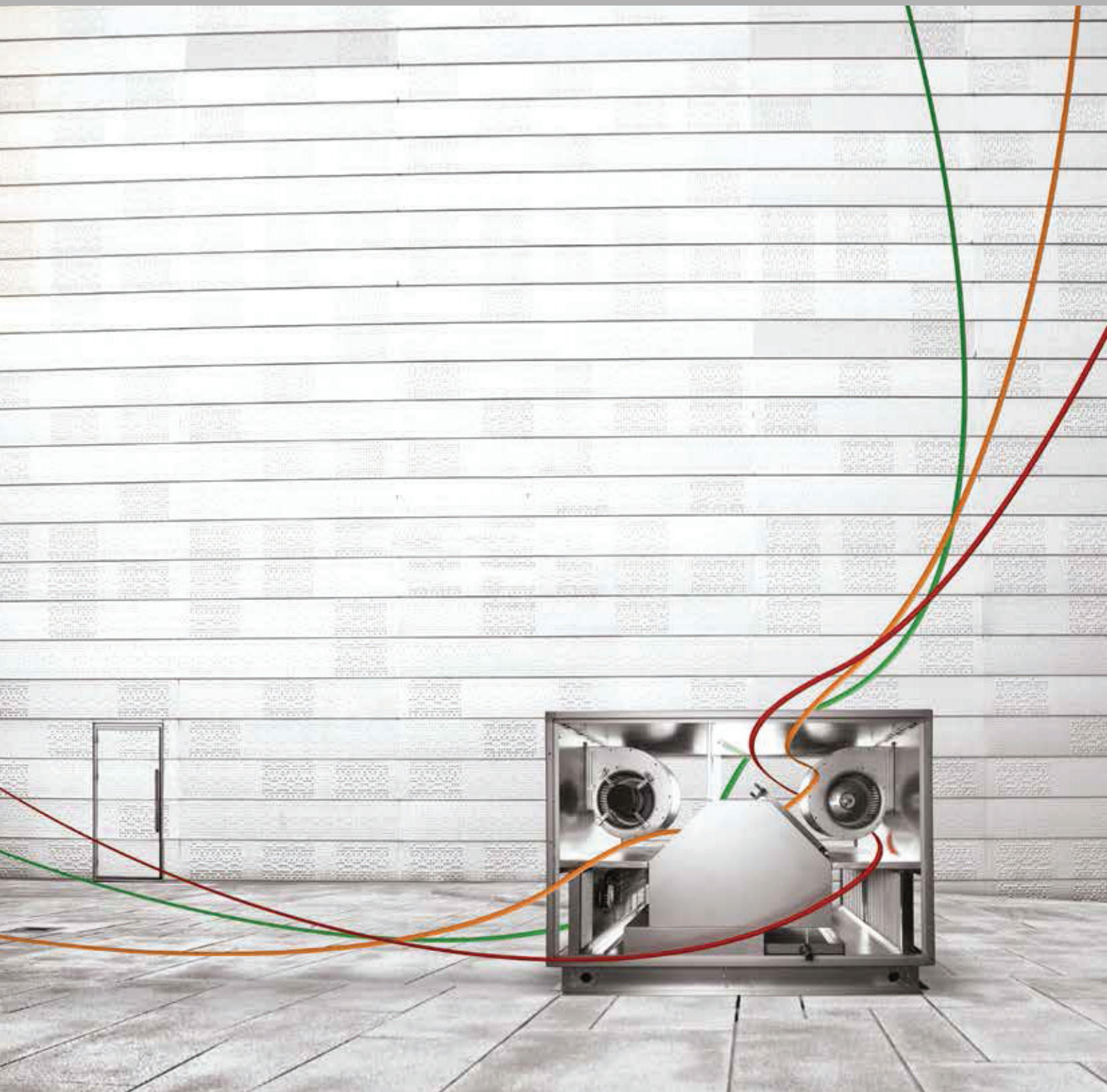
HRSERIES

DOUBLE FLOW VENTILATION UNITS WITH HIGH EFFICIENCY ENERGY RECOVERY

P.LEMMENS
AIR MOVEMENT COMPANY



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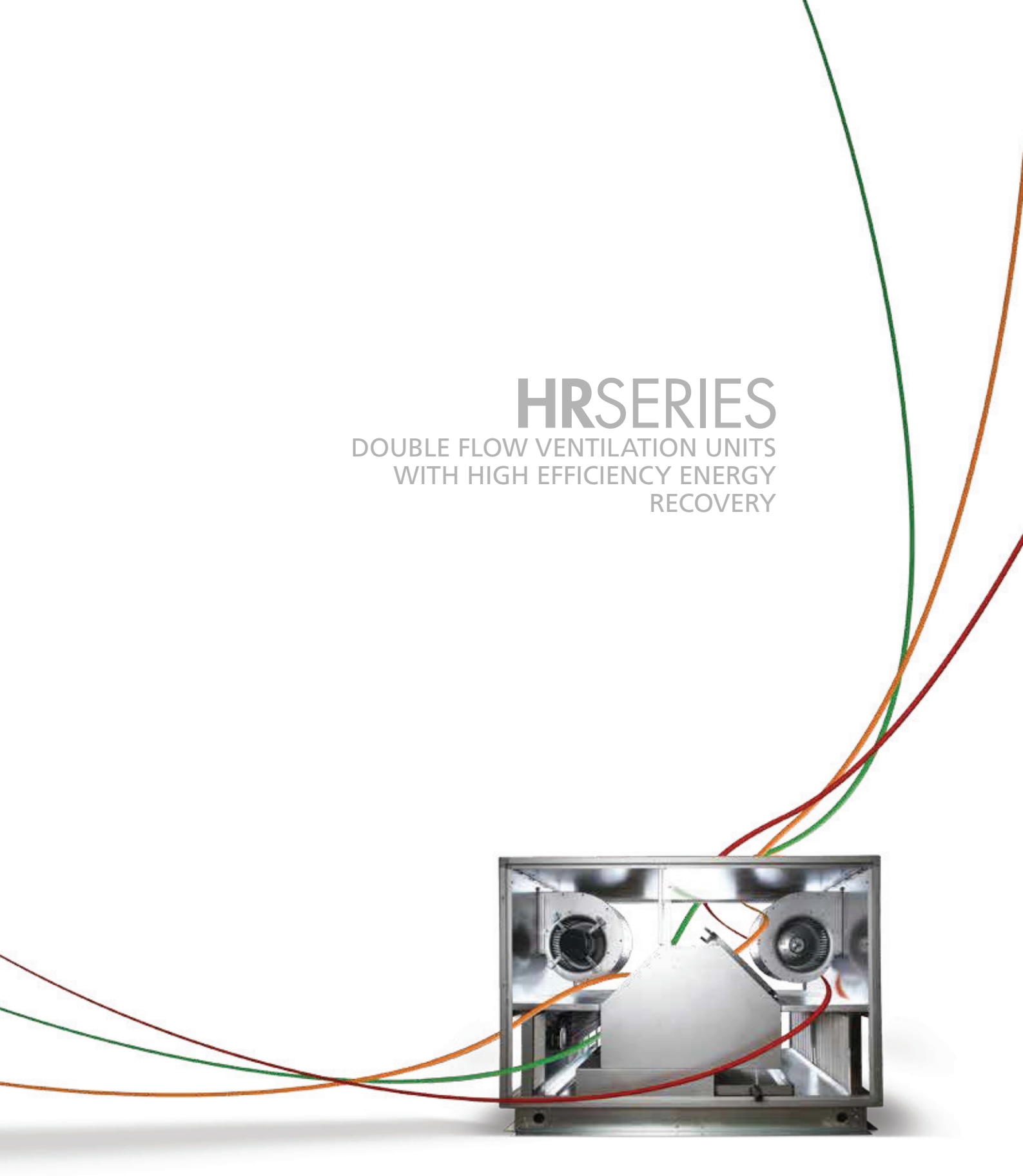


P.LEMMENS
AIR MOVEMENT COMPANY

FOREWORD

… ERP2015 Compliant... for more than 15 years…

ErP2015

P.LEMMENS AIR MOVEMENT COMPANY

is a Belgian company, founded in 1977 by Pierre Lemmens, specialised for more than 35 years in the control of air movement applied to heating, air conditioning and ventilation. The company employs a team of more than 50 in modern buildings exceeding 7500 m² of floor space, and focuses on developing and producing intelligent products relating to air movement.

P.LEMMENS has acquired real proficiency on the matter over the years. The Total Airflow Control (TAC) technology is one of the major fruits of this proficiency (cf. p. 11) and is currently in its fifth generation. This proficiency is applied also to producing and distributing developed products.

P.LEMMENS was a visionary, so TAC technology is applied to all the ranges of products (Cubus, AE, Aira, Compo and, of course, HR) since 1996. These products have consequently been 'ERP2015 Compliant' for more than 15 years. In other words, P.LEMMENS has been declared, through audits, to comply with the selective criteria of "positive economy" ®, a labelling concept intended to reconcile economy and ecology.

TAC technology is at the base of its growth and is today distributed throughout Europe.

REC HR: HIGH EFFICIENCY DOUBLE FLOW VENTILATION UNITS

P.LEMMENS has since 1997 specialised in the design and production of double flow ventilation units with energy recovery. The aim from the outset was to focus on efficiency. Brochures of that period stressed that "it is absurd to want to recover heat energy when electric energy was being wasted…" That is why first generation TAC technology was already applied to this product. Accordingly, direct current Electronically Commutated Motor (ECM) fans with permanent magnets were selected systematically for the development of the range. With this decision, the HR range anticipated the most exacting levels of electricity consumption to come such as the ErP2013/2015 standards, simply by a philosophical choice…
The motors have been further improved since as have the control systems which are now open to MODBUS communication and all its advantages.

PLUG & PLAY

All the HR range units are supplied as 'Plug&Play'. The standard settings are pre-programmed in the factory, so it suffices to connect the power supply and the control signals and/or the remote control, and to enter the specific settings for the application.
Putting the units into use becomes a breeze…

ACCESSIBILITY OF COMPONENTS

The units are designed to give the user easy access to the different components. The doors are largely sized and fitted with handles. They can be withdrawn, for easy access, even when installed in limited space. The control panel is likewise easy to access and centralises all the wiring.

COUNTERFLOW EXCHANGERS

The same focus on efficiency led us to opt for counterflow exchangers.

- These are far superior to other types of exchanger (96%).
- They ensure flawless tightness between the 2 airflows, thereby constituting great **advantage in terms of hygiene compared with rotary exchangers.** …

The exchangers are in "salt-air resistant" aluminium and are suitable for temperatures up to 80°C. They are compliant with the DIN1946 tightness standard and are Eurovent approved according to the EN 308 standard (measurement of heat efficiency and validity of technical data).

HIGH EFFICIENCY FANS

The TAC fans are equipped with high efficiency DC motors at the cutting edge of the latest technologies. They can achieve sizeable external pressure levels, whilst guaranteeing low consumption throughout the entire operating range.
The TAC control system guarantees the known precision from the operating point of view and makes an active contribution to optimising consumption.
The efficiency levels are naturally compliant with the ErP2013/2015 standards. P.LEMMENS has opted for a forward curved fan for its HR range for 2 reasons:

- Its characteristics relating to the tolerance system variations of pressure losses. In fact, it preserves good efficiency throughout the entire range of its use;
- Its lower noise level, thanks to a lower rotation speed and a higher number of blades.

TAC4 REGULATION COMPLETES THE SYSTEM

The HR units are fitted with a complete electronic regulation system used to operate the fans, the bypass, the anti-freeze protection of the exchanger, the valves, the pre-heating coil (option), and post-heating coil (option) as well as the external hot and/or cold exchangers (option).
It is equipped with a MODBUS communication bus used for its interfacing and complete integration with a standard centralised control system.

FIRE ALARM MANAGEMENT

The TAC4 regulation is provided with complete management of supply and exhaust airflow in case of fire alarm: for setting the airflow rate if the alarm is activated and for stopping or starting the supply and exhaust airflow independently via external contacts, intended for the fire brigade.

