Series
VUT PE EC

SAS908 control panel

Ceiling mounted energy saving Air Handling Units (AHU) with the air capacity up to **4000 m³/h** and the heat exchanger efficiency up to 90% in the sound- and heat-insulated casing with the electric heater.

Series
VUT PW EC

SAS908 control panel

Ceiling mounted Energy saving Air Handling Units (AHU) with the air capacity up to **3800 m³/h** and the heat exchanger efficiency up to 90% in the sound- and heat-insulated casing with the water heater.

Description

Air handling unit VUT PE EC with the electric heater and VUT PW EC with the water heating coils are the complete ventilation units designed to provide both both supply and exhaust ventilation with air filtration and extract air removal. The exhaust air energy is used to heat up the supply fresh air through the plate heat exchanger.

Designed for 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 160 (150), 200, 250, 315 и 400 mm round ducts.

Modifications

VUT PE EC – models with the electric heater.
VUT PW EC – models with water heating coils.

Casing

The casing is made of aluzink with 20 mm mineral wool internal heat and sound-insulating layer for VUT PE/PW 350, 600, 1000 units and 50 mm for VUT PE/PW 200, 3000 units.

Filter

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

Motor

VUT PE/PW EC units are equipped with exhaust and supply fans with backward curved blades powered by energy-saving direct current Electronically Commutated (EC) motors. These motors give up to 50% energy consumption economy as compared to standard AC motors. EC motors have built-in thermal overheating protection with automatic restart and enable smooth speed regulation from 0 to 100%. The ball bearings used with the EC motors are designed for at least 40 000 hours operation and are maintenance-free. Premium efficiency reaching 90% is an absolute privilege of the electronically commutated motor.

Heat exchanger

VUT 350, 600 and 1000 models are fitted with the counter-flow heat recovery element made of polystyrene. VUT 2000 and 3000 models are manufactured with the cross-flow air-to-air plate heat exchanger made of aluminum. All the units are equipped with the drain pan for condensate drainage.

Heater

The units are supplied with the water coils (VUT PW) or electric heater (VUT PE). If the external temperature is too low and/or heat energy transfer from the exhaust air is insufficient to heat up the supply air to the required temperature, the heater is turned automatically on. The control system regulates the heating power to keep the indoor temperature as set up by the user.

Automation

The unit is equipped with the built-in automation system with multifunctional control panel and graphic LCD indicator. The standard delivery set includes 10 m

Designation key:

Series	Rated air capacity, m³/h	Model	Heater type	Motor type
VUT	350; 600; 1000; 2000; 3000	**P** – suspended	**E** – electric heater; **W** – water heater	**EC** – electronically commutated synchronous motor

Accessories

Offered options to the units

wire for connection to the control panel. To prevent the heat exchanger freezing the icing electronic protection is applied. It includes the by-pass damper and the heater. The by-pass damper is opened as the temperature sensor requires to let the air flow pass through the heat exchanger through the by-pass duct. During the heat exchanger defrost cycle the supply air is warmed up in the heater up to the required temperature. During the defrosting process the warm exhaust air warms the heat exchanger. After that the by-pass damper closes again, the heater is switched off, supply air warms up again through the heat exchanger and the unit continues operating under rated conditions.

VUT PE (EC) control and protection functions

- safe start-up and shutdown of the unit;
- setting and maintaining the desired temperature of the supply air with the control panel;
- motor speed control and regulation of the unit air capacity accordingly by means of the control panel;
- control of the external intake and exhaust air damper actuators;
- working-out the required patterns while the unit start-up and shutdown;
- programming daily and weekly schedules by user;
- active electric heating elements overheating protection;
- disabling electric heater operation when the motor is not running;
- two thermostats for electric heater over-heating protection;
- automatic switch ensuring the short circuit protection of the automation system;
- controlling filter clogging.

General description of VUT PW (EC) control system

The unit is equipped with the built-in automatic control and monitoring system.

The control unit performs the following functions:

- safe start-up and shutdown of the unit;
- supply air temperature control by means of actuating three-way valve regulating the feed of the heat medium into the water coils;
- water (glycol) heating coils freezing protection as the leaving air temperature and leaving heat medium temperature sensors require;
- control of the heat exchanger by-pass actuator;
- control of the of external circulation pump installed on the heat medium entering into the water coils;
- heat exchanger freezing protection;
- control of the supply and exhaust fans;
- air clogging control according to engine hours;
- control of the external intake and exhaust air damper actuators.

Air handling unit is equipped with the remote control panel that provides:

- starting-up/shutdown of the ventilation unit;
- setting the required air flow;
- setting the required supply air temperature;
- displaying the temperature in the room;
- failure (emergency) alarm indication.

Mounting

Air handling unit is suspended to the ceiling. The unit can be mounted either in service spaces or in main premises above the suspended ceiling, in the pocket or the unit can be placed directly in the room. Mounting in any position shall provide the correct condensate drainage. Access for the unit maintenance and filter cleaning shall be provided through the side panels.

