R32
NEW REFRIGERANT GAS

Guide to R32

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NEW REFRIGERANT GAS
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Panasonic is leading the change on adopting renewable energy sources. Panasonic has consolidated its residential and commercial air-conditioning ranges with less than 3kg of refrigerant, including its newly designed RAC floor consoles, split, multi-split and cassettes, to be compatible with R32.

Panasonic recommend R32 because it is environmental friendly. Compared to R22 and R410A, R32 has a very low potential impact on the depletion of ozone layer and global warming. After successfully leading the introduction of R32 in Japan, Panasonic is ready to drive the refrigerant change in Europe.

According to 2014 EU F-Gas Regulation (517/2014), Europe must reduce the Global Warming Performance year by year. This regulation defines how each industry needs to contribute to reach the total European target. In the air-conditioning industry this affects Single Split air-conditioning systems containing less than 3kg of fluorinated greenhouse gases. The refrigerant within this system must be less than 750 GWP by the year 2025. Panasonic is ready now (in 2018) to supply any kind of Residential Single Split and Multi Split system with up to 5 ports in addition to Commercial Splits of up to 14kW.

R32 has a much lower impact on global warming when compared to its blended predecessors - its Global Warming Potential (GWP), is significantly lower than that of R410A.

When considering future legislation and the anticipated reduction in the availability of refrigerants, plus a drive towards the use of lower GWP refrigerants; Panasonic products will be future proofed.

R32 is also a more efficient alternative to R410A, with realistic efficiency increases of up to 10%, leading to significant energy savings for building services managers.

As R32 is already a familiar component of R410A, the switch doesn’t present any new challenges to installers. Procedures including piping and testing remain the same. There may be a need for slightly different tooling, such as recovery systems and leak detectors (see pg. 6), but again this should not present a significant challenge. As with all refrigerants, R32 must be safely handled at all times and spaces properly ventilated when it is being charged and recovered from air conditioning units.

Not everyone is ready for change. Indeed, there are some who resist the future, but we believe in technologies that improve people’s lives.

Which is why Panasonic strive to make our air conditioners highly reliable and surprisingly efficient, with minimum noise impact and the lowest environmental footprint possible. To all that we then add sophisticated and elegant designs.

Panasonic will be offering comprehensive training and information on R32 over the coming months, to help installers get to grips with the new technology.
WHY THE FOCUS ON R32?

On 9th June 2014, the EU F-Gases Regulation came into force with the aim to protect the environment by reducing emissions of F-gases from refrigeration and air-conditioning units, electrical switchgear, heat pumps, fire-protection systems as well as other sources.

The EU F-Gases Regulation follows previous research which revealed that R32 could be an attractive solution with a low-global warming potential (GWP) for air conditioning and heat pump installation, with performance comparable to R410A. The results were in favour of R32, in terms of efficiency and cost as a suitable replacement for R410A. R32 has been used as a component of both R407C and R410A for many years, and makes up 50% of R410A.

R32’s use as part of R410A means that the installation of the refrigerant should change little from current procedure.

The major difference is that R32 is mildly flammable, which means it must be properly ventilated when being charged and recovered, because if the gas builds up it can be ignited by a naked flame. However, this should not present a significant issue to installers, as currently if R410A separates into its component gases then R32 is present.

The move towards R32 is part of an overall strategy to reduce the impact of refrigerants on the environment. In 2020 refrigerants such as R404A and R507, with a GWP higher than 2500, will be banned for use in stationery units and will have to be converted to R407A. By 2025 refrigerants with a GWP greater than 750 will be banned for use in splits air conditioning units, and in 2030 use of R410A, R134A and R407C will be heavily restricted.

Panasonic is continuing to develop new products that incorporate R32.

*By replacing R410A with R32 we are significantly reducing the ozone depletion of our air conditioners. The use of air conditioning is rapidly increasing in developing countries thus making it increasingly necessary to use refrigerants with low global warming potential.*
KEY FEATURES

R32 has a number of attributes which make it an attractive alternative, including:

- R32 reduces charging volume by 30% compared to R410A
- R32 has higher efficiency (10% compared to R410A) => Higher COP and EER
- R32 delivers better performance at extreme outdoor temperature

Other Key points

- R32 has a GWP of 675 compared with R410A’s GWP of 2,088
- R32 can be more energy efficient than R410A
- Smaller charges result in heat exchangers and other components being more compact
- R32 is rated as A2L – there is a low risk of accidents due to toxicity (A), and low risk of flammability (2L)
- As a single component refrigerant, R32 is easier to reuse and recycle
- The boiling temperature of R32 is similar to R410A, slightly higher than R22
- It is easy to handle because it doesn’t fractionate
BUT ISN’T IT FLAMMABLE?

