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LIVING ENVIRONMENTAL SYSTEMS

Changes for the Better

HotelilSereno

COMO LAKE

Technological innovation according to Mitsubishi Electric

for a greener tomorrow eco Changes

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HotelilSereno

COMO LAKE

The Hotel Il Sereno***** Luxury will be built at Torno (Como), on the small promontory once occupied by the Villa Flora hotel. The facility will boast 34 spacious rooms, all with a lake view and private, partitioned balconies, an 18 meter infinity pool suspended over the lake, a fully equipped spa and a restaurant staffed by award-winning chefs.

The property, owned by the American holding Sereno Group headed by Luis felipe Contreras (http://www.lesereno.com/reflections/countdown-to-como.htm), will remain true to the company's hallmark values of privacy, relaxation, understated elegance and exciting design.
Overseeing the interior design of the Hotel Il Sereno is Patricia Urquiola, the Spanish designer who studied in Italy under Achille Castiglioni back in the 1990s, and who was recently named "Designer of the Year" by the magazine Wallpaper.

Two vertical gardens conceived by garden designer Patrick Blanc will contribute even further to create an impression of a hotel nestled harmoniously in the surrounding environment.

Technological innovation according to Mitsubishi Electric

The prerogative for the entire project was to create the perfect conditions to give guests the sensation of being cocooned in an oasis of tranquillity, where the opportunity to enjoy the spectacular landscape is made all the more special by every conceivable comfort. Particia Urquiola has designed every space in the property to offer a privileged window onto the lake and the mountains,
and as a consequence, the use of predominantly natural materials – such as wood, stone, copper and textiles – was a logical choice.

This pursuit of the perfect conditions for guests is also reflected in a choice of utility systems combining technological innovation and environmental sustainability with comfort.
This is why Mitsubishi Electric was chosen as a supplier, which responded to the primary energy requirements of the facility (heating, cooling and domestic hot water production) with its state of the art air conditioning systems.
Specifically, the manufacturer's new HVRF hybrid variable refrigerant flow technology – denominated Hybrid CITY MULTI – has been implemented for the hotel.

HYBRID
CITY MULTI

HYBRID City Multi

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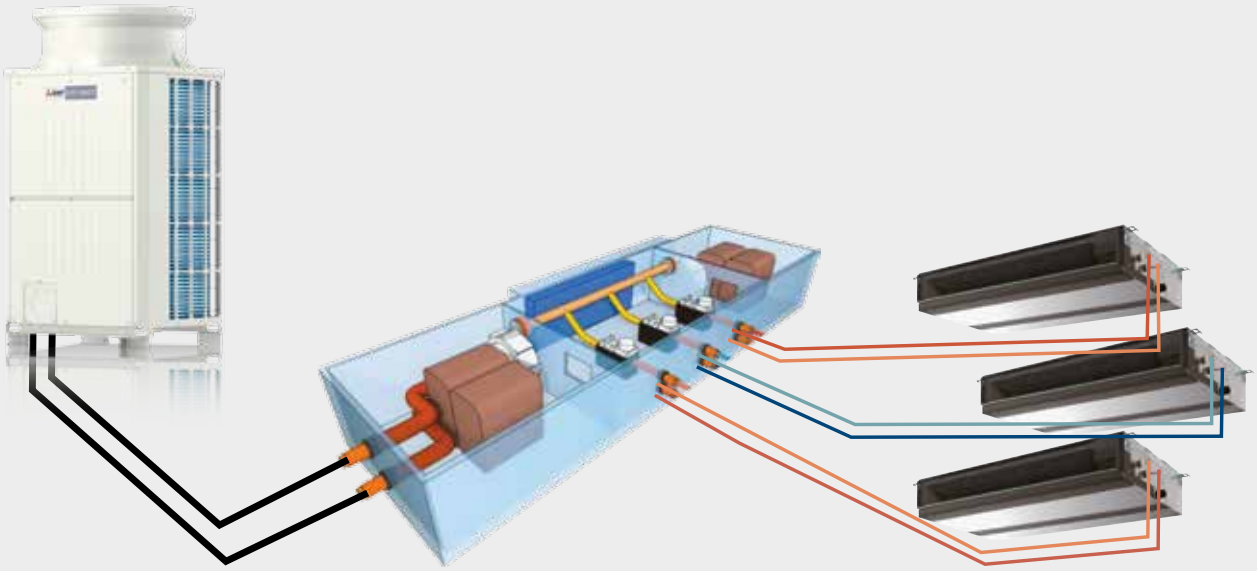
WHAT IS HYBRID VRF?



Derived from the R2 system, HYBRID City Multi is the world's first and only system combining superior air comfort with the benefits of a direct expansion, variable refrigerant flow solution.

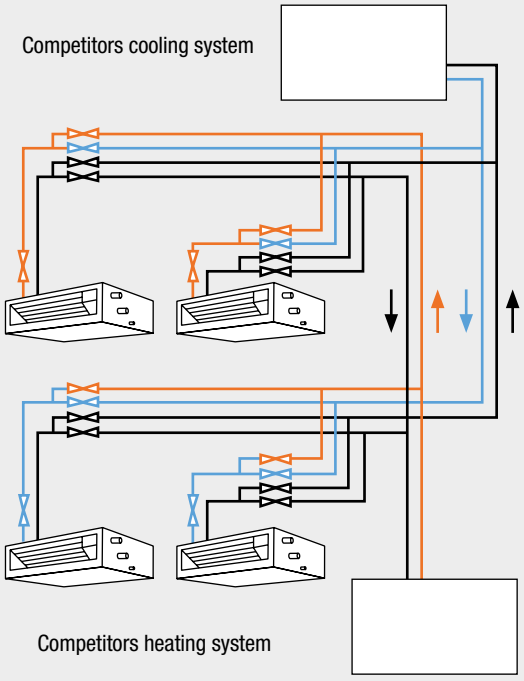
Why HYBRID VRF?

