WESTERN™
AIRCONDITIONING

ErP 2018

indoor air quality and energy saving

# TECHNICAL DATA

# EASY-T 3

VENTILATION UNIT WITH HEAT RECOVERY FOR COMMERCIAL AND INDUSTRIAL BUILDINGS

HRE-TOP EC
Non-residential ventilator unit with dual flow and high yield heat recovery.

## PERFORMANCE

Equipped with counter current heat exchanger in aluminium (Eurovent certified) and electronic backward blade ventilators. The total bypass as standard allows favourable climatic conditions to be taken advantage of outside the building for free cooling (or free heating) in automatic mode.

## STRUCTURE

HRE-TOP EC is manufactured using a profiled extruded aluminium frame and 36 mm thick sandwich panels, insulated in polyurethane foam. The panels and inner parts are manufactured in Aluzinc®, material that ensures high strength against corrosion and oxidation. A pair of panels with hinged opening eases access to the filters (F7 for the renewed air flow and M5 for the extraction air flow). HRE-TOP EC is prepared for installation outdoors (with an optional, specific protective roof) and indoors; it is supplied with 100 mm high aluminium bases for installation on the floor. Available in 4 sizes, it can be equipped with air post-treatment systems (inside the unit) such as: hot/cold water battery, electrical heater or direct expansion battery.

## CONTROLS

HRE-TOP EC was supplied with an electric box and control system; it is available in a version equipped with EVO-PH control and a version equipped with EVOD-PH-IP control prepared for complete integration in home automation systems (Modbus protocol with Ethernet connection or, on request, with the addition of connection RS485). The new version of our control systems enables extremely easy and rapid passage from a control system to another, even after installation with the single replacement of the remote panel.

The EVO-PH control has a coloured, backlit touch screen interface with intuitive viewing of the working status of the machine. It enables precise adjustment of ventilator speed and has a weekly , time schedule for automatic management of the ventilators. It can be controlled by an external switch to activate the booster function, it can automatically adjust the air flow rate if connected to an air quality probe, it can manage any air post treatment accessories, it automatically manages the bypass and prevents heat exchanger freezing by managing the speed of the ventilators or, if installed, an electrical pre-heating resistor (optional accessory outside the machine); it signals to the user the need to replace the filters (the clogging status of the filters is monitored by a pair of different pressure switches, supplied as standard) or an anomaly, indicating the origin. With the addition of optional accessories (COP kit and CAV kit installed on the channel) you can manage the ventilation machine in constant pressure or constant flow rate mode.

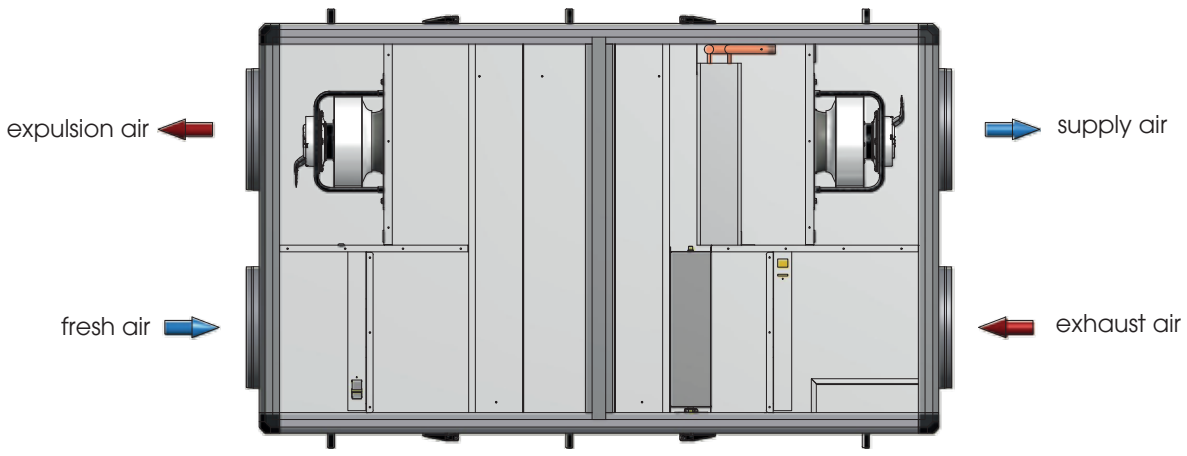
The EVOD-PH-IP control has the same characteristics as the EVO-PH version with the addition of Modbus communication protocol which allows full control of the machine by the supervision software of the home automation system. The implemented webserver allows interaction with the machine, even with an internet browser of a device connected (even from remote) to the home automation system in which the machine is inserted.

## ACCESSORIES

HRE-TOP EC can be equipped with other accessories such as:
. R.H. of probe, $CO_2$ or $CO_2$ / VOC
. Operating kit pressure or constant flow
. protection roof for outside instalalzione
. grilles and damper

For a more complete view of the characteristics of the control panels, please read the specific manuals

## TOP VIEW

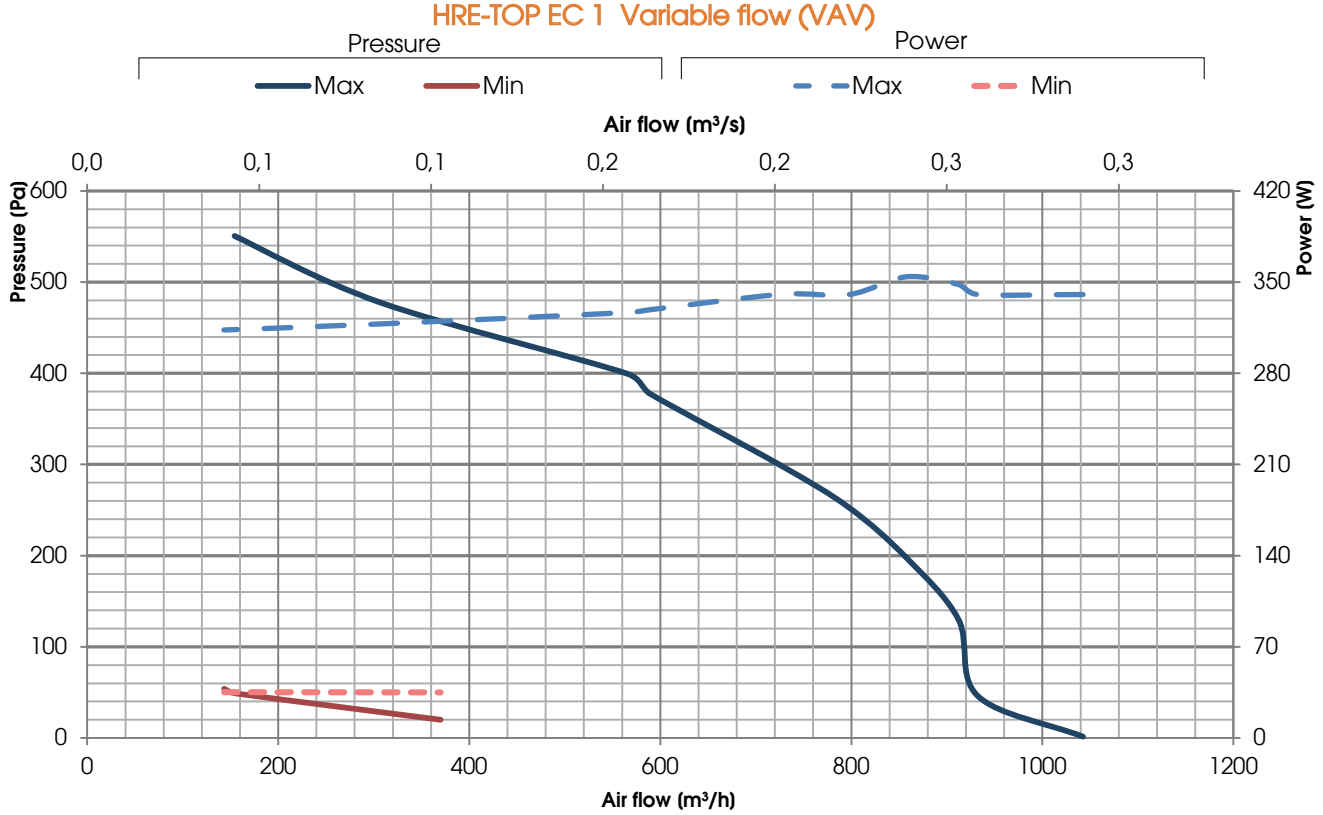



Counterflow heat exchanger made of aluminum manufactured by RECUTECH
RECUTECH participates in the Eurovent Certification Program

