



## 48/50UA-UH

Packaged Rooftop Cooling  
Only Units, Heat Pumps and  
Gas Heating Units

PRO-DIALOG



Installation, operation and maintenance instructions



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#### **NOTES FOR 48 SERIES UNITS FITTED WITH A GAS BURNER**

**IMPORTANT:** *The appliance must be installed in accordance with local safety codes and regulations and is intended for outdoor use only.*

*Please read the manufacturer's instructions carefully before starting this unit.*

**CAUTION:** *Before installation, check that the local distribution conditions, type of gas and available pressure, and the power supply and adjustments of the appliance are correct.*

**The drawings in this document are for illustrative purposes only and is not part of any offer for sale or contract.**

## 1 - INTRODUCTION

Prior to the initial start-up of the 48/50UA-UH units, the people involved should be thoroughly familiar with these instructions and the specific project data for the installation site. The 48/50UA-UH packaged rooftop units are designed to provide a very high level of safety and reliability making installation, start-up, operation and maintenance easier and more secure. They will provide safe and reliable service when operated within their application range.

The procedures in this manual are arranged in the sequence required for machine installation, start-up, operation and maintenance.

Be sure you understand and follow the procedures and safety precautions contained in the instructions supplied with the machine, as well as those listed in this guide, such as: protective clothing such as gloves, safety glasses, safety shoes and appropriate tools, and suitable qualifications (electrical, air conditioning, local legislation).

To find out, if these products comply with European directives (machine safety, low voltage, electromagnetic compatibility, equipment under pressure, etc.) check the declarations of conformity for these products.

### 1.1 - Check equipment received

- Inspect the unit for damage or missing parts. If damage is detected, or if shipment is incomplete, immediately file a claim with the shipping company.
- Confirm that the unit received is the one ordered. Compare the name plate data with the order.
- The name plate is attached to the unit on the outside on one of the unit sides
- The unit name plate must include the following information:
  - Model number - size
  - CE marking
  - Serial number
  - Year of manufacture and pressure and leak tightness test date
  - Refrigerant used
  - Refrigerant charge per circuit
  - PS: Min./max. allowable pressure (high and low pressure side) - see chapter 11
  - TS: Min./max. allowable temperature (high and low pressure side) - see chapter 11
  - Pressure switch cut-out pressure
  - Unit leak test pressure
  - Voltage, frequency, number of phases
  - Maximum current drawn
  - Maximum power input
  - Unit net weight
- Confirm that all accessories ordered for on-site installation have been delivered, are complete and undamaged.

***The unit must be checked periodically during its whole operating life for possible damage of the insulation (thermal, acoustic) to ensure that no shocks (handling accessories, tools, etc.) have damaged it. If necessary, the damaged insulation parts must be repaired or replaced. See also chapter "Maintenance".***

## 1.2 - Installation safety considerations

After the unit has been received, and before it is started up, it must be inspected for damage. Check that the refrigerant circuits are intact, especially that no components or pipes have shifted or been damaged (e.g. following a shock). If in doubt, carry out a leak tightness check. If damage is detected upon receipt, immediately file a claim with the shipping company or repair.

The unit must be installed in a place that is not accessible to the public or protected against access by non-authorised persons.

***The unit should not be installed in an explosive atmosphere.***

***Do not remove the skid or the packaging until the unit is in its final position. These units can be moved with a fork lift truck, as long as the forks are positioned in the right place and direction on the unit.***

***The units can also be lifted with slings, using only the designated lifting points marked on the unit (labels on the chassis and a label with all unit handling instructions are attached to the unit).***

***Use slings with the correct capacity, and always follow the lifting instructions on the certified drawings supplied for the unit.***

***This unit is designed for ducted installation (indoor air discharge). If ducts are not used the installer must place a protection grille in the discharge.***

***Safety is only guaranteed, if these instructions are carefully followed. If this is not the case, there is a risk of material deterioration and injuries to personnel.***

***These units are not designed to be lifted from above.***

***All precautions concerning handling of refrigerant must be observed in accordance with local regulations.***

***Accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation or explosions.***

***Inhalation of high concentrations of vapour is harmful and may cause heart irregularities, unconsciousness, or death. Vapour is heavier than air and reduces the amount of oxygen available for breathing. These products cause eye and skin irritation. Decomposition products can be hazardous.***

### 1.3 - Equipment and components under pressure

These products incorporate equipment or components under pressure, manufactured by Carrier or other manufacturers.

We recommend that you consult your appropriate national trade association or the owner of the equipment or components under pressure (declaration, re-qualification, retesting, etc.). The characteristics of this equipment/these components are given on the nameplate or in the required documentation, supplied with the products.



Do not introduce high static and dynamic pressure compared with the existing operating pressures - either service or test pressures in the refrigerant circuit.

#### 1.4 - Maintenance safety considerations

Engineers working on the electric or refrigeration or gas heating components must be authorised, trained and fully qualified to do so (e.g. electricians trained and qualified in accordance with IEC 60364 Classification BA4).

All refrigerant circuit work must be carried out by a trained person, fully qualified to work on these units. He must have been trained and be familiar with the equipment and the installation. All welding operations must be carried out by qualified specialists.

These units use high-pressure R-410A refrigerant (the unit operating pressure is above 40 bar). Special equipment must be used when working on the refrigerant circuit (pressure gauge, charge transfer, etc.).

*Any manipulation of a refrigerant recovery valve must be carried out by a qualified and authorised engineer, observing applicable standards (e.g. during refrigerant removal). The unit must be switched off while this is done.*

*During any handling, maintenance and service operations the engineers working on the unit must be equipped with safety gloves, glasses, shoes and protective clothing.*

*Never work on a unit that is still energised. Never work on any of the electrical components, until the general power supply to the unit has been cut.*

*If any maintenance operations are carried out on the unit, lock the power supply circuit in the open position and secure the machine upstream with a padlock.*

*If the work is interrupted, always ensure that all circuits are still deenergised before resuming the work.*

**ATTENTION:** *Even if the unit has been switched off, the power circuit remains energised, unless the unit or circuit disconnect switch is open. Refer to the wiring diagram for further details. Attach appropriate safety labels.*

*If any work is carried out in the fan area, specifically if the grilles or casings have to be removed, cut the power supply to the fans to prevent their operation.*

#### OPERATING CHECKS:

- **IMPORTANT INFORMATION REGARDING THE REFRIGERANT USED:**

*This product contains fluorinated greenhouse gas covered by the Kyoto protocol.*

*Refrigerant type: R-410A*

*Global Warming Potential (GWP): 1975*

*Periodic inspections for refrigerant leaks may be required depending on European or local legislation.*

*Please contact your local dealer for more information.*

- *During the life-time of the system, inspection and tests must be carried out in accordance with national regulations.*

#### Protection device checks:

- *If no national regulations exist, check the protection devices on site in accordance with standard EN378: once a year for the high-pressure switches.*

*At least once a year thoroughly inspect the protection devices. If the machine operates in a corrosive environment, inspect the protection devices more frequently.*

*Regularly carry out leak tests and immediately repair any leaks.*

*Ensure regularly that the vibration levels remain acceptable and close to those at the initial unit start-up.*

*Before opening a refrigerant circuit, transfer the refrigerant to bottles specifically provided for this purpose and consult the pressure gauges.*

*Change the refrigerant after an equipment failure, following a procedure such as the one described in NF E29-795 or carry out a refrigerant analysis in a specialist laboratory.*

*If the refrigerant circuit remains open for longer than a day after an intervention (such as a component replacement), the openings must be plugged and the circuit must be charged with nitrogen (inertia principle). The objective is to prevent penetration of atmospheric humidity and the resulting corrosion on the internal walls and on non-protected steel surfaces.*

#### 1.5 - Repair safety considerations

All installation parts must be maintained by the personnel in charge, in order to avoid deterioration and injury. Faults and leaks must be repaired immediately. The authorized technician must have the responsibility to repair the fault immediately. After each repair of the unit, check the operation of the protection devices and create a report of the parameter operation at 100%.

Comply with the regulations and recommendations in unit and HVAC installation safety standards, such as: EN 378, ISO 5149, etc.

*Never use air or a gas containing oxygen during leak tests to purge lines or to pressurise a machine. Pressurised air mixtures or gases containing oxygen can be the cause of an explosion. Oxygen reacts violently with oil and grease.*

*Only use dry nitrogen for leak tests, possibly with an appropriate tracer gas.*

*If the recommendations above are not observed, this can have serious or even fatal consequences and damage the installation.*

*Never exceed the specified maximum operating pressures. Verify the allowable maximum high- and low-side test pressures by checking the instructions in this manual and the pressures given on the unit name plate.*

*Do not unweld or flamecut the refrigerant lines or any refrigerant circuit component until all refrigerant (liquid and vapour) and the oil have been removed from the unit. Traces of vapour should be displaced with dry nitrogen. Refrigerant in contact with an open flame can produce toxic gases.*

*The necessary protection equipment must be available, and appropriate fire extinguishers for the system and the refrigerant type used must be within easy reach.*

*Do not siphon refrigerant. Avoid spilling liquid refrigerant on skin or splashing it into the eyes. Use safety goggles and safety gloves. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, immediately and abundantly flush the eyes with water and consult a doctor.*

*Never apply an open flame (blowlamp) or overheated steam (high-pressure cleaner) to the refrigerant circuit. Dangerous overpressure can result.*

*During refrigerant removal and storage operations follow applicable regulations. These regulations, permitting conditioning and recovery of halogenated hydrocarbons under optimum quality conditions for the products and optimum safety conditions for people, property and the environment are described in standard NF E29-795.*

*Refer to the certified dimensional drawings for the units.*

*It is dangerous and illegal to re-use disposable (non-returnable) cylinders or attempt to refill them. When cylinders are empty, evacuate the remaining gas pressure, and move them to a designated place for recovery. Do not incinerate.*

*Do not attempt to remove refrigerant circuit components or fittings, while the machine is under pressure or while it is running. Be sure pressure is at 0 kPa and that the unit has been shut-down and de-energised before removing components or opening a circuit.*

*Do not attempt to repair or recondition any safety devices when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism. If necessary, replace the device.*

**ATTENTION:** *No part of the unit must be used as a walkway, rack or support. Periodically check and repair or if necessary replace any component or piping that shows signs of damage.*

*Do not step on refrigerant lines. The lines can break under the weight and release refrigerant, causing personal injury.*

*Do not climb on a machine. Use a platform, or staging to work at higher levels.*

*Use mechanical lifting equipment (crane, hoist, winch, etc.) to lift or move heavy components. For lighter components, use lifting equipment when there is a risk of slipping or losing your balance.*

*Use only original replacement parts for any repair or component replacement. Consult the list of replacement parts that corresponds to the specification of the original equipment.*

*Periodically inspect all valves, fittings and pipes of the refrigerant and hydronic circuits to ensure that they do not show any corrosion or any signs of leaks.*

*It is recommended to wear ear defenders, when working near the unit and the unit is in operation.*

*Always ensure you are using the correct refrigerant type before recharging the unit.*

*Charging any refrigerant other than the original charge type (R-410A) will impair machine operation and can even lead to a destruction of the compressors. The compressors operate with R-410A and are charged with a synthetic polyolester oil.*

*Before any intervention on the refrigerant circuit, the complete refrigerant charge must be recovered.*

## **2 - MOVING AND SITING THE UNIT**

### **2.1 - Moving**

*See chapter 1.2 - "Installation safety considerations".*

### **2.2 - Siting the unit**

*Always refer to the chapter "Dimensions and clearances" to confirm that there is adequate space for all connections and service operations. For the centre of gravity coordinates, the position of the unit mounting holes, and the weight distribution points, refer to the certified dimensional drawing supplied with the unit.*

*Typical applications of these units do not require earthquake resistance. Earthquake resistance has not been verified.*

**CAUTION:** *Only use slings at the designated lifting points which are marked on the unit.*

Before siting the unit check that:

- the permitted loading at the site is adequate or that appropriate strengthening measures have been taken.
- the unit is installed level on an even surface (maximum tolerance is 5 mm in both axes).
- there is adequate space above the unit for air flow and to ensure access to the components (see dimensional drawings).
- the number of support points is adequate and that they are in the right places.
- the location is not subject to flooding.
- if heavy snowfall is likely and long periods of sub-zero temperatures are normal, provision has to be made to prevent snow accumulating by raising the unit above the height of drifts normally experienced. Baffles may be necessary to deflect strong winds. They must not restrict air flow into the unit.

**CAUTION:** *Before lifting the unit, check that all casing panels are securely fixed in place. Lift and set down the unit with great care. Tilting and jarring can damage the unit and impair unit operation.*

If units are hoisted with rigging, it is advisable to protect coils against crushing while a unit is being moved. Use struts or a lifting beam to spread the slings above the unit. Do not tilt a unit more than 15°.

**WARNING: Never push or lever on any of the enclosure panels of the unit. Only the base of the unit frame is designed to withstand such stresses.**

### 2.3 - Checks before system start-up

Before the start-up of the refrigeration system, the complete installation, including the refrigeration system must be verified against installation drawings, dimensional drawings, system piping and instrumentation diagrams and the wiring diagrams.

Follow national regulations for these checks. If the national regulation does not specify any details, refer to standard EN 378-2 as follows: External visual installation checks:

- Compare the complete installation with the refrigeration system and power circuit diagrams.
- Check that all components comply with the design specifications.
- Check that all protection documents and equipment provided by the manufacturer (dimensional drawings, P&ID, declarations etc.) to comply with the regulations are present.
- Verify that the environmental safety and protection and devices and arrangements provided by the manufacturer to comply with the regulations are in place.
- Verify that all documents for pressure containers, certificates, name plates, files, instruction manuals provided by the manufacturer to comply with the regulations are present.
- Verify the free passage of access and safety routes.
- Verify the instructions and directives to prevent the deliberate removal of refrigerant gases.
- Verify the installation of connections.
- Verify the supports and fixing elements (materials, routing and connection).
- Verify the quality of welds and other joints.
- Check the protection against mechanical damage.
- Check the protection against heat.
- Check the protection of moving parts.
- Verify the accessibility for maintenance or repair and to check the piping.
- Verify the status of the valves.
- Verify the quality of the thermal insulation and of the vapour barriers.
- Ensure that the ventilation in the machine room is sufficient.
- Check the refrigerant detectors.

## 3 - INSTALLATION

### 3.1 - Unit base frame

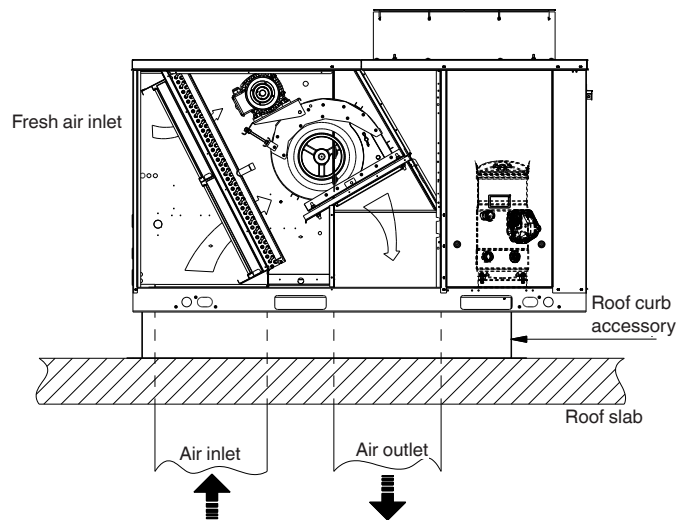
This unit is for connection to a ducted air system only. It should not be used without ductwork connected to the air outlet or discharge side of the unit. It is possible to provide fresh air to the unit air inlet side without the use of ductwork via an optional kit containing a louvre system, and protective hood and grilles. Consult the unit supplier or distributor for more information.

Due to the size and weight of the units the base frame must be on a support which fulfils the following requirements:

- The surface area must be sufficient for distributing the unit weight over the building structure.
- Sufficient drainholes should be provided to avoid the accumulation of rain water.
- The unit should be firmly fixed to the floor.
- The structure should be capable of supporting the unit weight during installation and operation.
- The standard unit leaves the factory with the air discharge and return in the lower section (see Fig. 1) and the corresponding holes on the roof must be made.

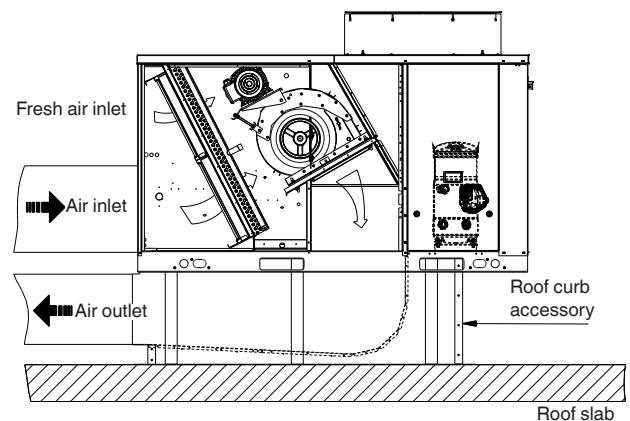
**Refer to the certified dimensional drawings for the discharge and return openings.**

**Fig. 1 – Roofcurb accessory - standard vertical discharge and return**



The unit air discharge and return can be horizontal (see Fig. 2). In this case, the roof curb accessory may be used after placing the panels covering the return area in the lower section.

**Fig. 2 – Roofcurb accessory - horizontal discharge/return**



It is necessary to use adequate sealants and joints to ensure correct fitting and water-tightness between the ducts and the support so that air and moisture do not enter the building.

**WARNING: Do not drill any holes in the indoor coil area as this might damage the condensate drain pan.**



**WARNING:** For 48 series units (with gas burners) the minimum rooftop unit height from the ground must be 500 mm for horizontal discharge applications.

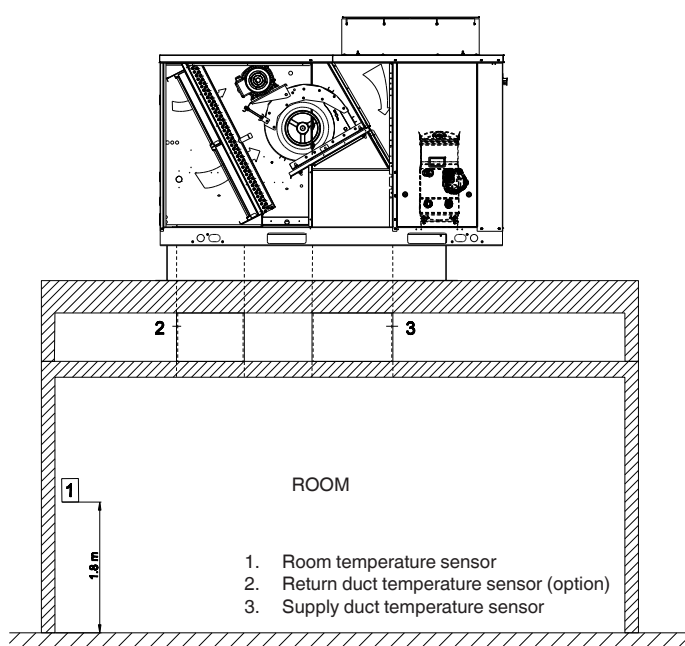
**IMPORTANT:** The unit should be correctly levelled to avoid drainage problems.

### 3.2 - Sensor connection and location

The room temperature sensor and supply temperature sensor are located in the control box together with their connectors. Please refer to the wiring diagrams for the required connections and suitable cable diameter. Criteria for selecting sensor locations will vary with system and building specifics. Recommended sensor locations are shown in Fig. 3.

**NOTE:** The return duct sensor or the room temperature sensor can be used.

**Fig. 3 - Recommended sensor location**



### 3.3 - Ductwork

Determine the ductwork dimensions according to the air flow to be carried, and the available static unit pressure. The different air flows and static pressures that each unit can supply, are shown in the fan performance tables.

It is recommended to observe the following considerations:

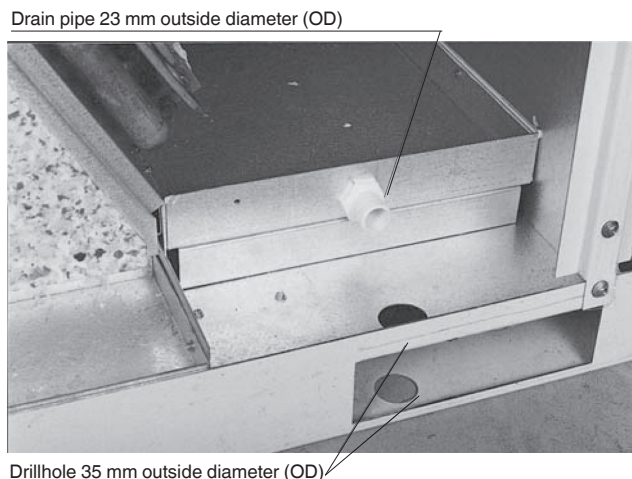
- Whatever type of ductwork is used, it should not be made of materials which are flammable, or which give off toxic gases in the event of a fire. The internal surfaces should be smooth, and not contaminate the air which passes through. It is recommended to use sheet metal ducts which are adequately insulated to avoid condensation and thermal leakage.
- At the points where the ducts join the unit, it is recommended to use flexible connections which absorb vibrations, prevent noise inside the ductwork and allow access to the unit.
- Bends near the unit outlet should be avoided as much as possible. If unavoidable, they should be as slight as possible, and internal deflectors should be used when the duct has large dimensions.

**NOTE:** All duct sizing and design work should be carried out by qualified technicians.

### 3.4 - Condensate and rainwater drainage

The units incorporate drillholes in the base near the outdoor coils to drain rainwater and condensation. The indoor heat exchanger area incorporates a condensate pan with an outside drain pipe diameter of 23 mm, and a 35 mm diameter drillhole must be made in the support (see Fig. 4).

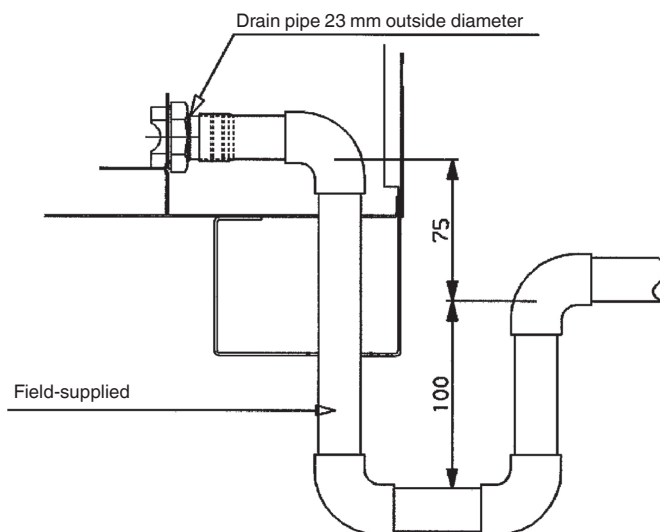
**Fig. 4 - Condensate drain details**



A drain pipe for evacuating condensate must be incorporated taking into account the following recommendations:

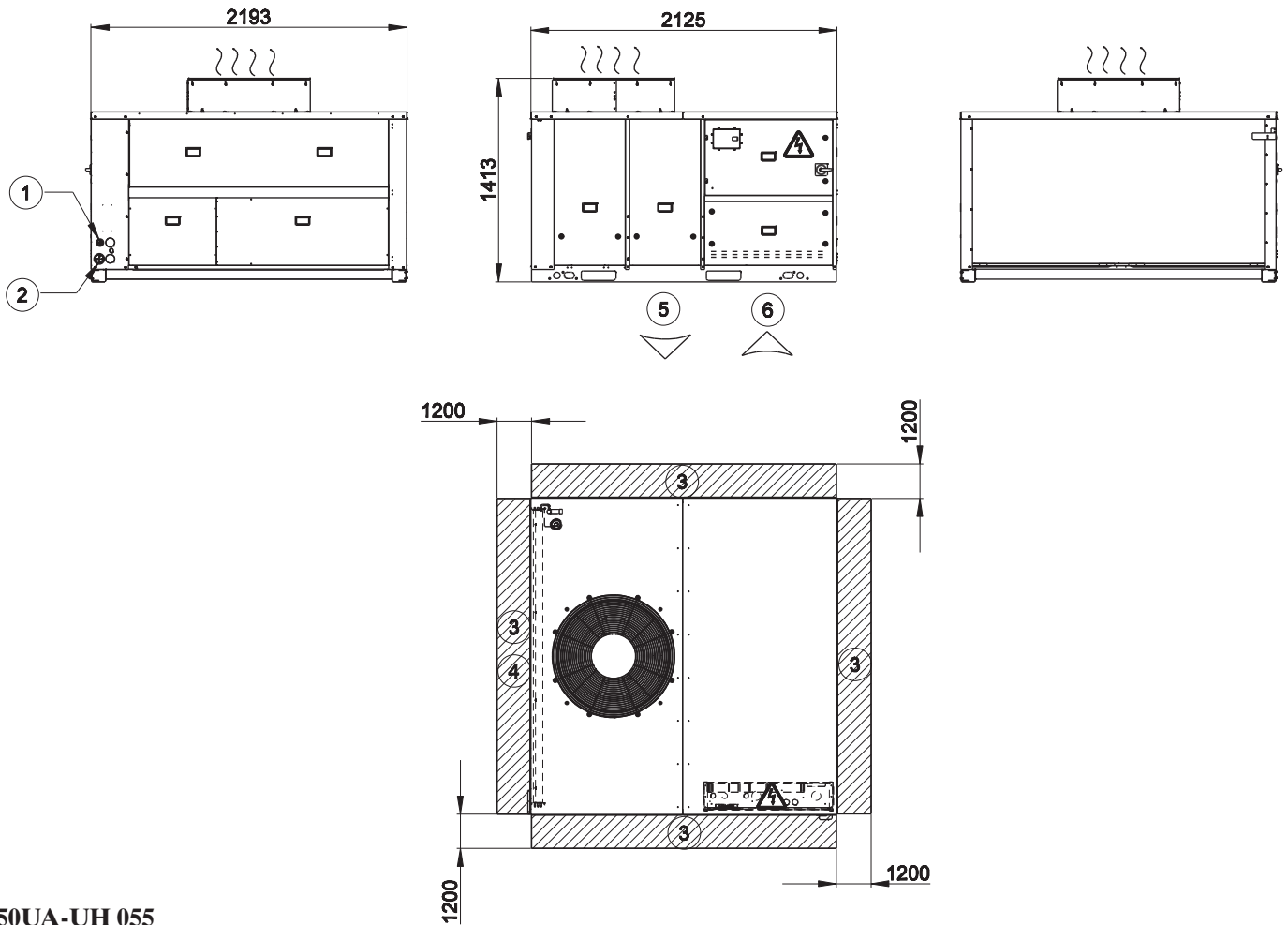
- Use galvanized steel, copper or plastic piping. Do not use ordinary garden hose material.
- If a rigid material has been used for the drain pipe, it is necessary to provide an elastic coupling in the drainage line to absorb possible vibrations.
- It is recommended to incorporate a trap of the appropriate dimensions (see Fig. 5).
- The drain pipe should always be below the connection itself, and should slope to facilitate drainage.

**Fig. 5 - Condensate drain pipe details**

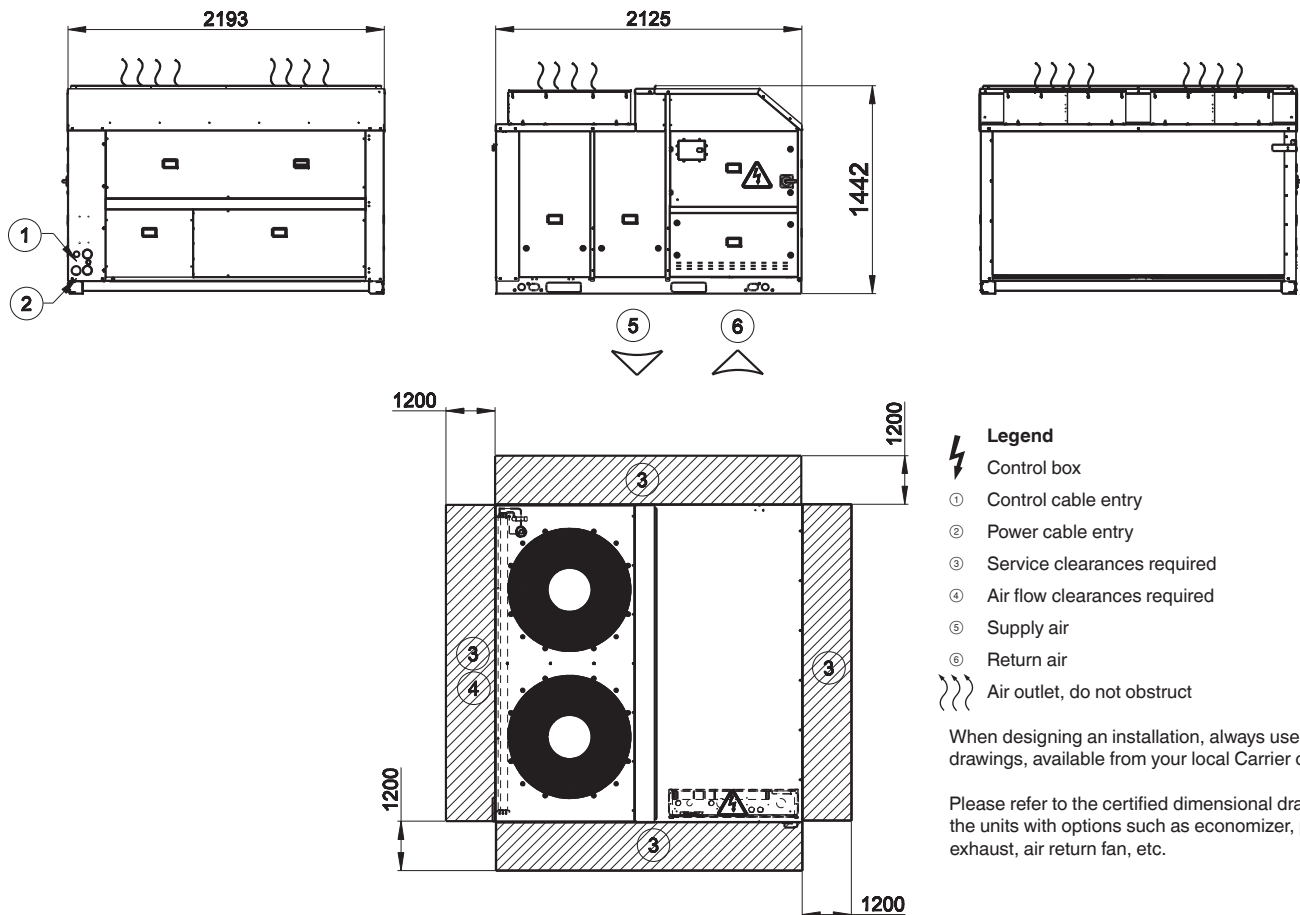


#### 4 - DIMENSIONS, CLEARANCES, mm

##### 50UA-UH 045



##### 50UA-UH 055



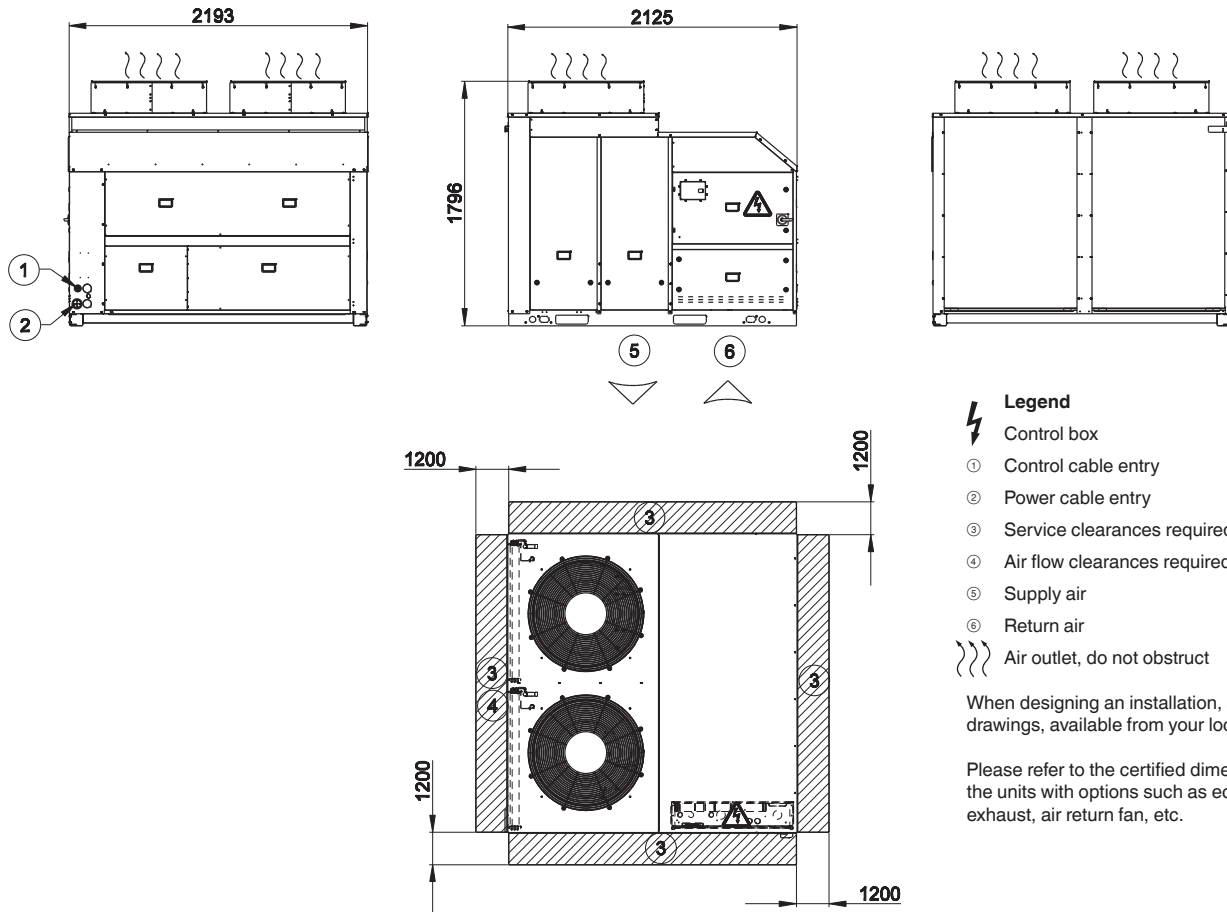
- Legend**
- ⚡ Control box
  - ① Control cable entry
  - ② Power cable entry
  - ③ Service clearances required
  - ④ Air flow clearances required
  - ⑤ Supply air
  - ⑥ Return air
  - ))) Air outlet, do not obstruct

When designing an installation, always use up-to-date drawings, available from your local Carrier office.

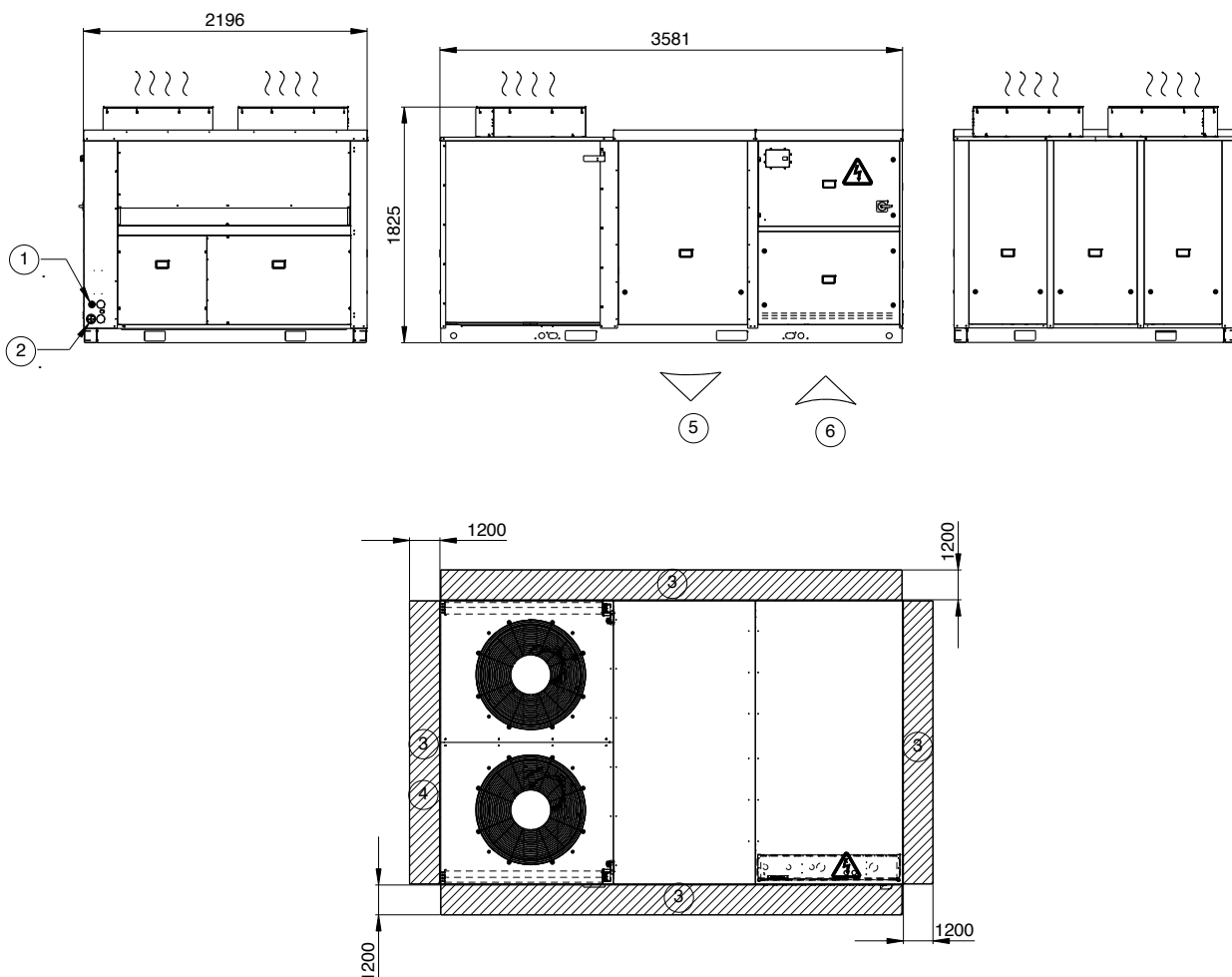
Please refer to the certified dimensional drawings for the units with options such as economizer, power exhaust, air return fan, etc.