HYBRID City Multi is a heat recovery system (simultaneous heating and cooling) that joins the City Multi family and, for the first time, uses water as the medium to distribute thermal and refrigeration power to the interior space.

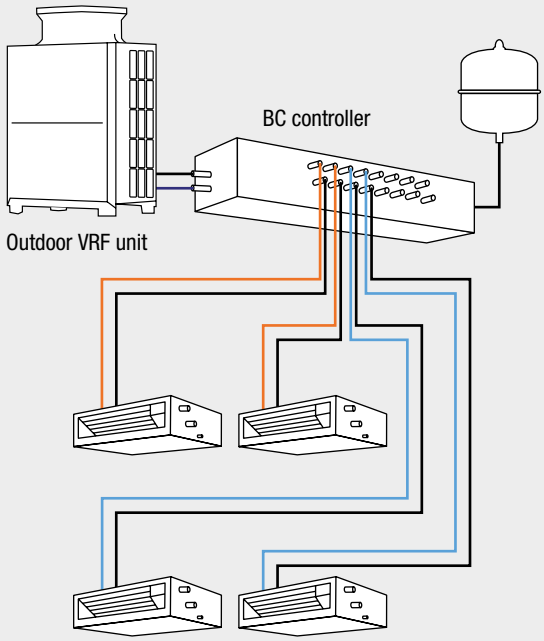
Simultaneous cooling/heating with heat recovery

The new HYBRID City Multi system is the world's first and only two-pipe simultaneous cooling and heating system with heat recovery to combine the benefits of direct expansion technology with those of a conventional hydronic system.
Technologically, the new system is based on Mitsubishi Electric's City Multi R2 heat recovery system, and consists of a City Multi series R2 (or WR2) outdoor unit, the innovative new Hybrid BC controller (HBC), which makes it possible to use refrigerant gas and water as the thermal media fluids, and indoor units equipped with a specific water media heat exchanger coil.

Traditional hydronic 4-pipe system



HVRF 2-pipe system



Cold water Hot water Refrigerant Return pipes

Comparison of the connection points to be implemented in the system

Lower concentrations of R410 gas in building

Using hydronic distribution allows the system to comply with the stringent restrictions of the regulation UNI EN 378 on refrigerant gas concentrations. This is made possible by the fact that the only part of the installation containing refrigerant gas is the section connecting the outdoor unit to the Hybrid BC Controller. This solution reduces the quantity of refrigerant used in the installation by up to 45% compared with a conventional VRF system.

Two-pipe systems

A two-pipe system is much simpler to design and install and offers much more flexibility in terms of layout than a conventional four-pipe hydronic system. For example, the HYBRID City Multi needs no additional pumps, tanks or switching valves. The significantly smaller number of connection points in a two-pipe system also limits the potential for leaks, making the system itself safer and reducing the need for maintenance.

HYBRID City Multi

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Cooling with high SHF (Sensible Heat Factor)

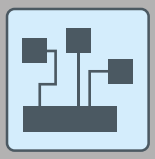
HYBRID City Multi technology makes it possible to design and install systems with the same extraordinary simplicity of a VRF system, while also benefitting from the superior comfort offered by using water as the thermal medium. The water media indoor units (supplied by Mitsubishi Electric) are capable of even more comfortable and stable temperature control than a conventional direct expansion system, with a higher Sensible Heat Factor (SHF).

Minimised defrost times and faster setpoint stabilisation

Using water as the thermal medium offers yet another advantage in heating mode with significantly shorter defrost times. The thermal flywheel effect of water allows the system to resume heat production immediately after a defrost cycle, minimising system downtimes.

Silent operation with water cooled convectors

The indoor units usable in conjuction with the HYBRID City Multi system are equipped with water media heat exchanger coils. With no LEV lamination valves, these machines are even quieter, making them ideal for use in particularly noise-sensitive locations such as libraries, teaching facilities and bedrooms.



A modular system which can even be installed in intermediate stages

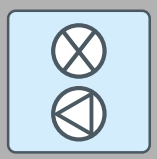
The auto-adaptive capabilities of the HYBRID City Multi make it particularly suitable for all applications where certain indoor units in the system itself will be installed at a later date, once it is already in operation. This is a common situation in the case of units in residential/commercial complexes sold to different users.

Load and requested capacity dependent modulated pump regulation

The new HYBRID City Multi system already includes all the components necessary to meet the distribution and regulation requisites of a typical hydronic system. Featuring two variable speed, inverter-controlled circulation pump units, the HVRF system is capable of regulating the water flow delivered to the individual hydronic units (indoor units) completely automomously in response to the thermal power requests of each indoor space.

M-Net control system

As part of the City Multi family, the HYBRID City Multi system is also compatible with M-Net control and communication systems for VRF installations, and benefits as a result from the M-NET Power function, which allows the system to continue to operate normally even in the event of a loss of electric power to one or more indoor units. This function is particularly advantageous and effective in applications where the air conditioning system is shared between multiple users (shopping malls, condominiums etc.).



Integrated valves, pumps, heat exchangers and monitoring and regulation systems

Featuring special plate type heat exchangers, the innovative Hybrid BC Controller (HBC) is the only device in the world to use refrigerant gas and water as thermal media fluids. The controller already contains all the components necessary to distribute and control the water flow delivered to the individual indoor units. With two plate heat exchangers, the system is always ready to produce hot and cold water simultaneously, while delivery and return manifolds, water flow regulator valves and two variable flow pumps allow the system to manage hydronic distribution to the individual indoor units autonomously in relation to a complex set of parameters acquired by the system itself.

