

Series VENTS VUT EH EC



A8 control panel



Air handling units with the air capacity up to **600 m³/h** and heat recovery efficiency up to 90% in the sound- and heat-insulated casing with the electric heater

Series VENTS VUT WH EC



A13 control panel



Air handling units with the air capacity up to **550 m³/h** and the heat recovery efficiency up to 90% in the sound- and heat-insulated casing with the water heater

Description

VUT EH EC air handling units with the electric heater and VUT WH EC with water heater are the complete ventilation units designed to provide both supply and exhaust ventilation, air filtration and cleaning as well as removal of contaminated exhaust air. The exhaust air energy is transferred to supply air through the plate heat exchanger. Applied in ventilation and conditioning systems for various premises requiring economic solution and controllable air exchange. EC motors reduce energy consumption by 1.5-3 times and ensure high efficiency and low noise level at the same time. All the models are compatible with Ø 150, 160 and 200 mm round ducts.

Modifications

VUT EH EC – a range of compact energy saving air handling units (AHU) equipped with intake

and exhaust centrifugal fans with EC motors, counter-flow heat exchanger, electric heater and air filters.

VUT WH EC – a range of compact energy saving air handling units (AHU) equipped with supply and exhaust centrifugal fans with EC motors, counter-flow heat exchanger, water or glycol heater and air filters.

Casing

The casing is manufactured from aluminum-zinc compound with internal 25 mm mineral wool heat- and sound- insulating layer.

Filter

Two incorporated G4 panel filters for extract air ventilation and F7 filters for supply air ventilation are supplied with the unit.

Fans

The double inlet impellers with forward curved blades are powered by high efficient electronically commutated (EC) direct current motors with external rotor. As of today, such motor type is the most advanced solution for energy saving. EC motors are featured with high efficiency and the best control over the whole fan speed range. Premium efficiency (reaching 90%) is an absolute advantage of the electronically commutated motors.

Heat exchanger

The units are equipped with the high efficient heat exchangers with heat recovery up to 95%. VUT EH EC and VUT WH EC models are fitted with the counter-flow heat exchangers made of polystyrene. The unit is equipped with the drain pan at the bottom of the heat exchanger for condensate drainage.

Designation key:

Series	Rated air capacity [m³/h]	Heater type	Duct connection	Motor type
VENTS VUT	300; 400; 600	E – electric W – water	H – horizontal	EC – synchronous electronically commutated motor

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■ Heater

The electric heater (for the unit VUT EH) or the water heater (for the unit VUT WH) at outlet from the heat exchanger is designed for warming up of supply air up to the set level if heat recovery is not enough to attain the set supply air temperature. The water heaters are designed for max. operating pressure 1.0 MPa (10 bar) and max. heat medium operating temperature 95 °C.

■ Control and automation

The unit incorporates an integrated automation and control system with a multi-functional control panel with LCD display. The standard delivery set includes 10 m connection cable for connection to the remote control panel. The unit has the freezing protection function to prevent the heat exchanger freezing by means of actuating the bypass damper and controlling water heater. As the temperature sensor warns of the freezing danger, the bypass air damper is opened and the intake air is directed through the air duct beside the heat exchanger. As the heat exchanger is warmed the supply air temperature rises up to the set level while passing through the heater. Meanwhile the warm extract air warms up the heat exchanger. After the freezing danger is no longer imminent, the bypass damper shuts the bypass duct and the unit reverts to the standard operation mode.

■ VUT EH EC control and protection functions

- ▶ control from the control panel: switching on/off, speed selection, timer, faults;

- ▶ maintaining the set room temperature by the sensor on the control panel – smooth heating capacity control;
- ▶ three-speed fan speed control (low-medium-high);
- ▶ unit operation according to daily and week schedule (timer adjustable from the control panel);
- ▶ safe start-up/shutdown of the fans;
- ▶ electric heater overheating protection by the temperature sensor installed in the supply air duct and by two overheating thermostats, one thermostat activated at 60 °C with automatic reset and another thermostat activated at 90 °C with manual reset. Blowing of the heating elements for heat removing at the end of the heating cycle;
- ▶ filter clogging control by engine hours.