FREE COOLING FOR SUMMER NIGHTS

All HR units are equipped with a 100% bypass as a standard (the Mural range is equipped with a 70% bypass). Operated entirely by regulation, this system cools the rooms during the night when the differences of indoor and outdoor temperature permit. This system can be connected to a ground-coupled heat exchanger to improve efficiency even more. The control settings can be adjusted by the operator.

NON-RETURN VALVES (OPTION CT)

A non-return valve can be mounted in the factory to avoid undesirable (natural) draughts on the incoming and outgoing airflows when the unit is stopped. It is supplied fully wired with servomotor and is operated by the TAC regulation. A delay is provided when starting the fans.

AIR FILTERS

All the units of the HR line are supplied as a standard with oversized air filters (to reduce the pressure drop) that protect the exchanger and improve the quality of the incoming air. F7 filters (G4 for the Flat and Mural series) are mounted on the fresh air suction (outdoor air) and G4 filters on the room suction (indoor air). Replacement filter kits are also available.

INTERNAL PRE-HEATING (OPTION KWin)

The Global and Flat ranges can be equipped in the factory with an electric pre-heating system built in the unit. The purpose is to avoid the risk of frosting of the exchanger when the temperatures are too low. The capacity of the exchanger is modulated automatically by the TAC regulation. It is delivered "ready to use."

INTERNAL POST-HEATING (OPTION KWOUT OR NV)

The HR Global range can be equipped in the factory with a built-in electric (KWout) or hydraulic (NV) post-heating system.
The purpose is to offset the low temperature loss in the exchanger and thus ensure a comfortable supply air temperature.
The units are delivered ready to use and are regulated entirely by the TAC regulation system to maintain a constant supply air temperature (defined by the user). The power of the electric exchangers (KWout) is modulated by a regulator (delivered wired). The water coil (NV) is fitted with a 3-way valve with servomotor and delivered ready to be connected to the hydraulic network.

EXTERNAL POST-HEATING/ COOLING (OPTION BA+/-)

The HR ranges can be equipped with external post-heating and/ or cooling exchangers. These exchangers are fitted outside the unit, but designed to be assembled harmoniously. The TAC regulation is provided to manage this option fully. It is delivered "ready to use."

AREAS OF APPLICATION

The REC HR can be used in the construction or renovation of buildings:

- Apartment buildings
- Day-care centres
- Individual houses
- Pre-schools and secondary schools
- Offices, medical centres
- New residential complexes
- Supermarkets
- Fitness centres, gyms
- Cafeterias, restaurants,
- Hotels, cinemas, theatres
- Swimming pools
- Hospitals

They have to be selected in accordance with the application and the desired result in terms of efficiency and sound level.

VENTILATION SYSTEMS

With the HRGLOBAL, HRFLAT and HRMURAL series, P.LEMMENS presents a wide, mature and complete range of centralised ventilation units with energy recovery. There is a unit that corresponds to each application, if it is between 100 and 6000 m³/h. Whether the application is residential or otherwise, all the units have high efficiency, high-tech EC operated by an intelligent TAC4 system, and exchangers are used to recover up to 96% of the heat energy contained in the ventilation cycle. These characteristics guarantee an optimal efficiency for the unit.

HRGLOBAL, HRFLAT, HRMURAL

The most important criterion for selecting one or another unit is its area of application. The HRMURAL units are more suitable for energy optimisation applications for residential purposes, whereas HRFLAT and HRGLOBAL units are better suited for non-residential buildings, such as schools, offices and shopping centres. They can also be used for residential buildings, of course, if such a choice proves economically and technically reasonable.

ADVANTAGES OF HR UNITS

- The HR units are high efficiency with low operating and maintenance costs
- All the HR units can be configured in a simple (GRC) or more sophisticated network (SAT MODBUS, TCP/IP module or GPRS).
- The air breathed in the buildings is always pleasantly fresh and healthy.
- The systems avoid the damages caused by humidity and mildew.
- Extensive energy savings thanks to high efficiency exchangers.
- The constant pressure regulation (CPs) ensures individualised centralised ventilation in an apartment building.
- The constant airflow regulation (CA) ensures that the flow rate is maintained irrespective of the loss of load.
- The constant airflow regulation linked to a 0-10V (LS) signal links the flow rate directly to a sensor value (example, an air quality sensor).
- The post-heating and/or cooling batteries (option) ensure the desired comfort temperature of supply air.

SUMMARY

HRGLOBAL SERIES	AIRFLOW RATE [M³/H]	AUTOMATIC BYPASS	BUILT-IN PRE-/POST-HEATING	EXTERNAL POST-HEATING/COOLING
HRGLOBAL 800	100-800	Yes - 100%	YES	YES
HRGLOBAL 1200	100-1200	Yes - 100%	YES	YES
HRGLOBAL 2000	100-2000	Yes - 100%	YES	YES
HRGLOBAL 3000	100-3000	Yes - 100%	YES	YES
HRGLOBAL 4000	100-4000	Yes - 100%	YES	YES
HRGLOBAL 5000	100-5000	Yes - 100%	YES	YES
HRGLOBAL 6000	100-6000	Yes - 100%	YES	YES
HRGLOBALUP 450	50-450	Yes - 100%	NO	YES
HRGLOBALUP 800	100-800	Yes - 100%	YES	YES
HRGLOBALUP 1200	100-1200	Yes - 100%	YES	YES
HRGLOBALUP 2000	100-2000	Yes - 100%	YES	YES

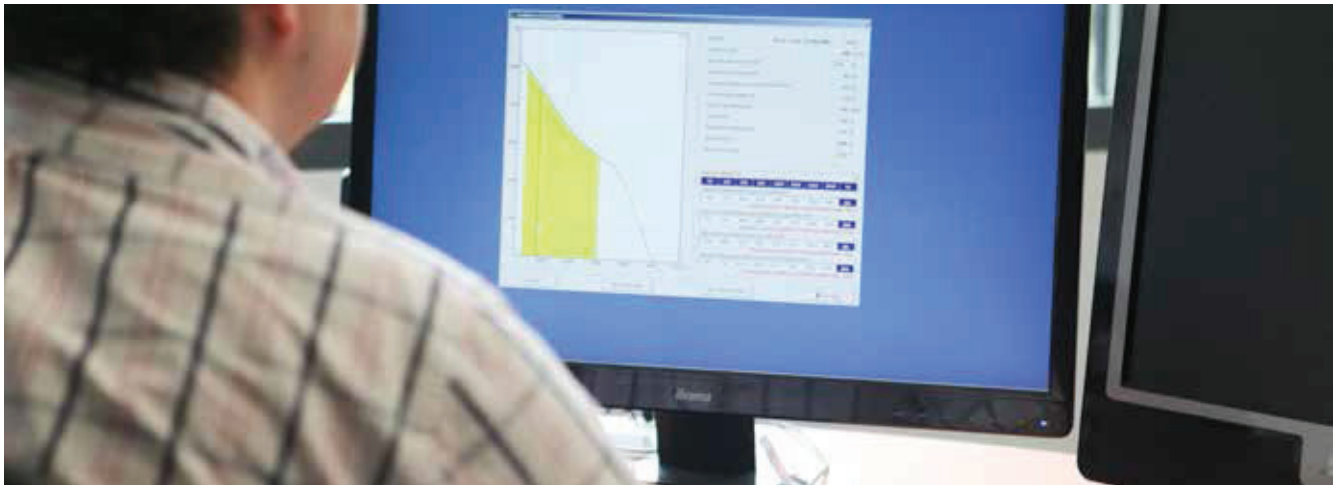
HRFLAT SERIES	AIRFLOW RATE [M³/H]	AUTOMATIC BYPASS	BUILT-IN PRE-/POST-HEATING	EXTERNAL POST-HEATING/COOLING
HRFLAT 450	50-450	Yes - 100%	YES	YES
HRFLAT 600	50-600	Yes - 100%	YES	YES
HRFLAT 1000	100-1000	Yes - 100%	YES	YES
HRFLAT 1600	100-1600	Yes - 100%	YES	YES
HRFLAT 2000	100-2000	Yes - 100%	YES	YES

HRMURAL SERIES	AIRFLOW RATE [M³/H]	AUTOMATIC BYPASS	BUILT-IN PRE-/POST-HEATING	EXTERNAL POST-HEATING/COOLING
HRMURAL 450	50-450	Yes - 70%	NO	YES
HRMURAL 600	50-600	Yes - 70%	NO	YES
HRMURAL 800	100-800	Yes - 70%	NO	YES
HRMURAL 1200	100-1200	Yes - 70%	NO	YES
HRMURALUP 450	50-450	Yes - 70%	NO	YES

SELECTION PROGRAMMES

A selection programme is available for all the series of HR products.
It can be used to determine all the technical characteristics of the unit under the conditions of application chosen: power consumption, heat efficiency, air characteristics, sound level, etc.

Easy and user-friendly, it can be downloaded from our website: **www.lemmens.com** .



ASSEMBLY / DISASSEMBLY

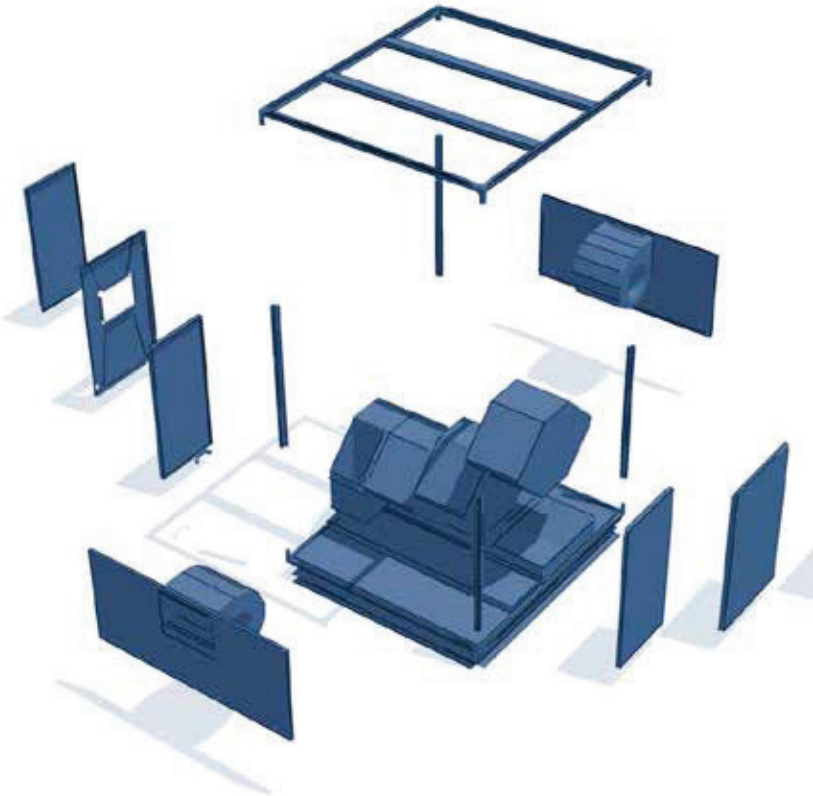
The HR units can be installed easily everywhere.

The units of the HRglobal range are at times too bulky to be introduced in certain rooms. That is why they can be partially disassembled so they can be brought in the room where they have to be installed.

In such a case, it is possible to deliver the unit ready to be easily disassembled and reassembled on the spot. It is nonetheless preferable to provide for this functionality, which requires a specific assembly in the factory, from the outset.

You can carry this operation out yourself by following the instructions of the manual provided for this purpose,

Contact our sales department or consult our ad hoc brochure for more information on the subject.



TAC4 REGULATION SYSTEM

The TAC4 regulation system handles the complete regulation of the basic unit as well as the options.
The main functionalities are:

- Built-in clock to vary the setting depending on the time slot.
- Fire alarm management by activating supply and extraction air with possible derogation by the fire brigade using external contacts.
- Signalling/information for all alarms.

