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AIR CONDITIONING & REFRIGERATION

THE EMERGENCE OF SMART AC

As cities become smarter, homes more connected, and environmental concerns more urgent, the air conditioning industry is experiencing a quiet revolution.

At the heart of this transformation is the emergence of smart air conditioners—an innovation reshaping how we interact with our indoor environments and manage energy consumption.

In the past, air conditioning systems functioned in isolation—offering cooling comfort but requiring manual operation, physical presence, and little adaptability. Today, thanks to advances in artificial intelligence, Internet of Things (IoT) technology, and mobile connectivity, smart ACs have ushered in a new era of personalised, efficient, and intelligent climate control.

Benefits of a Smart Thermostat

1. Control your home's temperature from anywhere
2. Take advantage of automataion features
3. Improve your energy efficiency
4. Monitor your themostat's energy usage more effectively
5. Increase the value of your home

Understanding what makes an ac 'smart'

A smart air conditioner is essentially an air conditioning unit that goes beyond basic temperature control. It is designed with integrated Wi-Fi, sensors, and intelligent algorithms that allow it to be remotely accessed and autonomously controlled via smartphones, tablets, or voice assistants.

Unlike conventional units, which maintain fixed settings regardless of external or internal factors, smart ACs continuously adapt to real-time inputs. These may include ambient temperature, room occupancy, weather conditions, and user preferences.

Smart ACs are part of a broader movement toward smart homes—living spaces that are connected, efficient, and customisable. Users can switch their units on or off remotely, pre-cool their homes before arrival, set complex schedules, and receive energy consumption reports.

The ability to control the unit remotely, automate functions, and monitor performance not only enhances convenience but also opens new dimensions of efficiency and sustainability.

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SUPPLEMENT TEAM

Marketing Manager
Violette Fakhry

Editor
Amjad Vanimal

Business Promoter
Dr. Sabu K.C.

Graphic Designer
A.K. Vinay Kumar

Circulation In-charge
Sherif Samy

Printed by
Raya Commercial Printing Press

Advertising Office
Gulf Times / Arrayah Building,
C Ring Road,
P.O. Box 533, Doha Qatar
Tel: (+974) 44466552
Fax: (+974) 44360986
email: gtadv@gulf-times.com

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A leap in comfort and control

One of the primary appeals of smart ACs lies in the degree of control they offer. With the help of intuitive mobile applications, users can operate the unit from virtually anywhere in the world. This feature is especially useful in hot climates like the Middle East, where residents often want to cool their living spaces before arriving home. Smart thermostats allow users to set preferred temperature ranges, and some systems even use geofencing to detect when a user is approaching or leaving, adjusting the temperature automatically.

Beyond simple on-and-off functionality, smart ACs often come with detailed scheduling tools. Users can program the system to operate at different temperatures at different times of the day, based on occupancy patterns or peak electricity rates.

For example, the AC can be set to operate at a higher temperature while the residents are at work, then gradually cool the home as they return. This level of personalisation optimises comfort while significantly reducing energy waste.

Integration with voice assistants such as Amazon Alexa, Google Assistant, and Apple's Siri further simplifies interaction.

Instead of fumbling with remote controls, users can simply speak commands like "Set the temperature to 22 degrees" or "Turn off the AC in the guest room." This hands-free convenience is particularly valued in households with children, elderly residents, or people with mobility challenges.

The sustainability imperative

The rise of smart ACs cannot be viewed in isolation from the larger conversation around energy use and climate change. Air conditioning, while essential in many parts of the world, is notoriously energy-intensive.

In gulf countries, air conditioning can account for 60 to 70 percent of total electricity consumption during peak summer months. This has placed an enormous burden on national power grids and has significant implications for carbon emissions and climate policy.

Smart ACs, through real-time optimisation and user awareness, address this issue head-on. By dynamically adjusting operations to suit actual demand, these systems consume less electricity than traditional units.

