remove any soot or other crud, which may be on the burner. All of the burner plate holes must be clear so air can pass through them unrestricted. The holes in the burner plate allow air to mix with the gas in increasing amounts, as the flame gets longer. Scrub the rust, soot and other foreign material from the burner orifice area. After the burner plates are cleaned inspect them for cracking. Cracks occurring between one or two holes are normal and should be of no concern. If the cracking is more extensive, the affected plates should be replaced. Clean the burner gas and air ports using a drill or piece of wire of the appropriate size. See the Table 5 for drill size. After the orifices are drilled to the correct size and using compressed air or a vacuum, remove any debris from the manifold. Debris left in the manifold will prematurely clog the orifices in the future.

After the burner plates and orifices are cleaned inspect the spark rod. The tip should be clean and free of dirt and carbon. The porcelain must be intact. If it is cracked, replace it. Pull the flame rod or ultraviolet scanner as well. If the flame sensor is a scanner, clean the lens with a clean damp soft rag. The flame rod's metal rod should be clean and free of dirt and carbon. Like the spark rod igniter, the porcelain on the flame rod must be intact as well. Replace it if it is cracked.

6.2.2.7 Pilot Assembly

Check that the pilot is free from damage and clear of obstructions. Ignite the heater with the main gas valve isolated and examine the colour and consistency of the pilot. The pilot should be a consistent blue flame reaching the flame sensor.

6.2.3 Casing Components

6.2.3.1 Weatherproof Casing Condition

Check the weatherproof casing for signs of damage, rust and leaks.

6.2.3.2 Duct Condition

Visually inspect the ductwork connection into the unit for damage. When the unit is operating inspect the ductwork for leaks where visible.

6.2.3.3 General Installation

Visually inspect the mounting and how the unit is secured to the roof/ground. Ensure that the unit is stable and correctly aligned with the ductwork.

6.2.3.4 Access to Unit

Check that access to the unit is free of obstructions. If the unit is located on a roof and an anchor system and harness are certified and maintained by an appropriately qualified individual.

6.2.3.5 Maintenance Records

Ensure that maintenance records are up to date and stored in a location where they are protected from the weather and other possible causes of damage.

UNIT MAINTENANCE

6.3 FAULT FINDING

Problem	Possible Cause	Remedy
No heat	a. Switched off.	Check selector switch is on. Check time switch settings
	b. Blown fuse.	Check and repair fuse.
	c. Loose electrical connection	Tighten connections.
	d. Faulty burner control.	Ensure power to correct terminals. Refer to wiring diagrams. Replace control if necessary.
No heat – Burner control cycles part way and stops	a. Insufficient air volume at air pres-sure switch	Check air supply source. Use manometer to check air pressure.
	b. Air pressure leaking away from switch	Check pipe connections, ensure pressure test point screws are in.
	c. Fault air pressure switch	Replace air pressure switch.
Burner control will not reset	a. Pilot or main valves leaking, flame present out of sequence.	Dismantle valves and clean. Replace defective valve.
Burner cuts in and out	a. Air pressure switch cycling.	Check pressure switch setting. Check air supply source, air filters, fan belts etc.
Burner control cycles part way and locks out.	a. No gas to heater.	Check gas supply.
	b. No ignition.	Clean ignition electrode and set. Ensure HT cap on ignition electrode. Check ignition spark. Check power to transformer. Replace ignition transformer.
	c. No gas to pilot	Clean orifice in pilot burner.
	d. Faulty pilot solenoid valve.	Check power to pilot solenoid valve. Replace pilot solenoid valve.
	e. Burner control faulty	Replace burner control
Pilot starts, burner control locks out.	a. Dirty flame rod	Clean flame rod.
	b. Pilot flame does not reach flame rod.	Adjust flame rod
	c. Low gas pressure	Check gas supply.
Main burner runs, burner control locks out	a. High limit tripping out	Check high limit setting. Insufficient air; check air supply source. Main burner pressure too high; set to data plate spec.
	b. High limit faulty.	Replace high limit.
Pilot burner runs, no main burner.	a. Loose electrical connections.	Tighten connections.
	b. Main gas valve actuator/s faulty	Replace gas valve actuator/s.
Temperatures too high in heated area.	a. Thermostat set too high.	Set thermostat to desired temperature.
	b. Thermostat sticking.	Clean thermostat contacts.
	c. Thermostat faulty	Replace thermostat.
Combustion values exceed values set out by standards or local regulators.	a. Incorrect airflow	Check injectors are not blocked. Check burner for signs of damage and replace as required. Check gas pressures throughout gas train. Check air supply is operating as expected.
	b. Incorrect gas rate	
Excessive combustion gas build up inside the heated area.	a. Insufficient relief area	Confirm that the relief area has not been altered or restricted.

6.4 REPLACEMENT PARTS LIST

Contact Seeley Spare Parts for comprehensive spare parts list, Model and Serial Number will be required.