■ VUT WH EC control and protection functions

- ▶ control from the control panel: switching the unit on/off, room temperature display, fan speed selection (low/medium/high speed);
- ▶ each fan speed is 100% adjustable both for supply and exhaust fan during the system setup;
- ▶ maintaining supply air temperature set from the control panel by controlling the circulation pump and actuating the heat medium regulating valve;
- ▶ freezing protection of the water heating coils by the exhaust temperature sensor and the return heat medium temperature sensor;
- ▶ safe start-up/ shutdown of the fans, warming up of the water heater before start-up; maintaining the set return heat medium temperature when the fan is off;

- ▶ actuating the external air dampers with a return spring;
- ▶ unit shut down at signal from the fire alarm system;
- ▶ smooth bypass damper control in the bypassing mode to prevent the heat exchanger freezing.

■ Mounting

The unit is designed for indoor mounting. While mounting the unit provide the correct condensate collection and drainage. Access for the unit servicing and filter cleaning is from the side panels.

■ Accessories

For attenuation of sound generated by the fans it is recommended to install the duct silencer (refer SR) from inside before the unit. For vibration absorbing it is recommended to install the flexible anti-vibration connectors (refer VVG) on both sides of the unit.

The VUT WH units are recommended to be equipped with automatic air dampers for the water heater freezing protection when the fans are off.

The mixing units USWK are recommended for smooth supply air temperature regulation in the units equipped with water heaters. The mixing unit USWK with three-way heat medium regulating valve and circulation pump provides smooth heating capacity regulation and minimizes the water heater freezing danger.

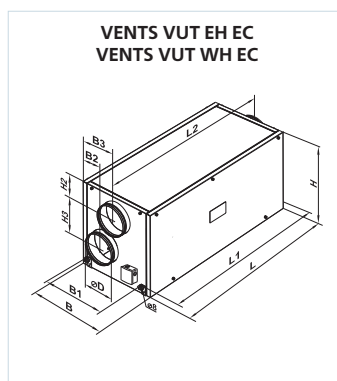
Accessories for air handling units:

Type	G4 replaceable filter (panel filter)	F7 replaceable filter (panel filter)
VUT 300-1 EH EC VUT 300-2 EH EC VUT 400 EH EC VUT 600 EH EC VUT 300-1 WH EC VUT 300-2 WH EC VUT 400 WH EC VUT 600 WH EC	SF VUT 300-600 EH/WH G4	SF VUT 300-600 EH/WH F7

AIR HANDLING UNITS WITH HEAT RECOVERY

Unit overall dimensions:

Type	Dimensions, [mm]										
	ØD	B	B1	B2	B3	H	H2	H3	L	L1	L2
VUT 300-1 EH EC	149	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-2 EH EC	159	500	403	161	249	555	127	231	1092	1137	1198
VUT 400 EH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 600 EH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-1 WH EC	149	500	403	161	249	555	127	231	1092	1137	1198
VUT 300-2 WH EC	159	500	403	161	249	555	127	231	1092	1137	1198
VUT 400 WH EC	199	500	403	161	249	555	127	231	1092	1137	1198
VUT 600 WH EC	199	500	403	161	249	555	127	231	1092	1137	1198



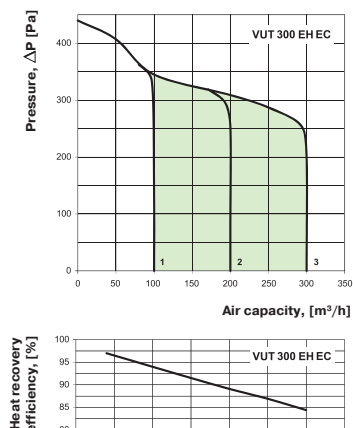
Technical data:

	VUT 300-1 EH EC	VUT 300-2 EH EC	VUT 300-1 WH EC	VUT 300-2 WH EC
Voltage [V / Hz]	1~ 220-240 / 50-60			
Maximum fan power [W]	2pcs. x 70			
Fan current [A]	2pcs. x 0.60			
Electric heater power [kW]	3.0		–	
Electric heater current [A]	13.0		–	
Number of water (glycol) coil rows	–		2	
Total unit power [kW]	3.14		0.14	
Total unit current [A]	14.2		1.2	
Air capacity [m³/h]	300			
RPM	1380			
Noise level at 3m [dBA]	24-45		24-45	
Transported air [°C]	-25 up to +60			
Casing material	aluzinc			
Insulation	25 mm mineral wool			
Extract filter	G4			
intake	F7 (EU7)			
Connected air duct diameter [mm]	Ø 150	Ø 160	Ø 150	Ø 160
Weight [kg]	38		40	
Heat recovery	up to 90%			
Heat exchanger type	counter-flow			
SEC Class	A+			
Heat exchanger material	polystyrene			

Technical data:

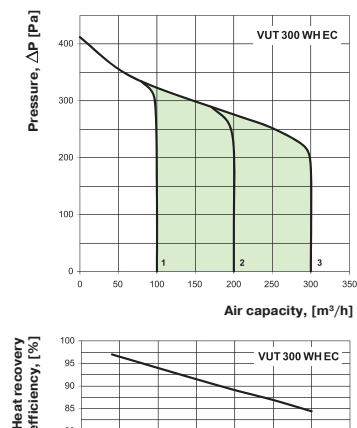
	VUT 400 EH EC	VUT 400 WH EC	VUT 600 EH EC	VUT 600 WH EC
Voltage [V / Hz]	1~ 220-240 / 50-60		1~ 220-240 / 50-60	
Maximum fan power [W]	2pcs. x 175		2pcs. x 175	
Fan current [A]	2pcs. x 1.3		2pcs. x 1.3	
Electric heater power [kW]	4.0	–	4.0	–
Electric heater current [A]	17.4	–	17.4	–
Number of water (glycol) coil rows	–	2	–	2
Total unit power [kW]	4.35	0.35	4.35	0.35
Total unit current [A]	20.0	2.6	20.0	2.6
Air capacity [m³/h]	400		600	
RPM	1340		2150	
Noise level at 3m [dBA]	28-47	28-47	28-47	28-47
Transported air [°C]	-25 up to +60		-25 up to +60	
Casing material	aluzinc		aluzinc	
Insulation	25 mm mineral wool		25 mm mineral wool	
Extract filter	G4		G4	
Supply filter	F7 (EU7)		F7 (EU7)	
Connected air duct diameter [mm]	Ø 200		Ø 200	
Weight [kg]	38	40	38	40
Heat recovery efficiency	up to 90%		up to 90%	
Heat exchanger type	counter-flow		counter-flow	
	A+		A	
Heat exchanger material	polystyrene		polystyrene	

VENTS VUT EH EC



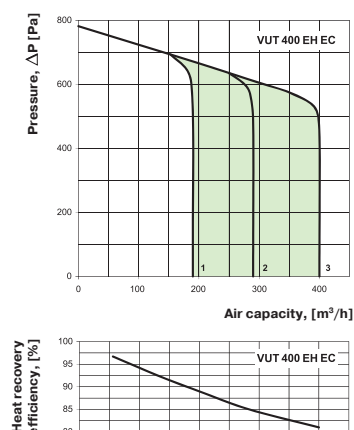
Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	51	30	48	46	37	42	36	32	21
L_{WA} to outlet	dBA	60	41	54	57	55	44	46	35	24
L_{WA} to environment	dBA	33	23	23	32	27	19	15	19	18