Some models include energy monitoring features, providing users with insights into their usage patterns and costs. When people see that a minor adjustment—say, increasing the thermostat setting by one or two degrees—can lead to noticeable savings, behavioural change is more likely.

In addition, many newer smart ACs are designed to work with high-efficiency inverter technology, which allows the compressor to operate at variable speeds rather than switching on and off repeatedly. This not only reduces power consumption but also extends the lifespan of the system. Some units are compatible with solar energy setups, further contributing to a sustainable lifestyle.

Indoor air quality takes centre stage

The global COVID-19 pandemic highlighted the importance of indoor air quality (IAQ), giving rise to consumer demand for air purification, humidity control, and ventilation enhancements.

In response, manufacturers have introduced smart ACs with built-in HEPA filters, UV-C sterilisation, and IAQ sensors. These systems can now detect pollutants, allergens, or excessive humidity and adjust their operation accordingly.

In larger systems, especially those used in offices or commercial spaces, building management systems (BMS) can be integrated with HVAC systems to maintain ideal conditions for health, safety, and productivity. Data collected from these systems can be used not only for immediate regulation but also for long-term analysis and health compliance reporting.

Market growth and regional momentum

The global market for smart air conditioners is experiencing rapid expansion. According to market research firm Statista, the smart HVAC sector is projected to grow at a compound annual growth rate (CAGR) of more than 10 percent through 2030, with particularly strong demand in Asia-Pacific, North America, and the Middle East.

In the GCC, where environmental conditions make cooling a necessity rather than a luxury, governments are actively promoting energy efficiency. Countries like Qatar, Saudi Arabia, and the UAE have introduced building codes and sustainability standards—such as GSAS and Estidama—that encourage or mandate the use of efficient cooling systems.

This policy landscape has accelerated the demand for smart ACs in new construction projects, including stadiums, airports, metro stations, and residential towers.

Leading global manufacturers such as LG, Daikin, Gree, Midea, Samsung, and Carrier have introduced advanced smart models in the regional market. Local suppliers and distributors have followed suit, offering smart retrofitting kits that can transform standard AC units into smart systems using plug-and-play devices.

Challenges to widespread adoption

Despite their advantages, smart ACs still face some hurdles. Chief among them is the higher upfront cost compared to conventional models. Although these units often pay for themselves in energy savings over time, the initial investment can be a deterrent—particularly in price-sensitive markets.

Another concern is data privacy and cybersecurity. Like all IoT devices, smart ACs collect and transmit user data. Consumers and regulators are increasingly scrutinising how this information is stored, shared, and protected. Manufacturers must ensure robust encryption and transparent privacy policies to build and maintain consumer trust.

Interoperability remains a technical challenge. As smart homes become more diverse in terms of devices and platforms, ensuring seamless communication between systems is crucial. Proprietary software or limited compatibility can frustrate users who expect a unified, intuitive experience.

Looking ahead

As smart technology continues to mature, the next evolution in air conditioning may be fully autonomous climate systems. These would not just respond to user commands but anticipate needs, self-regulate based on learning algorithms, and operate in coordination with other smart appliances. Imagine an AC system that checks tomorrow's weather forecast, adjusts itself based on your sleeping patterns, and collaborates with your smart blinds to optimise cooling with natural shade.

These systems could also play a role in grid-interactive buildings, which balance their energy needs dynamically based on grid demand. In the long term, such innovations will not only enhance individual comfort and efficiency but also contribute to national energy resilience.

In short, the emergence of smart air conditioners reflects a broader shift in the way we think about comfort, convenience, and conservation. No longer passive machines, today's AC units are intelligent partners—capable of learning, adapting, and evolving. For consumers in hot climates, especially in regions like the Gulf, this transformation offers practical benefits and long-term sustainability. As smart ACs become more accessible, we can expect them to become not just a technological upgrade but a standard feature of future-ready living.