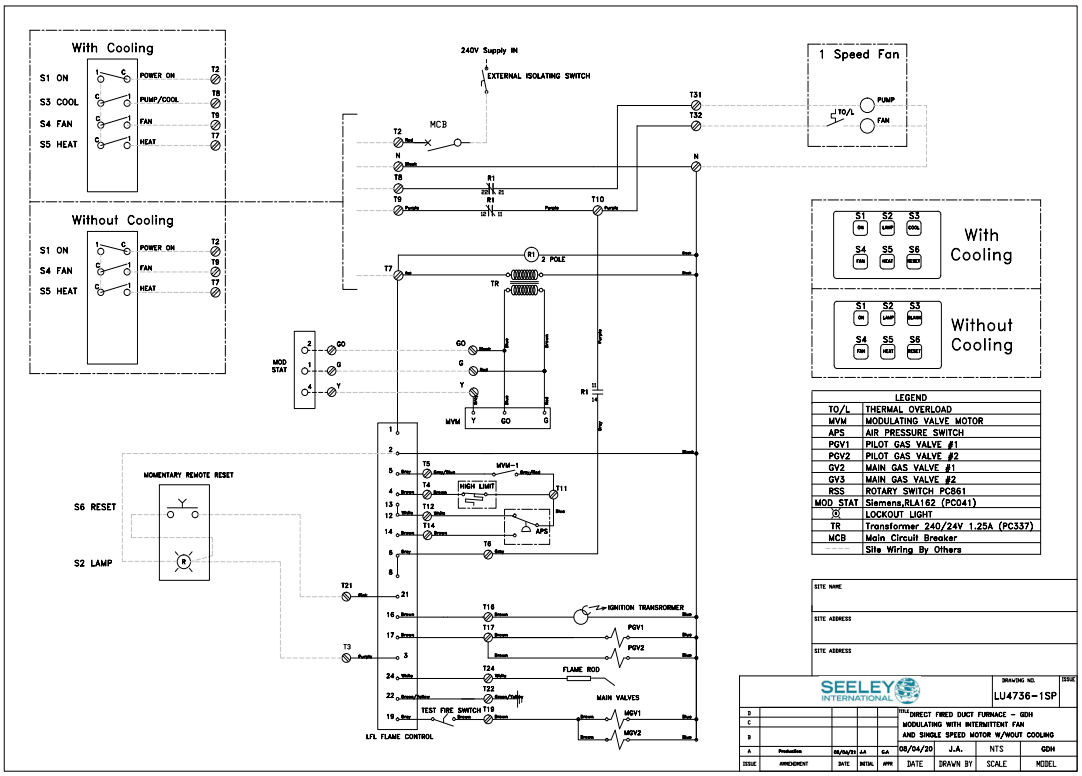
APPENDIX

A: AGA TYPE B INFORMATION

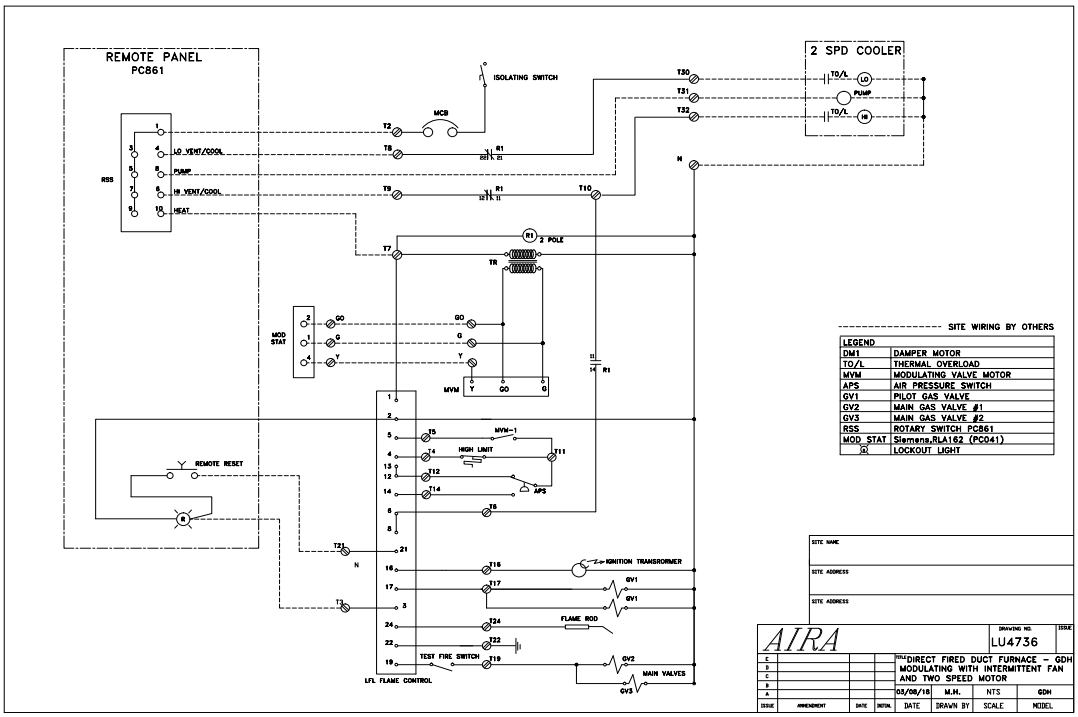
Each GDH unit will be supplied with the required calculations. This information should be recorded on the unit. If this information is missing contact Seeley International and the installer of the unit.

