

# EXAMPLES OF APPLICATION



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## RESIDENTIAL BUILDING

# Central heating of a residential building via HMUs connected to a KXZ system

The system provides hydronic heating only through a centralised type of distribution system in a residential building.

DHW is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



underfloor heating



DHW via Hot Water or Q-ton



### SYSTEM CHARACTERISTICS

28-168 kW

Outdoor unit power range



100%<sub>(max)</sub>

Total connectable I.U. power (HMU only)

40 m

Maximum level difference between O.U. and HMU. With a design temperature lower than -10°C, the O.U. must always be placed above HMU

510 m<sub>(max)</sub>

Split total length

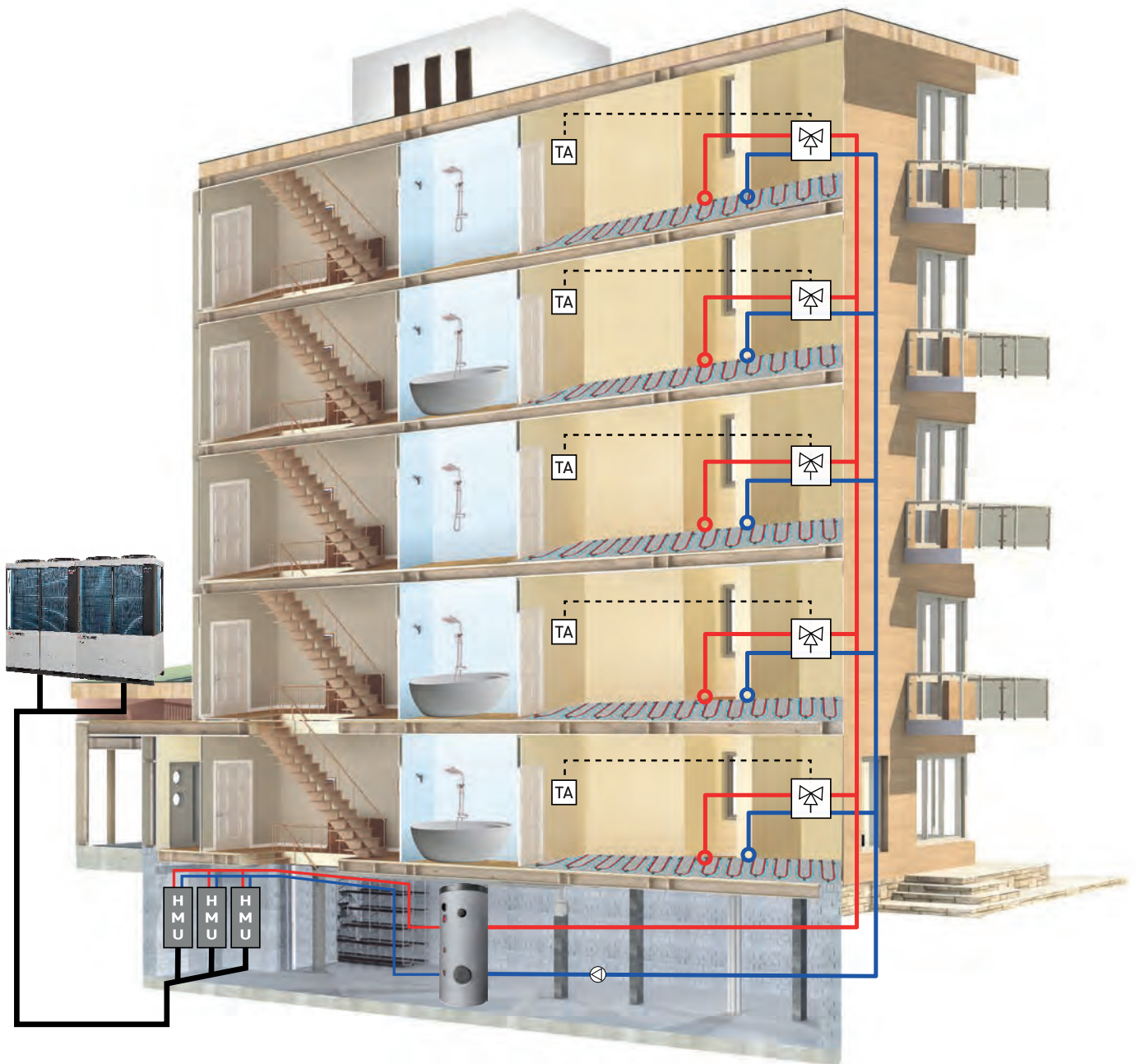
### CONTROL SYSTEM

By means of the RC-EX3H wired control connected to the HMUs, it is possible to switch the system on and off and set operating times.

Based on the outdoor temperature, the climate curve calculates the delivery temperature to the system.

According to the table at the side, the maximum supply temperature used to determine the design conditions varies with the outdoor temperature.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	55°C	20°C
5°C	55°C	20°C
0°C	55°C	25°C
-5°C	49°C	25°C
-10°C	43°C	25°C
-15°C	37°C	32°C
-20°C	32°C	27°C



## DESCRIPTION OF THE SYSTEM

After the outdoor units are connected in combination, the main cooling pipe branches off until it reaches the room designated for the hydromodules (thermal power plant), where it distributes cooling fluid to the various HMUs through Y-shaped derivations. These draw energy from the fluid and transfer it to the water in the heating system.

In the hydromodules, the circulators push water into a storage tank that acts as a hydraulic separator between the primary circuit (which consists of the HMUs), and the secondary circuit, which is used for the distribution to private users.