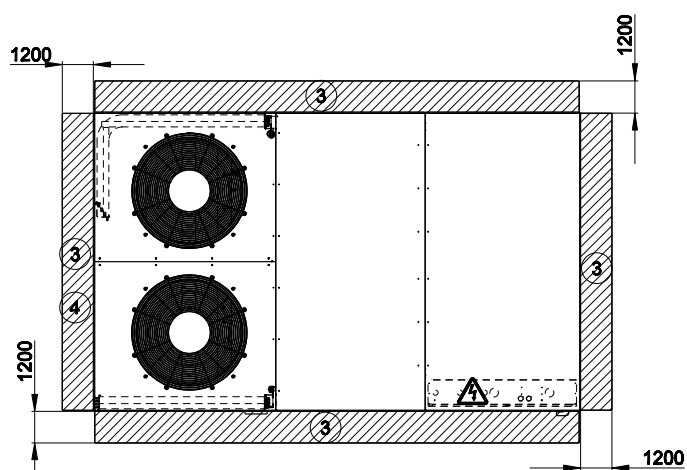
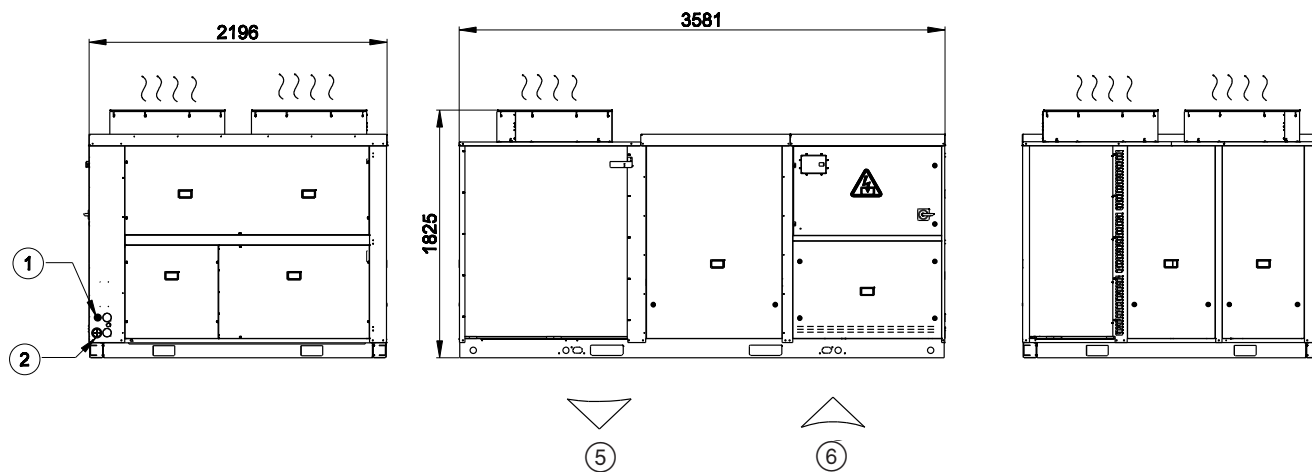
## 50UA-UH 065, 075



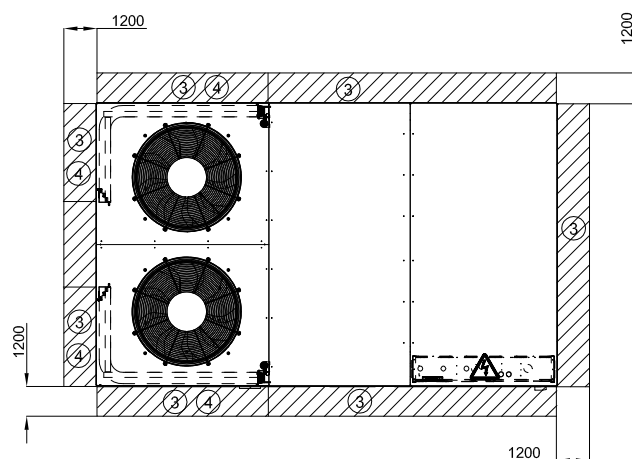
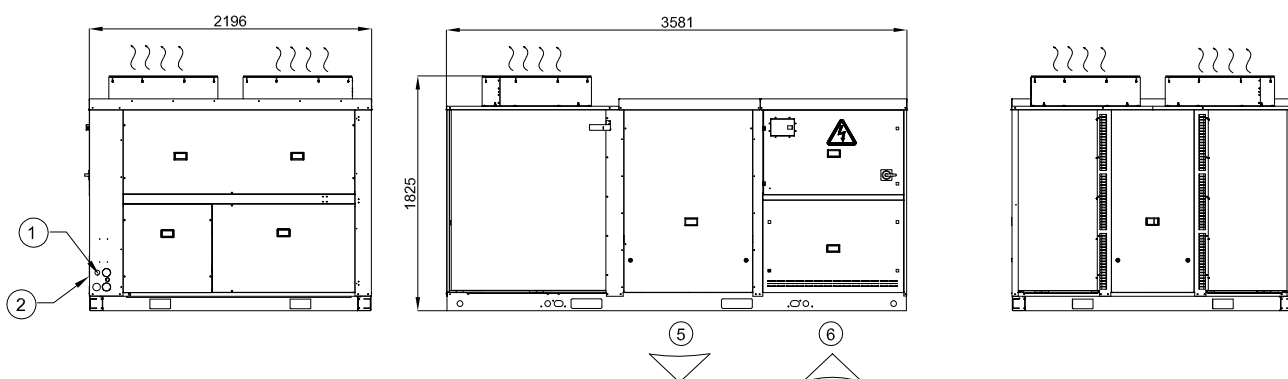
## 50UA-UH 085



## 50UA-UH 100



## 50UA-UH 120



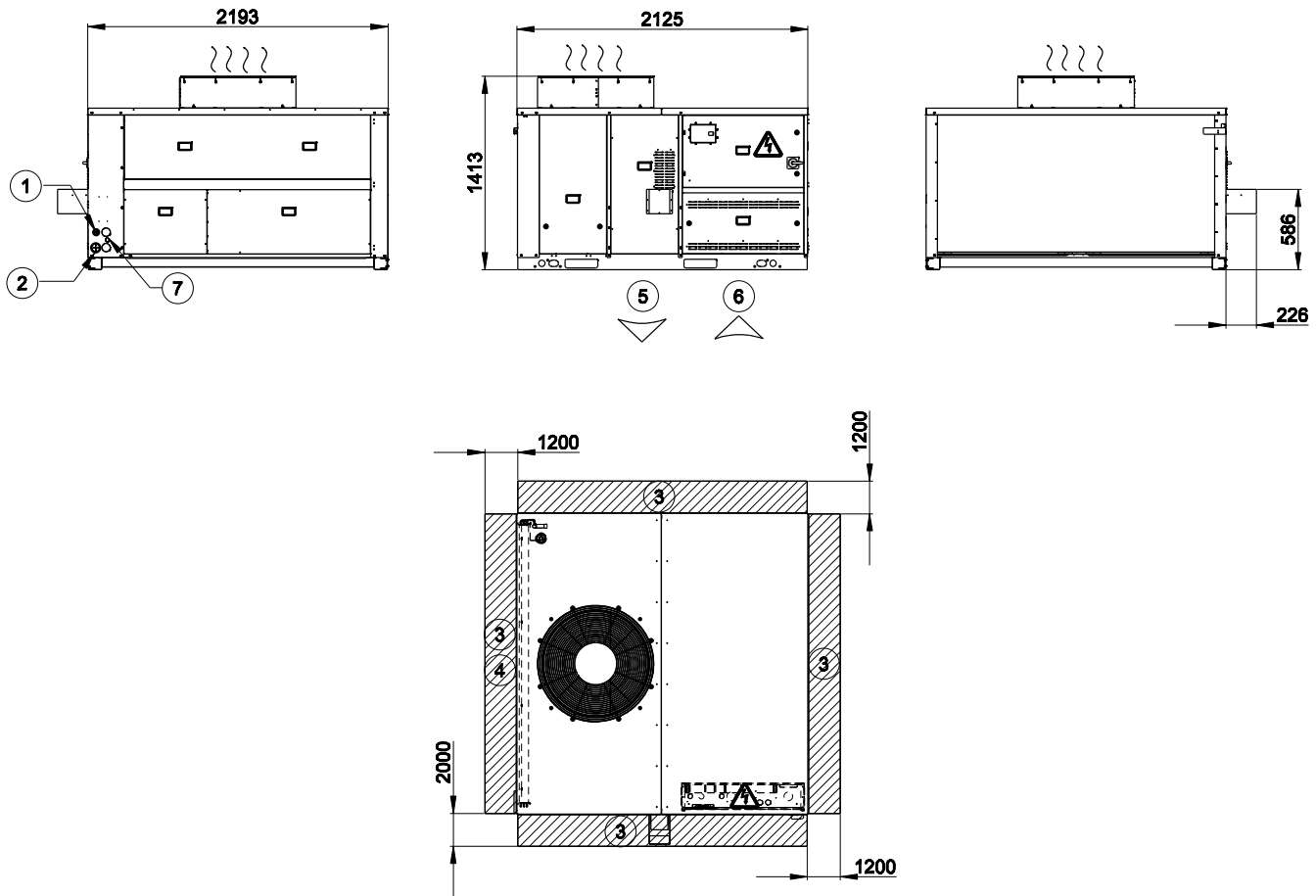
### Legend

- Control box
- ① Control cable entry
- ② Power cable entry
- ③ Service clearances required
- ④ Air flow clearances required
- ⑤ Supply air
- ⑥ Return air
- ))) Air outlet, do not obstruct

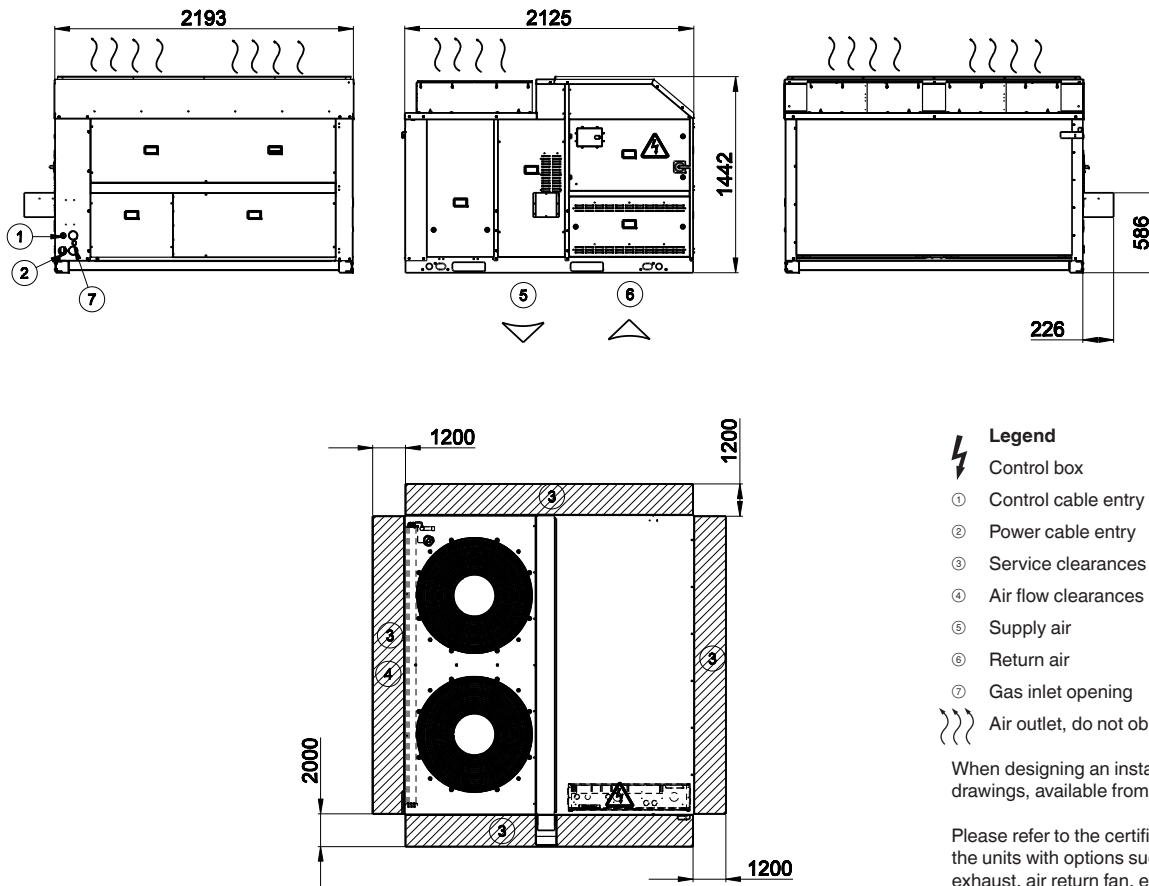
When designing an installation, always use up-to-date drawings, available from your local Carrier office.

Please refer to the certified dimensional drawings for the units with options such as economizer, power exhaust, air return fan, etc.

## 48UA-UH 045



## 48UA-UH 055

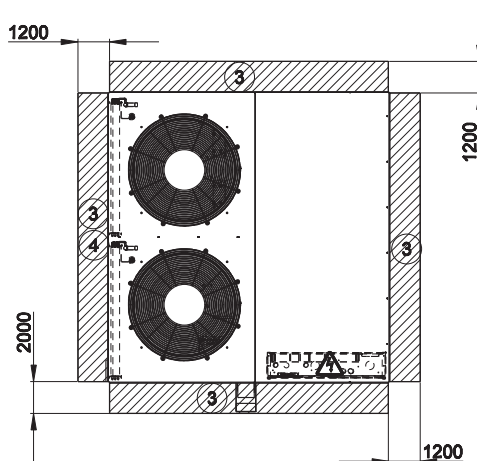
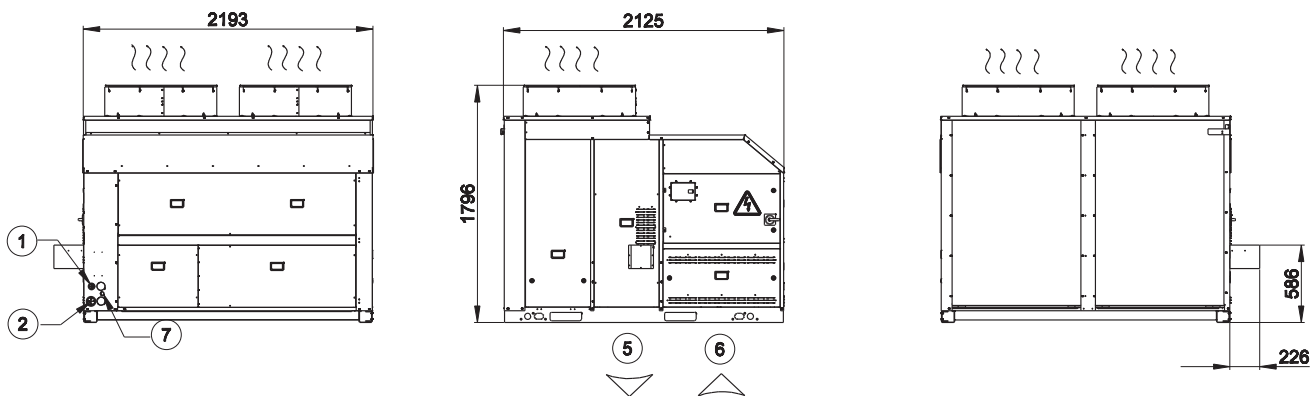


- Legend**
- ⚡ Control box
  - ① Control cable entry
  - ② Power cable entry
  - ③ Service clearances required
  - ④ Air flow clearances required
  - ⑤ Supply air
  - ⑥ Return air
  - ⑦ Gas inlet opening
  - ))) Air outlet, do not obstruct

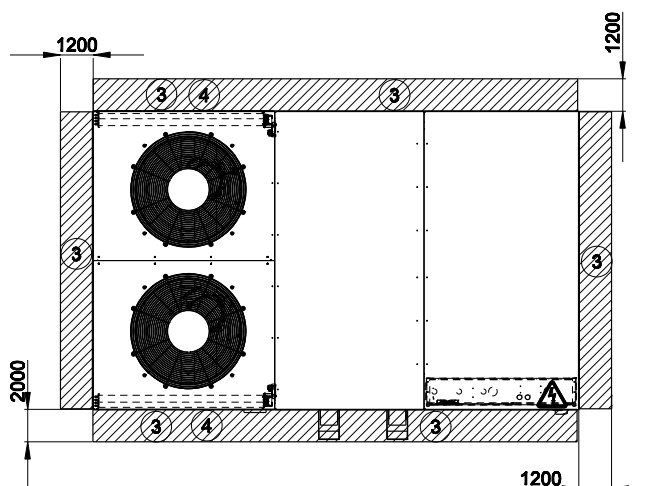
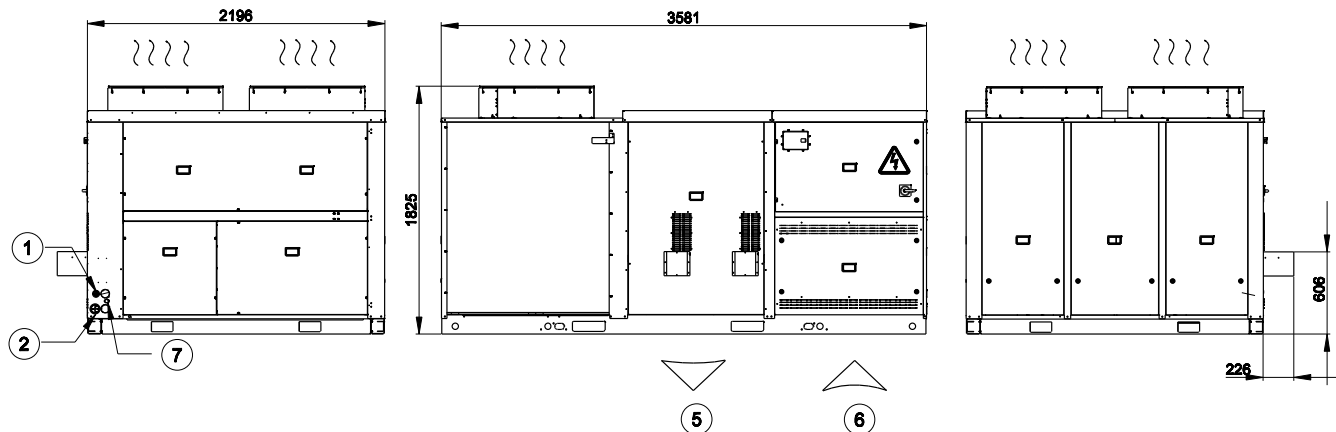
When designing an installation, always use up-to-date drawings, available from your local Carrier office.

Please refer to the certified dimensional drawings for the units with options such as economizer, power exhaust, air return fan, etc.

## 48UA-UH 065, 075



## 48UA-UH 085

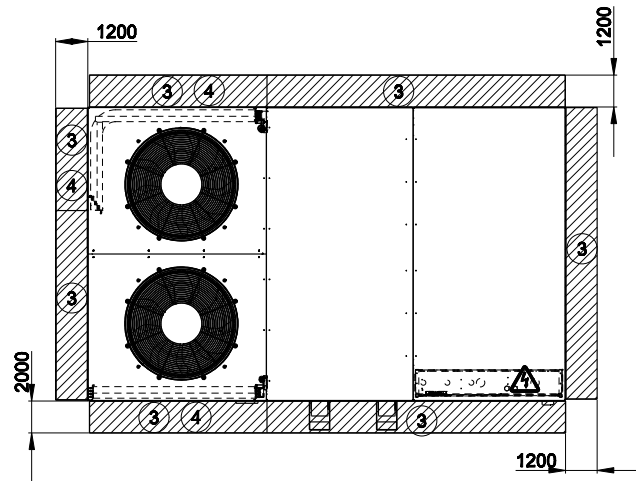
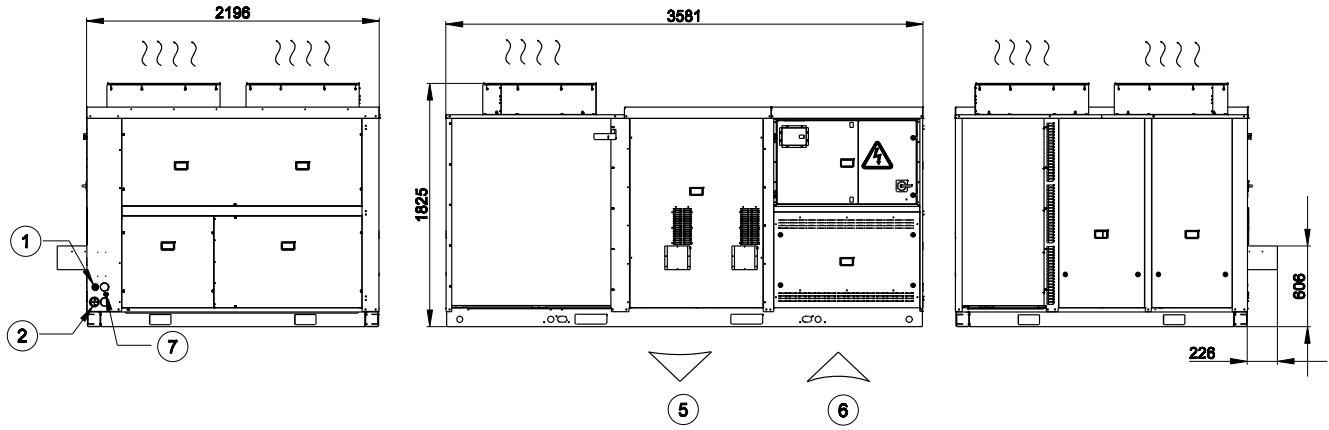


- Legend**
- ⚡ Control box
  - ① Control cable entry
  - ② Power cable entry
  - ③ Service clearances required
  - ④ Air flow clearances required
  - ⑤ Supply air
  - ⑥ Return air
  - ⑦ Gas inlet opening
  - ))) Air outlet, do not obstruct

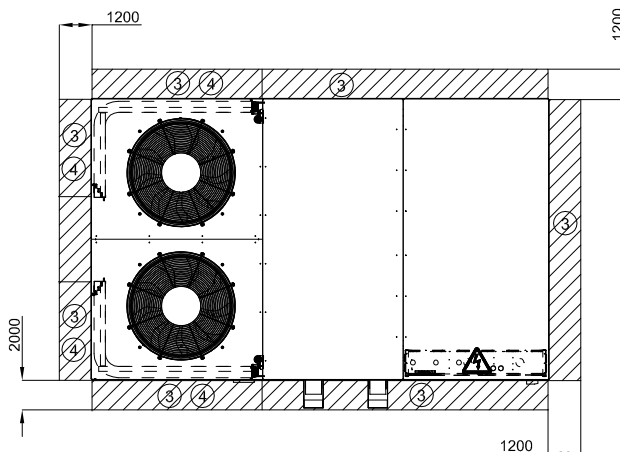
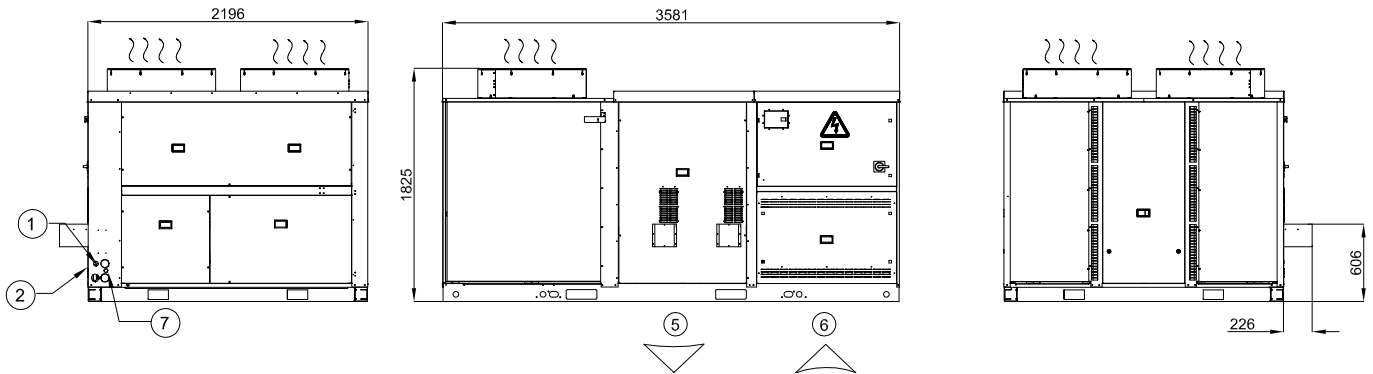
When designing an installation, always use up-to-date drawings, available from your local Carrier office.

Please refer to the certified dimensional drawings for the units with options such as economizer, power exhaust, air return fan, etc.

## 48UA-UH 100



## 48UA-UH 120



- Legend**
- ⚡ Control box
  - ① Control cable entry
  - ② Power cable entry
  - ③ Service clearances required
  - ④ Air flow clearances required
  - ⑤ Supply air
  - ⑥ Return air
  - ⑦ Gas inlet opening
  - ))) Air outlet, do not obstruct

When designing an installation, always use up-to-date drawings, available from your local Carrier office.

Please refer to the certified dimensional drawings for the units with options such as economizer, power exhaust, air return fan, etc.



## 5 - PHYSICAL DATA

### 5.1 - Physical data 48/50UA units

| 48/50UA                                  |                   | 045   | 055            | 065            | 075            | 085            | 100            | 120            |
|--|-------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Operating weight without option</b>   |                   |   |                |                |                |                |                |                |
| 48UA                                     | kg                | 815   | 955            | 1033           | 1043           | 1555           | 1645           | 1755           |
| 50UA                                     | kg                | 750   | 890            | 960            | 970            | 1420           | 1510           | 1600           |
| <b>Sound levels</b>                      |                   |   |                |                |                |                |                |                |
| Sound power level 10 <sup>-12</sup> W*   | dB(A)             | 86.5  | 84.4           | 90.6           | 90.6           | 90.7           | 91             | 91.3           |
| Sound pressure level at 10 m**           | dB(A)             | 55  | 53             | 59             | 59             | 59             | 59             | 59             |
| <b>Compressor type</b>                   |                   |   |                |                |                |                |                |                |
|  |                   | Hermetic scroll                               |                |                |                |                |                |                |
| Number, circuit A                        |                   | 1   | 2              | 1              | 1              | 1              | 2              | 2              |
| Number, circuit B                        |                   | -   | -              | 1              | 1              | 1              | 1              | 2              |
| No. of capacity steps                    |                   | 1   | 2              | 2              | 2              | 2              | 3              | 4              |
| <b>Oil type</b>                          |                   |   |                |                |                |                |                |                |
|  |                   | POE 160SZ                                     |                |                |                |                |                |                |
| Charge, circuit A                        | kg                | 3.6   | 6.6            | 3.3            | 3.3            | 3.3            | 6.6            | 6.6            |
| Charge, circuit B                        | kg                | -   | -              | 3.3            | 3.3            | 3.6            | 3.6            | 6.6            |
| <b>Refrigerant type</b>                  |                   |   |                |                |                |                |                |                |
|  |                   | R410A   |                |                |                |                |                |                |
| Charge, circuit A                        | kg                | 13  | 13             | 10             | 10             | 13             | 17.5           | 17.5           |
| Charge, circuit B                        | kg                | -   | -              | 11             | 11             | 14             | 14             | 19             |
| <b>Control type</b>                      |                   |   |                |                |                |                |                |                |
|  |                   | Pro-Dialog+                                   |                |                |                |                |                |                |
| Minimum capacity                         | %                 | 100   | 50             | 50             | 50             | 46             | 28             | 25             |
| <b>Indoor coil</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | Grooved copper tubes, aluminium fins          |                |                |                |                |                |                |
| Face area                                | m <sup>2</sup>    | 1.69  | 1.69           | 1.69           | 1.69           | 2.56           | 2.56           | 2.56           |
| No. of rows/fin spacing                  | mm                | 3 ... 1.81                                    | 3 ... 1.81     | 4 ... 1.81     | 4 ... 1.81     | 4 ... 1.7      | 4 ... 1.7      | 4 ... 1.6      |
| <b>Outdoor coil</b>                      |                   |   |                |                |                |                |                |                |
|  |                   | Grooved copper tubes, aluminium fins          |                |                |                |                |                |                |
| Face area                                | m <sup>2</sup>    | 2.06  | 2.06           | 2.78           | 2.78           | 3.46           | 4.28           | 5.08           |
| No. of rows/fin spacing                  | mm                | 3 ... 1.7                                     | 3 ... 1.7      | 3 ... 1.7      | 3 ... 1.7      | 4 ... 1.7      | 4 ... 1.7      | 4 ... 1.7      |
| <b>Indoor fan</b>                        |                   |   |                |                |                |                |                |                |
|  |                   | One, centrifugal                              |                |                |                |                |                |                |
| Nominal air flow                         | l/s               | 2528  | 3444           | 3472           | 3944           | 5550           | 5550           | 5550           |
|  | m <sup>3</sup> /h | 9100  | 12400          | 12500          | 14200          | 20000          | 20000          | 20000          |
| Nominal fan speed                        | r/s               | 16.07   | 18.48          | 19.13          | 20.13          | 13.18          | 13.18          | 13.18          |
| Nominal power input                      | kW                | 2.2   | 4.0            | 5.5            | 5.5            | 7.5            | 7.5            | 7.5            |
| Nominal external static pressure         | Pa                | 225   | 241            | 252            | 254            | 211            | 220            | 241            |
| <b>Outdoor fan</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | Axial Flying Bird 4 fans with rotating shroud |                |                |                |                |                |                |
| Quantity                                 |                   | 1   | 2              | 2              | 2              | 2              | 2              | 2              |
| Total air flow                           | l/s               | 5400  | 6700           | 10100          | 10100          | 10300          | 10600          | 10600          |
|  | m <sup>3</sup> /h | 19400   | 24100          | 36400          | 36400          | 37100          | 38200          | 39200          |
| Fan speed range (high/low)               | r/s               | 16.3/8.1                                      | 12.0/6.0       | 16.3/8.1       | 16.2/8.1       | 16.2/8.1       | 16.2/8.1       | 16.2/8.1       |
| Motor power input                        | kW                | 1.72  | 0.84           | 1.83           | 2.03           | 1.87           | 1.76           | 1.76           |
| <b>Air filters</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | G4  |                |                |                |                |                |                |
| Quantity                                 |                   | 6   | 6              | 6              | 6              | 9              | 9              | 9              |
| Filter size (width x height x thickness) | mm                | 595 x 495 x 50                                | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 |

\* In accordance with ISO 961461 and certified by Eurovent. The values have been rounded and are for information only.

\*\* For information. calculated from the sound power level Lw(A).

## 5.2 - Physical data 48/50UH units

| 48/50UH                                  |                   | 045   | 055            | 065            | 075            | 085            | 100            | 120            |
|--|-------------------|---|----------------|----------------|----------------|----------------|----------------|----------------|
| <b>Operating weight without option</b>   |                   |   |                |                |                |                |                |                |
| 48UH                                     | kg                | 820   | 965            | 1043           | 1053           | 1565           | 1655           | 1765           |
| 50UH                                     | kg                | 755   | 900            | 970            | 980            | 1430           | 1520           | 1610           |
| <b>Sound levels</b>                      |                   |   |                |                |                |                |                |                |
| Sound power level 10 <sup>-12</sup> W*   | dB(A)             | 86.5  | 84.4           | 90.6           | 90.6           | 90.7           | 91             | 91.3           |
| Sound pressure level at 10 m**           | dB(A)             | 55  | 53             | 59             | 59             | 59             | 59             | 59             |
| <b>Compressor type</b>                   |                   |   |                |                |                |                |                |                |
|  |                   | Hermetic scroll                               |                |                |                |                |                |                |
| Number, circuit A                        |                   | 1   | 2              | 1              | 1              | 1              | 2              | 2              |
| Number, circuit B                        |                   | -   | -              | 1              | 1              | 1              | 1              | 2              |
| No. of capacity steps                    |                   | 1   | 2              | 2              | 2              | 2              | 3              | 4              |
| <b>Oil type</b>                          |                   |   |                |                |                |                |                |                |
|  |                   | POE 160SZ                                     |                |                |                |                |                |                |
| Charge, circuit A                        | kg                | 3.6   | 6.6            | 3.3            | 3.3            | 3.3            | 6.6            | 6.6            |
| Charge, circuit B                        | kg                | -   | -              | 3.3            | 3.3            | 3.6            | 3.6            | 6.6            |
| <b>Refrigerant type</b>                  |                   |   |                |                |                |                |                |                |
|  |                   | R410A   |                |                |                |                |                |                |
| Charge, circuit A                        | kg                | 14  | 14             | 9              | 8.7            | 12             | 14.7           | 15             |
| Charge, circuit B                        | kg                | -   | -              | 10             | 9.7            | 13             | 13             | 15.5           |
| <b>Control type</b>                      |                   |   |                |                |                |                |                |                |
|  |                   | Pro-Dialog+                                   |                |                |                |                |                |                |
| Minimum capacity                         | %                 | 100   | 50             | 50             | 50             | 46             | 28             | 25             |
| <b>Indoor coil</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | Grooved copper tubes, aluminium fins          |                |                |                |                |                |                |
| Face area                                | m <sup>2</sup>    | 1.69  | 1.69           | 1.69           | 1.69           | 2.56           | 2.56           | 2.56           |
| No. of rows/fin spacing                  | mm                | 3 ... 1.81                                    | 3 ... 1.81     | 4 ... 1.81     | 4 ... 1.81     | 4 ... 1.7      | 4 ... 1.7      | 4 ... 1.6      |
| <b>Outdoor coil</b>                      |                   |   |                |                |                |                |                |                |
|  |                   | Grooved copper tubes, aluminium fins          |                |                |                |                |                |                |
| Face area                                | m <sup>2</sup>    | 2.06  | 2.06           | 2.78           | 2.78           | 3.46           | 4.28           | 5.08           |
| No. of rows/fin spacing                  | mm                | 3 ... 1.7                                     | 3 ... 1.7      | 3 ... 1.7      | 3 ... 1.7      | 4 ... 1.7      | 4 ... 1.7      | 4 ... 1.7      |
| <b>Indoor fan</b>                        |                   |   |                |                |                |                |                |                |
|  |                   | One, centrifugal                              |                |                |                |                |                |                |
| Nominal air flow                         | l/s               | 2528  | 3444           | 3472           | 3944           | 5550           | 5550           | 5550           |
|  | m <sup>3</sup> /h | 9100  | 12400          | 12500          | 14200          | 20000          | 20000          | 20000          |
| Nominal fan speed                        | r/s               | 16.07   | 18.48          | 19.13          | 20.13          | 13.18          | 13.18          | 13.18          |
| Nominal power input                      | kW                | 2.2   | 4.0            | 5.5            | 5.5            | 7.5            | 7.5            | 7.5            |
| Nominal external static pressure         | Pa                | 225   | 241            | 252            | 254            | 211            | 220            | 241            |
| <b>Outdoor fan</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | Axial Flying Bird 4 fans with rotating shroud |                |                |                |                |                |                |
| Quantity                                 |                   | 1   | 2              | 2              | 2              | 2              | 2              | 2              |
| Total air flow                           | l/s               | 5400  | 6700           | 10100          | 10100          | 10300          | 10600          | 10600          |
|  | m <sup>3</sup> /h | 19400   | 24100          | 36400          | 36400          | 37100          | 38200          | 39200          |
| Fan speed range (high/low)               | r/s               | 16.3/8.1                                      | 12.0/6.0       | 16.3/8.1       | 16.2/8.1       | 16.2/8.1       | 16.2/8.1       | 16.2/8.1       |
| Motor power input                        | kW                | 1.72  | 0.84           | 1.83           | 2.03           | 1.87           | 1.76           | 1.76           |
| <b>Air filters</b>                       |                   |   |                |                |                |                |                |                |
|  |                   | G4  | G4             | G4             | G4             | G4             | G4             | G4             |
| Quantity                                 |                   | 6   | 6              | 6              | 6              | 9              | 9              | 9              |
| Filter size (width x height x thickness) | mm                | 595 x 495 x 50                                | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 | 595 x 495 x 50 |

\* In accordance with ISO 961461 and certified by Eurovent. The values have been rounded and are for information only.

\*\* For information. calculated from the sound power level Lw(A).