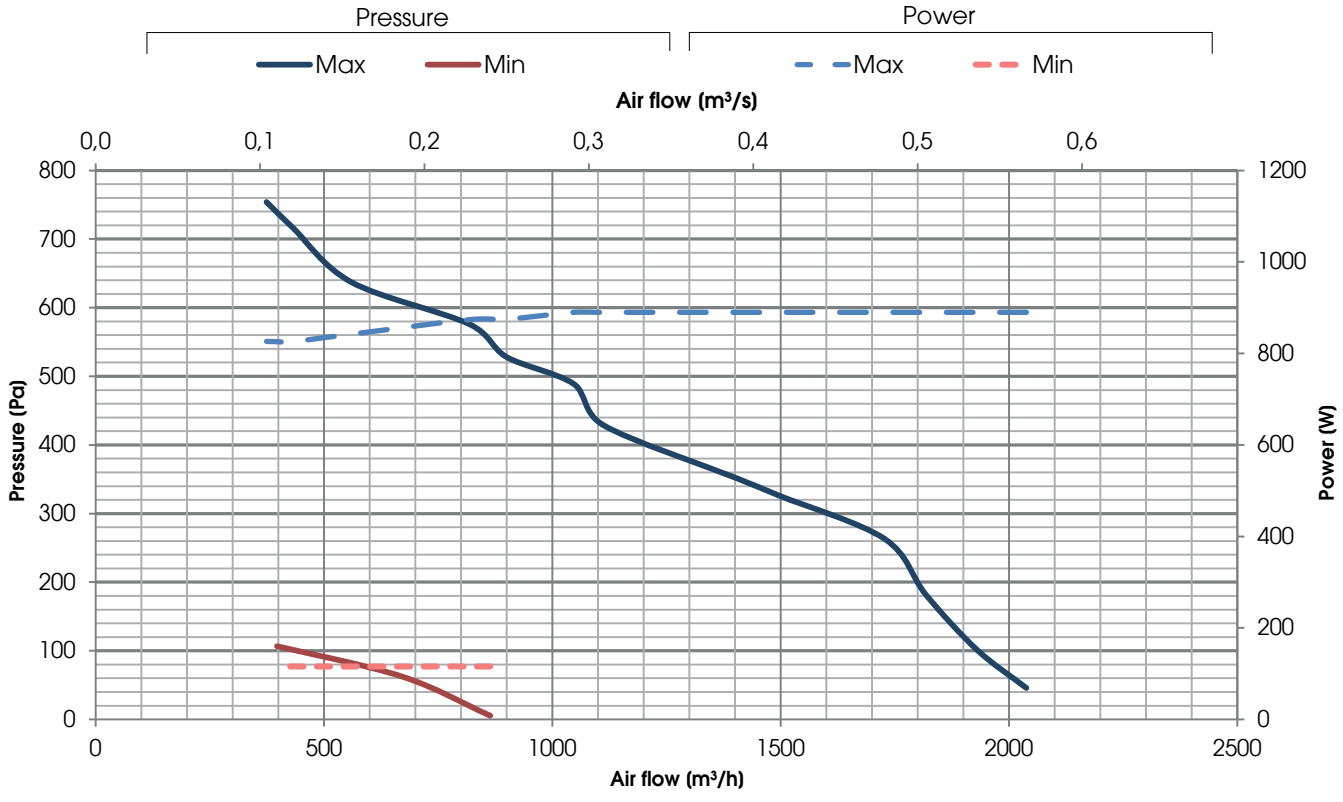
PERFORMANCE (UNI EN 13141-7)

The unit must be ducted properly: **Western** authorizes the use only according to its performance diagram shown into this catalogue
The declared performances are with CLEAN filters, and guaranteed ONLY with the original filters low pressure drop.

