Technical Bulletin

BT16F056GB-01

VERSATEMP EVH-XS

DIRECT EXPANSION HIGH EFFICIENCY INTERNAL
HORIZONTAL AUTONOMOUS AIR-CONDITIONER

R-410A

SERIE EVH-XS 005.1 - 007.1 RANGE
WATER-AIR HEAT PUMP

Nominal cooling capacity from 2,1 to 2,8 kW
Nominal heating capacity from 2,4 to 3,4 kW

ErP

VERSATEMP EVH-XS is the high efficiency packaged air-conditioner that automatically heats or cools spaces throughout the whole year, using water as source.

Thanks to its rotating compressor, its electronic expansion valve, its plate exchanger and its multi-speed centrifugal fan, this unit stands out due to its high level of efficiency in all operating conditions and its great reliability.

The operating silence is ensured by the particular sound-proofing of the compressor compartment, by the accurate balancing of the fans and by the standard anti-vibration devices for all moving parts.

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Total comfort is required all year round, even in the most difficult application situations

In applications like offices, shops, hotels and public buildings it is necessary to maintain comfort all year round, regardless of the external conditions and the different uses of the served ambient. Each area requires its own temperature, humidity and air purification level, in the fastest and simplest way for users.

The maintenance cost of this comfort depends on the chosen air-conditioning system, both when purchasing and above all during use and maintenance over its working lifetime. The rationale of the chosen system and its energy efficiency are therefore fundamental factors of choice.

Finally, an air-conditioning system must be perfectly integrated into a building, in harmony with the structure and the furniture. In some cases, this is a very complex challenge, where, for instance, external units cannot be installed and air vents cannot be fitted, as in certain buildings or historical structures due to regulatory or aesthetic reasons.



Highly efficient and reliable reversible electric heat pump technology

Electric heat pumps represent an efficient and advantageous choice for ambient air-conditioning. These devices enable energy to be exchanged between the external ambient, known as the source, and the served setting, using the particular refrigeration circuit which they are equipped with. This transfer only requires the use of electrical energy and is highly efficient, therefore at low consumption.

Furthermore, reversible electric heat pumps simplify the system, since only one plant can operate heating and cooling requirements over the entire annual cycle.

Thanks to their energy efficiency, electric heat pumps guarantee the desired level of comfort with reduced management costs and a low impact on the environment. For this reason there are numerous initiatives to aid their production with economic and fiscal incentives.

Heat pump systems which use water as heat source are even more efficient than traditional systems

In the face of apparently limited costs, direct expansion systems, for instance, split, multisplit and VRF/VRV systems have numerous limitations in their applications. The piping which contains the refrigerant passes through served settings and is therefore subject to restrictions and usage limitations. It must be limited in length and insulated. Furthermore, external units may be totally incompatible with the architectural and constructions characteristics of the building.

Hydronic systems are without doubt more complete and versatile. Often the system costs for medium and small sized systems are higher in that they are more highly articulated and subject to labour costs for installation, set up and calibration. The complexity increases even more in large-scale centralised systems with four-pipe distribution.

On the other hand, when each area is equipped with its own heat pump which uses water as a heat source, there are only two supply pipes, which save space and installation costs and pump usage costs. Furthermore, there are no length limitations, since they contain water and not refrigerant. The water temperature is generally neutral in comparison with the served ambient and therefore the pipes do not need to be insulated. By using water as a heat source, the energy efficiency of the heat pump further increases, even as much as by 30%.


The compact and silent solution

EVH-XS brings together the Clivet reversible heat pump technology and the VERSATEMP system reliability in a unit simple to false ceiling positioning and versatile like a fan coil. The minimum height allows the insertion in the most demanding architectural contexts and offers new opportunities to the most demanding designers.

A high efficient rotating compressor with ecological refrigerant R410A, mechanical expansion valve, plate exchanger source side and multi-speed fan: are only some of the solutions available in this completely automatic air-conditioner.

It's the ideal solution when there are the necessity to install the false ceiling unit or for its maximum integration within furnishings. Furthermore, it contains only a minimum quantity of ecological refrigerant (less than 0.6kg), and is therefore not subject to restrictions on use. The two water supply ducts do not have length limitations, even, in many cases, they do not need to be insulated and result easy to install and maintain.

It purifies and conditions the air in all settings

Use water as heat source

It contains the best reversible heat pump technology in its interior

Advantages

System simplification

Thanks to its one-piece construction, the system components and installations are already within the unit itself. The heat or cooling energy which is generated by the unit is directly transferred into the served ambient.

The supply water may come from an energy transfer WLHP loop circuit, from a natural source such as a groundwater.

Silence and reduction of management costs

Thanks to the numerous construction solutions which have been adopted and to its special automatic control, vibrations and sound emissions are undoubtedly reduced.

The reversible heat pump technology at high energy efficiency maintains the required comfort only where and when it is needed, reducing the consumption and therefore the management costs over the entire annual cycle.

In all the applications which allow it, the devices which limit water consumption reduce these expenses even further.

High energy efficiency all year round

VERSATEMP EVH-XS increases the overall system cost thanks to technological solutions from the inside, all choices for efficient operation and long-lasting is guaranteed by strict quality controls in the construction phase and rigorous testing functional on the finished product.

High efficiency rotary compressor

Horizontal rotary compressor with silent and reliable operation, it uses R410A ecological refrigerant. It is fixed on an anti-vibration plate and enclosed in a special compartment further soundproofed.

Source side plate exchanger

Universally recognised for its highly efficient heat exchange, it is complete with a regulation probe and safety device and is offered with a matching mechanical steel knit strainer which can ensure excellent performance over time.

EC fan

The EXTRAQUIET, QUIET and POWERFUL speeds allow to achieve always the best operating conditions in the different applications. In the AUTO mode, the unit automatically sets the most appropriate speed to quickly reach the comfort conditions, thanks to the automatic compensation depending on the distance between the effective temperature in the served room and the set-point.

The silent comfort

The compressor is housed in a dedicated compartment, made of thick stainless steel and covered with sound-proofing material.

It is equipped with a double anti-vibration support system, a vibration sound absorber in the refrigerant circuit, and also with a metal closure hood and finishing in the cased configuration.

At the end of the steady state phase, the AUTO fan mode activation maintains furthermore the minimum speed necessary to maintain the comfort, further increasing the acoustic comfort in the room.

Reliability and safety

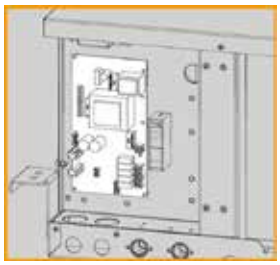
Among the numerous adopted solutions, are:

- The combination of outlet water anti-freeze sensor, treated air anti-freeze sensor, entering water temperature sensor and water flow-rate monitoring device protects the unit from the ice formation and any malfunctioning which may derive from it.
- The thermostatic valve with MOP (Maximum Operating Pressure) function automatically controls the evaporating pressure to an optimal value for the efficient compressor operating, even upon changes of the heat exchange conditions with the water source.

Easy to use in the small and large plants

VERSATEMP EVH-XS is extremely versatile and reliable even in solutions controlled by the User.

Standard automatic functions



The standard VERSATEMP EQV-XS version is equipped with a standard automatic control, complete with a micro processor card and control and safety sensors built-in. Given that it is without a user display, this version represents an efficient solution in all applications open to the public where the operating parameters could otherwise be inappropriately changed:

The automatic standard control:

- it detects the room conditions and compares them with the user set point
- it can automatically choose the operating mode (heating or cooling)
- it decides the activation of resources and can automatically select the fan speed depending on the distance from the scheduled set point;
- it can manage without further accessories a mini local network of 15 units, one of which is a master and the others slaves which replicate its operating

Voltage-free contact user interface

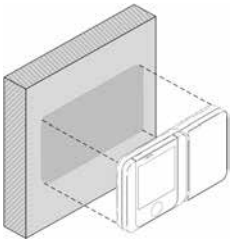
The standard version has a series of voltage-free contacts, or rather contacts without tension, for managing the following functions remotely: Switching on and switching off, Changing function mode (heating or cooling), setting the Set point (standard or economic), Cumulative alarm.

User interface with wall display

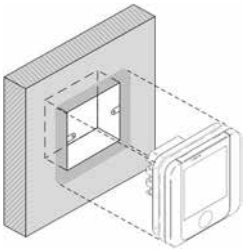
The control can be cased or uncased. It has a modern aspect and is very simple to use even for non-specialised users. Furthermore, it has different access levels, password protected, available for managing the different unit functions.

Among the main functions, it detects the temperature using the temperature sensor in its interior, schedules the operating time bands, displays and manages the operating alarms and parameters, enables the manual management of the fan speed and operating mode (heating or cooling).

USER INTERFACE INSTALLATION



on the wall



in an uncased box

User interface by serial connection

The various communication protocols allow the unit to exchange information with the main supervision systems by means of serial connections.

Modbus® LonWorks BACnet

Easy to connect to the water network

System components for connecting VERSATEMP EVH-XS to water circuit are available as accessories and are already sized to ensure the proper operating and efficiency of the unit.

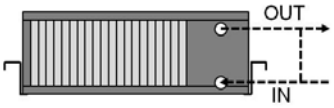
The assembly of hydraulic valves and cock outside the unit allows their place in a easily accessible position of the ceiling for routine maintenance.

Further components which are needed for connecting the hydraulic supply network are available as accessories for installation, encharged to the Client:

- Steel mesh strainer
- ON/OFF motorised 2-way valve for variable flow-rate system
- motorised 2-way modulating valve for system with disposable water
- Hand shut-off valves
- Hand by-pass valve for system cleaning
- Water balancing valve
- flexible pipe for water supply and condensate drain

The unit is complete with plate heat exchanger and control and safety devices.

standard unit



The versatility in different application systems

The integration of the unit with the optional hydraulic components makes it easier to start and run the system operation in the different installations: constant or variable flow-rate loop.