## 5.3 - Gas burner data

| Gas burners (48UA/UH only)                    |                   | 5 cells    | 6 cells    | 7 cells    | 5 + 5 cells | 6 + 6 cells | 7 + 7 cells |
|---|-------------------|------------|------------|------------|-------------|-------------|-------------|
| <b>Natural gas heating</b>                    |                   |            |            |            |             |             |             |
|   |                   | Option 90  | Option 91  | Option 92  | Option 93   | Option 94   | Option 95   |
| Net heat input (min./max.)                    | kW                | 35.4/52.6  | 48.6/69.4  | 56.7/81.0  | 35.4/105.2  | 48.6/138.8  | 56.7/162.0  |
| Heat output (min./max.)                       | kW                | 30.8/46.8  | 41.8/61.8  | 49.9/72.9  | 30.8/93.6   | 42.8/125.0  | 50.5/147.4  |
| Natural gas ( G20 ) - rate*                   | l/s               | 1.04/1.55  | 1.43/2.04  | 1.67/2.38  | 1.04/3.09   | 1.43/4.08   | 1.67/4.76   |
|   | m <sup>3</sup> /h | 3.74/5.57  | 5.14/7.34  | 6.00/8.57  | 3.74/11.13  | 5.14/14.7   | 6.00/17.14  |
| Natural gas ( G25 ) - rate*                   | l/s               | 1.21/1.80  | 1.66/2.37  | 1.94/2.77  | 1.21/3.60   | 1.66/4.74   | 1.94/5.54   |
|   | m <sup>3</sup> /h | 4.36/6.47  | 5.98/8.54  | 6.98/9.97  | 4.36/12.95  | 5.98/17.08  | 6.97/19.94  |
| Natural gas ( G25.1 ) - rate*                 | l/s               | 1.21/1.79  | 1.66/2.37  | 1.94/2.77  | 1.21/3.59   | 1.66/4.74   | 1.93/5.54   |
|   | m <sup>3</sup> /h | 4.34/6.46  | 5.97/8.53  | 5.97/9.96  | 4.34/12.94  | 5.97/17.07  | 6.96/19.93  |
| Injectors, quantity ... size                  | mm                | 5 ... 3.26 | 6 ... 3.45 | 7 ... 3.45 | 10 ... 3.26 | 12 ... 3.45 | 14 ... 3.45 |
| <b>Propane gas heating</b>                    |                   |            |            |            |             |             |             |
|   |                   | Option 100 | Option 101 | Option 102 | Option 103  | Option 104  | Option 105  |
| Net heat input (min./max.)                    | kW                | -/59.1     | -/71.0     | -/82.8     | 59.1 /118.2 | 71.0/142.0  | 82.8/165.6  |
| Heat output (min./max.)                       | kW                | -/53.2     | -/63.9     | -/74.5     | 52.6/105.2  | 63.9/127.8  | 75.3/150.7  |
| Propane gas ( G31 ) rate*                     | kg/h              | -/4.59     | -/5.51     | -/6.43     | 4.59/9.18   | 5.51/11.03  | 6.43/12.86  |
|   | l/s               | -/0.67     | -/0.81     | -/0.94     | 0.67/1.34   | 0.81/1.61   | 0.94/1.88   |
|   | m <sup>3</sup> /h | -/2.42     | -/2.90     | -/3.39     | 2.42/4.83   | 2.90/5.81   | 3.39/6.77   |
| Injectors, quantity ... size                  | mm                | 5 ... 1.9  | 6 ... 1.9  | 7 ... 1.9  | 10 ... 1.9  | 12 ... 1.9  | 14 ... 1.9  |
| <b>Weight**</b>                               | kg                | 65         | 73         | 80         | 135         | 150         | 165         |
| <b>Power consumption** (400 V-3 ph-50 Hz)</b> | kW                | 0.22       | 0.22       | 0.22       | 0.44        | 0.44        | 0.44        |
| <b>Gas connection (female)</b>                | in                | Rp 3/4     | Rp 3/4     | Rp 3/4     | Rp 3/4      | Rp 3/4      | Rp 3/4      |

\* Natural gas G20 net calorific value 34.02 MJ/m<sup>3</sup> at 15°C. 1013.25 mbar.  
Natural gas G25 net calorific value 29.25 MJ/m<sup>3</sup> at 15°C. 1013.25 mbar.  
Natural gas G25.1 net calorific value 29.3 MJ/m<sup>3</sup> at 15°C. 1013.25 mbar.  
Propane gas G31 net calorific value 46.34 MJ/kg at 15°C. 1013.25 mbar.  
Propane gas G31 net calorific value 88.0 MJ/m<sup>3</sup> at 15°C. 1013.25 mbar.

\*\* Weight and power input values are valid for the heating modules.

## 6 - ELECTRICAL DATA

### 6.1 - Electrical data 48/50UA units

| 48/50UA*  |         | 045  | 055   | 065   | 075   | 085   | 100   | 120    |
|---|---------|--|-------|-------|-------|-------|-------|--------|
| <b>Power circuit</b>                            |         |  |       |       |       |       |       |        |
| Nominal power supply                            | V-ph-Hz | 400-3-50   |       |       |       |       |       |        |
| Voltage range                                   | V       | 360-440  |       |       |       |       |       |        |
| <b>Control circuit supply</b>                   |         | 24V, via internal transformer                      |       |       |       |       |       |        |
| <b>Maximum start-up current**</b>               | A       | 206  | 173   | 183   | 204   | 246   | 261   | 226    |
| <b>Unit power factor at maximum capacity***</b> |         | 0.82   | 0.81  | 0.81  | 0.84  | 0.84  | 0.83  | 0.83   |
| <b>Maximum unit power input***</b>              | kW      | 21.68  | 27.41 | 33.52 | 40.50 | 44.58 | 52.98 | 59.38  |
| <b>Nominal unit current draw****</b>            | A       | 28.73  | 36.76 | 43.00 | 52.12 | 55.97 | 66.55 | 77.79  |
| <b>Maximum unit current draw†</b>               | A       | 38.20  | 49.10 | 60.10 | 69.80 | 77.00 | 92.20 | 103.10 |
| <b>Customer-side unit power reserve</b>         |         | Customer reserve at the 24 V control power circuit |       |       |       |       |       |        |

### 6.2 - Electrical data 48/50UH units

| 48/50UH*  |         | 045  | 055   | 065   | 075   | 085   | 100   | 120    |
|---|---------|--|-------|-------|-------|-------|-------|--------|
| <b>Power circuit</b>                            |         |  |       |       |       |       |       |        |
| Nominal power supply                            | V-ph-Hz | 400-3-50   |       |       |       |       |       |        |
| Voltage range                                   | V       | 360-440  |       |       |       |       |       |        |
| <b>Control circuit supply</b>                   |         | 24V, via internal transformer                      |       |       |       |       |       |        |
| <b>Maximum start-up current**</b>               | A       | 206  | 173   | 183   | 204   | 246   | 261   | 226    |
| <b>Unit power factor at maximum capacity***</b> |         | 0.82   | 0.81  | 0.81  | 0.84  | 0.84  | 0.83  | 0.83   |
| <b>Maximum unit power input***</b>              | kW      | 21.68  | 27.41 | 33.52 | 40.50 | 44.58 | 52.98 | 59.38  |
| <b>Nominal unit current draw****</b>            | A       | 28.74  | 36.51 | 42.13 | 51.39 | 54.08 | 65.93 | 77.11  |
| <b>Maximum unit current draw†</b>               | A       | 38.20  | 49.10 | 60.10 | 69.80 | 77.00 | 92.20 | 103.10 |
| <b>Customer-side unit power reserve</b>         |         | Customer reserve at the 24 V control power circuit |       |       |       |       |       |        |

\* Standard unit without options and accessories.

\*\* Maximum instantaneous start-up current at operating limit values (maximum operating current of the smallest compressor(s) + fan current + locked rotor current of the largest compressor).

\*\*\* Power input, compressors and fans, at their operating limits and nominal voltage of 400 V (data given on the unit nameplate).

\*\*\*\* Standardised Eurovent conditions: indoor air wet bulb 19°C, outside air temperature 35°C with standard fan performance.

† Maximum unit operating current at maximum unit power input and 400 V (values given on the unit nameplate).

#### Electrical data notes and operating conditions

- 48/50UA-UH units have a single power connection point located at the main switch.
- The control box includes the following standard features:**
  - a main disconnect switch,
  - starter and motor protection devices for each compressor, fans and electric heater option,
  - the control devices.
- Field connections:**
  - All connections to the system and the electrical installations must be in full accordance with all applicable local codes.
  - The Carrier 48/50UA-UH units are designed and built to ensure conformance with these codes.
  - The recommendations of European standard EN 60204-1 (machine safety - electrical machine components. part 1: general regulations - corresponds to IEC 60204-1) are specifically taken into account, when designing the electrical equipment.

#### Notes:

- Generally the recommendations of IEC 60364 are accepted as compliance with the requirements of the installation directives. Conformance with EN 60204 is the best means of ensuring compliance with the Machines Directive §1.5.1.
- Annex B of EN 60204-1 describes the electrical characteristics used for the operation of the machines.

- The operating environment is specified below:
  - Environment - Environment as classified in EN 60721 (corresponds to IEC 60721):
    - outdoor installation (IP43),
    - ambient temperature range: -10°C to +48°C,
    - altitude: ≤ 2000 m,
  - Competence of personnel. class BA4 (trained personnel - IEC 60364)
  - Power supply frequency variation: ± 2 Hz.
  - The neutral (N) conductor must not be connected directly to the unit (if necessary use a transformer).
  - Overcurrent protection of the power supply conductors is not provided with the unit.
  - The factory-installed disconnect switch(es)/circuit breaker(s) is(are) of a type suitable for power interruption in accordance with EN 60947.
  - The units are designed for connection to TN networks (IEC 60364). For IT networks the earth connection must not be at the network earth. Provide a local earth, consult competent local organisations to complete the electrical installation.

#### CAUTION:

**If particular aspects of an actual installation do not conform to the conditions described above, or if there are other conditions which should be considered, always contact your local Carrier representative.**

## 7- APPLICATION DATA

### 7.1 – Belt tension

On delivery, the drive belts are new and correctly tensioned. After the belts have run-in, stop the belt drive and check the belt tension. Running the belts under full load for an extended period of time will seat the V-belts into the sheave grooves. V-belt tension will drop after the initial run-in and seating process. This is normal. Adjust the belt tension as necessary.

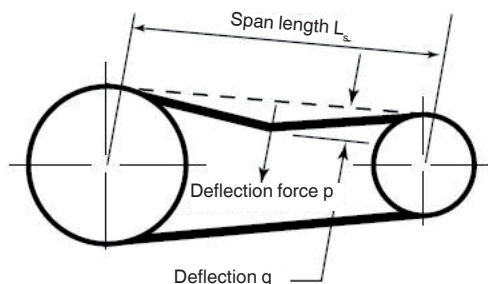
Since tension in V-belts will drop after the initial run-in and seating process, failure to check and re-tension the belt will result in low belt tension and belt slippage. This slippage will result in premature belt failure. Before adjusting the tension, make sure that the pulleys are correctly aligned.

#### Belt tension adjustment (Fig. 8)

1. Measure the span length ( $L_s$ ).
2. Measure the deflection force ( $p$ ) from the middle of the span in order to have a deflection ( $q$ ) of 1 mm per 100 mm of span length from its normal position.
3. The measured deflection force should be between 19 N and 28 N. If it is less than 19 N, tighten the belt. If it is more than 28 N, loosen the belt.

See chapter 7.10 for further information on indoor fan air flow adjustment.

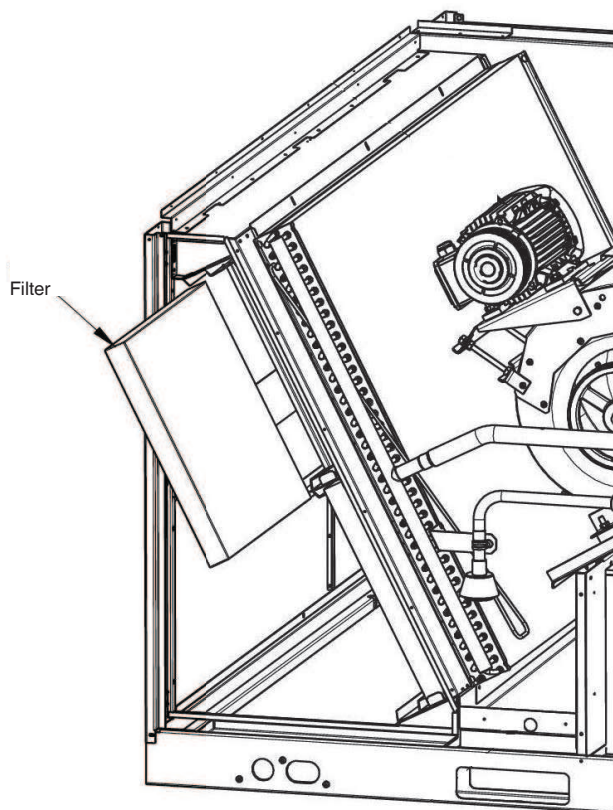
**Fig. 6 - Belt tension**



### 7.2 – Air filter replacement

Open the filter access panel, then remove and replace the filters by sliding them from the rails. Check the filter fire classification according to local regulations.

**Fig. 7 – Filter replacement**



## 7.3 - Fan performances, 48/50UA-UH 045

| 48/50UA-UH 045 - unit with standard static pressure |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|---|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow  |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|   |       | 50                           |       | 75    |       | 100   |       | 125   |       | 150   |       | 175   |       |
| l/s   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2000  | 7200  | -                            | -     | -     | -     | 11.23 | 0.758 | 12.10 | 0.851 | 12.93 | 0.948 | 13.73 | 1.050 |
| 2100  | 7560  | -                            | -     | 10.70 | 0.755 | 11.55 | 0.848 | 12.37 | 0.944 | 13.18 | 1.045 | 13.97 | 1.149 |
| 2200  | 7920  | -                            | -     | 11.05 | 0.849 | 11.87 | 0.944 | 12.67 | 1.044 | 13.43 | 1.148 | 14.20 | 1.255 |
| 2300  | 8280  | 10.60                        | 0.856 | 11.38 | 0.949 | 12.17 | 1.048 | 12.95 | 1.151 | 13.70 | 1.258 | 14.43 | 1.369 |
| 2400  | 8640  | 11.00                        | 0.963 | 11.77 | 1.062 | 12.52 | 1.164 | 13.27 | 1.269 | 13.98 | 1.379 | 14.70 | 1.493 |
| 2500  | 9000  | 11.40                        | 1.081 | 12.13 | 1.182 | 12.87 | 1.287 | 13.58 | 1.396 | 14.28 | 1.510 | 14.97 | 1.627 |
| 2600  | 9360  | 11.83                        | 1.210 | 12.53 | 1.315 | 13.23 | 1.424 | 13.92 | 1.536 | 14.60 | 1.652 | 15.27 | 1.773 |
| 2700  | 9720  | 12.22                        | 1.344 | 12.90 | 1.451 | 13.57 | 1.564 | 14.23 | 1.680 | 14.90 | 1.799 | 15.55 | 1.922 |
| 2800  | 10080 | 12.63                        | 1.489 | 13.28 | 1.602 | 13.93 | 1.718 | 14.58 | 1.836 | 15.22 | 1.959 | 15.85 | 2.086 |
| 2900  | 10440 | 13.03                        | 1.646 | 13.67 | 1.761 | 14.30 | 1.880 | 14.92 | 2.002 | 15.53 | 2.129 | 16.15 | 2.258 |
| 3000  | 10800 | 13.47                        | 1.816 | 14.07 | 1.935 | 14.68 | 2.057 | 15.28 | 2.184 | 15.88 | 2.313 | 16.48 | 2.446 |
| 3100  | 11160 | 13.88                        | 1.996 | 14.47 | 2.119 | 15.07 | 2.245 | 15.65 | 2.374 | 16.23 | 2.507 | 16.80 | 2.643 |

| 48/50UA-UH 045 - unit with high static pressure H1 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 175                          |       | 200   |       | 225   |       | 250   |       | 275   |       | 300   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2000   | 7200  | 13.73                        | 1.042 | 14.52 | 1.147 | 15.27 | 1.253 | 16.00 | 1.363 | 16.70 | 1.474 | 17.38 | 1.589 |
| 2100   | 7560  | 13.97                        | 1.141 | 14.73 | 1.247 | 15.47 | 1.358 | 16.17 | 1.471 | 16.87 | 1.586 | 17.53 | 1.703 |
| 2200   | 7920  | 14.20                        | 1.246 | 14.93 | 1.357 | 15.65 | 1.469 | 16.35 | 1.585 | 17.03 | 1.703 | 17.68 | 1.824 |
| 2300   | 8280  | 14.43                        | 1.359 | 15.15 | 1.472 | 15.85 | 1.588 | 16.53 | 1.707 | 17.20 | 1.828 | 17.83 | 1.951 |
| 2400   | 8640  | 14.70                        | 1.483 | 15.40 | 1.599 | 16.08 | 1.718 | 16.75 | 1.840 | 17.40 | 1.964 | 18.03 | 2.091 |
| 2500   | 9000  | 14.97                        | 1.615 | 15.65 | 1.734 | 16.32 | 1.856 | 16.97 | 1.981 | 17.60 | 2.109 | 18.22 | 2.240 |
| 2600   | 9360  | 15.27                        | 1.760 | 15.93 | 1.883 | 16.58 | 2.007 | 17.22 | 2.135 | 17.83 | 2.267 | 18.43 | 2.400 |
| 2700   | 9720  | 15.55                        | 1.909 | 16.18 | 2.033 | 16.82 | 2.163 | 17.43 | 2.293 | 18.03 | 2.427 | 18.63 | 2.564 |
| 2800   | 10080 | 15.85                        | 2.071 | 16.47 | 2.199 | 17.08 | 2.331 | 17.68 | 2.465 | 18.27 | 2.602 | 18.85 | 2.742 |
| 2900   | 10440 | 16.15                        | 2.242 | 16.75 | 2.374 | 17.35 | 2.508 | 17.93 | 2.646 | 18.52 | 2.786 | 19.08 | 2.928 |
| 3000   | 10800 | 16.48                        | 2.429 | 17.07 | 2.563 | 17.65 | 2.700 | 18.22 | 2.842 | 18.78 | 2.984 | 19.33 | 3.130 |
| 3100   | 11160 | 16.80                        | 2.624 | 17.37 | 2.762 | 17.93 | 2.903 | 18.50 | 3.047 | 19.05 | 3.193 | 19.58 | 3.341 |

| 48/50UA-UH 045 - Unit with high static pressure H2 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 275                          |       | 300   |       | 325   |       | 350   |       | 375   |       | 400   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2000   | 7200  | 16.45                        | 1.515 | 17.05 | 1.609 | 17.63 | 1.704 | 18.20 | 1.802 | 18.77 | 1.901 | 19.30 | 2.002 |
| 2100   | 7560  | 16.68                        | 1.653 | 17.27 | 1.751 | 17.83 | 1.849 | 18.40 | 1.949 | 18.93 | 2.050 | 19.48 | 2.154 |
| 2200   | 7920  | 16.93                        | 1.802 | 17.50 | 1.901 | 18.05 | 2.003 | 18.60 | 2.106 | 19.13 | 2.211 | 19.65 | 2.317 |
| 2300   | 8280  | 17.20                        | 1.961 | 17.75 | 2.063 | 18.28 | 2.168 | 18.80 | 2.273 | 19.33 | 2.381 | 19.83 | 2.490 |
| 2400   | 8640  | 17.48                        | 2.134 | 18.02 | 2.239 | 18.53 | 2.346 | 19.05 | 2.456 | 19.55 | 2.565 | 20.05 | 2.677 |
| 2500   | 9000  | 17.78                        | 2.320 | 18.30 | 2.428 | 18.80 | 2.537 | 19.30 | 2.649 | 19.80 | 2.762 | 20.28 | 2.877 |
| 2600   | 9360  | 18.10                        | 2.520 | 18.60 | 2.632 | 19.10 | 2.745 | 19.58 | 2.859 | 20.07 | 2.976 | 20.53 | 3.092 |
| 2700   | 9720  | 18.42                        | 2.729 | 18.90 | 2.843 | 19.37 | 2.959 | 19.85 | 3.077 | 20.32 | 3.196 | 20.78 | 3.316 |
| 2800   | 10080 | 18.75                        | 2.955 | 19.22 | 3.072 | 19.68 | 3.191 | 20.13 | 3.311 | 20.60 | 3.433 | 21.05 | 3.556 |
| 2900   | 10440 | 19.08                        | 3.195 | 19.53 | 3.315 | 19.98 | 3.436 | 20.43 | 3.559 | 20.88 | 3.684 | 21.33 | 3.810 |
| 3000   | 10800 | 19.45                        | 3.452 | 19.88 | 3.574 | 20.33 | 3.699 | 20.77 | 3.826 | 21.20 | 3.953 | 21.62 | 4.082 |
| 3100   | 11160 | 19.80                        | 3.724 | 20.23 | 3.849 | 20.67 | 3.977 | 21.08 | 4.107 | 21.52 | 4.237 | 21.93 | 4.369 |

| 48/50UA-UH 045 - Unit with high static pressure H3 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 375                          |       | 405   |       | 435   |       | 465   |       | 495   |       | 525   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2000   | 7200  | 18.77                        | 1.901 | 19.42 | 2.021 | 20.05 | 2.144 | 20.68 | 2.268 | 21.30 | 2.394 | 21.88 | 2.522 |
| 2100   | 7560  | 18.93                        | 2.050 | 19.58 | 2.175 | 20.22 | 2.301 | 20.82 | 2.429 | 21.43 | 2.558 | 22.02 | 2.690 |
| 2200   | 7920  | 19.13                        | 2.211 | 19.75 | 2.338 | 20.37 | 2.468 | 20.98 | 2.599 | 21.57 | 2.732 | 22.15 | 2.867 |
| 2300   | 8280  | 19.33                        | 2.381 | 19.93 | 2.512 | 20.55 | 2.645 | 21.13 | 2.780 | 21.72 | 2.916 | 22.28 | 3.055 |
| 2400   | 8640  | 19.55                        | 2.565 | 20.15 | 2.701 | 20.75 | 2.837 | 21.32 | 2.974 | 21.90 | 3.115 | 22.45 | 3.257 |
| 2500   | 9000  | 19.80                        | 2.762 | 20.38 | 2.900 | 20.95 | 3.040 | 21.52 | 3.182 | 22.08 | 3.325 | 22.63 | 3.471 |
| 2600   | 9360  | 20.07                        | 2.976 | 20.63 | 3.117 | 21.20 | 3.260 | 21.75 | 3.404 | 22.30 | 3.552 | 22.83 | 3.700 |
| 2700   | 9720  | 20.32                        | 3.196 | 20.87 | 3.340 | 21.42 | 3.487 | 21.97 | 3.635 | 22.50 | 3.785 | 23.02 | 3.938 |
| 2800   | 10080 | 20.60                        | 3.433 | 21.13 | 3.581 | 21.67 | 3.730 | 22.20 | 3.883 | 22.73 | 4.037 | 23.23 | 4.193 |
| 2900   | 10440 | 20.88                        | 3.684 | 21.42 | 3.835 | 21.93 | 3.989 | 22.45 | 4.144 | 22.97 | 4.301 | 23.47 | 4.461 |
| 3000   | 10800 | 21.20                        | 3.953 | 21.72 | 4.108 | 22.22 | 4.265 | 22.72 | 4.424 | 23.22 | 4.584 | 23.72 | 4.748 |
| 3100   | 11160 | 21.52                        | 4.237 | 22.02 | 4.396 | 22.52 | 4.555 | 23.00 | 4.718 | 23.48 | 4.883 | 23.97 | 5.049 |

|   |                  |
|---|------------------|
|  | Undersized drive |
|  | Oversized drive  |

### 7.3.1 - Fan speed (approximate) at various motor pulley settings, 48/50UA-UH 045

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |      |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|------|
| Drive                   | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 | 5    |
| Standard                | 16.1 | 15.8 | 15.6 | 15.4  | 15.1 | 14.9  | 14.7 | 14.4  | 14.2 | 14.0  | 13.7 |
| HS1                     | 19.9 | 19.7 | 19.4 | 19.1  | 18.8 | 18.5  | 18.2 | 17.9  | 17.6 | 17.3  | 17.0 |
| HS2                     | 21.8 | 21.5 | 21.2 | 21.0  | 20.7 | 20.4  | 20.2 | 19.9  | 19.7 | 19.4  | 19.2 |
| HS3                     | 24.2 | 23.8 | 23.5 | 23.1  | 22.8 | 22.4  | 22.1 | 21.7  | 21.4 | 21.0  | 20.7 |

NOTE: Factory settings are shaded.



7.4 - Fan performances, 48/50UA-UH 055

| 48/50UA-UH 055 - Unit with standard static pressure |       |                              |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow  |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |       |       |
|   |       | 50                           |       | 80    |       | 110   |       | 140   |       | 170   |       | 200   |       | 230   |       |
| l/s   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700  | 9720  | 12.22                        | 1.310 | 13.03 | 1.437 | 13.83 | 1.569 | 14.63 | 1.707 | 15.42 | 1.849 | 16.18 | 1.996 | 16.93 | 2.147 |
| 2850  | 10260 | 12.83                        | 1.527 | 13.60 | 1.660 | 14.37 | 1.799 | 15.13 | 1.942 | 15.88 | 2.090 | 16.62 | 2.243 | 17.33 | 2.400 |
| 3000  | 10800 | 13.47                        | 1.770 | 14.20 | 1.910 | 14.92 | 2.054 | 15.65 | 2.203 | 16.37 | 2.357 | 17.07 | 2.515 | 17.75 | 2.678 |
| 3150  | 11340 | 14.07                        | 2.034 | 14.77 | 2.181 | 15.47 | 2.331 | 16.17 | 2.486 | 16.83 | 2.646 | 17.52 | 2.810 | 18.18 | 2.978 |
| 3300  | 11880 | 14.70                        | 2.327 | 15.37 | 2.479 | 16.03 | 2.637 | 16.68 | 2.797 | 17.35 | 2.963 | 18.00 | 3.132 | 18.63 | 3.305 |
| 3450  | 12420 | 15.32                        | 2.644 | 15.95 | 2.802 | 16.58 | 2.965 | 17.22 | 3.132 | 17.85 | 3.303 | 18.47 | 3.479 | 19.08 | 3.657 |
| 3600  | 12960 | 15.93                        | 2.991 | 16.55 | 3.155 | 17.15 | 3.324 | 17.77 | 3.497 | 18.37 | 3.675 | 18.97 | 3.855 | 19.57 | 4.039 |
| 3750  | 13500 | 16.55                        | 3.362 | 17.13 | 3.534 | 17.72 | 3.708 | 18.30 | 3.888 | 18.88 | 4.071 | 19.47 | 4.257 | 20.03 | 4.448 |
| 3900  | 14040 | 17.15                        | 3.762 | 17.72 | 3.939 | 18.27 | 4.121 | 18.83 | 4.306 | 19.40 | 4.495 | 19.95 | 4.687 | 20.50 | 4.883 |
| 4050  | 14580 | 17.75                        | 4.195 | 18.30 | 4.379 | 18.85 | 4.566 | 19.38 | 4.757 | 19.93 | 4.951 | 20.47 | 5.150 | 21.00 | 5.351 |
| 4200  | 15120 | 18.35                        | 4.658 | 18.88 | 4.847 | 19.40 | 5.040 | 19.93 | 5.237 | 20.45 | 5.438 | 20.97 | 5.642 | 21.48 | 5.850 |
| 4350  | 15660 | 18.97                        | 5.155 | 19.48 | 5.351 | 19.98 | 5.551 | 20.48 | 5.754 | 21.00 | 5.960 | 21.50 | 6.170 | 22.00 | 6.383 |

| 48/50UA-UH 055 - Unit with high static pressure H1 |       |                              |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 100                          |       | 150   |       | 200   |       | 250   |       | 300   |       | 350   |       | 400   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 11.00                        | 1.327 | 12.15 | 1.552 | 13.25 | 1.787 | 14.28 | 2.032 | 15.28 | 2.284 | 16.22 | 2.542 | 17.12 | 2.807 |
| 2850   | 10260 | 11.43                        | 1.522 | 12.53 | 1.756 | 13.58 | 2.000 | 14.60 | 2.256 | 15.55 | 2.517 | 16.47 | 2.786 | 17.35 | 3.061 |
| 3000   | 10800 | 11.88                        | 1.737 | 12.93 | 1.982 | 13.93 | 2.237 | 14.92 | 2.500 | 15.85 | 2.773 | 16.75 | 3.051 | 17.60 | 3.337 |
| 3150   | 11340 | 12.32                        | 1.971 | 13.32 | 2.225 | 14.30 | 2.490 | 15.23 | 2.764 | 16.15 | 3.045 | 17.02 | 3.334 | 17.87 | 3.629 |
| 3300   | 11880 | 12.77                        | 2.229 | 13.73 | 2.492 | 14.67 | 2.767 | 15.58 | 3.050 | 16.47 | 3.343 | 17.32 | 3.641 | 18.13 | 3.946 |
| 3450   | 12420 | 13.22                        | 2.506 | 14.13 | 2.780 | 15.03 | 3.063 | 15.92 | 3.357 | 16.77 | 3.658 | 17.60 | 3.966 | 18.40 | 4.282 |
| 3600   | 12960 | 13.67                        | 2.809 | 14.55 | 3.092 | 15.43 | 3.386 | 16.28 | 3.689 | 17.10 | 4.000 | 17.92 | 4.318 | 18.70 | 4.643 |
| 3750   | 13500 | 14.12                        | 3.134 | 14.97 | 3.426 | 15.82 | 3.730 | 16.63 | 4.043 | 17.45 | 4.363 | 18.23 | 4.691 | 18.98 | 5.025 |
| 3900   | 14040 | 14.57                        | 3.480 | 15.38 | 3.899 | 16.20 | 4.095 | 17.00 | 4.418 | 17.78 | 4.748 | 18.53 | 5.085 | 19.28 | 5.429 |
| 4050   | 14580 | 15.02                        | 3.855 | 15.82 | 4.167 | 16.60 | 4.490 | 17.37 | 4.821 | 18.13 | 5.161 | 18.87 | 5.508 | 19.60 | 5.861 |
| 4200   | 15120 | 15.47                        | 4.255 | 16.23 | 4.576 | 17.00 | 4.908 | 17.75 | 5.250 | 18.48 | 5.598 | 19.20 | 5.955 | 19.92 | 6.318 |
| 4350   | 15660 | 15.92                        | 4.685 | 16.67 | 5.016 | 17.40 | 5.358 | 18.13 | 5.708 | 18.85 | 6.066 | 19.55 | 6.432 | 20.23 | 6.805 |

| 48/50UA-UH 055 - Unit with high static pressure H2 |       |                              |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 330                          |       | 360   |       | 390   |       | 420   |       | 450   |       | 480   |       | 510   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 15.85                        | 2.437 | 16.40 | 2.595 | 16.95 | 2.753 | 17.47 | 2.914 | 17.98 | 3.077 | 18.47 | 3.241 | 18.95 | 3.408 |
| 2850   | 10260 | 16.12                        | 2.677 | 15.65 | 2.840 | 17.18 | 3.005 | 17.70 | 3.172 | 18.20 | 3.341 | 18.68 | 3.511 | 19.17 | 3.684 |
| 3000   | 10800 | 16.38                        | 2.939 | 16.92 | 3.107 | 17.43 | 3.278 | 17.93 | 3.452 | 18.43 | 3.627 | 18.92 | 3.804 | 19.38 | 3.982 |
| 3150   | 11340 | 16.67                        | 3.218 | 17.18 | 3.393 | 17.70 | 3.570 | 18.18 | 3.748 | 18.67 | 3.930 | 19.15 | 4.113 | 19.60 | 4.297 |
| 3300   | 11880 | 16.97                        | 3.521 | 17.48 | 3.701 | 17.97 | 3.884 | 18.45 | 4.070 | 18.93 | 4.256 | 19.38 | 4.446 | 19.85 | 4.636 |
| 3450   | 12420 | 17.27                        | 3.842 | 17.77 | 4.029 | 18.25 | 4.217 | 18.72 | 4.409 | 19.18 | 4.602 | 19.63 | 4.797 | 20.08 | 4.993 |
| 3600   | 12960 | 17.60                        | 4.190 | 18.07 | 4.383 | 18.55 | 4.577 | 19.00 | 4.774 | 19.47 | 4.974 | 19.90 | 5.174 | 20.35 | 5.378 |
| 3750   | 13500 | 17.92                        | 4.559 | 18.38 | 4.757 | 18.83 | 4.957 | 19.28 | 5.161 | 19.73 | 5.366 | 20.17 | 5.572 | 20.60 | 5.781 |
| 3900   | 14040 | 18.23                        | 4.949 | 18.68 | 5.153 | 19.13 | 5.359 | 19.58 | 5.568 | 20.02 | 5.779 | 20.45 | 5.992 | 20.87 | 6.206 |
| 4050   | 14580 | 18.58                        | 5.369 | 19.02 | 5.578 | 19.45 | 5.790 | 19.88 | 6.005 | 20.32 | 6.221 | 20.73 | 6.440 | 21.13 | 6.661 |
| 4200   | 15120 | 18.92                        | 5.811 | 19.35 | 6.027 | 19.77 | 6.245 | 20.18 | 6.465 | 20.60 | 6.687 | 21.02 | 6.912 | 21.42 | 7.138 |
| 4350   | 15660 | 19.27                        | 6.285 | 19.68 | 6.507 | 20.10 | 6.731 | 20.52 | 6.957 | 20.92 | 7.185 | 21.32 | 7.414 | 21.72 | 7.647 |

| 48/50UA-UH 055 - Unit with high static pressure H3 |       |                              |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 400                          |       | 440   |       | 480   |       | 520   |       | 560   |       | 600   |       | 640   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 17.12                        | 2.730 | 17.80 | 2.940 | 18.47 | 3.153 | 19.07 | 3.353 | 19.73 | 3.589 | 20.33 | 3.811 | 20.93 | 4.036 |
| 2850   | 10260 | 17.35                        | 2.977 | 18.03 | 3.195 | 18.68 | 3.416 | 19.32 | 3.640 | 19.93 | 3.867 | 20.53 | 4.097 | 21.12 | 4.331 |
| 3000   | 10800 | 17.60                        | 3.245 | 18.27 | 3.471 | 18.92 | 3.700 | 19.53 | 3.932 | 20.15 | 4.167 | 20.73 | 4.405 | 21.32 | 4.646 |
| 3150   | 11340 | 17.87                        | 3.530 | 18.52 | 3.764 | 19.15 | 4.001 | 19.75 | 4.241 | 20.35 | 4.484 | 20.93 | 4.730 | 21.50 | 4.978 |
| 3300   | 11880 | 18.13                        | 3.839 | 18.77 | 4.079 | 19.38 | 4.324 | 20.00 | 4.572 | 20.58 | 4.824 | 21.15 | 5.077 | 21.72 | 5.334 |
| 3450   | 12420 | 18.40                        | 4.165 | 19.03 | 4.413 | 19.63 | 4.666 | 20.23 | 4.922 | 20.82 | 5.181 | 21.38 | 5.443 | 21.93 | 5.707 |
| 3600   | 12960 | 18.70                        | 4.517 | 19.30 | 4.774 | 19.90 | 5.033 | 20.48 | 5.298 | 21.05 | 5.564 | 21.62 | 5.834 | 22.17 | 6.106 |
| 3750   | 13500 | 18.98                        | 4.888 | 19.58 | 5.154 | 20.17 | 5.421 | 20.75 | 5.692 | 21.30 | 5.967 | 21.85 | 6.244 | 22.38 | 6.524 |
| 3900   | 14040 | 19.28                        | 5.282 | 19.87 | 5.554 | 20.45 | 5.829 | 21.00 | 6.108 | 21.55 | 6.391 | 22.10 | 6.675 | 22.62 | 6.963 |
| 4050   | 14580 | 19.60                        | 5.702 | 20.17 | 5.982 | 20.73 | 6.266 | 21.28 | 6.553 | 21.82 | 6.842 | 22.35 | 7.135 | 22.87 | 7.430 |
| 4200   | 15120 | 19.92                        | 6.147 | 20.47 | 6.434 | 21.02 | 6.724 | 21.55 | 7.019 | 22.08 | 7.316 | 22.60 | 7.616 | 23.12 | 7.920 |
| 4350   | 15660 | 20.23                        | 6.621 | 20.78 | 6.915 | 21.32 | 7.214 | 21.85 | 7.515 | 22.37 | 7.820 | 22.88 | 8.128 | 23.38 | 8.439 |

|  |                  |
|--|------------------|
|  | Undersized drive |
|  | Oversized drive  |

7.4.1 - Fan speed (approximate) at various motor pulley settings, 48/50UA-UH 055

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|
| Drive                   | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 |
| Standard                | 19.4 | 19.2 | 19.0 | 18.7  | 18.5 | 18.3  | 18.0 | 17.8  | 17.6 | 17.3  |
| HS1                     | 19.4 | 19.2 | 19.0 | 18.8  | 18.6 | 18.4  | 18.2 | 18.0  | 17.8 | 17.6  |
| HS2                     | 20.6 | 20.4 | 20.1 | 19.9  | 19.6 | 19.4  | 19.1 | 18.9  | 18.6 | 18.4  |
| HS3                     | 23.0 | 22.7 | 22.5 | 22.2  | 22.0 | 21.7  | 21.5 | 21.2  | 21.0 | 20.7  |

NOTE: Factory settings are shaded.