Refrigerants in Transition

From CFCs to Climate-Friendly Alternatives

Refrigerants have long been the invisible force behind the comfort and functionality of modern life—cooling our homes, preserving food, and enabling industrial and medical systems. But for decades, these compounds have also contributed significantly to environmental degradation, from ozone layer depletion to global warming. Today, the global HVAC-R industry is undergoing a pivotal transformation as it shifts toward climate-friendly, low-GWP (Global Warming Potential) refrigerants.

In the early 20th century, refrigerants like ammonia and sulfur dioxide were effective but hazardous. The invention of chlorofluorocarbons (CFCs) in the 1920s revolutionized the industry. CFCs were stable, non-toxic, and non-flammable, and they quickly became standard in air conditioning and refrigeration. However, scientific discoveries in the 1970s revealed that CFCs were severely damaging the ozone layer, prompting a global response.

The Montreal Protocol of 1987 marked a major turning point by mandating the global phase-out of ozone-depleting substances like CFCs and, later, hydrochlorofluorocarbons (HCFCs). These were replaced by hydrofluorocarbons (HFCs), which do not harm the ozone layer but are potent greenhouse gases. For example, R-134a and R-410A—commonly used HFCs—have GWPs over 1,000 times greater than carbon dioxide.

Recognizing this new threat, global leaders adopted the Kigali Amendment to the Montreal Protocol in 2016, aiming to phase down HFCs and prevent up to 0.5°C of global warming by 2100. Under the agreement, many countries have committed to gradually reducing their use of HFCs and transitioning to low-GWP alternatives.

These alternatives include hydrofluoroolefins (HFOs) such as R-1234yf, which have GWPs close to zero, and natural refrigerants like carbon dioxide (R-744), ammonia (R-717), and hydrocarbons such as propane (R-290). These substances offer minimal environmental impact, but they may present challenges related to flammability, toxicity, or system pressure that require careful engineering and safety protocols.

Manufacturers worldwide are responding by developing next-generation air conditioners, chillers, and refrigeration systems that comply with international regulations. In the Gulf region, where cooling is a year-round necessity, this transition has become especially critical. New infrastructure projects are increasingly being equipped with Kigali-compliant systems, and government policies are aligning with global environmental goals.

Despite higher initial costs and the need for updated safety standards and technician training, the transition to low-GWP refrigerants is well underway. As energy demand for cooling continues to rise globally, this shift is essential for balancing comfort with climate responsibility.

In short, the evolution of refrigerants reflects a broader journey toward sustainability. From CFCs to HFCs and now to environmentally responsible alternatives, the industry's transformation demonstrates the power of science, policy, and innovation in driving a greener future.

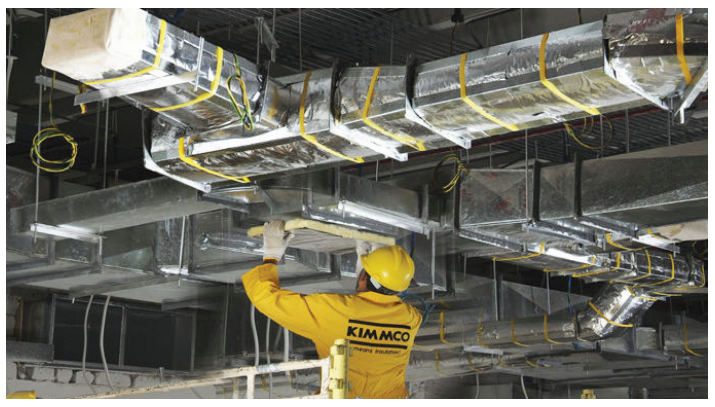
ETC: Powering Qatar's HVAC Excellence Since 1999

Established in 1999, ETC - Equipment Trading and Contracting W.L.L has grown into one of Qatar's leading suppliers of HVAC products and solutions. The company was co-founded by Kunju Mohamed Anwar and Ali Khalifa KH KH Al-Suwaidi, who envisioned a pioneering venture to serve Qatar's fast-evolving HVAC sector. Today, ETC stands as a trusted name in the industry, renowned for its unwavering commitment to quality, reliability, and innovation.

