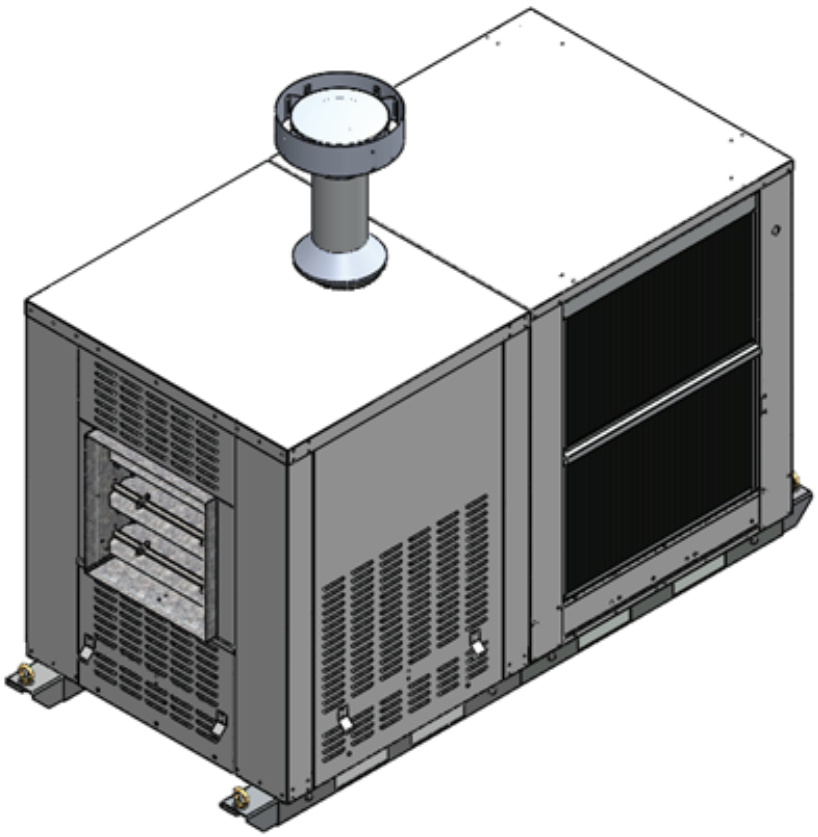
SEELEY INTERNATIONAL

# INSTALLATION AND OPERATION

## HCV HCVR HEATER COOLER VENT (RETURN)

## OR MODELS



AIRA By SEELEY INTERNATIONAL

Original English Instructions

# CONTENTS

# CONTENTS

# SAFETY

## 1.0 INTRODUCTION

This Manual is for use with a Seeley International manufactured AIRA Heating, Cooling and Ventilation (HCV) and Heating, Cooling, Ventilation and Return Air (HCVR) OR Model units. 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 HCV/HCVR 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 HCV and HCVR units contain a heating unit, a cooling unit, can provide ventilation and return air (HCVR only). The heating section of the units are natural draft gas fired appliance, capable of supplying indirect gas heating and direct air ventilation. The Cooling Section of the unit are evaporative coolers.

There are 8 different sizes available for both the HCV and HCVR. Throughout this manual both units will be referred to as HCV with HCVR used were return air function is applicable. HCVR units in cooling mode have a lower maximum allowable air velocity than equivalent HCV units due to having one cooling side removed for return air ducting. The lower air velocity is to prevent water carryover from the cooling pads on to internal components.

## 1.1 GENERAL SAFETY INFORMATION

**THIS COMBINED HCV UNIT 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** Use chlorine tablets

These AIRA HCV units must be installed in accordance with these instructions, local gas fitting and plumbing 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.<br>This should be considered in terms of:<br>• What are the chances of an incident occurring?<br>• What could the possible consequences be?<br>• What can be done to reduce, or better still, eliminate the risk? |

### 1.1.1 Handling the Unit

HCV units are provided with lifting external points.
The unit must remain in the upright position at all times.

### 1.1.2 Positioning the HCV

The unit should be installed so that it is level. Allow 1200mm clearance around the unit. Air intake to the unit should not be restricted in any manner. 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 HCV unit should not be installed in contact with combustible materials. Radiant heat from the unit must also be considered. Combustibles should not be stored within 1200mm of the unit.

# SAFETY

### 1.1.4 Wiring Electrical

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

### 1.1.5 Drainage

Drainage for the cooler section shall be done in accordance with relevant Australian Standards (AS3500) and statutory requirements and local legislation.

### 1.1.6 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.

### 1.1.7 Gas Piping

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

### 1.1.8 Water Supply

Pipework supplying the unit shall be installed by an appropriately qualified person and be fitted with the required isolation valves. Pressure to the unit must be no greater than 1400 kPa. Potable water shall be used.

### 1.1.9 Commissioning, Recommissioning and Decommissioning

Every 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.

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, water 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.

### 1.1.10 Operational Safety

AIRA HCV units 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 bypassed.

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

### 1.1.11 Gas Compliance

Aira HCV units contain a DU/SD heater. Not all SD heaters are Type A compliant. For those **NOT** Type A certified a 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. Where no requirement is given, good practice shall apply.

| Type A Compliant | | | |
|---|---|---|---|
| **Model** | **Heater** | **Natural Gas** | **LPG** |
| **HCV/HCVR12** | DU12 = HCV12 | YES | YES |
| **HCV/HCVR16** | DU16 = HCV16 | YES | YES |
| **HCV/HCVR26** | SD26 = HCV26 | YES | YES |
| **HCV/HCVR30** | SD30 = HCV30 | YES | YES |
| **HCV/HCVR35** | SD35 = HCV35 | YES | YES |
| **HCV/HCVR40** | SD40 = HCV40 | YES | YES |

*Table 1: Type A Compliance*

# SAFETY

### 1.1.12 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? (Flat sole jogger type is advisable.)
- 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.

### 1.1.13 Legionnaires Disease

Evaporative air conditioners have not been implicated in any outbreak of Legionnaires disease, although Legionella bacteria have been found in such systems. The water temperature in the evaporative air cooler section is normally at about 18°C at which temperature the Legionella bacteria (if present) will remain dormant and cannot multiply.

The following maintenance schedule is required to be followed in order to comply with the New South Wales Public Health Act 1991 section 46:-

a. Sumps are to be drained and cleaned at three monthly intervals or more frequently if necessary.
b. Wetted pads are to be drained and cleaned at three monthly intervals or more frequently if necessary.
c. Water strainers are to be cleaned at three monthly intervals or more frequently if necessary.
d. If any air filter is fitted, it is to be cleaned or replaced when necessary.

# GENERAL INFORMATION

## 2.1 UNIT OVERVIEW

AIRA HCV units are natural draft, indirect gas fired heaters with an attached evaporative cooler. The standard control system is configured for integration with Building Management Systems (BMS). An optional standalone control system utilising a room thermostat to control heat demand from the unit is also available. Aira Manual AM006 provides a comprehensive control and wiring information package.

HCV units are fitted with an evaporative cooler which houses a centrifugal fan and electric motor which is also used to provide airflow across the heat exchanger. Units come standard with a 2 speed motor with VSD compatible motors being optional. When the unit calls for cool air the fan starts, and the pump turns on and draws water into the cooler pads. The fan draws air through the pads which is cooled by the water before being blown through the ductwork delivering cool air.

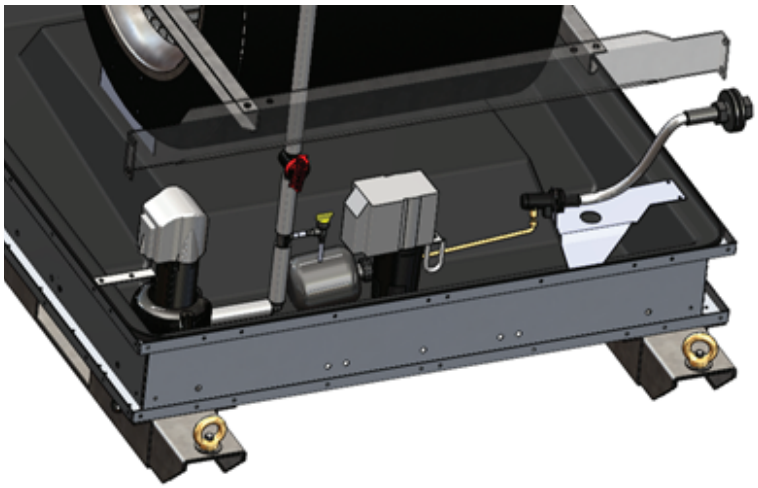


*Figure 1: Internal Cooler Components*

The heating section of the HCV unit operates when the thermostat is calling for heat. Gas is first supplied to the pilot light and once the pilot is confirmed the main burners will light. The heat rises through the heat exchanger and exits through the flue. At the same time the blower pushes air across the heat exchanger raising the temperature of the air before it enters the ductwork. HCV units are fitted with modulating motors to adjust the gas rate as the room temperature approaches the set temperature at the thermostat. Another modulating motor alters the dampers at the outlet of the heat exchanger.

Units are supplied with a flue suitable for external installation. Due to the intake of demand for cooling operation units should not be installed in an internal plant room.

Commissioning can be provided by Seeley International otherwise for all type A appliances an experienced Type A installer is recommended. 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 HCV unit that has been supplied will operate with the available gas supply, ie Natural or LPG gas.

## 2.3 FACTORY UNIT TEST

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

- Blower/fan operation
- Gas ignition and flame detection
- Gas valve modulation (if fitted)
- 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

| MODEL: | | | HCV12 | HCV16 | HCV26 | HCV30 | HCV35 | HCV40 | HCV50 | HCV60 |
|---|---|---|---|---|---|---|---|---|---|---|
| CONFIGURATION | Type | | SINGLE HEAT EXCHANGER HCV | | | | | | DUAL HEAT EXCHANGER HCV | |
| HEATING PERFORMANCE | Airflow 28C Temp Rise | (L/s) | 840 | 1118 | 1784 | 2100 | 2454 | 2785 | 3568 | 4200 |
| | Airflow 11C Temp Rise | (L/s) | 2098 | 2800 | 4460 | 5240 | 6316 | 6985 | 8920 | 10478 |
| | Input NG (LPG) | (MJ/hr) | 138 (127) | 184 (169) | 246 (274) | 287 (290) | 349 (349) | 390 (422) | 2x 246 (274) | 2x 287 (290) |
| | Output NG (LPG) | (kW) | 29 (26) | 38 (35) | 51 (44) | 60 (51) | 73 (62) | 81(69) | 2x 51 (44) | 2x 60 (51) |
| COOLING PERFORMANCE | Max Airflow | (L/s) | Refer to Technical Data Sheet: ES E213 | | | | | | | |
| | Pressure at Max Airflow | (Pa) | | | | | | | | |
| SERVICES | Electrical | Voltage V/Ph/Hz | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 |
| | | Max Power | 3.3 | 3.3 | 4.3 | 5.8 | 7.8 | 11.3 | 11.3 | 15.3 |
| | Water | Supply | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa |
| | | Max Temp | 40 °C | 40 °C | 40 °C | 40 °C | 40 °C | 40 °C | 40 °C | 40 °C |
| | | Inlet | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP |
| | | Drain | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP |
| | Duct Connections | Orientation (mm) | Side Discharge 457 x 457 | Side Discharge 457 x 596 | Side Discharge 522 x 865 | Side Discharge 522 x 1003 | Side Discharge 522 x 1208 | Side Discharge 522 x 1346 | Side Discharge | Side Discharge |
| CONTROLLER | Type | Standard | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface |
| | Type | Optional | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch |
| | Voltage | V/Ph/Hz | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) |
| FAN | Type | | Blower | Blower | Blower | Blower | Blower | Blower | Blower | Blower |
| | Diameter | Inch | 18 | 18 | 25 | 25 | 30 | 30 | 30 | 36 |
| | Capacity | | High | High | High | High | High | High | High | High |
| MOTOR | Type | | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase |
| | Speed | RPM | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 |
| | Output/ Power * | (kW) | 3.0 | 3.0 | 4.0 | 5.5 | 7.5 | 11.0 | 11.0 | 15.0 |
| | Rated | (A) | 6.41 | 6.41 | 8.43 | 11.2 | 14.6 | 21.6 | 21.6 | 27.4 |
| | Frame Size | | B56 | B56 | 100L | 100L | 100L | 100L | 100L | 100L |
| | Rating | IP | 21 | 21 | 55 | 55 | 55 | 55 | 55 | 55 |
| PUMP | Type | | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal |
| | Motor | | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous |
| | Power | (W) | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | Flow Rate | (L/min) | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| | Voltage | V/Ph/Hz | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 |
| | Rating | | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 |
| GAS SUPPLY LPG (Propane) | Maximum | (kPa) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| | Minimum | (kPa) | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 |
| GAS SUPPLY NG | Maximum | (kPa) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| | Minimum | (kPa) | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| TEST POINT LPG (Propane) | High | (kPa) | 2.5 | 2.5 | 2.5 | 2.5 | 2.3 | 2.5 | 2.5 | 2.5 |
| | Low | (kPa) | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 |
| TEST POINT NG | High | (kPa) | 0.875 | 0.875 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| | Low | (kPa) | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| GAS SUPPLY SIZE | | (inch) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| INJECTORS/BURNERS | | Number | 6 | 8 | 12 | 14 | 17 | 19 | 24 | 28 |
| COOLING PADS | Size | (mm) | 700 x 900 (3 Pads) | 700 x 900 (3 Pads) | 575 x 1175 (6 Pads) | 575 x 1175 (6 Pads) | 575 x 1530 (4 Pads) 745 x 1530 (2 Pads) | 575 x 1530 (4 Pads) 745 x 1530 (2 Pads) | 745 x 1765 (6 Pads) | 745 x 1765 (4 Pads) 545 x 1765 (3 Pads) |
| | Pad Area | (m2) | 1.89 | 1.89 | 4.05 | 4.05 | 5.8 | 5.8 | 7.89 | 8.29 |
| DIMENSIONS | Shipping | (mm) | 2400 Long 1200 Wide 1495 High | 2400 Long 1200 Wide 1495 High | 2900 Long 2400 Wide 1810 High | 2900 Long 2400 Wide 1810 High | 2900 Long 2400 Wide 2160 High | 2900 Long 2400 Wide 2160 High | 3700 Long 2600 Wide 2145 High | 3700 Long 2600 Wide 2145 High |
| | Operating not including flue | (mm) | 1915 Long 995 Wide 1252 High | 1915 Long 995 Wide 1252 High | 2468 Long 1556 Wide 1570 High | 2468 Long 1556 Wide 1570 High | 2469 Long 1893 Wide 1918 High | 2695 Long 1893 Wide 1918 High | 2650 Long 2240 Wide 1905 High | 3340 Long 2510 Wide 2235 High |
| | Service Clearance All Sides | (mm) | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| WEIGHT | Shipping | (kg) | 278 | 298 | 510 | 541 | 669 | 691 | 810 | 833 |
| | Operating inc. Water / Acc | (kg) | 309 | 329 | 551 | 582 | 726 | 748 | 867 | 908 |
| *Motor power may change dependant on required airflow and pressure. | | | | | | | | | | |

*Table 2A: HCV Unit Heating Technical Data*

# GENERAL INFORMATION

| MODEL: | | | HCVR12 | HCVR16 | HCVR26 | HCVR30 | HCVR35 | HCVR40 | HCVR50 | HCVR60 |
|---|---|---|---|---|---|---|---|---|---|---|
| CONFIGURATION | Type | | SINGLE HEAT EXCHANGER HCVR | | | | | | DUAL HEAT EXCHANGER HCVR | |
| HEATING PERFORMANCE | Airflow 28C Temp Rise | (L/s) | 840 | 1118 | 1784 | 2100 | 2454 | 2785 | 3568 | 4200 |
| | Airflow 11C Temp Rise | (L/s) | 2098 | 2800 | 4460 | 5240 | 6316 | 6985 | 8920 | 1478 |
| | Input NG (LPG) | (Mi/hr) | 138 (127) | 184 (169) | 246 (274) | 287 (290) | 349 (296) | 390 (422) | 2x 246 (274) | 2x 287 (290) |
| | Output NG (LPG) | (kW) | 29 (26) | 38 (35) | 51 (44) | 60 (51) | 73 (62) | 81 (69) | 2x 51 (44) | 2x 60 (51) |
| COOLING PERFORMANCE | Max Airflow | (L/s) | Refer to Technical Data Sheet: ES E213 | | | | | | | |
| | Pressure at Max Airflow | (Pa) | | | | | | | | |
| SERVICES | Electrical | Voltage V/Ph/Hz | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 | 240/1/50 or 415/3/50 |
| | | Max Power | 3.7 | 3.7 | 4.7 | 6.2 | 6.2 | 11.7 | 11.6 | 15.6 |
| | Water | Supply | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa | 20 L/min @ 100 - 800 kPa |
| | | Max Temp | 40 oC | 40 oC | 40 oC | 40 oC | 40 oC | 40 oC | 40 oC | 40 oC |
| | | Inlet | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP | 1/2" Male BSP |
| | | Drain | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP | 40mm Male BSP |
| | Duct Connections | Orientation (mm) | Side Discharge 457 x 457 | Side Discharge 457 x 596 | Side Discharge 522 x 865 | Side Discharge 522 x 1003 | Side Discharge 522 x 1208 | Side Discharge 522 x 1346 | Side Discharge | Side Discharge |
| CONTROLLER | Type | Standard | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface | BMS Interface |
| | Type | Optional | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch | Rotary Switch |
| | Voltage | V/Ph/Hz | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) | BMS (Customer Supplied) |
| FAN | Type | | Blower | Blower | Blower | Blower | Blower | Blower | Blower | Blower |
| | Diameter | Inch | 18 | 18 | 25 | 25 | 30 | 30 | 30 | 36 |
| | Capacity | | High | High | High | High | High | High | High | High |
| MOTOR | Type | | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase | 3 Phase |
| | Speed | RPM | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 | 1440 |
| | Output/ Power * | (kW) | 3.0 | 3.0 | 4.0 | 5.5 | 7.5 | 11.0 | 11.0 | 15.0 |
| | Rated | (A) | 6.41 | 6.41 | 8.43 | 11.2 | 14.6 | 21.6 | 21.6 | 27.4 |
| | Frame Size | | B56 | B56 | 100L | 100L | 100L | 100L | 100L | 100L |
| | Rating | IP | 21 | 21 | 55 | 55 | 55 | 55 | 55 | 55 |
| PUMP | Type | | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal | Centrifugal |
| | Motor | | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous | Synchronous |
| | Power | (W) | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | Flow Rate | (L/min) | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 |
| | Voltage | V/Ph/Hz | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 | 230/1/50 |
| | Rating | | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 | IPX4 |
| GAS SUPPLY LPG (Propane) | Maximum | (kPa) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| | Minimum | (kPa) | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 | 2.74 |
| GAS SUPPLY NG | Maximum | (kPa) | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 | 3.5 |
| | Minimum | (kPa) | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| TEST POINT LPG (Propane) | High | (kPa) | 2.5 | 2.5 | 2.5 | 2.5 | 2.3 | 2.5 | 2.5 | 2.5 |
| | Low | (kPa) | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 | 0.875 |
| TEST POINT NG | High | (kPa) | 0.875 | 0.875 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 | 0.72 |
| | Low | (kPa) | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| GAS SUPPLY SIZE | | (inch) | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 | 3/4 |
| INJECTORS/BURNERS | | Number | 6 | 8 | 12 | 14 | 17 | 19 | 24 | 28 |
| COOLING PADS | Size | (mm) | 700 x 900 (2 Pads) | 700 x 900 (2 Pads) | 575 x 1175 (4 Pads) | 575 x 1175 (4 Pads) | 575 x 1530 (4 Pads) or 575 x 1530 (2 Pads) 745 x 1530 (2 Pads) | 575 x 1530 (4 Pads) or 575 x 1530 (2 Pads) 745 x 1530 (2 Pads) | 745 x 1765 (6 Pads) | 745 x 1765 (4 Pads) 545 x 1765 (3 Pads) |
| | Pad Area | (m2) | 1.26 | 1.26 | 2.70 | 2.70 | 3.52 or 4.04 | 3.52 or 4.04 | 7.89 | 8.29 |
| DIMENSIONS | Shipping | (mm) | 2200 Long 1400 Wide 1495 High | 2200 Long 1400 Wide 1495 High | 3000 Long 1900 Wide 1810 High | 3000 Long 1900 Wide 1810 High | 2700 Long 2400 Wide 2160 High | 2700 Long 2400 Wide 2160 High | 3700 Long 2600 Wide 2145 High | 3700 Long 2600 Wide 2145 High |
| | Operating not including flue | (mm) | 2067 Long 1302 Wide 1254 High | 2067 Long 1302 Wide 1254 High | 2621 Long 1860 Wide 1570 High | 2621 Long 1860 Wide 1570 High | 2622 Long 2191 Wide 1918 High | 2622 Long 2191 Wide 1918 High | 2790 Long 2240 Wide 1905 High | 3500 Long 2510 Wide 2235 High |
| | Service Clearance All Sides | (mm) | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 | 1200 |
| WEIGHT | Shipping | (kg) | 355 | 370 | 652 | 684 | 832 | 859 | 1120 | 1295 |
| | Operating inc. Water/ Acc | (kg) | 349 | 370 | 630 | 662 | 826 | 847 | 1177 | 1370 |
| *Motor power may change dependant on required airflow and pressure. | | | | | | | | | | |

*Table 2B: HCVR Unit Heating Technical Data*

### 2.4.2 Construction

- The frame is a galvanised steel body with stainless steel burners and heat exchanger with draft diverter. Flues, flue cowls and external cabinet are marine grade aluminium.
- Aira units are designed to be used with Aira flues and flue cowls. Fitment of third-party flues and flue cowls must be approved by an accredited flue designer.

### 2.4.3 Blower

- The standard blower is forward curved and constructed from steel. Units not installed in ductwork are typically optioned with an axial fan due to the low pressure drop.
- Blower housings are powder coated steel as standard.

### 2.4.4 Fan Motors

- Fan motors are mounted externally to the blower and connect via a set of pulleys.
- All units are available at order with 2 different motor power capacities to meet flow and pressure requirements. Units may be fitted with a larger motor at additional cost. Contact Seeley International for further advice.

