SOLUTIONS FOR DHW & HEATING

AIR-TO-WATER HEAT PUMPS

MITSUBISHI HEAVY INDUSTRIES

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MITSUBISHI
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LOW ENVIRONMENTAL IMPACT GWP & REFRIGERANTS

Talking about low environmental impact means valorising refrigerant gases on the basis of their GWP. The GWP value indicates the potential to affect global warming and the accumulation of carbon dioxide.

It is essential to reduce the emission of greenhouse gases: the higher the GWP value of the refrigerant gases entering the atmosphere, the more rapidly and drastically the average temperatures of the globe increase and the climate changes. Appliances with GWP = 1 refrigerants are MHI's technological arrival point in low-temperature heating.

GWP 1

R744 REFRIGERANT

R744 gas (CO2) has a GWP of 1 and is a natural substance that can be used as a fluid in different heating applications thanks to its high heat exchange properties.

It has particular environmentally friendly characteristics, such as non-flammability and non-harmfulness for the ozone layer.

Using CO2 as a refrigerant significantly reduces the amount of greenhouse gas emissions in the atmosphere, which are the origin of climate change.

ADVANTAGES OF R744 GAS

- it is ecological;
- **it is not flammable**;
- it is not toxic;
- it is not harmful and does not present risks for ozone;
- it is very efficient;
- it has no limitations of use worldwide.

GWP 675

R32 REFRIGERANT

The specific name of R32 gas is difluoromethane. It is currently present among the fluorinated gases with a low GWP value, which can be used in air conditioners with multiple uses.

The most significant aspect of R32 gas is its GWP value, equal to 675, which allows the creation of systems containing up to 7.4 kg of gas without exceeding the threshold which requires leak control, equipment register keeping , and annual declaration to ISPRA, a threshold which for an R410A gas is already exceeded by 2.4 kg of gas.

ADVANTAGES OF R32 GAS

- it is ecological;
- it is not toxic;
- it is slightly flammable;
- it is not harmful and does not present risks for ozone;
- it is very efficient.

GWP 2088

R410A REFRIGERANT

R410A gas is a refrigerant fluid which is mainly used for air conditioners and which is made up of a mixture of two fluorinated hydrocarbons: R32 and R125 in equal parts. Not containing chlorine atoms, this gas cannot damage the earth's ozone layer and therefore has a reduced impact on our planet's environment (ODP=0).

L'R410A rappresenta, quindi, un gas refrigerante che garantisce ottime prestazioni ed elevata efficienza, ma allo stesso tempo un basso impatto ambientale.

ADVANTAGES OF R410A GAS

- it is ecological;
- **it is not flammable**;
- it is not harmful and does not present risks for ozone;
- it is very efficient.

MHI AIR-TO-WATER HEAT PUMPS CLASS A QUALITY

MHI CONTRIBUTES TO THE DECARBONIZATION OF THE PLANET

The enormous success and widespread diffusion of high-efficiency heat pumps is revolutionizing and improving energy consumption. Awareness of the need to reduce emissions has encouraged the development of products with increasingly cutting-edge technology.

MHI heat pumps exploit air as a fundamental source of clean energy, thus allowing you to heat your home and produce domestic hot water without installing gas boilers. They are developed for professionals who want to create systems using renewable energy, with great comfort and reduced management costs. L'esteso range di potenza permette la massima flessibilità di applicazione in contesti sia residenziali che commerciali e industriali.

LEGAL DECREE ON RENEWABLE ENERGY FOR NEW BUILDINGS

On the basis of the Renewable Energies Decree (Legislative Decree 28/2011) and subsequent extensions, the projects of new buildings and the projects of significant renovations of existing buildings for which the request for the building permit is presented one hundred and eighty days after the date of entry into force (13 June 2022, decree transposing the REDII directive), **involve the use of renewable sources to cover heat, electricity and cooling consumption according to the minimum integrations principles.**

MHI heat pumps use renewable energy and allow us to achieve these objectives.

CLASS A SYSTEMS

- Since 2015, heating and DHW production systems must display a label that clearly indicates the energy efficiency class; the objective of the European Directive is to eliminate inefficient products from the market.
- MHI heat pumps are innovative systems that exploit renewable aerothermal energy for significant energy and consumption savings. They have an efficiency up to **class A+++ in heating** and **class A for DHW production**.

MITSUBISHI HEAVY INDUSTRIES

AIR-TO-WATER HEAT PUMPS FOR **HEATING**, **COOLING** AND **ACS PRODUCTION**

HYDROLUTION ALL IN ONE

HYDROLUTION HYDROBOX (OPTIONAL DHW)

60°C
Delivery temperature without additions up to 60° C

65°C
Temperature with electric integration elettrica

-20°C
Maximum efficiency down to -20° C outdoor

5.16
Energy efficiency with COP up to 5.16

GWP 675 GWP 2088

HYDROLUTION MONOBLOC FLEXIBLE

60°C
Delivery temperature up to 60°C guaranteed down to -25°C outdoor

128 kW
Maximum power in modular systems

GWP 675

AIR-TO-WATER HEAT PUMPS FOR **HEATING**

KXZ2 HEATING HYDROMODULE

55°C
Water only delivery water temperature

-20°C
Excellent performance down to -20°C outside

A++
Energy efficiency class

4.20
Energy efficiency with COP up to 4.20

GWP 2088

AIR-TO-WATER HEAT PUMPS FOR **DHW PRODUCTION**

R744
LOWEST GWP REFRIGERANT

Q-TON FOR HGH TEMPERATURE DHW

90°C
DHW temperature without mixing

-25°C
Outdoor air minimum operating limit

-7°C
100% of nominal power output down to -7°C

4,30
Energy efficiency with nominal COP 4.30

R744
GWP=1

GWP 1

MITSUBISHI HEAVY INDUSTRIES

HYDROLUTION ALL IN ONE

HEATING, COOLING & DHW IN A SINGLE SOLUTION

The All in One combination provides the complete solution for all your heating, cooling and DHW needs.

All in One includes an outdoor unit and an HMA system, having an integrated DHW tank, an electric resistance and a circulation pump.

GWP 675 **R32** 6 & 8 kW models

GWP 2088 **R410A** 10 kW model

All in One outdoor units

6 kW

8 kW

10 kW

Indoor units

HMA 60-W for 6 kW O.U.

HMA 100-W for 8 & 10 kW O.U.

FUNCTIONALITY	APPLICATIONS	ADVANTAGES FOR PROFESSIONALS	ADVANTAGES FOR CUSTOMERS
• floor heating • heating via high efficiency radiators • DHW & heating • cooling • fancoil heating	• independent homes	• can also be installed in small spaces • installation flexibility • low environmental impact • can be integrated with traditional heating systems	• heating, DHW and cooling in a single system • easy to use • quiet operation • high performance • long-term reliability • low management costs

HYDROLUTION HYDROBOX

HEATING & COOLING WITH OPTIONAL DHW

The Hydrobox combination offers space heating and cooling with the option of adding domestic hot water production.

HYDROLUTION Hydrobox is composed of an external unit and a hydromodule (HMS), having an electrical resistance and a circulation pump inside.

GWP 675 **R32** 6 & 8 kW models

GWP 2088 **R410A** 10 & 16 kW models

Hydrobox outdoor units

6 kW

8 kW

10 kW

16 kW

Indoor units

Hydromodule for units up to 16 kW

Tanks

Accumulation volume 300 lt

Accumulation volume 500 lt

FUNCTIONALITY	APPLICATIONS	ADVANTAGES FOR PROFESSIONALS	ADVANTAGES FOR CUSTO,MERS
• floor heating • heating via high efficiency radiators • DHW & heating • cooling • fancoil heating	• independent homes • micro condominiums • offices • small shops	• integrates with traditional heating systems • installation flexibility • low environmental impact • can also be installed in small spaces	• high performance • long-term reliability • low management costs • quiet operation • easy to use

MITSUBISHI HEAVY INDUSTRIES

HYDROLUTION MONOBLOC FLEXIBLE

HEATING & COOLING WITH OPTIONAL DHW

The Monobloc Flexible combination offers space heating and cooling with the option of adding domestic hot water production.

HYDROLUTION Monobloc Flexible is composed of the outdoor unit only (FDCM). By combining the accessories, the installation is even more complete and adapts to every air conditioning need.

GWP 675

R32

10 &16 kW models

EZY

FUNCTIONALITY	APPLICATIONS	ADVANTAGES FOR PROFESSIONALS	ADVANTAGES FOR CUSTO,MERS
• floor heating • heating via high efficiency radiators • DHW & heating • cooling • fancoil heating	• independent homes • condominiums • hotels • offices	• installation flexibility • low environmental impact • modular solution up to 128 kW • safety measures not needed because the gas is confined to the outdoor unit	• high performance • long-term reliability • quiet operation • low management costs

KXZ2 HEATING

THE MHI HYDROMODULE COMBINES PRACTICAL APPLICATION AND EXCELLENT PERFORMANCE

Combining underfloor heating with KXZ systems brings maximum benefits for the customer in terms of efficiency and comfort.

GWP 2088

Hydromodule

HMU140~280 KXZE1

KXZ2 outdoor units

FDC 280~1680 KXZE2

FUNCTIONALITY	APPLICATIONS	ADVANTAGES FOR PROFESSIONALS	ADVANTAGES FOR CUSTO,MERS
• floor heating	• condominium • office building • residential building • shopping center	• integrates with air conditioning systems • installation flexibility • low environmental impact	• heating • in case of use of Hot Water or Q-ton for DHW, possibility of completely eliminating methane

Q-TON DHW

DHW PRODUCTION AT HIGH TEMPERATURE

Q-ton is a heat pump system with natural refrigerant R744 (CO2) for the production of high temperature domestic hot water.
This system can be used in residential, commercial, tourism and industrial applications.

Q-ton can produce domestic hot water up to 90° C in the presence of external temperatures down to -25° C.

It can produce mixed DHW at 45°C up to 17.000 litres/day, or at 90°C without mixing. Maintains nominal power output down to -7° C.

Q-ton boasts performance values among the best on the market, obtained thanks to the use of the two-stage compressor produced and patented by Mitsubishi Heavy Industries.

GWP 1

R744

ESA30EH2-25

FUNCTIONALITY	APPLICATIONS	ADVANTAGES FOR PROFESSIONALS	ADVANTAGES FOR CUSTO,MERS
• DHW	• large condominiums • spa facilities • large hotels • industrial processes • gyms	• operation even at very low outdoor temperatures • installation flexibility • low environmental impact	• high performance • long-term reliability • low management costs • single centralized system for DHW

HYDROLUTION

HYDROLUTION FOR HEATING & DHW PRODUCTION

HYDROLUTION is a complete system for heating, cooling and domestic hot water.
A highly energy efficient system that reduces consumption and emissions.

HIGH PERFORMANCE

- Delivery temperature up to 60° C, top of the category. Even with external temperatures between -20° and 43° C.
- Water up to 65° C with electrical integration.

60°C
Delivery temperature without integrations up to 60° C

65°C
Temperature with electrical integration

RESPONSIBLE FOR THE ENVIRONMENT

- Ecological, as it guarantees low environmental impact and silent operation.
- It takes advantage of the Thermal Account on all capacities.

R32
For all capacities

R410A
For 10 & 16 kW capacities

TOP EFFICIENCY

- COP between 4.20 and 5.16 in heating.
- The compressor is designed to be efficient down to -20° C, it is suitable for the harshest climates.

-20°C
Maximum efficiency down to -20° C

5,16
Maximum COP in heating

FLEXIBILITY AND RELIABILITY

- Modular, efficient and with low management costs.
- It boasts wide installation flexibility and application versatility (from large condominiums to single apartments).
- Can also be installed in small spaces thanks to the Hydrobox configuration.
- Possibility of integrating with traditional heating systems and renewable sources.
- Compact size.

ADVANTAGES

- It guarantees the sanitation of the water thanks to periodic anti-legionella cycles.
- Silent mode that reduces the sound emission level to 35 dB(A) at 5 meters.
- Remote control and management of the Hydrolution system via MODBUS.
- The refrigerant circuit is contained internally in the outdoor unit. There will therefore be no refrigeration pipes (HYDROLUTION Monobloc Flexible).

35dB
Sound level at 5 meters

Remote control via MODBUS

HYDROLUTION

APPLICATION EXAMPLES

All in one

Hydrobox

Monobloc Flexible

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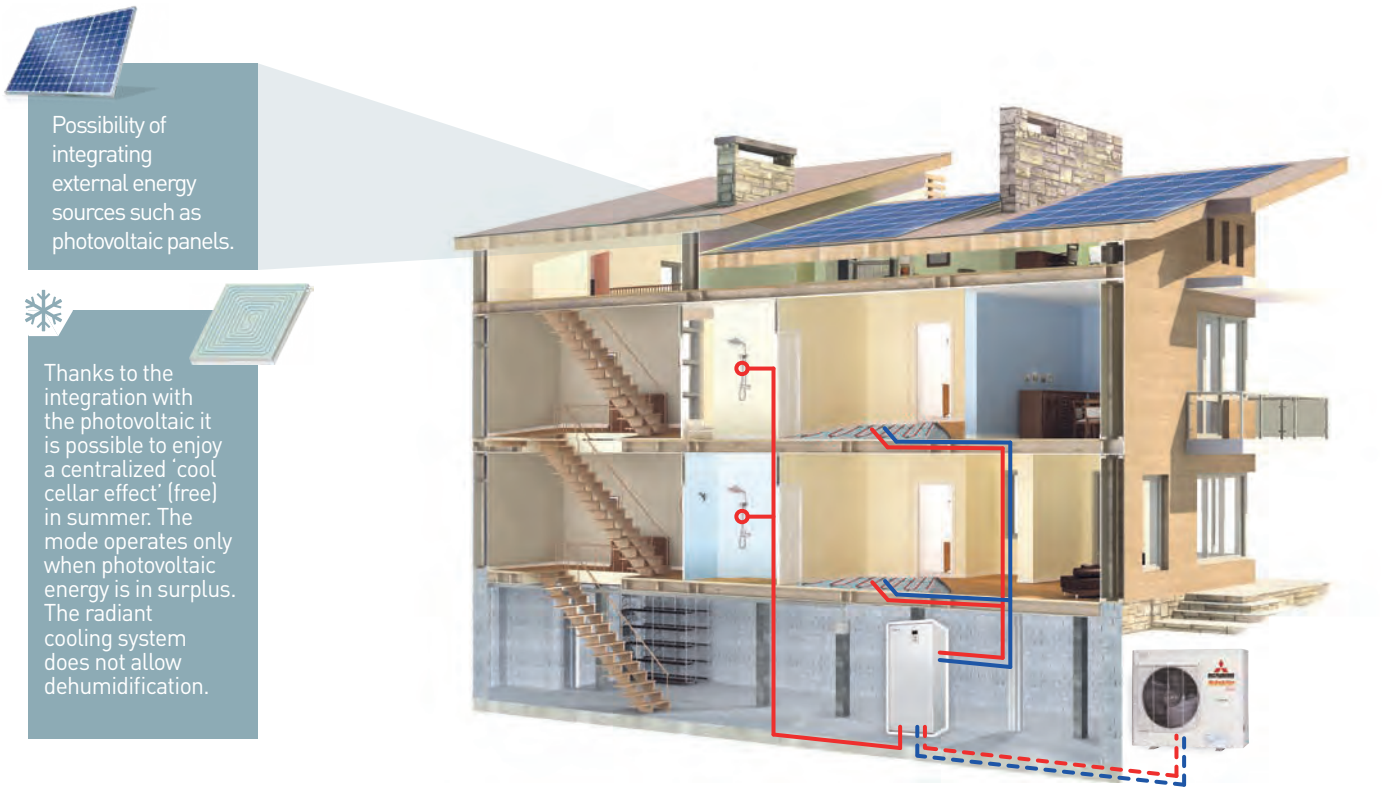
INDEPENDENT HEATING & DHW
VIA HYDROLUTION ALL IN ONE



floor heating

DHW combined with heating

cool effect in summer

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the figure above describes the system in an independent home in which the heating consists of the HYDROLUTION system in All in One configuration with domestic hot water production combined with heating: the DHW tank has a capacity equal to 180 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C, in this example it is combined with low temperature radiant panels, which can also be used in summer to produce a 'cool cellar effect'.

This solution can always be combined with autonomous split systems. Possibility of connecting the RMU40M remote control with built-in room sensor.

CONTROL SYSTEM

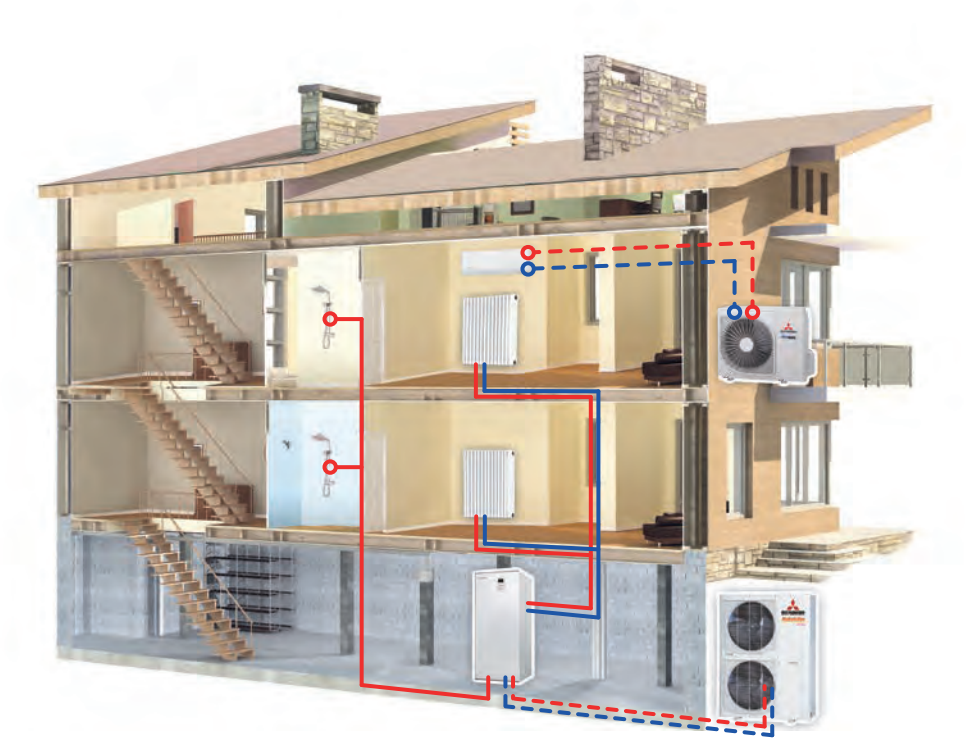
Through the control panel it is possible to program the operation of HYDROLUTION in heating/Silent/DHW mode.

Specifically, the control allows you:

- to create 3 daily heating operation programs;
- to create 2 time schedules for operation in 'Silent' mode;
- to attenuate the heating and suspend the production of DHW, via the 'Holidays' setting;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to set the 'Temporary luxury' function;
- to manage the integration of external energy sources.

Calculation according to UNI TS 11300-2

AUTONOMOUS HEATING AND DHW VIA HYDROLUTION ALL IN ONE AND **AUTONOMOUS COOLING** WITH MONOSPLIT/MULTISPLIT SYSTEMS



heating with high efficiency radiators

DHW combined with heating

autonomous cooling

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes the system in an independent home in which the heating consists of the HYDROLUTION system in All in One configuration with production of domestic hot water combined with heating: the DHW tank has a capacity equal to 180 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with medium temperature heating elements (high efficiency radiators).

The cooling system consists of a heat pump system (monosplit/multisplit systems), with an external unit on the balcony.

