

Series  
**VUTR 400 EH EC/WH EC**  
**VUTR 700 EH EC/WH EC**  
**VUTR 900 EH EC/WH EC**



Series  
**VUTR 1200 EH EC/WH EC**  
**VUTR 1500 EH EC/WH EC**



Series  
**VUTR 2000 EH EC/WH EC**



Air handling units in heat- and sound-insulated casing with an electric or a water heater.  
 Air flow up to **2250 m<sup>3</sup>/h**.  
 Heat recovery efficiency up to **95 %**

**Description**

The air handling units VUTR EH EC with an electric heater and VUTR WH EC with a water heater are the fully-featured ventilation units that ensure air filtration, fresh air supply and stale air extract. During the operation process the extract air heat is transferred to the supply air through the rotary heat exchanger. The units are used in ventilation and air conditioning systems installed in various premises that require reasonable energy saving solutions and controllable ventilation systems. EC motors reduce energy demand by 1.5-3 times and ensure high performance and low noise operation.

The VUTR 400/700/900/1200/1500 EH/WH EC units are compatible with round air ducts (Ø 160, 250 and 315 mm).

The VUTR 200 EH/WH EC units are compatible with rectangular air ducts (Ø 500x300).

**Modifications**

**VUTR EH EC** models are equipped with an electric heater.

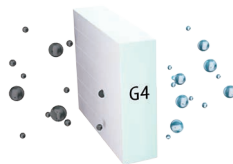
**VUTR WH EC** models are equipped with a water heater.

**Casing**

The casing consists of a frame and three-layer 20 mm (VUTR 1500 and 2000 – 25 mm) thick panels made of zinc aluminium internally filled with mineral wool for reliable heat- and sound-insulation. Due to the specially designed removable side panels the unit requires little space for servicing and accessing to all the unit components.

**Filter**

The two integrated G4 filters ensure sufficient supply and extract air purification.



**Motor**

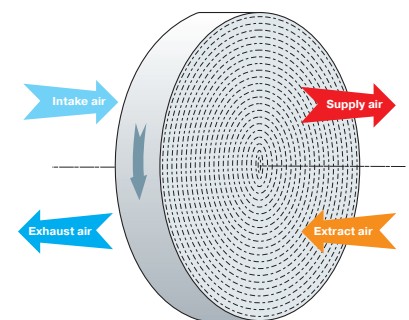
The air handling units are equipped with high-efficiency electronically commutated (EC) direct current motors with an external rotor and backward-curved blades. These state-of-the-art motors offer the very best in energy efficiency today. In addition to that, EC motors combine high performance and optimum control over the entire speed range. The high efficiency (up to 90 %) is a definite advantage of EC motors.

**Rotary heat exchanger**

The rotary heat exchanger is a short rotating cylinder filled with layers of corrugated aluminium tape packaged in a such way so as to enable free passage of the supply and extract air flows.

As the cylinder rotates the aluminium tape contained in the heat exchanger is first exposed to the supply air stream and then - to the extract air stream.

As a result the material undergoes repeated warming and heating cycles thereby transferring heat and humidity from the warm air stream to the cold one. Compared to plate-type devices a rotary heat exchanger demonstrates better efficiency and helps maintain a comfortable air humidity level while reducing frostbite danger to a bare minimum (tending to zero at normal temperature and humidity).



Rotary heat exchanger operation principle

**Designation key**

| Series           | Heat exchanger type             | Rated air flow [m <sup>3</sup> /h] | Heater type                           | Pipe modification    | Motor type   | Control panel                           |
|------------------|---------------------------------|------------------------------------|---------------------------------------|----------------------|--|---|
| <b>VENTS VUT</b> | <b>R:</b> rotary heat exchanger | 400; 700; 900;<br>1200; 1500; 2000 | <b>E:</b> electric<br><b>W:</b> water | <b>H:</b> horizontal | <b>EC:</b> synchronous motor with electronic control | <b>A17:</b> th-Tune<br><b>A18:</b> pGD1 |

**Heater**

The air handling units are equipped with electric heaters (VUTR EH EC models) or water heaters (VUTR WH EC models) to operate at low outside temperatures. If heat recovery is not sufficient to reach the set supply air temperature, the heater is activated to warm up supply air. The heaters are equipped with protecting devices to ensure safe and reliable operation of the unit. The water heaters are designed for maximum operating pressure 1.0 MPa (10 bar) and maximum heat medium operating temperature +95 °C.

**Control and automation**

The VUTR EH EC A17 and VUTR WH EC A17 units are equipped with a th-Tune control panel.



The VUTR EH EC A18 and VUTR WH EC A18 units are equipped with a pGD1 control panel.