Classified at a grade of A2, R32 gas is a mildly flammable gas, but R32 has been used for many years, making up 50% of current R410A gasses. Not only is it a more efficient and environmentally friendly alternative to R410A, but it is equally as safe to use. There have been concerns surrounding the fact that R32 gas is partly flammable, however, this gas is extremely difficult to ignite. In the rare case a fire were to start, R32 burns at a slower speed than walking pace, at 6.7 cm/s as opposed to Propane’s burning velocity of 46 cm/s, reducing the likelihood of any damage, dispelling the concern surrounding this flammability score.

Under normal, everyday circumstances, R32 possesses no risk to the air conditioning systems or work environment. There is no possibility of an ignition caused by a spark within the machine or in the magnetic switch of a power panel.

Only under extremely specific circumstances might ignition occur. An example of this would be when ignition energy is applied whilst the gas concentration of R32 is between 13.3% and 29.3%. This gas concentration materialises at a level at which oxygen deficiency can occur (18% oxygen concentration or below), an environment in which people will not work in.

When exposed to high temperatures R32 will, like all HFC refrigerants, break down into three components: carbon dioxide, carbon monoxide and hydrogen fluoride, which converts to hydrofluoric acid, a toxic substance, when it comes into contact with water. It is important to remember that this is the case for all commonly used HFC refrigerants; indeed this process clearly indicates how important it is for those working in the refrigeration sector to be mindful of safe and proper working practice at all times.

SAFETY MEASURES & PRECAUTIONS

One of the main differences to consider when fitting R32 systems is the requirement for ventilation. All flammable refrigerants in the EU must be handled under restriction, including transit, storage and in work environments.

Although this sounds like a large burden to bear, there is little change in procedure from R410A to R32 installation, bar the requirement to provide ventilation during both transportation and fitting.
A concern for installers when moving to a new refrigerant is that installation will require a separate set of tools, and that additional safety measures and precautions need to be taken. However, many of the tools already in use can be used across both R410A and R32 and many of the safety measures will be already familiar.

There are a couple of changes needed, and a few more precautions to consider, but as R32 has now been around for a number of years, most modern equipment has factored it in to product development so is highly likely to be suitable.

<table>
<thead>
<tr>
<th>Tool used for R410A Installation</th>
<th>Compatible for R32 Installation?</th>
<th>Change Required (if any)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charge Hose</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Cylinder Thread Adapter</td>
<td>-</td>
<td>This will depend on the cylinder. Check with supplier beforehand.</td>
</tr>
<tr>
<td>Cylinder Cap</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Flaring Tool</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Flexibles</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Gas Leak Detector</td>
<td>-</td>
<td>Check with supplier that is rated for use with R32.</td>
</tr>
<tr>
<td>Gauge Manifolds</td>
<td>-</td>
<td>Check with supplier that is rated for use with R32.</td>
</tr>
<tr>
<td>Pipe Bender</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Pipe Cutter</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Recovery Bottle</td>
<td>x</td>
<td>Must be adapted to the refrigerant.</td>
</tr>
<tr>
<td>Refrigerant Recovery System</td>
<td>-</td>
<td>Check with supplier that is certified for use with R32.</td>
</tr>
<tr>
<td>Scale</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Torque Wrench</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Vacuum Pump</td>
<td>✓</td>
<td>N/A</td>
</tr>
<tr>
<td>Weighing Instrument</td>
<td>✓</td>
<td>N/A</td>
</tr>
</tbody>
</table>

NB: A ventilation unit is compulsory for installation of R32 - see pg. 5.

<table>
<thead>
<tr>
<th>Ventilation Unit</th>
<th>Recommended with R410A. Required with R32</th>
</tr>
</thead>
</table>
OUR COMMITMENT TO INNOVATION

Living an eco-lifestyle your way is now easier than ever.

Compared to R22 and R410A, R32 has a very low potential impact on the depletion of the ozone layer and global warming.

R32 has been established in line with the Montreal Protocol, a programme which is supported across European Countries and has been developed to prevent global warming, to maintain the environment and to protect the ozone layer.

