DAIKIN
AIR CONDITIONING

Daikin Airconditioning UK Ltd

# R22 Replacement

## A complete solution for the replacement of R22 systems

# R22 – Replacement of air conditioning systems

Due to the significant developments of heat pump technology – older forms of air conditioning run less efficiently than the systems available today. This has a direct impact on the $CO_2$ emissions of the building. With a view to making replacement of old systems as cost effective as possible, the Daikin 'Super Inverter RZQ' condensing units can be installed using existing pipe work.

The full range of Sky Air fan coils can be used including the revolutionary Roundflow Cassette. When combined with the RZQ 71, 100, 125 and 140 models, the range of capacity is from 7kW to 14kW.

www.daikin.co.uk

# Daikin Airconditioning UK Ltd provides a complete solution for the replacement of R22 systems.

## Previously, R22 pipe work could only be used by using 'cleaning filters' to remove the residue from the R22 pipe work. However Daikin is leading the replacement market with 'filterless' technology.

### Reuse existing pipe work

Filterless technology can be used on all R22 systems, which are still running at the time of replacing and have no history of compressor burnout. Each system will be required to run for 30 minutes before pump down. See flow chart for more details.

Eliminating the requirement for cleaning filters reduces the risk of the cleaning filter being left in a system – breaking down resulting in critical system contamination.

As good as the filters are, R22 systems with contaminated oil following a burnout are almost impossible to completely correct.

### Recycling

The WEEE (Waste Electrical and Electrical Equipment) directive 2002/96/EC came into force late 2007. The directive deals with the end of life disposal of many categories of electrical and electrical equipment.

Fixed air conditioning is not yet in scope of that recognition. However it is understood that this could be brought into scope within two to three years.

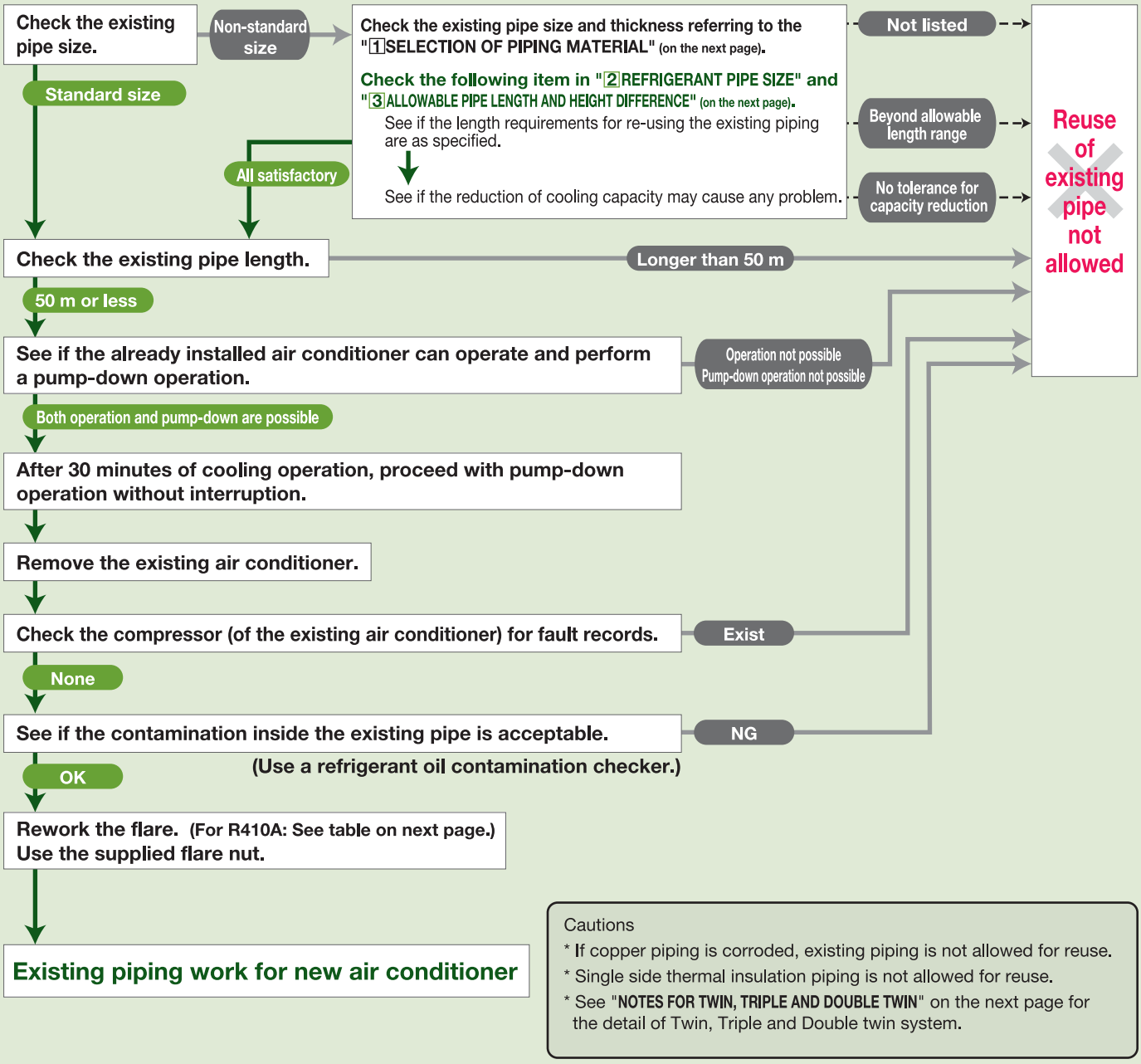
Regardless of whether in or out of scope, Daikin is working in association with installers, to act in an environmentally responsible way. Our End of Life Take Back scheme is a voluntary scheme whereby air conditioning equipment that has reached the end of it's life can be collected from site and reprocessed by an authorised WEEE recycler.