- Operation of supply and exhaust air fans in constant airflow with multiple set points (CA) or linked to a 0-10V (LS) signal, which makes it possible to subject the airflow setting to a CO2 rate (air quality) or a constant pressure mode (CPs), so as to modulate the air flow automatically according to the opening/closing of valves in a collective ventilation system, for instance.
- Automatic opening and closing of valves mounted on the suction.
- BOOST function to activate a pre-programmed airflow rate via an external contact.

- Networking units via MODBUS, KNX, or BAcnet communication. (Other protocols with gateway)

- Automatic regulation of the bypass based on indoor and outdoor temperature sensors and the time slot. Forced opening by external contact is also possible.
- Regulation of water or electric post-heating exchanger (NV / KWout).
- Regulation of external hot and/or cold water exchanger.

- Display of all the operating parameters: airflow rates, pressures, temperatures, state of bypass / valves / anti-freeze / inlets – outlets / ….
- Interfacing with simple (RC) or complete (GRC – touch screen) remote control.
- Control and display systems via WEB pages (TCP/IP or GPRS modules).

- Automatic anti-freeze protection of the counterflow exchanger by modulating flow rates and/ or the power of an electric pre-heating battery (KWin).

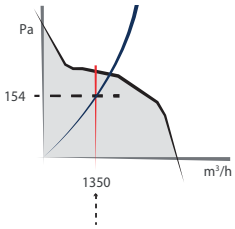
CONSTANT AIRFLOW OR CONSTANT PRESSURE?

Depending on the requirements and characteristics of the application, the ventilation system chosen will be a constant pressure (CPs) or constant airflow (CA) or variable constant airflow (LS) system via a 0-10V signal. The master/slave system (which may be deactivated if necessary) between supply and extraction ensures a balanced ventilation between supply and extraction air at all times. The HR units offer a sufficient reserve of available pressure as well as a possible modularity of the installation while retaining the operating setting.

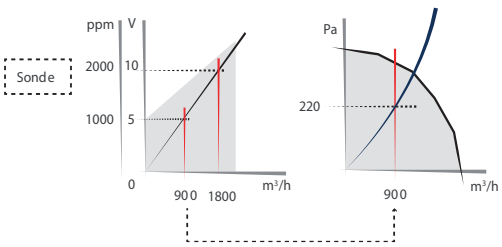
- Constant airflow (CA mode) is used when a stable volume of air is required, usually for non-residential purposes: offices, schools, day care centres, gyms, etc.
- Variable constant airflow (LS mode) is probably the most economical ventilation mode, because the airflow actually provided depends on the real demand at the moment, so there will not be any superfluous ventilation. Thus, for instance, the constant airflow required can be linked to a measurement of the CO2 rate via a 0-10V signal. When this rate is high (many people present), the flow rate will be adjusted accordingly, and vice-versa, when there are few people in the room. Energy consumption will follow the real ventilation need.
- Variable flow rate to maintain a constant pressure (CPs mode): a particularly interesting application of this operating mode is undoubtedly the individualised ventilation of apartments by a centralised ventilation unit. Once configured, the ventilation of each apartment remains constant even if several apartments change their ventilation demand, as the pressure in the network is maintained constant. A pressure measurement sensor must be provided to configure this very useful mode.

THE 3 OPERATING MODES: CONCRETE EXAMPLES

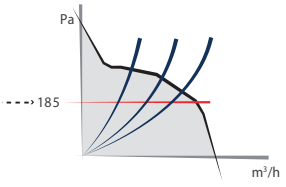
CA stands for "constant airflow." This means that you chose one (or more) flow rates and the TAC4 regulator will operate the fans to provide it, irrespective of the pressure loss.
Example: I request 1350 m³/h from the system and I obtain, irrespective of the pressure drop of the network, not about 1350 m³/h, but exactly 1350 m³/h….



LS stands for "link with a 0-10V signal." This means that you enter a specific linear relationship between a 0/10V signal (representing the temperature, humidity, CO2 rate, etc.) and the airflow that the fans will have to provide. The system will see to this link, irrespective of the pressure drop of the network.



CP stands for "constant pressure." This means that you enter an initialisation flow rate. The resulting pressure will be stored and serve subsequently as the reference value to be maintained constant by the system which will operate the fan with that setting, irrespective of changes of the system. It is also possible to introduce the pressure value directly, if it is known.
Example: Once the network is balanced, I note that to obtain 150 m³/h in each apartment, I am creating a loss of load of 185 Pa in the network. I store this value and the system will change its flow rate to maintain it constant. This will ensure a constant flow rate in each apartment, irrespective of the changes that each inhabitant makes to his ventilation…



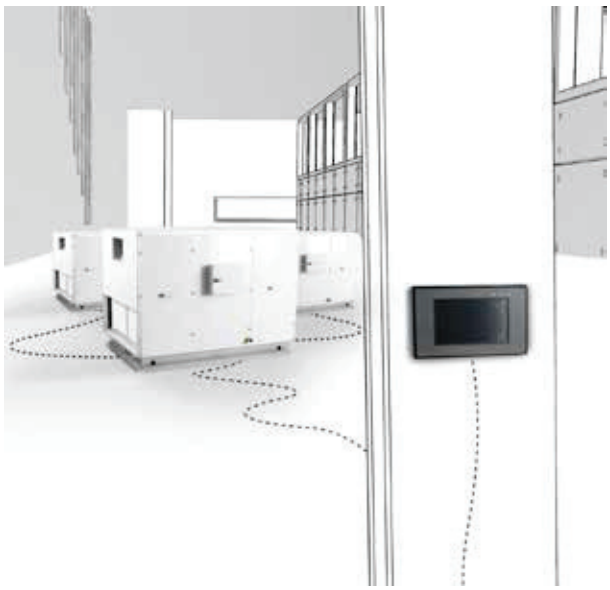
The TAC4 regulation built in the HR units is used to configure the operating settings, to control the unit and to display all the settings in operation.
There are various possibilities of interfacing with the user:

TAC4 RC

- This is a remote control box that includes an LCD screen (2x8 characters), the signalling LEDs and 5 control buttons.
- It is used to configure the settings of the system based on sequential menus, to view all the settings in operation of an HR unit.
- It is used to manage 4 time slots and OFF days.
- It can be connected temporarily to set and/or to display the settings, or permanently.

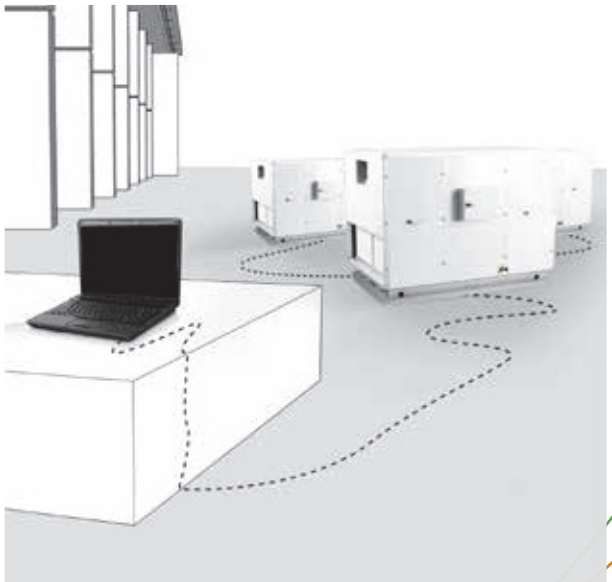
TAC4 GRC

- This is a 4.3" colour touch screen.
- It can be mounted exposed (under housing) or built in.
- It contains a very user-friendly and intuitive, Windows type of logical arrangement with menus.
- It is used to configure the settings of the system, to display all the settings in operation and to control the unit.
- It is used to manage 6 different time slots per day, as well as for the seasonal management of the bypass, the post-heating and post-cooling coil.
- Its MODBUS communication with the control box of the HR units is used for networking. A GRC can thus be connected to several units (247 maximum).



PC

- The TAC4 regulations built in the HR units offer the possibility of communication in MODBUS RTU, which means that the unit can be networked. A PC application (to be developed by the user) can then be used to communicate easily with the HR units.
- A converter of the COM or USB port to RS485 is needed to be able to connect to the MODBUS RTU network of the HR units.
- These must be equipped with the SAT MODBUS option and that's all there is to it!
- The gate of creativity is wide open here…



WEB PAGE

Two solutions are possible:

- The TAC4 TCP/IP module: communication module in TCP/IP with built-in Internet server.
- The TAC4 GPRS module: communication module in GPRS with built-in Internet server.

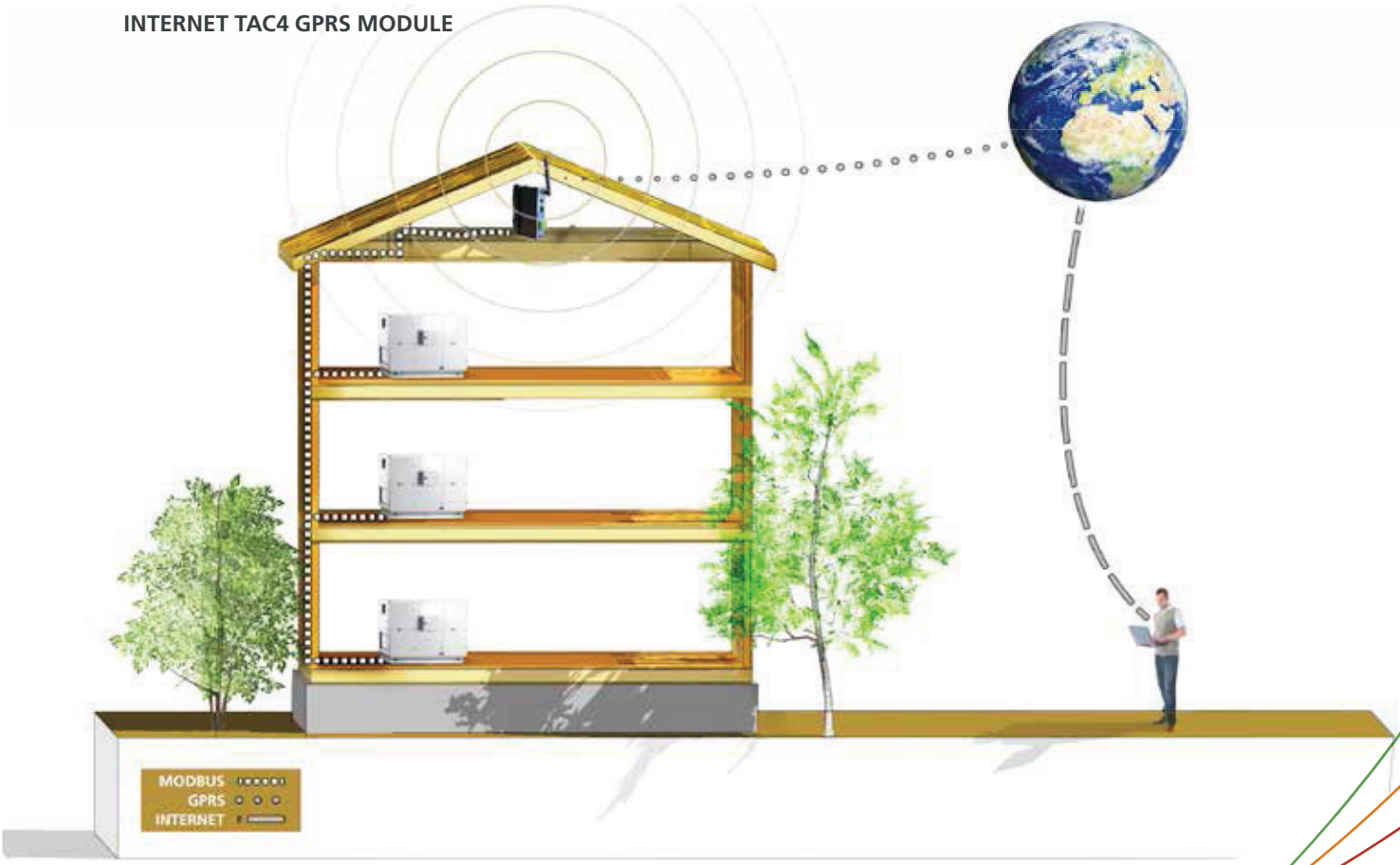
These modules include the same logical arrangement of screens as the GRC, but under the form of pages accessible via the Internet. This makes it possible to access HR units installed throughout the world, which offers enormous potential.

