

Success Case Study

The Vyra Hotel Suites (Samrya G44)
Doha, Qatar



A Daikin Total Solution



Overview

Open the doors to Luxury Living

Samrya 44 is a testament to Doha's vision of making its mark in the international market. With 44 floors of elegantly-designed luxury suites, it adheres only to the highest standards in construction and HVAC.

Overcoming Challenges

This is a success story built on a strong foundation of expert collaboration and exceptional technical expertise. The key initiative was to optimize the partially installed Chilled Water System into a workable one which is the VRV Water Cooled with Cooling Towers without compromising as-built site conditions.



Our project is a residential tower with 44 stories and total value of 450 million QAR. It was started in December 2011 and had a target completion date of April 2018.

As a result of the brainstorming sessions we've conducted with Daikin, along with all the efforts and perseverance of every member of the G44 team, we've succeeded to deliver the project which we believe is a trademark given its unique concept and also the considerable enhancement of the final system from the original design wherein we minimized the cooling running cost by 40% and introduced heating, which was not originally conceived for.

As the building was already existing, designed for a different concept and has a fixed construction budget, the scale of the challenges was very high. However, thanks to the technology, knowledge, expertise, effort and perseverance of the team behind this project, we overcame all the obstacles and succeeded to reach our goal.

Antonio Ragheb
Head of Mechanical Engineering
Erga/SDT Qatar



"A challenging project in many aspects. The major drive for this solution was the trust of the client and the knowledge and openness of the consultant to design and execute a system for the first time. This project involved extensive equipment from Daikin product portfolio in the Middle East region, and it is the first project to have installed Heat recovery systems in the GCC region. The success story of this project came as a result of great partnership between Daikin and its clients and consultants. Together everything is possible!"



Laila Sahaf-Amin, Strategic Key Accounts

Preserving Site Integrity and Design

As a chilled water system has been partially installed in the building, one of the main goals of the project was to optimize it into a more customized and energy-efficient solution which will not only provide the basic HVAC needs of the building, but also address potential heating requirements.

Challenges

- › No change in the exterior of the building
- › Ensuring building structural stability for the heavy cooling towers
- › Selecting / locating chemical treatment systems for cooling towers and closed system
- › Complying with Ministry of Environment and Affairs for reverse osmosis reject, multimedia filters backwash and cooling towers blow down discharge
- › Ensuring all future maintenance/spare parts could be lifted by BMU and service lift.

Solution

- › Thorough review of site plan and collaboration with the consultant to ensure that all safety and structural preservation measures are observed
- › Offer the most efficient HVAC solution which could fulfill the design criteria of the building from an architectural and engineering point of view through the highly-efficient VRV water-cooled heat recovery system
 - * Compact design
 - * Low noise
- › Opt for per-floor-installation to reduce costs and achieve the highest efficiency and optimum operation due to shorter pipes



Samrya 44 Hotel Suites installed:



Heating & Cooling

Reliable VRV technology

VRV IV-W efficiency

- › Ideal for high-rise buildings using water as a heat source
- › Covers all thermal needs of a building via a single point of contact, accurate temperature control, ventilation, air handling units
- › Most compact casing available in the market



Ventilation

Plug & play Daikin Air Handling Units

- › Seamlessly integrates in the air conditioning system
- › Large quantities of fresh air can be brought in
- › Heat recovery from outgoing air for maximum efficiency
- › Customisable to the exact building needs



Intelligent Monitoring

Intelligent Network

- › 24/7 monitoring of VRV system
- › Predictive maintenance maximizes uptime
- › Daikin experts maximizes system lifetime
- › Performance analysis connects you to Daikin experts suggesting ways of improving performance



Service Plan

Daikin service partner

- › Keeps everything running frictionless for peace of mind
- › Service by the expert
- › Largest spare parts stock locally for quick intervention