Possibility of connecting the RMU40M remote control with built-in room sensor.

CONTROL SYSTEM

Through the control panel it is possible to program the operation of HYDROLUTION in heating/Silent/DHW mode.

Specifically, the control allows you:

- to create 3 daily heating operation programs;
- to create 2 time schedules for operation in 'Silent' mode;
- to attenuate the heating and suspend the production of DHW, via the 'Holidays' setting;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to set the 'Temporary luxury' function;
- to manage the integration of external energy sources.

Calculation according to UNI TS 11300-2

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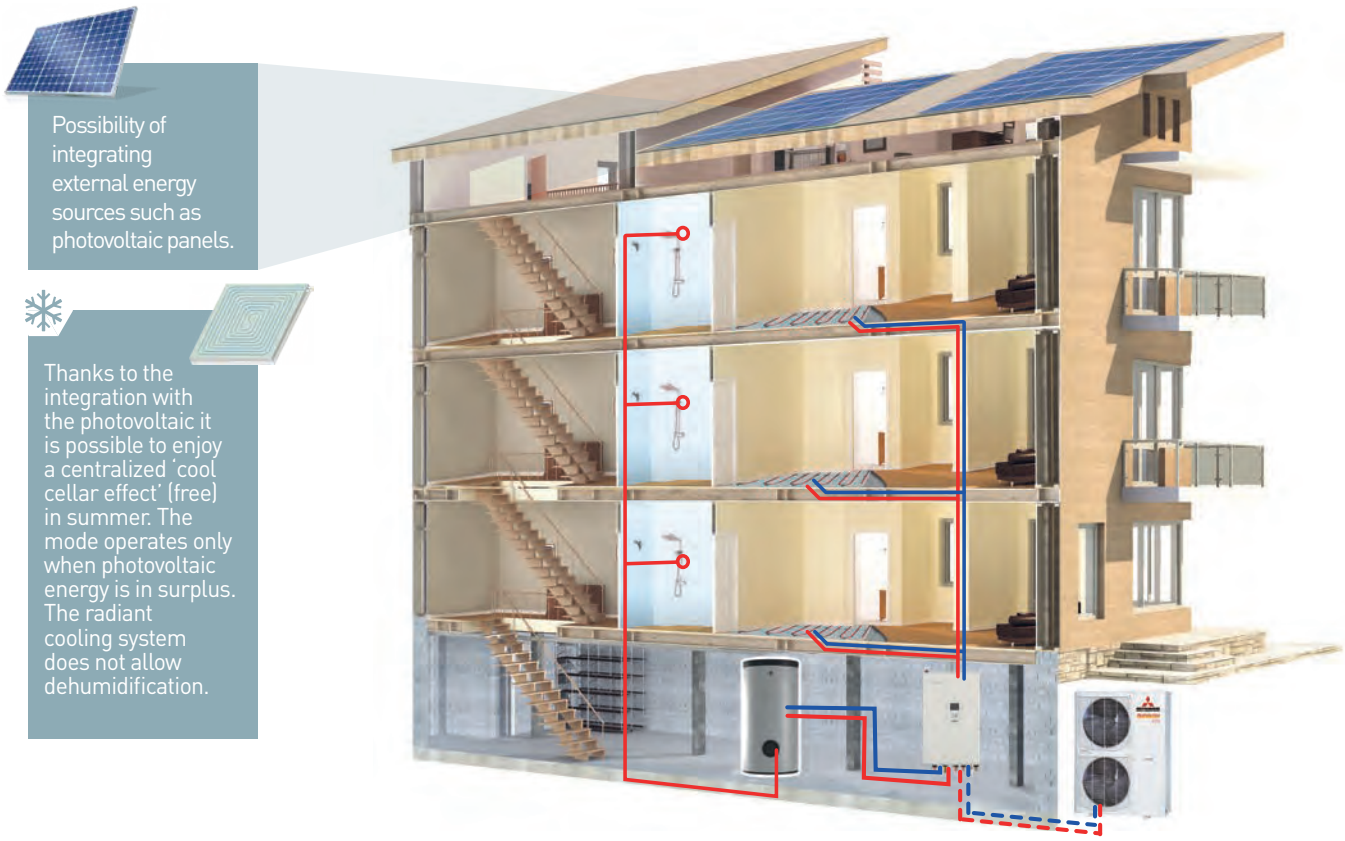
CENTRALIZED HEATING AND DHW, WITH COOLING EFFECT, VIA HYDROLUTION HYDROBOX



floor heating

DHW combined with heating

centralized cool effect

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the figure above describes a system inside a micro-condominium in which the heating consists of the HYDROLUTION system in Hydrobox heating and DHW configuration, with production of domestic hot water combined with the heating: the Applicable DHW has a capacity ranging from 300 to 500 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C.

In this example it is combined with low temperature radiant panels, which can also be used in summer to produce a 'cool cellar effect'. This centralized solution can always be combined with autonomous split systems.

CONTROL SYSTEM

RC-HY40-W is the control system integrated into HYDROLUTION Hydrobox heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources.

RC-HY40-W control unit

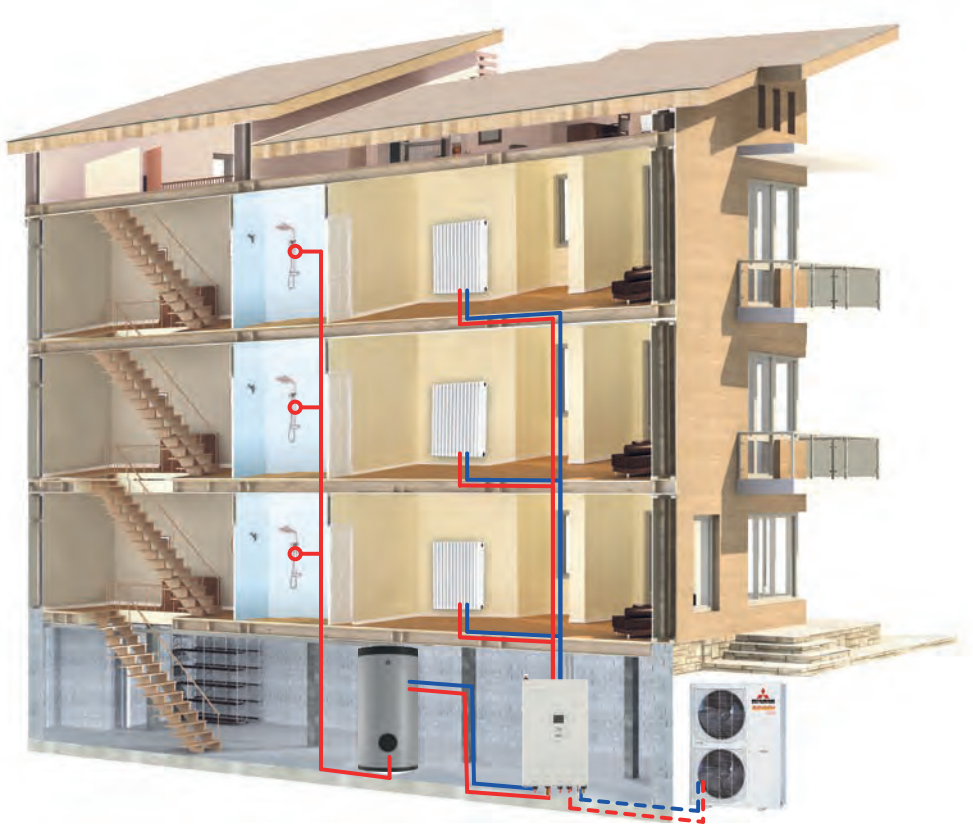
Calculation according to UNI TS 11300-2

CENTRALIZED HEATING AND DHW, VIA HYDROLUTION HYDROBOX

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Hydrobox heating and DHW configuration, with production of domestic hot water combined with the heating: the Applicable DHW has a capacity ranging from 300 to 500 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with medium temperature heating elements (high efficiency radiators).



heating with high efficiency radiators

DHW combined with heating

CONTROL SYSTEM

RC-HY40-W is the control system integrated into HYDROLUTION Hydrobox heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources.

RC-HY40-W control unit

Calculation according to UNI TS 11300-2

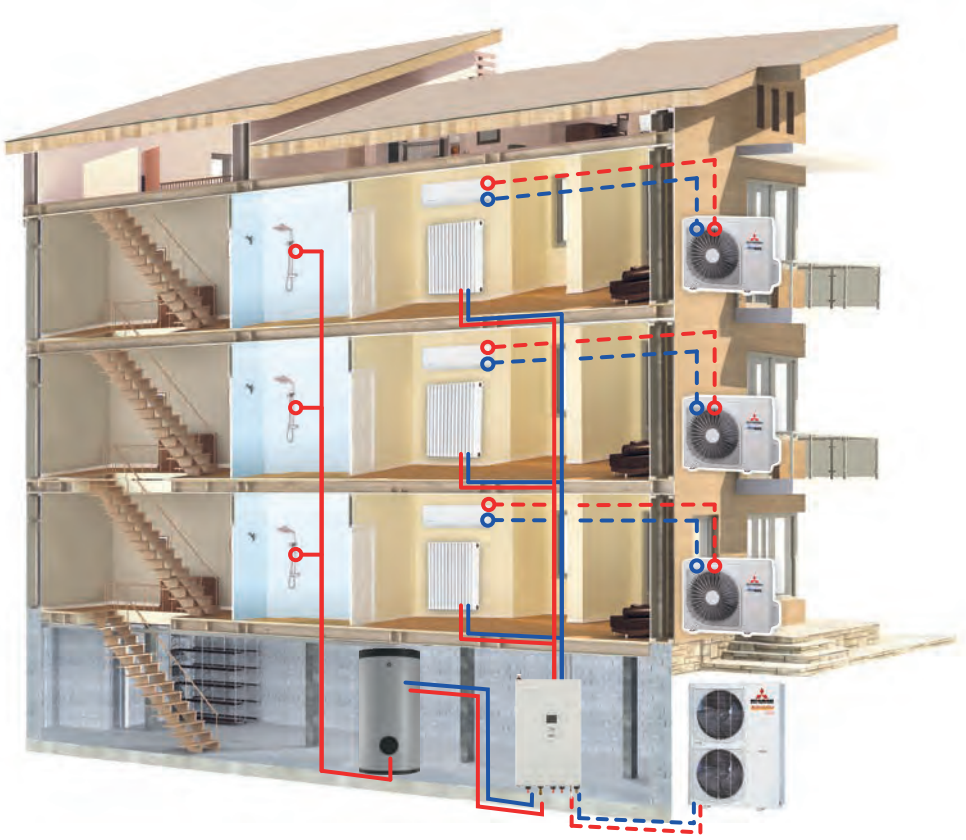
MITSUBISHI HEAVY INDUSTRIES

CENTRALIZED HEATING & DHW, VIA HYDROLUTION HYDROBOX, INDEPENDENT COOLING WITH MONOSPLIT/MULTISPLIT SYSTEMS

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Hydrobox heating and DHW configuration, with production of domestic hot water combined with the heating: the Applicable DHW has a capacity ranging from 300 to 500 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with medium temperature heating elements (high efficiency radiators).

The independent cooling system consists of a heat pump system (monosplit/multisplit systems) serving each apartment, with an external unit on the balcony.



high efficiency radiators

DHW combined with heating

autonomous cooling

CONTROL SYSTEM

RC-HY40-W is the control system integrated into HYDROLUTION Hydrobox heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- manage the integration of external energy sources.

RC-HY40-W control unit

! This type of system is particularly suitable for major renovations with insulation, where results in terms of energy saving and summer comfort are desired without intervening with drastic and expensive system revisions.

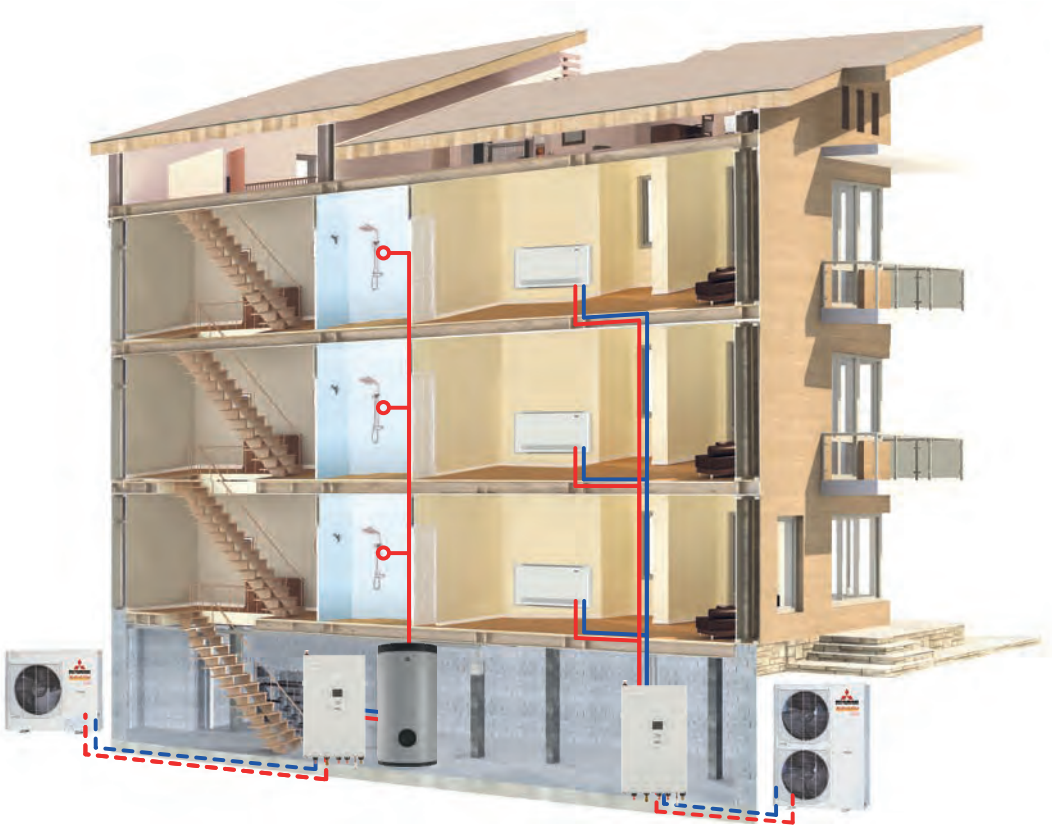
Calculation according to UNI TS 11300-2

CENTRALIZED HEATING, COOLING & DHW, VIA HYDROLUTION HYDROBOX

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a newly built micro-condominium, in which the heating consists of the HYDROLUTION system in Hydrobox heating configuration. The production of DHW is entrusted to HYDROLUTION in the Hydrobox DHW configuration: the applicable DHW tank has a capacity ranging from 300 to 500 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with warm coils.

In this configuration, the HYDROLUTION system, during the summer season, is able to effectively cool the environments.



heating with warmcoil

ACS with dedicated Hydrolution

cooling with warmcoil

CONTROL SYSTEM

RC-HY40-W is the control system integrated into HYDROLUTION Hydrobox heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources.

RC-HY40-W control unit

WHAT IS WARMCOIL?

This is a particular fan coil with a radiant effect that works with very low air movement in winter and allows effective air conditioning in summer.

Calculation according to UNI TS 11300-2

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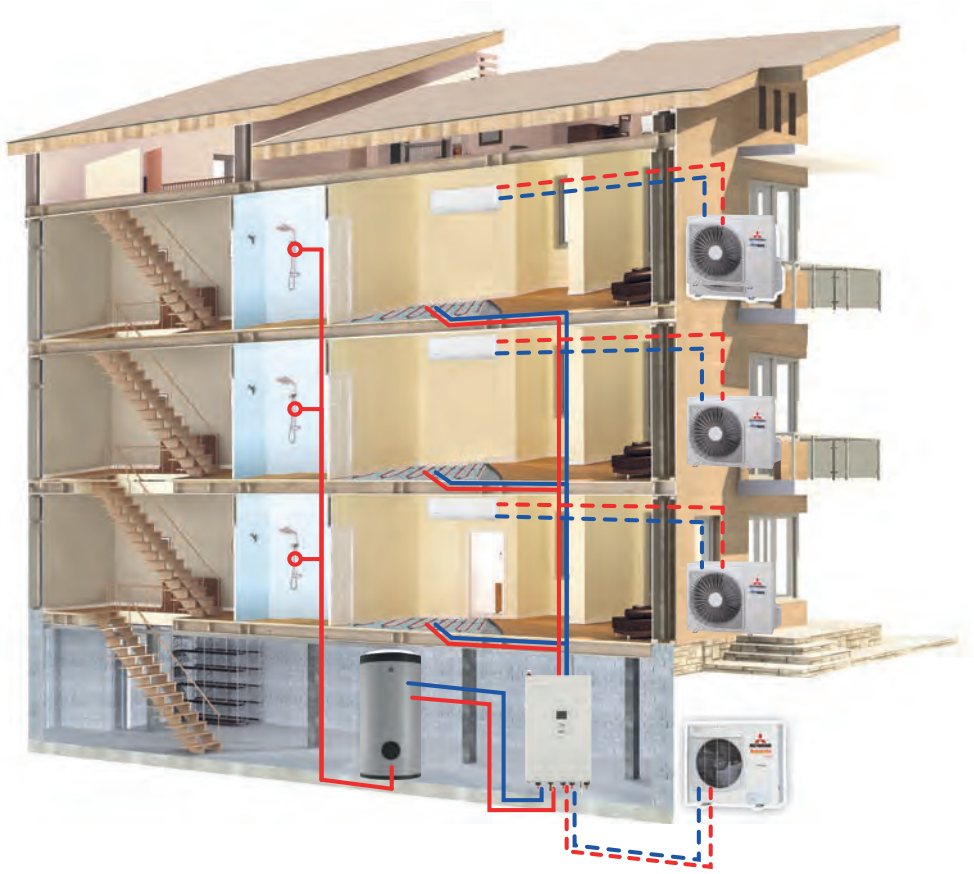
CENTRALIZED HEATING & DHW, VIA HYDROLUTION HYDROBOX AND INDEPENDENT COOLING WITH MONOSPLIT/ MULTISPLIT SYSTEMS

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Hydrobox heating and DHW configuration, with production of domestic hot water combined with the heating: the Applicable DHW has a capacity ranging from 300 to 500 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with low temperature heating elements (radiant panels).

The independent cooling system consists of a heat pump system (monosplit/multisplit systems) serving each apartment, with an external unit on the balcony.



floor heating

DHW combined with heating

autonomous cooling

CONTROL SYSTEM

RC-HY40-W is the control system integrated into HYDROLUTION Hydrobox heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources.