B: ELECTRICAL INFORMATION

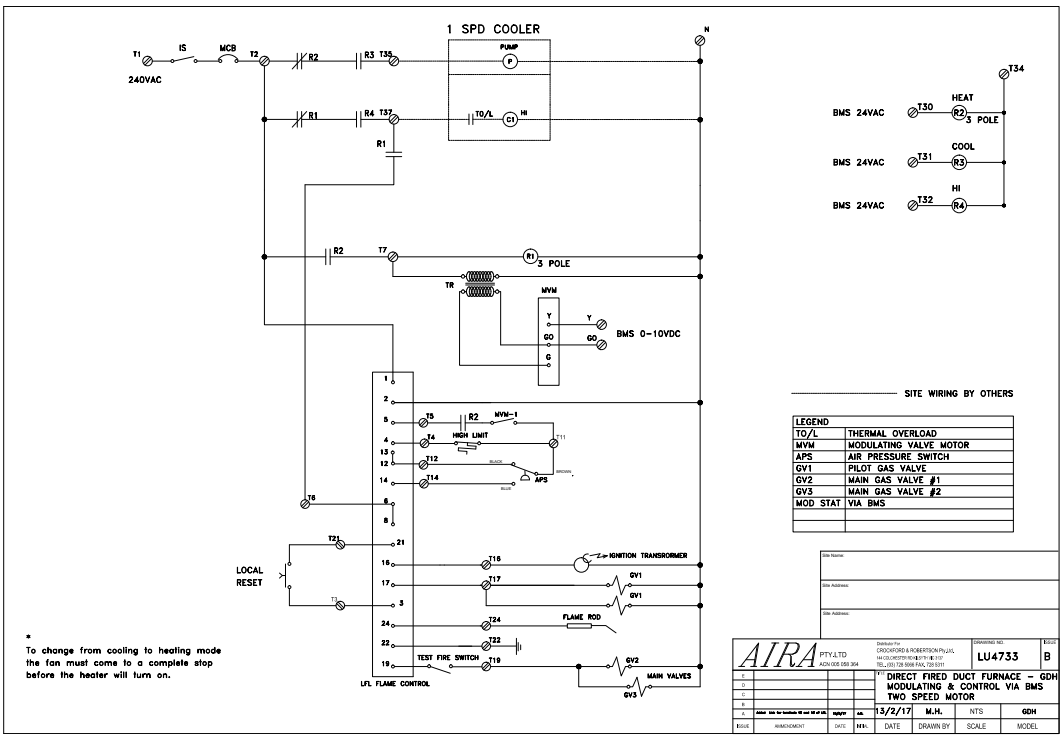
B1: Single speed motor rotary



B2: Two speed motor rotary

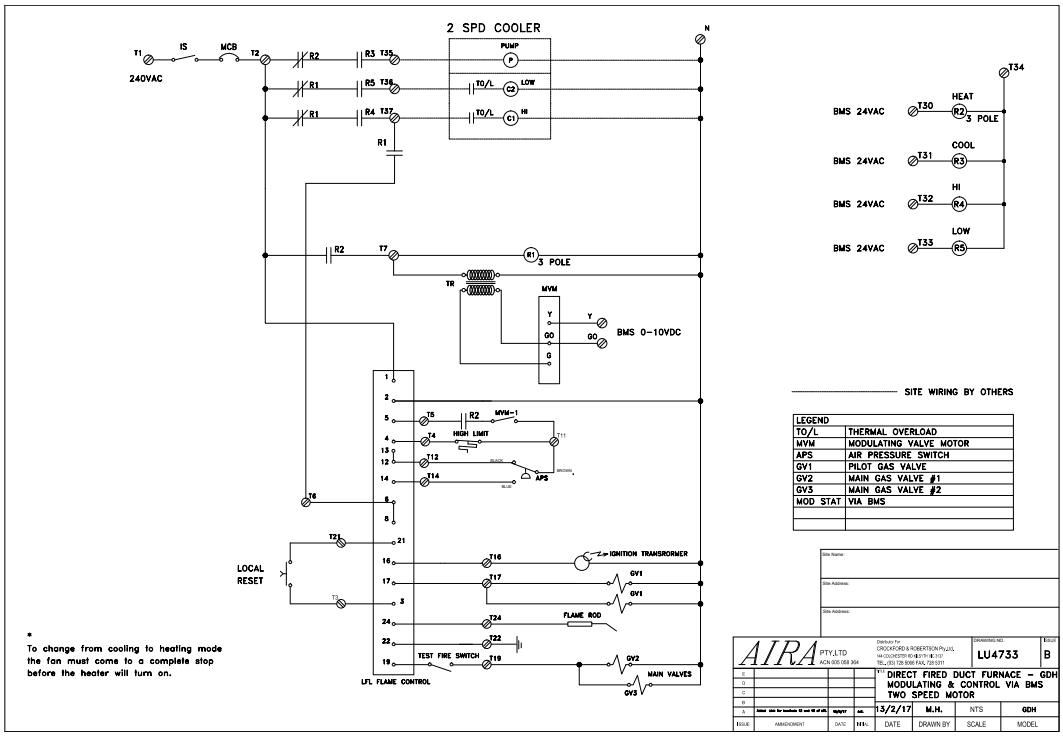


B3: Single speed motor bms



* To change from cooling to heating mode the fan must come to a complete stop before the heater will turn on.

