



## HRZT

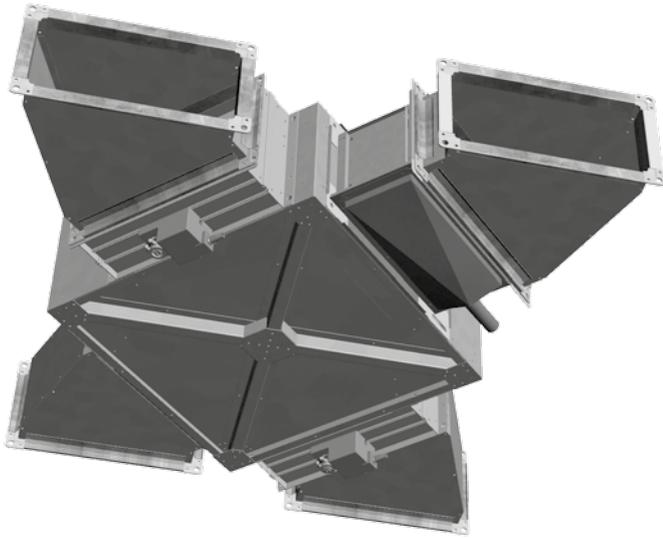
*Thick design, which minimises the installation area but is higher than the elements of the given Vento dimensional range*

## HRZF

*Flat design, respecting the height of the given Vento dimensional range*

## HRZ PLATE HEAT EXCHANGERS

FIGURE 1 – HRZ HEAT EXCHANGER



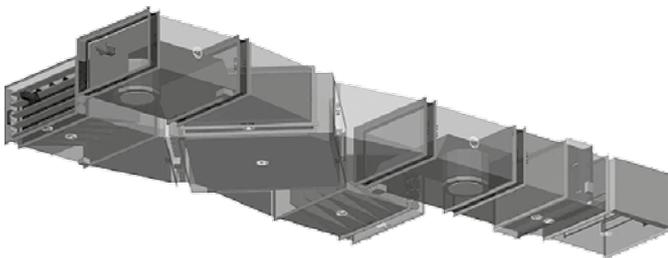
### APPLICATION

HRZ plate heat exchangers are designed to recover heat energy from air exhausted from an air-conditioned room. As compared with the HRV type, they provide greater efficiency, lower pressure losses and offer more additional features, such as a by-pass, mixing and drop eliminator. Further, they offer a significantly wider range of variants which can be divided into two basic groups: the "F" (Flat) design, respecting the height of the given Vento dimensional range, and the "T" (Thick) design, which minimises the installation area but is higher than the elements of the given Vento dimensional range (i.e., needs to be adapted to the standard dimensions of the Vento elements). Therefore, the "T" design is suitable for installations in corridors, stairs and areas between roof girders, such as hall-type buildings. Further, they can be classified according to the efficiency classes (E2016 and E2018 classes) defined by the EU Ecodesign regulation and can be delivered in Left-Hand or Right-Hand versions.

### OPERATING CONDITIONS AND POSITION

Inlet and outlet air must not contain solid, fibrous, sticky, aggressive or explosive contaminants. Heat exchangers are designed to be installed in an air-handling system, in a parallel, perpendicular or diagonal (45° angle) air inlet/outlet duct line, or various combinations of these. The disposition variability of the heat exchanger is provided by special elbows OBL.../xx. The number of these elbows must be specified depending on the intended disposition.