**Automation functions**

- ▶ Speed selection: low, medium, high.
- ▶ Speed is individually adjusted from 0 to 100 % for the supply and the extract fans.
- ▶ Filter maintenance indication.
- ▶ Alarm indication.
- ▶ Timer-based operation.
- ▶ Week-scheduled operation.
- ▶ Supply air temperature control.
- ▶ CCU control.
- ▶ Air damper actuator controlling.

**Mounting**

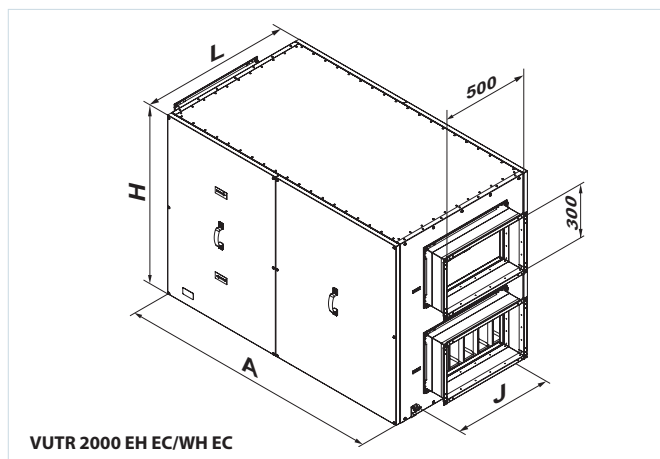
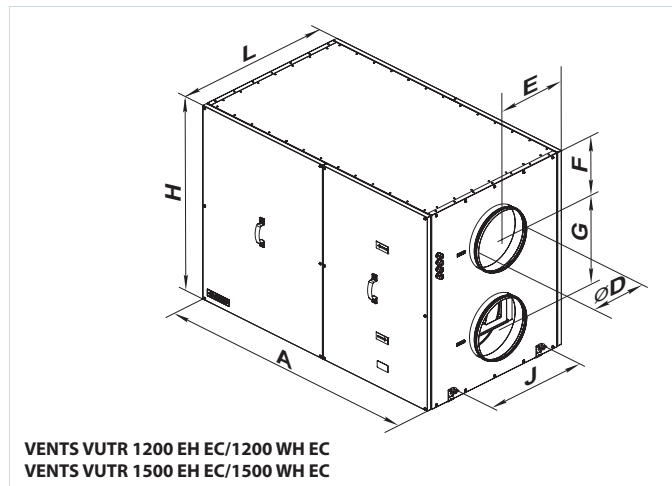
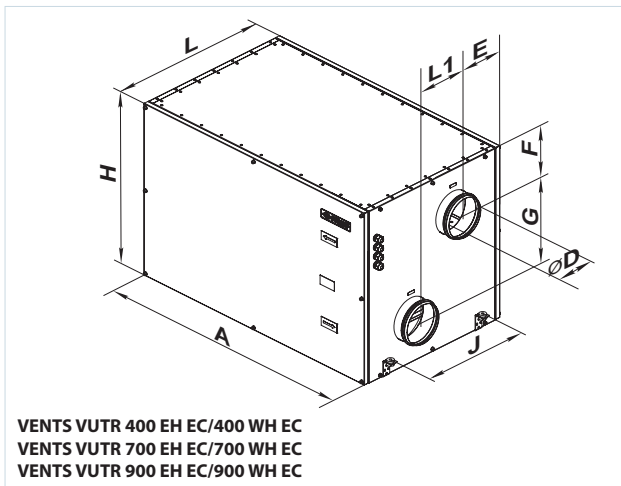
The unit is designed for mounting to a horizontal plane, suspension to a ceiling or wall mounting by means of brackets. Service access is from the left side panel (in air direction). The water heater pipes on the VUTR WH EC unit are led to the service side, on the left (in air direction).

**Calculation of air temperature at heat exchanger outlet:**

$t = t_{outd} + k_{hr} * (t_{ext} - t_{outd}) / 100$ , where  
 $t_{outd}$ : outdoor air temperature [°C]  
 $t_{ext}$ : extract air temperature [°C]  
 $k_{hr}$ : heat exchanger efficiency (according to the diagram) [%]