Accessories and safety components

The following additional material is all that is needed to install a HYBRID City Multi system:

- 20 mm diameter copper or multilayer piping
- An expansion tank, to be connected directly to the HBC Controller
- Water mains feed line (to fill the system), with cutoff valve, safety relief valve, filter and pressure regulator.
- Condensate drain line
- 220V mains electricity power line.

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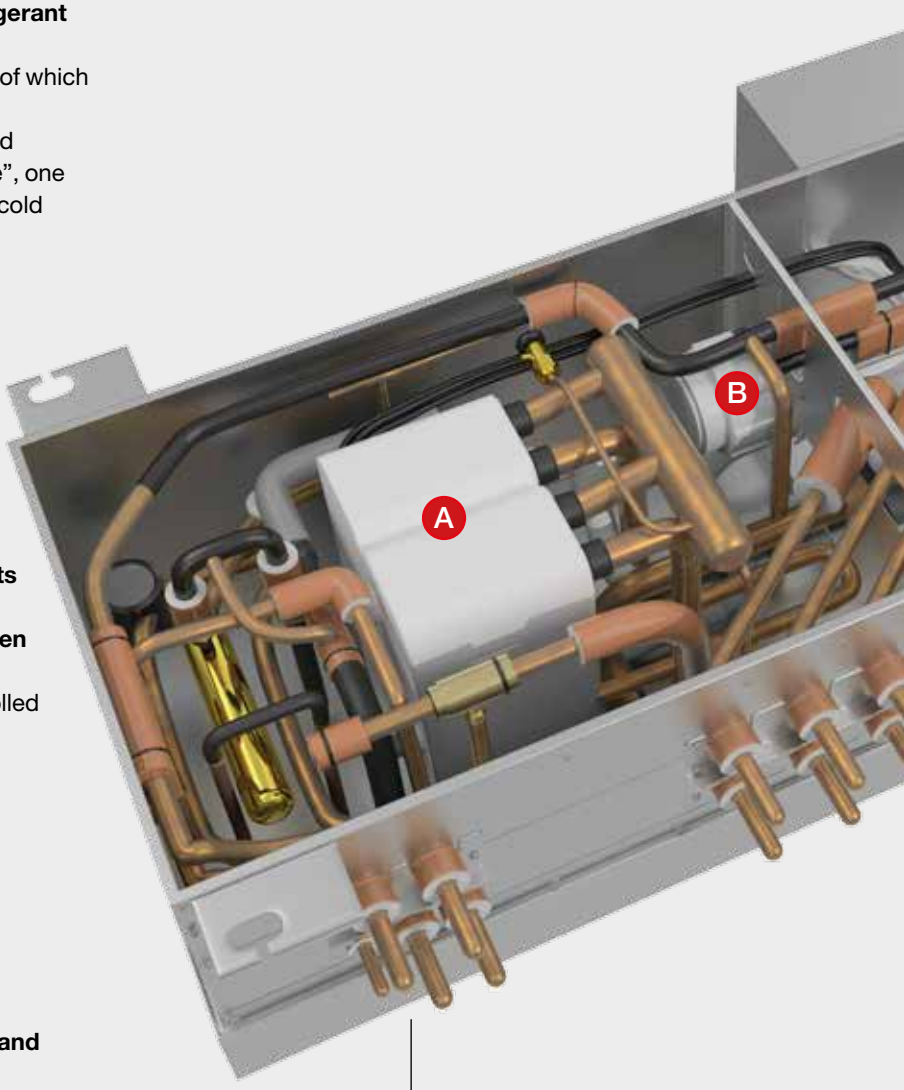
A

Plate heat exchangers

This is where energy is transferred from the refrigerant circuit to the water circuit.
There are two plate type heat exchanger units, both of which situated at the end of the HBC box.
Both units deliver hot water in heating mode and cold water in cooling mode. In “mixed hot and cold mode”, one exchanger delivers hot water and the other delivers cold water to the relative manifold inlets.



B

Pumps

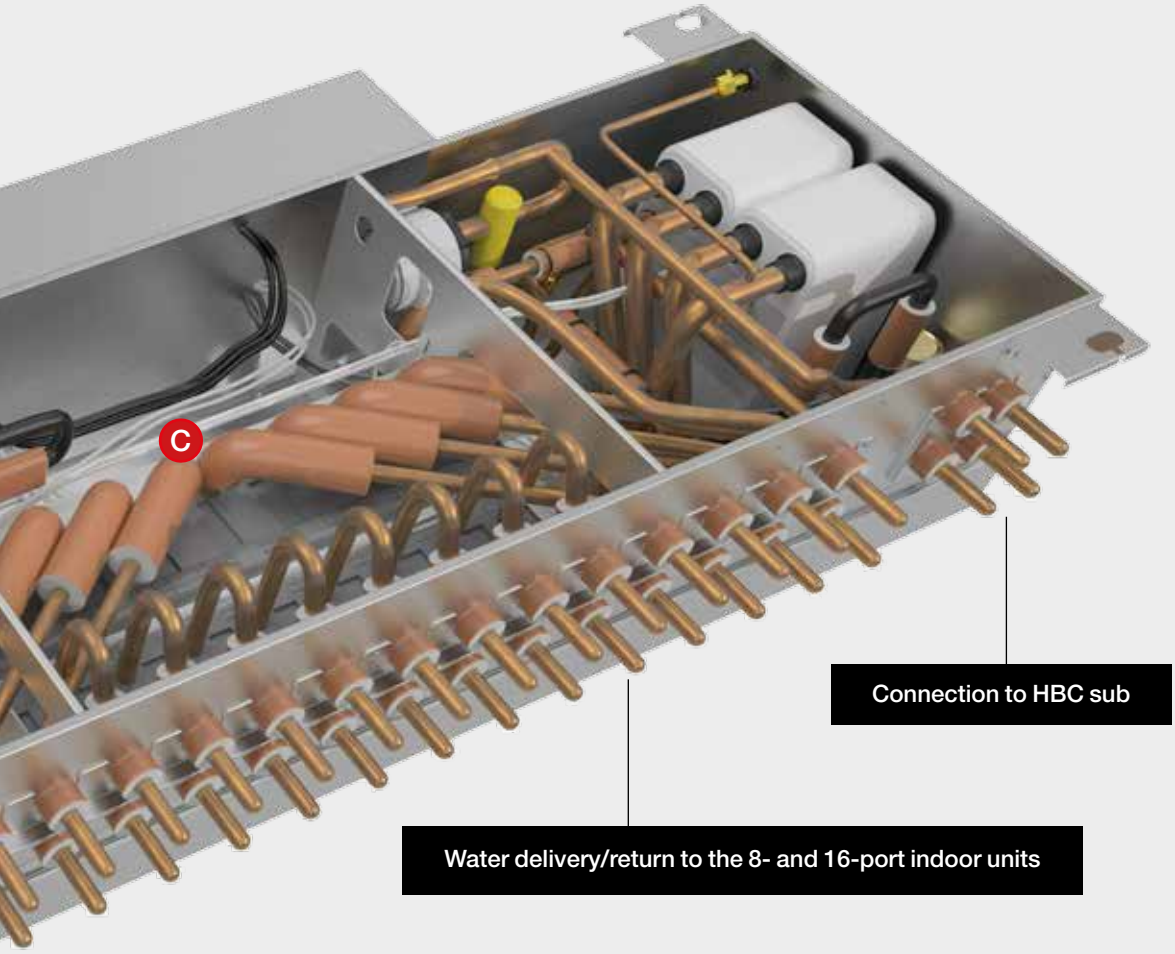
Each plate heat exchanger unit is equipped with its own DC inverter controlled circulation pump. The pump circulates water in the closed circuit between the HBC and in the indoor units.
The water flow delivered to each indoor unit is controlled by the valve block.