RC-HY40-W control unit

Calculation according to UNI TS 11300-2

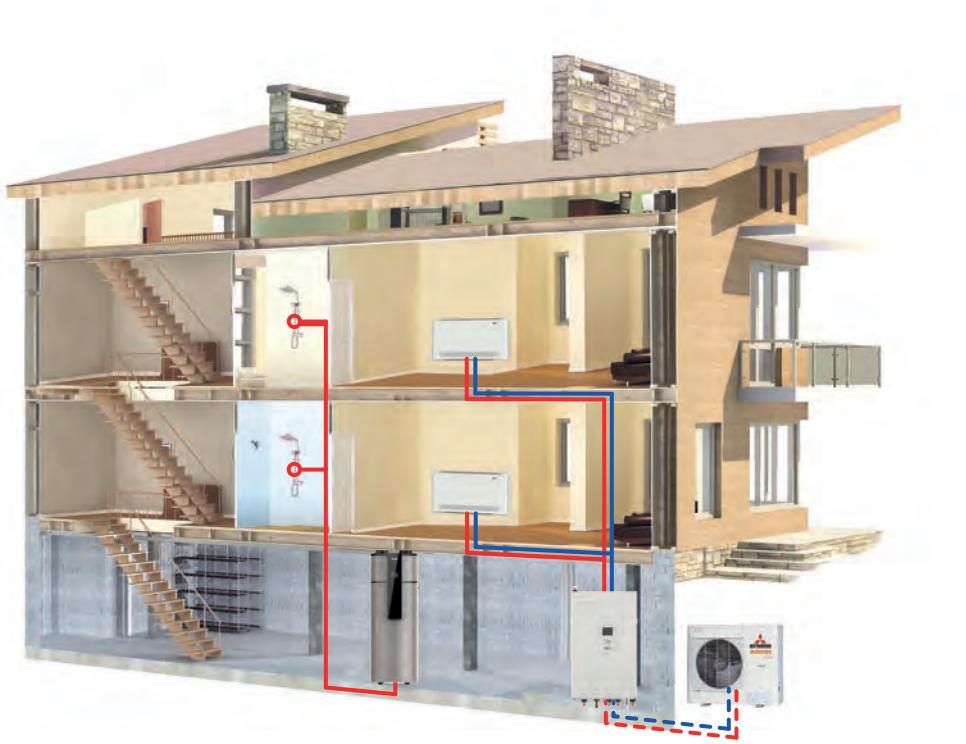
INDEPENDENT HEATING & COOLING, VIA HYDROLUTION HYDROBOX AND **ACS** VIA HOT WATER

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes the system in a newly built independent house, in which the heating consists of the HYDROLUTION system in Hydrobox heating configuration. The production of domestic hot water is entrusted to the Hot Water system: the DHW tank has a capacity of over 200 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with warm coils.

In this configuration, the HYDROLUTION system, during the summer season, is able to effectively cool the environments.

Possibility of connecting the RMU40M remote control with built-in room sensor.



heating with warmcoil

DHW with Hot Water

cooling with warmcoil

CONTROL SYSTEM

Within this type of system, **RC-HY40-W** is the control system integrated into the HYDROLUTION Hydrobox. Through the control panel it is possible to program the operation of HYDROLUTION in cooling/heating/Silent/ DHW mode. Specifically, the control allows you:

- to create 3 daily heating operation programs;
- to create 2 time schedules for cooling operation;
- to create 2 time schedules for operation in 'Silent' mode;
- to manage the integration of external energy sources.

RC-HY40-W control unit

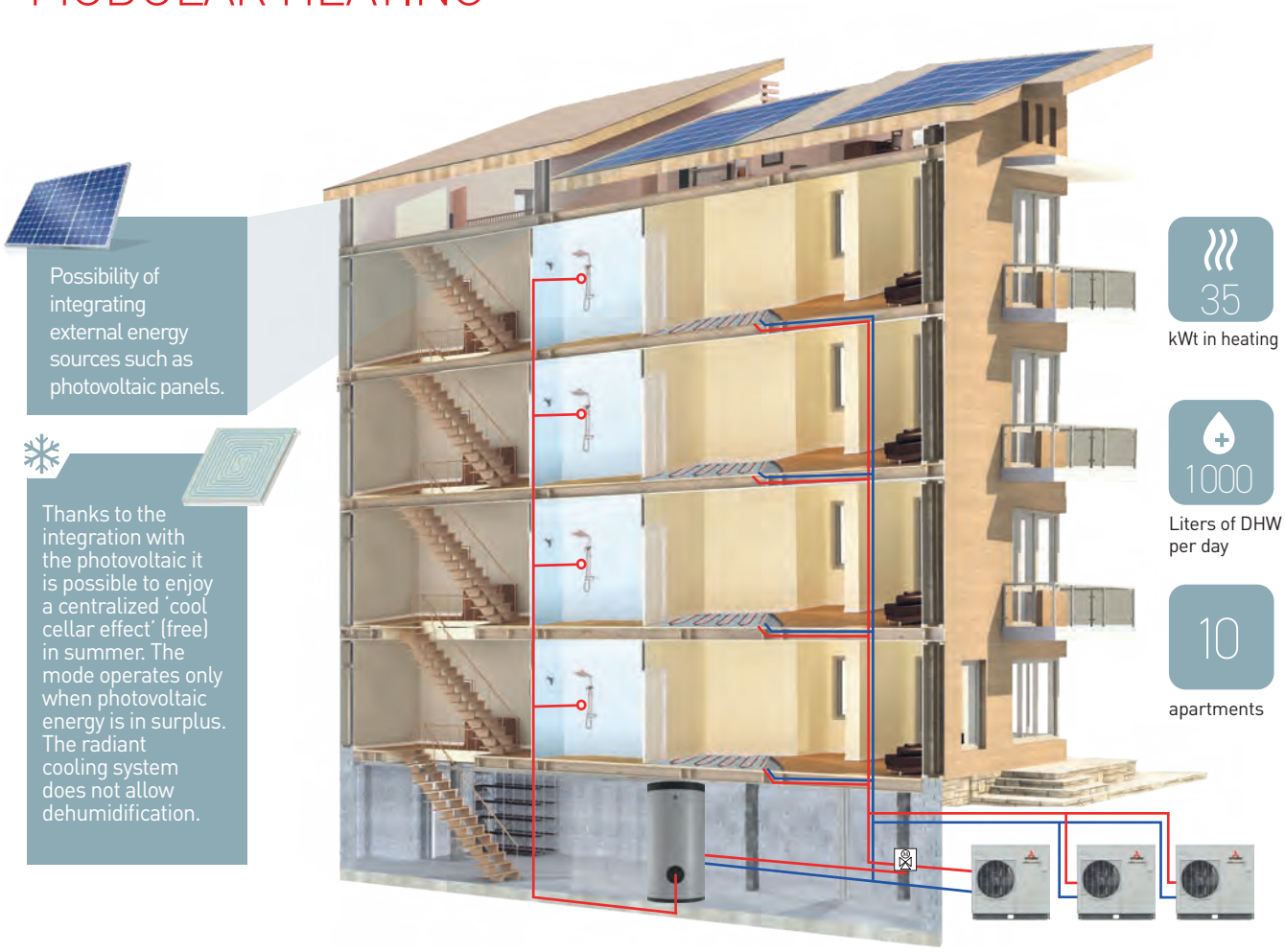
COS'È IL WARMCOIL?

This is a particular fan coil with a radiant effect that works with very low air movement in winter and allows effective air conditioning in summer.

Calculation according to UNI TS 11300-2

MITSUBISHI HEAVY INDUSTRIES

CENTRALIZED HEATING & DHW, WITH COOLING EFFECT, VIA HYDROLUTION MONOBLOC FLEXIBLE MODULAR HEATING



floor heating

DHW combined with heating

centralized cool effect

DESCRIPTION OF THE SYSTEM

HYDROLUTION in Monobloc Flexible modular combination up to 128 kW allows you to reach the building's heating energy needs and produce DHW at the same time.

Assuming you have a newly built condominium consisting of 10 apartments (70 m2 each), the estimated heating requirement is approximately 35 kWt.

This request is satisfied by means of 2 HYDROLUTIONs of 10 kW and one HYDROLUTION of 14 kW in combination which power a radiant floor system and produce the daily DHW requirement of the condominium which is around 1000 litres.

CONTROL SYSTEM

To maximize the potential of HYDROLUTION Monobloc Flexible modular heating, **RC-HY40-W** was designed, a **single** control that allows you:

- to manage up to 8 systems in heating and DHW configuration;
- to manage up to 8 distribution systems at different temperatures (e.g. radiant panels and radiators) via the ECSM40/ECSM41 accessory kit;
- to guarantee efficiency in regulation, durability of the system and continuity of service;
- to account for and allocate energy consumption by connecting an energy meter kit to the RC-HY40-W control.

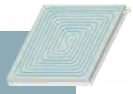
RC-HY40-W control unit

ECSM40/ ECSM41 kit

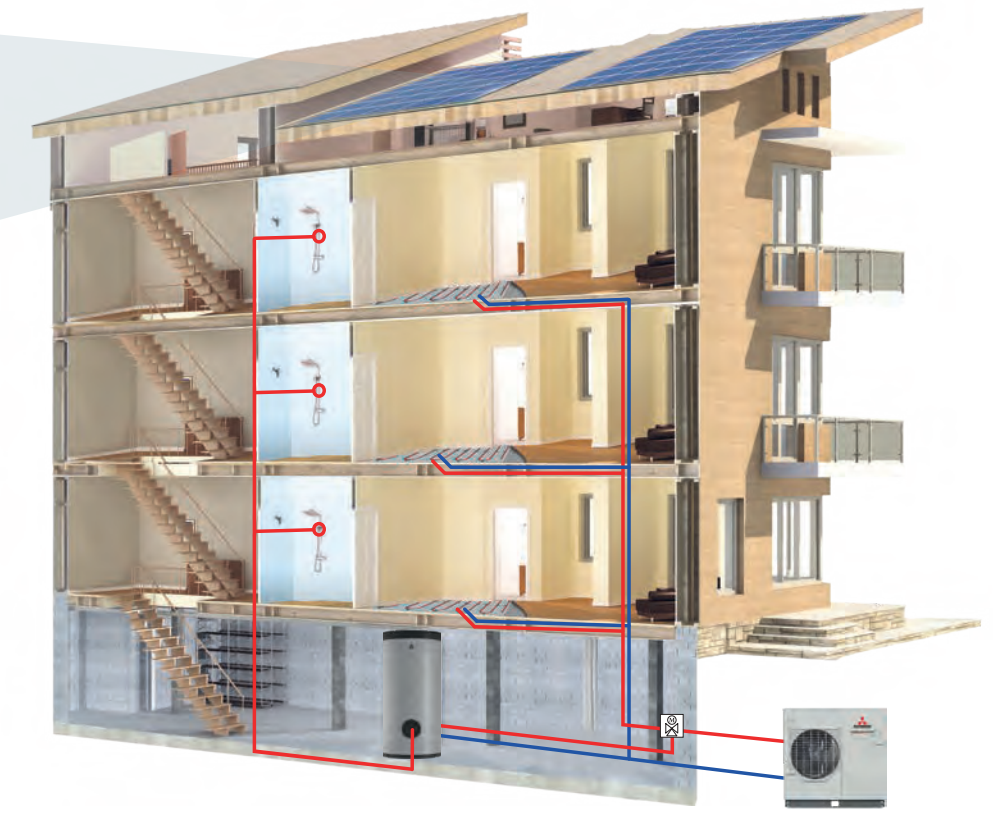
Calculation according to UNI TS 11300-2

CENTRALIZED HEATING & DHW, WITH FRESH EFFECT, THROUGH HYDROLUTION MONOBLOC FLEXIBLE

Possibility of integrating external energy sources such as photovoltaic panels.



Thanks to the integration with the photovoltaic it is possible to enjoy a centralized 'cool cellar effect' (free) in summer. The mode operates only when photovoltaic energy is in surplus. The radiant cooling system does not allow dehumidification.



floor heating

DHW combined with heating

centralized cool effect

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the figure above describes a system inside a micro-condominium in which the heating consists of the HYDROLUTION system in Monobloc Flexible heating and DHW configuration, with domestic hot water production combined with the heating: the The applicable DHW has a capacity ranging from 300 to 500 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C.

In this example it is combined with low temperature radiant panels, which can also be used in summer to produce a 'cool cellar effect'. This centralized solution can always be combined with autonomous split systems.

CONTROL SYSTEM

RC-HY20/40-W is the control system integrated into HYDROLUTION Monobloc Flexible heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources. (only with RC-HY40-W)

RC-HY20/40-W control unit

Calculation according to UNI TS 11300-2

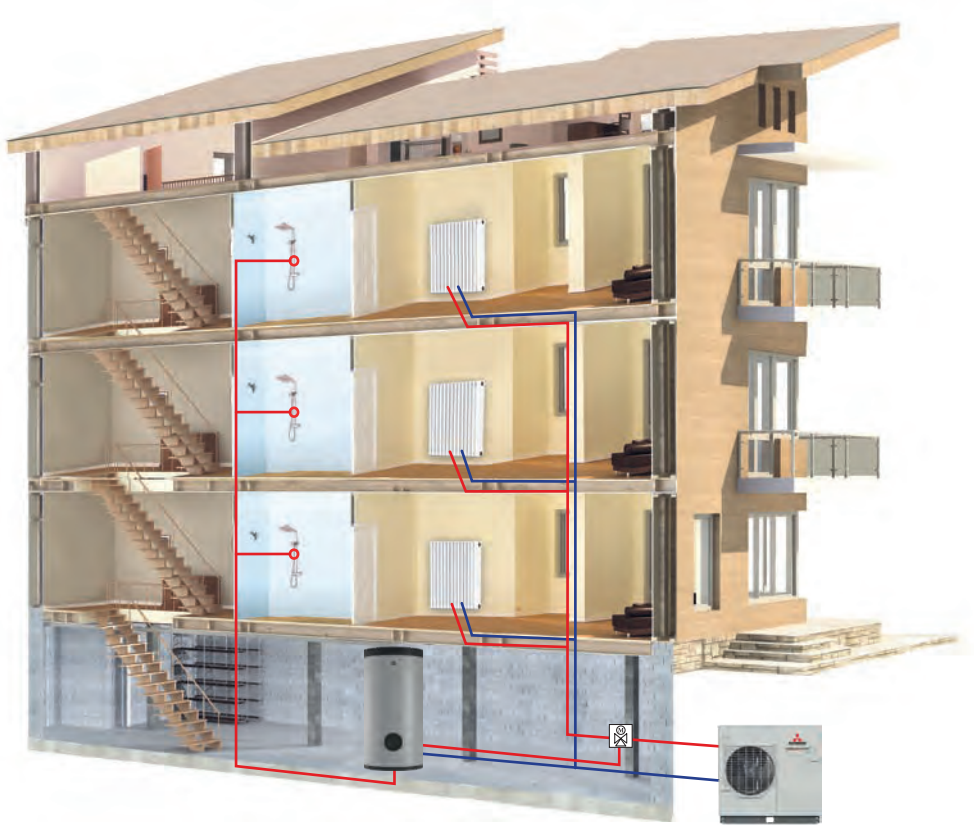
MITSUBISHI HEAVY INDUSTRIES

CENTRALIZED HEATING & DHW, VIA HYDROLUTION MONOBLOC FLEXIBLE

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Monobloc Flexible heating and DHW configuration, with domestic hot water production combined with the heating: the The applicable DHW has a capacity ranging from 300 to 500 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with medium temperature heating elements (high efficiency radiators). It is possible to provide more than one external unit in modular combination with the RC-HY40-W control.



high efficiency radiators

DHW combined with heating

CONTROL SYSTEM

RC-HY20/40-W is the control system that can be combined with HYDROLUTION Monobloc Flexible heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources. (only with RC-HY40-W)

RC-HY20/40-W control unit

Calculation according to UNI TS 11300-2

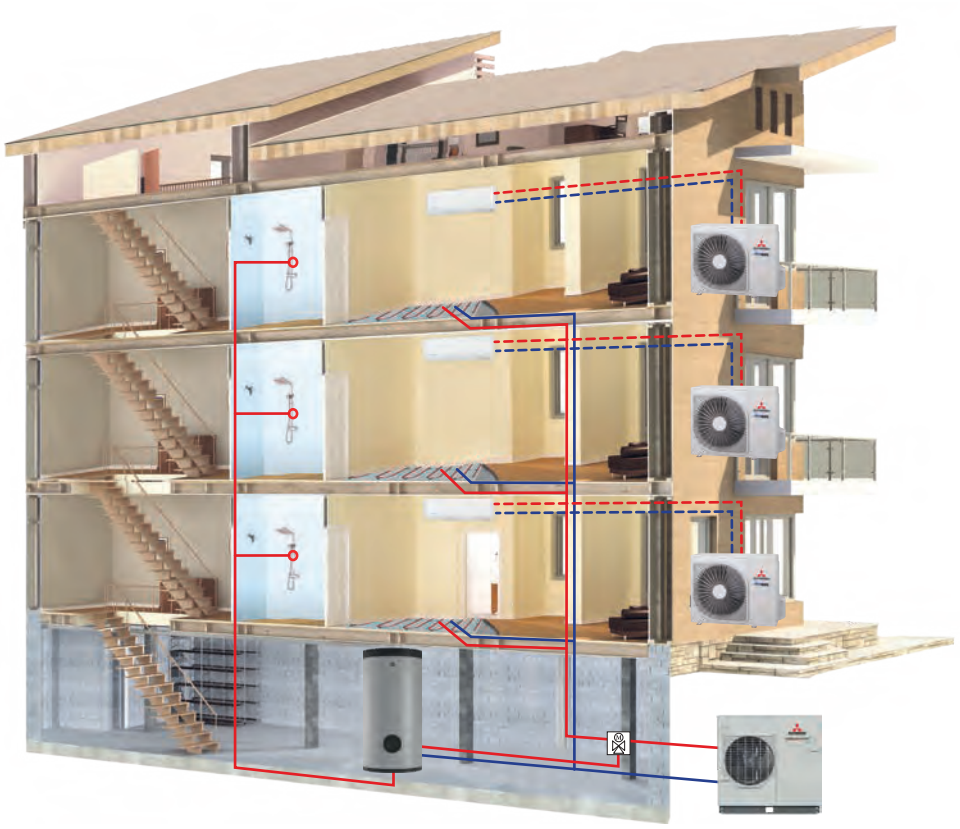
CENTRALIZED HEATING & DHW, VIA HYDROLUTION MONOBLOC FLEXIBLE AND INDEPENDENT COOLING WITH MONOSPLIT/ MULTISPLIT SYSTEMS

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Monobloc Flexible heating and DHW configuration, with domestic hot water production combined with the heating: the The applicable DHW has a capacity ranging from 300 to 500 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C.
In this example it is combined with low temperature heating elements (radiant panels).

The independent cooling system consists of a heat pump system (monosplit/multisplit systems) serving each apartment, with an external unit on the balcony.



floor heating

DHW combined with heating

autonomous cooling

CONTROL SYSTEM

RC-HY20/40-W is the control system that can be combined with HYDROLUTION Monobloc Flexible heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources. (only with RC-HY40-W)

RC-HY20/40-W control unit

Calculation according to UNI TS 11300-2

CENTRALIZED HEATING & DHW, VIA HYDROLUTION MONOBLOC FLEXIBLE INDEPENDENT COOLING WITH SYSTEMS SINGLE/MULTISPLIT

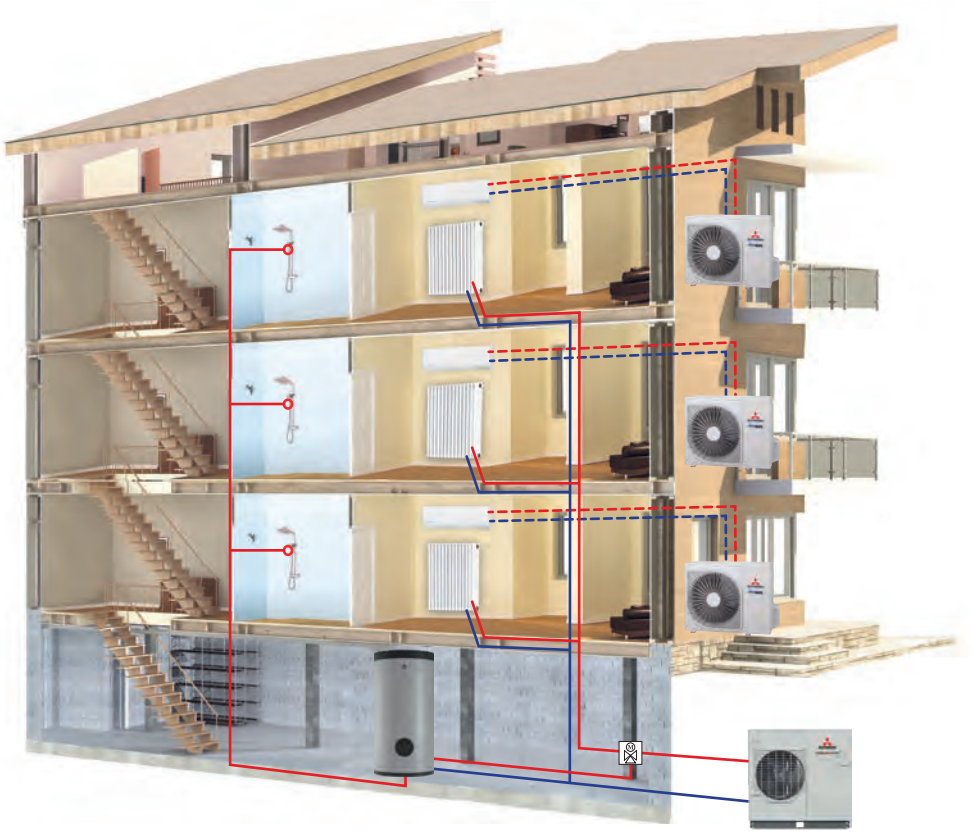
DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a micro-condominium in which the central heating consists of the HYDROLUTION system in Monobloc Flexible heating and DHW configuration, with domestic hot water production combined with the heating: the The applicable DHW has a capacity ranging from 300 to 500 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C.
In this example it is combined with medium temperature heating elements (high efficiency radiators).