**Overall dimensions**

| Model                      | Dimensions [mm] |      |     |     |     |     |     |      |     |
|----------------------------|-----------------|------|-----|-----|-----|-----|-----|------|-----|
|                            | øD              | A    | E   | F   | G   | L   | L1  | H    | J   |
| VUTR 400 EH EC/400 WH EC   | 159             | 1050 | 225 | 167 | 333 | 648 | 200 | 670  | 440 |
| VUTR 700 EH EC/700 WH EC   | 249             | 1210 | 243 | 180 | 340 | 745 | 260 | 700  | 580 |
| VUTR 900 EH EC/900 WH EC   | 249             | 1210 | 243 | 180 | 340 | 745 | 260 | 700  | 580 |
| VUTR 1200 EH EC/1200 WH EC | 314             | 1335 | 373 | 220 | 438 | 745 | -   | 880  | 460 |
| VUTR 1500 EH EC/1500 WH EC | 314             | 1430 | 427 | 275 | 460 | 855 | -   | 1010 | 560 |
| VUTR 2000 EH EC/2000 WH EC | -               | 1485 | -   | -   | -   | 875 | -   | 1010 | 630 |

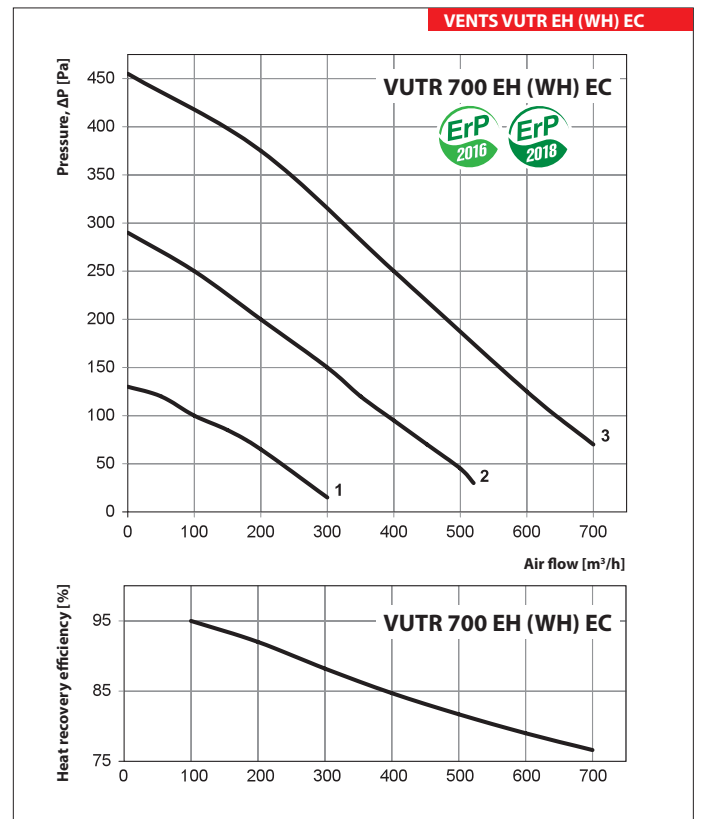
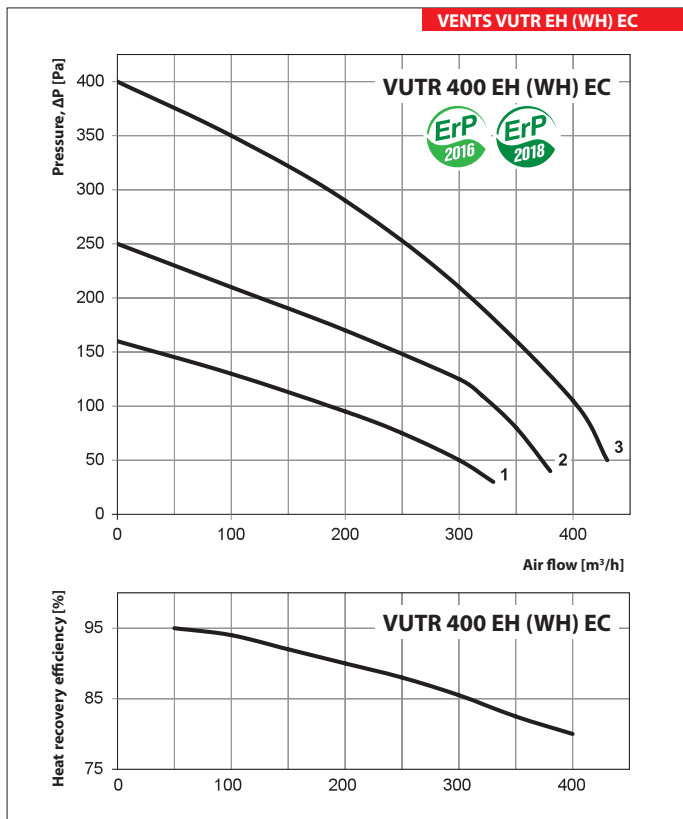