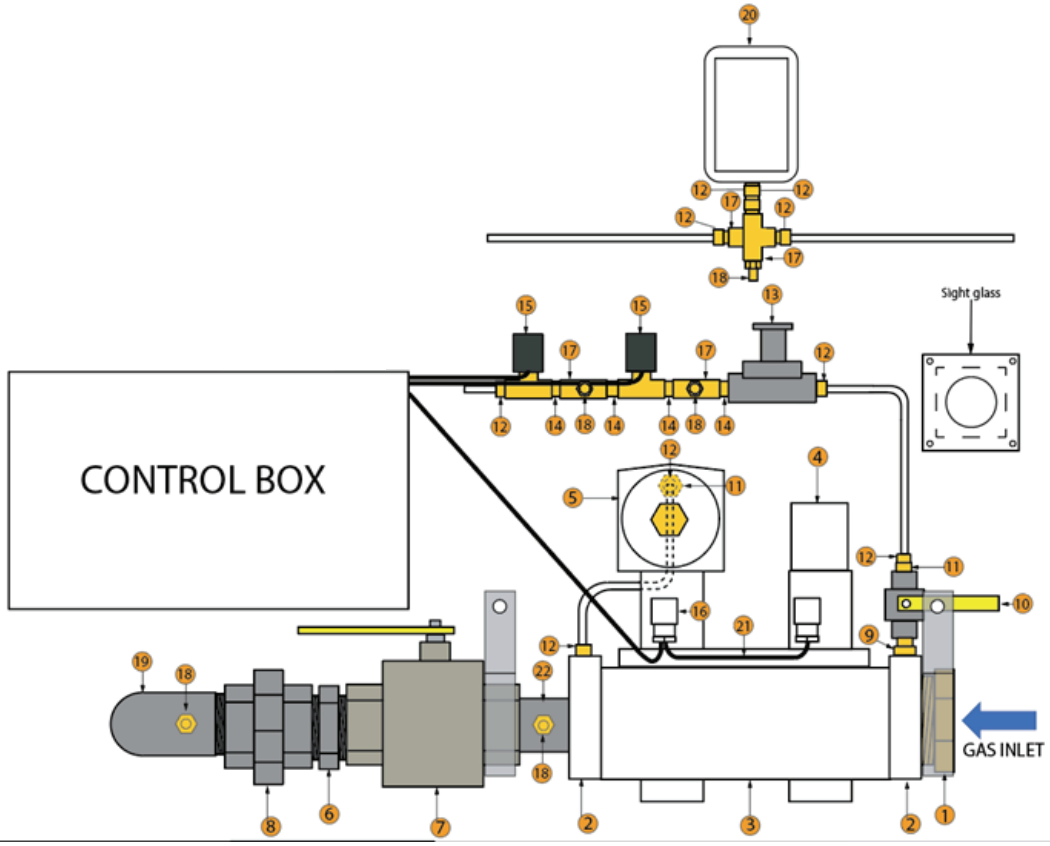
B4: Two speed motor bms



* To change from cooling to heating mode the fan must come to a complete stop before the heater will turn on.

C: GAS TRAIN INFORMATION

Item Number	Part Number	Description	GDH1055	GDH1585	GDH2110	GDH2500
1	9656202	REDUCER BRASS 1 1/2" -3/4"	1	1	1	1
2	PV332	FLANGE TO SUIT VGD20.403	2	2	2	2
3	PV159	DOUBLE GAS VALVE VDG20.403	1	1	1	1
4	PV116	VALVE ACTUATOR ON/OFF L&G	1	1	1	1
5	PV117	VALVE ACTUATOR REGULATED ON/OFF	1	1	1	1
6	PN029	NIPPLE GAL HEX 1 1/2"	1	1	1	1
7	PV155	BALL VALVE 1 1/2" ITAP	1	1	1	1
8	PU003	UNION GAL BRASS SEATED 1.5"	1	1	1	1
9	9656755	NIPPLE BRASS 1/4" TO 1/8" BSB BRASS	1	1	1	1
10	PV317	VALVE BALL 1/4 (AGA APP 6227)	1	1	1	1
11	9656136	REDUCER 1/4" TO 1/8" BSB	2	2	2	2
12	PT055	UNION BRASS 1/4""X 1/8""B INC	9	9	9	9
13	PG148	REGULATOR; MAXITROL RV12 1/8"	1	1	1	1
14	PZ079	NIPPLE BRASS HEX 1/8""BSP NO.	4	4	4	4
15	PC084	SOLENOID VALVE 1/8"" B2216P	2	2	2	2
16	PV314	POWER SUPPLY PLUG SKP25 &SKP15 (AGA64)	1	1	1	1
17	PT033	TEE BRASS 1/8""BSP FEMAIL NO. 4200 4DR	4	4	4	4
18	PP238	PRESSURE TEST POINT 1/8"" G09	6	6	6	6
19	PE064	ELBOW GAL 1.5"" M & F #ATH72025LP	1	1	1	1
20	PC121	PRESSURE SWITCH CLEVELAND	1	1	1	1
21	PL022	LEAD AGA62	1	1	1	1
22	648614	PIPE 1.5" MEDIUM GAL	100mm	100mm	100mm	100mm
23	9658153	SPARK ROD & FLAME ROD BRUTE LPG PILOT ASSMELBY	1	1	1	1
24	PB305	SPARK ROD & FLAME ROD BRUTE NG PILOT ASSEMBLY	1	1	1	1