- They are used to configure the settings of the system, display all the settings in operation and to control the unit.
- They are used to manage 6 different time slots per day, as well as for the seasonal management of the bypass, the post-heating and post-cooling battery.
- Their MODBUS communication with the control box of the HR units is used for networking. A GRC can thus be connected to several units (247 maximum).
- The GPRS module is moreover used to send alarm messages via SMS or e-mails.

INTRANET TAC4 TCP/IP MODULE

INTERNET TAC4 TCP/IP MODULE

INTERNET TAC4 GPRS MODULE



BUILDING MANAGEMENT SYSTEMS (BMS)

The TAC4 regulations built in the HR units offer the possibility of communication in MODBUS RTU, which means that the unit can be networked.

Their integration in the BMS systems is consequently possible and very easy. It suffices to plug the SAT MODBUS option on the circuit, and that's all there is to it!

The building management system can send the different settings (flow rate, bypass, supply air temperature, etc.) and read all the settings of the HR unit in real time via the registers of the MODBUS communication protocol.

Communication to other standard protocols like KNX and Bacnet are also available.

TAC4 REGULATION SYSTEM

Control refers to the change of the operating settings. The HR units can be controlled in different ways:

- **Via a TAC4 RC or TAC4 GRC remote control:**

  The remote control systems are used to activate the different airflow settings directly by means of buttons on the TAC4 RC or via the touch screen of the GRC…

  The GRC can be used to open the bypass, activate the BOOST flow and stop the post-heating.

- **Via the inputs of the TAC4 regulation circuit mounted on the HR units:**

  These inputs allow to:

  - change the airflow rate settings via external contacts or a 0-10V signal, depending on the operating mode,

  - force the opening of the bypass,

  - activate the fire alarm and start/stop the supply and/or extraction air fans,

  - activate or deactivate the time slots,

  - deactivate the post-heating,

  - activate the BOOST airflow.

- **Via Time slots:**

  Once configured, the TAC4 regulation mounted on the HR units can function autonomously. The settings then vary automatically according to the time slots.

  If the configuration was carried out via an RC, the setting can vary up to 4 times per day and be deactivated on certain days of the week (days OFF).

  If the configuration was carried out via a GRC, the setting could vary up to 6 times a day and in a different way on each day. An automatic seasonal management of the bypass, the post-heating and post-cooling battery could also be activated (if configured).

- **Via MODBUS communication:**

  The HR units then function on the basis of the last settings sent by the MODBUS communication. The external management system (e.g. a BMS) can change them at all times. No other external signal is then necessary.

  The HR units can be controlled by these various means in the same application. This makes it possible, for instance, to use an RC or GRC to have only the display, if no means of control is used.

RC TAC4 (025004)

KIT GRC TAC4 (372002)

The TAC4 regulation mounted in the HR units can be combined with different options :

TAC4 RC

- This is a remote control box that includes an LCD screen (2x8 characters), the signalling LEDs and 5 control buttons.
- It is used to configure the settings of the system based on sequential menus, to view all the settings in operation of an HR unit.
- It is used to manage 4 time slots and OFF days.
- It can be connected temporarily to set and/or to display the settings, or permanently.
- The RC and GRC cannot be connected simultaneously to an HR unit.

ARTICLE	CID
RC TAC4	025004

TAC4 GRC

- This is a 4.3" colour touch screen.
- It can be mounted exposed (under housing) or built in.
- It contains a very friendly-friendly and intuitive, Windows type of logical arrangement with menus.
- It is used to configure the settings of the system, to display all the settings in operation and to control the unit.
- It is used to manage 6 different time slots per day, as well as for the seasonal management of the bypass, the post-heating and post-cooling battery.
- Its MODBUS communication with the control box of the HR units is used for networking. A GRC can thus be connected to several units (247 maximum); provide one SAT TAC4 MODBUS per unit.
- The RC and GRC cannot be connected simultaneously to an HR unit.

ARTICLE	CID
Kit GRC TAC4	372002
Exposed assembly kit	372020
Built-in assembly kit	372013

TAC4 TCP/IP MODULE

- This is a communication module in TCP/IP with built-in web server.
- The web pages are displayed in the form of very user-friendly, intuitive Windows type menus. These pages make it possible to configure the settings of the system easily, to display all the settings in operation and to control the unit.
- They also make it possible to configure 6 different time slots per day (each day can be different) and to proceed to a seasonal management of the bypass, the post-heating and post-cooling battery.
- Its MODBUS communication with the control box of the HR units can be used to network the units. A GPRS module can thus be connected with one or more units (247 maximum); provide one SAT TAC4 MODBUS per unit.
- The accessibility of the module via the Internet (its IP address) without requiring a wire connection makes it possible to access HR units installed everywhere in the world, which offers enormous potential.
- This module can be combined with an RC but not with a GRC.

ARTICLE	CID
TCP/IP TAC4 module	025012

TAC4 GPRS MODULE

- This is a communication module in GPRS with built-in web server.
- The web pages are displayed in the form of very user-friendly, intuitive Windows type menus. These pages make it possible to configure the settings of the system easily, to display all the settings in operation and to control the unit.
- They also make it possible to configure 6 different time slots per day (each day can be different) and to proceed to a seasonal management of the bypass, the post-heating and post-cooling battery.
- The GPRS module moreover makes it possible to send alarm messages via sms or e-mail.
- Its MODBUS communication with the control box of the HR units can be used to network the units. A GPRS module can thus be connected with one or more units (247 maximum); provide one SAT TAC4 MODBUS per unit.
- The accessibility of the module via the Internet (its IP address) without requiring a wire connection makes it possible to access HR units installed everywhere in the world, which offers enormous potential.
- This module can be combined with an RC but not with a GRC.

ARTICLE	CID
GPRS TAC4 module	025010

TAC4 SAT MODBUS

- MODBUS RTU communication circuit to be plugged in the TAC4 regulation circuit.
- It is used to network HR units in order to configure and control them and to display the settings from a central point.
- A direct application of the SAT MODBUS is the integration of HR units in a BMS system.

ARTICLE	CID
SAT TAC4 MODBUS	025006

TAC4 SAT BA/KW

- This is a regulation circuit for hot (water or electric) and/or cold (water) battery.
- It regulates the external exchangers to maintain the temperature setting of the constant supply air. A setting can be configured on “hot” and another on “cold.”
- It is very simple to install: just plug it in the TAC4 regulation circuit.

ARTICLE	CID
SAT TAC4 BA/KW Kit	372004

SAT3

- This is a circuit comprising 2 relays used to signal that the fans are on (FAN ON) as well as to give a pressure alarm.
- The signalling is carried out by potential-free contact as well as by an LED placed above each relay.
- It is very simple to install: just plug it in the TAC4 regulation circuit.

ARTICLE	CID
SAT3	370005

HRMURAL SERIES

HRMURAL

HRMURAL is a range of controlled mechanical ventilation units with high efficiency heat recovery (up to 96%), composed of a counter flow aluminium plate exchanger, galvanized steel, class G4 and F7 (option) filters, a 70% bypass and centrifugal fans with high efficiency electronic motor (TAC series), from which it draws all the advantages. It is designed for applications going up to 1200 m³/h. The efficiency of the exchanger often makes adding a post-heating (or post-cooling) system superfluous, although such a system is provided as an option.

It is delivered ready to use, entirely pre-wired -- the options too -- and with a remote control (to choose) or a MODBUS communication for controlling the device without opening it… just connect to the power supply (outside the unit) and to the remote control or the MODBUS communication and to activate the unit, and it's ready to run.

The 450 model is available with horizontal (HRMURAL 450) or vertical (HRMURALUP 450) airflow directions

CONTROL MODULES AVAILABLE AS AN OPTION

RC REMOTE CONTROL

GRC GRAPHIC RE-MOTE CONTROL

GPRS TAC4 MODULE

TCP/IP TAC4 MODULE

SAT TAC4 MODBUS INTERFACE

SAT TAC4 BA/KW INTERFACE

SAT3

MODEL	CID	AIRFLOW RATE
HRMURAL 450	884200	50-450 m³/h
HRMURAL 450 VEX	884205	50-450 m³/h
HRMURALUP 450	884204	50-450 m³/h
HRMURAL 600	884201	50-600 m³/h
HRMURAL 600 VEX	884206	50-600 m³/h
HRMURAL 800	884202	100-800 m³/h
HRMURAL 800 VEX	884207	100-800 m³/h
HRMURAL 1200	884203	100-1200 m³/h
HRMURAL 1200 VEX	884208	100-1200 m³/h

AVAILABLE OPTIONS

- **HRMURAL for indoors installation**
- **HRMURAL VEX designed for outdoors installation. They are delivered with roof, base, suction hood and roller blind.**
- **The HRMURAL 600 and 800 can be installed horizontally or vertically.**

TECHNICAL CHARACTERISTICS

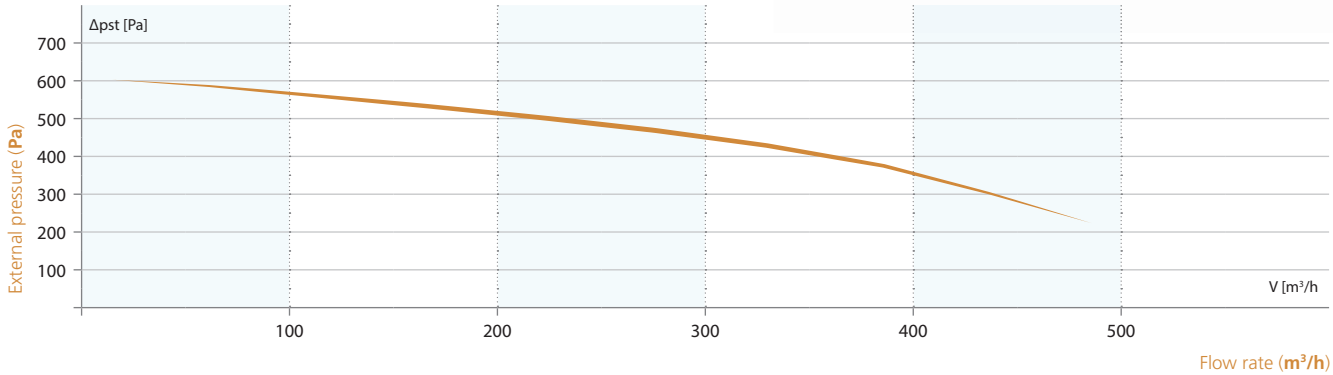
- High efficiency counter flow exchanger (up to 96% efficiency) in aluminium resistant to salt air and for temperatures between -30° C and +100° C. It is Eurovent approved according to EN308.
- High efficiency centrifugal fans: direct current motor with permanent magnets and electronic commutation:
- 3 operating modes possible: constant airflow (CA), link with 0-10V signal (LS) and constant pressure (CPs).
- Compact housing made of an anodised aluminium structure and acoustically and thermally insulated panels in painted steel on the outside (RAL9002) and galvanised steel inside. (UP version without aluminium frame.)
- Galvanized steel drainpan.
- Filters: G4 for incoming and outgoing air (F7 available as an option).
- Filter replacement alarm based on a measurement of pressure and/or operating time of the unit.
- Automatic 70% bypass activated by an actuator for free cooling in summer (temperature settings adjustable by the user). The bypass can also be operated by built-in clock and/or by external contact.
- Automatic anti-frosting system by modulating the air flows.
- Fire alarm management by activation of supply and extraction air flow with possible exemption by the fire brigade via the external contacts.
- Connection to a GTC system via a digital and/or analogue system (if the MODBUS communication cannot be used).
- GTC control functions via a MODBUS RTU protocol (SAT MODBUS option).
- The units are supplied with access panels on the side.
- The units are available in a left or right version (except HRMURALUP 450).

  All the units of the HRMURAL series are supplied complete with general switch, temperature sensors, servomotors where necessary, optional exchangers, wiring, etc. They are delivered plug & play and are individually tested in the factory after the final assembling with the options.