VUTR EH EC  
 WH EC  
 AIR HANDLING UNITS WITH  
 HEAT RECOVERY

# AIR HANDLING UNITS WITH HEAT RECOVERY

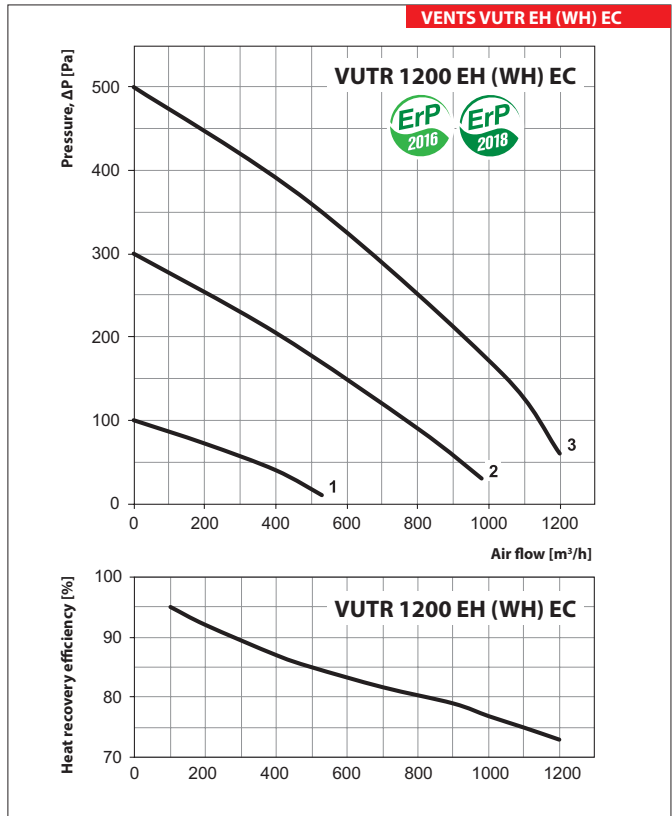
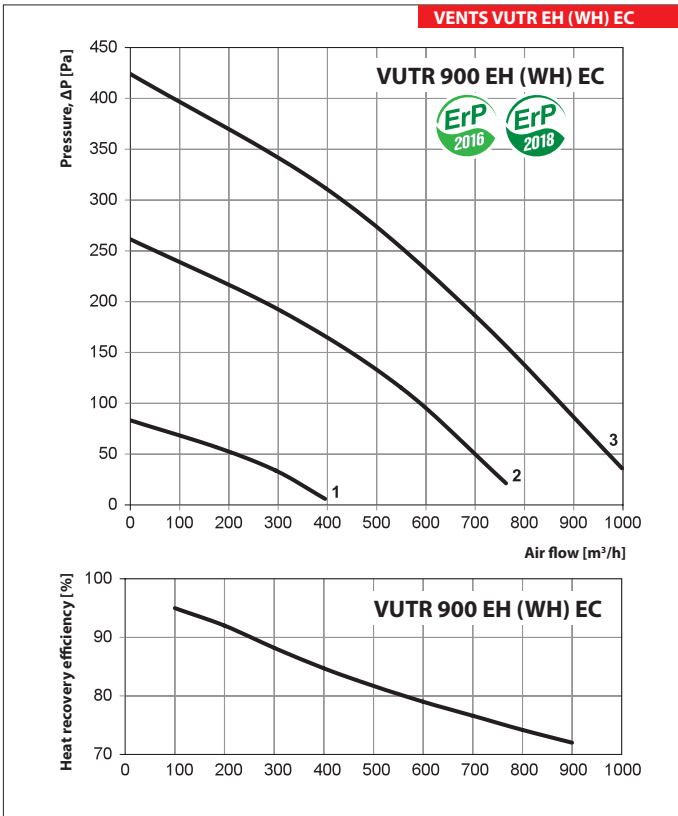
## Technical data