C

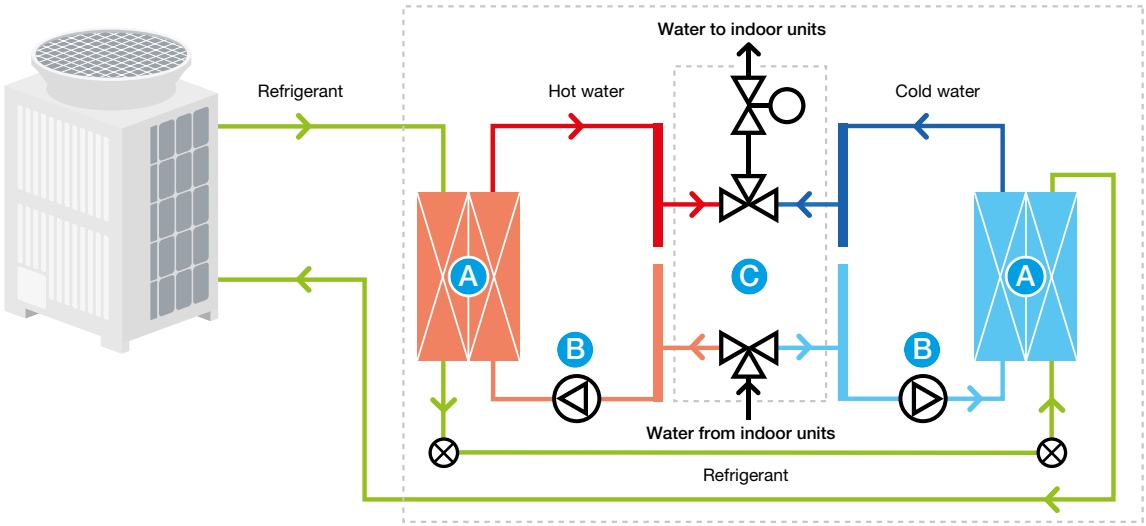
Valve Block

A valve block is connected between the delivery and return ports of each indoor unit.
This valve block has two functions: its primary function is to select which of the two delivery manifolds is used (hot water or cold), while its secondary function is to control the water flow delivered to the indoor unit, to modulate the thermal capacity of the unit itself.

Refrigerant piping towards outdoor unit, expansion tank (supplied separately) and mains water feed circuit (supplied separately).



HBC – FUNCTIONAL DIAGRAM OF SYSTEM
in simultaneous hot/cold mode



HYBRID City Multi

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Description of air conditioning installation

To provide primary heating and cooling functionality for the utilities situated on floors -1 to 4, a total of 6 Hybrid CITY MULTI HVRF simultaneous heating and cooling systems with indirect expansion heat recovery have been used (one HVRF per floor), using lake water for condensation. Lake water is drawn by a pumping station installed 15 meters below the surface level of the lake.
The six HVRF systems have a combined nomimal thermal capacity of 270 kW, and a combined nominal refrigerating capacity of 240 kW.
Via 6 HCB controllers, these systems feed a total 79 HVRF hydronic indoor units of a variety of different types, from PFFY-WP VLRMM-E built-in floor units (used predominantly in bedrooms), to PEFY-WP VMA-E medium static pressure ducted units and PLFY- WP VBM-E four-way cassette units.

Components of the HVRF system

VRF CITY MULTI WR2 Series Outdoor Units

SMALL module

LARGE module

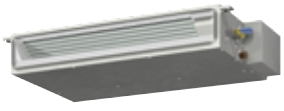
Hybrid Branch Controller (HBC)

CMB-WP1016V-GA1

HVRF Indoor Units (hydronic)

PEFY-WP-VMA-E
Ducted unit with static pressure up to 150 Pa, also suitable for particularly long air ducting.

PEFY-WP-VMA-E
900x900 mm 4-way cassette unit suitable for ceilings up to 4.2 m above floor.



