





AIR HANDLING UNITS

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Supply ventilation units

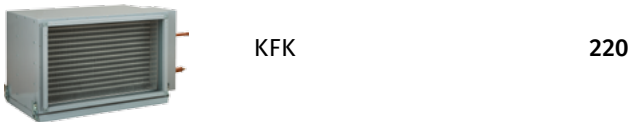
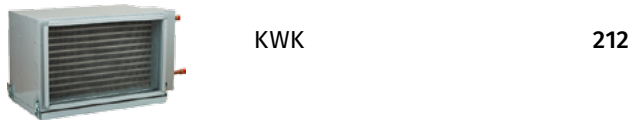
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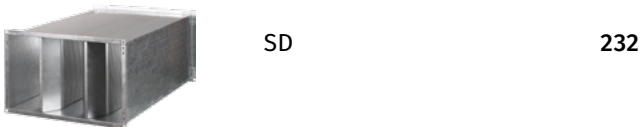
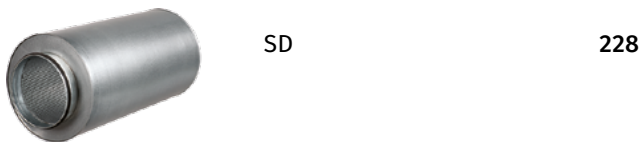
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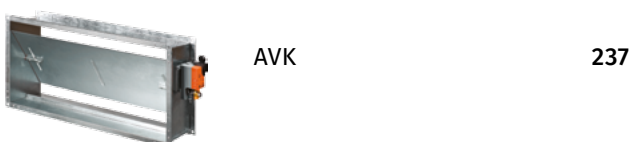
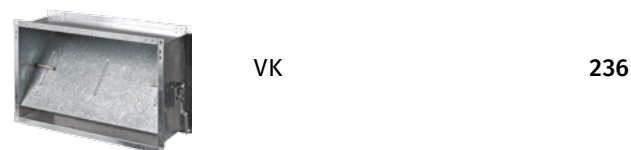
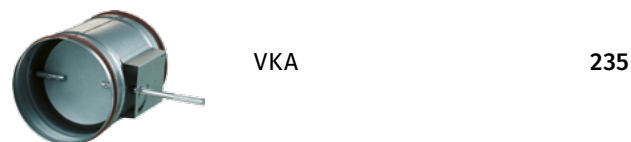
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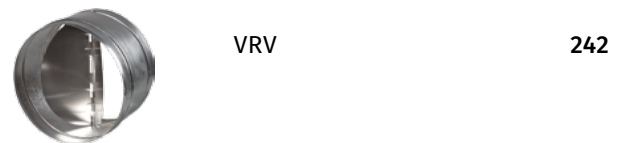
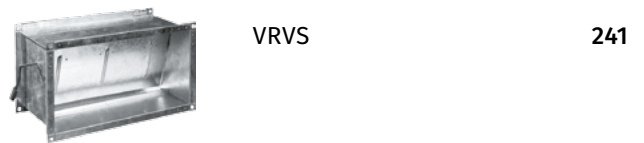
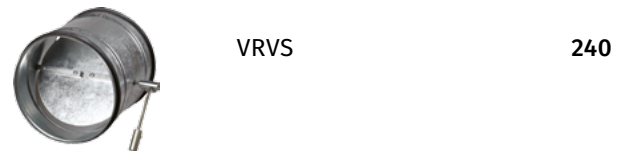
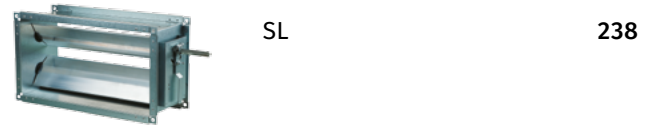
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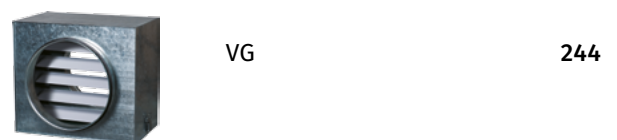
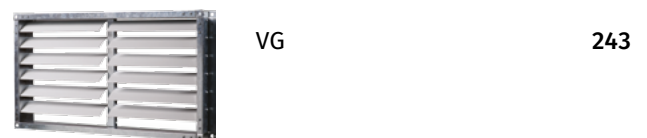
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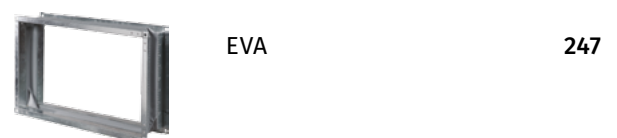
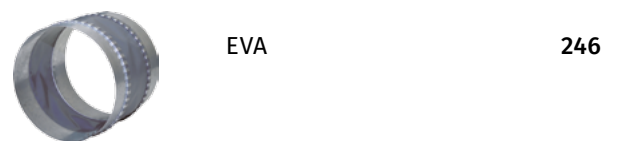
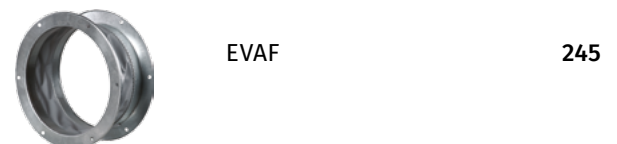
Air dampers



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KOMFORT ULTRA S250

Compact heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery reduces ventilation heat losses in the cold season and the load on the air conditioners in the hot season.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 250 m³/h
69 l/s



Heat recovery efficiency:
up to 78 %

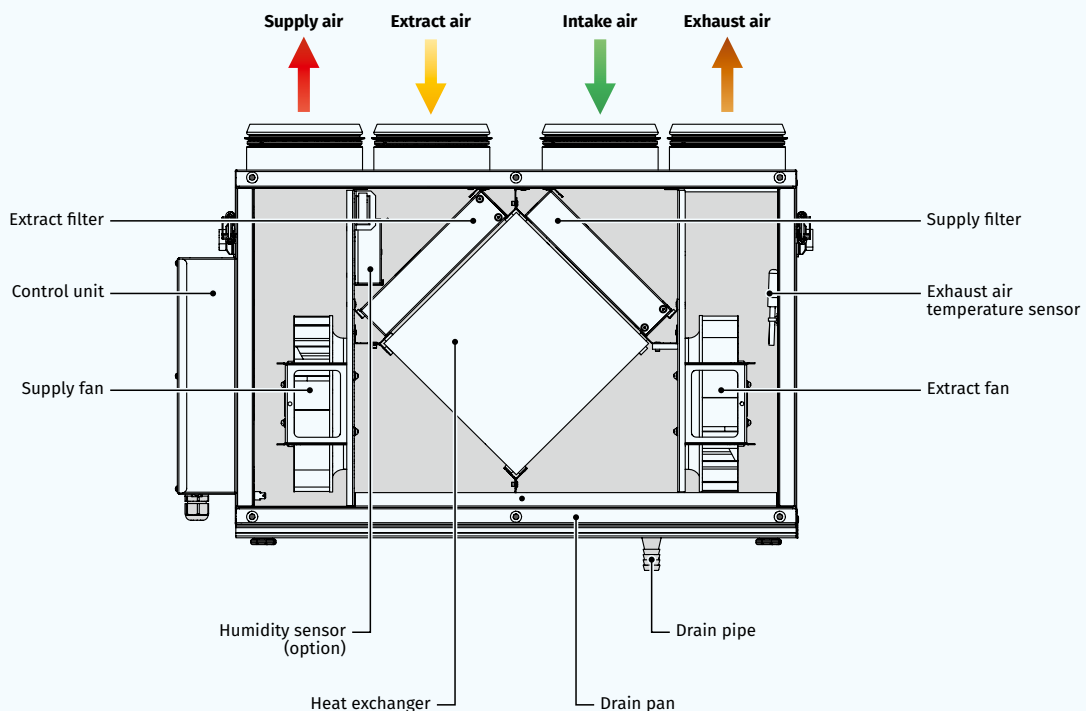


Design

- The casing of **KOMFORT Ultra S250 S12** is made of double-skinned aluzinc panels, internally filled with 20 mm, mineral wool layer for heat- and sound-insulation.
- The casing of **KOMFORT Ultra S250 S12 white** is made of double-skinned white painted metal panels, internally filled with 20 mm, mineral wool layer for heat and sound insulation.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged panel of the casing ensures easy access to the unit internals for service works including cleaning, filter replacement, etc.

Fans

- Asynchronous external rotor motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.



Heat recovery

The **KOMFORT Ultra S250-H S12** unit is equipped with a plate cross-flow aluminium heat exchanger that recovers heat. The drain pan under the heat exchanger block of the **KOMFORT Ultra S250-H S12** is used for condensate collection and drainage.



The **KOMFORT Ultra S250-E S12** unit is equipped with a plate enthalpy cross-flow heat exchanger made of polymerized cellulose that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



- In summer, when the indoor and outdoor temperature difference is small heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for warm seasons (available separately).

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.
- A F8 supply filter (specially ordered accessory) may be used for efficient supply air filtration.

Control and automation

- Smooth motor speed control from 0 up to 100 % by means of the thyristor speed controller SGS E1 (included in the delivery).

Mounting

- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra S250-E S12** unit is also suitable for ceiling mounting.
- While mounting provide free access to the service panel for filter replacement and servicing.
- The **KOMFORT Ultra S250-H S12** unit mounting position must provide condensate collection and drainage.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

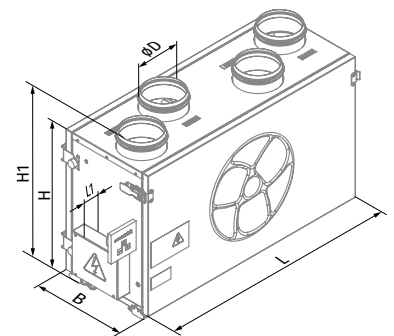
- The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In the cold season supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. Heat recovery minimizes heat losses, which reduces the cost of space heating.
- In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This reduces load on air conditioners and saves electricity.
- The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. In case of freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to the normal operation mode.

Designation key

Serie	Unit type	Spigot modification	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	Ultra: compact unit	S: vertical spigot orientation	250	- H: heat recovery E: energy recovery	S12: speed controller SGS E1

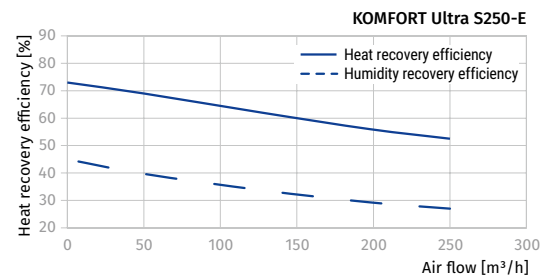
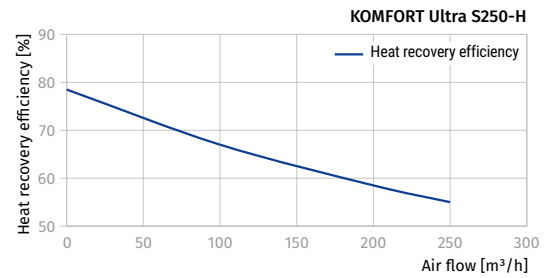
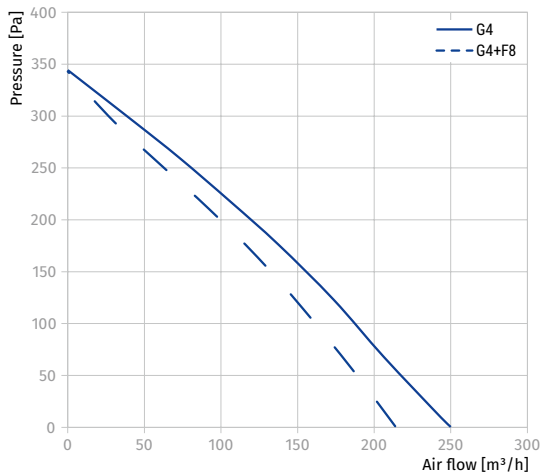
Overall dimensions [mm]

Model	D	B	H	H1	L	L1
KOMFORT Ultra S250(-E)	125	300	443	490	713	43













Technical data

Parameters	KOMFORT Ultra S250-H	KOMFORT Ultra S250-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	148	148
Current [A]	0.78	0.78
Maximum air flow [m ³ /h (l/s)]	250 (69)	250 (69)
RPM [min ⁻¹]	2700	2700
Sound pressure level at 3 m [dBA]	28-47	28-47
Transported air temperature [°C]	-25...+40	-25...+40
Insulation	20 mm, mineral wool	20 mm, mineral wool
Extract / supply filter	G4	G4
Replaceable filter	G4 (Option: F8 PM2.5 81 %)	G4 (Option: F8 PM2.5 81 %)
Connected air duct diameter [mm]	125	125
Heat recovery efficiency [%]	55-78	52-73
Humidity recovery efficiency [%]	-	27-45
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminium	polymerized cellulose
SEC class	B	B
ErP	2016, 2018	2016, 2018



Accessories

		KOMFORT Ultra S250-H	KOMFORT Ultra S250-E
G4 panel filter		FP 184x240x40 G4	FP 184x240x40 G4
F8 panel filter		FP 184x240x40 F8	FP 184x240x40 F8
Syphon kit		SFK 20x32	SFK 20x32
Silencer		SD 125	SD 125
Silencer		SDF 125	SDF 125
Backdraft air damper		VRV 125	VRV 125
Air damper		VKA 125	VKA 125
Electric actuator		LF230	LF230
Electric actuator		TF230	TF230
Summer block		SB C4 200/240	SB C4 200/240

KOMFORT ULTRA L250

Compact heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery reduces ventilation heat losses in the cold season and the load on the air conditioners in the hot season.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 250 m³/h
69 l/s



Heat recovery efficiency:
up to 78 %

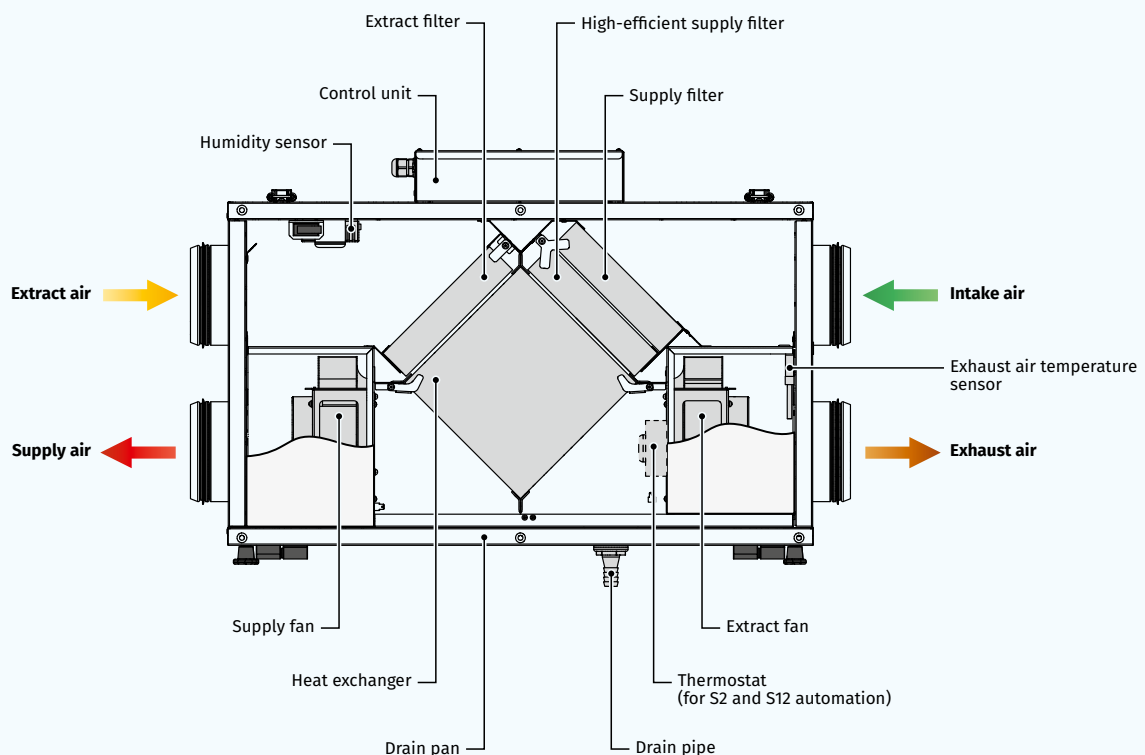


Design

- The casing of **KOMFORT Ultra L250 S12** is made of double-skinned aluzinc panels, internally filled with 20 mm, mineral wool layer for heat and sound insulation.
- The casing of **KOMFORT Ultra L250 S12 white** is made of double-skinned white painted metal panels, internally filled with 20 mm, mineral wool layer for heat and sound insulation.
- The spigots for connection to the air ducts are located at the side of the unit.
- The hinged panel of the casing ensures easy access to the unit internals for service works including cleaning, filter replacement, etc.

Fans

- Asynchronous external rotor motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.



Heat recovery

The **KOMFORT Ultra L250-H S12** unit is equipped with a plate cross-flow aluminium heat exchanger that recovers heat. The drain pan under the heat exchanger block of the **KOMFORT Ultra L250-H S12** is used for condensate collection and drainage.



The **KOMFORT Ultra L250-E S12** unit is equipped with a plate enthalpy cross-flow heat exchanger made of polymerized cellulose that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



- In summer, when the indoor and outdoor temperature difference is low heat recovery is not reasonable. In this case the heat exchanger can be temporarily replaced with a summer block for warm seasons (available separately).

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.
- A F8 supply filter (specially ordered accessory) may be used for efficient supply air filtration.

Control and automation

- Smooth motor speed control from 0 up to 100 % by means of the thyristor speed controller SGS E1 (included in the delivery).

Mounting

- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra L250-E S12** unit is also suitable for ceiling mounting.
- While mounting provide free access to the service panel for filter replacement and servicing.
- The **KOMFORT Ultra L250-H S12** unit mounting position must provide condensate collection and drainage.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

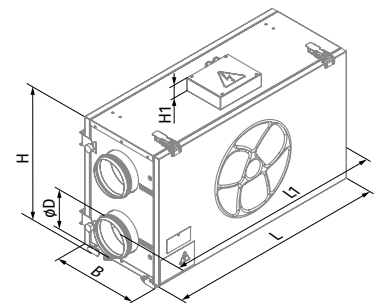
- The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In the cold season supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. Heat recovery minimizes heat losses, which reduces the cost of space heating.
- In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cooled extract air. This reduces load on air conditioners and saves electricity.
- The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. In case of freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to the normal operation mode.

Designation key

Serie	Unit type	Spigot modification	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	Ultra: compact unit	L: horizontal spigot orientation	250	- H: heat recovery E: energy recovery	S12: speed controller SGS E1

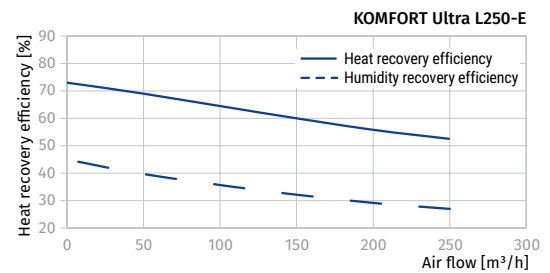
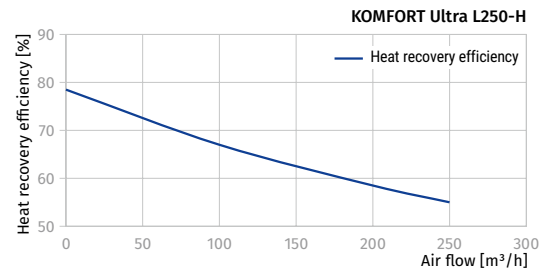
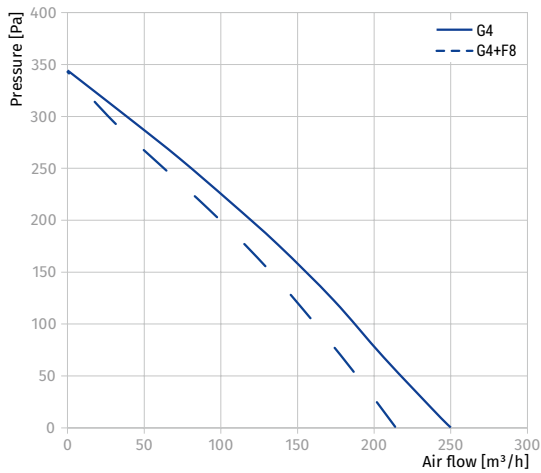
Overall dimensions [mm]

Model	D	B	H	H1	L	L1
KOMFORT Ultra L250	125	300	443	43	713	810













Technical data

Parameters	KOMFORT Ultra L250-H	KOMFORT Ultra L250-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	148	148
Current [A]	0.78	0.78
Maximum air flow [m ³ /h (l/s)]	250 (69)	250 (69)
RPM [min ⁻¹]	2700	2700
Sound pressure level at 3 m [dBA]	28-47	28-47
Transported air temperature [°C]	-25...+40	-25...+40
Insulation	20 mm, mineral wool	20 mm, mineral wool
Extract / supply filter	G4	G4
Replaceable filter	G4 (Option: F8 PM2.5 81 %)	G4 (Option: F8 PM2.5 81 %)
Connected air duct diameter [mm]	125	125
Heat recovery efficiency [%]	55-78	52-73
Humidity recovery efficiency [%]	-	27-45
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminium	polymerized cellulose
SEC class	B	B
ErP	2016, 2018	2016, 2018



COMPACT HEAT RECOVERY AIR HANDLING UNITS

Accessories

		KOMFORT Ultra L250-H	KOMFORT Ultra L250-E
G4 panel filter		FP 184x240x40 G4	FP 184x240x40 G4
F8 panel filter		FP 184x240x40 F8	FP 184x240x40 F8
Syphon kit		SFK 20x32	SFK 20x32
Silencer		SD 125	SD 125
Silencer		SDF 125	SDF 125
Backdraft air damper		VRV 125	VRV 125
Air damper		VKA 125	VKA 125
Electric actuator		LF230	LF230
Electric actuator		TF230	TF230
Summer block		SB C4 200/240	SB C4 200/240

KOMFORT ULTRA EC S2 300

Compact heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- The heat recovery technology is used to minimize ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 300 m³/h
83 l/s



Heat recovery efficiency:
up to 79 %



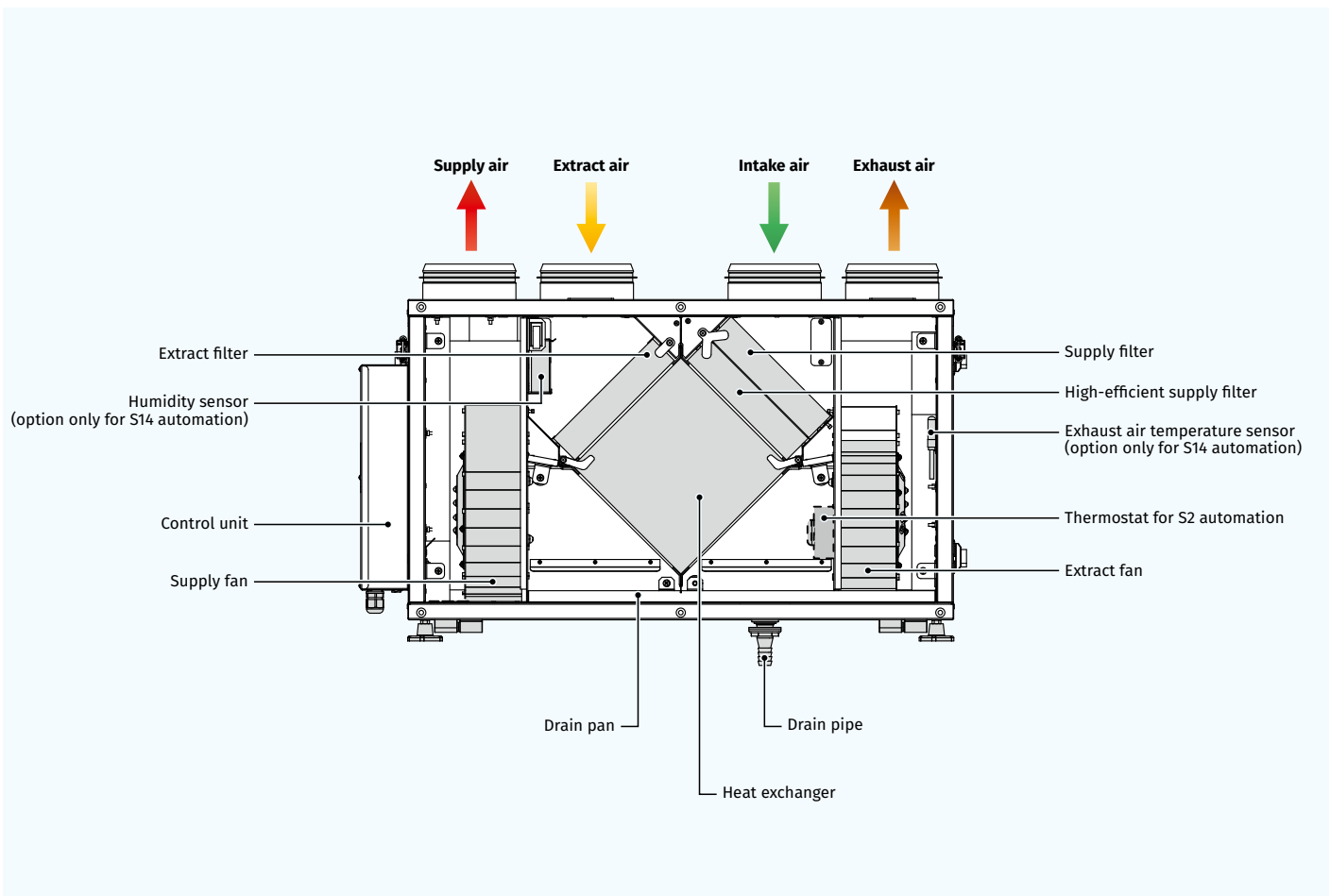
Design

- The casing of **KOMFORT Ultra EC S2 300** is made of double-skinned white painted metal panels, internally filled with 20 mm, mineral wool layer for heat- and sound-insulation.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged panel of the casing ensures easy access to the unit internals for service works including cleaning, filter replacement, etc.

Fans

- The unit is equipped with high-efficient external rotor EC motors and centrifugal impellers with forward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- The impellers are dynamically balanced.

COMPACT HEAT RECOVERY AIR HANDLING UNITS



Heat recovery

The **KOMFORT Ultra EC S2 300-H** unit is equipped with a plate cross-flow aluminium heat exchanger that recovers heat. The drain pan under the heat exchanger block of the **KOMFORT Ultra EC S2 300-H** is used for condensate collection and drainage.



The **KOMFORT Ultra EC S2 300-E** unit is equipped with a plate enthalpy cross-flow heat exchanger made of polymerized cellulose that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



Control and automation

- The **KOMFORT Ultra EC S2 300 S2** unit is equipped with the CDT E/0-10 speed controller that is included in the delivery.
- The **KOMFORT Ultra EC S2 300 S14** units have an integrated control system with a wall-mounted control panel S14 with a LED indication.



The KOMFORT Ultra EC S2 300 S14 control panel functions:

- Unit On/Off.
- Speed selection: Low, Medium or High.
- Activation of the summer ventilation mode: The supply fan stops and the extract fan continues its operation with no heat recovery.
- Alarm indication.
- Filter maintenance indication.

The KOMFORT Ultra EC S2 300 S14 unit is equipped with a USB connector (Type B) and can be connected to a PC for configuring the advanced settings in a special software:

- Fan speed adjustment from 0 to 100 %. Each speed is individually adjusted for the supply and the extract fans.
- Operation control on feedback from the FS2 duct humidity sensor (to be ordered separately).
- Unit operation setting according to the external relay (to be ordered separately).
- Temperature setting for freeze protection system activation.
- Control and operation adjustment of the filter maintenance timer.
- Error code indication.
- External control unit and humidity level control.
- Software version upgrading.

Mounting

- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra EC S2 300-E** unit is also suitable for ceiling mounting.
- While mounting provide free access to the service panel for filter replacement and servicing.
- The **KOMFORT Ultra EC S2 300-H** unit mounting position must provide condensate collection and drainage.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

- The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In cold season supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. Heat recovery minimizes heat losses, which reduces the cost of space heating. In summer heat recovery acts reverse and intake air is cooled in the heat exchanger by the cooled extract air. This reduces load on air conditioners and saves electricity.
- The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. In case of freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to the normal operation mode.
- In summer, when the indoor and outdoor temperature difference is low heat recovery is not reasonable. In this case the heat exchanger can be temporarily replaced with a summer block for warm seasons. Available upon separate order.

Air filtration

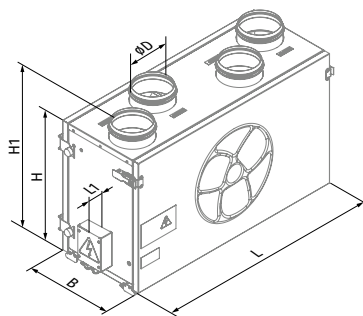
- Two built-in G4 and F7 filters provide efficient supply air filtration. The G4 filter is used for extract air filtration.

Designation key

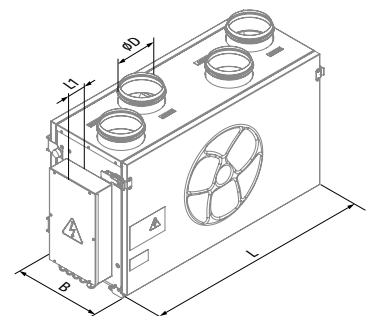
Serie	Unit type	Motor type	Spigot modification	Casing	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	Ultra: compact unit	EC: electronically commutated motor	S: vertical spigot orientation	2: Insulation 20 mm	300	— H: heat recovery E: energy recovery	S2: CDT E/0-10 speed controller S14: sensor control panel with LED indi- cation

Overall dimensions [mm]

Model	D	B	H	H1	L	L1
KOMFORT Ultra EC S2 300-H(E) S2	125	300	443	490	713	43
KOMFORT Ultra EC S2 300-H(E) S14	125	300	443	490	713	63



KOMFORT Ultra EC S2 300-H(E) S2



KOMFORT Ultra EC S2 300-H(E) S14

Technical data

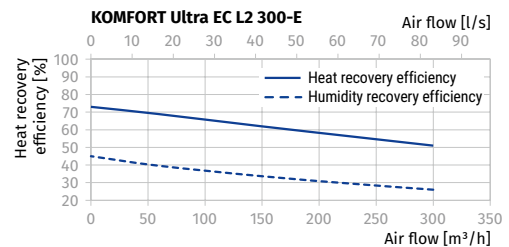
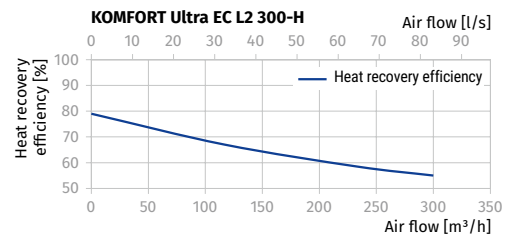
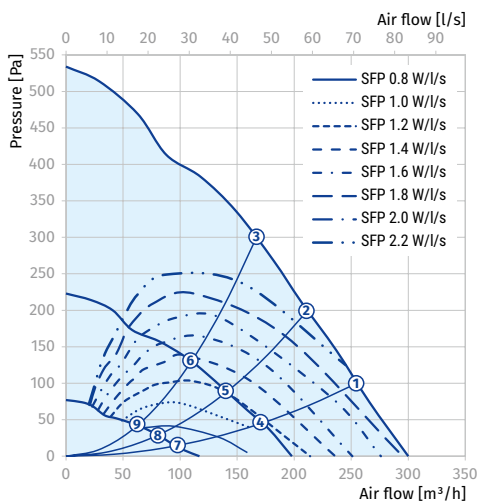
Parameters	KOMFORT Ultra EC S2 300-H	KOMFORT Ultra EC S2 300-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	165	165
Current [A]	1.3	1.3
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)
RPM [min ⁻¹]	2050	2050
Sound pressure level at 3 m [dBA]	33	33
Transported air temperature [°C]	-25...+60	-25...+60
Insulation	20 mm, mineral wool	20 mm, mineral wool
Extract / supply filter	G4	G4
Replaceable filter	G4, F7	G4, F7
Connected air duct diameter [mm]	125	125
Weight [kg]	32	28
Heat recovery efficiency [%]*	55-79	51-73
Humidity recovery efficiency [%]	-	26-45
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminium	polymerized cellulose
SEC class for S2 automation	B	C
SEC class for S14 automation	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with the EN 13141-7.








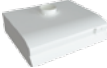





Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	56	48	43	53	44	44	40	26	24		
L _{WA} to supply outlet [dBA]	71	53	53	68	65	60	59	52	51		
L _{WA} to exhaust inlet [dBA]	57	43	51	52	52	45	37	26	21		
L _{WA} to exhaust outlet [dBA]	72	53	60	66	67	61	62	55	48		
L _{WA} to environment [dBA]	53	33	44	47	50	44	38	29	24	33	43

* Data provided for point 1 of the air flow diagram



Accessories

		KOMFORT Ultra EC S2 300-H(-E) S2	KOMFORT Ultra EC S2 300-H(-E) S14
G4 panel filter		FP 184x240x40 G4	FP 184x240x40 G4
F7 panel filter		FP 184x240x40 F7	FP 184x240x40 F7
Syphon kit		SFK 20x32	SFK 20x32
Internal humidity sensor		-	FS2
CO ₂ sensor with indication		-	CD-1
CO ₂ sensor		-	CD-2
Humidity sensor		-	HR-S
Kitchen hood		-	DAH 251-13
Silencer		SD 125	SD 125
Silencer		SDF 125	SDF 125
Backdraft air damper		VRV 125	VRV 125
Air damper		VKA 125	VKA 125
Electric actuator		LF230	LF230

KOMFORT ULTRA EC L2 300

Compact heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- The heat recovery technology is used to minimize ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 300 m³/h
83 l/s



Heat recovery efficiency:
up to 79 %

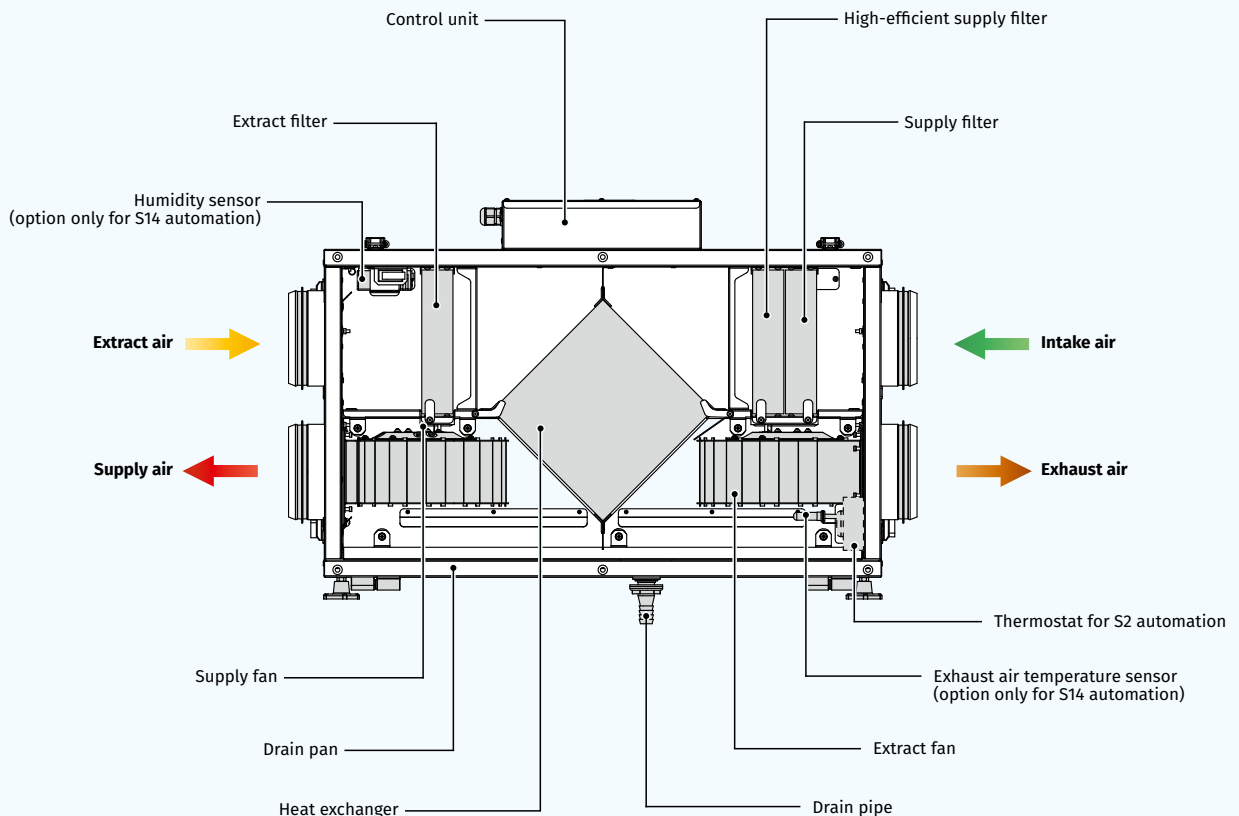


Design

- The casing of **KOMFORT Ultra EC L2 300** is made of double-skinned white painted metal panels, internally filled with 20 mm, mineral wool layer for heat- and sound-insulation.
- The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.
- The hinged panel of the casing ensures easy access to the unit internals for service works including cleaning, filter replacement, etc.

Fans

- The unit is equipped with high-efficient external rotor EC motors and centrifugal impellers with forward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- The impellers are dynamically balanced.

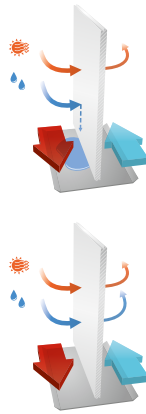


COMPACT HEAT RECOVERY AIR HANDLING UNITS

Heat recovery

The **KOMFORT Ultra EC L2 300-H** unit is equipped with a plate cross-flow aluminium heat exchanger that recovers heat. The drain pan under the heat exchanger block of the **KOMFORT Ultra EC L2 300-H** is used for condensate collection and drainage.

The **KOMFORT Ultra EC L2 300-E** unit is equipped with a plate cross-flow enthalpy heat exchanger made of polymerized cellulose that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



Control and automation

- The **KOMFORT Ultra EC L2 300 S2** unit is equipped with the CDT E/0-10 speed controller that is included in the delivery.
- The **KOMFORT Ultra EC L2 300 S14** units have an integrated control system with a wall-mounted control panel S14 with a LED indication.



The KOMFORT Ultra EC L2 300 S14 control panel functions:

- Unit On/Off
- Speed selection: Low, Medium or High
- Activation of the summer ventilation mode: The supply fan stops and the extract fan continues its operation with no heat recovery
- Alarm indication
- Filter maintenance indication

The KOMFORT Ultra EC L2 300 S14 unit is equipped with a USB connector (Type B) and can be connected to a PC for configuring the advanced settings in a special software:

- Fan speed adjustment from 0 to 100 %. Each speed is individually adjusted for the supply and the extract fans
- Operation control on feedback from the FS2 duct humidity sensor (to be ordered separately)
- Unit operation setting according to the external control unit (to be ordered separately)
- Temperature setting for freeze protection system activation
- Control and operation adjustment of the filter maintenance timer
- Error code indication
- External relay status and humidity level control
- Software version upgrading

Mounting

- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra EC L2 300-E** unit is also suitable for ceiling mounting.
- While mounting provide free access to the service panel for filter replacement and servicing.
- The **KOMFORT Ultra EC L2 300-H** unit mounting position must provide condensate collection and drainage.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

- The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In cold season supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. Heat recovery minimizes heat losses, which reduces the cost of space heating. In summer heat recovery acts reverse and intake air is cooled in the heat exchanger by the cooled extract air. This reduces load on air conditioners and saves electricity.
- The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. In case of freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to the normal operation mode.
- In summer, when the indoor and outdoor temperature difference is low heat recovery is not reasonable. In this case the heat exchanger can be temporarily replaced with a summer block for warm seasons. Available upon separate order.

Air filtration

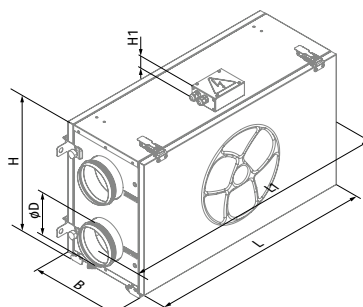
- Two built-in G4 and F7 filters provide efficient supply air filtration. The G4 filter is used for extract air filtration.

Designation key

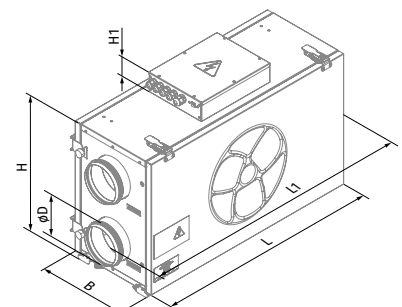
Serie	Unit type	Motor type	Modification	Casing	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	Ultra: compact unit	EC: electronically commutated motor	L: horizontal spigot orientation	2: Insulation 20 mm	300	– H: heat recovery E: energy recovery	S2: CDT E/0-10 speed controller S14: sensor control panel with LED indication

Overall dimensions [mm]

Model	D	B	H	H1	L	L1
KOMFORT Ultra EC L2 300-H(E) S2	125	300	443	43	713	810
KOMFORT Ultra EC L2 300-H(E) S14	125	300	443	63	713	810



KOMFORT Ultra EC L2 300-H(E) S2



KOMFORT Ultra EC L2 300-H(E) S14

Technical data

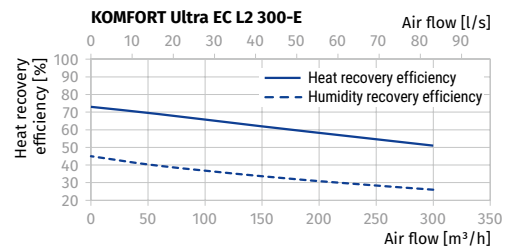
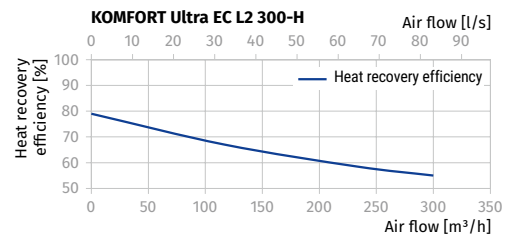
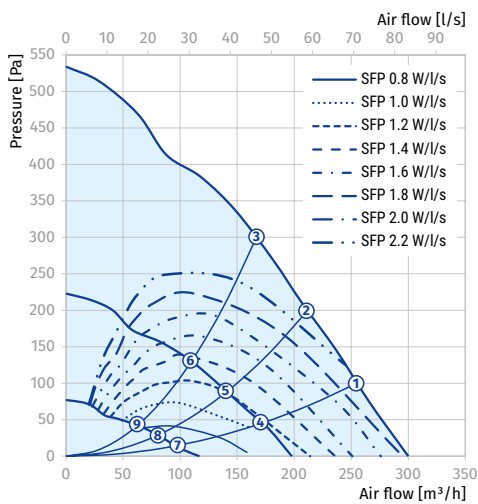
Parameters	KOMFORT Ultra EC L2 300-H	KOMFORT Ultra EC L2 300-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	165	165
Current [A]	1.3	1.3
Maximum air flow [m³/h (l/s)]	300 (83)	300 (83)
RPM [min ⁻¹]	2050	2050
Sound pressure level at 3 m [dBA]	33	33
Transported air temperature [°C]	-25...+60	-25...+60
Insulation	20 mm, mineral wool	20 mm, mineral wool
Extract / supply filter	G4	G4
Replaceable filter	G4, F7	G4, F7
Connected air duct diameter [mm]	125	125
Weight [kg]	32	28
Heat recovery efficiency [%]*	55-79	51-73
Humidity recovery efficiency [%]	-	26-45
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminium	polymerized cellulose
SEC class for S2 automation	B	C
SEC class for S14 automation	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with the EN 13141-7.














Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	56	48	43	53	44	44	40	26	24		
L _{WA} to supply outlet [dBA]	71	53	53	68	65	60	59	52	51		
L _{WA} to exhaust inlet [dBA]	57	43	51	52	52	45	37	26	21		
L _{WA} to exhaust outlet [dBA]	72	53	60	66	67	61	62	55	48		
L _{WA} to environment [dBA]	53	33	44	47	50	44	38	29	24	33	43

* Data provided for point 1 of the air flow diagram



Accessories

		KOMFORT Ultra EC L2 300-H(-E) S2	KOMFORT Ultra EC L2 300-H(-E) S14
G4 panel filter		FP 184x240x40 G4	FP 184x240x40 G4
F7 panel filter		FP 184x240x40 F7	FP 184x240x40 F7
Syphon kit		SFK 20x32	SFK 20x32
Internal humidity sensor		-	FS2
CO ₂ sensor with indication		-	CD-1
CO ₂ sensor		-	CD-2
Humidity sensor		-	HR-S
Kitchen hood		-	DAH 251-13
Silencer		SD 125	SD 125
Silencer		SDF 125	SDF 125
Backdraft air damper		VRV 125	VRV 125
Air damper		VKA 125	VKA 125
Electric actuator		LF230	LF230

KOMFORT ULTRA D105/D105-A

Single room heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 106 m³/h
29 l/s



Heat recovery efficiency:
up to 76 %



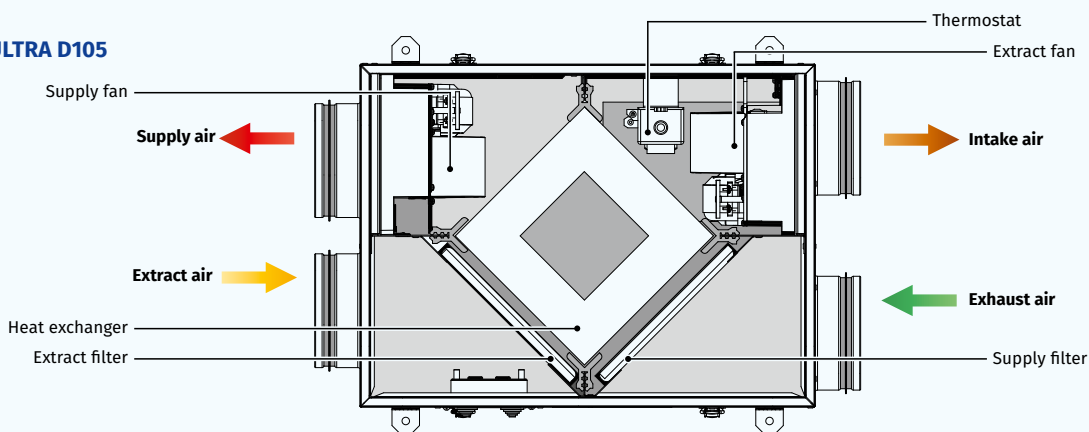
Design

- The compact casing is made of double-skinned aluzinc panels, internally filled with 15 mm PE foam film layer for heat and sound insulation.
- The casing has mounting angles for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The supply and exhaust spigots are equipped with backdraft dampers.
- The hinged side panel of the casing ensures easy access to the internals for cleaning and other maintenance operations.

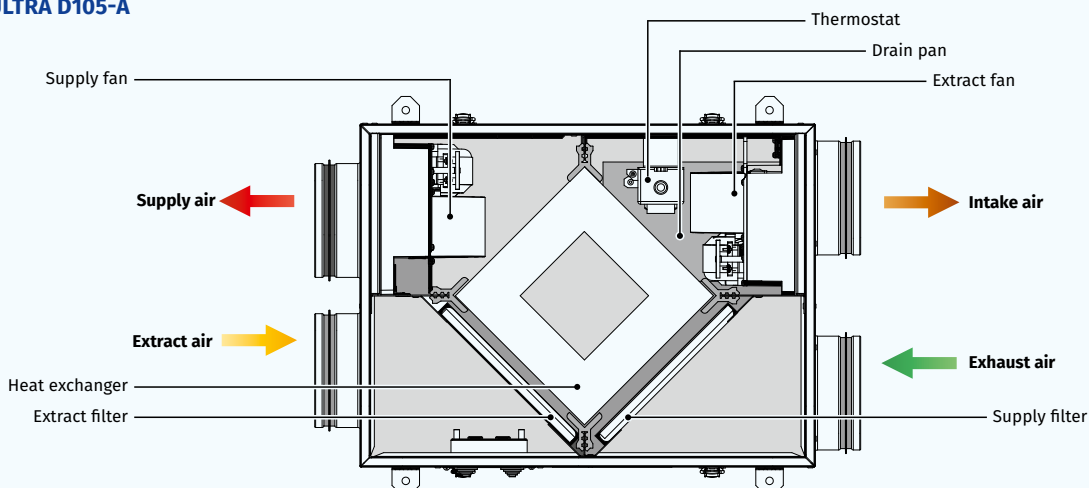
Fans

- Asynchronous motors are used for air supply and exhaust.
- Centrifugal impeller with forward curved blades ensures high pressure and low noise level.
- Integrated overheating protection.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.

KOMFORT ULTRA D105



KOMFORT ULTRA D105-A



COMPACT HEAT RECOVERY AIR HANDLING UNITS

Heat recovery

- The unit is equipped with two types of the plate cross-flow heat exchangers:
 - Aluminium** heat exchanger recovers extract air sensible energy.
 - Polymerized cellulose enthalpy** heat exchanger recovers sensible and latent energy of the extract air. These heat exchangers are frost-proof, produce no condensate and thus are recommended for operation in air conditioned premises.
- The air flows are fully separated within the heat exchanger. Odour and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up of supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The integrated electronic frost protection system in **KOMFORT Ultra D105-A** is used to prevent the heat exchanger freezing in cold seasons. In case of heat exchanger freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the the supply fan is turned on and the unit reverts to the normal operation mode.

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.

Control and automation

- Air flow control by the external speed switch CDP-3/5.
- The units has three fan speeds:
 - speed 1 – 57 m³/h, 24 dBA
 - speed 2 – 78 m³/h, 32 dBA
 - speed 3 – 106 m³/h, 41 dBA



Mounting

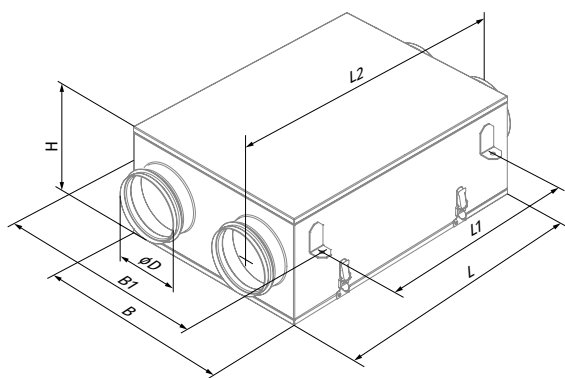
- Indoor installation in horizontal position.
- Mounting in a false ceiling is possible due to compact casing size.
- A small air distribution network for central ventilation may be arranged based on the unit.
- The correct mounted unit must provide free access to the hinged side panel for servicing and filter replacement.

Designation key

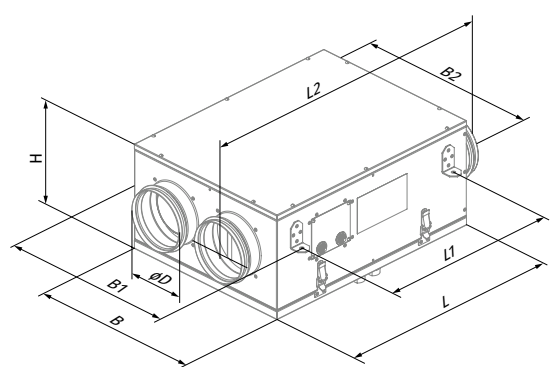
Serie	Unit type	Mounting type	Nominal air flow [m ³ /h]	Heat exchanger material
KOMFORT	Ultra: compact unit	D: suspended mounting, horizontally oriented spigots	105	-: polymerized cellulose -A: aluminium

Overall dimensions [mm]

Model	D	B	B1	B2	H	L	L1	L2
KOMFORT Ultra D105	125	374	404	-	125	497	397	595
KOMFORT Ultra D105-A	125	374	404	112.6	224	497	397	595



KOMFORT Ultra D105

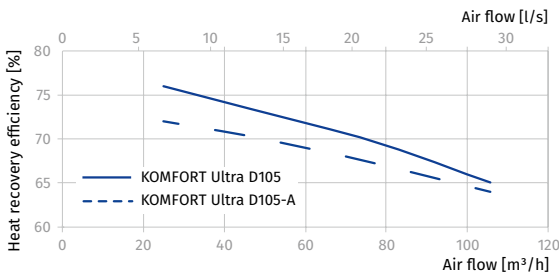
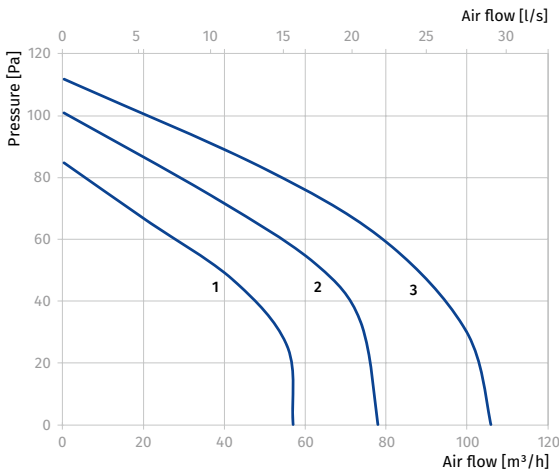


KOMFORT Ultra D105-A






Technical data

Parameters	KOMFORT Ultra D105			KOMFORT Ultra D105-A		
	I	II	III	I	II	III
Speed	I	II	III	I	II	III
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	30	38	56	30	38	56
Current [A]	0.18	0.23	0.34	0.18	0.23	0.34
Maximum air flow [m³/h (l/s)]	57 (16)	78 (22)	106 (29)	57 (16)	78 (22)	106 (29)
RPM [min ⁻¹]	1300	1950	2500	1300	1950	2500
Sound pressure level at 3 m [dBA]	24	32	41	24	32	41
Transported air temperature [°C]	-25...+50			-25...+50		
Casing material	aluzinc			aluzinc		
Insulation	15 mm, polyethylene foam			15 mm, polyethylene foam		
Extract / supply filter	G4			G4		
Connected air duct diameter [mm]	125			125		
Weight [kg]	10			13		
Heat exchanger type	rotary			rotary		
Heat recovery efficiency [%]	65-76			64-72		
Humidity recovery efficiency [%]	up to 65			-		
Heat exchanger type	cross-flow			cross-flow		
Heat exchanger material	polymerized cellulose			aluminum		
SEC class	B			A		
ErP	2016, 2018			2016, 2018		

COMPACT HEAT RECOVERY AIR HANDLING UNITS



Accessories

		KOMFORT Ultra D105	KOMFORT Ultra D105-A
G4 panel filter		FP 240x202x8 G4	FP 198x205x8 G4
Silencer		SD 125	SD 125
Silencer		SDF 125	SDF 125
Backdraft air damper		VRV 125	VRV 125
Air damper		VKA 125	VKA 125

KOMFORT EC S5B270(-E)

Heat and energy recovery air handling units



Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery minimizes ventilation heat losses during cold season and reduce air conditioner load during hot season.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 300 m³/h
83 l/s



Heat recovery efficiency:
up to 98 %



Design

- The casing is made of expanded polypropylene (EPP) 15-26 mm thickness with high heat- and sound-insulating properties.