FIGURE 2 – THE HEAT EXCHANGER IN THE VENTO ASSEMBLY

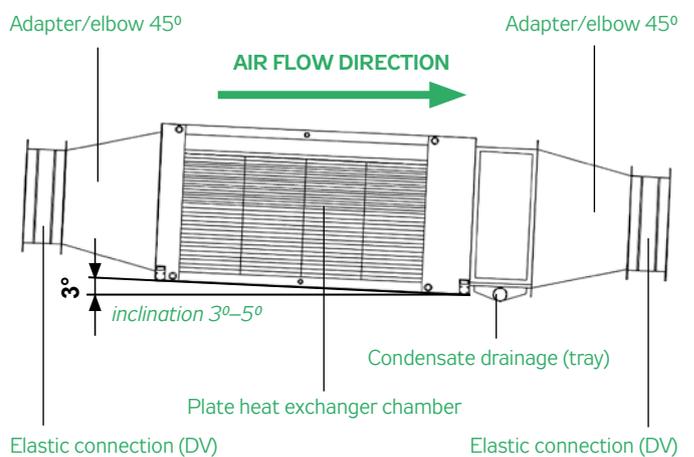


### Note:

- HRZ heat exchangers without elbows or reducing adapters (the reducing adapters are specified but not included in the Remak delivery) do not have the standard connecting dimensions of the Vento system.
- These heat exchangers are designed only for indoor installation in the horizontal (overhead) or vertical (wall) position. If installed in the vertical position, draining of condensate from the outlet air duct behind the heat exchanger must be ensured.
- When designing the air-handling system, it is necessary to ensure access space for installation of the heat exchanger and servicing of the M&C elements.
- The chamber must always be suspended in the balanced position.
- To ensure ideal condensate drainage, it is recommended to suspend the chamber with a positive inclination (towards the condensate drainage tray), a 3° to 5° angle depending on the condensate volume and pressure conditions.
- These effects cannot be defined in advance. Therefore, the installation should be performed so that additional inclination adjustment will be possible. The adjustment of the chamber inclination in relation to the building structure and air handling assembly can be enabled by using an elastic connection on fans along with elastic connections on other branches (not included in the Remak delivery).

**Positioning with a negative inclination in relation to condensate drainage is PROHIBITED!**

FIGURE 3 – SUSPENSION WITH A POSITIVE INCLINATION



### MATERIALS AND DESIGN

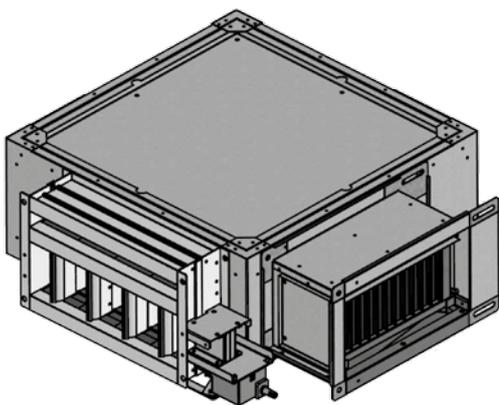
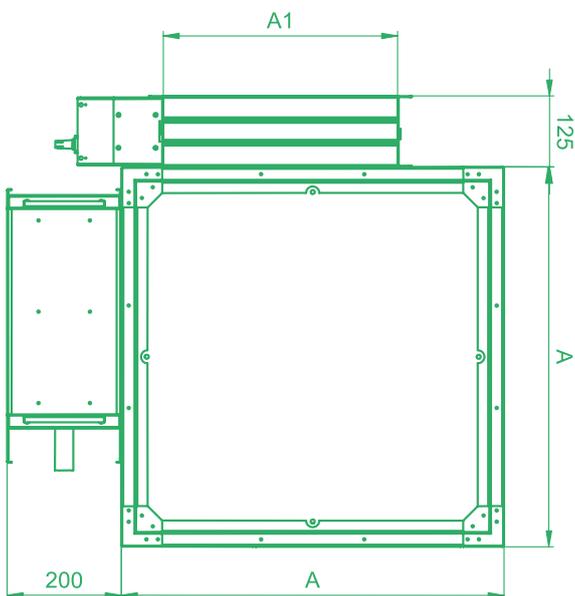
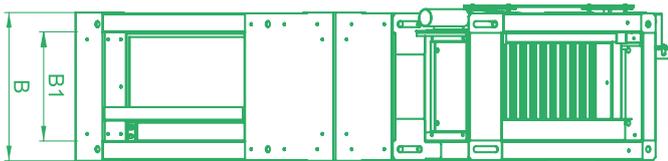
- Casing and linkage – galvanised steel Z275
- Sealing (on the air side)
  - Moisture-proof sealing with closed pores
  - Silicon-free polyurethane sealant (PU)
- Drop eliminator:
  - Frame – stainless steel AISI 304
  - Profiles – plastic
- Condensate drainage tray and parts – stainless steel
- Heat exchanger – aluminium
- Dampers
  - Profiles – aluminium
  - Gears, distance pieces, stops, bearings – plastic

## DIMENSIONAL RANGE

HRZ plate heat exchangers are included in all the dimensional ranges of the modular Vento air-handling system, i.e., from the 30-15 to 100-50 range (except the 50-25 range).

