Series
VENTS VUT PE EC

VUT 350 PE EC
VUT 600 PE EC
VUT 1000 PE EC

VUT 2000 PE EC
VUT 3000 PE EC

Ceiling mounted air handling units in compact heat- and sound-insulated casing with electic heater. Air flow up to **4000** m³/h, heat recovery efficiency up to 90 %.

Series
VENTS VUT PW EC

VUT 600 PW EC
VUT 1000 PW EC

VUT 2000 PW EC
VUT 3000 PW EC

Ceiling mounted air handling units in compact heat- and sound-insulated casing with water heater. Air capacity up to **3800** m³/h, heat recovery efficiency up to 90 %.

Description
The VUT PE EC air handling unit with electric heater and the VUT PW EC air handling unit with water heater are the fully-featured ventilation units ensure air filtration, fresh air supply and stale air extract. The heat energy contained in extract air is transferred to supply air through the plate heat exchanger.
The units are suitable for integration into various ventilation and air conditioning networks requiring cost-effective solutions and controllable ventilation. The integrated EC motors reduce energy demand by half up to three-fold and provide high air flow and low noise level. All the models are compatible with round 160 (150), 200, 250, 315 and 400 mm air ducts.

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

Casing
The aluzinc casing is internally filled with 20 mm mineral wool for VUT 350, 600, 1000 PE/PW EC and 25 mm for VUT 2000, 3000 PE/PW EC units.

Filter
Supply and extract air flows are purified through two panel filters with filtering class G4. Supply filter F7 can be supplied with the few models.

Motor
High-efficient electronically-commutated motors with external motor and impellers with backward curved blades. Such motors are the most state-of-the-art energy-saving solution. EC motors are featured with high performance and total speed controllable range. High efficiency reaching 90 % is the premium advantage of the electronically-commutated motors.

Heat exchanger
VUT 350, 600, 1000 PE/PW EC models are fitted with a counter-flow heat exchanger made of aluminum. VUT 2000, 3000 PE/PW EC models are fitted with a cross-flow plate heat exchanger made of aluminum. All the units are equipped with a drain pan for condensate drainage.

Heater
The electric heater (for the unit VUT PE) or the water heater (for the unit VUT PW) 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 includes an integrated automation and a multifunctional control panel with a remote LCD control panel.
The VUT PE EC unit incorporates a LCD control panel with a colour sensor display PU SENS 01.

The delivery set includes a 10 m connecting cable for connection of the unit to the control panel. The freezing protection function is performed by means of the bypass and the heater.
In case of a freezing danger according to the temperature sensor readings the bypass damper is opened to let supply air flow through the bypass duct and not come in contact with the heat exchanger. The heater warms up supply air up to the required temperature and meanwhile the heat exchanger is heated by the warm extract air. After the heat exchanger defrosting the bypass damper closes the bypass duct and the air handling unit reverts to the standard operation mode.

Designation key

Series	Rated air flow [m³/h]	Mounting modification	Heater type	Motor type	Service side	Control
VENTS VUT	350; 600; 1000; 2000; 3000	**P**: suspended	**E**: electric **W**: water	**EC**: synchronous electronically commutated motor	**L**: left **R**: right	_: PU SENS 01 control panel

Accessories

VUT PE EC control and protection functions

Control panel:

- Turning air handling unit on/off, room temperature indication, low-medium-high speed selection.
- Opening/closing bypass for summer ventilation; timer mode activation, setting week scheduled operation (applicable only for PU SENS 01).
- Supply and exhaust fan speed stage adjustment from 0 up to 100 % during the system set-up.
- Set indoor air maintaining by feedback of the sensor on the control panel.
- Overheating protection for the electric heating elements according to feedback of the duct temperature sensor as well as signal from the two thermal switches, one of self-resetting type actuated at +60°C and the other one of manual reset type actuated at +90°C.
- Cooling of the electric heating elements at the end of the heating cycle.
- Actuating external air dampers.
- Maintaining set indoor or room air temperature.
- Control according to the duct humidity sensor feedback HV1 (special accessory) or according to the humidity sensor in the control panel.
- Filter clogging control by filter timer.
- Ventilation system shutdown at signal from the fire alarm system.
- Cooler connection possibility.

VUT PW EC control and protection functions

Control panel:

- Turning air handling unit on/off, room temperature indication, low-medium-high speed selection.
- Setting week-scheduled operation.
- Supply and exhaust fan speed stage adjustment from 0 up to 100 % during the system set-up.
- Maintaining set supply air temperature by means of controlling the circulating pump and heat medium regulating valve of the water mixing unit.
- Heater freezing protection according to the feedback of the temperature sensor at outlet of the heater and of the return heat medium temperature sensor.
- Safe fan start/shutdown.
- Return heat medium temperature maintenance during the fan standby.
- Actuating external air dampers.
- Maintaining set indoor or room air temperature.
- Control according to the duct humidity sensor feedback HV1 (special accessory) or according to the humidity sensor in the control panel.
- Filter clogging control by filter timer.
- Ventilation system shutdown on signal from the fire alarm system.
- Cooler connection possibility.