## HRE-TOP EC 1 Variable flow (VAV)



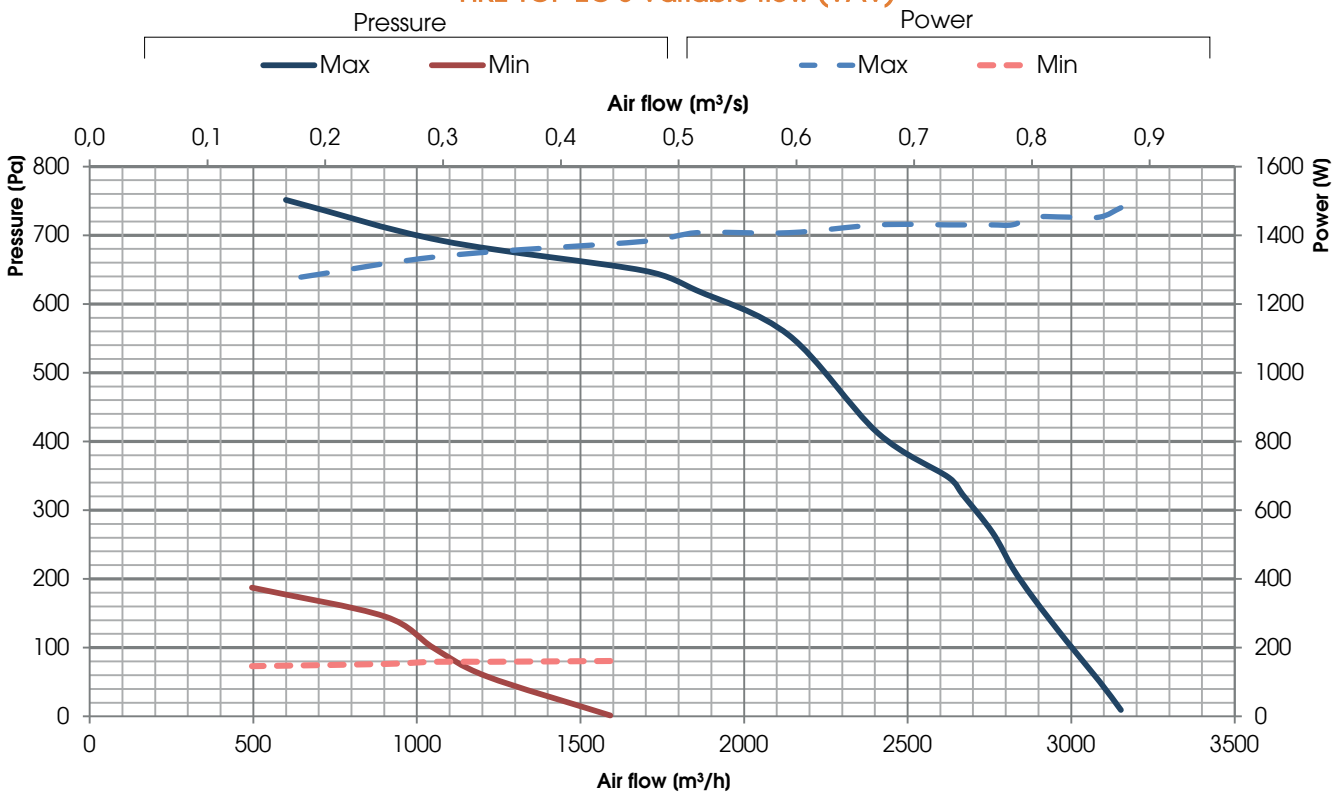

## HRE-TOP EC 2 Variable flow (VAV)



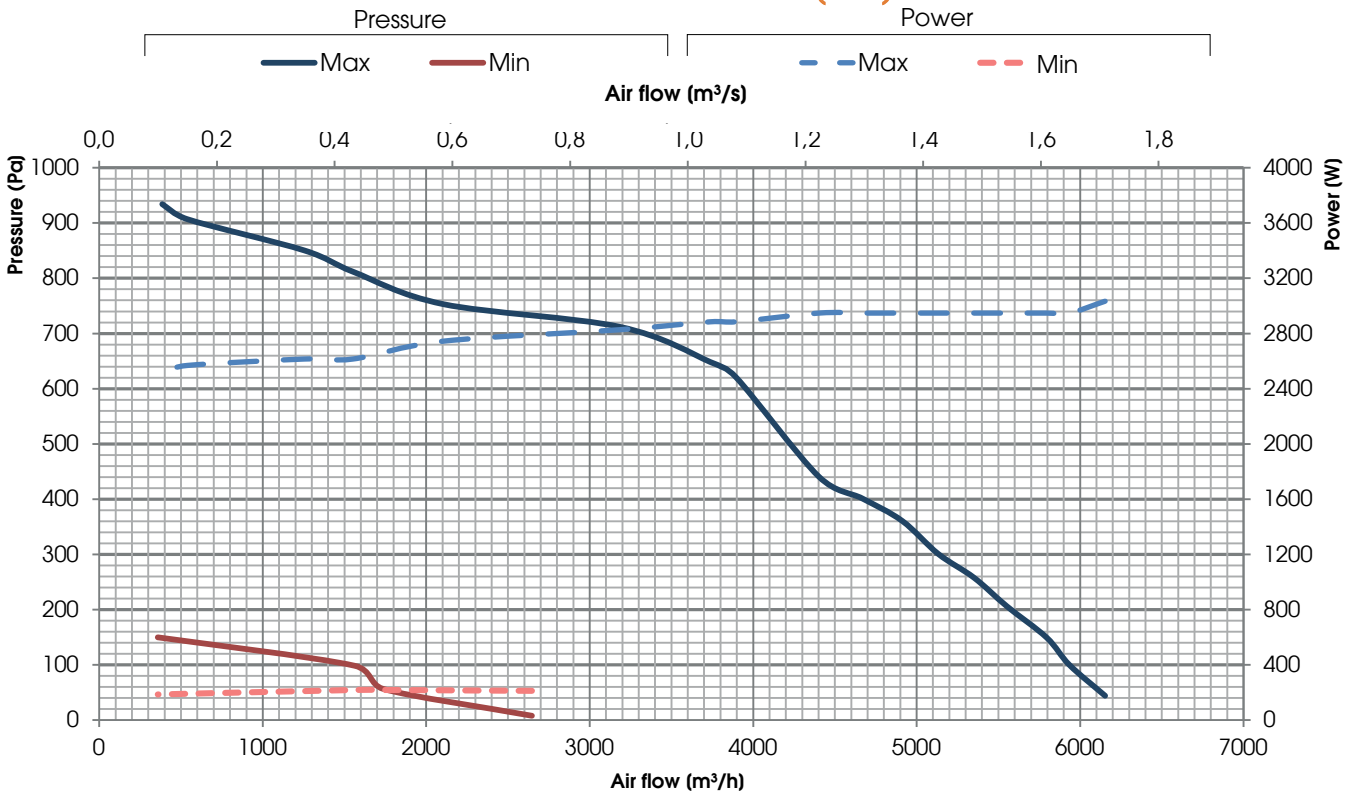
PERFORMANCE (UNI EN 13141-7)

The unit must be ducted properly: **Western** authorizes the use only according to its performance diagram shown into this catalogue
The declared performances are with CLEAN filters, and guaranteed ONLY with the original filters low pressure drop.

## HRE-TOP EC 3 Variable flow (VAV)

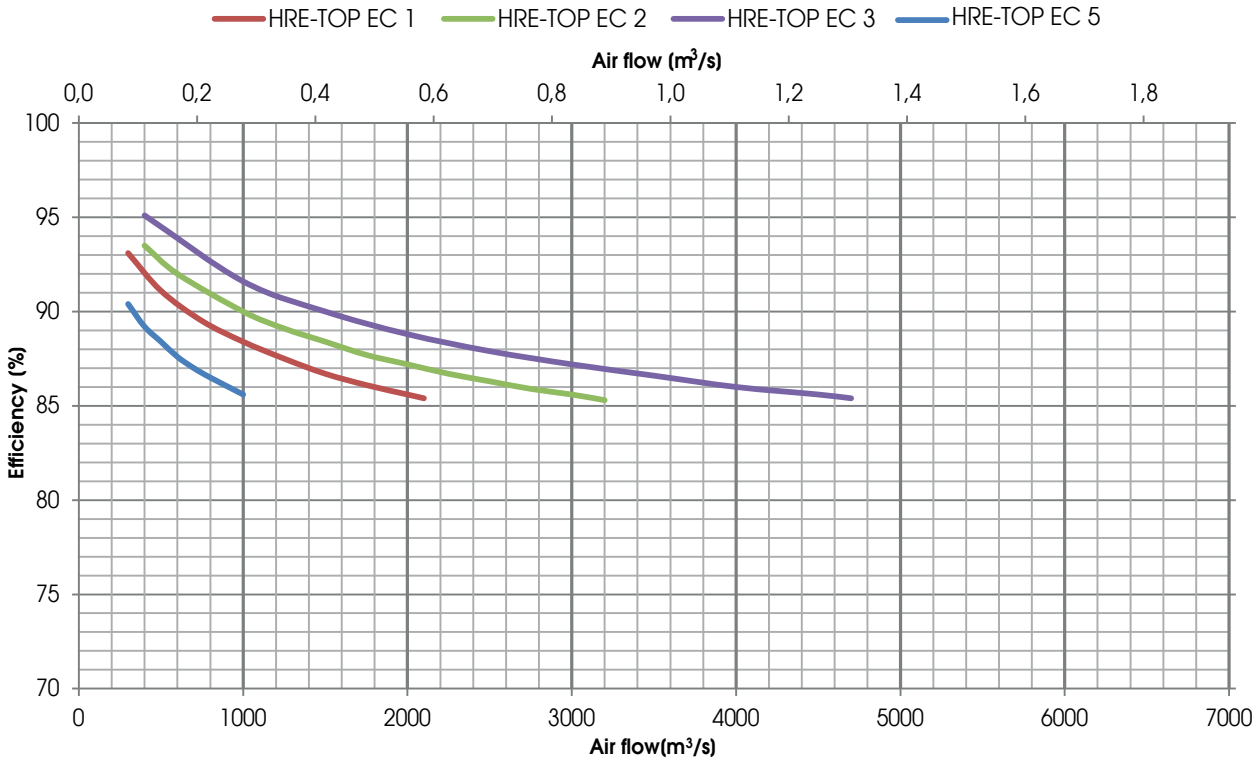



## HRE-TOP EC 5 Variable flow (VAV)



HEAT RECOVERY PERFORMANCE (sensible efficiency)

Values refered to the following conditions (UNI EN 13141-7): Tbs external air 5°C; U.R. esternal 72%; Tbs enviorment 25°C; U.R. enviorment 28%




ECODESIGN

| MOD. | $\eta_{t\_nvru}$ (%) | $q_{nom}$ (m³/s) | $\Delta p_{s,ext}$ (Pa) | P (kW) | SFPint (W/(m³/s)) | SFPint_lim 2016 (W/(m³/s)) | SFPint_lim 2018 (W/(m³/s)) | FRONT VELOCITY (m/s) | $\Delta p_{s,int}$ (Pa) | $\eta_{Fan}$ (%) | *internal LEAKAGE (%) | *external LEAKAGE (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HRE-TOP EC 1** | 81,3 | 0,24 | 200 | 0,35 | 606 | 1594 | 1314 | 2,38 | 347 | 59,8 | 5,8 | 3,7 |
| **HRE-TOP EC 2** | 81,0 | 0,50 | 200 | 0,89 | 989 | 1545 | 1265 | 2,00 | 628 | 62,7 | 5,2 | 4,3 |
| **HRE-TOP EC 3** | 80,6 | 0,79 | 200 | 1,44 | 853 | 1490 | 1210 | 2,53 | 422 | 52,0 | 4,7 | 2,9 |
| **HRE-TOP EC 5** | 81,5 | 1,38 | 350 | 2,95 | 1115 | 1430 | 1150 | 2,20 | 890 | 65,1 | 4,2 | 2,8 |

* Percentage of the nominal flow

TEST LEAKAGE (UNI EN 13141-7)

| | | LEAKAGE CLASSIFICATION | | | |
|---|---|---|---|---|---|
| LEAKAGE | TEST CONDITIONS | HRE-TOP EC 1 | HRE-TOP EC 2 | HRE-TOP EC 3 | HRE-TOP EC 5 |
| OUTDOOR | Positive pressure 250 Pa | A2 | A2 | A2 | A2 |
| OUTDOOR | Negative pressure 250 Pa | A2 | A2 | A1 | A1 |
| INDOOR | Pressure difference 100 Pa | A3 | A2 | A2 | A2 |