  Only the external control instruments (RC, GRC, TCP/IP module, GPRS module, any external pressure sensors, etc.) require connection on the spot by qualified staff.

HR MURAL 450

TECHNICAL CHARACTERISTICS



GENERAL CHARACTERISTICS

• AIR FLOW	50 - 450 m3/h
• DIMENSIONS (L X W X H)	712 x 500 x 500
• WEIGHT	87 kg
• NOMINAL VOLTAGE	1 x 230V - 50Hz
• MAXIMUM INTENSITY	2,9 A
• RECOMMENDED ELECTRICAL PROTECTION	8 A / D-10000A-AC3
• SUPPLY / EXTRACTION AIR FILTER	G4 / G4 (F7 en option)
• AVAILABLE OPTIONS	ER et SR by default
• AUTOMATIC FREE COOLING	OUI / Partiel
• OPERATING TEMPERATURE RANGE	-20°C à +50°C
• COLOUR OF PANELS	RAL 9002

TECHNICAL DATA

FLOW RATE	POWER ABSORBED	SFP	EXCHANGER EFFICIENCY	OUTLET T° AFTER EXCHANGER	SOUND LEVEL
m³/h	W	W/m³/h	%	°C	dBA
100	8	0,08	95,6	20,6	11,5
200	38	0,19	93,4	19,9	22,7
300	105	0,35	92,1	19,5	30,8
450	302	0,67	90,7	19	39,6

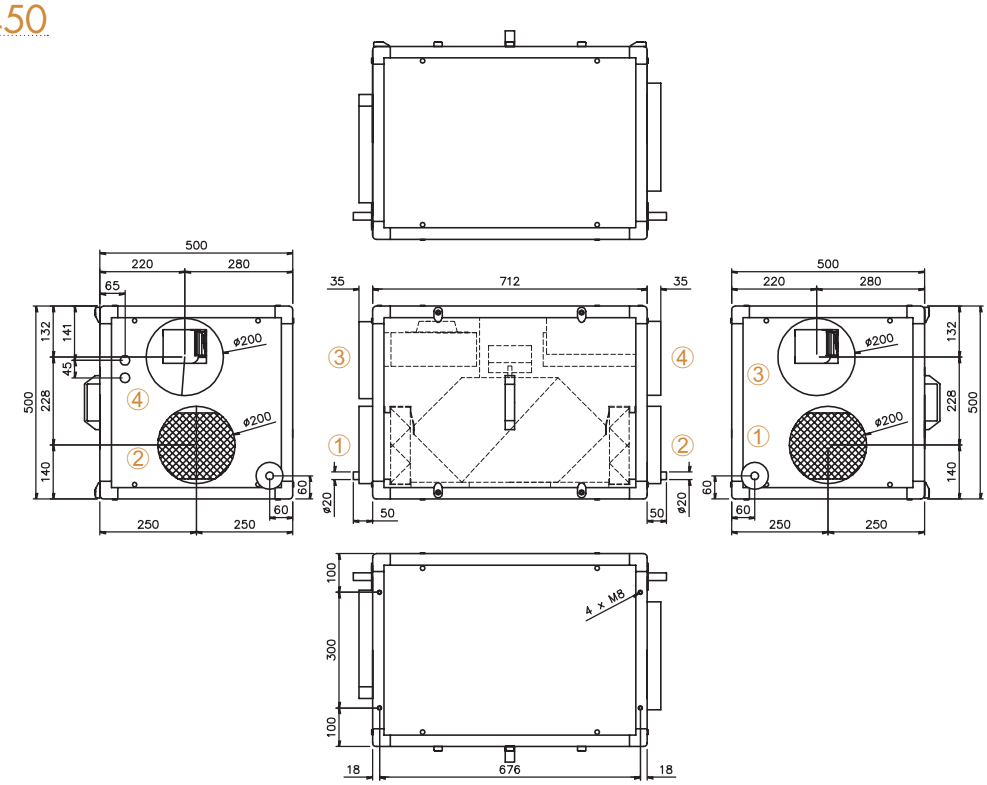
Conditions:

1. values calculated on the basis of an external 100 Pa system curve at maximum flow rate.
2. efficiency calculations for external conditions of -10°C, 90% RH and internal conditions of +22°C, 50% RH.
3. sound level in the open field at 3 m.

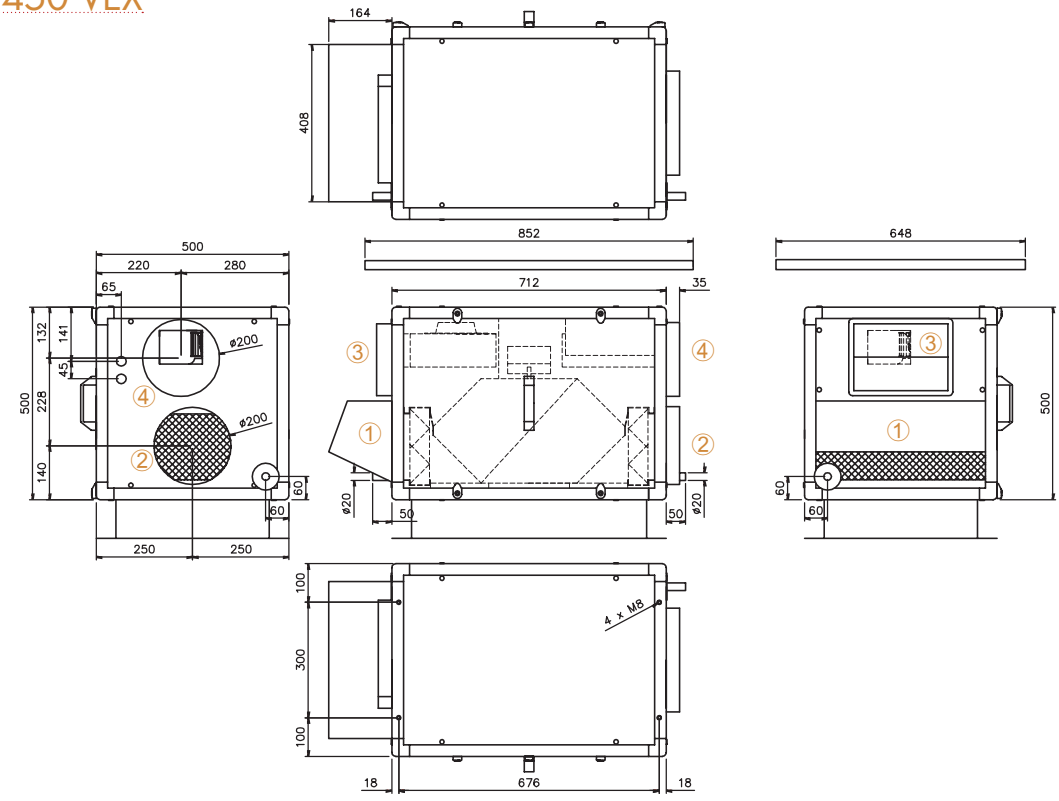
DIMENSIONS (mm)

① From the outside ② From the inside ③ To the outside ④ To the inside

HRMURAL 450



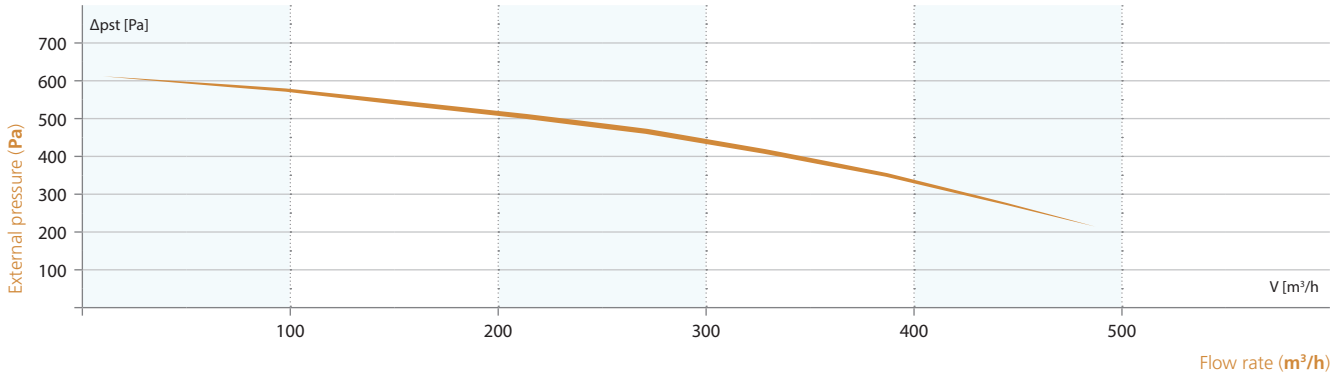
HRMURAL 450 VEX



MURAL

HR MURAL UP 450

TECHNICAL CHARACTERISTICS



GENERAL CHARACTERISTICS

• AIR FLOW	50 - 450 m3/h
• DIMENSIONS (L X W X H)	720 x 500 x 675
• WEIGHT	87 kg
• NOMINAL VOLTAGE	1 x 230V - 50Hz
• MAXIMUM INTENSITY	3,1 A
• RECOMMENDED ELECTRICAL PROTECTION	8 A / D-10000A-AC3
• SUPPLY / EXTRACTION AIR FILTER	G4 / G4 (F7 en option)
• AVAILABLE OPTIONS	ER et SR by default
• AUTOMATIC FREE COOLING	OUI / Partiel
• OPERATING TEMPERATURE RANGE	-20°C à +50°C
• COLOUR OF PANELS	RAL 9002

TECHNICAL DATA

FLOW RATE	POWER ABSORBED	SFP	EXCHANGER EFFICIENCY	OUTLET T° AFTER EXCHANGER	SOUND LEVEL
m³/h	W	W/m³/h	%	°C	dBA
100	8	0,08	95,6	20,6	11,5
200	42	0,2	93,4	19,9	22,5
300	111	0,36	92,1	19,5	30,5
450	316	0,69	90,7	19	39,5

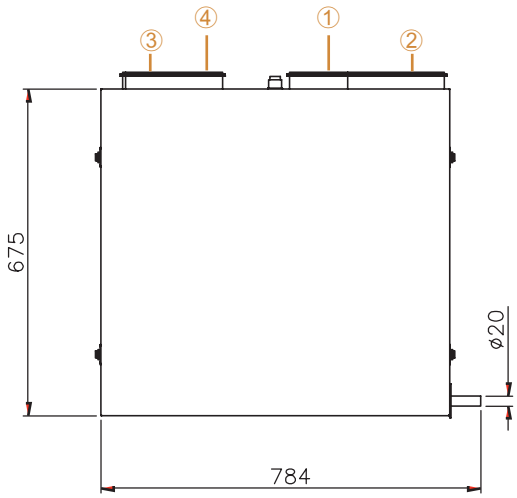
Conditions:

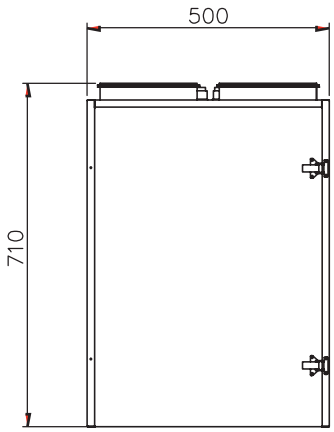
1. values calculated on the basis of an external 100 Pa system curve at maximum flow rate.
2. efficiency calculations for external conditions of -10°C, 90% RH and internal conditions of +22°C, 50% RH.
3. sound level in the open field at 3 m.