EFY-WP-VMS1-E
Ultra-flat ducted unit measuring just 200 mm in thickness.

PFFY-WP-VLRMM-E
Built-in floor unit for concealed installations.

Details of piping installation

Refrigerant connections between the six VRF outdoor units and the HCB controllers have been made with pipes in phosphorus-deoxidized copper with elastomeric insulation.
Water connections between the HCB controllers and the 79 HVRF hydronic indoor units have been made with DN20 insulated multi-layer piping.

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Details of HBC Hybrid Controller Installation

Details of HVRF Indoor Unit installation

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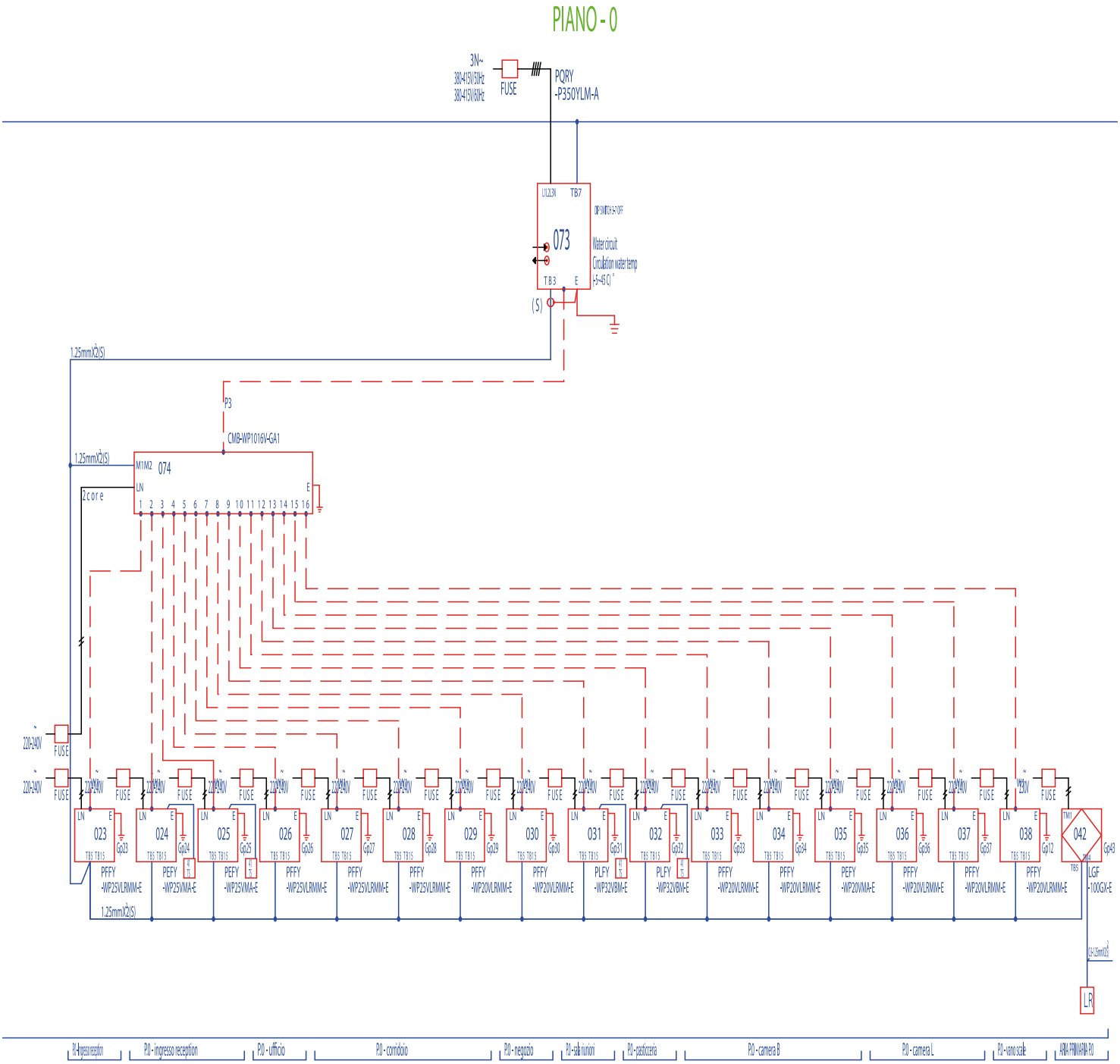
Details of pumping station installation

Skelton diagram of a typical floor installation



Lossnay LGF

Lossnay enthalpic heat recovery unit for basement installations

Description of ventilation installation

The outdoor air delivered to the floors is treated by a Lossnay LGF-100GX-E series heat recovery ventilation unit for basement installations.
The new Mitsubishi Electric LGF-100GX-E Lossnay enthalpic heat recovery unit for basement installations delivers up to 1000 m³/h of fresh air and offers extraordinary installation and operational flexibility, complying with the most stringent air hygiene standards and with the latest regulations regarding air exchange in non-residential environments.