VENTS VUT WH EC



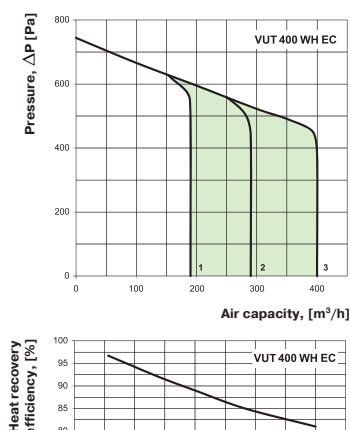
Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	49	30	46	49	39	42	38	31	20
L_{WA} to outlet	dBA	60	39	55	58	52	45	45	35	26
L_{WA} to environment	dBA	34	20	23	30	27	18	18	20	21

VENTS VUT EH EC



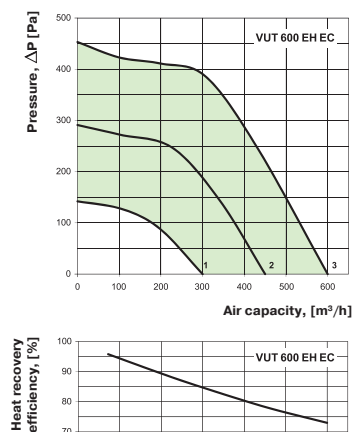
Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	54	32	50	51	40	43	40	37	25
L_{WA} to outlet	dBA	65	44	57	58	54	51	48	38	27
L_{WA} to environment	dBA	37	27	28	32	29	22	19	21	23

VENTS VUT WH EC



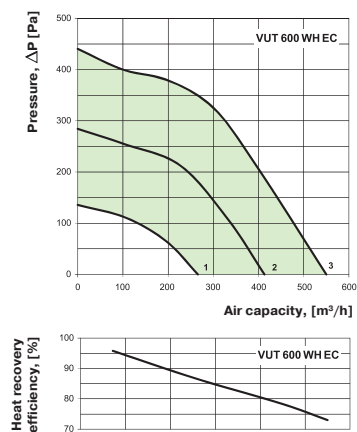
Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	56	33	51	50	40	44	41	37	22
L_{WA} to outlet	dBA	62	42	57	58	58	48	49	36	26
L_{WA} to environment	dBA	36	25	27	34	29	20	19	25	23

VENTS VUT EH EC



Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	36	55	54	43	46	43	38	26
L_{WA} to outlet	dBA	68	45	60	64	61	52	52	40	29
L_{WA} to environment	dBA	38	29	31	38	31	26	24	27	26