It is possible to provide more than one external unit in modular combination with the RC-HY40-W control.

The independent cooling system consists of a heat pump system (monosplit/multisplit systems) serving each apartment, with an external unit on the balcony.



high efficiency radiators

DHW combined with heating

autonomous cooling

CONTROL SYSTEM

RC-HY20/40-W is the control system that can be combined with HYDROLUTION Monobloc Flexible heating and ACS and allows you:

- ro guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- manage the integration of external energy sources. (only with RC-HY40-W)

RC-HY20/40-W control unit

! This type of system is particularly suitable for major renovations with insulation, where results in terms of energy saving and summer comfort are desired without intervening with drastic and expensive system revisions.

Calculation according to UNI TS 11300-2

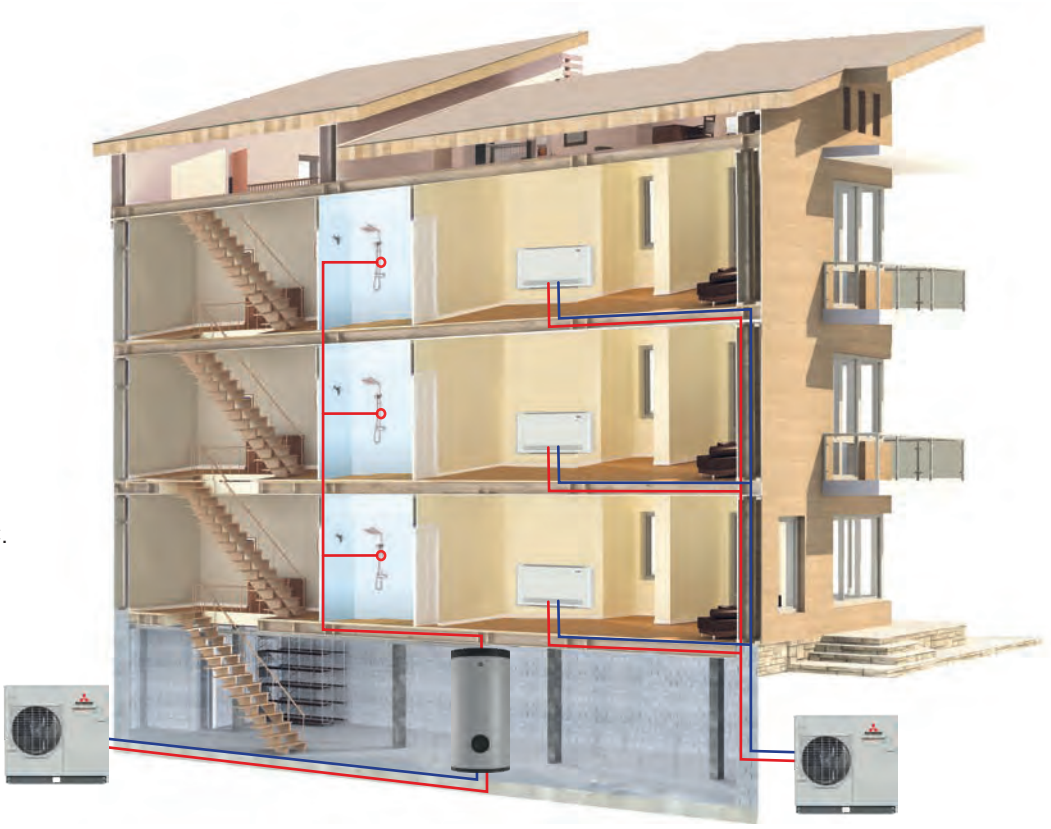
CENTRALIZED HEATING, COOLING & DHW, VIA HYDROLUTION MONOBLOC FLEXIBLE

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the adjacent figure describes a system inside a newly built micro-condominium, in which the heating consists of the HYDROLUTION system in Monobloc Flexible heating configuration. DHW production is entrusted to HYDROLUTION in the Monobloc Flexible ACS configuration: the applicable DHW tank has a capacity ranging from 300 to 500 litres. HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C.

In this example it is combined with warmcoils.

In this configuration, the HYDROLUTION system, during the summer season, is able to effectively cool the environments.



heating with warmcoil

DHW with dedicated Hydrolution

cooling with warmcoil

CONTROL SYSTEM

RC-HY20/40-W is the control system that can be combined with HYDROLUTION Monobloc Flexible heating and ACS and allows you:

- to guarantee efficiency in regulation by monitoring the DM parameter;
- to manage the delivery temperature to the system automatically through climate regulation of the system;
- to set on/off timer;
- to set 3 control levels (economy, normal, luxury) for DHW production;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to manage the integration of external energy sources. (only with RC-HY40-W)

RC-HY20/40-W control unit

WHAT IS WARMCOIL?

This is a particular fan coil with a radiant effect that works with very low air movement in winter and allows effective air conditioning in summer.

Calculation according to UNI TS 11300-2

MITSUBISHI HEAVY INDUSTRIES

INDEPENDENT HEATING & COOLING, VIA HYDROLUTION MONOBLOC FLEXIBLE AND DHW VIA HOT WATER

DESCRIPTION OF THE SYSTEM

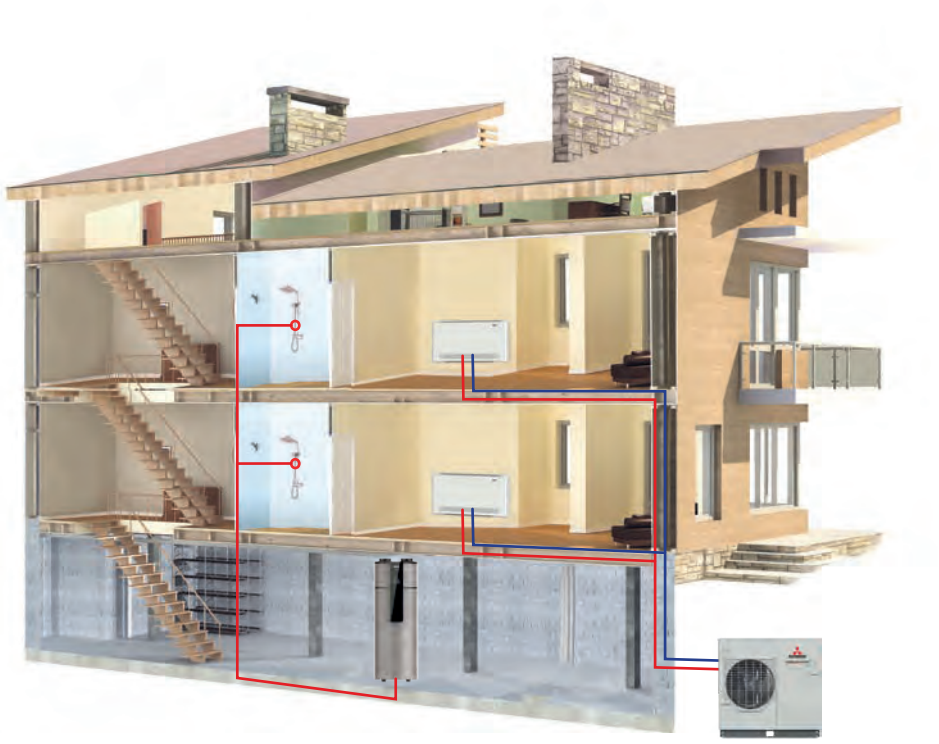
The application typology exemplified in the adjacent figure describes the system in a newly built independent house, in which the heating consists of the HYDROLUTION system in Monobloc Flexible heating configuration.

The production of domestic hot water is entrusted to the Hot Water system: the DHW tank has a capacity of over 200 litres.

HYDROLUTION produces hot water for heating up to a maximum temperature of 60° C. In this example it is combined with warmcoils.

In this configuration, the HYDROLUTION system, during the summer season, is able to effectively cool the environments.

Possibility of connecting the RMU40M remote control with built-in room sensor (only if present RC-HY40-W). It is possible to provide more than one external unit in modular combination with the RC-HY40-W control.



heating with warmcoil

DHW with Hot Water

cooling with warmcoil

CONTROL SYSTEM

Within this type of system, **RC-HY20/40-W** is the control system that can be combined with HYDROLUTION Monobloc Flexible heating and ACS. Through the control panel it is possible to program the operation of HYDROLUTION in cooling/heating/Silent/DHW mode. Specifically, the control allows you:

- to create 3 daily heating operation programs;
- to create 2 time schedules for cooling operation;
- to create 2 time schedules for operation in 'Silent' mode;
- to manage the integration of external energy sources (only with RC-HY40-W).

RC-HY20/40-W control unit

WHAT IS WARMCOIL?

This is a particular fan coil with a radiant effect that works with very low air movement in winter and allows effective air conditioning in summer.

Calcolo secondo UNI TS 11300-2

HYDROLUTION, THE SYSTEM FOR HEATING, COOLING AND DHW PRODUCTION

A+++

MINIMUM ENERGY CLASS 35° C

R32

ALL CAPACITIES

R410A

10 & 16 KW MODELS

HYDROLUTION SYSTEM - ADVANTAGES

Cutting-edge design and technological innovation are the basis of the HYDROLUTION system.

ENERGY SAVING

The HYDROLUTION outdoor units are equipped with Inverter technology and Twin Rotary compressor: it is possible to vary the operating frequency of the compressor based on the actual demand of the system, with consequent optimization of the COP and EER values.

MAXIMUM SILENCE OF THE OUTDOOR UNITS

The sound level emitted by the outdoor unit of an air conditioning system can be a problem, especially at night.
The HYDROLUTION system, thanks to the 'Silent' mode, is able to reduce the speed of the fan and compressor. This results in a significant reduction in the sound level. It is possible to set the operation of the outdoor unit in 'Silent' mode using the RC-HY20/40-W controls.

EXTREME COMPACTNESS

In the case of the indoor units of the All in One version system, the reduced size is due to the high performance of the internal components, in particular the domestic water tank and the plate heat exchanger.

HOT WATER UP TO 65° C

HYDROLUTION is a heat pump particularly suitable for primary heating, tested in numerous projects in Europe: it is capable of producing hot water **up to 60° C**. It is possible to raise the limit up to 65° C via an additional heat source, **and keep them constant even at an outdoor temperature of -20° C**. For this reason, it can be combined with: low temperature heating elements (radiant panels); medium temperature heating elements (high efficiency radiators, warmcoils).

HIGH RELIABILITY

The outdoor unit compressor is designed to be efficient even in very cold climates.

BLUE FIN TREATMENT

Corrosion of the outdoor unit, due to the action of atmospheric agents, can compromise the correct functioning of the system.
The 'Blue Fin' treatment, applied to the exchanger, helps prevent corrosion.

HYDROLUTION SYSTEM - CONFIGURATIONS

ALL IN ONE CONFIGURATION

The wide range of Mitsubishi Heavy Industries products offers the right heat pump to meet every need.
All in One is a complete solution, suitable for renovations and new buildings.

ALL IN ONE COMBINATIONS (OUTDOOR UNIT + INDOOR UNIT)

The All in One combination provides the complete solution for all your heating, cooling and domestic hot water needs.

Each All in One combination includes an outdoor unit and an HMA system, having an integrated DHW tank, an electric resistance and a circulation pump.

Here are the advantages of HYDROLUTION All in One:

- heating, cooling and hot water in one unit;
- easy installation and operation, the indoor and outdoor units are compact and make installation as simple as possible;
- ideal for residential use in apartments and small homes;
- three settable control levels (economy, normal, luxury) for DHW production;
- **CAPACITIES AVAILABLE**
  6 kW - R32/R410A
  8 kW - R32/R410A
  10 kW - R410A

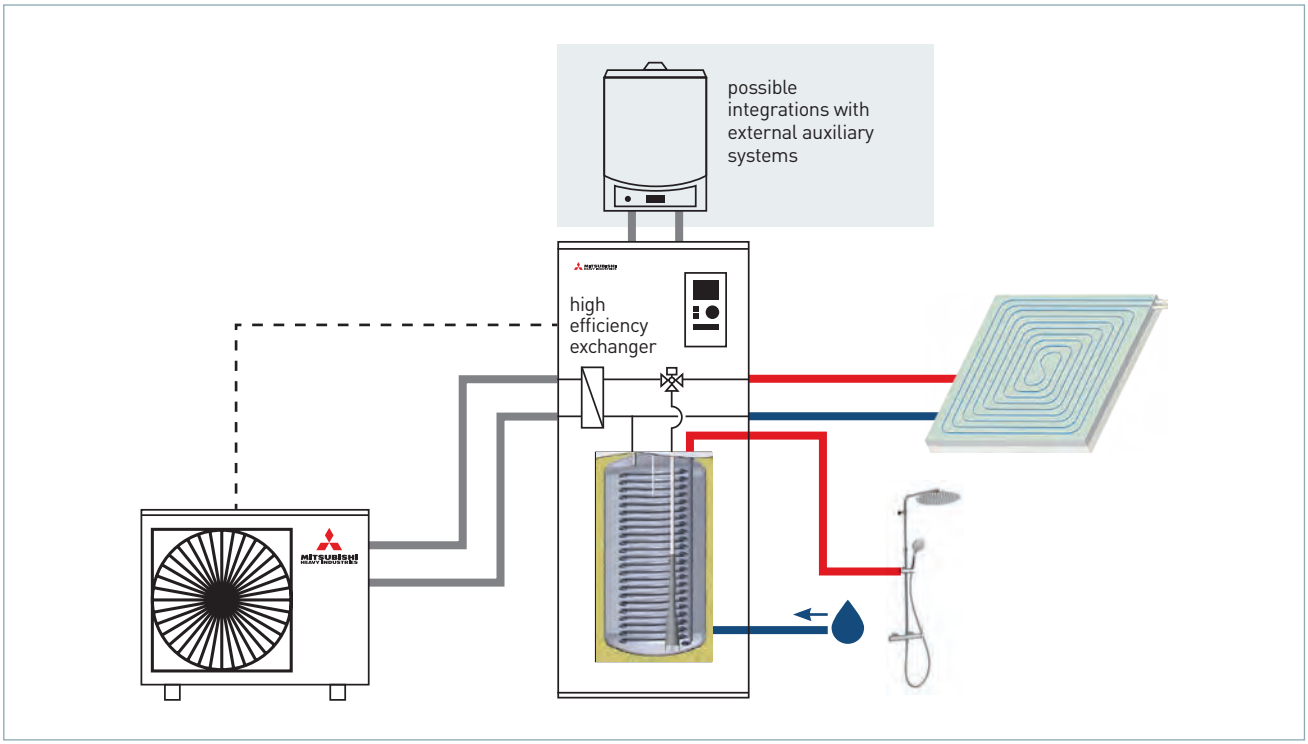
HMA MODULE

HYDROLUTION's All in One solution allows you to satisfy, with a plug-in solution, the main heating, cooling and DHW production needs of a home.

MAIN ADVANTAGES OF HMA MODULE

- integrated control on the machine which facilitates the management and installation of the system;
- compact, high-efficiency heat exchanger that allows you to quickly reach the desired temperatures;
- integrated 180 liter tank for the production of DHW;
- possibility of single-phase or three-phase power supply via special terminal block.

OPERATING DIAGRAM



HYDROBOX CONFIGURATION

In Hydrobox mode, HYDROLUTION can be used for heating and cooling only, or in combination with one or more storage tanks to also produce domestic hot water.

HYDROBOX COMBINATIONS

The Hydrobox combination offers space heating and cooling with the option of adding domestic hot water production.

HYDROLUTION Hydrobox is composed of an external unit and a hydromodule (HMS), having an electrical resistance and a circulation pump inside. By combining the accessories, the installation is even more complete and adapts to every air conditioning need.

Hydrobox solution has the following advantages:

- **HEATING AND COOLING ONLY OPTION**, is available without the addition of any accessories as the circulation pump and the electrical resistance are already inside the hydromodule;
- **DHW OPTION**, available by connecting a DHW tank to the HYDROLUTION Hydrobox;
- **FLEXIBLE INSTALLATION OF UNITS**, you can combine the components according to your needs;
- **CAPACITIES AVAILABLE**
  - **6 kW** - R32
  - **8 kW** - R32
  - **10 kW** - R410A
  - **16 kW** - R410A

MONOBLOC FLEXIBLE CONFIGURATION

Monobloc Flexible R32 is the heat pump for heating, cooling or in combination with one or more storage tanks to also produce domestic hot water.
A high-performance product, made with latest generation technologies and construction details to guarantee maximum operating efficiency.

MONOBLOC FLEXIBLE COMBINATIONS

The Monobloc Flexible combination offers space heating and cooling with the option of adding domestic hot water production.

HYDROLUTION Monobloc Flexible is composed of the outdoor unit only (FDCM). By combining the accessories, the installation is even more complete and adapts to every air conditioning need.