For more details and full terms and conditions, please visit www.daikin.co.uk

### Financial rewards

100% first year tax allowances are available for the expenditure on technologies and products listed on the government website **www.eca.gov.uk.** By investing in these qualifying products, companies will receive tax free relief for their investment much earlier than otherwise would be the case.

# How to Re-use the Existing Piping




## PRECAUTIONS ON REFRIGERANT PIPING

- Do not allow anything other than the designated refrigerant to get mixed into the freezing cycle, such as air, etc. If any refrigerant gas leaks while working on the unit, ventilate the room thoroughly right away.
- Use R410A only when adding refrigerant

**Installation tools:**
Make sure to use installation tools (gauge manifold charge hose, etc.) that are exclusively used for R410A installations to withstand the pressure.

**Vacuum pump:**
Use a 2-stage vacuum pump with a non-return valve
Make sure the pump oil does not flow oppositely into the system while the pump is not working.Use a vacuum pump which can evacuate to −100.7 kPa (5 Torr, −755 mmHg).

- **Check welded connections for gas leaks, if the local piping has welded connections.**

# NOTES FOR TWIN, TRIPLE AND DOUBLE TWIN

## Acceptability of existing piping re-use

| | Main Piping (L1) | Branch Pipe ("□") | Piping after Branch (L2~L7) |
|---|---|---|---|
| RZQ71, RZQ100<br>RZQ125, RZQ140 | Possible<br>but see "2 REFRIGERANT PIPE SIZE" | Impossible | Possible<br>but standard pipe size only |

" □ " on Fig.2, 3 and 4. : Branch piping

Fig.1 Pair

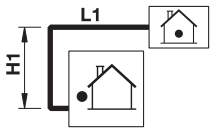



Fig.2 Twin

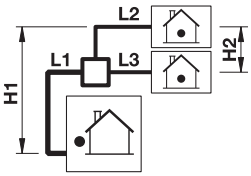



Fig.3 Triple

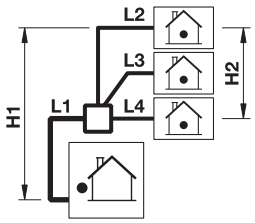
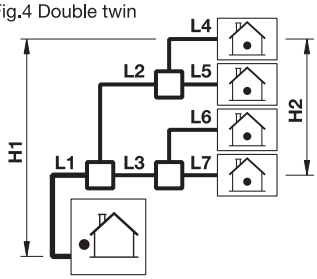



Fig.4 Double twin




## 1 SELECTION OF PIPING MATERIAL

- Construction material: phosphoric acid deoxidized seamless copper for refrigerant.
- Temper grade: use piping with temper grade in function of the pipe diameter as listed in table below.
- The pipe thickness of the refrigerant piping should comply with relevant local and national regulations. The minimal pipe thickness for R410A piping must be in accordance with the table below.

| Pipe ϕ | Temper grade of piping material | Minimal thickness t(mm) |
|---|---|---|
| 6.4 / 9.5 / 12.7 | O | 0.80 |
| 15.9 | O | 1 |
| 19.1 | 1/2H | 1 |

O = Annealed
1/2H = Half hard

## 2 REFRIGERANT PIPE SIZE

- Pipe size down and up is available for only main piping (L1)

| | Refrigerant pipe size(*) | | |
|---|---|---|---|
| | Gas pipe | | |
| Model | Size-down | Standard size | Size-up |
| RZQ71 | ϕ12.7 | **ϕ15.9** | —— |
| RZQ100, 125, 140 | —— | | ϕ19.1 |
| | Liquid pipe | | |
| Model | Size-down | Standard size | Size-up |
| RZQ71~140 | ϕ6.4 | **ϕ9.5** | ϕ12.7 |

NOTE Not using the standard pipe size may result in capacity decrease. It is up to the installer to judge on this phenomena carefully in function of the complete installation.