From humble beginnings, ETC has steadily expanded, driven by the evolving needs of the market and the continuous support of its clients. Its extensive portfolio now includes HVAC systems and components sourced from globally respected manufacturers across the USA, UK, Belgium, Italy, Germany, Korea, China, India, and the GCC.

Over the years, ETC has contributed significantly to Qatar's infrastructure development, supplying products to many of the nation's iconic projects.

Certified to ISO 9001:2015, ETC places a strong emphasis on quality leadership. The company consistently strives to exceed customer expectations by ensuring excellence in product performance, prompt delivery, and superior customer service. It continuously refines its operations through structured training and development programs, fostering a culture of excellence and innovation.



Insulations

ETC offers a complete range of high-performance insulation solutions tailored for HVAC and construction needs in Qatar. Our products include fiberglass (up to 230° C) for walls, ducts, and pipes; rockwool (up to 750° C) for high temperature areas; closed-cell nitrile rubber (-80° C to 110° C) for AC and plumbing; PIR boards (-65° C to 110° C) known for low thermal conductivity; XLPE (-40° C to 115° C) for chilled pipelines and acoustic insulation cellular glass (-268° C to 482° C) for civil and structural use; and advanced aerogel (-200° C to 650° C) for space-constrained, high-efficiency insulation.

Adhesives, Coatings & Tapes

ETC provides a wide range of adhesive solutions for insulation and ductwork. Our adhesives ensure strong bonding on cement, metal, glass, and more, with solvent-free options available. HVAC coatings protect insulation from water, UV, and weather damage, available in high-viscosity forms. Sealants fill gaps in ducts using caulking guns or rollers, suitable for metal, PIR, and flexible ducts, with fire-rated options available. Our tapes ensure airtight sealing of insulation joints and are available in jumbo rolls. We also offer waterproofing products like bituminous and EPDM membranes for structural protection. Specialty tapes include surface protection, signage tapes, and high-temperature-resistant options.

Noise, Shock & Seismic Controls

ETC offers effective solutions to reduce vibration, shock, and noise in HVAC and mechanical systems. Spring isolators and seismic controls minimize transmission from equipment like pumps, chillers, and boilers. Mounting pads and anti-vibration mounts provide flexible support for compressors, fans and ductwork. For sunproofing, we provide acoustic insulation for ducts, ceilings, and partitions, and acoustic underlays for floors using EPDM materials – ideal for comfort and noise control.

Ducting Accessories

ETC offers complete ducting solutions including flexible ducts for tight spaces, grills and diffusers for efficient airflow, flexible connectors to reduce vibration. We also provide pre-insulated ducts, glass/canvas cloth for insulation, and all necessary fasteners, supports, claddings, and hangers for HVAC and mechanical installations.

ESP, Air Curtains & Water Coolers

ETC supplies ESP & Ecology Units for commercial kitchens to remove grease, smoke, and odor using ESP and UV technology, with BMS compatibility and epoxy-coated GI construction. Air curtains are ideal for industrial entrances, cold stores, and warehouses, available with auto/manual control, heating options, and BMS/fire alarm integration. Our domestic water coolers reduce tank temperatures from 55°C to 20°C, ensuring safe, cool water even during peak summer.

HVAC Accessories & Tools

ETC offers a complete range of HVAC accessories and tools for installation, maintenance, and repair. We supply all types of compressors, refrigerant gases, and refrigerant oils, along with cleaning tools, cables, refrigerant tools, and ducting tools. Our range includes copper pipes and fittings, controls, capacitors, and fan motors for efficient HVAC system performance. We also provide duct supports and mounting systems for stability, ensuring safe and long-lasting installations.

Designing AC Systems for Energy-Efficient Buildings

Best Practices and Innovations in Eco-Friendly HVAC System Design and Installation

As buildings account for nearly 40% of global energy consumption, and a significant portion of that attributed to heating, ventilation, and air conditioning (HVAC), the pressure is mounting to rethink how we design and operate air conditioning systems. In hot and humid climates such as those in the Gulf countries, where air conditioning is essential for survival rather than comfort, creating energy-efficient and environmentally responsible HVAC systems is no longer a choice — it is a necessity.