Mounting

The unit is designed for indoor mounting. While mounting the unit ensure its correct position to enable condensate collection and drainage. Access for servicing and cleaning of the filter is from the right or left side panel for the dimension types 350, 600 and 1000 and from the bottom for the dimension types 2000 and 3000.

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 absorbing of vibration in the air duct it is recommended to install the flexible anti-vibration connectors (refer VVG) on both sides of the unit.

To disable uncontrollable air backdrafting during the fan standby and to prevent the water heater freezing the units must be equipped with automatic air dampers.

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

Accessories for air handling units

Model	G4 pocket filter	F7 pocket filter	G4 panel filter	Outdoor humidity sensor	Silencer		Backdraft damper	Air damper	Clamps	Electric actuators		Mixing unit
												
VUT 350 PE EC	SFK 208x236x27 G4	SFK 208x236x27 F7	SF 440x128x20 G4		SR 160 600/900/1200	SRF 160 600/900/1200	KOM 160	KRV 160	C 160	LF230	TF230	
VUT 600 PE EC	SFK 392x236x27 G4	SFK 392x236x27 F7	SF 782x128x20 G4		SR 200 600/900/1200	SRF 200 600/900/1200	KOM 200	KRV 200	C 200	LF230	TF230	
VUT 1000 PE EC	SFK 647x274x27 G4	SFK 647x274x27 F7	SF 647x274x20 G4		SR 250 600/900/1200	SRF 250 600/900/1200	KOM 250	KRV 250	C 250	LF230	TF230	-
VUT 2000 PE EC	-	-	SF 708x480x48 G4		SR 315 600/900/1200	SRF 315 600/900/1200	KOM 315	KRV 315	C 315	LF230	TF230	
VUT 3000 PE EC	-	-	SF 827x741x48 G4	HV1	SR 400 600/900/1200	SRF 400 600/900/1200	KOM 400	KRV 400	C 400	LF230	TF230	
VUT 600 PW EC	SFK 392x236x27 G4	SFK 392x236x27 F7	SF 782x128x20 G4		SR 200 600/900/1200	SRF 200 600/900/1200	KOM 200	KRV 200	C 200	LF230	TF230	USWK
VUT 1000 PW EC	SFK 647x274x27 G4	SFK 647x274x27 F7	SF 647x274x20 G4		SR 250 600/900/1200	SRF 250 600/900/1200	KOM 250	KRV 250	C 250	LF230	TF230	USWK
VUT 2000 PW EC	-	-	SF 708x480x48 G4		SR 315 600/900/1200	SRF 315 600/900/1200	KOM 315	KRV 315	C 315	LF230	TF230	USWK
VUT 3000 PW EC	-	-	SF 827x741x48 G4		SR 400 600/900/1200	SRF 400 600/900/1200	KOM 400	KRV 400	C 400	LF230	TF230	USWK

Unit overall dimensions

Type	Dimensions [mm]											Figure №
	ØD	B	B1	B2	B3	B4	H	H1	L	L1	L2	
VUT 350 PE EC	160	485	415	554	135.5	214	281	152	1238	1291	924	1
VUT 600 PE EC	200	827	712	–	294	345	280	120	1238	1291	–	2
VUT 1000 PE EC	250	1351	1216	608	431	655	318	143	1349	1402	–	2
VUT 2000 PE EC	314	950	–	405	225	500	761	367	1400	1453	–	3
VUT 3000 PE EC	399	1265	–	563	347	570	881	427	1835	1888	–	3
VUT 600 PW EC	200	827	712	–	294	345	280	120	1238	1291	–	2
VUT 1000 PW EC	250	1351	1216	608	431	655	318	143	1349	1402	–	2
VUT 2000 PW EC	314	950	–	405	225	500	761	367	1400	1453	–	3
VUT 3000 PW EC	399	1265	–	563	347	570	881	427	1835	1888	–	3

