

# EXP BOX

Multi-purpose System



Built-in hydronic system  
for the simultaneous or independent  
management of hot and cold water  
production



**NIBE** GROUP MEMBER

# Versatility and efficiency in any application context

**EXP BOX** is a modulating hydronic unit, which allows, together with a water-cooled chiller, the simultaneous or independent production of cold water and/or hot water. The solution, innovative to the HVAC market, has been patented by Rhoss.

RHOSS introduces a new generation of multi-purpose systems where the user can choose the technology, the gas refrigerant and type of compressors most suitable for the application, guaranteeing the EXP technology features, without any compromise.

With **EXP BOX**, Rhoss makes what does not exist on the HVAC market of traditional multi-purpose units, possible.



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**Multi-purpose system configurable with water-cooled chillers chosen with scroll or screw technology, both stepless and inverter**



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**Functional design  
and installation  
flexibility**

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**Top class energy  
efficiency with TER  
values up to 8.74**

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**Patented  
solution**



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**Green solutions  
with reduced  
environmental impact  
with the possibility  
of choosing low GWP  
ecological refrigerants**

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**Energy saving with the  
integrated Freecooling  
function**

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**Over 20 years  
experience in  
multipurpose units**

# The patented modulating hydronic unit

**EXP BOX** is a modulating hydronic unit that is connected to the heat exchangers of the chiller and to the source (usually groundwater) and, due to its integrated logic, works in symbiosis with the chiller to supply the thermal loads of the user.

In this manner **EXP BOX** together with a water-cooled chiller allows, the simultaneous or independent production of cold water and/or hot water.

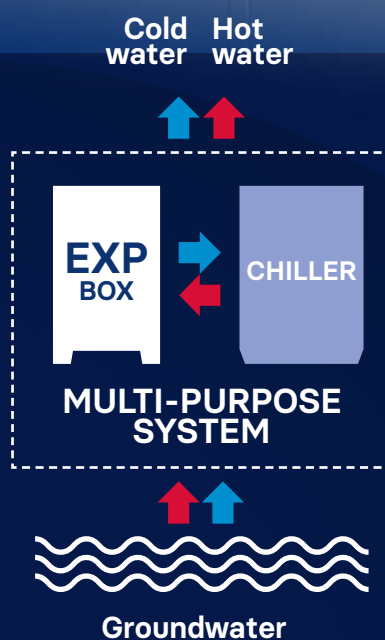


## Operating mode

**EXP BOX**, through its control logic, contained therein, interacts with the water-cooled refrigerant units and functions in three operating modes:

- cold water production
- cold and hot water production
- only hot/very hot water production (also for DHW preparation use)

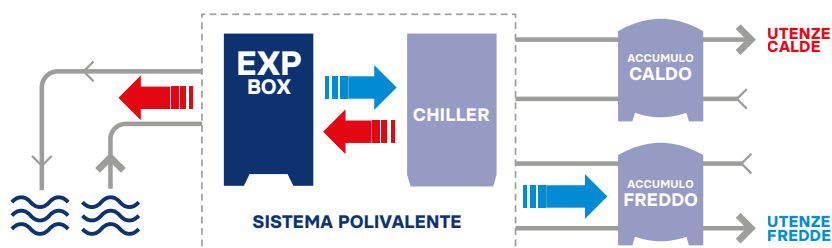
The operating modes of **EXP BOX** are activated automatically to meet the user load demands.



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## Cold water production

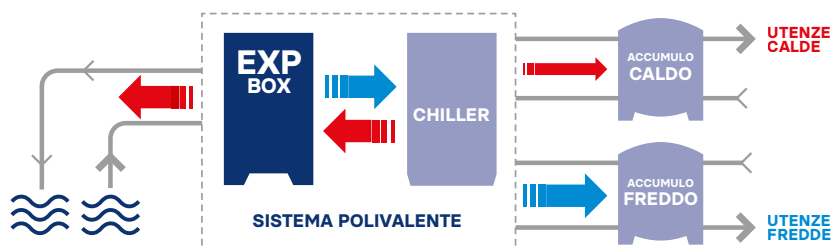
**EXP BOX**, in this mode, works to supply the chiller load required by the user producing chilled water according to the set temperature.



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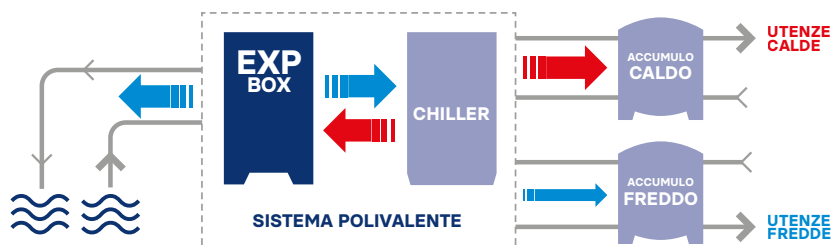
## Cold water and hot water production

**EXP BOX**, in this mode, works to supply both the cooling and thermal load required by the user and according to the imbalance of the loads, manages an operating priority that can be mainly for cold water or hot water production.