Unit overall dimensions:

Type	Dimensions, [mm]											Figure №
	⌀D	B	B1	B2	B3	B4	H	H1	L	L1	L2	
VUT 350 PE EC	160	485	415	596	132,5	220	285	130	1238	1286	948	1
VUT 600 PE EC	199	827	711	-	294	345	283	120	1238	1286	-	2
VUT 1000 PE EC	249	1350	1215	607,5	430	655	317	143	1346	1395	-	2
VUT 2000 PE EC	314	1050	915	457,5	247	575	750	375	1360	1408	-	2
VUT 3000 PE EC	399	1265	1130	565	297	632,5	830	415	1595	1643	-	2
VUT 600 PW EC	199	827	711	-	294	345	283	120	1238	1286	-	2
VUT 1000 PW EC	249	1350	1215	607,5	430	655	317	143	1346	1395	-	2
VUT 2000 PW EC	314	1050	915	457,5	247	575	750	375	1360	1408	-	2
VUT 3000 PW EC	399	1265	1130	565	297	632,5	830	415	1595	1643	-	2

VENTS VUT 350 PE EC

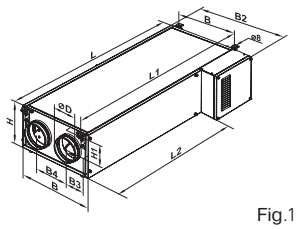


Fig.1

VENTS VUT PE EC
VENTS VUT PW EC

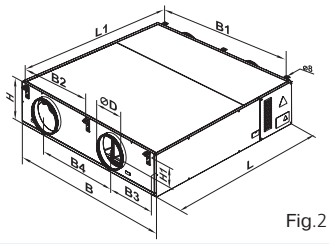


Fig.2

AIR HANDLING UNITS WITH HEAT RECOVERY

Technical data:

	VUT 350 PE EC	VUT 600 PE EC	VUT 600 PW EC
Unit supply voltage [V / 50 Hz]	1~ 230	1~ 230	
Maximum fan power [W]	2pcs. x 51	2pcs. x 100	
Fan current [A] (Supply voltage of the fan with EC motor)	2pcs. x 1,2 (48V)	2pcs. x 2,4 (48V)	
Electric heater capacity [kW]	1,5	2,0	-
Electric heater current [A]	6,5	8,7	-
Number of water (glycol) coil rows	-	-	2
Total power of the unit [kW]	1,502	2,20	0,20
Total current of the unit [A]	7,05	9,76	1,06
Air capacity [m^3/h]	400	700	600
RPM	2950	3150	
Noise level at 3m [dB[A]]	48	53	
Operating temperature [°C]	-25 up to +40	-25 up to +60	
Casing material	aluzink	aluzink	
Insulation	20 mm mineral wool	20 mm mineral wool	
Filter: exhaust	G4	G4	
intake	G4	G4	
Duct connection diameter, [mm]	⌀160 (150)*	⌀200	
Weight, [kg]	65	75	77
Recuperation efficiency	up to 90%	up to 90%	
Heat exchanger type	counter-flow	counter-flow	
Heat exchanger material	polystyrene	polystyrene	

* in case of reducer ⌀160/150 mm.

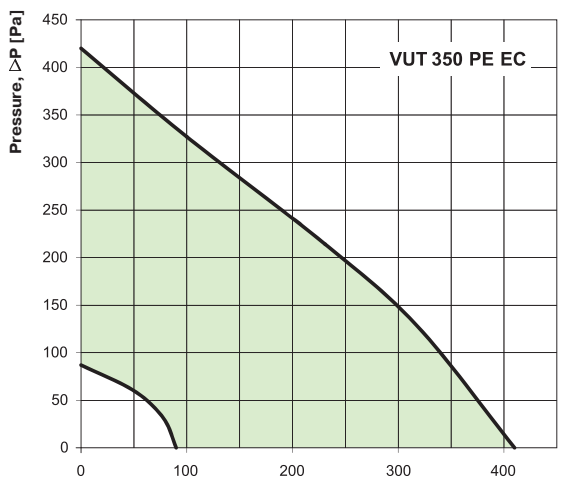
Technical data:

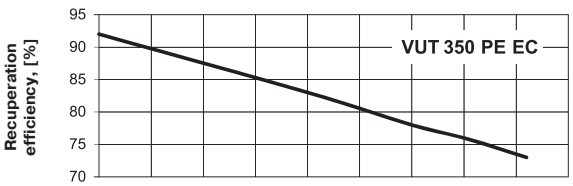
	VUT 1000 PE EC	VUT 1000 PW EC	VUT 2000 PE EC	VUT 2000 PW EC
Unit supply voltage [V / 50 Hz]	1~ 230		3~ 400	1~ 230
Maximum fan power [W]	2pcs. x 135		2pcs. x 420	
Fan current [A] (Supply voltage of the fan with EC motor)	2pcs. x 2,8 (48V)		2pcs. x 2,5 (230V)	
Electric heater capacity [kW]	3,3	-	12,0	-
Electric heater current [A]	14,3	-	17,4	-
Number of water (glycol) coil rows	-	4	-	2
Total power of the unit [kW]	3,57	0,27	12,84	0,84
Total current of the unit [A]	15,53	1,23	22,4	5
Air capacity [m^3/h]	1100	1000	2000	1950
RPM	2645		2920	
Noise level at 3m [dB[A]]	52		58	
Operating temperature [°C]	-25 up to +60		-25 up to +40	
Casing material	aluzink		aluzink	
Insulation	20 mm mineral wool		50 mm mineral wool	
Filter: exhaust	G4		G4	
intake	G4		G4	
Duct connection diameter, [mm]	⌀250		⌀315	
Weight, [kg]	95	98	190	194
Recuperation efficiency	up to 90%		up to 75%	
Heat exchanger type	counter-flow		cross-flow	
Heat exchanger material	polystyrene		aluminum	