NOISE LEVE

Lw Sound power level taken in accordance to UNI EN ISO 3747 - CLASS 3

| | NOISE FROM THE CASE (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 1 | 65 | 59,8 | 47,7 | 46,3 | 42,8 | 30,9 | 24,2 | 54,9 |

| | NOISE IN THE DUCTS (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 1 | 72,1 | 66,2 | 56,4 | 54,8 | 53,2 | 44 | 39,2 | 62,6 |

| | NOISE FROM THE CASE (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 2 | 74,3 | 68,9 | 49,1 | 47 | 43 | 37,7 | 33,3 | 62,7 |

| | NOISE IN THE DUCTS (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 2 | 76,5 | 69 | 58,7 | 62,5 | 57,7 | 50,3 | 38,8 | 67,2 |

| | NOISE FROM THE CASE (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 3 | 74,9 | 72 | 56,1 | 53,7 | 46,5 | 41,1 | 35,7 | 65,4 |

| | NOISE IN THE DUCTS (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 3 | 79,9 | 74,9 | 72,9 | 68,7 | 62,2 | 57,4 | 49,2 | 74,2 |

| | NOISE FROM THE CASE (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 5 | 82,6 | 77,1 | 62,4 | 59 | 50 | 41,8 | 34,9 | 71,3 |

| | NOISE IN THE DUCTS (dB) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 125 Hz | 250 Hz | 500 Hz | 1000 Hz | 2000 Hz | 4000 Hz | 8000 Hz | $L_w$ dB(A) |
| HRE-TOP EC 5 | 82,8 | 82,2 | 71,4 | 72,4 | 63,5 | 54,7 | 46 | 77,4 |

VALUES ACCORDING UNI EN 1886: 2008

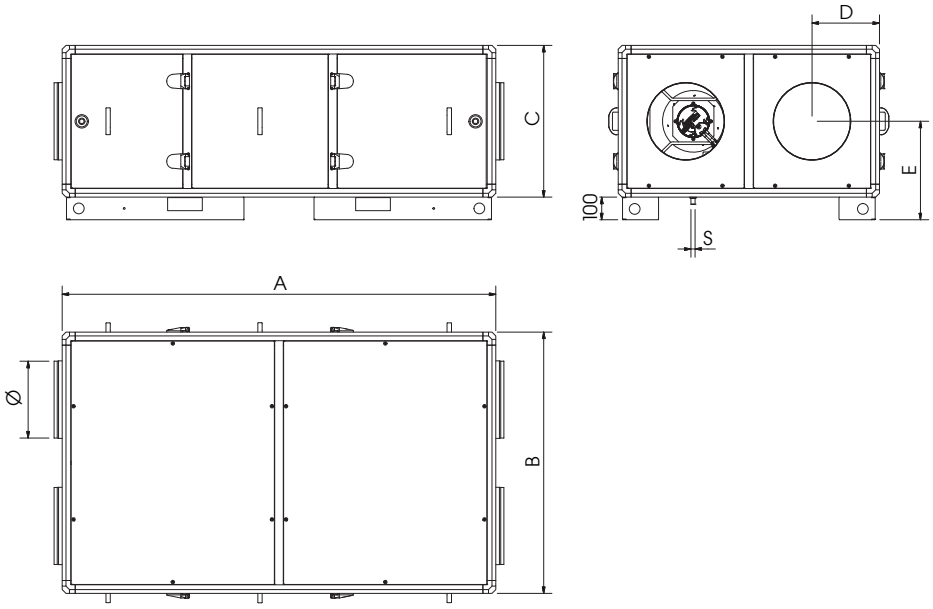
| MOD. | CASING STRENGTH | CASING LEAKAGE | FILTER CLASS | THERMAL TRANSMITTANCE | THERMAL BRIDGE |
|---|---|---|---|---|---|
| HRE-TOP EC 1 | D1 (M) | L3 (M) | F7 (M) | T4 (M) | TB3 (M) |
| HRE-TOP EC 2 | D1 (M) | L3 (M) | F7 (M) | T4 (M) | TB3 (M) |
| HRE-TOP EC 3 | D1 (M) | L3 (M) | F7 (M) | T4 (M) | TB3 (M) |
| HRE-TOP EC 5 | D1 (M) | L3 (M) | F7 (M) | T4 (M) | TB3 (M) |

ELECTRICAL DATA

| MATCHING | FANS | | | | UNIT HRE TOP-EC | | |
|---|---|---|---|---|---|---|---|
| | Power (W) | Supply | Current max.(A) | Insulation class | Supply | Current max.(A) | Insulation class |
| HRE-TOP EC 1 | 2 x 170 W | 230V 50/60 Hz 1F | 2 x 1,4 A | IP54 CLASSE B | 230V 50 Hz 1F | 3,0 | IP 20 |
| HRE-TOP EC 2 | 2 x 448 W | 230V 50/60 Hz 1F | 2 x 2,8 A | IP54 CLASSE B | 230V 50 Hz 1F | 6,0 | IP 20 |
| HRE-TOP EC 3 | 2 x 715 W | 230V 50/60 Hz 1F | 2 x 3,1 A | IP54 CLASSE B | 230V 50 Hz 1F | 6,8 | IP 20 |
| HRE-TOP EC 5 | 2 x 1850 W | 400V 50/60 Hz 3F | 2 x 2,9 A | IP54 CLASSE B | 400V 50 Hz 3F | 6,4 | IP 20 |

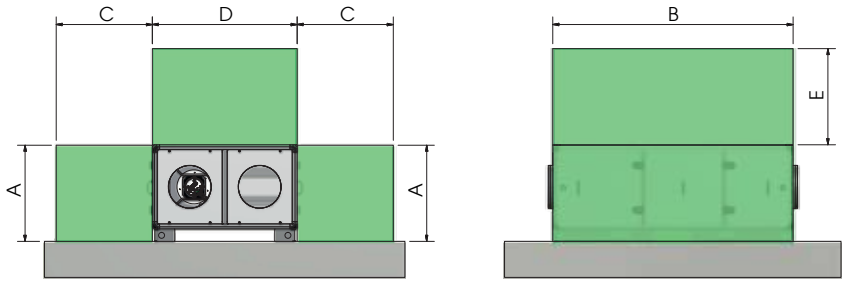
## DIMENSIONS (mm) WEIGHT (kg)

| UNIT | Dimensions (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | S | Ø | Weight(kg) |
| HRE-TOP EC 1 | 2000 | 1080 | 500 | 280 | 350 | 1/2" | 315 | 195 |
| HRE-TOP EC 2 | 2000 | 1205 | 700 | 311 | 455 | 1/2" | 355 | 254 |
| HRE-TOP EC 3 | 2000 | 1205 | 980 | 311 | 594 | 1/2" | 400 | 320 |
| HRE-TOP EC 5 | 2385 | 1584 | 1210 | 406 | 605 | 1/2" | 560 | 600 |



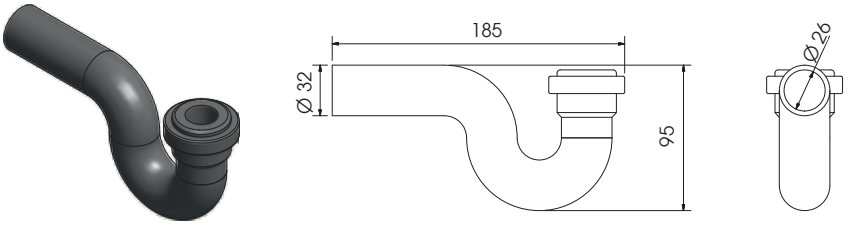

## INSTALLATION
## FLOOR INSTALLATION

Minimum required space for maintenance (mm)




| UNIT | Dimensions (mm) | | | | |
|---|---|---|---|---|---|
| | A | B | C | D | E |
| HRE-TOP EC 1 | 600 | 2000 | 800 | 1080 | 800 |
| HRE-TOP EC 2 | 800 | 2000 | 800 | 1205 | 800 |
| HRE-TOP EC 3 | 1080 | 2000 | 800 | 1205 | 800 |
| HRE-TOP EC 5 | 1310 | 2385 | 1000 | 1584 | 1000 |