The advantages of Monobloc Flexible solution are the following:

- **HEATING AND COOLING ONLY OPTION**, is available by connecting a circulation pump and an electric resistance (optional) to the HYDROLUTION Monobloc Flexible;
- **DHW OPTION**, available by connecting in addition to HYDROLUTION Monobloc Flexible a circulation pump, an electric resistance, a DHW tank and a diverter valve;
- **FLEXIBLE INSTALLATION OF UNITS**, you can combine the components according to your needs;
- **CAPACITIES AVAILABLE**
  10 kW - R32
  16 kW - R32

HYDROLUTION SYSTEM - ACCESSORIES

Model	Description	Code
	Electric resistor integration kit for Monobloc Flexible system.	ELK9M1
	6 kW All in One module (R32 - R410A).	HMA 60-W
	8, 10 kW All in One module (R32 - R410A).	HMA 100-W
	Hydrobox for 6 kW O.U.	HMS 60-W
	Hydrobox for 8, 10 kW O.U.	HMS 100-W
	Hydrobox for 16 kW O.U.	HMS 140-S
	Single units' control.	RC-HY20-W
	Modular units' control (up to 8).	RC-HY40-W
	Circulation pump (3.5HP).	CPD11-25M-65
	Circulation pump (6HP).	CPD11-25M-75
	DHW/heating diverter valve (3.5 - 6HP).	VST11M
	DHW/heating diverter valve for power > 16 kW and up to 40 kW.	VST20M
	Cooling Heating diverter valve (2 - 3HP).	VCC05M
	Cooling Heating diverter valve (3.5 - 6HP).	VCC11M
	Control kit for secondary heating systems up to 1200 l/h.	ECS40M
	Control kit for secondary heating systems up to 1950 l/h.	ECS41M
	Multifunction card.	AXC30M
	Ambient temperature sensor.	RTS40M
	Remote control.	RMU40M
	Energy measurement kit up to 85 litres/min.	EMK300M
	Energy measurement kit up to 150 litres/min.	EMK500M
	3 kW electric resistance kit + control unit.	ME1030+HR10M
	MODBUS remote control.	MODBUS40M

HYDROLUTION SYSTEM - ACCESSORIES

Model	Description	Code
	Integrated stainless steel storage tank and coil for the production of domestic hot water. Volume 300 litres. Dimensions (Ø x h) 650 x 1486 mm.	WT-AP-DW1-300 C-1
	Integrated stainless steel storage tank and coil for the production of domestic hot water. Volume 500 litres. Dimensions (Ø x h) 750 x 1786 mm.	WT-AP-DW1-500 C-1
	1.5 kW supplementary electric resistance for 300 and 500 liter tanks.	WT-EH-15-C
	Titanium anode for 300 liter tank.	WT-AT-2-4-C
	Titanium anode for 500 liter tank.	WT-AT-5-C
	Hydraulic separator - 25 liter thermal flywheel.	WT-SI-PDC-25 C
	Hydraulic separator - 51 liter thermal flywheel.	WT-SI-PDC-50 C
	100 liter inertial tank.	WT-VT-PDC-100 C

CONTROL SYSTEMS

To guarantee maximum efficiency of an air-water heat pump system like that of HYDROLUTION, MHI has designed and created a complete line of management and monitoring devices.

A residential heating system must necessarily be subjected to precise control 24 hours a day: **RC-HY20-W and RC-HY40-W** have been designed to simplify this control and reduce management costs and energy consumption.

The functions of these control devices are extremely flexible and as such adapt to the system configuration in which they are applied.

RC-HY20-W

Areas of application

Monobloc Flexible

RC-HY20-W e RC-HY40-W features & functions

The **RC-HY20-W and RC-HY40-W** control devices can be used for the management and regulation of **centralized and autonomous** systems created with HYDROLUTION. **RC-HY20-W** is specific for the Monobloc Flexible configuration, **RC-HY40-W** is integrated into All in One, Hydrobox heating, Hydrobox heating and DHW and can be used with Monobloc Flexible. Specifically, they allow you:

- to manage the operating modes (on/off) and time programming of the system;
- to guarantee efficiency in regulating the system;
- to manage the delivery water temperature automatically;
- to manage the anti-legionella cycles and the activation of the DHW recirculation pump;
- to activate the 'Silent' function.

RC-HY40-W

Areas of application

All in One
Hydrobox heating
Hydrobox heating e ACS
Monobloc Flexible

HYDROLUTION SYSTEM - CONTROL SYSTEMS

ON/OFF and system time programming

Through the **RC-HY20-W** and **RC-HY40-W** control devices it is possible to both manage the operation (switching on and off) of the HYDROLUTION system, the operation of the 'Silent' function and program the cooling supply, heating and DHW throughout the week. During the operation of the heat pump it is possible to:

- to create 3 daily programs in heating mode with the possibility of setting the deviation from the reference climate curve, or the desired temperature in the single period (only if the internal temperature sensor is present);
- to set 2 time schedules in cooling mode;
- to set 2 time schedules for system operation in 'Silent' mode;
- to program the temperature and DHW delivery

a) through 3 different DHW production control parameters: economical – normal – luxury; it is possible to program two daily production cycles with different temperature levels for each day of the week;

b) by activating the 'Temporary luxury' function it is possible to increase it for a certain period of time (up to 12 hours), the DHW production temperature;

c) by activating the 'Holidays' function it is possible to reduce the heating and temporarily suspend the DHW production.

Efficiency in system regulation

It is possible to guarantee system efficiency by monitoring the DM parameter (degrees per minute), which allows for rapid responses and better management of the operating frequencies of the outdoor unit compressor.

Anti-legionella cycles and DHW recirculation

It is possible to set the programming of the anti-legionella cycles via the 'Sterilyze' function: the activation interval of the cycles is between 1 and 90 days.

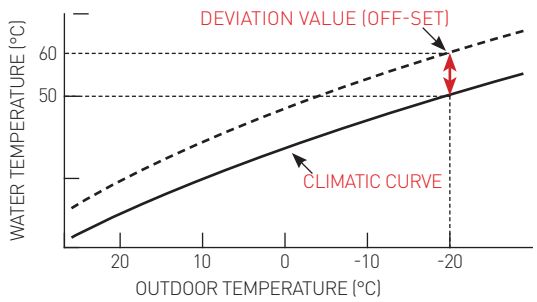
It is also possible to set 3 daily operating periods of the DHW recirculation pump.

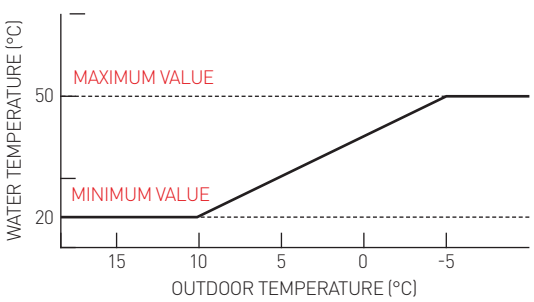
'Silent' function

Activating the 'Silent' function allows you to significantly reduce the noise emitted by the external unit, reducing the speed of the compressor and fan. It is possible to set 2 time schedules in this operating mode.

Automatic management of the system delivery temperature

The management of the delivery temperature to the system occurs by setting the climatic operating curve. From the control device the user can set a personalized climate curve, quickly modify it as needed, indicating a deviation value compared to the reference climate curve ('Off-set' function). It is possible to establish a lower and upper temperature limit for the water supplied to the system.





Climatic curve: to guarantee energy efficiency and indoor comfort, the system regulates the degrees °C of the supply water when the outside temperature changes.

RC-HY40-W
FEATURES & FUNCTIONS

The RC-HY40-W control device, in addition to being equipped with the features listed in the previous paragraphs, offers highly sophisticated continuous monitoring functions and provides valuable information on consumption, performance, as well as a wide range of operational data.

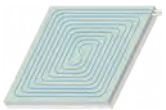
The features are described in more detail below.

- Through **RC-HY40-W**, efficiency in regulation, durability of the system and continuity of service are guaranteed.

- **RC-HY40-W is able to manage up to 8 distribution systems at different temperatures** (radiant panels, high efficiency radiators and warm coils). If inside a condominium there are heating systems that work at different delivery temperatures, by setting a climate curve dedicated to each system, via the RC-HY40-W control, it is possible to manage up to 8 distribution systems at different temperatures . It is necessary to add, for each distribution system, an ECSM40/ECSM41 accessory kit.


warmcoil


high efficiency radiators


radiant panels

- **RC-HY40-W is able to manage the accounting and distribution of energy consumption**: by connecting an energy meter kit to the RC-HY40-W control, it is possible to quantify the system's consumption and view it directly from the control system. The distribution of energy consumption of the various users can be carried out through the installation of heat meters and distribution boxes dedicated to each apartment.

RC-HY40-W
INTEGRATION WITH EXTERNAL HEAT SOURCES

RC-HY40-W is able to manage the integration of the HYDROLUTION system with external heat generators. Using an external generator (e.g. pellet or methane boilers) it is possible to raise the maximum temperature limit of the system water to **65° C**. Integration management is not limited to a simple switching on/off of the heat source integrative (already also present in the 20-W version), but can control a mixing valve adjusted to obtain a specific temperature set by command.

In the event of a heat pump failure, DHW production and heating are guaranteed with the help of the emergency function, which activates the integration system automatically.

Below are the possible operating methods of this management.

AUTOMATIC MODE

Allows you to set the operating range of the outdoor temperature of the heat pump heating and the boiler.

MANUAL MODE

Allows you to activate/deactivate integration from external heat generators.

Allows you to activate/deactivate heat pump heating.

EXTERNAL GENERATOR ONLY MODE

It allows the use of only the external generator for heating and DHW production.

In the event of a heat pump failure, DHW production and heating are guaranteed with the help of the emergency function, which activates the integration system automatically.

HYDROLUTION SYSTEM - TECHNICAL DATA

ALL IN ONE

Outdoor unit model				FDCW 60 VNX-W	FDCW 71 VNX-W	FDCW 100 VNX-A
Heating	Rated power	A7//W35	kW	5.08 (0.90~7.60)	8.30 (2.20~9.50)	9.20 (3.50~10.00)
	Power input			0.99	1.93	2.15
	Performance coefficient		COP	5.16	4.30	4.28
	Rated power	A7/W45	kW	2.70 (2.70~8.00)	8.00 (3.00~10.00)	9.00 (3.50~11.00)
	Power input			0.88	2.35	2.62
	Performance coefficient		COP	3.06	3.40	3.44
Cooling	Rated power	A35//W18	kW	7.54 (1.20~7.80)	9.00 (2.70~10.70)	11.00 (3.30~12.00)
	Power input			2.11	2.48	3.04
	Energy efficiency		EER	3.57	3.62	3.62
	Rated power	A35//W7	kW	5.31 (0.60~6.30)	7.10 (2.00~7.10)	8.00 (3.00~9.00)
	Power input			1.95	2.62	2.85
	Energy efficiency		EER	2.73	2.70	2.81
Seasonal data (Heating)	Design load (Pdesignh) @ -10°C	35/55	kW	4.8/5.3	7.5/7.0	8.5/10.0
	Seasonal energy efficiency (ηs)		%	190/137	180/131	165/126
	Energy efficiency class		-	A+++/A++	A+++/A++	A++/A++
	Annual energy consumption		kWh/y	2089/3193	3450/4421	4181/6391
Seasonal data (DHW)	Test cycle profile			XL	XL	XL
	Energy efficiency (ηwh)		%	100	107	98
	Energy efficiency class			A	A	A
	Annual energy consumption		kWh/y	-	-	1702
Operating range	Outdoor air temperature	Heating & DHW	°C	-20~43		
		Cooling		15~43		
Refrigerant circuit data	Refrigerant type (GWP)			R32 (675)		R410A (2088)
	Q.ty of precharge (tons CO2)		kg (t)	1.3 (0.878)	1.84 (1.242)	2.9 (6.055)
	Piping diameter liquid/gas		mm (inch)	6.35(1/4") / 12.7(1/2")	6.35(1/4") / 15.88(5/8")	9.52(3/8") / 15.88(5/8")
	Max splitting distance		m	30	50	30
	Max splitting level difference O.U.-I.U. / I.U.-O.U.		m	20 / 20	30 / 15	7 / 7
	Splitting distance without additional charge		m	15	15	15
	Additional charge		g/m	20	20	60
	Refrigerant control system			Capillary tube + EEV	Electronic expansion valve	
	Compressor		type	Twin rotary - DC Inverter		Rotary - DC Inverter
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz		
	Maximum current		A	15	18	23
	Power cable (recommended)		type	3x4 mm²	3x4 mm²	3x6 mm²
Product specifications	Fan	Type	q.ty	DC Inverter x 1		
		Air flow (max)	m³/h	2490	3000	4380
	Sound power level (max)		dB(A)	65	69	58
	Sound pressure level (a 1 m)		dB(A)	44	49	50
	Dimensions	LxDxH	mm	800x290x640	880x340x750	970x370x845
	Weight	Net	kg	46	62	81
Indoor unit model				**HMA 60-W**	**HMA 100-W**	**HMA 100-W**
Operating range	Delivery water temperature	Heating & DHW	°C	25~58	25~60	25~58
		Cooling		7~25		
	DHW temperature (tank)	Max		80		
Hydraulic data	DHW tank capacity		L	180		
	Water/freon heat exchanger		type	Braze-welded plates		
	Circulation pump			Included		
	Water connections	Size	mm	22		
	Operating pressure (system)	Max	bar	3		
	Expansion vessel	Volume	L	10		
		Precharge	bar	0.5		
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz / 3ph-400V-50Hz		
	Electrical integration	Power supply 230V /400V	kW	6 / 9		
	Power input (Max)		A	29 / 20	36 / 20	40 / 23
	Power cable (recommended)		type	3x6 mm² / 5x4 mm²	3x10 mm² / 5x4 mm²	3x10 mm² / 5x6 mm²
Product specifications	Sound power level		dB(A)	-	-	-
	Dimensions	LxDxH	mm	600x610x1715		
	Weight	Net	kg	155	165	
	Control (included)			On board machine		
	Remote control via Modbus (optional)			MODBUS40M		

The data reported above refers to the following standards: EN 14511:2018; EN 14825:2019; EN50564:2011; EN12102-1:2018; EN12102-2:2019; (EU)No:811:2013; (EU) No:813:2013; OJ 2014/C 207/02:2014.

HYDROLUTION SYSTEM - TECHNICAL DATA

HYDROBOX

Outdoor unit model				FDCW 60 VNX-W	FDCW 71 VNX-W	FDCW 100 VNX-A	FDCW 140 VNX-A
Heating	Rated power	A7//W35	kW	5.08 (0.90~7.60)	8.30 (2.20~9.50)	9.20 (3.50~10.00)	16.00 (4.20~16.00)
	Power input			0.98	1.93	2.15	3.81
	Performance coefficient		COP	5.16	4.30	4.28	4.20
	Rated power	A7/W45	kW	2.70 (2.70~8.00)	8.00 (3.00~10.00)	9.00 (3.50~11.00)	16.00 (5.80~16.00)
	Power input			0.88	2.35	2.62	4.83
	Performance coefficient		COP	3.06	3.40	3.44	3.31
Cooling	Rated power	A35//W18	kW	7.54 (1.20~7.80)	9.00 (2.70~10.70)	11.00 (3.30~12.00)	16.50 (5.20~16.50)
	Power input			2.11	2.49	3.04	4.36
	Energy efficiency		EER	3.57	3.62	3.62	3.78
	Rated power	A35//W7	kW	5.31 (0.60~6.30)	7.10 (2.00~7.10)	8.00 (3.00~9.00)	11.80 (3.10~11.80)
	Power input			1.95	2.63	2.85	4.45
	Energy efficiency		EER	2.73	2.70	2.81	2.65
Seasonal data (Heating)	Design load (Pdesignh) @ -10°C	35/55	kW	4.8/5.3	7.5/7.0	8.5/10.0	12.5/13.0
	Seasonal energy efficiency (ηs)		%	190/137	180/131	165/126	166/133
	Energy efficiency class		-	A+++/A++	A+++/A++	A++/A++	A++/A++
	Annual energy consumption		kWh/y	2089/3193	3450/4421	4181/6391	7906/6099
Seasonal data (DHW)	Test cycle profile			XXL	XXL	XXL	XXL
	Energy efficiency (ηwh)		%	113	-	89	88
	Energy efficiency class			A	-	A	A
	Annual energy consumption		kWh/y	-	-	2430	2449
Operating range	Outdoor air temperature	Heating & DHW	°C	-20~43			
		Cooling		15~43			
Refrigerant circuit data	Refrigerant type (GWP)			R32 (675)		R410A (2088)	
	Q.ty of precharge (tons CO2)		kg (t)	1.3 (0.878)	1.84 (1.242)	2.9 (6.055)	4.0 (8.352)
	Piping diameter liquid/gas		mm (inch)	6.35(1/4") / 12.7(1/2")	6.35(1/4") / 15.88(5/8")	9.52(3/8") / 15.88(5/8")	9.52(3/8") / 15.88(5/8")
	Max splitting distance		m	30	50	30	30
	Max splitting level difference O.U.-I.U. / I.U..-O.U.		m	20 / 20	30 / 15	7 / 7	7 / 7
	Splitting distance without additional charge		m	15	15	15	15
	Additional charge		g/m	20	20	60	60
	Refrigerant control system			Capillary tube + EEV	Electronic expansion valve		
	Compressor		type	Twin rotary - DC Inverter		Rotary - DC Inverter	
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz			
	Maximum current		A	15	18	23	25
	Power cable (recommended)		type	3x4 mm²	3x4 mm²	3x6 mm²	3x6 mm²
Product specifications	Fan	Type	q.ty	DC Inverter x 1		DC Inverter	
		Air flow	m³/h	2490	3000	4380	6000
	Sound power level (max)		dB(A)	65	69	58	58
	Sound pressure level (a 1 m)		dB(A)	44	49	50	54
	Dimensions	LxDxH	mm	800x290x640	880x340x750	970x370x845	970x370x1300
	Weight	Net	kg	46	62	81	105
Indoor unit model				**HMS 60-W**	**HMS 100-W**	**HMS 100-W**	**HMS 140-S**
Operating range	Delivery water temperature	Heating & DHW	°C	25~58	25~60	25~58	
		Cooling		7~25			
Hydraulic data	Min. DHW tank capacity (not included)		L	200		300	500
	Water/freon heat exchanger		type	Braze-welded plates			
	Circulation pump			Included			
	Water connections	Size	mm	22			28
	Operating pressure (system)	Max	bar	3			
	Expansion vessel	Volume	L	12			
		Precharge	bar	0.5			
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz / 3ph-400V-50Hz			
	Electrical integration	Power supply 230V /400V	kW	6 / 9			4.5 / 9
	Power input (Max)		A	29 / 20	36 / 20	36 / 23	45 / 25
	Power cable (recommended)		type	3x6 mm² / 5x4 mm²	3x10 mm² / 5x4 mm²	3x10 mm² / 5x4 mm²	3x10 mm² / 5x6 mm²
Product specifications	Sound power level		dB(A)	-	-	-	-
	Dimensions	LxDxH	mm	515x350x850			
	Weight	Net	kg	50	56		58
	Control (included)			On board machine			
	Remote control via Modbus (optional)			MODBUS40M			

The data reported above refers to the following standards: EN 14511:2018; EN 14825:2019; EN50564:2011; EN12102-1:2018; EN12102-2:2019; (EU)No:811:2013; (EU) No:813:2013; OJ 2014/C 207/02:2014.