### Cold water priority

The demand for cold water is usually met by the chiller, while the demand for hot water is modulated by **EXP BOX**. Application in which the cooling load is greater than the thermal load.



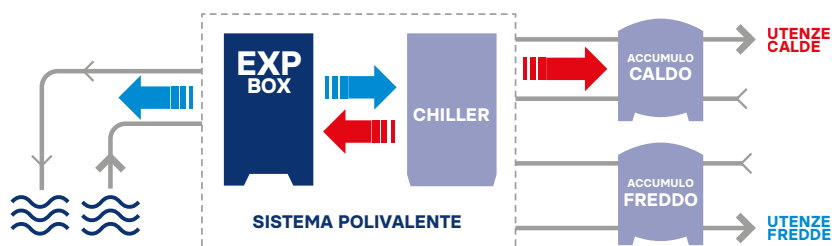
### Hot water priority

Application in which the demand for heating capacity is greater than the cooling capacity. The demand for cold water is met by the chiller, while the higher demand for hot water is integrated using the source (groundwater) and optimally modulating the thermal load.

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## Cold water hot water

**EXP BOX**, in this mode, works to supply only the thermal load required by the users using the source (groundwater).



# Automatic management and control of all parameters



## Control

The control developed by Rhoss is the system's core allowing the precise and automatic adjustment of the parameters for the management of the various functions of the **EXP BOX**.



## Source side intermediate heat exchanger

The plate exchanger, which can be inspected, located inside **EXP BOX**, allows the heat exchange between the water produced by the chiller and the groundwater.

## Hydraulic connections

**EXP BOX** is connected to the Rhoss water-cooled chiller and to the users to meet the demand for cold and hot water in a 4-pipe system.

## Dedicated components

The valves are sized to allow the correct distribution of cold and hot fluids to the users and are regulated by the control logic of the **EXP BOX**.

EXP BOX Multi-purpose System

# Maximum customisation for every requirement

## High technological content with zero impact

The multipurpose **EXP BOX** system is the innovative solution, which the customer can customise, to reach up to 1 MW of power with scroll, screw and inverter technology of the water-cooled chiller selected. The system's refrigerant gas belongs to the cooling unit chosen with the opportunity of selecting between traditional refrigerants or GWP reduced refrigerants with low environmental impact.

## Software dedicated to the best solution

The **EXP BOX** hydronic units to create your own **EXP** system, are available in 16 sizes and thanks to the RHOSS selection software you can always find the right match to meet the cooling and thermal load demands.





## Refrigeration units available



### **Range Y-FLOW**

water cooled unit with scroll compressors and R410A refrigerant gas also in the high temperature version up to 65°C



### **Range FullFLOW ECO VFD (1+i)**

water-cooled unit with inverter and stepless screw compressors, R1234ze refrigerant gas also in the high temperature version up to 60°C

### **Range FullFLOW VFD (1+i)**

water cooled unit with inverter and stepless screw compressors, R513A refrigerant gas also in the high temperature version up to 60°C

### **Range FullFLOW DX**

water-cooled unit with inverter and stepless screw compressors, R513A refrigerant gas and alternatively with R134a and R1234ze refrigerant gas, also in the high temperature version up to 58°C

# The **advantages** of the multi-purpose system



Solutions  
for a new  
concept  
of comfort,  
versatility  
and sustainability

## **Countless** combinations and green solutions

**EXP BOX** is available in 16 sizes that can be combined with water-cooled chillers.

The chillers can be chosen with scroll or screw technology, both stepless and inverter and with different types of refrigerant gas. The solution and the desired power also with R513A low environmental impact refrigerant gas and HFO gas with almost 0 GWP for a GREEN offer.



## **Operating** **simplicity**

The peculiarity of the multi-purpose system **EXP BOX** is the lack of switching.

The water chiller works without chiller side switching and with maximum energy efficiency. Also in the hydronic module **EXP BOX** connected to the chiller switching does not occur, but hot, cold and groundwater fluids are modulated to ensure that the user load required is met. The operating simplicity and the reduced pressure drops of the system, therefore constitute a perfect solution for the most demanding designer.



## High energy efficiency

The **EXP BOX** multi-purpose system uses water-cooled chillers, working in maximum energy efficiency and minimum electrical absorption conditions, as the heat exchange in the exchangers is always in counterflow.