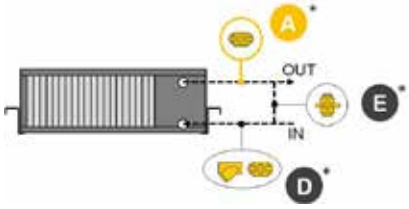
The pipe work arrangements enable the unit to be intercepted from the system, the system cleaning (fluxing), the water mechanical filtration during the ordinary operating to protect the exchanger from fouling.

The 2-way modulating valve, available as accessory, allows to:

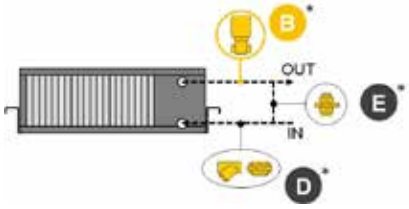
- further extend the application range to systems fed with groundwater or aqueduct. It is so possible to reduce the water consumption;
- extend the standard unit operating range in cooling mode with source at low water temperature;
- maximize the efficiency in heating mode also with source at high water temperature.

In the presence of the 2-way modulating valve, the water feeding must be at variable flow-rate. This allows an interesting energy saving on the installation and then a further reduction of the management costs.

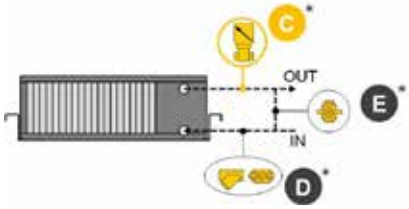
APPLICATION: CONSTANT FLOW-RATE LOOP



APPLICATION: VARIABLE FLOW-RATE LOOP



APPLICATION: WASTE WATER SYSTEM



A- Hand shut-off valve
B - ON/OFF motorised 2-way valve
C - Modulating 2-way motorised valve
D - Steel mesh strainer and hand shut-off valve
E - Hand by-pass valve

*** to instal outside the unit**

Standard unit technical specifications

Compressor

Horizontal rotating hermetic compressor, equipped with liquid separator without oil heater. It is mounted on a steel plate with two damping levels through rubber antivibration mounts.

Structure

Structure made entirely in Zinc–Magnesium plate that guarantees excellent mechanical characteristics and high corrosion strength over time. The compressor area is made from thick metal plate and is completely insulated with soundproofing material to minimise noise output. The ventilating section is completely lined with anti-condensate and soundproofing material.

Internal exchanger

Direct expansion finned exchanger, made of copper pipes in staggered rows and mechanically expanded to the fin collars. The fins are made of aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

External exchanger source side (water)

Direct expansion heat exchanger with braze welded stainless steel INOX AISI 316 plates and complete with external thermal/anti-condensation insulation.

The exchanger is complete with:

- differential pressure switch, water side
- entering water temperature sensor
- leaving water temperature sensor, with antifreeze function

Fan

Dual intake centrifugal electric fan, directly coupled, motor with external rotor, located in the centre of the fan in an aerodynamically optimum position and suspended on antivibration dampers. Forward blades for maximum efficiency and low noise, statically- and dynamically-balanced according to the ISO 1940 standards, section 6.3. The scroll, the rotor and the frame are made from galvanized steel plate (sendzimir).

The fan is mounted on a fixing plate that can be installed rotated by 180° so that the air supply intake is located on the upper part.

Refrigeration circuit

Refrigeration circuit with:

- liquid receiver
- 4-way reverse cycle valve
- safety high pressure switch
- low pressure safety switch
- electronic thermostatic valve

Filtration

Filter mounted on an external filter frame to simplify the maintenance, it can be extracted from the bottom or laterally.

Flat filter, consisting of a galvanized sheet metal frame with galvanized electrowelded protective meshes and 100% polyester renewable with PVC resin. G2 efficiency according to CEN-EN 779 standard (Eurovent class EU4/5 - average efficiency 79% ASHRAE 52 - 76 Atm). Self-extinguishing (resistance to fire class 1 - DIN 53438).

Drain pan

Condensate collecting tray plate "Aluzink" welded, fitted with a discharge coupling and covered externally with anti-condensate insulation.

Trap on the drop conduit to be performed by the installer

Electrical panel

The electrical panel, consisting of a microprocessor control, is located inside the unit and can be accessed via a panel which can be easily removed.

The capacity section includes:

- power input terminals
- main fuse
- Fan fuse

The control section includes:

- microprocessor control
- self-test system
- switch on and off daily and weekly programmer and set point
- cumulative alarms device, potential-free contacts for remote ON-OFF, summer/winter mode change, ECO setpoint setting
- antifreeze protection on the air side
- antifreeze protection water side
- no water flow-rate protection
- return air temperature probe with thermoregulation function
- manual or automatic fan speed selection

Accessories

- Water balancing valve (accessory separately supplied)
- Spring antivibration mounts (accessory separately supplied)
- Steel mesh strainer (sccessory separately supplied)
- Condensate drain pump (accessory separately supplied)
- 200 mm flexible pipes for the connection to the water circuit + drop conduit (accessory separately supplied)
- 500 mm flexible pipes for the connection to the water circuit + drop conduit (accessory separately supplied)
- Shut-off valve for by-pass (water side) (separately supplied accessories)
- 2-way ON-OFF valve for variable flow-rate loop (accessory separately supplied)
- 2-way modulating valve for disposable water system (accessory separately supplied)
- Electronic room control with display, for wall installation (accessory separately supplied)
- Electronic room control with display, for wall installation in built-in box (accessory separately supplied)
- RS485 serial port with Modbus protocol, built-in
- RS485 Serial port with Modbus protocol (accessory separately supplied)
- BACnet serial communication module (accessory separately supplied9
- LonWorks serial communication module (accessory separately supplied)

NOTE: The compatibility of the different options is shown in the table at the end of the "Accessory" section.

General technical data

Size			005.1	007.1
Cooling A 27/19,5 W 30				
Cooling capacity	1	kW	2,06	2,84
Sensible capacity	1	kW	1,75	2,31
Compressor power input	1	kW	0,48	0,60
Total power input	1	kW	0,53	0,67
EER			3,89	4,24
Heating A 20 W 20				
Heating capacity	2	kW	2,43	3,37
Compressor power input	2	kW	0,60	0,82
Total power input	2	kW	0,650	0,874
SCOP			3,74	3,86
Compressor				
Type of compressors	3		ROT	ROT
No. of compressors		Nr	1	1
refrigerant circuits			1	1
Air Handling Section Fans (Supply)				
Type of fans	4		CFG-EC	CFG-EC
Airflow		l/s	111	139
Airflow		m^3/h	400	500
Water side exchanger				
Type of exchanger	5		PHE	PHE
Water flow-rate	6	l/s	0,121	0,165
Pressure drop	7	kPa	2,5	4,0
Connections				
Water fittings	8		1/2"	1/2"
Condensate drain	9	mm	20	20
Power supply				
Standard power supply		V	230/1/50	230/1/50

The Product is compliant with the Erp (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 2016/2281, also known as Ecodesign Lot21.
Performances referred to the standard speed fan (Quiet)
A 27/19 W 30 = Unit inlet air temperature 27°C D.B. / 19,5°C W.B. Unit inlet water temperature
A 20 W 20 = Unit inlet air temperature 20°C Unit inlet water temperature 20°C
DB = dry bulb WB = wet bulb

1. Ambient air 27°C D.B./19°C W.B. Exchanger water temperature 30°C / 35°C The value does not take into account the power of the fan's motor and the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
2. Ambient air 20°C D.B. Exchanger inlet water temperature 20°C. The value does not take into account the power of the fan's motor and the part related to the pumps and required to overcome the pressure drops for the circulation of the solution inside the exchangers
3. ROT = rotary compressor
4. CFG-EC = centrifugal fan with EC-Brushless motor
5. PHE = plate exchanger
6. Water flow calculated in relation to the performances in cooling, DT 5°C.
7. Total pressure drop of the standard unit (without optional hydraulic pipe works). To obtain the total drops with any additional hydraulic components see accessory section.
8. inlet / outlet
9. pipe outside diameter

Electrical data

Size			005.1	007.1
F.L.A. - Full load current at max admissible conditions				
F.L.A. - Compressor 1		A	3,47	4,5
F.L.A. - Single supply fan		A	0,90	0,90
F.L.A. - Total		A	4,37	5,4
F.L.I. - Full load power input at max admissible conditions				
F.L.I. - Compressor 1		kW	0,75	0,91
F.L.I. - Single External Fan		kW	0,115	0,120
F.L.I. - Total		kW	0,87	1,03
M.I.C. Maximum inrush current				
M.I.C. - Value		A	18,8	21,0

Data refer to standard units.
Power supply: 230/1/50 Hz. Voltage variation: max. +/-10%

Sound levels

Extra-quiet = Fan minimum speed

SIZES	Sound Power Level [dB]								Sound Pressure Level	Sound Power Level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
005.1	73	64	59	51	43	35	29	25	**41**	**54**
007.1	74	69	56	54	43	35	29	28	**43**	**56**

Quiet (standard) = Fan medium speed

SIZES	Sound Power Level [dB]								Sound Pressure Level	Sound Power Level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
005.1	73	65	60	52	45	37	35	32	**42**	**55**
007.1	76	71	59	55	47	39	35	32	**45**	**58**

Powerful = Fan maximum speed

SIZES	Sound Power Level [dB]								Sound Pressure Level	Sound Power Level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
005.1	71	63	58	51	45	36	31	26	**41**	**54**
007.1	73	69	60	55	47	40	36	32	**43**	**56**

Sound levels refer to the unit at full load installed on the ceiling, ducted, with minimum, standard and maximum air flow rate of the fan. Available static pressure 50 Pa.
In accordance with the UNI-EN ISO 3744 regulation, the average sound pressure level refers to a distance of 1 m from the outer surface of a ducted unit installed on the ceiling.
Measurements are made in accordance to the UNI EN ISO 9614-2, with units installed over two sound reflective surfaces.
If the unit is installed in conditions other than the nominal ones(for instance, near walls or obstacles in generally) the sound levels may undergo substantial variations.