## DIMENSIONS AND PARAMETERS

FIGURE 4 – DIMENSIONS



### Dimensions of Adapters (elbows and reduction adapters)

- On the air-handling duct connection side, the dimensions are compatible with the flange dimensions of the Vento dimensional range, i.e., 20 or 30 mm.
- On the heat exchanger connection side (respectively the tray duct piece or damper), the dimension of the flange is 30 mm.

The flange dimension of the heat exchanger chamber, bypass damper, mixing damper and tray duct piece is always 30 mm.

TABLE 1 – DIMENSIONAL RANGES AND PARAMETERS

Dimensional range	Heat exchanger designation	Air flow rate [m <sup>3</sup> /h]	Efficiency [%]	Air pressure loss [Pa]	Connection width A1 [mm]	Connection height B1 [mm]	Total width A [mm]	Total height [mm]
30-15	HRZT 21-30 / 3S / ...	330	78	160	210	300	515	375
40-20	HRZT 51-35 / 9Z / ...	760	73	130	510	350	770	425
50-30	HRZT 61-60 / 0S / ...	1810	75	140	610	600	870	675
60-30		2160	76	120	610	800	870	875
60-35	HRZT 61-80 / 6S / ...	2160	76	120	610	800	870	875
70-40	HRZT 71-80 / 7Z / ...	2880	78	170	710	800	970	875
80-50	HRZT 121-90 / 6S / ...	4110	77	130	1210	900	1465	975
90-50	HRZT 121-100 / 4Z / ...	5000	76	150	1210	1000	1465	1075
100-50		5000	76	150	1210	1000	1465	1075

The parameters are calculated at the ODA air parameters (5°C, 87%) and ETA air parameters (25°C, 27%). The stated air flow rates are not maximum possible. Their values are selected so that the assembly in the given dimensional range and reference configuration will comply with the Ecodesign assessment.

TABLE 1 – TORQUE VALUES OF DAMPERS

(If the actuators are not included in the REMAK delivery.)

Heat exchanger designation	Bypass damper actuator	Mixing damper actuator
HRZT 2130	LM(5Nm)	LM(5Nm)
HRZT 3130	LM(5Nm)	LM(5Nm)
HRZF 4120	LM(5Nm)	LM(5Nm)
HRZF 5120	LM(5Nm)	LM(5Nm)
HRZT 5135	LM(5Nm)	LM(5Nm)
HRZT 6135	LM(5Nm)	LM(5Nm)
HRZT 6160	LM(5Nm)	LM(5Nm)
HRZT 6180	LM(5Nm)	LM(5Nm)
HRZT 6110	NM(10Nm)	LM(5Nm)
HRZT 7160	LM(5Nm)	LM(5Nm)
HRZT 7180	NM(10Nm)	LM(5Nm)
HRZT 7110	NM(10Nm)	LM(5Nm)
HRZT 1060	NM(10Nm)	LM(5Nm)
HRZF 1230	LM(5Nm)	LM(5Nm)
HRZF 1235	LM(5Nm)	LM(5Nm)
HRZF 1240	LM(5Nm)	LM(5Nm)
HRZF 1250	NM(10Nm)	LM(5Nm)
HRZT 1256	NM(10Nm)	LM(5Nm)
HRZT 1280	NM(10Nm)	LM(5Nm)
HRZT 1290	NM(10Nm)	LM(5Nm)
HRZT 1210	NM(10Nm)	LM(5Nm)
HRZF 1420	LM(5Nm)	LM(5Nm)
HRZF 1430	LM(5Nm)	LM(5Nm)
HRZF 1435	LM(5Nm)	LM(5Nm)
HRZF 1440	NM(10Nm)	LM(5Nm)
HRZF 1450	NM(10Nm)	LM(5Nm)

## HRZ PLATE HEAT EXCHANGERS

We offer numerous variants of HRZ heat exchangers and their accessories. Therefore, the offering process is performed exclusively using the AeroCAD design software, respectively through our commercial representatives. The heat exchangers described here and the data are only for information purposes to provide a general overview of outputs, efficiencies and dimensions.