## 7.5 - Fan performances, 48/50UA-UH 065

| 48/50UA-UH 065 - Unit with standard static pressure |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|---|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow  |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|   |       | 50                           |       | 85    |       | 120   |       | 155   |       | 190   |       | 225   |       |
| l/s   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700  | 9720  | 11.48                        | 1.200 | 12.43 | 1.342 | 13.38 | 1.494 | 13.38 | 1.651 | 15.23 | 1.815 | 16.13 | 1.986 |
| 2850  | 10260 | 11.82                        | 1.362 | 13.12 | 1.575 | 14.02 | 1.734 | 14.02 | 1.899 | 15.78 | 2.070 | 16.63 | 2.249 |
| 3000  | 10800 | 12.92                        | 1.671 | 13.78 | 1.830 | 14.63 | 1.996 | 14.63 | 2.168 | 16.32 | 2.346 | 17.13 | 2.532 |
| 3150  | 11340 | 13.65                        | 1.949 | 14.47 | 2.117 | 15.28 | 2.290 | 15.28 | 2.471 | 16.88 | 2.656 | 17.67 | 2.849 |
| 3300  | 11880 | 14.37                        | 2.253 | 15.15 | 2.428 | 15.92 | 2.610 | 15.92 | 2.797 | 17.45 | 2.991 | 18.20 | 3.190 |
| 3450  | 12420 | 15.05                        | 2.582 | 15.80 | 2.765 | 16.55 | 2.953 | 16.55 | 3.149 | 18.02 | 3.350 | 17.07 | 3.556 |
| 3600  | 12960 | 15.73                        | 2.936 | 16.45 | 3.127 | 17.15 | 3.324 | 17.15 | 3.527 | 18.57 | 3.734 | 19.27 | 3.947 |
| 3750  | 13500 | 16.40                        | 3.324 | 17.10 | 3.522 | 17.78 | 3.727 | 17.78 | 3.937 | 19.13 | 4.151 | 19.80 | 4.371 |
| 3900  | 14040 | 17.07                        | 3.739 | 17.73 | 3.945 | 18.38 | 4.157 | 18.38 | 4.375 | 19.70 | 4.596 | 20.33 | 4.823 |
| 4050  | 14580 | 17.70                        | 4.177 | 18.33 | 4.391 | 18.97 | 4.610 | 18.97 | 4.835 | 20.23 | 5.063 | 20.85 | 5.297 |
| 4200  | 15120 | 18.33                        | 4.651 | 18.95 | 4.872 | 19.57 | 5.099 | 19.57 | 5.330 | 20.78 | 5.567 | 21.38 | 5.808 |
| 4350  | 15660 | 18.97                        | 5.155 | 19.57 | 5.385 | 20.15 | 5.619 | 20.15 | 5.857 | 21.33 | 6.100 | 21.92 | 6.348 |

| 48/50UA-UH 065 - Unit with high static pressure H1 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 180                          |       | 220   |       | 260   |       | 300   |       | 340   |       | 380   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 12.22                        | 1.566 | 13.10 | 1.753 | 13.95 | 1.947 | 13.95 | 2.146 | 15.53 | 2.350 | 16.28 | 2.557 |
| 2850   | 10260 | 12.67                        | 1.785 | 13.50 | 1.981 | 14.32 | 2.183 | 14.32 | 2.391 | 15.85 | 2.603 | 16.58 | 2.818 |
| 3000   | 10800 | 13.08                        | 2.021 | 13.90 | 2.226 | 14.68 | 2.436 | 14.68 | 2.652 | 16.18 | 2.872 | 16.88 | 3.097 |
| 3150   | 11340 | 13.55                        | 2.288 | 14.33 | 2.500 | 15.08 | 2.719 | 15.08 | 2.943 | 16.53 | 3.171 | 17.22 | 3.404 |
| 3300   | 11880 | 14.02                        | 2.574 | 14.77 | 2.795 | 15.48 | 3.022 | 15.48 | 3.254 | 16.88 | 3.490 | 17.57 | 3.732 |
| 3450   | 12420 | 14.47                        | 2.881 | 15.18 | 3.110 | 15.88 | 3.345 | 15.88 | 3.585 | 17.23 | 3.830 | 17.90 | 4.079 |
| 3600   | 12960 | 14.90                        | 3.209 | 15.60 | 3.446 | 16.28 | 3.689 | 16.28 | 3.937 | 17.60 | 4.190 | 18.23 | 4.447 |
| 3750   | 13500 | 15.37                        | 3.565 | 16.03 | 3.811 | 16.68 | 4.061 | 16.68 | 4.318 | 17.97 | 4.579 | 18.58 | 4.844 |
| 3900   | 14040 | 15.82                        | 3.944 | 16.45 | 4.198 | 17.08 | 4.456 | 17.08 | 4.721 | 18.33 | 4.990 | 18.93 | 5.263 |
| 4050   | 14580 | 16.23                        | 4.341 | 16.87 | 4.602 | 17.48 | 4.869 | 17.48 | 5.140 | 18.68 | 5.417 | 19.27 | 5.698 |
| 4200   | 15120 | 16.67                        | 4.767 | 17.28 | 5.037 | 17.88 | 5.311 | 17.88 | 5.591 | 19.05 | 5.875 | 19.62 | 6.164 |
| 4350   | 15660 | 17.12                        | 5.219 | 17.70 | 5.497 | 18.27 | 5.779 | 18.27 | 6.066 | 19.42 | 6.359 | 19.97 | 6.656 |

| 48/50UA-UH 065 - Unit with high static pressure H2 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 260                          |       | 300   |       | 340   |       | 380   |       | 420   |       | 460   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 13.95                        | 1.947 | 14.75 | 2.146 | 15.53 | 2.350 | 15.53 | 2.557 | 17.00 | 2.769 | 17.68 | 2.985 |
| 2850   | 10260 | 14.32                        | 2.183 | 15.10 | 2.391 | 15.85 | 2.603 | 15.85 | 2.818 | 17.28 | 3.038 | 17.97 | 3.262 |
| 3000   | 10800 | 14.68                        | 2.436 | 15.45 | 2.652 | 16.18 | 2.872 | 16.18 | 3.097 | 17.57 | 3.325 | 18.23 | 3.557 |
| 3150   | 11340 | 15.08                        | 2.719 | 15.82 | 2.943 | 16.53 | 3.171 | 16.53 | 3.404 | 17.90 | 3.641 | 18.55 | 3.881 |
| 3300   | 11880 | 15.48                        | 3.022 | 16.20 | 3.254 | 16.88 | 3.490 | 16.88 | 3.732 | 18.22 | 3.976 | 18.85 | 4.224 |
| 3450   | 12420 | 15.88                        | 3.345 | 16.57 | 3.585 | 17.23 | 3.830 | 17.23 | 4.079 | 18.53 | 4.332 | 19.13 | 4.589 |
| 3600   | 12960 | 16.28                        | 3.689 | 16.95 | 3.937 | 17.60 | 4.190 | 17.60 | 4.447 | 18.85 | 4.708 | 19.47 | 4.974 |
| 3750   | 13500 | 16.68                        | 4.061 | 17.33 | 4.318 | 17.97 | 4.579 | 17.97 | 4.844 | 19.18 | 5.113 | 19.78 | 5.386 |
| 3900   | 14040 | 17.08                        | 4.456 | 17.72 | 4.721 | 18.33 | 4.990 | 18.33 | 5.263 | 19.52 | 5.540 | 20.10 | 5.822 |
| 4050   | 14580 | 17.48                        | 4.869 | 18.08 | 5.140 | 18.68 | 5.417 | 18.68 | 5.698 | 19.85 | 5.984 | 20.40 | 6.273 |
| 4200   | 15120 | 17.88                        | 5.311 | 18.47 | 5.591 | 19.05 | 5.875 | 19.05 | 6.164 | 20.18 | 6.458 | 20.73 | 6.755 |
| 4350   | 15660 | 18.27                        | 5.779 | 18.85 | 6.066 | 19.42 | 6.359 | 19.42 | 6.656 | 20.52 | 6.957 | 21.05 | 7.261 |

| 48/50UA-UH 065 - Unit with high static pressure H3 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 420                          |       | 460   |       | 500   |       | 540   |       | 580   |       | 620   |       |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2700   | 9720  | 17.00                        | 2.694 | 17.68 | 2.903 | 18.35 | 3.115 | 18.35 | 3.332 | 19.63 | 3.551 | 20.23 | 3.772 |
| 2850   | 10260 | 17.28                        | 2.955 | 17.97 | 3.173 | 18.62 | 3.393 | 18.62 | 3.618 | 19.87 | 3.844 | 20.47 | 4.074 |
| 3000   | 10800 | 17.57                        | 3.234 | 18.23 | 3.460 | 18.88 | 3.688 | 18.88 | 3.920 | 20.12 | 4.155 | 20.70 | 4.393 |
| 3150   | 11340 | 17.90                        | 3.542 | 18.55 | 3.775 | 19.17 | 4.012 | 19.17 | 4.252 | 20.38 | 4.496 | 20.97 | 4.742 |
| 3300   | 11880 | 18.22                        | 3.868 | 18.85 | 4.110 | 19.47 | 4.356 | 19.47 | 4.604 | 20.65 | 4.854 | 21.23 | 5.109 |
| 3450   | 12420 | 18.53                        | 4.214 | 19.15 | 4.464 | 19.77 | 4.717 | 19.77 | 4.973 | 20.93 | 5.233 | 21.48 | 5.495 |
| 3600   | 12960 | 18.85                        | 4.580 | 19.47 | 4.839 | 20.05 | 5.099 | 20.05 | 5.363 | 21.20 | 5.631 | 21.75 | 5.902 |
| 3750   | 13500 | 19.18                        | 4.975 | 19.78 | 5.240 | 20.37 | 5.509 | 20.37 | 5.782 | 21.48 | 6.057 | 22.03 | 6.335 |
| 3900   | 14040 | 19.52                        | 5.389 | 20.10 | 5.664 | 20.67 | 5.940 | 20.67 | 6.220 | 21.77 | 6.504 | 22.30 | 6.791 |
| 4050   | 14580 | 19.85                        | 5.821 | 20.40 | 6.103 | 20.97 | 6.387 | 20.97 | 6.675 | 22.05 | 6.966 | 22.57 | 7.260 |
| 4200   | 15120 | 20.18                        | 6.283 | 20.73 | 6.571 | 21.27 | 6.863 | 21.27 | 7.159 | 22.33 | 7.458 | 22.85 | 7.760 |
| 4350   | 15660 | 20.52                        | 6.767 | 21.05 | 7.064 | 21.58 | 7.364 | 21.58 | 7.667 | 22.62 | 7.974 | 23.13 | 8.284 |

|   |                  |
|---|------------------|
|  | Undersized drive |
|  | Oversized drive  |

### 7.5.1 - Fan speed (approximate) at various motor pulley settings, 48/50UA-UH 065

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |      |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|------|
| Drive                   | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 | 5    |
| Standard                | 20.6 | 20.4 | 20.1 | 19.9  | 19.6 | 19.4  | 19.1 | 18.9  | 18.6 | 18.4  | 18.1 |
| HS1                     | 19.4 | 19.2 | 19.0 | 18.8  | 18.6 | 18.4  | 18.2 | 18.0  | 17.8 | 17.6  | 17.3 |
| HS2                     | 20.6 | 20.4 | 20.1 | 19.9  | 19.6 | 19.4  | 19.1 | 18.9  | 18.6 | 18.4  | 18.1 |
| HS3                     | 23.0 | 22.7 | 22.5 | 22.2  | 22.0 | 21.7  | 21.5 | 21.2  | 21.0 | 20.7  | 20.5 |

NOTE: Factory settings are shaded

7.6 - Fan performances, 48/50UA-UH 075

| 48/50UA-UH 075 - Unit with standard static pressure |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|---|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow  |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|   |       | 50                           |       | 85    |       | 120   |       | 155   |       | 190   |       | 225   |       |
| l/s   | m³/h  | r/s                          |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       |
|   |       | kW                           |       | kW    |       | kW    |       | kW    |       | kW    |       | kW    |       |
| 3150  | 11340 | 13.65                        | 1.949 | 14.47 | 2.117 | 15.28 | 2.290 | 16.08 | 2.471 | 16.88 | 2.656 | 17.67 | 2.849 |
| 3300  | 11880 | 14.37                        | 2.253 | 15.15 | 2.428 | 15.92 | 2.610 | 16.68 | 2.797 | 17.45 | 2.991 | 18.20 | 3.190 |
| 3450  | 12420 | 15.05                        | 2.582 | 15.80 | 2.765 | 16.55 | 2.953 | 17.28 | 3.149 | 18.02 | 3.350 | 18.73 | 3.556 |
| 3600  | 12960 | 15.73                        | 2.936 | 16.45 | 3.127 | 17.15 | 3.324 | 17.87 | 3.527 | 18.57 | 3.734 | 19.27 | 3.947 |
| 3750  | 13500 | 16.40                        | 3.324 | 17.10 | 3.522 | 17.78 | 3.727 | 18.45 | 3.937 | 19.13 | 4.151 | 19.80 | 4.371 |
| 3900  | 14040 | 17.07                        | 3.739 | 17.73 | 3.945 | 18.38 | 4.157 | 19.05 | 4.375 | 19.70 | 4.596 | 20.33 | 4.823 |
| 4050  | 14580 | 17.70                        | 4.177 | 18.33 | 4.391 | 18.97 | 4.610 | 19.60 | 4.835 | 20.23 | 5.063 | 20.85 | 5.297 |
| 4200  | 15120 | 18.33                        | 4.651 | 18.95 | 4.872 | 19.57 | 5.099 | 20.17 | 5.330 | 20.78 | 5.567 | 21.38 | 5.808 |
| 4350  | 15660 | 18.97                        | 5.155 | 19.57 | 5.385 | 20.15 | 5.619 | 20.73 | 5.857 | 21.33 | 6.100 | 21.92 | 6.348 |
| 4500  | 16200 | 19.57                        | 5.684 | 20.15 | 5.921 | 20.72 | 6.162 | 21.28 | 6.408 | 21.85 | 6.657 | 22.42 | 6.912 |
| 4650  | 16740 | 20.17                        | 6.246 | 20.72 | 6.489 | 21.27 | 6.738 | 21.83 | 6.990 | 22.38 | 7.247 | 22.92 | 7.508 |
| 4800  | 17280 | 20.73                        | 6.832 | 21.28 | 7.084 | 21.82 | 7.338 | 22.35 | 7.597 | 22.88 | 7.861 | 23.42 | 8.129 |

| 48/50UA-UH 075 - Unit with high static pressure H1 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 180                          |       | 220   |       | 260   |       | 300   |       | 340   |       | 380   |       |
| l/s  | m³/h  | r/s                          |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       |
|  |       | kW                           |       | kW    |       | kW    |       | kW    |       | kW    |       | kW    |       |
| 3150   | 11340 | 13.55                        | 2.288 | 14.33 | 2.500 | 15.08 | 2.719 | 15.82 | 2.943 | 16.53 | 3.171 | 17.22 | 3.404 |
| 3300   | 11880 | 14.02                        | 2.574 | 14.77 | 2.795 | 15.48 | 3.022 | 16.20 | 3.254 | 16.88 | 3.490 | 17.57 | 3.732 |
| 3450   | 12420 | 14.47                        | 2.881 | 15.18 | 3.110 | 15.88 | 3.345 | 16.57 | 3.585 | 17.23 | 3.830 | 17.90 | 4.079 |
| 3600   | 12960 | 14.90                        | 3.209 | 15.60 | 3.446 | 16.28 | 3.689 | 16.95 | 3.937 | 17.60 | 4.190 | 18.23 | 4.447 |
| 3750   | 13500 | 15.37                        | 3.565 | 16.03 | 3.811 | 16.68 | 4.061 | 17.33 | 4.318 | 17.97 | 4.579 | 18.58 | 4.844 |
| 3900   | 14040 | 15.82                        | 3.944 | 16.45 | 4.198 | 17.08 | 4.456 | 17.72 | 4.721 | 18.33 | 4.990 | 18.93 | 5.263 |
| 4050   | 14580 | 16.23                        | 4.341 | 16.87 | 4.602 | 17.48 | 4.869 | 18.08 | 5.140 | 18.68 | 5.417 | 19.27 | 5.698 |
| 4200   | 15120 | 16.67                        | 4.767 | 17.28 | 5.037 | 17.88 | 5.311 | 18.47 | 5.591 | 19.05 | 5.875 | 19.62 | 6.164 |
| 4350   | 15660 | 17.12                        | 5.219 | 17.70 | 5.497 | 18.27 | 5.779 | 18.85 | 6.066 | 19.42 | 6.359 | 19.97 | 6.656 |
| 4500   | 16200 | 17.52                        | 5.690 | 18.10 | 5.974 | 18.65 | 6.264 | 19.22 | 6.560 | 19.77 | 6.860 | 20.30 | 7.164 |
| 4650   | 16740 | 17.93                        | 6.188 | 18.48 | 6.479 | 19.03 | 6.777 | 19.57 | 7.079 | 20.12 | 7.386 | 20.63 | 7.698 |
| 4800   | 17280 | 18.33                        | 6.703 | 18.87 | 7.002 | 19.40 | 7.307 | 19.93 | 7.617 | 20.45 | 7.932 | 20.97 | 8.251 |

| 48/50UA-UH 075 - Unit with high static pressure H2 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 260                          |       | 300   |       | 340   |       | 380   |       | 420   |       | 460   |       |
| l/s  | m³/h  | r/s                          |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       |
|  |       | kW                           |       | kW    |       | kW    |       | kW    |       | kW    |       | kW    |       |
| 3150   | 11340 | 15.08                        | 2.645 | 15.82 | 2.863 | 16.53 | 3.085 | 17.22 | 3.311 | 17.90 | 3.542 | 18.55 | 3.775 |
| 3300   | 11880 | 15.48                        | 2.940 | 16.20 | 3.165 | 16.88 | 3.395 | 17.57 | 3.630 | 18.22 | 3.868 | 18.85 | 4.110 |
| 3450   | 12420 | 15.88                        | 3.254 | 16.57 | 3.487 | 17.23 | 3.725 | 17.90 | 3.968 | 18.53 | 4.214 | 19.15 | 4.464 |
| 3600   | 12960 | 16.28                        | 3.588 | 16.95 | 3.830 | 17.60 | 4.076 | 18.23 | 4.326 | 18.85 | 4.580 | 19.47 | 4.839 |
| 3750   | 13500 | 16.68                        | 3.951 | 17.33 | 4.200 | 17.97 | 4.454 | 18.58 | 4.713 | 19.18 | 4.975 | 19.78 | 5.240 |
| 3900   | 14040 | 17.08                        | 4.335 | 17.72 | 4.593 | 18.33 | 4.854 | 18.93 | 5.120 | 19.52 | 5.389 | 20.10 | 5.664 |
| 4050   | 14580 | 17.48                        | 4.736 | 18.08 | 5.001 | 18.68 | 5.270 | 19.27 | 5.544 | 19.85 | 5.821 | 20.40 | 6.103 |
| 4200   | 15120 | 17.88                        | 5.167 | 18.47 | 5.439 | 19.05 | 5.716 | 19.62 | 5.997 | 20.18 | 6.283 | 20.73 | 6.571 |
| 4350   | 15660 | 18.27                        | 5.622 | 18.85 | 5.902 | 19.42 | 6.186 | 19.97 | 6.474 | 20.52 | 6.767 | 21.05 | 7.064 |
| 4500   | 16200 | 18.65                        | 6.095 | 19.22 | 6.381 | 19.77 | 6.674 | 20.30 | 6.970 | 20.83 | 7.269 | 21.37 | 7.573 |
| 4650   | 16740 | 19.03                        | 6.592 | 19.57 | 6.887 | 20.12 | 7.186 | 20.63 | 7.489 | 21.17 | 7.796 | 21.68 | 8.108 |
| 4800   | 17280 | 19.40                        | 7.109 | 19.93 | 7.411 | 20.45 | 7.716 | 20.97 | 8.026 | 21.47 | 8.342 | 21.98 | 8.660 |

| 48/50UA-UH 075 - Unit with high static pressure H3 |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|  |       | 420                          |       | 460   |       | 500   |       | 540   |       | 580   |       | 620   |       |
| l/s  | m³/h  | r/s                          |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       | r/s   |       |
|  |       | kW                           |       | kW    |       | kW    |       | kW    |       | kW    |       | kW    |       |
| 3150   | 11340 | 17.90                        | 3.542 | 18.55 | 3.775 | 19.17 | 4.012 | 19.78 | 4.252 | 20.38 | 4.496 | 20.97 | 4.742 |
| 3300   | 11880 | 18.22                        | 3.868 | 18.85 | 4.110 | 19.47 | 4.356 | 20.07 | 4.604 | 20.65 | 4.854 | 21.23 | 5.109 |
| 3450   | 12420 | 18.53                        | 4.214 | 19.15 | 4.464 | 19.77 | 4.717 | 20.35 | 4.973 | 20.93 | 5.233 | 21.48 | 5.495 |
| 3600   | 12960 | 18.85                        | 4.580 | 19.47 | 4.839 | 20.05 | 5.099 | 20.63 | 5.363 | 21.20 | 5.631 | 21.75 | 5.902 |
| 3750   | 13500 | 19.18                        | 4.975 | 19.78 | 5.240 | 20.37 | 5.509 | 20.93 | 5.782 | 21.48 | 6.057 | 22.03 | 6.335 |
| 3900   | 14040 | 19.52                        | 5.389 | 20.10 | 5.664 | 20.67 | 5.940 | 21.22 | 6.220 | 21.77 | 6.504 | 22.30 | 6.791 |
| 4050   | 14580 | 19.85                        | 5.821 | 20.40 | 6.103 | 20.97 | 6.387 | 21.50 | 6.675 | 22.05 | 6.966 | 22.57 | 7.260 |
| 4200   | 15120 | 20.18                        | 6.283 | 20.73 | 6.571 | 21.27 | 6.863 | 21.80 | 7.159 | 22.33 | 7.458 | 22.85 | 7.760 |
| 4350   | 15660 | 20.52                        | 6.767 | 21.05 | 7.064 | 21.58 | 7.364 | 22.10 | 7.667 | 22.62 | 7.974 | 23.13 | 8.284 |
| 4500   | 16200 | 20.83                        | 7.269 | 21.37 | 7.573 | 21.88 | 7.881 | 22.40 | 8.192 | 22.90 | 8.506 | 23.40 | 8.823 |
| 4650   | 16740 | 21.17                        | 7.796 | 21.68 | 8.108 | 22.18 | 8.423 | 22.68 | 8.741 | 23.18 | 9.063 | 23.67 | 9.387 |
| 4800   | 17280 | 21.47                        | 8.342 | 21.98 | 8.660 | 22.48 | 8.982 | 22.97 | 9.307 | 23.45 | 9.636 | 23.93 | 9.968 |

Undersized drive

Oversized drive

7.6.1 - Fan speed (approximate) at various motor pulley settings, 48/50UA-UH 075

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |      |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|------|
| Drive                   | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 | 5    |
| Standard                | 20.6 | 20.4 | 20.1 | 19.9  | 19.6 | 19.4  | 19.1 | 18.9  | 18.6 | 18.4  | 18.1 |
| HS1                     | 19.5 | 19.3 | 19.1 | 18.8  | 18.6 | 18.4  | 18.1 | 17.9  | 17.6 | 17.4  | 17.2 |
| HS2                     | 20.6 | 20.4 | 20.1 | 19.9  | 19.6 | 19.4  | 19.1 | 18.9  | 18.6 | 18.4  | 18.1 |
| HS3                     | 21.9 | 21.6 | 21.4 | 21.1  | 20.8 | 20.6  | 20.3 | 20.1  | 19.8 | 19.5  | 19.3 |

NOTE: Factory settings are shaded



## 7.7 - Fan performances, 48/50UA-UH 085-100-120

| 48/50UA-UH 085 - Unit with standard static pressure |       |                              |       |       |       |       |       |       |       |       |       |       |        |
|---|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| Air flow  |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |        |
|   |       | 50                           |       | 85    |       | 120   |       | 155   |       | 190   |       | 225   |        |
| l/s   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW     |
| 4250  | 15300 | 8.28                         | 1.832 | 8.92  | 2.044 | 9.55  | 2.262 | 10.15 | 2.487 | 10.73 | 2.717 | 11.32 | 2.954  |
| 4500  | 16200 | 8.77                         | 2.169 | 9.37  | 2.391 | 9.95  | 2.621 | 10.52 | 2.858 | 11.08 | 3.099 | 11.63 | 3.347  |
| 4750  | 17100 | 9.25                         | 2.546 | 9.82  | 2.781 | 10.37 | 3.022 | 10.92 | 3.270 | 11.45 | 3.522 | 11.98 | 3.781  |
| 5000  | 18000 | 9.73                         | 2.967 | 10.27 | 3.214 | 10.80 | 3.467 | 11.32 | 3.725 | 11.83 | 3.991 | 12.33 | 4.259  |
| 5250  | 18900 | 10.22                        | 3.434 | 10.73 | 3.694 | 11.23 | 3.958 | 11.73 | 4.229 | 12.23 | 4.504 | 12.72 | 4.785  |
| 5500  | 19800 | 10.70                        | 3.951 | 11.20 | 4.222 | 11.68 | 4.498 | 12.17 | 4.780 | 12.63 | 5.068 | 13.10 | 5.359  |
| 5750  | 20700 | 11.22                        | 4.526 | 11.68 | 4.809 | 12.15 | 5.097 | 12.62 | 5.392 | 13.07 | 5.690 | 13.52 | 5.994  |
| 6000  | 21600 | 11.72                        | 5.147 | 12.17 | 5.443 | 12.62 | 5.743 | 13.05 | 6.048 | 13.48 | 6.359 | 13.92 | 6.674  |
| 6250  | 22500 | 12.22                        | 5.834 | 12.65 | 6.141 | 13.08 | 6.454 | 13.52 | 6.771 | 13.93 | 7.093 | 14.35 | 7.421  |
| 6500  | 23400 | 12.73                        | 6.580 | 13.15 | 6.900 | 13.57 | 7.225 | 13.98 | 7.554 | 14.38 | 7.888 | 14.78 | 8.226  |
| 6750  | 24300 | 13.25                        | 7.388 | 13.65 | 7.720 | 14.05 | 8.057 | 14.45 | 8.398 | 14.83 | 8.744 | 15.22 | 9.094  |
| 7000  | 25200 | 13.77                        | 8.260 | 14.15 | 8.605 | 14.53 | 8.954 | 14.92 | 9.307 | 15.30 | 9.666 | 15.67 | 10.027 |

| 48/50UA-UH 085 - Unit with high static pressure H1 |       |                              |       |       |       |       |       |       |        |       |        |       |        |
|--|-------|------------------------------|-------|-------|-------|-------|-------|-------|--------|-------|--------|-------|--------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |       |       |        |       |        |       |        |
|  |       | 140                          |       | 175   |       | 210   |       | 245   |        | 280   |        | 315   |        |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW     | r/s   | kW     | r/s   | kW     |
| 4250   | 15300 | 9.88                         | 2.390 | 10.48 | 2.619 | 11.07 | 2.852 | 11.63 | 3.092  | 12.18 | 3.336  | 12.72 | 3.585  |
| 4500   | 16200 | 10.28                        | 2.756 | 10.85 | 2.995 | 11.40 | 3.240 | 11.95 | 3.491  | 12.47 | 3.746  | 12.98 | 4.005  |
| 4750   | 17100 | 10.68                        | 3.163 | 11.22 | 3.411 | 11.75 | 3.670 | 12.27 | 3.932  | 12.78 | 4.197  | 13.28 | 4.468  |
| 5000   | 18000 | 11.10                        | 3.614 | 11.62 | 3.876 | 12.12 | 4.144 | 12.62 | 4.416  | 13.12 | 4.693  | 13.60 | 4.975  |
| 5250   | 18900 | 11.52                        | 4.112 | 12.02 | 4.385 | 12.50 | 4.664 | 12.98 | 4.947  | 13.45 | 5.235  | 13.92 | 5.528  |
| 5500   | 19800 | 11.95                        | 4.658 | 12.43 | 4.944 | 12.90 | 5.233 | 13.37 | 5.528  | 13.82 | 5.827  | 14.27 | 6.131  |
| 5750   | 20700 | 12.42                        | 5.265 | 12.87 | 5.562 | 13.32 | 5.863 | 13.77 | 6.169  | 14.20 | 6.480  | 14.63 | 6.795  |
| 6000   | 21600 | 12.87                        | 5.917 | 13.30 | 6.225 | 13.73 | 6.539 | 14.17 | 6.856  | 14.58 | 7.178  | 15.00 | 7.504  |
| 6250   | 22500 | 13.33                        | 6.634 | 13.75 | 6.955 | 14.17 | 7.280 | 14.58 | 7.609  | 14.98 | 7.943  | 15.38 | 8.280  |
| 6500   | 23400 | 13.80                        | 7.412 | 14.20 | 7.744 | 14.62 | 8.081 | 15.00 | 8.422  | 15.40 | 8.767  | 15.78 | 9.116  |
| 6750   | 24300 | 14.28                        | 8.252 | 14.67 | 8.595 | 15.05 | 8.944 | 15.43 | 9.296  | 15.82 | 9.653  | 16.20 | 10.014 |
| 7000   | 25200 | 14.75                        | 9.156 | 15.13 | 9.512 | 15.52 | 9.872 | 15.88 | 10.236 | 16.25 | 10.604 | 16.62 | 10.976 |

| 48/50UA-UH 085 - Unit with high static pressure H2 |       |                              |       |       |       |       |        |       |        |       |        |       |        |
|--|-------|------------------------------|-------|-------|-------|-------|--------|-------|--------|-------|--------|-------|--------|
| Air flow   |       | External static pressure, Pa |       |       |       |       |        |       |        |       |        |       |        |
|  |       | 220                          |       | 255   |       | 290   |        | 325   |        | 360   |        | 395   |        |
| l/s  | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW     | r/s   | kW     | r/s   | kW     | r/s   | kW     |
| 4250   | 15300 | 10.70                        | 2.796 | 11.23 | 3.027 | 11.75 | 3.262  | 12.25 | 3.502  | 12.75 | 3.744  | 13.22 | 3.991  |
| 4500   | 16200 | 11.00                        | 3.171 | 11.52 | 3.411 | 12.02 | 3.656  | 12.50 | 3.905  | 12.98 | 4.159  | 13.45 | 4.418  |
| 4750   | 17100 | 11.33                        | 3.584 | 11.83 | 3.835 | 12.32 | 4.092  | 12.78 | 4.350  | 13.25 | 4.616  | 13.70 | 4.884  |
| 5000   | 18000 | 11.68                        | 4.040 | 12.15 | 4.301 | 12.62 | 4.569  | 13.07 | 4.840  | 13.52 | 5.112  | 13.95 | 5.392  |
| 5250   | 18900 | 12.05                        | 4.541 | 12.50 | 4.814 | 12.95 | 5.091  | 13.38 | 5.371  | 13.82 | 5.655  | 14.23 | 5.944  |
| 5500   | 19800 | 12.42                        | 5.089 | 12.85 | 5.371 | 13.28 | 5.660  | 13.70 | 5.951  | 14.12 | 6.247  | 14.53 | 6.545  |
| 5750   | 20700 | 12.80                        | 5.695 | 13.23 | 5.988 | 13.63 | 6.287  | 14.05 | 6.590  | 14.45 | 6.895  | 14.85 | 7.205  |
| 6000   | 21600 | 13.20                        | 6.343 | 13.60 | 6.648 | 14.00 | 6.958  | 14.40 | 7.270  | 14.78 | 7.587  | 15.17 | 7.906  |
| 6250   | 22500 | 13.60                        | 7.056 | 14.00 | 7.370 | 14.38 | 7.692  | 14.77 | 8.016  | 15.15 | 8.342  | 15.52 | 8.673  |
| 6500   | 23400 | 14.02                        | 7.824 | 14.40 | 8.151 | 14.77 | 8.482  | 15.15 | 8.817  | 15.50 | 9.155  | 15.87 | 9.498  |
| 6750   | 24300 | 14.45                        | 8.652 | 14.82 | 8.992 | 15.17 | 9.332  | 15.53 | 9.679  | 15.88 | 10.029 | 16.23 | 10.381 |
| 7000   | 25200 | 14.87                        | 9.544 | 15.23 | 9.894 | 15.58 | 10.245 | 15.92 | 10.602 | 16.27 | 10.963 | 16.60 | 11.327 |

| 48/50UA-UH 085 - Unit with high static pressure H3 |       |                              |        |       |        |       |        |       |        |       |        |       |        |
|--|-------|------------------------------|--------|-------|--------|-------|--------|-------|--------|-------|--------|-------|--------|
| Air flow   |       | External static pressure, Pa |        |       |        |       |        |       |        |       |        |       |        |
|  |       | 395                          |        | 430   |        | 465   |        | 500   |        | 535   |        | 570   |        |
| l/s  | m³/h  | r/s                          | kW     | r/s   | kW     | r/s   | kW     | r/s   | kW     | r/s   | kW     | r/s   | kW     |
| 4250   | 15300 | 13.22                        | 3.991  | 13.70 | 4.243  | 14.15 | 4.497  | 14.60 | 4.756  | 15.03 | 5.017  | 15.47 | 5.282  |
| 4500   | 16200 | 13.45                        | 4.418  | 13.90 | 4.679  | 14.35 | 4.942  | 14.78 | 5.212  | 15.22 | 5.483  | 15.63 | 5.758  |
| 4750   | 17100 | 13.70                        | 4.884  | 14.13 | 5.154  | 14.57 | 5.429  | 15.00 | 5.709  | 15.42 | 5.988  | 15.82 | 6.275  |
| 5000   | 18000 | 13.95                        | 5.392  | 14.38 | 5.674  | 14.80 | 5.958  | 15.22 | 6.247  | 15.62 | 6.538  | 16.02 | 6.834  |
| 5250   | 18900 | 14.23                        | 5.944  | 14.65 | 6.238  | 15.07 | 6.531  | 15.47 | 6.832  | 15.85 | 7.132  | 16.25 | 7.438  |
| 5500   | 19800 | 14.53                        | 6.545  | 14.93 | 6.848  | 15.33 | 7.153  | 15.72 | 7.463  | 16.10 | 7.776  | 16.48 | 8.090  |
| 5750   | 20700 | 14.85                        | 7.205  | 15.23 | 7.517  | 15.63 | 7.834  | 16.00 | 8.153  | 16.38 | 8.477  | 16.75 | 8.803  |
| 6000   | 21600 | 15.17                        | 7.906  | 15.55 | 8.230  | 15.93 | 8.558  | 16.30 | 8.887  | 16.67 | 9.223  | 17.02 | 9.558  |
| 6250   | 22500 | 15.52                        | 8.673  | 15.88 | 9.008  | 16.25 | 9.346  | 16.60 | 9.686  | 16.97 | 10.031 | 17.32 | 10.378 |
| 6500   | 23400 | 15.87                        | 9.498  | 16.23 | 9.842  | 16.58 | 10.192 | 16.93 | 10.544 | 17.27 | 10.898 | 17.62 | 11.254 |
| 6750   | 24300 | 16.23                        | 10.381 | 16.58 | 10.737 | 16.92 | 11.096 | 17.27 | 11.459 | 17.60 | 11.823 | 17.93 | 12.191 |
| 7000   | 25200 | 16.60                        | 11.327 | 16.95 | 11.692 | 17.28 | 12.063 | 17.60 | 12.436 | 17.93 | 12.813 | 18.25 | 13.191 |

|   |                  |
|---|------------------|
|  | Undersized drive |
|  | Oversized drive  |

### 7.7.1 - Fan speed (approximate) at various motor pulley settings, 48/50UA-UH 085-100-120

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |      |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|------|
| Drive                   | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 | 5    |
| Standard                | 14.6 | 14.4 | 14.3 | 14.1  | 13.9 | 13.7  | 13.5 | 13.4  | 13.2 | 13.0  | 12.8 |
| HS1                     | 16.2 | 16.1 | 15.9 | 15.7  | 15.5 | 15.4  | 15.2 | 15.0  | 14.8 | 14.6  | 14.5 |
| HS2                     | 16.2 | 16.0 | 15.7 | 15.5  | 15.3 | 15.0  | 14.8 | 14.6  | 14.3 | 14.1  | 13.8 |
| HS3                     | 17.5 | 17.3 | 17.1 | 16.9  | 16.7 | 16.5  | 16.2 | 16.0  | 15.8 | 15.6  | 15.4 |

**NOTE:** Factory settings are shaded. The factory setting for the standard drive is 4 turns open (13.2 r/s) for sizes 085 and 100 and 2 turns open (13.9 r/s) for size 120.