LGF-1000GX-E - Front view

Removal of the front panels

Removal of the filters and Lossnay recovery unit

Cleaning of partitions

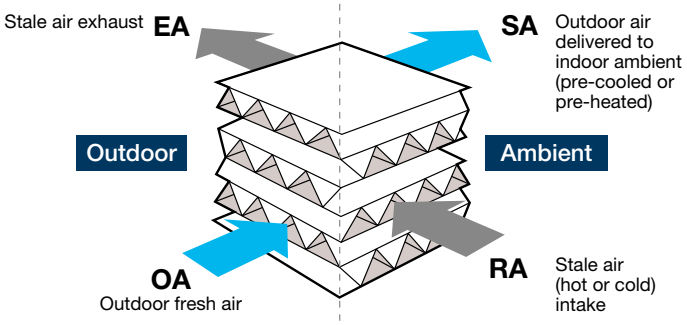
Cleaning of partitions

Removal of the ventilation section

Lossnay technology

The Lossnay total heat recovery module has a cross-flow plate fin structure and heat transfer diaphragms in special treated paper. The excellent thermal transfer properties and permeability to moisture of this special paper ensure the highly efficient exchange of both sensible and latent heat between the two air flows passing through the recovery core. The result is a ventilation system with outstanding characteristics ensuring extremely high levels of comfort and wellbeing in the environment treated, which can also cut operating costs substantially. The diaphragm pores, which were already microscopic in previous generations, have been further reduced in size to reduce the possibility of the passage of waterborne soluble gases such as ammonia and hydrogen from the exhausted stale air to the fresh air delivered to the indoor space. To increase heat and moisture exchange, a special treatment is applied to the paper used for the diaphragms. These improvements have increased moisture permeability while reducing impermeability to harmful gases, resulting in an overall increase in recovery efficiency and a more effective shielding action against the transfer of these gases.

Costruzione e principio di funzionamento dell'unità lossnay



High effective static pressure

Selecting the "Extra high" fan speed setting makes it possible to produce effective static pressure values up to 200 Pa for applications requiring long aeraulic duct lengths.

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CRHV

Packaged Ecodan System

Description of DHW production system

Two CRHV-P600YAHPB packaged ecodan water/water heat pumps have been used to supply the entire hotel with domestic hot water.
With a combined thermal capacity of 120 kW, these two CRHV-P600YAHPB heat pumps produce hot water at up to 65°C by exchanging the entire thermal power of the array via the heating coil of a 2000 litre capacity domestic hot water boiler.

Packaged WtW heat pumps for hot water

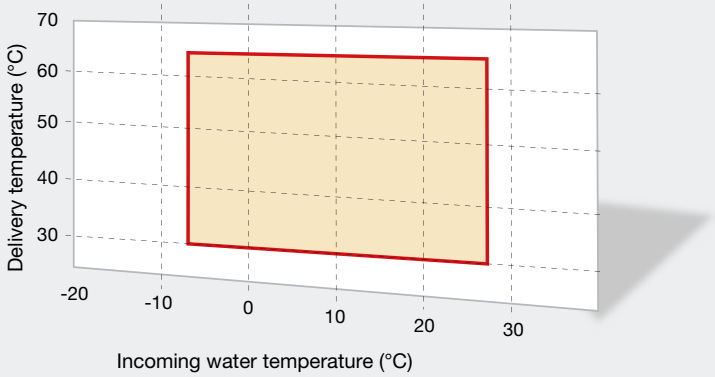
The new CRHV Water-to-Water Packaged Hot Water Heat Pump completes the Mitsubishi Electric range of heat pumps for hot water production, confirming its leadership in the production of these systems.
Equipped with two compressors using R410A refrigerant delivering a nominal capacity up to 60kW and drawing energy from the ground, the CRHV packaged system is the ideal solution for geothermal applications and applications using borehole, river or lake water as a heat source to produce hot water for heating or domestic hot water up to 65°C. The CRHV Hot Water Heat Pump offers class-beating innovation and efficiency.

Operating temperatures

The new CRHV packaged system is capable of operating at incoming source water temperatures between -8°C and 27°C with a counterflow configuration, while the incoming source water temperature range may be extended to up to 45°C using a parallel flow configuration.
The water delivery temperature range is from 30°C and 65°C (in parallel flow configuration, the maximum water delivery temperature is 60°C at incoming water temperatures above 27°C).
The CRHV packaged system is also suitable for indoor installation.

Remote control via external contacts

The wide choice of analogue and digital inputs and digital outputs available on the electronic board of the system makes it possible to control the system remotely from a BMS, a timer or external contacts.



Common condenser loop with heat recovery

The six VRF water condensing outdoor units and two CRHV-P600YAHPB units are installed in a utility room on sublevel 2.
To allow the 8 water condensing heat pumps installed in the system to evaporate or condense in response to the requests of the field, a hydronic loop with an intermediate heat exchanger has been included to dissipate or absorb thermal power into or from the lake water, which remains at a constant 7°C all year round.