VENTS VUT 350 PE EC

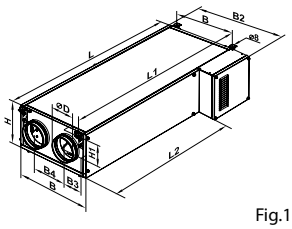


Fig.1

VENTS VUT PE EC
VENTS VUT PW EC

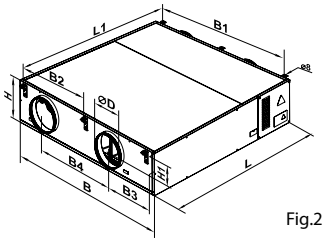


Fig.2

VENTS VUT 2000 PW/PE EC
VENTS VUT 3000 PW/PE EC

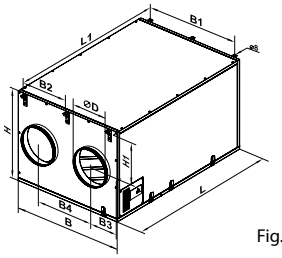


Fig.3

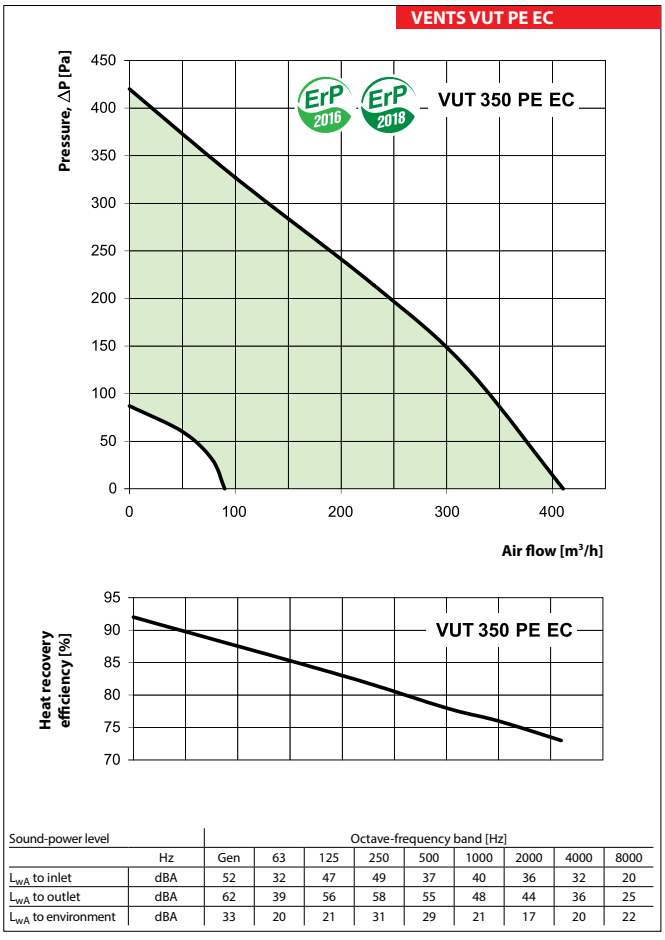
Technical data

	VUT 350 PE EC	VUT 600 PE EC	VUT 600 PW EC	VUT 1000 PE EC	VUT 1000 PW EC
Voltage [V/Hz]	1~230/50-60	1~230/50-60		1~230/50-60	
Maximum fan power [W]	200	270		400	
Fan current [A]	1.62	1.6		2.26	
Electric heater power [kW]	1.5	2.0	–	3.3	–
Electric heater current [A]	6.5	8.7	–	14.3	–
Number of water (glycol) coil rows	–	–	2	–	4
Total unit power [kW]	1.7	2.27	0.27	3.7	0.4
Total unit current [A]	8.12	10.3	1.6	16.56	2.26
Air flow [m³/h]	350	700	600	1100	1000
RPM	3560	3060		2780	
Noise level at 3m [dBA]	48	53		52	
Transported air temperature [°C]	-25 up to +40	-25 up to +40		-25 up to +40	
Casing material	aluzinc	aluzinc		aluzinc	
Insulation	20 mm mineral wool	20 mm mineral wool		20 mm mineral wool	
Extract filter	G4	G4		G4	
Supply filter	G4 (F7*)	G4 (F7*)	G4	G4 (F7 *)	
Connected air duct diameter [mm]	⌀160 (150**)	⌀200		⌀250	
Weight [kg]	67	75	77	95	98
Heat recovery efficiency	up to 90 %	up to 90 %		up to 90 %	
Heat exchanger type	counter-flow	counter-flow		cross-flow	
Heat exchanger material	aluminum	aluminum		aluminum	
SEC Class	A			-	-