Fans

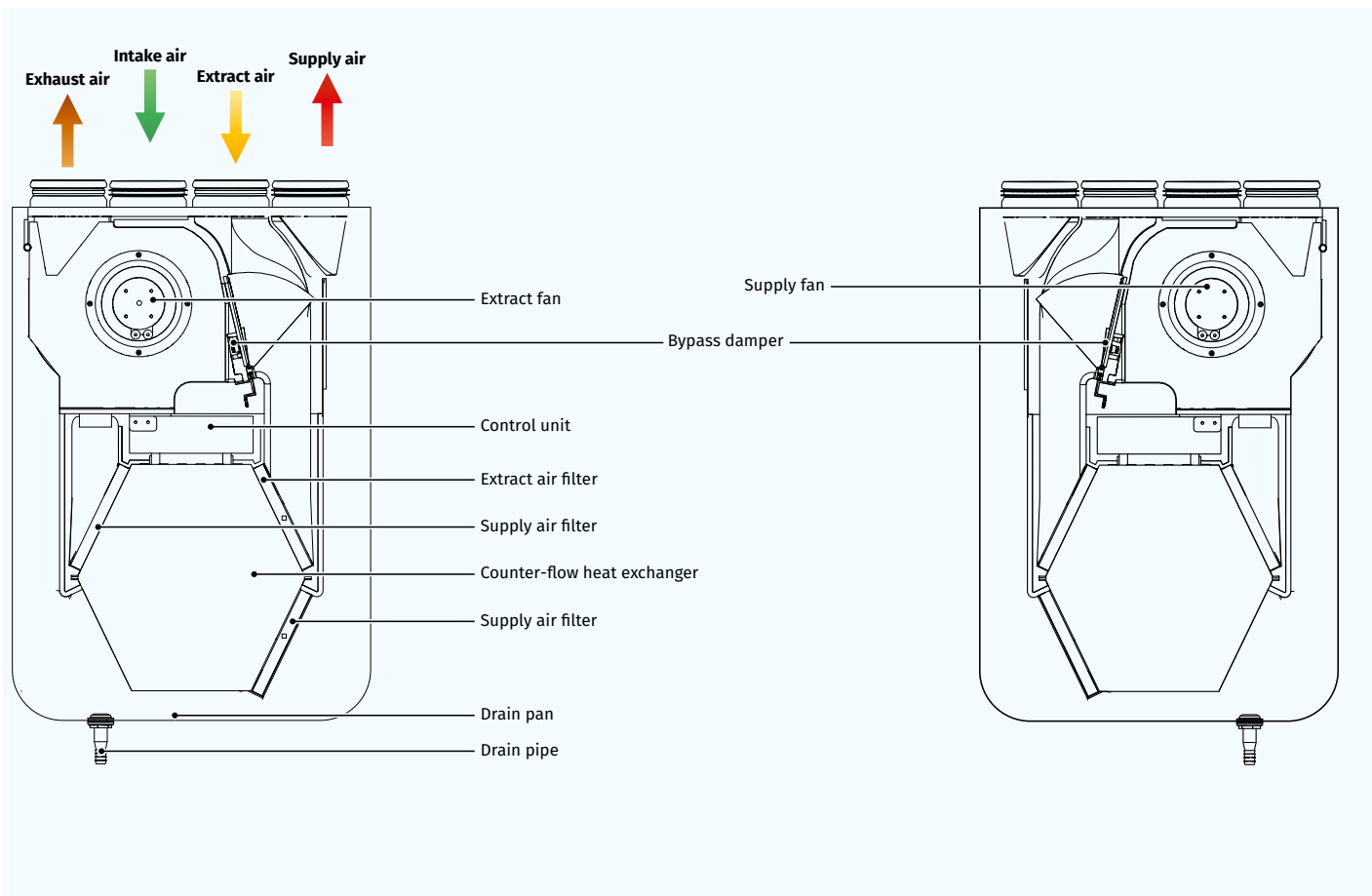
- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.

- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

Air filtration

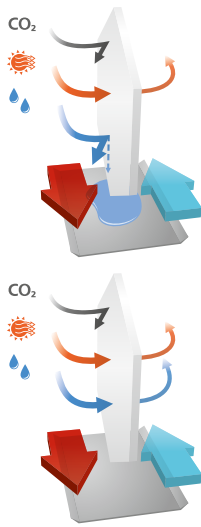
- The supply and extract air streams are stripped of impurities on the panel G4 air filters. Optionally a F8 replaceable filter may be applied.

EPP HEAT AND ENERGY RECOVERY AIR HANDLING UNITS



Heat recovery

- KOMFORT EC S5B270** have a counter-flow polystyrene heat exchanger. In the cold season the extract air heat energy is absorbed by the cold intake air and the ventilation heat losses are minimized. The condensate produced by heat recovery is collected in a drain pan and drained to the sewage system. In the warm season the heat of the outside air is absorbed by the exhaust air. This way the supply air is pre-cooled and operation load for air conditioners is reduced.
- KOMFORT EC S5B270-E** have a counter-flow enthalpy membrane heat exchanger. In the cold season the heat and moisture contained in the extract air are transferred to the intake air flow through the enthalpy membrane. This way the ventilation heat losses are minimized. In the warm season the heat and moisture of the outside air are absorbed by the exhaust air through the enthalpy membrane. This way the supply air is pre-cooled and dehumidified and operation load for air conditioners is reduced.



Bypass

- The **KOMFORT EC S5B270(-E)** models are equipped with a bypass which can be opened if there is a need to cool down the ventilated area with cool intake air.

Mounting

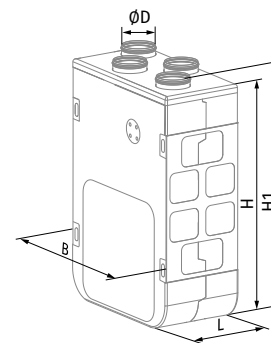
- The ventilation units are designed for wall mounting.
- Due to universal casing design both left and right mounting is possible.
- The service panel located on the left and on the right from the unit as seen from the supply air direction.

Designation key

Serie	Motor type	Spigot orientation	Casing modification	Bypass	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	EC: electronically commutated motor	S: vertical spigot orientation	5: EPP	B: integrated bypass	270	-: heat recovery -E: energy recovery	S14: sensor control panel with LED indication

Overall dimensions [mm]

Model	D	B	H	H1	L
KOMFORT EC S5B270(-E)	125	590	852	893	316



Control and automation

- KOMFORT EC S5B270(-E) S14** has an integrated control panel with sensor buttons and LED indication.

FREEZE PROTECTION

- The freeze protection is based on shutdown of the supply fan. In case of a freezing danger communicated by the temperature sensor the supply fan turns off for a period that enables warming up of the heat exchanger with warm extract air. After a freezing danger is no longer imminent the ventilation unit reverts to the standard operation mode.

Functions	S14
Control functions	
Unit on/off	•
Low, Medium, High speed selection	•
Filter maintenance indication	•
Alarm indication	•
Bypass control	Manual
Fan speed adjustment from 0 to 100 %	•
Additional equipment available	
Internal humidity sensor	o
Kitchen hood, CO ₂ or humidity sensor contacts (NO)	•
Fire contacts (NC)	•
Air damper contacts	•

• - available; o - option.

Technical data

Parameters	KOMFORT EC S5B270 S14	KOMFORT EC S5B270-E S14
Voltage [V/50-60 Hz]	1 ~ 230	1 ~ 230
Power [W]	162	162
Current [A]	1.2	1.2
Maximum air flow [m³/h]	300	300
RPM [min⁻¹]	3200	3200
Sound pressure level at 3 m [dBA]	34	34
Transported air temperature [°C]	-25...+50	-25...+50
Casing material	EPP	EPP
Insulation	15-26 mm, EPP	15-26 mm, EPP
Extract filter	G4	G4
Supply filter	G4 (Option: F8)	G4 (Option: F8)
Connected air duct diameter [mm]	125	125
Weight [kg]	13	13.5
Heat recovery efficiency [%]	87-98	72-94
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class for S14 automation	A+	A+
ErP	2016, 2018	2016, 2018

Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	82	65	63	65	80	74	74	68	64		
L _{WA} to supply outlet [dBA]	66	60	56	55	63	58	49	40	33		
L _{WA} to exhaust inlet [dBA]	85	64	67	71	81	77	79	75	67		
L _{WA} to exhaust outlet [dBA]	71	51	64	62	68	60	60	50	42		
L _{WA} to environment [dBA]	55	37	45	44	53	43	43	40	38	34	44

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	153	34 (44)
2	150	34 (44)
3	142	33 (43)
4	62	30 (40)
5	60	29 (39)
6	59	28 (38)
7	17	27 (37)
8	17	23 (33)
9	16	23 (33)

Calculation of the exhaust air temperature:

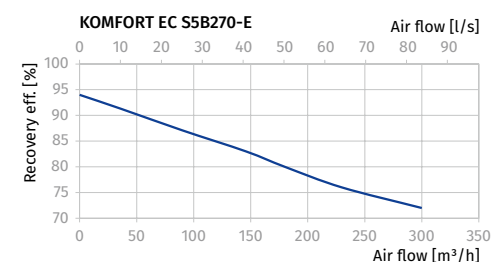
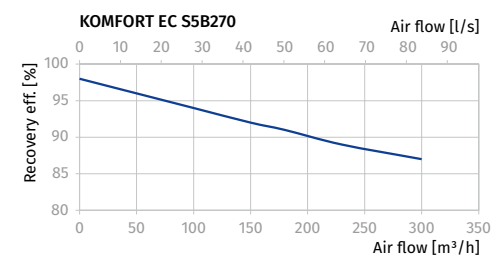
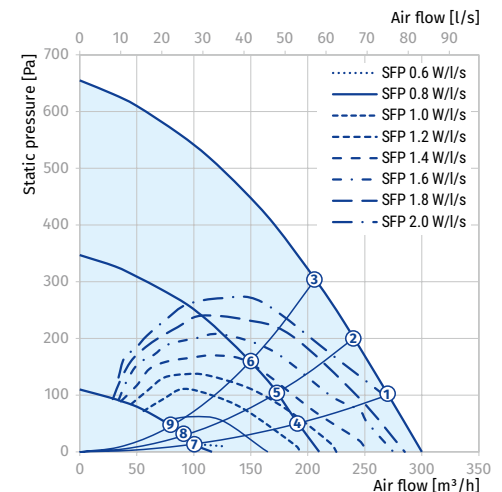
$$t = t_{\text{outd}} + k_{\text{hr}} \times (t_{\text{extr}} - t_{\text{outd}}) / 100,$$

where










t_{outd} – outdoor air temperature [°C],

t_{extr} – extract air temperature [°C],

k_{hr} – heat exchanger efficiency (according to the diagram) [%]



Accessories

		KOMFORT EC S5B270 S14	KOMFORT EC S5B270-E S14
G4 panel filter		FP 182x254x18 G4	FP 182x254x18 G4
F8 panel filter		FP 182x254x18 F8	FP 182x254x18 F8
Internal humidity sensor		FS2	FS2
External CO ₂ sensor with indication		CD-1	CD-1
External CO ₂ sensor		CD-2	CD-2
External humidity sensor		HR-S	HR-S
Syphon kit		SFK 20x32	SFK 20x32
Air damper		VKA 125	VKA 125
Electric actuator		LF230	LF230

KOMFORT EC D5B180(-E)

Heat and energy recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery minimizes ventilation heat losses during cold season and reduce air conditioner load during hot season.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø150 mm air ducts.



Air flow:
up to 220 m³/h
61 l/s



Heat recovery efficiency:
up to 98 %



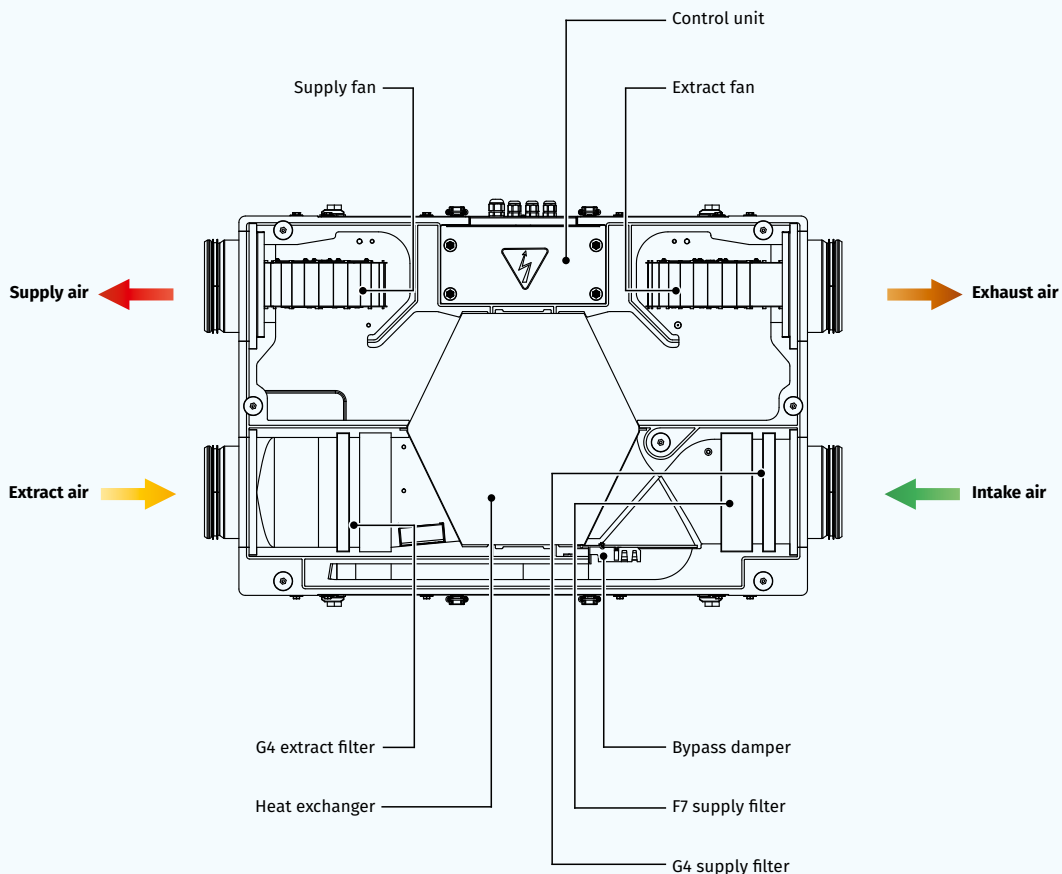
Design

- The casing is made of expanded polypropylene (EPP) 15-30 mm thickness with high heat- and sound-insulating properties.

Fans

- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.

- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.



Air filtration

- The built-in F7 and G4 supply filters provide efficient air filtration. The built-in G4 extract filter provides extract air filtration.

Heat recovery

- KOMFORT EC D5B150** units have a counter-flow polystyrene heat exchanger. In the cold season the extract air heat energy is absorbed by the cold intake air and the ventilation heat losses are minimized. The condensate produced by heat recovery is collected in a drain pan and drained to the sewage system. In the warm season the heat of the outside air is absorbed by the exhaust air. This way the supply air is pre-cooled and operation load for air conditioners is reduced.



- KOMFORT EC D5B150-E** units have a counter-flow enthalpy membrane heat exchanger. In the cold season the heat and moisture contained in the extract air are transferred to the intake air flow through the enthalpy membrane. This way the ventilation heat losses are minimized. In the warm season the heat and moisture of the outside air are absorbed by the exhaust air through the enthalpy membrane. This way the supply air is pre-cooled and dehumidified and operation load for air conditioners is reduced.



Bypass

- The **KOMFORT EC D5B180(-E)** models are equipped with a bypass which can be opened if there is a need to cool down the ventilated area with cool intake air.

Mounting

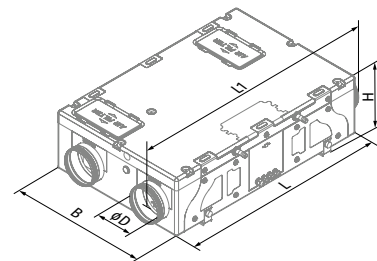
- The units are designed for suspended ceiling mounting, vertical or horizontal wall mounting.
- The correct mounted unit must provide good access for servicing and filter replacement.

Designation key

Serie	Motor type	Mounting type	Casing modification	Bypass	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	EC: electronically commutated motor	D: Suspended mounting, horizontally oriented spigots	5: EPP	B: integrated bypass	180	-: heat recovery -E: energy recovery	S14: sensor control panel with LED indication

Overall dimensions [mm]

Model	D	B	H	L	L1
KOMFORT EC D5B180(-E)	150	600	264	900	1009



Control and automation

- KOMFORT EC D5B180(-E) S14** have an integrated control panel with sensor buttons and LED indication.

FREEZE PROTECTION

- The freeze protection is based on shutdown of the supply fan. In case of a freezing danger communicated by the temperature sensor the supply fan turns off for a period that enables warming up of the heat exchanger with warm extract air. After a freezing danger is no longer imminent the ventilation unit reverts to the standard operation mode.

Functions	S14	
-----------	-----	--

Control functions

Unit on/off	•
Low, Medium, High speed selection	•
Filter maintenance indication	•
Alarm indication	•
Bypass control	Manual
Fan speed adjustment from 0 to 100 %	•

Additional equipment available

Internal humidity sensor	o
Kitchen hood, CO ₂ or humidity sensor contacts (NO)	•
Fire contacts (NC)	•
Air damper contacts	•

• - available; o - option.

Technical data

Parameters	KOMFORT EC D5B180 S14	KOMFORT EC D5B180-E S14
Voltage [V/50-60 Hz]	1~ 230	1~ 230
Power [W]	87	87
Current [A]	0,71	0,71
Maximum air flow [m³/h]	220	220
RPM [min ⁻¹]	2200	2200
Sound pressure level at 3 m [dBA]	33	33
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	EPP	EPP
Insulation	15-30 mm, EPP	15-30 mm, EPP
Extract filter	G4	G4
Supply filter	G4, F7	G4, F7
Connected air duct diameter [mm]	150	150
Weight [kg]	14	14
Heat recovery efficiency [%]	88-98	79-94
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class for S14 automation	A+	A+
ErP	2016, 2018	2016, 2018

Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	59	27	46	54	55	53	48	44	35		
L _{WA} to supply outlet [dBA]	60	27	46	54	55	53	49	44	35		
L _{WA} to exhaust inlet [dBA]	55	25	41	50	51	44	42	39	30		
L _{WA} to exhaust outlet [dBA]	55	26	41	51	51	44	42	39	31		
L _{WA} to environment [dBA]	54	18	36	47	49	48	43	37	33	33	43

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	77	33 (43)
2	64	33 (43)
3	53	32 (42)
4	31	29 (39)
5	30	28 (38)
6	26	27 (37)
7	14	23 (33)
8	13	21 (31)
9	12	19 (29)

Calculation of the exhaust air temperature:

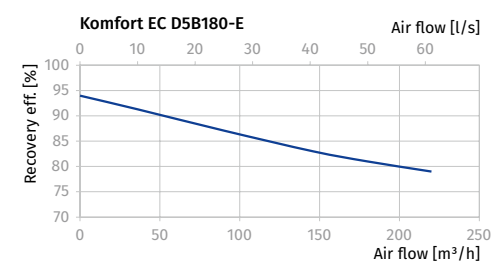
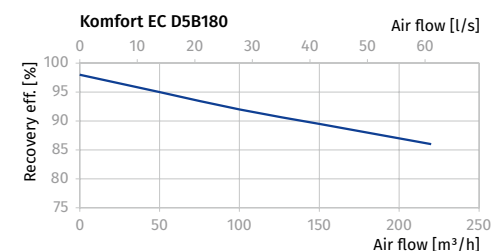
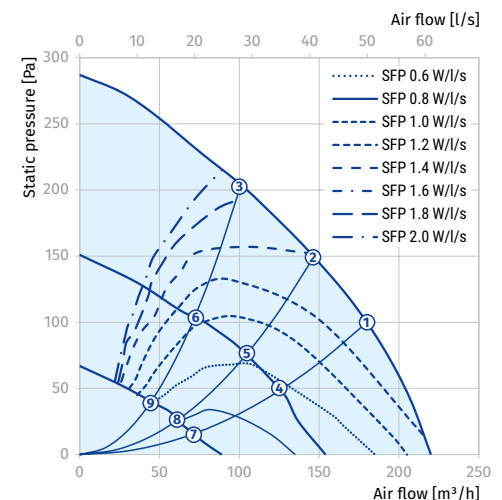
$$t = t_{\text{outd}} + k_{\text{hr}} \times (t_{\text{extr}} - t_{\text{outd}}) / 100,$$

where










t_{outd} – outdoor air temperature [°C],

t_{extr} – extract air temperature [°C],

k_{hr} – heat exchanger efficiency (according to the diagram) [%]



Accessories

		KOMFORT EC D5B180 S14	KOMFORT EC D5B180-E S14
G4 panel filter		FP 186x214x18 G4	FP 186x214x18 G4
F7 panel filter		FP 186x214x48 F7	FP 186x214x48 F7
Internal humidity sensor		FS2	FS2
External CO ₂ sensor with indication		CD-2	CD-2
External CO ₂ sensor		CD-1	CD-1
External humidity sensor		HR-S	HR-S
Syphon kit		SFK 20x32	SFK 20x32
Air damper		VKA 150	VKA 150
Electric actuator		LF230	LF230

KOMFORT EC S(B)(-E)

Heat and energy recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery minimizes ventilation heat losses during cold season and reduce air conditioner load during hot season.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125, 160, 200 mm air ducts.



Air flow:
up to 750 m³/h
208 l/s



Heat recovery efficiency:
up to 98 %



Design

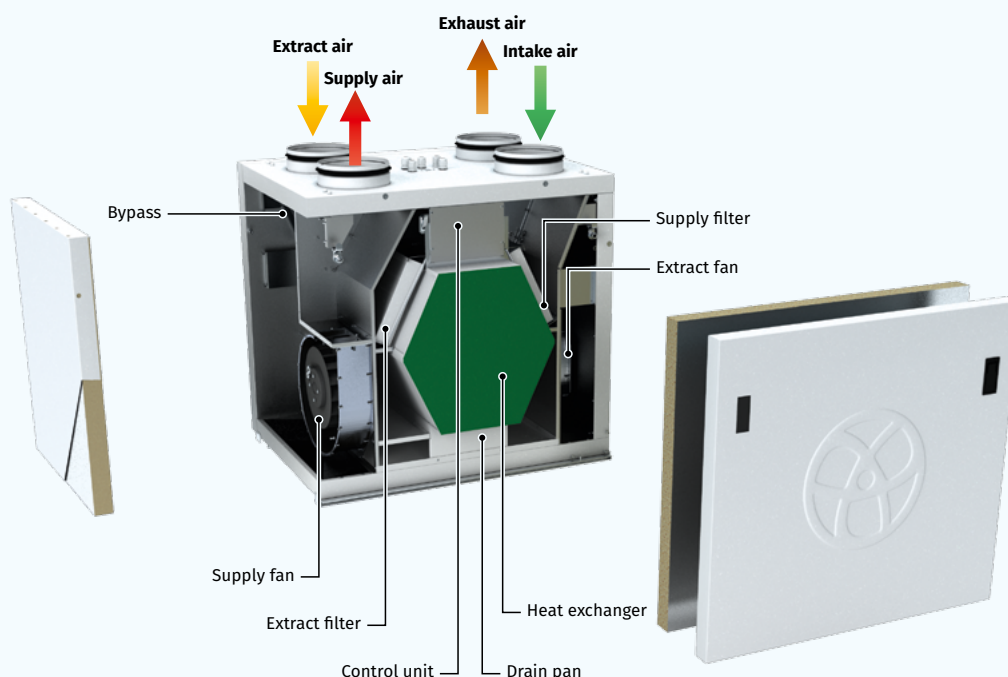
- The casing made of high-quality polymer coated steel, internally filled with a heat- and sound-insulated layer of mineral wool.
- The spigots are located at the top of the unit, and are rubber sealed for airtight connection to the air ducts.
- Depending on model, the units are equipped with either hinged service panel for easy maintenance operations or separate access for quick filter replacement (**KOMFORT EC S(B)200(-E)**, **KOMFORT EC S(B)250(-E)**).

Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

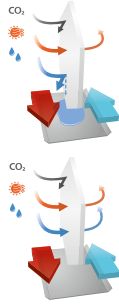
Air filtration

- The built-in F7 supply filter and G4 extract filter provide efficient air filtration.
- **KOMFORT EC S(B)200(-E)** units are equipped with G3 supply and extract filters.
- **KOMFORT EC S(B)250(-E)** units are equipped with G4 and F7 filters for supply and G4 filters for extract.



Heat recovery

- o The **KOMFORT EC S(B)** units have a counter-flow polystyrene heat exchanger that recovers heat.
- o The **KOMFORT EC S(B) -E** units have a counter-flow enthalpy membrane heat exchanger that recovers heat and humidity.
- o Due to humidity recovery the enthalpy heat exchanger produces no condensate.
- o The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- o Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In the cold season supply air is heated in the heat exchanger by transferring the heat energy of warm and humid extract air to the cold fresh air. Heat recovery minimizes heat losses, which reduces the cost of space heating.
- o In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cooled extract air. This reduces load on air conditioners and saves electricity.



FROST PROTECTION

- o The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. Depending on the model either supply fan stop and/or electrical preheating freezing protection is available.

Bypass

- o The **KOMFORT EC SB and KOMFORT EC SB...-E** models are equipped with a 100 % bypass which can be opened if there is a need to cool down the ventilated area with cool intake air.

Control and automation

- o **KOMFORT EC S S11 / KOMFORT EC SB S11** units incorporate an integrated control system with the S11 wall-mounted control panel with an LCD display.



- o **KOMFORT EC S S14 / KOMFORT EC SB S14** units incorporate an integrated control system with the S14 wall-mounted control panel with a LED indication. The units are equipped with the Type B USB Connector for advanced options setting in a special software. The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- o **S11 automation functions:**
 - Activating/deactivating the unit.
 - Setting required supply and extract fan speed for the unit air flow control. Each speed is individually adjusted during set-up.
 - Automatic bypass damper opening / closing for summer ventilation.
 - Setting and maintaining room or duct air temperature.
 - Timer turning on/off and timer operation adjustment.
 - Setting day- and week-scheduled operation of the unit.
 - Operation control on feedback from FS1 duct humidity sensor (available separately) or from the humidity sensor in the control panel.
 - Filter clogging indication by motor meter.
 - System shutdown on signal from a fire alarm panel.
 - Controlling supply and exhaust air dampers (available separately).
 - Alarm indication with an error code indication.
 - Cooler control (to be ordered separately).
- o **S14 automation functions:**
 - Activating/deactivating the unit.
 - Air flow control (selecting low, medium or high speed).
 - Bypass damper opening/closing for summer ventilation.
 - Alarm indication.
 - Filter maintenance indication.
- o **Extra functions of the S14 automation with the installed software:**
 - Fan speed control from 0 to 100 %. Each speed is individually adjusted for the supply and the exhaust fans.
 - Operation control on feedback from FS2 duct humidity sensor or any other optionally connected sensor as CO₂ sensor, IAQ sensor, etc. (not included in the delivery set).
 - Unit operation setting according to external control unit (available as a specially ordered accessory).
 - Temperature setting for freeze protection system activation.
 - Control and operation adjustment of the filter maintenance timer.
 - Error code indication.
 - Remote control unit, bypass and humidity control.
 - Software version upgrading.



Mounting

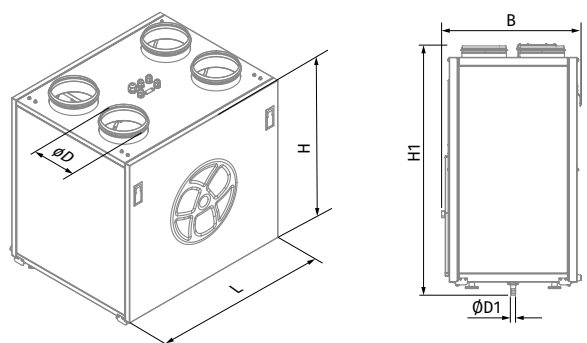
- o The units are designed for wall and floor mounting.
- o The access for unit and filter maintenance is available from the front panel.
- o During mounting stage the front and the back panels can be reversed providing either left-handed or right-handed unit mounting.

Designation key

Serie	Motor type	Spigot modification	Casing modification	Bypass	Nominal air flow [m ³ /h]	Heat exchanger type	Control
KOMFORT	EC: electronically commutated motor	S: vertical spigot orientation	_: standard 2: insulation 20 mm	_: no bypass B: integrated bypass	160; 200; 250; 300; 350; 550	_: heat recovery -E: energy recovery	S11: sensor LCD control panel S14: sensor control panel with LED indication

Overall dimensions [mm]

Model	D	D1	B	H	H1	L
KOMFORT EC S160(-E)	124	18	348	550	650	600
KOMFORT EC SB160(-E)	124	18	348	580	690	600
KOMFORT EC S(B)200(-E)	124	18	326	771	858	564
KOMFORT EC S(B)250(-E)	159	18	489	788	881	567
KOMFORT EC S2B300(-E)	159	18	465	634	737	735
KOMFORT EC SB350(-E)	159	18	610	675	758	730
KOMFORT EC SB550(-E)	198	18	741	675	758	828
KOMFORT EC S2B550(-E)	198	18	566	634	737	810



Technical data

Parameters	KOMFORT EC S160	KOMFORT EC S160-E	KOMFORT EC SB160	KOMFORT EC SB160-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	51	51	51	51
Current [A]	0.4	0.4	0.4	0.4
Maximum air flow [m ³ /h (l/s)]	180 (50)	180 (50)	180 (50)	180 (50)
RPM [min ⁻¹]	3770	3770	3770	3770
Sound pressure level at 3 m [dBA]	24	24	24	24
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel
Insulation	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	F7 (G4 optional)	F7 (G4 optional)	F7 (G4 optional)	F7 (G4 optional)
Connected air duct diameter [mm]	125	125	125	125
Weight [kg]	42	42	44	44
Heat recovery efficiency [%]	88-98	80-94	88-98	80-94
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane	polystyrene	enthalpy membrane
SEC class	A+	A+	A+	A+
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018

KOMFORT EC S(B)160(-E)

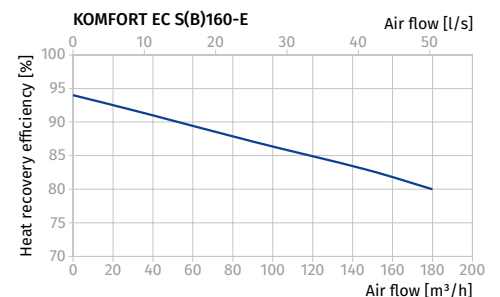
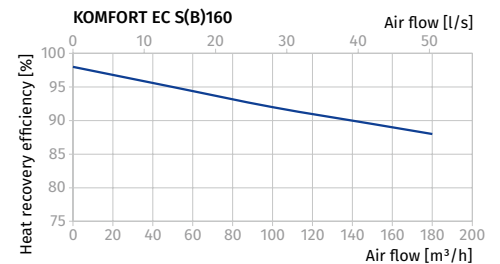
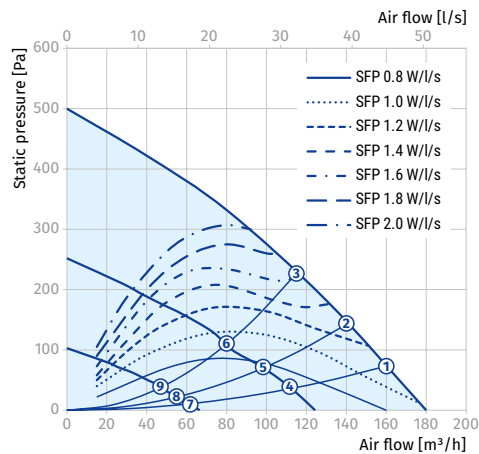
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply air inlet [dBA]	52	28	46	49	41	35	33	36	29		
L _{WA} to supply air outlet [dBA]	60	32	52	58	47	37	36	41	35		
L _{WA} to exhaust air inlet [dBA]	51	27	45	49	41	36	32	35	29		
L _{WA} to exhaust air outlet [dBA]	60	31	50	59	48	36	36	41	32		
L _{WA} surrounding [dBA]	45	25	41	42	34	31	28	27	22	24	34

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	50	24 (34)
2	51	23 (33)
3	50	23 (33)
4	22	20 (30)
5	22	20 (30)
6	21	20 (30)
7	9	13 (23)
8	9	13 (23)
9	9	13 (23)


Calculation of the exhaust air temperature:

$$t = t_{\text{outd}} + k_{\text{hr}} \times (t_{\text{extr}} - t_{\text{outd}}) / 100,$$

where

t_{outd} – outdoor air temperature [°C],
 t_{extr} – extract air temperature [°C],
 k_{hr} – heat exchanger efficiency (according to the diagram) [%]

Parameters	KOMFORT EC S200	KOMFORT EC S200-E	KOMFORT EC SB200	KOMFORT EC SB200-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	130	130	130	130
Current [A]	1.0	1.0	1.0	1.0
Maximum air flow [m³/h (l/s)]	260 (72)	260 (72)	260 (72)	260 (72)
RPM [min⁻¹]	2050	2050	2050	2050
Sound pressure level at 3 m [dBA]	24	24	24	24
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel
Insulation	25 mm mineral wool	25 mm mineral wool	25 mm mineral wool	25 mm mineral wool
Extract filter	G3	G3	G3	G3
Supply filter	G3	G3	G3	G3
Connected air duct diameter [mm]	125	125	125	125
Weight [kg]	45	45	45	45
Heat recovery efficiency [%]	83-98	74-94	83-98	74-94
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane	polystyrene	enthalpy membrane
SEC class	A+	A	A+	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018

KOMFORT EC S(B)200(-E)

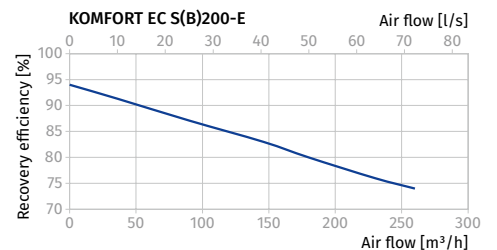
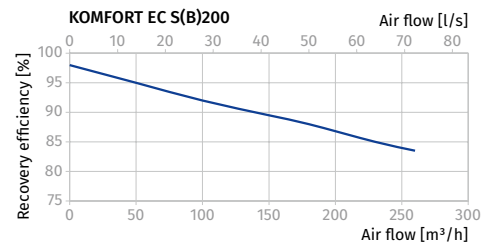
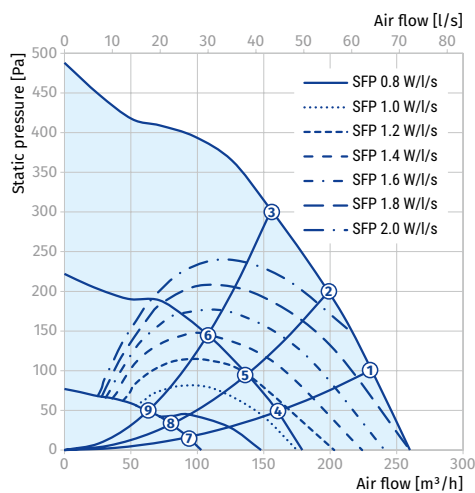
Sound power level, A-filter applied

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply air inlet [dBA]	51	28	46	49	41	35	33	36	29		
LWA to supply air outlet [dBA]	60	32	52	58	47	37	36	41	35		
LWA to exhaust air inlet [dBA]	51	27	44	49	41	35	32	34	29		
LWA to exhaust air outlet [dBA]	60	31	50	59	48	36	36	41	32		
LWA surrounding [dBA]	44	24	40	41	34	31	27	26	22	24	34

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	124	24 (34)
2	115	23 (33)
3	106	23 (33)
4	50	19 (29)
5	47	18 (28)
6	40	18 (28)
7	17	12 (22)
8	16	12 (22)
9	9	13 (23)



BRE.

Exhaust terminal configuration	Air flow rate [l/s]	Specific fan power [W/l/s]	Heat exchange efficiency [%]
Kitchen + 1 additional wet room	21	0.67	87
Kitchen + 2 additional wet rooms	29	0.69	85
Kitchen + 3 additional wet rooms	37	0.88	84
Kitchen + 4 additional wet rooms	45	1.13	83
Kitchen + 5 additional wet rooms	53	1.37	83

Parameters	KOMFORT EC S250	KOMFORT EC S250-E	KOMFORT EC SB250	KOMFORT EC SB250-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	101	101	101	101
Current [A]	0.81	0.81	0.81	0.81
Maximum air flow [m ³ /h (l/s)]	290 (81)	290 (81)	290 (81)	290 (81)
RPM [min ⁻¹]	2050	2050	2050	2050
Sound pressure level at 3 m [dBA]	25	25	25	25
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel
Insulation	30 mm mineral wool	30 mm mineral wool	30 mm mineral wool	30 mm mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4, F7	G4, F7	G4, F7	G4, F7
Connected air duct diameter [mm]	160	160	160	160
Weight [kg]	51	51	51	51
Heat recovery efficiency [%]	85-94	77-90	85-94	77-90
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane	polystyrene	enthalpy membrane
SEC class	A+	A	A+	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018

KOMFORT EC S(B)250(-E)

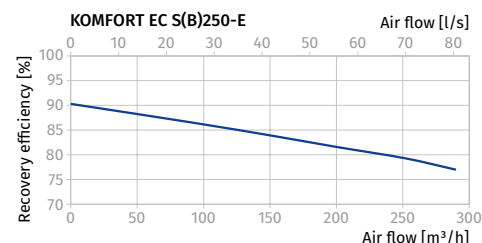
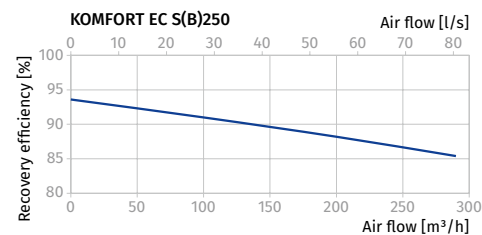
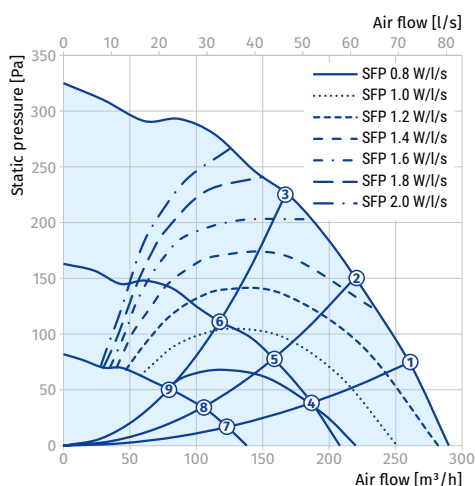
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply air inlet [dBA]	52	28	46	50	41	36	33	36	29		
L _{WA} to supply air outlet [dBA]	61	33	53	60	48	38	37	43	36		
L _{WA} to exhaust air inlet [dBA]	52	28	46	50	42	36	33	35	30		
L _{WA} to exhaust air outlet [dBA]	62	32	51	61	49	37	37	42	33		
L _{WA} surrounding [dBA]	45	25	41	42	35	32	28	27	22	25	35

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	96	25 (35)
2	91	24 (34)
3	77	24 (34)
4	42	20 (30)
5	39	19 (29)
6	34	19 (29)
7	21	13 (23)
8	19	12 (22)
9	17	12 (22)



BRE.

Exhaust terminal configuration	Air flow rate [l/s]	Specific fan power [W/l/s]	Heat exchange efficiency [%]
Kitchen + 1 additional wet room	21	0.65	92
Kitchen + 2 additional wet rooms	29	0.68	91
Kitchen + 3 additional wet rooms	37	0.77	90
Kitchen + 4 additional wet rooms	45	0.94	89
Kitchen + 5 additional wet rooms	53	1.12	88
Kitchen + 6 additional wet rooms	61	1.35	87
Kitchen + 7 additional wet rooms	69	1.70	86

Parameters	KOMFORT EC S2B300	KOMFORT EC S2B300-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	170	170
Current [A]	1.3	1.3
Maximum air flow [m³/h (l/s)]	330 (92)	330 (92)
RPM [min⁻¹]	3200	3200
Sound pressure level at 3 m [dBA]	30	30
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	20 mm mineral wool	20 mm mineral wool
Extract filter	G4	G4
Supply filter	F7 (G4 optional)	F7 (G4 optional)
Connected air duct diameter [mm]	160	160
Weight [kg]	53	53
Heat recovery efficiency [%]	85-93	76-90
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class	A+	A
ErP	2016, 2018	2016, 2018

KOMFORT EC S2B300(-E)

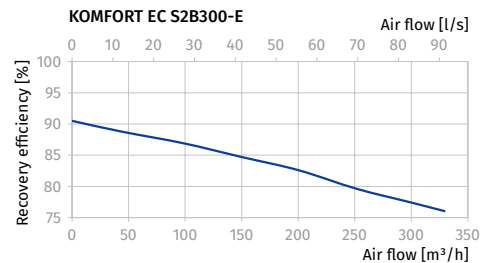
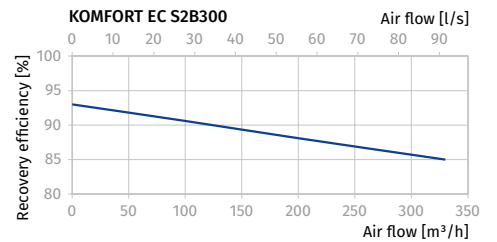
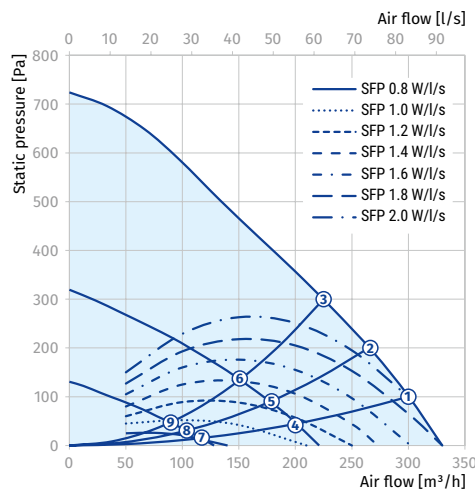
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply air inlet [dBA]	55	51	45	51	44	37	33	35	30		
L _{WA} to supply air outlet [dBA]	65	59	54	63	52	41	39	43	34		
L _{WA} to exhaust air inlet [dBA]	55	50	45	51	44	37	33	35	31		
L _{WA} to exhaust air outlet [dBA]	66	57	53	64	53	39	38	43	35		
L _{WA} surrounding [dBA]	51	46	41	47	41	35	31	27	23	30	40

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1m) [dBA]
1	146	30 (40)
2	143	29 (39)
3	139	29 (39)
4	60	25 (35)
5	59	24 (34)
6	56	24 (34)
7	25	17 (27)
8	25	16 (26)
9	24	16 (26)



Parameters	KOMFORT EC SB350	KOMFORT EC SB350-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	170	170
Current [A]	1.3	1.3
Maximum air flow [m ³ /h (l/s)]	415 (115)	415 (115)
RPM [min ⁻¹]	3200	3200
Sound pressure level at 3 m [dBA]	28	28
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4
Supply filter	F7 (G4 optional)	F7 (G4 optional)
Connected air duct diameter [mm]	160	160
Weight [kg]	66	66
Heat recovery efficiency [%]	80-89	76-89
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class	A+	A
ErP	2016, 2018	2016, 2018

KOMFORT EC SB350(-E)

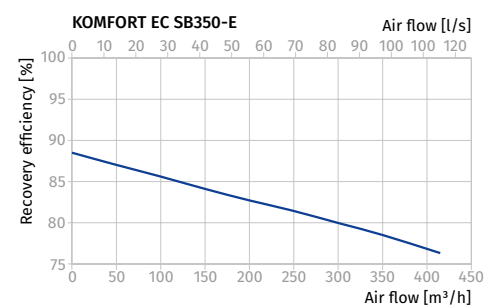
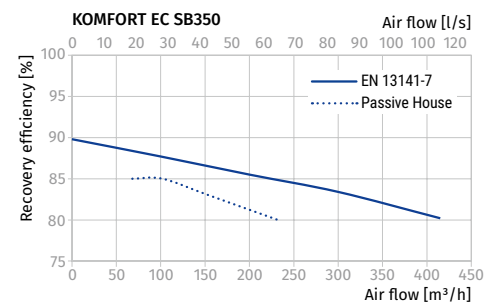
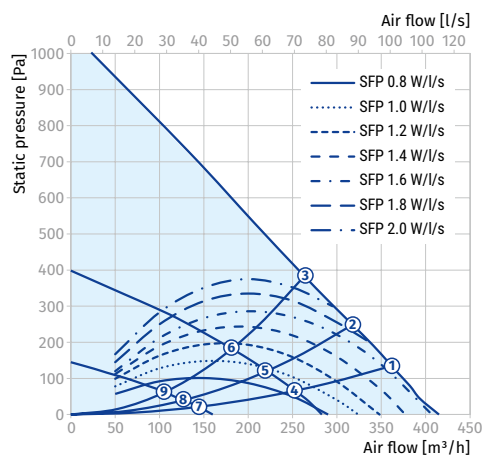
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply air inlet [dBA]	56	50	46	53	45	39	34	36	32		
L _{WA} to supply air outlet [dBA]	64	56	52	63	52	39	38	43	35		
L _{WA} to exhaust air inlet [dBA]	56	52	46	53	45	38	34	36	31		
L _{WA} to exhaust air outlet [dBA]	64	58	53	62	51	40	38	42	33		
L _{WA} surrounding [dBA]	49	45	40	44	38	33	29	27	22	28	38

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	165	28 (38)
2	165	27 (37)
3	165	27 (37)
4	63	23 (33)
5	62	22 (32)
6	60	22 (32)
7	21	15 (25)
8	20	14 (24)
9	20	14 (24)



KOMFORT EC SB350

Parameters	KOMFORT EC SB550	KOMFORT EC SB550-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	333	333
Current [A]	2.3	2.3
Maximum air flow [m³/h (l/s)]	750 (208)	750 (208)
RPM [min⁻¹]	3230	3230
Sound pressure level at 3 m [dBA]	26	26
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4
Supply filter	F7 (G4 optional)	F7 (G4 optional)
Connected air duct diameter [mm]	200	200
Weight [kg]	83	83
Heat recovery efficiency [%]	85-88	72-92
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class	A+	A
ErP	2016, 2018	2016, 2018

KOMFORT EC SB550(-E)

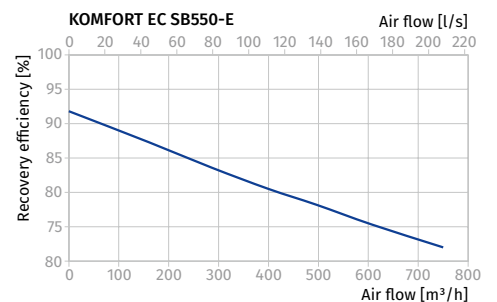
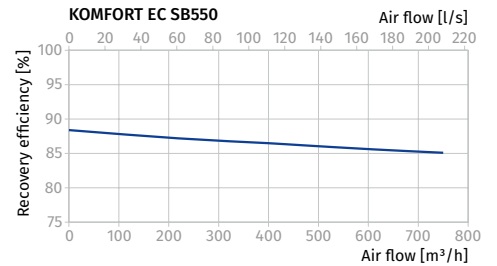
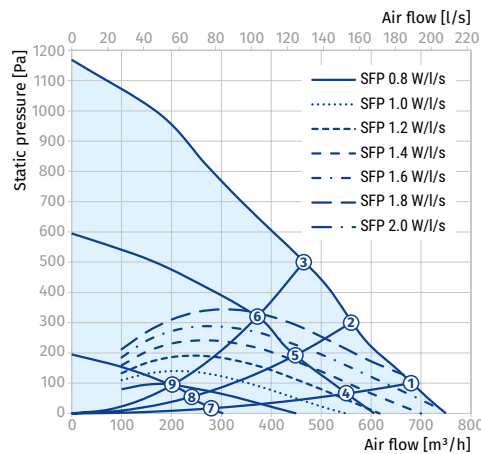
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply air inlet [dBA]	54	47	42	50	44	41	39	39	31		
LWA to supply air outlet [dBA]	69	63	56	65	59	55	50	52	46		
LWA to exhaust air inlet [dBA]	54	47	41	51	43	33	31	34	30		
LWA to exhaust air outlet [dBA]	65	61	50	61	55	46	43	46	40		
LWA surrounding [dBA]	47	42	37	43	36	31	28	26	21	26	36

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1m) [dBA]
1	332	26 (36)
2	331	26 (36)
3	332	25 (35)
4	133	24 (34)
5	129	24 (34)
6	126	22 (32)
7	32	15 (25)
8	31	14 (24)
9	30	13 (23)



Parameters	KOMFORT EC S2B550	KOMFORT EC S2B550-E
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Power [W]	370	370
Current [A]	2.5	2.5
Maximum air flow [m ³ /h (l/s)]	625 (174)	625 (174)
RPM [min ⁻¹]	3230	3230
Sound pressure level at 3 m [dBA]	30	30
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	20 mm mineral wool	20 mm mineral wool
Extract filter	G4	G4
Supply filter	F7 (G4 optional)	F7 (G4 optional)
Connected air duct diameter [mm]	200	200
Weight [kg]	62	62
Heat recovery efficiency [%]	73-88	71-88
Heat exchanger type	counter-flow	counter-flow
Heat exchanger material	polystyrene	enthalpy membrane
SEC class	A	A
ErP	2016, 2018	2016, 2018

KOMFORT EC S2B550(-E)

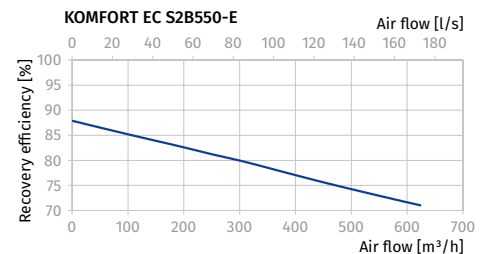
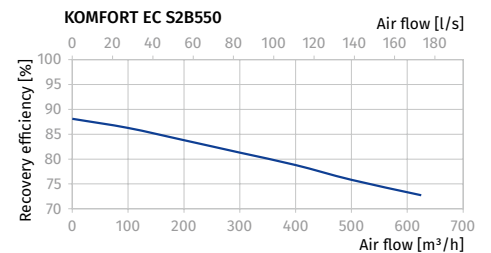
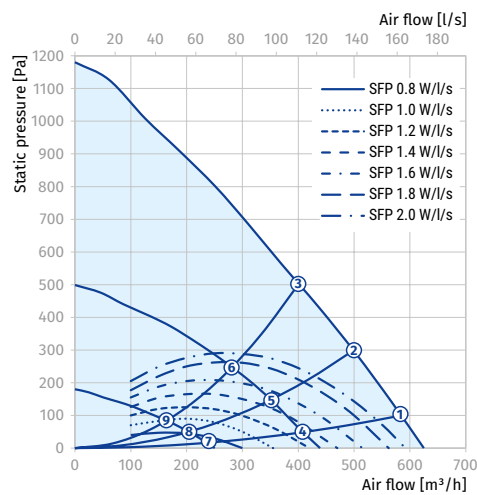
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply air inlet [dBA]	54	46	42	51	44	42	38	39	31		
L _{WA} to supply air outlet [dBA]	69	63	56	65	59	55	50	52	46		
L _{WA} to exhaust air inlet [dBA]	54	47	40	52	43	31	31	33	30		
L _{WA} to exhaust air outlet [dBA]	65	61	50	61	55	46	43	46	40		
L _{WA} surrounding [dBA]	50	45	39	47	38	34	30	30	25	30	40

* Data provided for point 1 of the air flow diagram















Total power. Total sound pressure level.









