

**Would you like a new air conditioning system?  
Would you like it to be self-financing and pay for  
itself within 2 years?**

Ask Toshiba to demonstrate how...



- Ensure compliance with new legislation
- Remove old systems operating on R22 refrigerant that legislation is phasing out fast
- Significantly reduce system operating costs in the region of 40-70%
- Reduce carbon footprint up to 40%
- Reduce installation costs up to 37%
- Increase staff productivity or customer comfort
- Have peace of mind with an extended 5 year warranty
- Provide a stable, comfortable and pleasant atmosphere
- Free site survey to help maximise building operation costs



Around the world global warming is headline news and energy efficiency is at the top of everyone's agenda; individuals, businesses and governments.

In the UK, buildings account for approximately 49% of our total energy consumption. In a typical office building, 55% of the energy is used by the building services; heating cooling, ventilation and hot water.

The Government have set an ambitious target to reduce carbon emissions by more than 26% by 2020 and have introduced a range of measures aimed at achieving this goal.

26%

59%



## What is R22 refrigerant and why do I need to remove it from my building/s?

Within any air conditioning system there is a quantity of refrigerant that runs through the pipework. R22 refrigerant has been used for many years but contributes to the depletion of the ozone and government has put restrictions in place to phase out its use as more efficient and less damaging refrigerants have been introduced.

**Here are some of the key dates you need to know.**



Production and supply of new air conditioning systems operating on R22 was banned in 2004.



Legislation bans the supply of new R22 refrigerant used to service equipment from 31st December 2009.



Only reclaimed or recycled R22 refrigerant may be used from January 2010 until 31st December 2014.



Systems operating on R22 refrigerant will be classed as "not serviceable" from December 2014.



A complete ban of R22 refrigerant, including reclaimed or recycled will be effective on 31st December 2014.



When a commodity is in low demand the costs are guaranteed to increase, the cost of R22 refrigerant is expected to quadruple in price year on year and analysts are predicting we will run out of recycled R22 refrigerant by 2013.

“Retaining pipework and electrics saves time and money.”  
Dean O’Flynn, Troup Bywaters and Anders

### **Why have the Government banned R22 refrigerant and what will replace it?**

The Government have made plans to ban R22 refrigerant as it contributes to the depletion of the ozone layer and no longer delivers the best energy efficiency or technological solutions. R22 contains carbon and carbon was banned as part of the Kyoto Protocol. R22 is classed as a Greenhouse Gas and has an Ozone Depleting Potential (ODP) of 0.05.

Within the air conditioning industry, a refrigerant called R410A has been selected for its energy efficiency performance:

- R410A is a blend of R32 and R125. R410A offers a 35% greater heat transfer rate than R22
- It also has an Ozone Depleting Potential (ODP) of zero and is classed as an A1 refrigerant; this means it is neither flammable or toxic
- R410A has a decreased compressor displacement of 30%

### **Toshiba manufacture advanced air conditioning systems that comply with legislation and demonstrate significant savings in both energy and running costs**

Toshiba have been manufacturing advanced energy efficient air conditioning systems for decades and as you would expect from Toshiba, quality and performance is paramount. Toshiba have the most efficient products in every sector of the markets it operates in. Every kilowatt hour (Kwh) of power used produces 0.53 kg of CO2 gas into the atmosphere (0.139 kg of carbon and 0.391 of oxygen). So by producing more energy efficient products Toshiba helps the environment by reducing the amount of CO2 into the atmosphere.

The R22 refrigerant legislation (EC Reg 2037/2000) states that all HCFC refrigerants must be phased out due to their detrimental impact on the environment. All Toshiba air conditioning systems are designed to operate on non-ozone depleting refrigerant R410A. This is an HFC refrigerant that is energy efficient.

#### **Innovative design results in savings on installation costs and time.**

Toshiba have designed new air conditioning specifically to solve the R22 replacement needs led by Government. The systems; Digital and Super Digital Inverter utilise the energy efficient R410A refrigerant and deliver impressive energy savings. These systems are innovatively designed to be used as replacement solutions for buildings that currently have R22 systems in place.



By simply removing the old, inefficient indoor and outdoor units and replacing the old system with more efficient units we can re-utilise the existing services such as the pipework. This solution typically saves 37.5% on installation costs and 30% on installation time. These savings alone are significant however combine this with the savings in the running costs and the reduction of on-site disruption and it is clear that Toshiba have invested in a solution to an industry problem that benefits the end user, contractor and the environment.