|  | VUTR<br>400 EH EC  | VUTR<br>400 WH EC | VUTR<br>700 EH EC | VUTR<br>700 WH EC | VUTR<br>900 EH EC | VUTR<br>900 WH EC |
|--|--------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Voltage [V/Hz]                             | 1~230/50-60        |                   | 1~230/50-60       |                   | 3~400/50-60       |                   |
| Maximum fan power [W]                      | 2 pcs. x 100       |                   | 2 pcs. x 105      |                   | 2 pcs. x 135      |                   |
| Electric heater power [kW]                 | 2.0                | -                 | 3.3               | -                 | 4.5               | -                 |
| Total unit power [W]                       | 2290               | 290               | 3615              | 315               | 4940              | 440               |
| Total unit current [A]                     | 9.9                | 1.2               | 15.8              | 1.4               | 7.2               | 1.9               |
| Maximum air flow [m³/h]                    | 400                |                   | 700               |                   | 900               |                   |
| RPM  | up to 3100         |                   | up to 2600        |                   | up to 2600        |                   |
| Sound pressure level at 3 m distance [dBA] | 45                 |                   | 52                |                   | 58                |                   |
| Transported air temperature [°C]           | -25...+40          |                   |                   |                   |                   |                   |
| Casing material                            | Aluzinc            |                   |                   |                   |                   |                   |
| Insulation                                 | 20 mm mineral wool |                   |                   |                   |                   |                   |
| Extract filter                             | G4                 |                   |                   |                   |                   |                   |
| Supply filter                              | G4                 |                   |                   |                   |                   |                   |
| Connected air duct diameter [mm]           | Ø160               |                   | Ø250              |                   | Ø250              |                   |
| Mass [kg]                                  | 112                |                   | 128               |                   | 130               |                   |
| Heat recovery efficiency [%]               | 80-95              |                   | 76-95             |                   | 72-95             |                   |
| Heat exchanger type                        | rotary             |                   |                   |                   |                   |                   |
| Heat exchanger material                    | aluminium          |                   |                   |                   |                   |                   |
| SEC class                                  | A                  |                   |                   |                   |                   |                   |



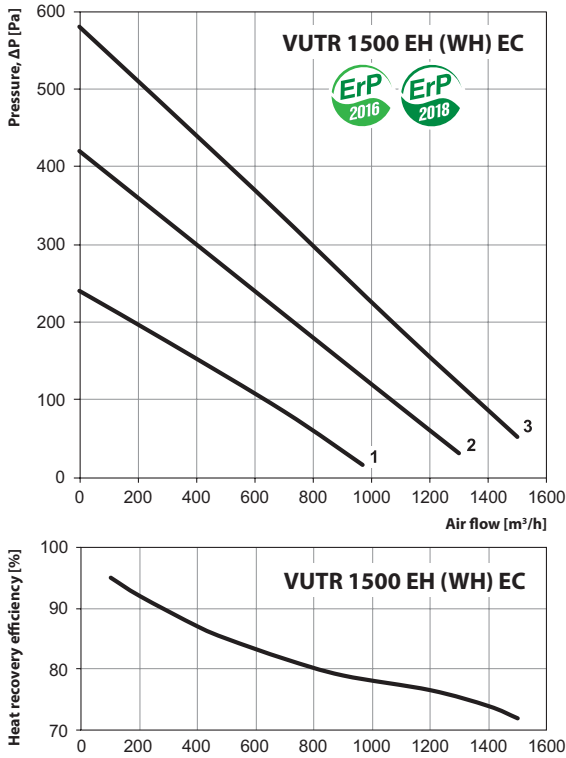
**Technical data**

|  | VUTR 1200 EH EC    | VUTR 1200 WH EC | VUTR 1500 EH EC | VUTR 1500 WH EC    | VUTR 2000 EH EC | VUTR 2000 WH EC |
|--|--------------------|-----------------|-----------------|--------------------|-----------------|-----------------|
| Voltage [V/Hz]                             | 3~400/50-60        | 1~230/50-60     | 3~400/50-60     | 1~230/50-60        | 3~400/50-60     | 1~230/50-60     |
| Maximum fan power [W]                      | 2 pcs. x 208       |                 | 2 pcs. x 222    |                    | 2 pcs. x 448    |                 |
| Electric heater power [kW]                 | 6.0                | -               | 9.0             | -                  | 12              | -               |
| Total unit power [W]                       | 6570               | 570             | 9750            | 750                | 13070           | 1070            |
| Total unit current [A]                     | 9.5                | 2.5             | 14.1            | 3.2                | 22.4            | 5               |
| Maximum air flow [m³/h]                    | 1200               |                 | 1500            |                    | 2250            |                 |
| RPM  | up to 1930         |                 | up to 2000      |                    | up to 3000      |                 |
| Sound pressure level at 3 m distance [dBA] | 60                 |                 | 62              |                    | 64              |                 |
| Transported air temperature [°C]           | -25...+40          |                 |                 |                    |                 |                 |
| Casing material                            | Aluzinc            |                 |                 |                    |                 |                 |
| Insulation                                 | 20 mm mineral wool |                 |                 | 25 mm mineral wool |                 |                 |
| Extract filter                             | G4                 |                 |                 |                    |                 |                 |
| Supply filter                              | G4                 |                 |                 |                    |                 |                 |
| Connected air duct diameter [mm]           | Ø315               |                 | Ø315            |                    | 500x300         |                 |
| Mass [kg]                                  | 165                |                 | 175             |                    | 198             |                 |
| Heat recovery efficiency [%]               | 73-95              |                 | 72-95           |                    | 68-93           |                 |
| Heat exchanger type                        | rotary             |                 |                 |                    |                 |                 |
| Heat exchanger material                    | aluminium          |                 |                 |                    |                 |                 |