BENEFITS OF INTEGRATED SYSTEM FROM SINGLE MANUFACTURER



SINGLE POINT OF CONTACT FOR THE ENTIRE HVAC-R



LOWEST RUNNING COST/M²



ALL EQUIPMENT MANAGED BY ONE CENTRAL SYSTEM



HIGH QUALITY AND DURABILITY



MONITORING BY THE EXPERT AND ADVICE



PEACE OF MIND

Comparison between Aircooled Chiller System Vs. Proposed water cooled VRV system

	Quantity	Connected Cooling Load @ Design condition (KW)	Connected Power (KW)	Power at Design condition	
AIR COOLED CHILLED WATER SYSTEM(Including Pumps)	4 (3 Duty + 1 Standby)	6,132 total (4,599 working)	3,326	2,487	128%
WATER COOLED VRV SYSTEM (Including pumps and cooling tower)	219 Outdoor units	5,020	2,075	1,945	160%

ELECTRICAL POWER BREAKDOWN - AIR COOLED CHILLED WATER SYSTEM

Equipment	Quantity	Location	Connected Power (KW)	Power at Maximum Load (KW)
Chillers	4 (3 Duty + 1 Standby)	Roof	2,996	2,247
Primary and Secondary Pumps	12 (8 Duty + 4 Standby)	24th, 44th	330	240
TOTAL POWER			3,326	2,487

ELECTRICAL POWER BREAKDOWN - WATER COOLED VRV SYSTEM

Equipment	Quantity	Location	Connected Power (KW)	Power at Maximum Load (KW)
Cooling Towers	8 (8 Duty)	Roof & GR	320	320
Hydronic Pumps	8 (6 Duty + 2 Standby)	44th & B1	520	390
VRV System (OU)	219	All	1,235	1,235
TOTAL POWER			2,075	1,945

An integrated approach to deliver

The lowest environmental impact

Every area of the hotel has its own requirements but each needs to have an optimal solution



Heating & cooling



Ventilation



Centralised Control

VRV IV standard & technologies

Our new VRV IV systems set pioneering standards in all-round climate comfort performance. Total design simplicity, offering rapid installation, full flexibility as well as absolute efficiency and comfort. Find out about all these revolutionary changes at www.daikinmea.com

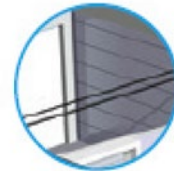
VRV IV water-cooled + series

- › Suitable for high rise and large buildings because of the nearly unlimited possibilities of water piping
- › Not affected by outdoor temperature/climate conditions
- › Reduce CO₂ emissions thanks to high COP of 6
- › Allows heat recovery in the entire building thanks to the storage of energy in the water circuit
- › Lower refrigerator levels thanks to the limited distance between outdoor and indoor units

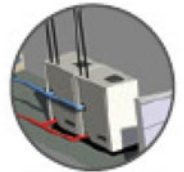
COMPONENTS:



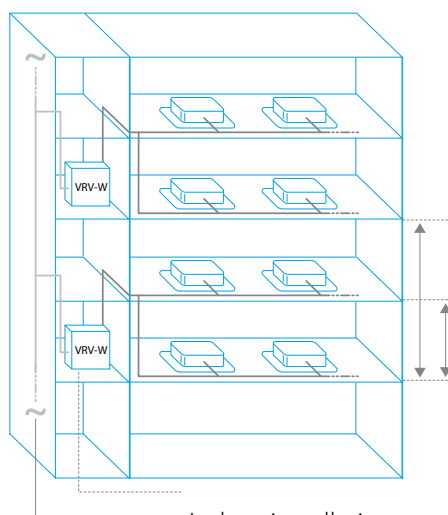
Indoor Unit



Refrigerant Piping



Outdoor Unit



Level difference between the VRV-W and indoor units:
50m if the VRV-W is above
40m if the VRV-W is below