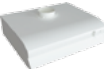




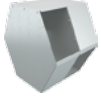
Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	369	30 (40)
2	366	30 (40)
3	360	29 (39)
4	150	25 (35)
5	148	25 (35)
6	138	24 (34)
7	48	17 (27)
8	47	17 (27)
9	46	16 (26)



Accessories

		KOMFORT EC S160(-E)		KOMFORT EC SB160(-E)		KOMFORT EC S200(-E)		KOMFORT EC SB200(-E)	
		S14	S11	S14	S11	S14	S11	S14	S11
G3 panel filter		-	-	-	-	FP 264x195x18 G3		FP 264x195x18 G3	
G4 panel filter		FP 285x195x10 G4		FP 285x195x10 G4		-	-	-	-
F7 panel filter		FP 285x195x10 F7		FP 285x195x10 F7		-	-	-	-
Internal humidity sensor		-	FS1	-	FS1	-	FS1	-	FS1
Internal humidity sensor		FS2	-	FS2	-	FS2	-	FS2	-
CO ₂ sensor with indication		CD-1	-	CD-1	-	CD-1	-	CD-1	-
CO ₂ sensor		CD-2	-	CD-2	-	CD-2	-	CD-2	-
Humidity sensor		HR-S	-	HR-S	-	HR-S	-	HR-S	-
Kitchen hood		DAH 251-13	-	DAH 251-13	-	DAH 251-13	-	DAH 251-13	-
Electrical preheater		-	EVH-125	-	EVH-125	-	EVH-125	-	EVH-125
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 125	VKA 125	VKA 125	VKA 125	VKA 125	VKA 125	VKA 125	VKA 125
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230	LF230	LF230
Summer block		SB C6 366/285		-	-	SB C6 366/240		-	-

		KOMFORT EC S250(-E)		KOMFORT EC SB250(-E)		KOMFORT EC S2B300(-E)		KOMFORT EC SB350(-E)	
		S14	S11	S14	S11	S14	S11	S14	S11
G3 panel filter		-	-	-	-	-	-	-	-
G4 panel filter		FP 417x200x18 G4		FP 417x200x18 G4		FP 400x196x40 G4		FP 500x196x40 G4	
F7 panel filter		FP 417x200x18 F7		FP 417x200x18 F7		FP 400x196x40 F7		FP 500x196x40 F7	
Internal humidity sensor		-	FS1	-	FS1	-	FS1	-	FS1
Internal humidity sensor		FS2	-	FS2	-	FS2	-	FS2	-
CO ₂ sensor with indication		CD-1	-	CD-1	-	CD-1	-	CD-1	-
CO ₂ sensor		CD-2	-	CD-2	-	CD-2	-	CD-2	-
Humidity sensor		HR-S	-	HR-S	-	HR-S	-	HR-S	-
Kitchen hood		DAH 251-13	-	DAH 251-13	-	DAH 251-13	-	DAH 251-13	-
Electrical preheater		-	EVH-160	-	EVH-160	-	EVH-160	-	EVH-160
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 160	VKA 160	VKA 160	VKA 160	VKA 160	VKA 160	VKA 160	VKA 160
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230	LF230	LF230
Summer block		SB C6 366/384		-	-	-	-	-	-

		KOMFORT EC SB550(-E)		KOMFORT EC S2B550(-E)	
		S14	S11	S14	S11
G3 panel filter		-	-	-	-
G4 panel filter		FP 630x198x40 G4		FP 500x196x40 G4	
F7 panel filter		FP 630x198x40 F7		FP 500x196x40 F7	
Internal humidity sensor		-	FS1	-	FS1
Internal humidity sensor		FS2	-	FS2	-
CO ₂ sensor with indication		CD-1	-	CD-1	-
CO ₂ sensor		CD-2	-	CD-2	-
Humidity sensor		HR-S	-	HR-S	-
Kitchen hood		DAH 251-13	-	DAH 251-13	-
Electrical preheater		-	EVH-200	-	EVH-200
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 200	VKA 200	VKA 200	VKA 200
Electric actuator		LF230	LF230	LF230	LF230
Summer block		-	-	-	-

KOMFORT EC DB

Suspended heat recovery air handling units

Features

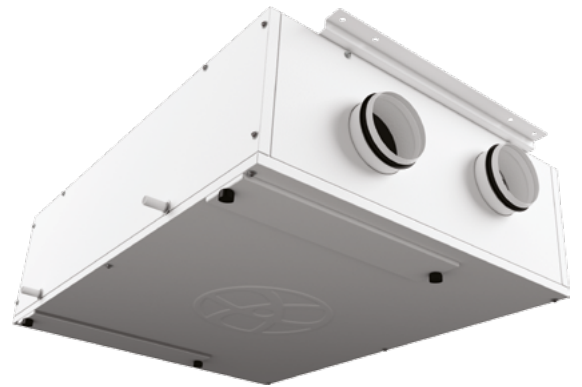
- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125 and 160 mm air ducts.



Air flow:
up to 410 m³/h
114 l/s



Heat recovery efficiency:
up to 98 %



Design

- The casing is made of double-skinned aluzinc panels, internally filled with 40 mm, mineral wool layer for heat and sound insulation.
- The panel of the casing ensures easy access to the internals for cleaning and other maintenance operations.
- The spigots for connection to the air ducts are located at the sides of the unit and are rubber sealed for airtight connection to the air ducts.

Fans

- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.

- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

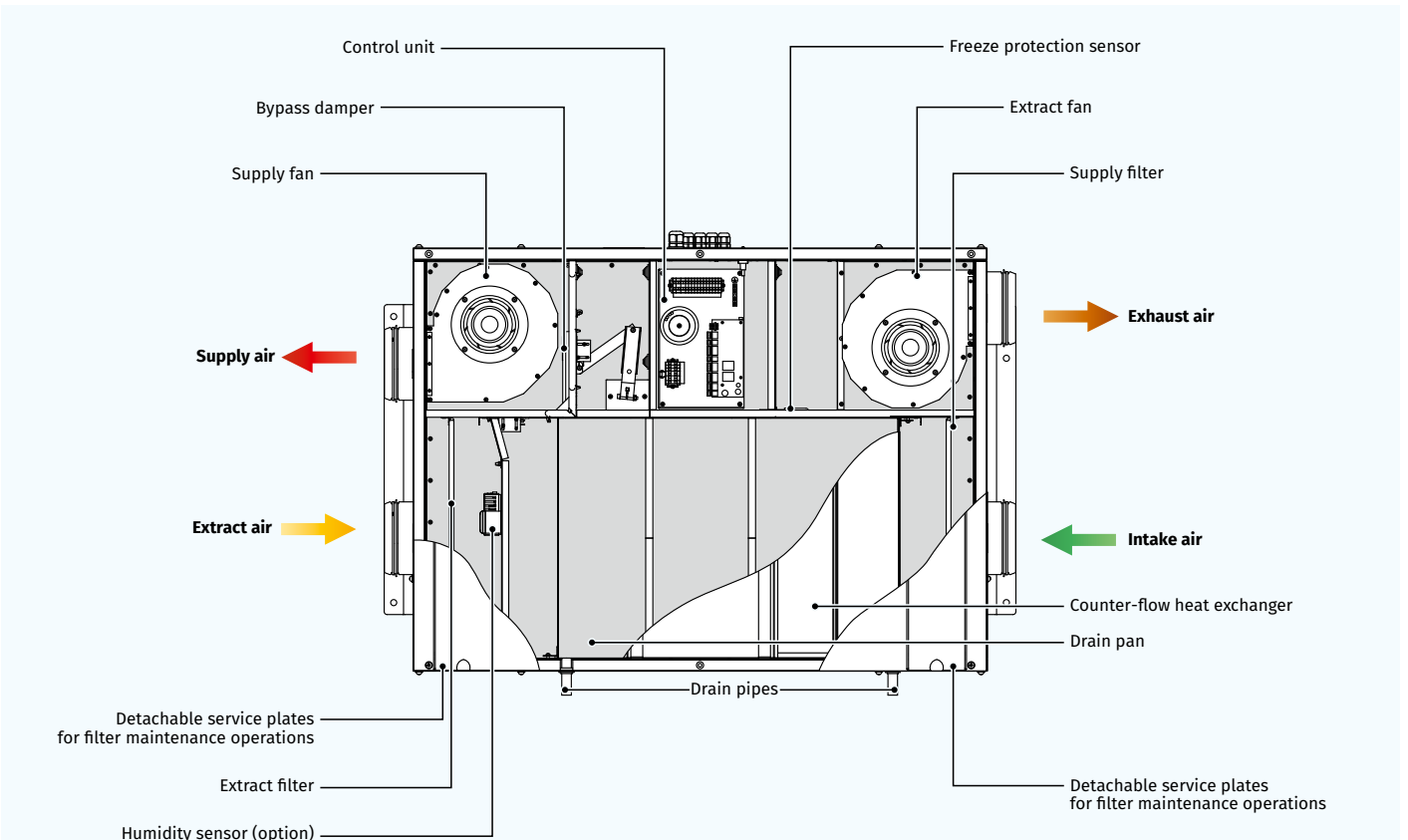
Bypass

- The units are equipped with the 100 % bypass for summer ventilation (room cooling by the cool intake air).

Air filtration

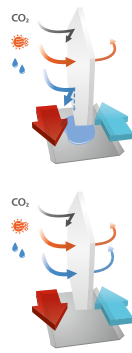
- The built-in F7 supply filter provides efficient supply air filtration.
- The built-in G4 extract filter provides extract air filtration.

HEAT RECOVERY AIR HANDLING UNITS



Heat recovery

- The units are equipped with a plate counter-flow aluminium heat exchanger with a high heat recovery efficiency.
- Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up the supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and transfers a part of the accumulated coolness from the cooled extract air for warming up the intake air. This contributes to better performance of air conditioners in ventilated premises.
- The drain pan under the heat exchanger block is used for condensate collection and drainage. The drain pan is fitted with drain pipes for condensate removal.
- The electronic freeze protection system is used to prevent the heat exchanger freezing in cold seasons. In case of a freezing danger registered by the temperature sensor the supply fan turns off to let the heat exchanger surface get warmed up with warm extract air flow. After a freezing danger is over the supply fan is turned on and the unit reverts to the standard operation mode.



Control and automation

- KOMFORT EC DB S11** units incorporate an integrated control system with the S11 wall-mounted control panel with an LCD display.
- KOMFORT EC DB S14** units incorporate an integrated control system with the S14 wall-mounted control panel with a LED indication. The units are equipped with the Type B USB Connector for advanced options setting in a special software.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.



- S11 automation functions:**
 - Activating / deactivating the unit.
 - Setting required supply and extract fan speed for the unit air flow control. Each speed is individually adjusted during set-up.
 - Bypass damper opening / closing for summer ventilation.
 - Setting and maintaining room or duct air temperature.
 - Timer turning on/off and timer operation adjustment.
 - Setting day- and week-scheduled operation of the unit.
 - Operation control on feedback from FS1 duct humidity sensor (to be ordered separately) or from the humidity sensor in the control panel.
 - Filter clogging indication by motor meter.
 - System shutdown on signal from a fire alarm panel.
 - Controlling supply and exhaust air dampers (to be ordered separately).
 - Alarm indication with an error code indication.
 - Cooler control (to be ordered separately).
- S14 automation functions:**
 - Activating / deactivating the unit.
 - Air flow control (selecting low, medium or high speed).
 - Bypass damper opening / closing for summer ventilation.
 - Alarm indication.
 - Filter maintenance indication.
- Extra functions of the S14 automation with the installed software:**
 - Fan speed adjustment from 0 to 100 %. Each speed is individually adjusted for the supply and the exhaust fans.
 - Operation control on feedback from FS2 duct humidity sensor (to be ordered separately).
 - Unit operation setting according to external control unit (to be ordered separately).
 - Temperature setting for freeze protection system activation.
 - Control and operation adjustment of the filter maintenance timer.
 - Error code indication.
 - External control unit, bypass and humidity level control.
 - Software version upgrading.

Mounting

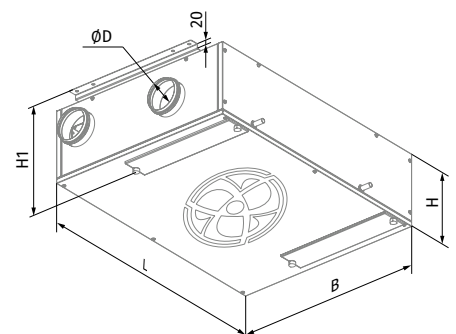
- The units are designed for ceiling or wall mounting, with the spigots upwards.
- The mounting place must provide enough space for connection to drain system and condensate drainage using the KIT SFK 20x32 kit (to be ordered separately).

Designation key

Serie	Motor type	Mounting type	Bypass	Nominal air flow [m³/h]	Control
KOMFORT	EC: electronically commutated motor	D: suspended mounting, horizontally oriented spigots	B: integrated bypass	160; 250; 350	S11: sensor LCD control panel S14: sensor control panel with LED indication

Overall dimensions [mm]

Model	D	B	H	H1	L
KOMFORT EC DB160	125	754	320	361	1004
KOMFORT EC DB250	125	754	320	361	1004
KOMFORT EC DB350	160	1044	320	363	1135



Technical data

Parameters	KOMFORT EC DB160	KOMFORT EC DB250	KOMFORT EC DB350
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	50	101	170
Current [A]	0.4	0.8	1.3
Maximum air flow [m ³ /h (l/s)]	190 (53)	270 (75)	410 (114)
RPM [min ⁻¹]	3770	4480	3200
Sound pressure level at 3 m [dBA]	26	28	34
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60
Casing material	galvanized steel	galvanized steel	galvanized steel
Insulation	40 mm, mineral wool	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4	G4
Supply filter	F7	F7	F7
Connected air duct diameter [mm]	125	125	160
Weight [kg]	48	48	70
Heat recovery efficiency [%]	82-94	80-98	80-91
Heat exchanger type	counter-flow	counter-flow	counter-flow
Heat exchanger material	aluminum	aluminum	aluminum
SEC class	A+	A	A
ErP	2016, 2018	2016, 2018	2016, 2018

KOMFORT EC DB160

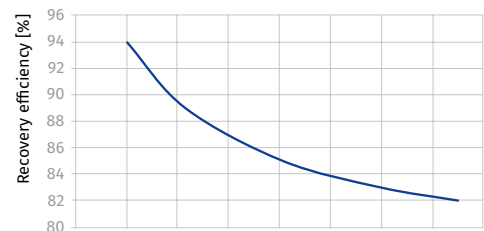
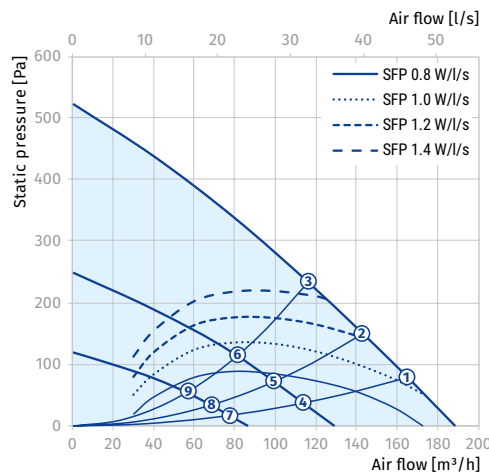
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	53	32	45	50	45	38	34	36	29		
L _{WA} to supply outlet [dBA]	61	36	51	60	52	38	39	41	33		
L _{WA} to exhaust inlet [dBA]	53	33	45	50	45	38	34	35	31		
L _{WA} to exhaust outlet [dBA]	61	37	51	59	54	41	40	41	33		
L _{WA} to environment [dBA]	47	29	41	44	37	34	28	27	23	26	36

* Data provided for point 1 of the air flow diagram

Total power, sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) distance [dBA]
1	49	26 (36)
2	49	26 (36)
3	48	25 (35)
4	21	22 (32)
5	21	22 (32)
6	20	21 (31)
7	8	19 (29)
8	8	18 (28)
9	8	18 (28)



KOMFORT EC DB250

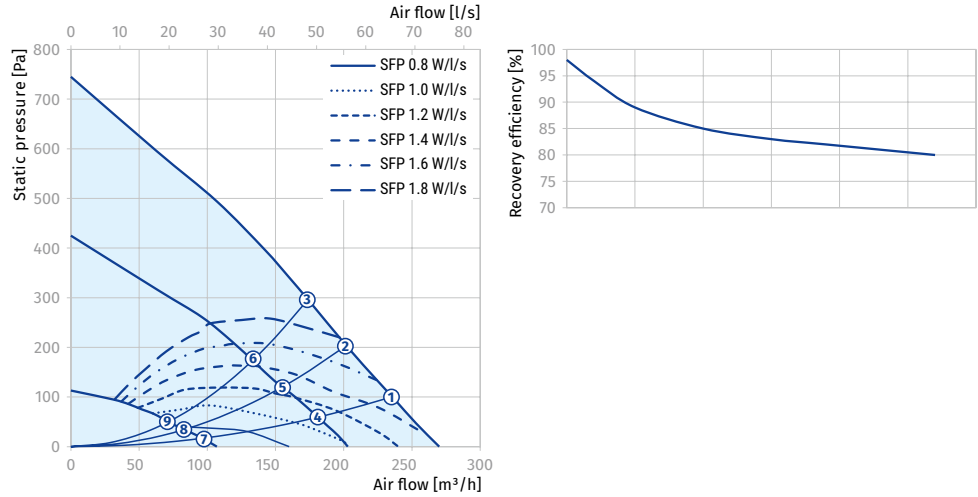
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	55	51	45	51	44	37	33	35	30		
LWA to supply outlet [dBA]	65	59	54	63	52	41	39	43	34		
LWA to exhaust inlet [dBA]	55	50	45	51	44	37	33	35	31		
LWA to exhaust outlet [dBA]	66	57	53	64	53	39	38	43	35		
LWA to environment [dBA]	49	45	40	44	38	33	29	27	22	28	38

* Data provided for point 1 of the air flow diagram

Total power, sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) distance [dBA]
1	100	28 (38)
2	99	27 (37)
3	98	27 (37)
4	55	23 (33)
5	54	22 (32)
6	54	22 (32)
7	17	15 (25)
8	17	14 (24)
9	16	14 (24)



KOMFORT EC DB350

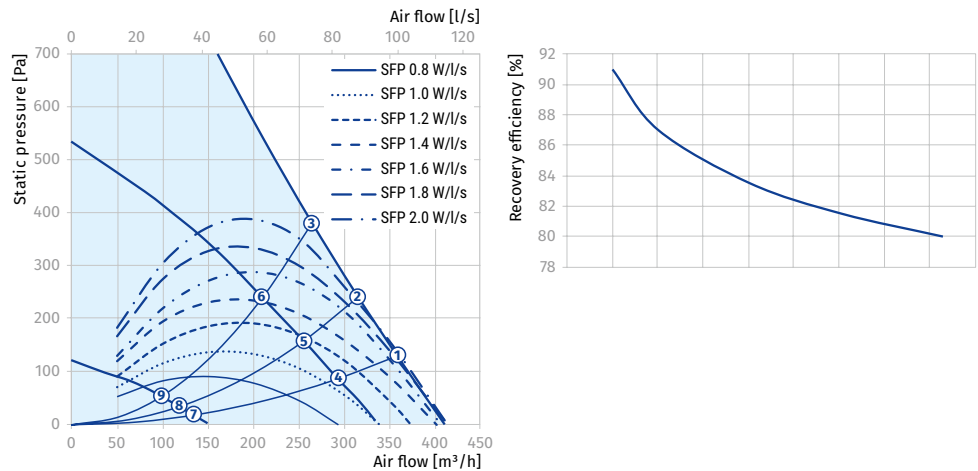
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	60	46	54	58	50	46	40	40	31		
LWA to supply outlet [dBA]	63	52	58	60	54	46	40	41	35		
LWA to exhaust inlet [dBA]	61	47	54	58	50	47	41	41	32		
LWA to exhaust outlet [dBA]	63	51	58	59	56	46	40	41	35		
LWA to environment [dBA]	55	44	51	51	43	38	32	28	24	34	44

* Data provided for point 1 of the air flow diagram












Total power, sound pressure level.












Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) distance [dBA]
1	169	34 (44)
2	169	34 (44)
3	169	33 (43)
4	87	28 (38)
5	86	28 (38)
6	84	27 (37)
7	20	22 (32)
8	19	22 (32)
9	19	21 (31)



HEAT RECOVERY AIR HANDLING UNITS

Accessories

		KOMFORT EC DB160 S11	KOMFORT EC DB160 S14	KOMFORT EC DB250 S11	KOMFORT EC DB250 S14
G4 panel filter		FP 253x403x48 G4	FP 253x403x48 G4	FP 253x403x48 G4	FP 253x403x48 G4
F7 panel filter		FP 253x403x48 F7	FP 253x403x48 F7	FP 253x403x48 F7	FP 253x403x48 F7
Internal humidity sensor		FS1	-	FS1	-
Internal humidity sensor		-	FS2	-	FS2
CO ₂ sensor with indication		-	CD-1	-	CD-1
CO ₂ sensor		-	CD-2	-	CD-2
Humidity sensor		-	HR-S	-	HR-S
Electrical preheater		EVH-125	-	EVH-125	-
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 125	VKA 125	VKA 125	VKA 125
Electric actuator		LF230	LF230	LF230	LF230

		KOMFORT EC DB350 S11	KOMFORT EC DB350 S14
G4 panel filter		FP 253x603x48 G4	FP 253x603x48 G4
F7 panel filter		FP 253x603x48 F7	FP 253x603x48 F7
Internal humidity sensor		FS1	-
Internal humidity sensor		-	FS2
CO ₂ sensor with indication		-	CD-1
CO ₂ sensor		-	CD-2
Humidity sensor		-	HR-S
Electrical preheater		EVH-160	-
Syphon kit		SFK 20x32	SFK 20x32
Air damper		VKA 160	VKA 160
Electric actuator		LF230	LF230

KOMFORT ERV EC DB S14

Suspended heat and energy recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Reduction of load on air conditioning systems in a hot climate and heat loss in a cold climate due to heat and moisture recovery.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø100 or 150 mm air ducts.



Air flow:
up to 430 m³/h
119 l/s



Heat recovery efficiency:
up to 85 %



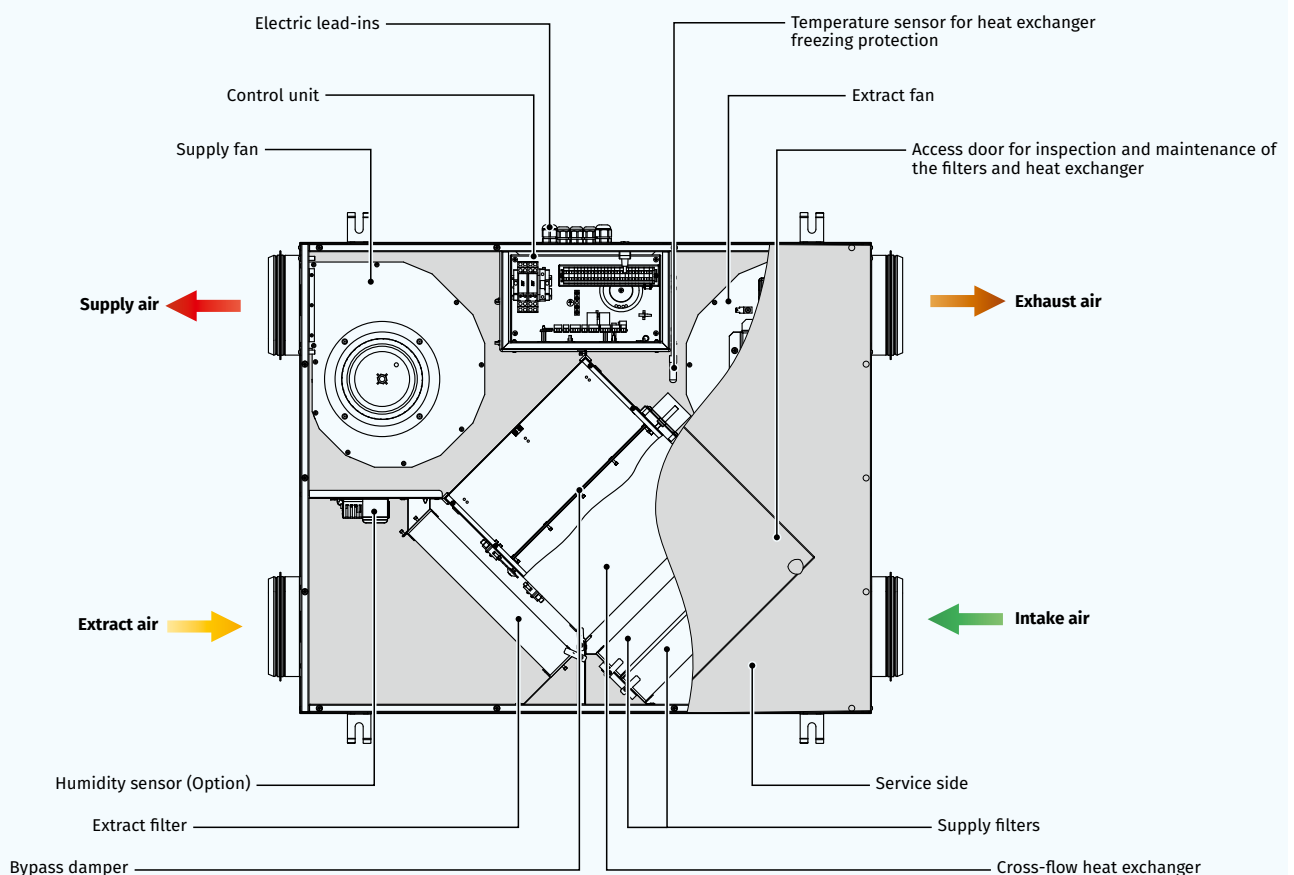
Design

- The casing is made of polymer-coated steel panels, internally filled with foamed polyurethane layer 5-10 mm (depend on modification) for heat- and sound-insulation.
- The unit is equipped with a removable bottom panel for ease of maintenance. This service panel is used to access the filters and the heat exchanger for maintenance operations.
- The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.
- The casing is equipped with fixing brackets to suspend the unit to the ceiling.

Fans

- The unit is equipped with high-efficient external rotor EC motors used for air supply and exhaust.
- The **KOMFORT ERV EC DB150 S14** and **KOMFORT ERV EC DB250 S14** units are equipped with a centrifugal impeller with forward curved blades and the **KOMFORT ERV EC DB350 S14** units - with backward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- The impellers are dynamically balanced.

HEAT RECOVERY AIR HANDLING UNITS



Heat recovery

- o The units are equipped with the enthalpy cross flow heat exchangers made of polymerized cellulose.
- o Heat recovery is based on heat and moisture transfer between the extract and supply air streams through the heat exchanger plates. The air flows are fully separated while flowing through the heat exchanger. The process of heat transfer proceeds in the heat exchanger where extract air transfers most of its heat to the intake air flow. This reduces thermal energy losses in cold seasons. In summer heat recovery acts reverse: the cooled extract air transfers part of cold to the warm intake air. This contributes to better performance of the air conditioner in ventilated premises.



Control and automation

- o The **KOMFORT ERV EC DB S14** units have an with a wall-mounted control panel S14 with a LED indication. The units are equipped with a USB connector (Type B) and can be connected to a PC for configuring the advanced settings in a special software.
- o The standard delivery set includes a 10 m cable for connection of the unit to the control panel.
- o **S14 automation functions:**
 - Unit On/Off.
 - Unit performance control (selection of Low, Medium or High speed).
 - Bypass damper opening and closing for summer ventilation.
 - Alarm indication.
 - Filter maintenance indication.
- o **Additional functions of the S14 automation with installed software:**
 - Fan speed adjustment from 0 to 100 %. Each speed is individually adjusted for the supply and the extract fans.
 - Operation control on feedback from the FS2 duct humidity sensor (to be ordered separately).
 - Unit operation setting according to the external control unit (to be ordered separately).
 - Temperature setting for freeze protection system activation.
 - Control and operation adjustment of the filter maintenance timer
 - Error code indication.
 - External relay control unit and humidity level control.
 - Software version upgrading.



FROST PROTECTION

- o **The electronic frost protection system** is used to prevent the heat exchanger freezing in cold seasons. In case of heat exchanger freezing danger communicated by the temperature sensor the supply fan is stopped to let warm extract air warm up the heat exchanger. After that the supply fan is turned on and the unit reverts to normal operation.

Air filtration

- o Two built-in G4 and F7 filters provide efficient supply air filtration.
- o The G4 filter is used for extract air filtration.

Bypass

- o The units are equipped with a bypass for summer ventilation (air cooling by the cool air from outside).

Mounting

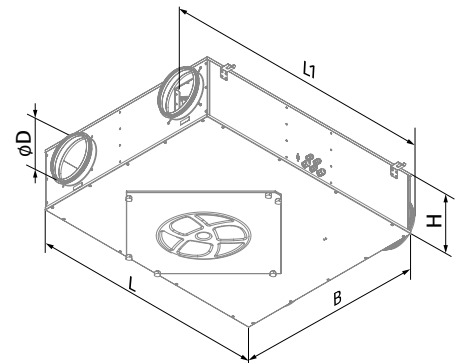
- o Due to a low casing height the air handling units are a perfect solution for space-restricted installation above suspended ceilings.
- o The unit mounting position must provide access for service maintenance.

Designation key

Serie	Unit type	Motor type	Mounting type	Bypass	Nominal air flow [m³/h]	Control
KOMFORT	ERV: energy recovery ventilation	EC: electronically commutated motor	D: suspended mounting, horizontally oriented spigots	B: integrated bypass	150; 250; 350	S14: sensor control panel with LED indication

Overall dimensions [mm]

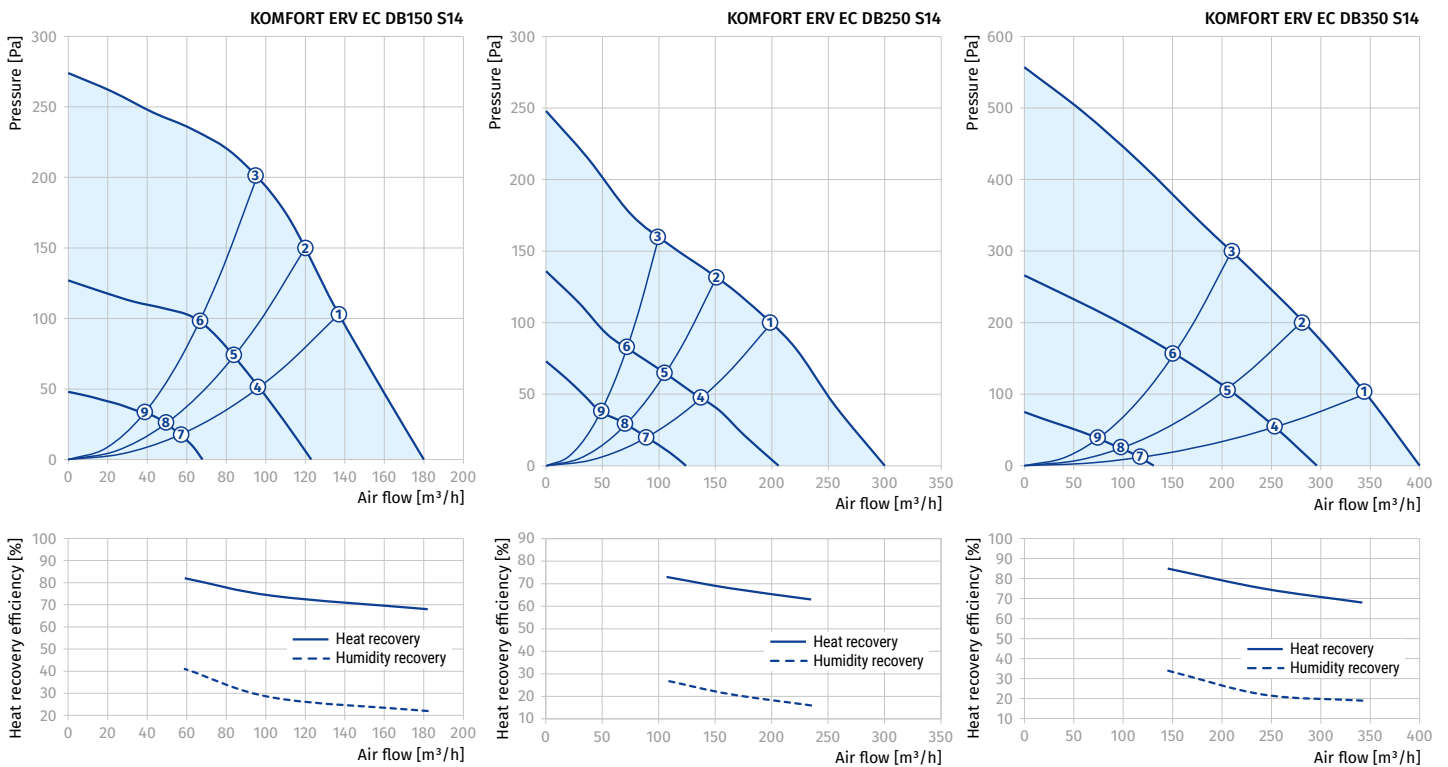
Model	D	B	H	L	L1
KOMFORT ERV EC DB150 S14	99	704	227	947	854
KOMFORT ERV EC DB250 S14	149	704	227	947	854
KOMFORT ERV EC DB350 S14	149	754	277	1117	1024



Technical data










Parameters	KOMFORT ERV EC DB150 S14	KOMFORT ERV EC DB250 S14	KOMFORT ERV EC DB350 S14
Voltage [V / 50 (60) Hz]	1 ~ 220-240	1 ~ 220-240	1 ~ 220-240
Power [W]	83	84	171
Current [A]	0.7	0.7	1.3
Maximum air flow [m ³ /h (l/s)]	215 (60)	300 (83)	430 (119)
RPM [min ⁻¹]	2000	2000	3200
Sound pressure level at 3 m [dBA]	32	36	46
Transported air temperature [°C]	-25...+40	-25...+40	-25...+40
Extract filter	G4	G4	G4
Supply filter	G4 and F8 (PM2.5 93 %)	G4 and F8 (PM2.5 83 %)	G4 and F8 (PM2.5 87%)
Connected air duct diameter [mm]	100 (150**)	150	150
Weight [kg]	26	29	42
Heat recovery efficiency [%]*	68-82	63-73	68-85
Humidity recovery efficiency [%]	22-41	16-27	19-34
Heat exchanger type	cross flow	cross flow	cross flow
Heat exchanger material	polymerized cellulose	polymerized cellulose	polymerized cellulose
SEC class	A	A	A
ErP	2016, 2018	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.
 **KOMFORT ERV EC DB250P S14


Total power of the unit, W

Point	KOMFORT ERV EC DB150 S14	KOMFORT ERV EC DB250 S14	KOMFORT ERV EC DB350 S14
1	64	80	147
2	61	67	145
3	55	59	144
4	26	43	75
5	24	34	73
6	23	28	70
7	13	23	21
8	13	22	21
9	13	19	20

Accessories

		KOMFORT ERV EC DB150 S14	KOMFORT ERV EC DB250 S14	KOMFORT ERV EC DB350 S14
G4 panel filter		FP 300x220x48 G4	FP 300x220x48 G4	FP 300x270x48 G4
F8 panel filter		FP 300x220x48 F8	FP 300x220x48 F8	FP 300x270x48 F8
Internal humidity sensor		FS2	FS2	FS2
CO ₂ sensor with indication		CD-1	CD-1	CD-1
CO ₂ sensor		CD-2	CD-2	CD-2
Humidity sensor		HR-S	HR-S	HR-S
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 100	VKA 150	VKA 150
Electric actuator		LF230	LF230	LF230

KOMFORT ERV D

Suspended heat and energy recovery air handling units

Features

- Air handling unit for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat and humidity recovery minimizes ventilation heat losses during cold season and reduce air conditioner load during hot season.
- Controllable air exchange ensures the best suitable indoor microclimate.
- Compatible with round Ø100 or 150 mm air ducts.



Air flow:
up to 400 m³/h
111 l/s



Heat recovery efficiency:
up to 87 %

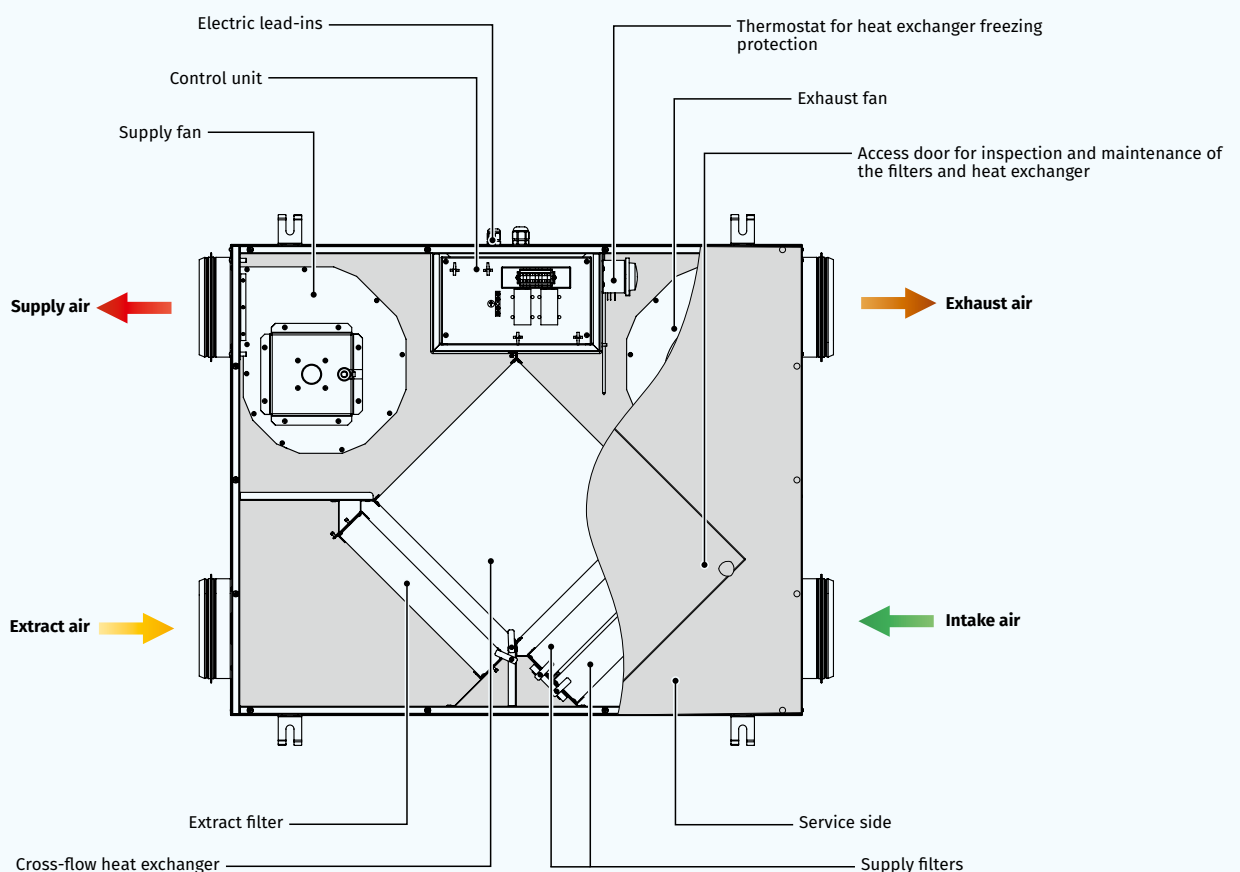


Design

- The casing is made of polymer coated steel panels, internally heat- and sound-insulated with 5-10 mm (depend on modification) polyurethane foam.
- The bottom service panel provides easy access for maintenance of the filters and the heat exchanger.
- The spigots for connection to the air ducts are located at the sides of the unit and are rubber sealed for airtight connection to the air ducts.
- The mounting brackets on the casing ensure easy installation under the ceiling.

Fans

- Asynchronous motors are used for air supply and exhaust.
- **KOMFORT ERV D150 S20**, **KOMFORT ERV D250 S20** and **KOMFORT ERV D350 S20** are equipped with a centrifugal impeller with forward curved blades.
- Integrated overheating protection with automatic restart.
- Ball bearings for longer service life.
- Dynamically balanced impellers.
- Featured with reliable and low-noise operation.



Heat recovery

- o The unit is equipped with a plate cross-flow enthalpy heat exchanger made of polymerised cellulose.
- o Energy recovery is based on heat and humidity transfer from extract to intake air flow through the heat exchanger plates. The air streams remain separated.
- o Most of extract air heat energy is transferred to the intake air flow. Heat recovery reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and cools down the supply air by transferring most of its coolness to hot intake air. This reduces load on air conditioners in ventilated premises.



Control and automation

- o Integrated control system based on triac speed controller CDT1 E.



Air filtration

- o Two built-in G4 and F8 filters provide efficient supply air filtration.
- o The G4 filter is used for extract air filtration.

Mounting

- o Due to the low casing height the unit is the ideal solution for mounting in the limited space behind the suspended ceiling.
- o The installation place must be easily accessible for servicing.

FROST PROTECTION

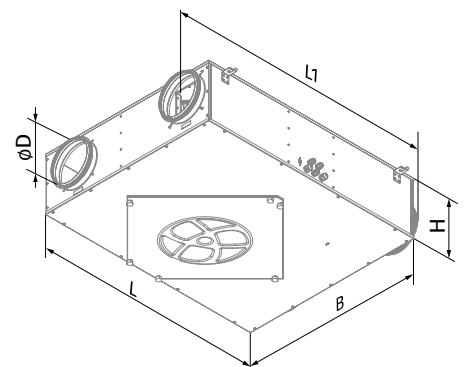
- o A frost protection system is used to prevent the heat exchanger freezing during cold seasons. In case of a heat exchanger freezing danger communicated by the temperature sensor the supply fan stops to let warm extract air heat up the heat exchanger surface. After a freezing danger is over the supply fan turns on and the unit reverts to the normal operation mode.

Designation key

Serie	Unit type	Mounting type	Nominal air flow [m³/h]	Control
KOMFORT	ERV: energy recovery ventilation	D: suspended mounting, horizontally oriented spigots	150; 250; 350	S20: speed controller CDT1 E

Overall dimensions [mm]

Model	D	B	H	L	L1
KOMFORT ERV D150 S20	99	704	227	947	854
KOMFORT ERV D250 S20	149	704	227	947	854
KOMFORT ERV D350 S20	149	754	277	1117	1024

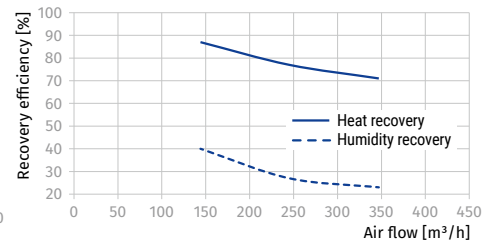
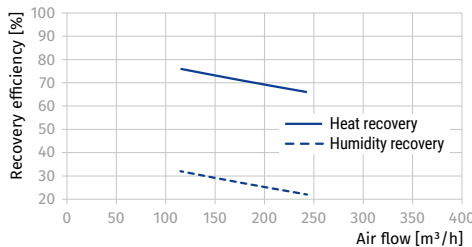
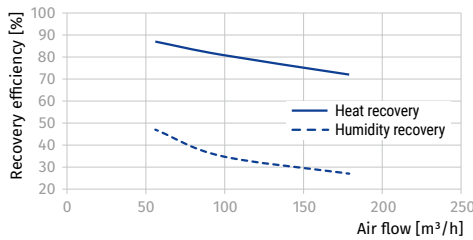
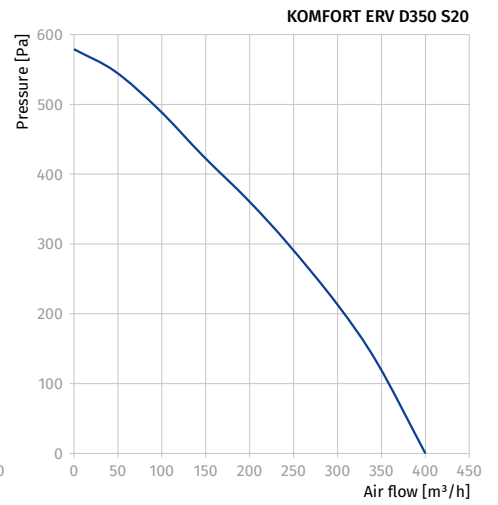
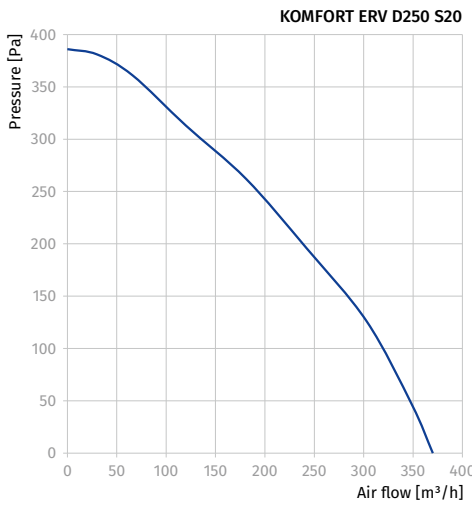
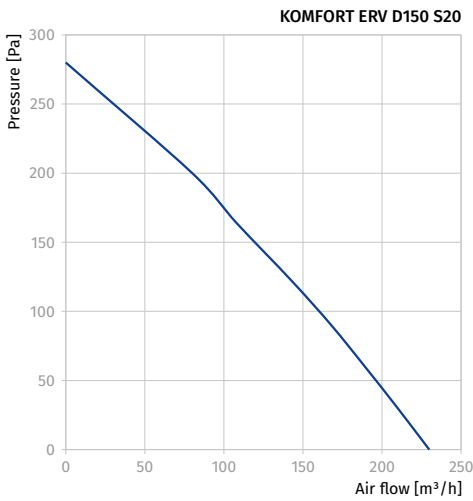


Technical data











Parameters	KOMFORT ERV D150 S20	KOMFORT ERV D250 S20	KOMFORT ERV D350 S20
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	125	250	310
Current [A]	0.6	1.1	1.4
Maximum air flow [m ³ /h (l/s)]	230 (64)	370 (103)	400 (111)
RPM [min ⁻¹]	2235	2400	2150
Sound pressure level at 3 m [dBA]	49	52	57
Transported air temperature [°C]	-25...+40	-25...+40	-25...+40
Insulation [mm]	5 - 10	5 - 10	5 - 10
Extract filter	G4	G4	G4
Supply filter	G4 and F8 (PM2.5 93%)	G4 and F8 (PM2.5 93%)	G4 and F8 (PM2.5 93%)
Connected air duct diameter [mm]	100	150	150
Heat recovery efficiency [%]*	72-87	66-76	71-87
Humidity recovery efficiency [%]	27-47	22-32	23-40
Heat exchanger type	counter-flow	counter-flow	counter-flow
Heat exchanger material	polymerized cellulose	polymerized cellulose	polymerized cellulose
SEC class	D	E	E
ErP	2016, 2018	2016	2016

* Heat recovery efficiency is specified in compliance with EN 13141-7.

HEAT RECOVERY AIR HANDLING UNITS



Accessories

		KOMFORT ERV EC DB150 S14	KOMFORT ERV EC DB250 S14	KOMFORT ERV EC DB350 S14
G4 panel filter		FP 300x220x48 G4	FP 300x220x48 G4	FP 300x270x48 G4
F8 panel filter		FP 300x220x48 F8	FP 300x220x48 F8	FP 300x270x48 F8
Internal humidity sensor		FS2	FS2	FS2
CO ₂ sensor with indication		CD-1	CD-1	CD-1
CO ₂ sensor		CD-2	CD-2	CD-2
Humidity sensor		HR-S	HR-S	HR-S
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32
Air damper		VKA 100	VKA 150	VKA 150
Electric actuator		LF230	LF230	LF230
Summer block		SB C4 300/220	SB C4 300/220	SB C4 300/270

KOMFORT EC DE

Suspended heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- For controllable mechanical energy saving ventilation systems.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø160 to 400 mm air ducts.



Air flow:
up to 4000 m³/h
1111 l/s



Heat recovery efficiency:
up to 90 %



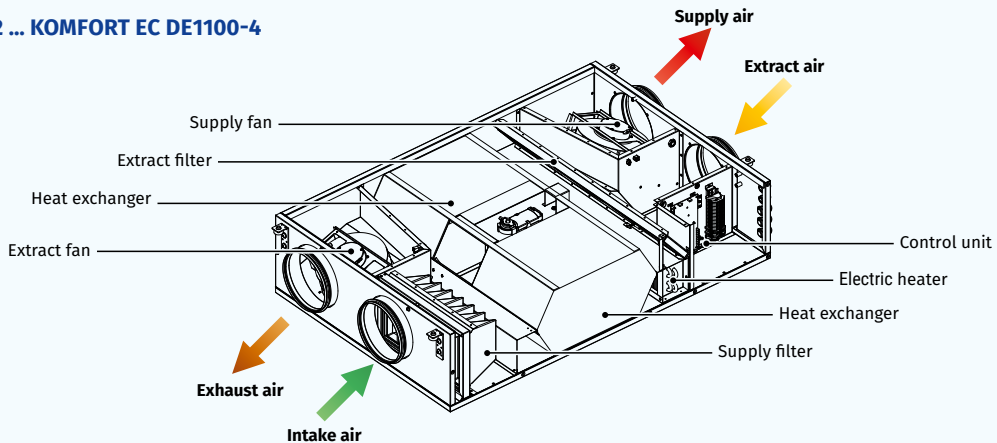
Design

- The casing is made of double-skinned aluzinc panels, internally filled with 20 or 25 mm, mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The service panel ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

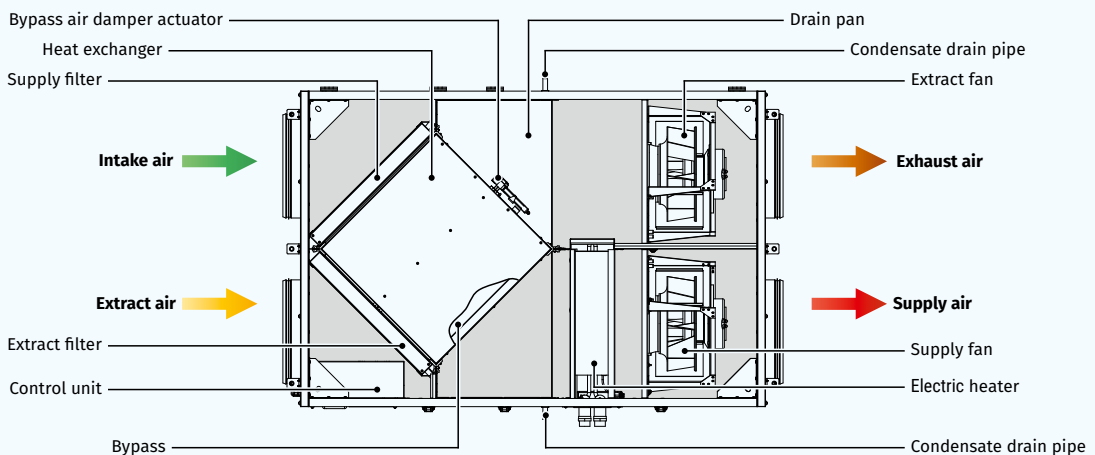
Fans

- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

KOMFORT EC DE400-2 ... KOMFORT EC DE1100-4



KOMFORT EC DE2000-2 ... KOMFORT EC DE4000-2



HEAT RECOVERY AIR HANDLING UNITS

Heat recovery

- The **KOMFORT EC DE400/700/1100** models are equipped with a high-efficient counter-flow aluminium heat exchangers with a large surface area.
- The **KOMFORT EC DE2000/4000** models are equipped with a high-efficient plate cross-flow aluminium heat exchangers with a large surface area.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up of supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic frost protection system based on bypass and heater is used to prevent the heat exchanger freezing in cold seasons. The bypass damper is opened and the heater is turned on automatically according to temperature sensor readings. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After a freezing danger is over the bypass damper is closed, the heater is turned off. The unit reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.

Air heater

- The unit is equipped with an electric heater for operation during cold seasons at low outside temperature.
- The integrated electric heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth heat output control ensures automatic supply air temperature maintaining.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Air filtration

- **KOMFORT EC DE400/700/1100:** The built-in G4 supply filter and G4 extract filter provide air filtration. A F7 supply filter (specially ordered accessory) may be used for efficient supply air filtration.
- **KOMFORT EC DE2000/4000:** The built-in G4 supply filter and G4 extract filter provide air filtration.

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and a sensor display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Automation functions:**
 - Activating/deactivating the unit.
 - Setting required speed for the supply and extract fan for the unit air flow control. Each speed is individually adjusted during set-up.
 - Automatic heater activation/deactivation and smooth heat output control. Heater overheating protection. Cooling of the heater at the end of the heating cycle.
 - Opening/closing the bypass damper for summer ventilation.
 - Setting and maintaining room or duct air temperature.
 - Timer activation/deactivation and set-up.
 - Setting day- and week-scheduled operation of the unit.
 - Operation control on feedback from F51 duct humidity sensor (available separately) or on the humidity sensor in the control panel.
 - Filter clogging control.
 - System shutdown on signal from the fire alarm panel.
 - Controlling supply and exhaust air dampers (to be ordered separately).
 - Cooler control (available separately).



Mounting

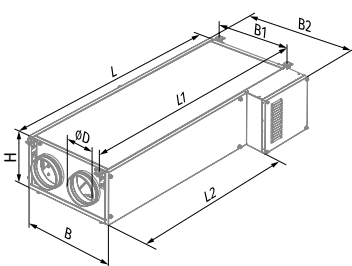
- Ceiling mounting with fixing brackets.
- The correct mounted unit must provide free condensate collection and drainage as well as good access for servicing and filter replacement.
- **Access for maintenance:**
 - **KOMFORT EC DE400 / 700 / 1100:** on the right or left side panel.
 - **KOMFORT EC DE2000 / 4000:** on the bottom.