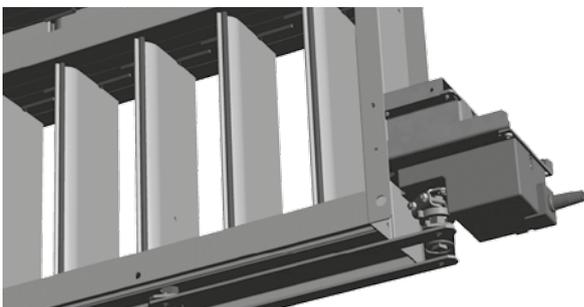
FIGURE 5 – HRZ HEAT EXCHANGER CHAMBER



### ASSEMBLED ELEMENTS

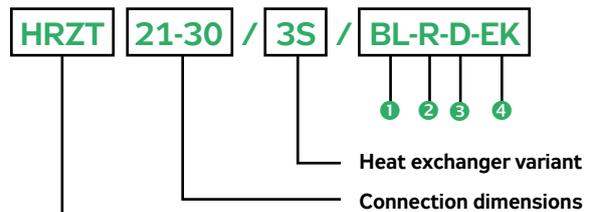
- The purpose of the **heat exchanger chamber** is to recover the heat energy and it consists of the following elements:
  - A chamber with an integrated by-pass channel
  - A counter-flow plate heat exchanger, for selected sizes in the "combi" version, consisting of two separate heat exchangers and two baffles
  - Suspensions
- The **By-pass**, designed as an extension of the heat exchanger chamber, serves as an antifreeze protection of the heat exchanger and/or as a summer by-pass. It consists of the following elements:
  - **Damper**
    - Flexible side arrangement - by turning the damper
    - Covered gear drive
    - The damper flaps in the vertical position (in relation to the chamber position) are divided into two parts (by-pass and heat exchanger) with an angular displacement of 90°.
    - "Downward-oriented" damper axis (in relation to the horizontal position of the chamber).
  - **Damper drive** (optional)
    - Variants: an actuator or a hand lever;
    - Actuator position: either under the damper or on the damper side.

FIGURE 6 – BY-PASS DAMPER ACTUATOR



- **Linkage** (optional) serves to lead the damper control/actuator out to the damper side
- **The tray duct piece** is designed as an extension of the chamber to collect and drain the condensate and serves for the following parts:
  - **Chamber with an integrated tray** :
    - 3D sloping
    - Side outlet, side flexible (by turning the tray)
    - DN32 dimension
  - **Holders to fit the drop eliminator**
  - **Drop eliminator** (optional)

FIGURE 7 – HEAT EXCHANGER CHAMBER DESIGNATION



**HRZT** version higher than other elements of a specific dimensional range  
**HRZF** version respecting the installation height of the given Vento-dimensional range

- 1 **Side arrangement**
- 2 **Type of bypass damper actuator:**
  - R** hand lever
  - X** actuator controlled by 0-10V signal and powered by 24V
  - H** without drive
  - 24** actuator controlled by ON/OFF signal and powered by 24V
  - 230** actuator controlled by ON/OFF signal and powered by 230V
- 3 **Position and location of the damper**
  - D** lower
  - B** side
- 4 **Drop eliminator**
  - EK** integrated drop eliminator
  - BE** without drop eliminator

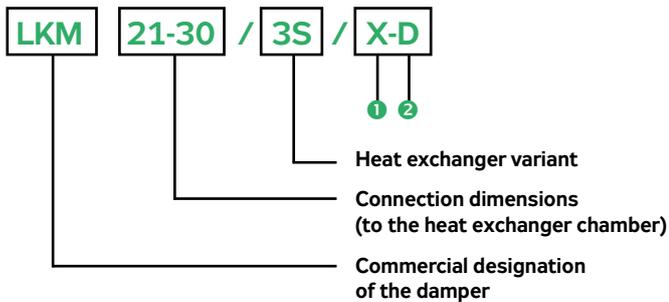
### NON-ASSEMBLED ELEMENTS

(enclosed with the delivery as separate parts)

- **Condensate drainage kit** (siphon)
- **Mixing as an extension to the heat exchanger**, It is used to mix the inlet and outlet air using the heat exchanger by-pass channel and consists of:
  - **Damper**
    - Flexible side arrangement - by turning the damper
    - Covered gear drive
    - The damper flaps in the vertical position (in relation to the chamber position) are divided into two parts (by-pass and free space without flaps).
    - "Downward-oriented" damper axis (in relation to the horizontal position of the chamber)
  - **Damper drive** (optional)
    - Variants: an actuator or a hand lever
    - Actuator position: either under the damper or on the damper side
  - **Linkage** (optional) serves to lead the damper control/actuator out to the damper side