D: COMMISSIONING REPORT

		Pass = ✓ Adjust = A Attention Req. = X
Unit Details	OEM	Seeley International
	Model Number	
	Nominal Gas Consumption	
	Serial Number	
	Installer	
	Installation Date	
	Site Address	
	Unit Condition	
General Installation	Access to the Unit	
	Condition of Casing	
	Unit is Adequately Secured	
	Duct Work to Unit Connected	
	Required Labelling Attached	
	Type B Calculations Completed and Recorded	
Electrical Commissioning	Have Electrical Connections Been Completed by a Licensed, Experienced Person	
	Isolator Fitted and Operating	
	Single or 3 Phase Power (Test)	V
	Connected Fan Blower Operation	
	Air Pressure Switch Activation	
	Thermostat Connected/Operational	
Gas Commissioning	Have Gas Connections Been Completed by a Licensed, Experienced Person?	
	Gas Isolation Fitted	
	Gas Supply Free of Condensate and Deposits	
	Gas Train Connections	
	Pilot Connection	
	Incoming Line Purge	
	Incoming Gas Pressure	kPa
	Gas Type	NG/LPG
	Modulating Motor Set and Operational Check	
	Purge Time < Purge Run Time	
Controls	High Limit Control securely installed and free of damage	
	High Limit Temp as specified	
	High Limit Control Wired In	
	High Limit Control Trips when Heat Applied	
	Thermostat and Wall Switch connected	
	BMS connection (if fitted)	
	Thermostat Range confirmed on RLU	
	Leaving Air Temp confirmed on RLU	
	Damper Blade Movement	

General Operation	All Foreign Objects Removed from unit	
	All Access Panels Installed and Secure	
	De-isolate Gas Supply	
	De-isolate Electrical Supply	
	Air Pressure	
	Pilot Ignition	
	Main Burner Ignition	
	Pilot Pressure	kPa
	Main Burner Pressure	kPa
	Temperature Rise Across Heat Exchanger	°C
Electrical Commissioners Details	Name:	Date:
	License number:	Signature:
Gas Commissioners Details	Name:	Date:
	License number:	Signature:

Commissioning Notes:

E: MAINTENANCE

E1: Maintenance Schedule

DESCRIPTION	COMPONENT	Month 1/7	Month 2/8	Month 3/9	Month 4/10	Month 5/11	Month 6/12
Electrical	Incoming Electrical Supply	✓	✓	✓	✓	✓	✓
	Electrical Wiring	✓					
	Isolator Fitted and Operating	✓					
	Single or 3 Phase Power Test	✓					
	Leaving Air Sensor Set Temp	✓					
	Thermostat Connected and Operational	✓					
	Air Supply	✓			✓		
	Air Pressure Switch Activation	✓					
Gas	Incoming Gas Supply	✓	✓	✓	✓	✓	✓
	Gas Connections Visual Inspection	✓					
	Gas Isolation Fitted and in Good Condition	✓			✓		
	Gas Supply Pressure	✓					
	Gas Train Isolation	✓					
	Clean Burner and Pilot	✓					
	Gas Burner Pressuerer (High/Low)	✓					
	Pilot Assembly	✓					
	Leaving Air Sensor	✓					
Installation	Weatherproof Casing Condition	✓	✓	✓	✓	✓	✓
	Duct Condition	✓					
	General Installation	✓			✓		
	Access to Unit	✓	✓	✓	✓	✓	✓
	Maintenance Records	✓	✓	✓	✓	✓	✓
Operation	Start Up and Run Sequence	✓					
	Control Operations	✓					
	Burner Emissions	✓					
	Safety Features	✓					

E2: Monthly Maintenance Check

Owner Monthly Checklist

Description	Component	Check For	C=Clean R= Replace A= Adjust ✓= Check
Electrical	Incoming Electrical Supply	Visually inspect incoming electrical supply and isolation for signs of damage.	
Gas	Incoming Gas Supply	Visually inspect incoming gas connection for signs of damage	
Casing	Access to unit	Access to unit is clear of obstructions	
	Weatherproof casing	Case is secure, not damaged and	
	Maintenance records	Previous maintenance records are in a safe location and any required maintenance items have been actioned	

