



**General Safety Consideration
for Installation, Operation &
Maintenance of MultiChill
Propane Heat Pumps**

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1. Personnel Skills

Maintenance & service work requiring the assistance of qualified personnel must be carried out under the supervision of an engineer competent & qualified in the use of flammable refrigerants. Including BS EN 13313 and/or BS EN 22712.

Personnel working on systems containing flammable refrigerants must be competent in the safety aspects of handling flammable refrigerants supported by evidence of appropriate training. This will include the following :

- Knowledge of legislation , regulations & standards concerning flammable refrigerants
- Detailed knowledge & skills in handling flammable refrigerants , personal protective equipment, preventing refrigerant leaks, handling cylinders, filing, detecting leaks, recovery & disposal

Competent engineers must be able to understand & apply the requirements of BS EN 378-4.

All Airedale service engineers designated to perform service & maintenance on these products are fully qualified to do so.

2. Propane

The unit contains R290 refrigerant (Propane).

According to PED directive 2014/68/EU this substance is classified as a Class 1 gas (hazardous fluids).

According to BS EN 378-1, the refrigerant is classified as a Class A3 substance (low toxicity, high flammability).

Main characteristics:

- Colourless
- Odourless
- Highly Flammable
- Heavier than air (stratifies to low level)

3. Refrigerant Characteristics

Safety Class	A3 (Highly Flammable)
GWP (Global Warming Potential)	3 (100 years)
ODP (Ozone Depletion Potential)	0
LFL (Lower Flammability Limit)	0.038 kg/m ³ / 2.1 % vol
Boiling Point	-42°C
Ignition Temperature	+470°C
Density (at +20°C, 1 bar(a))	1.86 kg/m ³
Density relative to air (at +20°C, 1 bar(a))	1.55

4. Required Checks Prior to Installation

Reception

Check for any refrigerant leaks

Check that the unit has not been damaged during transit

Check that the products/materials delivered correspond with details provided on the documentation, comparing data with the identification label provided on the packaging

Warning – the product must not be tilted more than 15° during transport.

Storage

Check for any refrigerant leaks

Store in well-ventilated areas

Keep away from ignition sources

Keep away from flammable materials

Check that suitable firefighting equipment is available

Minimum storage temperature -20°C

Maximum storage temperature +55°C

Maximum storage relative humidity 95%

Removal of Packaging

Check for any refrigerant leaks

Warning – if there is a release of refrigerant, it may be within the packaging.

Warning – Plastic packaging can cause electrostatic charges than can be sources of ignition

5. Installation

The positioning, hydraulic system, refrigeration, electrics & the ducting of air must be determined by the system designer in accordance with local regulations in force.

6. Designated Installation Area

There must be a 'safety' area surrounding the unit due to the potential explosion that could be caused upon a refrigerant leak. The characteristics of this area depend on the refrigerant type & charge:

The proposed installation site must comply with the requirements of BS EN 378-1

Access Category	Maximum Permissible R290 Charge	Applicable to MultiChill R290 ?
'A' : Generic access	Less than 5 kg	Applicable to Model sizes 14.1 to 20.1 (single compressor)
'B' : Supervised / restricted access	Less than 10 kg	Applicable to Model sizes 25.2 to 30.2 (dual compressor)
'C' : Access for authorised personnel only	More than 10 kg	Not applicable to the MultiChill R290 range




Access Category 'A' – Requirements (Applicable to Single Compressor Models)

- A 'Caution flammable material' sign must be clearly visible (fig.1).
- The unit(s) must be positioned so that any leakage cannot enter buildings, or damage people & property.
- If the refrigerant leaks, it must not be able to flow through any ventilation openings, doors, hatches or similar openings, or stagnate.
- If a guard is built around the unit(s), natural ventilation must be ensured, or forced ventilation must be provided.
- Minimum distance from building openings, sewer openings, closed tunnels, any ignition sources, openings on the installation level & connecting rooms below ground – more than 2.5 m

Access Category 'B' – Requirements (Applicable to Dual Compressor Models)

All requirements from Category 'A' apply, in addition:

- Access to the unit(s) should be restricted to trained personnel.
- Unit(s) must be positioned in a place inaccessible to the public – this requirement can be observed for example, by fencing the unit(s) off.
- A 'No naked flames: Fire, ignition sources & smoke are prohibited' sign must be clearly visible (fig.2).
- A 'Caution: Area where an explosive atmosphere may form' sign must be clearly visible (fig.3).
- Unit(s) must be installed in an open area to allow adequate natural ventilation of the area.
- Installation on driveway ramps is not permitted.
- If unit(s) are placed at a distance less than 3 m from areas with passing vehicles, protection must be provided : at least 1 m from the floor plan perimeter. Minimum protection: kerb 0.2 m high at a distance less than 1.5 m.
- Minimum distance from railway lines : greater than 15 m

Sign to be applied	Description	Access Category
 (fig.1)	Caution flammable material	A & B
 (fig.2)	No naked flames: Fire, ignition sources & smoke are prohibited	B only
 (fig.3)	Caution: Area where an explosive atmosphere may form	B only

Safety Fencing

Safety fencing is not mandatory for access categories 'A' or 'B'.

7. Other Installation Requirements

The designated installation area should be considered in any fire documentation for the building in which it is installed.

A non-exhaustive list of additional safety measures that can be used is as follows:

- Addition of a mechanical safety ventilation system
- Addition of refrigerant leak detectors at the most critical points within the installation area
- Visual & audible alarm systems if a leak is detected
- Fire system
- Refer to BS EN 378-1 for further requirements

Extension of the Installation Area

Always consider that the designated installation area may extend beyond the limits of the unit(s) themselves due to the following:

- Venting of the pressure relief valve(s) in case of fire – Warning, the installer must carefully assess how to duct the pressure relief valve(s) & the potential explosive atmosphere that could occur where it is ducted
- Operation of the unit(s) exhaust fan(s)
- Refrigerant stagnation in areas with poor ventilation or in recesses within the ground

This is a summary of safety information; please refer to our installation, operation and maintenance manual (IOM) for full and further information.