- **45° Elbow** directs the air flow of the air branch and simultaneously can extend the connection dimension A1 – width (as needed for the selected size)
- **Sensors of antifreeze protection** (P33, NS)
- **VCS control system**  
(if a complete air-handling unit assembly is ordered)

FIGURE 8 – MIXING DAMPER DESIGNATION

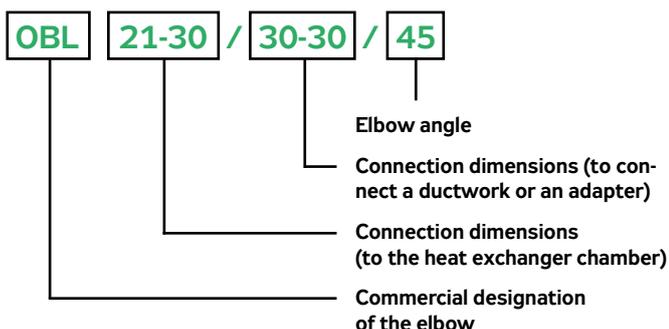


- 1 **Type of bypass damper actuator:**
  - R** hand lever
  - X** actuator controlled by 0-10V signal and powered by 24V
  - H** without drive
  - 24** actuator controlled by ON/OFF signal and powered by 24V
  - 230** actuator controlled by ON/OFF signal and powered by 230V
- 2 **Position and location of the damper drive**
  - D** lower
  - B** side

FIGURE 9 – 45° ELBOW



FIGURE 10 – ELBOW DESIGNATION

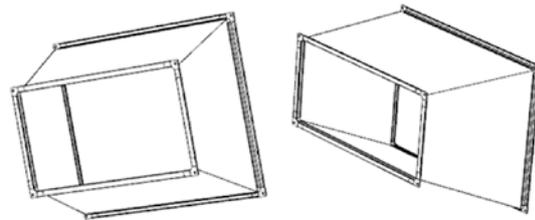


## NON-REMAK ELEMENTS

(Remak only specifies the design)

- Adapters are intended to reduce or extend the B connection dimension (height) to the selected/desired value. Adapters can be designed with a reduced dimension of one side or reduced dimensions of both sides (a variant with a short length).

FIGURE 11 – EXAMPLE OF AN ADAPTER/EXTENSION



## MOUNTING AND INSTALLATION

Installation of the heat exchanger can be performed in a way similar to the installation of other Vento components.

### HRZ CHAMBER SUSPENSION

#### Horizontal position (overhead installation):

The heat exchanger chamber can be suspended either using Z-hangers with silent-blocks (included in the Remak delivery) and M8 threaded rods (not included in the Remak delivery) or by other options, i.e., using suspension bars or brackets (not included in the Remak delivery).

#### Vertical position (wall installation):

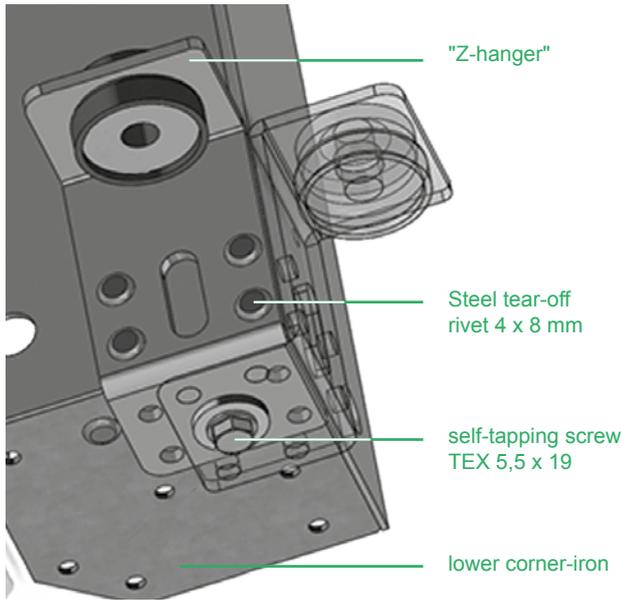
It is recommended to support and secure the heat exchanger chamber at the location of the edge support profiles. It is advisable to use suitable rubber pads between the chamber and supports (not included in the Remak delivery).