**System operating costs deliver further significant savings.**

Toshiba's Digital Inverter and Super Digital Inverter systems typically provide a minimum of 40% saving in energy costs when compared with older R22 systems and in many cases this percentage can increase to almost 75% - a very significant saving in power consumption and in cost.



Traditional boilers operate in the region of 80% efficiency after approximately 5 years. In addition, new boilers struggle to provide efficiencies in excess of 90%. For every £1 you spend, you only get the equivalent of £0.80 worth of heat output.

Compare this to Toshiba's energy efficient solution where for every £1 you spend, you can expect to get the equivalent of £4 of heat output, this is when the system is running at full speed. When the system is running at partial load conditions, this figure can increase to more than £6.

Typical annual running costs of a 7 kW ceiling cassette in an office environment would be approximately £375 per annum.

“Toshiba systems offer a reliable, cost-effective solution to the growing issue of R22 replacement.”

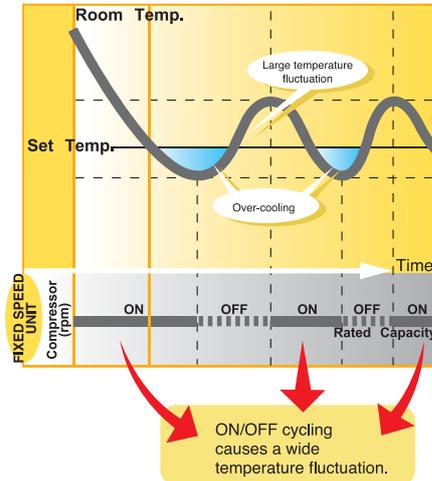
**Richard McElroy, Boots UK**

## Toshiba's Hybrid Inverter Technology

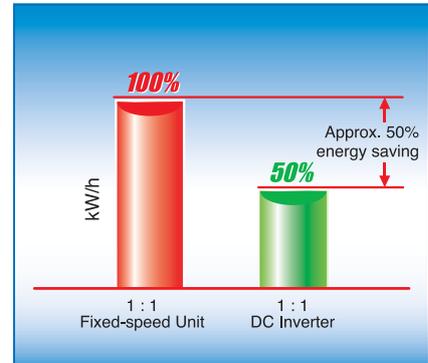
Where high performance delivers outstanding benefits and savings

Toshiba's new inverter technology offers multiple benefits in terms of energy efficiency and savings. Eco-driving twin rotary compressors are incorporated into all units making the systems energy class A in both heating and cooling modes.

### Conventional Technology



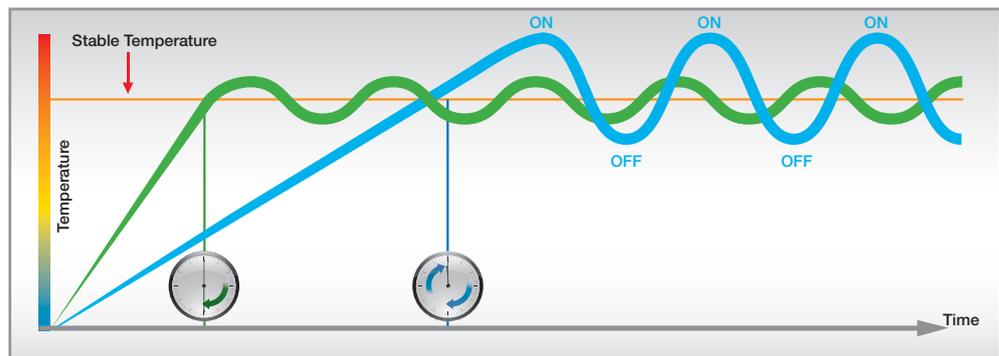
### Energy Saving



\*Test conditions:

- Indoor temperature: 30°C Db, Rh 70%
- Outdoor temperature: 35 - 24°C

### INVERTER TECHNOLOGY



**Inverter technology**  
 Increase power to reach set point quickly and effectively  
 Close control to set point, no wasted energy

**Conventional R22 technology**

**DIGITAL  
 INVERTER**

**Still not convinced?  
Here's a case study.**

This case study demonstrates how the savings in energy efficiency and costs ensured the Toshiba system paid for itself – and within only 2 years.

Toshiba carried out a full audit of a site in Manchester where two 12.5 kW ceiling cassettes operating on R22 refrigerant were installed in December 2007. The old system was removed and two Toshiba Digital Inverter systems utilising the existing pipework and electrics from the original R22 system were installed.