Designation key

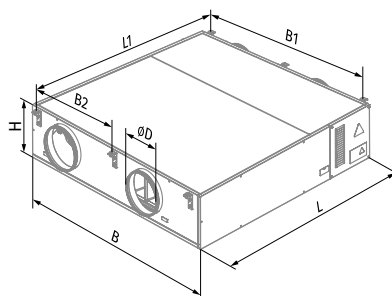
Serie	Motor type	Mounting type	Heater type	Nominal air flow [m³/h]	Heater power [kW]
KOMFORT	EC: electronically commutated motor	D: suspended mounting, horizontally oriented spigots	E: electric heater	400; 700; 1100; 2000; 4000	— 1.5; 2; 3.3; 12; 21

Overall dimensions [mm]

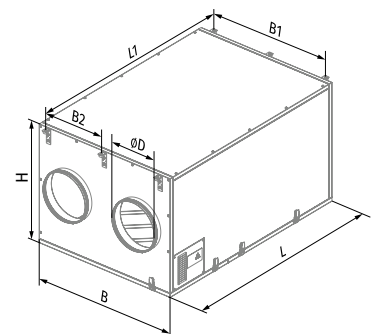
Model	D	B	B1	B2	H	L	L1	L2
KOMFORT EC DE400-1.5	160	485	415	554	281	1238	1291	924
KOMFORT EC DE700-2	200	827	711	—	280	1238	1291	—
KOMFORT EC DE1100-3.3	250	1351	1215	608	318	1349	1402	—
KOMFORT EC DE2000-12	314	950	915	405	761	1400	1453	—
KOMFORT EC DE4000-21	399	1265	1130	563	881	1835	1888	—



KOMFORT EC DE400-1.5



KOMFORT EC DE700-2
KOMFORT EC DE1100-3.3



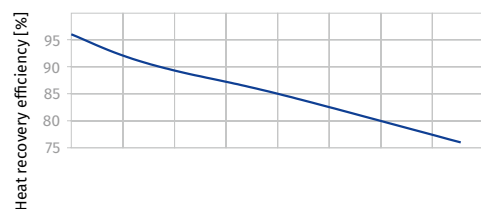
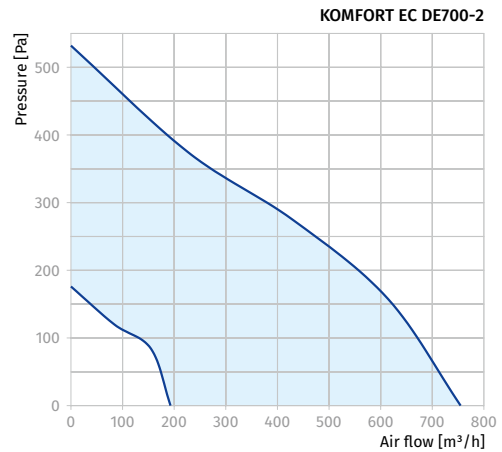
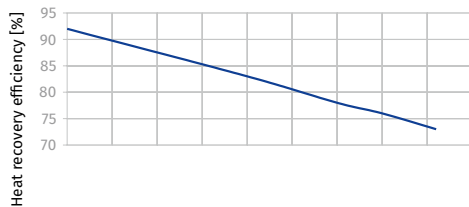
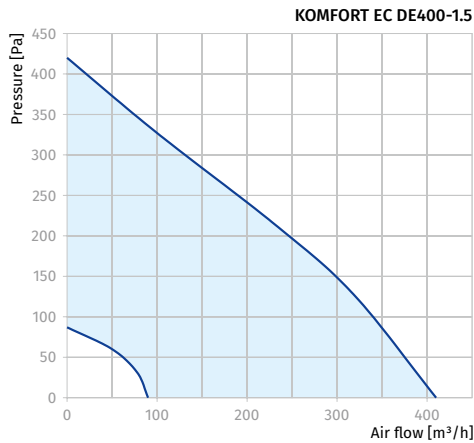
KOMFORT EC DE2000-12
KOMFORT EC DE4000-21

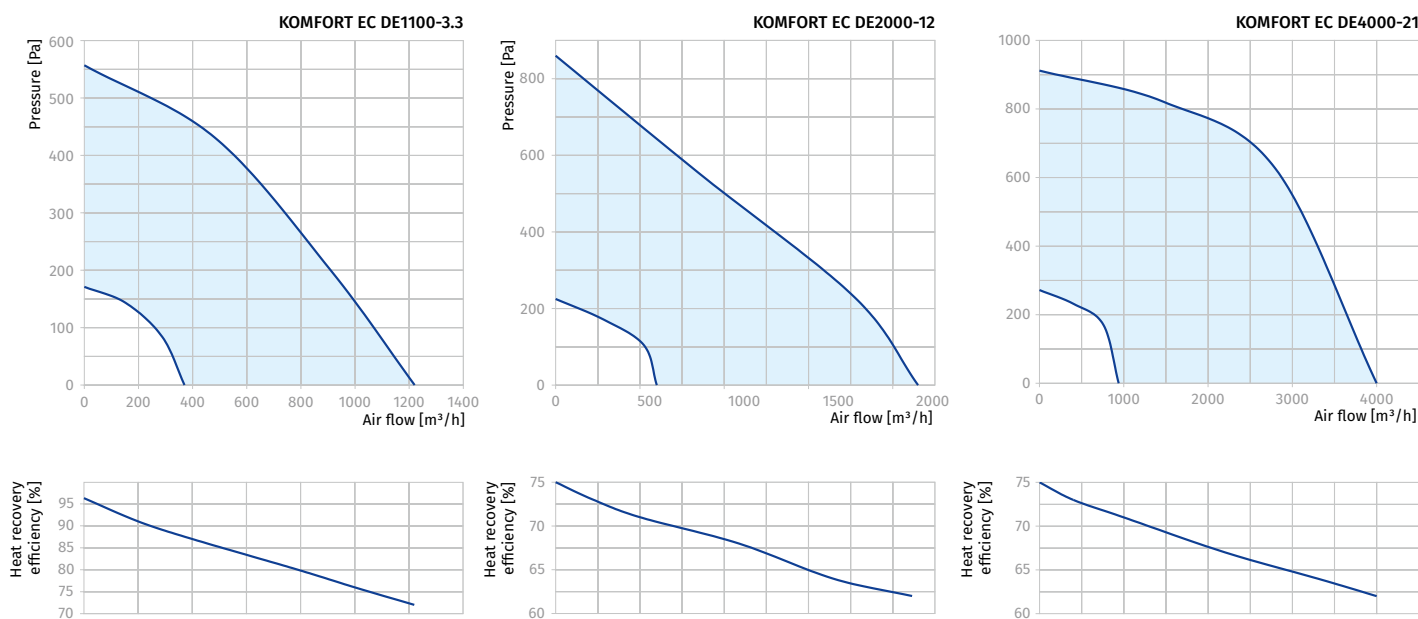
Technical data

Parameters	KOMFORT EC DE400-1.5	KOMFORT EC DE700-2	KOMFORT EC DE1100-3.3	KOMFORT EC DE2000-12	KOMFORT EC DE4000-21
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	3 ~ 400	3 ~ 400
Max. unit power without electric heater [kW]	0.2	0.27	0.4	0.84	1.98
Max. unit current without electric heater [A]	1.62	1.6	2.26	5	3.4
Electric heater power [kW]	1.5	2.0	3.3	12.0	21.0
Electric heater current [A]	6.5	8.7	14.3	17.4	30.0
Max. power with electric heater [kW]	1.7	2.27	3.7	12.84	23.0
Max. current with electric heater [A]	8.12	10.3	16.56	22.4	33.4
Maximum air flow [m ³ /h (l/s)]	400 (111)	700 (194)	1100 (306)	2000 (556)	4000 (1111)
RPM [min ⁻¹]	3560	3060	2780	2920	2580
Sound pressure level at 3 m [dBA]	48	53	52	58	59
Transported air temperature [°C]	-25...+40	-25...+60	-25...+60	-25...+40	-25...+50
Casing material	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4	G4
Supply filter	G4 (Option: F7)	G4 (Option: F7)	G4 (Option: F7)	G4	G4
Connected air duct diameter [mm]	160	200	250	315	400
Weight [kg]	67	75	95	190	290
Heat recovery efficiency [%]*	up to 90	up to 90	up to 90	up to 75	up to 75
Heat exchanger type	counter-flow	counter-flow	counter-flow	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum	aluminum	aluminum	aluminum
SEC class	A	A	NRVJ**	NRVJ**	NRVJ**
ErP	2016, 2018	2016, 2018	2016, 2018	2016	2016

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.

**Nonresidential Ventilation Unit





Accessories

		KOMFORT EC DE400-1.5	KOMFORT EC DE700-2	KOMFORT EC DE1100-3.3	KOMFORT EC DE2000-12	KOMFORT EC DE4000-21
G4 extract filter		FP 440x128x20 G4	FP 782x128x20 G4	FP 648x273x20 G4	FP 708x480x48 G4	FP 827x741x48 G4
G4 supply filter		FPT 208x236x27 G4	FPT 392x236x27 G4	FPT 647x274x27 G4	FPT 708x480x48 G4	FPT 827x741x48 G4
F7 supply filter		FPT 208x236x27 F7	FPT 392x236x27 F7	FPT 647x274x27 F7	FPT 708x480x48 F7	FPT 827x741x48 F7
Silencer		SD 160	SD 200	SD 250	SD 315	SD 400 600/900/1200
Silencer		SDF 160	SDF 200	SDF 250	SDF 315	SDF 400 600/900/1200
Mixing set		WMG	WMG	WMG	WMG	WMG
Backdraft air damper		VRV 160	VRV 200	VRV 250	VRV 315	VRV 400
Air damper		VKA 160	VKA 200	VKA 250	VKA 315	VKA 400
Internal humidity sensor		FS1	FS1	FS1	FS1	FS1
Electric actuator		LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230

KOMFORT EC DW

Suspended heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Provide controllable air exchange to create the best suitable indoor microclimate.
- Compatible with round Ø200 to 400 mm round air ducts.



Air flow:
up to 3800 m³/h
1056 l/s



Heat recovery efficiency:
up to 90 %



Design

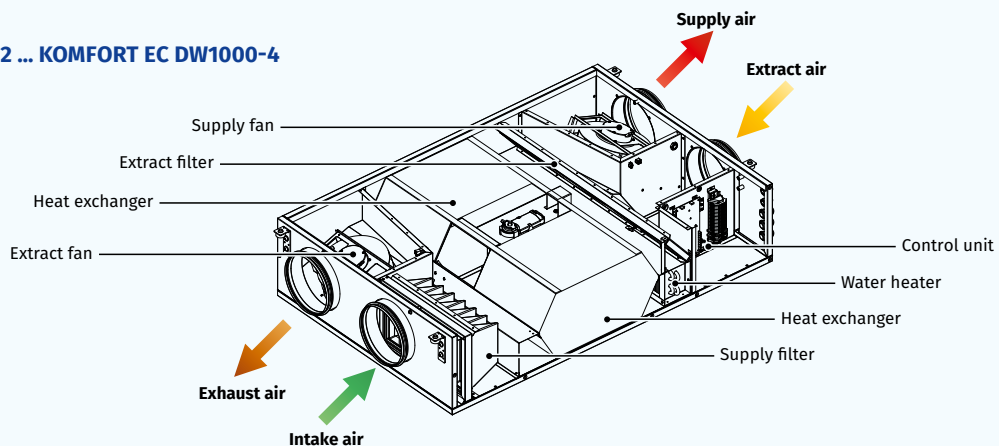
- The casing is made of double-skinned aluzinc panels, internally filled with 20 or 25 mm, mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The service panel ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fans

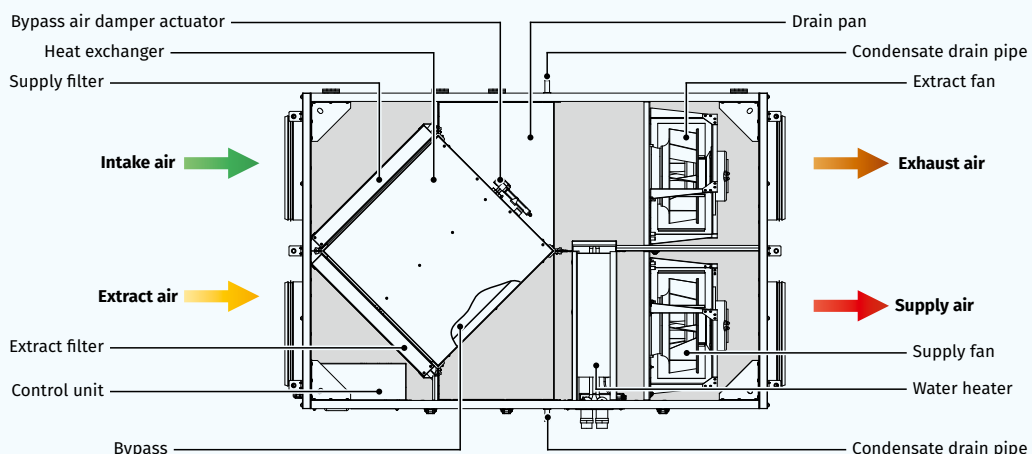
- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

HEAT RECOVERY AIR HANDLING UNITS

KOMFORT EC DW600-2 ... KOMFORT EC DW1000-4



KOMFORT EC DW2000-2 ... KOMFORT EC DW3800-2



Heat recovery

- The **KOMFORT EC DW600/1000** models are equipped with a high-efficient counter-flow polystyrene heat exchangers with a large surface area.
- The **KOMFORT EC DW2000/3800** models are equipped with a high-efficient cross-flow aluminium heat exchangers with a large surface area.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up of supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic frost protection system based on bypass and heater is used to prevent the heat exchanger freezing in cold seasons. The bypass damper is opened and the heater is turned on automatically according to the feedback from the temperature sensor. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After a freezing danger is over the bypass damper is closed, the heater is turned off. The unit reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.



Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.

Control and automation

- The unit incorporates an integrated control system control panel and a sensor display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Automation functions:**
 - Activating/deactivating the unit.
 - Setting required speed for the supply and extract fan for the unit air flow control. Each speed is individually adjusted during set-up.
 - Set supply air temperature maintaining by means of the circulating pump and heat medium regulating valve control.
 - Water heater freezing protection on feedback from the temperature sensor downstream of the water heating coils and the return water temperature sensor.
 - Pre-heating cycle prior to the heater start and maintaining set return water temperature during the fan shutoff.
 - Opening/closing the bypass damper for summer ventilation.
 - Setting and maintaining room or duct air temperature.
 - Timer activation/deactivation and set-up.
 - Setting day- and week-scheduled operation of the unit.
 - Operation control on feedback from FS1 duct humidity sensor (to be ordered separately) or on the humidity sensor in the control panel.
 - Filter clogging control.
 - System shutdown on signal from the fire alarm panel.
 - Controlling supply and exhaust air dampers (to be ordered separately).
 - Cooler control (to be ordered separately).



Air heater

- The unit is equipped with a water (glycol) heater for operation at low outside air temperature.
- The integrated water heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth water heater power control ensures automatic supply air temperature maintaining.
- The air temperature sensor downstream of the waterheating coils and the return water temperature sensor are used for freezing protection of the water heater.

Mounting

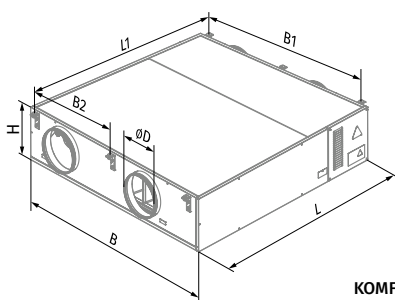
- Mounting to the ceiling with fixing brackets.
- The correct mounted unit must provide free condensate collection and drainage as well as good access for servicing and filter replacement.
- **Servicing access:**
 - **KOMFORT EC DW600/1000:** on the right or left panel side;
 - **KOMFORT EC DW2000/3800:** on the bottom.

Designation key

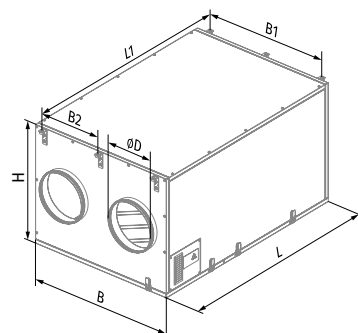
Serie	Motor type	Mounting type	Heater type	Nominal air flow [m³/h]	Number of water coil rows
KOMFORT	EC: electronically commutated motor	D: suspended mounting, horizontally oriented spigots	W: water heater	600; 1000; 2000; 3800	— 2; 4

Overall dimensions [mm]

Model	D	B	B1	B2	H	L	L1
KOMFORT EC DW600-2	199	827	711	—	283	1238	1286
KOMFORT EC DW1000-4	249	1350	1215	607.5	317	1346	1395
KOMFORT EC DW2000-2	314	950	915	405	761	1400	1453
KOMFORT EC DW3800-2	399	1265	1130	563	830	1835	1888



KOMFORT EC DW600-2
KOMFORT EC DW1000-4



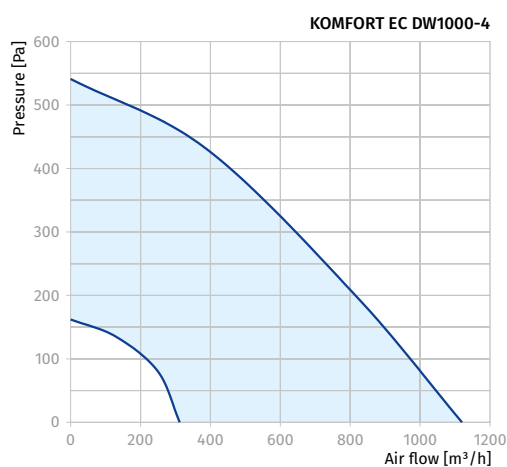
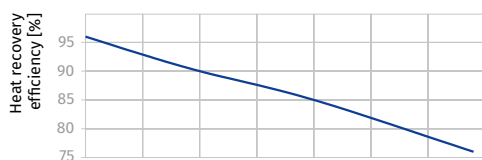
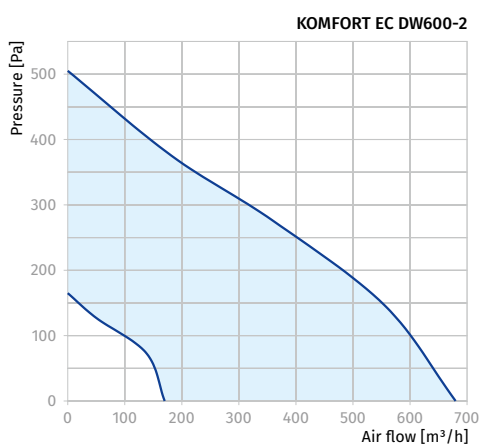
KOMFORT EC DW2000-2
KOMFORT EC DW3800-2

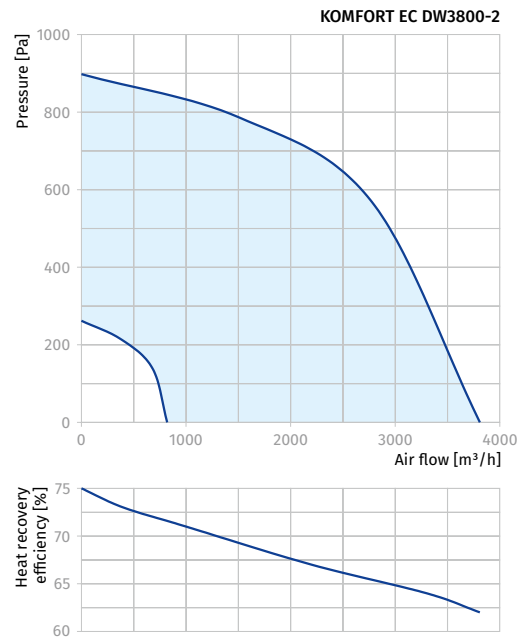
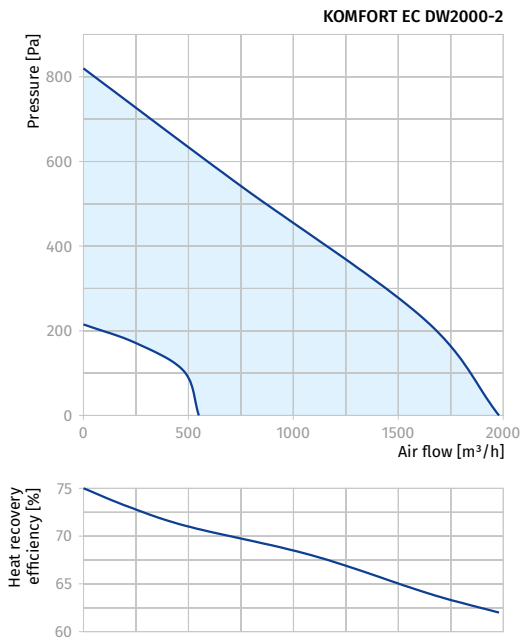
Technical data

Parameters	KOMFORT EC DW600-2	KOMFORT EC DW1000-4	KOMFORT EC DW2000-2	KOMFORT EC DW3800-2
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	3 ~ 400
Number of water (glycol) coil rows	2	4	2	2
Power [kW]	0.27	0.40	0.84	1.99
Current [A]	1.60	2.26	5.00	3.40
Maximum air flow [m ³ /h (l/s)]	600 (167)	1000 (278)	1950 (542)	3800 (1056)
RPM [min ⁻¹]	3060	2780	2920	2580
Sound pressure level at 3 m [dBA]	53	52	58	59
Transported air temperature [°C]	-25...+60	-25...+60	-25...+40	-25...+50
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	20 mm, mineral wool	20 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4	G4	G4	G4
Connected air duct diameter [mm]	200	250	315	400
Weight [kg]	77	98	194	295
Heat recovery efficiency [%]*	up to 90	up to 90	up to 75	up to 75
Heat exchanger type	counter-flow	counter-flow	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum	aluminum	aluminum
SEC class	A	NRVU**	NRVU**	NRVU**
ErP	2016, 2018	2016, 2018	2016	2016

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.

**Nonresidential Ventilation Unit.

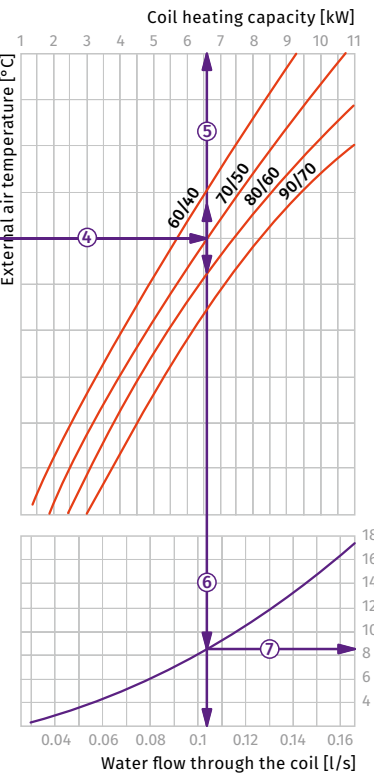
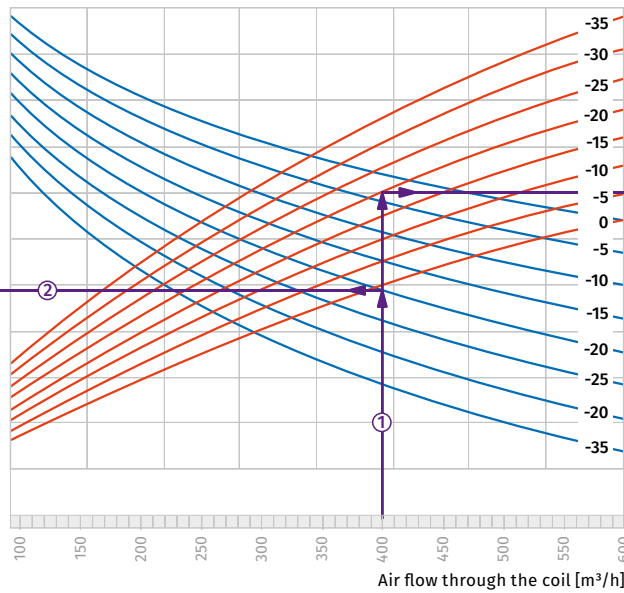
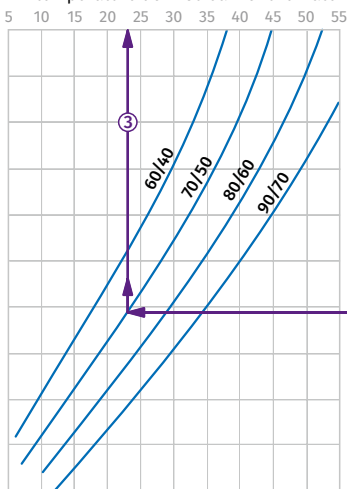




Hot water coil calculation diagram

KOMFORT EC DW600-2

Air temperature downstream of the water heating coils [°C]

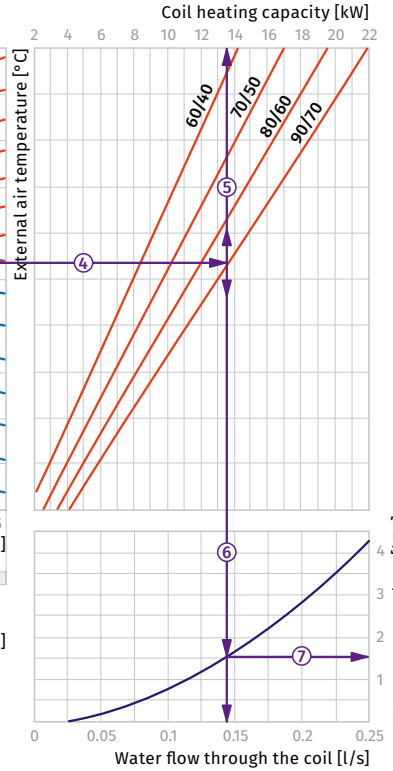
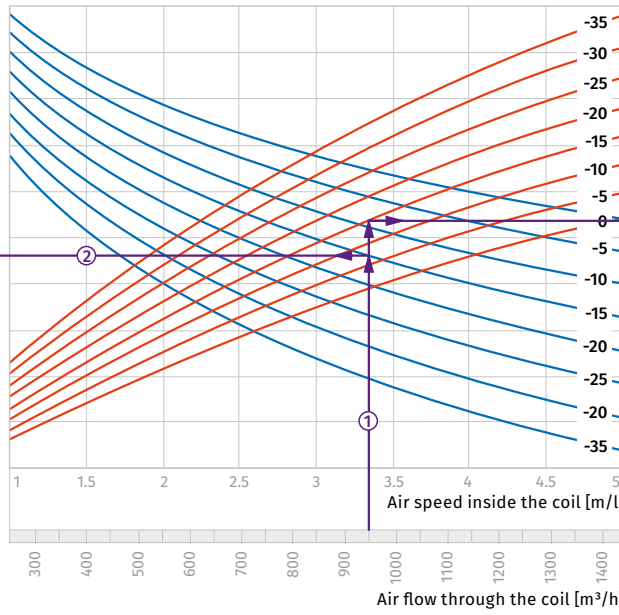
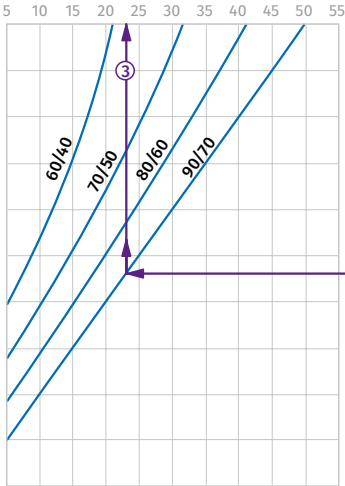


How to use water heater diagrams.
 Sample parameters: Air flow = 400 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +70/+50 °C.

- To calculate the maximum air temperature find the intersection point of the air flow line (e.g., 400 m³/h) ① with the rated outer temperature shown in blue line (e.g., -20 °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 (+23 °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., -20 °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 (6.6 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑤ downwards to the water flow axis (0.105 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 (8.5 kPa).

KOMFORT EC DW1000-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

Sample parameters: Air flow = 950 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

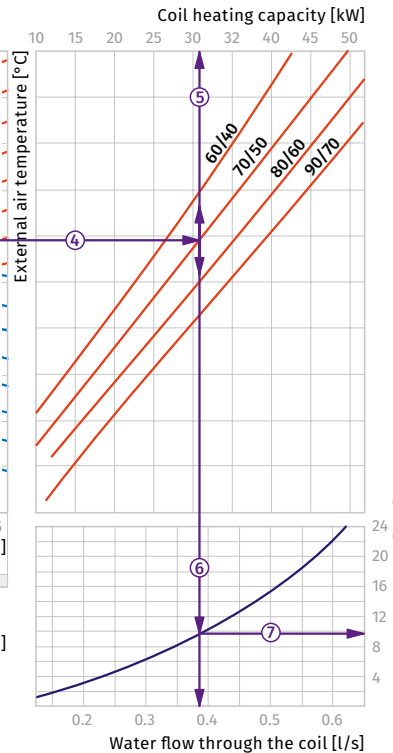
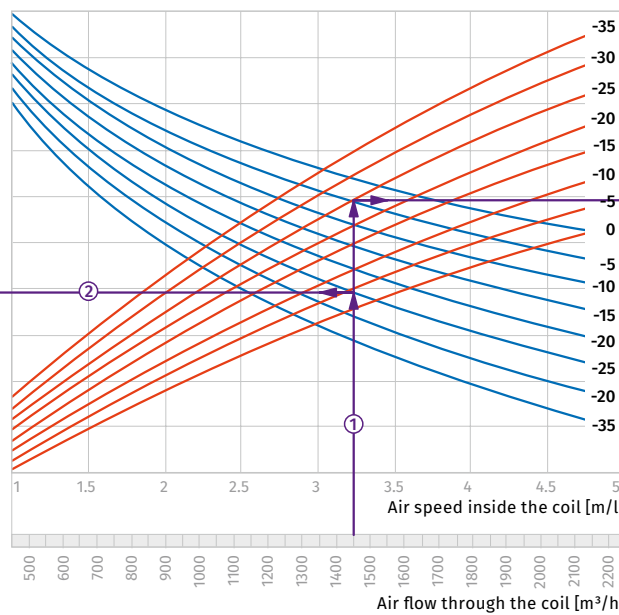
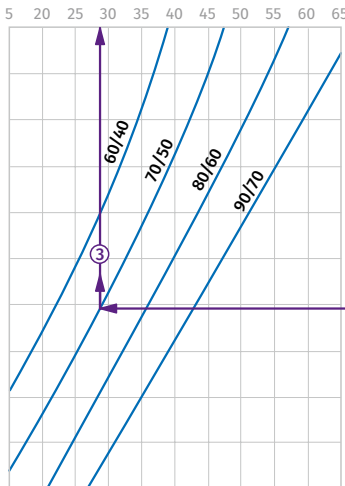
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+23 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (13.5 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.14 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 (1.5 kPa).

KOMFORT EC DW2000-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

Sample parameters: Air flow = 1450 m³/h.
Outside air temperature = -25 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 1450 m³/h and the air speed in the heater is 3.2 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °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.

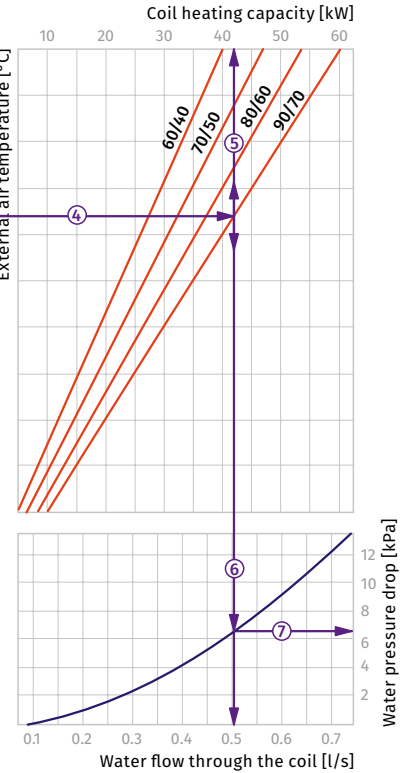
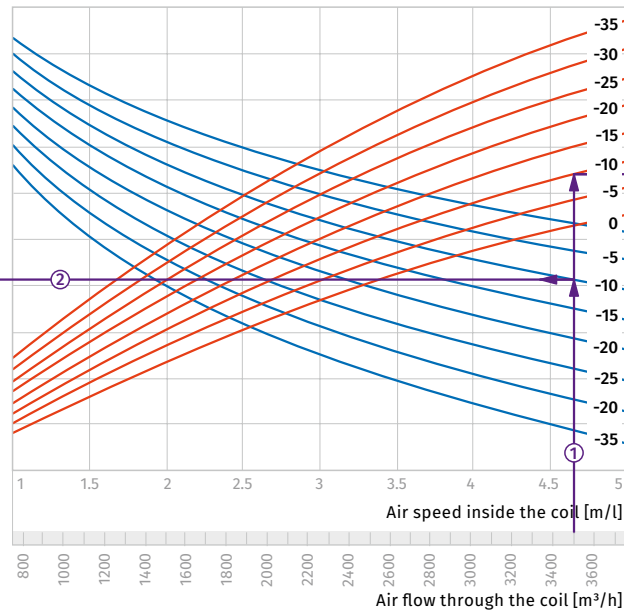
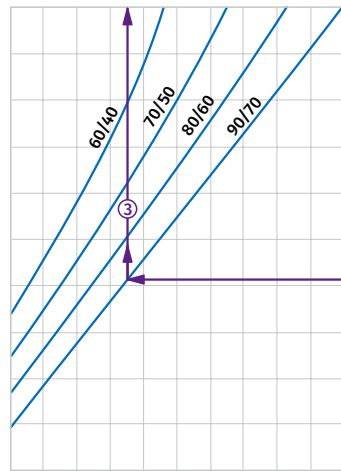
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -25 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the heater power axis (31.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.38 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 (9.8 kPa).

KOMFORT EC DW3800-2

Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



How to use water heater diagrams.

Sample parameters: Air flow = 3500 m³/h.
 Outside air temperature = -10 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 3500 m³/h and the air speed in the heater is 4.65 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -10 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22.5 °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., -10 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (42.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.5 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 (6.5 kPa).

Accessories

	KOMFORT EC DW600-2	KOMFORT EC DW1000-4	KOMFORT EC DW2000-2	KOMFORT EC DW3800-2
G4 extract filter	FP 782x128x20 G4	FP 648x273x20 G4	FP 708x480x48 G4	FP 827x741x48 G4
G4 supply filter	FPT 392x236x27 G4	FPT 647x274x27 G4	FP 708x480x48 G4	FP 827x741x48 G4
Silencer	SD 200	SD 250	SD 315	SD 400 600/900/1200
Silencer	SDF 200	SDF 250	SDF 315	SDF 400 600/900/1200
Backdraft air damper	VRV 200	VRV 250	VRV 315	VRV 400
Air damper	VKA 200	VKA 250	VKA 315	VKA 400
Internal humidity sensor	FS1	FS1	FS1	FS1
Electric actuator	LF230	LF230	LF230	LF230
Electric actuator	TF230	TF230	TF230	TF230

HEAT RECOVERY AIR HANDLING UNITS

KOMFORT L

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 to 315 mm air ducts.



Air flow:
up to 2200 m³/h
611 l/s



Heat recovery efficiency:
up to 88 %



Design

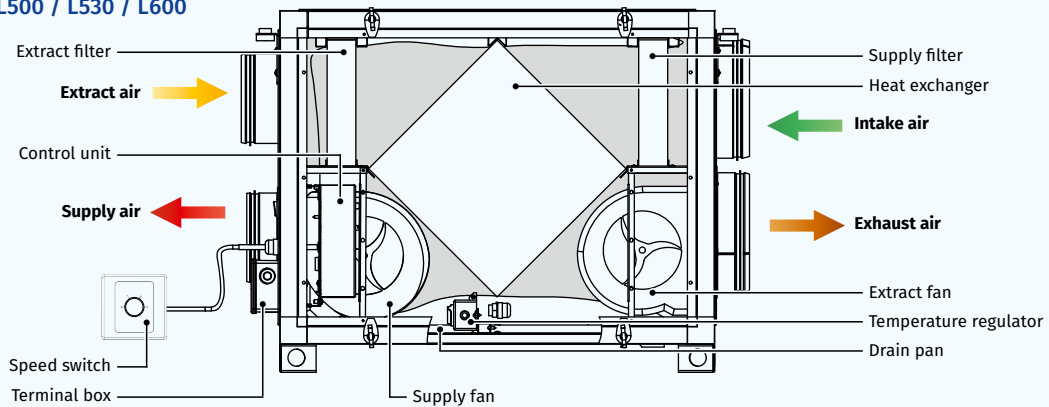
- The casing is made of aluminium profile and double-skinned aluzinc panels, internally filled with mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged casing side panels ensure easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fans

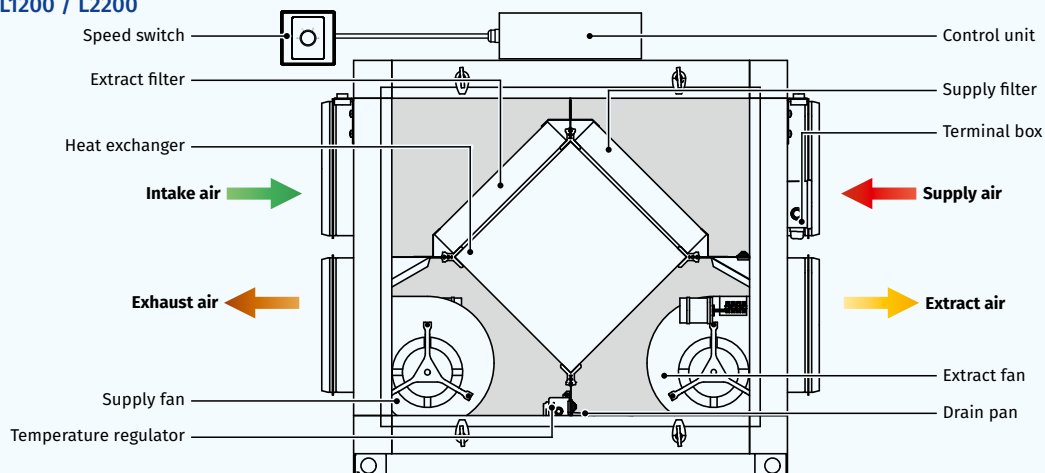
- Asynchronous external rotor motors and centrifugal double-intake impellers with forward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.

HEAT RECOVERY AIR HANDLING UNITS

KOMFORT L350 / L500 / L530 / L600



KOMFORT L1200 / L2200



Heat recovery

- The unit is equipped with a cross-flow aluminium heat exchanger with a large surface area and high heat recovery efficiency.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on the utilization of the thermal energy of the extract air for heating up supply air. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The built-in freezing protection system automatically turns the supply fan off in case of a freezing danger to enable warming of the heat exchanger with the warm extract air flow. When a freezing danger is over the the supply fan is turned on and the unit reverts to previous operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.
- Heat recovery is not useful in warm season with small indoor and outdoor temperature difference. In this case the heat exchanger may be temporary replaced with a summer block (available separately).

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration. A F7 supply filter (specially ordered accessory) may be used for efficient supply air filtration.

Control and automation

- Speed control by means of the four-position speed switch CDP-3/5 that enables setting low, medium, maximum speed and turning the unit off.

Mounting

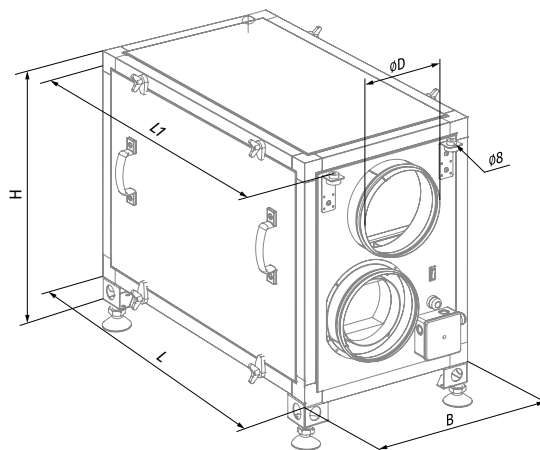
- Mounting to floor, ceiling or wall with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panel for servicing and filter replacement.

Designation key

Serie	Spigot modification	Nominal air flow [m³/h]
KOMFORT	L: horizontal spigot orientation	300; 500; 530; 600; 1200; 2200

Overall dimensions [mm]

Model	D	B	H	L	L1
KOMFORT L350	124	416	603	722	768
KOMFORT L500	149	416	603	722	768
KOMFORT L530	159	416	603	722	768
KOMFORT L600	199	416	603	722	768
KOMFORT L1200	248	548	794	802	850
KOMFORT L2200	313	846	968	1000	1050

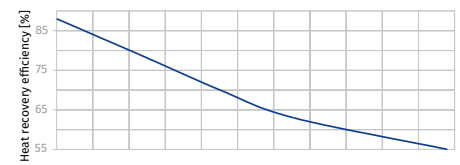
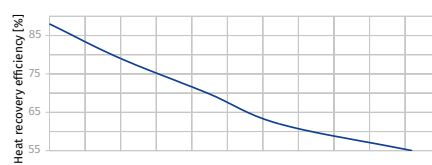
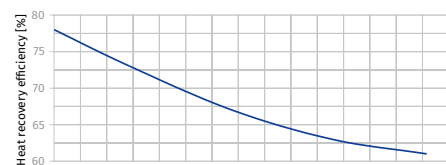
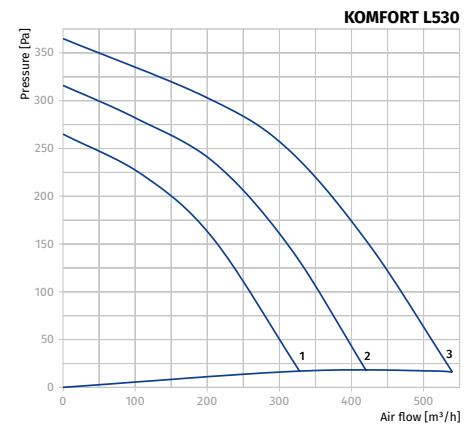
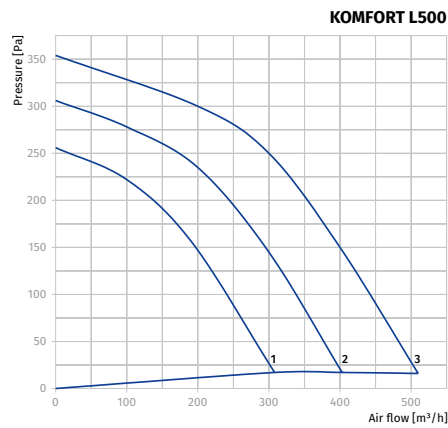
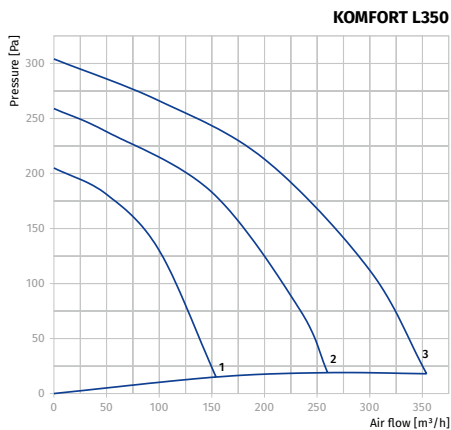


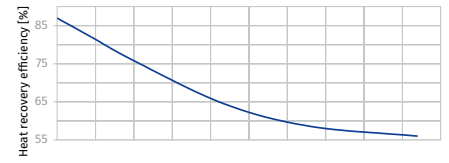
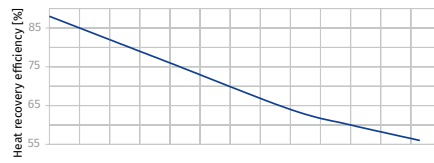
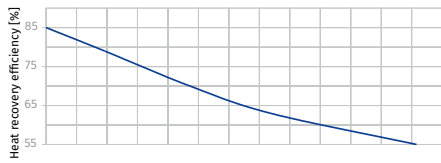
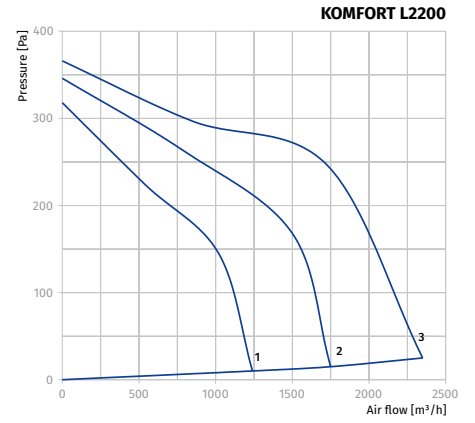
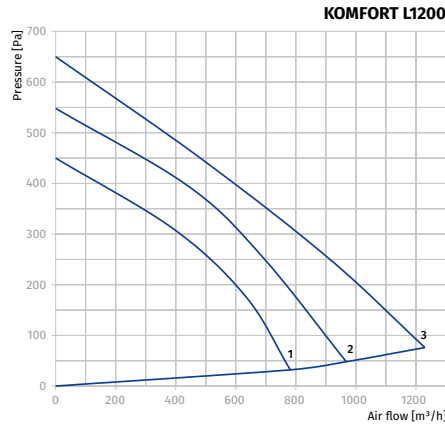
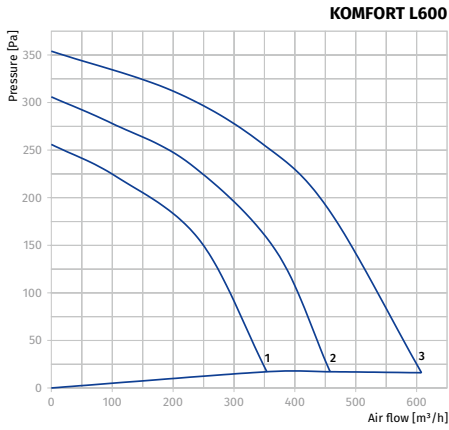
Technical data

Parameters	KOMFORT L350	KOMFORT L500	KOMFORT L530	KOMFORT L600	KOMFORT L1200	KOMFORT L2200
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [kW]	0.26	0.3	0.3	0.39	0.82	1.3
Current [A]	1.2	1.32	1.32	1.72	3.6	5.68
Maximum air flow [m ³ /h (l/s)]	350 (97)	500 (139)	530 (147)	600 (167)	1200 (333)	2200 (611)
RPM [min ⁻¹]	1150	1100	1100	1350	1850	1150
Sound pressure level at 3 m [dBA]	24-45	28-47	28-47	32-48	60	65
Transported air temperature [°C]	-25...+55	-25...+50	-25...+50	-25...+55	-25...+40	-25...+40
Casing material	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	50 mm mineral wool	50 mm mineral wool
Extract filter	G4	G4	G4	G4	G4	G4
Supply filter	F7	F7	F7	F7	G4 (Option: F7)	G4 (Option: F7)
Connected air duct diameter [mm]	125	150	160	200	250	315
Weight [kg]	45	49	49	54	85	96
Heat recovery efficiency [%]*	up to 78	up to 88	up to 88	up to 85	up to 88	up to 87
Heat exchanger type	cross-flow	cross-flow	cross-flow	cross-flow	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum
SEC class	E	E	E	E	NRVU**	NRVU**
ErP	2016	2016	2016	2016	-	-

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.

** Nonresidential Ventilation Unit.





Accessories

		KOMFORT L350	KOMFORT L500	KOMFORT L530	KOMFORT L600	KOMFORT L1200	KOMFORT L2200
G4 panel filter		FP 378x210x47 G4	FP 378x210x47 G4	FP 378x210x47 G4	FP 378x210x47 G4	FP 450x295x48 G4	FP 750x295x48 G4
F7 panel filter		FP 378x210x47 F7	FP 378x210x47 F7	FP 378x210x47 F7	FP 378x210x47 F7	FP 450x295x48 F7	FP 750x295x48 F7
Silencer		SD 125	SD 150	SD 160	SD 200	SD 250	SD 315
Silencer		SDF 125	SDF 150	SDF 160	SDF 200	SDF 250	SDF 315
Backdraft air damper		VRV 125	VRV 150	VRV 160	VRV 200	VRV 250	VRV 315
Air damper		VKA 125	VKA 150	VKA 160	VKA 200	VKA 250	VKA 315
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230	TF230
Summer block		SB C4 200/384	SB C4 300/384	SB C4 300/384	SB C4 300/384	SB C4 300/450	SB C4 300/750

KOMFORT LE

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø125 to 315 mm air ducts.



Air flow:
up to 2200 m³/h
611 l/s



Heat recovery efficiency:
up to 88 %



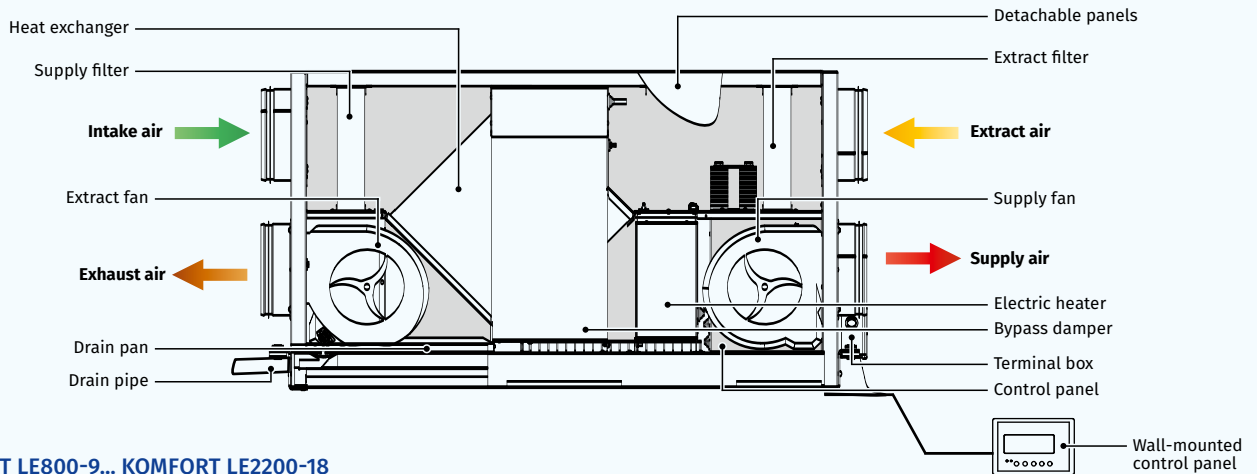
Design

- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm, mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged casing side panels ensure easy access to the internals for cleaning, filter replacement and other maintenance operations.

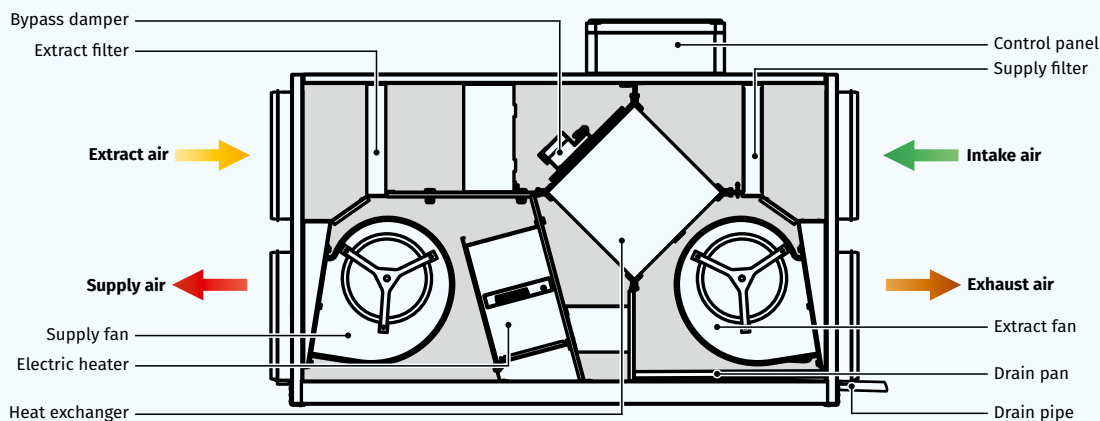
Fans

- Asynchronous external rotor motors and centrifugal double-intake impellers with forward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.

KOMFORT LE 350-3... KOMFORT LE600-4



KOMFORT LE800-9... KOMFORT LE2200-18



Heat recovery

- The unit is equipped with a plate cross-flow aluminium heat exchanger with a large surface area and high heat recovery efficiency.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on the utilization of the thermal energy of the extract air for heating up supply air. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic protection system based on bypass and heater is used for freezing protection of the unit in cold seasons. The bypass damper is opened and the heater is turned on automatically according to temperature sensor readings. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After a freezing danger is over the bypass damper is closed, the heater is turned off. The heat exchanger reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.

Air heater

- The unit is equipped with an electric heater for operation during cold seasons at low outside temperature.
- The integrated electric heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth heat output control ensures automatic supply air temperature maintaining.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Designation key

Serie	Spigot modification	Heater type	Nominal air flow [m³/h]	Heater power [kW]
KOMFORT	L: horizontal spigot orientation	E: electric heater	300; 500; 530; 600; 800; 1200; 1700; 2200	3; 4; 9; 18

Overall dimensions [mm]

Model	D	B	B1	H	H1	L	L1	L2
KOMFORT LE350-3	124	497	403	554	-	954	996	1057
KOMFORT LE500-3	149	497	403	554	-	954	996	1057
KOMFORT LE530-4	159	497	403	554	-	954	996	1057
KOMFORT LE600-4	199	497	403	554	-	954	996	1057
KOMFORT LE800-9	249	613	460	698	832	1071	1117	1176
KOMFORT LE1200-9	249	613	460	698	832	1071	1117	1176
KOMFORT LE1700-18	314	842	581	814	947	1345	1394	1447
KOMFORT LE2200-18	314	842	581	814	947	1345	1394	1447

Air filtration

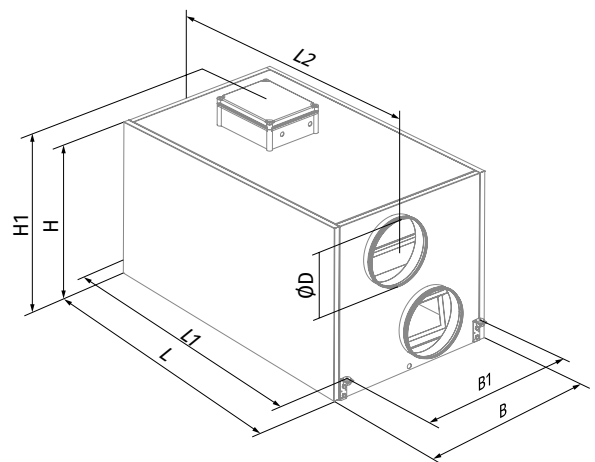
- Two built-in G4 filters provide efficient supply and extract air filtration.