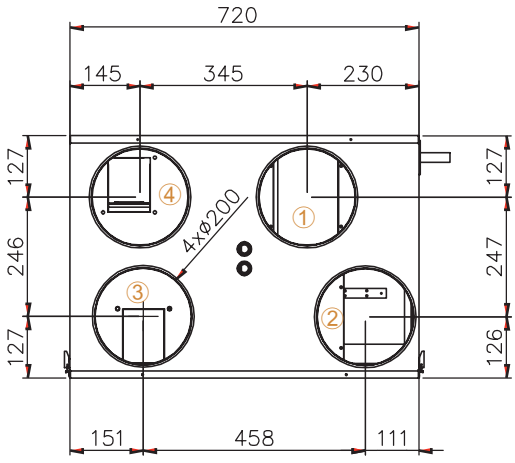
DIMENSIONS (mm)

① From the outside ② From the inside ③ To the outside ④ To the inside

HRMURAL UP 450

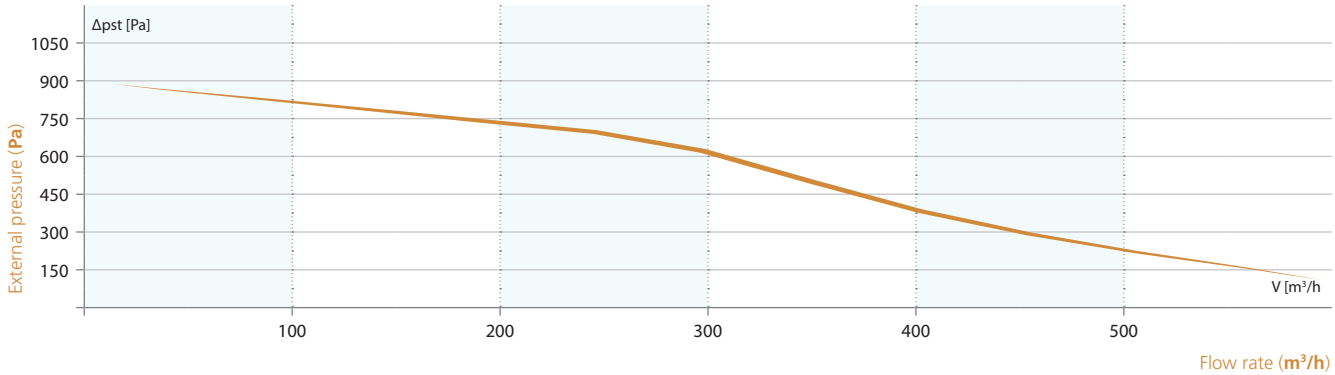






HR MURAL 600

TECHNICAL CHARACTERISTICS



GENERAL CHARACTERISTICS

• AIR FLOW	50 - 600 m3/h
• DIMENSIONS (L X W X H)	860 x 500 x 860
• WEIGHT	106 kg
• NOMINAL VOLTAGE	1 x 230V - 50Hz
• MAXIMUM INTENSITY	3,1 A
• RECOMMENDED ELECTRICAL PROTECTION	8 A / D-10000A-AC3
• SUPPLY / EXTRACTION AIR FILTER	G4 / G4 (F7 en option)
• AVAILABLE OPTIONS	ER et SR by default
• AUTOMATIC FREE COOLING	OUI / Partiel
• OPERATING TEMPERATURE RANGE	-20°C à +50°C
• COLOUR OF PANELS	RAL 9002

TECHNICAL DATA

FLOW RATE	POWER ABSORBED	SFP	EXCHANGER EFFICIENCY	OUTLET T° AFTER EXCHANGER	SOUND LEVEL
m³/h	W	W/m³/h	%	°C	dBA
150	13	0,09	95,6	20,6	13,9
300	65	0,22	93,5	19,9	25,3
450	162	0,36	92,2	19,5	31,9
600	328	0,55	91,2	19,2	37

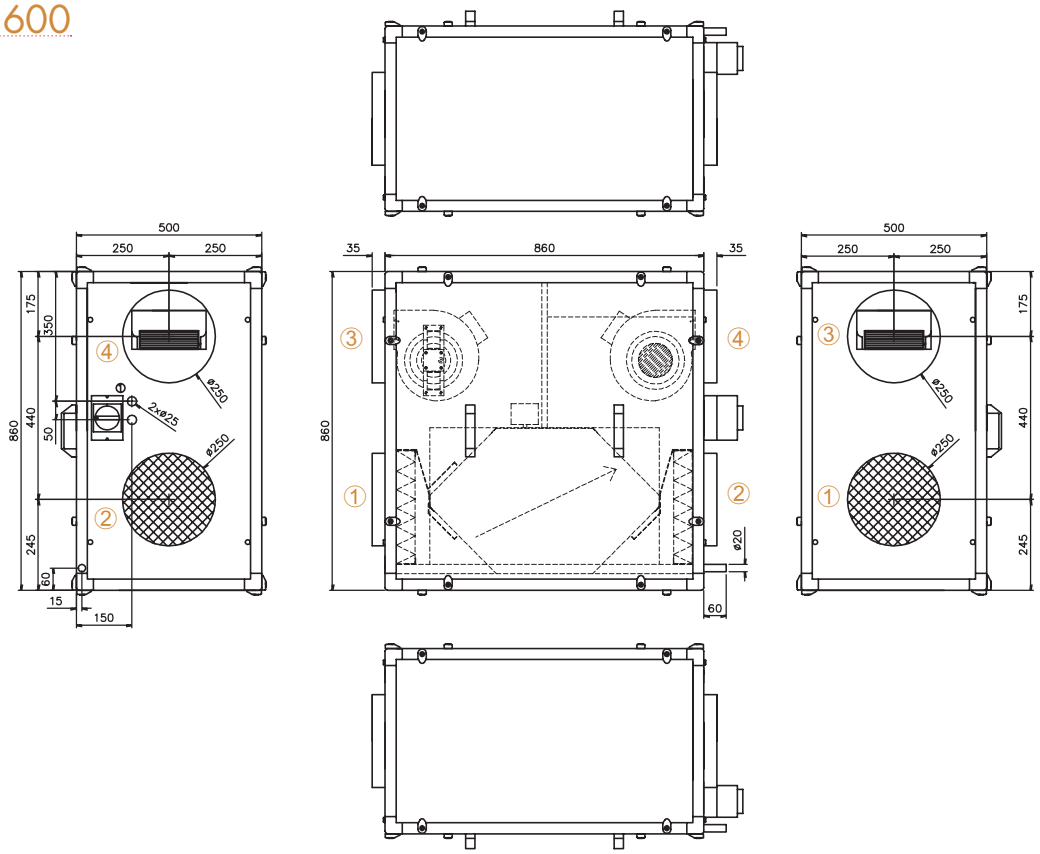
Conditions:

1. values calculated on the basis of an external 100 Pa system curve at maximum flow rate.
2. efficiency calculations for external conditions of -10°C, 90% RH and internal conditions of +22°C, 50% RH.
3. sound level in the open field at 3 m.

DIMENSIONS (mm)

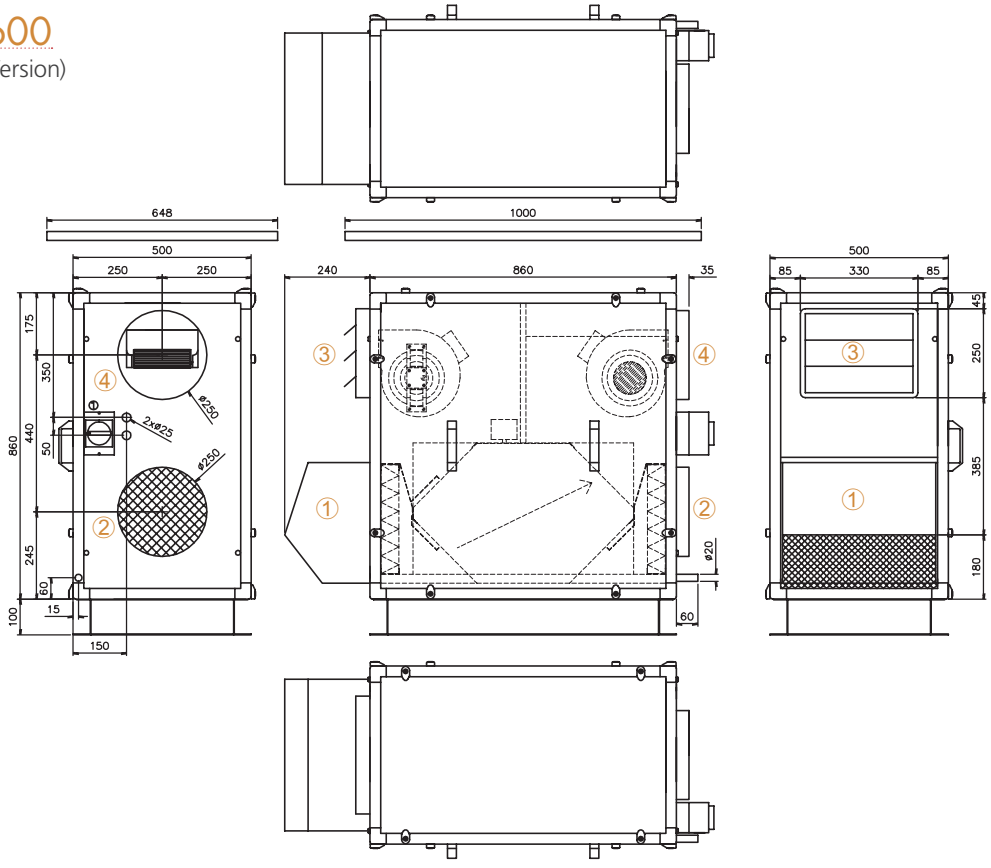
① From the outside ② From the inside ③ To the outside ④ To the inside

HRMURAL 600



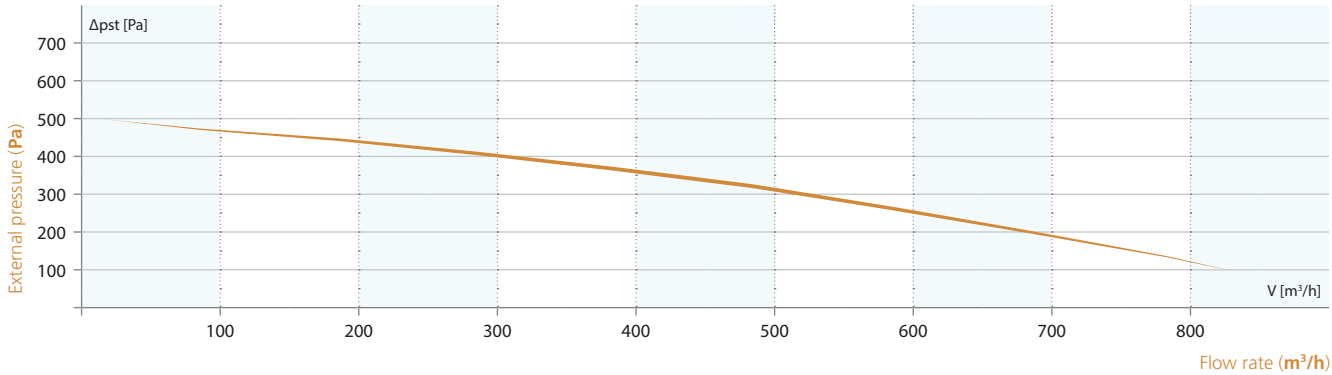
HRMURAL 600

VEX (External Version)



HR MURAL 800

TECHNICAL CHARACTERISTICS



GENERAL CHARACTERISTICS

• AIR FLOW	100 - 800 m3/h
• DIMENSIONS (L X W X H)	860 x 500 x 860
• WEIGHT	119 kg
• NOMINAL VOLTAGE	1 x 230V - 50Hz
• MAXIMUM INTENSITY	3,5 A
• RECOMMENDED ELECTRICAL PROTECTION	8 A / D-10000A-AC3
• SUPPLY / EXTRACTION AIR FILTER	G4 / G4 (F7 en option)
• AVAILABLE OPTIONS	ER et SR by default
• AUTOMATIC FREE COOLING	OUI / Partiel
• OPERATING TEMPERATURE RANGE	-20°C à +50°C
• COLOUR OF PANELS	RAL 9002

TECHNICAL DATA

FLOW RATE	POWER ABSORBED	SFP	EXCHANGER EFFICIENCY	OUTLET T° AFTER EXCHANGER	SOUND LEVEL
m³/h	W	W/m³/h	%	°C	dBA
200	20	0,10	94,8	20,3	18,6
400	98	0,25	92,6	19,6	29,2
600	262	0,44	91,2	19,2	35,7
800	524	0,66	90,2	18,9	40,5