Performances - Fan minimum speed (Extraquiet)

Cooling

Supply air flow:

005.1 = 370m³/h 007.1 = 400m³/h

SIZE	Ta (°C) DB/WB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE (°C)																							
		20/25				25/30				30/35				35/40				40/45				45/50			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
005.1	22 / 16	1,90	1,64	0,37	**5,14**	1,84	1,59	0,43	**4,28**	1,75	1,57	0,48	**3,65**	1,70	1,49	0,53	**3,21**	1,59	1,44	0,59	**2,69**	1,45	1,38	0,64	**2,27**
	24 / 17	1,97	1,74	0,37	**5,32**	1,92	1,68	0,43	**4,47**	1,84	1,64	0,48	**3,83**	1,74	1,62	0,53	**3,28**	1,65	1,53	0,59	**2,80**	1,51	1,46	0,65	**2,32**
	26 / 19	2,14	1,73	0,36	**5,94**	2,04	1,71	0,42	**4,86**	1,97	1,66	0,48	**4,10**	1,89	1,60	0,53	**3,57**	1,76	1,54	0,59	**2,98**	1,63	1,45	0,65	**2,51**
	27 / 19.5	2,16	1,79	0,36	**6,00**	2,10	1,73	0,42	**5,00**	1,99	1,72	0,48	**4,15**	1,93	1,63	0,53	**3,64**	1,81	1,57	0,59	**3,07**	1,65	1,51	0,65	**2,54**
	28 / 21	2,29	1,74	0,35	**6,54**	2,22	1,68	0,42	**5,29**	2,11	1,67	0,48	**4,40**	2,01	1,61	0,53	**3,79**	1,87	1,55	0,59	**3,17**	1,74	1,46	0,65	**2,68**
	30 / 22	2,37	1,85	0,35	**6,77**	2,30	1,78	0,42	**5,48**	2,18	1,77	0,48	**4,54**	2,08	1,71	0,53	**3,92**	1,97	1,61	0,59	**3,34**	1,81	1,54	0,65	**2,78**
007.1	22 / 16	2,51	2,13	0,47	**5,34**	2,43	2,07	0,54	**4,50**	2,34	2,00	0,61	**3,84**	2,26	1,94	0,67	**3,37**	2,13	1,82	0,73	**2,92**	1,97	1,71	0,80	**2,46**
	24 / 17	2,60	2,25	0,47	**5,53**	2,52	2,19	0,54	**4,67**	2,43	2,12	0,61	**3,98**	2,34	2,06	0,67	**3,49**	2,18	1,98	0,73	**2,99**	2,01	1,87	0,81	**2,48**
	26 / 19	2,83	2,23	0,46	**6,15**	2,75	2,16	0,54	**5,09**	2,61	2,15	0,61	**4,28**	2,49	2,08	0,67	**3,72**	2,35	1,96	0,74	**3,18**	2,18	1,84	0,81	**2,69**
	27 / 19.5	2,83	2,32	0,46	**6,15**	2,75	2,26	0,54	**5,09**	2,67	2,19	0,60	**4,45**	2,55	2,12	0,67	**3,81**	2,38	2,04	0,74	**3,22**	2,24	1,87	0,81	**2,77**
	28 / 21	2,99	2,27	0,46	**6,50**	2,91	2,21	0,53	**5,49**	2,81	2,14	0,60	**4,68**	2,69	2,07	0,67	**4,01**	2,50	1,99	0,74	**3,38**	2,47	1,86	0,78	**3,17**
	30 / 22	3,11	2,38	0,46	**6,76**	2,99	2,32	0,53	**5,64**	2,90	2,26	0,60	**4,83**	2,77	2,19	0,67	**4,13**	2,66	2,01	0,74	**3,59**	2,62	1,98	0,82	**3,20**

Performances referred to the minimum speed fan (Extraquiet)

EER referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb WB = wet bulb

kWf = Cooling capacity in kW.
kWe = Compressor power input in kW
kWs = sensible cooling capacity (kW)

not all cooling yields take into account the heat dissipated by the fan motors

Heating

Supply air flow:

005.1 = 370m³/h 007.1 = 400m³/h

SIZE	Ta (°C) DB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE																		
		12/7			15/10			17/12			20/15			25/20			35/30		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
005.1	10	2,13	0,47	**4,53**	2,31	0,50	**4,62**	2,44	0,51	**4,78**	2,61	0,53	**4,92**	2,90	0,57	**5,09**	3,16	0,61	**5,18**
	15	2,08	0,51	**4,08**	2,23	0,54	**4,13**	2,35	0,55	**4,27**	2,51	0,57	**4,40**	2,77	0,61	**4,54**	3,03	0,65	**4,66**
	18	2,04	0,53	**3,85**	2,19	0,56	**3,91**	2,29	0,57	**4,02**	2,43	0,60	**4,05**	2,69	0,64	**4,20**	2,95	0,69	**4,28**
	20	2,01	0,55	**3,65**	2,14	0,58	**3,69**	2,24	0,59	**3,80**	2,39	0,62	**3,85**	2,65	0,66	**4,02**	2,91	0,71	**4,10**
	22	1,98	0,57	**3,47**	2,12	0,59	**3,59**	2,21	0,61	**3,62**	2,35	0,63	**3,73**	2,60	0,68	**3,82**	2,88	0,74	**3,89**
	25	1,92	0,59	**3,25**	2,05	0,62	**3,31**	2,15	0,63	**3,41**	2,29	0,66	**3,47**	2,55	0,71	**3,59**	2,94	0,79	**3,72**
007.1	10	2,92	0,66	**4,42**	3,15	0,69	**4,57**	3,29	0,71	**4,63**	3,53	0,73	**4,84**	3,89	0,79	**4,92**	4,22	0,85	**4,96**
	15	2,80	0,71	**3,94**	3,00	0,74	**4,05**	3,15	0,76	**4,14**	3,34	0,79	**4,23**	3,71	0,85	**4,36**	4,05	0,94	**4,31**
	18	2,75	0,73	**3,77**	2,94	0,76	**3,87**	3,06	0,79	**3,87**	3,24	0,83	**3,90**	3,61	0,90	**4,01**	4,04	0,97	**4,16**
	20	2,68	0,76	**3,53**	2,88	0,79	**3,65**	3,00	0,81	**3,70**	3,19	0,85	**3,75**	3,57	0,92	**3,88**	4,31	1,06	**4,07**
	22	2,64	0,77	**3,43**	2,83	0,81	**3,49**	2,94	0,84	**3,50**	3,13	0,88	**3,56**	3,54	0,96	**3,69**	4,09	1,08	**4,05**
	25	2,56	0,81	**3,16**	2,74	0,85	**3,22**	2,86	0,88	**3,25**	3,08	0,92	**3,35**	3,62	1,01	**3,58**	3,89	1,12	**3,47**
	25	2,6	0,6	**4,33**	2,86	0,62	**4,61**	3,01	0,63	**4,78**	3,23	0,64	**5,05**	3,53	0,65	**5,43**	3,58	0,70	**5,09**
	30	2,55	0,66	**3,86**	2,78	0,68	**4,09**	2,93	0,7	**4,19**	3,12	0,71	**4,39**	3,41	0,73	**4,69**	3,46	0,78	**4,42**

Performances referred to the minimum speed fan (Extraquiet)

COP referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb
kWt = Heating capacity (kW).
kWe = Compressor power input in kW

not all thermal yields take into account the heat dissipated by the fan motors

Performances - Fan medium speed (Quiet)

Cooling

Supply air flow:

005.1 = 400m³/h 007.1 = 500m³/h

SIZE	Ta (°C) DB/WB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE (°C)																							
		20/25				25/30				30/35				35/40				40/45				45/50			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
005.1	22 / 16	1,95	1,68	0,37	**5,27**	1,88	1,64	0,43	**4,37**	1,81	1,59	0,48	**3,77**	1,71	1,56	0,53	**3,23**	1,62	1,48	0,59	**2,75**	1,49	1,39	0,65	**2,29**
	24 / 17	2,02	1,78	0,36	**5,61**	1,95	1,74	0,43	**4,53**	1,85	1,73	0,48	**3,85**	1,78	1,66	0,53	**3,36**	1,66	1,61	0,59	**2,81**	1,54	1,50	0,65	**2,37**
	26 / 19	2,15	1,82	0,36	**5,97**	2,09	1,75	0,42	**4,98**	2,02	1,69	0,48	**4,21**	1,93	1,64	0,53	**3,64**	1,79	1,58	0,59	**3,03**	1,65	1,51	0,65	**2,54**
	27 / 19.5	2,22	1,84	0,36	**6,17**	2,11	1,82	0,42	**5,02**	2,06	1,75	0,48	**4,29**	1,94	1,72	0,53	**3,66**	1,82	1,64	0,59	**3,08**	1,68	1,55	0,65	**2,58**
	28 / 21	2,35	1,78	0,35	**6,71**	2,25	1,75	0,42	**5,36**	2,15	1,72	0,48	**4,48**	2,05	1,66	0,53	**3,87**	1,93	1,57	0,59	**3,27**	1,75	1,52	0,65	**2,69**
	30 / 22	2,41	1,91	0,35	**6,89**	2,31	1,87	0,41	**5,63**	2,25	1,79	0,47	**4,79**	2,13	1,76	0,53	**4,02**	2,00	1,67	0,59	**3,39**	1,85	1,58	0,65	**2,85**
007.1	22 / 16	2,67	2,25	0,47	**5,68**	2,58	2,18	0,54	**4,78**	2,49	2,11	0,61	**4,08**	2,39	2,05	0,67	**3,57**	2,24	1,93	0,73	**3,07**	2,07	1,82	0,81	**2,56**
	24 / 17	2,77	2,38	0,47	**5,89**	2,68	2,31	0,54	**4,96**	2,59	2,24	0,61	**4,25**	2,48	2,17	0,67	**3,70**	2,34	2,05	0,74	**3,16**	2,16	1,92	0,81	**2,67**
	26 / 19	2,98	2,37	0,46	**6,48**	2,90	2,30	0,54	**5,37**	2,81	2,22	0,60	**4,68**	2,68	2,15	0,67	**4,00**	2,48	2,08	0,74	**3,35**	2,30	1,95	0,81	**2,84**
	27 / 19.5	3,09	2,40	0,46	**6,72**	2,99	2,32	0,53	**5,64**	2,84	2,31	0,60	**4,73**	2,71	2,23	0,67	**4,04**	2,55	2,11	0,74	**3,45**	2,37	1,98	0,82	**2,89**
	28 / 21	3,26	2,34	0,45	**7,24**	3,10	2,32	0,53	**5,85**	3,01	2,23	0,60	**5,02**	2,86	2,17	0,67	**4,27**	2,71	2,03	0,74	**3,66**	2,48	1,93	0,82	**3,02**
	30 / 22	3,35	2,48	0,45	**7,44**	3,27	2,40	0,53	**6,17**	3,12	2,36	0,60	**5,20**	2,95	2,29	0,67	**4,40**	2,81	2,14	0,74	**3,80**	2,56	2,06	0,82	**3,12**