With new materials, smart technologies, and green design strategies available, engineers and architects today are better equipped than ever to balance cooling performance with sustainability. This article explores the best practices and emerging innovations that are shaping the next generation of eco-friendly AC systems.

1. Building Envelope First: Insulation and Passive Design

Before addressing the HVAC system itself, the most impactful efficiency gains begin with the building envelope — the walls, roofs, windows, and orientation. High-performance insulation, double or triple-glazed windows, reflective roofing, and airtight construction reduce the thermal load on the AC system.

In energy-conscious design, passive cooling strategies such as cross ventilation, shading devices, and strategic window placement help minimise the need for mechanical cooling. By lowering the building's base cooling demand, the AC system can be designed smaller and more efficiently.

2. Right-Sizing the System

One of the most common yet costly mistakes in HVAC design is over-sizing the system. An oversized unit cycles on and off frequently, leading to energy waste, inconsistent humidity control, and shortened equipment life. Accurate cooling load calculations — considering occupancy, equipment, lighting, and climate — ensure that the system is precisely matched to the building›s needs.

Software tools like HVAC load simulators and building energy models allow for more accurate predictions and optimized system design during the planning phase.

3. Variable Refrigerant Flow (VRF) and Inverter Technology

Among the most energy-efficient technologies for modern buildings is Variable Refrigerant Flow (VRF), which allows individual indoor units to operate independently while a single outdoor unit modulates refrigerant flow. VRF systems adjust dynamically to varying loads in different zones, significantly reducing energy consumption.

Similarly, inverter compressors, which can vary their speed based on real-time cooling demand, prevent energy loss associated with frequent stop-start cycles typical of traditional systems. These technologies are now standard in high-efficiency buildings worldwide.

4. Smart Controls and Building Automation

The integration of smart thermostats, occupancy sensors, and building management systems (BMS) has revolutionised energy control. These technologies allow HVAC systems to adjust based on real-time data such as room usage, outdoor conditions, and user preferences.

Advanced systems can learn behavioural patterns and weather forecasts to pre-cool or adjust temperatures gradually, avoiding peak energy consumption periods and maintaining thermal comfort more efficiently.

5. Zoning and Demand-Controlled Ventilation

Modern energy-efficient buildings often use zoned cooling systems, which allow different parts of a building to be cooled to different temperatures depending on use and occupancy. This avoids the common inefficiency of cooling empty rooms or underused spaces.

Demand-Controlled Ventilation (DCV) systems use CO_2 sensors to adjust the amount of outdoor air brought in, balancing indoor air quality with energy use. DCV is especially effective in commercial spaces like conference rooms, offices, and classrooms.

6. High-Efficiency Equipment and Low-GWP Refrigerants

Installing HVAC units with high SEER (Seasonal Energy Efficiency Ratio) or EER (Energy Efficiency Ratio) ratings ensures better performance per unit of electricity consumed. In addition, a growing emphasis is placed on selecting units that use low-GWP refrigerants such as R-32, HFO-1234yf, or even natural refrigerants like CO_2 or propane — all of which align with global climate goals under the Kigali Amendment.

As governments introduce tighter regulations and carbon reduction targets, refrigerant choice will be as important as energy consumption in determining a system's sustainability.

7. Integration with Renewable Energy Sources

Energy-efficient AC systems can be even more eco-friendly when paired with on-site renewable energy, particularly solar photovoltaic (PV) systems. Solar-assisted AC, where cooling demand peaks coincide with solar energy generation, presents a natural synergy, especially in sun-rich regions like the Middle East.

Hybrid AC systems that use solar thermal energy or ice storage are also gaining traction in green building projects globally.

8. Commissioning and Maintenance

Even the best-designed systems can underperform without proper commissioning — a process that verifies the system is installed, calibrated, and functioning as intended. Regular maintenance and filter replacement are equally vital for ensuring continued efficiency and indoor air quality.