The energy indexes can reach EER up to 8.56, COP up to 4.86 and TER up to 8.74 at nominal operating conditions



## Exclusive features

Two functions connected to the groundwater source have been implemented in the **EXP BOX** system: Water saving and Water control. The Water Saving function permits the modulation of drawing groundwater, reducing it to a minimum while maintaining the complete operation of the system. The Water Control function allows the monitoring and active control of the  $\Delta T$  between drawing and discharging water or the control of the maximum discharge temperature, in compliance with applicable laws in force. To facilitate the start-up of the systems when the hot tank temperature is particularly low, even a few degrees above 0°C, the Warm Up function has been introduced which allows easy start-up of the cooling unit in total safety.



## Integrated freecooling

**EXP BOX** has been designed to ensure maximum performance with minimum energy consumption.

IT IS equipped with the possibility of supplying free cold water when production conditions allow it. The function is a prerequisite for obtaining LEED certification credits

## The advantages of the multi-purpose system



### Reduced tanks

**EXP BOX** uses chillers with technologies that reduce the minimum quantity of water on the system side to guarantee the correct and safe operation, compared to traditional units. This aspect has an important impact on the spaces to be considered for the tanks and on the related costs to be considered during the design phase.



### Reduced refrigerant load

**EXP BOX**, uses a water-cooled chiller as a generator, which due to its nature is a compact unit with a reduced refrigerant load compared to heat pumps and multi-purpose units. This feature is important for the purposes of the process of obtaining LEED credits and to be always in step with new and future regulations concerning refrigerant content.



### Versatile solution

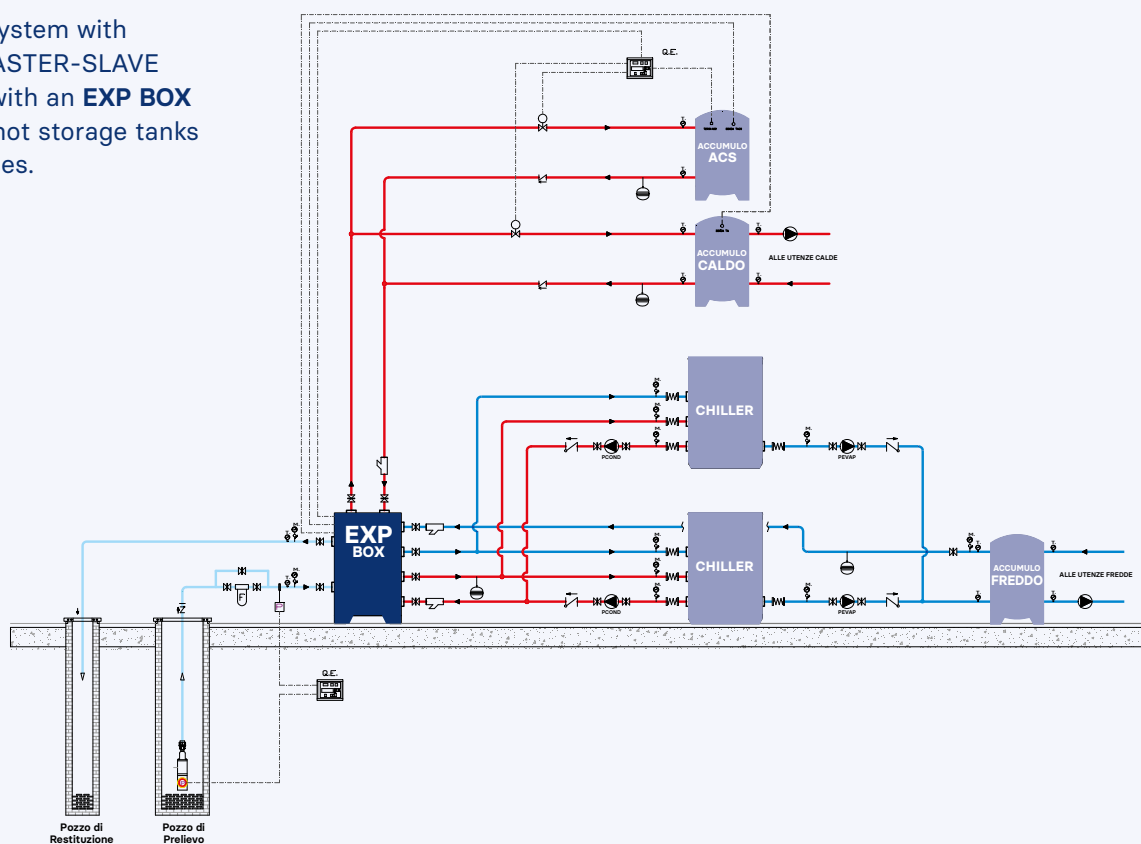
**EXP BOX** is the solution that can use a single chiller connected to the hydronic module or, if an increase in system redundancy is required, to split the power into two chillers connected in MASTER and SLAVE mode.