### 2.4.5 Pulleys

- Upon order the customer will be given the options of one of three pulley kits to meet their flow and pressure requirements.
- Variations in external pressure drop outside of the standard product range require pulley and belt combinations to be supplied by the customer.
- All pulleys are of steel construction with taper lock mounting.

### 2.4.6 Dampers

- All units are supplied with adjustable galvanised steel dampeners with preset positions to be set by the installer.
- Axial fan units use the dampers to adjust air throw in addition to heat rise.

### 2.4.7 Electrical Control

- All units are equipped with an electrical control box which controls the Gas Pilot, Main Valve, Modulating Valve (when installed) and blower operation.
- All units are fitted with High Limit Safety Switches on the Air Inlet and Outlet Side and an Automatic Fan Switch to prevent overheating.
- **Caution:** Automatic fan switch will cause the fan to operate without notice once the unit is powered down and heat soak takes place.

### 2.4.8 Supply Water Specification

Water consumption rates vary with weather conditions but the following can be used as a guide. The evaporative cooler can evaporate around 2.5L of water per hour for every 100L/s of supply air. So a large cooler providing 14,000L/s of air could evaporate 2.5 x 140 = 350L of water per hour of operation. The water bleed off rate must be added to this in order to calculate the total operating water flow rate.

### 2.4.9 Relief Area Calculation

Evaporative air coolers always run on 100 % fresh outside air. Always ensure adequate relief is available via open doors and/or windows. Allow approximately 0.4m² per 1000L/s of supply air. If 0.5mm fly wire screens are fitted to the relief area, allow 0.8m² per 1000L/s for this area. Contact manufacturer if other fly wire thicknesses are installed.

**Example:**

AL30 – 7.5kW Cooler with 200Pa pressure drop

Air delivery will be approximately 11,890 L/s (refer spec sheet)

If no fly screens are fitted to relief openings:

$0.4\ m^2 \times (11890\ L/s / 1000\ L/s) = 4.8m^2$ relief area required

If fly screens are fitted to 70% of the relief openings:

$[(0.8\ m^2 \times 70\%) + (0.4\ m^2 \times 30\%)]\ (11890\ L/s / 1000\ L/s) = 8.1\ m^2$ relief area required (minimum)

Select relief openings to provide the best pattern of cool air flow throughout the building. Note that relief openings may be ineffective if exposed to high winds. If air exhaust volume is a problem, mechanical exhaust ventilation will be required for as much as 80% of the air delivery of the cooler.

**Coolers must not discharge into a closed space but must always be able to relieve from a building.**

If Supply air ducts are fitted with adjustable outlet grill blades, the blades should be adjusted to give the best cool air distribution in the area served by the outlet.

**Do not close blades too far or air whistle may occur.**

To ensure long life and efficient operation it is essential that the cooler receive an annual service. In extreme environments (e.g. hot dusty areas) more frequent service may be required. Check with the unit installer.

During normal operation of the cooler it is important that the water bleed-off is operating and is not shut off or blocked. This bleed-off will prevent an accumulation of salts and solids in the unit.

### 2.4.10 Drainage

All coolers require adequate drainage to remove water from the unit. It is the installers responsibility to ensure that the drain is adequately sized to accommodate the unit. The local drains shall be sufficient to remove the excess water required to clean out the unit as required.

# INSTALLATION INFORMATION

## 3.0 INSTALLATION INFORMATION

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

The space in which the HCV unit is installed shall be ventilated to the extent required to ensure safe and effective operation. The unit shall also not be installed in a location that will affect the operation of mechanical devices used to displace air either within the same space or within a connected space.

HCV units shall be installed so that adjacent combustible surfaces are protected from damage resulting from thermal effects of their operation.

If there are existing gas appliances the it shall be confirmed that there is adequate capacity before connecting the HCV unit.

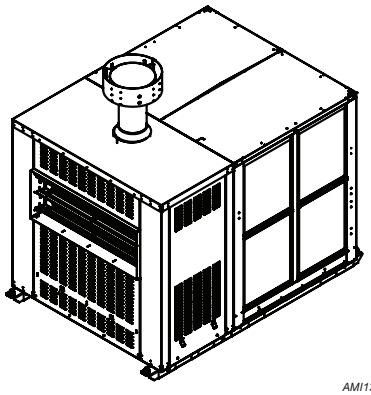
Isolation of the gas, water and electrical supplies to the units shall be accessible and identifiable at all times.

# INSTALLATION INFORMATION

## 3.1 MODEL VARIATIONS AND DIMENSIONS

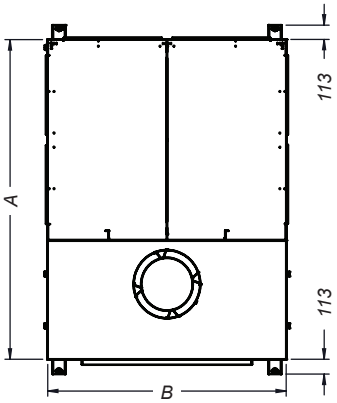
### SINGLE HEAT EXCHANGER NO BLOWER

**ISOMETRIC**



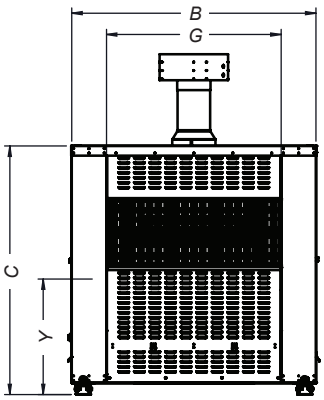
AMI134-A ISO

**TOP**



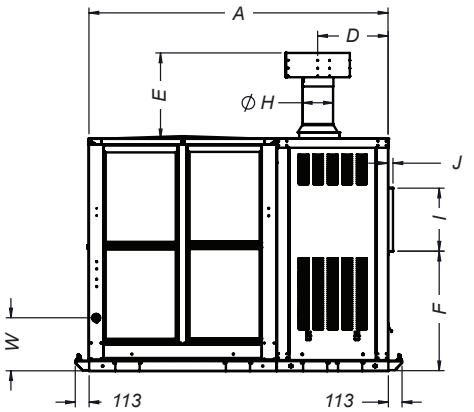

AMI134-A TOP

**REAR**



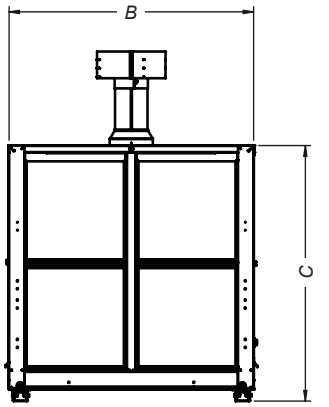

AMI134-A REAR

**SIDE**



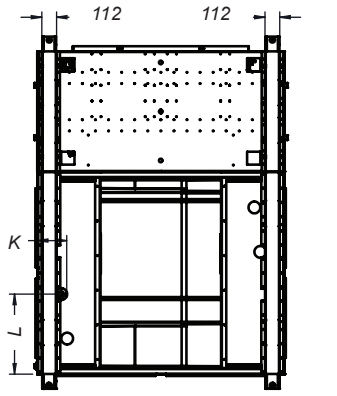

AMI134-A SIDE

**FRONT**




AMI134-A FRONT

**BOTTOM**




AMI134-A BOTTOM

Dimensions are in mm.

*Figure 2A: HCV Units*

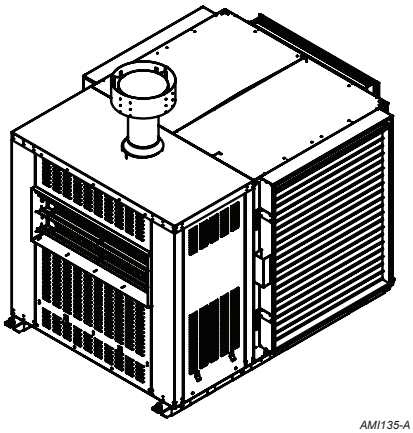
### 3.1.1 UNIT DIMENSIONS - SINGLE HEAT EXCHANGER HCV

| DIM | HCV12 | HCV16 | HCV26 | HCV30 | HCV35 | HCV40 |
|---|---|---|---|---|---|---|
| A | 1915 | 1915 | 2468 | 2468 | 2469 | 2469 |
| B | 995 | 995 | 1556 | 1556 | 1893 | 1893 |
| C | 1252 | 1252 | 1570 | 1570 | 1918 | 1918 |
| D | 712 | 712 | 734 | 734 | 585 | 585 |
| E | 505 | 515 | 635 | 800 | 570 | 655 |
| F | 510 | 510 | 728 | 728 | 987 | 987 |
| G | 457 | 596 | 865 | 1003 | 1208 | 1346 |
| H | 150 | 175 | 200 | 250 | 250 | 250 |
| I | 455 | 455 | 525 | 525 | 525 | 525 |
| J | 44 | 44 | 35 | 35 | 38 | 40 |
| K | 150 | 150 | 200 | 200 | 240 | 240 |
| L | 500 | 500 | 650 | 650 | 650 | 650 |
| W (Water inlet) | 440 | 440 | 440 | 440 | 440 | 440 |
| Y (Gas inlet) | 370 | 370 | 580 | 580 | 840 | 840 |

# INSTALLATION INFORMATION

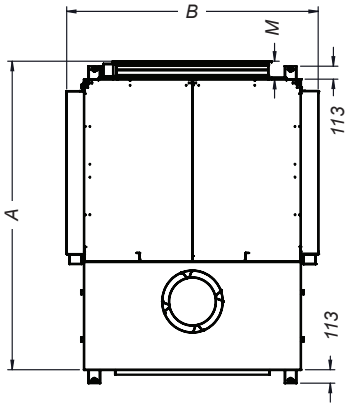
### SINGLE HEAT EXCHANGER HCVR

**ISOMETRIC**



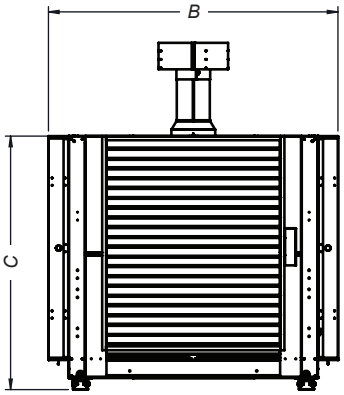
AMI135-A ISO

**TOP**



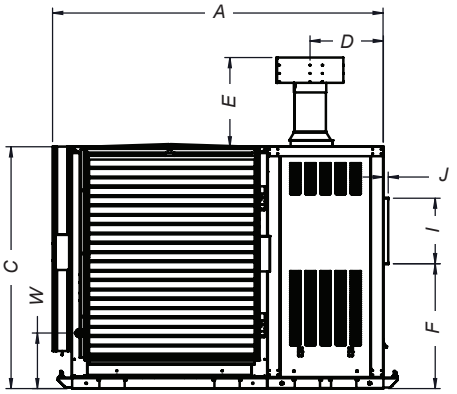

AMI135-A TOP

**REAR**



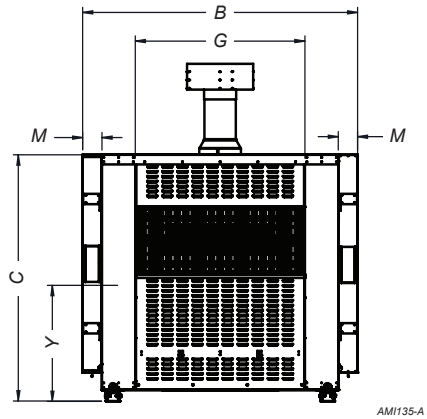

AMI135-A REAR

**SIDE**



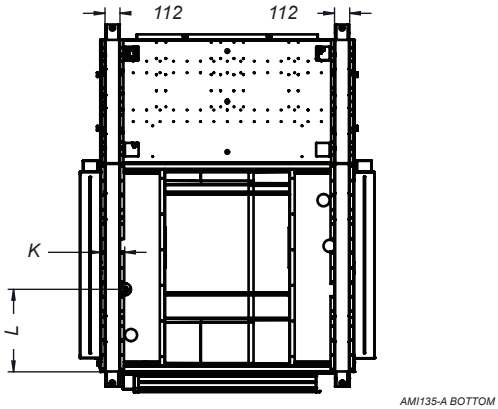

AMI135-A SIDE

**FRONT**




AMI135-A FRONT

**BOTTOM**




AMI135-A BOTTOM

*Figure 2B: HCVR Units*

Dimensions are in mm.

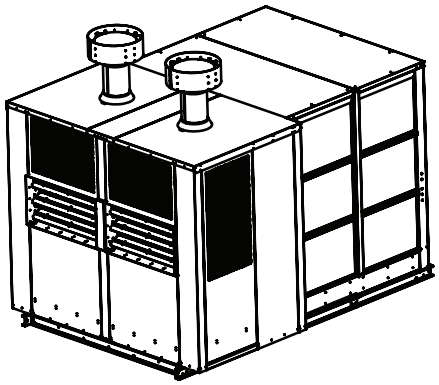
## 3.1.2 UNIT DIMENSIONS - SINGLE HEAT EXCHANGER HCVR

| DIM | HCVR12 | HCVR16 | HCVR26 | HCVR30 | HCVR35 | HCVR40 |
|---|---|---|---|---|---|---|
| A | 2067 | 2067 | 2621 | 2621 | 2622 | 2622 |
| B | 1302 | 1302 | 1860 | 1860 | 2191 | 2191 |
| C | 1254 | 1254 | 1570 | 1570 | 1918 | 1918 |
| D | 695 | 705 | 727 | 758 | 585 | 582 |
| E | 526 | 530 | 680 | 840 | 720 | 710 |
| F | 525 | 510 | 728 | 726 | 987 | 987 |
| G | 457 | 596 | 865 | 1003 | 1208 | 1346 |
| H | 150 | 175 | 200 | 250 | 250 | 250 |
| I | 455 | 455 | 525 | 525 | 525 | 525 |
| J | 44 | 44 | 35 | 35 | 38 | 40 |
| K | 440 | 440 | 440 | 440 | 440 | 440 |
| L | 370 | 370 | 580 | 580 | 840 | 840 |
| M | 150 | 150 | 150 | 150 | 150 | 150 |
| W (Water Inlet) | 440 | 440 | 440 | 440 | 440 | 440 |
| Y (Gas Inlet) | 370 | 370 | 580 | 580 | 840 | 840 |

# INSTALLATION INFORMATION

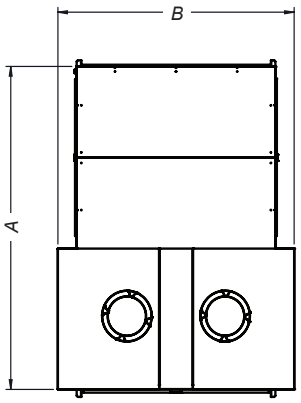
### DUAL HEAT EXCHANGER HCV

**ISOMETRIC**



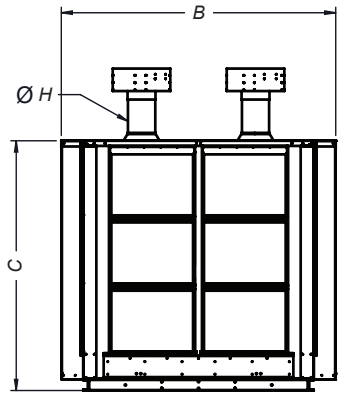
AMI136-A ISO

**TOP**



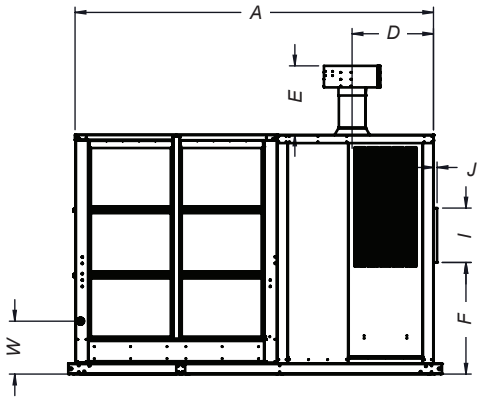

AMI136-A TOP

**REAR**



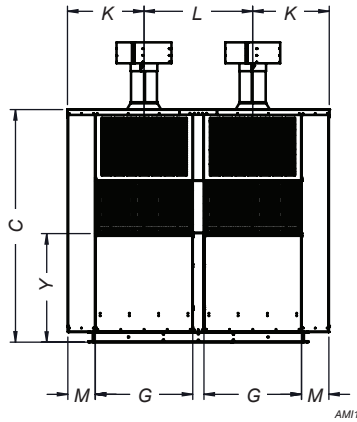

AMI136-A REAR

**SIDE**



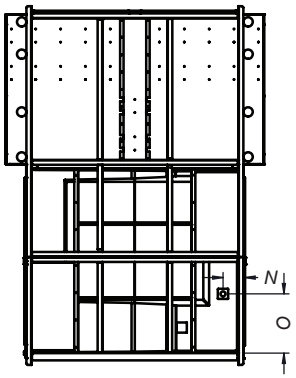

AMI136-A SIDE

**FRONT**




AMI136-A FRONT

**BOTTOM**




AMI136-A BOTTOM

Dimensions are in mm.

*Figure 2C: HCV Dual Heat Exchange Units*

## 3.1.3 UNIT DIMENSIONS - DUAL HEAT EXCHANGER HCV

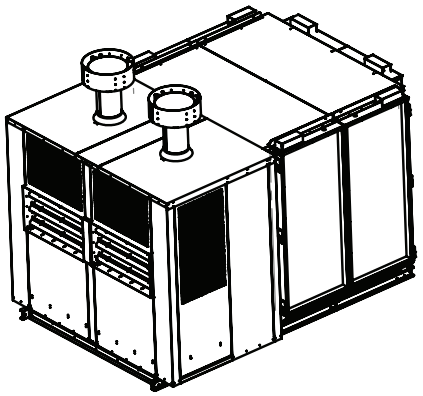
| DIM | HCV50 | HCV60 |
|---|---|---|
| A | 2650 | 3340 |
| B | 2240 | 2510 |
| C | 1905 | 2235 |
| D | 735 | 760 |
| E | 430 | 430 |
| F | 815 | 1045 |
| G | 800 | 935 |
| H | 200 | 250 |
| I | 505 | 505 |
| J | 35 | 35 |
| K | 665 | 730 |
| L | 910 | 1050 |

| DIM | HCVR50 | HCVR60 |
|---|---|---|
| M | 150 | 150 |
| N | 175 | 215 |
| O | 610 | 575 |
| W (Water Inlet) | 440 | 440 |
| Y (Gas Inlet) | 580 | 580 |

# INSTALLATION INFORMATION

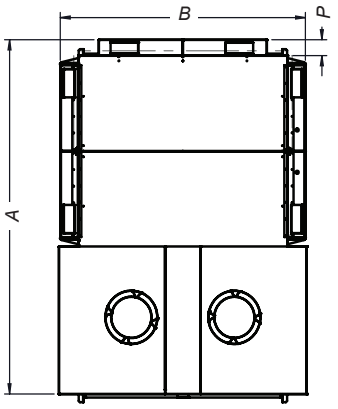
### DUAL HEAT EXCHANGER HCVR

**ISOMETRIC**



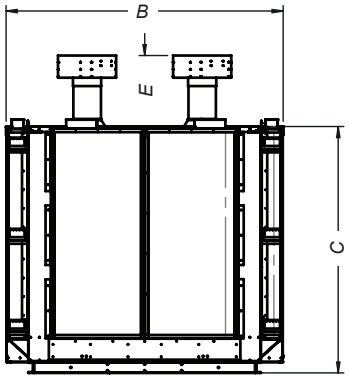
AMI135-A ISO

**TOP**



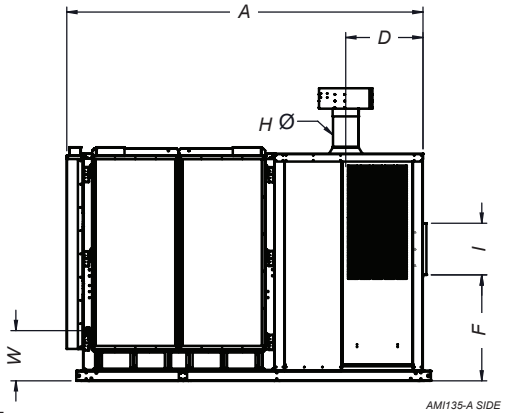

AMI135-A TOP

**REAR**



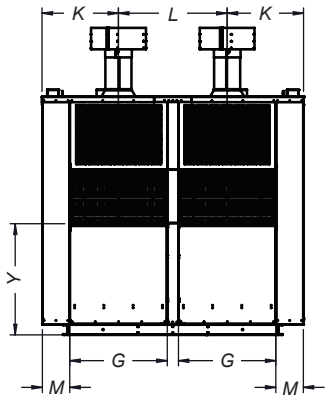

AMI135-A REAR

**SIDE**



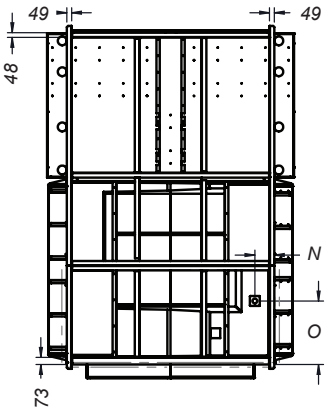

AMI135-A SIDE

**FRONT**




AMI135-A FRONT

**BOTTOM**




AMI135-A BOTTOM

Dimensions are in mm.

*Figure 2D: HCVR Dual Heat Exchange Units*

## 3.1.4 UNIT DIMENSIONS - DUAL HEAT EXCHANGER HCVR

| DIM | HCVR50 | HCVR60 |
|---|---|---|
| A | 2790 | 3500 |
| B | 2240 | 2510 |
| C | 1905 | 2235 |
| D | 735 | 760 |
| E | 430 | 430 |
| F | 815 | 1045 |
| G | 800 | 935 |
| H | 200 | 250 |
| I | 505 | 505 |
| J | 35 | 35 |
| K | 665 | 730 |
| L | 910 | 1050 |

| DIM | HCVR50 | HCVR60 |
|---|---|---|
| M | 150 | 150 |
| N | 175 | 215 |
| O | 610 | 575 |
| P | 150 | 150 |
| W (Water Inlet) | 440 | 440 |
| Y (Gas Inlet) | 580 | 580 |

# INSTALLATION INFORMATION

## 3.2 INSTALLATION

The following recommendations are not intended to supplant or take precedence over relevant official regulations. AIRA HCV 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. 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 an unit is an unrestricted supply of clean fresh air. Units shall not be installed in an environment where negative pressure is exerted on the unit. The prime requisites for the correct location of an unit is an unrestricted supply of clean fresh air.