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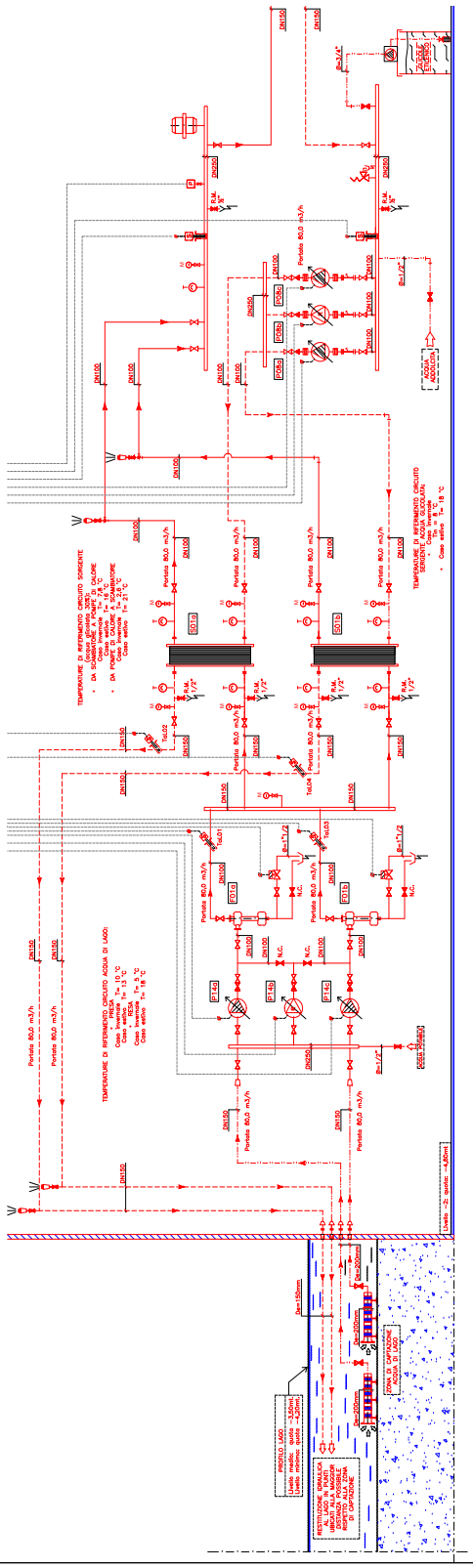
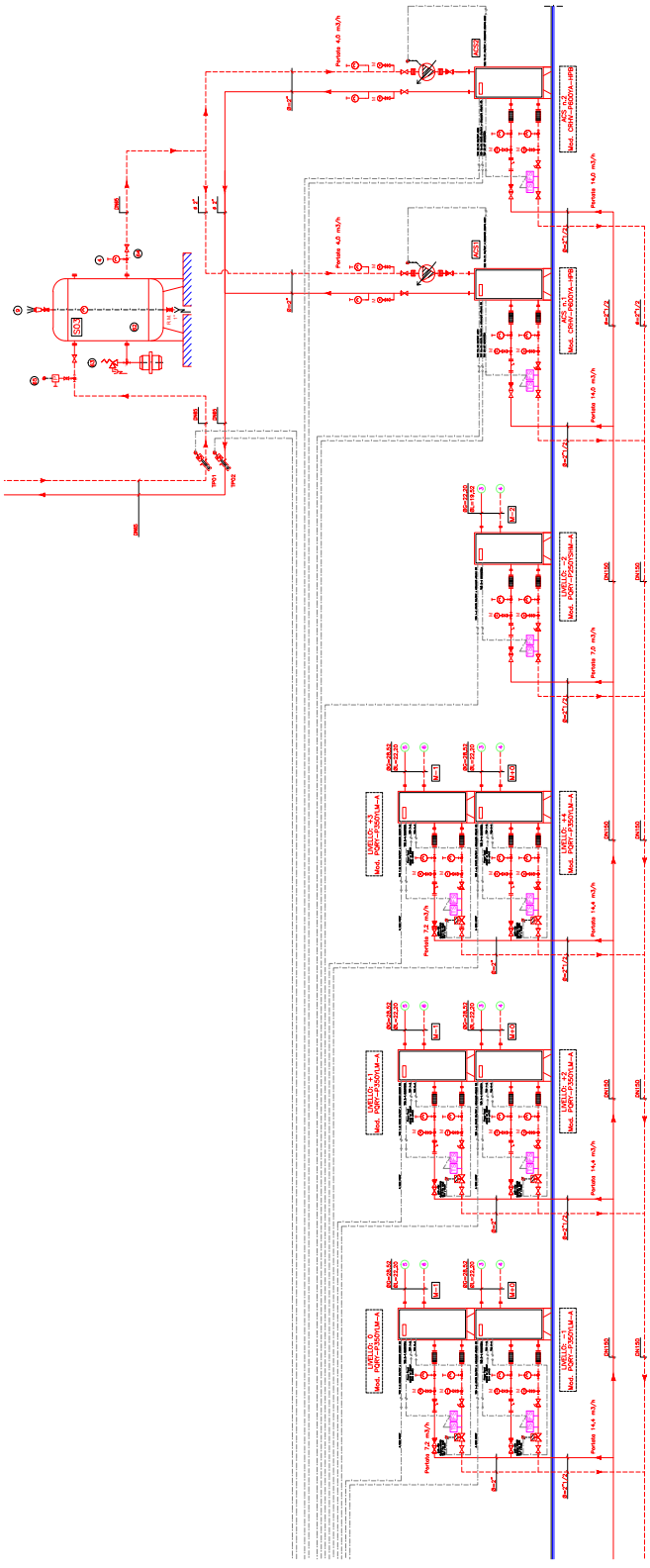
SOURCE side (lake) condenser loop



SOURCE side (lake) condenser loop



THE PROFESSIONALS INVOLVED

Technological innovation according to Mitsubishi Electric

The professionals working on the project

Architectural and structural project: Studio SCE Project

Fabio Curcio Valentini is an independent consultant who works through his company CVHP, in collaboration with other engineering businesses and consulting teams such as Società Rinascimento Valori Srl and SCE Project Srl, and directly for private investors.
This has given him the opportunity to manage a succession of major property development and hotel projects in Italy.
Fabio Curcio Valentini provides support to public and private sector clients for the development of complex, mixed usage brownfield and greenfield estate projects for every possible application (offices, residential, hotel, industrial, logistics and retail sale).
Fabio Curcio Valentini has recently concluded a number of major projects, such as the renovation of a significant portion of the rooms and common areas of the Hotel Danieli in Venice (November 2014 - March 2015), the renovation of a number of the rooms at the Four Seasons hotel in Milan, the final completion and handover of the Hotel Mandarin in Milan (May 2015), the coordination of the planning project for the hotel W in Rome (October 2014 - May 2015), and the management on behalf of Società Rinascimento Valori of two new 5 star luxury hotel projects of a leading international brand in the heart of Via Veneto in Rome. Consulting and real estate feasibility analyses for companies in the New York property market on behalf of One Stone Capital.

Fabio Curcio Valentini is currently handling the following projects:

- Project management for a luxury apartment building in Via Moscova 38, Milan (end of May 2015) for a private client.
- Project and construction management for the new Hotel Sheraton San Siro in Milano, a joint venture with Società Rinascimento Valori, on behalf of the IHI group
- Owner Rep, project manager and construction manager for the new Il Sereno luxury hotel on COMO LAKE, for private investors.
- Project manager on behalf of SCE Project for the renovation of the major logistics hub at Rome Fiumicino airport for Kryalos Italia (the Italian Blackstone group).