*modification; **reducer ⌀160 to 150 mm is required

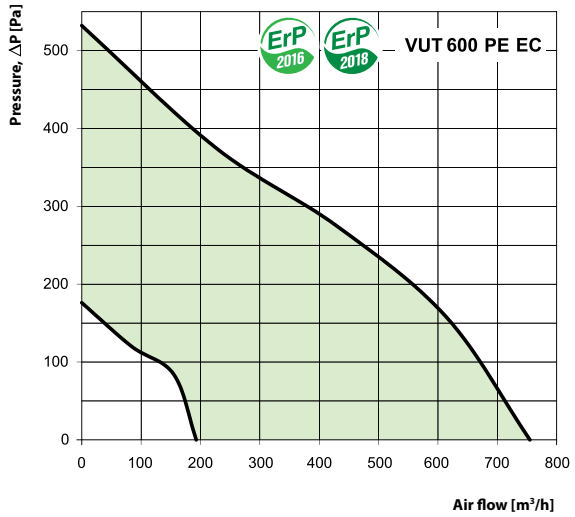
Technical data

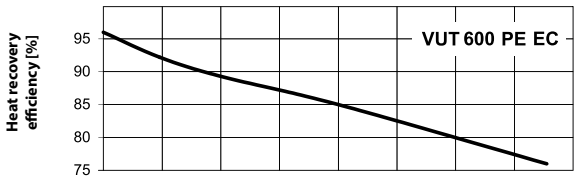
	VUT 2000 PE EC	VUT 2000 PW EC	VUT 3000 PE EC	VUT 3000 PW EC
Voltage [V/Hz]	3~400/50-60	1~230/50-60	3~400/50-60	
Maximum fan power [W]	2 pcs. x 420		2 pcs. x 990	
Fan current [A]	2 pcs. x 2.5		2 pcs. x 1.7	
Electric heater power [kW]	12.0	–	21.0	–
Electric heater current [A]	17.4	–	30.0	–
Number of water (glycol) coil rows	–	2	–	2
Total unit power [kW]	12.84	0.84	23.0	1.99
Total unit current [A]	22.4	5	33.4	3.4
Air flow [m³/h]	2000	1950	4000	3800
RPM	2920		2580	
Noise level at 3m [dBA]	58		59	
Transported air temperature [°C]	-25 up to +40		-25 up to +40	
Casing material	aluzinc		aluzinc	
Insulation	25 mm mineral wool		25 mm mineral wool	
Extract filter	G4		G4	
Supply filter	G4		G4	
Connected air duct diameter [mm]	⌀315		⌀400	
Weight [kg]	190	194	290	295
Heat recovery efficiency	up to 75 %		up to 75 %	
Heat exchanger type	cross-flow		cross-flow	
Heat exchanger material	aluminum		aluminum	



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

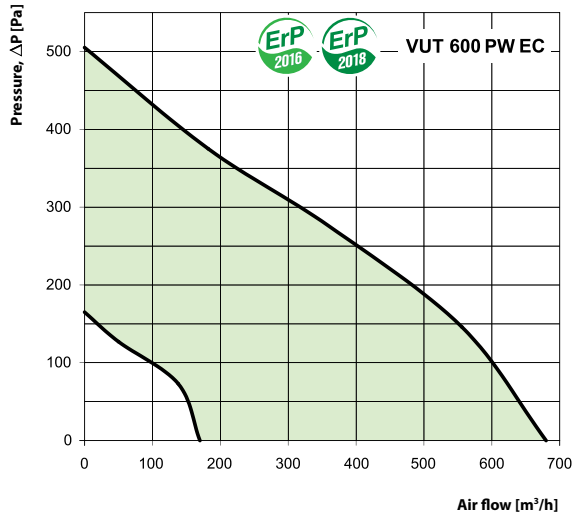
VENTS VUT PE EC

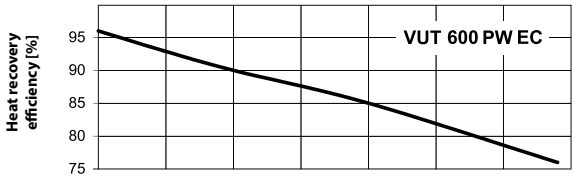




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	55	35	56	53	43	47	45	37	28
L_{WA} to outlet	dBA	65	47	60	61	61	52	51	40	30
L_{WA} to environment	dBA	39	30	30	39	33	23	24	26	28

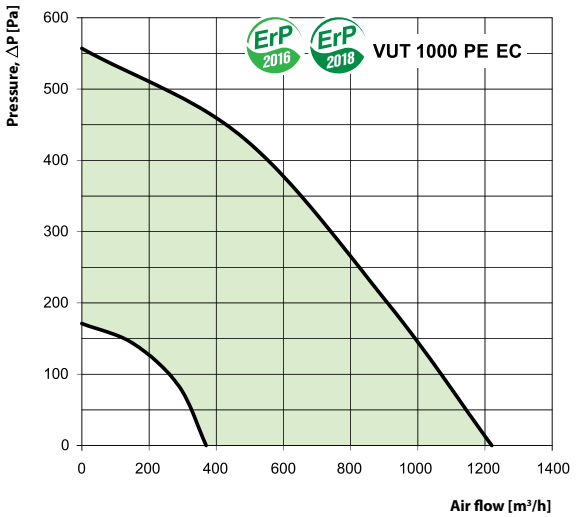
VENTS VUT PW EC

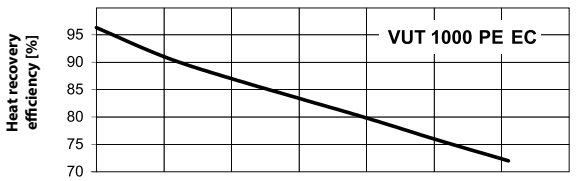




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	59	34	56	54	43	46	44	36	24
L_{WA} to outlet	dBA	68	43	59	62	59	52	52	40	29
L_{WA} to environment	dBA	38	29	27	39	33	23	23	24	24