**Failure to do so may result in fatalities.**

When selecting a location for the HCV 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 personnel 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 minimise the risks associated with storage, use or release of hazardous or flammable substances in the vicinity of the unit?
5. How to minimise 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 bedrooms, living rooms, meetings rooms 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

1200mm is the recommended clearance around all sides for service access. All combustibles must be kept outside the 1200mm clearance zone.

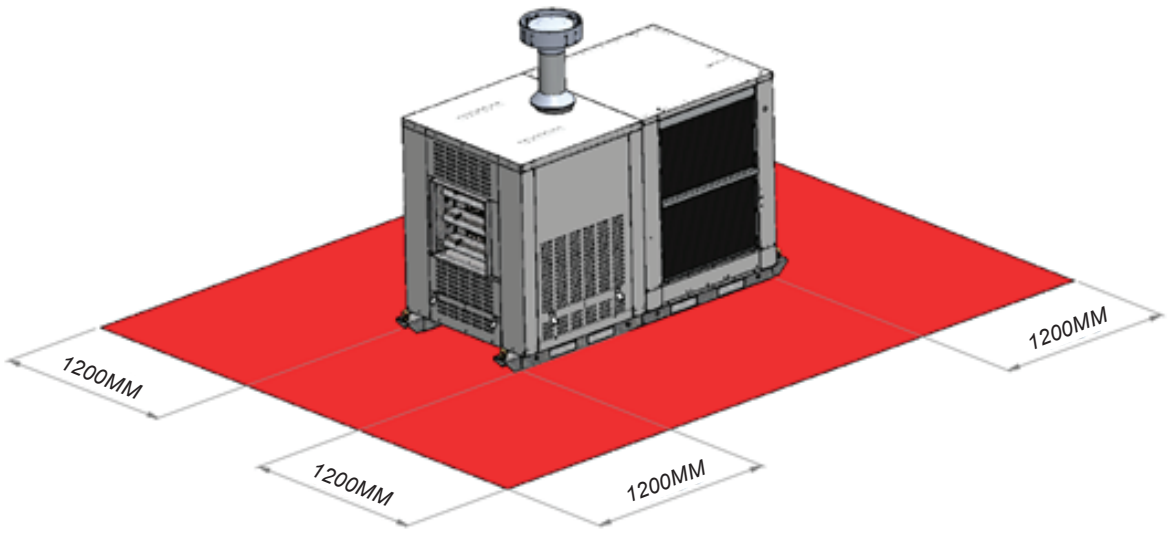



*Figure 3: Service Clearance around Unit*
*(All dims = mm)*

### 3.2.3 Plant Room

It is **not** recommended to install a HCV unit in an enclosed plant room. Doing so may introduce negative pressure into the plant room and allow for harmful gases and fumes to be pulled into the building creating a risk to the building occupants when the unit is in heating mode. If a unit is placed in a plant room a suitably qualified engineer must be consulted to ensure that enough clean airflow is entering the plant room.

If the unit is installed in an external plant room a suitably qualified engineer should be engaged to ensure that other plant that may generate harmful gases and fumes are located at a distance such that the gases and fumes will not be drawn into the building. Operating the unit in cooling mode inside a plant room will limit the airflow across the cooling pads making the unit inefficient. The relief area must be considered if installed in a location were airflow is restricted.

### 3.2.4 Roof Stands

If a roof stand was supplied with the unit it is to be installed in accordance with Aira Manual AM011. If the customer chooses to use a 3rd party support structure they must be adequately and professionally designed by a structural engineer to support the operating weight of the unit. Roof stands shall be installed so that the unit sits level. Figure 4: Typical HCV Roof Stand depicts a typical roof stand used across the AIRA range. Refer to AM011 for Roof stand installation, commissioning and maintenance.

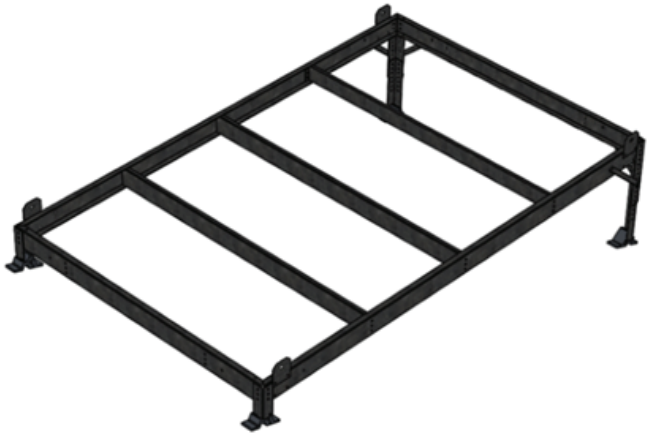


*Figure 4: Typical HCV Roof Stand*

### 3.2.5 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 corner weights of the units with and without blower.

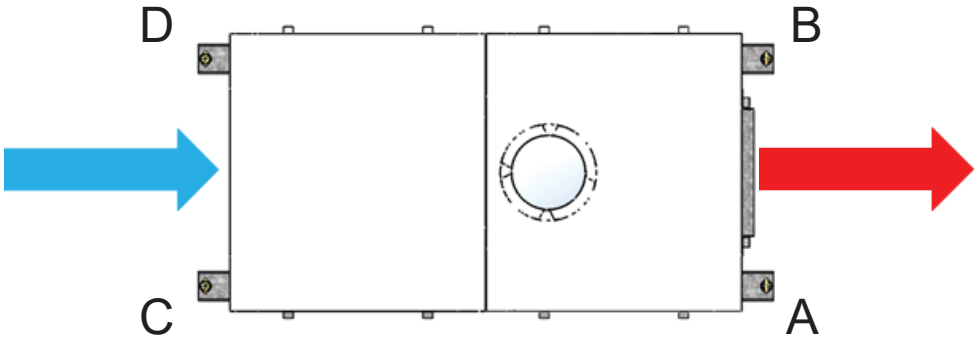



*Figure 5: Unit Corner Weights*

| MODEL | A | B | C | D |
|---|---|---|---|---|
| HCV 12 | 94kg | 61kg | 47kg | 76kg |
| HCV 16 | 97kg | 64kg | 64kg | 73kg |
| HCV 26 | 117kg | 162kg | 161kg | 70kg |
| HCV 30 | 147kg | 158kg | 144kg | 92kg |
| HCV 35 | 183kg | 162kg | 189kg | 135kg |
| HCV 40 | 182kg | 205kg | 181kg | 123kg |

*Table 5: Unit Corner Weights*

### 3.2.6 Lifting

Units are to be lifted by the points specified and designed to lift only the specific units' dry weight. These lifting points are suitable for either Crane or Helicopter lift with suitable spreader bars. The unit cabinet is lightweight aluminium and at no point should the lifting slings or spreader bar contact the cabinet, failure to comply will permanently damage the case.

Lifting point securing bolts and lifting eyes must be inspected for prior to lifting to ensure all bolts are installed, of correct tensile strength and are correctly tensioned. If any damage is observed, lifting points and/or eyes should be replaced.

Below is a suggested lifting arrangement. Noting that the centre of gravity should be assessed for each unit prior to lifting by suitably qualified crane operator, rigger and dogmen. Certification of the lifting lug assembly may be obtained by contacting Seeley International.

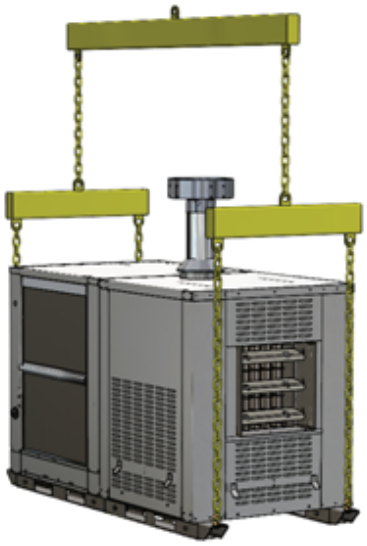


*Figure 6: Lifting Example*

### 3.2.7 Positioning and Securing

Small, Medium and Large cabinet units are supplied with under cabinet skids. Units are designed to be supported along the length of the skids. Holes may be drilled into the skids to secure the unit in place.  Lifting points at either end of the units are NOT to be used for anything other than lifting the unit into place and may be removed once installation has occurred.

It is the responsibility of the installer to ensure that any platform used to support the unit is suitably designed. A suitably qualified Civil or Structural Engineer must be engaged to conduct an assessment.

# INSTALLATION INFORMATION

### 3.2.8 Duct Connections

The outlet of the unit is provided with a 40mm flange for Ductmate® or similar ductwork connection. An inspection and service panel are located above and below the duct connection flange. Duct connection should be in a manner which maintains panel operation without the need to remove ductwork. Refer to manufacturer's specifications for further details.

Refer to the Model Variants and Dimensions section of the document for specific unit details.

*Figure 7: Duct Connections*

### 3.2.9 Flue Connections

Units are provided with a short section of flue which is designed to suit the heat exchanger, draft diverter and rain collar. It is the installers responsbility to provide additional lengths and orentations of flue to ensure that the flue terminates in a location that is compliant with AS5601.1 and local regulations and requirements. All flue installations must be in accordance with AS5601 and local regulations. Flue cowls supplied are certified by AGA independent of the unit. So may be suitable for use  on different length flues in accordance with AS4566-2005 Flue cowls – Gas appliances.

The flue is to be secured to the draft divertor spigot with sheet metal TEK type screws. If a different flue design is used the flue up draft must be confirmed after appliance if started to ensure adequate flow. Flue temperatures are expected between 250 to 300 Deg C. and may require additional flue skins especially when penetration through walls, roofs, floors, etc. The flue cowl is designed to go over the external diameter of the flue and may have a crimped end to assist with fitment. The rain collar is to sit over the flue and does not require fasteners or to be sealed to the flue or cab top

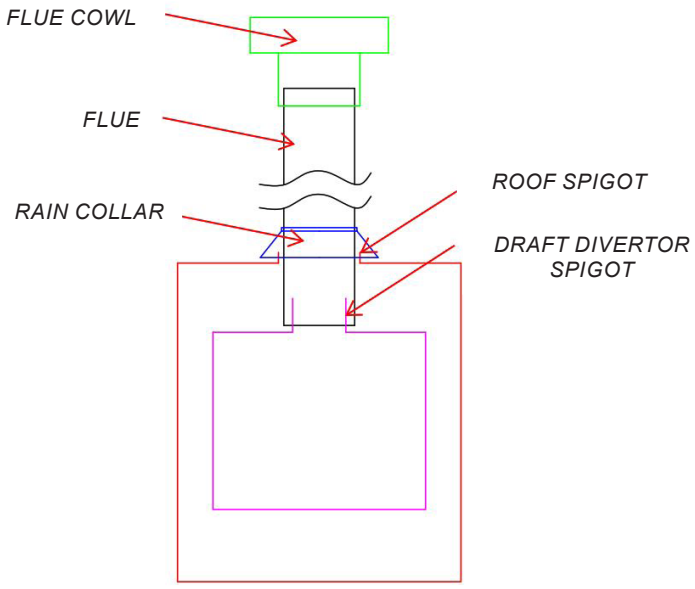



*Figure 8: Flue Connections*

# INSTALLATION INFORMATION

## 3.3 ELECTRICAL CONNECTIONS

### 3.3.1 Electrical Supply

All electrical connections are to be as per AS3000. All electrical work shall be performed by a registered electrical contractor. Aira Manual AM006, provides a comprehensive electrical connection guide including wiring configurations for different control setups and wiring diagram package and should be used in conjunction with this manual.

- Electrical circuit breakers must be a minimum of a " D curve" motor start circuit breaker.
- Electrical circuit breakers must be sized according to the total load requirements.

For Weatherproof units, the Electrical connection will require a hole saw to drill through a corner panel for conduit entry.

When entering the unit:

- **DO NOT** run cables or conduit across the heater.
- **DO NOT** run the cables on the floor under the heat exchanger.
- **DO NOT** wire directly into the control box except for control wires as per the wiring diagram.

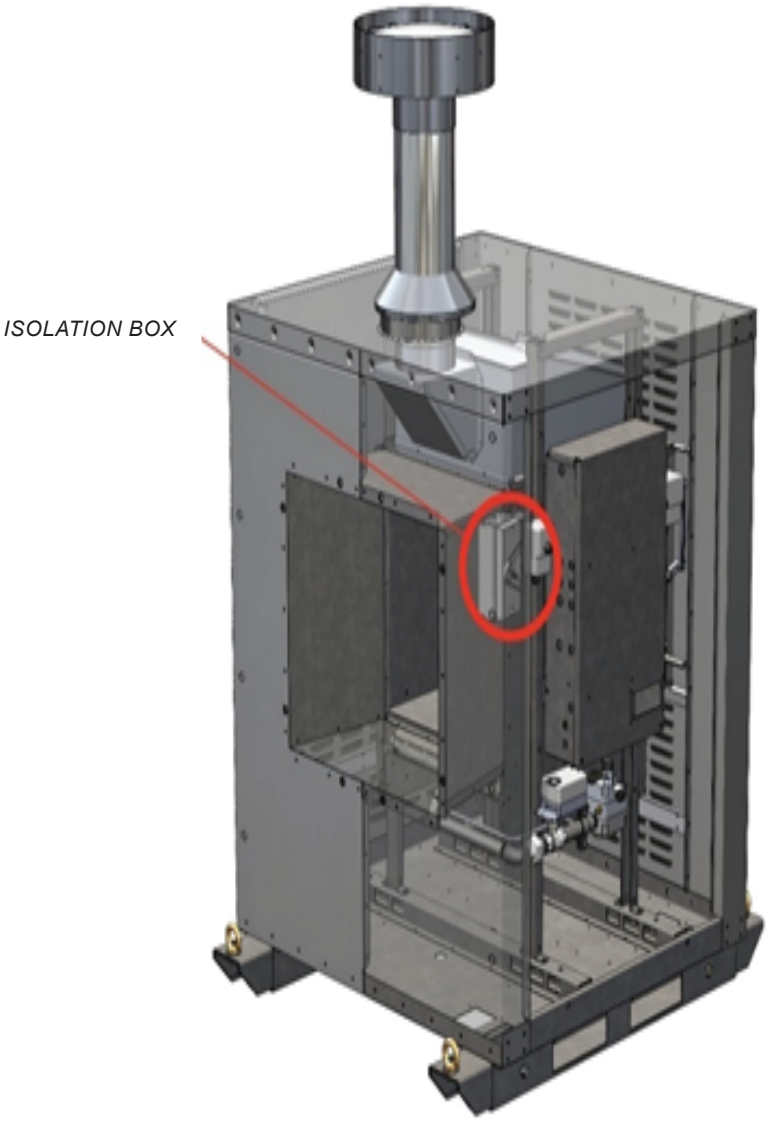



*Figure 9: Isolation Box Location*

# INSTALLATION INFORMATION

### 3.3.2 User Control Configuration Options

There are 2 primary control options for AIRA HCV units, Wall switch and BMS. Units are specified with either a wall switch or capability to be wired for BMS interface. BMS specified units have a different RLU program to those specified with the wall switch. Wall switch units have a Siemens room thermostat supplied. Dual heat exchangers have a different control setup. Refer to Aira Manual AM006.


*Figure 10: Thermostat*


*Figure 11: Rotary Wall Switch*

| | |
|---|---|
| **OFF** | UNIT 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 |
| **HIGH COOL** | FAN ON HIGH, WATER SUPPLIED TO COOLING PADS |
| **HEAT** | FAN ON LOW, GAS SUPPLIED TO UNIT IF THERMOSTAT IS SET ABOVE CURRENT ROOM TEMPERATURE |

### 3.3.3 Blower / Fan Setup

The evaporative cooling blower function as a blower for the heater and will run on low speed.

# INSTALLATION INFORMATION

## 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 on site. 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 ¾" Inch 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 6: Gas Supply Pressures. Note that there is different pressure requirements for NG and LPG. If the pressure is greater than 7kPA an over pressure shut off regulator is required.

| GAS PRESSURE | NG | LPG |
|---|---|---|
| **Maximum kPa** | 3.5 | 3.5 |
| **Minimum kPa** | 1.12 | 2.74 |

*Table 6: Gas Supply Pressures*

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 under sized and/or restricted
- The Gas meter may be under sized
- 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

For dual heat exchanger units a separate gas supply shall be provided to each gas train with individual isolation valves provided.

### 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 Supply for Dual Heat Exchangers

Dual heat exchanger units have 2 independent gas valves and control systems therefore require 2 separate gas supply connections. Each gas supply requires an isolation valve and shall be individually commissioned. Pipework to the unit shall be sized so that the pressure and gas flow is sufficient so that both heat exchanges may be operated at the maximum output simultaneously.

### 3.4.4 Gas Train Information

The Gas Train as pictured in Figure 12: Gas Train Front View 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.

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.

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.

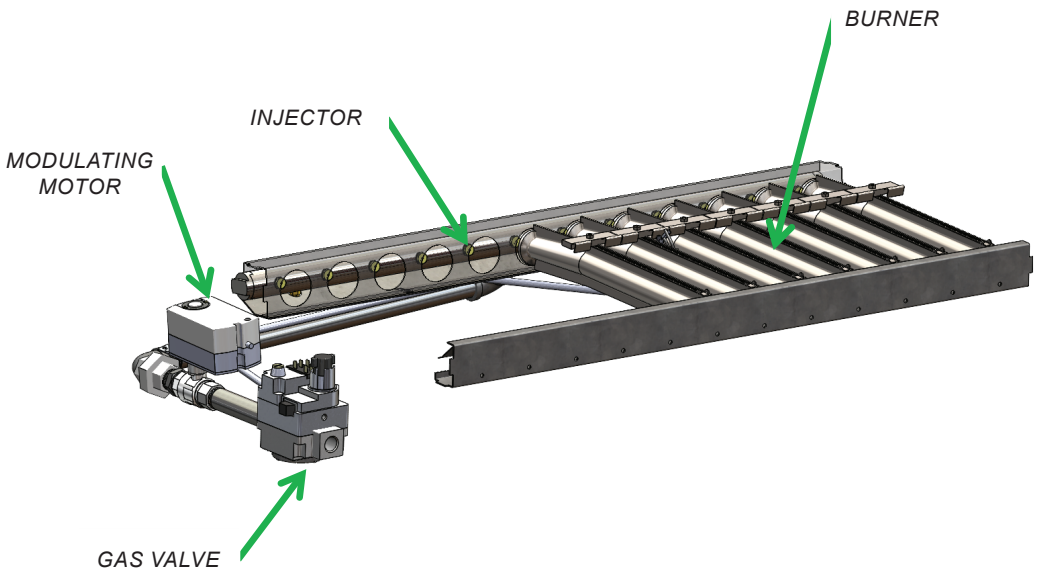



*Figure 12: Gas Train Front View*

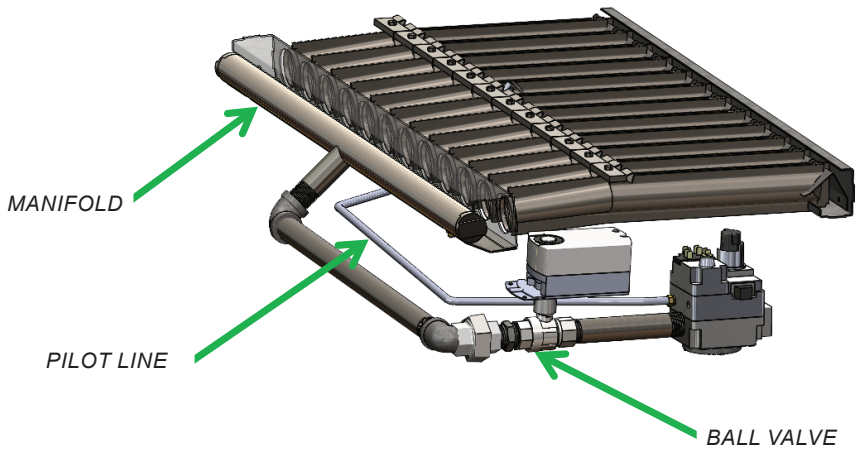



*Figure 13: Gas Train Side View*

# INSTALLATION INFORMATION

### 3.4.5 Gas Pressure Valve

Natural gas and LPG have different gas valves. The Natural gas valve may be identified by the on/off rotary knob where the LPG valve has a switch. Figures 14 and 15 depict a typical natural gas valve. Natural gas valves may be converted for use with LPG by using a conversion kit. Valves converted for use with LPG need to have appropriate stickers applied to the valve.