Performances referred to the medium speed fan (Quiet)

EER referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb WB = wet bulb

kWf = Cooling capacity in kW.
kWe = Compressor power input in kW
kWs = sensible cooling capacity (kW)

not all cooling yields take into account the heat dissipated by the fan motors

Heating

Supply air flow:

005.1 = 400m³/h 007.1 = 500m³/h

SIZE	Ta (°C) DB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE (°C)																		
		12/7			15/10			17/12			20/15			25/20			35/30		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
005.1	10	2,14	0,46	**4,65**	2,33	0,48	**4,85**	2,46	0,50	**4,92**	2,65	0,51	**5,20**	2,95	0,55	**5,36**	3,24	0,59	**5,49**
	15	2,10	0,50	**4,20**	2,27	0,52	**4,37**	2,38	0,53	**4,49**	2,55	0,56	**4,55**	2,83	0,59	**4,80**	3,09	0,63	**4,90**
	18	2,06	0,53	**3,89**	2,22	0,54	**4,11**	2,32	0,56	**4,14**	2,48	0,58	**4,28**	2,75	0,62	**4,44**	3,01	0,66	**4,56**
	20	2,03	0,54	**3,76**	2,19	0,56	**3,91**	2,29	0,57	**4,02**	2,43	0,60	**4,05**	2,70	0,64	**4,22**	2,96	0,69	**4,29**
	22	2,00	0,55	**3,64**	2,14	0,58	**3,69**	2,23	0,60	**3,72**	2,38	0,62	**3,84**	2,65	0,66	**4,02**	2,90	0,72	**4,03**
	25	1,95	0,58	**3,36**	2,09	0,60	**3,48**	2,18	0,62	**3,52**	2,33	0,64	**3,64**	2,58	0,69	**3,74**	2,88	0,76	**3,79**
007.1	10	3,05	0,63	**4,84**	3,30	0,66	**5,00**	3,47	0,68	**5,10**	3,71	0,70	**5,30**	4,15	0,75	**5,53**	4,52	0,80	**5,65**
	15	2,97	0,68	**4,37**	3,18	0,71	**4,48**	3,33	0,73	**4,56**	3,56	0,76	**4,68**	3,95	0,81	**4,88**	4,31	0,86	**5,01**
	18	2,89	0,71	**4,07**	3,11	0,74	**4,20**	3,24	0,76	**4,26**	3,46	0,79	**4,38**	3,83	0,85	**4,51**	4,18	0,92	**4,54**
	20	2,83	0,73	**3,88**	3,04	0,76	**4,00**	3,18	0,78	**4,08**	3,37	0,82	**4,11**	3,76	0,87	**4,32**	4,16	0,95	**4,38**
	22	2,78	0,75	**3,71**	2,98	0,78	**3,82**	3,11	0,80	**3,89**	3,32	0,84	**3,95**	3,70	0,90	**4,11**	4,05	0,99	**4,09**
	25	2,71	0,78	**3,47**	2,89	0,81	**3,57**	3,01	0,84	**3,58**	3,22	0,89	**3,62**	3,66	0,95	**3,85**	3,99	1,04	**3,84**

Performances referred to the medium speed fan (Quiet)

COP referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb
kWt = Heating capacity (kW).
kWe = Compressor power input in kW

not all thermal yields take into account the heat dissipated by the fan motors

Performances - Fan maximum speed (Powerfull)

Cooling

Supply air flow:

005.1 = 450m³/h 007.1 = 600m³/h

SIZE	Ta (°C) DB/WB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE (°C)																							
		20/25				25/30				30/35				35/40				40/45				45/50			
		kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER	kWf	kWs	kWe	EER
005.1	22 / 16	2,00	1,77	0,36	**5,56**	1,94	1,71	0,43	**4,51**	1,86	1,67	0,48	**3,88**	1,77	1,62	0,53	**3,34**	1,65	1,55	0,59	**2,80**	1,51	1,47	0,65	**2,32**
	24 / 17	2,08	1,88	0,36	**5,78**	1,99	1,85	0,43	**4,63**	1,93	1,77	0,48	**4,02**	1,83	1,75	0,53	**3,45**	1,70	1,69	0,59	**2,88**	1,57	1,57	0,65	**2,42**
	26 / 19	2,21	1,91	0,36	**6,14**	2,14	1,85	0,42	**5,10**	2,07	1,78	0,48	**4,31**	1,97	1,73	0,53	**3,72**	1,83	1,66	0,59	**3,10**	1,68	1,59	0,65	**2,58**
	27 / 19.5	2,28	1,93	0,35	**6,51**	2,21	1,87	0,42	**5,26**	2,11	1,83	0,48	**4,40**	1,99	1,80	0,53	**3,75**	1,87	1,71	0,59	**3,17**	1,72	1,62	0,65	**2,65**
	28 / 21	2,41	1,87	0,35	**6,89**	2,31	1,84	0,41	**5,63**	2,21	1,80	0,47	**4,70**	2,11	1,74	0,53	**3,98**	1,96	1,67	0,59	**3,32**	1,80	1,60	0,65	**2,77**
	30 / 22	2,48	2,01	0,34	**7,29**	2,42	1,93	0,41	**5,90**	2,31	1,89	0,47	**4,91**	2,19	1,85	0,53	**4,13**	2,04	1,78	0,59	**3,46**	1,90	1,66	0,65	**2,92**
007.1	22 / 16	2,80	2,41	0,47	**5,96**	2,71	2,33	0,54	**5,02**	2,60	2,27	0,61	**4,26**	2,49	2,19	0,67	**3,72**	2,31	2,10	0,73	**3,16**	2,15	1,94	0,81	**2,65**
	24 / 17	2,91	2,55	0,46	**6,33**	2,84	2,44	0,54	**5,26**	2,71	2,40	0,61	**4,44**	2,59	2,33	0,67	**3,87**	2,43	2,19	0,74	**3,28**	2,22	2,09	0,81	**2,74**
	26 / 19	3,15	2,53	0,46	**6,85**	3,06	2,45	0,53	**5,77**	2,94	2,37	0,60	**4,90**	2,80	2,29	0,67	**4,18**	2,60	2,21	0,74	**3,51**	2,40	2,07	0,82	**2,93**
	27 / 19.5	3,24	2,56	0,45	**7,20**	3,11	2,52	0,53	**5,87**	2,96	2,48	0,60	**4,93**	2,83	2,39	0,67	**4,22**	2,68	2,23	0,74	**3,62**	2,54	2,21	0,82	**3,10**
	28 / 21	3,36	2,56	0,45	**7,47**	3,25	2,49	0,53	**6,13**	3,13	2,41	0,60	**5,22**	2,99	2,31	0,67	**4,46**	2,78	2,21	0,74	**3,76**	2,60	2,04	0,82	**3,17**
	30 / 22	3,55	2,64	0,44	**8,07**	3,42	2,57	0,52	**6,58**	3,25	2,54	0,60	**5,42**	3,07	2,47	0,67	**4,58**	2,90	2,33	0,74	**3,92**	2,71	2,16	0,82	**3,30**

Performances referred to the maximum speed fan (Powerfull)

EER referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb WB = wet bulb

kWf = Cooling capacity in kW.
kWe = Compressor power input in kW
kWs = sensible cooling capacity (kW)

not all cooling yields take into account the heat dissipated by the fan motors

Heating

Supply air flow:

005.1 = 450m³/h 007.1 = 600m³/h

SIZE	Ta (°C) DB	EXCHANGER ENTERING/LEAVING WATER TEMPERATURE WATER SIDE (°C)																		
		12/7			15/10			17/12			20/15			25/20			35/30		
		kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP	kWt	kWe	COP
005.1	10	2,16	0,44	**4,91**	2,36	0,46	**5,13**	2,49	0,48	**5,19**	2,70	0,49	**5,51**	3,04	0,52	**5,85**	3,33	0,56	**5,95**
	15	2,12	0,49	**4,33**	2,31	0,50	**4,62**	2,42	0,52	**4,65**	2,60	0,54	**4,81**	2,90	0,57	**5,09**	3,18	0,60	**5,30**
	18	2,09	0,51	**4,10**	2,25	0,53	**4,25**	2,36	0,54	**4,37**	2,54	0,56	**4,54**	2,83	0,59	**4,80**	3,09	0,63	**4,90**
	20	2,07	0,52	**3,98**	2,23	0,54	**4,13**	2,33	0,55	**4,24**	2,49	0,58	**4,29**	2,77	0,61	**4,54**	3,03	0,65	**4,66**
	22	2,03	0,54	**3,76**	2,18	0,56	**3,89**	2,29	0,57	**4,02**	2,44	0,60	**4,07**	2,71	0,64	**4,23**	2,97	0,68	**4,37**
	25	1,98	0,57	**3,47**	2,13	0,58	**3,67**	2,23	0,60	**3,72**	2,38	0,62	**3,84**	2,64	0,67	**3,94**	2,91	0,71	**4,10**
007.1	10	3,10	0,60	**5,17**	3,38	0,62	**5,45**	3,56	0,64	**5,56**	3,85	0,66	**5,83**	4,31	0,70	**6,16**	4,73	0,74	**6,39**
	15	3,03	0,65	**4,66**	3,28	0,67	**4,90**	3,44	0,69	**4,99**	3,70	0,71	**5,21**	4,12	0,76	**5,42**	4,51	0,80	**5,64**
	18	2,97	0,68	**4,37**	3,21	0,70	**4,59**	3,35	0,72	**4,65**	3,58	0,75	**4,77**	3,98	0,79	**5,04**	4,36	0,85	**5,13**
	20	2,93	0,69	**4,25**	3,15	0,72	**4,38**	3,30	0,74	**4,46**	3,52	0,77	**4,57**	3,93	0,81	**4,85**	4,31	0,87	**4,95**
	22	2,87	0,72	**3,99**	3,07	0,75	**4,09**	3,21	0,77	**4,17**	3,46	0,79	**4,38**	3,82	0,85	**4,49**	4,21	0,91	**4,63**
	25	2,79	0,75	**3,72**	2,99	0,78	**3,83**	3,13	0,80	**3,91**	3,35	0,83	**4,04**	3,73	0,89	**4,19**	4,15	0,95	**4,37**

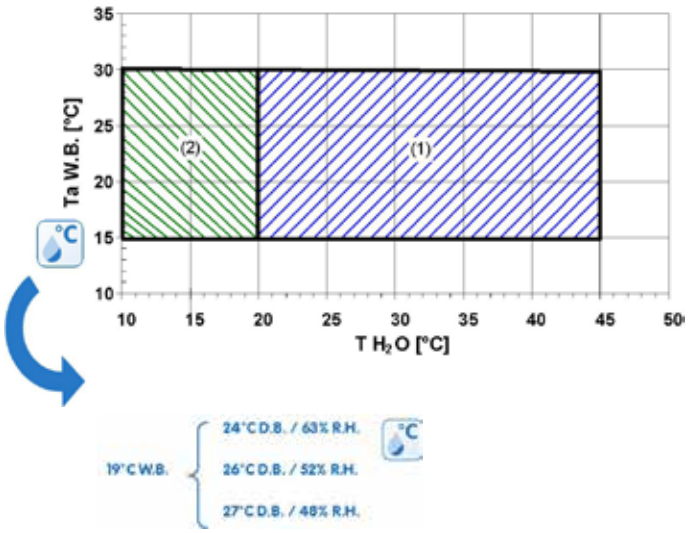
Performances referred to the maximum speed fan (Powerfull)

COP referred only to compressors

Ta = entering handling coil air temperature (°C)
DB = dry bulb
kWt = Heating capacity (kW).
kWe = Compressor power input in kW

not all thermal yields take into account the heat dissipated by the fan motors

Operating range (Cooling)



The limits are meant as an indication and they have been calculated by considering:

- general and non specific sizes
- Standard airflow (Fan speed: Quiet)
- Non-critical positioning and correct use of the unit
- operation at full load
- outlet water temperature = 5°C

Ta = ENTERING HANDLING COIL AIR TEMPERATURE (°C)
WARNING! WET BULB TEMPERATURE
(W.B. = WET BULB)
TH2O = Water temperature at plate exchanger input (°C)

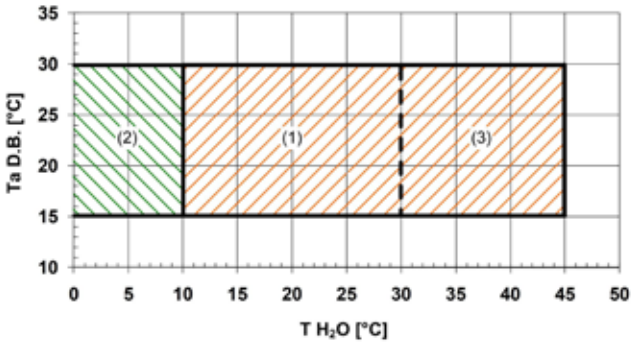
1. Standard operating range

2. Operating range for unit equipped with 'V2MODX - 2-way modulating valve for installation with disposable water' option, i.e.,groundwater or anyway a source at low water temperature. By this option the water feeding system must be at variable flow-rate.

WARNING: THE GRAPH REFERS TO A WATER TEMPERATURE DIFFERENTIAL OF 5°C. WITH A REDUCED WATER FLOW RATE, THE TEMPERATURE DIFFERENTIAL IS MORE THAN 5°C, SO IT IS NECESSARY TO REDUCE THE SPECIFIED OPERATING RANGE FOR STEPS EXCEEDING THE NOMINAL 5°C

EXAMPLE: WITH A TEMPERATURE DIFFERENTIAL OF 8°C, THE UPPER TH2O LIMIT IS NO LONGER 45°C BUT 42°C.

Operating range (Heating)



The limits are meant as an indication and they have been calculated by considering:

- general and non specific sizes
- Standard airflow (Fan speed: Quiet)
- Non-critical positioning and correct use of the unit
- operation at full load
- difference between inlet / outlet water temperature = 5°C

Ta = ENTERING HANDLING COIL AIR TEMPERATURE (°C)
CAUTION!! Dry bulb measured temperature (D.B.=DRY BULB)

TH2O = Water temperature at plate exchanger input (°C)

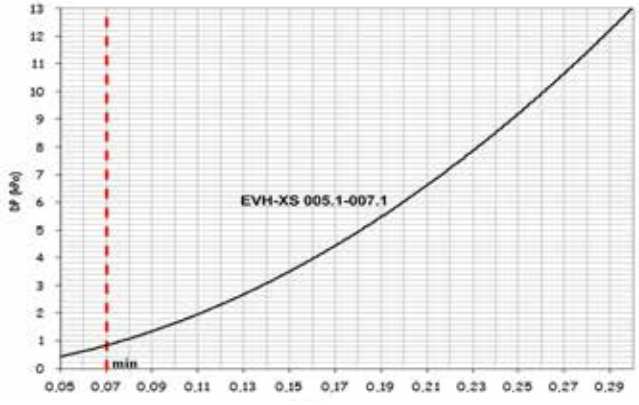
1. Standard operating range
2. Operating field for water glycol system (to prevent frost)

3. Unit operating range with 'V2MODX – 2-way modulating valve for installation with disposal water' that controls the heat exchange with the source. Whit this option the water feeding system must be a variable flow-rate

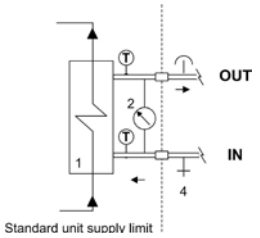
WARNING: THE GRAPH REFERS TO A WATER TEMPERATURE DIFFERENTIAL OF 5°C. WITH A REDUCED WATER FLOW RATE, THE TEMPERATURE DIFFERENTIAL IS MORE THAN 5°C, SO IT IS NECESSARY TO REDUCE THE SPECIFIED OPERATING RANGE FOR STEPS EXCEEDING THE NOMINAL 5°C

EXAMPLE: WITH A TEMPERATURE DIFFERENTIAL OF 8°C, THE LOWER TH2O LIMIT IS NO LONGER 10°C BUT 13°C

Standard unit water circuit pressure drops



Q = Water flow rate [l/s]
DP = Water side pressure drops (kPa)
min = minimum water flow-rates admissibles

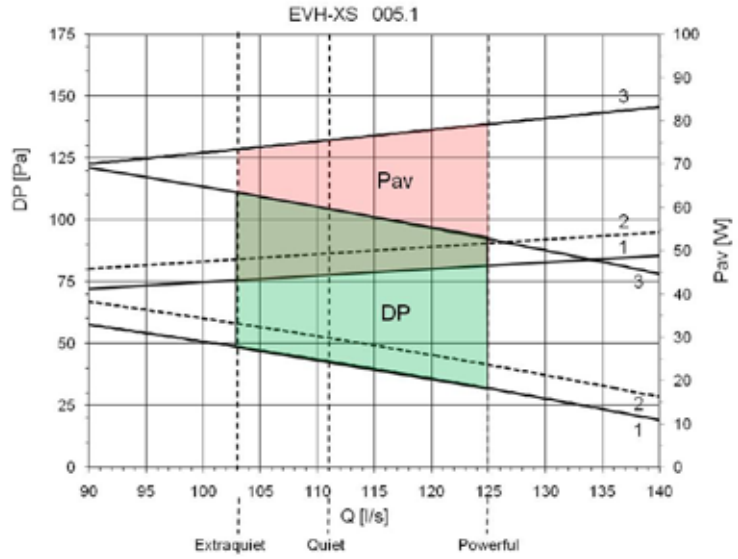


The standard unit (supply limit A) includes the following components:

1 - plate exchanger and water temperature control probes on the inlet and the outlet (to preventive from forming and to disable the compressor when the water temperature drops below a limit value)
2 - water side differential pressure switch (to control the water flow- rate presence)
3 - relief valve (to allow the air to bleed out from the system) drain valve (to allow to drain the exchanger for maintenance operations).

It does not include other shut-off or control parts.