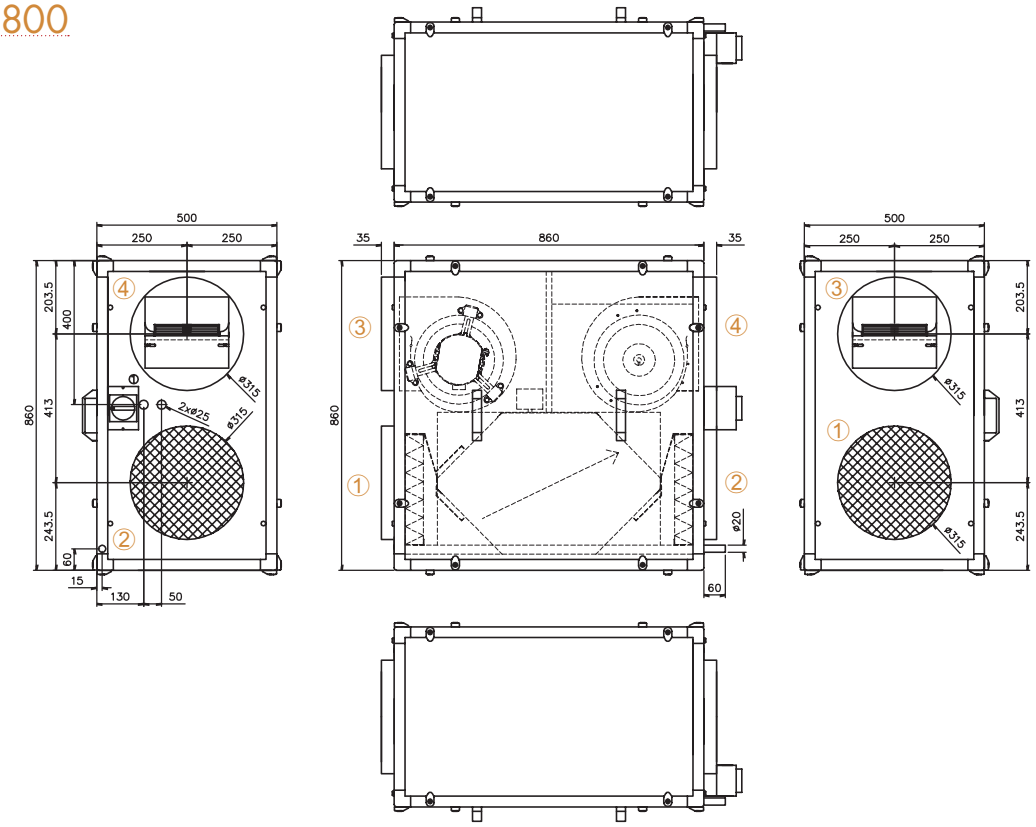
Conditions:

1. values calculated on the basis of an external 100 Pa system curve at maximum flow rate.
2. efficiency calculations for external conditions of -10°C, 90% RH and internal conditions of +22°C, 50% RH.
3. sound level in the open field at 3 m.

DIMENSIONS (mm)

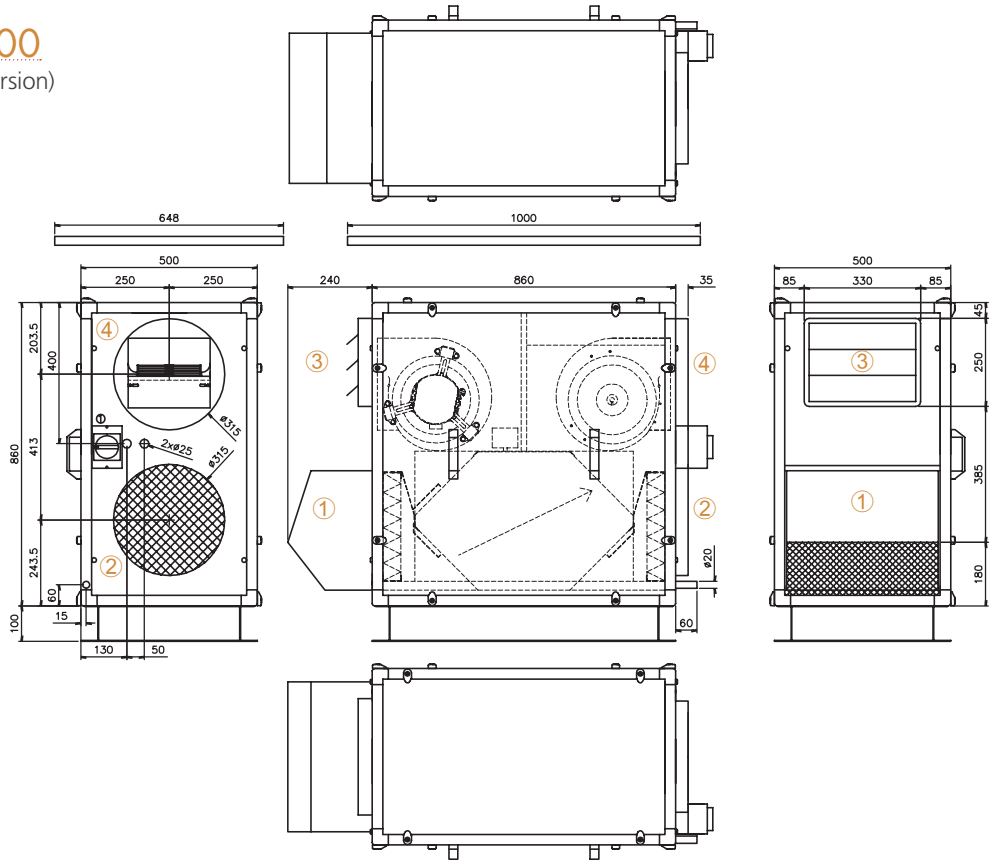
① From the outside ② From the inside ③ To the outside ④ To the inside

HRMURAL 800



HRMURAL 800

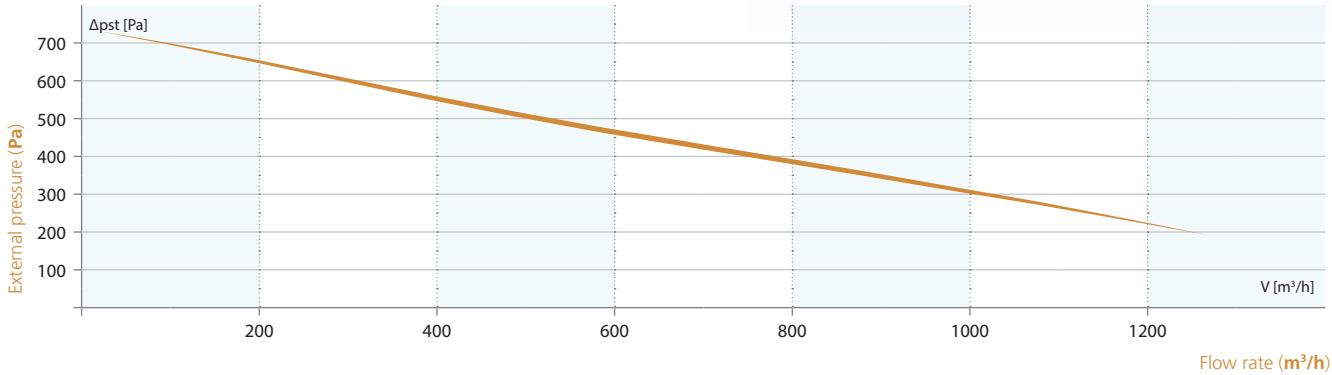
VEX (External Version)



MURAL

HR MURAL 1200

TECHNICAL CHARACTERISTICS



GENERAL CHARACTERISTICS

• AIR FLOW	100 - 1200 m3/h
• DIMENSIONS (L X W X H)	1000 x 860 x 860
• WEIGHT	179 kg
• NOMINAL VOLTAGE	1 x 230V - 50Hz
• MAXIMUM INTENSITY	4,8 A
• RECOMMENDED ELECTRICAL PROTECTION	8 A / D-10000A-AC3
• SUPPLY / EXTRACTION AIR FILTER	G4 / G4 (F7 en option)
• AVAILABLE OPTIONS	SR by default
• AUTOMATIC FREE COOLING	OUI / Partiel
• OPERATING TEMPERATURE RANGE	-20°C à +50°C
• COLOUR OF PANELS	RAL 9002

TECHNICAL DATA

FLOW RATE	POWER ABSORBED	SFP	EXCHANGER EFFICIENCY	OUTLET T° AFTER EXCHANGER	SOUND LEVEL
m³/h	W	W/m³/h	%	°C	dBA
300	26	0,09	94,8	20,3	19,3
600	125	0,21	92,6	19,6	30,2
900	329	0,37	91,2	19,2	36,9
1200	654	0,55	90,2	18,9	41,7

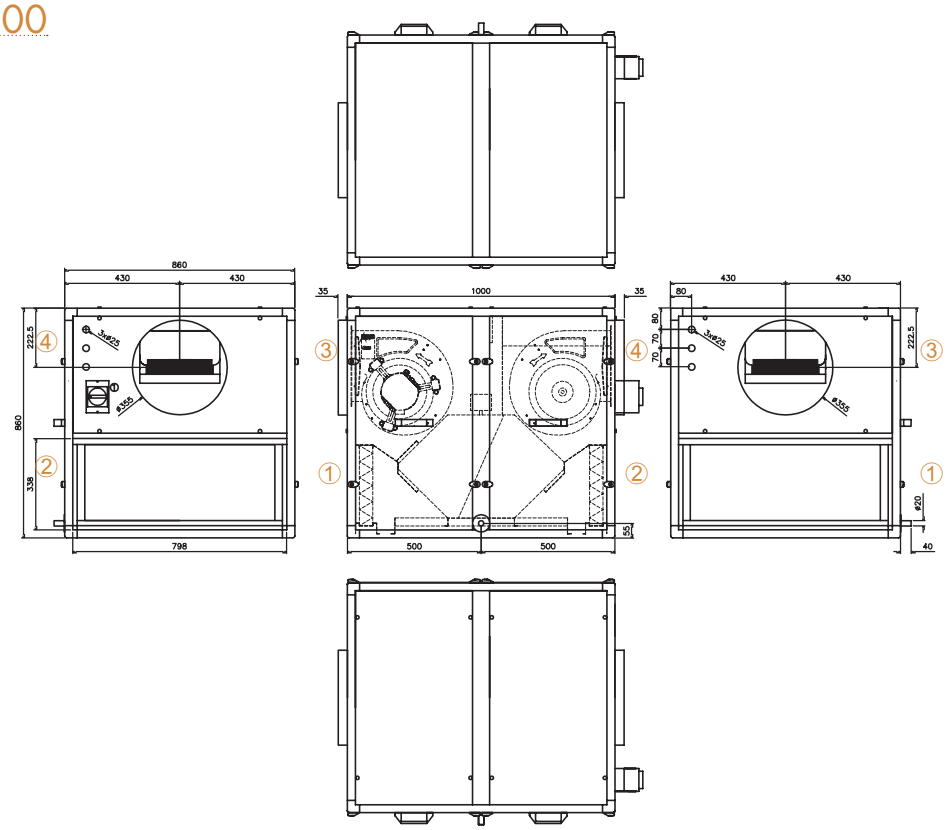
Conditions:

1. values calculated on the basis of an external 100 Pa system curve at maximum flow rate.
2. efficiency calculations for external conditions of -10°C, 90% RH and internal conditions of +22°C, 50% RH.
3. sound level in the open field at 3 m.