Level difference between indoor units: 30m **NEW**

Indoor installation
Unlimited water piping length

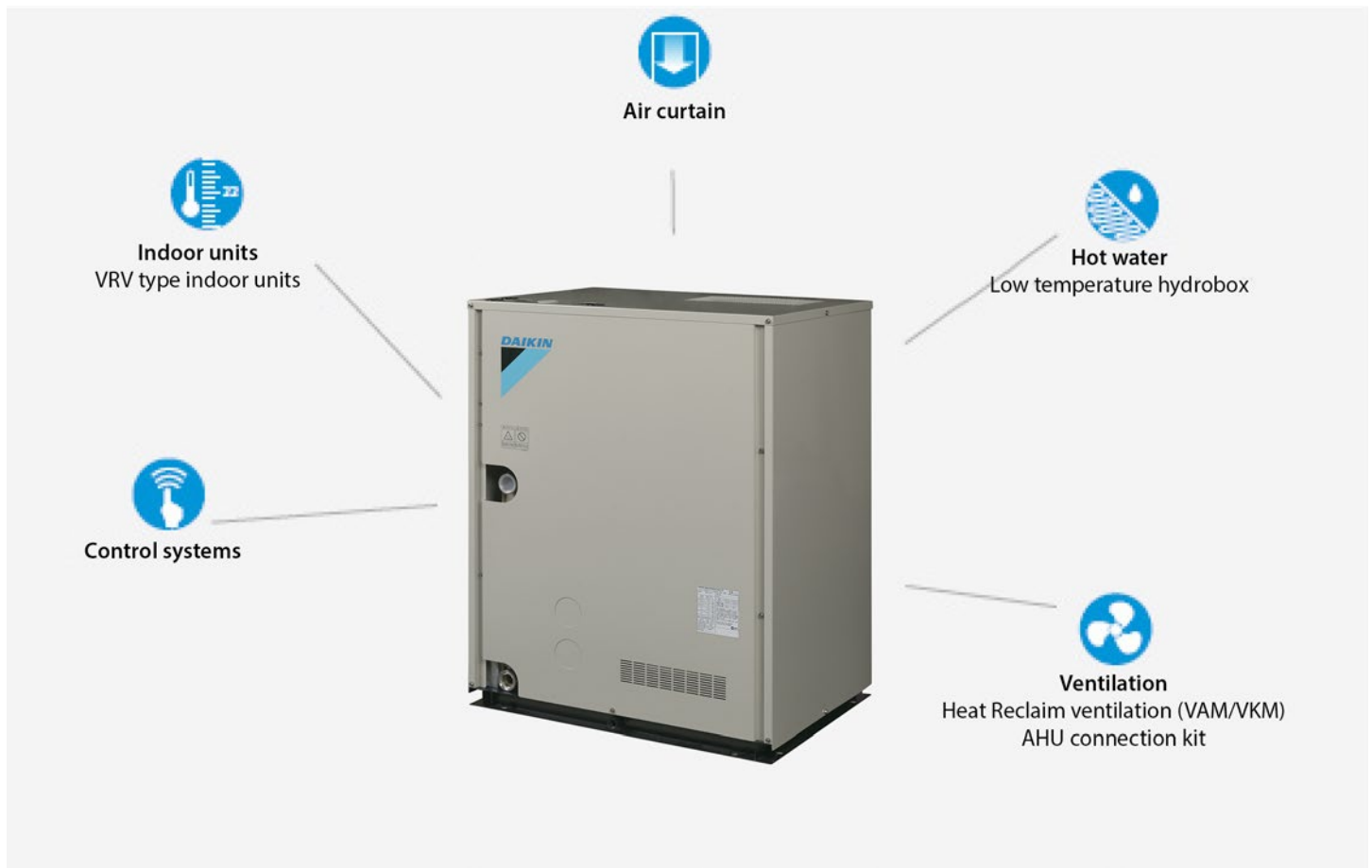
— Water piping
— Refrigerant piping

Optimum technical HVAC solution

One of the main challenges of the project is locating the optimum and efficient placement of outdoor units without compromising delivery of comfort and ease of monitoring. The efficient VRV water-cooled heat recovery system provides both the heating and cooling capacities proposed for the project.