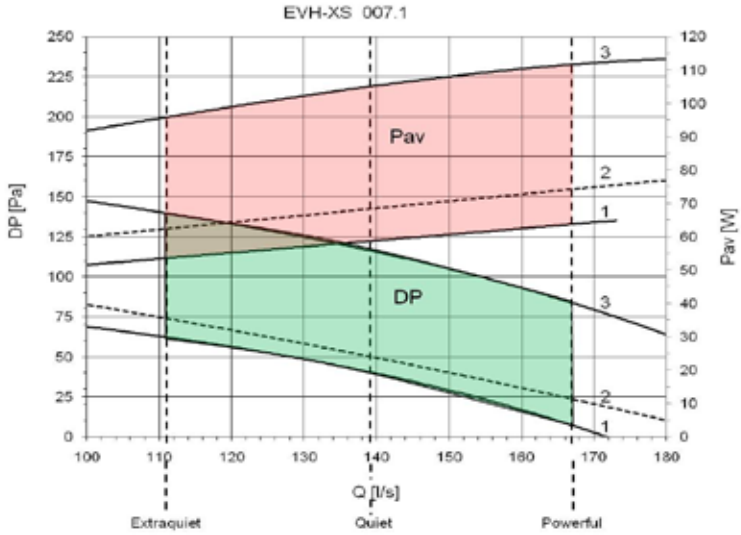
Airflow / head curves



The three speeds can be set via the user interface or the serial protocol as indicated in the user and maintenance manual.

1. Minimum speed (Extra-quiet)
2. Average speed (Quiet)
3. Maximum speed (Powerful)

Q = airflow (l/s)
DP = available pressure (Pa)
Pav = Power input of the fan (W)



The three speeds can be set via the user interface or the serial protocol as indicated in the user and maintenance manual.

1. Minimum speed (Extra-quiet)
2. Average speed (Quiet)
3. Maximum speed (Powerful)

Q = airflow (l/s)
DP = available pressure (Pa)
Pav = Power input of the fan (W)

Accessories

TPF - Filter-holder frame with lateral and bottom exhaust

Device that makes it easier to take out the air filters in the event of a ducted unit. It consists of a galvanised steel frame with doors to access and remove the filter both from the bottom and the side. The device is installed built-in the unit

FILTER EXTRACTION: FROM THE SIDE

FILTER EXTRACTION: FROM THE BOTTOM

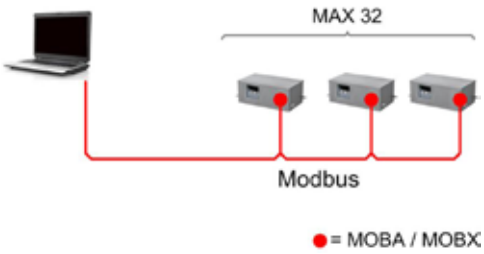
Provide for suitable access areas and clearances to remove the doors to take out the filter.

MOBA - RS485 serial port with Modbus protocol, built-in

It allows the serial connection to supervision systems, using BACnet as the communication protocol. It allows the access to the complete list of operating variables, controls and alarms.

On the serial line can be connected up to 32 units for a typical distance of 1000 m. The connection is made using a suitable cable to RS485 network or formed by a twisted pair and shielded wires.

The device is installed and wired built-in the unit.



Accessories separately supplied

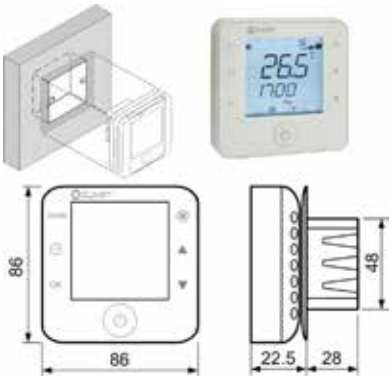
CIWMX - Electronic room control with display for wall installation with uncased box

Option which allows the remote control of the unit which can be easily installed in the main built-in units which are available on the market with squared or rounded 65 mm diameter / 31 mm deep profiles.

The electronic control with display is simple to use even for non-specialised users.

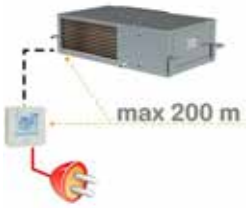
Thanks to the icon menu which is complete with back-lighting, it allows different unit functions to be controlled, including:

- switching the unit on and off
- reading the temperature using the probe in its interior
- display the alarm code and the unit stata
- password protection to access the unit's parameters
- changing the manual operating mode (hot or cold) and/or set point
- programming the daily and weekly time schedule for switching on and off and for setting the standard or economic set point.
- management of the operating parameters.
- language management for the navigation menu
- manually, or automatically, managing the fan speed, depending on the distance from the set- point.



Electrical connection for distances lower than 10m

Electrical connection for distances exceeding 10m



The device is prepared for connection to a unit electrical panel (installation by the Client) with the following modes: - For a max distance of 10m only use the power supply cable and serial communication included in the pack. In this way electric power is supplied by the unit. - For a max distance of 200m use a shielded twisted pair cable with a min 0.5 / max 1.5 mm2 section. In this case the 230/1/50 electricity supply is by the Client (transformer integrated in the display).

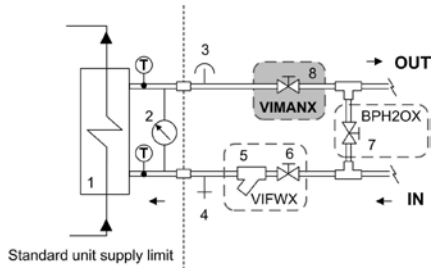
VIMANX - Hand shut-off valve

Shut-off device which enables the unit to be hydraulically closed for maintenance operations and to prepare the system before connecting the unit. The two hand valves are located on the water lines at the inlet and outlet.

Features of the hand shut-off valve

Size	005.1 - 007.1
Diameter of the fittings	1/2"
System side water fittings	FEMALE
Unit side water fittings	MALE

Water connection diagram



1. Internal exchanger with temperature probes
2. Differential pressure switch
3. Vent valve
4. Drainage bibcock
5. Steel mesh strainer (included with the VIFWX accessory)
6. Hand shut-off valve (included in the VIFWX accessory)
7. Shut-off valve for by-pass (water side) (BPH2OX accessory)
8. Hand shut-off valve (VIMANX accessory)

Option to be installed outside the unit on the water outlet pipe of the exchanger. Provide for spaces to assemble/disassemble the valve.

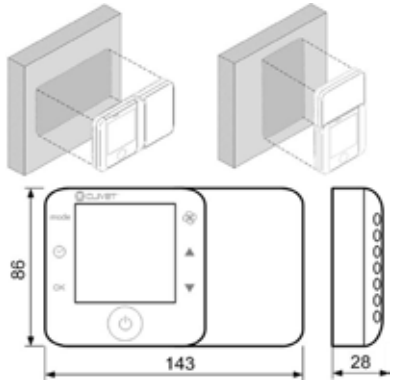
CWMX - Electronic control with display for wall installation

An option which enables the unit to be remotely controlled. It can be attached to a wall with the support in a horizontal or vertical position.

The electronic control with display is simple to use even for non-specialised users.

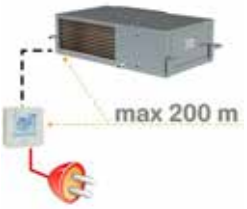
It allows different unit functions to be controlled, including:

- reading the temperature directly on the thermostat using the probe in its interior
- switching the unit on and off
- unit parameter protection with password
- programming the daily and weekly time schedule for switching on and off and for setting the standard or economic set point.
- changing the manual operating mode (hot or cold) and/or set point
- alarm and unit status display;
- management of the operating parameters.
- language management for the navigation menu
- back-lit icon menu
- manual or automatic fan speed management in relation to how far away the setpoint is.



Electrical connection for distances lower than 10m

Electrical connection for distances exceeding 10m



The device is prepared for connection to a unit electrical panel (installation by the Client) with the following modes: - For a max distance of 10m only use the power supply cable and serial communication included in the pack. In this way electric power is supplied by the unit. - For a max distance of 200m use a shielded twisted pair cable with a min 0.5 / max 1.5 mm2 section. In this case the 230/1/50 electricity supply is by the Client (transformer integrated in the display).

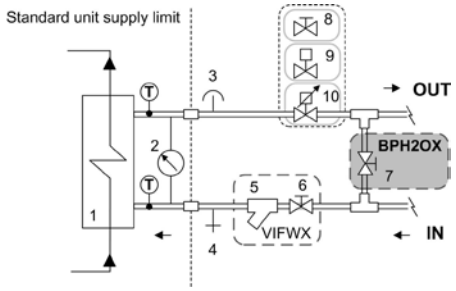
BPH2OX – Shut-off valve for by-pass (water side)

The device allows the exchanger by-pass inside the unit for the cleaning operations (flowing) the water circuit. This allows to prevent the exchanger from getting dirty. It consists of a 2-way hand valve.

Option technical specifications

Size	005.1 - 007.1
Diameter of the fittings	1/2"
Couplings	FEMALE

Water connection diagram



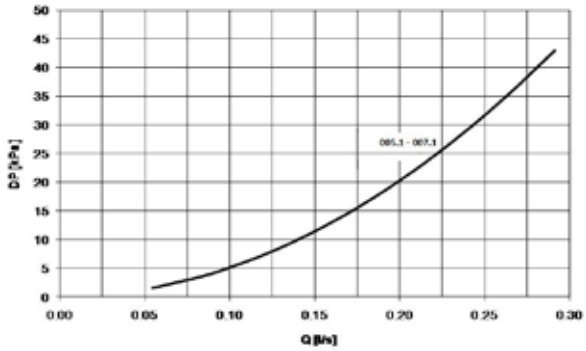
1. Internal exchanger with temperature probes
2. Differential pressure switch
3. Vent valve
4. Drainage bibcock
5. Steel mesh strainer (included with the VIFWX accessory)
6. Hand shut-off valve (included in the VIFWX accessory)
7. Shut-off valve for by-pass (water side) (BPH2OX accessory)
8. Regulating / shut-off valves for the system (see the VIMANX, V2MODX and V2ONX accessories)

V2MODX - 2-way modulating valve for installation with disposable water

Option indicated in the applications with disposable water at a temperature relatively low (groundwater) or with a variable flow-rate loop where the unit must operate in heating with high water temperatures or in cooling with low water temperatures. The 2-way motorised valve, modulating type, is placed in the exchanger output water side and is fed by the unit. Its operating is combined with that of the refrigerant circuit: the modulation by 0-10V signal according to the refrigerant pressure in the exchanger source side, reduces the water consumption and maintains the unit in the provided operating range both in cooling and in heating mode.