As the producer and manufacturer of electronic products, Panasonic works closely with the community to actively make this programme successful.

At Panasonic, we strive each and every day to make our air conditioners highly reliable and surprisingly efficient, with minimum noise impact and the lowest environmental footprint possible. To all that we then add sophisticated and elegant designs. Our air conditioners are like that: innovative inside and beautiful outside.

The best proof of our commitment is that we are moving ahead of the sector by including the R32 refrigerant in our entire range of domestic air conditioners, representing an enormous technological lead that manages to combine excellent comfort in the home and perfect harmony with the environment.
1. INSTALLATION INNOVATION

- Extremely easy to install, practically the same as for the R410A. (Just remember to verify that the pressure gauge and vacuum pump are compatible with the R32)
- This refrigerant is 100% pure, which makes it easier to recycle and reuse.

2. ENVIRONMENTAL INNOVATION

- Zero impact on the ozone layer.
- 75% less impact on global warming.

<table>
<thead>
<tr>
<th>Refrigerant</th>
<th>Composition</th>
<th>GWP (Global Warming Potential)</th>
<th>ODP (Ozone Depletion Potential)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R410A</td>
<td>Blend of 50% R32 + 50% R134a</td>
<td>2007.5</td>
<td>0</td>
</tr>
<tr>
<td>R32</td>
<td>Pure R32 (no blend)</td>
<td>675</td>
<td>0</td>
</tr>
</tbody>
</table>

R32 is a refrigerant with just one-third the global warming potential of R410A, meaning less risk of damage to the environment.

3. ECONOMIC AND ENERGY CONSUMPTION INNOVATION

Lower cost and greater savings:

- 30% less refrigerant.
- Higher energy efficiency A+++ than R410A.
- R32 consumes less energy when there are extreme temperatures outside.
R32 FULL DOMESTIC RANGE

All domestic applications have been transformed to be compatible with R32 refrigerant whilst still maintaining excellent performance. Panasonic has not just fully adapted to new refrigerant, the new units have been designed to maximise the eco advantages of new refrigerant in all of our domestic ranges, from wall mounts, to cassette, hide away, floor console and even multi split systems.

WALL MOUNTED SYSTEMS

Wall Mounted Etherea Inverter+

The Etherea has an astonishingly slim design. A breakthrough design that combines perfectly with the most modern environments. We have selected the best materials and processes for a refined design and now they’re available in an elegant metallic or matt silver and matt white.

Econavi Sensor technology reduces waste by adjusting the operation of the air conditioner to suit the requirements of the room. With just one touch of a button, energy can be saved efficiently with uninterrupted cooling, comfort and convenience.

Wall Mounted TZ Compact Style

The TZ indoor units have a new size. With a width of only 799mm, the air conditioner can fit comfortably on the top of a standard door.

The units also feature improved noise reduction with 20dB(A) we have succeeded in making one of the most silent air conditioners on the market. Panasonic Inverter air conditioner’s indoor operating noise has been reduced as the Inverter constantly varies its output power to enable more precise temperature control.

NEW Wall Mounted FZ Type

FZ Inverter models are powerful and efficient, with an outstanding energy ranking of A++/A+ which is unique in the market. The FZ range works up to an outdoor temperature of -15°C in heating mode and -10°C up a outdoor temperature and whilst still maintaining a high efficiency and capacity. The annual energy consumption has never been so low.

NEW Wall Mounted Professional Inverter -20°C

Not only can these units provide continuous cooling, even when outside temperatures are as high as 46°C, they also provide heating when external conditions are as low as -20°C, and cooling when conditions are down to -15°C outside.
OTHER SYSTEM TYPES

NEW 4 Way Cassette Standard Inverter
Lighter and slimmer, easier installation, this lightweight and very slim unit makes installation possible even in narrow ceilings. Designed to fit exactly into a 600 x 600mm ceiling grid without the need to alter the bar configuration.

NEW Low Static Pressure Hide Away Standard Inverter
Designed for homes, offices, retail and restaurants, this unit is ideal for small rooms where the air conditioning and the heating should be nicely integrated and where high comfort and efficiency is needed.

With the new Intesis Home interface, you can control the unit from your smartphone and internet very easily!

NEW Floor Console Type Inverter+
Our new floor console features new nanoe™ X air-purifying system, providing outstanding A++ efficiency and comfort (Super Quiet technology only 20dB(AI)) and healthy air combined with a breakthrough design.