Technical data:

	VUT 3000 PE EC	VUT 3000 PW EC
Unit supply voltage [V / 50 Hz]	3~ 400	
Maximum fan power [W]	2pcs. x 990	
Fan current [A] (Supply voltage of the fan with EC motor)	2pcs. x 1,7 (400V)	
Electric heater capacity [kW]	21,0	-
Electric heater current [A]	30,0	-
Number of water (glycol) coil rows	-	2
Total power of the unit [kW]	23,0	1,99
Total current of the unit [A]	33,4	3,4
Air capacity [m³/h]	4000	3800
RPM	2580	
Noise level at 3m [dB[A]]	59	
Operating temperature [°C]	-25 up to +50	
Casing material	aluzink	
Insulation	50 mm mineral wool	
Filter: exhaust	G4	
intake	G4	
Duct connection diameter, [mm]	⌀400	
Weight, [kg]	290	295
Recuperation efficiency	up to 75%	
Heat exchanger type	cross-flow	
Heat exchanger material	aluminum	

VENTS VUT PE EC



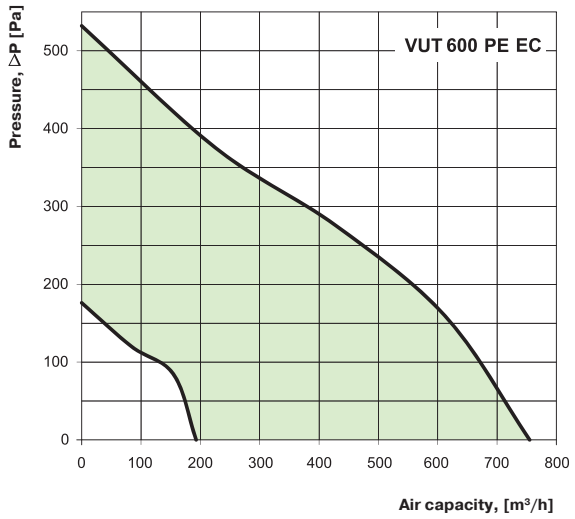


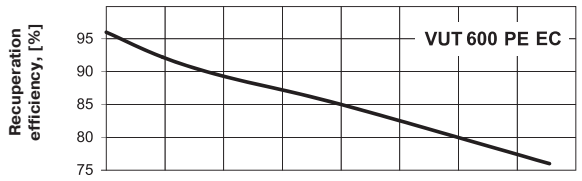
Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dB(A)	52	32	47	49	37	40	36	32	20
L_{WA} to outlet	dB(A)	62	39	56	58	55	48	44	36	25
L_{WA} to environment	dB(A)	33	20	21	31	29	21	17	20	22

Accessories to air handling units:

Type	Replaceable filter	
	Intake (pocket type)	Exhaust (panel type)
VUT 350 PE EC	SFK 350 PE G4	SF 350 PE G4
VUT 600 PE EC	SFK 600 PE/PW G4	SF 600 PE/PW G4
VUT 1000 PE EC	SFK 1000 PE/PW G4	SF 1000 PE/PW G4
VUT 2000 PE EC	SF 2000 PE/PW G4	
VUT 3000 PE EC	SF 3000 PE/PW G4	
VUT 600 PW EC	SFK 600 PE/PW G4	SF 600 PE/PW G4
VUT 1000 PW EC	SFK 1000 PE/PW G4	SF 1000 PE/PW G4
VUT 2000 PW EC	SF 2000 PE/PW G4	
VUT 3000 PW EC	SF 3000 PE/PW G4	