## STANDARD SIPHON (mm)

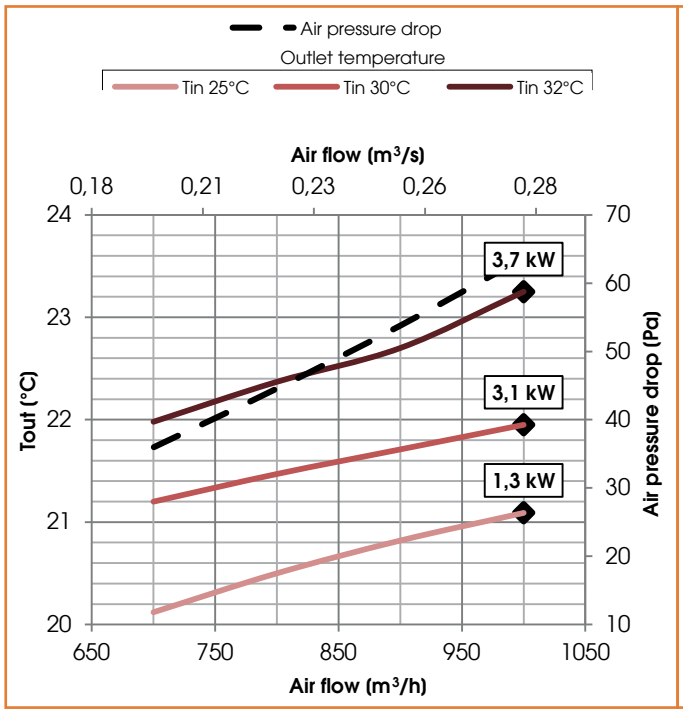


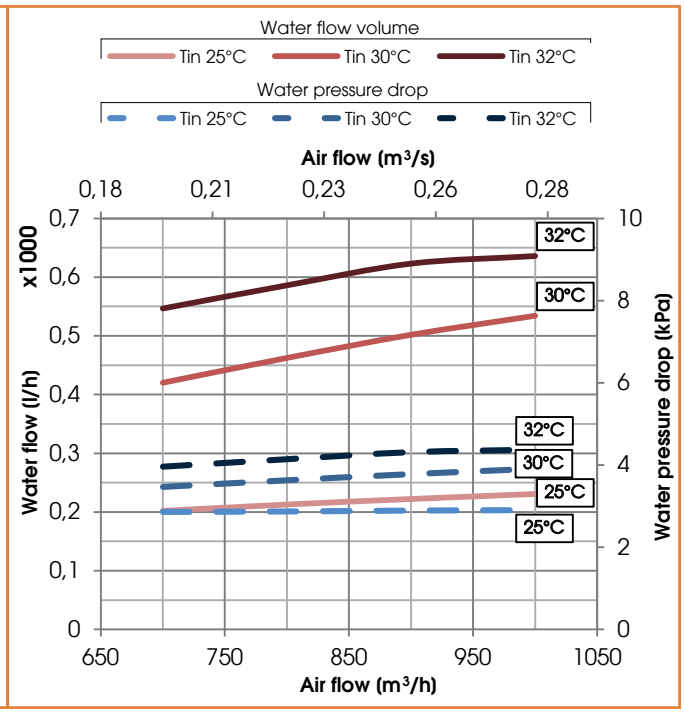
The way to read the graphs is specified within the accessories techno-list.

## COILS HRE-TOP 1 EC

### Cooling water coil (7°C/12°C)

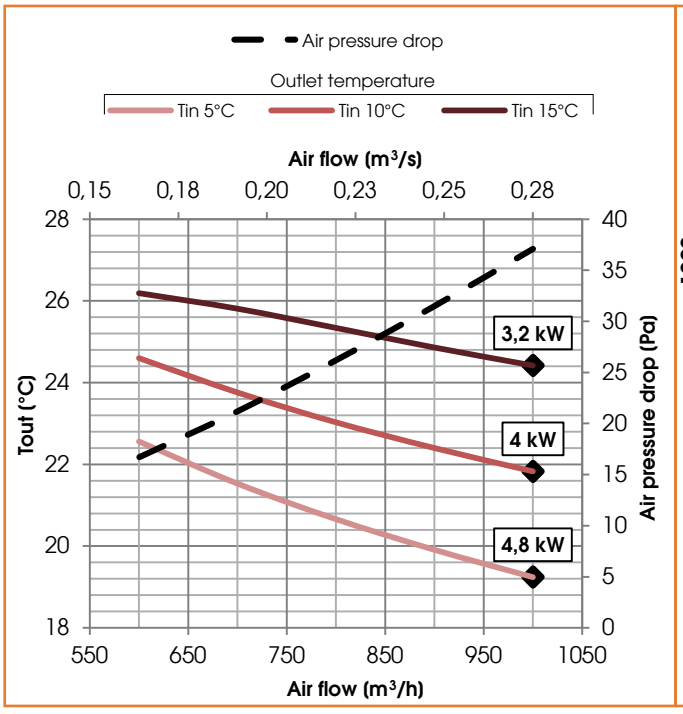
| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER ("gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4" | 3 | 2,5 | 2 | Cu | Al | Fe Zn |

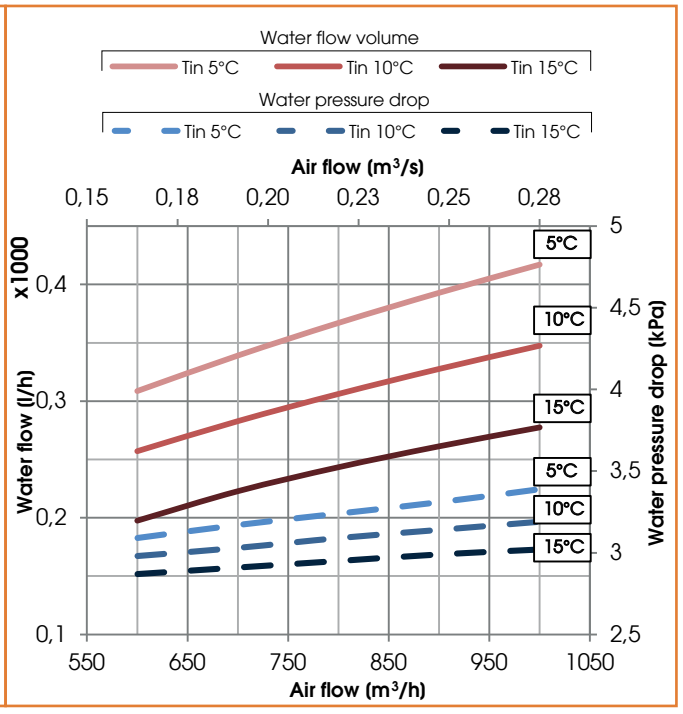



### Heating water coil (45°C/35°C)

| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER ("gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4" | 3 | 2,5 | 2 | Cu | Al | Fe Zn |