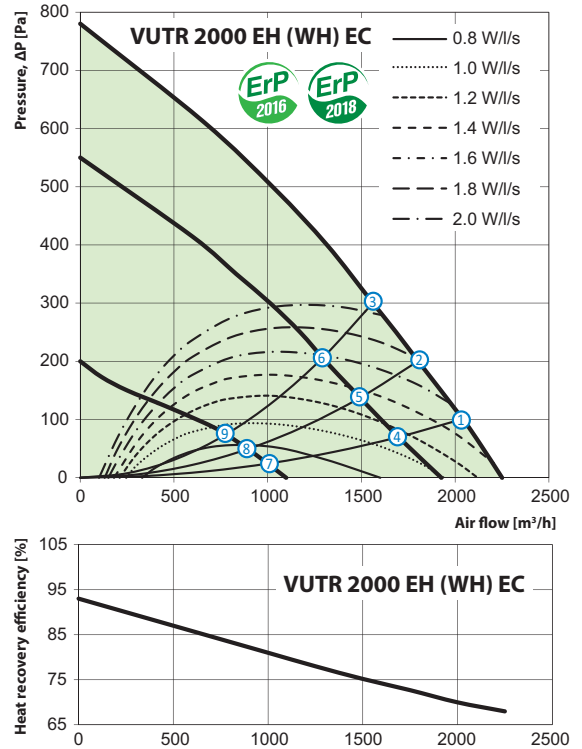


VUTR EH EC / WH EC  
 AIR HANDLING UNITS WITH HEAT RECOVERY

VENTS VUTR EH (WH) EC

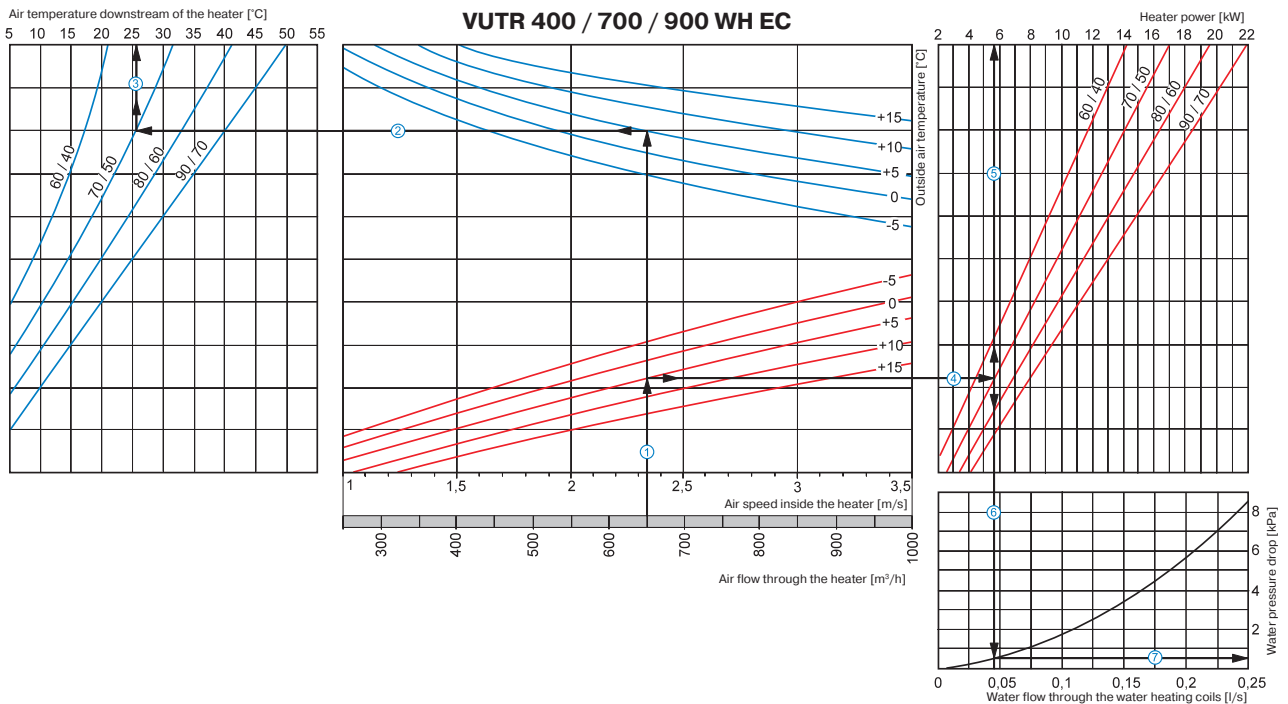


VENTS VUTR EH (WH) EC



Water heater parameters calculation

VENTS VUTR WH EC



Water heater parameters calculation example

The air flow is 650 m<sup>3</sup>/h and the air speed in the heater is 2.35 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated winter temperature shown in blue line (e.g., +5 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the supply air temperature downstream of the heater (+26 °C) ③.
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., +5 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the heater power axis (5.8 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0,04 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (0.5 kPa).