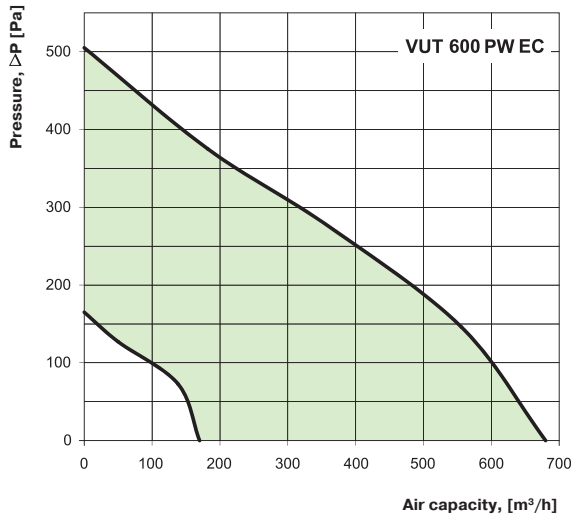
VUT PE EC

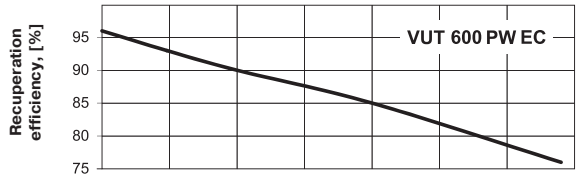




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dB(A)	55	35	56	53	43	47	45	37	28
L_{WA} to outlet	dB(A)	65	47	60	61	61	52	51	40	30
L_{WA} to environment	dB(A)	39	30	30	39	33	23	24	26	28

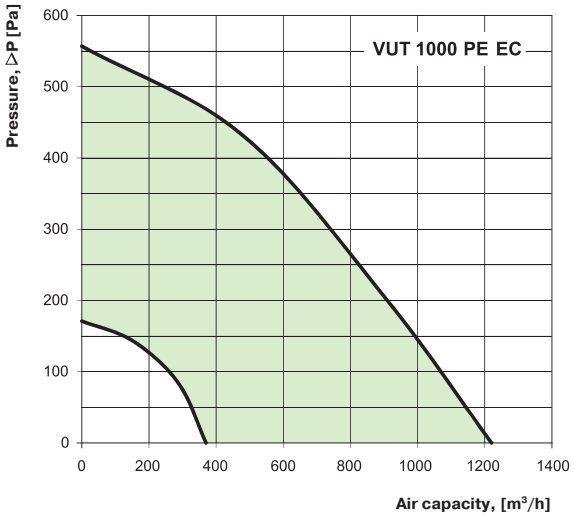
VUT PW EC

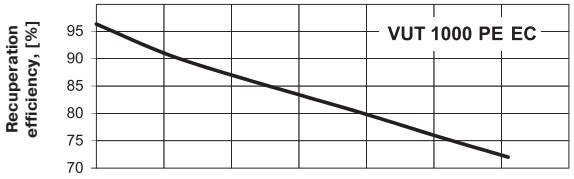




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dB(A)	59	34	56	54	43	46	44	36	24
L_{WA} to outlet	dB(A)	68	43	59	62	59	52	52	40	29
L_{WA} to environment	dB(A)	38	29	27	39	33	23	23	24	24

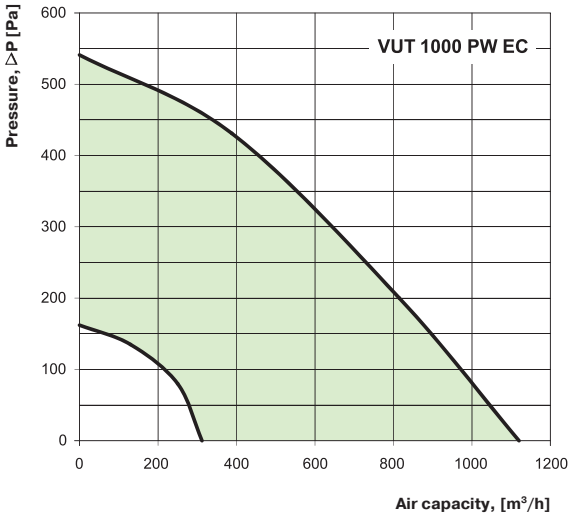
VUT PE EC

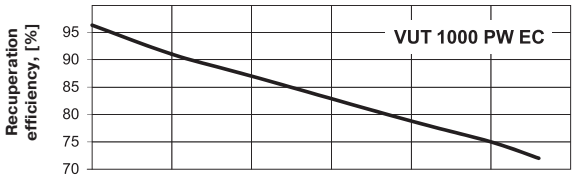




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dB(A)	68	67	68	70	68	60	60	61	55
L_{WA} to outlet	dB(A)	70	71	69	68	66	65	63	61	58
L_{WA} to environment	dB(A)	45	57	56	47	52	42	38	34	35

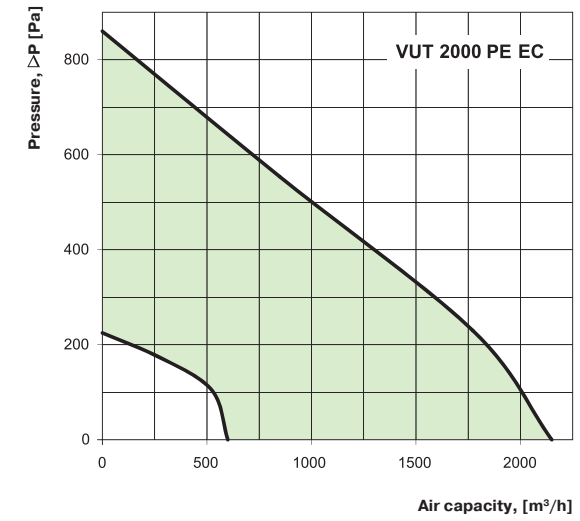
VUT PW EC

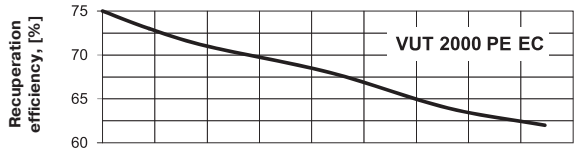




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dB(A)	67	68	67	67	66	59	61	61	56
L_{WA} to outlet	dB(A)	69	70	71	68	66	66	64	59	58
L_{WA} to environment	dB(A)	47	58	52	47	53	40	41	35	35