#### Z-Hanger Installation

The Z-hanger with a silent-block is designed only for horizontal overhead installation of the unit using the M8 threaded rods and is always situated in the lower corners (corner-iron) of the heat exchanger chamber. When installing the Z-hanger, it is possible to select the side of the suspension silent-block location, e.g., due to the damper actuator linkage (if the Z-hanger collides with the actuator).

The Z-hanger is secured to the chamber corner-iron by a "TEX" 5.5 x 19 self-tapping screw with an M8 washer and four steel tear-off rivets 4 x 8 mm – if the location of the Z-hanger is changed, it is necessary to drill new holes for the rivets according to the holes in the Z-hanger using a drill bit of 4.0 mm diameter.

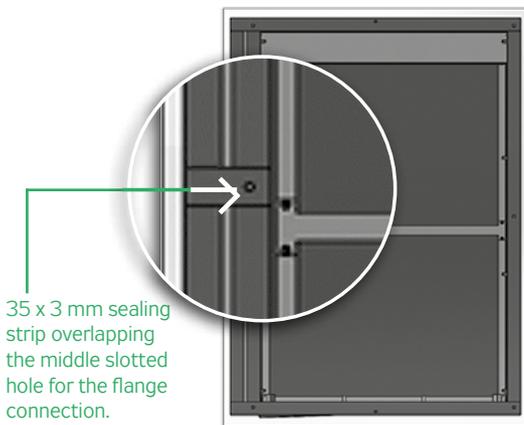
FIGURE 12 – SUSPENSION USING THE Z-HANGER



**Note:**

To maintain joint tightness and strength when connecting the 45° elbows, reduction adapters or other elements of the air-handling assembly to the flange of the condensate drainage tray, we recommend applying self-adhesive 35 x 3 sealing (included in the Remak delivery).

FIGURE 13 – SELF-ADHESIVE SEALING APPLICATION



**Installation of 45° Elbows and Reduction Adapters**

Before installation, always apply self-adhesive sealing onto the connecting flange faces of the 45° elbows and reduction adapters. The connection of the elbows and reduction adapters to the heat exchanger chamber is carried out using the flange with pressed nuts situated in the connecting chamber wall corners. To brace flanges with a side longer than 40 cm, it is advisable to also connect them in the middle (to prevent flange bar gapping). This centre connection to the heat exchanger chamber is carried out using the self-tapping screws and to the duct or reduction adapter using the screw coupling clamps. It is necessary to ensure conductive connection of the flange using fan-washers placed on both sides on at least one flange connection.

**Mixing Damper Installation**

Before installation, always apply self-adhesive sealing onto the connecting flange faces. The connection of the mixing damper to the heat exchanger chamber is carried out through the pre-drilled holes in the flange to the pressed nuts on the connecting wall of the heat exchanger. It is necessary to ensure conductive connection of the damper flange using fan-washers on at least one flange connection. If the damper is equipped with a side situated linkage and actuator, it is possible to change the linkage location to right-hand or left-hand by turning the entire damper according to operating needs or space requirements.

**Note:**

If retrofitting the mixing damper, the by-pass cover panel must be disassembled and removed to open the air inlet on the mixing damper side – the cover panel can be unscrewed from outside, i.e., from the side where the mixing damper is to be installed.

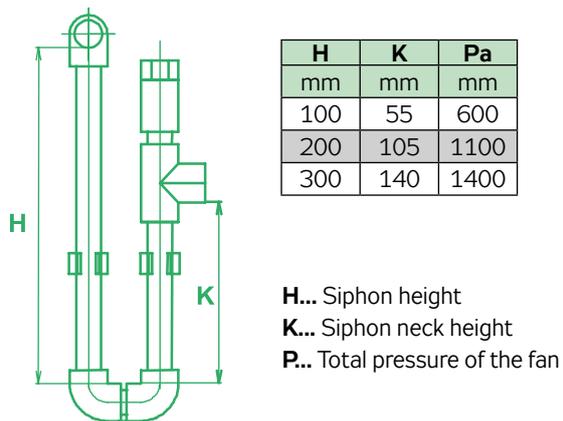
**Condensate Drainage Installation**

It is recommended to place the siphon right behind the tray neck. Correct

The correctly selected siphon height depends on the total pressure of the fan and heat exchanger chamber and ensures its proper functioning. The siphon height dimension must be designed depending on the fan pressure.