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Switching on/off.
 - Three-speed fan selection, selecting heating/cooling modes (if connected to duct heater).
 - Temperature display.
- **Automation functions:**
 - Maintaining supply air temperature set from the control panel by controlling the circulation pump and actuating the heat medium regulating valve; input from the heat medium flow switch (pump alarm);
 - Safe start-up/ shutdown of the fans, warming up of the water heater before start-up; return heat medium temperature control when the fan is off.
 - Freezing protection of the water heating coils by the exhaust temperature sensor and the return heat medium temperature sensor.
 - Control of the compressor and condensing unit of the water cooler by the room temperature sensor (for the models equipped with a duct air cooler);
 - Actuating the external air dampers with a return spring
 - Unit operation according to week schedule (set at the system setup).
 - 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

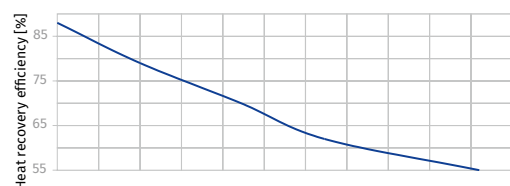
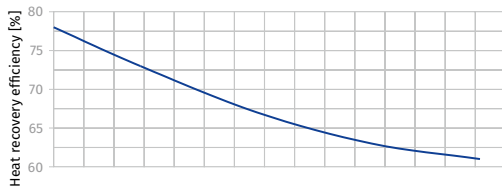
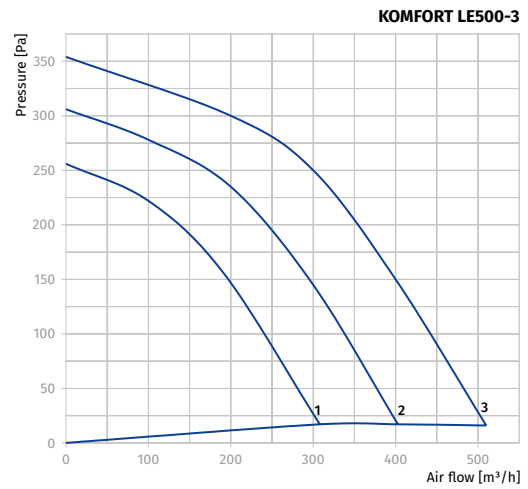
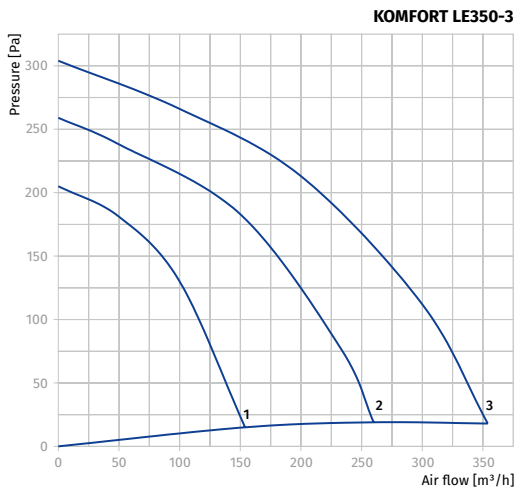
- Mounting to floor, ceiling or wall with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panel for servicing and filter replacement.



Technical data

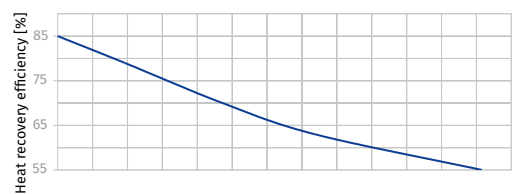
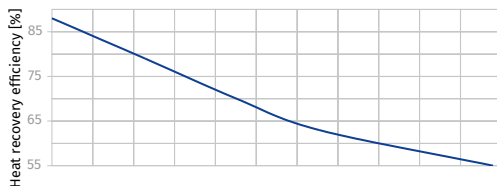
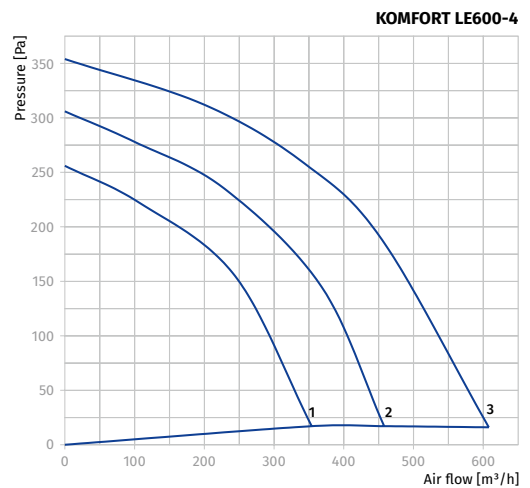
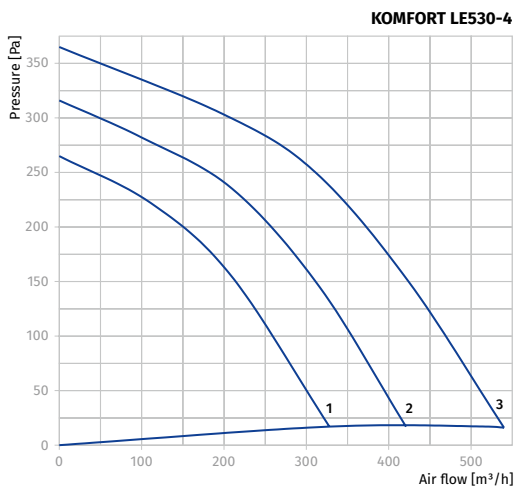
Parameters	KOMFORT LE350-3	KOMFORT LE500-3
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. power without electric heater [kW]	0.26	0.3
Max. current without electric heater [A]	1.2	1.32
Electric heater power [kW]	3	3
Electric heater current [A]	13	13
Max. power with electric heater [kW]	3.26	3.3
Max. current with electric heater [A]	14.2	14.32
Maximum air flow [m ³ /h (l/s)]	350 (97)	500 (139)
RPM [min ⁻¹]	1150	1100
Sound pressure level at 3 m [dBA]	24-45	24-47
Transported air temperature [°C]	-25...+55	-25...+50
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]	125	150
Weight [kg]	45	49
Heat recovery efficiency [%]*	up to 78	up to 88
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
SEC class	E	E
ErP	2016	2016

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.



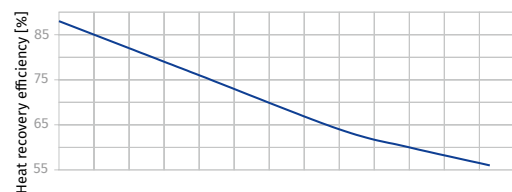
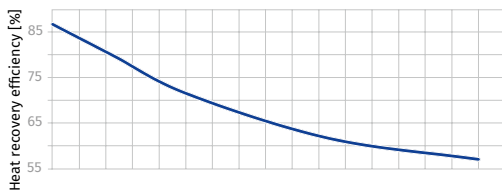
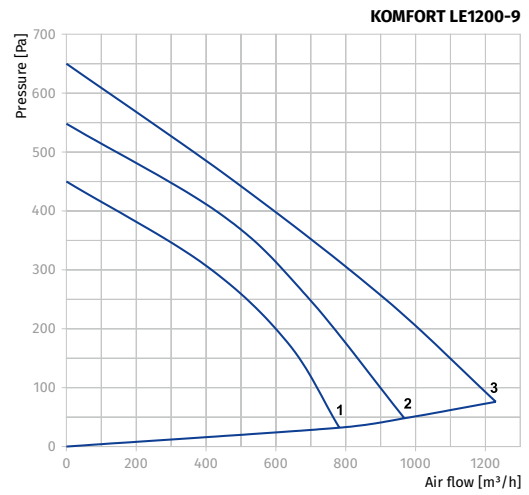
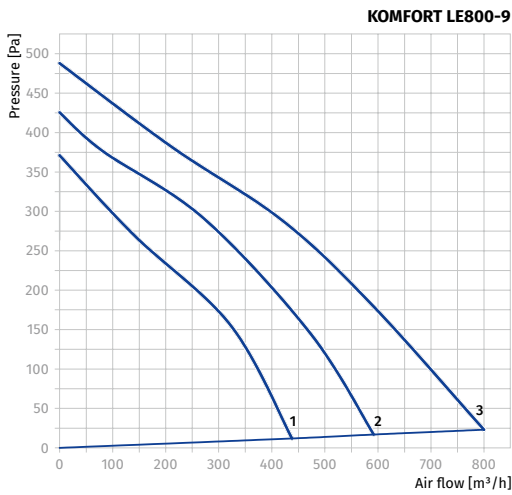
Parameters	KOMFORT LE530-4	KOMFORT LE600-4
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. power without electric heater [kW]	0.3	0.39
Max. current without electric heater [A]	1.32	1.72
Electric heater power [kW]	4	4
Electric heater current [A]	17.4	17.4
Max. power with electric heater [kW]	4.3	4.39
Max. current with electric heater [A]	18.72	19.1
Maximum air flow [m³/h (l/s)]	530 (147)	600 (167)
RPM [min ⁻¹]	1100	1350
Sound pressure level at 3 m [dBA]	28-47	32-48
Transported air temperature [°C]	-25...+50	-25...+55
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]	160	200
Weight [kg]	49	54
Heat recovery efficiency [%]*	up to 88	up to 85
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
SEC class	E	E
ErP	2016	2016

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.



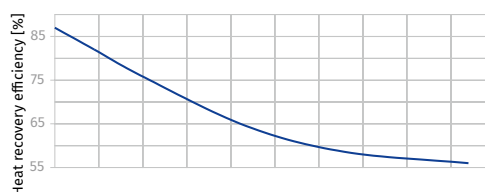
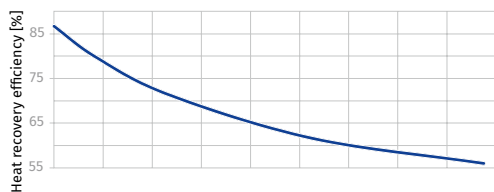
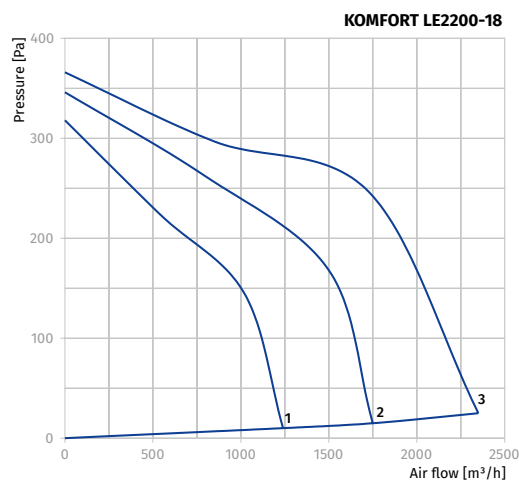
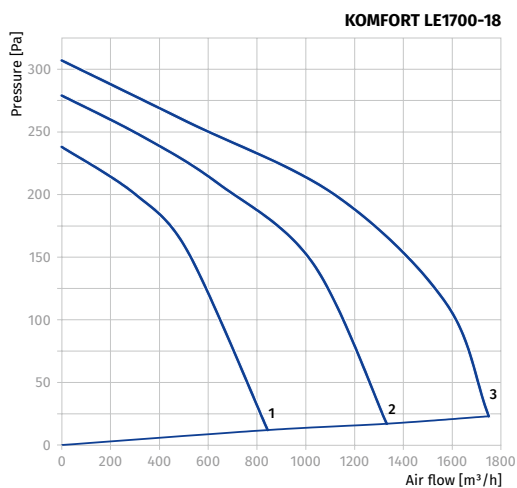
Parameters	KOMFORT LE800-9	KOMFORT LE1200-9
Voltage [V / 50 (60) Hz]	3 ~400	3 ~400
Max. power without electric heater [kW]	0.49	0.82
Max. current without electric heater [A]	2.16	3.6
Electric heater power [kW]	9.0	9.0
Electric heater current [A]	13.0	13.0
Max. power with electric heater [kW]	9.49	9.80
Max. current with electric heater [A]	15.16	16.6
Maximum air flow [m ³ /h (l/s)]	800 (222)	1200 (333)
RPM [min ⁻¹]	1650	1850
Sound pressure level at 3 m [dBA]	48	60
Transported air temperature [°C]	-25...+45	-25...+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]	250	250
Weight [kg]	85	85
Heat recovery efficiency [%]*	up to 78	up to 78
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
SEC class	E	NRVU**
ErP	2016	-

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.
** Nonresidential Ventilation Unit.












Parameters	KOMFORT LE1700-18	KOMFORT LE2200-18
Voltage [V / 50 (60) Hz]	3 ~ 400	3 ~ 400
Max. power without electric heater [kW]	0.98	1.3
Max. current without electric heater [A]	4.3	5.68
Electric heater power [kW]	18.0	18.0
Electric heater current [A]	17.4	17.4
Max. power with electric heater [kW]	26.0	26.0
Max. current with electric heater [A]	30.3	31.7
Maximum air flow [m³/h (l/s)]	1750 (486)	2200 (611)
RPM [min ⁻¹]	1100	1150
Sound pressure level at 3 m [dBA]	49	65
Transported air temperature [°C]	-25...+45	-25...+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	315
Weight [kg]	96	96
Heat recovery efficiency [%]*	up to 77	up to 77
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
SEC class	NRVU**	NRVU**
ErP	-	-

* Heat recovery efficiency is specified in compliance with the EN308 EU norms.
 ** Nonresidential Ventilation Unit.



Accessories

		KOMFORT LE350-3	KOMFORT LE500-3	KOMFORT LE530-4	KOMFORT LE600-4	KOMFORT LE800-9	KOMFORT LE1200-9	KOMFORT LE1700-18	KOMFORT LE2200-18
G4 panel filter		FP 438x215x48 G4	FP 438x215x48 G4	FP 438x215x48 G4	FP 438x215x48 G4	FP 550x254x48 G4	FP 550x254x48 G4	FP 780x273x48 G4	FP 780x273x48 G4
Mixing set		WMG	WMG	WMG	WMG	WMG	WMG	WMG	WMG
Silencer		SD 125	SD 150	SD 160	SD 200	SD 250	SD 250	SD 315	SD 315
Silencer		SDF 125	SDF 150	SDF 160	SDF 200	SDF 250	SDF 250	SDF 315	SDF 315
Backdraft air damper		VRV 125	VRV 150	VRV 160	VRV 200	VRV 250	VRV 250	VRV 315	VRV 315
Air damper		VKA 125	VKA 150	VKA 160	VKA 200	VKA 250	VKA 250	VKA 315	VKA 315
Flexible anti-vibration connector		EVA 125	EVA 150	EVA 160	EVA 200	EVA 250	EVA 250	EVA 315	EVA 315
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230	TF230	TF230	TF230

KOMFORT LW

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø250 to 315 mm air ducts.



Air flow:
up to 2100 m³/h
583 l/s



Heat recovery efficiency:
up to 78 %



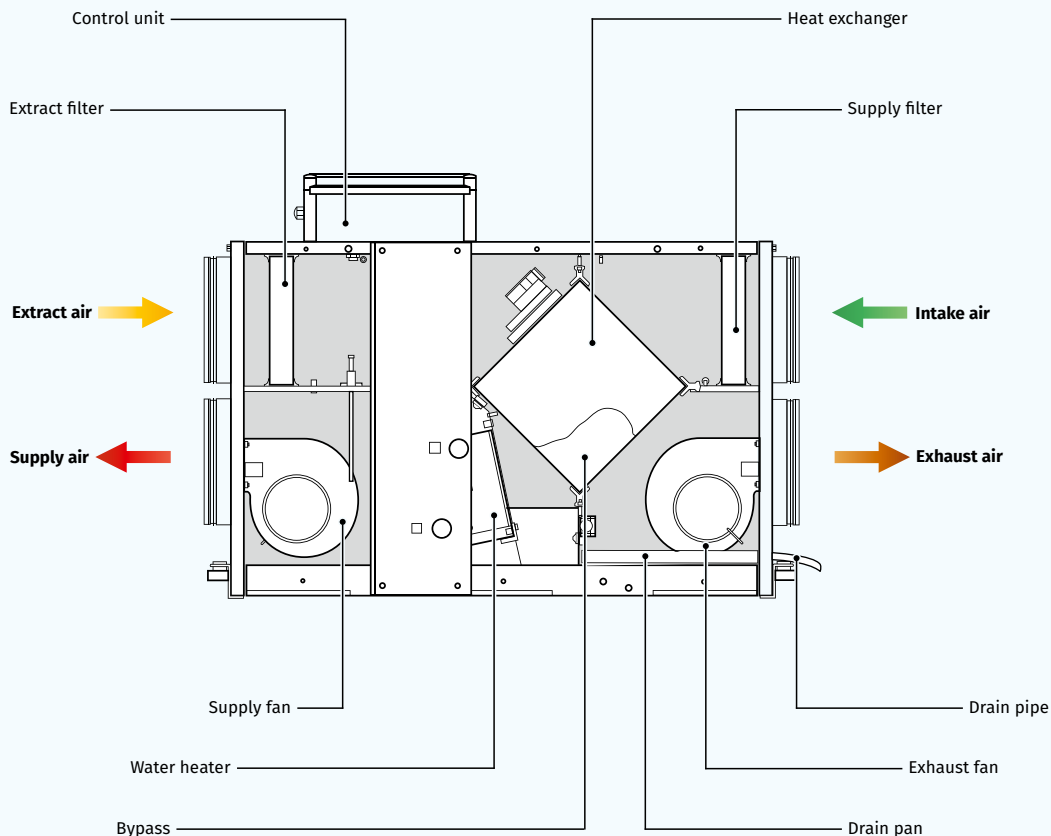
Design

- The casing is made of double-skinned aluzinc panels, internally filled with 50 mm, mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged casing side panels ensure easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fans

- Asynchronous external rotor motors and centrifugal double-intake impellers with forward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.

HEAT RECOVERY AIR HANDLING UNITS



Heat recovery

- The unit is equipped with a plate cross-flow aluminium heat exchanger with a large surface area and high heat recovery efficiency.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on the utilization of the thermal energy of the extract air for heating up supply air. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic protection system based on bypass and heater is used for freezing protection of the unit in cold seasons. The bypass damper is opened and the heater is turned on automatically according to temperature sensor readings. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After a freezing danger is over the bypass damper is closed, the heater is turned off. The heat exchanger reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.

Air heater

- The unit is equipped with a water or glycol heater heater for operation during cold seasons at low outside temperature.
- The integrated electric heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth heat output control ensures automatic supply air temperature maintaining.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.
- A F7 supply filter (specially ordered accessory) may be used for efficient supply air filtration.

Designation key

Serie	Spigot modification	Heater type	Nominal air flow [m³/h]	Number of water heater rows
KOMFORT	L: horizontal spigot orientation	W: water heater	800; 1100; 1700; 2100	– 2; 4

Overall dimensions [mm]

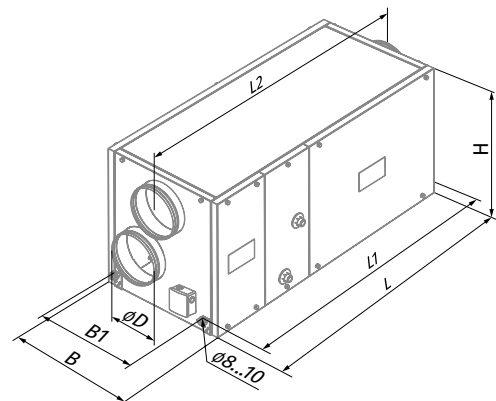
Model	D	B	B1	H	L	L1	L2
KOMFORT LW800	249	613	460	698	1071	1117	1171
KOMFORT LW1100	249	613	460	698	1071	1117	1171
KOMFORT LW1700	314	842	581	814	1345	1388	1445
KOMFORT LW2100	314	842	581	814	1345	1388	1445

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Switching on/off.
 - Three-speed fan selection, selecting heating/cooling modes (if connected to duct heater).
 - Temperature display.
- **Automation functions:**
 - Maintaining supply air temperature set from the control panel by controlling the circulation pump and actuating the heat medium regulating valve; input from the heat medium flow switch (pump alarm);
 - Safe start-up/ shutdown of the fans, warming up of the water heater before start-up; return heat medium temperature control when the fan is off.
 - Freezing protection of the water heating coils by the exhaust temperature sensor and the return heat medium temperature sensor.
 - Control of the compressor and condensing unit of the water cooler by the room temperature sensor (for the models equipped with a duct air cooler);
 - Actuating the external air dampers with a return spring
 - Unit operation according to week schedule (set at the system setup).
 - 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

- Mounting to floor, ceiling or wall with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panel for servicing and filter replacement.

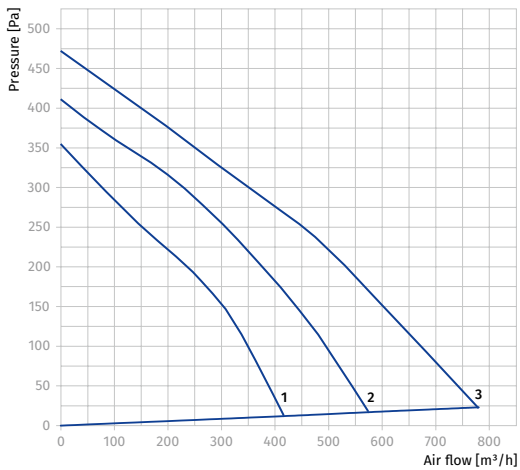


Technical data

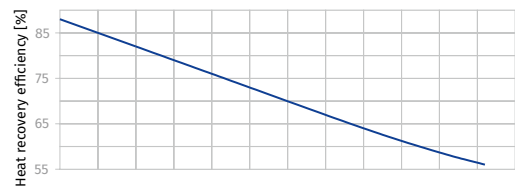
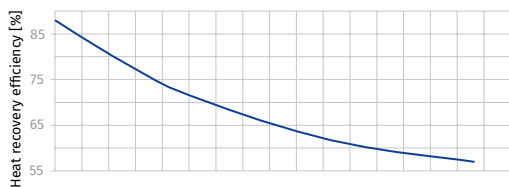
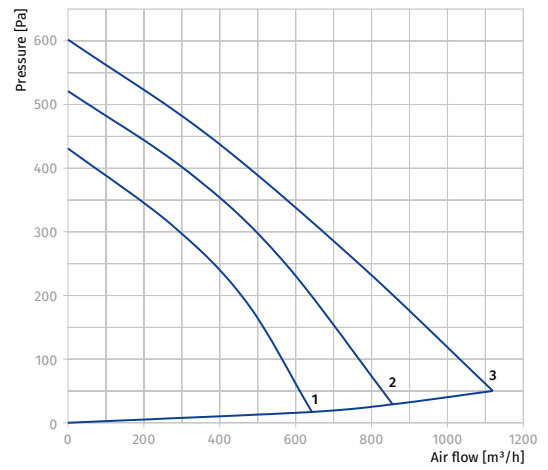
Parameters	KOMFORT LW800-2 / KOMFORT LW800-4	KOMFORT LW1100-2 / KOMFORT LW1100-4
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230
Number of water heater rows	2 or 4	2 or 4
Power [kW]	0.49	0.82
Current [A]	2.16	3.6
Max. air flow [m ³ /h (l/s)]	780 (217)	1100 (306)
RPM [min ⁻¹]	1650	1850
Sound pressure level at 3 m distance [dBA]	48	60
Transported air temperature [°C]	-25...+45	-25...+40
Casing material	aluzinc	aluzinc
Insulation	50 mm, mineral wool	50 mm, mineral wool
Extract filter	G4	G4
Supply filter	G4 (F7 Optional)	G4 (F7 Optional)
Connected air duct diameter [mm]	250	250
Weight [kg]	88	88
Heat recovery efficiency [%]	up to 78	up to 78
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
ErP	2016	-

HEAT RECOVERY AIR HANDLING UNITS

**KOMFORT LW800-2
KOMFORT LW800-4**

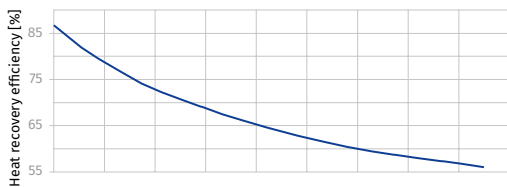
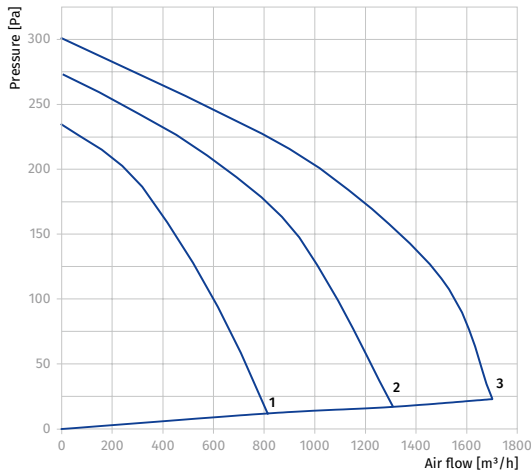


**KOMFORT LW1100-2
KOMFORT LW1100-4**

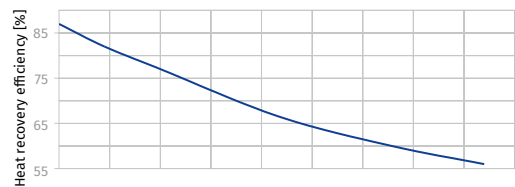
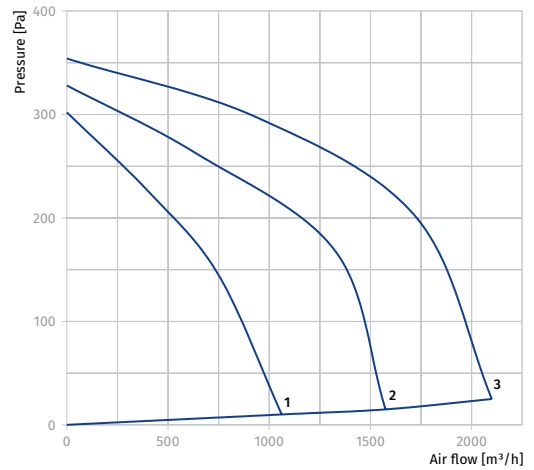


Parameters	KOMFORT LW1700-2 / KOMFORT LW1700-4	KOMFORT LW2100-2 / KOMFORT LW2100-4
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230
Number of water heater rows	2 or 4	2 or 4
Power [kW]	0.98	1.30
Current [A]	4.3	5.68
Max. air flow [m³/h (l/s)]	1700 (472)	2100 (583)
RPM [min ⁻¹]	1100	1150
Sound pressure level at 3 m distance [dBA]	49	65
Transported air temperature [°C]	-25...+45	-25...+40
Casing material	aluzinc	aluzinc
Insulation	50 mm, mineral wool	50 mm, mineral wool
Extract filter	G4	G4
Supply filter	G4 (F7 Optional)	G4 (F7 Optional)
Connected air duct diameter [mm]	315	315
Weight [kg]	99	99
Heat recovery efficiency [%]	up to 77	up to 77
Heat exchanger type	cross-flow	cross-flow
Heat exchanger material	aluminum	aluminum
ErP	-	-

**KOMFORT LW1700-2
KOMFORT LW1700-4**



**KOMFORT LW2100-2
KOMFORT LW2100-4**

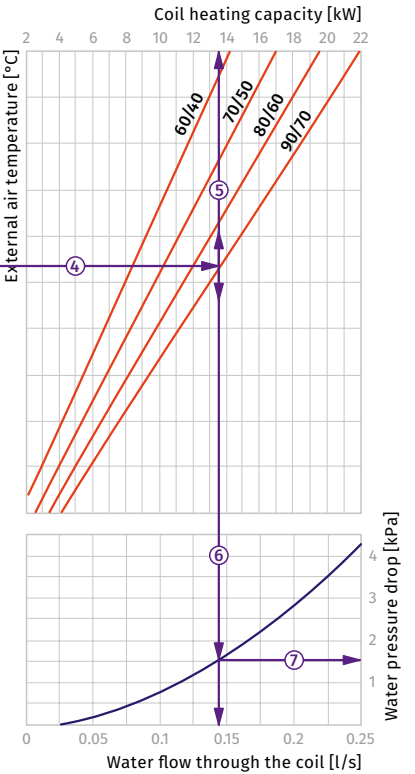
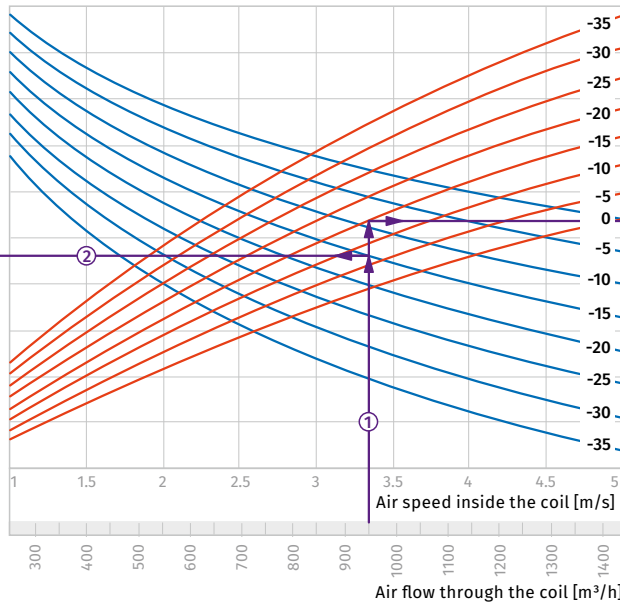
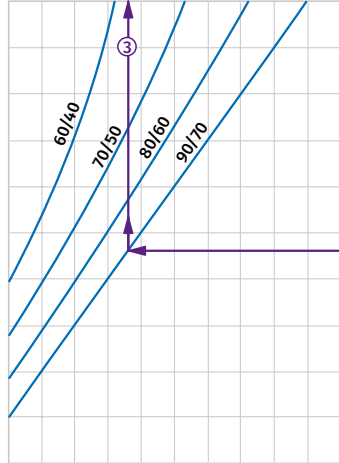


Hot water coil calculation diagram

KOMFORT LW800-2

Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+23 °C) ③.

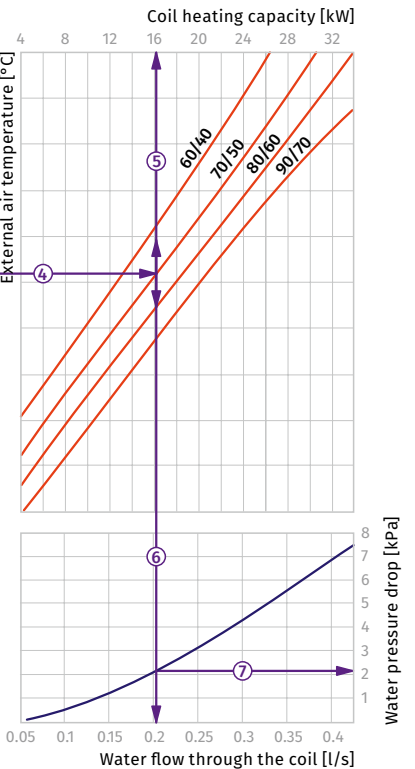
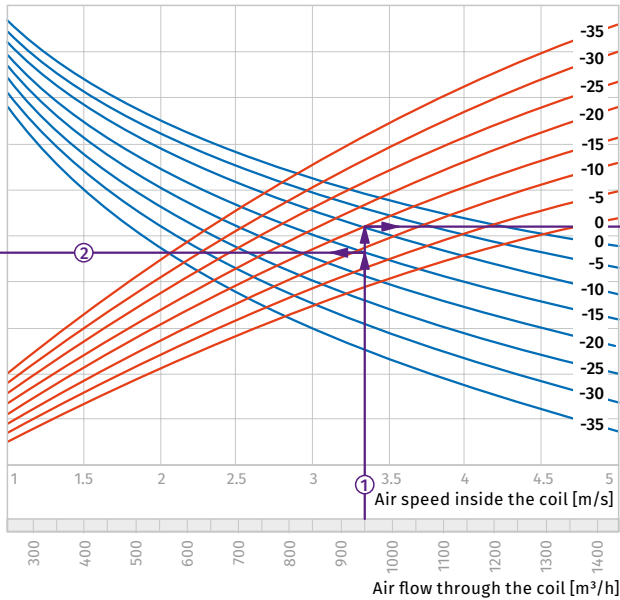
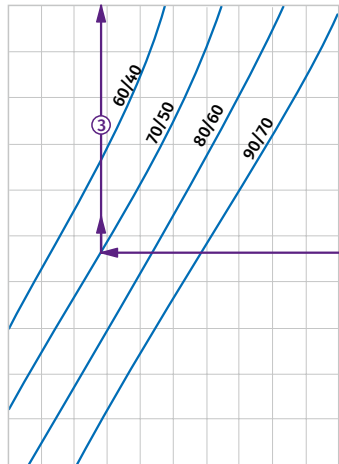
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (13.5 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.14 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 (1.5 kPa).

KOMFORT LW800-4

Air temperature downstream of the water heating coils [°C]

15 20 25 30 35 40 45 50 55 60 65



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

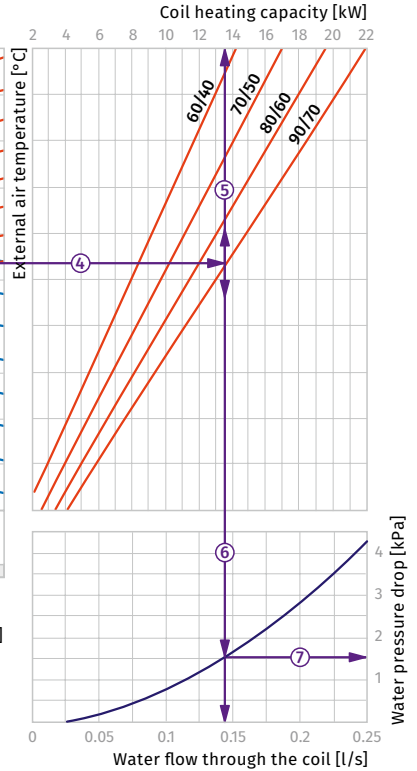
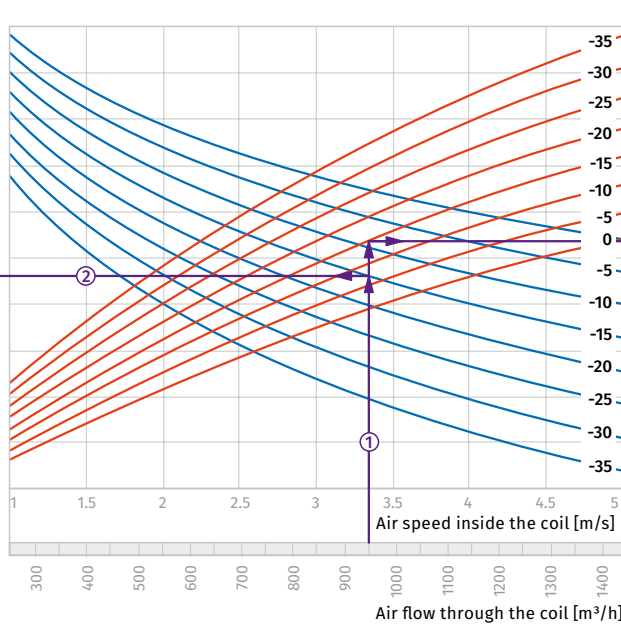
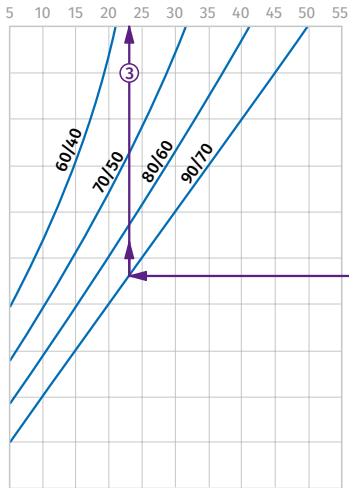
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+29 °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., -15 °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 (16.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.2 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 (2.1 kPa).

KOMFORT LW1100-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the heater is 4.35 m/s ①.

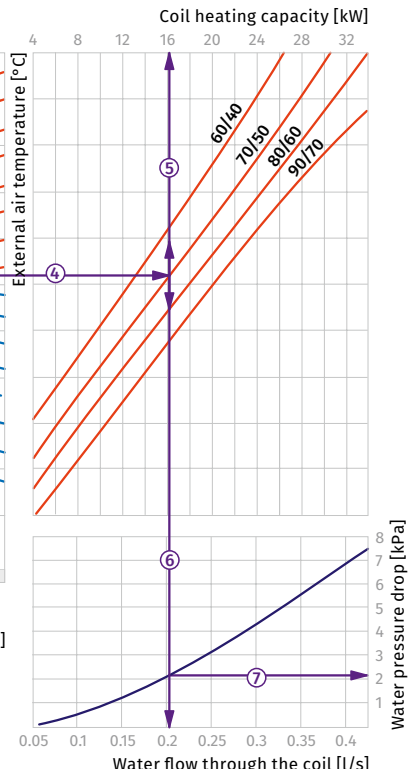
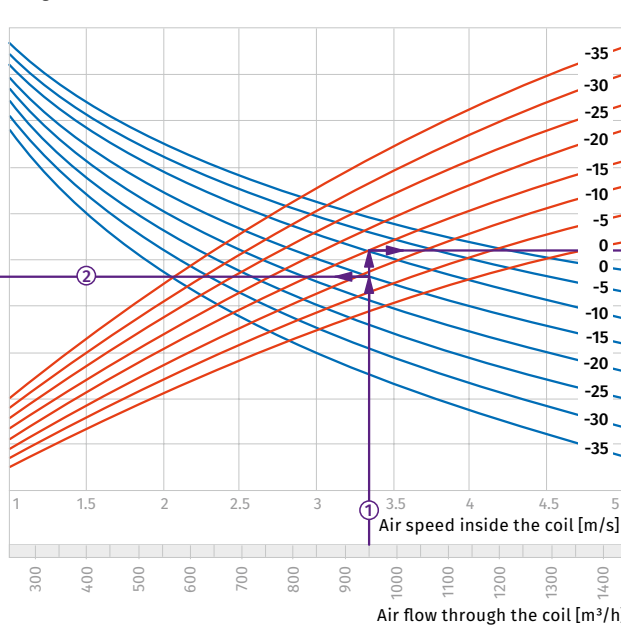
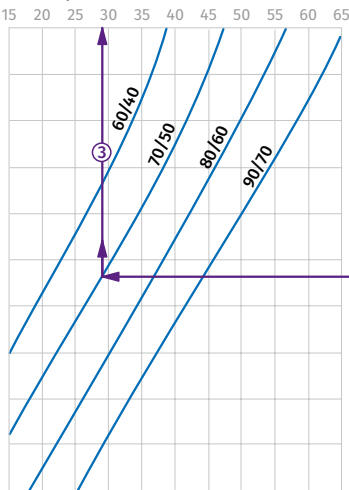
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+23 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (13.5 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.4 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 (1.5 kPa).

KOMFORT LW1100-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

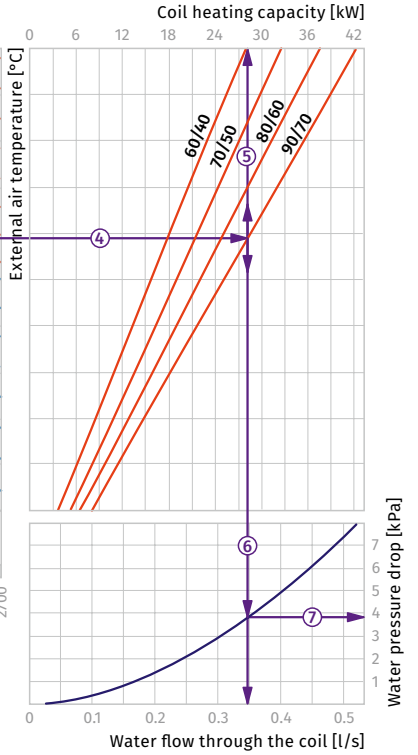
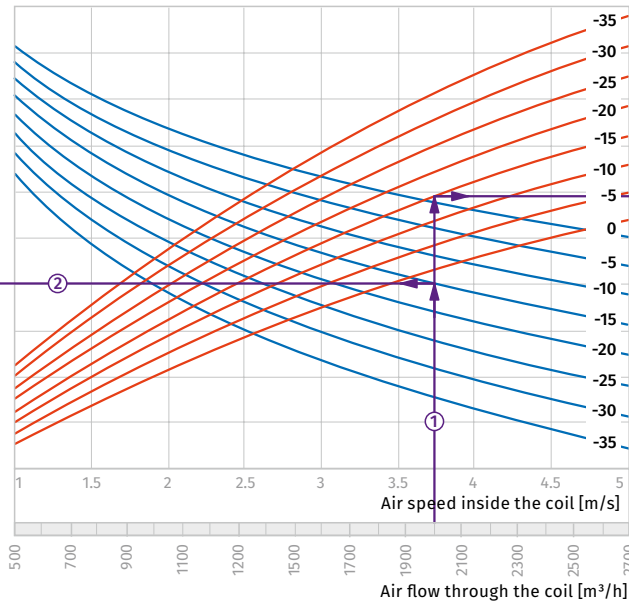
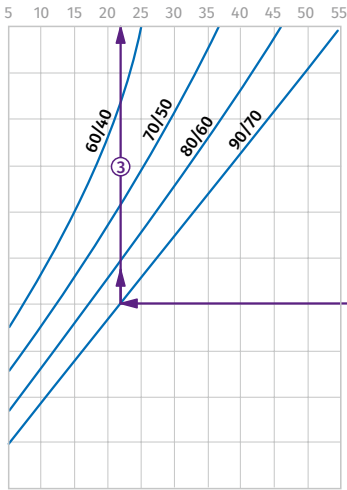
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+29 °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., -15 °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 (16.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.2 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 (2.1 kPa).

KOMFORT LW1700-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

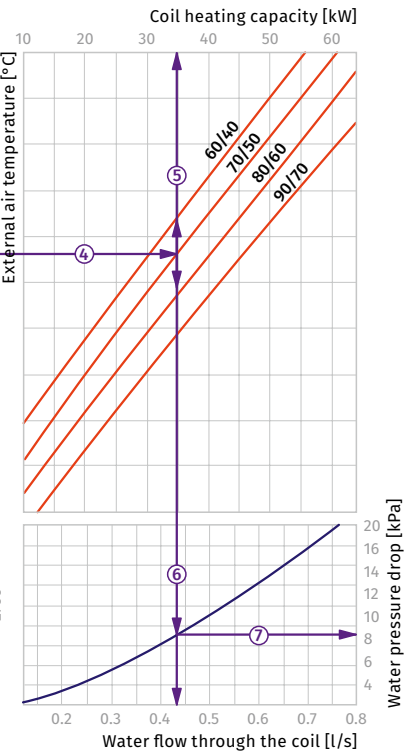
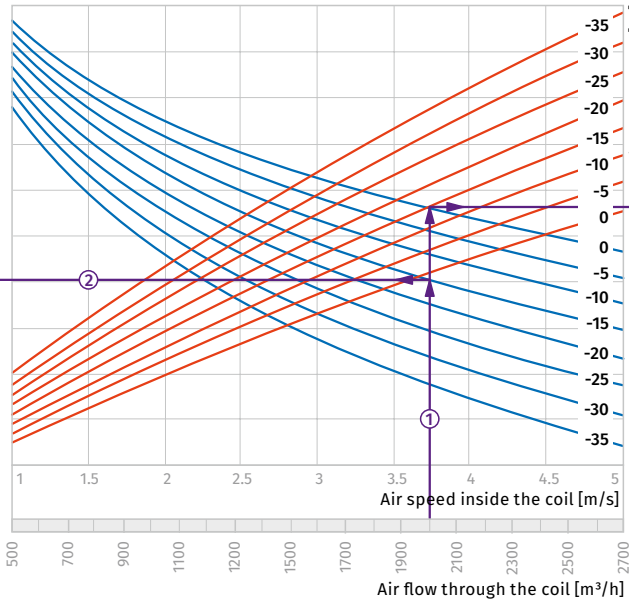
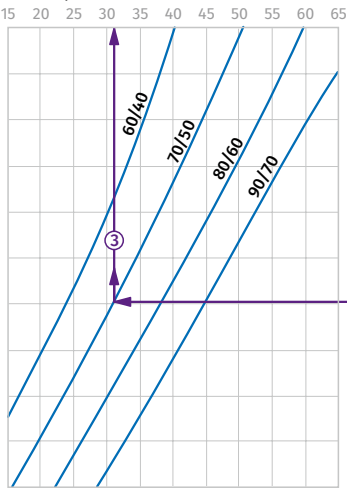
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (28.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.35 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 (3.8 kPa).

KOMFORT LW1400-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

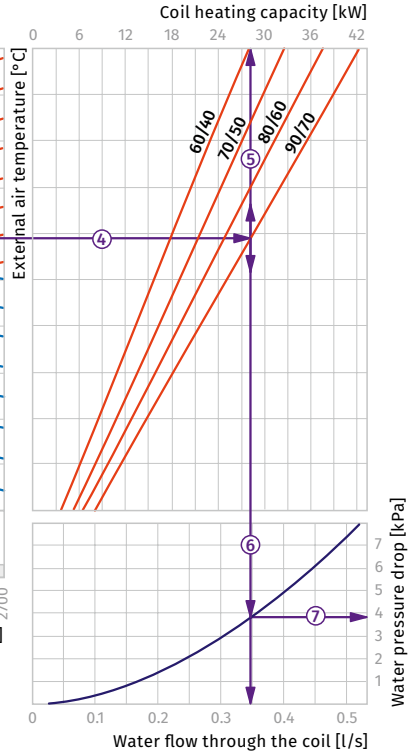
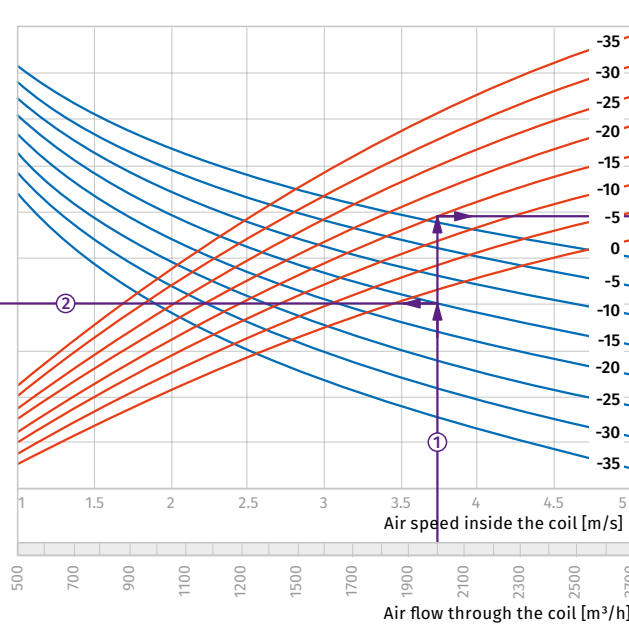
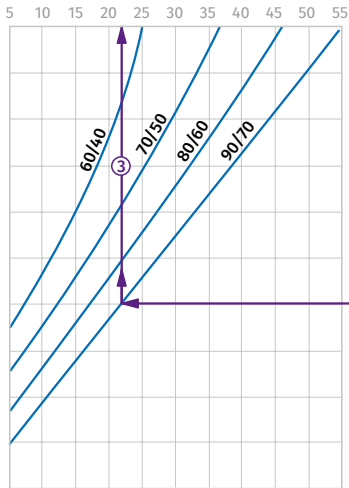
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+31 °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., -15 °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 (35.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.43 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 (9.0 kPa).

KOMFORT LW2100-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

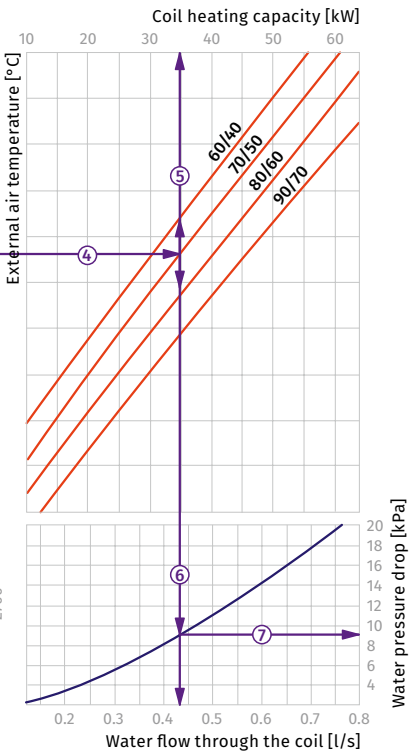
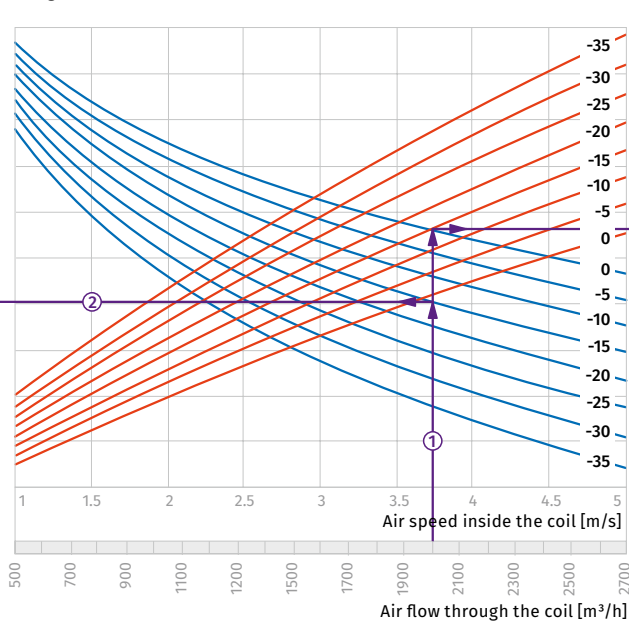
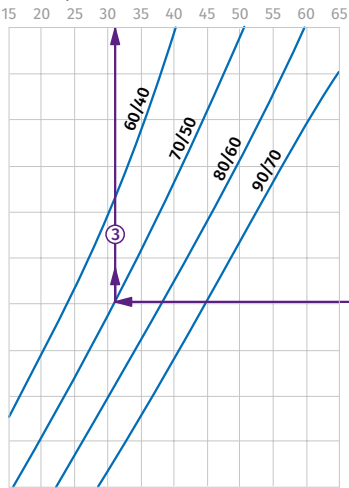
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (28.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.35 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 (3.8 kPa).

KOMFORT LW2100-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.












The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °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 (+31 °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., -15 °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 (35.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.43 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 (9.0 kPa).

Accessories

		KOMFORT LW800	KOMFORT LW1100	KOMFORT LW1700	KOMFORT LW2100
G4 panel filter		FP LW1100-4 G4	FP LW1100-4 G4	FP LW2100-4 G4	FP LW2100-4 G4
F7 panel filter		FP LW1100-4 F7	FP LW1100-4 F7	FP LW2100-4 F7	FP LW2100-4 F7
Mixing set		WMG	WMG	WMG	WMG
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Silencer		SD 250	SD 250	SD 315	SD 315
Silencer		SDF 250	SDF 250	SDF 315	SDF 315
Backdraft air damper		VRV 250	VRV 250	VRV 315	VRV 315
Air damper		VKA 250	VKA 250	VKA 315	VKA 315
Flexible anti-vibration connector		EVA 250	EVA 250	EVA 315	EVA 315
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

KOMFORT EC L

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Controllable mechanical energy saving ventilation systems.
- Heat recovery minimises ventilation heat losses.
- Regulated air exchange creates individually controlled microclimate.
- Compatible with round Ø150, 160, 200 and 250 mm air ducts.



Air flow:
up to 810 m³/h
225 l/s



Heat recovery efficiency:
up to 98 %

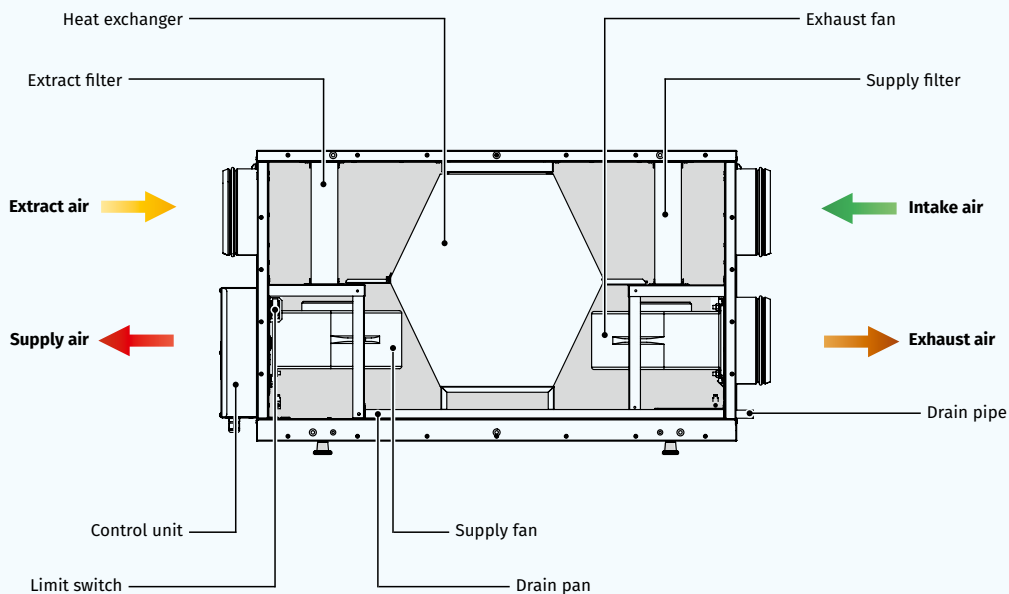


Design

- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm, mineral wool layer for heat and sound insulation.
- The casing is equipped with adjustable leveling feet on the bottom panel that enable the unit installation on the floor. The **KOMFORT EC L300(-E) S6, L1/300(-E) S6 and L400(-E) S6** models include a fixing bracket for wall mounting.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The service access to filters is on the side panel which can be installed on the left or on the right, seen on the supply air flow direction, during the unit mounting.

Fans

- High-efficient external rotor EC motors are used for air supply and exhaust.
- The **KOMFORT EC L300(-E) S6, L1/300(-E) S6 and L400(-E) S6** units are equipped with constant flow fans and forward curved blades. This fan design ensures set air flow even in case of variable resistance in the ventilation system, i.e. in case of filter clogging.
- The **KOMFORT EC L600(-E) S6** unit includes fans with backward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.



Heat recovery

The **KOMFORT EC L** units have a counter-flow polystyrene heat exchanger that recovers heat.



The **KOMFORT EC L -E** units have a counter-flow enthalpy membrane heat exchanger that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



- The air streams are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on the utilization of the heat energy contained in the extract air for heating up of supply air stream in the heat exchanger. Extract air transfers most of its heat to the intake fresh air stream. This technology significantly reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The integrated freeze protection system is used to prevent the heat exchanger freezing. In case of a freezing danger communicated by the temperature sensor the supply fan is turned off. The warm extract air warms up the heat exchanger. After that the the supply fan is turned on and the unit reverts to the normal operation mode.

- The drain pan under the heat exchanger block is used for condensate collection and drainage.
- Heat recovery is not useful in warm season with low indoor and outdoor temperature difference. In this case the heat exchanger may be temporary replaced with a summer block (available separately).

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration. A F7 supply filter (specially ordered accessory) may be used for efficient supply air filtration.