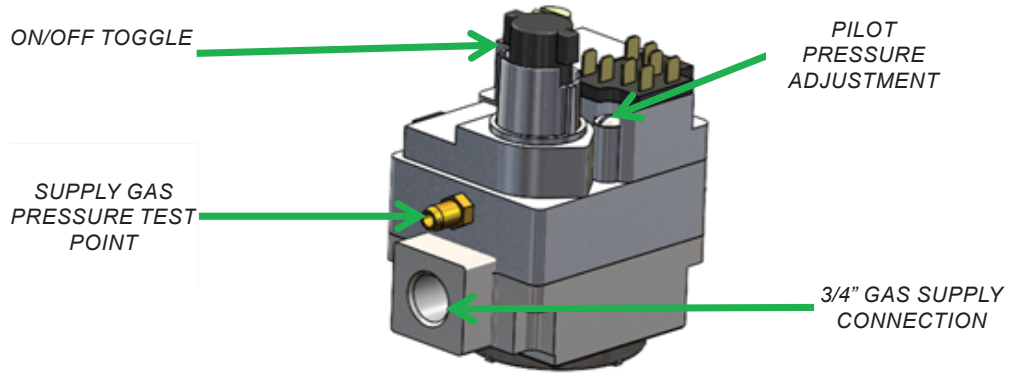



*Figure 14: Gas Valve Supply View*

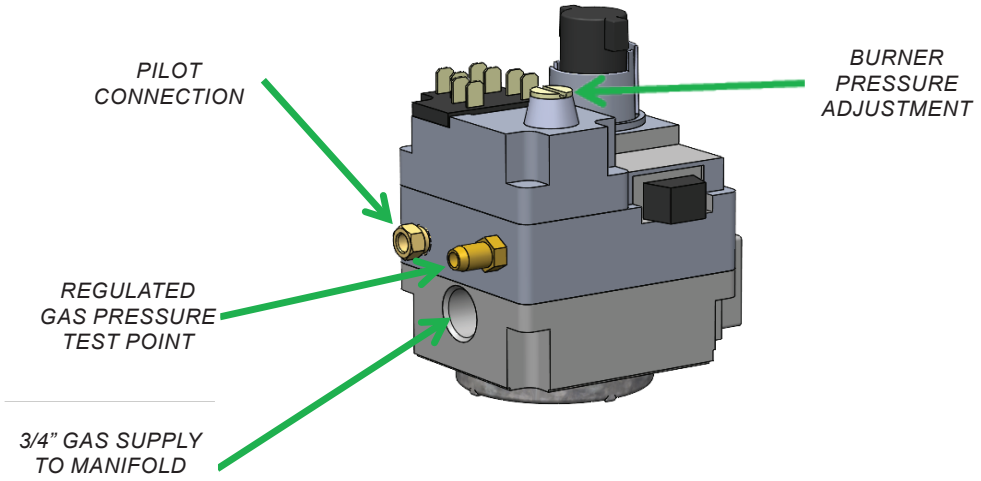



*Figure 15: Gas Valve Discharge View*

### 3.4.6 Operating Pressure of the Gas Valve

| UNIT | GAS TYPE | HIGH PRESSURE (kPA) | LOW PRESSURE (kPA) |
|---|---|---|---|
| HCV12 (DU12) | Natural Gas | 0.875 | 0.3 |
| | LPG | 2.5 | 0.875 |
| HCV16 (DU16) | Natural Gas | 0.875 | 0.3 |
| | LPG | 2.5 | 0.875 |
| HCV26 (SD26) | Natural Gas | 0.72 | 0.3 |
| | LPG | 2.5 | 0.875 |
| HCV30 (SD30) | Natural Gas | 0.72 | 0.3 |
| | LPG | 2.5 | 0.875 |
| HCV35 (SD35) | Natural Gas | 0.72 | 0.3 |
| | LPG | 2.3 | 0.875 |
| HCV40 (SD40) | Natural Gas | 0.72 | 0.3 |
| | LPG | 2.5 | 0.875 |

*Table 7: High and Low Operational Pressures*

### 3.4.7 Setting Gas Valve Pressure

The regulated valve pressure is to be set based of the ranges in Table 7.

To set the regulated pressure follow the steps below.

1. Connect a manometer to the supply pressure test point.
2. Measure the incoming gas pressure to ensure that it less than 3.5kPa. If found to be greater than 3.5kpA 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 6. 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.

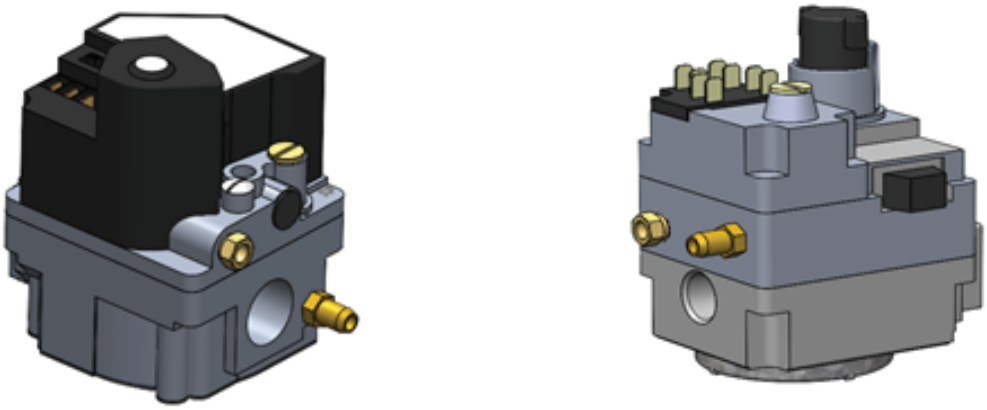


*Figure 16: Typical LPG (left) and NG (right) Gas valves*

### 3.4.8 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 17 onto Adaptor Shaft.

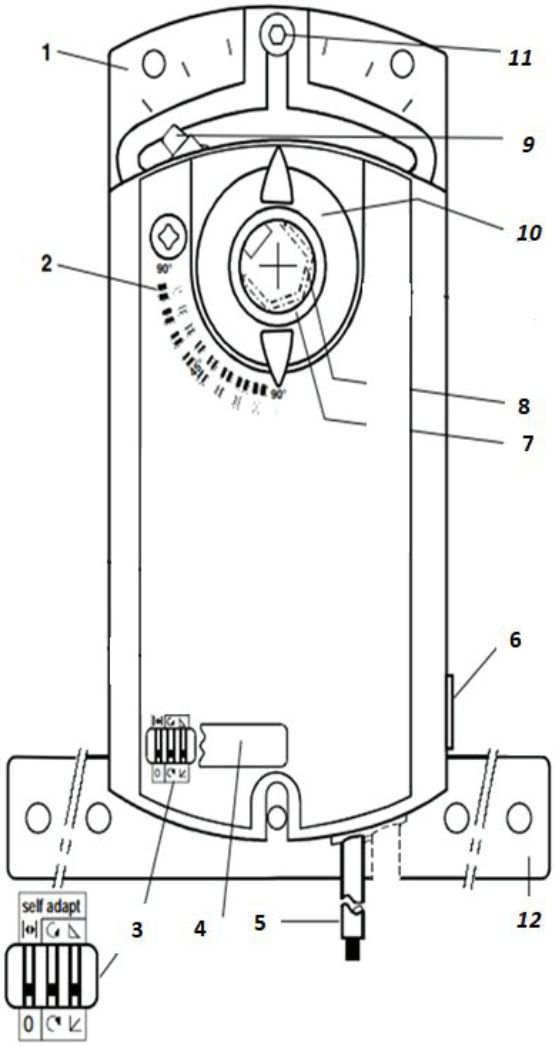
**Setting Modulating Motor**

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 (6) 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. A rate equal to 59% of full gas rate may be obtained by adjusting the gas flow at the low fire setting, which equates to the correct minimum gas flow rate.

NG: Full Gas = .870kPa, Low Gas = .300kPa, LPG: Full Gas = 2.5kPa, Low Gas = .875kPa




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 17: 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.**

### 3.4.9 Pilot Injector Setup

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

The Pilot can be removed by removing the retaining clip from the housing, then removing the injector from the housing. Care must be taken when working on the pilot system not to damage the aluminium gas hard line.

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 with both screw and the injector clip.

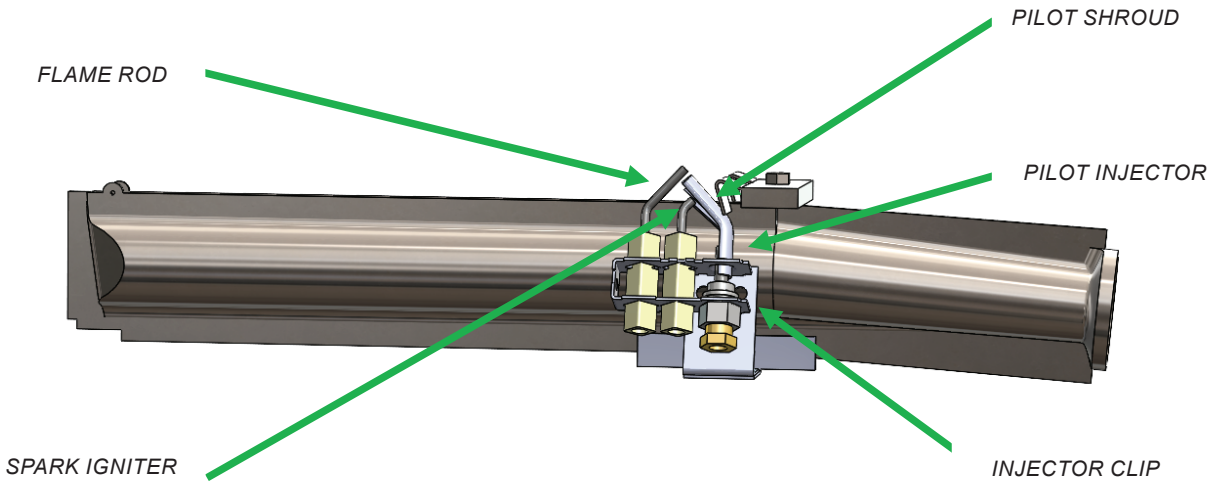



*Figure 18: Pilot Assembly*

### 3.4.10 Aeration Plates

All Gas trains require an Aeration Plate installed to achieve proper primary aeration. Ensure that the Aeration plate is installed fully in a fully closed position, with minimal gaps between the manifold and aeration plate. If the unit experiences light back issues, ensure that the aeration plate is fully closed.

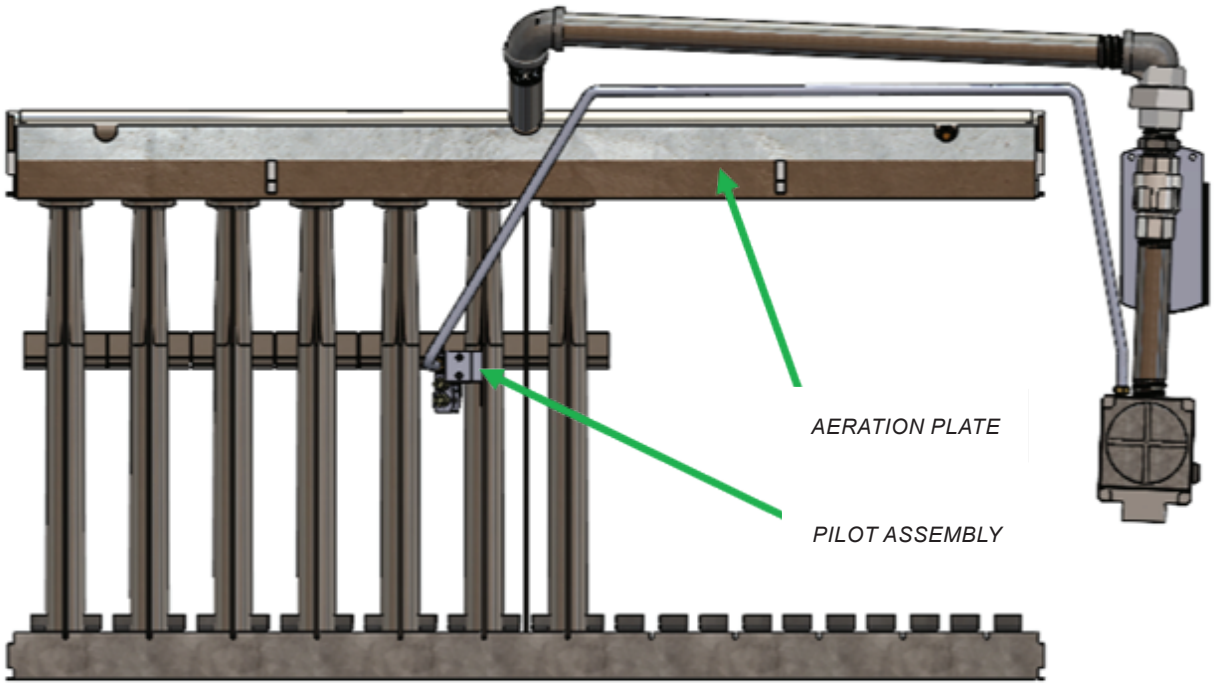



*Figure 19: Aeration Plate viewed from below*

# INSTALLATION INFORMATION

## 3.5 WATER CONNECTIONS

### 3.5.1 Water Supply

The supply pipe should be suitably sized to meet the specified flow and pressure. A ¼ turn ball isolating valve must be installed on the supply pipe near the unit for ease of maintenance. Do not use duo or non-return (check) valves of any kind including stop taps with jumper washers. The incoming water supply requires a pressure between 100-800kPa.

NOTE: Non-return type valves can have an effect on the operation of the water solenoid valves. They may lock up and damage can be caused.

1. Fit water supply isolation close to the unit to assist in routine servicing.
2. Before connecting the supply pipe, flush it clear of any swarf or debris that may cause the float valve to stick and leak.

NOTE: In areas where water pipes freeze, provisions will be needed to drain the water piping to prevent damage.

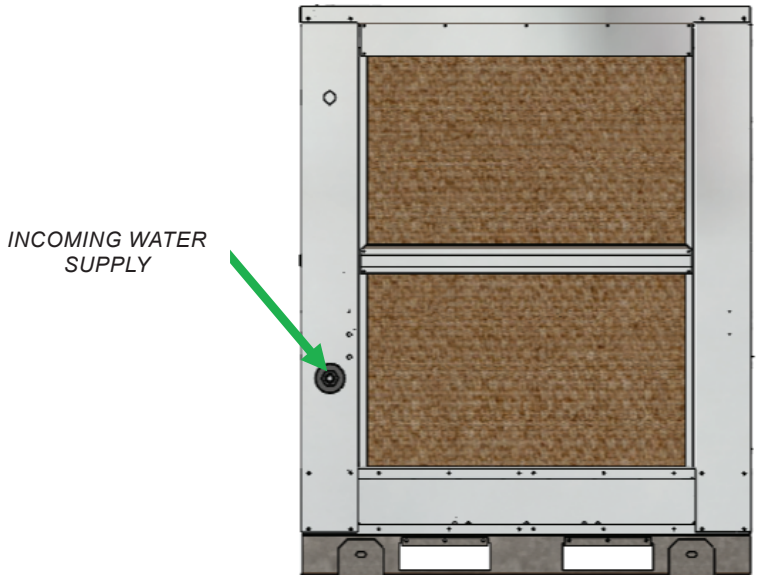



*Figure 20: Incoming Water Supply Location*

### 3.5.2 Water Setup

HCV units come with internal water components pre-plumbed. Once the unit is in position the water supply to the unit and drainage from the unit will need to connected.

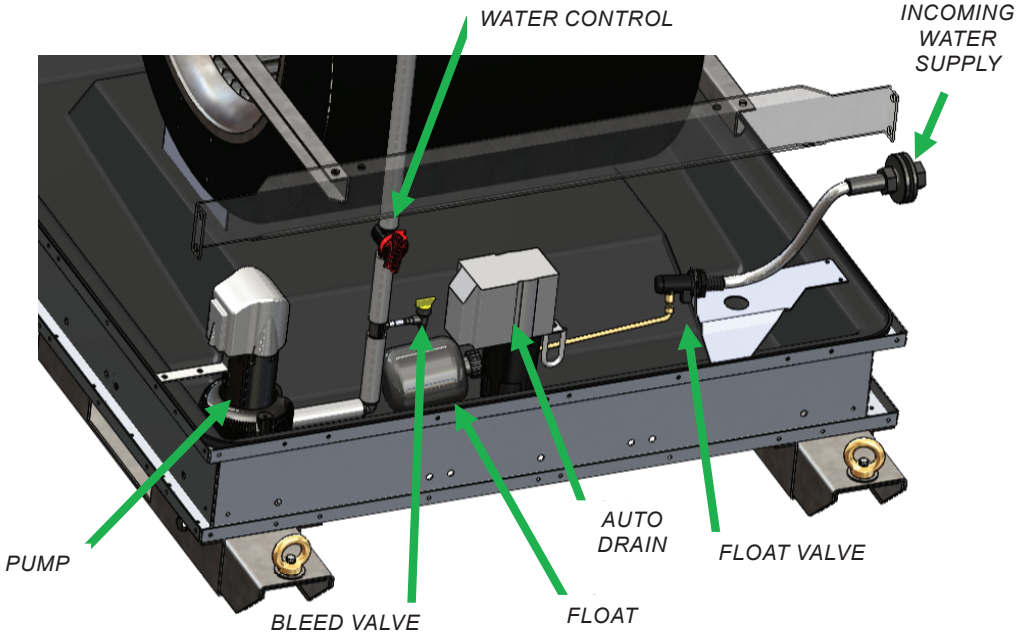



*Figure 21: Internal Cooler Components*

### 3.5.3 Drain

The combination drain/overflow pipe outlet must be connected to a drainpipe with sufficient capacity to take the discharge of water from the reservoir. The pipe must connect to a suitable drain or gutter. Drain must be lower than base of pad assembly.

**Note: Refer to local regulations to ensure discharge of drain / overflow water is in accordance with statutory requirements.**

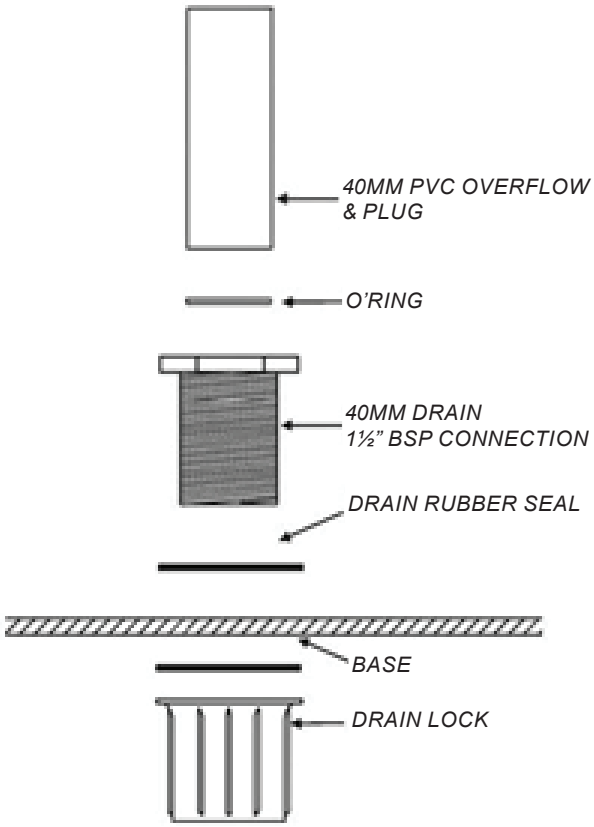



*Figure 22: Drain Configuration*

### 3.5.4 Automatic Drain Valve

An optional automatic dump valve (Auto Drain Kit Installation. AL12-36 DST) is available. The valve either replaces the Drain or can be installed in addition. The ADV is designed to empty the sump at the end of a cooling operation. There are multiple configuration options what are explained in detail within the ADV manual. The ADV manual shall be used to ensure correct installation and operation.

The Auto Drain Kit is supplied with a solenoid to control water flow into the unit. Where a solenoid is installed a back flow prevention device and/or check valve must not be installed.

The installer must remove the link wire located in the master control box to ensure correct operation. Failure to do so may result in Auto Drain Kit Failure.

### 3.5.5 Bleed off Valve

To reduce the accumulation of salts and minerals in the re circulated water it is essential to bleed a certain amount of water to waste, Increased flow of makeup water reduces the salt content. The bleed rate will vary with the water supply quality, but initially should be set to Table 8: Bleed Off Rate. The bleed line from the flow delivery line inside the unit, must be suspended through the overflow pipe or into the optional automatic drain valve.

### 3.5.6 Cooling Pads

All units have removable cooling pads that provide access to the internal components of the cooler.

The following steps can be used to remove cooling pads.

1. Confirm that the unit is not operating and that the power is isolated. Do not remove pads whilst the unit is operational.
2. Lift pad vertically using the handle on the pad frame assembly shown in Figure 23: Cooling Pads
3. Angle the bottom of the pad and pull out of the unit bottom first

The following steps can be used to install cooling pads.

1. Confirm that the unit is not operating and that the power is isolated. Do not remove pads whilst the unit is operational.
2. Place the pad frame assemblies top first into the unit casing.
3. Lift the pad using the handle and align the bottom of the pad with the corresponding slot in the unit casing.
4. Carefully lower the pad frame assembly and confirm that it is held in position by the unit casing.

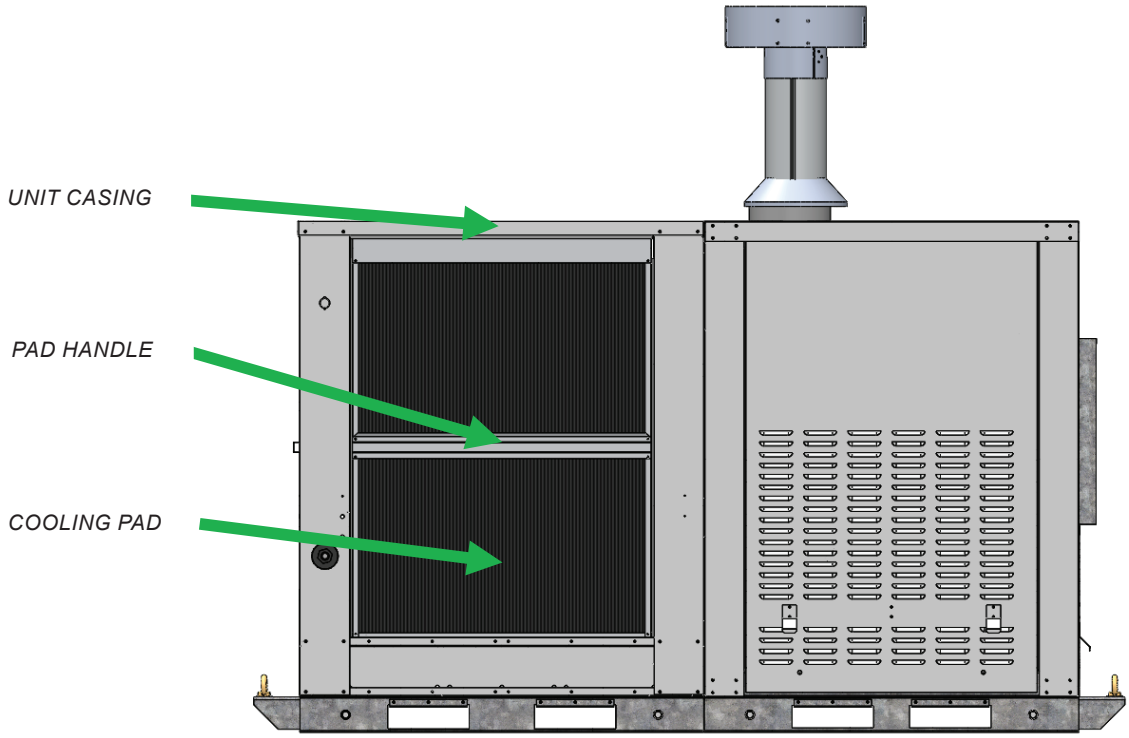



*Figure 23: Cooling Pads*

# COMMISSIONING INFORMATION

### 4.0 COMMISSIONING

Prior to commencement ensure power is isolated from the unit 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! This unit is fitted with an auto fan switch. If temperatures within the unit match the overtemp set temperature the blower fan will start without warning. Electrical isolation of the unit is the only way to prevent this from occurring.**

### 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.

### 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 weatherproof casing is in good condition and free from damage.
3. Check that the unit is sufficiently secured and level. If located on a roof stand, ensure that the roof stand is installed as per the designing engineers' specifications.
4. Check that ductwork from the unit is correctly installed and secured by a qualified person.
5. Flue installed and secure.
6. Check that all pads are in position and free of foreign material.