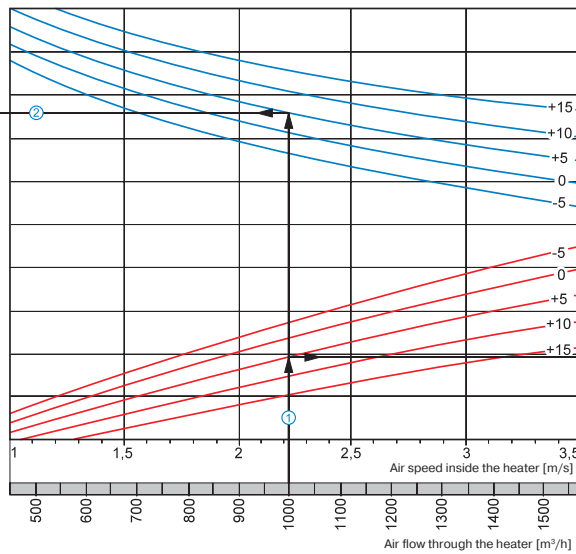
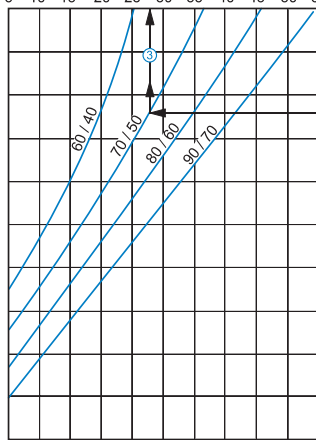
### Water heater parameters calculation

VENTS VUTR WH EC

Air temperature downstream of the heater [°C]

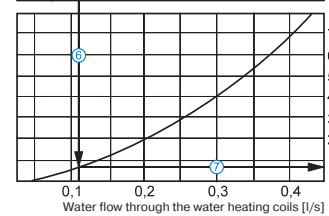
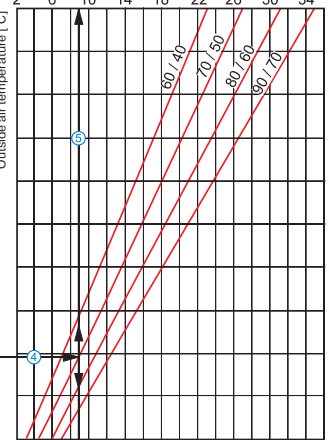
5 10 15 20 25 30 35 40 45 50 55

#### VUTR 1200 WH EC



Heater power [kW]

2 6 10 14 18 22 26 30 34



Water pressure drop [kPa]

Water flow through the water heating coils [l/s]

#### Water heater parameters calculation example

The air flow is 1000 m<sup>3</sup>/h and the air speed in the heater is 2.22 m/s ①.

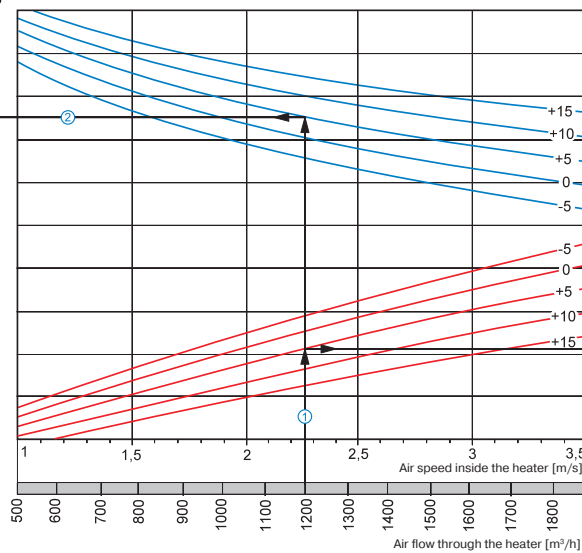
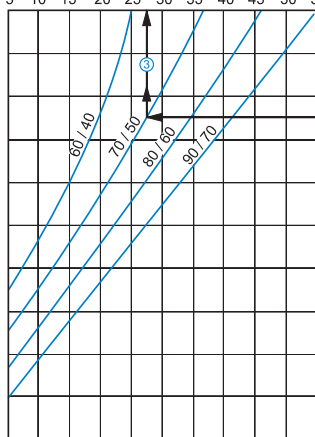
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated winter temperature shown in blue line (e.g., +5 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the supply air temperature downstream of the heater (28 °C) ③.
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., +5 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the heater power axis (9.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑤ downwards to the water flow axis (0.11 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (0.8 kPa).