As each flat is equipped with a consumption allocation box controlled by a room thermostat (TA), users are able to use the heating in accordance with your needs, thus paying only for the actual energy consumed.

The distribution inside the flat takes place with underfloor heating panels.

Example of mixed application

## RESIDENTIAL BUILDING WITH ADJOINING SHOPS

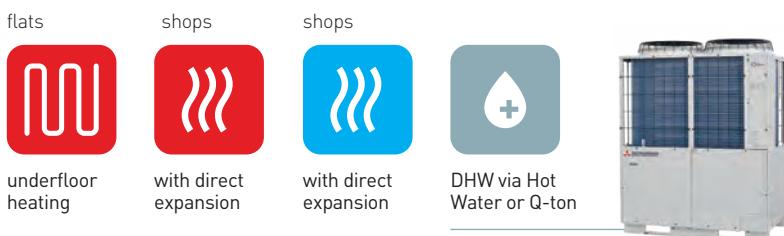
(distribution by floors)

# Heating of flats through HMU units located on the individual floors and air-conditioning of the shops through air-air I.U., connected to a KXZ system

The plant provides **hydronic heating through a distribution system divided by floors**, with an HMU to serve the individual residential units on the same floor.

It is a residential building with shops below, which is usually found in winter tourist areas, where there is no need for summer air conditioning.

The shops are air-conditioned with direct expansion indoor air/air units. DHW is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



### SYSTEM CHARACTERISTICS

28-168 kW

Outdoor unit power range



200% (max)

(for O.U. up to 45 kW)

160% (max)

(for O.U. up to 45 kW)

Total connectable I.U. power (HMU+DX). It is mandatory to connect at least 50% of the total power of DX type I.U.s

40 m

Maximum level difference between O.U. and I.U. (HMU or DX)

18 m

Maximum level difference between I.U. (HMU or DX)

510 m (max)

Split total length

-10°C

Minimum design outdoor temperature

### CONTROL SYSTEM

Through the centralised control SL4, it is possible to manage every single I.U. connected to the system both locally and via the internet.

The local control is also available for each I.U. DX with its own individual control (wired or wireless), with the possibility of weekly programming, while with the RC-EX3H wired control it is possible to turn each individual HMU on and off and set operating times.