HYDROLUTION SYSTEM - TECHNICAL DATA

MONOBLOC FLEXIBLE

Outdoor unit model				FDCM 100 VNX-W	FDCM 140 VNX-W
Heating	Rated power	A7//W35	kW	10.00 (4.50~11.00)	14.00 (5.40~17.00)
	Power input			2.33	3.11
	Performance coefficient		COP	4.29	4.50
	Rated power	A7/W45	kW	10.00 (6.40~11.00)	14.50 (7.60~16.50)
	Power input			2.90	4.26
	Performance coefficient		COP	3.45	3.40
Cooling	Rated power	A35//W18	kW	11.00 (4.00~11.00)	16.50 (4.50~16.50)
	Power input			2.97	4.34
	Energy efficiency		EER	3.70	3.80
	Rated power	A35//W7	kW	8.50 (3.70~9.50)	12.50 (4.20~12.50)
	Power input			2.98	4.31
	Energy efficiency		EER	2.85	2.90
Seasonal data (Heating)	Design load (Pdesignh) @ -10°C	35/55	kW	8.0/8.0	12.0/12.0
	Seasonal energy efficiency (ηs)		%	191/136	181/133
	Energy efficiency class		-	A+++/A++	A+++/A++
	Annual energy consumption		kWh/y	-	-
Operating range	Outdoor air temperature	Heating & DHW	°C	-25~43	-20~43
		Cooling		15~43	
	Delivery water temperature	Heating & DHW	°C	25~60	25~58
		Cooling		7~25	
Refrigerant circuit data	Refrigerant type (GWP)			R32 (675)	
	Q.ty of precharge (tons CO2)		kg (t)	2.0 (1.350)	2.9 (1.958)
	Refrigerant control system			Electronic expansion valve	
	Compressor		type	Twin rotary - DC Inverter	
Hydraulic data	Min. DHW tank capacity (not included)		L	300	500
	Water/freon heat exchanger		type	Braze-welded plates	
	Water connections	Dimensione	pollici	1"M (DN25)	
	Operating pressure (system)	Max	bar	3	
Electrical data	Power supply		Ph-V-Hz	1ph-230V-50Hz	
	Maximum current		A	21	28
	Power cable (recommended)		type	3x6 mm²	3x6 mm²
Product specifications	Fan	Type	q.ty	DC Inverter	DC Inverter
		Air flow	m³/h	3180	3600
	Sound power level		dB(A)	60	63
	Sound pressure level (a 1 m)		dB(A)	45	48
	Dimensions	LxDxH	mm	1160x440x1120	1160x440x1120
	Weight	Net	kg	104	118
	Control (included)			RC-HY20-W / RC-HY40-W	
	Remote control via Modbus (optional)			MODBUS40M[1]	

1. Not compatible with RC-HY20-W.

The data reported above refers to the following standards: EN 14511:2018; EN 14825:2019; EN50564:2011; EN12102-1:2018; EN12102-2:2019; (EU)No:811:2013; (EU)No:813:2013; OJ 2014/C 207/02:2014.

TANKS

Model		WT-AP-DW1-300 C-1	WT-AP-DW1-500 C-1
Power supply		-	-
Volume	liter	291	498
Heating element	kW	Optional	Optional
Height/diameter	mm/ø	1486/650	1786/750
Weight	kg	75	118
Connector diameter	inches	1" 1/4"	1" 1/4"
Max. tank pressure	Bar	10	
Max. heat exchanger pressure	Bar	12	
Energy class		C	C

Tank range compatible with Hydrolution Hydrobox and Monobloc Flexible versions.

KXZ2 HEATING

KXZ2 HEATING FOR HEATING RESIDENTIAL AND COMMERCIAL BUILDINGS

Using KXZ systems for floor heating brings maximum benefits for the customer in terms of efficiency and comfort. The MHI hydromodule combines practicality of application and excellent performance.

KXZ2 combines high performance with application flexibility, intuitive and customizable controls, easy maintenance and management.

HMU 140 KXZE1 & HMU 280 KXZE1 HYDROMODULES

The new Hydromodule is available in two different capacities, 14 and 28 kW, and can be connected to the external units of the KXZE2 and KXZXE1 series.

HIGH PERFORMANCE

- High energy yields.
- Compact size and easy to install.
- Digital inputs and outputs to facilitate management and control (for example ON/OFF, activation of pump and/or electric resistance, anomaly signalling, local control inhibition, etc.).

CONSTANT CONTROL OF THE OUTLET WATER TEMPERATURE

This is achieved through controlling:

- the frequency of the compressor;
- the electronic expansion valve;
- the power of the HMUs based on the load.

THE CONTROL SYSTEM

Using the **RC-EX3H wired control connected to the HMU**, it is possible to turn the system on and off or set operating time bands.

The delivery temperature to the system is calculated from the climatic curve based on the external thermal conditions.

ANTIFREEZE PROTECTION

The antifreeze protection of the plate heat exchanger is also active during defrosting operations.

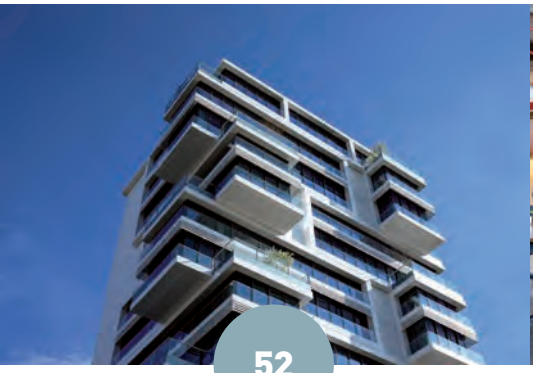
14 kW 28 kW
Two different capacities of the Hydromodule

-20°C
Max. efficiency down to -20°C

55°C
Hot water temperature in water only mode

KXZ2 HEATING

APPLICATION EXAMPLES



Centralized systems

Water only application

Mixed applications (water + air)

Autonomous systems

CENTRALIZED HEATING OF A RESIDENTIAL BUILDING VIA HMU UNITS CONNECTED TO A KXZ SYSTEM

The system provides hydronic heating only via a centralized distribution system in a residential condominium.

DHW production is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the volume needed.

floor heating

DHW via Hot Water or Q-ton

SYSTEM FEATURES

28-168 kW
Capacity range of the outdoor units

100% (max)
Total power of connectable I.U.(HMU only)

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

510 m (max)
Total splitting distance

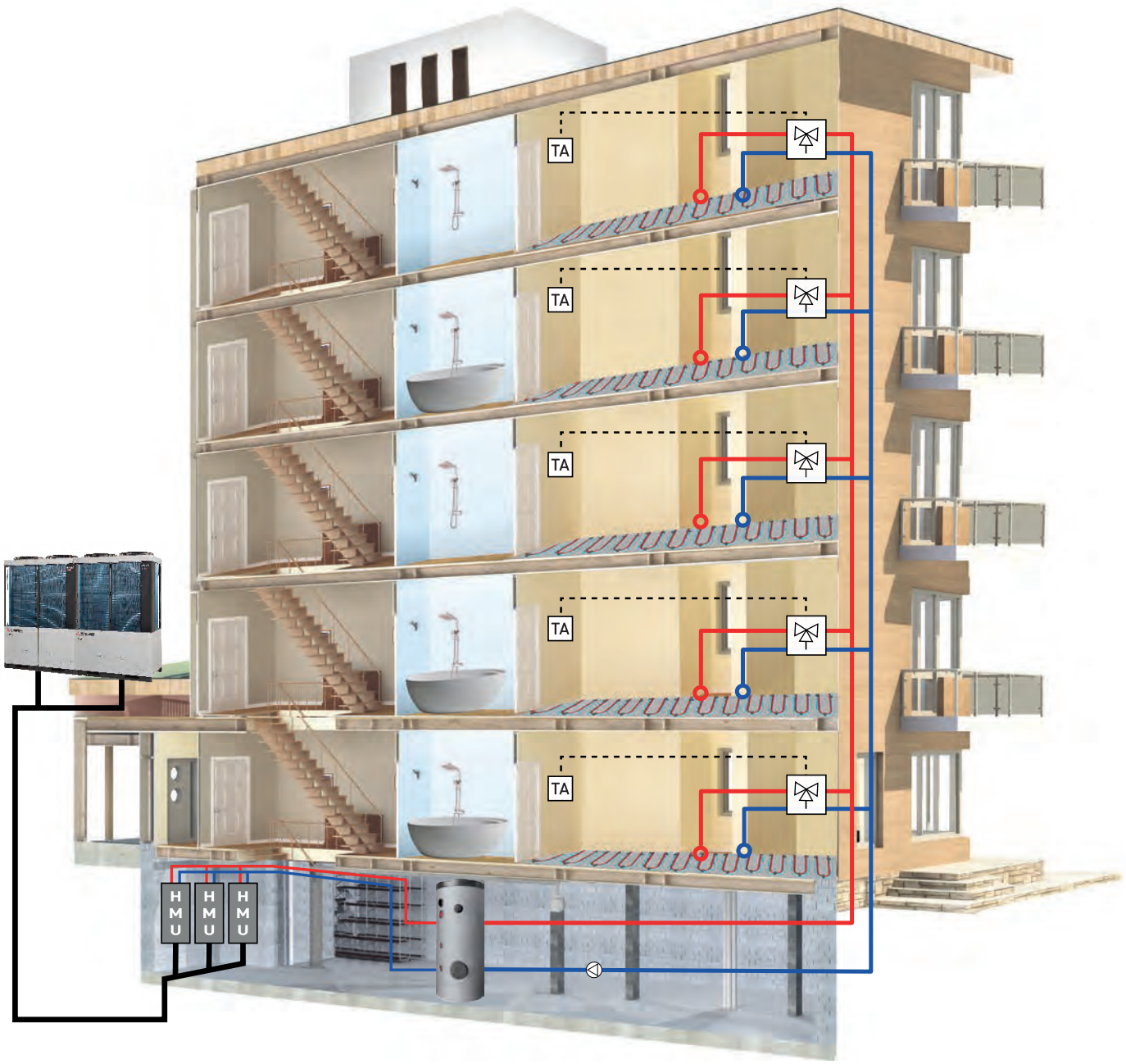
CONTROL SYSTEM

Using the RC-EX3H wired control connected to the HMUs, it is possible to turn the system on and off and set operating time bands.

The delivery temperature to the system is calculated from the climatic curve based on the outdoor temperature.

The maximum flow temperature useful for determining the project conditions varies based on the outdoor temperature according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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

The main refrigerant pipe branches from the outdoor units connected in combination, until it reaches the room designed to house the Hydromodules (thermal power plant): from here and through Y-shaped branches, the refrigerant fluid is distributed to the various HMUs. These take energy from the fluid and transfer it to the water in the heating system.

The Hydromodules use the circulators present inside them to push the water into a storage tank, which acts as a hydraulic separator between the primary circuit, made up of the HMUs and the secondary circuit made up of the distribution to private users.

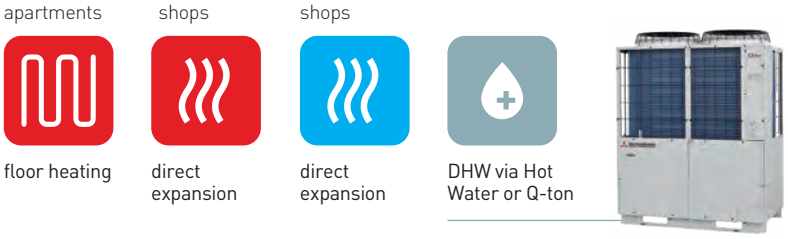
Each apartment has a consumption distribution box, controlled by a room thermostat (RT), which allows you to use the heating according to your needs, thus paying only for actual use. Distribution inside the apartments occurs with radiant floor panels.

HEATING OF THE APARTMENTS VIA HMU UNITS LOCATED ON THE FLOORS AND **AIR CONDITIONING** OF THE SHOPS VIA AIR-TO-AIR INDOOR UNITS, CONNECTED TO A KXZ SYSTEM

The system provides hydronic heating via a distribution system divided by floors, **with an HMU serving the individual real estate units on the same floor**.

The condominium is of a residential type with shops underneath, typically present in winter tourist areas, where there is no need for summer air conditioning in the apartments.
The air conditioning of the shops takes place with indoor direct expansion air-to-air units.

DHW production is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the volume needed.



SYSTEM FEATURES

28-168 kW
Capacity range of the outdoor units

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

160% (max)
(for O.U. more than 45 kW)

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

40 m
Max. splitting level difference between O.U. and I.U. (HMU or DX)

18 m
Max. splitting level difference between the I.U. (HMU or DX)

510 m (max)
Total splitting distance

-10°C
Minimum outdoor design temperature

CONTROL SYSTEM

Through the SL4 centralized control, it is possible to manage every single U.I. (including HMU modules) to the system both locally and via the Internet.

Local control is also available for each DX I.U. 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 time bands.

The delivery temperature to the system is calculated from the climatic curve based on the outdoor thermal values.
The maximum flow temperature useful for determining the design conditions varies based on the outdoor values, according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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 based on need) contributing to the reduction of installation costs (no water risers), and use the circulators present inside them to push the water directly into the individual apartments.

Each apartment has a consumption distribution box, controlled by a room thermostat (RT), which allows you to use the heating according to your needs, thus paying only for actual use. Distribution inside the apartments occurs with radiant floor panels.

In the apartments, air conditioning is disabled by a specific setting available in the RC-EX3H control connected to the HMUs.

The direct expansion indoor units are positioned in the shops (one or more based on need).

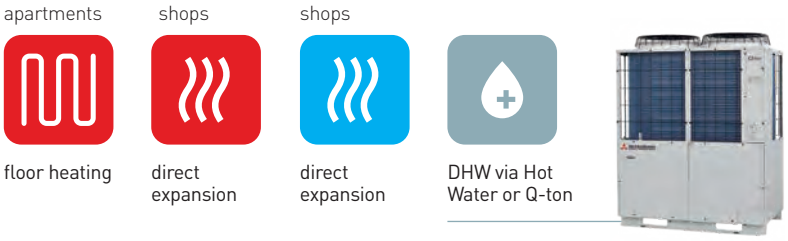
The management costs are divided per I.U., whether air or water, by means of a centralized control which, in the presence of a LAN connection, also allows remote management via the web.

HEATING OF THE APARTMENTS VIA HMU UNITS LOCATED IN A TECHNICAL ROOM AND **AIR CONDITIONING** OF THE SHOPS VIA AIR-TO-AIR I.U., CONNECTED TO A KXZ SYSTEM

The system provides for the supply of hydronic heating via a riser distribution system, **with an HMU serving the individual real estate units on the same floor. The HMU units are installed in a designated room on the same level as the shops.**

The condominium is of a residential type with shops underneath, typically present in winter tourist areas where there is no need for summer air conditioning in the apartments. The air conditioning of the shops takes place with indoor direct expansion air-to-air units.

DHW production is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the volume needed.



SYSTEM FEATURES

28-168 kW
Capacity range of the outdoor units

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

160% (max)
(for O.U. more than 45 kW)

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

40 m
Max. splitting level difference between O.U. and I.U. (HMU or DX). With design temperature lower than -10°C, the O.U. must always be placed above the I.U.

18 m
Max. splitting level difference between the U.I. (HMU or DX)

510 m (max)
Total splitting distance

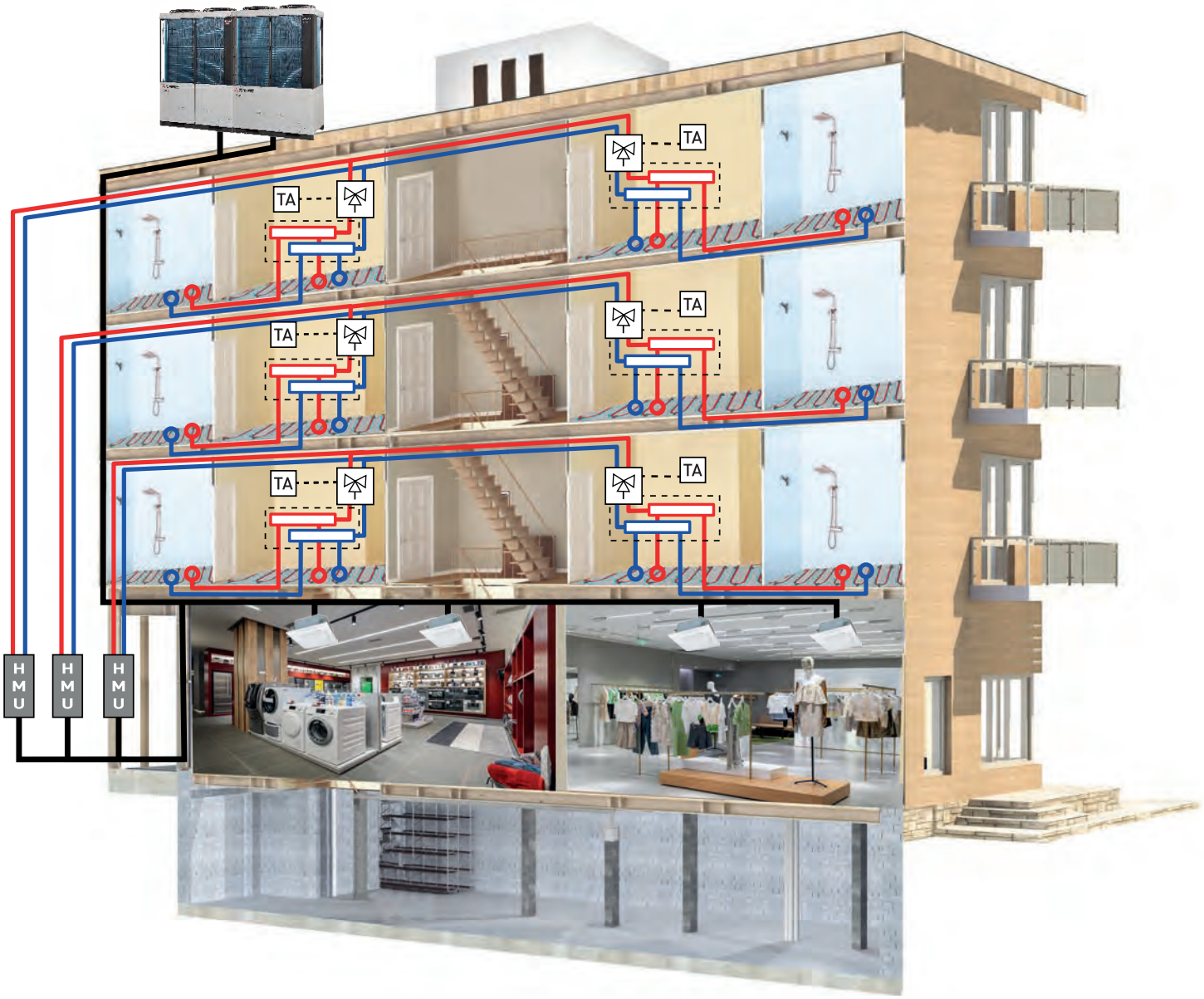
CONTROL SYSTEM

Through the SL4 centralized control, it is possible to manage every single U.I. (including HMU modules) to the system both locally and via the Internet.

Local control is also available for each DX I.U. 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 time bands.

The delivery temperature to the system is calculated from the climatic curve based on the outdoor thermal values. The maximum flow temperature useful for determining the design conditions varies based on the outdoor values, according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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

The Hydromodules are located in a room set up on the same level as the shops. Each HMU serves the apartments on the floor via a riser column, which brings the heating water to the specific floor from the boiler room.

Each apartment has a consumption distribution box, controlled by a room thermostat (RT), which allows you to use the heating according to your needs, thus paying only for actual use.
Distribution inside the apartments occurs with radiant floor panels.

In the apartments, air conditioning is disabled by a specific setting available in the RC-EX3H control connected to the HMUs.

The direct expansion indoor units are positioned in the shops (one or more based on need).

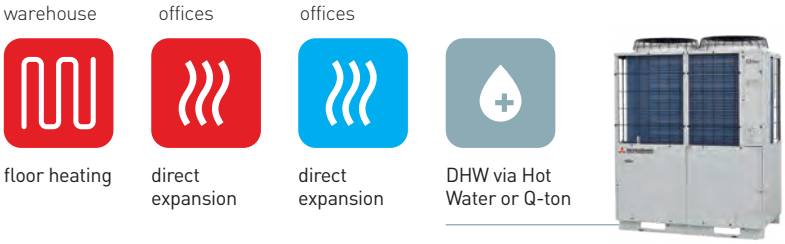
The management costs are divided per I.U., whether air or water, by means of a centralized control which, in the presence of a LAN connection, also allows remote management via the web.

WAREHOUSE HEATING VIA HMU UNITS LOCATED IN A TECHNICAL ROOM AND OFFICE AIR CONDITIONING VIA AIR-TO-AIR I.U., CONNECTED TO A KXZ SYSTEM

The system involves the supply of hydronic heating via a radiant floor distribution system for a warehouse that does not require summer air conditioning, and is adjacent to the company office building.