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Innovative, reliable solutions for electrical, special and heating/plumbing installations, electrical boards and wiring installations, all of which drawing from our extensive experience. Since 1960, as well as designing, fabricating and installing systems, we also offer a qualified aftersales service with class-beating maintenance and rapid response solutions tailored to the needs of each client.
Quality always comes first for us, whatever the project. We apply the most innovative technology and design our installations to meet even the most specific requisites of our clients, especially concerning energy savings. Every aspect of every project is coordinated in-house by our own staff for the peace of mind of total reliability.

The professionals working on the project

Mechanical and Technology Systems: Studio Tecnico Forte ing. Giuseppe

The professional studio founded by Giuseppe Forte in 1984 deals with the design of Mechanical, Electrical and Special systems developing in detail: Feasibility studies, Preliminary, Definitive and Executive Projects, General and Technical Specifications, Calculations, Estimates and Price Analyses, Supervision, Project management, Project Accounting, and activities relating to Fire Prevention, Appraisals and Final Tests. Its areas of work are diverse and varied: residential, commercial, hospital, service sector, sporting, and industrial.

Its main projects and/or extensions in the Industrial sector include the renovation of buildings and offices/laboratories for Ferrero SpA, Mondo SpA, Miroglio SpA, SKF SpA, and Pirelli SpA

In the hospital sector it has been involved directly in the design of the new hospital in Alba- Bra (CN) (550 beds), the new hospital in Ancona Sud (250 beds) and the new “Villa del Sorriso” residential care home in Bormio.

Important projects include those for the XX Olympic Winter Games held in Turin in 2006 and many others in the commercial and services sector. These were both from a strictly design point of view and in terms of project management.

They include the “Gli Orsi” shopping centre in Biella owned by Sonae and Novacoop, the Rivalta shopping centre, the new headquarters of Banca Sella in Biella, the renovation and adaptation of the former Officine Savigliano in Turin, the business services centre in Novara and the new headquarters of Novacoop in Vercelli.

The educational and cultural sectors are also areas where Studio Professionale dell’Ing Forte Giuseppe operates and on which it has successfully left its mark.

The design of the New Faculty of Veterinary Medicine of Lodi and the new school of Arts and Crafts of Venaria (TO) and the renovation of the Ancient Baths of Acqui Terme (AL) are just some of its references.

The professionals working on the project

PROJECT

Architectural and structural project: Studio SCE Project

Founded by the engineers Fabrizio Bozzi, Stefano De Cerchio and Manuela Fantini, SCE Project now boasts a staff of over 65 persons, with engineers, architects and specialised technicians supported by administrative, IT and technical archive personnel. At its two branches in Rome and Milan, the skills of every single member of the team contribute to a multidisciplinary work model where individual areas of specialisation are continuously honed to offer the client a superior product in every stage of the project, from conceptualisation to construction on site.
The SCE Project team uses the most sophisticated state of the art hardware and software tools for the development of projects and for the quality control of the components used in construction. To offer the client an even more comprehensive service, SCE Projet also collaborates with external businesses and specialised consultants with proven competence in their respective sectors.
With personnel working on-site at different locations in continuous contact with the team and IT network of their respective branch, SCE Project is capable of planning and building projects throughout Italy and abroad.
The company has a UNI EN ISO 9001:2000 certified Quality Management system.

http://www.sceproject.it

Interior design project: Patricia Urquiola

Born in Oviedo, Spain, Patricia Urquiola now lives and works in Milan. She studied architecture at Madrid Polytechnic and, subsequently, Milan Polytechnic, where she graduated in 1989 under Achille Castiglioni. She worked as assistant lecturer for Achille Castiglioni, has collaborated with Vico Magistretti and was design director for Lissoni Associati.
She opened her own studio in 2001, which operates in product design, interior design and architecture. Her most recent architectural projects include: the Jewellery museum in Vicenza, Hotel Mandarin Oriental in Barcelona, Hotel Das Stue in Berlin, the spa of the Hotel Four Seasons in Milan, and retail and outfitting projects for Gianvito Rossi, BMW, Cassina, Ferragamo, Flos, Missoni, Molteni, Officine Panerai, H&M, Santoni and Pitti Uomo Firenze. She has designed products for leading Italian and international companies, among which: Agape, Alessi, Axor-Hansgrohe, B&B Italia, Baccarat, Boffi, Budri, De Padova, Driade, Flos, Gan, Georg Jensen, Glas Italia, Haworth, Kartell, Kettal, Kvadrat, Listone Giordano, Louis Vuitton, Molteni, Moroso, Mutina, Rosenthal and Verywood.
Some of her products are now exhibited in major art and design museums, such as the MoMa in New York, the Musée des Arts Decoratifs in Paris, the Zurich Design Museum, the Vitra Design Museum in Basel, the Victorian & Albert Museum in London, the Stedelijk in Amsterdam, and the Triennale Museum in Milan.
She has received numerous international accolades, among which: the Medalla de Oro al Mérito en las Bellas Artes, from the Spanish government; the Order of Isabella the Catholic granted by His Majesty King Juan Carlos I of Spain; “Designer of the Decade” awarded by the magazines Home and Häuser; and the “Designer of the Year” award from the magazines Wallpaper, AD Spain, Elle Decor International amd Architektur und Wohnen. She acted as Ambassador for the 2015 Milan Expo, while in September 2015, Patricia Urquiola was nominated Art Director of Cassina


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eco Changes **for a greener tomorrow**

Eco Changes is the Mitsubishi Electric Group's environmental statement, and expresses the Group's stance on environmental management. Through a wide range of businesses, we are helping contribute to the realization of a sustainable society.

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