Based on the outdoor thermal values, the climate curve calculates the delivery temperature for the system.

According to the table at the side, the maximum supply temperature used to determine the design conditions varies according to the outdoor values.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	40°C	20°C
5°C	40°C	20°C
0°C	40°C	25°C
-5°C	40°C	25°C
-10°C	40°C	25°C





## DESCRIPTION OF THE SYSTEM

The hydromodules are located on the floors, (one or more depending on need) contributing to the reduction of installation costs (no water uprights) and use the circulators inside them to push water directly into the individual flats.

As each flat is equipped with a consumption allocation box controlled by a room thermostat (TA), users are able to use the heating in accordance with your needs, thus paying only for the actual energy consumed. The distribution inside the flat takes place with underfloor heating panels.

The RC-EX3H control connected to the HMUs in flats can be set to disable the air conditioning.

Direct-expansion indoor units are positioned in the retail stores (one or more as needed).

Using a centralised control that permits remote management through the web when a LAN connection is available, management costs are divided by I.U., both air and water.

Example of mixed application

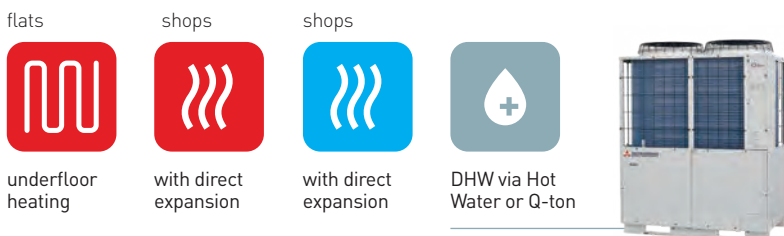
## RESIDENTIAL BUILDING WITH ADJOINING RETAIL STORES (Vertical pipeline distribution)

# Heating of flats through HMU units located in a technical room and air-conditioning of the shops through air-air I.U., connected to a KXZ system

The system provides hydronic heating through a distribution system with vertical pipelines, **with an HMU to serve the individual residential units on the same floor. The HMUs are installed in a room set up at the same level as the retail stores.**

It is a residential building with shops below, which is usually found in winter tourist areas, where there is no need for summer air conditioning. The retail stores are air-conditioned with direct expansion indoor air/air units.

DHW is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



### SYSTEM CHARACTERISTICS

28-168 kW

Outdoor unit power range



200% (max)  
(for O.U. up to 45 kW)

160% (max)  
(for O.U. over 45 kW)

Total connectable I.U. power (HMU+DX). It is mandatory to connect at least 50% of the total power of DX type I.U.s

40 m

Maximum level difference between O.U. and I.U. (HMU or DX).  
When the design temperature is below -10°C, the O.U. should always be placed above the I.U.

0 m

Maximum level difference between I.U. (HMU or DX)

510 m (max)