Unit Type: _____

ONLY A QUALIFIED TECHNICIAN SHALL ADJUST SETTINGS

Checked By: _____

Signature: _____ **Date:_____**

E3: Maintenance Checklist

Maintenance Check List

Unit Type: _____ **Date of Maintenance: _____**

Description	Component	Check For	C=Clean R= Replace A= Adjust ✓= Check N/A= Not Required
Electrical	Incoming electrical supply	Visually inspect incoming electrical supply and isolation for signs of damage. If any major upgrades have been installed to the site confirm that there is sufficient power for unit operation.	
	Electrical wiring	Check wiring in control box. Replacing any damaged or loose wires.	
	Isolator fitted and operating	Check isolator switch for signs of damage. Confirm that switch isolates unit.	
	Single or 3 phase power test	Test and record incoming voltage to unit.	
	Leaving Air Temperature Sensor	Check that leaving air temperature sensor is correctly fitted and secure. Confirm that the limit of the leaving air sensor is set to a maximum of 80° C.	
	Thermostat connected and operational	Changing temperature on the thermostat shuts off heater once temperature is met and modulating motor on gas valve activation.	
	Air Supply	Confirm that the fan/blower is operational.	
	Air Pressure Swithc Activation	Confirm that the air pressure switch activates with the supplied airflow.	
Gas	Incoming Gas Supply	Visually inspect incoming gas connection for signs of damage. Check that the site gas shut off valve is in good working condition and easily accessible. If any new gas appliances have been installed confirm that there is sufficient gas for unit operation.	
	Gas connections visual inspection	Visually inspect the gas piping to and within the unit. A leak detection solution should be used on gas fittings.	
	Gas isolation fitted and in good condition	Check gas isolation valve successfully isolates the unit.	
	Gas Supply Pressure	Check incoming supply pressure against unit label	
	Gas Train Isolation	Check that all isolation valves on the gas train can be operated.	
	Clean Burner and Pilot	Clean burner and pilot as required.	
	Pilot Assembly	Check that the assembly is secure. Check that flame sense sparker wiring is free of damage and terminated correctly. Check that the pilot line is free of damage. Clean pilot injector	
	Burner operation and combustion	Clean burners. Check that the pilot lights. Check that the all burners light. Check the burners produce a consistent flame.	
	Leaving Air Sensor	Check the leaving air temp reading on the RLU vs temperature measured with a digital thermometer.	
Installation	Access to unit	Access to unit is clear of obstructions. Roof anchor system is compliant and certified if required.	
	Weatherproof casing	Check that the case is free of damage. Check that all access panels are secure. Check the internal of the cases for signs of water build up. Remove any foreign objects.	
	Duct Condition	Check duct connection to unit.	
	General Installation	Check the condition of all fixings securing the unit. If a roof stand is installed check condition of the stand. Confirm that the unit is level.	
	Maintenance records	Check that previous maintenance records are in a safe location and any required maintenance items have been actioned	

Operation	Start Up and Run Sequence	Check that unit operates as expected with no visual, sound or smell abnormalities.	
	Control Operations	Check that thermostat and wall switch/BMS controls operate as expected	
	Burner Emissions	Check that burner emissions are below that allowable limit. Record results.	
	Safety Features	Allow the unit to run for 45 minutes to an hour to ensure the units run as expected. To pass no safety features may trip.	

Checked By: _____

Signature: _____ **Date:_____**

F: WARRANTY INFORMATION

HOW TO REGISTER YOUR PRODUCT WARRANTY (Australia and New Zealand only)

Please register your warranty online by visiting seeleyinternational.com

Step 1 - select **"Support"** then **"Register for Warranty"**

Step 2 Enter your product serial number and **"Submit"**

Step 3 Enter the required information and **"Submit"**

Important Note: You need to have the following information to complete your registration:

- your unit model and size
- serial number
- date your system was installed
- name of the dealer you purchased it from

Please complete this section. You will also need to retain your purchase receipt, and proof of any warranty period extension.

Brand: _____

Model: _____

Serial No: _____

Customer Name: _____

Installation Address: _____

Installation Type: Residential / Non Residential / Commercial

Date of installation: _____

Installer / Dealer: _____

As with any product that has moving parts or is subject to wear and tear, it is **VERY IMPORTANT** that you maintain your Cooler / Heater and have it regularly serviced. It is a condition of warranty cover for your Cooler / Heater that you comply with all of the maintenance and service requirements set out in the Owner's / Operation / Service Manual. Compliance with these requirements will prolong the life of your Cooler / Heater. Further, it is also a condition of warranty cover that each item in the Maintenance Schedule in the Owner's / Operation / Service Manual is performed with the frequency indicated, by a qualified, licensed technician, and that the Maintenance Schedule is properly filled out (i.e. names, signature, date, and action taken) when the item is completed.

ANY FAILURE TO CARRY OUT THE REQUIRED MAINTENANCE AND SERVICING REQUIREMENTS, AND ANY FAILURE TO PROPERLY FILL OUT THE MAINTENANCE SCHEDULE, WILL VOID YOUR WARRANTY.

WARRANTY TERMS AND INFORMATION (Australia and New Zealand Only)

In this warranty:

We or ***us*** means Seeley International Pty Ltd (Seeley) ABN 23 054 687 035, and our contact details are set out at the end of this warranty;

You means you, the original end-user purchaser of the Goods;

Supplier means the authorised distributor or retailer of the Goods that sold you the Goods in Australia or New Zealand;

Goods means the product, unit, appliance or equipment which was accompanied by this warranty and purchased in Australia for installation and use only in Australia, or purchased in New Zealand for installation and use only in New Zealand; and

Relevant Warranty Period means the various warranty periods as described in clause 1 and clause 3 below, as appropriate.