Thanks to the VRV IV-W's compact design, it was easily installed in a discreet location on every floor ensuring

- ✓ Reduced installation costs
- ✓ Significant savings in copper wiring
- ✓ Highly efficient performance due to shorter piping



Benefits of VRV IV outdoor system:

- › Designed for seasonal efficiency
- › Lowest running cost per month compared to other technologies
- › Variable Water Flow control option increases flexibility and control
- › Compact & lightweight design can be stacked for maximum space saving

Catering to Comfort and Convenience

Delivering the ultimate in comfort to every unit is the main goal that needs to be delivered. In order to do this, an efficient heat recovery system that provides both heating and cooling options throughout any season was installed in every room with Daikin's ducted indoor units which provide:

- ✓ Individual and intuitive comfort
- ✓ Seamless integration with interior design
- ✓ Whisper-quiet operation that make less noise (down to 27dBa) for better acoustic comfort



Slimmest yet most powerful medium static pressure unit on the market!

FXSQ-A



- › Slimmest unit in class, only 245mm
- › Low operating sound level
- › Medium external static pressure up to 150Pa, facilitates using flexible ducts of varying lengths
- › Automatic air flow adjustment function measures the air volume and static pressure and adjusts it towards the nominal air flow, guaranteeing comfort.

Achieving Maximum Energy Savings

By installing fresh air handling units in technical floors, connecting to VRV water-cooled outdoor units, heating mode introduced to building as compared to the original system design which can only provide cooling, resulting to:

- ✓ Integrated fresh air ensuring high comfort even for large groups
- ✓ Lower running cost throughout the year
- ✓ Efficient connectivity of FAHUs to water-cooled VRV systems



Plug and play connection of
AHU to Daikin VRV

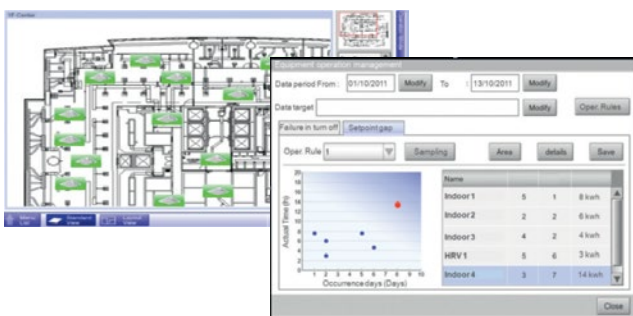
Zoneable Cooling and Heating

Backed by Daikin's Intelligent Manager, monitoring and control are made easier and more manageable throughout the whole building ensuring:

- ✓ Smart energy management
- ✓ Cross-pillar integration (heating, air conditioning, air handling units)
- ✓ Easy servicing and commissioning

Daikin's unique Intelligent Network Service aims to prevent the equipment coming to an unexpected stop or needing emergency repair.

Intelligent Manager



Plug & play



Split



SkyAir



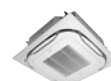
VRV



Fan coils



Chillers and AHU



Conveni-pack indoor units



HRV ventilation

Daikin: High-Quality Products, Exceptional Service

Daikin is the top-range manufacturer of VRV, having the best technology in addition to the best qualified staff. Note that without the professionalism, perseverance and proactivity of the Daikin staff (and specifically Miss Laila), we couldn't have conceived the new cooling system in our project.

One of the unique features of Daikin is the Fan Coil Unit Auto-Balancing which could save cost of third-party air balancing when Fan Coil Units are supplying single zone, in addition that this would minimize further the noise level of the fan.

Antonio Ragheb
Head of Mechanical Engineering
Erga/SDT Qatar



Product Photos





What we delivered

Green solution for low environmental impact

- › High seasonal efficiencies of VRV IV watercooled and heat recovery system

Simple and powerful management system

- › Integration with building management control room of Intelligent Touch manager

Low total life cycle cost

- › Lower installed cost compared to water-based 4-pipe configuration
- › Optimised seasonal efficiencies
- › Powerful control & management reduces running costs

Single point of contact for the different technical solutions

- › Daikin offers total HVAC-R solution
- › Daikin offers a monitoring system & periodic technical reporting

A Daikin Total Solution

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