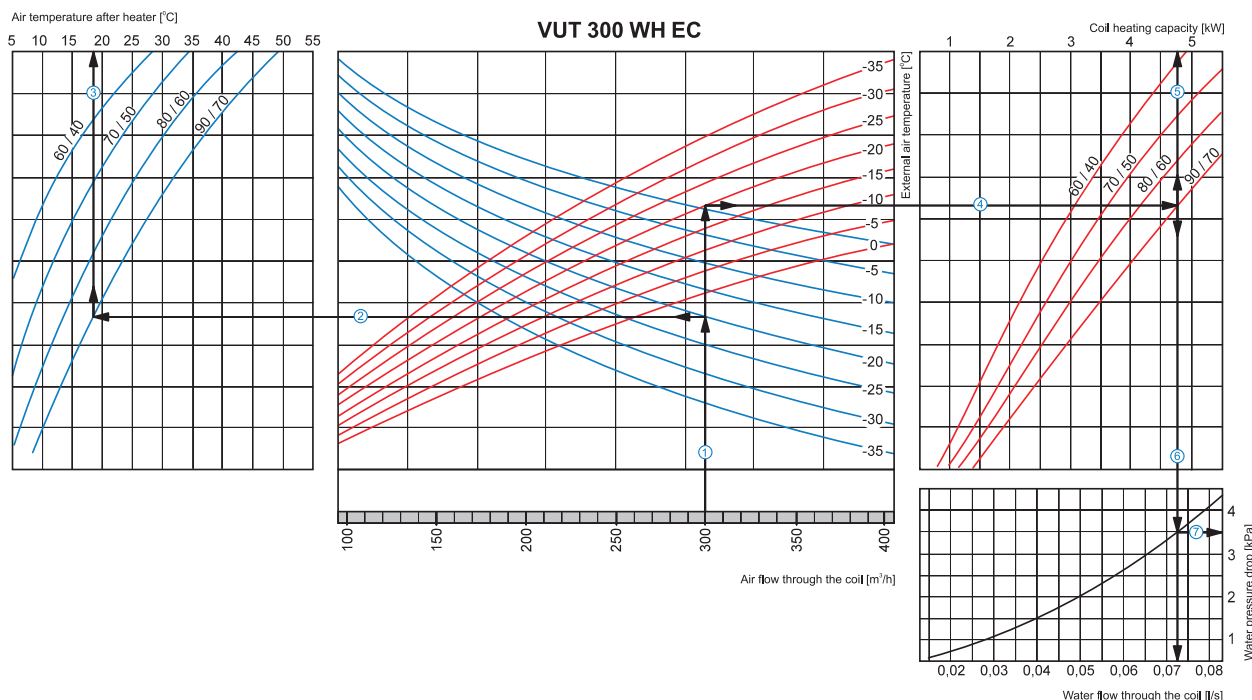
VENTS VUT WH EC



Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	38	56	52	41	47	44	40	24
L_{WA} to outlet	dBA	66	45	59	62	57	52	50	39	30
L_{WA} to environment	dBA	41	26	31	35	32	25	24	24	28

Hot water coil parameters:

VENTS VUT WH EC

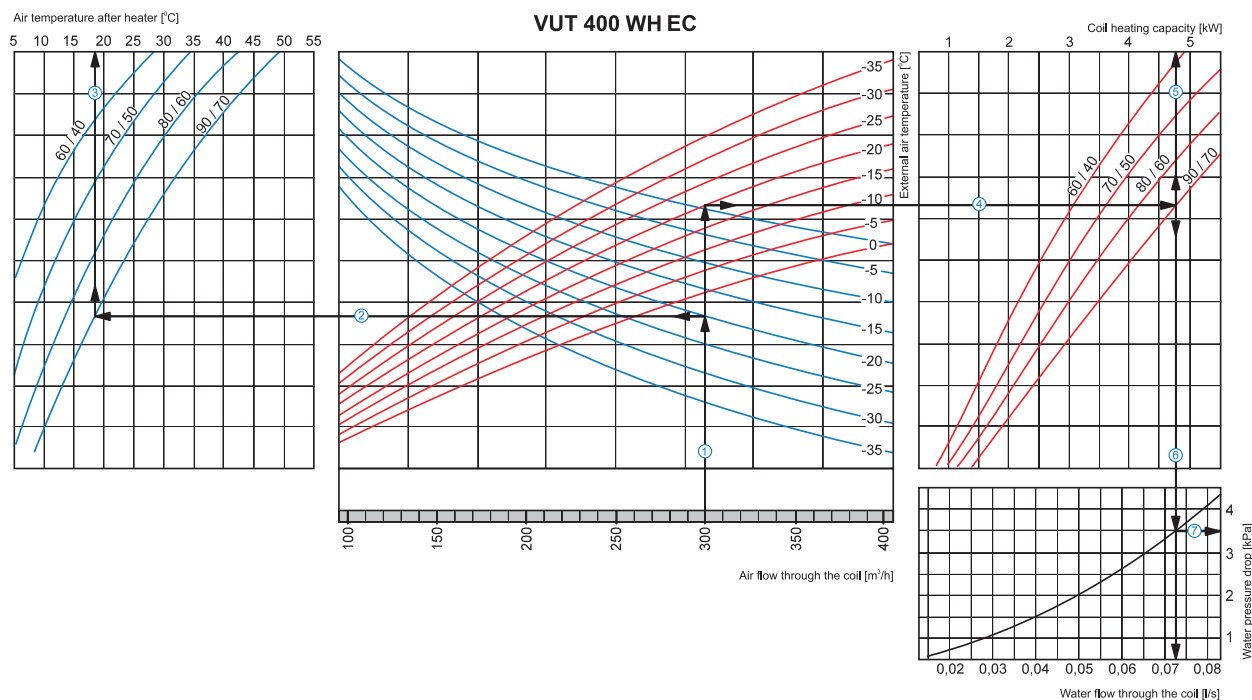


How to use water heater diagrams

System Parameters: Air flow = 300 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- Supply air temperature. Prolong the line of air flow (e.g., 300 m³/h) ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left till crossing water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+18 °C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses water in/out temperature curve (e.g., 90/70 °C), from here draw a vertical line ⑤ up to the scale representing the heating coil capacity (4.75 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.072 l/s).
- Water pressure drop. Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis. (3.5 kPa).

VENTS VUT WH EC



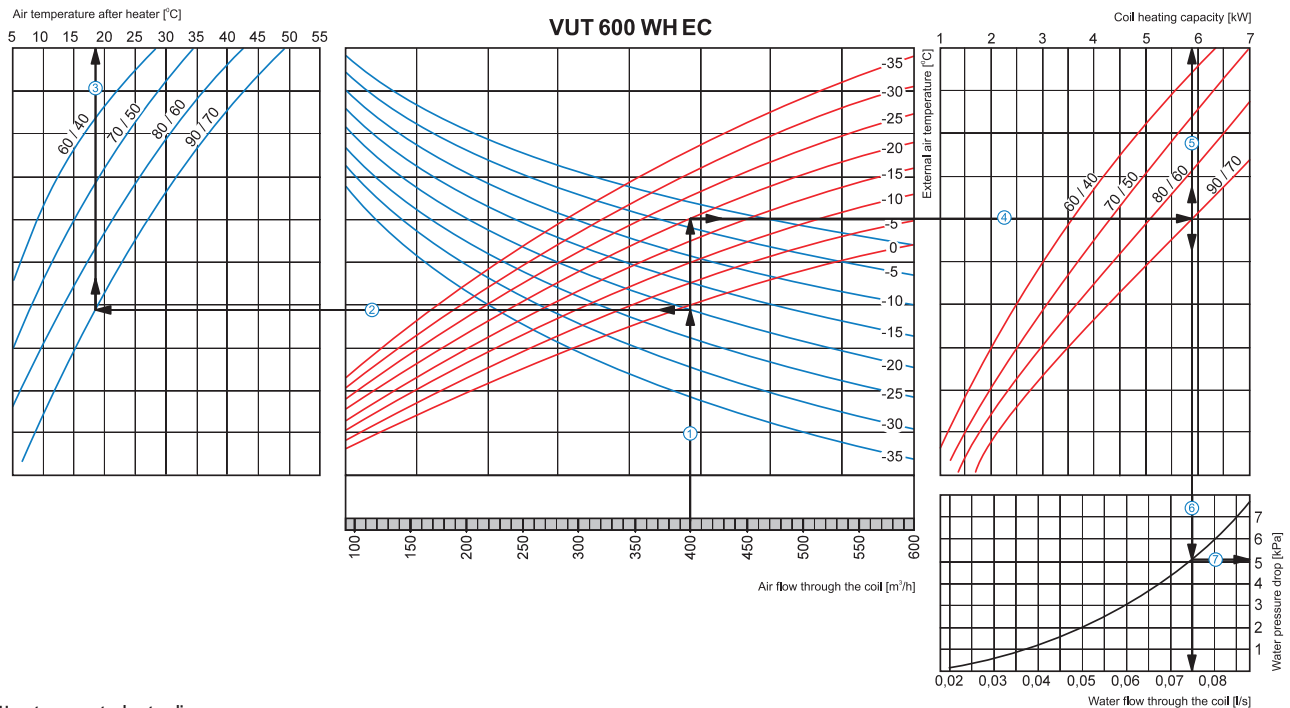
How to use water heater diagrams

System Parameters: Air flow = 300 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C.

- Supply air temperature. Prolong the line of air flow (e.g., 300 m³/h) ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left till crossing water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+18 °C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses water in/out temperature curve (e.g., 90/70 °C), from here draw a vertical line ⑤ up to the scale representing the heating coil capacity (4.75 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.072 l/s).
- Water pressure drop. Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis. (3.5 kPa).