### 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/3 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

#### 4.3.2 Blower Box Checks

1. Check the fan motor is securely fitted and aligned. The motor should be sitting level. Confirm that the motor platform is properly secured and tighten if necessary.
2. Check that pulleys are correctly aligned. Confirm horizontal and vertical angularity as well as axial offset are not present. Confirm that all taper locks are secured.


*Figure 24: Pulley Alignment*

3. Check that the belts are correctly fitted and tensioned. Refer to manufacturer's literature for tensioning methodology and tension requirements.
4. Confirm the fan direction. If the fan is spinning in reverse, check the wiring diagram to ensure that the motor is wired in correctly. Fan direction is to be checked on high and low settings.

### 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 the pilot and ignition are correctly aligned to the pilot burner such that the pilot flame will enter the adjacent main burner gas stream. Refer to Pilot Injector Setup Section
6. Purge all air from the pipeline and check for leaks by using a soap solution or leak detector.
7. Check gas supply pressure before gas valve (Must be less than 3.5 kPa) Gas pressures exceeding 3.5Kpa will cause the units gas valve to "lockup" requiring relief of the line pressure prior to the valve. This is generally done by bleeding the supply line. Record results

#### 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. If the valve has been converted for LPG use it will have labels attached (Figure 25: LPG Valve Labelling). Record results.

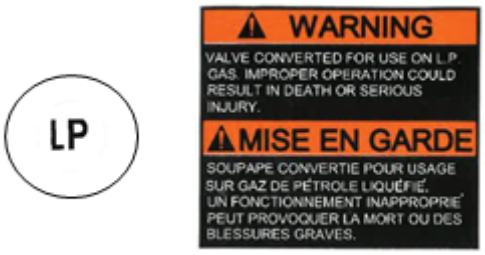



*Figure 25: LPG Valve Labelling*

2. Confirm that main burner spuds are the correct type for the supply gas and 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.

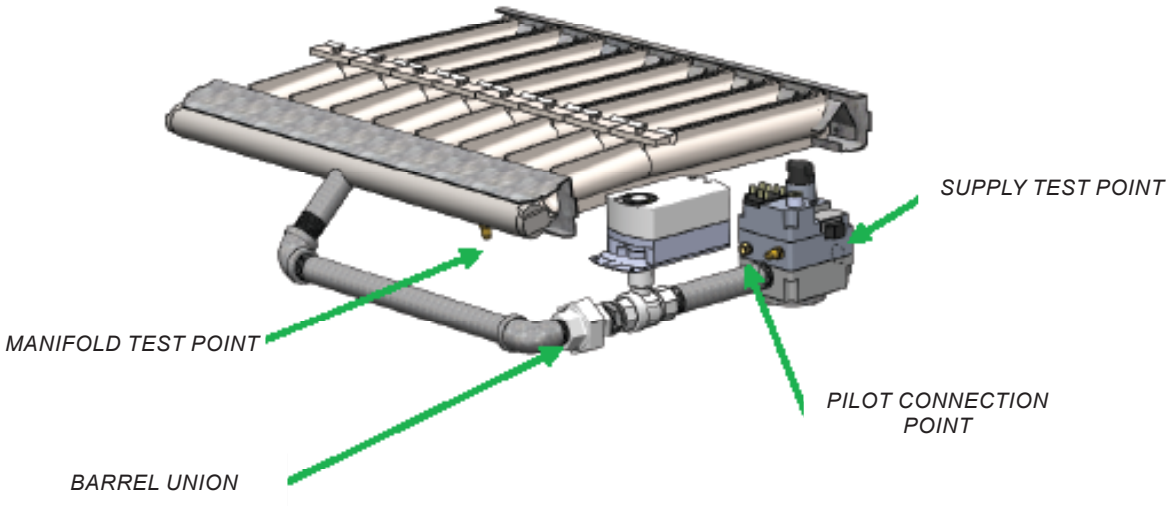



*Figure 26: Gas Train Test Point*

#### 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 must not be less than 60% of full fire rate.

To set the fire rate follow the steps below;

1. Engage the slider (6) 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. A rate equal to 60% of full gas rate may be obtained by adjusting the gas flow at the low fire setting, which equates to the correct minimum gas flow rate.

#### 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.

### 4.5 WATER CHECKS

#### 4.5.1 Incoming Water Supply Checks

1. Turn OFF main isolator and follow LOTO procedures. **Failure to do so may result in Injury or Death.**
2. The water connections are to be completed by a licensed and experienced person.
3. Confirm that the base tray is free of debris and clean.
4. Confirm that the drain pipework is connected and sealed.
5. Confirm that incoming water lines where flushed prior to de-isolating ball valve for unit water supply.
6. Check the incoming pressure to the unit is at least 220kPa and not exceeding 1400kPa.
7. Confirm that there is sufficient flow to the unit so that all pumps can operate at 100% demand.

#### 4.5 2 Internal Water Checks

1. Open the ball valve controlling supply to the unit.
2. Allow the reservoir to fill to 5mm below the overflow line and confirm that the float valve shuts off the incoming supply.
3. Allow for the reservoir to remain full for a minimum of 30 minutes periodically checking for leaks.
4. By pushing the ball float down confirm that the overflow/drain works.
5. If an automatic drain valve has been provided activate the solenoid to test functionality. Refer to Auto Drain Valve manual for instructions.

## COMMISSIONING INFORMATION

### 4.5.3 Start Up Procedure

1. Turn blower by hand and check that all moving parts run freely. CAUTION: do not put anything inside the blower at any point.
2. Turn off power isolating switch and remove pad assemblies from the cooler.
3. Check fan/motor belt deflection and adjust if necessary.
4. If necessary, wash out reservoir.
5. Set float valve to maintain water level approximately 5-15mm below overflow.
6. Check operation of isolation switch.
7. Check and set water distribution by adjusting the water restrictor in the hose from the cooler's water pump to the distribution pipe. Set to ½ open initially with adjustment of the saturation of the cooling pads outlined in 4.5.4 Setting Pad Saturation.
8. Measuring the flow rate from the water bleed. Using Table 8: Bleed Off Rate adjust the bleed valve to fill 1L in the time shown according to the air flow rate and hardness of the water.

***Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off.***

| BLEED OFF RATE SETTING IN SECONDS (INTERPOLATE FOR OTHER AIR QUANTITIES) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Air Quantity l/s** | **2300** | **3600** | **5200** | **10000** | **14000** | **18000** | **Water Quality** |
| **Time Seconds/L** | 240 | 200 | 120 | 80 | 60 | 45 | **Soft 40-100 mg/L** |
| **Time Seconds/L** | 120 | 100 | 60 | 40 | 30 | 22 | **Average 100-400 mg/L** |
| **Time Seconds/L** | 60 | 50 | 30 | 20 | 15 | 11 | **Hard 400+ mg/L** |

*Table 8: Bleed Off Rate*

9. Check and ensure sufficient air relief is available via operable windows and/or doors in the cooled area. Required relief calculations as per 2.4.9 Relief Area Calculation.
10. Check that sufficient relief area is provided for a full load current check. Load test motor with a Tong-test or clip-on ammeter. If the motor amps are over the rating plate adjust pulley ratio or increase duct pressure drop to reduce amps to equal to or below ratings as shown on fan motor compliance plate. Pulley ratio change is the responsibility of the installer.
11. Run pump for five minutes to ensure the pads are saturated with water. Run fan on high for five minutes. Shut down unit and isolate power following LOTO procedures. Remove pads and check that fan motor, pump motor, fan etc. are not being splashed with water.
12. Check belt tensions and pulley alignment and adjust if necessary. Check to ensure that the blower wheel has not shifted. If unsure please contact a Seeley International service agent.
13. Ensure that a maintenance schedule is prepared in accordance with suppliers' recommendations and requirements of local authorities.

### 4.5.4 Setting Pad Saturation

1. Locate the water adjuster/taps. Depending on the cooler model there could be up to four pumps installed in the unit. The discharge line from each pump line will have a dedicated adjuster/tap.
2. If the unit is new, then the pump flow rate adjuster/tap will likely be found to be in the ½ open position.
3. The evaporative unit must be installed, plumbed and float levelled as per Seeley International instructions. The airflow rate should be adjusted to meet specifications.
4. Pre-set each of the adjustor/taps to the ½ open position and fit all pad frames into place.
5. Start the unit fan on high speed and turn on the pumps. All pad frames should now be fitted such that water is flowing to each pad but is not subject to draw-off or carryover around the pad frames. Always check for signs of splashing on interior unit components.
6. The filter pads on the operating unit must now be observed. Check the outside of the unit for signs that the pads are becoming damp. It may take a few minutes for dampness to appear.
7. After 10 minutes check the running unit again. Take note of any pads that still have dry sections. Stop the unit, remove the filter pad/s that provides access to the respective adjuster/tap and open the flow adjuster/tap slightly for any pad(s) that were found to be dry. Never adjust the water flow rate with the unit running.
8. If a pad has been found to be very wet, and in danger of flooding, then close the corresponding adjuster/tap a small amount and re-test.
9. Continue these procedures until all the pads are just damp and no flooding is visible on the pads. Stop the unit and check for signs of water draw-off or carry-over inside the unit (ie. water droplets on pulleys, motor, bearings, scroll, impeller etc.) If carry-over has occurred then adjust (reduce) the water flow to the respective pad(s) and restart the unit.
10. The aim is to have all the pads suitably damp but not flooded.
11. Continue this procedure until suitable wetting has been achieved.

**Notes:**

a). The filter pad evaporation rate changes with entering air (ambient) conditions. The water flow rate should be set with this in mind and may have to be readjusted later due to seasonal weather changes.

b). When performing scheduled maintenance it is recommended that the flow rate for each pump should be checked.

c). The electrical current flow to the fan motor should be verified to ensure that it falls within the rating specified on the fan motor nameplate.

d). Excessive airflow can cause water carryover by increasing the pad's face velocity. Airflow should remain within the maximums specified for the unit.

e) Filter pads with obstructed or blocked passages are more prone to water carryover. Blocked pads may have to be replaced if the blockage cannot be cleaned out. Otherwise, the water flow/airflow may be temporarily reduced to compensate. This will result in reduced capacity.

f) As pads age they can accumulate unmovable dirt and accumulations. This may reduce the water flow rate the pad is able to handle without producing water carryover.

g) Whenever the unit's water bleed rate has been adjusted the water flow to the pads should be rechecked.

**Avoid Flooded Pads!**

If the water flow rate to the filter pads is too high water draw-off or carryover will occur, often resulting in unit damage and premature component failures. In some cases water droplets can be sucked into the blower/fan wheel scroll and blown down the attached dropper or duct system.

When commissioning or servicing the unit look for tell-tale signs of flooded pads such as water washed bearings, rust on the dropper/plenum, water stains on the sides of the blower housing, fan scroll, and on the dropper/plenum. Over time water carryover will result in premature bearing failures, excessive corrosion, and damage to electrical components in the unit.

**Damage due to water carryover is not covered by warranty.**

# COMMISSIONING INFORMATION

## 4.6 SETTING CONTROLS

### 4.6.1 High Limit Control

All units in the HCV/HCVR range are fitted with a high temperature limiter which will trip once the unit reaches a certain temperature (usually 85°C,105 or 115°C) that is to be. If the high limit does trip the cause should be sought and rectified as this is not a normal operating function.

The high limit control also contains another switch which functions to allow the fan to run on or restart when unit is turned “OFF” at the selector switch. This occurs to remove residual heat and to prevent the high limits from locking out. The switch will cause the fan to start if the temperature is greater than 60°C and cut it out at 32°C.

If the high limit control does activate it will need to be manually reset before the unit can be operated again.

To reset the overtemp follow the following procedure.

1. Allow for fan to run until the unit is sufficiently cooled.
2. Remove the black cap from the overtemp control.
3. Press and hold the orange button in to return the overtemp control to its initial state.

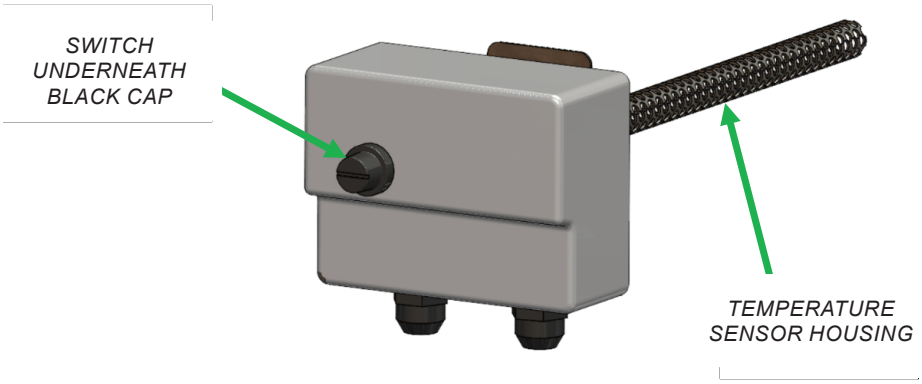



*Figure 27: High Limit Control*

All units have two high limit controls per heat exchanger. The following steps are to be completed during the commissioning of the unit.

1. Check that the high limit control is securely installed and free from damage.
2. Confirm that the high temperature limit is as per client specification. Confirm that the control is wired into the control box.
3. Using a digital thermometer and heat gun confirm that the switch activates at the required temperature. Record Results.

### 4.6.2 Thermostat and User Controls

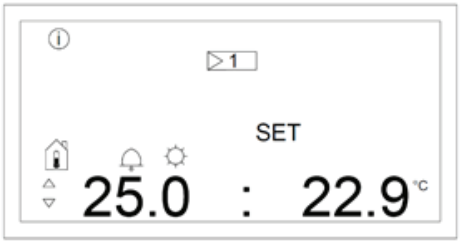
Check that the thermostat and wall switch are installed and wired back to the unit.

If a BMS is installed refer to AM006 for wiring information.

### 4.6.3 RLU Screens

The modulating valve screen indicates the percentage valve opening. If the valve is positioned less than 10% the burner will turn off. If the Position is greater than 20% the burner will turn on.


The room set temperature is indicated by the RH value. As the room thermostat set value is altered the value will change accordingly. The LH value is the current room temperature as room thermostat. The RLU has an upper limit setting of 29 Deg C.




The leaving air temperature sensor is indicated by the LH value. The leaving air temperature sensor is located on the outlet of the unit. The value indicates the current ambient temperature in the ductwork. The RH value is a calculated minimum set temperature value and is not used so can be ignored.


*Figure 28: RLU Screens*

The following steps are to be completed.

1. Turn on power to the unit.
2. Check the thermostat set temperature against RLU read out. Test against the entire range of the thermostat.
3. Using a digital thermometer record the temperature and confirm that the leaving air sensor and RLU read out matches.

### 4.7 FLOW ADJUSTMENT THROUGH LEVER AND DAMPER BLADES

Outlet duct flow can be regulated via the adjustment of the outlet damper blades when installed on HCV units.

The damper blades are controlled by another modulating motor that is set by following the method described in 4.4.3 Setting the Modulating Valve Motor. When the unit is set to cool the dampers are to be in the fully open position. In heating mode, the dampers motor will modulate to the preset position to achieve the required temperature rise across the heat exchanger.

Temperature rise across Heat Exchanger needs to be 11°C to 33°C. Dampers should be fully open for initial testing and gradually closed to achieve the required temperature rise.

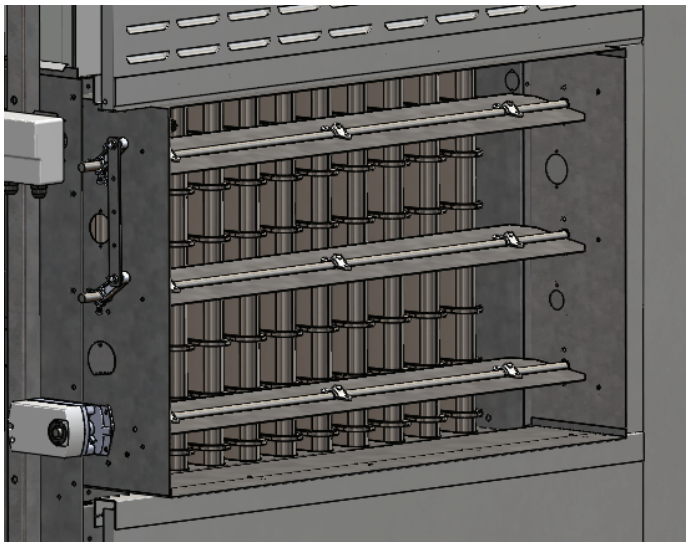


*Figure 29: Dampers Full Open*

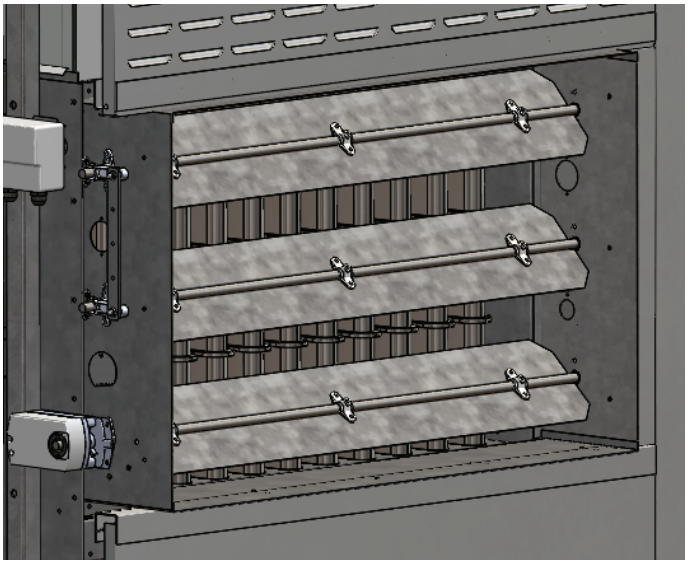


*Figure 30: Dampers 1/2 Open*

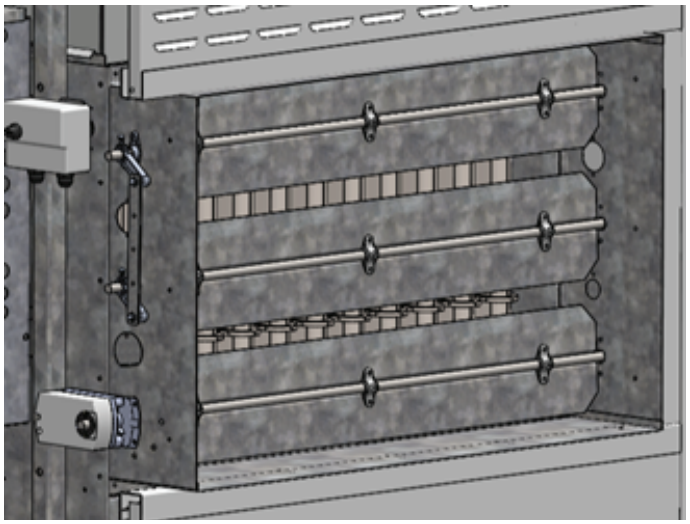


*Figure 31: Dampers Fully Closed*

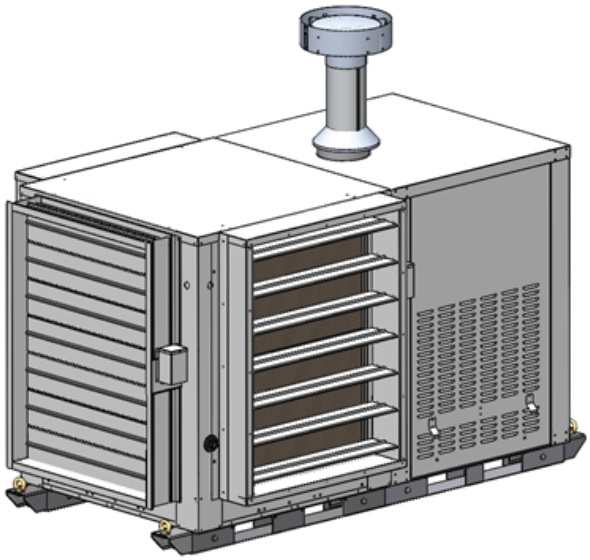
# COMMISSIONING INFORMATION

## 4.8 DAMPER ADJUSTMENT FOR RETURN AIR (HCVR ONLY)

The HCVR has 3 sets of adjustable louvres, 2 louvres covering pads and 1 pad inside the return air ducting connection. Figure 32 depicts the louvres of a HCVR.

In cooling mode confirm the following:

1. Louvre inside the return air is fully closed. (Figure 32: HCVR in cooling mode)
2. Louvres covering cooling pads are fully open.



In heating mode confirm the following.

1. Louvre inside the return air duct is fully open.
2. Louvres covering the cooling pads are fully closed.
3. If more fresh air is required to be introduced into the system set the modulating motor to only partially close the louvres covering the pads.