The air conditioning of the offices takes place with internal direct expansion air-to-air units.

DHW production is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the volume needed.



SYSTEM FEATURES

28-168 kW
Capacity range of the outdoor units

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

160% (max)
(for O.U. more than 45 kW)

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

40 m
Max. splitting level difference between the O.U. and the I.U. (HMU or DX).
With design temperature lower than -10°C, the O.U. must always be placed above the I.U.

18 m
Max. splitting level difference between I.U. (HMU or DX)

510 m (max)
Total splitting distance

CONTROL SYSTEM

Through the SL4 centralized control, it is possible to manage every single U.I. (including HMU modules) to the system both locally and via the Internet.

Local control is also available for each DX I.U. 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 time bands.

The delivery temperature to the system is calculated from the climatic curve based on the outdoor thermal values.
The maximum flow temperature useful for determining the design conditions varies based on the outdoor values, according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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

The necessary Hydromodules are positioned inside a designated room (thermal power plant) and use the circulators present inside them to push the water into a storage tank, which acts as a hydraulic separator between the primary circuit, composed of the HMUs and the secondary, consisting of the distribution system towards the warehouse with radiant floor panels.
The direct expansion indoor units are positioned in the office building in quantities and types suitable for needs.

In the presence of a LAN connection, remote control via the web is possible.

INDEPENDENT HEATING VIA HMU UNITS LOCATED IN EACH APARTMENT AND AIR CONDITIONING VIA AIR-TO-AIR I.U., CONNECTED TO A KXZ SYSTEM

The system provides independent heating and cooling for the apartments of a residential building.

The heating is hydronic via a radiant floor distribution system for each individual property unit. Air conditioning takes place with indoor direct expansion air-to-air units located in the same rooms.

The preparation of domestic water is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the necessary volume.

floor heating

direct expansion

DHW via Hot Water or Q-ton

SYSTEM FEATURES

28-168 kW
Capacity range of the outdoor units

28 kW
Min. I.U. capacity that can be installed per apartment, divided into 14 kW (1 HMU) + 14 kW split between the various DX I.U.

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

160% (max)
(for O.U. more than 45kW)

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

40 m
Max. splitting level difference between the O.U. and the I.U. (HMU or DX)

18 m
Max. splitting level difference between I.U. (HMU or DX)

510 m (max)
Total splitting distance

-10°C
Min. outdoor design temperature

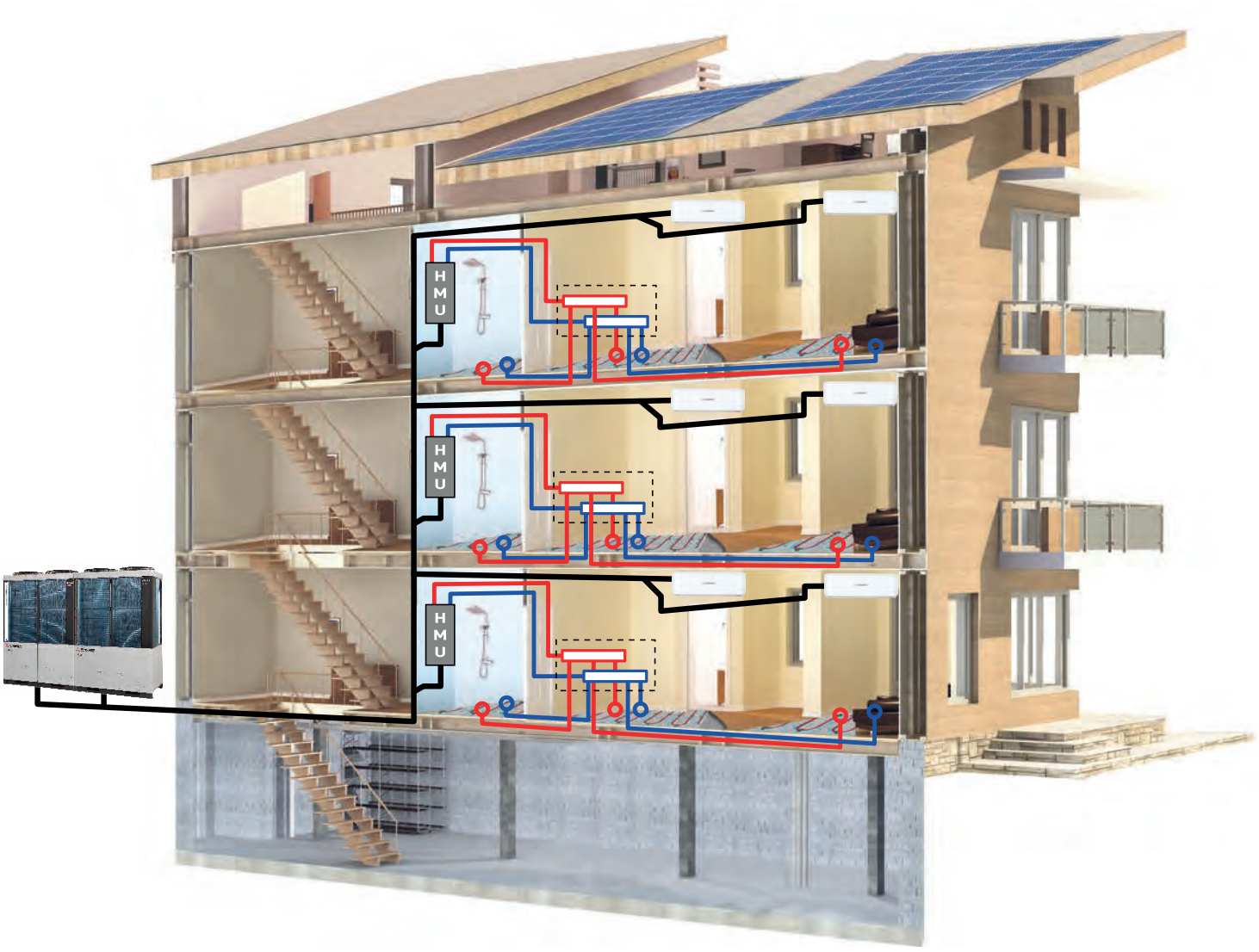
CONTROL SYSTEM

Through the SL4 centralized control, it is possible to divide the operating costs between the various real estate units.

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

The delivery temperature to the system is calculated from the climatic curve based on the outdoor thermal values.
The maximum flow temperature useful for determining the design conditions varies based on the outdoor values, according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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 apartment and each uses the circulator present inside to push the water directly into the floor system.

The U.I. with direct expansion ensure efficient air conditioning and an exceptionally low sound level for a VRF system, as the expansion valves which normally cause noise are remoted, soundproofed and isolated inside or outside the apartment.

They are powered continuously with a backup card, so that the user can cut off the power to his apartment without damaging the functioning of the entire system.

Each apartment is autonomous in terms of determining operating costs, since the distribution is made by I.U., whether air or water, by means of a centralized control installed in the DHW production room.

INDEPENDENT HEATING VIA HMU UNITS LOCATED WITHIN THE STORE AND AIR CONDITIONING VIA AIR-TO-AIR I.U., CONNECTED TO A KXZ SYSTEM

The system involves the supply of independent heating and cooling for the shops of a shopping centre, located on the same floor.

Hydronic heating is provided via a radiant floor distribution system for each individual store. Air conditioning takes place with indoor direct expansion air-to-air units located in the individual rooms.

The preparation of domestic water is centralized and entrusted to specific products such as Hot Water or Q-ton, based on the necessary volume.

floor heating

direct expansion

DHW via Hot Water or Q-ton

SYSTEM FEATURES

28 kW

Min. I.U. capacity that can be installed per apartment, divided into 14 kW (1 HMU) + 14 kW split between the various DX I.U.

28-168 kW

Capacity range of the outdoor units

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

160% (max)
(for O.U. more than 45 kW)

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

40 m

Max. splitting level difference between the O.U. and the I.U. (HMU o DX). With design temperature lower than -10°C, the O.U. must always be placed above the I.U.

18 m

Max. splitting level difference between I.U. (HMU or DX)

510 m (max)

Total splitting distance

CONTROL SYSTEM

Through the SL4 centralized control, it is possible to divide the operating costs between the various users.

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

The delivery temperature to the system is calculated from the climatic curve based on the outdoor thermal values.
The maximum flow temperature useful for determining the design conditions varies based on the outdoor values, according to the table alongside.

Outdoor design temp.	Maximum design temp. for the delivery	Minimum return temp.
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

The Hydromodules are located inside the shop (one or more based on need) and each uses the circulator present inside to push the water directly into the floor system.

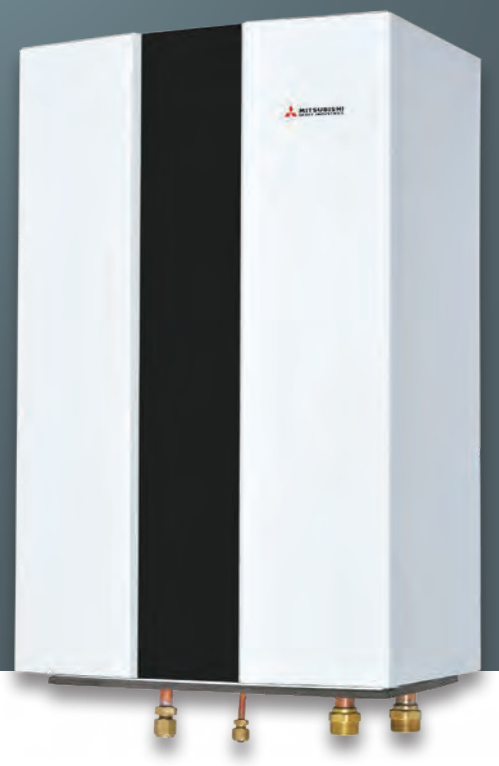
The U.I. with direct expansion ensure excellent air conditioning thanks to effective dehumidification of the rooms, typical of the system.

The expansion valves are powered continuously with a backup board, so that the tenant can cut off power to his shop without damaging the operation of the entire system.

Each shop is autonomous in terms of determining operating costs, since the distribution is made by I.U., whether air or water, via a centralized control installed in the DHW production room.

KXZ2 HEATING FOR HEATING RESIDENTIAL AND COMMERCIAL BUILDINGS

COP 4.20	A++	-20°C	55°C
Energy efficiency with COP up to 4.20	Energy efficiency class	Outdoor air minimum operating limit	Delivery water temperature water only



KXZ HEATING - HYDRONIC MODULE

THE HYDRONIC MODULE FOR THE PRODUCTION OF HOT WATER CONNECTED TO THE KXZ SYSTEMS

The HMU KXZ hydronic module is a unit designed and distributed by Mitsubishi Heavy Industries to provide winter heating for residential and commercial buildings.

HMU KXZ is an indoor unit that can be connected to the outdoor units of the KXZ system, thanks to which it is possible to produce hot water up to a temperature of 55°C for heating.

Through the use of this hydronic module, the KXZ system can entirely replace traditional heating systems, avoiding the construction of the heating plant and the flue and the costs relating to the supply of methane gas. Therefore the KXZ system becomes a complete and even more flexible system, adapting to different installation needs.

A SOLUTION THAT REDUCES CO2 EMISSIONS ON SITE AND GUARANTEES HOT WATER PRODUCTION WITH HIGH ENERGY EFFICIENCY

The system can be used in two different ways:

a) **exclusively with HMU indoor units connected to the system (water only application);**

b) **with indoor air-to-air units and HMU units coexisting in the same system (mixed application).**

Distribution within the rooms can be assigned to radiant panels, fan coils and air heating units.

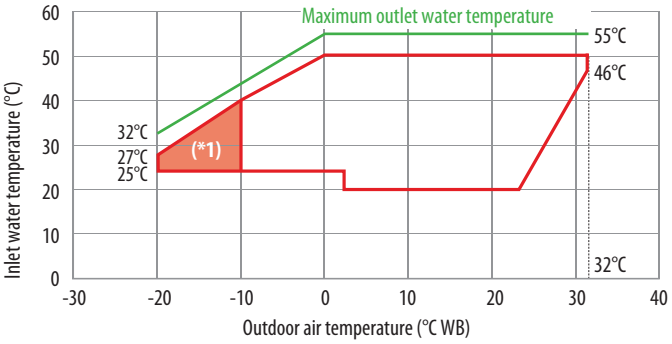
HMU UNITS

PARTS THAT MAKE UP THE HYDROMODULE

The Hydromodule is composed of the following parts:

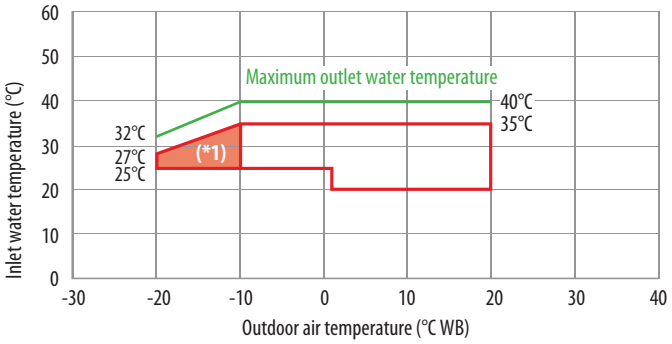
Electric control box	Plate heat exchanger	Circulation pump
HMU-kit	14 kW : V26Hx26 28 kW : V26Hx50	14 kW : 80kPa 28 kW : 90kPa

RANGE OF USE OF HMU IN WATER ONLY MODE



(*1) In the highlighted area, operation is possible with some limitations.

RANGE OF USE OF HMU IN MIXED MODE



(*1) In the highlighted area, operation is possible with some limitations.

IMPORTANT!

In case of cold start-up of the system for the first time in winter, it is advisable to prepare the hydraulic connections for an additional electric heater to be used to bring the water to the minimum expected temperature, based on the outdoor temperature. This way, if necessary, the heater can be installed and dismantled after start-up.

HMU UNITS

PERFORMANCE

Indoor unit model				HMU 280 KXZE1
Outdoor unit model				**FDC 280 KXZE2**
Heating	Rated power	A7//W35	kW	25.20
	Power input			6.00
	Perfomance coefficient		COP	4.20
	Rated power	A7/W45	kW	23.15
	Power input			6.90
	Perfomance coefficient		COP	3.36
	Rated power	A7/W55	kW	23.00
	Power input			8.40
	Perfomance coefficient		COP	2.74
	Nominal water flow rate		L/min	80
	Seasonal energy efficiency (ηs)	35	%	151
	Energy efficiency class	35	-	A++

TECHNICAL FEATURES

Model				HMU140 KXZE1	HMU 280 KXZE1
Heating	Max capacity		kW	14.00	28.00
Operating range	Outdoor air temperature	Water only	°C	-20~32	
		Mixed use		-20~20	
	Delivery water temperature[1]	Water only	°C	25~55	
		Mixed use		25~40	
Hydraulic data	Water flow	Min ~ Max	L/min	20 ~ 40	24 ~ 80
	Heat exchanger		Type	Brazed plates	
	Circulation pump			Included	
	Pump static pressure		kPa	98	80
	Expansion vessel			Not included	
	Water connections size		inches	R1-1/2"	
	Safety valve		bar	6	
Electrical data	Power supply		Ph-V-Hz	1ph-220~240V-50Hz	
	Maximum current		A	1.54	1.54
	Power input	Max	kW	0.36	0.36
Product specifications	Dimensions	HxLxD	mm	955(+110)x550x354	
	Weight	Net	kg	46	48
	Sound pressure level	Max	dB(A)	27	31
	Sound power level	Max	dB(A)	46	49
	Refrigerant pipings	Liquid - Gas	inch (mm)	ø3/8" (9.52) - ø5/8" (15.88)	ø3/8" (9.52) - ø7/8" (22.22)
Control (not included)	Wired control			RC-EX3H	

1. For project specifications, see the field of application in detail.

Q-TON

Q-TON
HIGH PERFORMANCE

R744
LOWEST GWP REFRIGERANT

Q-ton is a system that uses renewable air-thermal energy for significant energy and consumption savings.

HIGH PERFORMANCE

- It is particularly suitable for the production of DHW at cold outdoor temperatures, down to -25° C.
- It can produce mixed DHW at 45°C up to 17,000 litres/day, or at 90°C without mixing.
- Maintains nominal power output down to -7° C.

RESPONSIBLE FOR THE ENVIRONMENT

- Minimizes the environmental impact thanks to the low GWP value = 1, with CO2 refrigerant.
- ODP (ozone destruction coefficient) equal to zero.

TOP EFFICIENCY

- The highest energy efficiency coefficient in the sector in DHW production mode (rated COP 4.3).
- Maximum reduction in management costs.

FLEXIBILITY & RELIABILITY

- It is modular up to 16 units.
- High quality, durable internal components.
- It boasts extreme versatility of use and easy operation and maintenance.

OPERATION IS JUST A CLICK AWAY

- Touch screen control panel, with user friendly graphics.
- Possibility of sending notifications via MODBUS communication with the interface RCI-MDQE2.

-25°C
Operation limit

17000
DHW liters per day

-7°C
100% nominal yield down to -7° C

90°C
DHW temperature without mixing

1 GWP
Global Warming Potential minimo

0 ODP
Ozone Depletion Potential zero

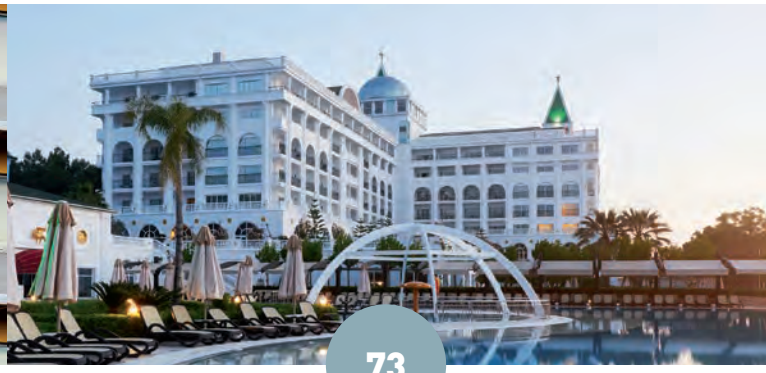
High efficiency

6.07 COP
Maximum energy efficiency coefficient in DHW

16
Connectable Q-ton outdoor units

Q-TON

APPLICATION EXAMPLES



72

73

Q-TON FOR ACS

Residential

Commercial

MITSUBISHI HEAVY INDUSTRIES

Q-TON FOR CENTRALIZED DHW PRODUCTION

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the figure describes the system of a large condominium in which the production of domestic hot water is entrusted to the Q-ton system, a CO2 heat pump: the system is combined with 3 stratifying tanks whose storage volume it can vary from 500 up to 4500 litres.