Split total length

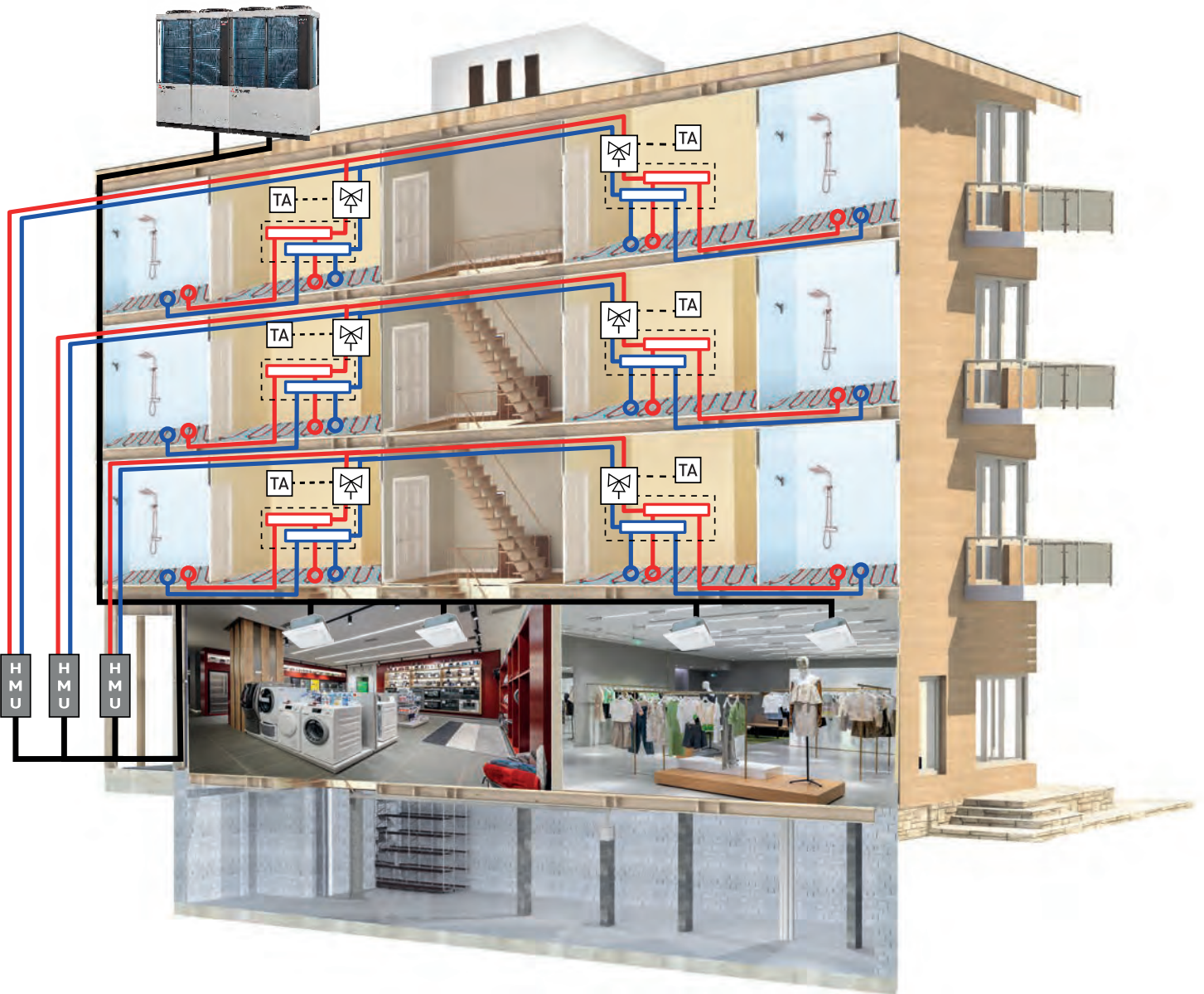
### CONTROL SYSTEM

Through the centralised control SL4, it is possible to manage every single I.U. connected to the system both locally and via the internet.

The local control is also available for each I.U. DX with its own individual control (wired or wireless), with the possibility of weekly programming, while with the RC-EX3H wired control it is possible to turn each individual HMU on and off and set operating times.

Based on the outdoor thermal values, the climate curve calculates the delivery temperature for the system. According to the table at the side, the maximum supply temperature used to determine the design conditions varies according to the outdoor values.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	40°C	20°C
5°C	40°C	20°C
0°C	40°C	25°C
-5°C	40°C	25°C
-10°C	40°C	25°C
-15°C	36°C	31°C
-20°C	32°C	27°C



## DESCRIPTION OF THE SYSTEM

Hydromodules are located on the same level as the retail stores. Each HMU distributes heat to the flats on the floor through an upright column that brings hot water from the central heating plant to that floor

As each flat is equipped with a consumption allocation box controlled by a room thermostat (TA), users are able to use the heating in accordance with your needs, thus paying only for the actual energy consumed.