The system is able to manage the hot tank and cold tank with the set points provided on the system side and possibly a third high temperature water tank for the production of DHW (up to 65°C and higher according to the chiller technology used).

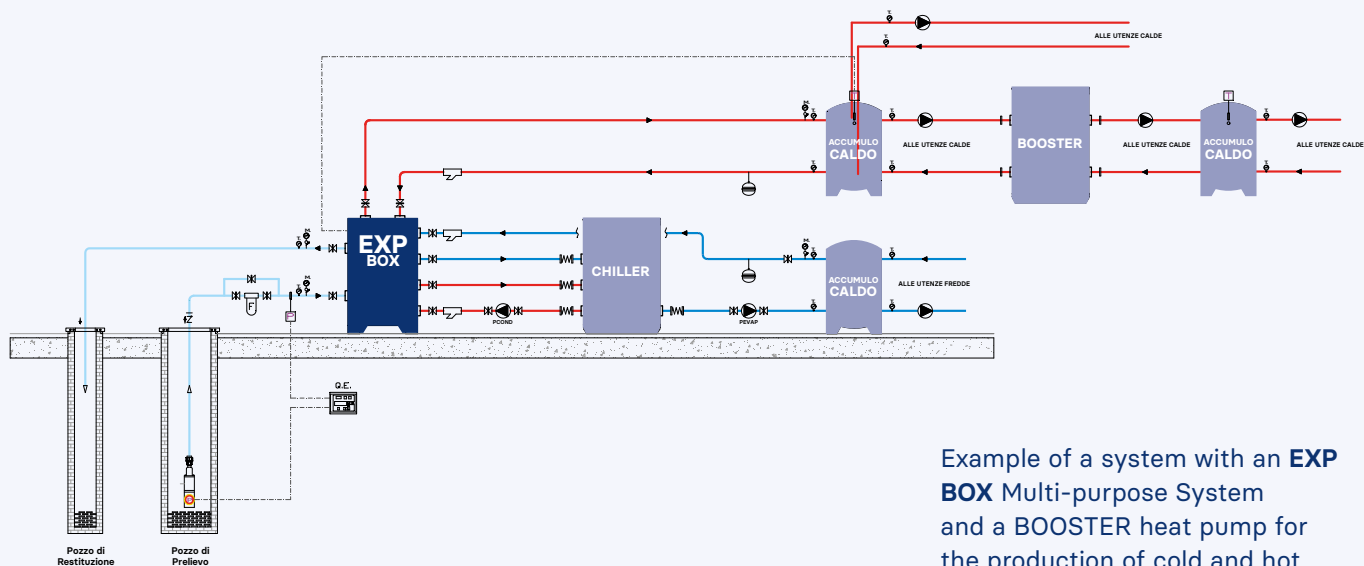
Redundancy is therefore guaranteed both on the system side and on the DHW side, avoiding the cost of installing machines dedicated to this purpose and fully exploiting heat recovery.

## EXP BOX Multi-purpose System

Example of a system with 2 chillers in MASTER-SLAVE configuration with an **EXP BOX** module and 2 hot storage tanks for different uses.



If, for specific needs, the temperature of the hot water produced needs to be increased, the Rhoss **BOOSTER** units can be used with the production of hot water up to 78°C.



Example of a system with an **EXP BOX** Multi-purpose System and a **BOOSTER** heat pump for the production of cold and hot water at very high temperatures.

# Comfort, ecology and flexibility

Efficiency that stands out,  
without being noticed



## Centralised residential complex

(MILAN) - ITALY

Total cooling capacity:

**200 kW**

Machines installed:

**2 CHILLERS + 1 EXP BOX**



## Office building and production site

(BRESCIA) - ITALY

Total cooling capacity:

**550 kW**

Machines installed:

**1 CHILLER + 1 EXP BOX**



## School building (TURIN) - ITALY

Total cooling capacity:

**500 kW**

Machines installed:

**2 CHILLERS + 1 EXP BOX**



## Residential complex (MILAN) - ITALY

Total cooling capacity:

**450 kW**

Machines installed:

**2 CHILLERS + 1 EXP BOX**



## Residential and office building

(MILAN) - ITALY

Total cooling capacity:

**800 kW**

Machines installed:

**4 CHILLERS + 1 EXP BOX**



## Office building and SPA (NOVA MILANESE) - ITALY

Total cooling capacity:

**250 kW**

Machines installed:

**2 CHILLERS + 1 EXP BOX**



## Residential and office building

(MILAN) - ITALY

Total cooling capacity:

**700 kW**

Machines installed:

**2 CHILLER + 2 EXP BOX**





# New air for the future.

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