**Site details**

- The system was the only form of heating and cooling for the building
- Running costs are based on a cost of 9.5p per Kwh
- Prices were quoted by a Toshiba Approved Installer
- The space allocated for the condenser plant had been halved
- Improved air movement with the new system was a requirement

**Full replacement of an old R22 system with a new Toshiba R410A one**

Full replacement cost including installation **£7,800**

Annual system operating cost **£1,502**

Peace of mind 5 year warranty

Qualifies for full Enhanced Capital Allowance (ECA)

**Update the system with new indoor and outdoor units – whilst utilising existing pipework**

Replacement cost including installation **£4,875**

Annual system operating cost **£1,502**

Peace of mind 5 year warranty

Qualifies for full Enhanced Capital Allowance (ECA)

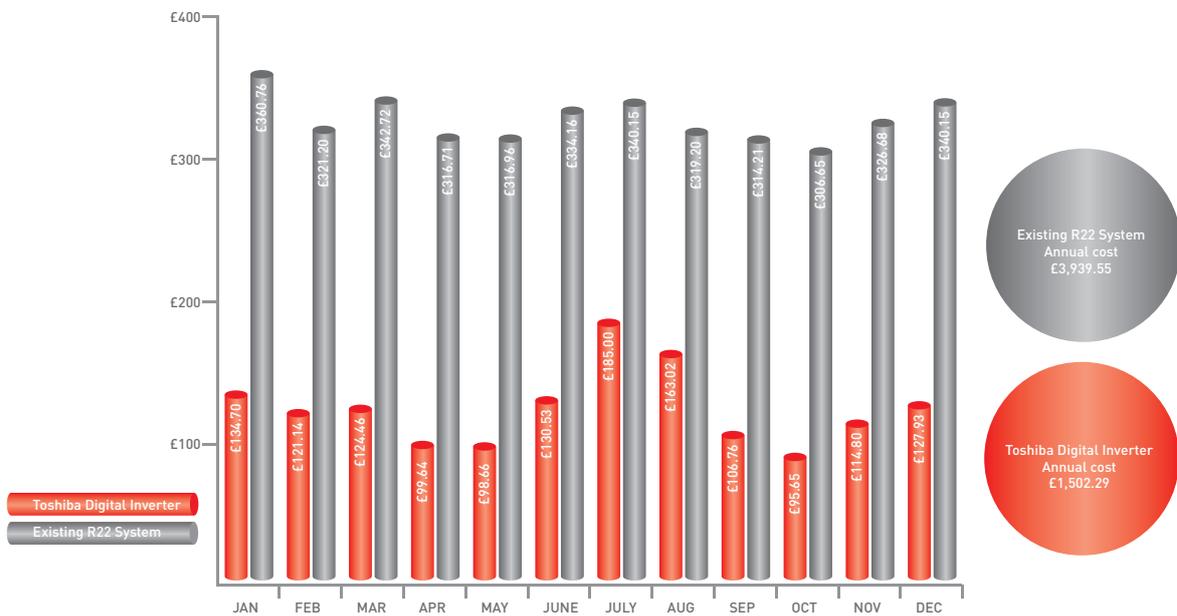


“ A cost-effective, straight forward way to comply with legislation and limit environmental impact. ”

**Graham Moore, Parsons Brinckerhoff**

### Annual running cost comparison

The table below illustrates the annual operating costs of both systems. Maintaining the R22 system that incorporates dated, less energy efficient technology compared to updating the system and ensuring compliance with legislation.



### Annual operating costs of both systems

This table illustrates the annual operating costs of both systems. The highlighted figure shows that by replacing the old system with the new system, the breakeven point is just 2 years. The value of £7,879 for the new system includes system purchase, installation and maintenance for 12 months plus a 5 year manufacturer's warranty.

	Toshiba Digital Inverter	R22 System
2008	£6,377.29	£3,939.54
2009	<b>£7,879.58</b>	£7,879.09
2010	£9,381.86	£11,818.63
2011	£10,884.15	£15,758.17
2012	£12,386.44	£19,697.72
2013	£13,888.73	£23,637.26
2014	£15,391.02	£27,576.80
2015	£16,893.31	£31,516.35

“An award winning technology that is going to save our clients money whilst at the same time help reduce carbon emissions.”  
**Paul Bailey, CBG Consultants Ltd**

The cost for the old R22 system simply accounts for the running costs. It is highly likely the system would need further investment including annual refrigerant checks, first year and on-going service charges and mechanical breakdown costs (as the system will be out of warranty). In addition to these factors there is also the increasing concern that R22 refrigerant costs are increasing rapidly and that its availability is uncertain. Combine these factors with the potential failure of the system and its impact on your daily business operation, and it is clear why Toshiba recommend you act now to save both energy and money.