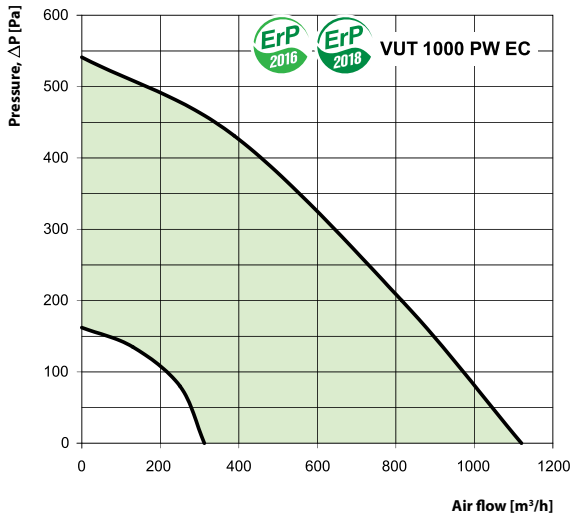
VENTS VUT PE EC

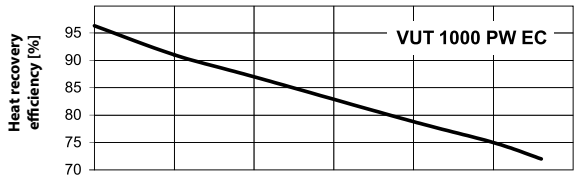




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	68	67	68	70	68	60	60	61	55
L_{WA} to outlet	dBA	70	71	69	68	66	65	63	61	58
L_{WA} to environment	dBA	45	57	56	47	52	42	38	34	35

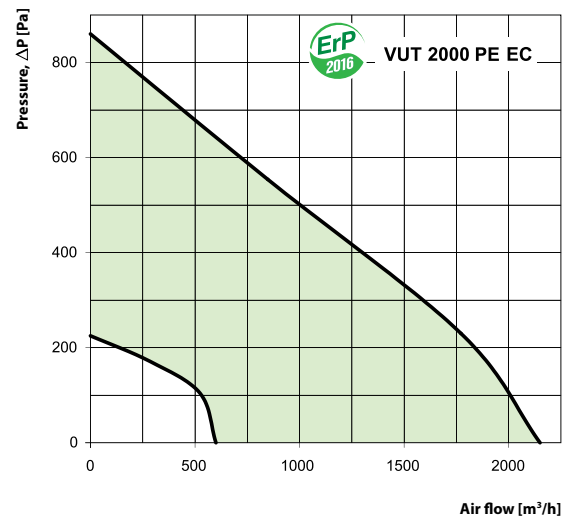
VENTS VUT PW EC

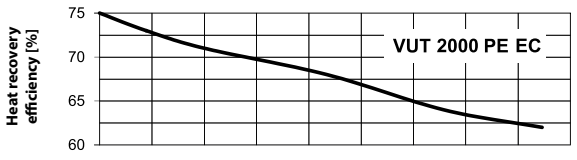




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{WA} to inlet	dBA	67	68	67	67	66	59	61	61	56
L_{WA} to outlet	dBA	69	70	71	68	66	66	64	59	58
L_{WA} to environment	dBA	47	58	52	47	53	40	41	35	35

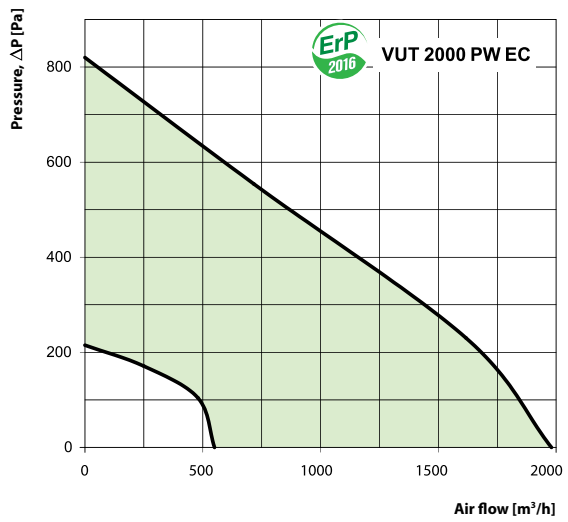
VENTS VUT PE EC

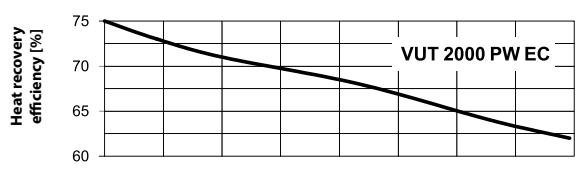




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	77	83	83	78	72	73	66	67	58
L_{wA} to outlet	dBA	83	86	84	80	72	75	70	72	69
L_{wA} to environment	dBA	56	65	66	59	53	46	42	39	39