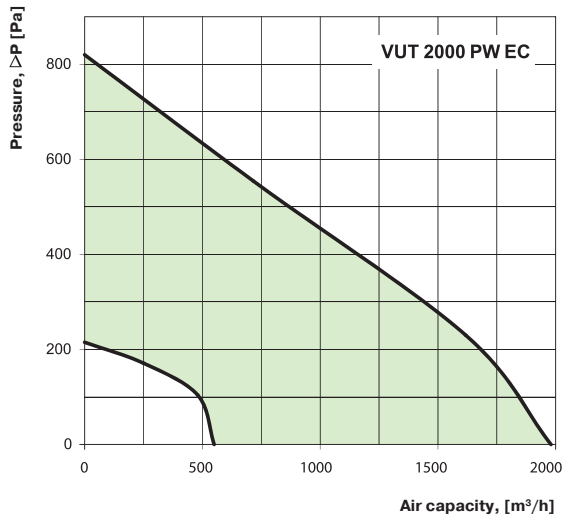
VUT PE EC

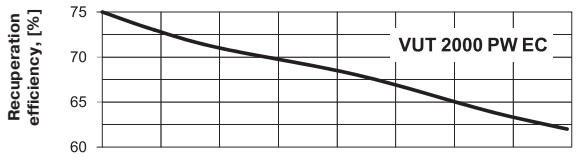




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dB(A)	77	83	83	78	72	73	66	67	58
L_{wA} to outlet	dB(A)	83	86	84	80	72	75	70	72	69
L_{wA} to environment	dB(A)	56	65	66	59	53	46	42	39	39

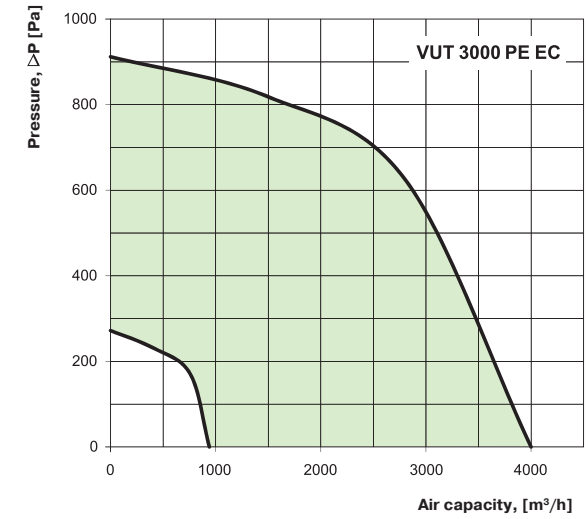
VUT PW EC

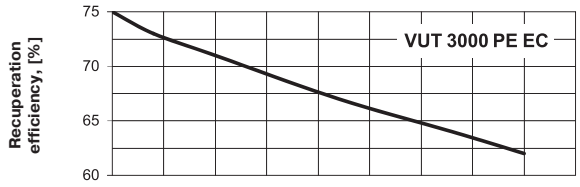




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dB(A)	79	80	80	79	71	72	69	64	58
L_{wA} to outlet	dB(A)	81	84	83	79	71	77	71	73	69
L_{wA} to environment	dB(A)	56	66	66	59	55	48	44	38	38

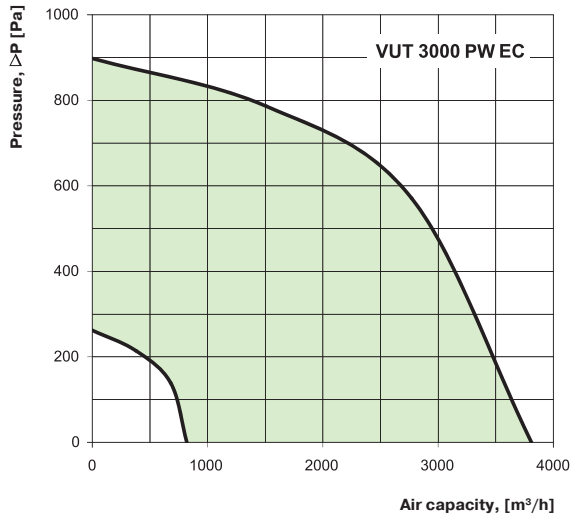
VUT PE EC

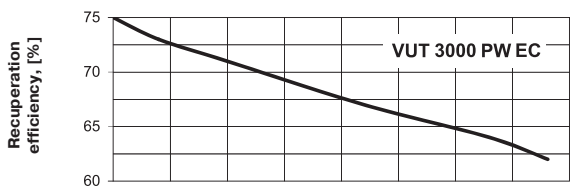




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dB(A)	80	85	83	82	75	75	72	70	64
L_{wA} to outlet	dB(A)	86	87	86	83	77	80	75	75	74
L_{wA} to environment	dB(A)	61	70	69	63	58	51	48	42	41