It is worth noting that Toshiba's new R410A systems incorporate less refrigerant within the refrigerant circuit. Standard systems in the industry above 7 kW in capacity contain around 5 kg of R410A refrigerant, this is generally sufficient for pipe runs up to 30 m in length. The Toshiba Digital Inverter range has less than 3 kg of R410A refrigerant on systems up to 14 kW in capacity. There is therefore significantly less refrigerant in the system making it exempt from the annual refrigerant leak tests. This is outlined in the F-Gas regulations.

**Note:**

In addition to the above case study Toshiba have analysed five other sites including small and large retailers, an office, a café and a bank. All of these sites have different heating and cooling gains, different requirements and business operating times. However, in all of the tests the maximum payback period was less than 4 years. This payback period is destined to be reduced further with the predicted rise in the cost of our energy sources such as electricity.



## Frequently asked questions

**Q: Can Toshiba do a site evaluation for me specifically and is this free of charge?**

A: Yes. Toshiba can evaluate your own site and demonstrate the specific savings that you would make in terms of both energy and cost.

**Q: If we decide to go ahead, can you recommend a good installation company in our area?**

A: Yes. Toshiba has a list of highly skilled and Toshiba Approved Installers nationwide to ensure confidence in a quality installation

**Q: Can the Toshiba system provide heating, when it is very cold?**

A: Yes. The Digital Inverter range is capable of operating in heating mode in temperatures down to minus 20 degrees.

**Q: Does the new replacement system require any additional service or maintenance?**

A: No. The Toshiba system requires the same level of service and maintenance as a standard system

**Q: The Digital Inverter range incorporates a lot of new technology, does this mean it is larger and heavier than other systems available?**

A: No. The Toshiba system is in fact the smallest and lightest system available. You should in fact find that it is in the region of 40% lighter and 42% smaller than the unit it would be replacing.

**Q: If we choose the new replacement system will we lose any capacity from the units?**

A: No. The system produces exactly the same capacity whether it is utilising existing or new pipework.

**Q: Do I have to order a special unit if I want to utilise my existing pipework?**

A: No. The Toshiba standard system has the technology built in and is activated by a simple dip switch setting.

**Q: If we decide to utilise our existing pipework, will this affect the warranty?**

A: No. The warranty is not affected as long as the system is installed and maintained correctly.

**Q: If I choose to use the system in a residential application, do I pay VAT?**

A: Yes. VAT is applicable but at a lower rate of 5%.

**Toshiba's advice – is contact us today and we'll demonstrate exactly how much you could save**

“The Toshiba digital system is perfect for retro-fitting to old R22 systems cost efficiently.”

**Darren Hicks, W H Smith**

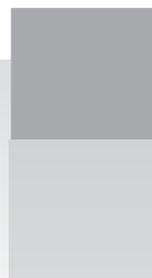
## Explanations of terminology, legislation requirements and benefits

**The Enhanced Capital Allowance (ECA)** was a scheme introduced by the Government to encourage the use of energy efficient technology. The ECA enables the end user to offset up to 100% of the total cost of the air conditioning system, including the installation cost from the year end tax bill. For further details please contact Toshiba or visit [www.eca.gov.uk](http://www.eca.gov.uk)

**The Carbon Trust's energy efficient loans** are another great way of reducing costs and saving energy. They not only offer interest free credit to help you make your business more efficient, but they also help you lower your energy bills and cut carbon emissions. For further details on eligibility and how to apply please visit [www.carbontrust.co.uk](http://www.carbontrust.co.uk)

**Annual Refrigerant Leak Tests** have become a legal requirement. All air conditioning and refrigeration systems containing more than 3 kg of refrigerant must have at least an annual leak test. If the system is found to have a leak, further tests are required. An estimated cost for a refrigerant check would be between £65 and £80 per system per annum.

**Manufacturer's Warranty.** It is recommended that any Toshiba system is installed by a Toshiba Approved Installer. The Toshiba Approved Installers have undertaken extensive training on the full range of Toshiba products to ensure the end user has confidence in a quality installation. The added benefit of this to the end user is a 5 year warranty that covers the costs of any parts and an allowance towards labour.



**TOSHIBA** Leading Innovation >>>

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**TOSHIBA AIRCONDITIONING**

Advancing the **eco**-evolution