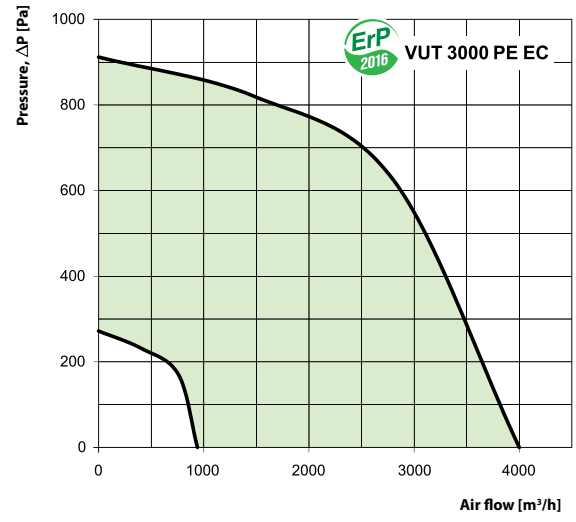
VENTS VUT PW EC

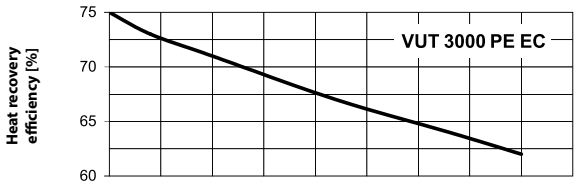




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	79	80	80	79	71	72	69	64	58
L_{wA} to outlet	dBA	81	84	83	79	71	77	71	73	69
L_{wA} to environment	dBA	56	66	66	59	55	48	44	38	38

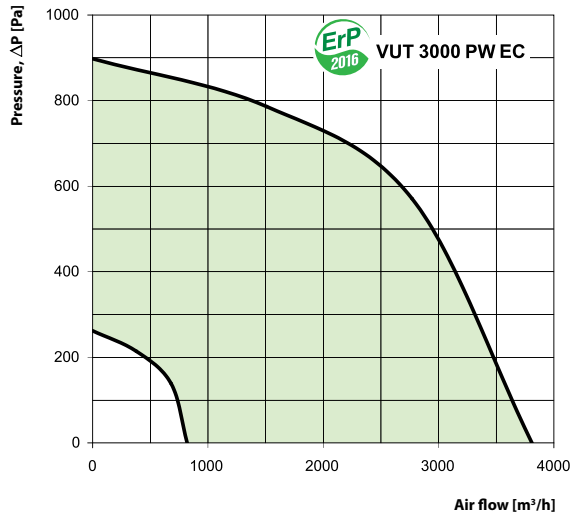
VENTS VUT PE EC

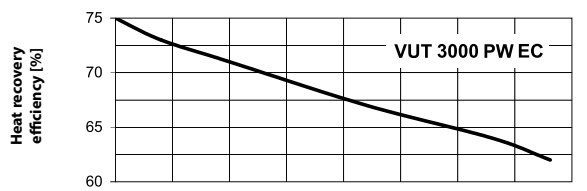




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	80	85	83	82	75	75	72	70	64
L_{wA} to outlet	dBA	86	87	86	83	77	80	75	75	74
L_{wA} to environment	dBA	61	70	69	63	58	51	48	42	41