VUT PW EC

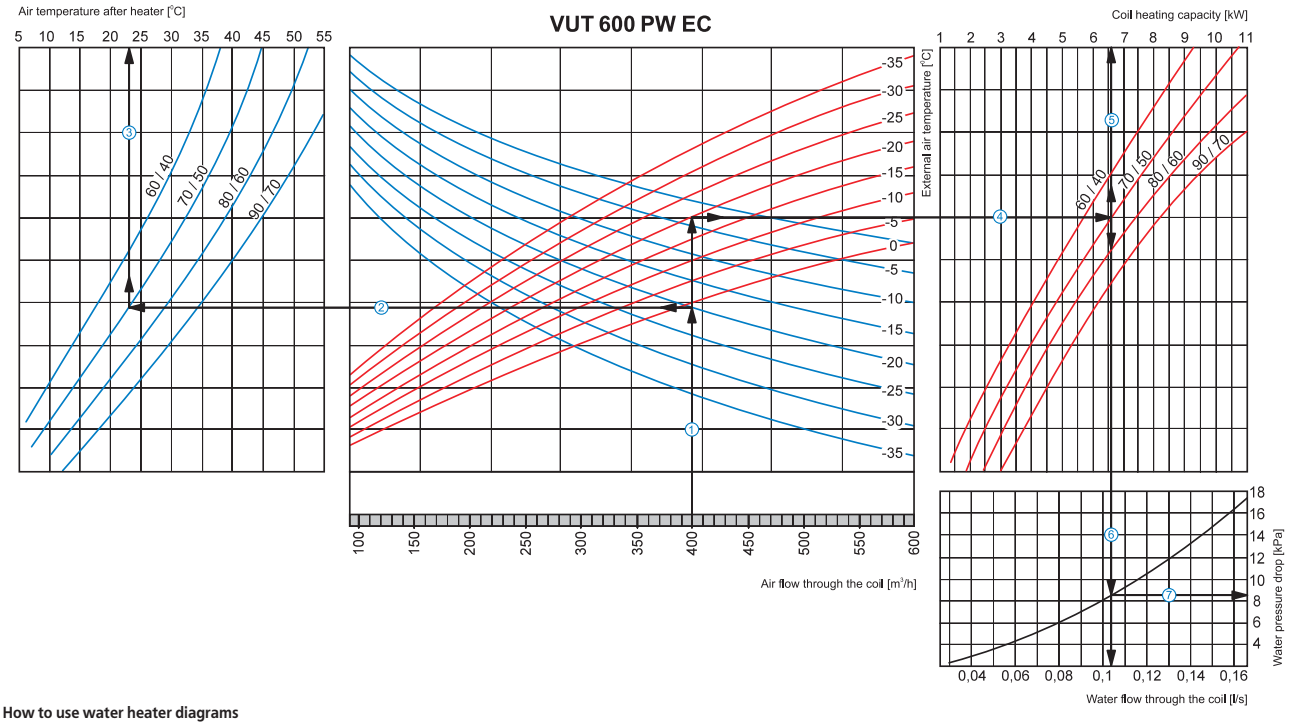




Sound-power level		Octave-frequency band [Hz]								
	Hz	Tot.	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dB(A)	82	87	83	84	75	72	72	69	63
L_{wA} to outlet	dB(A)	84	86	85	82	74	80	77	76	73
L_{wA} to environment	dB(A)	60	69	68	62	56	51	47	41	41

Hot water coil parameters:

VUT PW EC

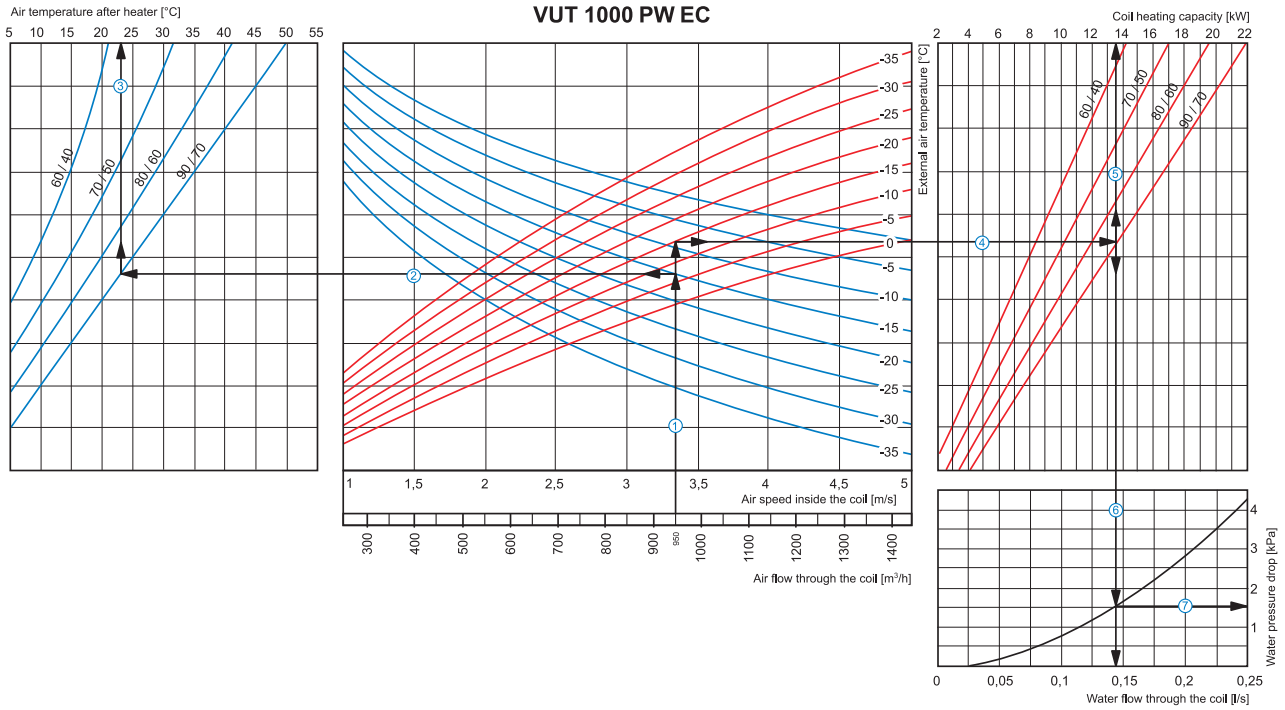


How to use water heater diagrams

System Parameters: Air flow = 400 m³/h. Outside air temperature =-20°C. Water temperature (in/out) = 70/50 °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. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+23°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., 70/50 °C), from here draw a vertical line ⑤ up to the scale representing the heating coil capacity (6.6 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.105 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. (8.5 kPa).

VUT PW EC



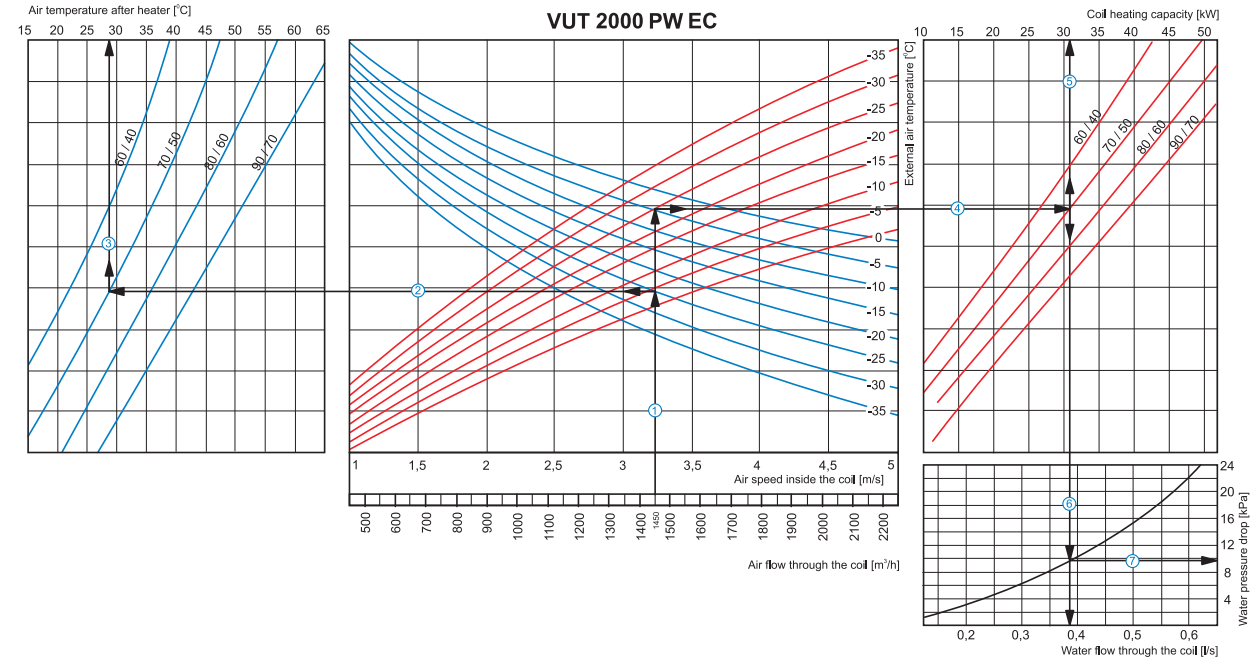
How to use water heater diagrams

Air Speed. Starting from 950 m³/h on the air flow scale draw a vertical line ① till the air speed axis which makes about 3.35 m/s.