*Figure 32: HCVR in cooling mode*

## 4.9 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. De-isolate gas and electrical supply to the heater.
4. Set wall switch to “Heat and low fan”. **WARNING!** Blower will begin to rotate. Ensure doors are correctly installed and no tools are present within the blower box section of the unit.
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 until the pilot is established. When pilot ignites, check that the flame is licking over the edge of the main burner adjacent. If not the pilot flame may be adjusted by the small adjusting screw located on the top of gas valve marked pilot adj. 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. The flame rod will sense the pilot and open the main gas valve. The main burners will ignite. Ensure that all burners are lit. 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 under sized 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 heat exchanger must be within the range of 11°C to 33°C on full flame. The RLU will display the leaving air temperature. The rise in temperature can be controlled by changing the airflow with the dampers by altering the position of the dampers. If the temperature rise is not specified it shall be set to 22°C. Once the required temperature rise is achieved the dampers are be locked into position.
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 value specified in Table 7.
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.

# COMMISSIONING INFORMATION

## 4.10 SETTING UNIT FUNCTIONAL PARAMETERS

Fine tuning of the modulating motor and damper blade position may be required as every installation may have different ducting, supply pressures and heating requirements.

Leaving air dampers are set half closed from the factory but may require adjustment. The below steps are to be followed for adjusting the temperature rise. **Note: Gas rates should not be adjusted outside of unit specifications.**

1. Thermostat to max.
2. Observe RLU temperature rise on screen 2 of Figure 28: RLU Screens as it approaches the set temperature.
3. Periodically check screen 3 of Figure 28 noting the leaving air temp will rise.

These steps will lead to one of three outcomes. The unit cannot reach the set temperature, the unit reaches the set temperature and the modulating motor controls the temperature or the leaving air temperature reaches 50°C causing the unit to shut down. Examples are provided in Appendix E.

Table 9: Temperature Rise Over Heat Exchanger provides a starting point for airflows over the heat exchanger to achieve the desired temperature rise.

| MODEL | ΔT 11°C | ΔT 28°C |
|---|---|---|
| **HCV 12** | 2098 L/s | 840 L/s |
| **HCV 16** | 2800 L/s | 1118 L/s |
| **HCV 26** | 4460 L/s | 1784 L/s |
| **HCV 30** | 5240 L/s | 2100 L/s |
| **HCV 35** | 6316 L/s | 2454 L/s |
| **HCV 40** | 6985 L/s | 2785 L/s |

*Table 9: Temperature Rise Over Heat Exchanger*

For the best result the modulation of the gas flow should keep the unit in operation rather than turning on and off. This helps reduce the inrush or cold air from cool duct work. The modulating motor is to be adjusted by following steps in 4.4.3 Setting the Modulating Valve Motor. Continue balancing the airflow and the gas modulation until continual operation is achieved at the desired temperature rise.

## 4.11 COMMISSIONING RESULTS

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

# OPERATING INSTRUCTIONS

### 5.1 STARTUP – ROTARY SWITCH UNITS TO PROVIDE HEAT

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

### 5.2 STARTUP - ROTARY SWITCH UNITS TO PROVIDE VENTILATION

1. Switch Rotary Switch to LOW FAN or HIGH FAN.

### 5.3 STARTUP -ROTARY SWITCH UNITS TO PROVIDE COOLING

1. Switch Rotary Switch to LOW COOL or HIGH COOL.

### 5.4 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING HEAT

1. Switch Rotary Switch to OFF.

### 5.5 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING VENTILATION

1. Switch Rotary Switch to OFF.

### 5.6 SHUTDOWN - ROTARY SWITCH UNITS PROVIDING COOLING

1. Switch Rotary Switch to OFF.

### 5.7 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 Aira Manual AM006. No changes should be made to the internal control box wiring.
2. For High Temperature Blower Units the RLU programming will differ to a standard unit. This can only be supplied by Seeley.International.
3. 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.

## 5.6 OPERATIONAL FLOWCHART

### 5.6.1 Heating Flowchart

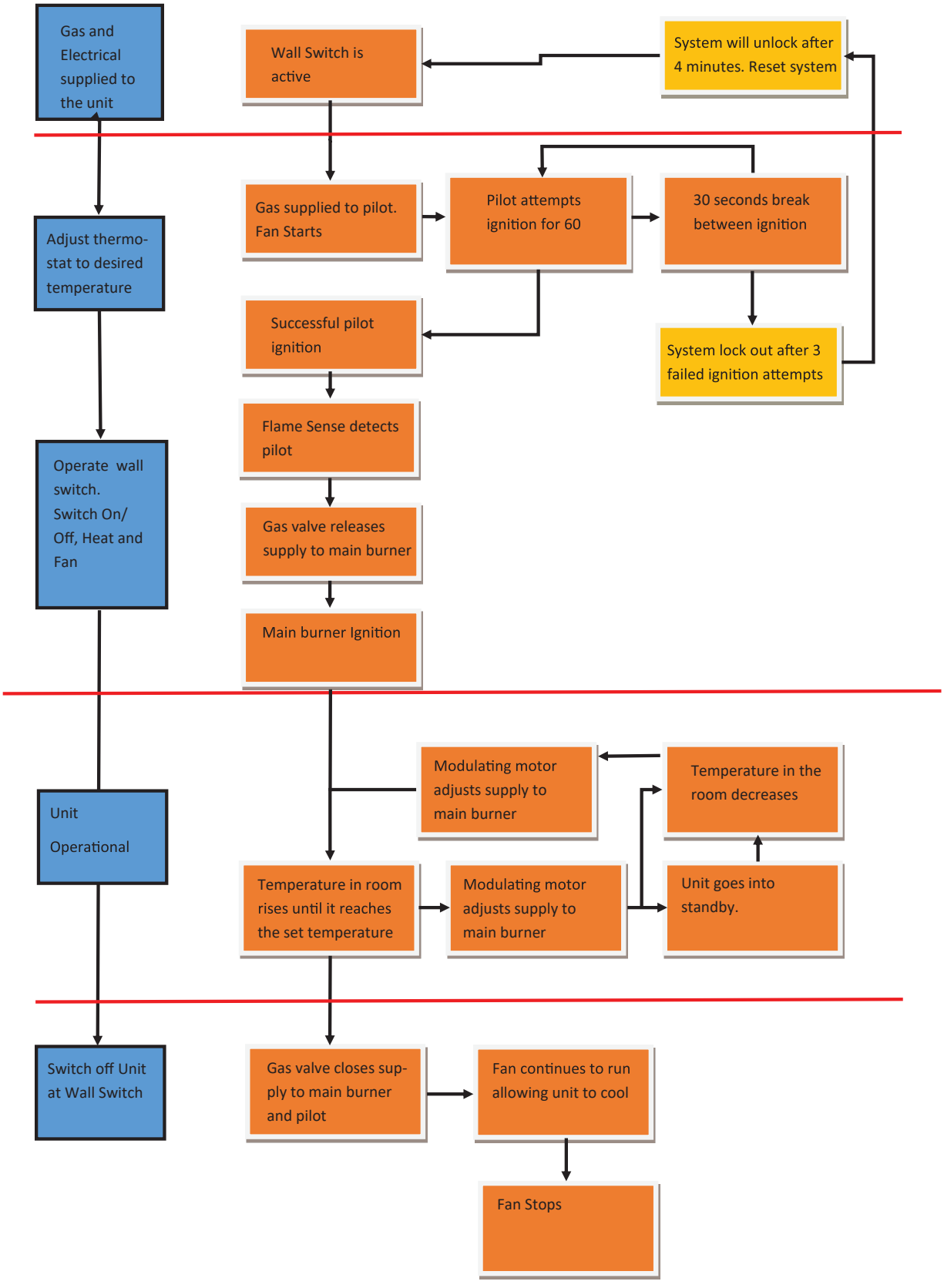



*Figure 33: Heating Flow Chart*

### 5.6.2 Cooling Flowchart

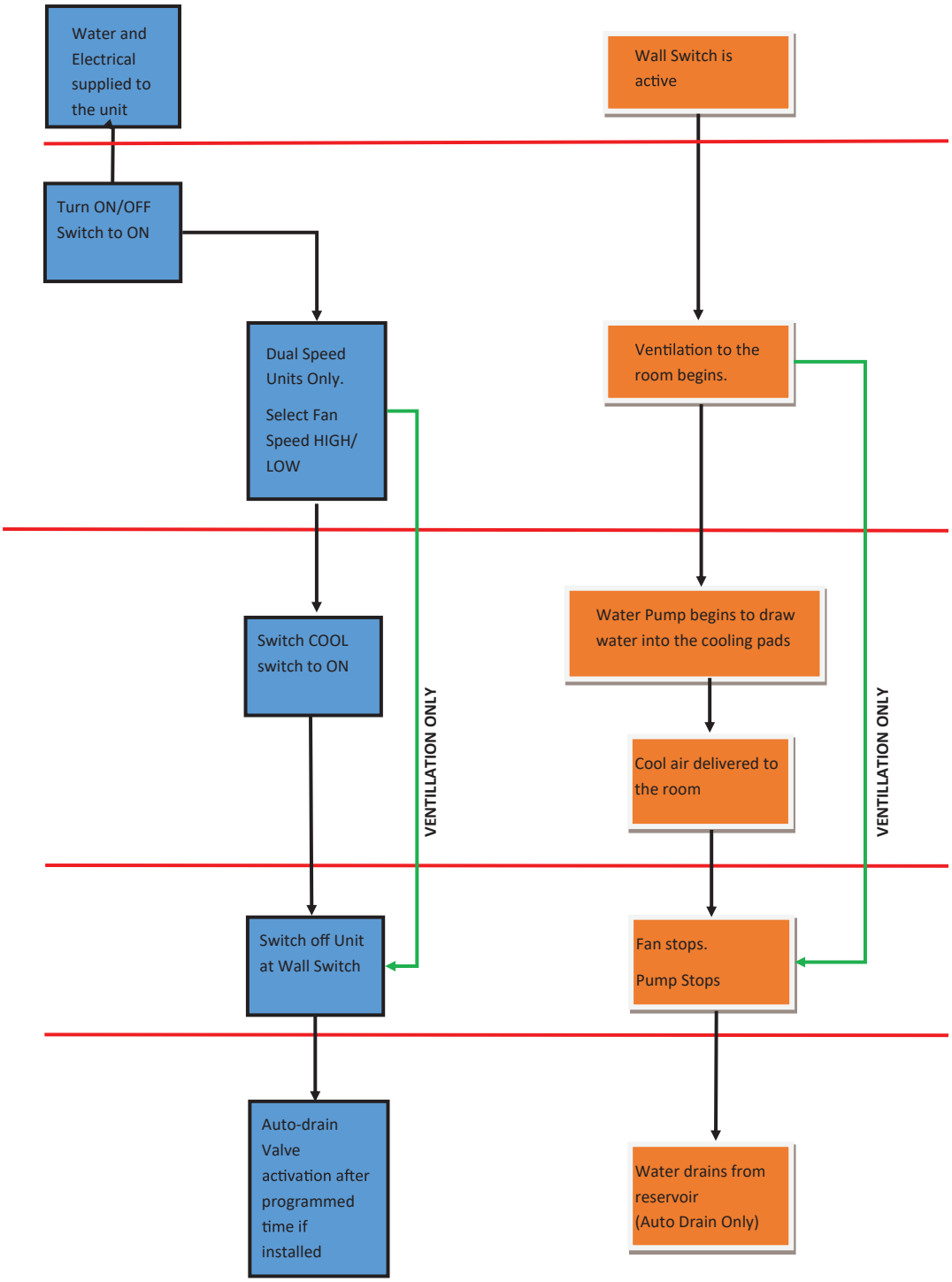



*Figure 34: Cooling Flow Chart*

# UNIT MAINTENANCE

## 6.0 SERVICE AND MAINTENANCE

**WARNING!** This unit is fitted with an auto fan switch. If temperatures within the unit match or exceed the over temp set temperature the blower fan will start without warning. Electrical isolation of the unit is the only way to prevent this from occurring. This unit must be isolated before commencing any service or maintenance activities.

Aira HCV units require electrical, gas fitting and plumbing trades to service all aspects of 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 heat exchanger 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.

Any maintenance required by Australian Standards shall be carried out at required intervals. The maintenance schedule provided in Appendix F1: Maintenance Schedule is the minimum recommended and the time between servicing may need to be decreased depending on environmental factors and operational demand.

Table 10 is the minimum recommended inspection and service schedule. A detailed service schedule and Maintenance checklist can be found in Appendix F. Appendix F also contains a monthly checklist for the owner.

| Component | Minimum Inspection and Service Schedule |
|---|---|
| Belts | Quarterly visual inspection/ 6 monthly thorough inspection |
| Pulleys | Quarterly visual inspection/ 6 monthly thorough inspection |
| Heater Maintenance | Every 6 months |
| Motor | In accordance with manufacturers' specifications |
| Gas Controls | Preseason |
| Cooler Maintenance | Every 3 Months |

*Table 10: Inspection and Service of Major Components*

## 6.1 MAINTENANCE

### 6.1.1 Heater Maintenance

The frequency with which maintenance must be carried out will depend upon installation conditions and heater usage. To ensure maximum efficiency and reliability from the installation it is recommended that the instructions below be carried out at least twice a year.

Soot and dirt will prevent proper combustion. Clean flue tubes and burners before they become badly fouled. Inspect flames for irregular shape before carrying out maintenance work to determine which, if any, require attention. Switch off electricity supply at isolator and isolate Gas.

1. Drop bottom tray to give clear access to burner chamber. (if fitted)
2. Remove the pilot assembly and burner bars (refer to specific instructions below).
3. Replace bottom tray to collect dirt when cleaning tubes.
4. Disconnect flue pipe.
5. Remove draft hood assembly as follows:
   Remove sheet metal screw at rear and lift rear about 50mm, then slide slightly towards the rear to remove from offset at front.
6. Lift internal baffle assemblies from flue tubes.
7. Clean baffle and inner surface of flue thoroughly, a 40 or 45mm diameter wire brush with a long handle is recommended.
8. Remove dirt from bottom pan.

### 6.1.2 Cooler Maintenance

**THIS SECTION DETERMINES THE LIFE SPAN OF THE COOLER**

1. Turn off electric power supply following LOTO procedures. Isolate the water supply to the unit.
2. Remove pad assemblies as per 3.5.6 Cooling Pads
3. Check condition of Pads – use a hose to clean dirt off pads. Do not use excessive water pressure as this may make holes in the pads. If pads are to be replaced obtain replacement pads from the manufacturer. Replacement pads are made to order.

4. Drain the unit via the drain or auto drain valve if installed and clean out the internal tray of the unit ensuring all foreign debris is being removed. De-isolate the water supply to the unit and confirm that the float valve stops flow at the required level. **DO NOT** add any biocides to the water tray after filling.
5. Check condition and tension of fan belt/s. Adjust and/or replace as necessary.
6. Re-grease fan shaft bearings.
7. Check pump operation and that bleed-off is operating correctly and not blocked.
8. Refit pad frames and start up unit in accordance with operating instructions.
9. De-isolate the electrical power and run the unit to confirm that pads are sufficiently saturated. Adjust if necessary.
10. LEGIONNAIRES DISEASE: Evaporative air conditioners have not been implicated in any outbreak of Legionnaires disease, although Legionella bacteria have been found in such systems. The water temperature in the evaporative air cooler section is normally at about 18°C at which temperature the Legionella bacteria (if present) will remain dormant and cannot multiply.
11. The following maintenance schedule is required to be followed in order to comply with the New South Wales Public Health Act 1991 section 46:-
    a). Sumps are to be drained and cleaned at three monthly intervals or more frequently if necessary.
    b). Wetted pads are to be drained and cleaned at three monthly intervals or more frequently if necessary.
    c). Water strainers are to be cleaned at three monthly intervals or more frequently if necessary.
    d). If any air filter is fitted, it is to be cleaned or replaced when necessary.

### 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 or 3 Phase Power 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 Overtemp Control Switch

Check that the overtemp control switches are fitted properly and free from damage. If there is no physical damage evident the overtemp switches are to be tested pre-season.

The following are the recommended steps to test the overtemp control switches.

1. Electrically isolate the unit and remove the switch from the unit.
2. De-isolate the electrical supply and turn on the unit.
3. Using a heat gun and a digital thermometer heat the overtemp control switch until the switch activates.
4. Turn off unit. The fan should continue to run until the overtemp control switch reaches 32.
5. Refit the overtemp control switch.

The following are the recommended steps for removing the overtemp control switches

1. Turn OFF main isolator and follow LOTO procedures. **Failure to do so may result in Injury or Death!**
2. Disconnect from control box.
3. Remove single screw located on top of the plastic enclosure.
4. Carefully extract sensor.
5. To Refit sensor complete sequence in reverse order

#### 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 Fan and Motor (When fitted as part of Appliance)

Motors range in weight from approximately 20 to 270Kg's. Generally the larger the unit the larger the motor. Refer to technical data sheet or contact Seeley International with the units serial number to identify which motor you have. The use of a lifting apparatus and/or several service personnel may be required for heaver motors.

Tools Required: Metric open end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar, ½" Socket set, metric hex key set, nylon hammer

1. Electrically isolate unit.
2. Disconnect Blower motor.
3. Loosen motor platform and jacking bolts if fitted.
4. Slacken and remove drive belt/s.
5. Extend motor platform fully to gain access to motor mount bolts.
6. Removed motor mount nuts/bolts (The rear bolts may remain in place).
7. Check motor weight on name plate and use appropriate lifting equipment if necessary.
8. Remove motor.
9. Replace motor in reverse order.
10. To tighten belts, use prybar to assist in lifting motor into place whist tightening locking bolts. Larger motors will have jacking bolts in the motor platform to hold the weight of the motor. Adjust these to the required length to achieve correct belt tension.

**Note:**

a). Bolt tensions should be in accordance with bolt manufacturer's recommendations for the bolt diameter, thread type and material. All mount bolts should be high tensile and a minimum grade of 8.8. Anti-seize should be used on all stainless steel bolts.

b). Belt Tensioner recommended when replacing/re-installing belts.

#### 6.2.1.7 Belts

Replacement of drive belts needs to be conducted routinely. The frequency of replacement will be determined by hours of operation, operational environment and previous maintenance schedule. Belts should be visually inspected monthly with a thorough inspection every 3rd month.

Tools Required: Metric open-end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar and ½" Socket set.

The following are the recommended steps to replace the drive belts. Before works commence ensure all spare parts ordered match that of the unit they are replacing. Aira units are often custom specified for each application and may have components which differ from the standard product offering.

1. Electrically isolate unit.
2. Remove Blower Box access panels.
3. Loosen motor platform bolts.
4. Slacken and remove drive belt/s.
5. Check Pulleys for excess wear, replace if necessary.
6. Replace Belt/s. For multiple drive belt units ensure that they are a matched set. Belts from different suppliers and different batch lots will differ in length.

#### 6.2.1.8 Pulleys

Pulleys are manufactured from steel or aluminium and will generally require replacement less than the drive belts. Any wear on the pulleys will shorten the drive belt life, therefore should be replaced if there are any signs of wear.

Tools Required: Metric open end ring spanner set, Drive belt tensioning gauge, Pry bar or lever bar, ½" Socket set, metric hex key set, nylon hammer.

1. Electrically isolate unit.
2. Remove Blower Box access panels.
3. Loosen motor platform to scroll nuts.
4. Slacken and remove drive belt/s.
5. Remove Pulley/s from Taperlock bush. A taper lock bush is used to secure the pulleys to the drive shaft. If unsure on how to remove the taper lock bushes refer to the Fenner brand bush guide. Alternately contact Seeley International for Service assistance.

6. Remove Taperlock bush from shaft, may require gentle tapping with nylon hammer.
7. Remove Pulley/s.
8. To reinstall pulley complete operation in reverse.

**Note:**

a). The same diameter and belt designation must be used to ensure correct operation. Failure to do so will result in poor unit performance. It may also cause the drive motor to overamp.

b). Bolt tensions should be in accordance with bolt manufacturer's recommendations for the bolt diameter, thread type and material. All mount bolts should be high tensile and a minimum rating of 8.8. Anti-seize should be used on all stainless steel bolts.

c). Belt Tensioner recommended when replacing/reinstalling belts.

d). This is ONLY applicable to units with a Seeley supplied blower box. 3rd Party blowers will have their own maintenance schedule.

#### 6.2.1.9 Fan Direction

Check that the fan is blowing in the right direction. If the fan is running in reverse change check the wiring diagram and swap the power to the motor.

### 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 Injectors

Check that the correct injectors are installed and that they are free of debris.

#### 6.2.2.7 Draft Diverters

Check the draft diverter for signs of damage and rust. If rust has cause loss of structural integrity the diverter is to be replaced.

#### 6.2.2.8 Pilot Assembly

Check that the pilot is free from damage and clear of obstructions. Ignite the heater and examine the colour and consistency of the pilot and main burner. The pilot should be a consistent blue flame with the main burner providing a consistent flame across all burners after ignition.

The following are the recommended steps to service the pilot assembly and main burners.

1. Uncouple pilot union at valve.
   a). Uncouple thermocouple union at valve.
   b). If electronic ignition – remove flame rod and ignition leads.
2. Remove screws holding pilot burner to pilot mounting bar and remove pilot burner assembly.
3. Remove burner tubes one at a time by sliding bars sufficiently towards the front of the heater (against the spring resistance) to disengage the rear end of the burner tube from the manifold plate; lower end of burner tube and remove from front location plate.
4. CLEANING MAIN BURNER BARS: Lightly brush away any deposit from the burner bars and inspect for damage or blocked ports.
5. Replace burners, making certain that they seat properly in place.
6. Check the flame sense and igniter cabling for damage, replacing if damaged.
7. Secure the pilot assembly to the burner.

#### 6.2.2.8.1 CLEANING PILOT BURNER:

1. THERMOCOUPLE FITTED UNITS: Wipe off any carbon deposits on end of thermocouple and ensure that pilot burner is free from deposits.
   Remove orifice spud fitting and using a small wire brush, clean pilot body, orifice and burner parts. Blow off loose particles.
   Assemble and install in original position.
   On relighting, adjust pilot flame to surround thermocouple for about 10mm. Flame must be soft and blue – not hard, noisy or yellow.
2. FLAME ROD FITTED UNITS: Wipe off any carbon deposits on flame rod, ignition electrode or ground fins and ensure that pilot burner is free of deposits.
   Remove orifice spud fitting (if fitted) and using a small wire brush, clean pilot body, orifice, electrodes and burner parts. Blow off loose particles.
   Assemble and install in original position. Adjust electrode gap between ignition electrode and pilot burner tip. This gap MUST be 2mm to 3mm.
   Flame rod gap must be adjusted to give 2 microamperes (pa) or more for stable performance. Adjust the flame rod to produce maximum output by bending the rod to left and/or right and raising slightly if necessary. Size of pilot flame may also require adjustment. Pilot flame must be soft and blue – not hard, noisy or yellow. Aeration shutter (if fitted) may require adjustment.