The distribution inside the flat takes place with underfloor heating panels.

The RC-EX3H control connected to the HMUs in flats can be set to disable the air conditioning.

Direct-expansion indoor units are positioned in the retail stores (one or more as needed).

Using a centralised control that permits remote management through the web when a LAN connection is available, management costs are divided by I.U., both air and water.



## WAREHOUSE WITH OFFICE BUILDING

# Heating of warehouses through HMU units located in a technical room and air-conditioning of the shops through air-air I.U., connected to a KXZ system

Hydronic heating is provided through a radiant floor distribution system for a warehouse adjacent to the company's offices that does not require summer air conditioning.

Offices are cooled by indoor air/air units with direct expansion.

DHW is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



### SYSTEM CHARACTERISTICS

28-168 kW

Outdoor unit power range



200% (max)

(for O.U. up to 45 kW)

160% (max)

(for O.U. over 45 kW)

Total connectable I.U. power (HMU+DX). It is mandatory to connect at least 50% of the total power of DX type I.U.s

40 m

Maximum level difference between O.U. and I.U. (HMU or DX). When the design temperature is below -10°C, the O.U. should always be placed above the I.U.

3 m

Maximum level difference between I.U. (HMU or DX)

510 m (max)

Split total length

### CONTROL SYSTEM

Through the centralised control SL4, it is possible to manage every single I.U. connected to the system both locally and via the internet.

The local control is also available for each I.U. DX with its own individual control (wired or wireless), with the possibility of weekly programming, while with the RC-EX3H wired control it is possible to turn each individual HMU on and off and set operating times.

Based on the outdoor thermal values, the climate curve calculates the delivery temperature for the system. According to the table at the side, the maximum supply temperature used to determine the design conditions varies according to the outdoor values.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	40°C	20°C
5°C	40°C	20°C
0°C	40°C	25°C
-5°C	40°C	25°C
-10°C	40°C	25°C
-15°C	36°C	31°C
-20°C	32°C	27°C





## DESCRIPTION OF THE SYSTEM

Within a prepared room (central heating plant), the required hydromodules are positioned, and the circulators within them are used to push the water into a storage tank. This serves as a hydraulic separator between the primary circuit, containing the HMUs, and the secondary circuit, which consists of radiant panels beneath the floor of the warehouse.

Indoor direct expansion units are positioned in an office building in a quantity and type that is appropriate to the building's requirements.

Remote control via the web is possible with a LAN connection.

## RESIDENTIAL BUILDING - GLOBAL CLIMATE SYSTEM

# Independent heating by means of HMU units located in each flat and air-conditioning by air-air I.U., connected to a KXZ system

In a residential building, the system provides independent heating and cooling for each flat.

Each unit of real estate is heated hydronically through a radiant floor distribution system. Air conditioning is provided by indoor air/air units with direct expansion, which are also located in the same environment.

The preparation of domestic hot water is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



underfloor heating



with direct expansion



DHW via Hot Water or Q-ton



## 28 kW

Minimum installable I.U. power per flat, divided into 14 kW (1 HMU) + 14 kW divided among the various I.U.s DX

### SYSTEM CHARACTERISTICS

## 28-168 kW

Outdoor unit power range



## 200% (max)

(for O.U. up to 45 kW)

## 160% (max)

(for O.U. over 45kW)

Total connectable I.U. power (HMU+DX). It is mandatory to connect at least 50% of the total power of DX type I.U.s

## 40 m

Maximum level difference between O.U. and I.U. (HMU or DX)

## 18 m

Maximum level difference between I.U. (HMU or DX)