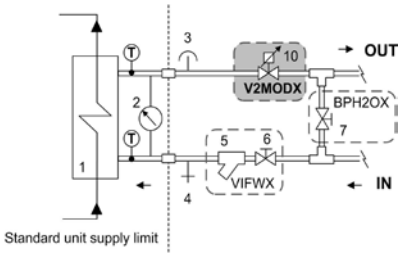
The supplied valve ensures proper opening and closure for water differential pressures that do not exceed 800 kPa, i.e. 8 bar.

PRESSURE DROPS OF V2MODX OPTION



Q = water flow rate[l/s]
DP = water side pressure drops (kPa)

WATER CONNECTION DIAGRAM



1. Internal exchanger with temperature probes
2. Differential pressure switch
3. Vent valve
4. Drainage bibcock
5. Steel mesh strainer (included with the VIFWX accessory)
6. Hand shut-off valve (included in the VIFWX accessory)
7. Shut-off valve for by-pass (water side) (BPH2OX accessory)
10. Two-way modulating valve for systems with disposable water (V2MODX accessory)

Option to be installed outside the unit on the water outlet pipe of the exchanger. Provide for spaces to assemble/disassemble the valve.

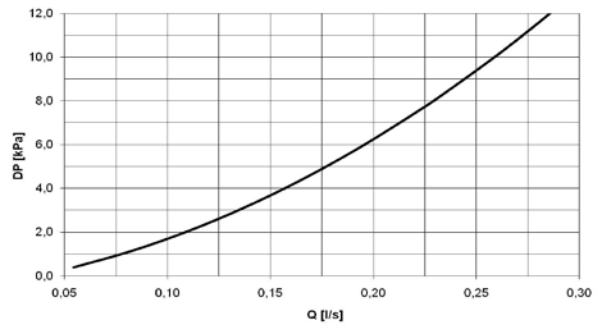
With this option the unit is provided full of rapid electric connections for the valve feeding and automatic control.

V2ONX - ON/OFF 2-way valve for variable flow-rate loop

Option recommended for applications with a variable water flow-rate loop. It includes an ON/OFF motorised 2-way valve located at the outlet of the exchanger on the water side, powered and controlled by the unit. It operates in conjunction with the refrigeration circuit: when the compressor is stationary, the valve remains closed, thereby reducing water consumption.

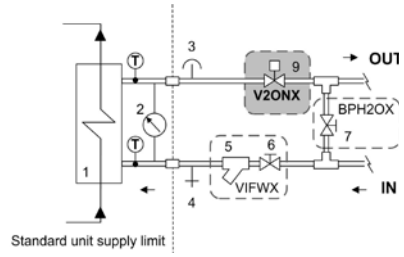
The supplied valve ensures proper opening and closure for water differential pressures that do not exceed 2000 kPa, i.e. 20 bar.

PRESSURE DROPS OF THE V2ONX OPTION



Q = water flow rate[l/s]
DP = water side pressure drops (kPa)

WATER CONNECTION DIAGRAM



1. Internal exchanger with temperature probes
2. Differential pressure switch
3. Vent valve
4. Drainage bibcock
5. Steel mesh strainer (included with the VIFWX accessory)
6. Hand shut-off valve (included in the VIFWX accessory)
7. Shut-off valve for by-pass (water side) (BPH2OX accessory)
9. 2-way ON-OFF valve for variable flow-rate loop (V2ONX accessory)

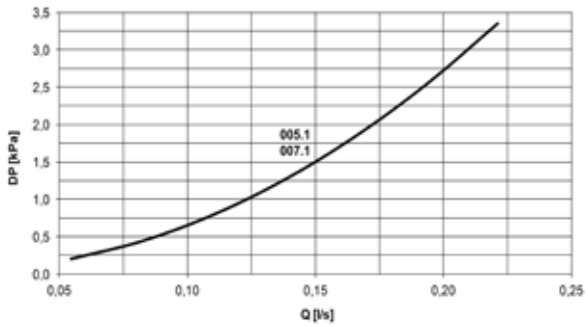
Option to be installed outside the unit on the water outlet pipe of the exchanger. Provide for spaces to assemble/disassemble the valve.

With this option the unit is provided full of rapid electric connections for the valve feeding and automatic control.

VIFWX - Steel mesh strainer and hand shut-off valve

The device protects the plate exchanger from any impurities inside the water circuit. The stainless steel mesh mechanical strainer must be placed on the water inlet line. It can be easily removed for periodical maintenance and cleaning operations. It also includes the hand two-way shut-off valve located on the inlet line and required for periodical maintenance operations.

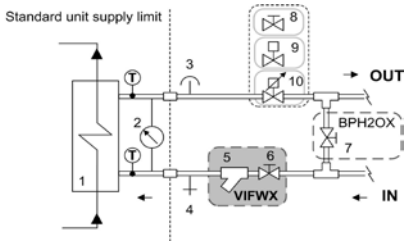
PRESSURE DROPS OF THE VIFWX OPTION



Pressure drop referred to a clean filter

Q = water flow-rate [l/s]
DP = water side pressure drops (kPa)

WATER CONNECTION DIAGRAM



1. Internal exchanger with temperature probes
2. Differential pressure switch
3. Vent valve
4. Drainage bibcock
5. Steel mesh strainer (included with the VIFWX accessory)
6. Hand shut-off valve (included in the VIFWX accessory)
7. Shut-off valve for by-pass (water side) (BPH2OX accessory)

8-9-10. Regulating / shut-off valves for the system (see the VIMANX, V2MODX and V2ONX accessories)

VIFWX option technical features

Size	005.1 - 007.1
Filter diameter	1/2"
Water fitting diameter	1/2"
System side water fittings	FEMMINA
Unit side water fittings	MASCHIO
Degree of filtration	400 µm

Hydraulic connection performed by Customer. Provide for spaces to assemble/disassemble the components and for routine maintenance operations

Routine maintenance operations require a shut-off device on the unit's outlet pipe. Therefore we recommend combining it with one of the following options depending on the type of system: 'V2ONX - On/OFF 2-way valve for variable flow-rate loop', 'V2MODX - 2-way modulating valve for system with disposable water' or 'VIMANX - Hand shut-off valve"

FCVBX - Manual balancing valve

The device enables the water flow through the unit to be calibrated without measuring tables or devices. In this way it is possible to balance the water flow in the circuit. The special viewer enables instantaneous reading of the water flow (in litres / minute). The calibration can be easily carried out even by non-specialised operators, operating on the special control screws. It includes adaptors for varying the diameter between the balancing valve and the water fittings.

Features of the manual balancing valve

Size	005.1 - 007.1
Balancing valve diameter	3/4"
Water fitting diameter	1/2"
System side water fittings	MASCHIO
Unit side water fittings	MASCHIO
Max. operating pressure	10 bar
Field flow control	0.05 ÷ 0.2 l/s
flow rate coefficient (Kvs)	1.85

La perdita di carico lato acqua può essere determinata con la formula

$$Dp\ [bar] = \left(\frac{3.6 \times Q\ [l/s]}{Kvs} \right)^2$$

Q = Portata acqua [l/s]

Dp = Perdite di carico lato acqua (bar)

Kvs = coefficiente di flusso [m^3/h]

PFHCX - 200 mm flexible pipes for water connection and condensate drain

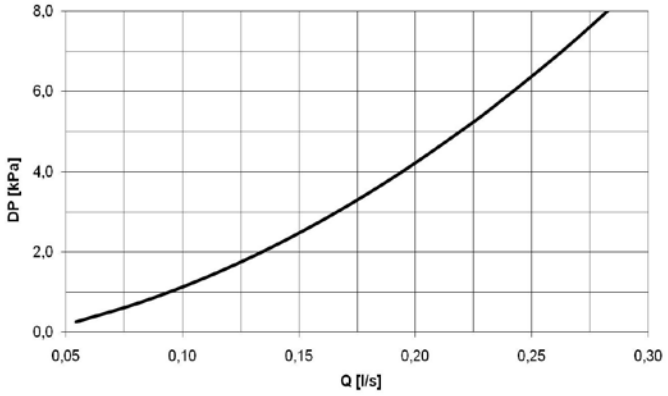
PFHC1X - 500 mm flexible pipes for water connection and condensate drain

An option which simplifies the water connection and reduces any vibrations between the unit and the system. It includes two flexible pipes with stainless steel net covering and a reinforced plastic pipe for the connection of the tray to the external drain.

Technical specifications of the flexible pipes for water connections

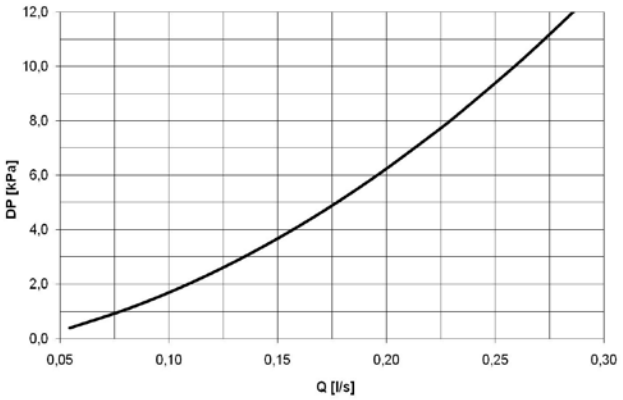
Size	005.1 - 007.1
Diameter of the fittings	1/2"
System side water fittings	FEMALE
Unit side water fittings	MALE
Max. operating pressure	12 bar
Min. bending radius	45 mm

Pressure drops of the single 200 mm flexible pipe



Q = water flow rate (l/s)
DP = water side pressure drops (kPa)

Pressure drops of the single 500 mm flexible pipe



Q = water flow-rate [l/s]
DP = water side pressure drops (kPa)

Technical specifications of the flexible pipe for condensate drain

Size	005.1 - 007.1
Pipe diameter	15 mm
Pipe length	1 m

The flexible pipe of the condensate drain can be completed with a suitable trap to prevent the odour return in the room and connected to a suitable drain (installed by Customer).