#### 6.2.2.9 Leaving Air Sensor

Remove Sensor

1. Turn OFF main isolator and follow LOTO procedures. **Failure to do so may result in Injury or Death!**
2. Disconnect from control box.
3. Remove screws holing sensor support bracket.
4. Extract from unit.
5. Remove sensor from bracket.
6. To refit sensor, complete sequence in reverse order.

### 6.2.3 Water Components

#### 6.2.3.1 Water Controls

Confirm that the incoming water supply isolation valve is operational. If the isolation valve is in a location accessible by the public ensure that the valve can be locked open and closed.

#### 6.2.3.2 Water Connection Visual Inspection

The incoming water supply is to be visually inspected for damage and leaks. If visual damage is evident the supply is to be isolated and location of the leak to be identified and fixed.

#### 6.2.3.3 Water Isolation Fitted and in Good Working Condition

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

#### 6.2.3.4 Water Supply Pressure

The water supply pressure is to be read at the entry to the unit and recorded.

#### 6.2.3.5 Float Valve Operation

Check that the float valve allows for water to enter the reservoir and is set so that flow stops when the water level is 5 - 10mm below the overflow. Adjust if necessary.

#### 6.2.3.6 Overflow and Drainage

Push the float valve down allowing excessive water into the reservoir until water flows into the overflow drain. Confirm the drain takes away all excess water.

#### 6.2.3.7 Automatic Drain Valve

Refer to Automatic Drain Manual and confirm operation.

#### 6.2.3.8 Bleed Valve

Confirm that the bleed valve is set to the correct rate. Refer to Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off. If there are white deposits in the pads or tank the bleed rate needs to be increased.

#### 6.2.3.9 Cooling Pads

The cooling pads should be periodically cleaned. Once the pads have been removed from the unit they can be cleaned using a spray nozzle on a garden hose with a moderate pressure. **Do not** use a high-pressure hose. At this time the cooler cabinet should be inspected and cleaned.

Cooling pads should be periodically changed, the frequency being determined by the rapidity with which dirt, alkali and other foreign matter accumulates in the pads to the extent that cooling efficiency is impaired. The need for changing pads will vary with the locality. If in very good condition, pads may be washed to clean away dust etc, but if pads appear aged or badly fouled, then replace. In localities where there is an excess of lime and alkali, the reservoir pan should be cleaned out every 60 days. If the water is all re-circulated this clean out must be done more frequently. This will also remove dirt which has been washed out of the filter pads.

### 6.2.4 Casing Components

#### 6.2.4.1 Weatherproof Casing Condition

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

#### 6.2.4.2 Water Carry Over

As pads become blocked the open area decreases consequently increasing air velocity across the pads which leads to excessive water carry over from the pads onto the internal components. The effect can lead to premature bearing failure and corrosion within the unit and ductwork. Pads are to be cleaned and/or replaced and confirm saturation rate of pads.

#### 6.2.4.3 Duct Condition

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

#### 6.2.4.4 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.

#### 6.2.4.5 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.

#### 6.2.4.6 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

### 6.3.1 Fault Finding Heater

| FAULT | POSSIBLE CAUSE | REMEDY |
|---|---|---|
| Pilot Flame Goes Out | 1. Flame too small.<br>2. Down drafts or negative pressure in room.<br>3. Dirt in pilot line or orifice.<br>4. Gas pressure fluctuates widely.<br>5. Pilot flame “lifts”.<br>6. Low gas pressure at unit. | 1. Defective thermocouple or gas valve.<br>2. Exhaust fans will cause trouble unless adequate “make-up” air is supplied. Correct any defective venting.<br>3. See cleaning instructions.<br>4. Install a pilot regulator.<br>5. Adjust pilot gas regulator and/or adjust pilot burner aeration shutter (if fitted).<br>6. Increase line pressure or incoming pipe size. |
| Pilot Flame Lights but Will Not Hold In | 1. Thermocouple not yet heated.<br>2. Pilot flame too small or yellow.<br>3. Defective thermocouple. | 1. Allow at least 15 seconds to heat up.<br>2. Clean pilot line, primary air opening orifice Adjust flame to surround thermocouple about 10mm.<br>Flame must be soft, quiet and blue.<br>3. To check, use a Voltmeter and adaptor. Volt readings on a closed circuit using an adaptor must be at least 10 mV. If reading is lower replace the thermocouple. If reading is higher, the gas valve is defective and requires replacement.<br>If a Voltmeter is not available, replace the thermocouple with a new one. If the unit still fails to operate the valve must be defective. |
| Pilot flame does not ignite, or, no ignition spark | 1. Unit not calling for heat<br>2. Modulating Valve in Fully Closed Position<br>3. Fuse Blown<br>4. Remote Reset not working<br>5. Gas Line not primed | 1. Check thermostat is calling for heat.<br>2. Check that end switch in modulating valve (if fitted) is “made”.<br>3. Check 2 Amp fuse in low voltage circuit.<br>4. Check that remote reset button (if fitted) is in “made” position<br>5. Purge and prime gas line |
| Burners Do Not Come On When Pilot Flame is Alight and Room Thermostat is “MADE” | 1. Loose electrical connection or gas valve not in circuit.<br>2. Limit switch defective or stuck in “open” position.<br>3. Gas valve defective – stuck in close position. | 1. See wiring diagram – check for electrical supply at valve terminals in junction box with test lamp or Multimeter.<br>2. Bridge across limit switch terminals. If burners light, replace switch.<br>3. Replace gas valve. |
| Unit Overheats and Locks Out on Limit Switch | 1. Gas valve stuck in open position.<br>2. Inadequate air delivery from blower.<br>3. Poor air flow patterns through heater.<br>4. Defective fan switch.<br>5. Dirt on fan blades or clogged filters.<br>6. Defective fan switch.<br>7. System fan motor cutting out on overload. | 1. Replace gas valve.<br>2. Check blower speed and for obstructions, check for excessive system static pressure.<br>3. Ensure that air flow across heat exchanger is uniform. Adjust to give maximum velocity across bottom section of heat exchanger.<br>4. Fan control must start blowers within 3 minutes after burners go on (ON/OFF units only). Replace fan switch.<br>5. Clean fan and/or replace filters.<br>6. Replace switch.<br>7. Check for high or low voltage. Check for defective motor or motor overload. |
| System Fan Motor Fails to Operate Within 3 Minutes | 1. Fan control set too high.<br>2. Loose wiring connection. | 1. Adjust setting (adjustable type). Replace if fixed type.<br>2. Make sure all wiring connections are tight. Connect line voltage directly to motor. Replace If motor operates.<br>3. Replace fan control. |
| Burner Flames are Yellow or Tend to Float | 1. Gas input too high due to oversized injectors.<br>2. Incorrect injectors installed.<br>3. Gas line pressure over 3.5 kPa.<br>4. Exhaust fans causing faulty draft.<br>5. Improper flueing.<br>6. Dirty flue tubes (Draft OK at relief opening).<br>7. Inadequate combustion air. | 1. Refer to “Venting” in Australian Standard (AS 5601)”.<br>2. Consult manufacturer for proper orifice size.<br>3. Install high-pressure regulator if line pressure cannot be reduced.<br>4. Provide opening to admit adequate fresh air to room to eliminate negative pressure. Provide ‘make-up’ air if necessary.<br>5. See “Flues” Australian Standards, “AS5601”.<br>6. See burner cleaning instructions.<br>7. ***NOTE:** Faulty draft can be determined by holding a lighted match at the top of the front relief opening. Flame will be pulled in if draft is OK or pushed out if draft is poor. |

## UNIT MAINTENANCE

| FAULT | POSSIBLE CAUSE | REMEDY |
|---|---|---|
| Heater Not Delivering Proper Amount of Heat | 1. Under sized orifices or gas pressure too low<br>2. Limited air delivery<br>3. Dirty flue tubes | 1. Check with gas-company or manufacturer before changing injectors or adjusting regulator. Be sure that gas pipe sizing is adequate<br>2. Clean filters (if fitted) and check fan speed. Clean blower blades<br>3. See cleaning instructions |
| Flame Light Back And / Or Burning at Orifices | 1. Incorrect manifold position<br>2. Gas input too low at full fire<br>3. Defective burner ribbon<br>4. Excessive primary air<br>5. Low fire rate set too low<br>6. Incorrect burner ribbons<br>7. Out of Spec Burner | 1. Contact Service agent for investigation<br>2. Increase gas pressure (by regulator if possible)<br>3. Replace burner<br>4. Adjust primary air shutter for correct primary air. Applies LPG and Towns gas units only<br>5. Adjust bypass rate screw (high/low units) or reset auxiliary switch cam (modulating units |
| Delayed or Rough Ignition | 1. Dirt in main orifices<br>2. Burners covered with scale or other foreign matter<br>3. Poor pilot flame or position<br>4. Check high and low gas fire rates are correct<br>5. Burner cross light bars not positioned correctly | 1. Remove and clean<br>2. Remove and clean<br>3. Realign Pilot to Burner<br>4. As per Commissioning<br>5. Remove burners and align |
| Burners do not light | 1. Exceed 3.5kPa inlet causing gas valve to lock. | 1. Isolate Gas Supply<br>2. Remove inlet gas fitting to depressurize valve<br>3. Reduce Gas pressure at regulator to below 3.5kPa<br>4. Reconnect gas supply and test at test point |

*Table 11: Heater Fault Finding*

# UNIT MAINTENANCE

### 6.3.2 Fault Finding Cooler

| FAULT | POSSIBLE CAUSE | REMEDY |
|---|---|---|
| Inadequate Cooling | 1. Clogged or dirty pads.<br>2. Dry pads or lack of water while cooler is in operation.<br>3. Insufficient air discharge openings or inadequate exhaust from area being cooled, causing high humidity.<br>4. High Humidity.<br>5. Fan running backwards.<br>6. Fan running slowly. | 1. Clean or replace pads.<br>2. Check water distribution system for possible obstruction in tubing. Check pump operation. Check water flow restrictor and level of unit.<br>3. Make sure there is adequate provision for exhausting air from area being cooled.<br>4. When outside humidity is high, evaporation rates will be low, thus reducing efficiency of cooler. Turn off 'cool' switch for best results.<br>5. Rewire motor for correct rotation.<br>6. Check motor amps. If below the maximum amps ( refer to data plate) re-adjust motor pulley to increase speed. |
| Fan does not start | 1. Circuit breaker tripped or fuse blown.<br>2. Loose electrical connections.<br>3. Faulty control switch<br>4. Faulty motor<br>5. Loose pulley or belt<br>6. Broken belt | 1. Check circuit breaker for motor start-up and draw suitability.<br>2. Check and tighten all connections.<br>3. Replace.<br>4. Replace and determine reason for fault.<br>5. Tighten pulleys and belts to manufacturers' specifications.<br>6. Replace and tighten to correct tension. |
| Belt slip or excessive belt wear | 1. Belt loose.<br>2. Pulleys not correctly aligned.<br>3. Wet belt. | 1. Tighten belt to manufacturers' specified tension.<br>2. Adjust alignment and check with an alignment tool.<br>3. Stop any water leaking onto belt from pad assembly or distribution system and adjust water restrictions as per commissioning documentation. |
| Pump fails to start | 1. Pump motor faulty.<br>2. Incorrect wiring of pump and control switch.<br>3. Loose electrical connection.<br>4. Pump switch faulty. | 1. Replace Pump<br>2. Refer to wiring diagrams in Appendix B.<br>3. Check all connections and tighten as required.<br>4. Replace switch |
| Pump runs but water not circulated, or pads are dry | 1. Insufficient water in base tray.<br>2. Pump strainer basket blocked.<br>3. Blocked water tubes. | 1. Adjust ball valve/float assembly.<br>2. Remove, clean and replace.<br>3. Remove, clean and replace. |
| Water constantly overflowing | 1. Float valve incorrectly set<br>2. Inlet valve not sealing | 1. Adjust float valve<br>2. Replace Valve |
| Noisy Air Conditioning | 1. Belt "Squelching".<br>2. Belt "Squealing".<br>3. Inadequate sized ducts or grilles.<br>4. Loose Water Connections. | 1. Adjust motor alignment.<br>2. Tighten belt by adjusting motor platform or tighten belt.<br>3. Increase grille size.<br>4. Tighten all connections. |
| Formation of white deposits in tan and on pads | 1. High mineral content in water supply. | 1. Increase the bleed rate. |
| Unpleasant Odour | 1. Intake air located near the source of odour.<br>2. New pads fitted.<br>3. Algae in tank.<br>4. Pad remains wet after shutdown.<br>5. Break in water distribution system. | 1. Relocate the intake or remove the odour source.<br>2. Will go after a short time<br>3. Drain tank and clean thoroughly, fill with new clean water and install new pads.<br>4. Allow fan to run for further 10 minutes after pump has been shut off.<br>5. Replace any cracked or broken tubing. |
| Water being thrown into area being cooled | 1. Too much water in the pad. | 1. Ensure filter pads are correctly installed.<br>2. Replace with new filter pads.<br>3. Check restrictor tap setting and adjust if required. |

*Table 12: Fault Finding Coolers*

### 6.4 REPLACEMENT PARTS LIST

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

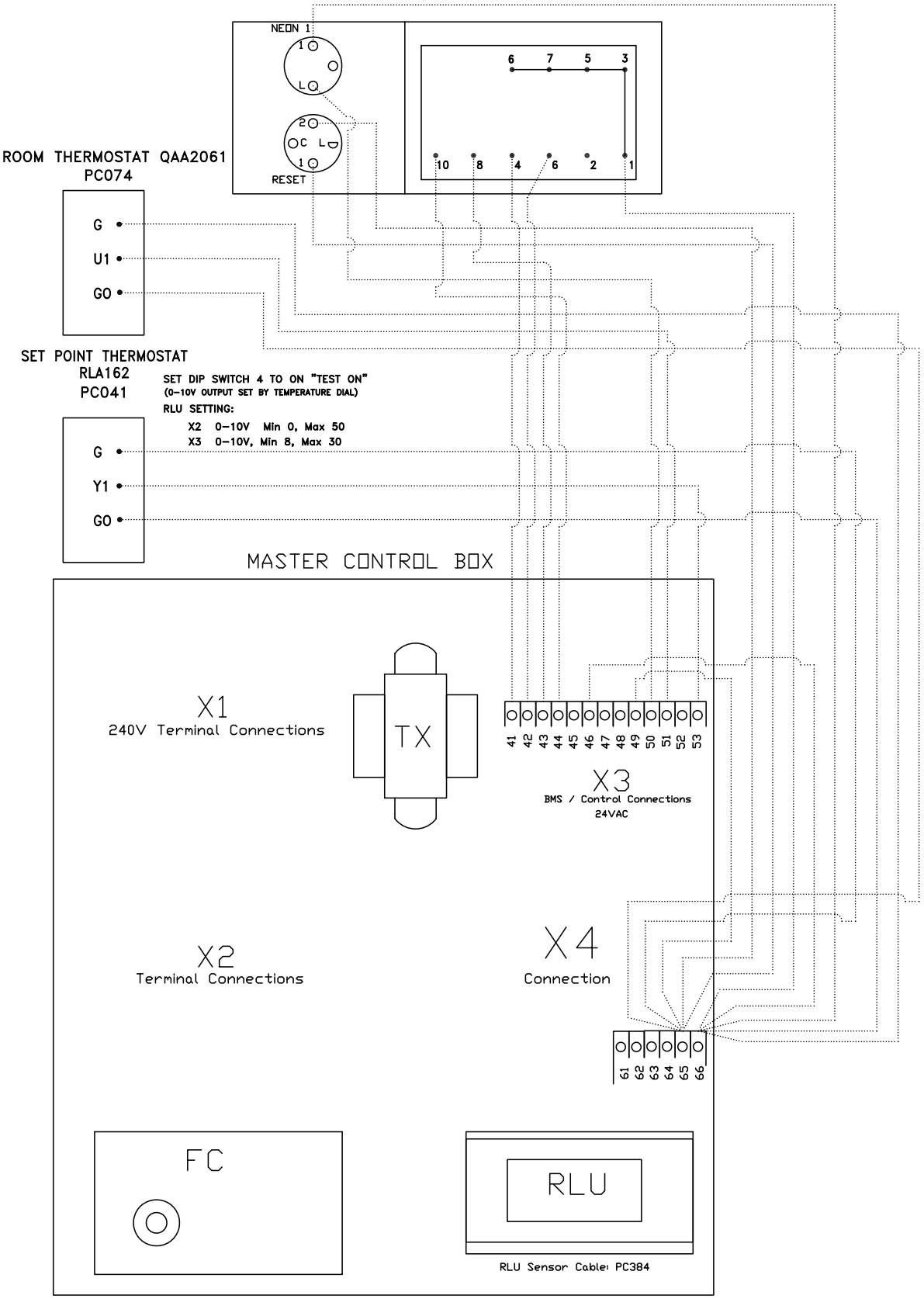
## APPENDIX A: AGA TYPE B INFORMATION

Contact Seeley International for further details

## APPENDIX B: ELECTRICAL INFORMATION

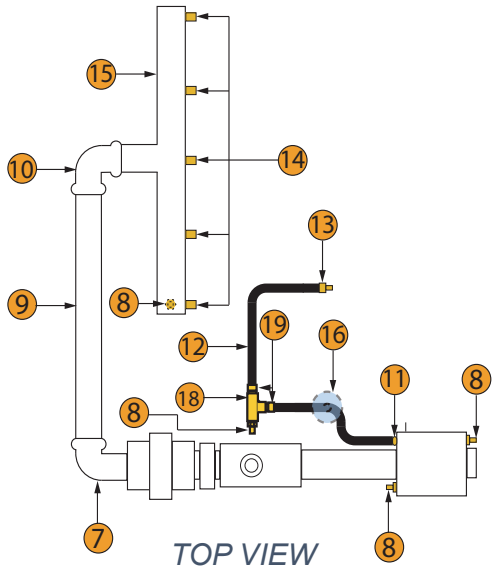
Please refer to

- **AM006 Aira Control Configuration Options HCV/HCVR**
- **WD-CH637 DU SD HCV Control Box Wiring Diagrams**

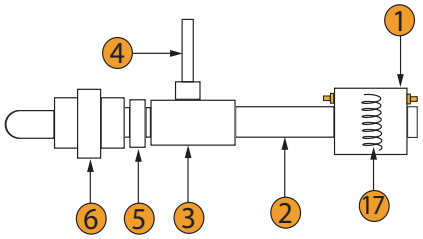


# APPENDIX C: GAS TRAIN INFORMATION

| MODULATING GAS VALVE – NATURAL GAS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Item Number** | **Part Number** | **Description** | **HCV12** | **HCV16** | **HCV26** | **HCV30** | **HCV35** | **HCV40** |
| 1 | PC332<br>PV326 | WR GAS VALVE ¾ 24V 36C68C or 36H32409 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 648613 | PIPE ¾" MEDIUM GAL (mm) | 150 | 150 | 150 | 150 | 150 | 150 |
| 3 | PV051 | BALL VALVE ¾" ITAP ART 066 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 9656325 | MODULATING COUPLING SHAFT SML | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | PN037 | NIPPLE GAL HEX ¾" | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | PU009 | UNION BARREL GAL BS 3*4" F/F | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | PB419 | BEND GAL ¾" M & F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | PP238 | PRESSURE TEST POINT 1/8" G09 | 3 | 3 | 3 | 3 | 3 | 3 |
| 9 | 648613 | PIPE ¾"MEDIUM GAL (mm) | 240 | 320 | 480 | 560 | 680 | 760 |
| 10 | PE071 | ELBOW GAL ¾" F&F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | PZ643 | 1/8NPT X ¼ NUT & OLIVE | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | PT032 | TUBE ALUMINIMUM 6.35mmODX1.42 | 410 | 490 | 650 | 730 | 850 | 930 |
| 13 | PB773 | PILOT INJECTOR NG 0.57mm | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | PB213 | NG MANIFOLD INJECTOR | 6 | 8 | 12 | 14 | 17 | 19 |
| 15 | VARIOUS | MANIFOLD | PM301 | PM302 | PM304 | PM305 | PM306 | PM307 |
| 16 | NOT REQUIRED | - | - | - | - | - | - | - |
| 17 | NOT REQUIRED | - | - | - | - | - | - | - |
| **MODULATING GAS VALVE – LPG** | | | | | | | | |
| **Item Number** | **Part Number** | **Description** | **HCV12** | **HCV16** | **HCV26** | **HCV30** | **HCV35** | **HCV40** |
| 1 | PV326 | WR GAS VALVE 36H32-409 24V | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 648613 | PIPE ¾" MEDIUM GAL | 150 | 150 | 150 | 150 | 150 | 150 |
| 3 | PV051 | BALL VALVE ¾" ITAP ART 066 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | 9656325 | MODULATING COUPLING SHAFT SML | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | PN037 | NIPPLE GAL HEX ¾" | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | PU009 | UNION BARREL GAL BS 3*4" F/F | 1 | 1 | 1 | 1 | 1 | 1 |
| 7 | PB419 | BEND GAL ¾" M & F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 8 | PP238 | PRESSURE TEST POINT 1/8" G09 | 3 | 3 | 3 | 3 | 3 | 3 |
| 9 | 648613 | PIPE ¾"MEDIUM GAL | 240 | 320 | 480 | 560 | 680 | 760 |
| 10 | PE071 | ELBOW GAL ¾" F&F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 11 | PZ643 | 1/8NPT X ¼ NUT & OLIVE | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | PT032 | TUBE ALUMINIMUM 6.35mmODX1.42 | 410 | 490 | 650 | 730 | 850 | 930 |
| 13 | PB774 | PILOT INJECTOR LPG SUITS PB772 | 1 | 1 | 1 | 1 | 1 | 1 |
| 14 | PB209 | LPG MANIFOLD INJECTOR | 6 | 8 | 12 | 14 | 17 | 19 |
| 15 | VARIOUS | MANIFOLD | PM301 | PM302 | PM304 | PM305 | PM306 | PM307 |
| 16 | PG149 | REGULATOR; MAXITROL RV12 1/8" Optional | 1 | 1 | 1 | 1 | 1 | 1 |
| 17 | PC394 | LPG CONVERSION KIT WHITE ROGER | 1 | 1 | 1 | 1 | 1 | 1 |