DIMENSIONS (mm)

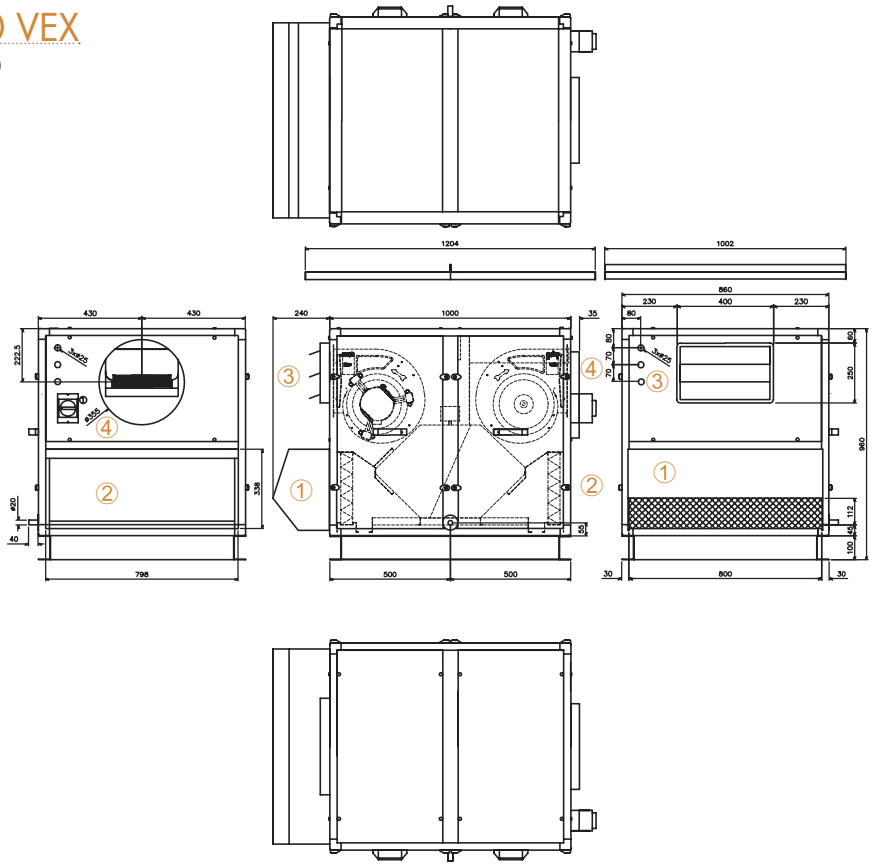
① From the outside ② From the inside ③ To the outside ④ To the inside

HRMURAL 1200



HRMURAL 1200 VEX

VEX (External Version)



REPLACEMENT FILTER KITS

The HRMURAL units are delivered as a standard with G4 filters on incoming and outgoing air.
Class F7 filtering on incoming air is available as an option.

A replacement kit with all the necessary filters is available for each unit.

It exists in **2 versions**.

- G4 filters for incoming and outgoing air.
- G7 filter(s) for incoming air and G4 for outgoing air

MODEL	CID	Filters fresh air in	Filters stale air out
HRMURAL(UP) 450	510042	G4	G4
HRMURAL(UP) 450	510014	F7	G4
HRMURAL 600/800	510043	G4	G4
HRMURAL 600/800	510015	F7	G4
HRMURAL 1200	510044	G4	G4
HRMURAL 1200	510016	F7	G4

MODULE BA+/-

This external module is provided for the HRmural models and can be mounted in the supply air ductway. It comprises a water (+/-) or evaporation/condensation 4-rows heat exchanger.
It can be used for the post-heating and/or post-cooling of supply air.
If the BA module is equipped with a water coil, it is supplied ready to be connected to the hydraulic network (+/-), with the full regulation and a motorised 3-way valve. It suffices to set the desired exhaust air temperature; the regulation will modulate the capacity of the coil to attain it.

CONDENSATION ⊕

MODEL	CONNEC-TIONS	HEATING CAPACITY (1) (3)	ΔT (1) (3)	PRESSURE DROP AIR (2)	FLUID FLOW RATE (2) (3)	PRESSURE DROP FLUID (2) (3)	CID
	[mm]	[kW]	[°C]	[Pa]	[kg/h]	[kPa]	
HRmural(up) 450	22/12	1,9 / 1,2	13 / 16	40	27,2	0,1	882446
HRmural 600	22/12	2,3 / 1,4	11 / 14	61	32,2	0,1	882446
HRmural 800	28/12	5,2 / 3	19 / 22	27	72,7	0,5	882448
HRmural 1200	28/12	7,9 / 4,6	20 / 23	31	110,7	1,3	882450

Conditions : Exterior air: -10°C and 90% RH, Interior air: +22°C and 50% RH, exit air temperature without BA: 19 °C

(1) Calculated at 100% and 50% of the maximum flow rate.
(2) Calculated at maximum flow rate.
(3) R410A / Condensation temperature = 40°C

EVAPORATION ⊖

MODEL	CONNEC-TIONS	COLD POWER (1) (2) (3)	ΔT (1) (3)	PRESSURE DROP AIR (2)	FLUID FLOW RATE (2) (3)	PRESSURE DROP FLUID (2) (3)	CID
	[mm]	[kW]	[°C]	[Pa]	[kg/h]	[kPa]	
HRmural(up) 450	12/22	2,5 / 1,6	11 / 13	53	61,1	0,6	882446
HRmural 600	12/22	3,0 / 1,9	10 / 12	80	72,9	0,9	882446
HRmural 800	12/28	5,3 / 3,2	13 / 15	35	127,9	3,9	882448
HRmural 1200	12/28	8,1 / 4,7	13 / 14	41	196,5	10,2	882450

Conditions : Exterior air: 30°C and 40% RH, Interior air: +22°C and 50% RH, exit air temperature without BA evaporation: 23.5°C

(1) Calculated at 100% and 50% of the maximum flow rate.
(2) Calculated at maximum flow rate.
(3) R410A / Evaporation temperature = 4°C

HOT WATER (BA+)

MODEL	CONNECTIONS	WATER TEMPERATURE [°C]	HEATING CAPACITY (1) [kW]	ΔT (1) [°C]	PRESSURE DROP AIR (2) [Pa]	WATER FLOW RATE (2) [l/h]	PRESSURE DROP WATER (2) [kPa]	CID
HRmural(up) 450	3/4''	80 / 60 50 / 40 40 / 35	6,2 / 3,5 3,0 / 1,6 2,2 / 1,2	41 / 46 20 / 21 15 / 16	43 41 40	274 262 387	0,8 0,8 1,8	882445
HRmural 600	3/4''	80 / 60 50 / 40 40 / 35	7,7 / 4,4 3,7 / 2,1 2,6 / 1,5	38 / 44 18 / 20 14 / 15	65 62 61	339 324 477	1,2 1,2 2,5	882445
HRmural 800	3/4''	80 / 60 50 / 40 40 / 35	12,5 / 6,8 6,2 / 3,3 4,5 / 2,4	46 / 50 23 / 25 17 / 17	28 27 26	547 538 773	1,9 2,0 4,0	882447
HRmural 1200	3/4''	80 / 60 50 / 40 40 / 35	18,3 / 10,2 9,1 / 5,0 6,6 / 3,6	45 / 50 23 / 25 16 / 18	33 31 31	806 793 1139	2,4 2,5 5,0	882449

Conditions : Exterior air: -10°C and 90% RH, Interior air: +22°C and 50% RH, exit air temperature without BA+: 19 °C

(1) Calculated at 100% and 50% of the maximum flow rate.
(2) Calculated at maximum flow rate.

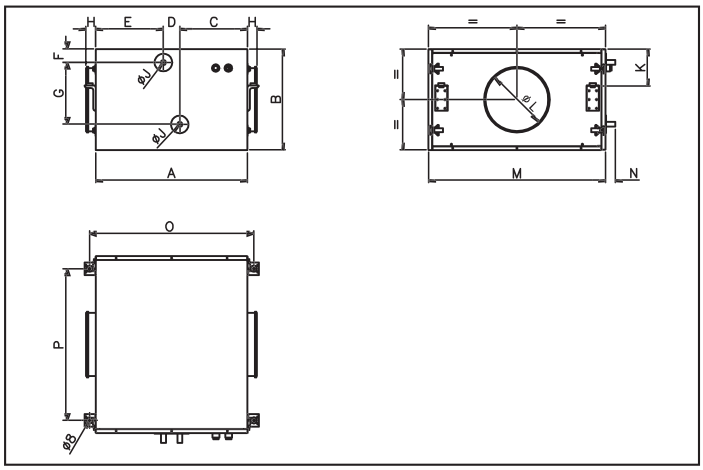
COLD WATER (BA-)

MODEL	CONNECTIONS	WATER TEMPERATURE [°C]	HEATING CAPACITY (1) [kW]	ΔT (1) [°C]	PRESSURE DROP AIR (2) [Pa]	WATER FLOW RATE (2) [l/h]	PRESSURE DROP WATER (2) [kPa]	CID
HRmural(up) 450	3/4''	7 / 12 10 / 15 13 / 18	1,4 / 1,0 1,0 / 0,7 0,7 / 0,4	8 / 10 7 / 8 5 / 6	44 39 38	239 170 117	0,9 0,5 0,3	882445
HRmural 600	3/4''	7 / 12 10 / 15 13 / 18	1,6 / 1,1 1,1 / 0,8 0,8 / 0,5	7 / 9 6 / 7 4 / 5	66 58 59	270 193 132	1,2 0,6 0,3	882445
HRmural 800	3/4''	7 / 12 10 / 15 13 / 18	3,8 / 2,0 2,2 / 1,4 1,4 / 0,9	10 / 11 8 / 9 5 / 7	32 27 25	650 380 240	3,6 1,4 0,6	882447
HRmural 1200	3/4''	7 / 12 10 / 15 13 / 18	5,6 / 2,7 3,5 / 1,9 1,9 / 1,2	10 / 10 8 / 8 5 / 6	37 32 29	962 597 329	4,6 2,0 0,7	882449

Conditions : Exterior air: 30°C and 40% RH, Interior air: +22°C and 50% RH, exit air temperature without BA-: 23.5°C

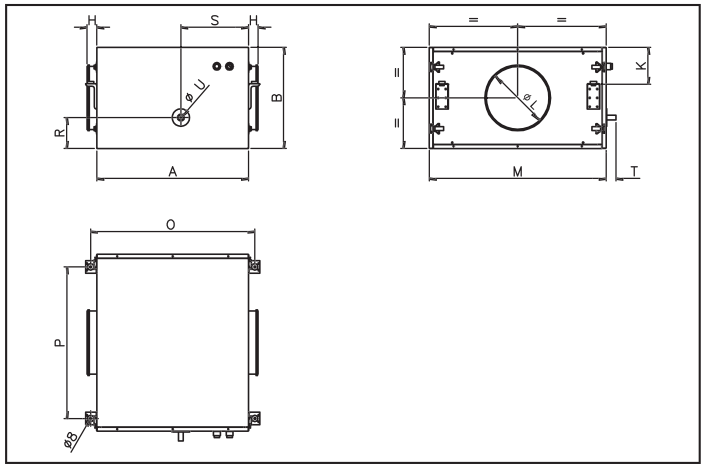
(1) Calculated at 100% and 50% of the maximum flow rate.
(2) Calculated at maximum flow rate.

DIMENSIONS BA W (HOT WATER/COLD WATER)



MODEL	CID	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U
										[mm]										
HRMURAL 450 / 600	882445	600	320	268	65	268	49	158	39	3/4''	107	250	500	55	650	400	-	-	-	-
HRMURAL 800	882447	600	400	268	65	268	53	245	39	3/4''	147	250	700	55	650	600	-	-	-	-
HRMURAL 1200	882449	600	400	268	65	268	53	245	39	3/4''	147	315	900	55	650	650	-	-	-	-

DIMENSIONS BA DX (EVAPORATION/CONDENSATION)



MODEL	CID	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	R	S	T	U
										[mm]										
HRMURAL 450 / 600	882446	600	320	-	-	-	-	-	39	-	107	250	500	-	650	400	132	268	55	22
HRMURAL 800	882448	600	400	-	-	-	-	-	39	-	147	250	700	-	650	600	122	268	55	28
HRMURAL 1200	882450	600	400	-	-	-	-	-	39	-	147	315	900	-	650	650	122	268	55	28

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