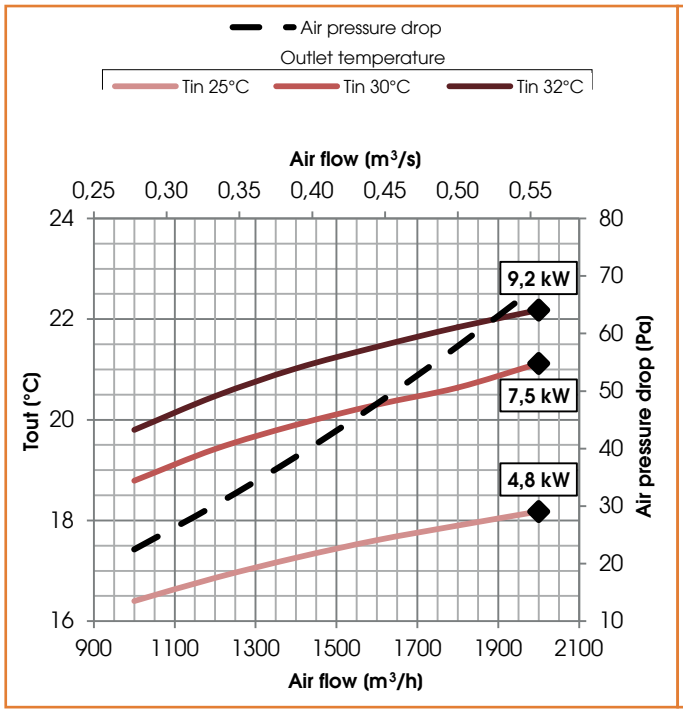


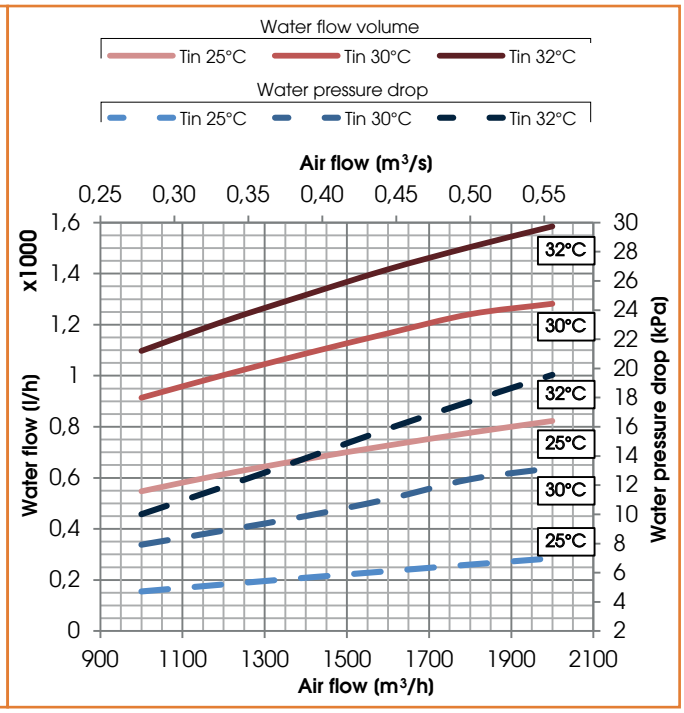



## COILS HRE-TOP 2 EC

### Cooling water coil (7°C/12°C)

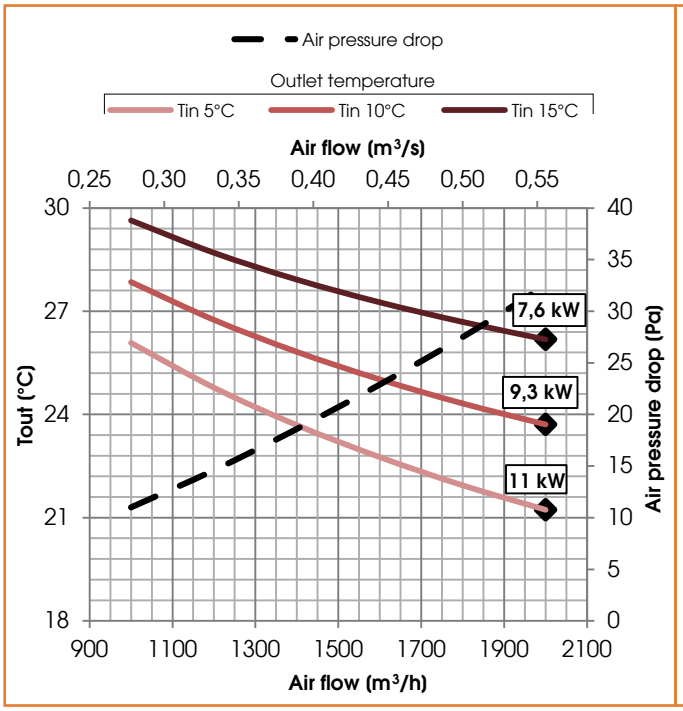
| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER (”gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4” | 3 | 2,5 | 4 | Cu | Al | Fe Zn |

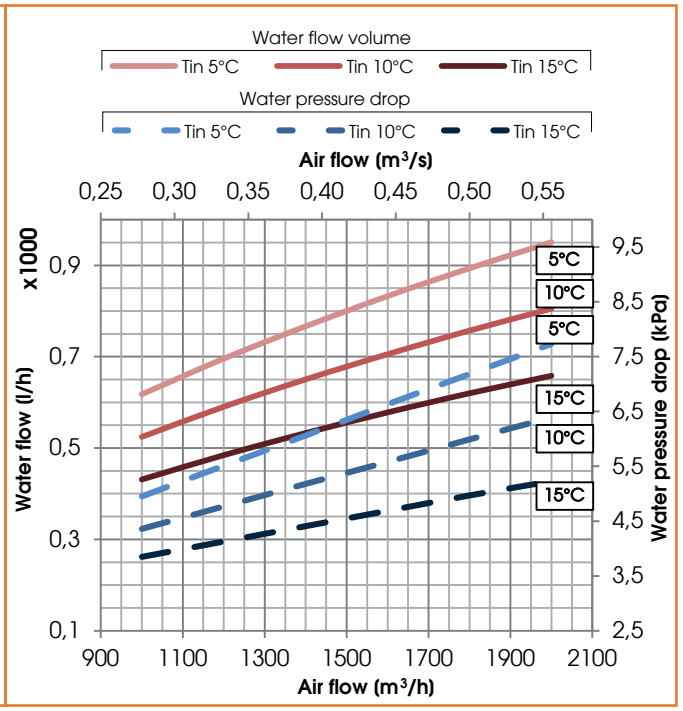



### Heating water coil (45°C/35°C)

| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER (”gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4” | 3 | 2,5 | 4 | Cu | Al | Fe Zn |