Hot water coil parameters:

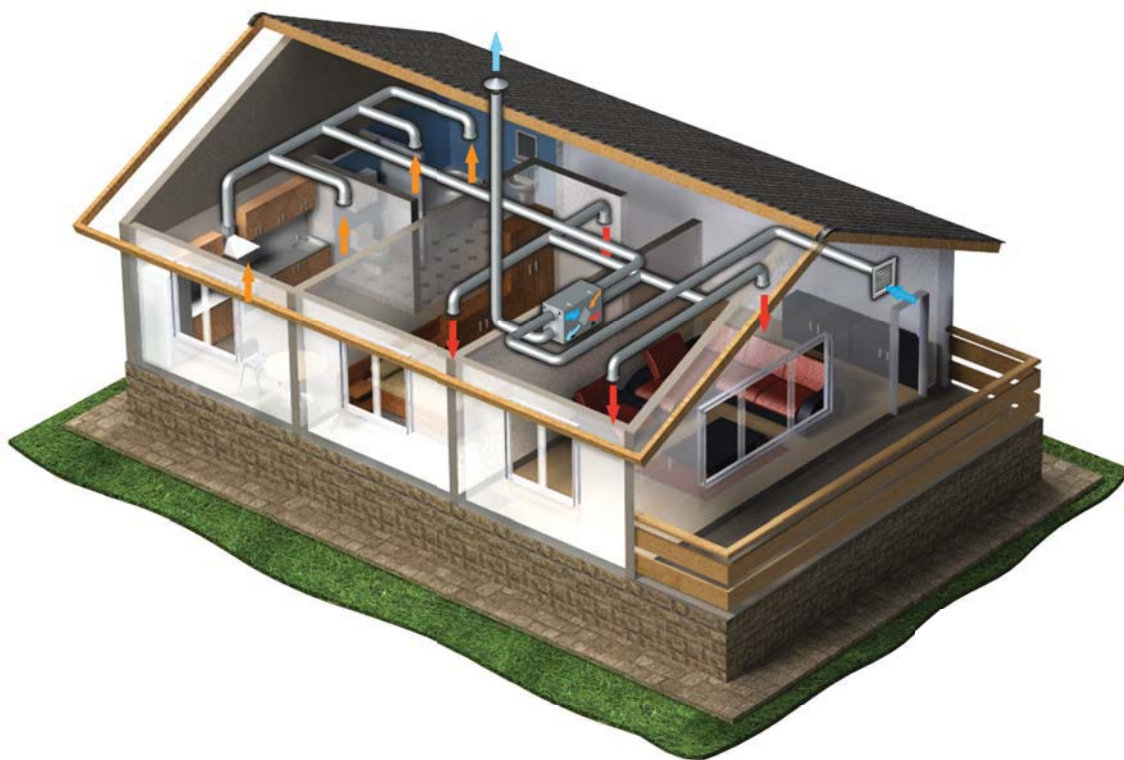
VENTS VUT WH EC



How to use water heater diagrams

System Parameters: Air flow = 400 m³/h. Outside air temperature = -20 °C. Water temperature (in/out) = 90/70 °C

- Supply air temperature. prolong the line of air flow (e.g., 400 m³/h) ① up to the point where it crosses the outside air temperature (blue curve, e.g. -20 °C); then draw a horizontal line ② from this point to the left till crossing water in/out temperature curve (e.g. 90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+18 °C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -20 °C, red curve) and draw a horizontal line ④ from this point to the right until it crosses water in/out temperature curve (e.g., 90/70 °C), from here draw a vertical line ⑤ up to the scale representing the heating coil capacity (5.9 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.075 l/s).
- Water pressure drop. Draw the line ⑦ from the point where the line ⑥ crosses the black curve to the pressure drop axis. (5.1 kPa).



VUT EH EC ventilation and air exchange example in the cottage