Modern AC systems with self-diagnostics and predictive maintenance alerts help building managers preempt issues, reduce downtime, and optimise energy use over the system's life cycle.

As energy costs rise and environmental concerns intensify, designing air conditioning systems for energy-efficient buildings is both a technical and ethical imperative. From load calculations and smart zoning to inverter technology and eco-friendly refrigerants, a holistic approach is essential.

LG Launches Smart AI Air Conditioners in Qatar

Redefining Summer Comfort

Revolutionary Cooling Meets Smart Living for 2025

As temperatures soar in Qatar, LG Electronics is transforming the way residents stay cool with its new generation of AI-driven air conditioning systems. Tailored for the Gulf's extreme weather, LG's 2025 range introduces intelligent cooling with the DUALCOOL™ AI Inverter and upgraded JetCool™ units—delivering performance, efficiency, and style in equal measure.

Smarter, Faster, Greener: AI-Enhanced Climate Control

At the heart of LG's latest models lies the AI DUAL Inverter™ Compressor, which accelerates cooling by 60% while cutting energy usage by up to 65%. The system dynamically adjusts to your surroundings—factoring in real-time environmental data, user patterns, and even presence in the room to provide personalized, stable comfort.

New features in the 2025 models include Human Detection Sensors that tailor airflow based on occupancy and AI Sleep Timer+ for a quiet, uninterrupted night. LG's AI kW Manager also empowers users to monitor and manage their electricity consumption with ease.

Cleaner Air, Healthier Spaces

LG prioritizes health with built-in Dual Protection Filters that trap particles over 10 microns, while select models come equipped with the advanced Plasmaster™ Ionizer++. This system actively purifies the air, removing up to 99.9% of airborne bacteria and allergens—making your home safer and fresher.

Built Tough for the Gulf's Harsh Climate

Designed with Qatar in mind, the 2025 series is engineered to handle high heat and humidity. Gold Fin™ Anti-Corrosion Coating ensures longevity and reliability, while JetCool™ technology provides instant relief by rapidly lowering room temperatures.

Connected Living via LG ThinQ™

Seamlessly blending into smart homes, all models come Wi-Fi enabled and fully compatible with the LG ThinQ™ app. Adjust temperatures, set schedules, and track energy usage remotely—from anywhere, at any time.

Available Now Across Qatar

LG's state-of-the-art air conditioners are now on sale at Jumbo Electronics, LG Brand Stores, major hypermarkets, and online at www.jumbosouq.com.

Live smarter. Stay cooler. Choose LG.

Next-generation cooling engineered for comfort, energy savings, and cleaner air

65% Energy Saving

Purpose-built for the Gulf's demanding conditions, LG air conditioners are equipped with Gold Fin Anti-Corrosion Coating to withstand dust and humidity. Selected models include JetCool technology for rapid room cooling that enhance heat transfer and long-term efficiency.

LG DUALCOOL I23TNC

• 18000 BTU • 60% Faster Cooling & 15% More Cooling
• Gold Fin™ • Comfort Air • Comfort Sleep • 4 Way Swing
• Dual Protection Filter • Smart-Hidden Display

2,799 QR.00

LG DUALCOOL I27TNC

• 22042 BTU • 60% Faster Cooling & 15% More Cooling
• Gold Fin™ • Comfort Air • Comfort Sleep • 4 Way Swing
• Dual Protection Filter • Smart-Hidden Display

3,299 QR.00

LG DUALCOOL I34TKF

• 28343 BTU • 65°C Dual Inverter Compressor™
• 10 Year Compressor Warranty
• 60% Faster Cooling • 65% Energy Saving • Gold Fin™

5,499 QR.00

LG DUALCOOL I38TKF

• 31000 BTU • 65°C Dual Inverter Compressor™
• 10 Year Compressor Warranty
• 60% Faster Cooling • 65% Energy Saving • Gold Fin™

5,999 QR.00

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