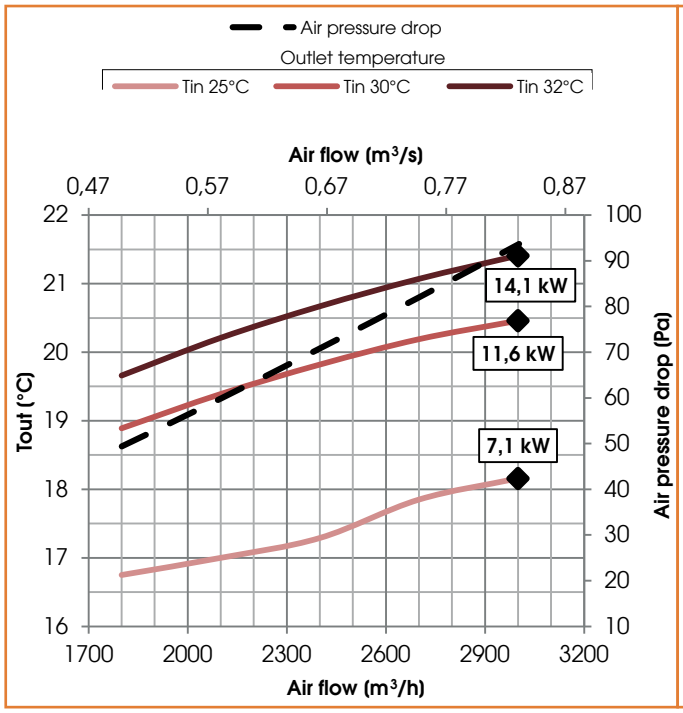


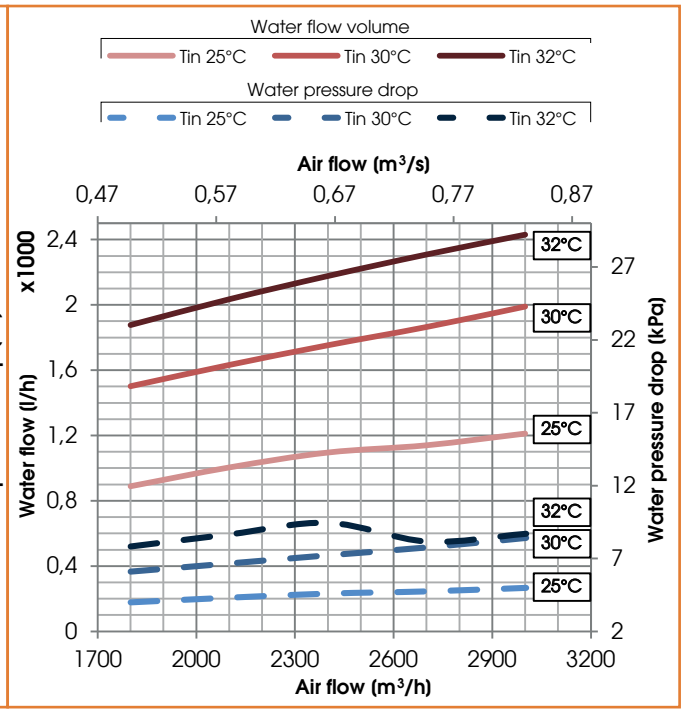



## COILS HRE-TOP 3 EC

### Cooling water coil (7°C/12°C)

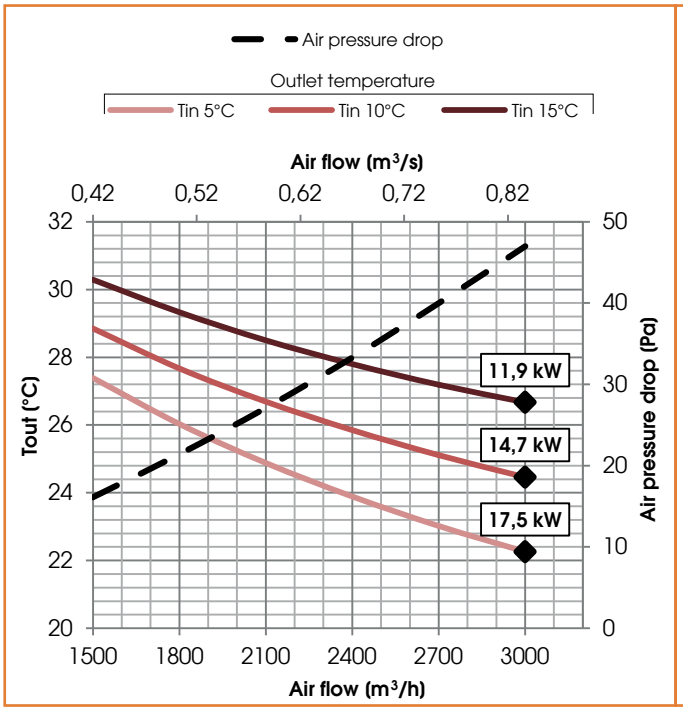
| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER ("gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4" | 3 | 2,5 | 5 | Cu | Al | Fe Zn |

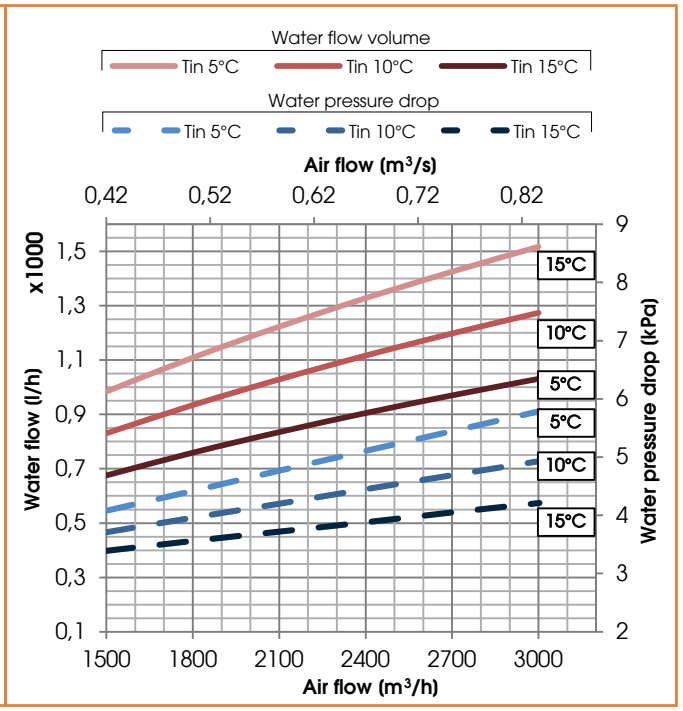



### Heating water coil (45°C/35°C)

| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER ("gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 3/4" | 3 | 2,5 | 5 | Cu | Al | Fe Zn |

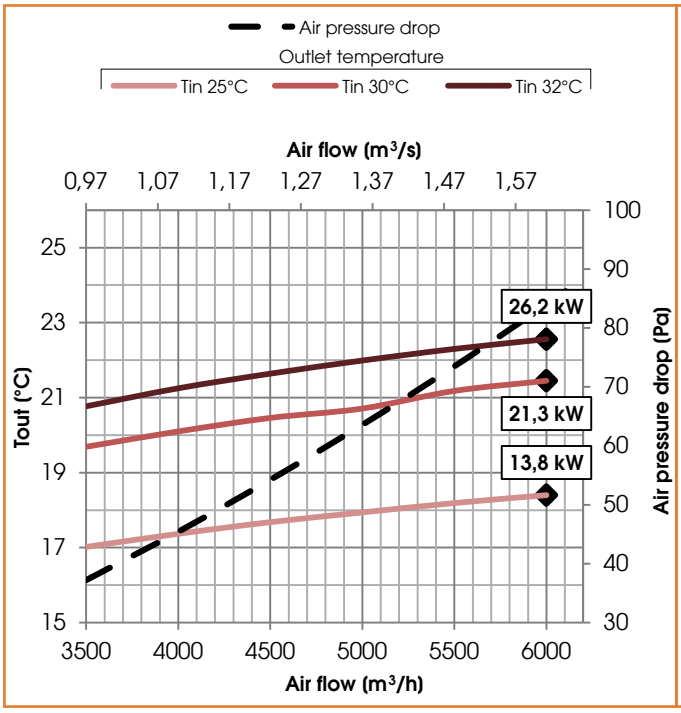


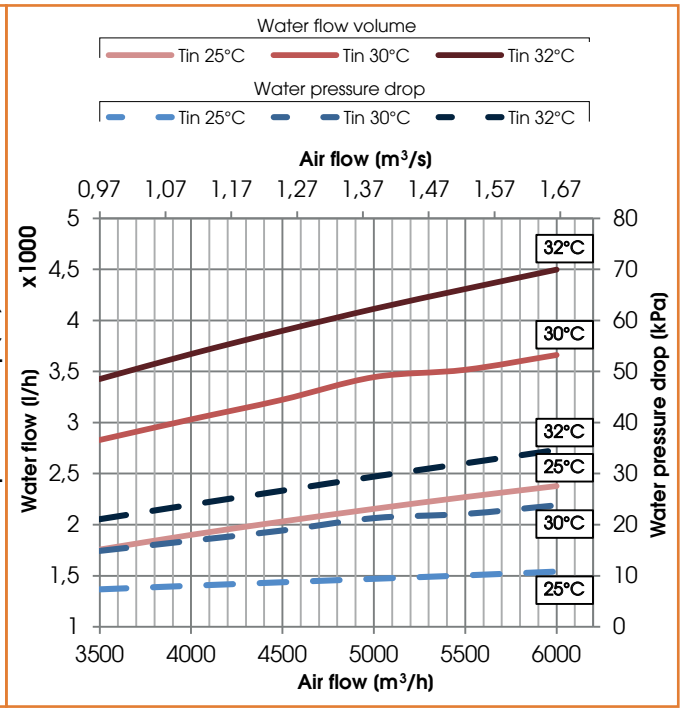



## COILS HRE-TOP 5 EC

### Cooling water coil (7°C/12°C)

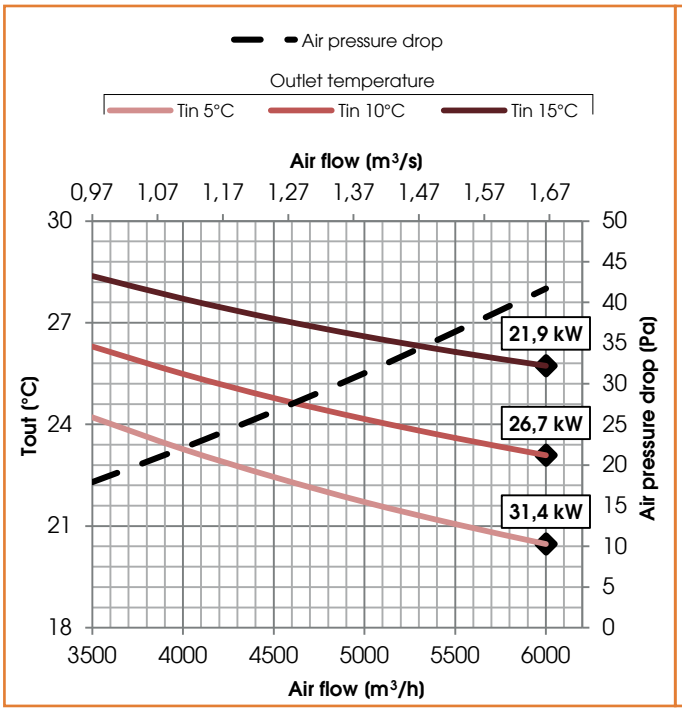
| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER (”gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 1”1/4 | 3 | 2,5 | 11 | Cu | Al | Fe Zn |