VENTS VUT PW EC

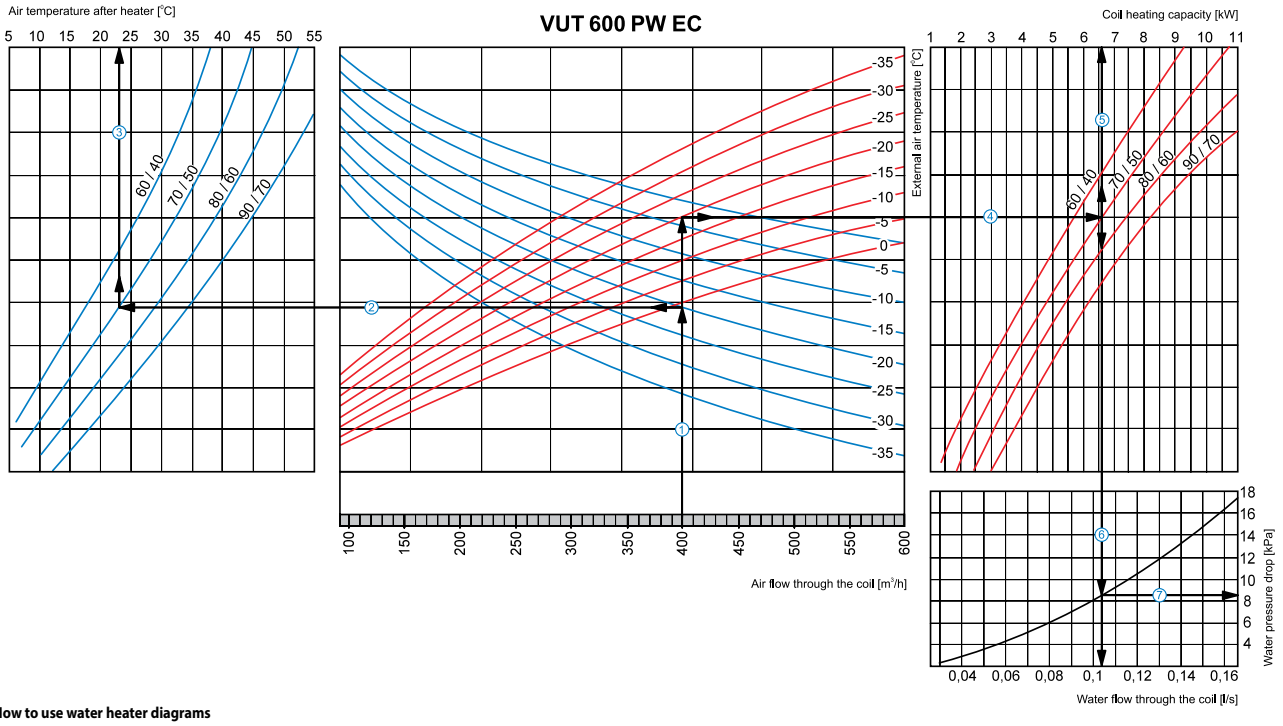




Sound-power level		Octave-frequency band [Hz]								
	Hz	Gen	63	125	250	500	1000	2000	4000	8000
L_{wA} to inlet	dBA	82	87	83	84	75	72	72	69	63
L_{wA} to outlet	dBA	84	86	85	82	74	80	77	76	73
L_{wA} to environment	dBA	60	69	68	62	56	51	47	41	41

Hot water coil parameters

VENTS VUT PW EC

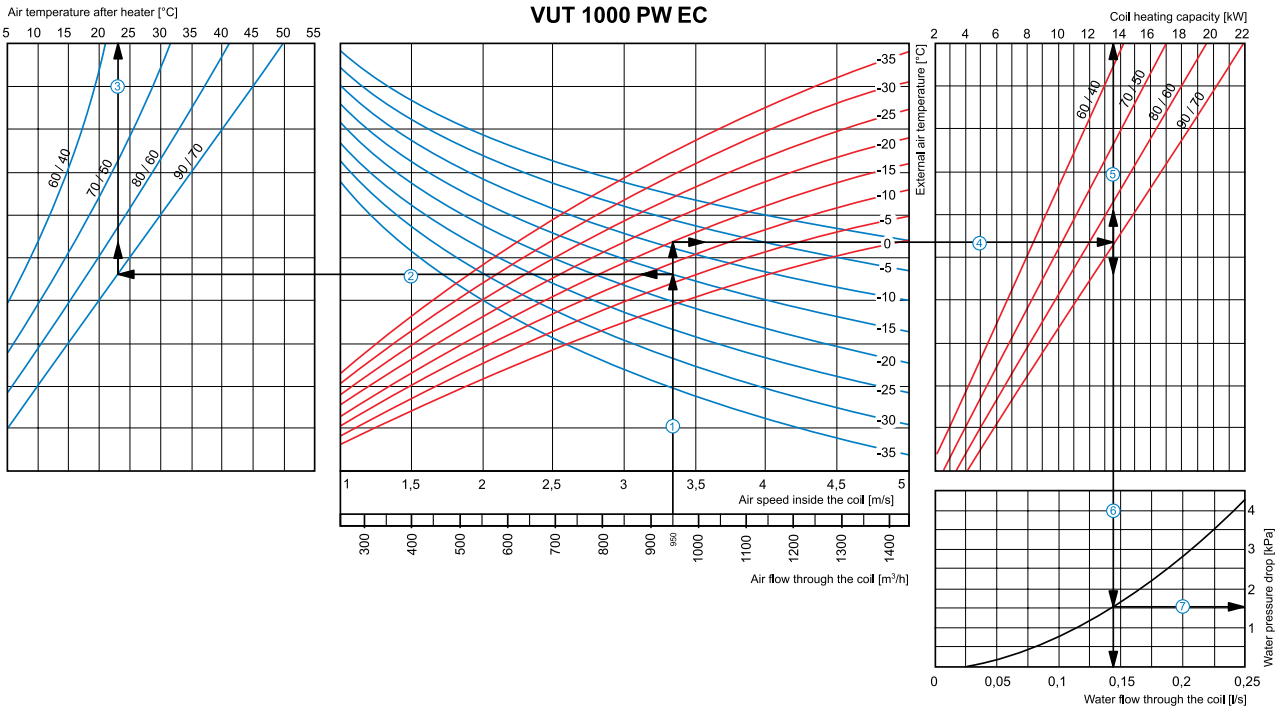


How to use water heater diagrams

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).