For Australian customers: Our Goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Goods repaired or replaced if the Goods fail to be of acceptable quality and the failure does not amount to a major failure.

In addition to any rights and remedies that You may have under the Australian Consumer Law, the Customer Guarantee Act 1993 (New Zealand) or any other law, subject to the terms of this warranty, We provide the following warranty:

1. If during the first one (1) years from the date of purchase, the Goods upon examination prove defective by reason of improper workmanship or material, We will repair or replace, at our option, the Goods or any part thereof without charge for either parts or labour, during normal working hours.
2. The warranty granted under clause 1 applies to all components which form part of the original cooler / heater, but does not cover:

a) fair or normal wear and tear;

b) damage, loss or claims caused by, resulting from, or arising out of any utilities that service or are connected to the Goods. This includes but it is not limited to electrical surges, and inadequacies, failure, or other problems in or with any electricity, power, or water supply to the Goods;

c) after the first year: (i) the replacement, supply, or servicing of consumable items (including without limitation cooler pads, washers, seals, drive belts) and (ii) maintenance adjustments to the cooler / heater; and

d) despite clause 2.c. above, air filters;

e) installation (including without limitation ductwork, fittings, and other related installation components) which is excluded.

f) batteries (including damage caused by leaking or faulty batteries), cracking or breaking of display screens in controllers, physical damage caused by the user or third parties, and accidental breakage.

3. Seeley also warrants the Fan Motor for the first two (2) years from the date of the Goods purchase, if upon examination prove defective by reason of improper workmanship or material, We will repair or replace at our option, the Fan Motor or any part thereof without charge for parts, during normal working hours.

4. During the period to which any expressed warranty applies, all defective part(s) shall be replaced or repaired (at the discretion of Seeley) without charge for either parts or labour, during normal working hours. Should we deem in our absolute discretion to replace the Goods pursuant to clause 1 or clause 3, we may substitute any similar good even if it is not on our current price/ equipment list. Further, Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the Goods.

5. We are under no obligation to repair or replace the Goods or Parts under clause 1 and 3 above if (i) the Goods have not been installed and commissioned in accordance with the Installation Manual (ii) the Goods have not been installed and commissioned properly or competently, (iii) the Goods have not been operated, serviced and maintained in accordance with the instructions provided in the Owner's Manual, or (iv) if any such service or maintenance has not been properly or competently performed. It is a condition of warranty cover that each item in the Maintenance Schedule in the Owner's / Operation / Service Manual (if it was published with such a Schedule) is performed with the frequency indicated, by a qualified, licensed technician, and that the Maintenance Schedule is properly filled out (ie names, signature, date, and action taken) when the item is completed. Any failure to carry out the required maintenance and servicing requirements, and any failure to properly fill out a Maintenance Schedule in the Manual, will void your warranty. The addition of any third party device, (except where it is required by the installation instructions and complies with those instructions), or the removal or alteration of any Seeley component, or damage due to misuse of the unit, or faulty installation or commissioning, will void this warranty.

6. As far as the law permits, We will not be liable for any consequential loss suffered through, or resulting from, the non-operation, or ineffective operation of the cooler / heater. The warranties granted under clause 1 and clause 3 do not cover damage to the cooler / heater or other loss resulting from acts of God.

7. No other person, company or corporation is authorised to offer, or give on our behalf, any other warranty. The benefits conferred are in favour of You and any person deriving title to the cooler / heater whilst in its original place of installation. Nothing in this warranty shall be construed as affecting any rights You may have under all the relevant laws, or Commonwealth or State Legislation which give You rights which cannot be modified or excluded by agreement.

8. In order to claim under the warranties granted under clause 1 or clause 3 You must:

a) either:

- contact us within the Relevant Warranty Period on Australia 1300 650 644, New Zealand 0800 589 151; or
- log a warranty claim on our website (website address below) within the Relevant Warranty Period; and

b) make available for inspection by the service agent who will come to the location of the Goods or send to us at the address below within the Relevant Warranty Period: (i) the legible and unmodified original proof of purchase, which clearly indicates the name and address of the original retailer, the date and place of purchase, the product name or other product serial number, (ii) all of your records of all service and maintenance carried out to the Goods, plus the Maintenance Schedule in the Owner's Manual (if it was published with such a Schedule), (iii) a copy of the completed Warranty Information section above, and (iv) if an extended warranty period was provided by Seeley International for the Goods, then the relevant document provided by Seeley International confirming that extended warranty period. If you choose to send the documents described in (i) to (iv) to Seeley International, then they must be accompanied by a covering letter which states your name and address and daytime telephone number, the address at which the Goods are installed, and the model and serial number of the Goods.