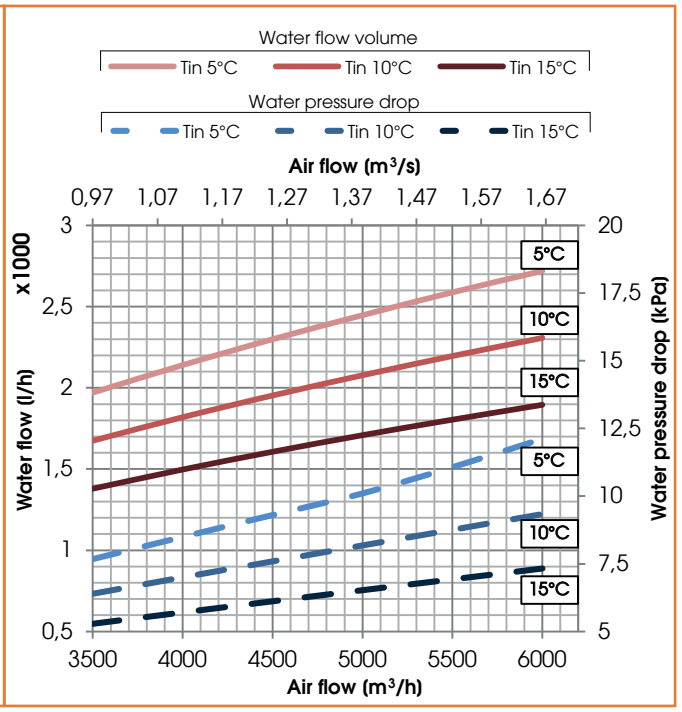



### Heating water coil (45°C/35°C)

| | | | | MATERIALS | | |
|---|---|---|---|---|---|---|
| Ø WATER (”gas) | N. ROWS | FIN PITCH (mm) | INT.VOL. (dm³) | TUBES | FINS | FRAME |
| 1”1/4 | 3 | 2,5 | 11 | Cu | Al | Fe Zn |



## DX coil HRE-TOP 1 EC

| DIRECT EXPANSION COIL (R410A) TECHNICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| Air flow (m³/h) | Tin (C°) | R.H in (%) | Power (kW) | Tout (°C) | R.H: out (%) | Air pressure drop (Pa) |
| 900 | 28 | 70 | 5,2 | 19 | 92 | 120 |

| Ø Connection (mm) | Fin pitch (mm) | N. Rows | Vol.Int (dm³) | T evap (°C) | T cond (°C) |
|---|---|---|---|---|---|
| 22-16 | 2,5 | 3 | 2 | 5 | 50 |

## DX coil HRE-TOP 2 EC

| DIRECT EXPANSION COIL (R410A) TECHNICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| Air flow (m³/h) | Tin (C°) | R.H in (%) | Power (kW) | Tout (°C) | R.H: out (%) | Air pressure drop (Pa) |
| 2000 | 28 | 70 | 11,95 | 20 | 92 | 110 |

| Ø Connection (mm) | Fin pitch (mm) | N. Rows | Int.Vol. (dm³) | T evap (°C) | T cond (°C) |
|---|---|---|---|---|---|
| 28-16 | 2,5 | 3 | 3 | 5 | 50 |

## DX coil HRE-TOP 3 EC

| DIRECT EXPANSION COIL (R410A) TECHNICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| Air flow (m³/h) | Tin (C°) | R.H in (%) | Power (kW) | Tout (°C) | R.H: out (%) | Air pressure drop (Pa) |
| 3000 | 28 | 50 | 17,75 | 19 | 92 | 117 |

| Ø Connection (mm) | Fin pitch (mm) | N. Rows | Int.Vol. (dm³) | T evap (°C) | T cond (°C) |
|---|---|---|---|---|---|
| 28-16 | 2,5 | 3 | 5 | 5 | 50 |

## DX coil HRE-TOP 4 EC

| DIRECT EXPANSION COIL (R410A) TECHNICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| Air flow (m³/h) | Tin (C°) | R.H in (%) | Power (kW) | Tout (°C) | R.H: out (%) | Air pressure drop (Pa) |
| 4400 | 29 | 65 | 25 | 20 | 90 | 131 |

| Ø Connection (mm) | Fin pitch (mm) | N. Rows | Int.Vol. (dm³) | T evap (°C) | T cond (°C) |
|---|---|---|---|---|---|
| 35-22 | 2,5 | 3 | 6 | 5 | 50 |

## DX coil HRE-TOP 5 EC

| DIRECT EXPANSION COIL (R410A) TECHNICAL DATA | | | | | | |
|---|---|---|---|---|---|---|
| Air flow (m³/h) | Tin (C°) | R.H in (%) | Power (kW) | Tout (°C) | R.H: out (%) | Air pressure drop (Pa) |
| 5900 | 29 | 65 | 33,8 | 21 | 90 | 132 |

| Ø Connection (mm) | Fin pitch (mm) | N. Rows | Int.Vol. (dm³) | T evap (°C) | T cond (°C) |
|---|---|---|---|---|---|
| 35-28 | 2,5 | 3 | 9 | 5 | 50 |

## Electrical heater

| PRE-POST ELECTRICAL HEATER TECHNICAL DATA | | | | |
|---|---|---|---|---|
| Unit | Power supply | Power (kW) | Current (A) | N. stages |
| HRE-TOP 1 EC | 230V, 50Hz,1F | 4 | 17,4 | 1 |
| HRE-TOP 2 EC | 230V, 50Hz,1F | 6 | 26,1 | 1 |
| HRE-TOP 3 EC | 400V, 50Hz,3F | 8 | 11,6 | 1 |
| HRE-TOP 4 EC | 400V, 50Hz,3F | 12 | 17,4 | 1 |
| HRE-TOP 5 EC | 400V, 50Hz,3F | 16 | 23,2 | 1 |

N.B. – for other batteries PRE or POST treatment see the Techno-list of ACCESSORIES

| | | | | | |
|---|---|---|---|---|---|
| A | Manufacturer's name | | | | |
| B | Manufacturer's model identifier | HRETOP-EC 1 VAV BP EVO-PH SH | HRETOP-EC 2 VAV BP EVO-PH SH | HRETOP-EC 3 VAV BP EVO-PH SH | HRETOP-EC 5 VAV BP EVO-PH SH |
| C | Declared typology | UVNR / UVB | UVNR / UVB | UVNR / UVB | UVNR / UVB |
| D | Type of drive installed | Multiple speeds | Multiple speeds | Multiple speeds | Multiple speeds |
| E | Type of HRS | other | other | other | other |
| F | Thermal efficiency of heat recovery (%) | 81,3 | 81,0 | 80,6 | 81,5 |
| G | Nominal NRVU flow rate ($m^3/s$) | 0,238 | 0,499 | 0,790 | 1,38 |
| H | Effective electric power input (kW) | 0,35 | 0,89 | 1,44 | 2,95 |
| I | SFPint ($W/(m^3/s)$) | 605 | 990 | 853 | 1115 |
| J | Face velocity at design flow rate (m/s) | 2,4 | 2,0 | 2,5 | 2,2 |
| K | Nominal external pressure (Pa) | 200 | 200 | 200 | 350 |
| L | Internal pressure drop of ventilation components (Pa) | 347 | 628 | 422 | 890 |
| M | Optional: internal pressure drop of non-ventilation components | - | - | - | - |
| N | Static efficiency of fans used in accordance with Regulation (EU) No 327/2011 (%) | 59,8 | 62,7 | 52,0 | 65,1 |
| O | Declared maximum external leakage rate of the casing of ventilation units (%) | 3,7 | 4,3 | 2,9 | 2,8 |
| | Declared maximum internal leakage rate of bidirectional ventilation units or carry over (for regenerative heat exchangers only) (%) | 5,8 | 5,2 | 4,7 | 4,2 |
| P | Energy performance, preferably energy classification, of the filters (declared information about the calculated annual energy consumption | F7/M5 | F7/M5 | F7/M5 | F7/M5 |
| Q | Position and description of visual filter warning for RVUs intended for use with filters, including text pointing out the importance of regular filter changes for performance and energy efficiency of the unit | Filter warning is signaled on the display of the control system: the flashing writing "DirtyFilters" will appear. "To preserve the energy efficiency of the NRVU, it's recommended to replace the filters when signaled." Positioned near the filters inspection | | | |
| R | Casing sound power level (LWA) (dB) | 55 | 63 | 65 | 71 |
| S | | | | | |

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