## 7.8 - Pressure drop, options (Pa)

### Chassis 1 (48/50UA-UH 045 and 055)

|                                      |             | Factory-installed options/accessory static pressure correction factor to be added, Pa |             |             |             |             |             |             |              |              |              |
|--------------------------------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| Unit air flow rate                   | l/s         | 2000  | 2250        | 2500        | 2750        | 3000        | 3250        | 3500        | 3750         | 4000         | 4250         |
|                                      | m³/h        | 7200  | 8100        | 9000        | 9900        | 10800       | 11700       | 12600       | 13500        | 14400        | 15300        |
| Option 83 - Electric heater          | 16          | 19  | 23          | 27          | 32          | 36          | 41          | 46          | 51           | 56           |              |
| Option 84 - Electric heater          | 16          | 19  | 23          | 27          | 32          | 36          | 41          | 46          | 51           | 56           |              |
| Option 85 - Electric heater          | 16          | 19  | 23          | 27          | 32          | 36          | 41          | 46          | 51           | 56           |              |
| Option 155 - Hot-water coil          | 58          | 71  | 85          | 100         | 115         | 132         | 150         | 168         | 188          | 208          |              |
| Option 37 - Hot-water coil           | 58          | 71  | 85          | 100         | 115         | 132         | 150         | 168         | 188          | 208          |              |
| Option 90 - Natural gas              | 22          | 33  | 44          | 55          | 65          | 76          | 87          | 98          | 109          | 120          |              |
| Option 91 - Natural gas              | 23          | 35  | 47          | 59          | 71          | 83          | 95          | 107         | 119          | 131          |              |
| Option 100 - Propane gas             | 22          | 33  | 44          | 55          | 65          | 76          | 87          | 98          | 109          | 120          |              |
| Option 101 - Propane gas             | 23          | 35  | 47          | 59          | 71          | 83          | 95          | 107         | 119          | 131          |              |
| Option 118 - Fresh-air panel         | 8           | 10  | 13          | 16          | 19          | 22          | 26          | 31          | 35           | 40           |              |
| Option 40 - Manual damper            | 8           | 10  | 13          | 16          | 19          | 22          | 26          | 31          | 35           | 40           |              |
| Option 35, 36, 156, 157 - Economizer | 8           | 10  | 13          | 16          | 19          | 22          | 26          | 31          | 35           | 40           |              |
| Option 145 - G4 filter M1            | 0           | 0   | 0           | 0           | 0           | 0           | 0           | 0           | 0            | 0            |              |
| Option 147 - F7 filter M1            | 27          | 32  | 36          | 41          | 46          | 51          | 56          | 62          | 67           | 73           |              |
| Option 158 - G4 + F7 filter M1       | 59          | 69  | 80          | 91          | 103         | 115         | 127         | 140         | 153          | 166          |              |
| Option 159 - F6 + F7 filter M1       | 71          | 84  | 98          | 113         | 128         | 144         | 160         | 177         | 194          | 212          |              |
| <b>ERM fresh air flow rate</b>       | <b>l/s</b>  | <b>800</b>  | <b>1100</b> | <b>1400</b> | <b>1700</b> | <b>2000</b> | <b>2300</b> | <b>2600</b> | <b>2900</b>  | <b>3200</b>  | <b>3500</b>  |
|                                      | <b>m³/h</b> | <b>2880</b>   | <b>3960</b> | <b>5040</b> | <b>6120</b> | <b>7200</b> | <b>8280</b> | <b>9360</b> | <b>10440</b> | <b>11520</b> | <b>12600</b> |
| Option 160 - ERM filters             | 16          | 24  | 34          | 44          | 56          | 68          | 82          | 97          | 114          | 132          |              |
| Option 160 - ERM heat recovery wheel | 35          | 48  | 62          | 76          | 90          | 105         | 120         | 135         | 150          | 166          |              |
| Total option 160                     | 51          | 73  | 96          | 120         | 146         | 173         | 202         | 232         | 264          | 298          |              |

### Chassis 2 - 48/50UA-UH 065 and 075

|                                      |             | Factory-installed options/accessory static pressure correction factor to be added, Pa |             |             |             |             |             |             |              |              |              |
|--------------------------------------|-------------|---|-------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|--------------|
| Unit air flow rate                   | l/s         | 2750  | 3000        | 3250        | 3500        | 3750        | 4000        | 4250        | 4500         | 4750         | 5000         |
|                                      | m³/h        | 9900  | 10800       | 11700       | 12600       | 13500       | 14400       | 15300       | 16200        | 17100        | 18000        |
| Option 84 - Electric heater          | 27          | 32  | 36          | 41          | 46          | 51          | 56          | 62          | 68           | 74           |              |
| Option 85 - Electric heater          | 27          | 32  | 36          | 41          | 46          | 51          | 56          | 62          | 68           | 74           |              |
| Option 86 - Electric heater          | 27          | 32  | 36          | 41          | 46          | 51          | 56          | 62          | 68           | 74           |              |
| Option 37 - Hot water coil           | 100         | 115   | 132         | 150         | 168         | 188         | 208         | 229         | 251          | 273          |              |
| Option 38 - Hot water coil           | 100         | 115   | 132         | 150         | 168         | 188         | 208         | 229         | 251          | 273          |              |
| Option 91 - Natural gas              | 59          | 71  | 83          | 95          | 107         | 119         | 131         | 143         | 155          | 167          |              |
| Option 92 - Natural gas              | 63          | 77  | 90          | 103         | 116         | 129         | 142         | 155         | 168          | 181          |              |
| Option 101 - Propane gas             | 59          | 71  | 83          | 95          | 107         | 119         | 131         | 143         | 155          | 167          |              |
| Option 102 - Propane gas             | 63          | 77  | 90          | 103         | 116         | 129         | 142         | 155         | 168          | 181          |              |
| Option 118 - Fresh air panel         | 16          | 19  | 22          | 26          | 31          | 35          | 40          | 45          | 50           | 56           |              |
| Option 40 - Manual damper            | 16          | 19  | 22          | 26          | 31          | 35          | 40          | 45          | 50           | 56           |              |
| Option 35, 36, 156, 157 - Economizer | 16          | 19  | 22          | 26          | 31          | 35          | 40          | 45          | 50           | 56           |              |
| Option 145 - G4 filter M1            | 0           | 0   | 0           | 0           | 0           | 0           | 0           | 0           | 0            | 0            |              |
| Option 147 - F7 filter M1            | 41          | 46  | 51          | 56          | 62          | 67          | 73          | 78          | 84           | 90           |              |
| Option 158 - G4 + F7 filter M1       | 91          | 103   | 115         | 127         | 140         | 153         | 166         | 180         | 194          | 208          |              |
| Option 159 - F6 + F7 filter M1       | 113         | 128   | 144         | 160         | 177         | 194         | 212         | 230         | 249          | 268          |              |
| <b>ERM fresh air flow rate</b>       | <b>l/s</b>  | <b>800</b>  | <b>1100</b> | <b>1400</b> | <b>1700</b> | <b>2000</b> | <b>2300</b> | <b>2600</b> | <b>2900</b>  | <b>3200</b>  | <b>3500</b>  |
|                                      | <b>m³/h</b> | <b>2880</b>   | <b>3960</b> | <b>5040</b> | <b>6120</b> | <b>7200</b> | <b>8280</b> | <b>9360</b> | <b>10440</b> | <b>11520</b> | <b>12600</b> |
| Option 160 - ERM filters             | 16          | 24  | 34          | 44          | 56          | 68          | 82          | 97          | 114          | 132          |              |
| Option 160 - ERM heat recovery wheel | 35          | 48  | 62          | 76          | 90          | 105         | 120         | 135         | 150          | 166          |              |
| Total option 160                     | 51          | 73  | 96          | 120         | 146         | 173         | 202         | 232         | 264          | 298          |              |

### Chassis 3 - 48/50UA-UH 085, 100 and 120

|                                      |             | Factory-installed options/accessory static pressure correction factor to be added, Pa |             |             |             |             |              |              |              |              |              |
|--------------------------------------|-------------|---|-------------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|
| Unit air flow rate                   | l/s         | 4300  | 4600        | 4900        | 5200        | 5500        | 5800         | 6100         | 6400         | 6700         | 7000         |
|                                      | m³/h        | 15480   | 16560       | 17640       | 18720       | 19800       | 20880        | 21960        | 23040        | 24120        | 25200        |
| Option 85 - Electric heater          | 59          | 64  | 68          | 72          | 76          | 81          | 85           | 89           | 94           | 98           |              |
| Option 86 - Electric heater          | 59          | 64  | 68          | 72          | 76          | 81          | 85           | 89           | 94           | 98           |              |
| Option 87 - Electric heater          | 59          | 64  | 68          | 72          | 76          | 81          | 85           | 89           | 94           | 98           |              |
| Option 38 - Hot water coil           | 66          | 74  | 82          | 91          | 100         | 109         | 119          | 129          | 139          | 150          |              |
| Option 39 - Hot water coil           | 66          | 74  | 82          | 91          | 100         | 109         | 119          | 129          | 139          | 150          |              |
| Option 93 - Natural gas              | 59          | 72  | 85          | 97          | 110         | 123         | 135          | 148          | 161          | 174          |              |
| Option 94 - Natural gas              | 62          | 76  | 90          | 104         | 118         | 132         | 146          | 160          | 174          | 188          |              |
| Option 95 - Natural gas              | 65          | 81  | 96          | 112         | 127         | 143         | 158          | 174          | 190          | 205          |              |
| Option 103 - Propane gas             | 59          | 72  | 85          | 97          | 110         | 123         | 135          | 148          | 161          | 174          |              |
| Option 104 - Propane gas             | 62          | 76  | 90          | 104         | 118         | 132         | 146          | 160          | 174          | 188          |              |
| Option 105 - Propane gas             | 65          | 81  | 96          | 112         | 127         | 143         | 158          | 174          | 190          | 205          |              |
| Option 118 - Fresh air panel         | 34          | 40  | 46          | 54          | 62          | 71          | 80           | 90           | 101          | 113          |              |
| Option 40 - Manual damper            | 34          | 40  | 46          | 54          | 62          | 71          | 80           | 90           | 101          | 113          |              |
| Option 35, 36, 156, 157 - Economizer | 34          | 40  | 46          | 54          | 62          | 71          | 80           | 90           | 101          | 113          |              |
| Option 145 - G4 filter M1            | 0           | 0   | 0           | 0           | 0           | 0           | 0            | 0            | 0            | 0            |              |
| Option 147 - F7 filter M1            | 44          | 48  | 52          | 56          | 60          | 65          | 69           | 73           | 78           | 82           |              |
| Option 158 - G4 + F7 filter M1       | 98          | 106   | 115         | 125         | 134         | 143         | 153          | 163          | 173          | 183          |              |
| Option 159 - F6 + F7 filter M1       | 119         | 132   | 144         | 158         | 171         | 185         | 199          | 213          | 228          | 243          |              |
| <b>ERM fresh air flow rate</b>       | <b>l/s</b>  | <b>500</b>  | <b>1000</b> | <b>1500</b> | <b>2000</b> | <b>2500</b> | <b>3000</b>  | <b>3500</b>  | <b>4000</b>  | <b>4500</b>  | <b>5000</b>  |
|                                      | <b>m³/h</b> | <b>1800</b>   | <b>3600</b> | <b>5400</b> | <b>7200</b> | <b>9000</b> | <b>10800</b> | <b>12600</b> | <b>14400</b> | <b>16200</b> | <b>18000</b> |
| Option 160 - ERM filters             | 5           | 13  | 22          | 32          | 43          | 56          | 70           | 86           | 103          | 122          |              |
| Option 160 - ERM heat recovery wheel | 14          | 29  | 44          | 60          | 75          | 92          | 108          | 125          | 143          | 161          |              |
| Total option 160                     | 20          | 42  | 66          | 91          | 118         | 147         | 178          | 211          | 246          | 283          |              |



## 7.9 - Air flow limits, l/s

| 50UA-UH | Cooling/heating |         |
|---------|-----------------|---------|
|         | Minimum         | Maximum |
| 045     | 2022            | 3033    |
| 055     | 2755            | 4132    |
| 065     | 2777            | 4166    |
| 075     | 3155            | 4732    |
| 085     | 4440            | 6660    |
| 100     | 4440            | 6660    |
| 120     | 4440            | 6660    |

## 7.10 - Indoor fan air adjustment

The drive is factory set in accordance with the standard fan performance tables.

When indoor pressure and air flow requirements differ from nominal ratings, the motor pulley can be adjusted for different available static pressure values (see fan performance tables).

To change the fan speed:

1. Move the motor along its track in order to remove the belt.
2. Loosen the pulley setscrews and rotate as necessary.
3. Tighten the setscrews.
4. Replace the belt(s) in the channel of the pulley.
5. Tighten the belt(s), using the tension screw nut and washer. See maintenance section and Fig. 8.

To align fan and motor pulleys:

1. Loosen fan pulley setscrews. Slide fan pulley along the pulley shaft and align with the motor using a ruler, making sure that it is parallel to the belt.
2. Tighten the fan pulley setscrews.

To adjust the belt tension, loosen the motor mounting plate bolts and slide the motor mounting plate until the belts are tensioned as shown in Fig. 8. Please refer to chapter 7.1 for the belt tension.

Fan and motor pulleys can be aligned as shown in Fig. 9. If the unit is equipped with adjustable pulleys, the pulley ratio and operating point can be adjusted by loosening the setscrew, arranging the moving part of the pulley to the appropriate position and then fixing the setscrew.

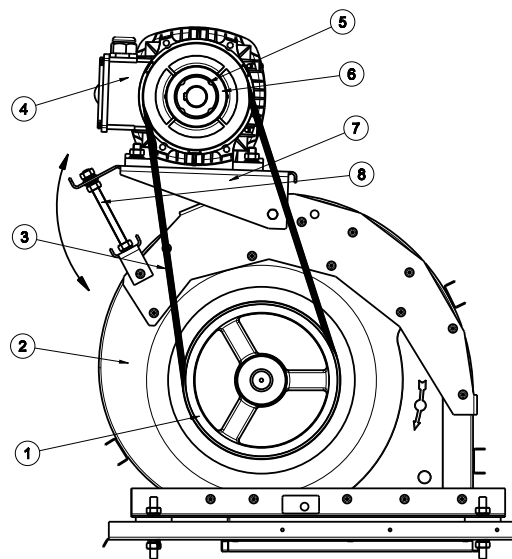
See fan performance tables for adjustments.

Fig. 8 - Fan speed adjustment

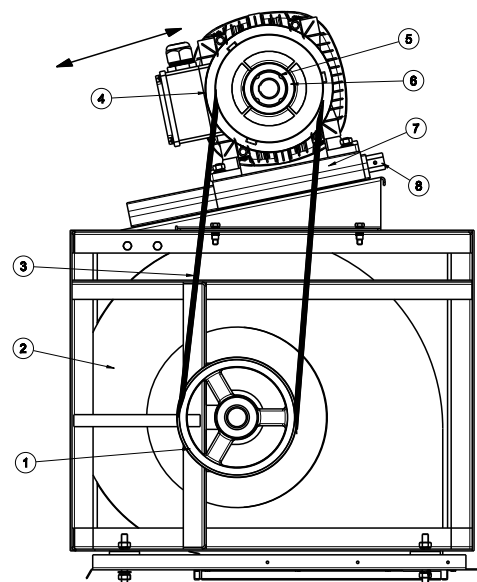
48/50UA-UH 045 standard - HS1 - HS2 - HS3

48/50UA-UH 055/065 standard - HS1 - HS2

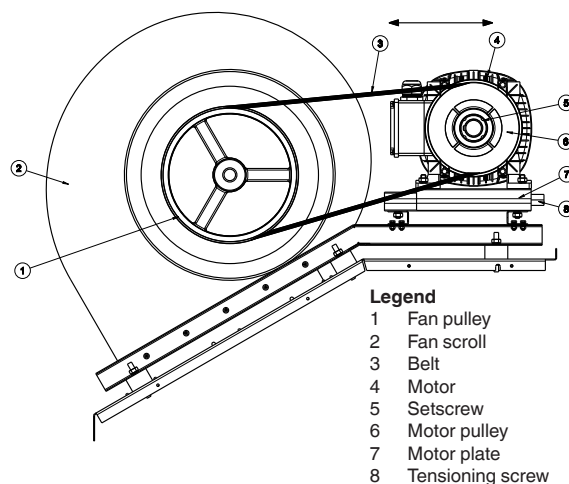
48/50UA-UH 075 standard - HS1



48/50UA-UH 055-065 - HS2/075 - HS3

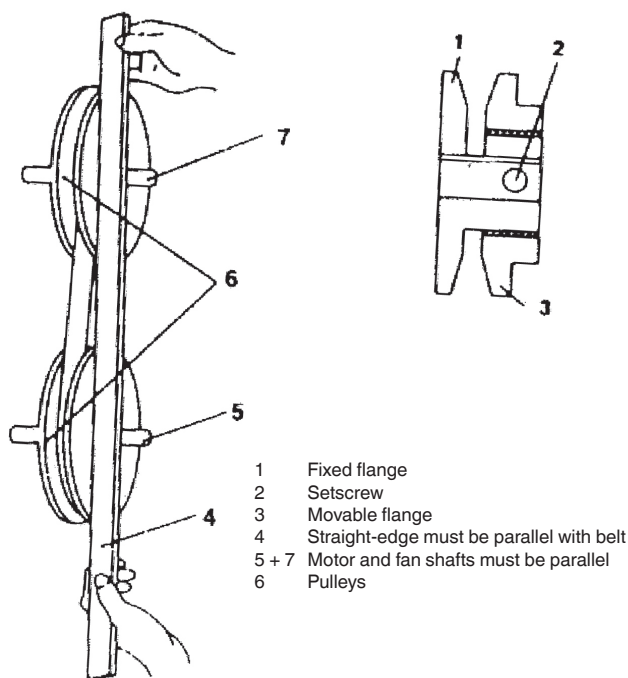


48/50UA-UH 085-100 standard - HS1 - HS2 - HS3



**NOTE:** Drives HS1, HS2, and HS3 are for units with high static pressure

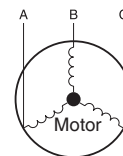
**Fig. 9 - To align fan and motor pulleys**



**Example:**

Nominal supply: 400-3-50

AB = 404 V  
BC = 399 V  
AC = 394 V



$$\text{Average voltage} = \frac{404 + 399 + 394}{3} = 399 = 400 \text{ V}$$

Determine maximum deviation from average voltage:

AB = 404 - 400 = 4  
BC = 400 - 399 = 1  
AC = 400 - 394 = 6

Largest deviation is 6 volts. Percentage voltage imbalance is therefore:

$$\frac{6}{400} \times 100 = 1.5\%$$

This is less than the permissible 2% and is therefore acceptable.

## 8 - ELECTRICAL CONNECTIONS

**WARNING:** To prevent electrical shock or equipment damage, make sure disconnects are open before electrical connections are made. If this action is not taken, personal injury may occur.

Field wiring must comply with all applicable codes. Take special care when making the earth connection with the main earth bar inside the control box.

### 8.1 - Control box

Please refer to the certified dimensional drawings, supplied with the unit.

### 8.2 - Power supply

The power supply must conform to the specification on the unit nameplate. The supply voltage must be within the range given in the electrical data table. For connections refer to the wiring diagrams and the certified dimensional drawings.

**WARNING:** Operation of the unit with an improper supply voltage or excessive phase imbalance constitutes abuse which will invalidate the Carrier warranty. If the phase imbalance exceeds 2% for voltage, or 10% for current, contact your local electricity supply at once and ensure that the unit is not switched on until corrective measures have been taken.

### 8.3 - Voltage phase imbalance (%)

Never operate a unit if the voltage imbalance exceeds 2%. The following formula must be used to determine the percentage of voltage imbalance. Voltage imbalance % =

$$\frac{\text{Largest deviation from average voltage}}{\text{Average voltage}}$$

### 8.4 - Recommended wire sections

Wire sizing is the responsibility of the installer, and depends on the characteristics and regulations applicable to each installation site. The following is only to be used as a guide-line, and does not make Carrier in any way liable. After wire sizing has been completed, using the certified dimensional drawing, the installer must ensure easy connection and define any modifications necessary on site. The connections provided as standard for the field-supplied power entry cables to the general disconnect/isolator switch are designed for the number and type of wires, listed in the table below.

The calculations are based on the maximum machine current (see electrical data tables) and the standard installation practises, in accordance with IEC 60364, table 52C.

- The calculation is based on PVC Cu.
- A maximum ambient temperature of 46°C has been taken into consideration.

**IMPORTANT - phase rotation check:** Before connection of the main power cables (L1 - L2 - L3) on the terminal block, it is imperative to check the correct order of the 3 phases before proceeding to the connection on the main disconnect/isolator switch.

- The given wire length limits the voltage drop to < 5% (length L in metres - see table below).

| FLA   | S min. (mm <sup>2</sup> ) by phase | Cable type | L (mm) |
|-------|------------------------------------|------------|--------|
| 36.0  | 1 x 6                              | PVC Cu     | 65     |
| 50.0  | 1 x 10                             | PVC Cu     | 80     |
| 66.0  | 1 x 16                             | PVC Cu     | 95     |
| 84.0  | 1 x 25                             | PVC Cu     | 115    |
| 104.0 | 1 x 35                             | PVC Cu     | 130    |
| 123.0 | 1 x 50                             | PVC Cu     | 160    |
| 155.0 | 1 x 70                             | PVC Cu     | 175    |
| 192.0 | 1 x 95                             | PVC Cu     | 195    |

FLA - Full load current, A

## Power and control cable entry

For the cable entry refer to the certified dimensional drawing for the unit.

## 8.5 - Field control wiring

Refer to the Pro-Dialog+ Controls IOM and the certified wiring diagram supplied with the unit for the field control wiring of the following features:

- Remote on/off switch
- Demand limit external switch
- Remote setpoint
- Alarm, alert and operation report

## 8.6 - Power supply

**ATTENTION:** After the unit has been commissioned, the power supply must only be disconnected for quick maintenance operations (one day maximum). For longer maintenance operations or when the unit is taken out of service the power supply must be maintained to ensure supply to the heaters (compressor oil crankcase heaters for unit frost protection).

After all possible options have been connected, the transformer ensures the availability of a usable 24 VA or 1 A power reserve for the control circuit on site.

## 9 - START-UP

### 9.1 - Preliminary checks

Never be tempted to start the rooftop unit without reading fully, and understanding, the operating instructions and without having carried out the following pre-start checks:

- Ensure that all electrical connections are properly tightened.
- Ensure that the unit is level and well-supported.
- Check the condition of the ductwork in case damage has occurred during installation.
- The air filter should be clean and in place.
- All the panels should be fitted and firmly secured with the corresponding screws.
- Make sure that there is sufficient space for servicing and maintenance purposes.
- Check the drain connections.
- Ensure that there are no refrigerant leaks.
- Confirm that the electrical power source agrees with the unit nameplate rating.
- Make sure that compressors float freely on the rubber isolators.

**WARNING:** The compressors are mounted on vibration isolators. Do not loosen or remove the support mounting bolts.

- Check if the phase rotation is in the right order for supply air fan, outdoor air fan and compressors.

## 9.2 - Actual start-up

### IMPORTANT:

- Commissioning and start-up of the unit must be supervised by a qualified refrigeration engineer.
- Start-up and operating tests must be carried out with a thermal load applied and the correct air flow rate circulating through the indoor coil.
- All setpoint adjustments and control tests must be carried out before the unit is started up.
- Please refer to the Pro-Dialog+ control manual.

The unit should be started up in Local ON mode.

Ensure that all safety devices are satisfied, especially the high pressure switches.

Actual start-up should only be done under the supervision of a qualified refrigeration mechanic.

## 9.3 - Defrost cycle

When the outdoor temperature is sufficiently low, and depending on the atmospheric humidity, the water condensing on the outdoor coil freezes and this impedes correct air flow and heat exchange rate. It is necessary to remove the ice by melting it. This will be done by changing over the reversing valve on the solenoid coil. This reverses the system cycle and injects hot gas into the outdoor heat exchanger.

Defrost will be completed when the outdoor coil reaches the defrost temperature setpoint or after a predetermined period of time from the start of the cycle.

## 10 - MAJOR SYSTEM COMPONENTS

### 10.1 - Compressors

48/50UA-UH units use hermetic scroll compressors.

Each compressor is equipped with a crankcase oil heater, as standard for all units.

Each compressor sub-function is equipped with:

- Anti-vibration mountings between the unit chassis and the chassis of the compressor sub-function.
- A single pressure safety switch at the discharge.

### 10.2 - Lubricant

The compressors installed in these units have a specific oil charge, indicated on the name plate of each compressor.

The oil level check must be done with the unit switched off, when then suction and discharge pressures are equalised. The oil level must be visible and above the middle of the sight-glass in the oil equalisation line. If this is not the case, there is an oil leak in the circuit. Search and repair the leak, then recharge oil, so that it reaches a level between the middle and three quarters of the sight-glass (unit in vacuum).

**ATTENTION:** Too much oil in the circuit can cause a unit defect. Please refer to the oil content in the physical data table.

**NOTE: Use only oils which have been approved for the compressors. Never use oils which have been exposed to air.**

**Carrier ERCD reference: 7754024.**

**CAUTION: R-22 oils are absolutely not compatible with R-410A oils and vice versa.**

### 10.3 - Condensers

The 48/50UA-UH coils are condensers/evaporators with internally grooved copper tubes with aluminum fins. To prevent ice formation at the bottom of the coils in 48/50UA-UH units, electric heaters are installed under the sheet metal base. They are switched on based on the outside temperature and during defrost cycle.

### 10.4 - Outdoor fans

The fans are axial Flying Bird fans equipped with rotating shroud and made of composite recyclable material. The motors are three-phase, with permanently lubricated bearings and insulation class F.

### 10.5 -Indoor fans

The fans are forward-curved centrifugal fans equipped with adjustable motor pulleys. The motors are three-phase, with efficiency class IE2 and insulation class F.

### 10.6 - Thermostatic expansion valve (TXV)

48/50UA-UH units use bi-flow TXVs with adjustable superheat setting.

### 10.7 - Moisture indicator

Located on the liquid line, the moisture indicator may be used to charge the unit and to indicate if there is moisture in the circuit. The presence of moisture changes the colour of the indicator paper in the sight-glass.

### 10.8 - Filter drier

This is a one-piece, brazed filter drier, located in the liquid line. The role of the filter drier is to keep the circuit clean and moisture-free. The moisture indicator shows when it is necessary to change the filter drier. A difference in temperature between the filter inlet and outlet shows that the element is dirty.

### 10.9 - Refrigerant

48/50UA-UH units operate with refrigerant R-410A.

### 10.10 – Four-way valve (48/50UH heat pumps)

This permits reversal of the cycle for operation in cooling and heating mode and during defrost cycles.

### 10.11 - Sensors

The units use thermistors to measure the temperature, and pressure transducers to control and regulate system operation (see Pro-Dialog+ Control IOM for a more detailed explanation).

### 10.12 - High-pressure safety switch

| Refrigerant side                      |     | High pressure | Low pressure |
|---------------------------------------|-----|---------------|--------------|
| Allowable pressure, min./max. (PS)    | kPa | -100/4420     | -11/3000     |
| Allowable temperature, min./max. (TS) | °C  | -20/68        | -20/51       |
| Pressure switch setting               | kPa | 4420          |              |
| Unit leak test pressure               | kPa | 3300          |              |

48/50UA-UH units are equipped with automatically reset high-pressure safety switches, calibrated to 4420 kPa relative pressure (unit alarm is manually reset).

**WARNING: Alteration of factory settings other than the design setpoint, without manufacturer's authorisation, may void the warranty.**

## 11 - OPERATING LIMITS

These units have been designed to operate within the following limits (the pressure values are given as relative pressure):

#### Cooling operation

| Zone    | Air temperature |          |
|---------|-----------------|----------|
|         | Dry bulb        | Wet bulb |
| Indoor  |                 |          |
| Maximum | +35°C           | +23°C    |
| Minimum | +18°C           | +13°C    |
| Outdoor |                 |          |
| Maximum | +48°C           | -        |
| Minimum | +10°C           | -        |

#### Heat pump operation

| Zone    | Air temperature |          |
|---------|-----------------|----------|
|         | Dry bulb        | Wet bulb |
| Indoor  |                 |          |
| Maximum | +27°C           |          |
| Minimum | +10°C           |          |
| Outdoor |                 |          |
| Maximum | +22°C           | +18°C    |
| Minimum | -10°C           | -11°C    |



## 12 - GAS HEATING (48UA/UH ONLY)

**IMPORTANT:** Inadequate installation, adjustment, information, servicing or maintenance can cause damage, injury to staff or loss of life.

Any unauthorized modifications or adjustments to the appliance are likely to invalidate the certification, any warranty or guarantee and may also infringe on current statutory requirements.

Petrol, or other inflammable, fume-emitting products and liquids of any other application must not be stored or use in the vicinity of units.

After removing panels from the unit, keep them in a safe place to prevent them dropping from the roof.

### 12.1 - Introduction

The gas heating system is designed to be used as an alternative to the hot water coil or electric heating options. The rooftop unit is available with three gas heating modules with two-step heating for natural gas and one-step heating for LPG in 48UA/UH 045-075 series rooftop units. In 48UA/UH 085-120 series rooftop units, two of same modules are working in series with three-step heating for natural gas and two-step heating for LPG.

#### 12.1.1 - Tubular, dimpled gas heat exchanger

The tubular, dimpled gas heat exchangers optimize the heat transfer for improved efficiency. The tubular design permits hot gases to make multiple passes across the path of the supply air. The dimpled design creates a turbulent gas flow to maximize the heating efficiency. The extra thick Alumagard™ heat exchanger coating provides corrosion resistance and ensures long life on the heat exchanger.

#### 12.1.2 - Modular burner compartment

The burner assembly consists of series of injectors. The gas-air mixture, prepared in the burners, enables excellent combustion within the heat exchanger tubes. The direct-spark ignition system saves operating expense when compared to pilot ignition systems. No crossover tube is required, therefore no sooting or pilot fouling problems can occur.

#### 12.1.3 - Induced draft combustion system

The unsightly appearance of flue stacks is eliminated and the effects of wind on heating operations are diminished by the induced draft combustion system. The inducer fan draws hot combustion gas through the heat exchanger at the optimum rate for most effective heat transfer. The heat exchanger operates under negative pressure, preventing flue gas leakage into the indoor supply air for improved efficiency.

#### 12.1.4 - Integrated gas unit controller (IGC)

All ignition components are contained in the compact IGC which is easily accessible for servicing. The ignition control board with CE mark, provides built-in diagnostic capability. Two LEDs (light-emitting diodes) simplify troubleshooting by providing visual fault notification and system status confirmation. This LED fault notification system reduces service personnel troubleshooting time and minimizes service costs.

Fig. 10 - Tubular, dimpled gas heat exchanger

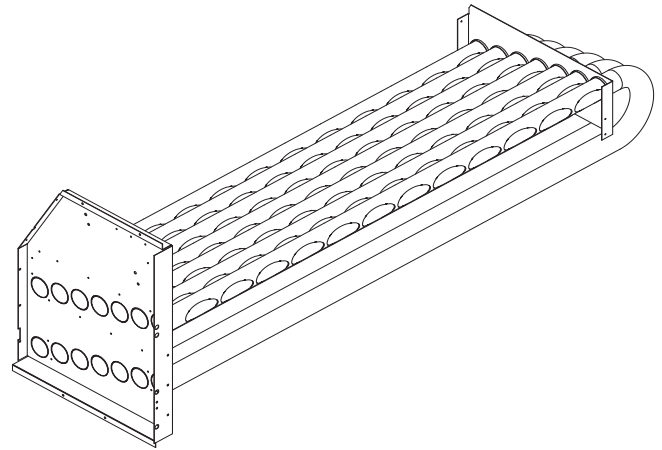


Fig. 11 - Modular burner compartment

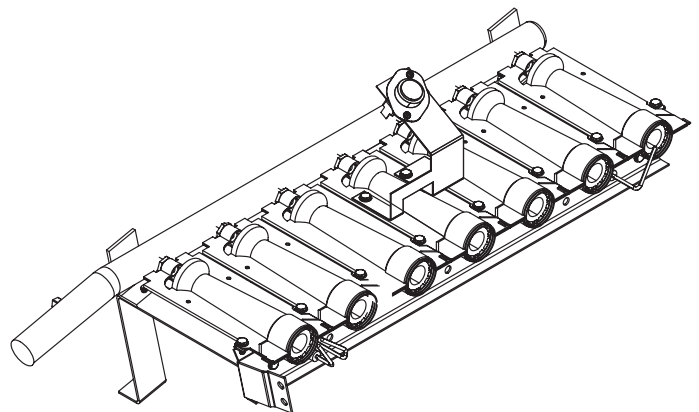
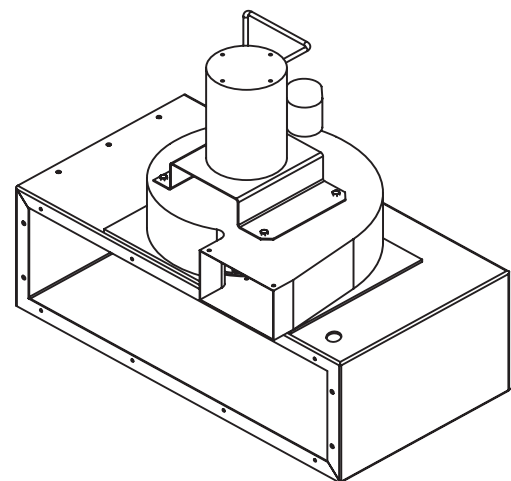


Fig. 12 - Induced draft combustion system



## 12.2 - Preliminary checks before start-up

### NOTES:

*Any work on the gas system must be carried out by qualified personnel.*

*This unit must be installed in accordance with local safety codes and regulations and can only be used in a well ventilated area.*

*Please read the manufacturer's instructions carefully before starting a unit.*

*Prior to dispatch, the rooftop unit was operated and tested at the factory. Gas type, power supply, adjustment and settings of the unit have been factory set and sealed and are indicated on the data plate.*

*Before commissioning a unit with gas burner, it is mandatory to ensure that the gas distribution system (type of gas, available pressure) is compatible with the gas type, power supply, adjustment and settings of the unit.*

### Check access and clearance around the unit (refer to the certified dimensional drawings)

- Make sure one can move freely around the unit.
- A minimum 2 m clearance must be left in front of the gas module side.
- Combustion air inlet and burnt gas exhausts must not be obstructed in any way.

**WARNING:** *This appliance is suitable only for operation using the gas as stated on the identification warning label. For appliances supplied as double category appliances, i.e. for those countries using gas categories II2H3P, II2Er3P, II2E3P and II2Hs3P, it is possible to convert from natural gas to propane or vice versa. Consult your local distributor or appliance manufacturer for further information. They will advise if conversion is suitable and will supply you with the correct conversion kit and suitable conversion instructions for your appliance.*

**WARNING:** *Only original manufacturers' parts shall be used. Failure to fit original manufacturers' parts will invalidate any warranty or guarantee and may contravene the approval and certification of this appliance.*

*Any gas conversion operation shall be carried out only by qualified and authorized personnel.*

*It is the responsibility of the authorized person to ensure the correct and safe operation of the appliance following any gas conversion procedure.*

*The appliance must be re-commissioned following any gas conversion procedure in accordance with the gas conversion instructions.*

## 12.3 - Gas connection

- Gas fired rooftop units are designed to operate on either natural gas (G20)/(G25)/(G25.1) or propane gas (G31).
- The gas supply to a rooftop gas unit must be realized according to gas safety installation and use regulations and local safety codes and rules.
- The diameter of the pipework connected to each rooftop must never be smaller than the diameter of the connection on the rooftop unit.
- Make sure that a shut-off isolation valve has been installed before **each** rooftop. The isolation valve must be connected to the main gas inlet supply pipe as close as possible to the appliance. For safety and accessibility reasons the isolation valve must not be fitted within the appliance gas valve compartment.
- Make sure that the gas service includes a filter and has been tested and purged in accordance with prescribed practice prior to commissioning and taking the appliance into service.
- Gas service pipes shall not be routed through any heated or fresh air ducts.
- Supply network pipe sizing: female threaded connection: ISO 7 Rp 3/4".

## 12.4 - Operating limits

Air flow limits are the minimum and maximum values given in the table below.

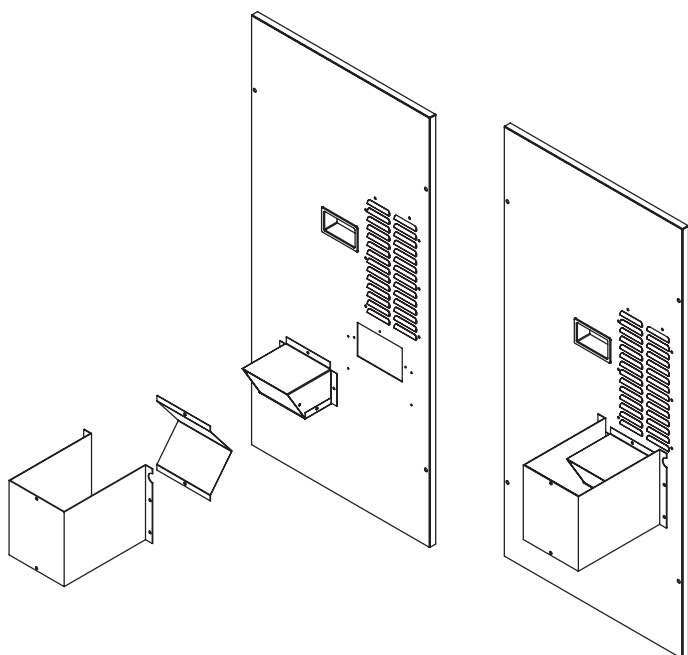
| 48UA/UH | Air flow, l/s |         |
|---------|---------------|---------|
|         | Minimum       | Maximum |
| 045     | 2022          | 3033    |
| 055     | 2755          | 4132    |
| 065     | 2777          | 4166    |
| 075     | 3155          | 4732    |
| 085     | 4440          | 6660    |
| 100     | 4440          | 6660    |
| 120     | 4440          | 6660    |

- The minimum allowable ambient (outdoor air) temperature is -15°C.
- The maximum allowable ambient (outdoor air) temperature is 60°C.

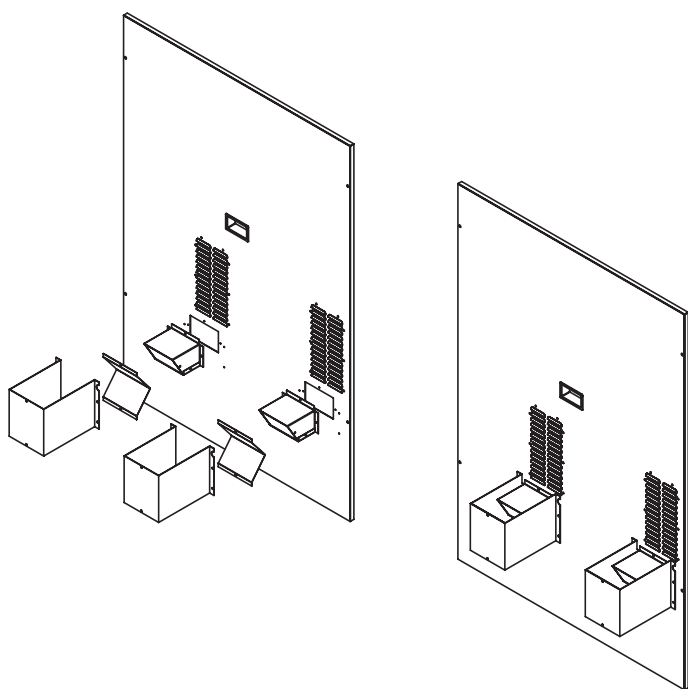
## 12.5 - Installation of flue outlet terminal guard and wind baffle

The flue outlet terminal guard and wind baffle are shipped secured under main control box. To install, secure the flue terminal guard to the access panel. See Fig. 13. The wind baffle is then installed over the flue terminal guard. There are two flue terminal guards and wind baffles for 48UA/UH 085-100-120 units. See Fig. 14.

**Fig. 13 - Flue outlet terminal guard and wind baffle location for 48UA/UH 045-075**



**Fig. 14 - Flue outlet terminal guard and wind baffle location for 48UA/UH 085-100-120**



## 12.6 - Commissioning

### 12.6.1 - Checks to be carried out before starting up the gas burner

**NOTE:** Access is required to the gas valve compartment only for commissioning checks. This requires the use of the special key tool supplied with the unit. Upon completion of any work the key tool shall not be left with the user so as to discourage inappropriate or unauthorized access.