9. The warranty granted in clause 1 and clause 3 covers the costs of parts and labour but you will be responsible for:

a) the cost of travel incurred for a Seeley International service agent to get to and from the location of the Goods if the location of the Goods is either: (i) outside the metropolitan areas of the capital cities; or (ii) more than 35 kilometres from an authorised Seeley International branch or service representative; and

b) any costs for additional labour or equipment associated with gaining acceptable and safe service access to the Goods installed in restricted, high or unsafe locations, and/ or the removal and replacement of any barrier, walls, roofs, fences etc; and

c) any costs incurred by the Seeley International service agent in gaining access to the Goods which is necessary to comply with any safety or workplace safety requirements and/or any other relevant regulations. For the avoidance of doubt, the reference to any costs incurred also includes the cost of any necessary site inductions.

10. We are not responsible in any way for any failure and/or inadequate performance of the Goods which arises from or is connected to the use in the Goods of non-genuine spare parts. Seeley International strongly recommends that only spare parts supplied or approved by it are used in the Goods.
11. The employees and Executive of Seeley International are not responsible for the installation of the Goods and expressly disclaim all liability resulting from incorrect installations or installations that do not conform to local electrical codes, local plumbing codes, Occupational Health and Safety requirements, and by laws which are legislated or in effect at the time of installation.
12. This warranty is only valid and enforceable in Australia or New Zealand.

Note: It is important that the safety and privacy of our service technicians is protected at all times. Accordingly, We and our Seeley International service agents reserve the right to refuse service if (i) safety and accessibility to the unit cannot be guaranteed or (ii) the owner of the unit, occupant of the site where the Goods are located, or any other third party seeks to take photographs, or make a video or audio recording, of the service technician(s) while they are on the site or carrying out service to the unit. If a service technician attends the site but subsequently leaves for any of these reasons then a service charge will be made for the call which charge shall be a debt immediately due and payable by the person or entity that has made the claim under this Warranty. If a service call reveals no warranty fault found with the Goods, a charge will be made for the call.

Our liability under this warranty is limited to the extent permitted by law. That is, to the extent that it is fair and reasonable, if the Goods are not of a kind ordinarily acquired for personal, domestic or household use or consumption, your remedies associated with any failure or defect of the Product will be limited to:

a) the replacement of the Goods or the supply of equivalent goods;
b) the repair of the Goods;
c) the payment of the cost of replacing the Goods or of acquiring equivalent goods; or
d) the payment of the cost of having the Goods repaired

and subject to the terms and conditions included in this warranty.

SERVICE DEPARTMENT

Seeley International Pty Ltd
112 O'Sullivan Beach Road
Lonsdale, South Australia 5160
Customer Service Centre 08 8328 3844
Website: www.seeleyinternational.com

FOR SERVICE

To book a Service on your Seeley International product:
Visit www.seeleyinternational.com the select **"Support"** and **"Find Agent / Book Service"** then enter the required information.
or Phone Australia 1300 650 644 or New Zealand 0800 589 151 to be directed to your closest authorised Service Agent.

PRIVACY NOTICE

Seeley International Pty Ltd ABN 23 054 687 035 will use the personal information you provide us with to provide warranty support for the product you have purchased and to inform you about other products and services. If you choose not to supply us with the information requested, we may be unable to provide you with warranty support. We may also disclose your information to third parties, such as related entities; retailers, distributors, service agents and contractors who are affiliated with us; or marketing or market research companies. If you would prefer not to receive direct marketing communications from us, please follow the instructions to "unsubscribe" which will be included in the direct marketing communications we send you, or contact our Privacy Officer using the details set out below. While we do not currently transfer personal information to recipients who are outside of Australia or New Zealand or store personal information outside of Australia, if we transfer your information to third parties who do so, we will take reasonable steps to ensure that the overseas recipients do not breach the Australian Privacy Principles or if you are a New Zealand customer, the New Zealand Privacy Principles. By registering your warranty, you consent to having your personal information used in this way. Please read our Privacy Policy on our website www.seeleyinternational.com for further explanation of how we collect, use, hold and disclose personal information, and how you may access and seek correction of your information. It also sets out how you may complain about a breach of the Australian Privacy Principles, or if you are a New Zealand customer, a breach of the New Zealand Privacy Principles, and how we will deal with your complaint. You may contact us at: Privacy Officer, Seeley International Pty Ltd, 112 O'Sullivan Beach Road, Lonsdale, South Australia 5160.

G: RELEASE INFORMATION

Ver	Revision	Date	Amendment	Author	Approved
1.0	A	22/03/22	Initial Release	D. Wall	C. Arnel
1.1	B	12/07/2023	Updated contact details	D.Wall	C.Arnel
1.2	C	26/10/2023	Updated range	D.Wall	M.Gay
1.3	D	26/02/2024	ECN-00969	D.Wall	M.Gay
1.4	E	04/04/2024	ECN-01007	D.Wall	M.Gay

Warranty Service
Australia: 1300 650 644
New Zealand: 0800 589 151

Seeley International Technical Support
Australia: 1300 650 399
New Zealand: 0800 589 152

For all other regions, contact your local distributor.
seeleyinternational.com

Online Support Portal (AUS/NZ)
Scan or Click QR

It is the policy of Seeley International to introduce continuous product improvement.
Accordingly, specifications are subject to change without notice.
Please consult with your dealer to confirm the specifications of the model selected.