The condensate drainage tray is attached to the structure using sealing and screws which enable removal of the tray and its side arrangement – a left-hand and right-hand neck.

FIGURE 14 – CONDENSATE DRAINAGE



**Drop Eliminator Installation**

In the condensate drainage tray's piping piece area, the prepared attachments are situated, enabling installation/insertion (also retrofitting) of the eliminator. The eliminator can be inserted into the condensate drainage tray's duct piece area through the removable (screwed) side covers of the duct piece, or through the removable (screwed) tray in the lower part of the duct piece. Removal of the eliminator, e.g., for cleaning, can be performed the same way.

**Note:**

Please ensure the correct orientation of the eliminator's fins.

FIGURE 15 –CORRECT ORIENTATION OF THE ELIMINATOR'S FIN



## INSTALLATION OF M&C ELEMENT

If needed, the M&C elements can be installed/attached to the external side of the corner profiles of the chamber casing (here, the attachment holes can be drilled into the chamber casing).

### Recommended locations of M&C elements:

- NA 120 – standard installation on the ductwork, 45° elbow or reduction adapter behind the heat exchanger in accordance with the Sensor Installation Instructions.
- CAP (capillary tube) – installation on the chamber casing. The capillary tube must be evenly distributed in the area behind the heat exchanger.
- P33N –installation on the ductwork, 45° elbow or reduction adapter of the outlet branch in front of or behind the heat exchanger.

**Note: Never drill or install the M&C elements onto the chamber bottom or chamber lid – there is a risk of damage to the heat exchanger or leakage of the casing.**

## OPERATION AND MAINTENANCE

When used in accordance with the project designed in the AeroCAD software and instructions in the chapter "Operating Conditions and Position", HRZ heat exchangers require only minimum maintenance related mainly to cleaning the condenser, free passage through the condensate drainage, functionality (rotation) of the dampers and functionality of the M&C elements.

### Inspections

(Minimum recommended interval for inspections and cleaning – 2x per year)

- Check the intactness and internal cleanliness of the heat exchanger and eliminator.
- Check functionality of the dampers, linkage and actuators.
- Check functionality of the installed M&C elements.
- Check free passage through the entire condensate drainage.
- Check state of the unit's suspension

## Access to Individual Components of the HRZ Heat Exchanger

- Dampers (by-pass and mixing) with actuators are installed from the outer side of the chamber – free access.
- The installed heat exchanger – access through the elbows, reduction adapter (removable) and from above through the removable (screws) cover of the heat exchanger chamber.
- By-pass area – access from above through the removable (screws) cover of the heat exchanger chamber.
- The ductwork piece and tray with eliminator – access through the removable (screws) side covers and removable condensate drainage tray.

### Caution

- The VCS control system includes the function of heat exchanger drying which, using the fan run-out, helps remove the remaining condensate when the equipment is switched off. If a quick service action is needed, the equipment must be switched off by the main switch to eliminate the fan run-out.
- The heat exchanger is made of thin aluminium profiles. Any unqualified handling can cause permanent and unrepairable damage. The bypass duct must be regulated, so that the air pressure loss in the duct bypass will be approximately the same the air pressure loss in the heat exchanger. Otherwise, the parameters of the air-handling system could be changed, respectively, the working point of the supply fan could be shifted into the non-working (forbidden) area. Therefore, the supply current of the fan must be checked during the heat exchange mode as well as during the bypass mode.
- Air filters must be installed in front of the cold and hot air inlets to avoid fouling of the heat-exchange surfaces, gradual reduction of the heat exchange effectiveness, and increasing pressure losses.

## HANDLING AND TRANSPORT

- Handling and transport of the chamber must always be performed in the horizontal position, i.e., with the by-pass channel situated upwards, on a flat surface (e.g., pallet + cardboard box).
- Lifting must be performed using the **lower** corners of the casing, respectively, the **lower** edges of the chamber.
- The chamber structure allows 3 chambers to be stacked during transport. Cardboard must always be inserted between the chambers.
- The support area of the chamber is created by the corners and perimeter of the chamber. Therefore, do not place smaller items on the cover of the chamber – risk of breakage of the chamber cover and area around the by-pass channel.
- The heat exchanger is made of thin aluminium profiles. Any unqualified handling can cause permanent and unrepairable damage.