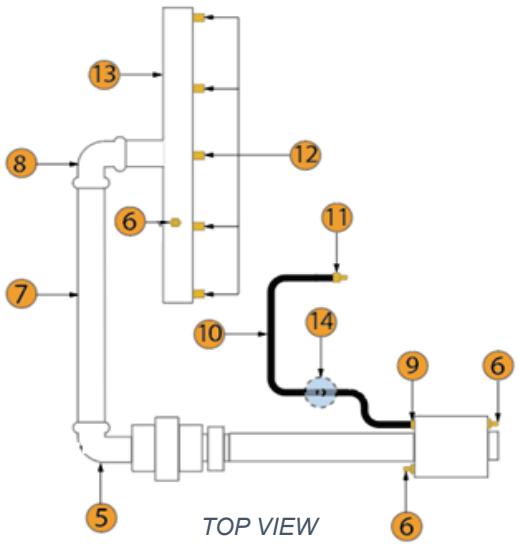
*TOP VIEW*



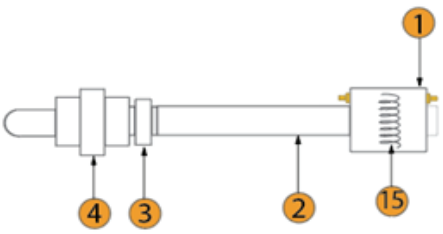
*SIDE VIEW*

# APPENDIX C: GAS TRAIN INFORMATION

| GAS TRAIN ON/OFF – NATURAL GAS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Item Number** | **Part Number** | **Description** | **HCV12** | **HCV16** | **HCV26** | **HCV30** | **HCV35** | **HCV40** |
| 1 | PC332 | WR GAS VALVE ¾ 24V 36C68C- | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 648613 | PIPE ¾" MEDIUM GAL (mm) | 150 | 150 | 150 | 150 | 150 | 150 |
| 3 | PN037 | NIPPLE GAL HEX ¾" | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | PU009 | UNION BARREL GAL BS 3*4" F/F | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | PB419 | BEND GAL ¾" M & F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | PP238 | PRESSURE TEST POINT 1/8" G09 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 648613 | PIPE ¾"MEDIUM GAL (mm) | 240 | 320 | 480 | 560 | 680 | 760 |
| 8 | PE071 | ELBOW GAL ¾" F&F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | PZ643 | 1/8NPT X ¼ NUT & OLIVE | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | PT032 | TUBE ALUMINIMUM 6.35mmODX1.42 | 410 | 490 | 650 | 730 | 850 | 930 |
| 11 | PB773 | PILOT INJECTOR NG 0.57mm | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | PB213 | NG MANIFOLD INJECTOR | 6 | 8 | 12 | 14 | 17 | 19 |
| 13 | VARIOUS | MANIFOLD | PM301 | PM302 | PM304 | PM305 | PM306 | PM307 |
| 14 | NOT REQUIRED | - | - | - | - | - | - | - |
| 15 | NOT REQUIRED | - | - | - | - | - | - | - |
| **GAS TRAIN ON/OFF – LPG** | | | | | | | | |
| **Item Number** | **Part Number** | **Description** | **HCV12** | **HCV16** | **HCV26** | **HCV30** | **HCV35** | **HCV40** |
| 1 | PV326 | WR GAS VALVE 36H32-409 24V | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 | 648613 | PIPE ¾" MEDIUM GAL | 150 | 150 | 150 | 150 | 150 | 150 |
| 3 | PN037 | NIPPLE GAL HEX ¾" | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | PU009 | UNION BARREL GAL BS 3*4" F/F | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 | PB419 | BEND GAL ¾" M & F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 6 | PP238 | PRESSURE TEST POINT 1/8" G09 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 | 648613 | PIPE ¾"MEDIUM GAL | 240 | 320 | 480 | 560 | 680 | 760 |
| 8 | PE071 | ELBOW GAL ¾" F&F" | 1 | 1 | 1 | 1 | 1 | 1 |
| 9 | PZ643 | 1/8NPT X ¼ NUT & OLIVE | 1 | 1 | 1 | 1 | 1 | 1 |
| 10 | PT032 | TUBE ALUMINIMUM 6.35mmODX1.42 | 410 | 490 | 650 | 730 | 850 | 930 |
| 11 | PB774 | PILOT INJECTOR LPG SUITS PB772 | 1 | 1 | 1 | 1 | 1 | 1 |
| 12 | PB209 | LPG MANIFOLD INJECTOR | 6 | 8 | 12 | 14 | 17 | 19 |
| 13 | VARIOUS | MANIFOLD | PM301 | PM302 | PM304 | PM305 | PM306 | PM307 |
| 14 | PG149 | REGULATOR; MAXITROL RV12 1/8" Optional | 1 | 1 | 1 | 1 | 1 | 1 |
| 15 | PC394 | LPG CONVERSION KIT WHITE ROGER | 1 | 1 | 1 | 1 | 1 | 1 |



*TOP VIEW*



*SIDE VIEW*

## APPENDIX D: COMMISSIONING REPORT

| | | Pass = ✓<br>Adjust = A<br>Attention Req. = X |
|---|---|---|
| **Unit Details** | Model Number | |
| | Serial Number | |
| | Installer | |
| | Installation Date | |
| | Site Address | |
| | Unit Condition | |
| **General Installation** | Access to the Unit | |
| | Condition of Casing | |
| | Unit is adequately secured | |
| | Structural bolts and grub screws tight | |
| | Roof Stand Installation | |
| | Duct Work to unit connected | |
| | Flue Installation | |
| **Electrical Commissioning** | Have Electrical connections been completed by a licensed, experienced person | |
| | Isolator fitted and operating | |
| | Single or 3 phase power (test) | V |
| | Fan Motor / Alignment (if fitted) | |
| | Pulleys/ Alignment (if fitted) | |
| | Fan Belts properly tensioned (if fitted) | |
| | Fan direction correct (if fitted) | |
| | 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 Valve Converted for LPG | |
| | Correct Spuds Installed and Free of Obstructions | |
| | Visual Inspection of pipe work with leak detector | |
| | Modulating Motor Set and Operational Check | |
| **Water Commissioning** | Water Isolation Fitted | |
| | Water Connections Free of Damage | |
| | Incoming Water Pressure between 220kPa and 1400kPa | |
| | Unit base and reservoir free of debris and clean | |
| | Flow to unit can meet 100% of pump requirement | |
| | Water isolation ball valve operation | |
| | Float Valve correctly set | |
| | Reservoir checked for leaks | |
| | Drain and Overflow Operation | |
| | Automatic drain valve operation/Link wire removed | |
| **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 Rotary Switch connected | |
| | BMS connection (if fitted) | |
| | Thermostat Range confirmed on RLU | |
| | Leaving Air Temp confirmed on RLU | |
| | Damper Blade Movement | |

## APPENDIX D: COMMISSIONING REPORT

| | | |
|---|---|---|
| **General Operation** | All Foreign Objects Removed from unit | |
| | Confirm fan can be easily turned by hand | |
| | All Access Panels Installed and Secure | |
| | De-isolate Gas Supply | |
| | De-isolate Electrical Supply | |
| | De-isolate Water Supply | |
| | Rotary Switch or BMS activates Fan High and Low | |
| | Rotary Switch or BMS activates Heating | |
| | Pilot Ignition | |
| | Main Burner Ignition | |
| | Pilot Pressure | kPa |
| | Main Burner Pressure | kPa |
| | Temperature Rise Across Heat Exchanger | °C |
| | Damper Position Set for Heating | |
| | Rotary Switch or BMS activates Cooling High/Low | |
| | Dampers Open for Cooling | |
| | Pad Saturation | |
| | Bleed Valve Set | |
| | Pump Operating | |
| | Motor Amps | |
| | Secure Location for Results communicated with owner | |
| **Electrical Commissioners Details** | Name: | Date: |
| | License number: | Signature: |
| **Gas Commissioners Details** | Name: | Date: |
| | License number: | Signature: |
| **Water Commissioners Details** | Name: | Date: |
| | License number: | Signature: |

**Commissioning Notes:**

# APPENDIX E: TEMPERATURE RISE OVER HEAT EXCHANGER

## APPENDIX E1 - LEAVING AIR TEMP EXCEEDS 50°C

HCV12 with an airflow of 840 L/s over the heat exchanger to achieve a 28°C rise in temperature. The outside air temperature is 25°C. Thermostat is set to 29°C .

As the leaving air temperature is greater than 50°C the unit will shut down. To stop the unit from shutting down the dampers need to be opened further to allow for greater airflow across the heat exchanger.

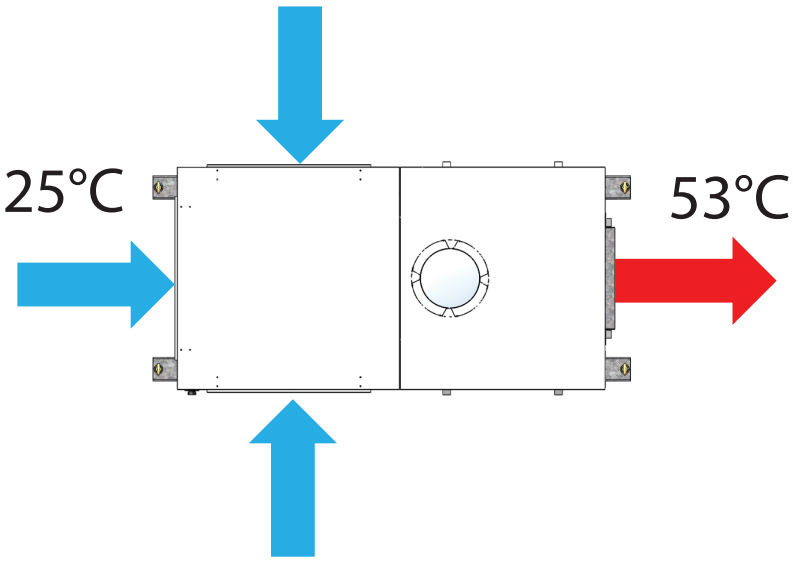



*Figure 35: Leaving Air Exceeds 50C*

## APPENDIX E2 - SET TEMPERATURE CANNOT BE REACHED

HCV12 with an airflow of 2098 L/s over the heat exchanger to achieve a 11°C rise in temperature. The outside air temperature is 15°C. Thermostat is set to 29°C.

The airflow over the heat exchanger is too high to allow for the temperature to increase sufficiently to heat the room to the set temperature.

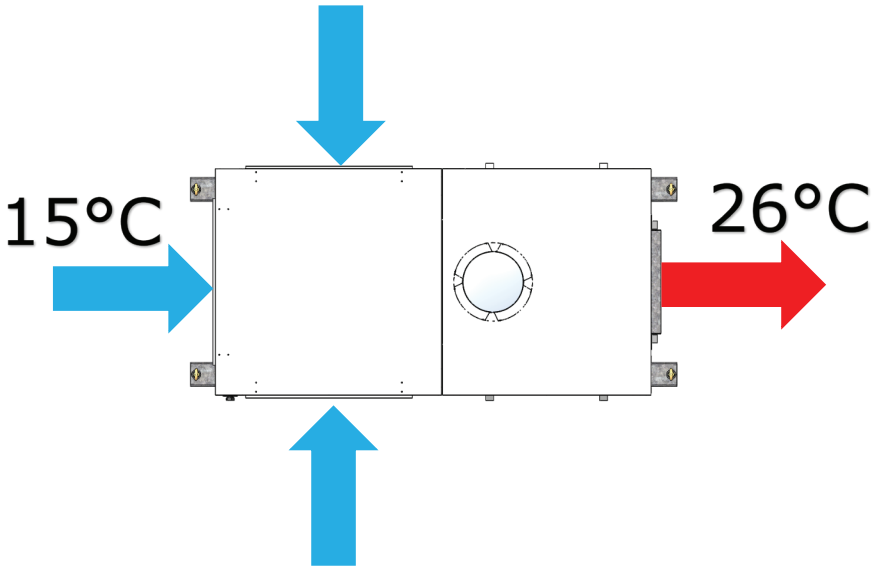



*Figure 36: Set Temperature Not Reached*

# APPENDIX E: TEMPERATURE RISE OVER HEAT EXCHANGER

## APPENDIX E3 - SET TEMPERATURE IS ACHIEVED AND MODULATING MOTOR CONTROLS TEMPERATURE

HCV12 with the dampers set to achieve an airflow between 804L/s and 2098 L/s over the heat exchanger that achieves a temperature rise 22°C rise in temperature. The outside air temperature is 15°C. Thermostat is set to 29°C.

The leaving air temperature sensor does not exceed 50°C so the unit continues to operate. As the room temperature reaches the set temperature of 29°C the modulating motor begins to modulate the gas flow to maintain a steady temperature. If the modulation does not lower the temperature sufficiently the unit will shut off.

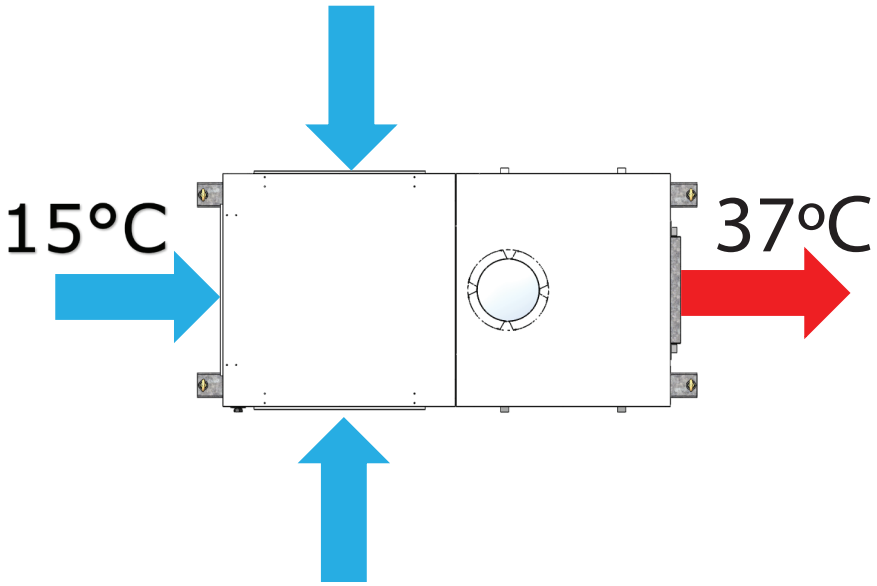



*Figure 37: Set Temperature Achieved and Modulating Controls Temp*

# APPENDIX F: MAINTENANCE

## APPENDIX F1: MAINTENANCE SCHEDULE

| DESCRIPTION | COMPONENT | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Month 7 | Month 8 | Month 9 | Month 10 | Month 11 | Month 12 | Pre-Season |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Electrical** | Incoming Electrical Supply | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Electrical Wiring | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Isolator Fitted and Operating | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Single or 3 Phase Power Test | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Overtemp Control | ✓ | | | | | | | | | | | | ✓ |
| | Thermostat Connected and Operational | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Fan Motor | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Belts & Pulleys Visual Inspection | ✓ | | | ✓ | | | ✓ | | | ✓ | | | |
| | Belts & Pulleys Thorough Inspection | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Fan Obstructions Direction | ✓ | | | | | | | | | | | | ✓ |
| | Damper Operation | ✓ | | | | | | | | | | | | ✓ |
| **Gas** | Incoming Gas Supply | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Gas Connections Visual Inspection | ✓ | | | | | | | | | | | | |
| | Gas Isolation Fitted and in Good Condition | ✓ | | | ✓ | | | ✓ | | | ✓ | | | |
| | Gas Supply Pressure | ✓ | | | | | | | | | | | | ✓ |
| | Gas Burner Pressure (High/Low) | ✓ | | | | | | | | | | | | ✓ |
| | Gas Injectors | ✓ | | | | | | | | | | | | ✓ |
| | Draft Diverter | ✓ | | | | | | | | | | | | ✓ |
| | Pilot Assembly | ✓ | | | | | | | | | | | | ✓ |
| | Burner Operation and Combustion | ✓ | | | | | | | | | | | | ✓ |
| | Flue Operation | ✓ | | | | | | | | | | | | ✓ |
| | Leaving Air Sensor | ✓ | | | | | | | | | | | | ✓ |
| **Water** | Incoming Water Supply | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Water Connections Visual Inspection | ✓ | | | ✓ | | | ✓ | | | ✓ | | | |
| | Water Isolation Fitted and in Good Condition | ✓ | | | ✓ | | | ✓ | | | ✓ | | | |
| | Water Supply Pressure | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| | Float Valve Operation | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| | Overflow and Drainage | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| | Automatic Drain Valve | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| | Bleed Valve | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| | Pad Saturation | ✓ | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| **Installation** | Weatherproof Casing Condition | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Duct Condition | ✓ | | | | | | | | | | | | ✓ |
| | General Installation | ✓ | | | ✓ | | | ✓ | | | ✓ | | | |
| | Access to Unit | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| | Maintenance Records | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Operation** | Start Up and Run Sequence | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Control Operations | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Motor Amps High and Low Speed | ✓ | | | | | | ✓ | | | | | | ✓ |
| | Safety Features | ✓ | | | | | | ✓ | | | | | | ✓ |

# APPENDIX F: MAINTENANCE

## APPENDIX F2: MONTHLY MAINTENANCE CHECK

**Owner Monthly Checklist**

**Unit Type: _____**

| Description | Component | Check For | C=Clean<br>R= Replace<br>A= Adjust<br>✓= 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 | |
| **Water** | Incoming Water Supply | Visually inspect incoming water 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 | |

**ONLY A QUALIFIED TECHNICIAN SHALL ADJUST SETTINGS**

**Checked By: _____**

**Signature: _____** **Date:_____**

# APPENDIX F: MAINTENANCE

## APPENDIX F3: MAINTENANCE CHECKLIST

### Maintenance Check List

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

| Description | Component | Check For | C=Clean<br>R= Replace<br>A= Adjust<br>✓= Check<br>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. | |
| | Overtemp Control | Check that overtemp control is correctly fitted and secure.<br>Check that overtemp activate at the specified temperature and that the fan continues to run at to sufficiently cool the unit. | |
| | Thermostat connected and operational | Changing temperature on the thermostat it reflected on the control box RLU. | |
| | Fan Motor | Refer to manufactures specifications | |
| | Belts and pulleys visual inspection | Check belts and pulleys for signs of wear and damage. Check for rubber deposits and if belts have a glazed or slick look. Replace if required | |
| | Belts and pulleys thorough inspection | Check alignment of pulleys. Check tension of belts. Replace if required | |
| | Fan obstructions and direction | Check fan is clear of any foreign objects. Confirm fan is operating in correct direction | |
| | Damper Operation | Check temperature rise across the heat exchanger. Check that dampers are locked in correct position. | |
| **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 Burner Pressure (High/Low) | Check burner operation with the gas valve set to the high and low operating pressures. | |
| | Gas Injectors | Check that the correct injectors are installed and free of debris. Clean or replace if required. | |
| | Draft Diverter | Check for damage, rust and debris. | |
| | 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. | |
| | Flue Operation | Check flue for debris. Check that the rain collar is securely fitted. | |
| | Leaving Air Sensor | Check the leaving air temp reading on the RLU vs temperature measured with a digital thermometer. | |

## APPENDIX F: MAINTENANCE

| | | | |
|---|---|---|---|
| **Water** | Incoming Water Supply | Visually inspect incoming water connection for signs of damage. Check that the unit isolation valve is in good working condition and easily accessible. If any new water appliances have been installed confirm that there is sufficient water pressure and flow for unit operation. | |
| | Water connections visual inspection | Visually inspect the water piping to and within the unit. | |
| | Water isolation fitted and in good condition | Check water isolation valve successfully isolates the unit. | |
| | Water Supply Pressure | Check incoming supply pressure against unit label | |
| | Drain Unit | Confirm that drain or auto-drain can remove water from the unit | |
| | Clean out the unit | All foreign material is cleaned out of the unit. Internal surfaces wiped down. | |
| | Cooling pads. | Wash the cooling pads with a garden hose spray nozzle. Check for build up of dirt and/or salt. Replace if required. | |
| | Float Valve Operation | Check that the float valve allows water to flow until the water reaches 5mm below the overflow. | |
| | Bleed Valve Operation | Check that the bleed valve rate per Note:- Formation of salt deposit in cooler pads indicates insufficient bleed off. | |
| | Pump Operation | Check that the pump operates when the cooling function is active. | |
| | Water Distribution Tap Settings | Check that the water distribution tap is set to allow the required flow rate to the pads. | |
| **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. | |
| | Internal Condition | Check for signs of water carry over. Check that the internal reservoir is not leaking. | |
| | 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 | |
| | Motor Amps High and Low Speed | Check motor amps on high and low speeds to ensure the motor is not over-amping. | |
| | Pad saturation | Check that pads are sufficiently saturated. Under saturation will limit cooling. Over saturation will lead to water carry over. | |
| | 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:**_____

# APPENDIX G: 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.**

# APPENDIX G: WARRANTY INFORMATION

**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:

## APPENDIX G: WARRANTY INFORMATION

- 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

# APPENDIX G: WARRANTY INFORMATION

## 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.

## APPENDIX H: RELEASE INFORMATION

| Ver | Revision | Date | Amendment | Author | Approved |
|---|---|---|---|---|---|
| 1.0 | A | 27.07.2021 | Initial Release | D. Wall | C. Arnel |
| 1.1 | B | 12.08.2021 | HCV30 Type A update | D. Wall | C. Arnel |
| 1.2 | C | 24.09.2021 | Dimension and table references | D.Wall | C. Arnel |
| 1.3 | D | 25.01.2022 | HCV 26 and 35 Type A update | D.Wall | C. Arnel |
| 1.4 | E | 23.05.2022 | SD40 Update | D.Wall | C.Arnel |
| 1.5 | F | 22.07.2022 | Leaving Air Temp Update | D.Wall | C.Arnel |
| 1.6 | G | 04.04.2023 | Update flue drawing/Auto drain | D.Wall | C.Arnel |
| 1.7 | H | 12.07.2023 | Updated rear page | D.Wall | M.Gay |
| 1.8 | J | 26.02.2024 | ECN-00969 | 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.