CDPX - Condensate drain pump

Device which enables condensation water to be discharged into the collection tray in case it cannot drain away due to gravity. It is necessary in installations where the external outlet is placed at a higher height than the condensate tray. The integrated sensor activates the pump only when necessary. If the water level in the tray should be greater than the pre-set limit, the unit stops the compressor to avoid the tray overflowing, signalling the fault with an alarm.

The device is designed to be installed outside the unit (to be carried out by the Customer). The pack includes the 1m condensate drain flexible pipe and the 1.5m power supply cable

Technical specifications of the condensate drain pump

Size	005.1 - 007.1
Water flow rate with a 2m head	15 l/h
Water flow rate with a 10m head	4 l/h
Maximum supply height	10 m

AMMX - Spring antivibration mounts

The rubber antivibration mounts must be applied in designated areas on the support brackets and are used to dampen the vibrations produced by the unit by reducing the noise transmitted to the structures. They consist of steel spring elements inserted in elastomer retaining plates. They can dampen axial and tangential stress and their physical and mechanical properties remain constant over time thanks to the highly resistant materials they are made of.

The accessory includes the nut used for securing the item on the threaded bar. The bar used for ceiling installation (to be provided by the Customer) must have an M8 metric threading

MOBX - RS485 serial port with Modbus protocol

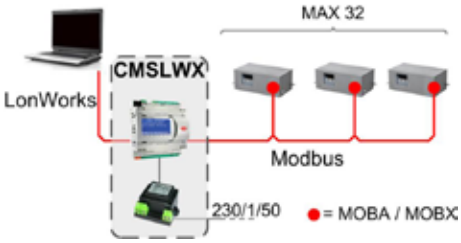
This accessory has the same technical specifications of MOBA accessory, with the exception of the installation and wiring to be complet by customer.

The device is ready for connecting to the electrical panel (installed by the customer).

CMSLWX - LonWorks serial communication module

This enables the serial connection of the supervision system which uses the LonWorks communication protocol. It enables access to a list of operating variables, commands and alarms which comply with the Echelon® standard.

With this accessory, each unit can communicate with the main supervisor systems such as Trend, Johnson Controls, PlantVisor.



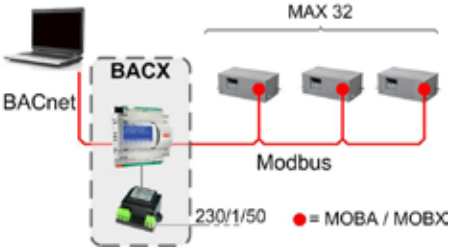
The device needs to be combined with the RS485 serial port option with Modbus protocol.

The package includes the transformer, which is powered by 230/1/50, and the Gateway of communication between the supervisor and the Modbus serial line. The configuration and management of the LonWorks network are the responsability of the Customer.

The device is prearranged to mounting in DIN rail, for external installation (7 DIN modules, installed by the customer)

BACX - BACnet serial communication module

Allows to perform the serial connection to supervision systems by using BACnet as a communication protocol. It allows the access to the entire list of operating variables, controls and alarms



The device requires the coupling with the "RS485 serial port with Modbus protocol" option

The package includes the transformer, which is powered by 230/1/50, and the Gateway of communication between the supervisor and the Modbus serial line. The configuration and management of the BACnet network are the responsability of the customer.

The device is prearranged to mounting in DIN rail, for external installation (7 DIN modules, installed by the customer)

Main variables of supervision by serial (Modbus / LonWorks / BACnet).

- Current room temperature
- Ideal temperature Set-Point
- Maximum correction of the set-point temperature set by the user via electronic room control
- Fan speed (Extraquiet, Quiet, Powerful, AUTO)
- Operating mode (Heating, Cooling, AUTO)
- Alarm reset
- ECONOMIC operating mode (using a pre-set ECO set point)
- Remote ON-OFF
- Heating temperature hysteresis
- Cooling temperature hysteresis
- Deadband

Option compatibility

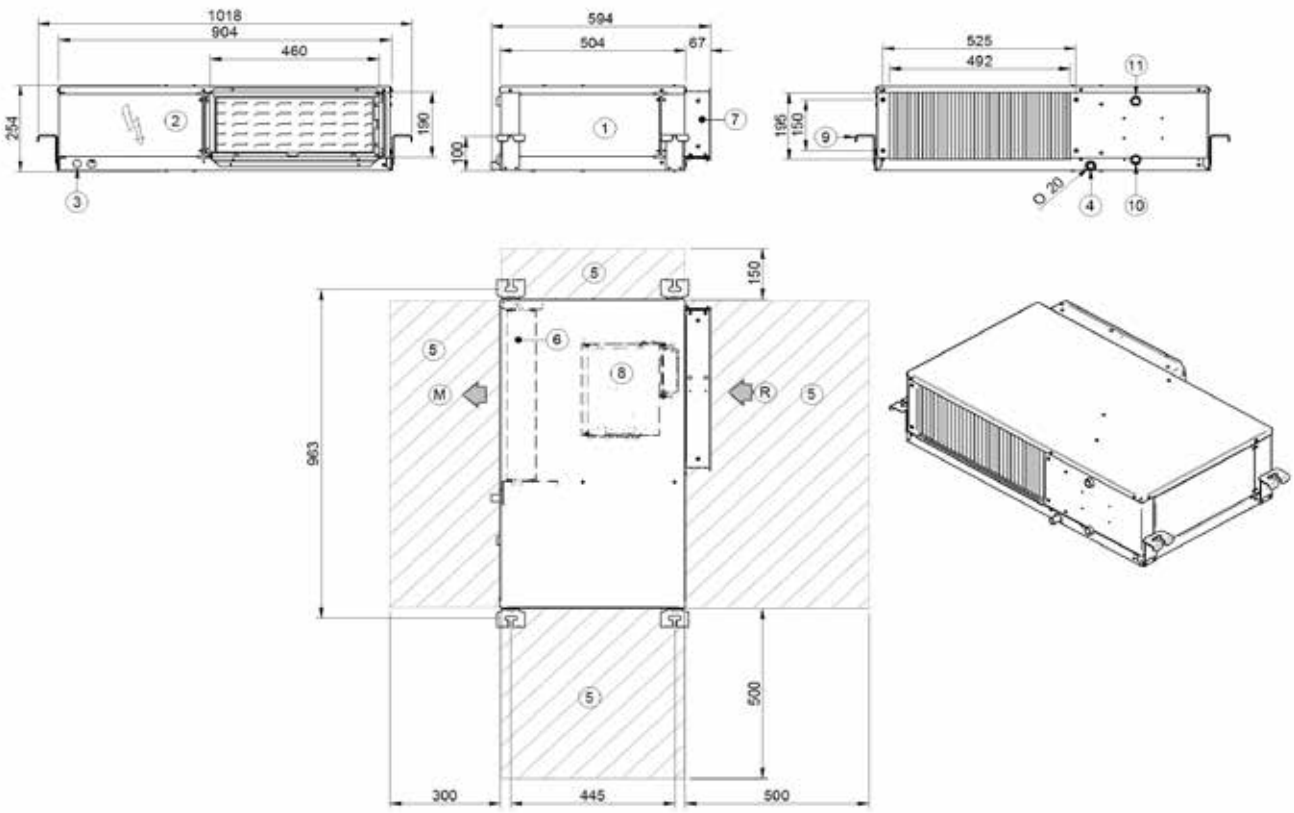
REF.	DESCRIPTION	
Aeraulic circuit		
TPF	Filter-holder frame with lateral and bottom exhaust	x
Water circuit		
CDPX	condensate drain pump	◊
VIFWX	Steel mesh strainer and hand shut-off valve	◊
FCVBX	Water balancing valve	◊
PFHCX	200 mm flexible pipes for the connection to the water circuit + drop conduit	◊
PFHC1X	500 mm flexible pipes for the connection to the water circuit + drop conduit	◊
V2ONX	2-way ON-OFF valve for variable flow-rate loop	◊
BPH2OX	Manual shut-off valve on the system water connections	◊
VIMANX	Hand shut-off valve	◊
V2MODX	2-way modulating valve for disposable water system	◊
Electric circuit		
MOBA	RS485 serial port with Modbus protocol, built-in	O
MOBX	RS485 serial port kit with Modbus protocol	◊
CMSLWX	LonWorks serial communication module	◊
BACX	BACnet serial communication module	◊
CWMX	Electronic room control with display, for wall installation	◊
CIWMX	Electronic room control with display, for wall installation in built-in box	◊
Installation		
AMMX	spring antivibration mounts	◊

x Standard component
O Optional component
◊ Accessory separately supplied (optional)

Dimensional drawings

DAAB705_07_00 REV00
DATA 05/05/2016

Size 005.1 - 007.1



1. Compressor compartment
2. Electrical panel
3. Power input
4. Condensate drain
5. Functional spaces
6. treatment coil
7. G2 filters (standard)
8. Electric fan
9. Lifting brackets (removable)
10. Water inlet 1/2"F
11. Water outlet 1/2"F

(R) Return Air

(M)Air supply

SIZES	005.1	007.1
A (Lenght)	1018	1018
B (Height)	254	254
C (Depth)	594	594
Weight	59	60
Standard unit water fittings	69	70

The presence of optional accessories may result in a substantial variation of the weights shown in the table.

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