Control and automation

- The unit incorporates an integrated control system, a wall-mounted control panel with an LCD display and a remote control.
- **Automation functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply and extract fan. Each speed is individually adjusted during set-up.
 - Controlling supply and exhaust air dampers (available separately).
 - Unit shutdown on signal from a fire alarm panel.
 - Switching to the maximum speed in case of activation of a CO₂ sensor, humidity sensor, IAQ sensor or any other sensor (available separately).
 - Filter clogging control and indication by operating hours.
 - Setting week-scheduled operation of the unit.

Mounting

- Floor, ceiling or wall mounting with a fixing bracket.
- The proper unit mounting position provides condensate collecting and drainage and free access to the side panels for servicing and filter replacement.

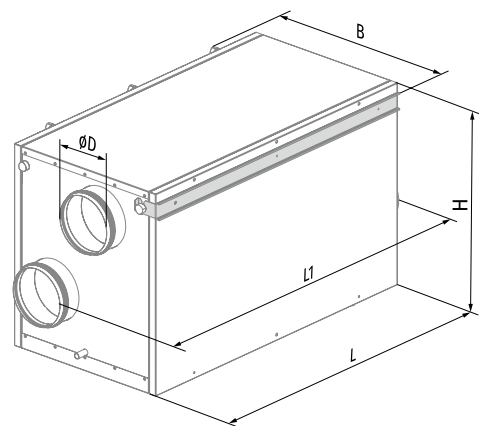
Designation key

Serie	Motor type	Spigot modification	Heater type
KOMFORT	EC: electronically commutated motor	L: horizontal spigot orientation	E: electric heater

Nominal air flow [m ³ /h]	Heat exchanger type	Control
300; 400; 600	- : heat recovery E: energy recovery	S6: control panel with an LCD display and a remote control

Overall dimensions [mm]

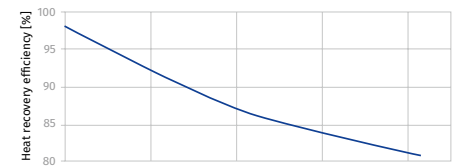
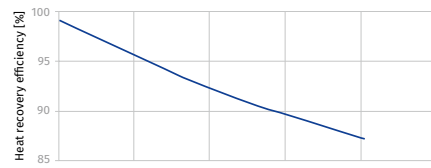
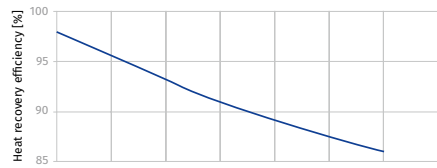
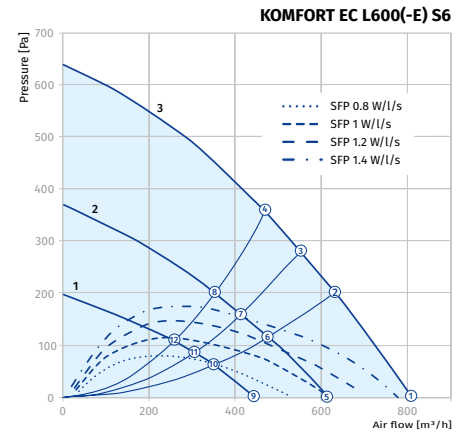
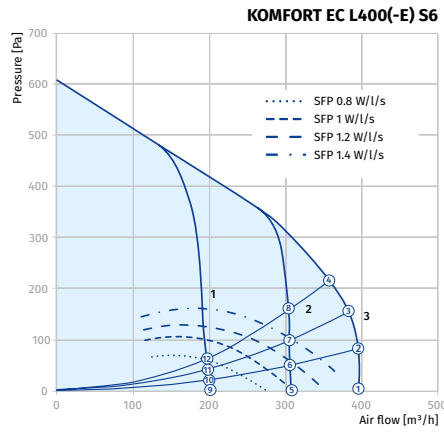
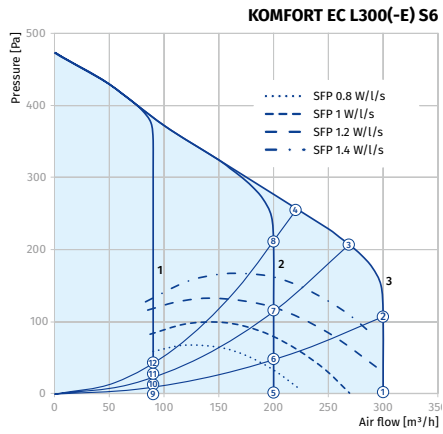
Model	D	B	H	L	L1
KOMFORT EC L300 (-E) S6	150	455	525	945	830
KOMFORT EC L1/300 (-E) S6	160	455	525	945	830
KOMFORT EC L400 (-E) S6	200	570	540	925	830
KOMFORT EC L600 (-E) S6	250	840	660	1010	890



Technical data

Parameters	KOMFORT EC L300 S6	KOMFORT EC L1/300 S6	KOMFORT EC L400 S6	KOMFORT EC L600 S6
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	140	140	210	334
Current [A]	1.2	1.2	1.6	2.2
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)	400 (111)	810 (225)
RPM [min ⁻¹]	2300	2300	2600	2860
Sound pressure level at 3 m [dBA]	24–45	24–45	30–45	30–45
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4 (F7 Option)	G4 (F7 Option)	G4 (F7 Option)	G4 (F7 Option)
Connected air duct diameter [mm]	150	160	200	250
Weight [kg]	36	36	67	83
Heat recovery efficiency [%]	86–98	86–98	86–98	81–98
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	polystyrene	polystyrene	polystyrene
SEC class	A+	A+	A	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018












Parameters	KOMFORT EC L300-E S6	KOMFORT EC L1/300-E S6	KOMFORT EC L400-E S6	KOMFORT EC L600-E S6
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Power [W]	140	140	210	334
Current [A]	1.2	1.2	1.6	2.2
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)	400 (111)	810 (225)
RPM [min ⁻¹]	2300	2300	2600	2860
Sound pressure level at 3 m [dBA]	24–45	24–45	30–45	30–45
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4 (F7 Option)	G4 (F7 Option)	G4 (F7 Option)	G4 (F7 Option)
Connected air duct diameter [mm]	150	160	200	250
Weight [kg]	36	36	67	83
Heat recovery efficiency [%]	86–98	86–98	86–98	81–98
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	enthalpy membrane	enthalpy membrane	enthalpy membrane	enthalpy membrane
SEC class	A+	A+	A	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Power [W]

Point	KOMFORT EC L300(-E) S6 KOMFORT EC L1/300(-E) S6	KOMFORT EC L400(-E) S6	KOMFORT EC L600(-E) S6
1	93	139	333
2	120	187	334
3	137	219	333
4	122	226	327
5	36	87	179
6	42	101	178
7	60	116	174
8	90	135	167
9	10	32	77
10	12	37	77
11	14	42	75
12	18	47	69

Accessories

		KOMFORT EC L300(-E) S6	KOMFORT EC L1/300(-E) S6	KOMFORT EC L400(-E) S6	KOMFORT EC L600(-E) S6
G4 panel filter		FP 378x210x48 G4	FP 378x210x48 G4	FP 500x214x48 G4	FP 768x280x48 G4
F7 panel filter		FP 378x210x48 F7	FP 378x210x48 F7	FP 500x214x48 F7	FP 768x280x48 F7
Silencer		SD 150	SD 160	SD 200	SD 250
Silencer		SDF 150	SDF 160	SDF 200	SDF 250
Backdraft air damper		VRV 150	VRV 160	VRV 200	VRV 250
Air damper		VKA 150	VKA 160	VKA 200	VKA 250
CO ₂ sensor with indication		CD-1	CD-1	CD-1	CD-1
CO ₂ sensor		CD-2	CD-2	CD-2	CD-2
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230
Summer block		SB R6 366/384	SB R6 366/384	SB R6 366/500	SB R6 366/384

KOMFORT EC LB/LBE

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- For arranging of controlled energy saving ventilation systems.
- Heat recovery minimises ventilation heat losses.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø160, 200 and 250 mm air ducts.



Air flow:
up to 940 m³/h
261 l/s



Heat recovery efficiency:
up to 98 %



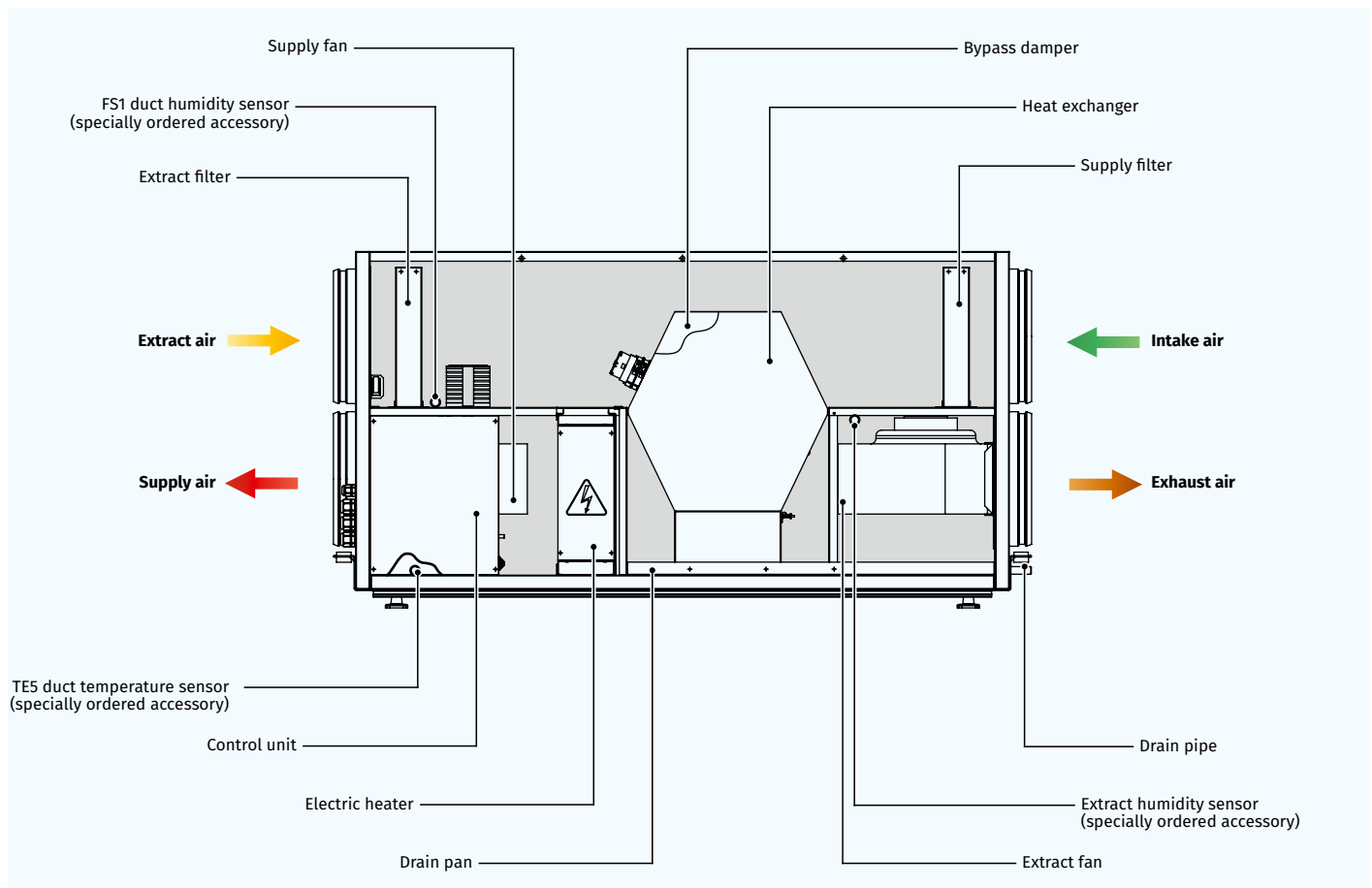
Design

- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm, mineral wool layer for heat and sound insulation.
- Casing has fixing brackets with vibration absorbing connectors for easy installation.
- The hinged casing panel ensures easy access to the internals for cleaning and other maintenance operations.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The bypass damper is opened automatically in summer time to cool down a room with cool outside air. For the model with a heater the bypass damper is also used for the heat exchanger freezing protection.

Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- The forward curved blades in **KOMFORT EC LB300/LB400/LBE300/LBE400** provide constant flow air flow.
- The **KOMFORT EC LB(E)600** model has impellers with backward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

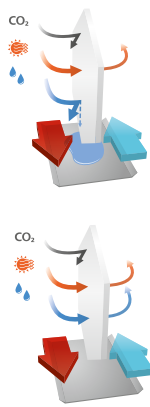
HEAT RECOVERY AIR HANDLING UNITS



Heat recovery

o **KOMFORT EC LB/LBE 300/400/600** are equipped with a counter-flow polystyrene plate heat exchanger for heat recovery. The drain pan under the heat exchanger block is used for condensate collection and drain.

o **KOMFORT EC LB/LBE 300/400/600-E** are equipped with a counter-flow plate enthalpy heat exchanger made of enthalpy membrane for heat and humidity recovery. Due to humidity recovery the enthalpy heat exchanger produces no condensate. The air flows are fully separated within the heat exchangers. Odours and contaminants contained in the extract air are not transferred to the supply air flow.



- Heat recovery is based on heat and/or humidity transfer through the plates of the heat exchanger. In the cold season the intake air is heated in the heat exchanger due to the warm extract air. Heat recovery enables to reduce ventilation heat losses and heating costs. In the summer season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This reduces load on air conditioners and saves energy costs.
- The integrated freeze protection system is used to prevent the heat exchanger freezing in the cold season.
 - KOMFORT EC LBE:** the bypass damper is opened on signal from the temperature sensor. The intake air flows through the bypass duct and is heated up to the set temperature by the heater. Meanwhile the heat exchanger is warmed up with the warm extract air. After defrosting of the heat exchanger the bypass damper closes the bypass duct and the unit continues its operation in the normal operation mode.
 - KOMFORT EC LB:** the supply fan is stopped on signal from the outer temperature sensor and the heat exchanger is warmed up with the warm extract air. After defrosting of the heat exchanger the supply fan turns on and the unit continues its operation in the normal operation mode.

Air heater

- The **KOMFORT EC LBE** model is equipped with an electric heater for operation during cold seasons at low outside temperature.
- The integrated electric heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth heat output control ensures automatic supply air temperature maintaining.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Designation key

Serie	Motor type	Spigot modification	Bypass	Heater type	Nominal air flow [m³/h]	Heat exchanger type	Control
KOMFORT	EC: electronically commutated motor	L: horizontal spigot orientation	_ : no bypass B: integrated bypass	_ : no heater E: electric heater	300; 400; 600	_ : heat recovery -E: energy recovery	S11: sensor LCD control panel S14: sensor control panel

Overall dimensions [mm]

Model	D	B	B1	H	L	L1
KOMFORT EC LB300(-E)	159	566	125	475	1081	1187
KOMFORT EC LBE300(-E)	159	566	125	475	1081	1187
KOMFORT EC LB400(-E)	199	687	255	514	1092	1174
KOMFORT EC LBE400(-E)	199	687	255	514	1092	1174
KOMFORT EC LB600(-E)	249	940	250	620	1200	1282
KOMFORT EC LBE600(-E)	249	940	250	620	1200	1282

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration.

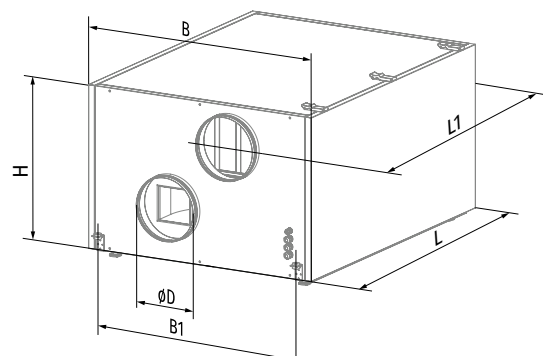
Control and automation

- KOMFORT EC LB/LBE S11** units incorporate an integrated control system with the S11 wall-mounted control panel with an LCD display.
- KOMFORT EC LB/LBE S14** units incorporate an integrated control system with the S14 wall-mounted control panel with a LED indication. The units are equipped with the Type B USB Connector for advanced options setting in a special software. The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- S11 automation functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply and extract fan as well as air flow control. Each speed is individually adjusted during set-up.
 - Automatic heater activation/deactivation and smooth heat output control. Heater overheating protection. Cooling of the heater at the end of the heating cycle for **KOMFORT EC LBE S11**.
 - Opening/closing the bypass damper for summer ventilation.
 - Setting and maintaining room or duct air temperature.
 - Timer activation/deactivation and set-up.
 - Setting day- and week-scheduled operation of the unit.
 - Operation control on feedback from FS1 duct humidity sensor (to be ordered separately) or from the humidity sensor in the control panel.
 - Filter clogging control.
 - System shutdown on signal from a fire alarm panel.
 - Controlling supply and exhaust air dampers (available separately).
 - Cooler control (available separately).
- S14 automation functions:**
 - Activating/deactivating the unit.
 - Air flow control (selecting low, medium or high speed).
 - Bypass damper opening/closing for summer ventilation.
 - Alarm indication.
 - Filter maintenance indication.



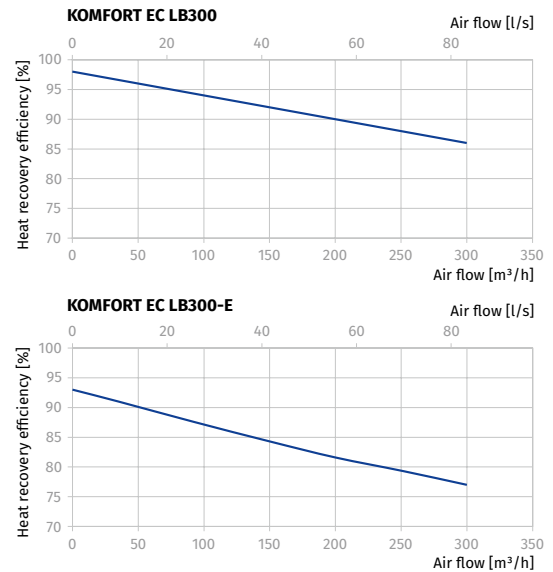
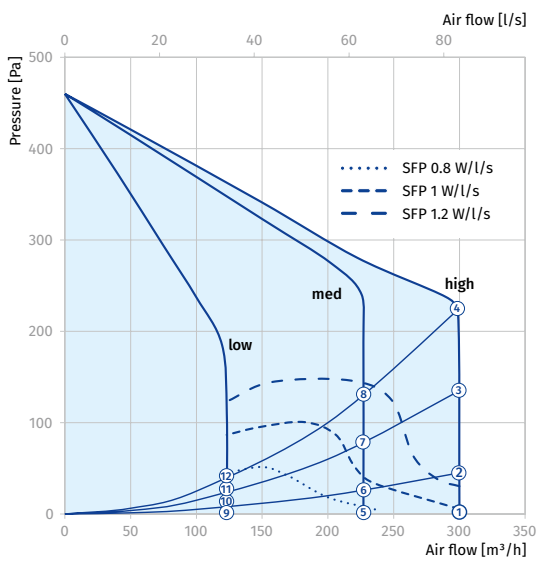
Mounting

- The unit is suitable for floor, ceiling or wall mounting using fixing brackets.
- The correct mounted unit must provide free condensate collection and drainage as well as good access for servicing and filter replacement.
- The service access is on the side of the removable service side panel, leftwards along supply air flow.



Technical data

Parameters	KOMFORT EC LB300 S11 (S14)	KOMFORT EC LBE300 S11	KOMFORT EC LB300-E S11(S14)	KOMFORT EC LBE300-E S11
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Max. power without electric heater [kW]	138	138	138	138
Max. current without electric heater [A]	0.9	0.9	0.9	0.9
Electric heater power [kW]	-	3.0	-	3.0
Electric heater current [A]	-	13.0	-	13.0
Max. power with electric heater [kW]	3.0	-	3.0	-
Max. current with electric heater [A]	13.0	-	13.0	-
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)	300 (83)	300 (83)
RPM [min ⁻¹]	1380	1380	1380	1380
Sound pressure level at 3 m [dBA]	24-45	24-45	24-45	24-45
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4	G4	G4	G4
Connected air duct diameter [mm]	160	160	160	160
Weight [kg]	40	42	40	42
Heat recovery efficiency [%]	86-98	86-98	83-96	83-96
Casing material	galvanized steel	galvanized steel	galvanized steel	galvanized steel
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	polystyrene	enthalpy membrane	enthalpy membrane
SEC class for S11 automation	A	A	A	A
SEC class for S14 automation	A+	-	A	-
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Sound power level, A-filter applied.

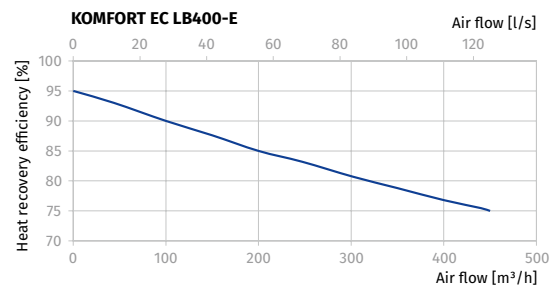
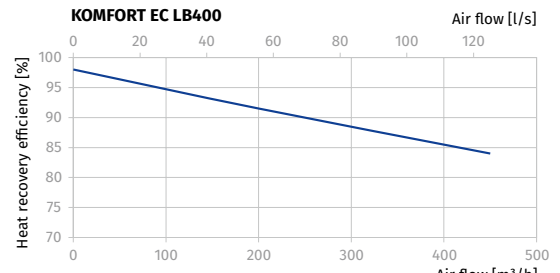
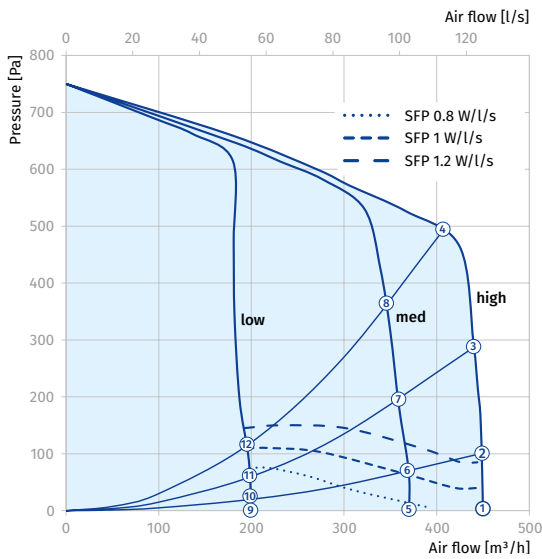
Sound power level, A-weighted	Gen.	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	51	30	48	46	37	42	36	32	21		
L _{WA} to supply outlet [dBA]	61	41	54	57	55	44	46	35	24		
L _{WA} to exhaust inlet [dBA]	51	30	47	46	38	43	35	31	22		
L _{WA} to exhaust outlet [dBA]	61	40	52	58	56	43	46	34	22		
L _{WA} to environment [dBA]	34	23	23	32	27	19	15	19	18	14	24

* Data provided for point 1 of the air flow diagram

Unit power with no heater [W]

Point	KOMFORT EC LB300(-E) S11(S14) / KOMFORT EC LBE300(-E) S11
1	83
2	96
3	124
4	134
5	45
6	48
7	6
8	73
9	20
10	22
11	25
12	27

Parameters	KOMFORT EC LB400 S11 (S14)	KOMFORT EC LBE400 S11	KOMFORT EC LB400-E S11(S14)	KOMFORT EC LBE400-E S11
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Max. power without electric heater [kW]	306	306	306	306
Max. current without electric heater [A]	2	2	2	2
Electric heater power [kW]	-	3.0	-	3.0
Electric heater current [A]	-	13.0	-	13.0
Max. current without electric heater [kW]	3.0	-	3.0	-
Max. current with electric heater [A]	13.0	-	13.0	-
Maximum air flow [m³/h (l/s)]	450 (125)	450 (125)	450 (125)	450 (125)
RPM [min⁻¹]	2600	2600	2600	2600
Sound pressure level at 3 m [dBA]	28-47	28-47	28-47	28-47
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	G4	G4	G4	G4
Connected air duct diameter [mm]	200	200	200	200
Weight [kg]	45	47	45	47
Heat recovery efficiency [%]	85-98	85-98	75-95	75-95
Casing material	galvanized steel	galvanized steel	galvanized steel	galvanized steel
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	polystyrene	enthalpy membrane	enthalpy membrane
SEC class for S11 automation	A	A	A	A
SEC class for S14 automation	A+	-	A	-
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Sound power level, A-filter applied.

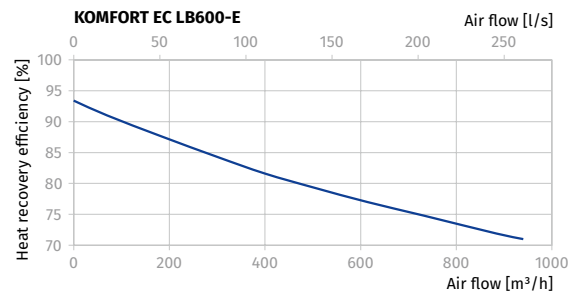
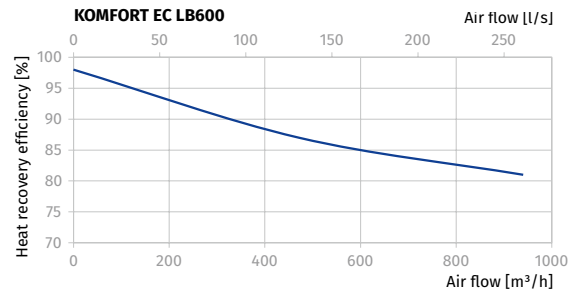
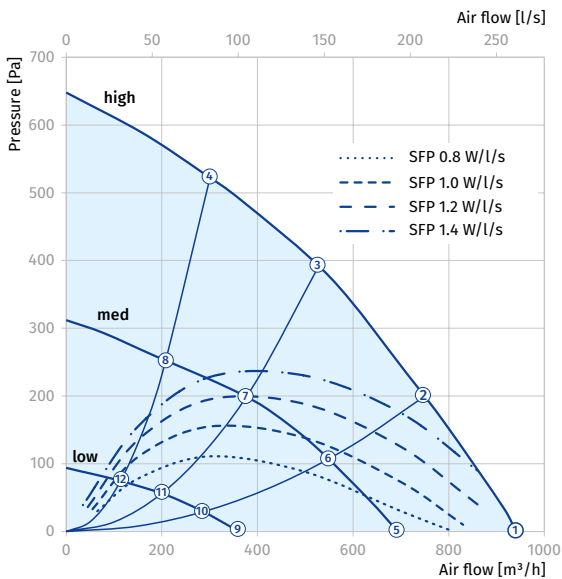
Sound power level, A-weighted	Gen.	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	54	32	50	51	40	43	40	37	25		
LWA to supply outlet [dBA]	62	44	57	58	54	51	48	38	27		
LWA to exhaust inlet [dBA]	54	32	49	51	41	44	39	36	26		
LWA to exhaust outlet [dBA]	62	43	55	59	55	50	48	37	25		
LWA to environment [dBA]	36	27	28	32	29	22	19	21	23	16	26

* Data provided for point 1 of the air flow diagram

Unit power with no heater [W]

Point	KOMFORT EC LB400(-E) S11(S14) / KOMFORT EC LBE400(-E) S11
1	87
2	145
3	247
4	299
5	79
6	103
7	143
8	217
9	28
10	32
11	41
12	56

Parameters	KOMFORT EC LB600 S11 (S14)	KOMFORT EC LBE600 S11	KOMFORT EC LB600-E S11(S14)	KOMFORT EC LBE600-E S11
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Max. power without electric heater [kW]	340	340	340	340
Max. current without electric heater [A]	2.2	2.2	2.2	2.2
Electric heater power [kW]	-	3.0	-	3.0
Electric heater current [A]	-	13.0	-	13.0
Max. current without electric heater [kW]	3.0	-	3.0	-
Max. current with electric heater [A]	13.0	-	13.0	-
Maximum air flow [m³/h (l/s)]	940 (261)	940 (261)	940 (261)	940 (261)
RPM [min ⁻¹]	1740	1740	1740	1740
Sound pressure level at 3 m [dBA]	28-47	28-47	28-47	28-47
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract/Supply filter	G4	G4	G4	G4
Connected air duct diameter [mm]	250	250	250	250
Weight [kg]	77	80	77	80
Heat recovery efficiency [%]	81-98	81-98	74-94	74-94
Casing material	galvanized steel	galvanized steel	galvanized steel	galvanized steel
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	polystyrene	enthalpy membrane	enthalpy membrane
SEC class for S11 automation	A	A	A	A
SEC class for S14 automation	A+	-	A	-
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018


Sound power level, A-filter applied.

Sound power level, A-weighted	Gen.	Octave frequency band [Hz]							LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000		
L _{WA} to supply inlet [dBA]	57	36	55	51	41	47	42	38	28	
L _{WA} to supply outlet [dBA]	66	47	62	62	59	53	52	42	29	
L _{WA} to exhaust inlet [dBA]	57	36	54	51	42	48	41	37	29	
L _{WA} to exhaust outlet [dBA]	66	46	60	63	60	52	52	41	27	
L _{WA} to environment [dBA]	39	26	29	36	32	24	22	26	26	28

* Data provided for point 1 of the air flow diagram

Unit power with no heater [W]

Point	KOMFORT EC LB600(-E) S11(S14) / KOMFORT EC LBE600(-E) S11
1	340
2	340
3	336
4	300
5	138
6	140
7	120
8	110
9	33
10	32
11	32
12	28

Accessories

		KOMFORT EC LB 300(-E) S11	KOMFORT EC LBE 300(-E) S11	KOMFORT EC LB 300(-E) S14	KOMFORT EC LB 400(-E) S11	KOMFORT EC LBE 400(-E) S11
G4 panel filter		FP 511x177x48 G4	FP 511x177x48 G4	FP 511x177x48 G4	FP 625x215x48 G4	FP 625x215x48 G4
Internal humidity sensor		FS1	FS1	-	FS1	FS1
Internal humidity sensor		-	-	FS2	-	-
Electric heater		EKH-KOMFORT EC LB 300E	-	-	EKH-KOMFORT EC LB 400E	-
Silencer		SD 160 / SDF 160	SD 160 / SDF 160	SD 160 / SDF 160	SD 200 / SDF 200	SD 200 / SDF 200
Backdraft air damper		VRV 160	VRV 160	VRV 160	VRV 200	VRV 200
Air damper		VKA 160	VKA 160	VKA 160	VKA 200	VKA 200
Electric actuator		LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230
		KOMFORT EC LB 400(-E) S14	KOMFORT EC LB 600(-E) S11	KOMFORT EC LBE 600(-E) S11	KOMFORT EC LB 600(-E) S14	
G4 panel filter		FP 625x215x48 G4	FP 896x293x48 G4	FP 896x293x48 G4	FP 896x293x48 G4	
Internal humidity sensor		-	FS1	FS1	-	
Internal humidity sensor		FS2	-	-	FS2	
Electric heater		-	EKH-KOMFORT EC LB 600E	-	-	
Silencer		SD 200 / SDF 200	SD 250 / SDF 250	SD 250 / SDF 250	SD 250 / SDF 250	
Backdraft air damper		VRV 200	VRV 250	VRV 250	VRV 250	
Air damper		VKA 200	VKA 250	VKA 250	VKA 250	
Electric actuator		LF230	LF230	LF230	LF230	
Electric actuator		TF230	TF230	TF230	TF230	

KOMFORT EC LW

Heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- For controllable mechanical energy saving ventilation systems.
- Heat recovery minimises ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round Ø150, 160 or 200 mm air ducts.



Air flow:
up to 550 m³/h
153 l/s



Heat recovery efficiency:
up to 90 %

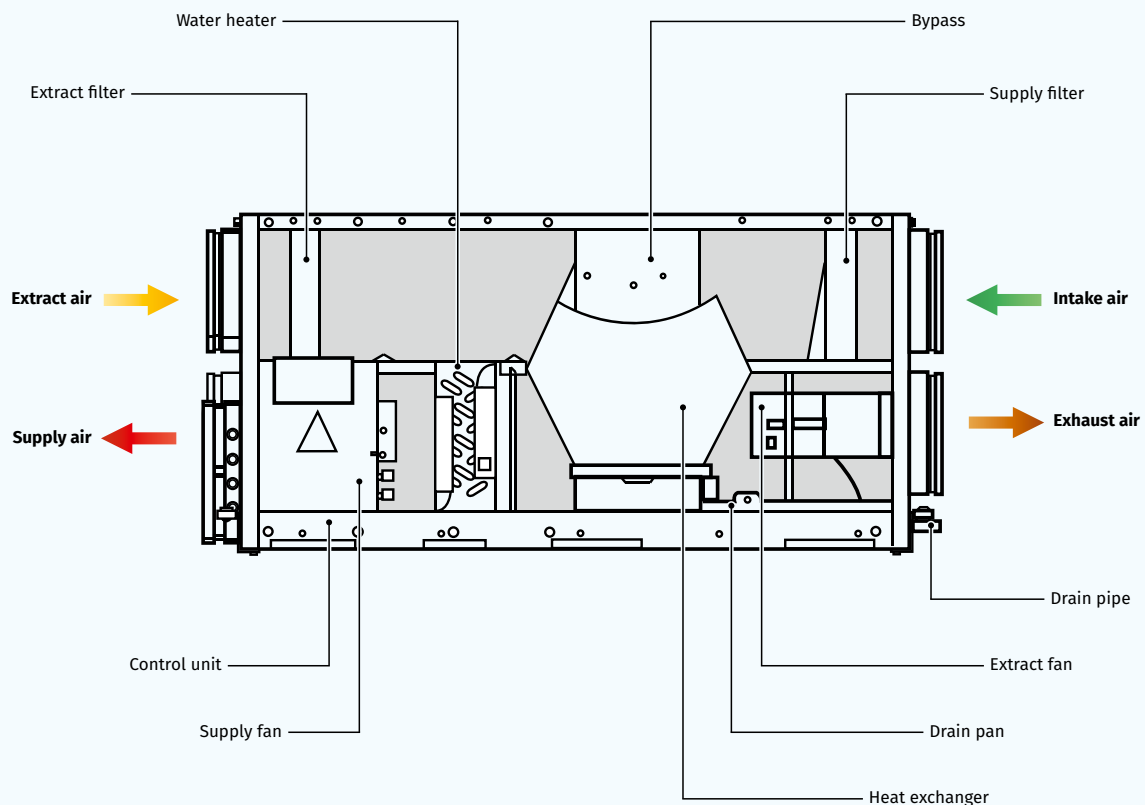


Design

- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm, mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged casing side panels ensure easy access to the internals for cleaning, filter replacement and other maintenance operations.

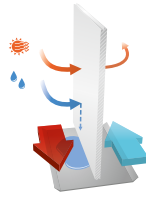
Fans

- High-efficient external rotor EC motors and centrifugal double-inlet impellers with forward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.



Heat recovery

The **KOMFORT EC LW** units have a counter-flow polystyrene heat exchanger that recovers heat.



The **KOMFORT EC LW-E** units have a counter-flow enthalpy membrane heat exchanger that recovers heat and humidity. Due to humidity recovery the enthalpy heat exchanger produces no condensate.



- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on the utilization of the thermal energy of the extract air for heating up supply air. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat losses in cold seasons. In summer the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic protection system based on bypass and heater is used for freezing protection of the unit in cold seasons. The bypass damper is opened and the heater is turned on automatically according to temperature sensor readings. Cold intake air passes by the heat exchanger and is warmed up to set temperature in the heat exchanger. Synchronously extract air that passes by the heat exchanger is used for its defrosting. After a freezing danger is over the bypass damper is closed, the heater is turned off. The intake air flows again through the heat exchanger and absorbs the accumulated heat. The unit reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.

Air heater

- The unit is equipped with a water (glycol) heater for operation at low outside air temperature.
- The integrated water heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- Smooth water heater power control ensures automatic supply air temperature maintaining.
- The air temperature sensor downstream of the waterheating coils and the return water temperature sensor are used for freezing protection of the water heater.

Air filtration

- The built-in F7 supply filter and G4 extract filter provide efficient air filtration.

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and sensor display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Activating/deactivating the unit.
 - Setting required fan speed.
 - Setting and maintaining supply air temperature.
 - Setting week-scheduled operation of the unit.
 - Displaying indoor air temperature.
- **Automation functions:**
 - Set supply air temperature maintaining by means of the heat medium regulating valve.
 - Controlling the heat exchanger bypass damper.
 - Controlling the circulating pump installed on the heat medium supply pipeline to the water heater.
 - Setting supply and extract fan speed.
 - Filter clogging control and indication by operating hours.
 - Controlling supply and exhaust air dampers (to be ordered separately).

Mounting

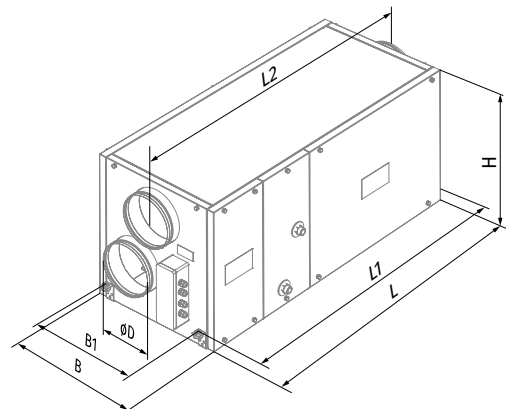
- Mounting to floor, ceiling or wall with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panels for servicing and filter replacement.

Designation key

Serie	Motor type	Spigot modification	Spigot diameter	Heater type	Nominal air flow [m³/h]	Heat exchanger type	Number of water (glycol) coil rows
KOMFORT	EC: electronically commutated motor	L: horizontal spigot orientation	_: standard diameter 1: Ø160 mm spigot	W: water heater	300, 400, 550	_: heat recovery E: energy recovery	2

Overall dimensions [mm]

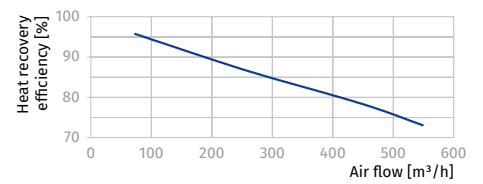
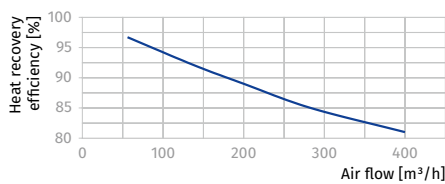
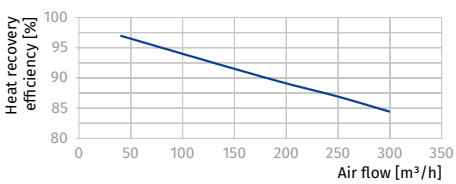
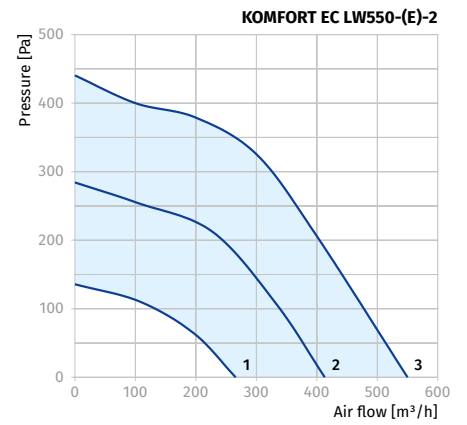
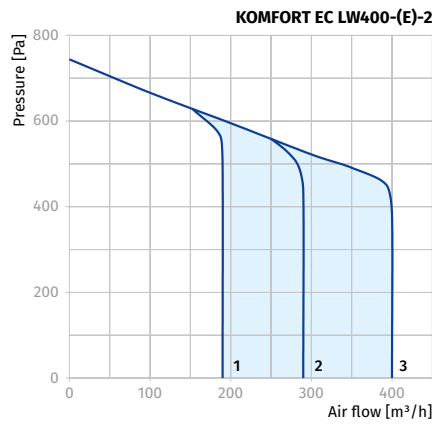
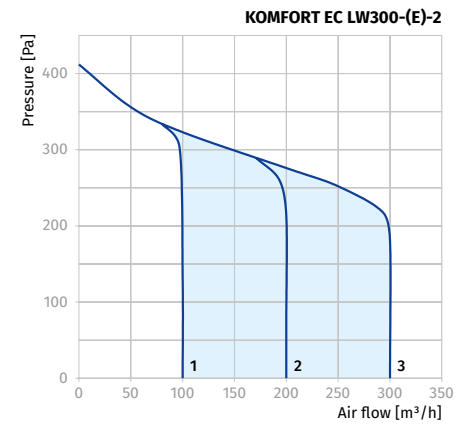
Model	D	B	B1	H	L	L1	L2
KOMFORT EC LW300(-E)-2	149	500	403	555	1092	1137	1198
KOMFORT EC L1W300(-E)-2	459	500	403	555	1092	1137	1198
KOMFORT EC LW400(-E)-2	199	500	403	555	1092	1137	1198
KOMFORT EC LW550(-E)-2	199	500	403	555	1092	1137	1198



Technical data

Parameters	KOMFORT EC LW300-2	KOMFORT EC L1W300-2	KOMFORT EC LW400-2	KOMFORT EC LW550-2
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Number of water (glycol) coil rows	2	2	2	2
Power [W]	140	140	350	350
Current [A]	1.2	1.2	2.6	2.6
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)	400 (111)	550 (153)
RPM [min ⁻¹]	1380	1380	1340	2150
Sound pressure level at 3 m [dBA]	24-45	24-45	28-47	28-47
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4
Supply filter	F7	F7	F7	F7
Connected air duct diameter [mm]	150	160	200	200
Weight [kg]	40	40	40	40
Heat recovery efficiency [%]	up to 90	up to 90	up to 90	up to 90
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	polystyrene	polystyrene	polystyrene	polystyrene
SEC class	A+	A+	A+	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018

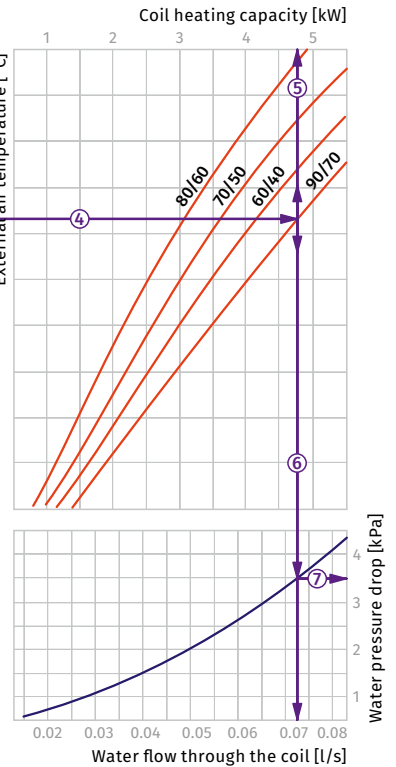
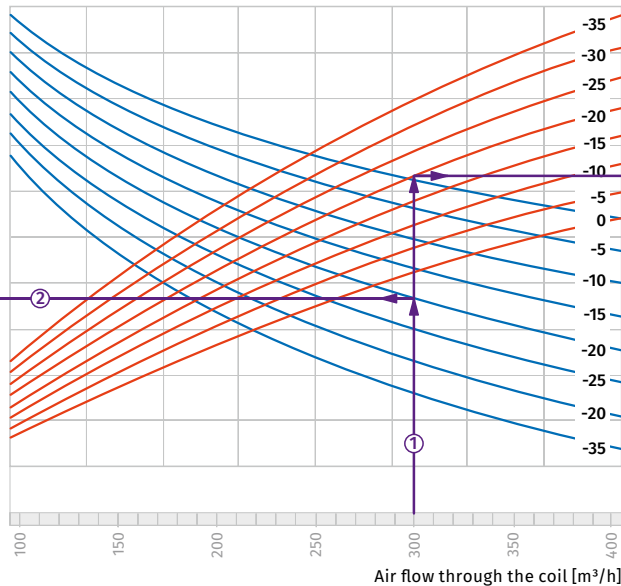
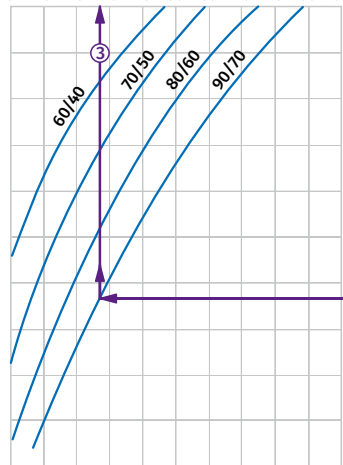
Parameters	KOMFORT EC LW300-E-2	KOMFORT EC L1W300-E-2	KOMFORT EC LW400-E-2	KOMFORT EC LW550-E-2
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Number of water (glycol) coil rows	2	2	2	2
Power [W]	140	140	350	350
Current [A]	1.2	1.2	2.6	2.6
Maximum air flow [m ³ /h (l/s)]	300 (83)	300 (83)	400 (111)	550 (153)
RPM [min ⁻¹]	1380	1380	1340	2150
Sound pressure level at 3 m [dBA]	24-45	24-45	28-47	28-47
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4 panel filter	G4 panel filter	G4 panel filter	G4 panel filter
Supply filter	panel F7	panel F7	panel F7	panel F7
Connected air duct diameter [mm]	150	160	200	200
Weight [kg]	40	40	40	40
Heat recovery efficiency [%]	up to 90	up to 90	up to 90	up to 90
Heat exchanger type	counter-flow	counter-flow	counter-flow	counter-flow
Heat exchanger material	enthalpy membrane	enthalpy membrane	enthalpy membrane	enthalpy membrane
SEC class	A+	A+	A+	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Hot water coil calculation diagram

KOMFORT EC LW300-(E)-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.
 Sample parameters: Air flow = 300 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +90/+70 °C.

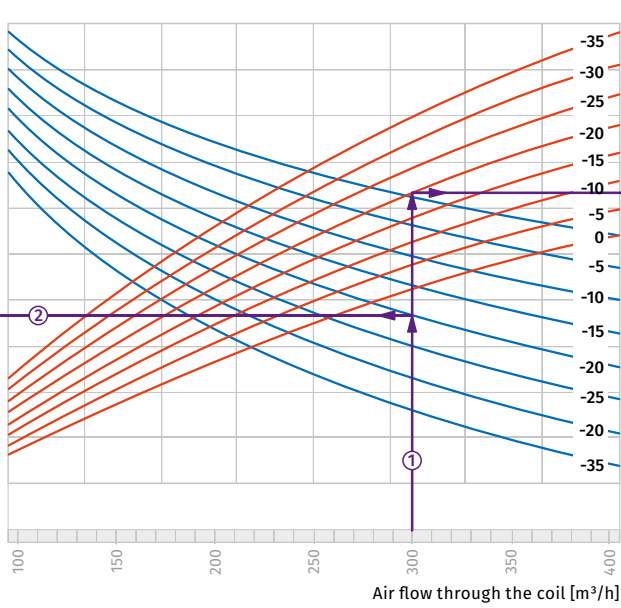
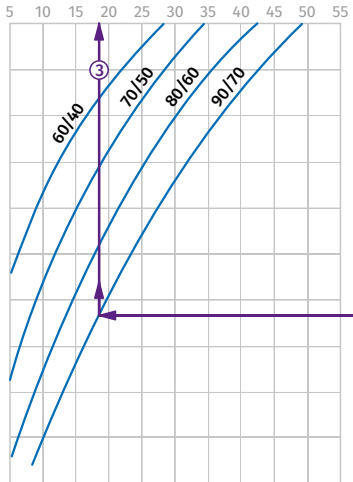
- To calculate the maximum air temperature find the intersection point of the air flow line (e.g., 300 m³/h) ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+18 °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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (4.75 kW) ⑤.

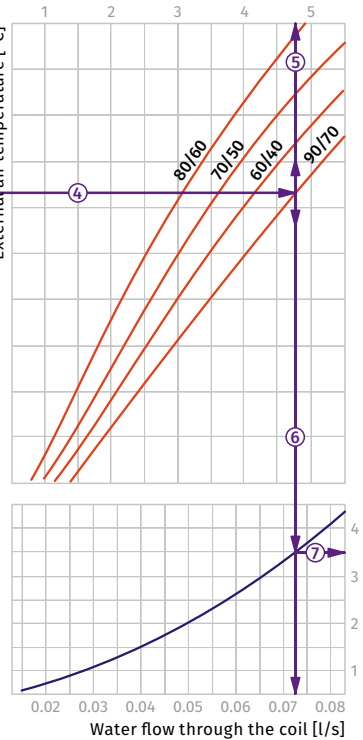
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.072 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (3.5 kPa).

KOMFORT EC LW400-(E)-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

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

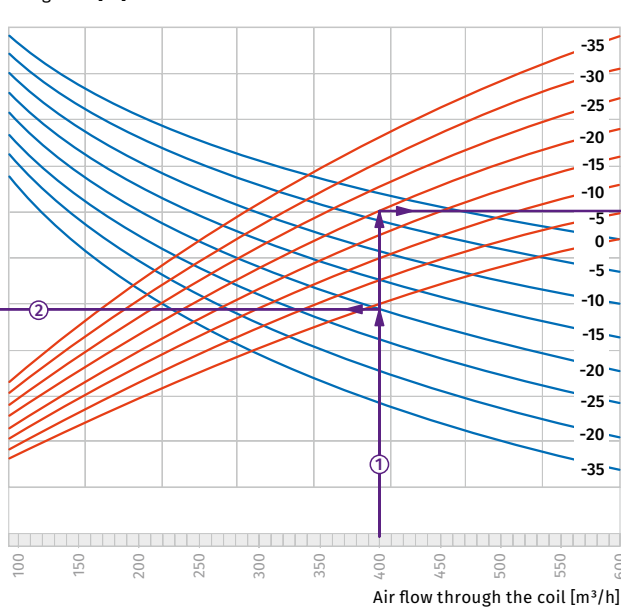
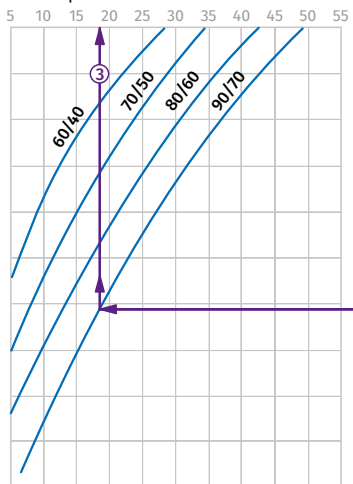
- To calculate the maximum air temperature find the intersection point of the air flow line (e.g., 300 m³/h) ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+18 °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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (4.75 kW) ⑤.

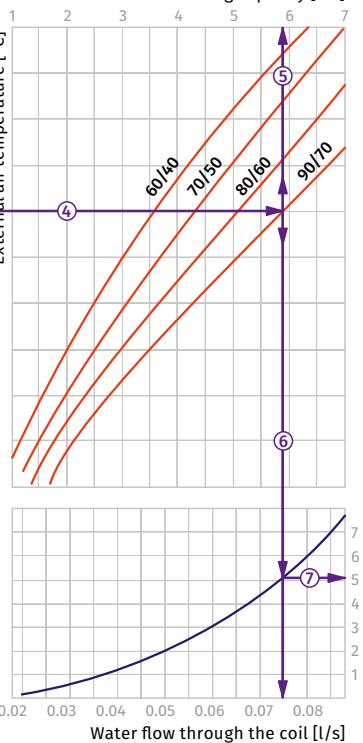
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.072 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (3.5 kPa).

KOMFORT EC LW550-(E)-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.













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

- To calculate the maximum air temperature find the intersection point of the air flow line (e.g., 400 m³/h) ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+18 °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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (5.9 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.075 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 (5.1 kPa).

Accessories

		KOMFORT EC LW300-2 / KOMFORT EC LW300-E-2	KOMFORT EC L1W300-2 / KOMFORT EC L1W300-E-2	KOMFORT EC LW400-2 / KOMFORT EC LW400-E-2	KOMFORT EC LW550-2 / KOMFORT EC LW550-E-2
G4 panel filter		FP 436x215x48 G4	FP 436x215x48 G4	FP 436x215x48 G4	FP 436x215x48 G4
F7 panel filter		FP 436x215x48 F7	FP 436x215x48 F7	FP 436x215x48 F7	FP 436x215x48 F7
Mixing set		WMG	WMG	WMG	WMG
Syphon kit		SFK 20x32	SFK 20x32	SFK 20x32	SFK 20x32
Silencer		SD 150	SD 160	SD 200	SD 200
Silencer		SDF 150	SDF 160	SDF 200	SDF 200
Backdraft air damper		VRV 150	VRV 160	VRV 200	VRV 200
Air damper		VKA 150	VKA 160	VKA 200	VKA 200
Flexible anti-vibration connector		EVA 150	EVA 160	EVA 200	EVA 200
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230
Summer block		SB C6 366/314	SB C6 366/314	SB C6 366/314	SB C6 366/314

KOMFORT EC SKE270-1.5

Kitchen heat recovery air handling units

Features

- Air handling unit with a kitchen hood for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery minimises ventilation heat losses.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125 mm air ducts.