### 12.6.2 - Required equipment list for start-up

- An accurate manometer from 0 to 3500 Pa (0 to 350 mbar): 0.1 % full scale
- Flexible PVC or similar tubing
- Suitable gas leak detection fluid
- 8 mm wrench
- 3.5 mm screwdriver

The following recommendations refer specifically to gas operation:

1. Check that the gas used is the right type for the unit to be used.
2. Check that there is a shut-off isolation valve fitted at the gas inlet of the unit.
3. Isolate the appliance from the electrical mains supply and turn off the gas supply to the appliance at the isolation valve.
4. The whole of the gas service installation including the meter must be inspected, tested for soundness and purged in accordance with appropriate requirements.

**NOTE:** The soundness of the gas burner pipework has been checked prior to leaving the factory. However during installation, connections may have been loosened. Check the soundness of the appliance pipework using a suitable gas leak detection solution. If any leaks are found they must be rectified immediately.

**CAUTION:** Never use a flame for checking gas soundness.

5. To check the gas supply pressure locate the pressure test point on the inlet side of the gas valve(s). Loosen, but do not remove the screw within the test point and connect a suitable pressure gauge.
6. Turn on the gas and electrical supplies.
7. Check that the gas inlet pressure is at least as indicated on the appliance identification data label (e.g. for 2H - G20 - 20 mbar).
8. Operate the appliance via the Pro-Dialog control at the maximum rate. Refer to the start-up procedures in the Setting up Pro-Dialog control section. Increase the set temperature (room setpoint temperature) to a temperature higher than the actual room temperature.
9. Re-check that the appliance inlet pressure is as indicated on the appliance identification data label. If the inlet pressure is not as required, check supply pipework for adequacy or contact your gas supplier.
10. Turn off the appliance. Remove the pressure gauge and retighten the test point screw. Check for gas tightness at the test point using a suitable leak detection solution.
11. To check the appliance burner pressures locate the burner pressure test point on the outlet side of the gas valve(s). Loosen, but do not remove the screw within the test point and connect a suitable pressure gauge.
12. The appliance gas valve(s) is factory set and sealed at the correct settings for the gas type concerned according to the appliance data indication label and should not require adjustment. If adjustment is necessary, perhaps due to using G25 or G25.1 natural gases, then carry out the following procedure.

13. Again operate the appliance as detailed in point 8. Check that the maximum rate burner pressure is as stated on the data badge for the type of gas being supplied. If adjustment of the maximum rate is necessary refer to Pressure adjustments on the high-low regulating valve section.
14. To check the minimum rate burner pressure, disconnect one of the low voltage leads from the electrical high-low regulator to initiate operation at the minimum rate. If adjustment of the maximum rate is necessary refer to Pressure adjustments on the high-low regulating valve section.

**IMPORTANT: Following any adjustment procedure of the gas valve settings, the tamperproof cap must again be sealed. A suitable method is to apply a spot of durable paint as indicated in Fig. 15.**

15. After checking of the burner pressures, turn the appliance off, remove the test equipment and retighten the pressure test point screw. Check for gas tightness at the test point following the restart of the appliance.
16. Before leaving the installation, instruct and demonstrate the safe and efficient operation of the appliance to the user. Guide the user through the user instructions and also leave these installation instructions in their care, stressing that they will be required for future reference. Advise the user that continued safe and efficient use is dependent on regular servicing. Recommend that the gas circuit be serviced at least annually.

## 12.7 - Pressure adjustments on the high/low regulating valve

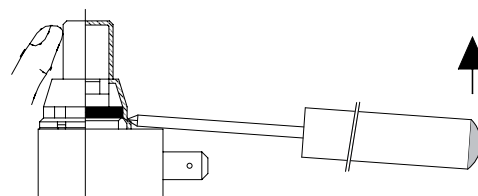
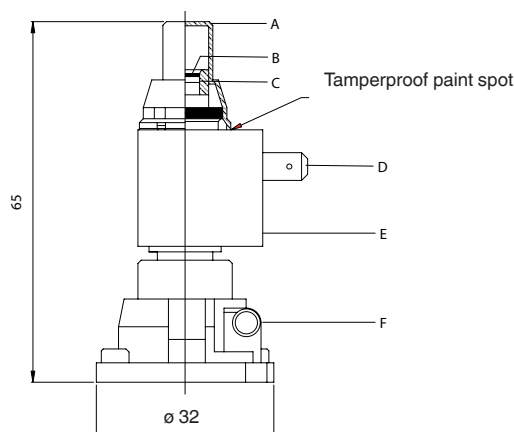
**IMPORTANT: The appliances burner pressure settings are factory set and sealed according to the appliance data name plate. Check and adjust if necessary the valve inlet pressure to 20.0 mbar (G20) or 25.0 mbar for (G25) or (G25.1) or 37.0 or 50.0 mbar for propane (G31) after gas burner ignition.**

- Before commencing an adjustment connect a manometer to the burner pressure test point on the gas valve.
- Lever off the cover cap as indicated.
- The maximum high pressure setting must be adjusted first after which the minimum low rate setting can be adjusted. Any adjustment of the maximum setting influences the minimum rate setting.
- Do not adjust maximum or minimum settings above or below the pressure stated on the name plate or in the table below.

### Pressure setting for each type of gas

| Category | Supply pressure  | Low heat injection | High heat Injection |
|----------|------------------|--------------------|---------------------|
| G20      | 20.0 ± 1         | 2.8 ± 0.2          | 5.8 ± 0.2           |
| G25      | 25.0 ± 1         | 4.2 ± 0.2          | 8.5 ± 0.2           |
| G25.1    | 25.0 ± 1         | 4.8 ± 0.2          | 9.5 ± 0.2           |
| G31      | 37.0/ 50.0 ± 1.9 | 25.5 ± 0.5         | 25.5 ± 0.5          |

**Fig. 15 - Gas valve adjustment details**



#### Legend:

- A Cap
- B Adjustment screw for maximum pressure setting
- C Adjustment screw for minimum pressure setting
- D 6.3 mm AMP terminals
- E Earth terminal
- F M5 pressure feedback connection

### 12.7.1 - Adjusting maximum pressure

- Energise the high-low regulator, set the gas control in operation (light burner) and wait until an outlet pressure is recorded on the pressure gauge.
- Use an 8 mm wrench to turn the adjustment screw for the maximum pressure setting, clockwise to increase, counter clockwise to decrease the pressure until the desired maximum pressure is obtained.
- Check the maximum pressure several times.

### 12.7.2 - Adjusting minimum pressure

- Disconnect the electrical connection of the high-low regulator.
- Set the gas control in operation and wait until an outlet pressure is recorded on the pressure gauge.
- Use a 3,5 mm screwdriver to turn the adjustment screw for the minimum pressure setting, clockwise to increase, counter clockwise to decrease pressure until the desired minimum pressure is obtained.

Check the minimum pressure several times. Before commencing an adjustment, connect a manometer to the burner pressure test point.



## 12.8 - Gas conversion instructions

**WARNING:** Only original manufacturer's parts shall be used. Failure to fit original manufacturer's parts will invalidate any warranty or guarantee and may contravene the approval and certification of this appliance.

*Any gas conversion operation shall be carried out only by qualified and authorized personnel. It is the responsibility of the authorized person to ensure the correct and safe operation of the appliance following any gas conversion procedure.*

*The appliance must be re-commissioned following any gas conversion procedure in accordance with these instructions.*

For conversion from a natural gas appliance to a propane appliance or a propane appliance to a natural gas appliance it will be necessary to obtain the correct conversion kit for your appliance. Refer to the list below and ensure the correct part number for the appliance has been supplied.

**Propane kit A (part no. 57080020710)** - for models 48UA/UH 045150 - 48UA/UH 055150 - containing 5 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Propane kit B (part no. 57080020720)** - for models 48UA/UH 045160 - 48UA/UH 055160 - 48UA/UH 065160 - 48UA/UH 075160 - containing 6 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Propane kit C (part no. 57080020730)** - for models 48UA/UH 065170 - 48UA/UH 075170 - containing 7 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Propane kit D (part no. 57080020740)** - for models 48UA/UH 085255 - 48UA/UH 100255 - containing 10 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Propane kit E (part no. 57080020750)** - for models 48UA/UH 075266 - 48UA/UH 085266 - 48UA/UH 100266 - containing 12 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Propane kit F (part no. 57080020760)** - for model 48UA/UH 120277 - containing 14 off  $\varnothing$  1.90 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Natural gas kit A (part no. 57080020711)** - for models 48UA/UH 045150 - 48UA/UH 055150 - containing 5 off  $\varnothing$  3.26 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Natural gas kit B (part no. 57080020721)** - for models 48UA/UH 045160 - 48UA/UH 055160 - 48UA/UH 065160 - 48UA/UH 075160 - containing 6 off  $\varnothing$  3.45 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Natural gas kit C (part no. 57080020731)** - for models 48UA/UH 065170 - 48UA/UH 075170 - containing 7 off  $\varnothing$  3.45 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Natural gas kit D (part no. 57080020741)** - for models 48UA/UH 085255 - 48UA/UH 100255 - containing 10 off  $\varnothing$  3.26 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

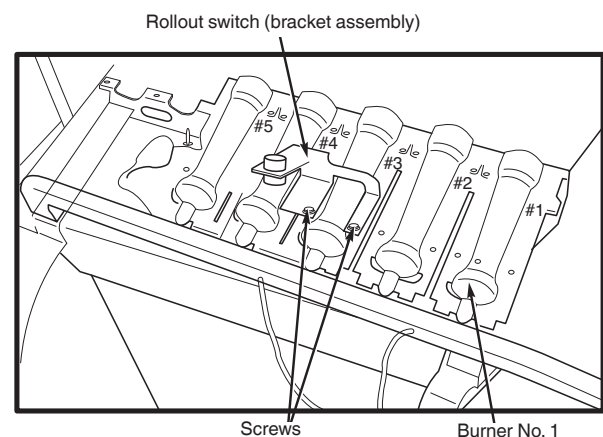
**Natural gas kit E (part no. 57080020751)** - for models 48UA/UH 075266 - 48UA/UH 085266 - 48UA/UH 100266 - containing 12 off  $\varnothing$  3.45 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

**Natural gas kit F (part no. 57080020761)** - for model 48UA/UH 120277 - containing 14 off  $\varnothing$  3.45 mm injectors, a replacement gas type indicating sticker for the additional appliance data label.

### 12.8.1 -Sequence

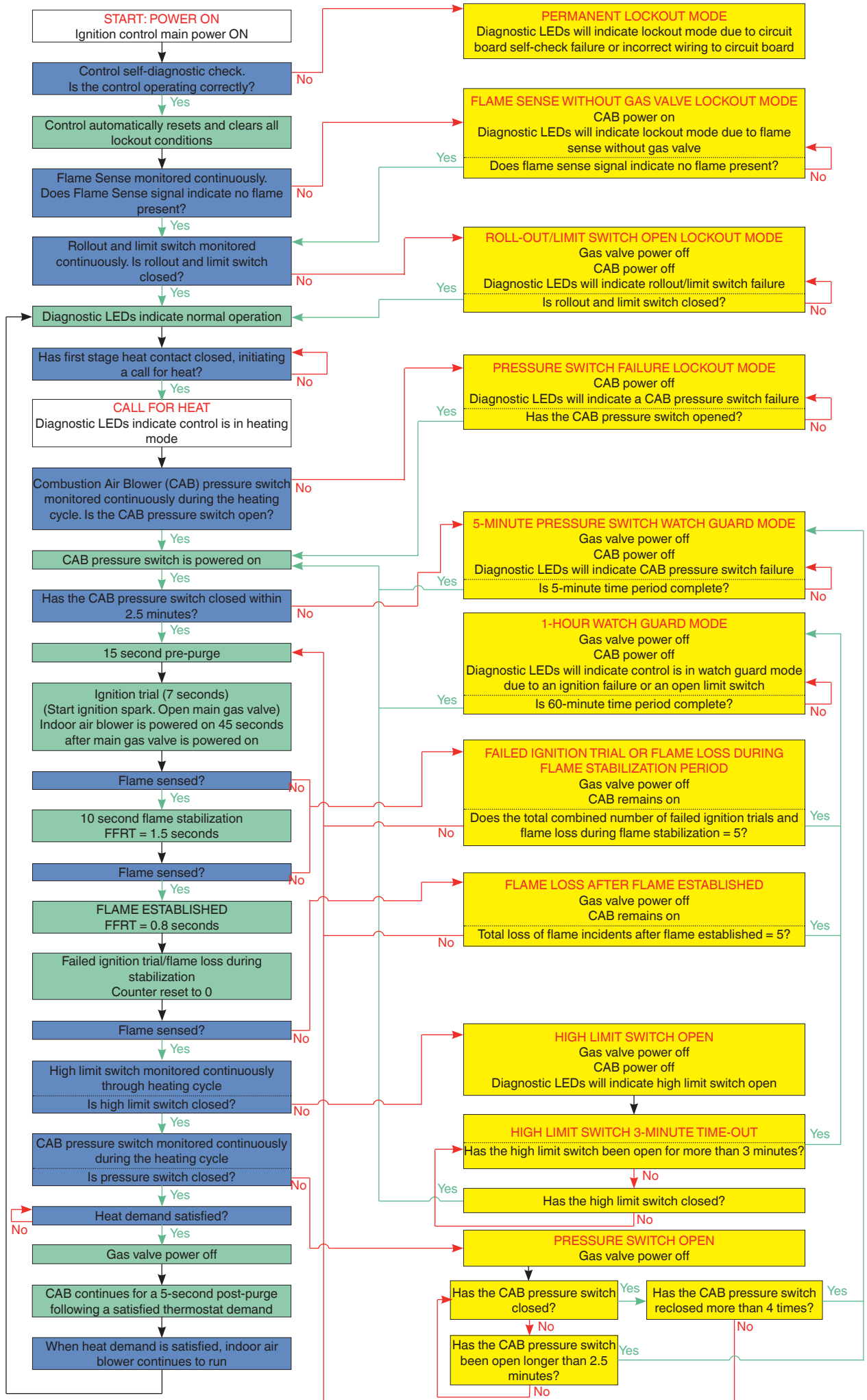
1. Isolate the appliance from the electrical mains supply and turn off the gas supply to the appliance at the isolation valve.
2. Remove the flue outlet terminal guard(s) and wind baffle(s) from the compartment panel.
3. Remove the compartment cover to gain access to the burner assembly.
4. Remove the 2 screws securing the flame rollout switch to the No. 4 burner for a natural gas appliance and No. 3 burner for a propane appliance and save.
5. Remove each individual burner tube component to gain access to the injectors. Ensure that the outer burners return to the original position when re-assembling.
6. Remove the injectors using a suitable 14 mm wrench.
7. Replace the injectors with the new injectors ensuring that the injector is tightened.
8. Refit the burner tubes and reattach the flame rollout switch to burner No. 3 for propane conversion or burner No. 4 for natural gas conversion using same screws. See Fig. 16 for rollout switch relocation in case of propane conversion.
9. Replace the compartment cover and the flue outlet guard(s) and wind baffle(s). Ensure any seals are intact and correctly positioned. Replace damaged seals if necessary.
10. Commission the appliance in accordance with the Commissioning section in this manual.

**Fig. 16 - Rollout switch relocation for propane conversion**





## 12.9 - Gas fire-up sequence



## 12.10 - Service and maintenance

**WARNING:** Before performing service or maintenance operations on the unit, turn off the main power switch to the unit.

Weatherproof covers are required under wet conditions.

Electrical shock could cause personal injury.

**IMPORTANT:** During any service or maintenance operation, if parts are evidently faulty or damaged they shall be replaced. Only original manufacturer's parts shall be used as detailed in the spare parts list. Failure to fit original manufacturer's parts will invalidate any warranty or guarantee and may contravene the approval and certification of this appliance.

Following any operation on the appliance which has necessitated removal and replacement of any parts, the appliance shall be recommissioned in accordance with the Commissioning section of these instructions.

### 12.10.1 - Cleaning

Inspect unit interior at beginning of each heating and cooling season and as operating conditions require. Remove unit side panels for access to unit interior.

### 12.10.2 - Main burner

At the beginning of each heating season, inspect for deterioration or blockage due to corrosion or other causes. Observe the main burner flames. Refer to the Main burners section.

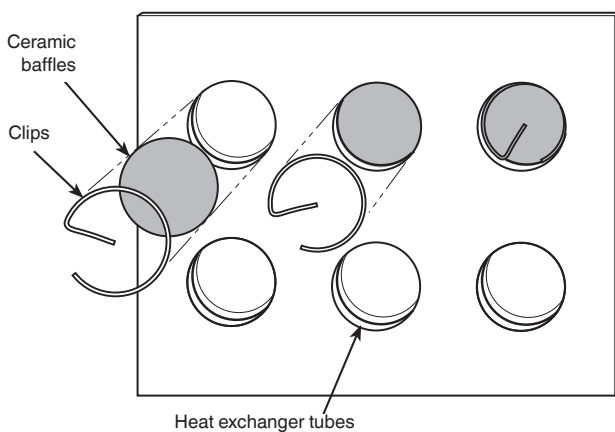
### 12.10.3 - Flue gas passageways

The flue collector box and heat exchanger cells may be inspected by removing the heat exchanger access panel, flue box cover, and main burner assembly (Fig. 25). Refer to the Main burners section for the burner removal sequence. If cleaning is required, remove the heat exchanger baffles and clean the tubes with a wire brush.

Use caution with the ceramic heat exchanger baffles. When installing a retaining clip, be sure the centre leg of the clip extends inward towards the baffle. See Fig. 21.

**NOTE:** One baffle and clip will be in each upper tube of the heat exchanger.

**Fig. 17 - Removing heat exchanger ceramic baffles and clips**

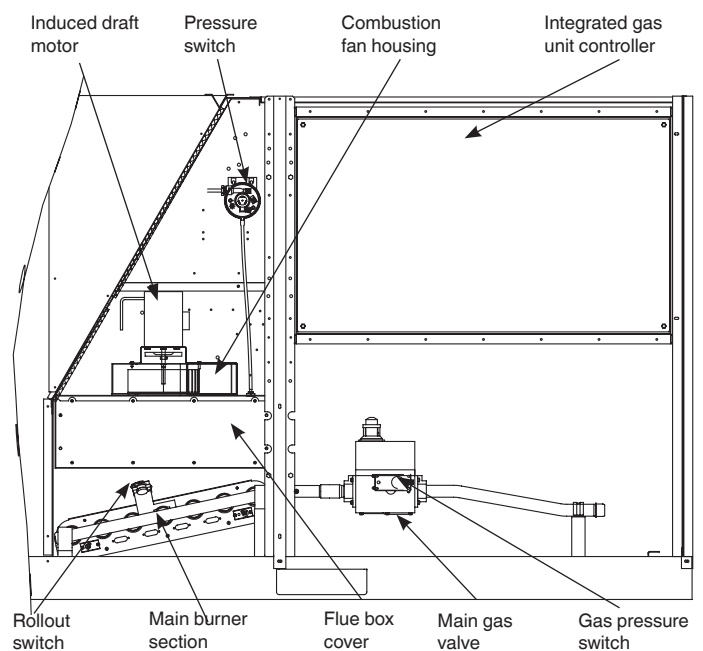


### 12.10.4 - Combustion air blower

Clean periodically to assure proper air flow and heating efficiency. Inspect the blower wheel every autumn and periodically during the heating season. For the first heating season, inspect the blower wheel bi-monthly to determine the proper cleaning frequency.

To inspect the blower wheel, remove the heat exchanger access panel. Shine a flashlight into the opening to inspect the wheel. If cleaning is required, remove the motor and wheel assembly by removing the screws holding the motor mounting plate to the top of the combustion fan housing (Fig. 18). The motor and wheel assembly will slide up and out of the fan housing. Remove the blower wheel from the motor shaft and clean with a detergent or solvent. Replace the motor and wheel assembly.

**Fig. 18 - Typical gas heating section, 48UA/UH 045-075**

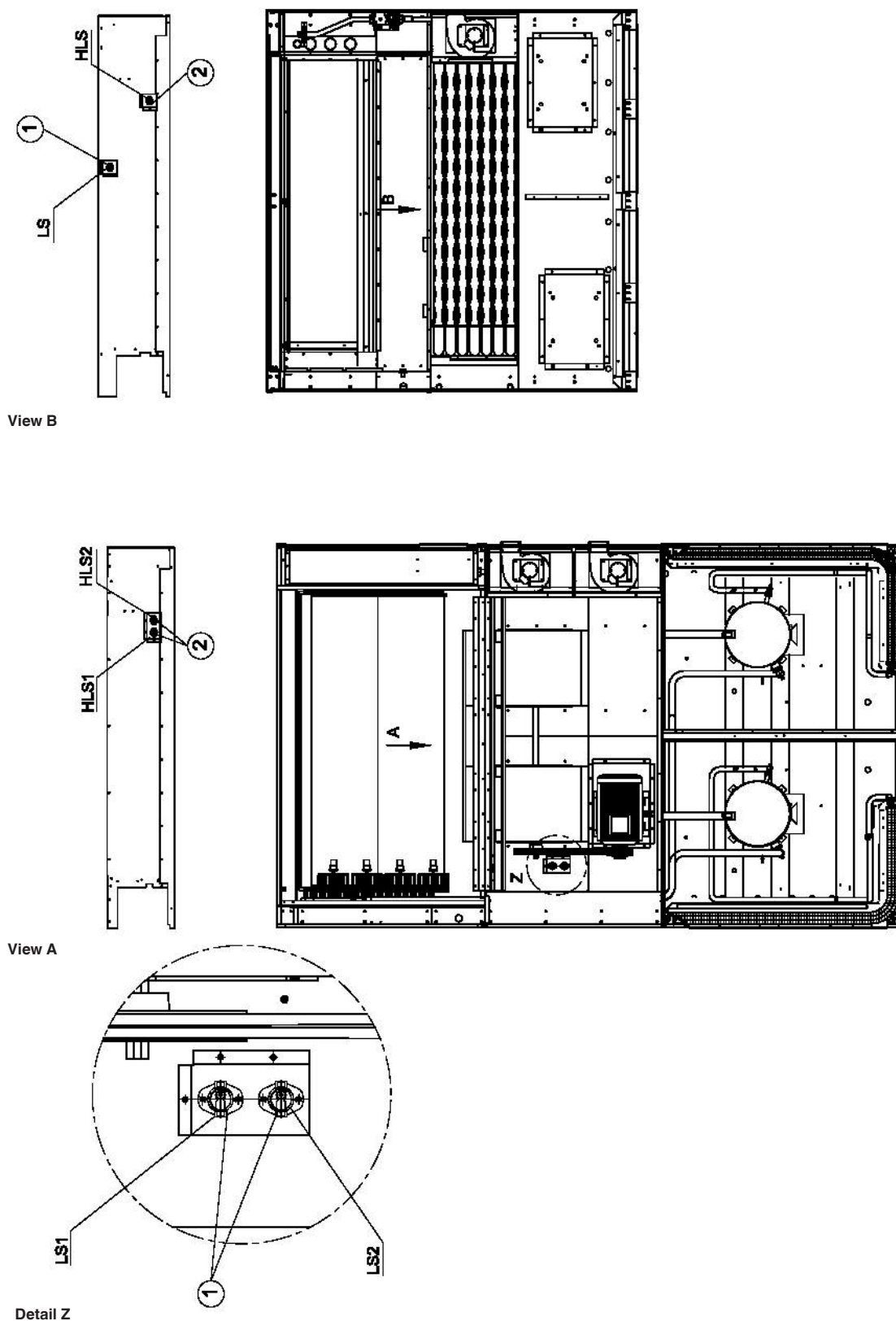


In unit sizes 48UA/UH 085-100-120 two of same modules are working in series and all the components of gas heating section are doubled.

## 12.11 - Temperature limit switches

There is one limit switch (LS) and one high limit switch (HLS) in 48UA/UH 045-075 units and two limit switches (LS1, LS2) and two high limit switches (HLS1, HLS2) in 48UA/UH 085-100-120 units which are all manually reset.

Fig. 19 - Temperature limit switches



## 12.12 - Main burners

For all applications, the main burners are factory set and should require no adjustment.

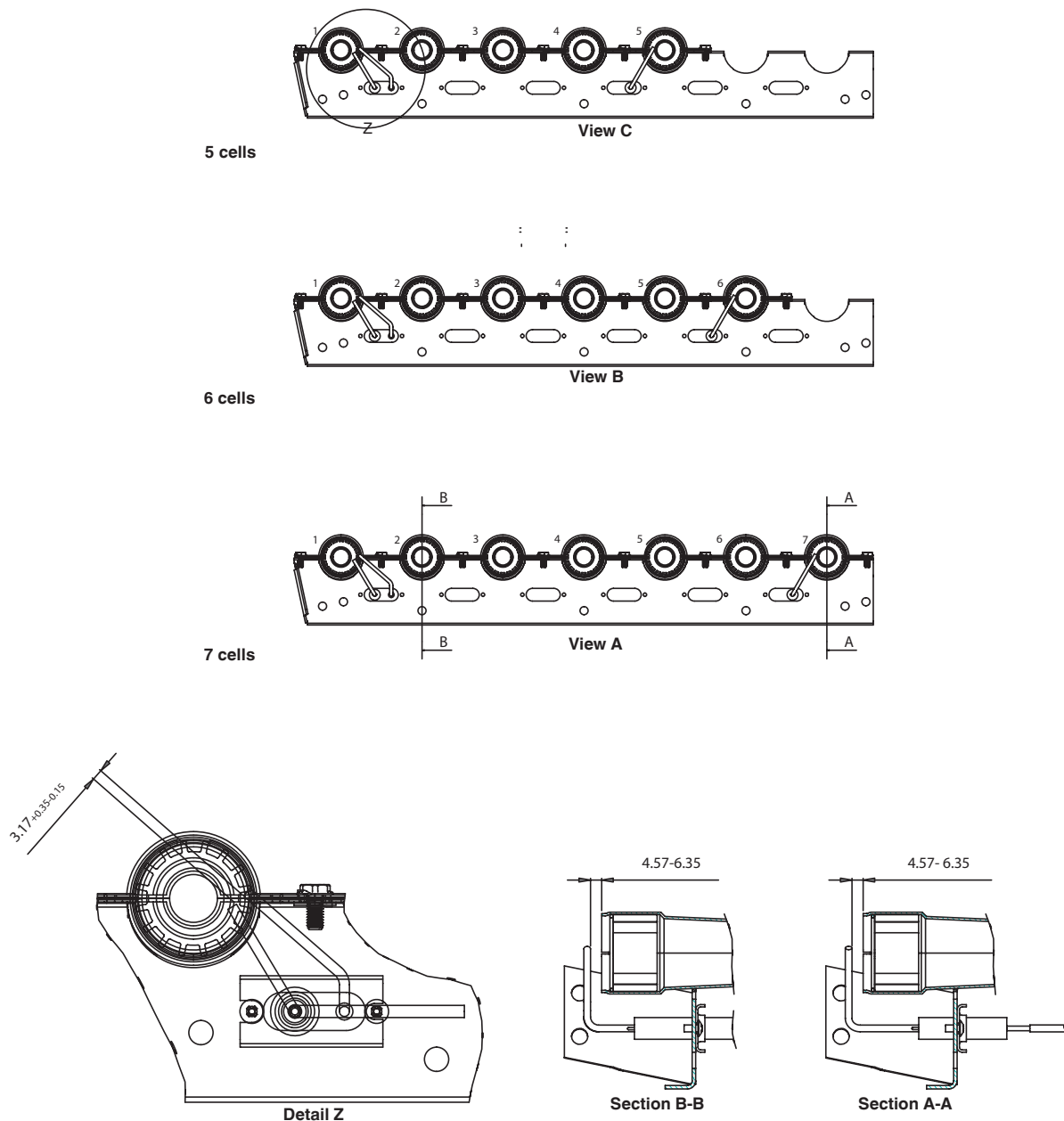
### 12.12.1 - Main burner removal

1. Shut off the (field-supplied) manual main gas valve.
2. Shut off power to the unit.
3. Open the unit control box access panel, remove the burner section access panel and centre post.
4. Disconnect the gas piping from the gas valve inlet.
5. Remove the wires from the gas valve.
6. Remove the wires from the rollout switch.
7. Remove the sensor wire and ignitor cable from the IGC board.
8. Remove the two screws securing the manifold bracket to the basepan.
9. Remove the two screws that hold the burner support plate flange to the vestibule plate.
10. Lift the burner assembly out of the unit.

### 12.12.2 - Cleaning and adjustment

1. Remove the burner rack from the unit as described in the Main burner removal section above.
2. Inspect the burners, and if dirty, remove burners from the rack.
3. Using a soft brush, clean the burners and crossover port as required.
4. Adjust the spark gap. See Fig. 20.
5. Reinstall the burners on the rack.
6. Reinstall the burner rack as described above.

Fig. 20 - Main burner details



12.13 - Integrated gas unit controller (IGC)

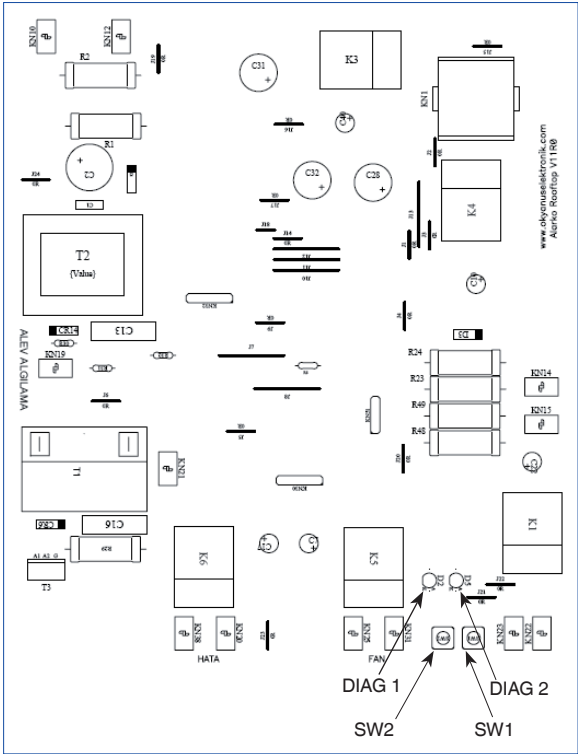
All ignition components are contained in the compact IGC which is easily accessible for servicing. At start-up, the control runs a self diagnostic check.

Diagnostic LEDs will indicate Lockout mode after a circuit board self-check or incorrect wiring to the circuit board. In 48UA/UH 085-100-120 series units, each module has its own ignition board. In the first heating stage, the first module is fired. At the second heating stage, the second module is fired and at the third heating stage, high heat of both modules is running.

If there is a call for heating, the operating sequence is as follows:

- Combustion air blower is powered on
- Pre-purge starts for 15 seconds
- Ignition spark starts for 7 seconds
- Main gas valve opens
- Flame is sensed by ionization

If a fault of any kind occurs during the ignition or operating cycles, the controller detects the fault, and diagnostic LEDs will indicate the mode of failure.



Two green LED lights are to be clearly marked as DIAG 1 and DIAG 2. The diagnostic signals for failure modes are as follows:

| Safety circuit  | Monitored during    | Action  | DIAG 1             | DIAG 2             |
|---|---------------------|---|--------------------|--------------------|
| High limit switch (manual reset) open                 | Heating demand only | Gas valve 'off'<br>Combustion air blower 'off'  | Flash              | On                 |
| Pressure switch open                                  | Heating demand only | Gas valve 'off'<br>Combustion air blower 'off'  | Off                | Flash              |
| 5-minute Watchguard                                   |                     |   |                    |                    |
| Pressure switch failed to close                       |                     |   |                    |                    |
| Burners failed to ignite                              | Heating demand only | Gas valve 'off'<br>Combustion air blower 'off'  | Alternate flash    | Alternate flash    |
| Flame sensed without valve energised                  | All times           | Gas valve 'off'<br>Combustion air blower 'off'  | Flash              | Off                |
| Rollout switch or limit switch (manual reset) open    | All times           | Gas valve 'off'<br>Combustion air blower 'off'  | On                 | Flash              |
| Circuit board failure or control is wired incorrectly | All times           | Gas valve 'off'<br>Combustion air blower 'off'  | On                 | On                 |
| Power on  | All times           | Control waiting for a heating signal from the thermostat. An increased flash rate indicates a call for heat | Simultaneous flash | Simultaneous flash |

12.13.1 - Lockout

After a system safety shut-down condition a restart is only possible if power is removed for 30 seconds and then restored, while pressing SW2 for five seconds. During the “Lockout” condition, the combustion blower will be “OFF” and the diagnostic will signal “Lockout” mode.

Control will hold the last failure code in the memory. To retrieve the last failure code, SW1 provided on the circuit board must be pressed. When this button is pressed and held, the diagnostic LED lights will signal the last failure code held in memory.

The high limit switch and limit switch must be reset manually by pressing reset buttons of switches during their faults.



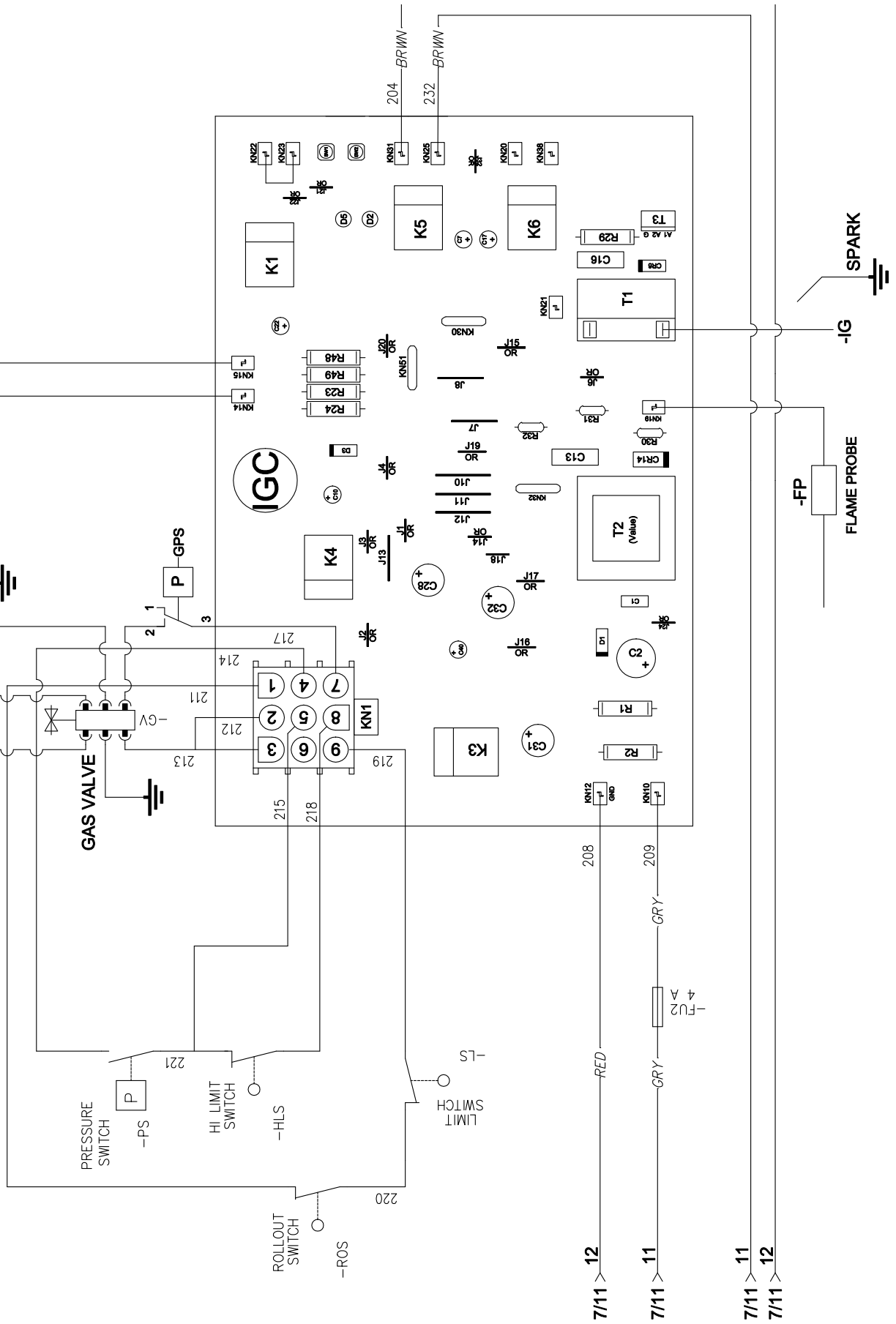
## 12.14 - Gas burner troubleshooting

- Check that the gas isolation shut-off valves are open.
- Check the gas pressure at the inlet of the gas valves.
- Adjust the set points to prioritise the burner. Increase the value of the room temperature set point to a temperature higher than actual room temperature.