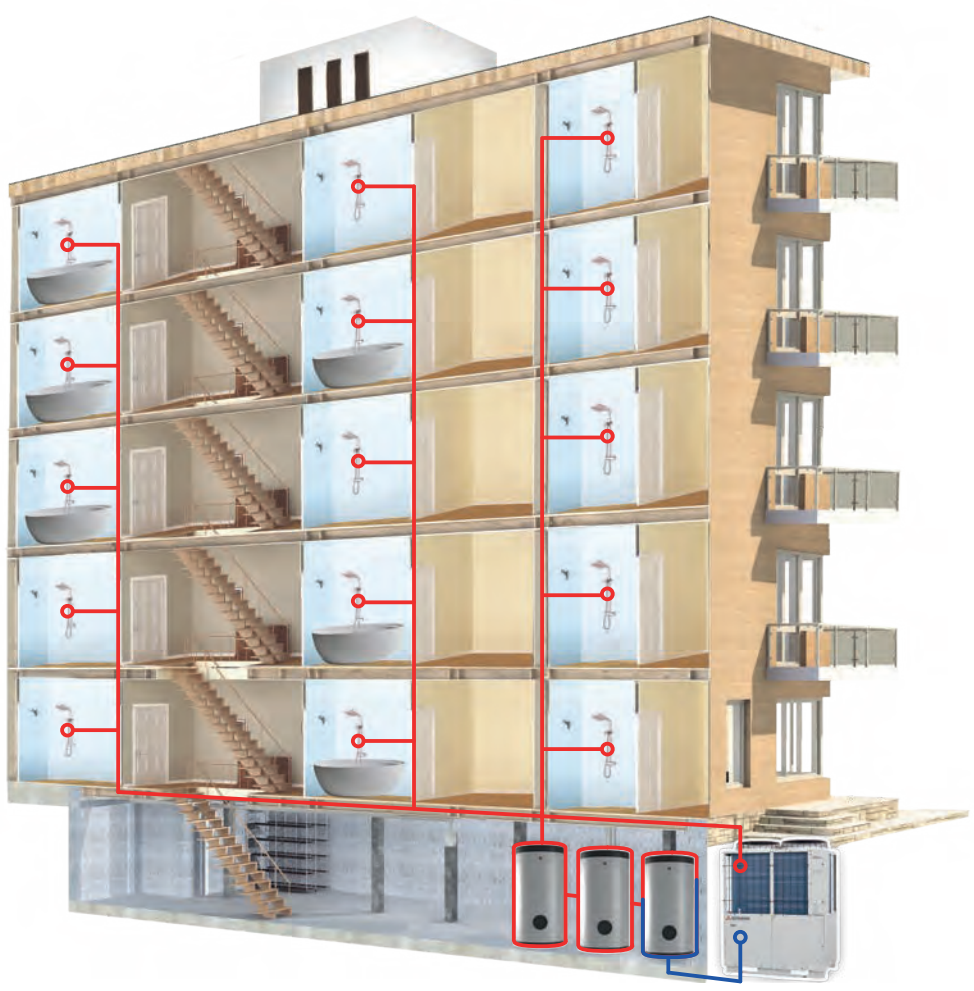
Q-ton produces 750 liters per hour of post-mixed hot water at 45° C, except for the energy input necessary for recirculation.

The Q-ton system can also be installed in series with tanks already present in a pre-existing system.

SYSTEM CHARACTERISTICS

4500

Liters of DHW per day



Q-TON FOR CENTRALIZED DHW PRODUCTION

DESCRIPTION OF THE SYSTEM

The application typology exemplified in the figure describes the system of a hotel equipped with a SPA in which the production of domestic hot water is delegated to the Q-ton system, a CO2 heat pump: the system is made up of 2 Q-ton units, connected in series, combined with 5 stratification tanks whose storage volume can vary from 500 to 7500 litres, except for the energy input necessary for recirculation.

To satisfy the need to produce large quantities of DHW, the Q-ton system can be installed in a modular combination: it is possible to connect up to 16 units of 30 kW each, controlled by a single remote control.

Consider that a 30 kW unit can produce up to 17,000 liters of DHW per day.

SYSTEM CHARACTERISTICS

16
Connectable outdoor units

7500
Liters of DHW per day

60 kW
modular combination

MITSUBISHI HEAVY INDUSTRIES

Q-TON
DHW FROM FREE NATURAL ENERGY

Q-ton systems are the only ones on the market that use R744 gas capable of working on low temperature heating systems and having a seasonal energy efficiency class of A+. These systems, being ECO friendly, are attentive to the possible risks associated with the introduction of climate-altering gases into the atmosphere and, in order to avoid the possible leakage of gas, are equipped with leak control sensors.

R744

REFRIGERANT GAS R744 (CO2)

90°C

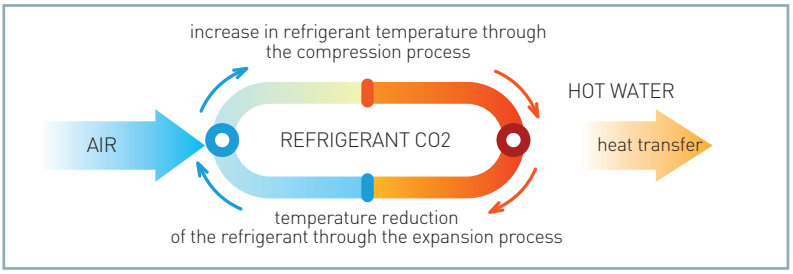
DOMESTIC HOT WATER PRODUCTION UP TO 90°C

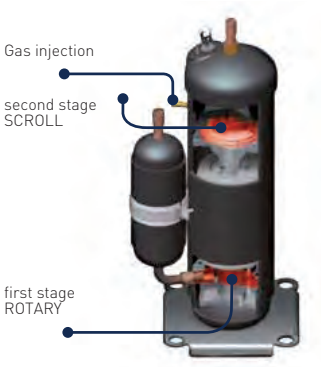
HEAT PUMP KEYMARK
Certificate of Approval for the Heat Pump KEYMARK Scheme

Q-TON - CO2 HEAT PUMPS

GRS two-stage compressor

Q-ton, thanks to the action of the two-stage compressor, allows you to produce a high quantity of energy for heating or for the production of domestic hot water. The nominal thermal power generated is stable and constant even as the external temperature decreases.





LCD touch panel

The management and main parameters of the system can be controlled both from the LCD wire control and remotely via MODBUS protocols. The system allows, via the wired control, to independently select the system's operating priority (heating or domestic hot water).

The circuit flow temperatures can be set either fixedly or by selecting the climatic curve.

EASY TO USE

LCD panel with illuminated buttons.
Large 2.8 inch display.
Backlight.

PEAK-CUT TIMER

Possibility of setting a DHW production schedule based on peak demand.

DAYLIGHT UPDATE

The system automatically adapts to daylight saving time allowing easy programming.

SCHEDULING

It is possible to carry out daily, weekly and annual programming.

THE TANK

It is always possible to manually fill the tank.

CLIMATE CURVE

In heating mode, it is possible to set a customizable climate curve that automatically determines the flow temperature based on outdoor temperature conditions.

RC-Q1EH2 FOR Q-TON

Q-TON - DOMESTIC HOT WATER PRODUCTION

Q-ton heat pumps absorb "free" heat from the outside air and amplify it to generate hot water quickly and efficiently, up to 90°C, without the need for additional electrical resistance.

They reduce operating costs and carbon emissions by 40 to 75% compared to a traditional system. They are suitable for installation in new buildings and do not require a backup system for heating. In existing buildings, with traditional heating systems, they are applicable only in the domestic hot water production function.

DOMESTIC HOT WATER

The installation of a Q-ton system is ideal for replacing old heating systems such as boilers, because it produces DHW based on the actual capacity required by the user.

PERFORMANCE

Operation down to -25° C outdoors

With DHW production up to 90° C

YIELD

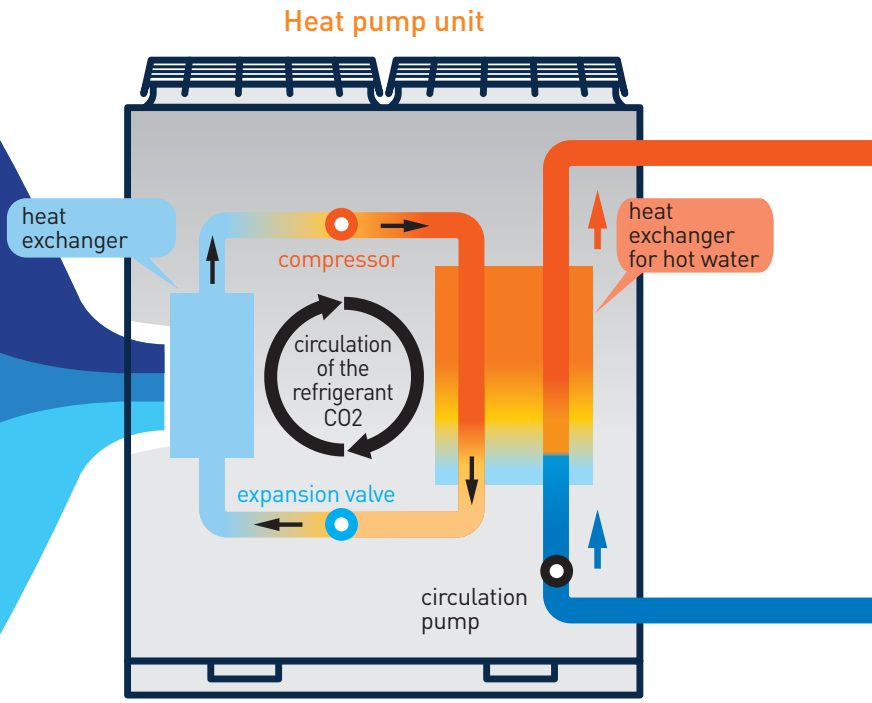
100% down to -7° C

Maintenance of nominal power output at 100% down to -7° C

EFFICIENCY

COP 4.3

The highest value on the market



90°C

Reachable temperature

16

Connectable outdoor units

480

The maximum modular power in kW

HOW DOES IT WORK

Q-ton systems use a cold refrigerant coil that absorbs heat from the outside air and, using the unique 2-stage compressor, compresses the refrigerant to increase its temperature. The heat exchanger then uses the heat generated to produce domestic hot water.

POWER AND DESIGN FLEXIBILITY

It is possible to manage up to 16 outdoor units by using a single control.

The maximum power that can be achieved by a combined system is 480 kW.

These powers make the installation of a Q-ton system suitable in large newly built condominiums, or in super-condominiums with district heating systems pre-existing.

SENSORS IN TANKS

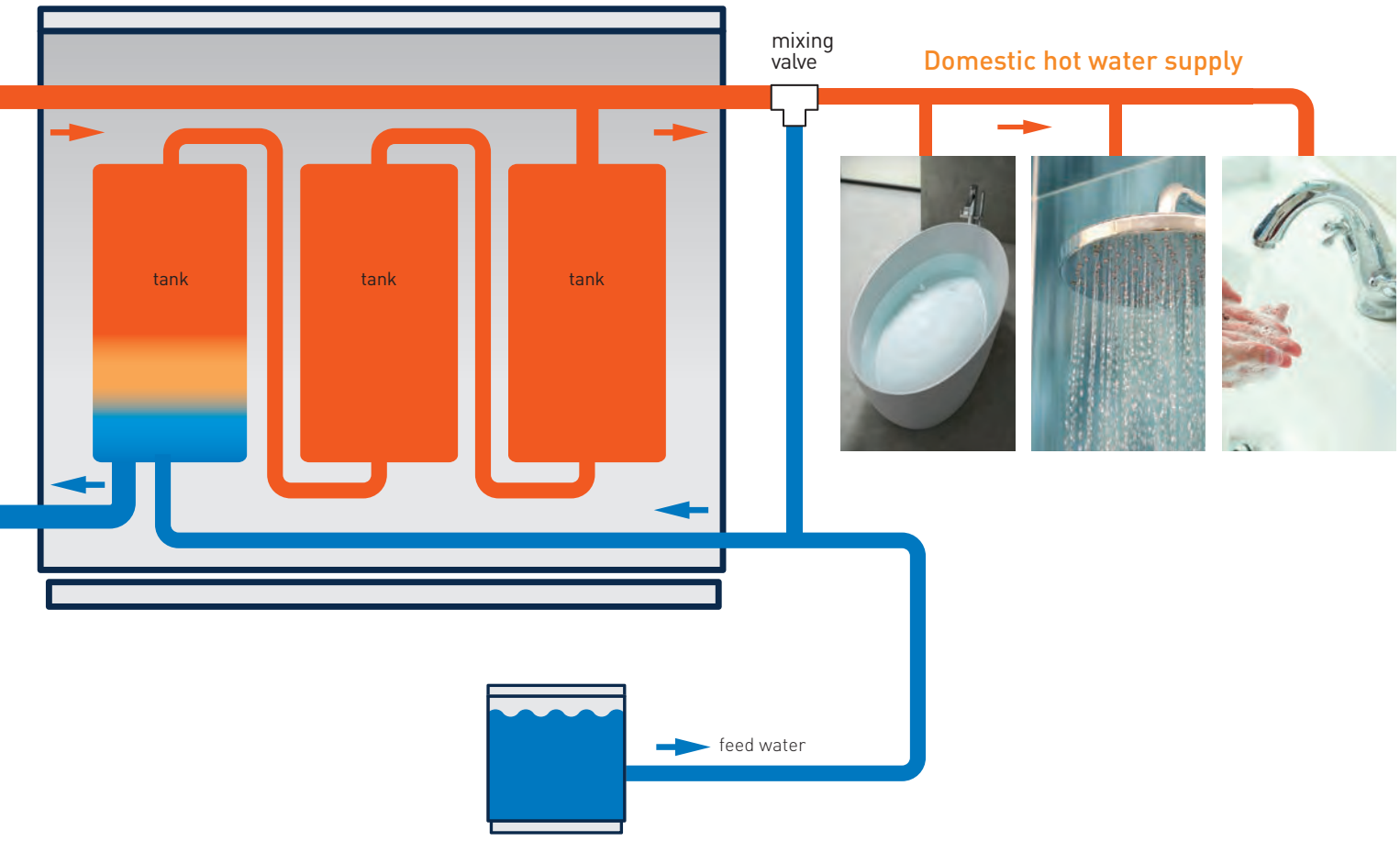
Each storage tank has five compartments in which temperature sensors can be inserted to detect the volume (in %) of hot water contained in the tank at a given time.

PROGRAMMING

The programming of the control system is made to maintain specific volumes of hot water at different times of the day, based on the user's needs.

REDUCED COSTS

Further savings for the user are given by the possibility of heating and storing water during times when electricity rates are lower.



MITSUBISHI HEAVY INDUSTRIES

Q-TON DHW

16 UNITS CONTROLLED BY A SINGLE DEVICE

Up to 480 kW of capacity by connecting 16 units of 30 kW each.
The extremely flexible modular configuration allows the installation of Q-ton DHW production, adapting the power of the system to different application contexts. The entire system can be managed from a single control device.

THE BEST OF SAIE INNOVATION 2016 VERSO IMPATTO ZERO TOWARDS ZERO IMPACT

Depending on the applications and installation needs, a module from 30 kW it can produce 17,000 liters of DHW per day.

Model				ESA30EH2-25
Nominal data	Power output (DHW production)	A16/W65[1]	kW	30
	Power input			7.0
	Performance coefficient		COP	4.30
Seasonal data	Test cycle profile			XXL
	Energy efficiency (nwh)		%	114
	Energy efficiency class			A
	Annual energy consumption		kWh/y	1909
Operating range	Outdoor air temperature		°C	-25~43
	Delivery water temperature			60~90
Refrigerant circuit data	Refrigerant		type (GWP)	R744 (1)
	Quantity (tons CO2)		kg (t)	8.5 (0.00)
	Compressor		type	Double stage - DC Inverter
Hydraulic data	Heat exchanger		type	Shell and tube
	Circulation pump	Static pressure	m (kPa)	5 m (49 kPa) @ 17L/min
	Water connections	Size	Inches	3/4" (DN20)
	Operating pressure	Min/Max	bar	1/5
Electrical data	Power supply		Ph-V-Hz	3Ph-380~415V-50Hz
	Maximum current		A	21
	Power cable (recommended)		type	5x6 mm²
Product specifications	Fan	Air flow	m³/h	15600
		Static pressure	Pa	50
	Sound power level		dB(A)	70
	Dimensions	LxDxH	mm	1350x720x1690
	Weight	Net	kg	375
Controls	Wired control	Not included		RC-Q1EH2
	Modbus	Optional		RCI-MDQE2

The data reported above refers to the following standards: EN 14511:2018; EN 14825:2019; EN50564:2011; EN12102-1:2018; EN12102-2:2019; (EU)No:811:2013; (EU)No:813:2013; OJ 2014/C 207/02:2014.1. Water conditions: inlet 17° C, outlet 65° C.

M-ACCESS

RM-CGW-E1

Management interface via M-ACCESS: this is a remote monitoring system for MHI products that adopts Cloud-type Gateway equipment and which allows centralized management of air conditioning and **DHW production** systems from multiple remote locations using the Internet of Things (IoT).

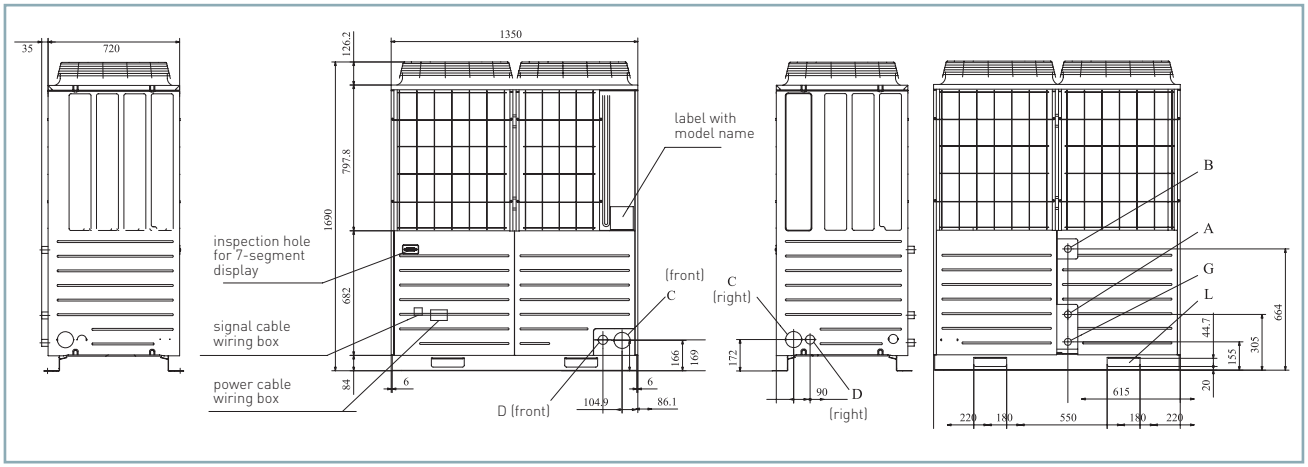
You can easily monitor and manage the status of external and internal drives via the Internet using, for example, a PC or tablet.

Some of the available functions are as follows:

- Real-time monitoring of machines.
- Management of operating parameters (on/off, mode, temperature and fan speed).
- Electricity consumption and alarm notifications via email.

All MHI residential, commercial, VRF and Q-ton products (with the necessary interface cards) can be connected to this new and innovative system.

ESA30EH2-25 DIAGRAMS AND DIMENSIONS



Item	Description	
A	Water inlet	RC 3/4 (copper tube 20A)
B	Hot water outlet	RC 3/4 (copper tube 20A)
C	Connection lines' output between the heat pump and the tank	0 88 (or 0 100)
D	Power cables' input	0 50 (right, front) lower hole 40x80
G	Waste water pipe outlet	RC 3/4 (copper tube 20A)
L	Opening for movement	180x44.7

MITSUBISHI
HEAVY INDUSTRIES

Due to the continuous technological evolution of the products, we reserve the right to vary the technical specifications within this catalog at any time and without giving notice. The products depicted are only examples of the application types. The data is measured under the following conditions (ISO-T1). Cooling: indoor ambient temperature 27°C DB, 19°C WB and outdoor temperature 35°C DB; heating: indoor ambient temperature 20° C DB, and outdoor temperature 7° C DB, 6° C WB. The energy efficiency values refer to measurements carried out following the harmonized standard EN 14511:3.

04-2024

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