Air flow:
up to 270 m³/h
75 l/s



Heat recovery efficiency:
up to 95 %

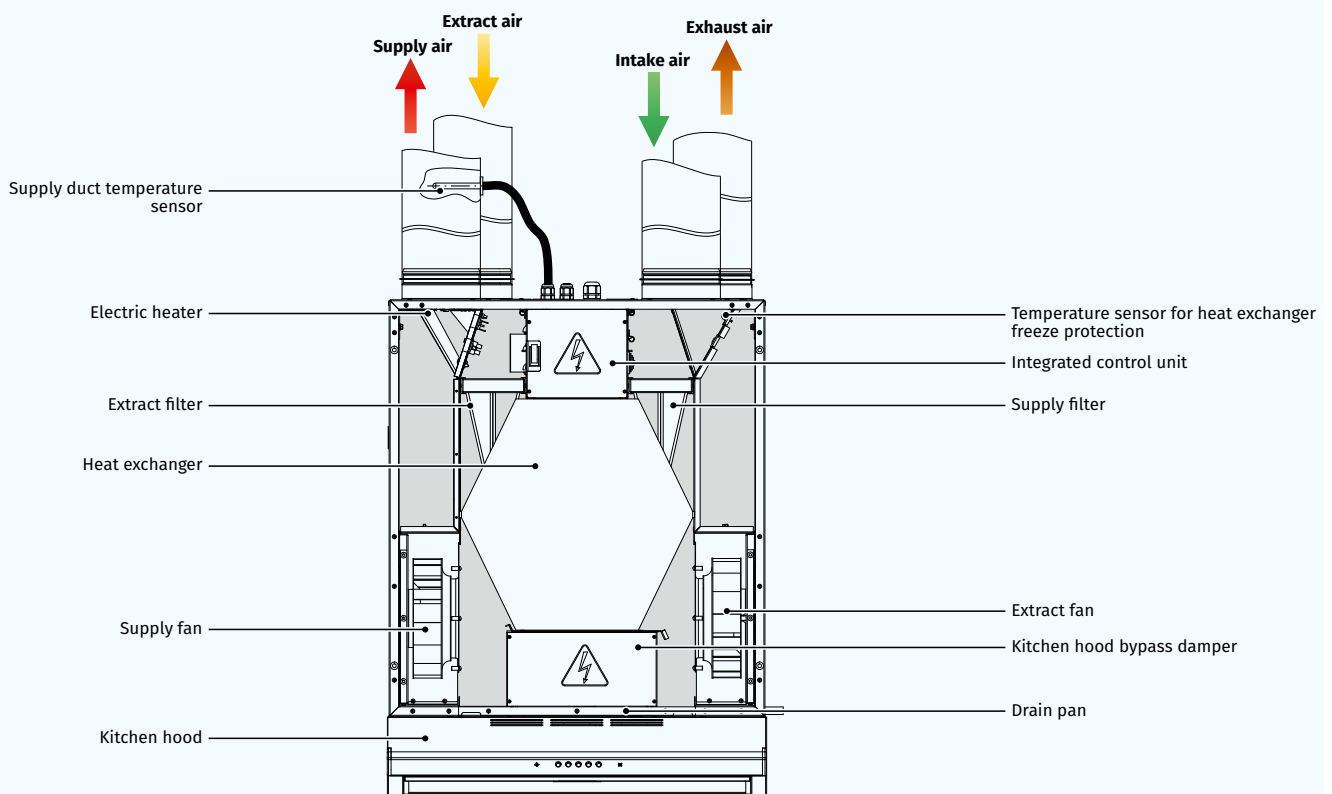


Design

- The casing is made of double-skinned white polymer coated steel panels, internally filled with polypropylene foam layer of 15 mm for heat and sound insulation.
- The unit includes an integrated kitchen hood with control buttons on the front panel.
- Wall mounting with the fixing components on the casing.
- The spigots for connection to the air ducts are located on the top of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged panel of the casing ensures easy access to the internals for cleaning and other maintenance operations.

Fans

- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.



Heat recovery

- The unit is equipped with a plate counter-flow polystyrene heat exchanger with a large surface area and high heat recovery efficiency.
- The air flows are fully separated within the heat exchanger. Odours and contaminants contained in the extract air are not transferred to the supply air flow.
- Heat recovery is based on utilization of heat energy contained in the extract air stream for heating up of supply air stream. Extract air transfers most of its heat to the intake air flow. Heat recovery reduces heat energy losses in cold seasons. In summer the heat exchanger performs reverse and transfers a part of the accumulated coolness from the cooled extract air for warming up of intake air. This contributes to better performance of the air conditioner in ventilated premises.
- The electronic frost protection system is used to prevent the heat exchanger freezing in cold seasons. In case of heat exchanger freezing danger communicated by the temperature sensor the supply fan stops to let warm extract air warm up the heat exchanger. After that the the supply fan is turned on and the unit reverts to the normal operation mode.
- The drain pan under the heat exchanger block is used for condensate collection and drainage.
- When the kitchen hood is ON, the extract air is exhausted through it and does not come in contact with the heat exchanger.

Air heater

- The unit is equipped with an electric heater for operation during cold seasons at low outside temperature.
- The integrated electric heater is activated to warm up supply air up to +30 °C if set indoor air temperature may not be reached by means of heat recovery only.
- The electric heater shuts down once the set air temperature is reached.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Air filtration

- The built-in G4 supply filter and G4 extract filter provide air filtration. A F7 supply filter (specially ordered accessory) may be used for efficient supply air filtration.
- The kitchen hood has a multilayer fat aluminium filter.

Control and automation

- The unit incorporates an integrated control system, a built-in control panel with an LCD display and a remote control.
- **The air handling unit has two operation modes:**
 - **Heat recovery mode.** When the kitchen hood is off, warm air from the premises is extracted through the air ducts to the heat exchanger to transfer its heat energy to supply air stream.
 - **Kitchen hood mode.** When the kitchen hood is on, warm air is extracted through the kitchen hood and is removed through the exhaust air duct outside. Both operation modes provide balanced indoor ventilation.
- **Automation functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply and extract fan. Air flow control. Each speed is individually adjusted during set-up.
 - Changeover between heat recovery and kitchen hood operation modes.
 - Unit shutdown on signal from a fire alarm panel.
 - Switching to the maximum speed in case of activation of a CO₂ sensor, humidity sensor, IAQ sensor or any other sensor (available separately).
 - Filter clogging control and indication by operating hours.
 - Setting week-scheduled operation of the unit.
 - Preventing overheating of the electric heating elements.

Mounting

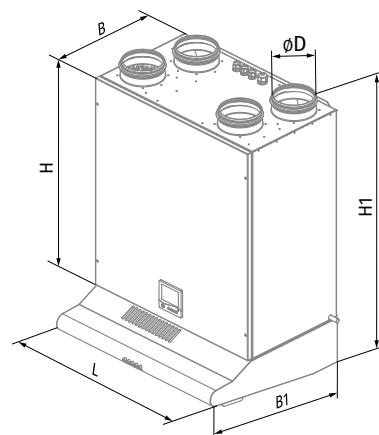
- Wall mounting in the kitchen.
- The correct mounted unit must provide sufficient access for servicing and repair operations.
- The unit must be connected to a drain system.
- To enable the correct supply air warming function install a duct temperature sensor from the delivery set not further than 1 m from the spigot in the supply air duct.

Designation key

Serie	Motor type	Spigot modification	Casing modification	Heater type	Nominal air flow [m ³ /h]	Heater power [kW]
KOMFORT	EC: electronically commutated motor	S: vertical spigot orientation	K: integrated kitchen hood	E: electric heater	270	1.5

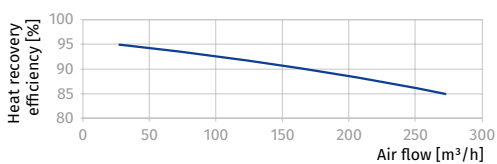
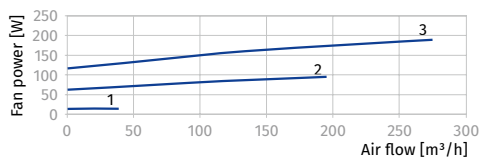
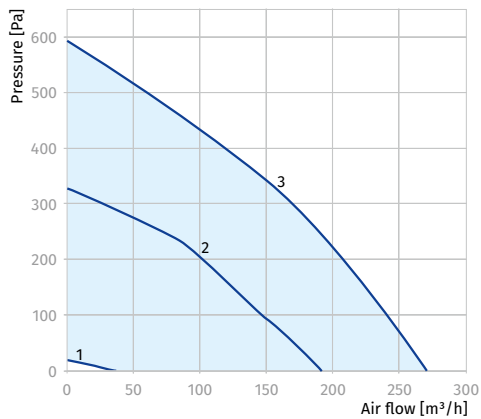
Overall dimensions [mm]

Model	D	B	B1	H	H1	L
KOMFORT EC SKE270-1.5	125	350	521	659	840	627











Technical data

Parameters	KOMFORT EC SKE270-1.5		
	I	II	III
Speed	I	II	III
Voltage [V / 50 (60) Hz]	1 ~ 230		
Max. power without electric heater [W]	16	94	187
Max. current without electric heater [A]	0.1	0.6	1.1
Max. power with electric heater [kW]	1.69		
Electric heater power [kW]	1.5		
Electric heater current [A]	6.5		
Maximum air flow [m ³ /h (l/s)]	40 (11)	190 (53)	270 (75)
RPM [min ⁻¹]	1280	2240	3200
Sound pressure level at 3 m [dBA]	28	39	42
Transported air temperature [°C]	-25...+60		
Casing material	steel		
Insulation	15 mm, polypropylene foam		
Extract filter	G4		
Supply filter	G4 (Option: F7)		
Connected air duct diameter [mm]	125		
Weight [kg]	38		
Heat recovery efficiency [%]	up to 95		
Heat exchanger type	counter-flow		
Heat exchanger material	polystyrene		
SEC class	A		
ErP	2016, 2018		



Accessories

		KOMFORT EC SKE270-1.5
G4 pocket filter		FPT 314x99x22 G4
F7 pocket filter		FPT 314x99x22 F7
Silencer		SD 125
Silencer		SDF 125
CO ₂ sensor with indication		CD-1
CO ₂ sensor		CD-2
Backdraft air damper		VRV 125
Air damper		VKA 125

KOMFORT Roto EC S(E)

Air handling units with rotary heat exchanger

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Heat recovery is provided by the rotary heat exchanger and minimizes ventilation heat losses.
- Controllable air exchange for creating the best suitable indoor microclimate.
- Compatible with round Ø125, 160 and 200 mm air ducts.
- Additional spigot for kitchen hood air duct connection.



Air flow:
up to 670 m³/h
186 l/s



Heat recovery efficiency:
up to 92 %



NEW



Design

- The fan casing is made of polymer coated steel and is heat- and sound-insulated with mineral wool.
- The insulation of **KOMFORT Roto EC S2(E) 200** is 20 mm, for **KOMFORT Roto EC S(E)280, 400** and **600** is 40 mm.
- **KOMFORT Roto EC S(2):** model without electric heater.
- **KOMFORT Roto EC S(2)E:** model with electric heater.

Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.

- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

Kitchen hood

- All units are equipped with a 5th spigot for connection to the kitchen hood air duct.
- The distinctive feature of **KOMFORT Roto EC S2(E)200** is the possibility to connect the kitchen hood DAH 251-13 (ordered separately) directly to the unit.

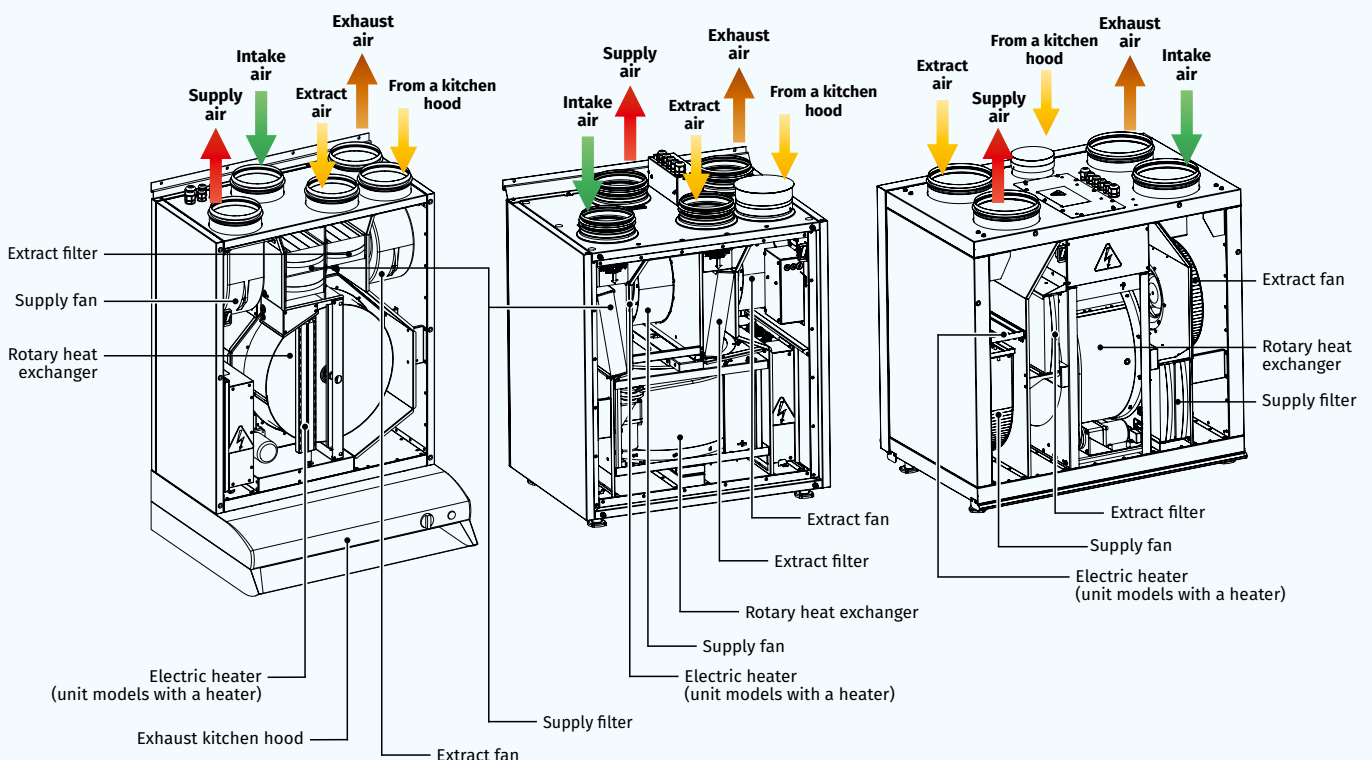


AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

KOMFORT ROTO EC S2(E)200

KOMFORT ROTO EC S2(E)280

KOMFORT ROTO EC S(E)400
KOMFORT ROTO EC S(E)600



Air filtration

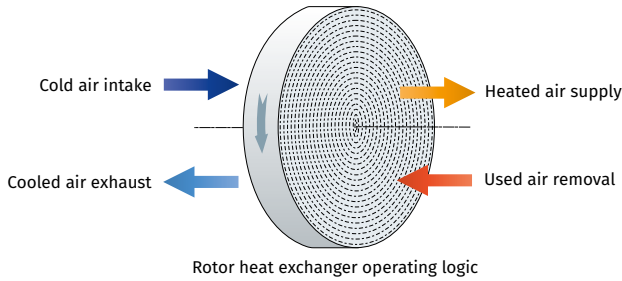
- Two built-in G4 and F7 filters provide efficient supply air filtration. The G4 filter is used for extract air filtration.

Heater

- The **KOMFORT Roto EC S(2)E** units are equipped with the electric heater. If the necessary temperature level of the supply air cannot be achieved through heat recovery, the heater turns on automatically and heats the air supplied to the premise. The heaters incorporate protective measures securing the safe unit operation.

Heat recovery

- The rotary heat exchanger is a short rotating cylinder filled with aluminium band layered in such a way that both supply and exhaust air flows pass through it. The band the heat exchanger is made of first contacts the supply air flow and then the exhaust air flow. As a result it is heated and cooled in turns transferring heat and moisture from the warm air flow to the cold one. The advantages of the rotary heat exchanger compared to plate heat exchangers are the absence of condensate, comfortable humidity level maintenance and low freezing danger.



Control and automation

- The **KOMFORT Roto EC S2(E) S17** units are equipped with the thTune control panel with an LCD display.
- The **KOMFORT Roto EC S2(E) S18** units are equipped with the pGD1 control panel with an LCD display.
- The thTune and pGD1 control panels are interchangeable.
- The standard delivery set includes a 10 m cable for connection to the control panel.
- Automation functions:**
 - Turning the unit on/off.
 - Turning on the operation modes: Automatic mode, Ventilation mode (can be enabled only from the pGD1 control panel).
 - Maintaining a pre-set room temperature by activating/deactivating the rotary heat exchanger.
 - Automatic reduction of the supply and exhaust ventilation air flow rate to obtain the user-defined minimum allowable supply air temperature.
 - Supply and exhaust fan control.
 - Unit operation according to a pre-programmed schedule.
 - Controlling the electric actuators of the supply and exhaust air dampers.
 - System shutdown on signal from fire fighting system.
 - When connecting external electrical heating elements and/or CCU to the unit the activation signal controls their operation if cooling/heating is required.
 - Filter contamination control by the number of operating hours.



Mounting

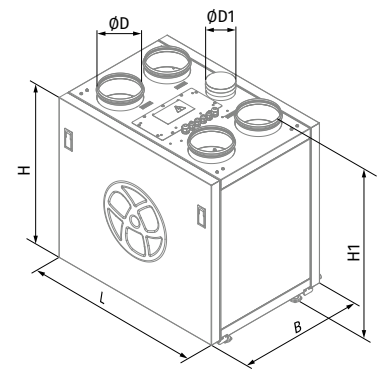
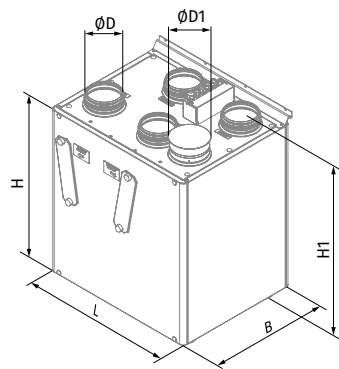
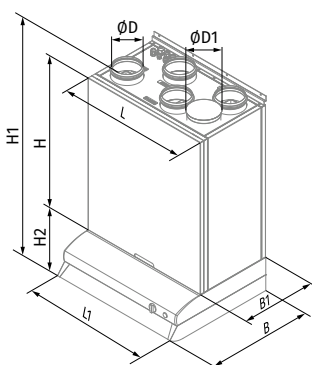
- The units are designed for wall mounting.
- The access for unit and filter maintenance is available from the front panel.
- During mounting stage the front and the back pan-els can be reversed providing either left-handed or right-handed unit mounting.

Designation key

Serie	Unit type	Motor type	Spigot modification	Insulation	Heater type	Nominal air flow [m³/h]	Control
KOMFORT	Roto: rotary heat exchanger	EC: electronically commutated motor	S: vertical spigot orientation	1: 40 mm 2: 20 mm	1: no heater E: electric heater	200; 280; 400; 600	S17: thTune control panel S18: pGD1 control panel

Overall dimensions [mm]

Model	D	D1	B	B1	H	H1	H2	L	L1
KOMFORT Roto EC S2(E)200	125	125	510	347	700	901	135	598	600
KOMFORT Roto EC S2(E)280	125	125	482	-	630	754	-	107	-
KOMFORT Roto EC S(E)400	160	100	528	-	675	755	-	740	-
KOMFORT Roto EC S(E)600	200	125	628	-	772	852	-	819	-



AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

Technical data

Parameters	KOMFORT Roto EC S2 200	KOMFORT Roto EC S2E200
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. unit power without electric heater [W]	95	95
Max. unit current without electric heater [A]	0.8	0.8
Max. unit power with electric heater [W]	-	700
Max. unit current with electric heater [A]	-	3
Maximum air flow [m³/h (l/s)]	230 (64)	230 (64)
RPM [min⁻¹]	1800	1800
Sound pressure level at 3 m [dBA]	27	27
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	20 mm, mineral wool	20 mm, mineral wool
Extract filter	G4	G4
Supply filter	G4, F7	G4, F7
Connected air duct diameter [mm]	125	125
Weight [kg]	47	48
Heat recovery efficiency [%]*	75-92	75-92
Heat exchanger type	rotary	rotary
Heat exchanger material	aluminum	aluminum
SEC class	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.

KOMFORT ROTO EC S2(E)200

Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band, Hz								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	74	53	59	69	71	66	63	54	45		
LWA to supply outlet [dBA]	61	46	45	59	56	46	38	25	13		
LWA to exhaust inlet [dBA]	66	48	59	67	66	65	60	53	53		
LWA to exhaust outlet [dBA]	60	42	53	58	55	44	34	26	24		
LWA to environment [dBA]	47	26	37	45	42	34	34	28	20	27	37

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

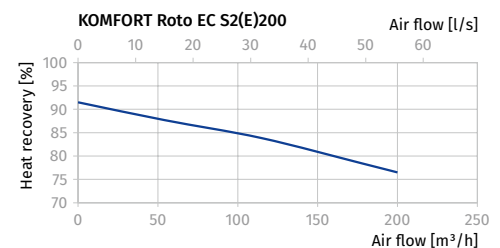
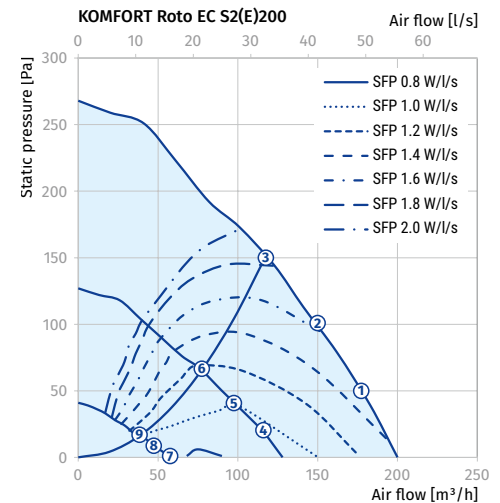
Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	68	27 (37)
2	68	26 (36)
3	68	26 (36)
4	26	21 (31)
5	26	21 (31)
6	24	20 (30)
7	12	19 (29)
8	12	19 (29)
9	10	17 (27)

Calculation of the exhaust air temperature:

$$t = t_{out} + k_{hre} \times (t_{exh} - t_{out}) / 100,$$

where

t_{out} – outdoor air temperature [°C],
 t_{exh} – extract air temperature [°C],
 k_{hre} – heat recovery efficiency (according to the diagram) [%]



Parameters	KOMFORT Roto EC S280	KOMFORT Roto EC SE280
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. unit power without electric heater [W]	170	170
Max. unit current without electric heater [A]	1.8	1.8
Max. unit power with electric heater [W]	-	650
Max. unit current with electric heater [A]	-	2.8
Maximum air flow [m³/h (l/s)]	300 (83)	300 (83)
RPM [min⁻¹]	2050	2050
Sound pressure level at 3 m [dBA]	26	26
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4
Supply filter	F7	F7
Connected air duct diameter [mm]	125	125
Weight [kg]	63	64
Heat recovery efficiency [%]*	81-90	81-90
Heat exchanger type	rotary	rotary
Heat exchanger material	aluminum	aluminum
SEC class	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.

KOMFORT ROTO EC S(E)280

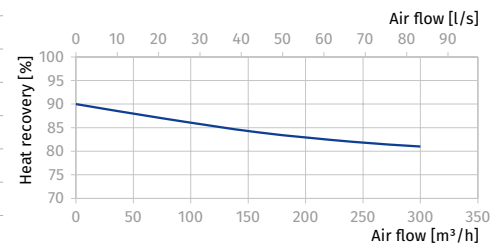
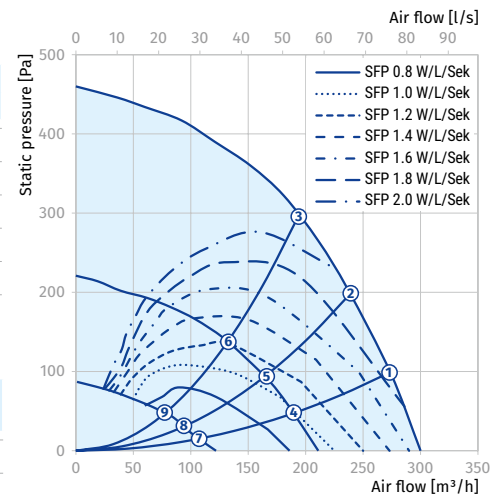
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band, Hz								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	54	47	42	50	44	41	39	39	31		
LWA to supply outlet [dBA]	69	63	56	65	59	55	50	52	46		
LWA to exhaust inlet [dBA]	54	47	41	51	43	33	31	34	30		
LWA to exhaust outlet [dBA]	65	61	50	61	55	46	43	46	40		
LWA to environment [dBA]	47	42	37	43	36	31	28	26	21	26	36

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	154	26 (36)
2	132	26 (36)
3	110	25 (35)
4	55	24 (34)
5	47	24 (34)
6	38	22 (32)
7	19	15 (25)
8	18	14 (24)
9	17	13 (23)



AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

Parameters	KOMFORT Roto EC S400	KOMFORT Roto EC SE400
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. unit power without electric heater [W]	175	175
Max. unit current without electric heater [A]	1.3	1.3
Max. unit power with electric heater [W]	-	1400
Max. unit current with electric heater [A]	-	6.1
Maximum air flow [m³/h (l/s)]	440 (122)	440 (122)
RPM [min ⁻¹]	3280	3280
Sound pressure level at 3 m [dBA]	33	33
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4
Supply filter	G4, F7	G4, F7
Connected air duct diameter [mm]	160	160
Weight [kg]	81	82
Heat recovery efficiency [%]*	76-85	76-85
Heat exchanger type	rotary	rotary
Heat exchanger material	aluminum	aluminum
SEC class	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.

KOMFORT ROTO EC S(E)400

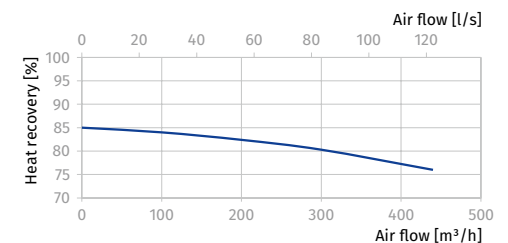
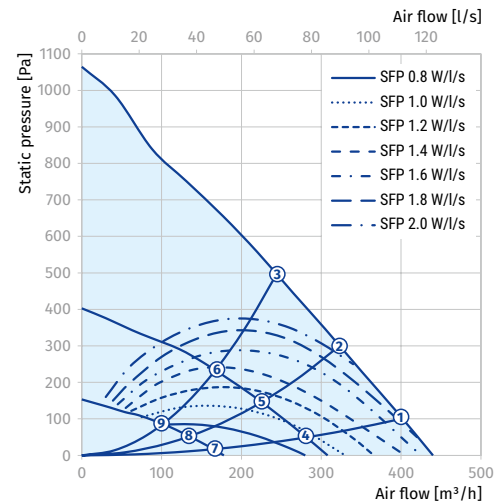
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band, Hz								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	59	27	46	54	55	53	48	44	35		
L _{WA} to supply outlet [dBA]	60	27	46	54	55	53	49	44	35		
L _{WA} to exhaust inlet [dBA]	55	25	41	50	51	44	42	39	30		
L _{WA} to exhaust outlet [dBA]	55	26	41	51	51	44	42	39	31		
L _{WA} to environment [dBA]	54	18	36	47	49	48	43	37	33	33	43

* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	170	33 (43)
2	170	33 (43)
3	170	32 (42)
4	68	31 (41)
5	65	28 (38)
6	59	27 (37)
7	26	23 (33)
8	25	21 (31)
9	25	19 (29)



Parameters	KOMFORT Roto EC S600	KOMFORT Roto EC SE600
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230
Max. unit power without electric heater [W]	380	380
Max. unit current without electric heater [A]	2.5	2.5
Max. unit power with electric heater [W]	-	2800
Max. unit current with electric heater [A]	-	12.2
Maximum air flow [m³/h (l/s)]	670 (186)	670 (186)
RPM [min⁻¹]	3230	3230
Sound pressure level at 3 m [dBA]	35	35
Transported air temperature [°C]	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel
Insulation	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4
Supply filter	G4, F7	G4, F7
Connected air duct diameter [mm]	200	200
Weight [kg]	90	92
Heat recovery efficiency [%]*	81-89	81-89
Heat exchanger type	rotary	rotary
Heat exchanger material	aluminum	aluminum
SEC class	A	A
ErP	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.

KOMFORT ROTO EC S(E)600

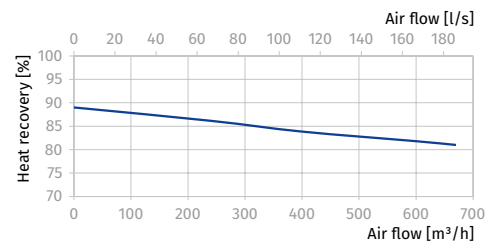
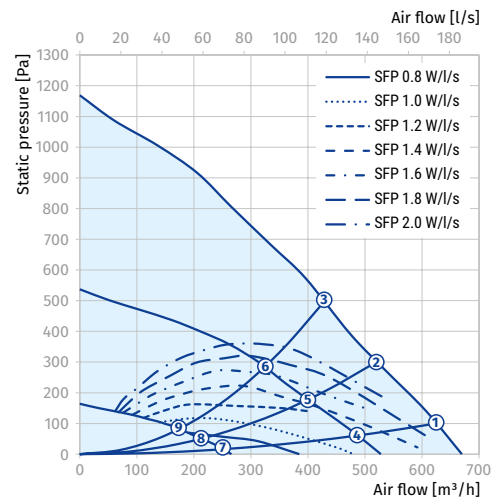
Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	82	65	63	65	80	74	74	68	64		
LWA to supply outlet [dBA]	66	60	56	55	63	58	49	40	33		
LWA to exhaust inlet [dBA]	82	64	67	71	81	77	79	75	67		
LWA to exhaust outlet [dBA]	70	51	64	62	68	60	60	50	42		
LWA to environment [dBA]	56	39	47	46	54	46	46	44	40	35	45















* Data provided for point 1 of the air flow diagram

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	375	35 (45)
2	375	35 (45)
3	375	34 (44)
4	163	30 (40)
5	155	29 (39)
6	151	28 (38)
7	43	27 (37)
8	42	23 (33)
9	39	23 (33)



Accessories

		KOMFORT Roto EC S2(E)200	KOMFORT Roto EC S(E)280	KOMFORT Roto EC S(E)400	KOMFORT Roto EC S(E)600
G4 panel filter		FP 103x284x60 G4	FP 196x400x40 G4	FP 196x436x40 G4	FP 220x536x40 G4
F7 panel filter		FP 103x284x60 F7	FP 196x400x40 F7	FP 196x436x40 F7	FP 220x536x40 F7
VOC sensor		DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600
External CO ₂ sensor		DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200
Humidity sensor		DPWC11200	DPWC11200	DPWC11200	DPWC11200
Humidity sensor		HR-S	HR-S	HR-S	HR-S
Internal humidity sensor		FS2	FS2	FS2	FS2
Kitchen hood		DAH 251-13	DAH 251-13	DAH 251-13	DAH 251-13
Silencer		SD 125	SD 125	SD 160	SD 200
Silencer		SDF 125	SDF 125	SDF 160	SDF 200
Backdraft air damper		VRV 125	VRV 125	VRV 160	VRV 200
Air damper		VKA 125	VKA 125	VKA 160	VKA 200
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

KOMFORT RoTo EC L(E)HP

Compact heat recovery air handling units

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- For arranging of controlled energy saving ventilation systems.
- Controllable air exchange for creating the best suitable indoor microclimate.
- A fully integrated heat pump eliminates the need for installing the indoor and outdoor units of an air conditioner inside the treated space and on the building face. The heated or cooled air is distributed via a duct system to individual rooms for air distribution through air diffusers which gives the building a clean aesthetic look both inside and outside.
- Compatible with round \varnothing 160 and 250 mm air ducts.



Air flow:
up to 955 m³/h



Heat recovery efficiency:
up to 85 %



Design

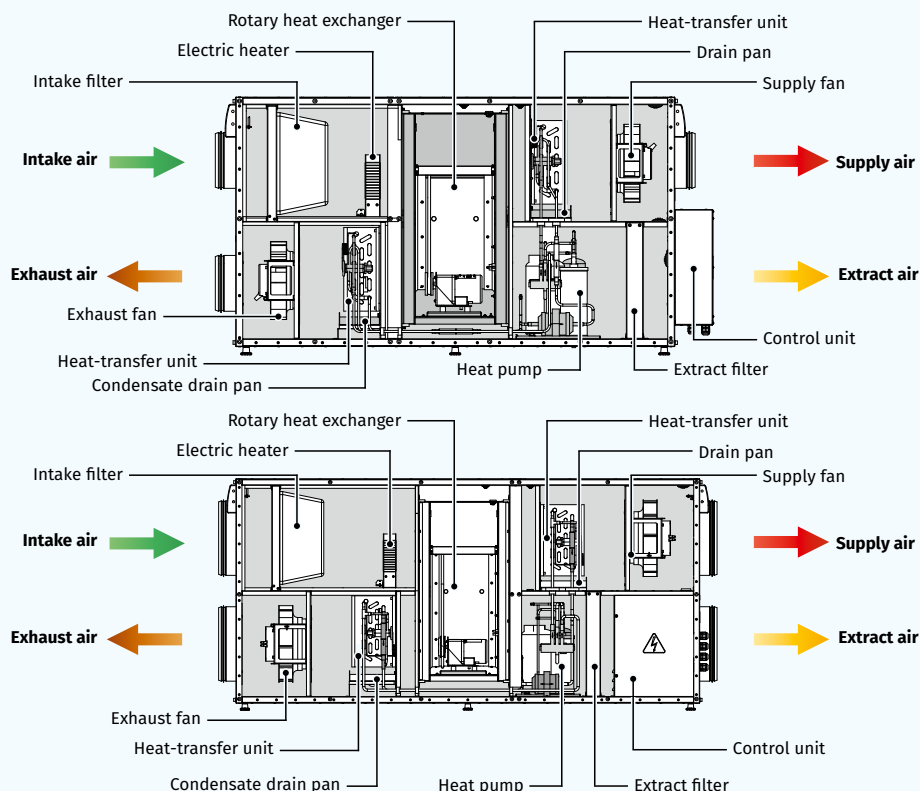
- The casing load-bearing structure consists of three-layer zinc aluminium panels with a 25 mm fibreglass interlayer for noise and heat insulation.
- The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.
- Specially designed removable side panels provide easy access to all the internal components of the air handling unit and reduce maintenance space requirements.
- **KOMFORT Roto EC LHP:** models with a rotary regenerator and heat pump with no preheating
- **KOMFORT Roto EC LEHP:** models with a rotary regenerator, heat pump and a supply air preheater

Air filtration

- Efficient air filtration is provided by a built-in G4 filters for extract and supply air.

Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

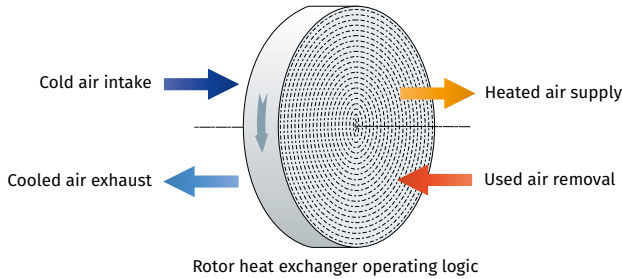


Two-stage heat energy recovery system

- o **Stage I** – heat energy recovery in the rotary heat exchanger.
- o **Stage II** – booster heating/booster cooling in the heat pump.

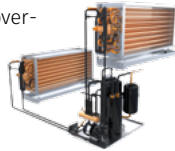
Heat recovery

- o The rotary heat exchanger is a short rotating cylinder filled with aluminium band layered in such a way that both supply and exhaust air flows pass through it.
- o The band the heat exchanger is made of first contacts the supply air flow and then the exhaust air flow. As a result it is heated and cooled in turns transferring heat and moisture from the warm air flow to the cold one.
- o The advantages of the rotary heat exchanger compared to plate heat exchangers are the absence of condensate, comfortable humidity level maintenance and low freezing danger.



Heat pump

- o The air handling unit features a reversible heat pump which can warm up or cool down the supply air stream using the extract air heat. A fully integrated heat pump eliminates the need for installing the indoor and outdoor units of an air conditioner inside the treated space and on the building face. The heated or cooled air is distributed via a duct system to individual rooms for air distribution through air diffusers which gives the building a clean aesthetic look both inside and outside.
- o This device transfers the extract air heat energy to the supply air stream. The amount of heat transferred is 2-6 times larger than the amount of electric energy used to power the process.
- o The heat pump is equipped with an array of protection systems including low and high pressure protection, freeze protection (automatic defrosting) and compressor over-heating protection.
- o The heat pump utilizes a high-efficiency rotary compressor which generates minimum noise. Ozone-layer friendly R410A cooling agent is used as the heat pump working fluid.



Air heater

- o The **KOMFORT Roto EC LEHP** unit is equipped with the optional posistor electric heater to warm up outdoor supply air at low temperatures.
- o Pre-heating reduces the number of heat pump defrosting cycles thus increasing the overall operational efficiency of the air handling unit.
- o The heater is divided into two active elements for reduced power electric power consumption while retaining sufficient heating capacity.

Control and automation

- o The **KOMFORT Roto EC L(E)HP S17** units are equipped with the thTune control panel with an LCD display.
- o The **KOMFORT Roto EC L(E)HP S18** units are equipped with the pGD1 control panel with an LCD display.



Unit operation modes

- o **«Auto» mode:** The unit runs in the automatic supply and exhaust mode maintaining a user-defined room temperature.
- o **«Heating» mode:** The unit ensures supply and exhaust ventilation of the treated space maintaining the room temperature above a pre-set threshold. As soon as the room temperature drops below the pre-set threshold the heat exchanger and the heat pump are engaged (in the heating mode).
- o **«Cooling» mode:** The unit ensures supply and exhaust ventilation of the treated space maintaining the room temperature below a pre-set threshold. As soon the room temperature exceeds the pre-set threshold the heat exchanger and the heat pump are engaged (in the cooling mode).

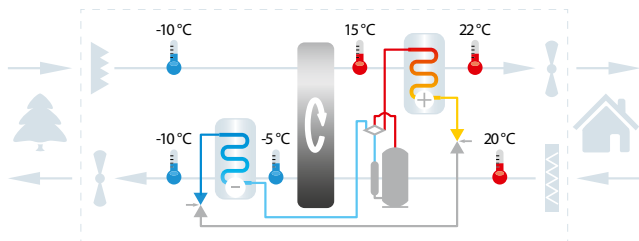
- o **«Heat Recovery» mode:** The unit runs in the supply and exhaust mode maintaining the room temperature by means of the heat exchanger only without engaging the heat pump. This mode is enabled automatically while in the «Auto», «Heating» or «Cooling» mode if the heat exchanger alone is able to maintain the user-defined room temperature without engaging the heat pump. This mode can also be enabled manually via the unit controller menu or the A18 (pGD1) control panel.
- o **«Ventilation» mode:** The unit ensures supply and exhaust ventilation of the treated space without maintaining a pre-set room temperature level. The heat exchanger and heat pump are disabled. Room temperature adjustment is not available. This operation mode is only available via the A18 (pGD1) control panel.
- o **«Defrosting» mode:** Enabled automatically (on elapsing of a pre-set time interval and/or on reaching a temperature threshold) while in the «Auto» and «Heating» modes to prevent the heat pump heat exchanger freezing. While in the «Defrosting» mode the fans are disabled. Upon the «Defrosting» mode deactivation the unit reverts to the previous operation mode automatically. While in the «Defrosting» mode user-selectable operation modes are not available.
- o **«Pre-Heating» mode:** While in the «Auto» or «Heating» modes at low ambient temperatures the supply air fed into the unit is warmed up by the electric pre-heater. This mode is enabled automatically upon the ambient temperature dropping below 8 °C. If the outdoor air temperature reaches above 8 °C the «Pre-Heating» mode is disabled. This mode is only available in factory configurations of the **KOMFORT Roto EC LEHP** models equipped with an electric heater. The «Pre-Heating» mode implementation in a **KOMFORT Roto EC LHP** requires upgrading the unit with a production electric heater (purchased separately) installed into the unit casing. The heater may only be installed by a service provider certified by the unit manufacturer.
- o **«Recirculation» mode:** This optional mode requires upgrading the unit with an external recirculation valve (purchased separately). The recirculation mode is enabled automatically at subzero ambient temperatures allowing a considerable reduction of unit energy consumption due to a partial redirection of the extract air into the supply duct of the unit.

Intelligent unit control system

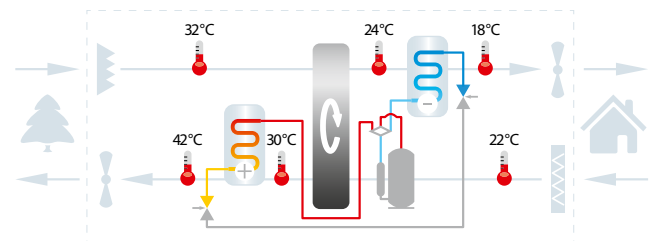
- o **Limit Function:** Reduces air flow automatically to maintain a user-defined temperature. If the unit cannot execute the user-defined room temperature setting after running in the «Auto» or «Heating» mode for 20 minutes the air flow rate (fan speed) is reduced automatically. The unit reverts to the original fan operation mode upon reaching the target air temperature as defined by the user. While in the «Limit Function» mode the air flow adjustment is not available.
- o **Warming-up:** Blocks cold air supply into the premises in the «Auto» or «Heating» mode. The effect is achieved by warming up the heat pump heat exchanger in the supply air duct while the supply fan remains disabled. The «Warming-up» mode is enabled after the «Defrosting» mode as well as upon the first start if the outdoor air temperature is below +10 °C. Upon completion of the «Warmingup» cycle the unit reverts to the original «Auto» or «Heating» mode.
- o **Higher Speed:** Increases air flow capacity automatically while in the «Cooling» mode to prevent excessive pressure build-up in the heat pump. The exhaust fan reverts to the initial speed once the pressure has dropped to normal.
- o **Smart Safe:** Automatically protects the unit from operating outside the safe performance range. The unit is equipped with an intelligent hardware protection system ensuring its safe and reliable performance within the permissible range of ambient temperature conditions. Therefore, the unit is able to adjust operating parameters or disable certain units and assemblies to compensate for abnormal operating conditions in order to prevent equipment failure.
- o **Heat Pump Protection:** Automatically prevents heat pump failure:
 - Protects against abnormally high or low pressure build-up. If the coolant pressure reaches beyond the safe performance range the pressure sensors send signals to the unit controller to power off the heat pump compressor. The compressor power is restored once the pressure has reverted to normal
 - Compressor thermal protection against overheating. The compressor is powered off when its casing temperature becomes abnormally high. The power is restored once the casing temperature has dropped to the normal performance range
 - Delayed Start. Protects the compressor from cycling (by blocking too frequent activation/deactivation of the compressor)
- o **Serviceability:** The design solutions provide for easy access to the unit parts and components, facilitate its maintenance and replacement of the consumables and wear parts and ensure high serviceability of the entire air handling unit.

- o **Fresh Air:** Ensures clean air supply into the treated spaces. The unit is equipped with a G4 filter (F7 filter optional). The control system monitors the filter performance automatically and generates replacement signals as necessary.
- o **Ozone Protection:** The heat pump utilizes the R410A high-tech two-component cooling agent which does not deplete the ozone layer.
- o **Save Energy:** A comprehensive engineering and technical approach to reducing the unit energy consumption which comprises the following elements:
 - Posistor electric pre-heater with two active elements
 - Upgraded thermal insulation of the supply chamber
 - Integral high-performance air-to-air heat pump
 - Adjustable fan speed
 - Automatic heat exchanger and heat pump activation/ deactivation
 - Electric heater deactivation in the «Defrosting» mode
 - Intelligent Blauberg Software – air handling unit control suite for maintaining optimum performance characteristics at low energy consumption based on the exclusive control algorithms
- o **Low Noise:** A comprehensive engineering and technical approach to reducing the unit noise levels during operation comprising the following elements:
 - Heat pump integrated into the sound-proof unit casing
 - Adjustable-speed fans
 - Low-noise rotary compressor

- o **Autorestart:** The unit memorizes the current operation mode and restores it after a power outage.
- o **Simple Use:** The units are pre-assembled at the factory and are ready for operation. The installation and maintenance costs are reduced to a bare minimum. The unit operation does not require any special training due to a clean-cut user-friendly interface.
- o **CO₂ Control:** Maintains the CO₂ level in the treated space below a user-defined value. If the CO₂ level in the indoor space exceeds the pre-set value the air handling unit increases the air exchange rate automatically. This option is only available with the external CO₂ control sensor with a 0-10 V output signal (purchased separately).
- o **RH Control:** Maintains the relative humidity level in the treated space below a user-defined value. Should the relative humidity become abnormally high the unit increases the air exchange rate automatically. This option is only available with the A17 (th-Tune) control panel in a special configuration or the external relative humidity control sensor with a 0-10 V output signal (purchased separately).
- o **Rapid Access to Set Mode:** The larger the difference between the outdoor temperature and the pre-set indoor temperature, the faster the heat pump is activated.



Unit operation in heat recovery and air heating ventilation mode



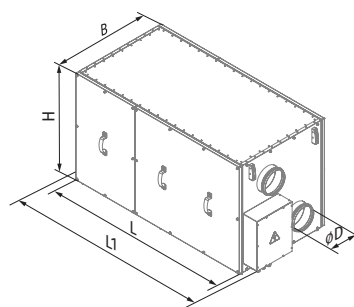
Unit operation in heat recovery and air cooling ventilation mode

Designation key

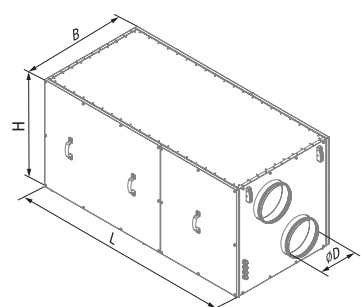
Serie	Unit type	Motor type	Spigot modification	Heater type	Modification	Nominal air flow [m ³ /h]	Control
KOMFORT	Roto: rotary heat exchanger	EC: electronically commutated motor	L: horizontal spigot orientation	_ : without heater E: electric heater	HP: heat pump	400; 700; 900	S17: thTune control panel S18: pGD1 control panel

Overall dimensions [mm]

Model	D	B	H	L	L1
KOMFORT Roto EC L(E)HP 400	159	648	710	1250	1421
KOMFORT Roto EC L(E)HP 700	249	748	750	1667	-
KOMFORT Roto EC L(E)HP 900	249	748	750	1667	-



KOMFORT Roto EC L(E)HP 400



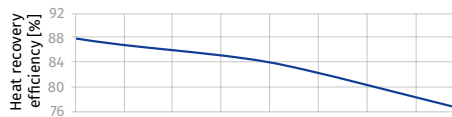
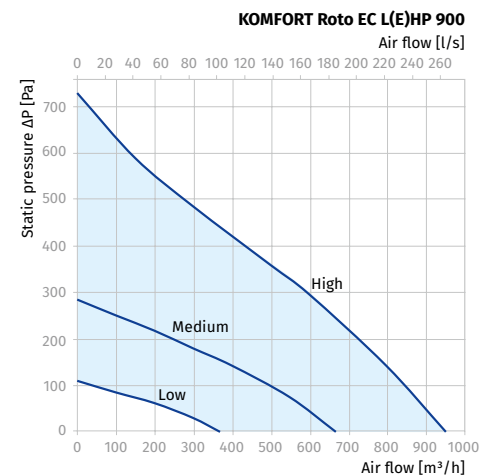
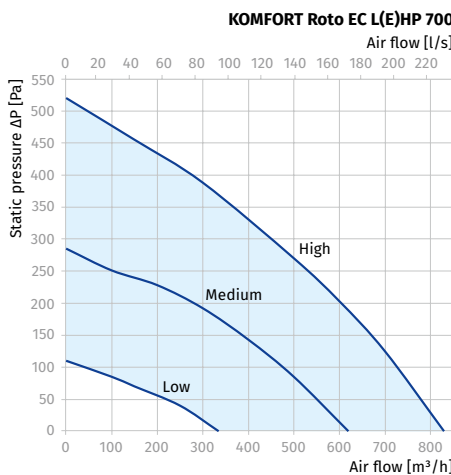
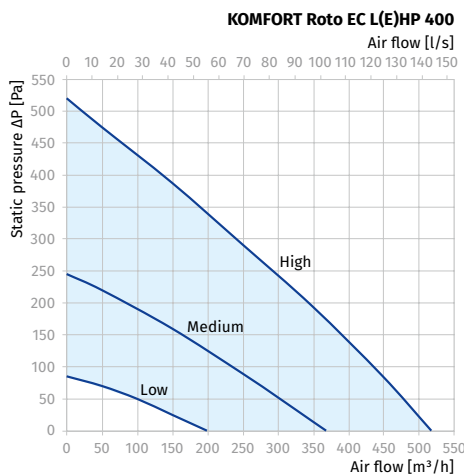
KOMFORT Roto EC L(E)HP 700
KOMFORT Roto EC L(E)HP 900

Technical data

General parameters	KOMFORT Roto EC LHP 400	KOMFORT Roto EC LHP 700	KOMFORT Roto EC LHP 900	KOMFORT Roto EC LEHP 400	KOMFORT Roto EC LEHP 700	KOMFORT Roto EC LEHP 900
Maximum air flow [m³/h]	520	830	955	520	830	955
Maximum transported air temperature [°C]	-10...+40	-10...+40	-10...+40	-25...+40	-25...+40	-25...+40
Heat recovery efficiency [%]	up to 85	up to 85	up to 85	up to 85	up to 85	up to 85
Sound pressure at 3 m [dB(A)]	45	52	58	45	52	58
Casing material	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc
Weight [kg]	150	160	165	150	160	165
Connected air duct diameter [mm]	160	250	250	160	250	250
Heat exchanger type	rotary	rotary	rotary	rotary	rotary	rotary
Heat exchanger material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
Air exhaust filter	G4	G4	G4	G4	G4	G4
Air supply filter	G4	G4	G4	G4	G4	G4
Electrical parameters						
Air-handling unit supply voltage [V / 50 Hz]	1~ 230	1~ 230	1~ 230	1~ 230	1~ 230	1~ 230
Maximum power consumption in "Heat Recovery" mode [kW]	0.31	0.36	0.46	0.31	0.36	0.46
Maximum power consumption in "Heat Recovery + Heat Pump" mode [kW]	0.745	0.94	1.195	0.745	0.94	1.195
Maximum power consumption in "Heat Recovery + Heat Pump + Pre-Heating" mode [kW]	-	-	-	2.145	3.74	3.995
Maximum current consumption [A]	4.6	5.7	6.7	10.9	18.5	19.4
Air-handling unit energy efficiency "Heating" mode (COP)	6	6.5	6.5	6	6.5	6.5
Air-handling unit energy efficiency "Cooling" mode (ERR)	4	4.15	4.25	4	4.15	4.25
Heat pump characteristics						
Coolant	R410A	R410A	R410A	R410A	R410A	R410A
Coolant weight [kg]	0.8	1.6	2	0.8	1.6	2
Heat output in "Heating" mode [kW] at t ₀ = +7 °C; t _k = +45 °C*	1.56	2.6	3.25	1.56	2.6	3.25
Heat output in "Cooling" mode [kW] at t ₀ = +7 °C; t _k = +45 °C*	1.2	2	2.5	1.2	2	2.5
Compressor type	Sealed, rotary type	Sealed, rotary type	Sealed, rotary type	Sealed, rotary type	Sealed, rotary type	Sealed, rotary type
Temperature setting range in "Cooling/Heating" modes [°C]	+16...+30	+16...+30	+16...+30	+16...+30	+16...+30	+16...+30

* t₀ – coolant boiling temperature; t_k – coolant condensation temperature.

AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

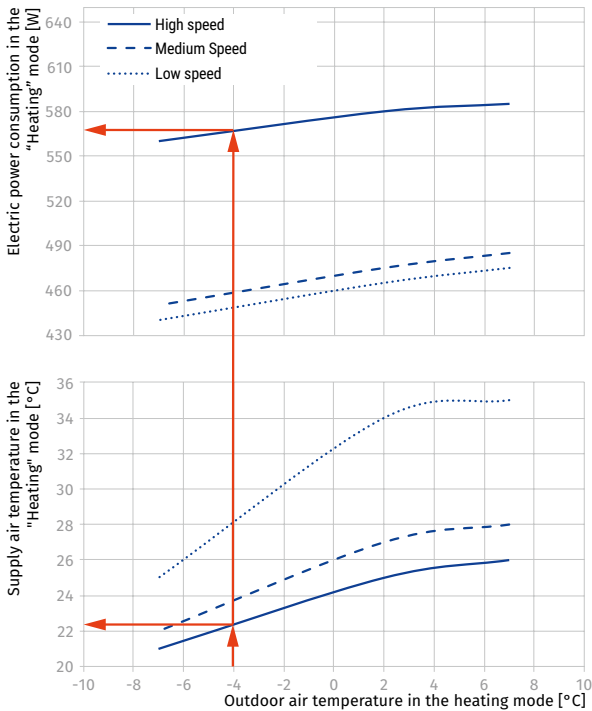


Heat pump characteristics in the "HEATING" mode

KOMFORT ROTO EC L(E)HP 400

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP* ₁ [W/W]	COP* ₂ [BTU/W]	Q _{heat} * [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	400	20	12 (~38%)	7	6 (~86%)	26	14 (~25%)	0.585	4.3	14.8	2.53
Medium	70	280	20	12 (~38%)	7	6 (~86%)	28	15 (~23%)	0.485	4	13.8	1.96
Low	40	160	20	12 (~38%)	7	6 (~86%)	35	17 (~14%)	0.475	3.1	10.7	1.49
High	100	400	20	12 (~38%)	2	1 (~80%)	25	12 (~18%)	0.580	5.3	18	3.07
Medium	70	280	20	12 (~38%)	2	1 (~80%)	27	13 (~17%)	0.475	4.9	16.8	2.33
Low	40	160	20	12 (~38%)	2	1 (~80%)	34	16 (~12.5%)	0.465	3.7	12.5	1.71
High	100	400	20	12 (~38%)	-7	-8 (~70%)	21	8 (~8%)	0.560	7.1	24.4	4
Medium	70	280	20	12 (~38%)	-7	-8 (~70%)	22	9 (~8%)	0.450	6.4	21.9	2.89
Low	40	160	20	12 (~38%)	-7	-8 (~70%)	25	10 (~8%)	0.440	4.1	14.1	1.81

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141 -7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.