## 510 m (max)

Split total length

## -10°C

Minimum design outdoor temperature

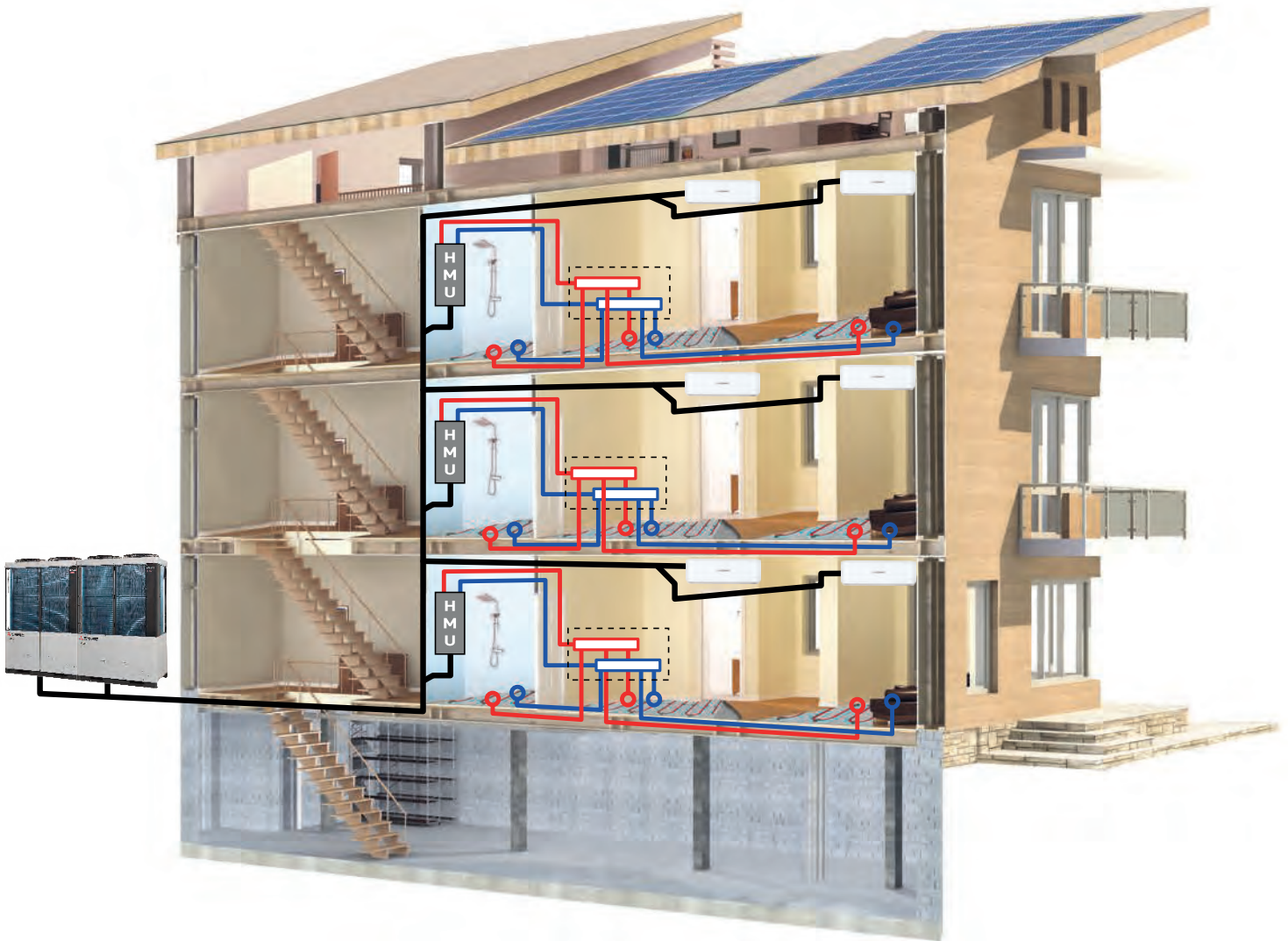
### CONTROL SYSTEM

Through the centralised control SL4, it is possible to distribute the operating costs among the various real estate units.