MULTI SPLIT SYSTEMS

Free Multi System Z
Full flexibility up to 10kW and up to 5 ports with wide range of indoor units including high performance Etherea indoor units, reaching up to A+++/A++ and using new generation refrigerant R32. Choose the indoor units according to the individual requirements of each rooms, and calculate which outdoor unit best adapts itself to the combinations of indoor units.

<table>
<thead>
<tr>
<th>2 Rooms</th>
<th>3 Rooms</th>
<th>4 Rooms</th>
<th>5 Rooms</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.2 - 5.7 kW</td>
<td>3.2 - 7.7 kW</td>
<td>4.5 - 9.5 kW</td>
<td>4.5 - 11.2 kW</td>
</tr>
<tr>
<td>3.2 - 6.0 kW</td>
<td>4.5 - 11.5 kW</td>
<td>4.5 - 13.8 kW</td>
<td>4.5 - 17.5 kW</td>
</tr>
<tr>
<td>3.2 - 6.0 kW</td>
<td>4.5 - 11.5 kW</td>
<td>4.5 - 13.8 kW</td>
<td>4.5 - 17.5 kW</td>
</tr>
</tbody>
</table>

CU-2Z35TBE  CU-2Z41TBE  CU-2Z50TBE  CU-3Z52TBE  CU-3Z68TBE  CU-4Z68TBE  CU-4Z80TBE  CU-5Z90TBE
PACI COMMERCIAL RANGE

PACI Commercial air to air is the full solution for shops, restaurants, offices or residential applications with outstanding efficiency and compact in size.

Product quality and safety. All Panasonic air conditioners undergo strict quality and safety tests before sale. This rigorous process includes obtaining all necessary safety approvals, to ensure that all air conditioners we sell are not only built to the highest market standards, but are also completely safe.

Panasonic recommended R32 because it is environmental friendly. Compared to R22 and R410A, R32 has a very low potential impact on the depletion of ozone layer and global warming.

In line with the European Countries who are concern in protecting and maintaining the environment by participating the Montreal Protocol to rectify one of its program in protecting the Ozone Layer and preventing Global Warming, Panasonic is leading the switch to R32.

1. Installation innovation. Extremely easy to install, practically the same as for the R410A. (Just remember to verify that the pressure gauge and vacuum pump are compatible with the R32). This refrigerant is 100% pure, which makes it easier to recycle and reuse

2. Environmental innovation. Zero impact on the ozone layer and 75% less impact on global warming

3. Economic and energy consumption innovation. Lower cost and greater savings and higher energy efficiency than R410A

COMMERCIAL SYSTEMS

Wall Mounted Professional Inverter & Wall Mounted Professional Inverter+

The unit’s compact design and flat face ensure discreet installation, even in a small space.

Smooth and durable design - The sleek, compact design ensures a discreet installation - even where space is limited.

Piping outlet in three directions -With three options for pipe outlets-rear, right and left - installation is made easy.

4 Way Cassette Inverter & 4 Way 60x60 Cassette Inverter+

Lighter and slimmer, easier installation - Lightweight and very slim which makes installation possible even in narrow ceilings. Designed to fit exactly into a 600 x 600mm ceiling grid without the need to alter the bar configuration.

Significant reduction of power consumption by using highly developed DC fan motors with variable speed, special heat exchangers.
4 Way 90x90 Cassette Inverter+

Thanks to advances in design and technology such as the new high performance turbo fan, the nanoe™ air cleaner and the Econavi floor temperature & humidity sensor. The new U2 Panasonic 900x900 4 way cassette provides industry leading performance and comfort.

Ceiling Inverter+

This range of ceiling mounted units feature a DC fan motor for increased efficiency and reduced operating sound levels.

All the units are the same height and depth for a uniform appearance in mixed installations. A knock out is provided to allow for supplementary fresh air for improved air quality.

Low Static Pressure Hide Away Inverter & Low Static Pressure Hide Away Inverter+

The depth of only 250mm provides greater installation flexibility and the unit can be used in more applications. Ideal for sites with narrow ceiling voids.

High Static Pressure Hide Away Inverter+

The ducted systems are the ideal solution for flexible, concealed air conditioning and the optional 200mm spigots ensure simple, hassle-free connection to spiral ductwork.
R32
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