- Supply air temperature. Prolong the line ① up to the point where it crosses the outside air temperature (blue curve), e.g. -15°C; then draw a horizontal line ② from this point to the left till crossing water in/out temperature curve (90/70 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+23°C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature indicated as red curve (e.g., -15°C) and draw a horizontal line ④ from this point to the right to the intersection of water in/out temperature curve (e.g., 90/70 °C). From this point draw a vertical line ⑤ up to the scale of heating coil capacity (13.5 kW).
- Water flow. Prolong the line ⑥ down to water flow axis at the bottom of the graphic (0.14 l/s).
- Water pressure drop. Draw the line ⑦ from the point where line ⑥ crosses the black curve to the pressure drop axis. (1.5 kPa).

Hot water coil parameters:

VUT PW EC



How to use water heater diagrams

System Parameters: Air flow = 1450 m³/h. Outside air temperature =-25°C. Water temperature (in/out) = 70/50 °C.

- Air Speed. Starting from 1450 m³/h on the air flow scale draw a vertical line ① till the air speed axis which makes about 3.2 m/s.
- Supply air temperature. prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -25°C); then draw a horizontal line ② from this point to the left till crossing water in/out temperature curve (e.g. 70/50 °C). From this point draw a vertical line ③ to the supply air temperature axis on top of the graphic (+28°C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -25°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., 70/50 °C), from here draw a vertical line ⑤ up to the scale representing the heating coil capacity (31.0 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.38 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. (9.8 kPa).

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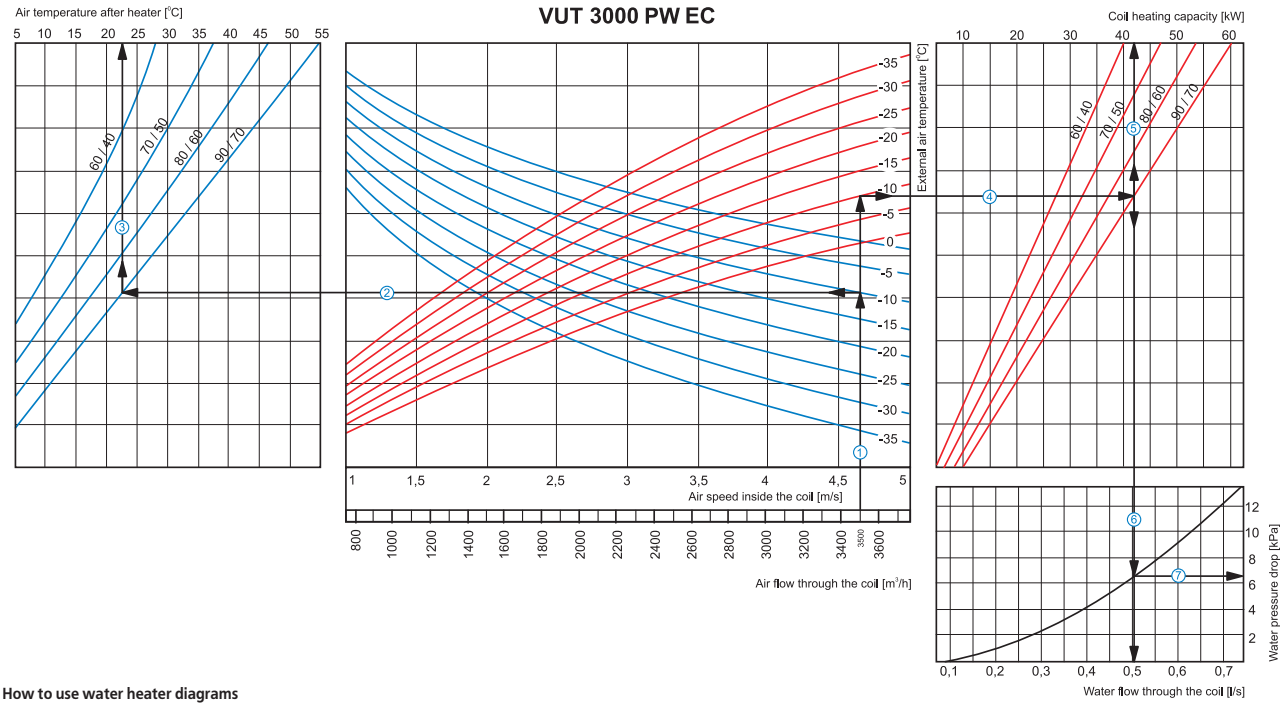

How to use water heater diagrams

System Parameters: Air flow = 3500 m³/h. Outside air temperature =-10°C. Water temperature (in/out) = 90/70 °C.

Air Speed. Starting from 3500 m³/h on the air flow scale draw a vertical line ① till the air speed axis which makes about 4.65 m/s.

- Supply air temperature. prolong the line ① up to the point where it crosses the outside air temperature (blue curve, e.g. -10°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 (+22,5°C).
- Heating coil capacity. Prolong the line ① up to the point where it crosses the outside air temperature (e.g. -10°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 (42.0 kW).
- Water flow. Prolong the line ⑤ down to water flow axis at the bottom of the graphic ⑥ (0.5 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. (6.5 kPa).