VENTS VUT PW EC



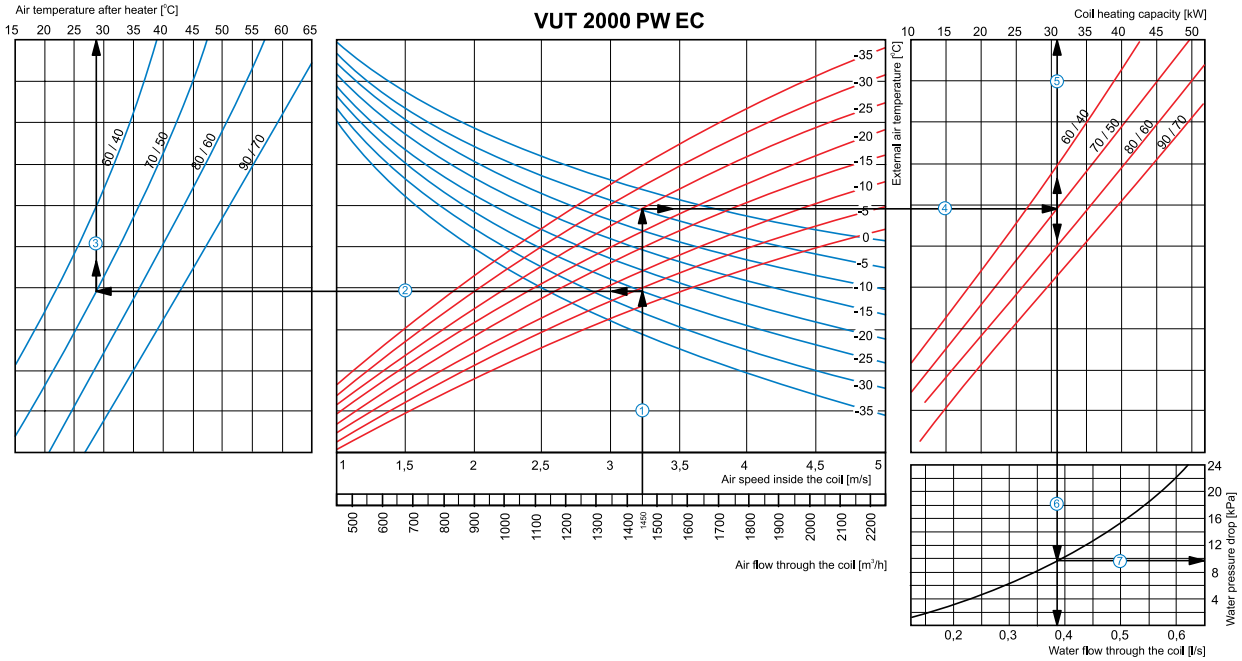
How to use water heater diagrams

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

VENTS 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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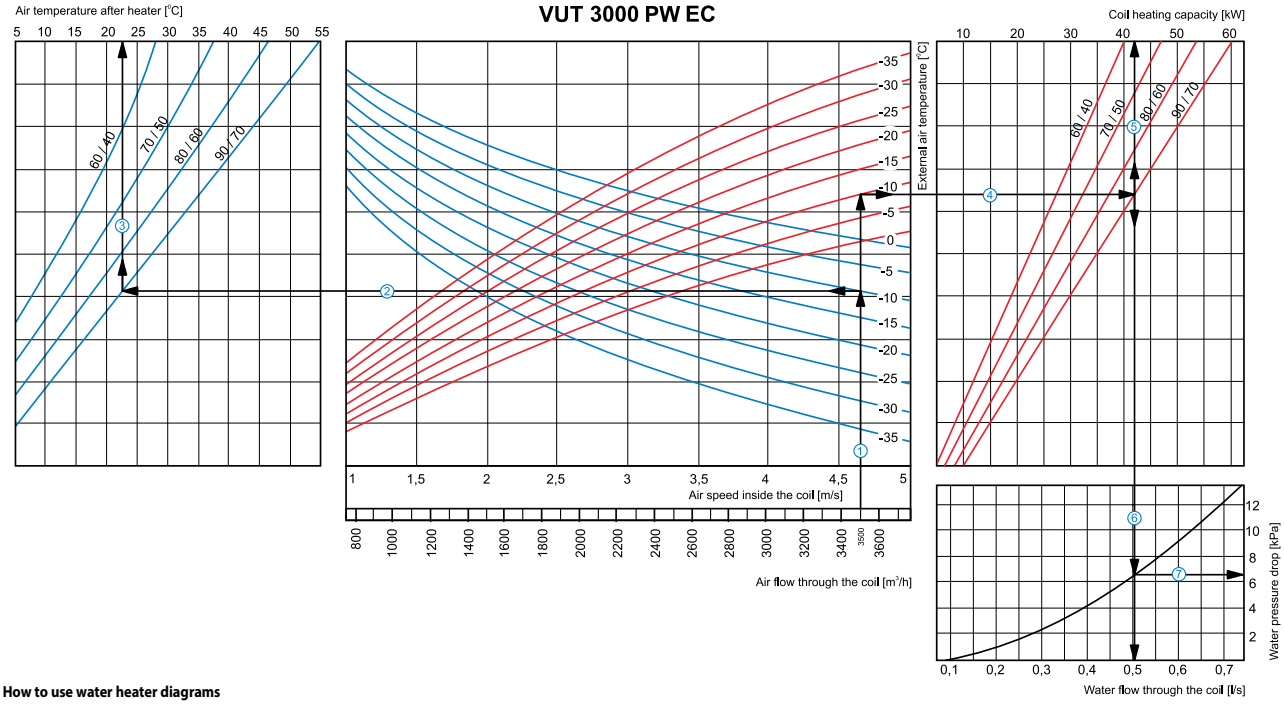

How to use water heater diagrams

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).