The local control is available for each I.U. DX with its own individual control (wired or wireless), with the possibility of weekly programming, while with the RC-EX3H wired control it is possible to turn the HMU on and off and set operating times.

Based on the outdoor thermal values, the climate curve calculates the delivery temperature for the system. According to the table at the side, the maximum supply temperature used to determine the design conditions varies according to the outdoor values.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	40°C	20°C
5°C	40°C	20°C
0°C	40°C	25°C
-5°C	40°C	25°C
-10°C	40°C	25°C



## DESCRIPTION OF THE SYSTEM

The hydromodules are located one per flat, and each is equipped with a circulator that pushes water into the floor system.

The direct expansion I.U.s ensure efficient air conditioning and an exceptionally low sound level for a VRF system. This is because the expansion valves - that normally cause noise - are remotely controlled, soundproofed and isolated inside or outside the flat.

Powered continuously by a backup card, the user can disconnect the power to their flat without affecting the operation of the entire system.

Each flat is autonomous in terms of determining operating costs, since the distribution is made for I.U. (both air and water) by means of a centralised control installed in the production room of the DHW.

## SHOPPING CENTRE RETAIL STORES

# Independent heating via HMU units located inside the store and air-conditioning by air-air I.U., connected to a KXZ system

Located on the same floor of a shopping centre, the system provides independent heating and cooling for retail stores.

Hydronic heating is provided through a floor heating distribution system for each individual store. Air conditioning is provided by indoor air/air units with direct expansion located in each individual environment.

The preparation of domestic hot water is produced centrally and assigned to specific products such as Hot Water or Q-ton according to volume requirements.



underfloor heating



with direct expansion



DHW via Hot Water or Q-ton



## 28 kW

Minimum installable I.U. power per flat, divided into 14 kW (1 HMU) + 14 kW divided among the various I.U.s DX

### SYSTEM CHARACTERISTICS

## 28-168 kW

Outdoor unit power range



## 200% (max)

(for O.U. up to 45 kW)

## 160% (max)

(for O.U. over 45 kW)

Total connectable I.U. power (HMU+DX). It is mandatory to connect at least 50% of the total power of DX type I.U.s

## 40 m

Maximum level difference between O.U. and I.U. (HMU or DX). When the design temperature is below -10°C, the O.U. should always be placed above the I.U.

## 0 m

Maximum level difference between I.U. (HMU or DX)

## 510 m (max)

Split total length

### CONTROL SYSTEM

Through the centralised control SL4, it is possible to distribute operating costs among the various users.

The local control is available for the I.U.s DX with its own individual control (wired or wireless), with the possibility of weekly programming, while with the RC-EX3H wired control it is possible to turn the HMU on and off and set operating times.

Based on the outdoor thermal values, the climate curve calculates the delivery temperature for the system. According to the table at the side, the maximum supply temperature used to determine the design conditions varies according to the outdoor values.

Outdoor design temperature	Maximum design temperature for delivery	Minimum return temperature
10°C	40°C	20°C
5°C	40°C	20°C
0°C	40°C	25°C
-5°C	40°C	25°C
-10°C	40°C	25°C
-15°C	36°C	31°C
-20°C	32°C	27°C





## DESCRIPTION OF THE SYSTEM

Several hydromodules are located within the store (one or more as required), each of which uses a circulator inside to push water directly into the floor system.

The I.U. With direct expansion ensure excellent air conditioning thanks to an effective dehumidification of the environments, typical of the system. A backup card continuously feeds the expansion valves, enabling the conductor to cut off the power to the shop without affecting the system as a whole.

Each shop is autonomous in terms of determining operating costs, since the distribution is made for I.U. (both air and water) by means of a centralised control installed in the production room of the DHW.