VENTS VUTR WH EC

Air temperature downstream of the heater [°C]

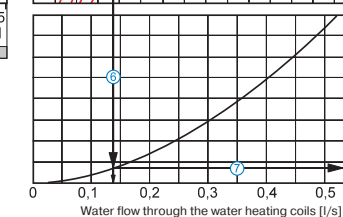
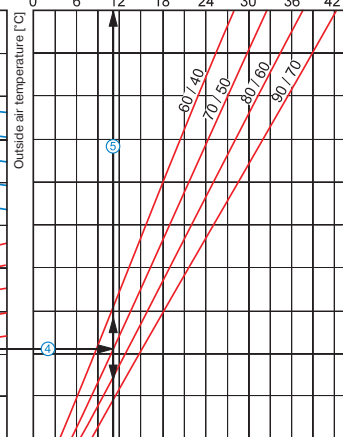
5 10 15 20 25 30 35 40 45 50 55

#### VUTR 1500/2000 WH EC



Heater power [kW]

0 6 12 18 24 30 36 42



Water pressure drop [kPa]

Water flow through the water heating coils [l/s]

#### Water heater parameters calculation example

The air flow is 1200 m<sup>3</sup>/h and the air speed in the heater is 2.25 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated winter temperature shown in blue line (e.g., +5 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the supply air temperature downstream of the heater (27 °C) ③.
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., +5 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g. 70/50). From this point draw a vertical line to the heater power axis (11.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑤ downwards to the water flow axis (0.13 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (0.8 kPa).

AIR HANDLING UNITS WITH HEAT RECOVERY  
VUTR EHEC / WH EC



# AIR HANDLING UNITS WITH HEAT RECOVERY

## Accessories for air handling units

| Model           | G4 supply pocket filter | G4 extract panel filter | Module Modbus-RS485 | Outdoor air quality sensor | Outdoor CO <sub>2</sub> sensor | Outdoor humidity sensor | Outdoor humidity sensor | Indoor humidity sensor (0-10 V) | Mixing unit | Back valves  | Air damper | Electric actuator |
|-----------------|-------------------------|-------------------------|---------------------|----------------------------|--------------------------------|-------------------------|-------------------------|---------------------------------|-------------|--------------|------------|-------------------|
| VUTR 400 EH EC  | SFK                     | SF                      |                     |                            |                                |                         |                         |                                 | -           |              |            | CM230             |
| VUTR 400 WH EC  | 393x235x27 G4           | 600x324x48 G4           |                     |                            |                                |                         |                         |                                 | USVK 3/4-4  | KOM 160      | KRV 160    | TF230             |
| VUTR 700 EH EC  |                         |                         |                     |                            |                                |                         |                         |                                 | -           |              |            | CM230             |
| VUTR 700 WH EC  | SFK                     | SF                      |                     |                            |                                |                         |                         |                                 | USVK 3/4-4  |              |            | TF230             |
| VUTR 900 EH EC  | 700x333x27 G4           | 700x332x48 G4           |                     |                            |                                |                         |                         |                                 | -           | KOM 250      | KRV 250    | CM230             |
| VUTR 900 WH EC  |                         |                         |                     |                            |                                |                         |                         |                                 | USVK 3/4-4  |              |            | TF230             |
| VUTR 1200 EH EC | SFK                     | SF                      | PCOS004850          | DPWQ 30600                 | DRWQ 40200                     | DPWC 11200              | HR-S                    | HV-2                            | -           |              |            | CM230             |
| VUTR 1200 WH EC | 700x423x27 G4           | 700x410x48 G4           |                     |                            |                                |                         |                         |                                 | USVK 3/4-4  |              |            | TF230             |
| VUTR 1500 EH EC |                         |                         |                     |                            |                                |                         |                         |                                 | -           | KOM 315      | KRV 315    | CM230             |
| VUTR 1500 WH EC | SFK                     | SF                      |                     |                            |                                |                         |                         |                                 | USVK 1-6    |              |            | TF230             |
| VUTR 2000 EH EC | 800x477x27 G4           | 800x477x47 G4           |                     |                            |                                |                         |                         |                                 | -           |              |            | CM230             |
| VUTR 2000 WH EC |                         |                         |                     |                            |                                |                         |                         |                                 | USVK 1-6    | KOM1 500x300 | KR 500x300 | TF230             |

## Application options