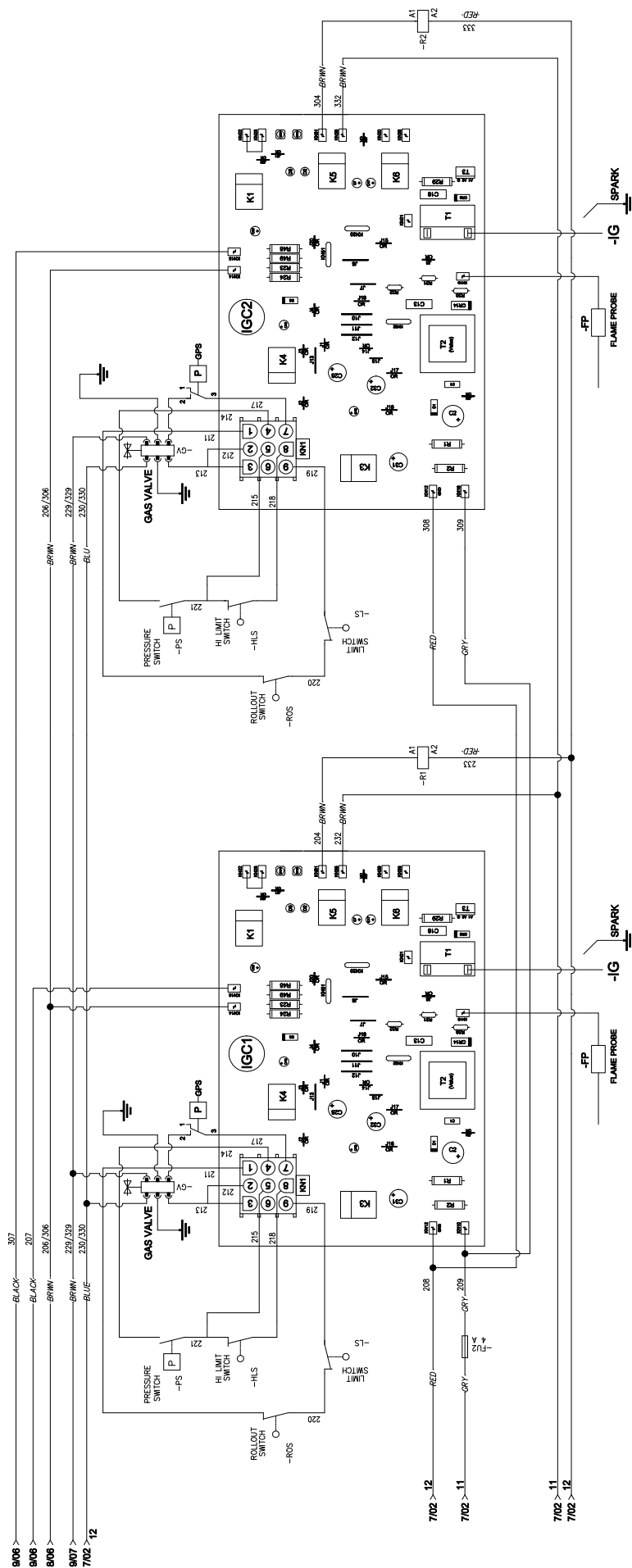
| Symptoms                          | Cause   | Remedy  |
|-----------------------------------|---|---|
| <b>Burners will not ignite</b>    | Misaligned spark electrodes   | Check flame ignition and sensor electrode positioning. Adjust as needed.  |
|                                   | No gas at main burners  | Check gas line for air; purge as necessary. After purging the gas line of air, allow the gas to dissipate for at least 5 minutes before attempting to relight the unit.<br>Check the gas valve. |
|                                   | Water in gas line   | Drain water and install drip leg to trap water.   |
|                                   | No power to unit  | Check power supply, fuses, wiring, and circuit breaker.   |
|                                   | No 24 V power supply to control circuit   | Check transformer. Check 24-V circuit breaker; reset if necessary.  |
|                                   | Miswired or loose connections   | Check all wiring and wire nut connections.  |
| <b>Inadequate heating</b>         | Dirty air filter  | Clean or replace filter as necessary.   |
|                                   | Gas input to unit too low   | Check gas pressure at manifold. Clock gas meter for input. If too low, increase manifold pressure or replace with correct orifices.   |
|                                   | Unit undersized for application   | Replace with proper unit or add additional unit.  |
|                                   | Restricted air flow   | Clean filter, replace filter, or remove any restrictions.   |
|                                   | Blower speed too low  | Install alternate motor, if applicable, or adjust pulley to increase fan speed.   |
|                                   | Limit switch cycles main burners  | Check rotation of blower, temperature settings, and temperature rise of unit. Adjust as needed.   |
|                                   | Too much outdoor air  | Adjust minimum position.  |
|                                   |   | Check economizer operation.   |
| <b>Poor flame characteristics</b> | Incomplete combustion (lack of combustion air) results in aldehyde odours, CO, sooting flame, or floating flame | Check all screws around flue outlets and burner compartment. Tighten as necessary.  |
|                                   |   | Cracked heat exchanger.   |
|                                   |   | Overfired unit - reduce input, change orifices, or adjust gas line or manifold pressure.  |
|                                   |   | Check vent for restriction. Clean as necessary.   |
|                                   |   | Check orifice to burner alignment.  |

**IMPORTANT:** Following any operation on the appliance which has necessitated removal and replacement of any parts, the appliance shall be recommissioned in accordance with the Commissioning section of these instructions.

|     |       |
|-----|-------|
| 207 | BLACK |
| 206 | BROWN |
| 229 | BROWN |
| 230 | BLUE  |



# Schematic of gas control for 48UA/UH 085-100-120



## 13 - OPTIONS

| Option  | No. | Description  | Advantage  | Use              |
|---|-----|--|--|------------------|
| <b>Electric heaters</b>                                   |     |  |  |                  |
| Electric heater 9 + 9 kW                                  | 83  | Electric heater coil offers auxiliary heating in cooling only and reversible units for low mixed air temperature (high fresh-air rate in winter).  | Electric heater is located after the main thermo-dynamic coil, guarantees constant and comfortable supply air temperature in winter. This option enhances comfort when the unit operates in the defrost cycle.   | 50UA-UH 045, 055 |
| Electric heater 18 + 9 kW                                 | 84  |  |  | 50UA-UH 045-075  |
| Electric heater 18 + 18 kW                                | 85  |  |  | All              |
| Electric heater 27 + 27 kW                                | 86  |  |  | 50UA-UH 065-120  |
| Electric heater 36 + 36 kW                                | 87  |  |  | 50UA-UH 085-120  |
| <b>Hot-water coils</b>                                    |     |  |  |                  |
| Hot-water coil 60 kW with 3-way valve                     | 37  | Hot-water coil offers auxiliary heating in cooling only and reversible units for low mixed air temperature (high fresh-air rate in winter).  | Hot-water coil located after the main thermo-dynamic coil, guarantees constant and comfortable supply air temperature in winter. Allows fully modulated heating capacity, using a three-way valve, protected by a frost protection sensor. This option allows high-capacity heating. | 50UA-UH 045-075  |
| Hot-water coil 100 kW with 3-way valve                    | 38  |  |  | 50UA-UH 065, 075 |
| Hot-water coil 130 kW with 3-way valve                    | 39  |  |  | 50UA-UH 085-120  |
| <b>Gas modules</b>  |     |  |  |                  |
| Natural gas 46.8 kW – 2 stages, 5 cells                   | 90  | Gas burner offers auxiliary heating in cooling only and reversible units for low mixed air temperature (high fresh-air rate in winter). Multiple stages for heating capacity control. Available with natural gas or liquified propane gas. | Gas burners located after the main thermo-dynamic coil, guarantees constant and comfortable supply air temperature in winter. This option allows high-capacity heating.  | 48UA/UH 045, 055 |
| Natural gas 61.8 kW – 2 stages, 6 cells                   | 91  |  |  | 48UA/UH 045-075  |
| Natural gas 72.9 kW – 2 stages, 7 cells                   | 92  |  |  | 48UA/UH 065, 075 |
| Natural gas 93.6 kW – 3 stages, 5 + 5 cells               | 93  |  |  | 48UA/UH 085, 100 |
| Natural gas 125 kW – 3 stages, 6 + 6 cells                | 94  |  |  | 48UA/UH 085-120  |
| Natural gas 147.4 kW – 3 stages, 7 + 7 cells              | 95  |  |  | 48UA/UH 120      |
| Propane gas 53.2 kW, 5 cells                              | 100 |  |  | 48UA/UH 045, 055 |
| Propane gas 63.9 kW, 6 cells                              | 101 |  |  | 48UA/UH 045-075  |
| Propane gas 74.5 kW, 7 cells                              | 102 |  |  | 48UA/UH 065, 075 |
| Propane gas 105.2 kW – 2 stages, 5 + 5 cells              | 103 |  |  | 48UA/UH 085, 100 |
| Propane gas 127.8 kW – 2 stages, 6 + 6 cells              | 104 | 48UA/UH 085-120  |  |                  |
| Propane gas 150.7 kW – 2 stages, 7 + 7 cells              | 105 |  |  | 48UA/UH 120      |
| <b>Coil protection options</b>                            |     |  |  |                  |
| Outdoor pre-coated/indoor standard                        | 154 | Coil fins made of UV- resistant polyurethane-protected pre-treated aluminium.  | Improved corrosion resistance for extended coil life.  | All              |
| Outdoor pre-coated/indoor pre-coated                      | 153 |  |  |                  |
| <b>Fresh air and economizer outdoor air options</b>       |     |  |  |                  |
| Fresh-air sliding panel                                   | 118 | Manual adjustment of permanent fresh-air volume up to 25%. Fresh-air hood also supplied.   | Fresh-air supply to the building with constant adjustable rate.  | All              |
| Manual outdoor air damper                                 | 40  | Manual adjustment of permanent fresh-air volume up to 40%. Fresh-air hood also supplied.   | Fresh-air supply to the building with constant adjustable rate.  |                  |
| Economizer, thermostatic control                          | 35  | Direct link-driven low-leakage blades to control fresh-air percentage up to 100% vs return air. Indoor and outdoor air temperature sensors supplied. Fresh-air hood also supplied.   | Fresh-air supply to the building with variable rate, based on the outside air temperature. Allows free-cooling operation for energy savings, based on temperature differential control.  |                  |
| Economizer, enthalpy control                              | 36  | Direct link-driven low-leakage blades to control fresh-air percentage up to 100% vs return air. Indoor and outdoor air enthalpy sensors supplied. Fresh-air hood also supplied   | Fresh-air supply to the building with variable rate, based on the outside air enthalpy (temperature and humidity level). Allows intelligent free-cooling operation for energy savings, based on enthalpy differential control.   |                  |
| Economizer, thermostatic + CO <sub>2</sub> sensor control | 156 | Direct link-driven low-leakage blades to control fresh-air percentage up to 100% vs return air. Indoor and outdoor air temperature sensor supplied. Indoor air quality CO <sub>2</sub> sensor supplied. Fresh-air hood also supplied.      | Fresh-air supply to the building with variable rate, based on the outside air temperature. Allows free-cooling operation for energy savings, based on temperature differential control. Controls CO <sub>2</sub> concentration levels in the building.                               |                  |
| Economizer, enthalpy + CO <sub>2</sub> sensor control     | 157 | Direct gear-driven low-leakage blades to control fresh-air percentage vs return air. Indoor and outdoor air temperature and humidity sensors supplied. Indoor air quality CO <sub>2</sub> sensor supplied. Fresh-air hood also supplied.   | Fresh-air supply to the building with variable rate, based on outside air temperature and humidity level. Allows intelligent free-cooling operation for energy savings, based on enthalpy differential control. Controls CO <sub>2</sub> concentration levels in the building.       |                  |
| <b>Supply fan options</b>                                 |     |  |  |                  |
| High static pressure 1                                    | 150 | Oversized fan and motor configuration  | High external static pressure requirements up to 680 Pa at nominal air flow rate (without options).  | All              |
| High static pressure 2                                    | 151 |  |  |                  |
| High static pressure 3                                    | 152 |  |  |                  |
| Standard with soft starter                                | 165 | Gradual supply fan motor starting.   | Progressive supply fan starting to reduce noise and start-up current.  |                  |
| High static pressure 1 with soft starter                  | 166 | Oversized fan and motor configuration and gradual supply fan motor starting time.  | High external static pressure requirements up to 680 Pa at nominal air flow rate (without options). Progressive supply fan starting to reduce noise and start-up current.  | All              |
| High static pressure 2 with soft starter                  | 167 |  |  |                  |
| High static pressure 3 with soft starter                  | 168 |  |  |                  |
| <b>Filter options</b>                                     |     |  |  |                  |
| Standard G4 filter (not classified)                       |     | G4 filters synthetic media 50 mm cardboard frame, 90% gravimetric efficiency and high filtration area.   | High-efficiency filtration for return air and fresh air with low pressure drop. No fire classification.  | All              |
| G4 filter M1 fire class                                   | 145 | G4 filters synthetic media 50 mm metallic frame, 90% gravimetric efficiency and high filtration area.  | High-efficiency filtration for return air and fresh air with low pressure drop with fire class M1.   |                  |
| F7 filter M1 fire class                                   | 147 | F7 filters synthetic media 50 mm metallic frame, 90% opacimetric efficiency and high filtration area.  | High-efficiency filtration for return air and fresh air with low pressure drop with fire class M1.   |                  |
| G4 + F7 filter M1 fire class                              | 158 | Two-stage particle filtration G4 and F7  | Two-stage high-efficiency filtration for return air and fresh air with medium pressure drop and fire class M1. Replaceable media G4.   |                  |
| F6 + F7 filter M1 fire class                              | 159 | Two-stage particle filtration F6 and F7  | Two-stage extra-high-efficiency filtration for return air and fresh air with medium pressure drop and fire class M1. Replaceable media F6.   |                  |

### 13 - OPTIONS (CONTINUED)

| Option  | No. | Description   | Advantage  | Use             |
|---|-----|---|--|-----------------|
| <b>Drain pan options</b>  |     |   |  |                 |
| Standard  |     | Galvanised steel drain pan with connection to a drain pipe.   | Standard easy condensate draining.   | All             |
| Stainless steel pan   | 72  | Stainless steel drain pan with connection to a drain pipe.  | Easy-to-clean drain pan for improved hygiene and easy condensate draining.   |                 |
| <b>Energy recovery options</b>  |     |   |  |                 |
| Energy recovery module (supplied separately)                            | 160 | The ERM is an individual dual-flow unit with a high-efficiency Eurovent-certified air-to-air condensation heat recovery wheel with 63% to 88% efficiency, an integrated variable exhaust air volume plug fan and a control system for a plug-and-play installation and connection to the rooftop control box. | Energy-saving solution when the unit operates with fresh air rate in extreme outdoor temperatures (winter or summer) allowing energy recovery from exhaust air and transfer to fresh-air side. Reduced installed unit cooling or heating capacity. Allows 100% free cooling. | All             |
| <b>Return/exhaust air options</b>                                       |     |   |  |                 |
| Barometric exhaust  | 71  | Aluminium blades with gravity-control closing to protect exhaust from rain.   | Allows pressure relief when fresh air is introduced to a building with good air tightness.   | All             |
| 1.1-kW power exhaust, air flow 2200 l/s, 80 Pa                          | 66  | Centrifugal exhaust fan for exhaust air, running when the fresh air inlet reaches 50% of the fresh air requirement. Fixed air flow. Includes barometric exhaust option 71.  | Minimised over-pressure in the building if fresh air is introduced. Allows additional exhaust air pressure for return ductwork medium pressure drop.   | 48/50UH 045-075 |
| 2.9-kW power exhaust, air flow 2800 l/s, 150 Pa                         | 67  |   |  | 48/50UH 085-120 |
| Return fan with manual 2.9-kW exhaust damper, 2800 l/s (shipped loose)  | 68  | Centrifugal return fan to provide high return air pressure. Adjustable air flow rate with variable pulley. Adjustable exhaust damper with low-leakage blades to adjust exhaust air flow rate. Available only with options 40 and 118.   | Allows additional return air pressure for return ductwork. Minimised over-pressure in the building if fresh air is introduced. Allows manual system air pressure balancing in the building.  | 48/50UH 045-075 |
| Return fan with manual 4-kW exhaust damper, 3600 l/s (shipped loose)    | 69  |   |  | 48/50UH 045-075 |
| Return fan with manual 5.5-kW exhaust damper, 4400 l/s (shipped loose)  | 70  |   |  | 48/50UH 085-120 |
| Return fan w. motorised 2.9-kW exhaust damper, 2800 l/s (shipped loose) | 142 |   |  | 48/50UH 045-075 |
| Return fan w. motorised 4-kW exhaust damper, 3600 l/s (shipped loose)   | 143 | Centrifugal return fan to provide high return air pressure. Adjustable air flow rate with variable pulley. Motorised exhaust damper with low-leakage blades for automatic pressure balancing.   | Allows additional return air pressure for return ductwork. Minimised over-pressure in the building if fresh air is introduced. Allows automatic system air pressure balancing in the building.   | 48/50UH 045-075 |
| Return fan w. motorised 5.5-kW exhaust damper, 4400 l/s (shipped loose) | 144 |   |  | 48/50UH 085-120 |
| <b>Temperature sensor options</b>                                       |     |   |  |                 |
| Standard space sensor T55   |     | T55 sensor to monitor room temperature.   | Supply air temperature control based on room temperature.  | All             |
| Space sensor with override and setpoint adjustment T56                  | 19  | T56 sensor to monitor room temperature and provide a temperature offset of 3 K maximum.   | Room temperature control with override and setpoint adjustment.  |                 |
| Space sensor with display, override, on/off and setpoint adjustment     | 24  | Room temperature sensor with occupied period extension (up to 4 hours), setpoint adjustment and on/off functions.   | Room temperature control with override, setpoint adjustment and display.   |                 |
| Two-space sensor T55 + T56  | 57  | Twin sensors T55 + T56 supplied   |  |                 |
| Two-space sensor T55 + option 24  | 59  | Twin sensors T55 + option 24 supplied   |  |                 |
| Duct temperature sensor   | 18  | Duct sensor to monitor return air temperature.  | Allows direct temperature control on return air duct.  |                 |
| <b>Communication options</b>  |     |   |  |                 |
| CCN/Jbus Gateway  | 26  | Two-direction communications board, complies with JBus communication protocol.  | Easy connection by communication bus to a Building Management System.  | All             |
| CCN/Lon Gateway   | 27  | Two-direction communications board, complies with LonTalk communication protocol.   | Easy connection by communication bus to a Building Management System.  |                 |
| CCN/BACnet Gateway  | 161 | Two-direction communications board, complies with BACnet communication protocol.  | Easy connection by communication bus to a Building Management System.  |                 |
| <b>Air flow safety devices</b>  |     |   |  |                 |
| Dirty-filter detection (pressure switch)                                | 96  | Alarm reported by adjustable differential pressure switch connected to ProDialog+ controller.   | Easy filter maintenance by checking the filter pollution level, improving energy efficiency  | All             |
| Supply air flow detection (pressure switch)                             | 99  | Alarm reported by adjustable differential pressure switch connected to ProDialog+ controller.   | Fan checking is "On".  |                 |
| Dirty-filter alarm and air flow detection                               | 162 | Combination of options 96 and 99.   | Filter pollution level and fan checking is "On".   |                 |
| <b>Smoke detection</b>  |     |   |  |                 |
| Smoke detector  | 97  | Generates general unit fault when the smoke is detected, economizer return air damper is closed, supply fan is stopped, electric heaters/hot-water coils/gas burners are switched off. Only available with economizer options.  | Building fire safety based on smoke detection.   | All             |
| Smoke detector + DAD (French ERP regulation)                            | 110 | Generates general unit fault when the smoke is detected, economizer return air damper is closed, supply fan is stopped, electric heaters/hot-water coils/gas burners are switched off. Additional DAD functions. Only available with economizer options.  | Building fire safety based on smoke detection DAD safety device.   |                 |
| Fire thermostat   | 121 | Generates general unit fault if thermostats detect return air temperature above adjustable temperature (factory-set to 70°C). Manually reset thermostat in return air duct.   | Building fire safety based on temperature rise detection.  |                 |
| <b>Duct connection</b>  |     |   |  |                 |
| Fixing frame  | 163 | Rigid metallic frame on air return and supply sides.  | Easy air duct installation.  | All             |
| <b>Packaging</b>  |     |   |  |                 |
| Standard (plastic wrap)   |     |   |  | All             |
| Pallet + coil protection + plastic wrap                                 | 128 | Packaging with pallet, coil protection + plastic wrap.  | Unit protection for transport  |                 |
| 70% open crate + coil protection + plastic wrap                         | 127 | Packaging with 70% open crate + coil protection + plastic wrap.   | Unit protection for long-distance transport  |                 |



### 13.1 - Electric heaters

Shielded electric resistance heaters are fully factory-wired and tested. Each stage is protected against overloads by two thermal protectors. The low-limit protector with automatic reset is located above the resistance heaters while the high-limit protector with manual reset is located in the heater control box. This high-temperature limit control offers overload protection and is set to 90°C. It is located less than 150 mm after electric heaters. Refer to the certified drawings and wiring diagrams for the electric heaters and to the Pro-Dialog+ Control IOM for further information.

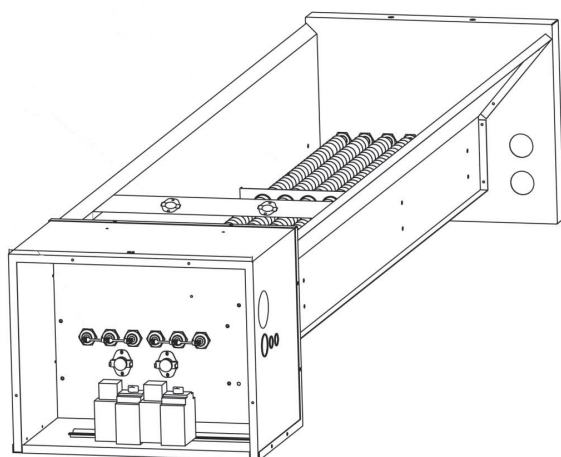
The electric heater data is as follows:

| 50UA/UH                | Nominal power supply, V-ph-Hz | Electric heater | Nominal heat output, kW | Electric heater air flows, l/s |         | Rated current, A | No. of steps |
|------------------------|-------------------------------|-----------------|-------------------------|--------------------------------|---------|------------------|--------------|
|                        |                               |                 |                         | Minimum                        | Maximum |                  |              |
| 045 (1 stage heating)  | 400-3-50                      | Option 83       | 18.0                    | 9.0/18.0                       | 3033    | 26.0             | 2            |
|                        |                               | Option 84       | 27.0                    | 18.0/27.0                      | 4132    | 39.0             | 2            |
|                        |                               | Option 85       | 36.0                    | 18.0/36.0                      | 4166    | 52.0             | 2            |
| 055 (1 stage heating)  | 400-3-50                      | Option 83       | 18.0                    | 9.0/18.0                       | 2777    | 26.0             | 2            |
|                        |                               | Option 84       | 27.0                    | 18.0/27.0                      | 4132    | 39.0             | 2            |
|                        |                               | Option 85       | 36.0                    | 18.0/36.0                      | 4166    | 52.0             | 2            |
| 065 (2 stages heating) | 400-3-50                      | Option 84       | 27.0                    | 18.0/27.0                      | 4732    | 39.0             | 2            |
|                        |                               | Option 85       | 36.0                    | 18.0/36.0                      | 6660    | 52.0             | 2            |
|                        |                               | Option 86       | 54.0                    | 27.0/54.0                      | 6660    | 77.9             | 2            |
| 075 (2 stages heating) | 400-3-50                      | Option 84       | 27.0                    | 18.0/27.0                      | 4732    | 39.0             | 2            |
|                        |                               | Option 85       | 36.0                    | 18.0/36.0                      | 6660    | 52.0             | 2            |
|                        |                               | Option 86       | 54.0                    | 27.0/54.0                      | 6660    | 77.9             | 2            |
| 085 (2 stages heating) | 400-3-50                      | Option 85       | 36.0                    | 18.0/36.0                      | 6660    | 52.0             | 2            |
|                        |                               | Option 86       | 54.0                    | 27.0/54.0                      | 6660    | 77.9             | 2            |
|                        |                               | Option 87       | 72.0                    | 36.0/72.0                      | 6660    | 103.9            | 2            |
| 100 (3 stages heating) | 400-3-50                      | Option 85       | 36.0                    | 18.0/36.0                      | 6660    | 52.0             | 2            |
|                        |                               | Option 86       | 54.0                    | 27.0/54.0                      | 6660    | 77.9             | 2            |
|                        |                               | Option 87       | 72.0                    | 36.0/72.0                      | 6660    | 103.9            | 2            |
| 120 (4 stages heating) | 400-3-50                      | Option 85       | 36.0                    | 18.0/36.0                      | 6660    | 52.0             | 2            |
|                        |                               | Option 86       | 54.0                    | 27.0/54.0                      | 6660    | 77.9             | 2            |
|                        |                               | Option 87       | 72.0                    | 36.0/72.0                      | 6660    | 103.9            | 2            |

The air flow limits are the min. and max. values given in the table below:

| 50UA/UH | Electric heater air flows, l/s |         |
|---------|--------------------------------|---------|
|         | Minimum                        | Maximum |
| 045     | 2022                           | 3033    |
| 055     | 2755                           | 4132    |
| 065     | 2777                           | 4166    |
| 075     | 3155                           | 4732    |
| 085     | 4440                           | 6660    |
| 100     | 4440                           | 6660    |
| 120     | 4440                           | 6660    |

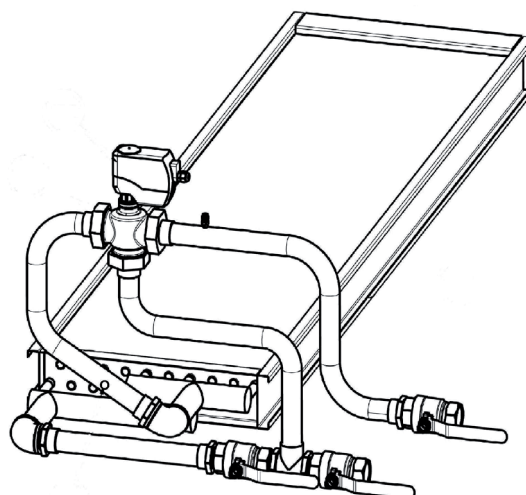
Fig. 21 - Electric heater option



### 13.2 - Hot-water coil

The hot-water coils offer a fully modulating proportional three-way valve as standard, with supply air temperature-based control. They also include two isolating shut-off valves and are factory-fitted, wired and fully factory-tested. Frost protection is provided by a low-temperature sensor and the coils are equipped with a purge system. Refer to the certified drawings and wiring diagrams for the water and electrical connections of the hot-water coil and to the Pro-Dialog+ Control IOM for further information.

Fig. 22 - Hot-water coil option



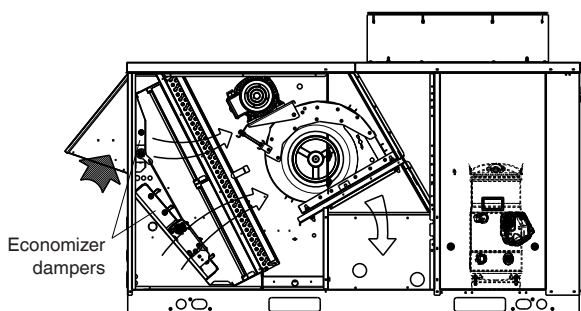
### 13.3 – Economizer options (thermostatic or enthalpic)

When the outdoor conditions are maintained based on temperature or enthalpy (depending on the option fitted), free cooling can be provided using fresh air. The economizer is factory-fitted and tested before leaving the factory (see Fig. 23).

The return air damper is operated by a 24 V actuator, and the fresh air damper is mechanically linked to this damper to open or close at opposite angles. During start-up, the return air damper is fully open, while the fresh air damper is fully closed.

The option also includes a factory-fitted fresh air hood that is folded during transportation to limit risks of damage and must be unfolded on site. Please refer to the certified drawings and wiring diagrams for the mechanical and electrical connections of the economizer and to the Pro-Dialog+ Control IOM for further information.

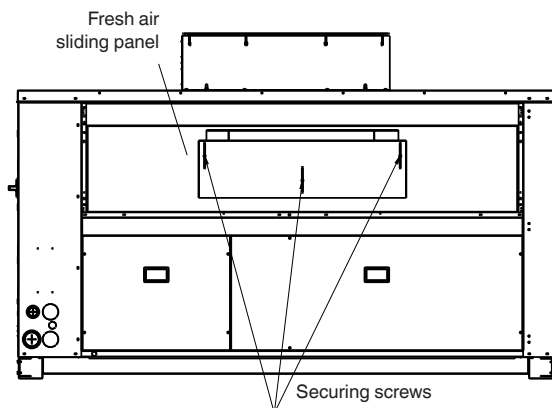
**Fig. 23 – Economizer option**



### 13.4 – Fresh air sliding panel

The sliding panel can be preset to admit up to 25% outside air into the return-air compartment. To adjust, loosen the securing screws and move the panel to the desired setting. Then retighten the screws to secure the panel (see Fig. 24). It also includes a factory-fitted fresh air hood.

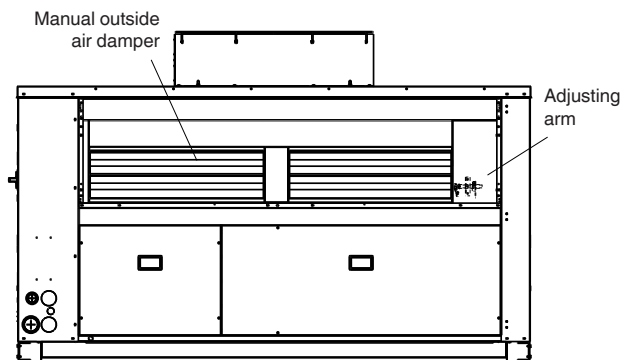
**Fig. 24 – Fresh air sliding panel option without fresh air hood**



### 13.5 – Manual outside air damper

Damper with direct link driven blades, can be preset to admit up to 40% outside air into the return-air compartment. To adjust, loosen the securing screw and rotate the arm of the damper blades to the desired setting. Then retighten the screw to secure the damper blades (see Fig. 25). It also includes a factory-fitted fresh air hood.

**Fig. 25 – Manual outside air damper option without fresh air hood**



### 13.6 – Economizer with CO<sub>2</sub> sensor options (thermostatic or enthalpic)

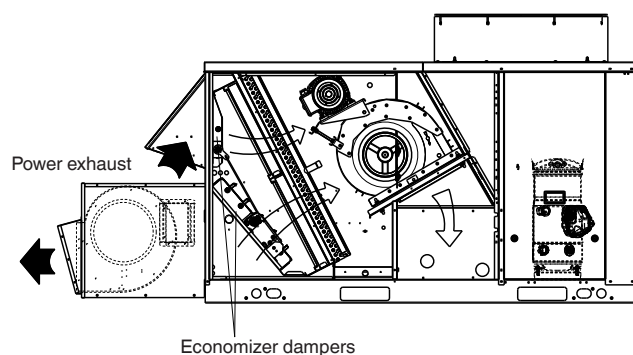
The indoor air quality is controlled by the Pro-Dialog+ control via the input from the CO<sub>2</sub> sensor, adjusting the economizer. Please refer to the Pro-Dialog+ IOM for the control logic. The room air CO<sub>2</sub> sensor, together with the connector, is in the control box. Please refer to the wiring diagrams for the required connection and correct cable diameter selection criteria. Sensor locations vary with system and building specifics.

### 13.7 – Power exhaust option

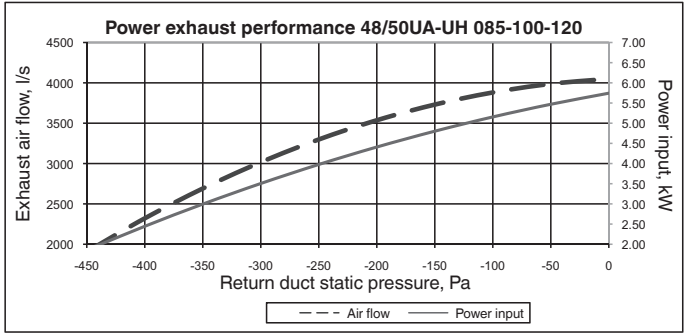
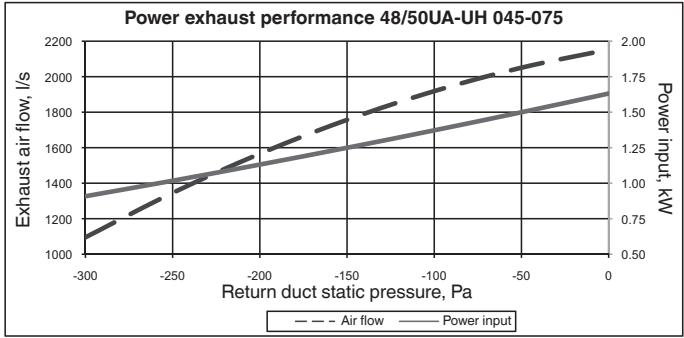
When a large amount of fresh air is introduced into the zone, power exhaust fans can be used to exhaust excessive air.

The exhaust fan runs when the outside air dampers are at least 50% open (adjustable value). It is overload protected. The exhaust fan is factory-fitted and tested before leaving the factory (see Fig. 26). Refer to the certified drawings and wiring diagrams for the mechanical and electrical connections of the power exhaust and to the Pro-Dialog+ Control IOM for further information.

**Fig. 26 – Power exhaust option**



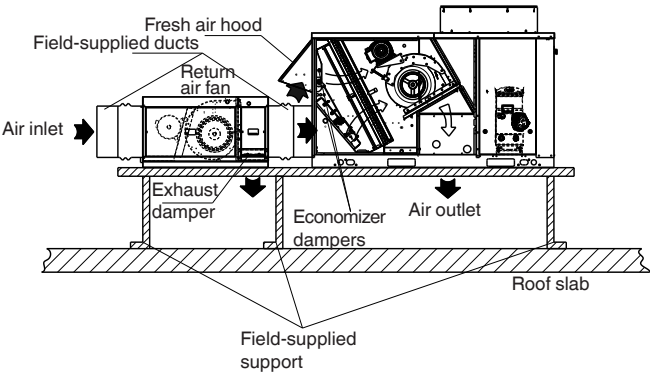
The power exhaust performance curves are shown below:



13.8 – Return air fan options

This option assists the supply air fan to overcome the return side pressure drop while running in series with the supply air fan. It is also fitted with a damper to exhaust excessive air due to fresh air usage. The exhaust damper can be manually or automatically adjusted, based on the fresh air options. The return air fan is shipped loose, but submitted to functional tests before leaving the factory. Supporting frames, ducts and cables for mechanical and electrical connection need to be field-supplied (see Fig. 27) The drive is factory-set in accordance with the return fan performance tables. If indoor pressure and air flow requirements differ from the nominal ratings, the motor pulley can be adjusted for different available static pressure values (see chapter 7.10 "Indoor fan air flow adjustment"). Refer to the certified drawings and wiring diagrams for the mechanical and electrical connections of return air fan. On the page opposite you will find the "Return air fan performance" and "Fan speed at various motor pulley settings" tables

Fig. 27 – Return air fan option



### 13.8.1 - Return air fan performances

| Return air fan 2.9 kW |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow              |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|                       |       | 40                           |       | 70    |       | 100   |       | 130   |       | 160   |       | 190   |       |
| l/s                   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
|                       |       | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2000                  | 7200  | -                            | -     | -     | -     | -     | -     | 11.23 | 0.753 | 12.27 | 0.864 | 13.27 | 0.982 |
| 2250                  | 8100  | -                            | -     | -     | -     | 10.57 | 0.818 | 11.53 | 0.931 | 12.43 | 1.048 | 13.42 | 1.173 |
| 2500                  | 9000  | -                            | -     | -     | -     | 11.05 | 1.027 | 11.93 | 1.145 | 12.80 | 1.270 | 13.67 | 1.401 |
| 2750                  | 9900  | -                            | -     | 10.78 | 1.155 | 11.60 | 1.275 | 12.40 | 1.401 | 13.20 | 1.532 | 14.00 | 1.670 |
| 3000                  | 10800 | 10.68                        | 1.315 | 11.43 | 1.440 | 12.18 | 1.569 | 12.92 | 1.702 | 13.65 | 1.841 | 14.38 | 1.985 |
| 3250                  | 11700 | 11.42                        | 1.639 | 12.12 | 1.773 | 12.80 | 1.910 | 13.48 | 2.051 | 14.17 | 2.197 | 14.85 | 2.348 |
| 3500                  | 12600 | 12.17                        | 2.014 | 12.80 | 2.158 | 13.45 | 2.304 | 14.08 | 2.453 | 14.72 | 2.607 | 15.35 | 2.766 |
| 3750                  | 13500 | 12.90                        | 2.445 | 13.52 | 2.598 | 14.12 | 2.753 | 14.70 | 2.912 | 15.30 | 3.073 | 15.90 | 3.239 |
| 4000                  | 14400 | 13.67                        | 2.937 | 14.23 | 3.098 | 14.80 | 3.262 | 15.35 | 3.429 | 15.92 | 3.599 | 16.47 | 3.773 |
| 4250                  | 15300 | 14.43                        | 3.490 | 14.97 | 3.662 | 15.48 | 3.835 | 16.02 | 4.011 | 16.55 | 4.190 | 17.07 | 4.372 |

| Return air fan 4 kW |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|---------------------|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow            |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|                     |       | 170                          |       | 200   |       | 230   |       | 260   |       | 290   |       | 320   |       |
| l/s                 | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
|                     |       | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 2500                | 9000  | 13.10                        | 1.289 | 13.95 | 1.418 | 14.78 | 1.553 | 15.60 | 1.693 | 16.40 | 1.836 | 17.17 | 1.984 |
| 2750                | 9900  | 13.47                        | 1.548 | 14.25 | 1.685 | 15.03 | 1.826 | 15.80 | 1.971 | 16.55 | 2.122 | 17.28 | 2.277 |
| 3000                | 10800 | 13.90                        | 1.854 | 14.63 | 1.996 | 15.35 | 2.144 | 16.08 | 2.295 | 16.78 | 2.452 | 17.48 | 2.613 |
| 3250                | 11700 | 14.40                        | 2.205 | 15.07 | 2.356 | 15.75 | 2.510 | 16.42 | 2.668 | 17.08 | 2.831 | 17.73 | 2.998 |
| 3500                | 12600 | 14.93                        | 2.610 | 15.57 | 2.767 | 16.18 | 2.928 | 16.82 | 3.093 | 17.43 | 3.262 | 18.07 | 3.436 |
| 3750                | 13500 | 15.50                        | 3.070 | 16.08 | 3.234 | 16.68 | 3.402 | 17.27 | 3.574 | 17.85 | 3.750 | 18.43 | 3.930 |
| 4000                | 14400 | 16.10                        | 3.590 | 16.65 | 3.761 | 17.20 | 3.937 | 17.77 | 4.116 | 18.32 | 4.299 | 18.87 | 4.485 |
| 4250                | 15300 | 16.72                        | 4.172 | 17.25 | 4.351 | 17.77 | 4.534 | 18.28 | 4.721 | 18.82 | 4.911 | 19.33 | 5.105 |
| 4500                | 16200 | 17.37                        | 4.820 | 17.85 | 5.009 | 18.35 | 5.200 | 18.85 | 5.394 | 19.33 | 5.591 | 19.83 | 5.793 |
| 4750                | 17100 | 18.02                        | 5.540 | 18.50 | 5.737 | 18.97 | 5.936 | 19.43 | 6.137 | 19.90 | 6.343 | 20.37 | 6.551 |

| Return air fan 5.5 kW |       |                              |       |       |       |       |       |       |       |       |       |       |       |
|-----------------------|-------|------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Air flow              |       | External static pressure, Pa |       |       |       |       |       |       |       |       |       |       |       |
|                       |       | 20                           |       | 50    |       | 80    |       | 110   |       | 140   |       | 170   |       |
| l/s                   | m³/h  | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
|                       |       | r/s                          | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    | r/s   | kW    |
| 3250                  | 11700 | -                            | -     | -     | -     | 8.78  | 1.102 | 9.55  | 1.247 | 10.32 | 1.399 | 11.05 | 1.561 |
| 3500                  | 12600 | -                            | -     | -     | -     | 9.15  | 1.312 | 9.88  | 1.462 | 10.58 | 1.622 | 11.28 | 1.790 |
| 3750                  | 13500 | -                            | -     | 8.85  | 1.400 | 9.55  | 1.551 | 10.22 | 1.708 | 10.88 | 1.873 | 11.53 | 2.047 |
| 4000                  | 14400 | -                            | -     | 9.30  | 1.663 | 9.95  | 1.820 | 10.58 | 1.984 | 11.22 | 2.157 | 11.83 | 2.336 |
| 4250                  | 15300 | 9.12                         | 1.798 | 9.75  | 1.958 | 10.37 | 2.123 | 10.97 | 2.295 | 11.55 | 2.473 | 12.15 | 2.660 |
| 4500                  | 16200 | 9.62                         | 2.119 | 10.20 | 2.288 | 10.78 | 2.462 | 11.35 | 2.641 | 11.92 | 2.826 | 12.48 | 3.019 |
| 4750                  | 17100 | 10.10                        | 2.478 | 10.67 | 2.655 | 11.22 | 2.837 | 11.77 | 3.024 | 12.30 | 3.217 | 12.83 | 3.416 |
| 5000                  | 18000 | 10.60                        | 2.875 | 11.13 | 3.062 | 11.65 | 3.252 | 12.17 | 3.446 | 12.68 | 3.647 | 13.20 | 3.854 |
| 5250                  | 18900 | 11.08                        | 3.315 | 11.60 | 3.509 | 12.10 | 3.707 | 12.60 | 3.911 | 13.08 | 4.118 | 13.57 | 4.333 |
| 5500                  | 19800 | 11.58                        | 3.796 | 12.07 | 4.000 | 12.55 | 4.207 | 13.03 | 4.418 | 13.50 | 4.633 | 13.97 | 4.855 |

Undersized drive
  Oversized drive

### 13.8.2 - Fan speed (approximate) at various motor pulley settings, return air fan

| Motor pulley turns open |      |      |      |       |      |       |      |       |      |       |      |
|-------------------------|------|------|------|-------|------|-------|------|-------|------|-------|------|
| Option No.              | 0    | 1/2  | 1    | 1-1/2 | 2    | 2-1/2 | 3    | 3-1/2 | 4    | 4-1/2 | 5    |
| 68/142                  | 16.9 | 16.7 | 16.4 | 16.2  | 15.9 | 15.7  | 15.5 | 15.2  | 15.0 | 14.7  | 14.5 |
| 69/143                  | 20.1 | 19.9 | 19.6 | 19.3  | 19.0 | 18.7  | 18.4 | 18.1  | 17.8 | 17.5  | 17.2 |
| 70/144                  | 11.6 | 11.4 | 11.2 | 11.1  | 10.9 | 10.7  | 10.6 | 10.4  | 10.2 | 10.1  | 9.9  |

NOTE: Factory settings are shaded

### 13.9 – Dirty filter detection option

Dirty filter detection is controlled from the Pro-Dialog+ control via the input from the differential pressure switch, checking the pressure drop across the filter. The factory setting is 250 Pa and it is adjustable. If the pressure drop across the filter exceeds 250 Pa, there will be an alarm on the Pro-Dialog+ control and the necessary actions will be taken. For mechanical and electrical connections of this option please refer to the certified drawings and wiring diagrams, and to the Pro-Dialog+ Control IOM for further information.