## 3 ALLOWABLE PIPE LENGTH AND HEIGHT DIFFERENCE

See the table below concerning lengths and heights. Refer to Fig.1, 2, 3 and 4. Assume that the longest line in the figure corresponds with the actual longest pipe, and the highest unit in the figure corresponds with the actual highest unit.

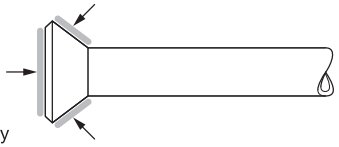
(*) Parenthesized figure represents the equivalent length.

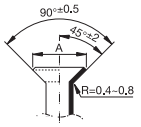
This table is only for existing piping re-use.

| | Liquid pipe size | Model RZQ 71 | 100 | 125-140 |
|---|---|---|---|---|
| **Maximum allowable piping length(*)** | | | | |
| Pair : L1<br>Twin and triple : L1+L2<br>Double twin : L1+L2+L4 | size-down | 10 m (15 m) | | |
| | **standard** | **50 m (70 m)** | **50 m (70 m)** | **50 m (70 m)** |
| | size-up | 25 m (35 m) | 35 m (45 m) | 35 m (45 m) |
| **Maximum total one-way piping length** | | | | |
| Twin : L1+L2+L3 | —— | **50 m** | **50 m** | **50 m** |
| Triple : L1+L2+L3+L4 | | —— | | |
| Double twin : L1+L2+L3+L4+L5+L6+L7 | | —— | | |
| **Maximum branch piping length** | | | | |
| Twin : L2<br>Double twin : L2+L4 | —— | **20 m** | | |
| **Maximum difference between branch lengths** | | | | |
| Twin : L2−L3 | —— | **10 m** | **10 m** | **10 m** |
| Triple : L2−L4 | | —— | | |
| Double twin : L2−L3, L4−L5, L6−L7, (L2+L4)−(L3+L7) | | —— | | |
| **Maximum height between indoor and outdoor** | | | | |
| All : H1 | —— | **30 m** | | |
| **Maximum height between indoors** | | | | |
| Twin, triple and double twin : H2 | —— | **0.5 m** | | |
| **Chargeless length** | | | | |
| All : L1+L2+L3+L4+L5+L6+L7 | size-down | ≤ 10 m | | |
| | **standard** | **≤ 30 m** | | |
| | size-up | ≤ 15 m | | |

## CAUTION FOR FLARE CONNECTION

- Please refer to the table for the dimensions for processing flares and for the tightening torques. (Too much tightening will end up in splitting of the flare.)
- When connecting the flare nut, apply refrigerating machine oil to the flare (inside and outside) and first screw the nut 3 or 4 turns by hand. Coat here with ether or ester oil.
- After completing the installation, carry out a gas leak inspection of the piping connections with nitrogen and such.



| Piping size | Flare nut tightening torque | A dimensions for processing fares (mm) | Flare shape |
|---|---|---|---|
| ϕ6.4 | 14.2~17.2 N·m (144~176 kgf·cm) | 8.7~9.1 |  |
| ϕ9.5 | 32.7~39.9 N·m (333~407 kgf·cm) | 12.8~13.2 | |
| ϕ12.7 | 49.5~60.3 N·m (504~616 kgf·cm) | 16.2~16.6 | |
| ϕ15.9 | 61.8~75.4 N·m (630~770 kgf·cm) | 19.3~19.7 | |
| ϕ19.1 | 97.2~118.6 N·m (989.8~1208 kgf·cm) | 23.6~24.0 | |

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Daikin Europe N.V. is approved by LRQA for its Quality Management System in accordance with the ISO9001 standard. ISO9001 pertains to quality assurance regarding design, development, manufacturing as well as to services related to the product.

Daikin units comply with the European regulations that guarantee the safety of the product.

ISO14001 assures an effective environmental management system in order to help protect human health and the environment from the potential impact of our activities, products and services and to assist in maintaining and improving the quality of the environment.

Daikin Europe N.V. participates in the Eurovent Certification Programme for Air Conditioners (AC), Liquid Chilling Packages (LCP) and Fan Coil Units (FC); the certified data of certified models are listed in the Eurovent Directory. Multi units are Eurovent certified for combinations up to 2 indoor units. VRV products and FWD-units are not within the scope of the Eurovent Certification Programme.


UK 11.07. Designed by Swim Design T/01454 415977.
Printed using vegetable oil based inks, on 75% recycled paper.