### 13.10 – Supply air flow detection option

The supply air flow detection is controlled by the Pro-Dialog+ control via the input from the differential pressure switch, checking the pressure drop between the return air side and the atmosphere. The factory setting is 20 Pa. If the pressure drop between the return air side and the atmosphere does not reach 20 Pa, there will be an alarm on the Pro-Dialog+ control and the necessary actions will be taken. For mechanical and electrical connections of this option please refer to the certified drawings and wiring diagrams, and to the Pro-Dialog+ Control IOM for further information.

### 13.11 – Smoke detector option

The smoke detector is factory-fitted in return air side. If smoke is detected, there will be an alarm on the Pro-Dialog+ control and the necessary actions will be taken. For mechanical and electrical connections of this option please refer to the certified drawings and wiring diagrams, and to the Pro-Dialog+ Control IOM for further information.

### 13.12 – Smoke detector + DAD option

The DAD is factory-fitted under the control board and its smoke detector is located in the return air side. If smoke is detected, there will be an alarm on the Pro-Dialog+ control and the necessary actions will be taken. This smoke detection option complies with French regulations for public buildings. For mechanical and electrical connections of this option please refer to the certified drawings and wiring diagrams, and to the Pro-Dialog+ Control IOM for further information.

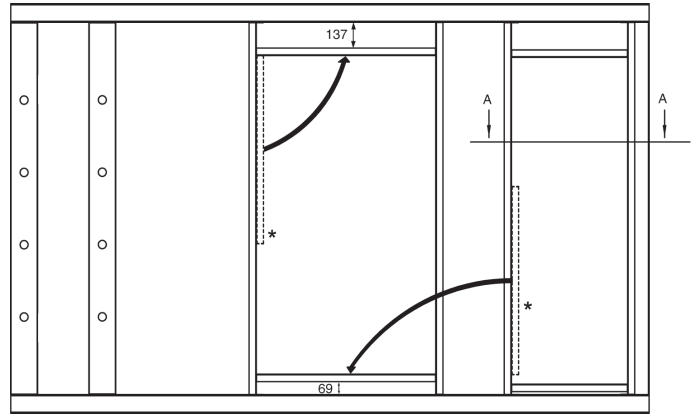
### 13.13 – Fire thermostat option

The fire thermostat is factory-fitted in the return air stream and checks the return air temperature. The factory setting is 70°C and adjustable. If the return air temperature exceeds 70°C, there will be an alarm on the Pro-Dialog+ control and the necessary actions will be taken. For mechanical and electrical connections of this option please refer to the certified drawings and wiring diagrams, and to the Pro-Dialog+ Control IOM for further information.

### 13.14 – Fixation frame

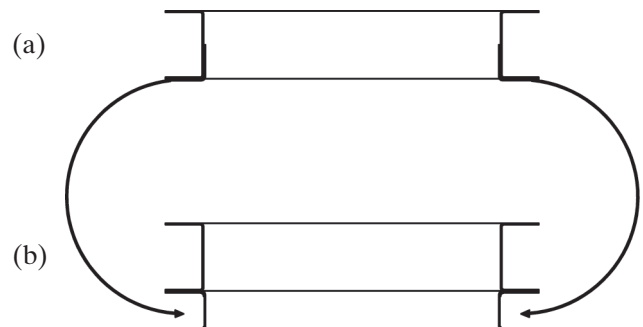
This option allows easy duct connection for inlet and outlet ducts when the roof curb accessories are not selected. For 48/50UA-UH 085-100-120 units, install the parts marked "\*" in the position shown in Fig. 28 before placing the unit on the support.

Fig. 28 - Unit air inlet and outlet



Air inlet and outlet flange parts should be mounted as shown in Fig. 29(b) before placing the unit on the support.

Fig. 29 - View A-A of Fig. 28





## 14 - ACCESSORIES

| Accessory   | Part No.                   | Description  | Advantage  | Use                                |
|---|----------------------------|--|--|------------------------------------|
| <b>Roof curbs</b>                                 |                            |  |  |                                    |
| Vertical supply roof curb                         | 57070020010<br>57070021501 | Galvanised steel 2 mm thick frame for vertical supply and vertical return air.   | Provides easy and cost-effective weather-proof sealed rooftop installation and easy connection to the air duct.                                    | 48/50UH 045-075<br>48/50UH 085-120 |
| Vertical supply adjustable longitudinal roof curb | 57070025510<br>57070027101 | Galvanised steel 2 mm thick frame for vertical supply and vertical return air. Adjustable longitudinal slope up to 5%. | Provides easy and cost-effective weather-proof sealed rooftop installation and easy connection to the air duct. Compatible with all roof profiles. | 48/50UH 045-075<br>48/50UH 085-120 |
| Vertical supply adjustable transversal roof curb  | 57070026310<br>57070027901 | Galvanised steel 2 mm thick frame for vertical supply and vertical return air. Adjustable transversal slope up to 5%.  |  | 48/50UH 045-075<br>48/50UH 085-120 |
| Horizontal supply roof curb                       | 57070022710<br>57070025210 | Galvanised steel 2 mm thick frame for horizontal supply and horizontal return air.                                     | Provides easy and cost-effective weather-proof sealed rooftop installation and easy connection to the horizontal supply air duct.                  | 48/50UH 045-075<br>48/50UH 085-120 |
| Transition roof curb (French ERP)                 | 57070034310<br>57070035410 | Thin galvanised steel frame for gas burner unit in France only. Standard or adjustable roof curb also required.        | Meets French regulation requirements for gas burners.  | 48/50UH 045-075<br>48/50UH 085-120 |
| <b>Remote control</b>                             |                            |  |  |                                    |
| Remote HMI Pro-Dialog+                            | 57260042910                | Remote user interface installation.  | Remote control of several units up to 300 m.   | All                                |

### 14.1 - Roof curbs

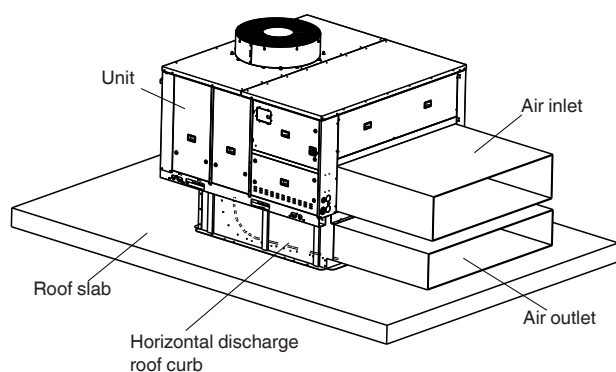
#### 14.1.1 - Horizontal discharge roof curb

The units leave the factory with the air discharge and return in the lower section. The horizontal discharge roof curb accessory changes the discharge and return to the horizontal direction.

##### Installation

1. Check that the building structure is capable of supporting the unit operating weight (see certified drawings).
2. Position the roof curb accessory in the place selected for unit operation.
3. The roof curb accessory should be completely level to allow correct unit drainage.
4. The ducts can be connected to the accessory before siting.
5. Assemble the unit on top of the roof curb accessory ensuring that the unit discharge coincides with the accessory inlet. The unit and accessory assembly should be as shown in Fig. 30.

**Fig. 30 - Horizontal discharge roof curb**



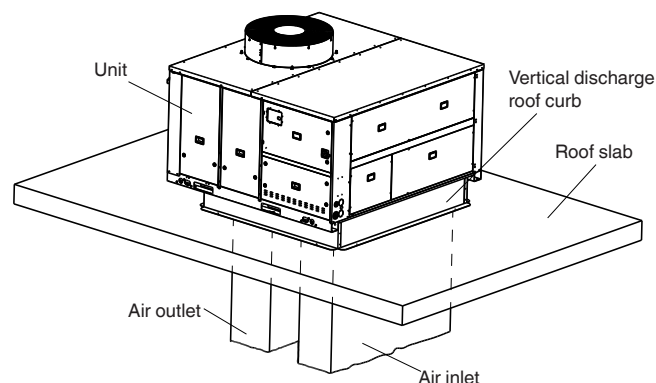
#### 14.1.2 - Vertical discharge roof curb

This accessory is used to improve unit installation and facilitate vertical connection of the air discharge and return ducts.

##### Installation

1. Check that the building structure is capable of supporting the unit operating weight.
2. Make the appropriate holes in the building ceiling so that the air discharge and return ducts can be inserted.
3. Place the roof curb accessory in the position selected for unit operation and ensure that the holes in the accessory coincide with those made in the ceiling.
4. The roof curb accessory should be perfectly levelled to allow correct unit drainage.
5. The ducts can be connected to the roof curb accessory before the unit is sited.
6. Assemble the unit on top of the roof curb accessory ensuring that the unit discharge and return air coincide with the accessory inlets. The unit and the accessory assembly should be as shown in Fig. 31.

**Fig. 31 - Vertical discharge roof curb**



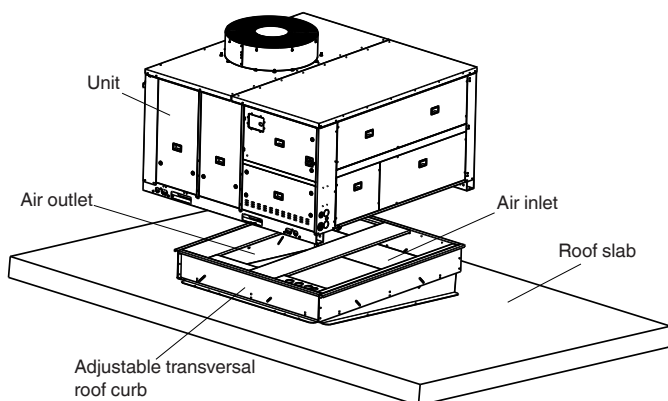
### 14.1.3 - Adjustable transversal roof curb

This accessory can be installed on a roof with up to 5% slope in transversal direction and also be used to improve unit installation and facilitate vertical connection of the air discharge and return ducts.

#### Installation

1. Check that the building structure is capable of supporting the unit operating weight.
2. Make the appropriate holes in the building ceiling so that the air discharge and return ducts can be inserted.
3. Place the roof curb accessory in the position selected for unit operation and ensure that the holes in the accessory coincide with those made in the ceiling.
4. The roof curb accessory should be perfectly levelled to allow correct unit drainage.
5. The ducts can be connected to the roof curb accessory before the unit is sited.
6. Assemble the unit on top of the roof curb accessory ensuring that the unit discharge and return air coincide with the accessory inlets. The unit and the accessory assembly should be as shown in Fig. 32.

**Fig. 32 - Adjustable transversal roof curb**



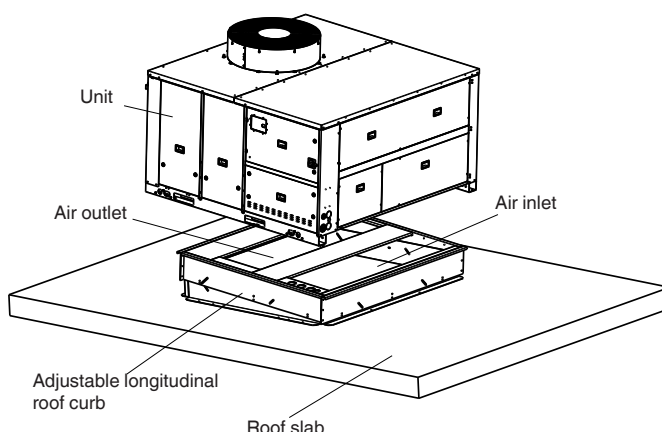
### 14.1.4 - Adjustable longitudinal roof curb

This accessory can be installed on a roof with up to 5% slope in longitudinal direction and also be used to improve unit installation and facilitate vertical connection of the air discharge and return ducts.

#### Installation

1. Check that the building structure is capable of supporting the unit operating weight.
2. Make the appropriate holes in the building ceiling so that the air discharge and return ducts can be inserted.
3. Place the roof curb accessory in the position selected for unit operation and ensure that the holes in the accessory coincide with those made in the ceiling.
4. The roof curb accessory should be perfectly levelled to allow correct unit drainage.
5. The ducts can be connected to the roof curb accessory before the unit is sited.
6. Assemble the unit on top of the roof curb accessory ensuring that the unit discharge and return air coincide with the accessory inlets. The unit and the accessory assembly should be as shown in Fig. 33.

**Fig. 33 - Adjustable longitudinal roof curb**



## 15 - STANDARD MAINTENANCE

Air conditioning equipment must be maintained by professional technicians, whilst routine checks can be carried out locally by specialised technicians.

*All refrigerant charging, removal and draining operations must be carried out by a qualified technician and with the correct material for the unit. Any inappropriate handling can lead to uncontrolled fluid or pressure leaks.*

**WARNING:** *Before doing any work on the machine ensure that the power is switched off. If a refrigerant circuit is opened, it must be evacuated, recharged and tested for leaks. Before any operation on a refrigerant circuit, it is necessary to remove the complete refrigerant charge from the unit with a refrigerant charge recovery group.*

In order to obtain maximum performance from the unit special attention should be paid to the following points:

- **Electrical connections:** The supply voltage should be within the limits permitted by the compressor.

Ensure that no faulty contacts exist in the terminal blocks, contactor boards, etc. Make sure that all the electrical connections are properly tightened, and that all the electrical components (contactors, relays, etc) are firmly secured to the corresponding rails.

Pay special attention to the condition of the connecting cables between the control elements and the control box, and to that of the unit power supply cable. Check the starting and running consumptions are within the limits specified in the corresponding technical information.

- **Drainage:** Frequently check that the drain is not obstructed, and that the condensate pan is clean and level.
- **Inlet filter:** This should be cleaned periodically. The frequency depends on the purity of the entering air. The dirty filter option can be used to find out when the filter needs to be changed. A set of filters can be ordered as a spare part.
- **Refrigerant circuit:** Ensure that there is no leakage of refrigerant or oil from the compressor. Check that the high and low side operating pressures are normal. Make sure that the coils are not dirty. Check for unusual compressor noise.
- **Controls:** Check the operation of all relays, high and low pressure transducers and the high-pressure switch, etc. Use the quick test function of the Pro-Dialog+ control.

### 15.1 - Maintenance programme

All maintenance operations must be carried out by technicians who have been trained on Carrier products, observing all Carrier quality and safety standards. Please contact the Carrier University.

### 15.2 - Maintenance instructions

During the unit operating life the service checks and tests must be carried out in accordance with applicable national regulations.

If there are no similar criteria in local regulations, the information on checks during operation in annex C of standard EN 378-2 can be used.

External visual checks: annex A and B of standard EN 378-2.

Corrosion checks: annex D of standard EN 378-2. These controls must be carried out:

- After an intervention that is likely to affect the resistance or a change in use or change of high-pressure refrigerant, or after a shut down of more than two years. Components that do not comply, must be changed. Test pressures above the respective component design pressure must not be applied (annex B and D).
- After repair or significant modifications or significant system or component extension (annex B)
- After re-installation at another site (annexes A, B and D)
- After repair following a refrigerant leak (annex D). The frequency of refrigerant leak detection can vary from once per year for systems with less than 1% leak rate per year to once a day for systems with a leak rate of 35% per year or more. The frequency is in proportion with the leak rate.

**NOTE:** *High leak rates are not acceptable. The necessary steps must be taken to eliminate any leak detected.*

**NOTE 2:** *Fixed refrigerant detectors are not leak detectors, as they cannot locate the leak.*

### 15.3 - Level 1 maintenance

See note in chapter 15.5. Simple procedures, can be carried out by the user on a weekly basis:

- Visual inspection for oil traces (sign of a refrigerant leak),
- Coil cleaning - see chapter 'Indoor/outdoor coils- level 1',
- Check for removed protection devices, and badly closed doors/covers,
- Check the unit alarm report when the unit does not work (see report in the Pro-Dialog+ control manual),
- General visual inspection for any signs of deterioration,
- Verify the charge in the sight-glass,
- Check that the temperature difference between the heat exchanger inlet and outlet is correct.
- Verify the unit operating parameters at 100% full load against the ones found during start-up.

## 15.4 - Level 2 maintenance

See note in chapter 15.5. This level requires specific know-how in the electrical, hydronic and mechanical fields. It is possible that these skills are available locally: existence of a maintenance service, industrial site, specialised subcontractor.

The frequency of this maintenance level can be monthly or annually depending on the verification type.

In these conditions, the following maintenance operations are recommended.

Carry out all level 1 operations, then:

### Electrical checks

- At least once a year tighten the power circuit electrical connections (see table with tightening torques).
- Check and retighten all control/command connections, if required (see table with tightening torques).
- Remove the dust and clean the interior of the control boxes, if required.
- Check the status of the fuses, contactors, disconnect switches and capacitors.
- Replace the fuses every 3 years or every 15000 hours (age-hardening).
- Check the presence and the condition of the electrical protection devices.
- Check the correct operation of all heaters.
- Check that no water has penetrated into the control box.

### Mechanical checks

- Check the tightening of the fan tower, fan, compressor and control box fixing bolts.

### Refrigerant circuit

- Fully clean the condensers with a low-pressure jet and a bio-degradable cleaner (counter-current cleaning - see chapter 'Indoor/outdoor coils - level 2).
- Check the unit operating parameters at 100% full load and compare them with previous values.
- Verify the tightening of the bulb with capillary tube of the thermostatic expansion valve. The bulb is best mounted in a position corresponding to 4 o'clock or 8 o'clock.
- Carry out an oil contamination test. Replace the oil, if necessary. Carrier ERCD reference: 7754024.
- Check the operation of the high-pressure switches. Replace them if there is a fault.
- Check the fouling of the filter drier in cooling mode. Replace it if necessary.
- Keep and maintain a maintenance sheet, attached to each HVAC unit.

*All these operations require strict observation of adequate safety measures: individual protection garments, compliance with all industry regulations, compliance with applicable local regulations and using common sense.*

## 15.5 - Level 3 (or higher) maintenance

See note in chapter 15.5. The maintenance at this level requires specific skills/approval/tools and know-how and only the manufacturer, his representative or authorised agent are permitted to carry out these operations. These maintenance operations concern for example:

- A major component replacement (compressor, coils),
- Any intervention on the refrigerant circuit (handling refrigerant),
- Changing of parameters set at the factory (application change),
- Removal or dismantling of the HVAC unit,
- Any intervention due to a missed established maintenance operation,
- Any intervention covered by the warranty.
- one to two leak checks per year with a certified leak detector and carried out by a qualified person.

*To reduce waste, the refrigerant and the oil must be transferred in accordance with applicable regulations, using methods that limit refrigerant leaks and pressure drops and with materials that are suitable for the products.*

*Any detected leaks must be repaired immediately.*

*The compressor oil that is recovered during maintenance contains refrigerant and must be treated accordingly.*

*Refrigerant under pressure must not be purged to the open air.*

*If a refrigerant circuit is opened, plug all openings, if the operation takes up to one day, or for longer periods charge the circuit with nitrogen.*

**NOTE:** Any deviation or non-observation of these maintenance criteria will render the guarantee conditions for the HVAC unit null and void, and the manufacturer, Carrier, will no longer be held responsible.

## 15.6 - Tightening torques for main electrical connections

| Component/screw type                             | Designation in the unit | Value (N·m) |
|--|-------------------------|-------------|
| Screw on disconnect switch                       |                         |             |
| M6   |                         | 7           |
| M8   | L1/L2/L3                | 14          |
| Screw PE (M5)                                    | PE                      | 4           |
| Tunnel terminal screw, compressor contactor      |                         |             |
| Contact 3RT 101                                  |                         | 1           |
| Contact 3RT 101                                  |                         | 2.2         |
| Contact 3RT 101                                  | KM_                     | 3.7         |
| Tunnel terminal screw, compressor fuse (3NP1123) | FU_                     | 11          |
| Tunnel terminal screw, control power transformer | TC                      | 2           |
| Tunnel terminal screw, disconnects               |                         |             |
| Disconnect 3RV1011_                              |                         | 1           |
| Disconnect 3RV1021_                              | QF_ /QM                 | 2.2         |
| Compressor phase and earth connection (4.8 mm)   |                         | 3           |

## 15.7 - Tightening torques for the main bolts and screws

| Screw type       | Used for                 | Torque (N·m) |
|------------------|--------------------------|--------------|
| Compressor strut | Compressor support       | 30           |
| M8 nut           | Single compressor fixing | 15           |
| M10 nut          | Compressor mounting      | 30           |
| M12 nut          | Tandem compressor fixing | 30           |
| Oil nut          | Oil equalisation line    | 90           |
| Taptite screw M6 | Fan motor fixing         | 13           |
| M8 screw         | Fan scroll fixing        | 16           |
| Metal screw      | Sheet metal plates       | 4.2          |

## 15.8 - Indoor/outdoor coils

We recommend, that finned coils are inspected regularly to check the degree of fouling. This depends on the environment where the unit is installed, and will be worse in urban and industrial installations and near trees that shed their leaves.

For coil cleaning, two maintenance levels are used:

### Level 1

- If the coils are fouled, clean them gently in a vertical direction, using a brush.
- Only work on coils with the fans switched off.
- For this type of operation switch off the HVAC unit if service considerations allow this.
- Clean coils guarantee optimal operation of your HVAC unit. This cleaning is necessary when the coils begin to become fouled. The frequency of cleaning depends on the season and location of the HVAC unit (ventilated, wooded, dusty area, etc.).

### Level 2

Clean the coil, using appropriate products.

We recommend TOTALINE products for coil cleaning:

Part No. P902 DT 05EE: traditional cleaning method

Part No. P902 CL 05EE: cleaning and degreasing.

The two cleaning products can be used for any of the following coil finishes: Cu/Cu, Cu/Al, Cu/Al with Polual, Blygold and/or Heresite protection.

These products have a neutral pH value, do not contain phosphates, are not harmful to the human body, and can be disposed of through the public drainage system.

Depending on the degree of fouling both products can be used diluted or undiluted.

For normal maintenance routines we recommend using 1 kg of the concentrated product, diluted to 10%, to treat a coil surface of 2 m<sup>2</sup>. This process can either be carried out using a high-pressure spray gun in the low-pressure position.

With pressurised cleaning methods care should be taken not to damage the coil fins. The spraying of the coil must be done:

- in the direction of the fins
- in the opposite direction of the air flow direction
- with a large diffuser (25-30°)
- at a minimum distance of 300 mm from the coil.

It is not necessary to rinse the coil, as the products used are pH neutral. To ensure that the coil is perfectly clean, we recommend rinsing with a low water flow rate. The pH value of the water used should be between 7 and 8.

**WARNING: Never use pressurised water without a large diffuser. Do not use high-pressure cleaners for Cu/Cu and Cu/Al coils.**

**Concentrated and/or rotating water jets are strictly forbidden. Never use a fluid with a temperature above 45°C to clean the air heat exchangers.**

**Correct and frequent cleaning (approximately every three months) will prevent 2/3 of the corrosion problems.**

**Protect the control box during cleaning operations.**

## 15.9 - Refrigerant volume

The unit must be operated in cooling mode to find out, if the unit charge is correct, by checking the actual subcooling. Following a small refrigerant leak a loss of refrigerant, compared to the initial charge will be noticeable in the cooling mode and affect the subcooling value obtained at the air heat exchanger (condenser) outlet, but it will not be noticeable in the heating mode.

**IMPORTANT: It is therefore not possible to optimise the refrigerant charge in the heating mode after a leak. The unit must be operated in the cooling mode to check, if an additional charge is required.**

## 15.10 - Characteristics of R-410A

| Saturated temperatures (°C) based on the relative pressure (in kPa) |                        |                           |                        |
|---|------------------------|---------------------------|------------------------|
| Saturated temperature, °C   | Relative pressure, kPa | Saturated temperature, °C | Relative pressure, kPa |
| -20   | 297                    | 25                        | 1552                   |
| -19   | 312                    | 26                        | 1596                   |
| -18   | 328                    | 27                        | 1641                   |
| -17   | 345                    | 28                        | 1687                   |
| -16   | 361                    | 29                        | 1734                   |
| -15   | 379                    | 30                        | 1781                   |
| -14   | 397                    | 31                        | 1830                   |
| -13   | 415                    | 32                        | 1880                   |
| -12   | 434                    | 33                        | 1930                   |
| -11   | 453                    | 34                        | 1981                   |
| -10   | 473                    | 35                        | 2034                   |
| -9  | 493                    | 36                        | 2087                   |
| -8  | 514                    | 37                        | 2142                   |
| -7  | 535                    | 38                        | 2197                   |
| -6  | 557                    | 39                        | 2253                   |
| -5  | 579                    | 40                        | 2311                   |
| -4  | 602                    | 41                        | 2369                   |
| -3  | 626                    | 42                        | 2429                   |
| -2  | 650                    | 43                        | 2490                   |
| -1  | 674                    | 44                        | 2551                   |
| 0   | 700                    | 45                        | 2614                   |
| 1   | 726                    | 46                        | 2678                   |
| 2   | 752                    | 47                        | 2744                   |
| 3   | 779                    | 48                        | 2810                   |
| 4   | 807                    | 49                        | 2878                   |
| 5   | 835                    | 50                        | 2947                   |
| 6   | 864                    | 51                        | 3017                   |
| 7   | 894                    | 52                        | 3088                   |
| 8   | 924                    | 53                        | 3161                   |
| 9   | 956                    | 54                        | 3234                   |
| 10  | 987                    | 55                        | 3310                   |
| 11  | 1020                   | 56                        | 3386                   |
| 12  | 1053                   | 57                        | 3464                   |
| 13  | 1087                   | 58                        | 3543                   |
| 14  | 1121                   | 59                        | 3624                   |
| 15  | 1156                   | 60                        | 3706                   |
| 16  | 1192                   | 61                        | 3789                   |
| 17  | 1229                   | 62                        | 3874                   |
| 18  | 1267                   | 63                        | 3961                   |
| 19  | 1305                   | 64                        | 4049                   |
| 20  | 1344                   | 65                        | 4138                   |
| 21  | 1384                   | 66                        | 4229                   |
| 22  | 1425                   | 67                        | 4322                   |
| 23  | 1467                   | 68                        | 4416                   |
| 24  | 1509                   | 69                        | 4512                   |
|   |                        | 70                        | 4610                   |

48/50UA-UH units use high-pressure R-410A refrigerant (the unit operating pressure is above 40 bar, the pressure at 35°C air temperature is 50% higher than for R-22). Special equipment must be used when working on the refrigerant circuit (pressure gauge, charge transfer, etc.).



## 15.11 - Servicing recommendations

- Before replacing any of the elements in the cooling circuit, ensure that the entire refrigerant charge is removed from both the high and low pressure sides of the unit.
- The control elements of the cooling system are highly sensitive. If they need to be replaced, care should be taken not to overheat them with blowlamps whilst soldering. A damp cloth should be wrapped around the component to be soldered, and the flame directed away from the component body.
- Silver alloy soldering rods should always be used.
- If the total unit gas charge has to be replaced, the quantity should be as given on the nameplate and the unit should be properly evacuated beforehand.
- During unit operation all panels should be in place, including the electrical box access panel.
- If it is necessary to cut the lines of the refrigerant circuit, tube cutters should always be used and never tools which produce burrs. All refrigerant circuit tubing should be of copper, specially made for refrigeration purposes.

## 15.12 - Final recommendations

The unit you have purchased has undergone strict quality control procedures before leaving the factory.

All components, including the control systems and electrical equipment, etc., are certified by our Quality Control Department, and tested under the harshest possible operating conditions in our laboratories. However, after leaving the factory, it is possible that one or more of these elements may be damaged due to causes beyond our control. In such an event, the user should not work on any of the internal components, or subject the unit to operating conditions which are not specified in this manual, since serious damage may result and the guarantee would be invalidated. Repair and maintenance work should always be left to the installer.

All recommendations concerning unit installation are intended to be as a guideline. The installer should carry out the installation according to the design conditions and should comply with all applicable regulations for air conditioning and refrigeration installations.

***NOTE: The manufacturer does not accept responsibility for any malfunctions resulting from misuse of the equipment.***

## 15.13 - Troubleshooting chart

A list of possible faults, as well as the probable cause and suggested solutions is shown in the table below. In the event of a unit malfunction it is recommended to disconnect the power supply and ascertain the cause.

| Symptoms  | Cause   | Remedy   |
|---|---|--|
| Unit does not start   | No power supply<br>Main switch open<br>Low line voltage<br>A protection has tripped<br>Contactor stuck open<br>Compressor failure | Connect power supply<br>Close main unit disconnect switch<br>Check voltage and remedy the deficiency<br>Reset<br>Check and if necessary replace contactor<br>Check and if necessary replace compressor |
| Unit starts and stops frequently                                | Defective compressor contactor<br>Defective compressor<br>Refrigerant losses  | Check and if necessary replace contactor<br>Check and if necessary replace compressor<br>Check and add the necessary quantity  |
| Unit continuously cuts out at low saturated suction temperature | Cooling unit/heat pump<br>Defective low pressure transducer<br>Refrigerant losses<br>Indoor/outdoor fan does not operate          | Check and if necessary replace low pressure transducer<br>Check and add the necessary quantity<br>Check fan motor  |
| Unit continuously cuts out at saturated discharge temperature   | Cooling unit/heat pump<br>Defective high pressure transducer<br>Blocked filter drier<br>Indoor/outdoor fan does not operate       | Check and if necessary replace pressure transducer<br>Check and if necessary replace filter<br>Check fan motor   |
| Abnormal system noise   | Noisy compressor<br>Badly fitting panels  | Check and change if necessary<br>Install correctly   |
| Compressor loses oil  | Leak in system  | Repair leak  |
| Water loss  | Defective drainage connections  | Check and tighten if necessary   |

***IMPORTANT: Following any operation on the appliance which has necessitated removal and replacement of any parts, the appliance shall be recommissioned in accordance with the Commissioning section of these instructions.***

## 16 - START-UP CHECKLIST FOR 48/50UA-UH ROOFTOP UNITS (USE FOR JOB FILE)

### Preliminary information

Job name: .....  
Location: .....  
Installing contractor: .....  
Distributor: .....  
Start-up preformed by: ..... Date: .....

### Equipment

Model 48/50UA-UH: ..... S/N .....

### Compressors

#### Circuit A

1. Model No. ....  
Serial No. ....  
  
2. Model No. ....  
Serial No. ....

#### Circuit B

1. Model No. ....  
Serial No. ....  
  
2. Model No. ....  
Serial No. ....

Additional options and accessories .....  
.....

### Preliminary equipment check

Is there any shipping damage? ..... If so, where? .....  
.....  
Will this damage prevent unit start-up? .....

- ☐ Unit is level in its installation
- ☐ Power supply agrees with the unit name plate
- ☐ Electrical circuit wiring has been sized and installed properly
- ☐ Unit ground wire has been connected
- ☐ Electrical circuit protection has been sized and installed properly
- ☐ All terminals are tight
- ☐ All cables and thermistors have been inspected for crossed wires

### Unit start-up

- ☐ Oil level is correct
- ☐ Compressor crankcase heaters have been energised for 12 hours
- ☐ Unit has been leak checked (including fittings)
- ☐ Locate, repair, and report any refrigerant leaks

Check voltage imbalance: AB ..... AC ..... BC .....  
Average voltage = ..... (see installation instructions)  
Maximum deviation = ..... (see installation instructions)  
Voltage imbalance = ..... (see installation instructions)

- ☐ Voltage imbalance is less than 2%

**WARNING: Do not start unit if voltage imbalance is greater than 2%. Contact local power company for assistance.**

- ☐ All incoming power voltage is within rated voltage range

Carry out the QUICK TEST function (see 48/50UA-UH Pro-Dialog+ control manual):

Re-enter the setpoints (see controls section)

To start up the unit

Once all checks have been made, start the unit in the "LOCAL ON" position.

Unit starts and operates properly

#### Temperatures and pressures

**WARNING:** Once the machine has been operating at 100% full load for a while and the temperatures and pressures have stabilized, record the following:

Entering air temperature .....  
Leaving air temperature .....  
Ambient temperature .....  
Circuit A suction pressure .....  
Circuit B suction pressure.....  
Circuit A discharge pressure .....  
Circuit B discharge pressure.....  
Circuit A suction temperature .....  
Circuit B suction temperature.....  
Circuit A discharge temperature .....  
Circuit B discharge temperature.....  
Circuit A liquid line temperature .....  
Circuit B liquid line temperature.....

#### ACCESSORIES

.....  
.....

### 17 - GAS HEATING SECTION

#### Gas burner 1

|  |  |
|--|--|
| Size:.....   | Serial No.: .....                        |
| Pipe size: .....                                     | Gas type: G .....                        |
| Line pressure: ..... mbar                            |  |
| Check burner pressure                                |  |
| Min. rate: ..... mbar                                | Max. rate:..... mbar                     |
| Pressure cut-out, air flow pressure switch: ..... Pa |  |
| Motor current:.....A    Flue temp.: ..... °C         | CO <sub>2</sub> :.....%    CO ppm:.....% |

#### Gas burner 2

|  |  |
|--|--|
| Size:.....   | Serial No.: .....                        |
| Pipe size: .....                                     | Gas type: G .....                        |
| Line pressure: ..... mbar                            |  |
| Check burner pressure                                |  |
| Min. rate: ..... mbar                                | Max. rate:..... mbar                     |
| Pressure cut-out, air flow pressure switch: ..... Pa |  |
| Motor current:.....A    Flue temp.: ..... °C         | CO <sub>2</sub> :.....%    CO ppm:.....% |

**NOTE:** Complete this start-up list at the time of installation.



www.eurovent-certification.com  
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Manufacturer reserves the right to change any product specifications without notice.

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