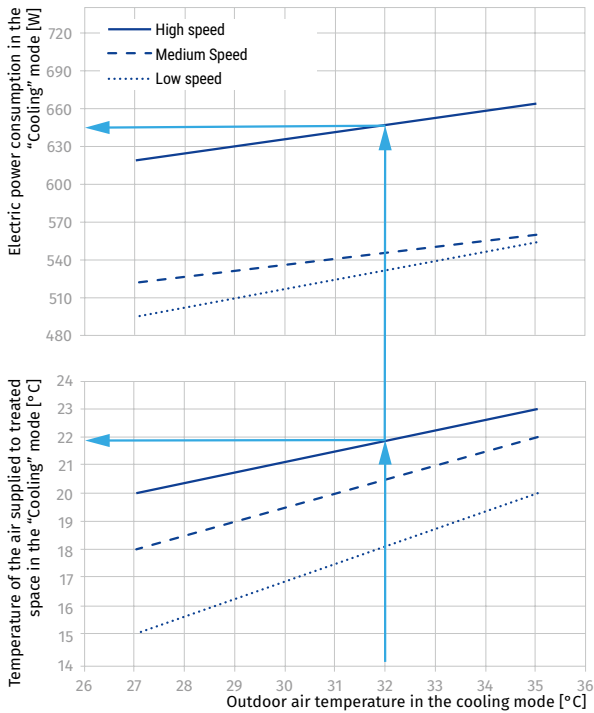


Heat pump characteristics in the "COOLING" mode

KOMFORT ROTO EC L(E)HP 400

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP*, [W/W]	COP*, [BTU/W]	Q _{cool} [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	400	27	19 (~47.5%)	35	24 (~40%)	23	21 (~85%)	0.664	2.4	8.2	1.6
Medium	70	280	27	19 (~47.5%)	35	24 (~40%)	22	20.5 (~85%)	0.560	2.2	7.4	1.21
Low	40	160	27	19 (~47.5%)	35	24 (~40%)	20	19 (~90%)	0.554	1.8	6.2	1.01
High	100	400	27	19 (~47.5%)	27	19 (~47.5%)	19	16.5 (~78%)	0.619	1.7	5.9	1.07
Medium	70	280	27	19 (~47.5%)	27	19 (~47.5%)	18	15.5 (~78%)	0.522	1.6	5.5	0.84
Low	40	160	27	19 (~47.5%)	27	19 (~47.5%)	15	14 (~88%)	0.495	1.6	5.5	0.8

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141-7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.

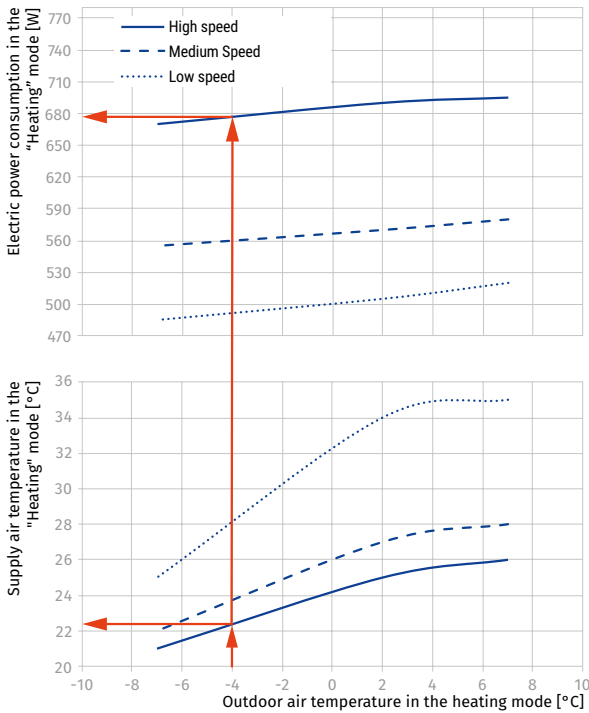


Heat pump characteristics in the "HEATING" mode

KOMFORT ROTO EC L(E)HP 700

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP* ₁ [W/W]	COP* ₂ [BTU/W]	Q _{heat} * [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	700	20	12 (~38%)	7	6 (~86%)	26	14 (~25%)	0.695	6.4	21.8	4.43
Medium	70	490	20	12 (~38%)	7	6 (~86%)	28	15 (~23%)	0.580	5.9	20.2	3.43
Low	40	280	20	12 (~38%)	7	6 (~86%)	35	17 (~14%)	0.520	5.0	17.1	2.61
High	100	700	20	12 (~38%)	2	1 (~80%)	25	12 (~18%)	0.690	7.8	26.5	5.37
Medium	70	490	20	12 (~38%)	2	1 (~80%)	27	13 (~17%)	0.570	7.2	24.4	4.08
Low	40	280	20	12 (~38%)	2	1 (~80%)	34	16 (~12.5%)	0.505	5.9	20.2	2.99
High	100	700	20	12 (~38%)	-7	-8 (~70%)	21	8 (~8%)	0.670	10.4	35.6	7.00
Medium	70	490	20	12 (~38%)	-7	-8 (~70%)	22	9 (~8%)	0.555	9.1	31.1	5.06
Low	40	280	20	12 (~38%)	-7	-8 (~70%)	25	10 (~8%)	0.485	6.5	22.3	3.17

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141 -7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.

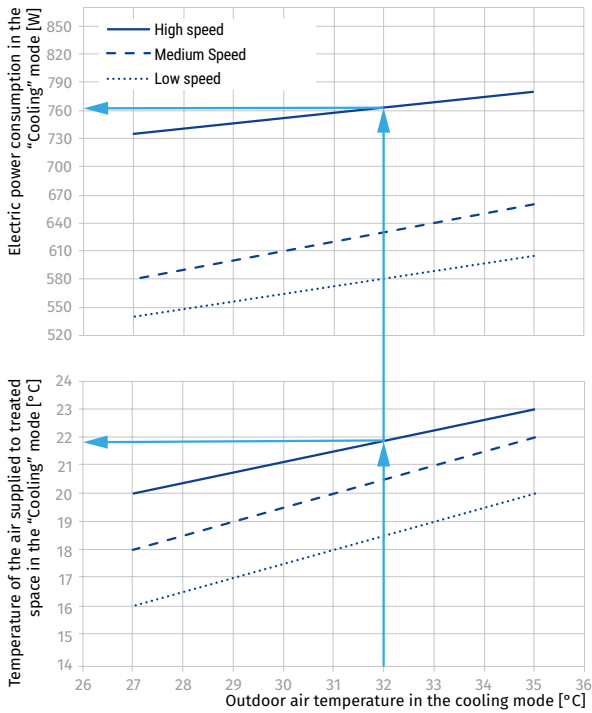


Heat pump characteristics in the "COOLING" mode

KOMFORT ROTO EC L(E)HP 700

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP*, [W/W]	COP*, [BTU/W]	Q _{cool} [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	700	27	19 (~47.5%)	35	24 (~40%)	23	21 (~85%)	0.780	3.6	12.2	2.8
Medium	70	490	27	19 (~47.5%)	35	24 (~40%)	22	20.5 (~85%)	0.660	3.2	11	2.12
Low	40	280	27	19 (~47.5%)	35	24 (~40%)	20	19 (~90%)	0.605	2.9	10	1.77
High	100	700	27	19 (~47.5%)	27	19 (~47.5%)	19	16.5 (~78%)	0.735	2.5	8.7	1.87
Medium	70	490	27	19 (~47.5%)	27	19 (~47.5%)	18	15.5 (~78%)	0.580	2.5	8.6	1.47
Low	40	280	27	19 (~47.5%)	27	19 (~47.5%)	15	14 (~88%)	0.540	2.2	7.7	1.21

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141-7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.



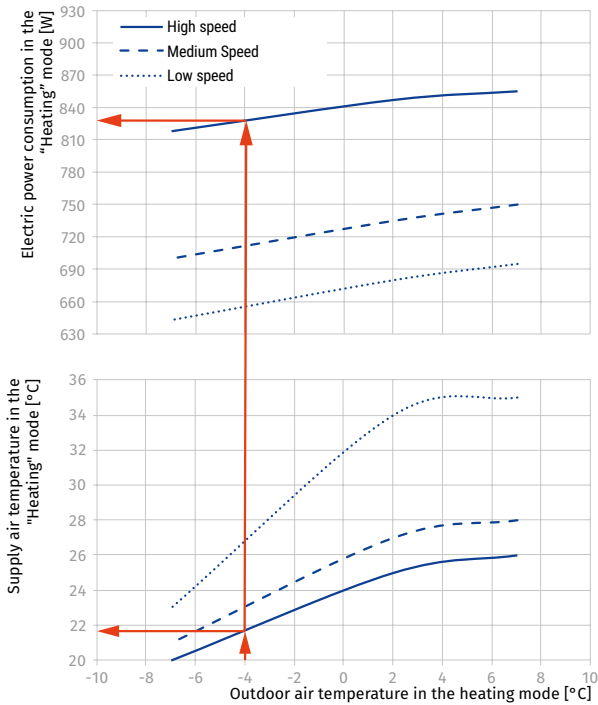
Heat pump characteristics in the "HEATING" mode

KOMFORT ROTO EC L(E)HP 900

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP* ₁ [W/W]	COP* ₂ [BTU/W]	Q _{heat} * [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	900	20	12 (~38%)	7	6 (~86%)	26	14 (~25%)	855	6.7	22.7	5.70
Medium	70	630	20	12 (~38%)	7	6 (~86%)	28	15 (~23%)	750	5.9	20.1	4.41
Low	40	360	20	12 (~38%)	7	6 (~86%)	35	17 (~14%)	695	4.8	16.5	3.36
High	100	900	20	12 (~38%)	2	1 (~80%)	25	12 (~18%)	847	8.1	27.8	6.90
Medium	70	630	20	12 (~38%)	2	1 (~80%)	27	13 (~17%)	735	7.1	24.4	5.25
Low	40	360	20	12 (~38%)	2	1 (~80%)	34	16 (~12.5%)	680	5.6	19.3	3.84
High	100	900	20	12 (~38%)	-7	-8 (~70%)	20	8 (~8%)	818	11.0	37.5	9.00
Medium	70	630	20	12 (~38%)	-7	-8 (~70%)	21	9 (~8%)	700	9.3	31.7	6.51
Low	40	360	20	12 (~38%)	-7	-8 (~70%)	23	10 (~14%)	643	6.3	21.7	4.08

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141 -7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.

AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

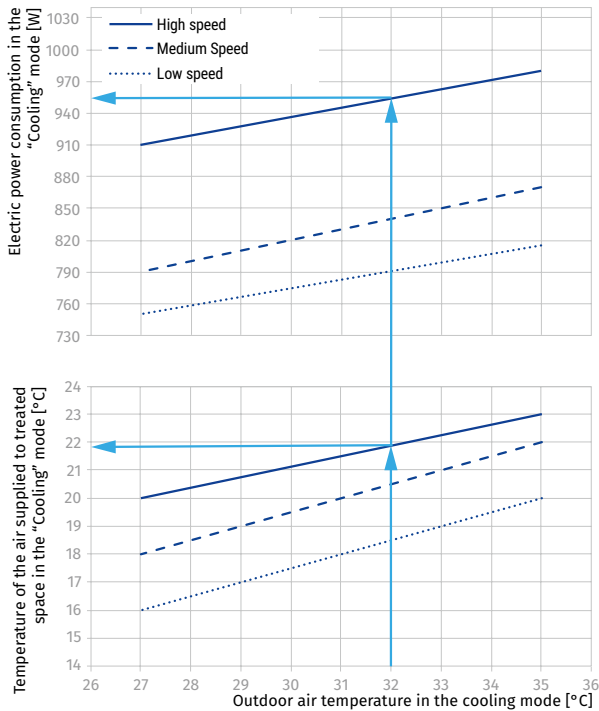


Heat pump characteristics in the "COOLING" mode










KOMFORT ROTO EC L(E)HP 900

Speed	Air flow rate		Room air temperature [°C]		Temperature at fresh air intake [°C]		Temperature of outdoor air supplied to treated space [°C]		Electric power consumption [kW]	COP*, [W/W]	COP*, [BTU/W]	Q _{cool} , [kW]
	% of max	[m³/h]	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)	Dry-bulb temperature	Wet-bulb temperature (relative humidity)				
High	100	900	27	19 (~47.5%)	35	24 (~40%)	23	21 (~85%)	0.980	3.7	12.5	3.60
Medium	70	630	27	19 (~47.5%)	35	24 (~40%)	22	20.5 (~85%)	0.870	3.1	10.7	2.73
Low	40	360	27	19 (~47.5%)	35	24 (~40%)	20	19 (~90%)	0.815	2.8	9.5	2.28
High	100	900	27	19 (~47.5%)	27	19 (~47.5%)	19	16.5 (~78%)	0.910	2.6	9	2.40
Medium	70	630	27	19 (~47.5%)	27	19 (~47.5%)	18	15.5 (~78%)	0.790	2.4	8.2	1.89
Low	40	360	27	19 (~47.5%)	27	19 (~47.5%)	15	14 (~88%)	0.750	2.1	7.1	1.56

* Important! The temperature parameters and the COP and ERR factors were defined at the temperature-humidity conditions as per the EN 13141-7:2010 standard. The factors were calculated based on the assumption of continuous heat pump operation whereas the cyclic heat pump operation was disregarded.



Accessories

		KOMFORT Roto EC L(E)HP 400	KOMFORT Roto EC L(E)HP 700	KOMFORT Roto EC L(E)HP 900
G4 supply pocket filter		FP 600x330x27 G4	FP 700x351x27 G4	FP 700x351x27 G4
G4 extract panel filter		FP 600x332x48 G4	FP 700x352x48 G4	FP 700x352x48 G4
Silencer		SD 160	SD 250	SD 250
Silencer		SDF 160	SDF 250	SDF 250
Backdraft air damper		VRV 160	VRV 250	VRV 250
Air damper		VKA 160	VKA 250	VKA 250
Flexible anti-vibration connector		EVA 160	EVA 250	EVA 250
Electric actuator		LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230

KOMFORT Roto EC LE/LW

Air handling units with rotary heat exchanger

Features

- Air handling units for efficient supply and exhaust ventilation in flats, houses, cottages and other buildings.
- Used to create controlled energy-saving ventilation systems.
- The heat recovery technology is used to minimize ventilation heat losses.
- Control of air exchange for creating comfortable indoor microclimate.
- Compatible with round $\varnothing 160, 250$ or 315 mm air ducts. **KOMFORT Roto EC LE/LW 200** are designed for connection to 500×300 mm rectangular air ducts.



Air flow:
up to $2250 \text{ m}^3/\text{h}$
 625 l/s



Heat recovery efficiency:
up to 95 %



Design

- **KOMFORT Roto EC LE** – model with electric heater.
- **KOMFORT Roto EC LW** – model with water heater.
- The casing is made of double-skinned aluzinc panels, internally filled with 20-25 mm, mineral wool layer for heat- and sound-insulation.
- The casing has mounting brackets with anti-vibration rubber mounts for easy installation.
- The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.
- The hinged side panels ensure easy access to the internals for service works including cleaning, filter replacement, etc.

Air filtration

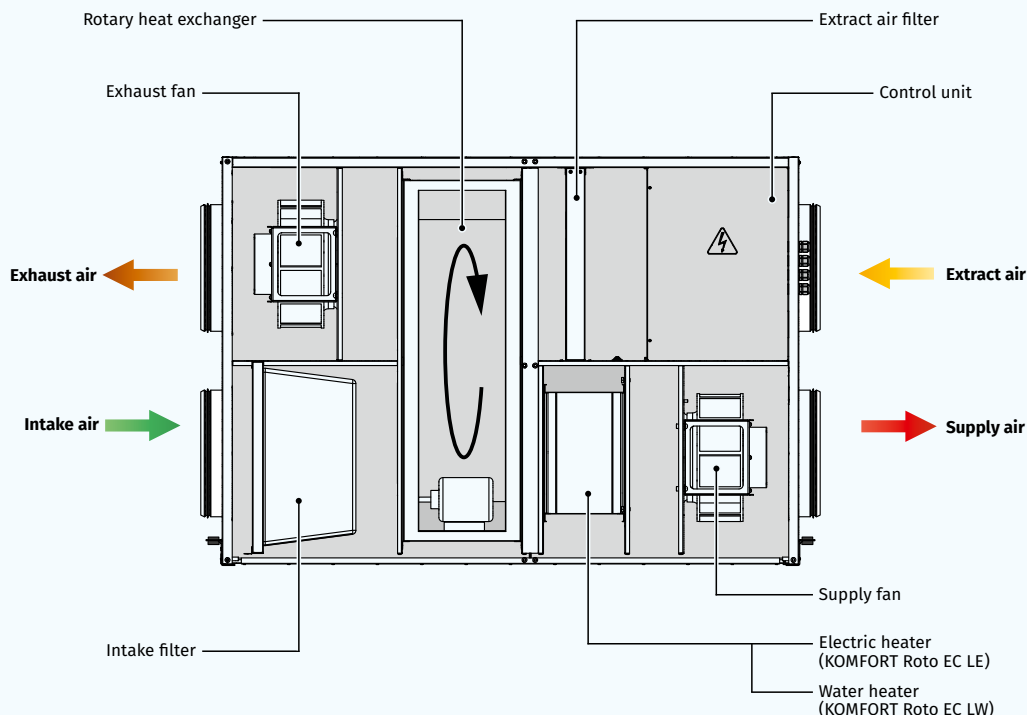
- Efficient air filtration is provided by a built-in G4 filter for extract air and a G4 pocket filter for supply air.

Fans

- The unit is equipped with high-efficient external rotor EC motors and centrifugal impellers with backward curved blades.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- The impellers are dynamically balanced.

Mounting

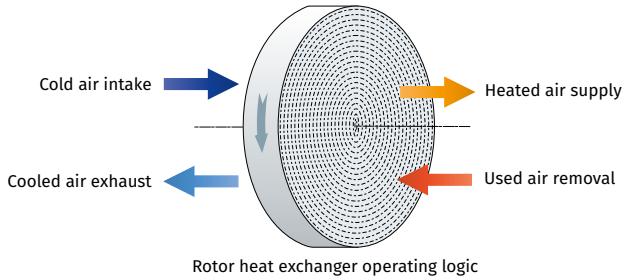
- The unit can be installed on the floor, suspended to the ceiling or fixed to the wall by means of mounting brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panel for servicing and filter replacement.
- Access on the left side.



AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

Heat recovery

- The unit is equipped with a high-efficient rotary heat exchanger made of aluminium.
- The advantages of the rotary heat exchanger compared to plate heat exchangers are higher efficiency, comfortable humidity level maintenance and extremely low freezing danger which is nearly excluded in rated temperature and humidity conditions.
- Heat recovery is based on the utilization of the thermal energy of the extract air for heating up supply air. The process of heat transfer proceeds in the heat exchanger where extract air transfers most of its heat to the intake air flow. This reduces thermal energy losses in cold seasons. In summer heat recovery acts reverse. The cooled extract air transfers part of cold to the warm intake air. This contributes to better performance of the air conditioner in ventilated premises.



Heater

- The integrated heater is activated to warm up supply air flow if set indoor air temperature may not be reached by means of heat recovery only.
- **KOMFORT Roto EC LE** are equipped with an electric heater for operation at low outside temperatures.
 - Smooth electric heater output control ensures automatic maintenance of supply air temperature.

- For overheating protection the electro heater is equipped with two built-in thermal switches: with +60 °C operating temperature, automatic restart, and with +90 °C operating temperature, manual restart.
- **KOMFORT Roto EC LW** are equipped with a water (glycol) heater for operation at low outside temperatures.
 - Smooth water heater control ensures automatic maintenance of supply air temperature.
 - The air temperature sensor downstream of the heater and the return water temperature sensor are used for freezing protection of the water heater.
 - Water heaters are designed for operation with maximum operating pressure of 1 MPa (10 bar) and maximum heat medium operating temperature +95 °C.
 - The spigots of water heater are located on service panel side.

Control and automation

- **KOMFORT Roto EC LE S17** and **KOMFORT Roto EC LW S17** are equipped with the th-Tune control panel.
- **KOMFORT Roto EC LE S18** and **KOMFORT Roto EC LW S18** are equipped with the pGD1 control panel.
- **Automation functions:**
 - Fan speed selection: low, high or medium.
 - Speed setting from 0 to 100 % for supply and exhaust fans separately
 - Filter maintenance indication
 - Alarm indication
 - Timer-based operation of the unit
 - Week-scheduled operation of the unit
 - Control and regulation of supply air temperature
 - CCU controlling
 - Air damper actuator controlling

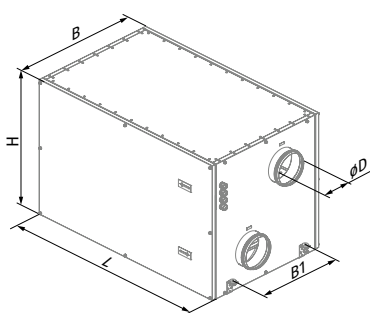


Designation key

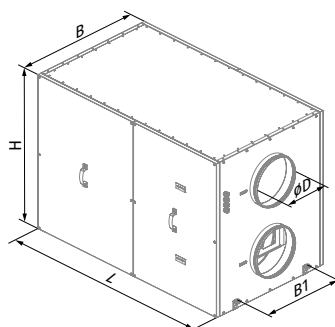
Series	Unit type	Motor type	Spigot modification	Heater type	Nominal air flow [m³/h]	Heater parameters	Control
KOMFORT	Roto: rotary heat exchanger	EC: electronically commutated motor	L: horizontal spigot orientation	E: electric heater W: water heater	400; 700; 900; 1200; 1500; 2000	2; 3.3; ...: heater power [kW] (electric heater) 2: heater rows (water heater)	S17: thTune control panel S18: pGD1 control panel

Overall dimensions [mm]

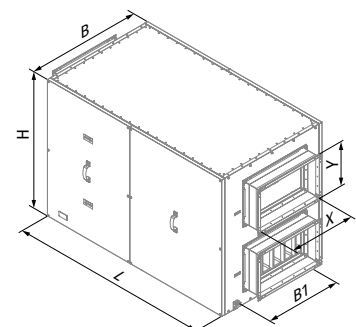
Model	D	B	B1	H	L	X	Y
KOMFORT Roto EC LE/LW 400	159	648	440	670	1050	-	-
KOMFORT Roto EC LE/LW 700	249	745	580	700	1210	-	-
KOMFORT Roto EC LE/LW1000	249	745	580	700	1210	-	-
KOMFORT Roto EC LE/LW1200	314	745	460	880	1335	-	-
KOMFORT Roto EC LE/LW1500	314	855	560	1010	1430	-	-
KOMFORT Roto EC LE/LW2000	-	875	630	1010	1485	500	300



KOMFORT Roto EC LE/LW400 / Roto EC LE/LW700 / Roto EC LE/LW1000



KOMFORT Roto EC LE/LW1200 / Roto EC LE/LW1500

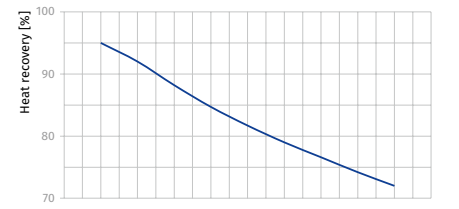
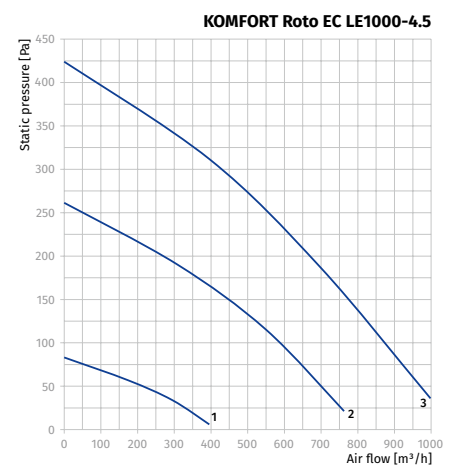
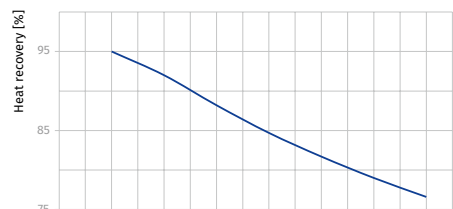
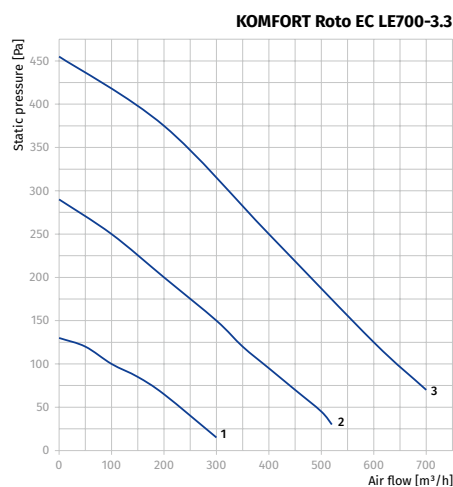
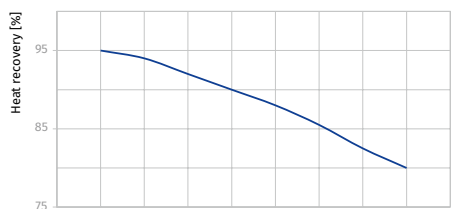
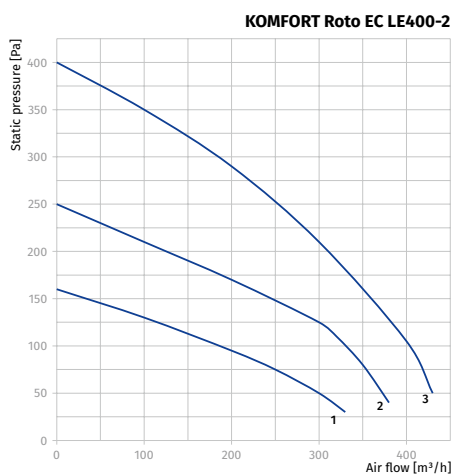


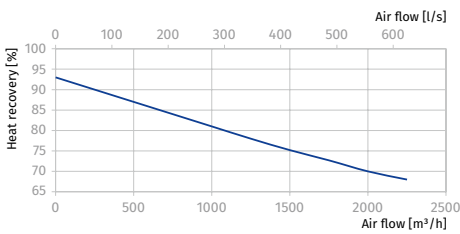
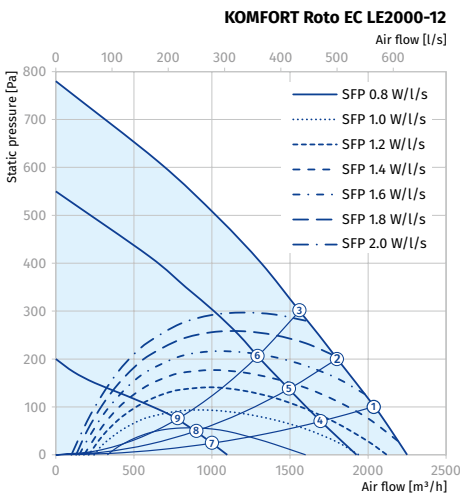
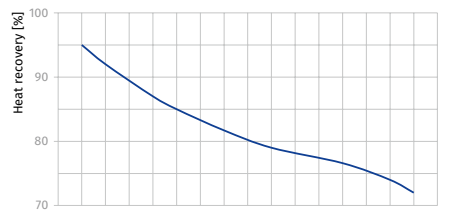
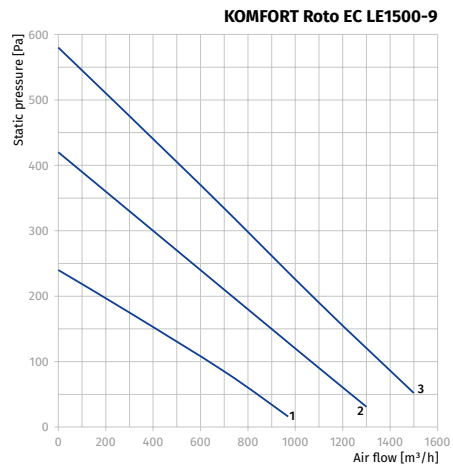
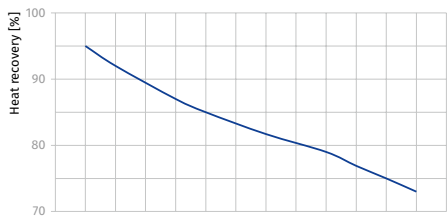
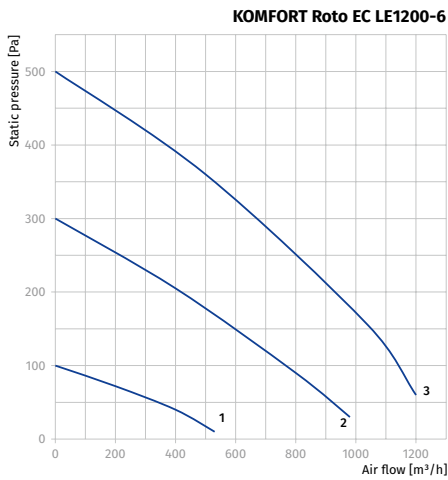
KOMFORT Roto EC LE/LW2000

Technical data

Parameters	KOMFORT Roto EC LE400-2	KOMFORT Roto EC LE700-3.3	KOMFORT Roto EC LE1000-4.5	KOMFORT Roto EC LE1200-6	KOMFORT Roto EC LE1500-9	KOMFORT Roto EC LE2000-12
Voltage [V / 50 (60) Hz]	1 ~ 220-240	1 ~ 220-240	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Max. power without electric heater [W]	2 items x 100	2 items x 105	2 items x 135	2 items x 208	2 items x 222	2 items x 448
Electric heater power [kW]	2	3.3	4.5	6	9	12
Max. power with electric heater [W]	2290	3615	4940	6570	9750	13070
Max. current with electric heater [A]	9.9	15.8	7.2	9.5	14.1	22.4
Maximum air flow [m ³ /h (l/s)]	400 (111)	700 (194)	900 (250)	1200 (333)	1500 (417)	2250 (625)
RPM [min ⁻¹]	up to 3100	up to 2600	up to 2600	up to 1930	up to 2000	up to 3000
Sound pressure level at 3 m [dBA]	45	52	58	60	62	64
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool
Extract filter	G4	G4	G4	G4	G4	G4
Supply filter	G4	G4	G4	G4	G4	G4
Connected air duct diameter [mm]	160	250	250	315	315	500x300
Weight [kg]	112	128	130	165	175	198
Heat recovery efficiency [%]	80-95	76-95	72-95	73-95	72-95	68-93
Heat exchanger type	rotary	rotary	rotary	rotary	rotary	rotary
Heat exchanger material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
SEC class	A	A	A	NRVU*	NRVU*	NRVU*
ErP	2016, 2018	2016, 2018	2016, 2018	-	-	-

* Nonresidential Ventilation Unit.



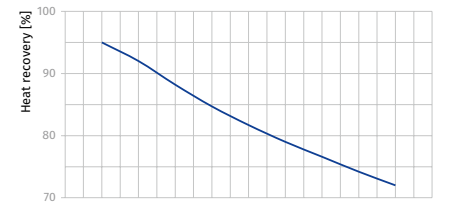
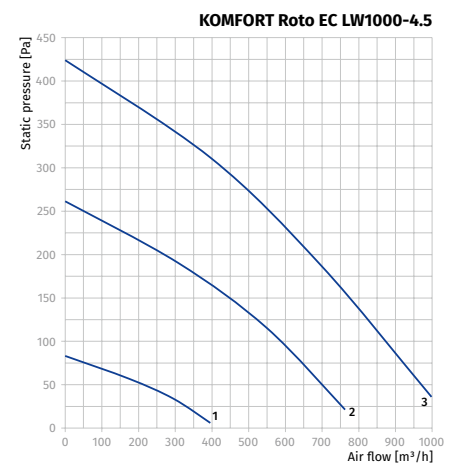
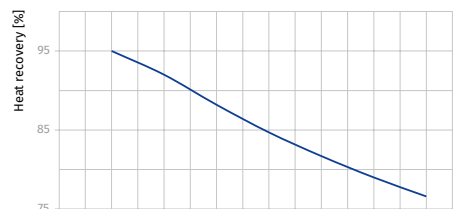
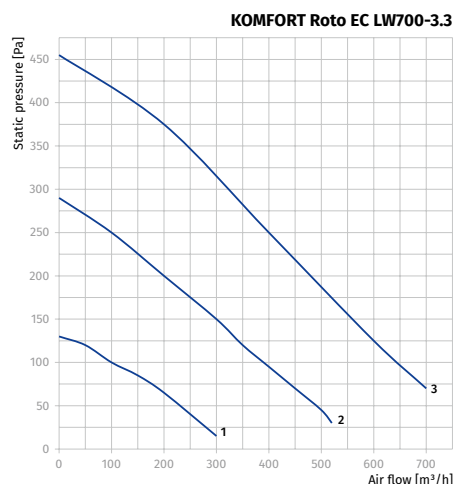
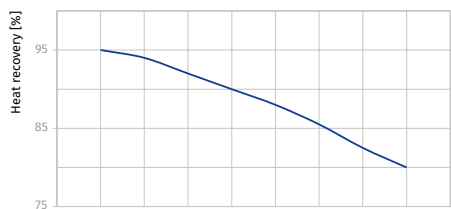
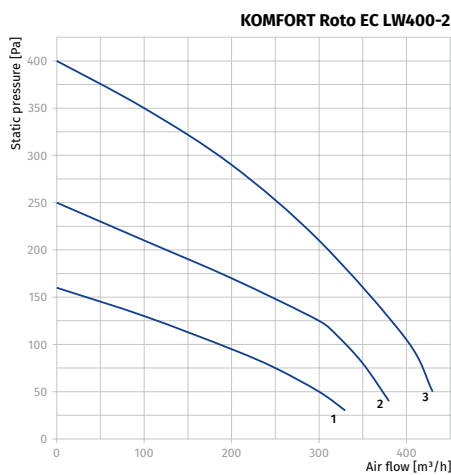


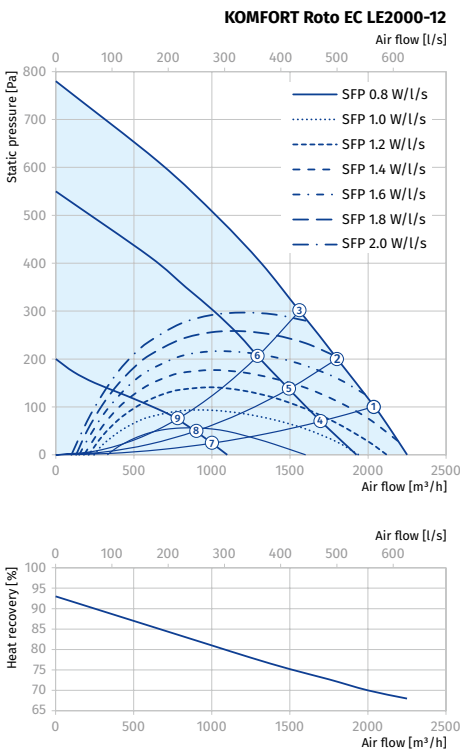
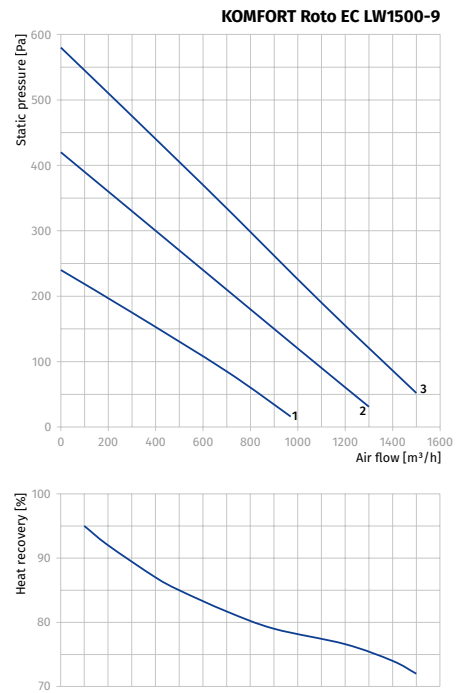
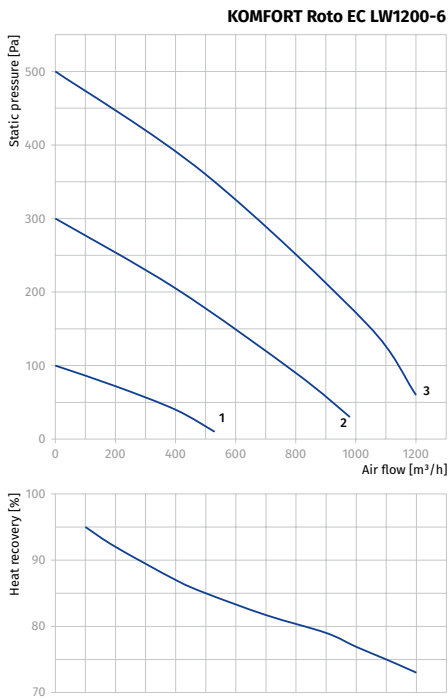
Total power of the unit, W

Point	KOMFORT Roto EC LE2000-12
1	874
2	893
3	905
4	545
5	562
6	568
7	181
8	182
9	184

Parameters	KOMFORT Roto EC LW400-2	KOMFORT Roto EC LW700-2	KOMFORT Roto EC LW1000-2	KOMFORT Roto EC LW1200-2	KOMFORT Roto EC LW1500-2	KOMFORT Roto EC LW2000-2
Voltage [V / 50 (60) Hz]	1 ~ 220-240	1 ~ 220-240	1 ~ 220-240	1 ~ 220-24	1 ~ 220-240	1 ~ 220-240
Max. power without electric heater [W]	2 items x 100	2 items x 105	2 items x 135	2 items x 208	2 items x 222	2 items x 448
Max. power with electric heater [W]	290	315	440	570	750	1070
Max. current with electric heater [A]	1.2	1.4	1.9	2.5	3.2	5
Maximum air flow [m ³ /h (l/s)]	400 (111)	700 (194)	900 (250)	1200 (333)	1500 (417)	2250 (625)
RPM [min ⁻¹]	up to 3100	up to 2600	up to 2600	up to 1930	up to 2000	up to 3000
Sound pressure level at 3 m [dBA]	45	52	58	60	62	64
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Extract filter	G4	G4	G4	G4	G4	G4
Supply filter	G4	G4	G4	G4	G4	G4
Connected air duct diameter [mm]	160	250	250	315	315	500x300
Weight [kg]	112	128	130	165	175	198
Heat recovery efficiency [%]	80-95	76-95	72-95	73-95	72-95	68-93
Heat exchanger type	up to 85	up to 85	up to 85	up to 85	up to 85	up to 85
Heat exchanger type	rotary	rotary	rotary	rotary	rotary	rotary
Heat exchanger material	aluminium	aluminium	aluminium	aluminium	aluminium	aluminium
SEC class	A	A	A	NRVU*	NRVU*	NRVU*
ErP	2016, 2018	2016, 2018	2016, 2018	-	-	-

* Nonresidential Ventilation Unit.





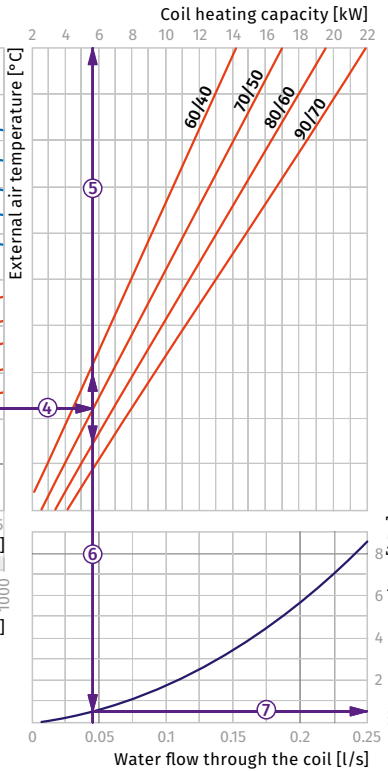
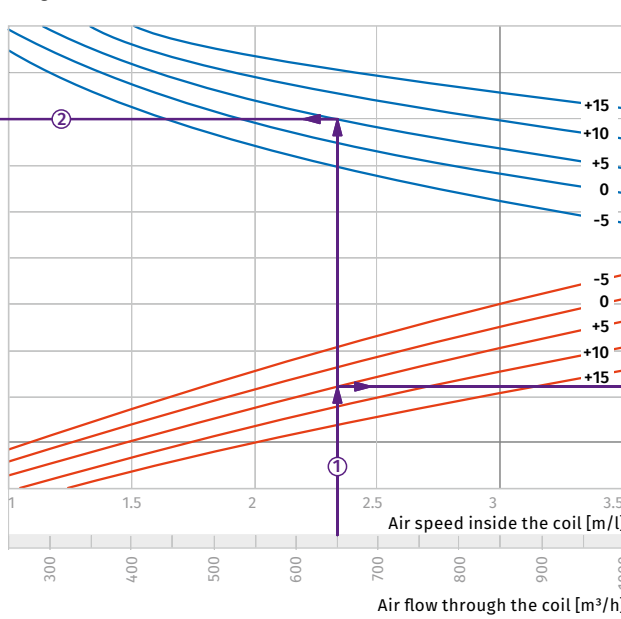
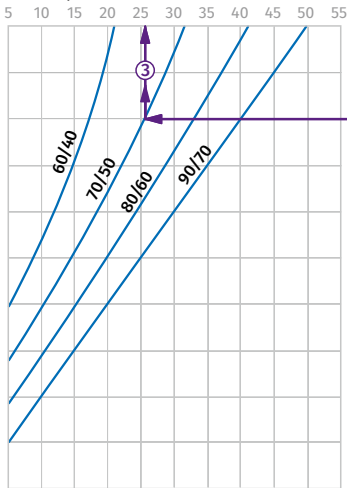
Total power of the unit, W

Point	KOMFORT Roto EC LE2000-12
1	874
2	893
3	905
4	545
5	562
6	568
7	181
8	182
9	184

Calculation of water heater parameters of the unit

KOMFORT Roto EC LW400-2 / KOMFORT Roto EC LW700-2 / KOMFORT Roto EC LW1000-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

Sample parameters: Air flow = 650 m³/h.
Outside air temperature = +5 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 650 m³/h and the air speed in the heater is 2.35 m/s ①.

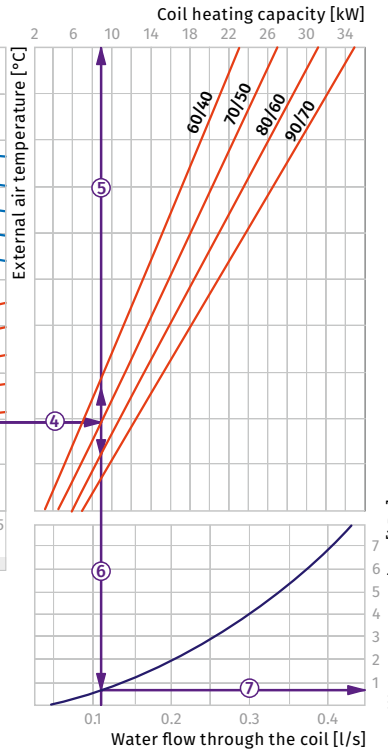
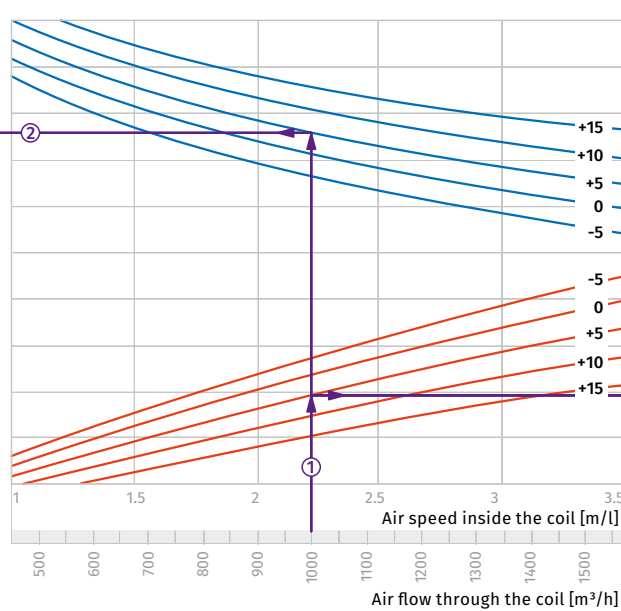
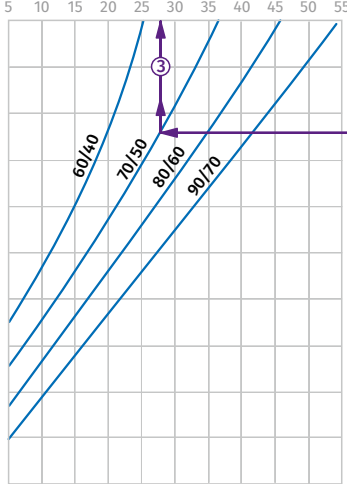
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., +5 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to 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).

KOMFORT ROTO EC LW1200-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

Sample parameters: Air flow = 1000 m³/h.
Outside air temperature = +5 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 1000 m³/h and the air speed in the heater is 2.22 m/s ①.

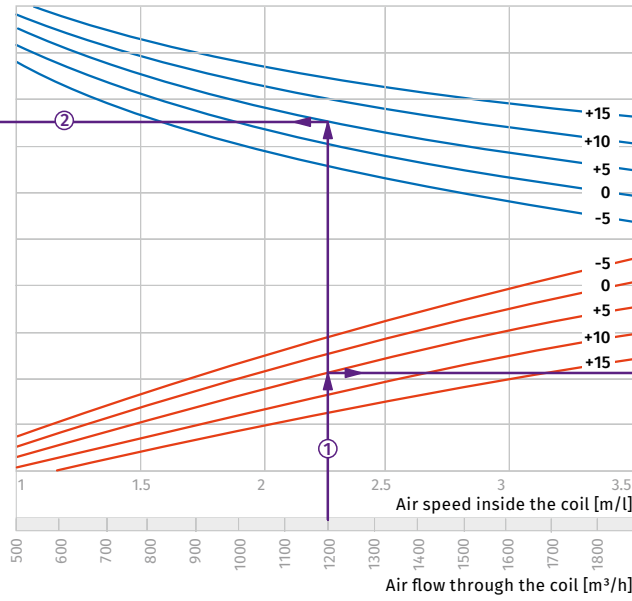
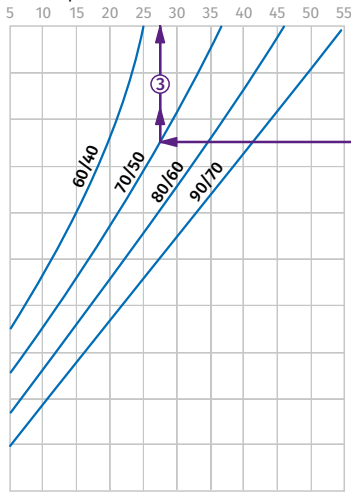
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., +5 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to 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.

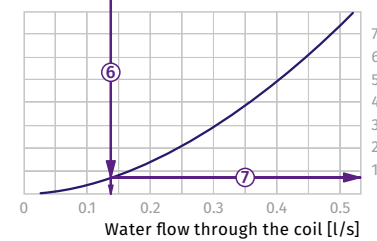
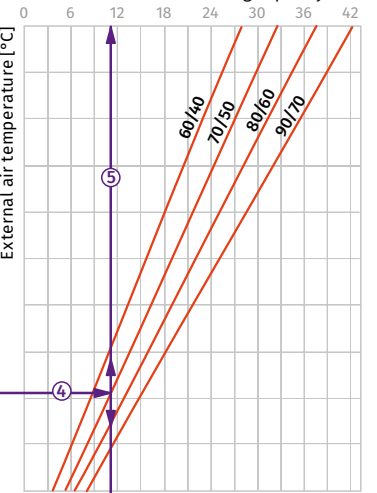
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.11 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (0.8 kPa).

KOMFORT ROTO EC LW1500-2 / KOMFORT ROTO EC LW2000-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.













Sample parameters: Air flow = 1200 m³/h.
 Outside air temperature = +5 °C.
 Water temperature (in/out) = +70/+50 °C.
 The air flow is 1200 m³/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 outer 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 ⑥ 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).

Accessories
KOMFORT ROTO EC LE

		KOMFORT Roto EC LE400-2	KOMFORT Roto EC LE700-3.3	KOMFORT Roto EC LE1000-4.5	KOMFORT Roto EC LE1200-6	KOMFORT Roto EC LE1500-9	KOMFORT Roto EC LE2000-12
G4 extract panel filter		FP 600x324x48 G4	FP 700x332x48 G4	FP 700x332x48 G4	FP 700x410x48 G4	FP 800x477x47 G4	FP 800x477x47 G4
G4 supply pocket filter		FPT 393x235x27 G4	FPT 700x333x27 G4	FPT 700x333x27 G4	FPT 700x423x27 G4	FPT 800x477x27 G4	FPT 800x477x27 G4
Backdraft air damper		VRV 160	VRV 250	VRV 250	VRV 315	VRV 315	-
Backdraft air damper		-	-	-	-	-	VRVS 500x300
Air damper		VRVS 160	VRVS 250	VRVS 250	VRVS 315	VRVS 315	-
Air damper		-	-	-	-	-	VK 500x300
VOC sensor		DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600
External CO ₂ sensor		DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200
Humidity sensor		DPWC11200	DPWC11200	DPWC11200	DPWC11200	DPWC11200	DPWC11200
Humidity sensor		HR-S	HR-S	HR-S	HR-S	HR-S	HR-S
Internal humidity sensor		FS2	FS2	FS2	FS2	FS2	FS2
Electric actuator		CM230	CM230	CM230	CM230	CM230	CM230

KOMFORT ROTO EC LW

		KOMFORT Roto EC LW400-2	KOMFORT Roto EC LW700-2	KOMFORT Roto EC LW1000-2	KOMFORT Roto EC LW1200-2	KOMFORT Roto EC LW1500-2	KOMFORT Roto EC LW2000-2
G4 extract panel filter		FP 600x324x48 G4	FP 700x332x48 G4	FP 700x332x48 G4	FP 700x410x48 G4	FP 800x477x47 G4	FP 800x477x47 G4
G4 supply pocket filter		FPT 393x235x27 G4	FPT 700x333x27 G4	FPT 700x333x27 G4	FPT 700x423x27 G4	FPT 800x477x27 G4	FPT 800x477x27 G4
Mixing set		WMG 3/4-4	WMG 3/4-4	WMG 3/4-4	WMG 3/4-4	WMG 1-6	WMG 1-6
Backdraft air damper		VRV 160	VRV 250	VRV 250	VRV 315	VRV 315	-
Backdraft air damper		-	-	-	-	-	VRVS 500x300
Air damper		VRVS 160	VRVS 250	VRVS 250	VRVS 315	VRVS 315	-
Air damper		-	-	-	-	-	VK 500x300
VOC sensor		DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600
External CO ₂ sensor		DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200
Humidity sensor		DPWC11200	DPWC11200	DPWC11200	DPWC11200	DPWC11200	DPWC11200
Humidity sensor		HR-S	HR-S	HR-S	HR-S	HR-S	HR-S
Internal humidity sensor		FS2	FS2	FS2	FS2	FS2	FS2
Electric actuator		TF230	TF230	TF230	TF230	TF230	TF230

AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

KOMFORT Roto EC D/DE

Air handling units with rotary heat exchanger

NEW



Features

- **KOMFORT Roto EC D(E)** are the ready-to-use ventilation units that provide air filtering, supply of fresh air to the premises and removal of stale air. Heat recovery from the exhaust air to the supply air is provided by the rotary heat exchanger. The units are used in ventilation systems installed in various premises that require reasonable energy saving solutions and controllable ventilation systems. The use of EC motors allows to reduce the electricity consumption in 1,5-3 times while providing the high capacity and low noise level. All models are designed for connection to $\varnothing 125$ and 200 mm round air ducts.



Air flow:
up to 430 m³/h
119 l/s



Heat recovery efficiency:
up to 78 %



Design

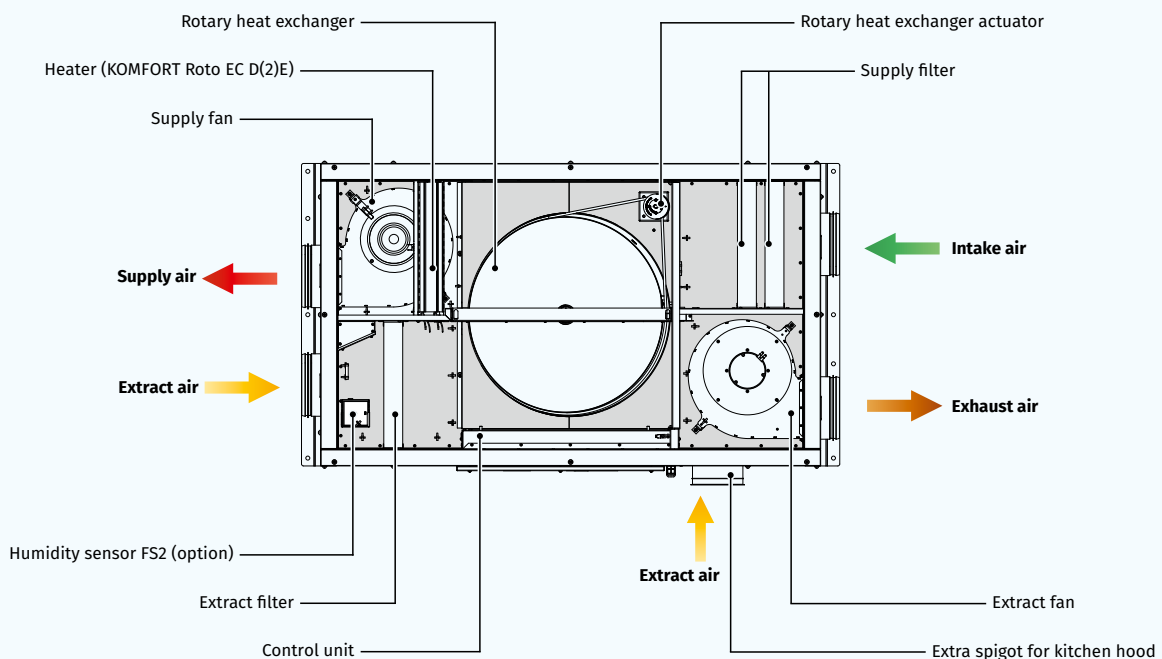
- The fan casing is made of galvanized steel soundproofed on the inside with mineral wool.
- **KOMFORT Roto EC D** – model without electric heater.
- **KOMFORT Roto EC DE** – model with electric heater.
- The insulation of **KOMFORT Roto EC D(E)** is 40 mm, for **KOMFORT Roto EC D2/ KOMFORT Roto EC D2E** 20 mm.

- Unit maintenance is performed from the bottom panel side.
- The distinctive feature of **KOMFORT Roto EC D2/ KOMFORT Roto EC D2E** is a low casing profile.



AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

KOMFORT ROTO EC D(E) L (LEFT SERVICE SIDE)



Kitchen hood

- All the models are equipped with a fifth spigot for connection of the air duct from the kitchen hood.

Filter

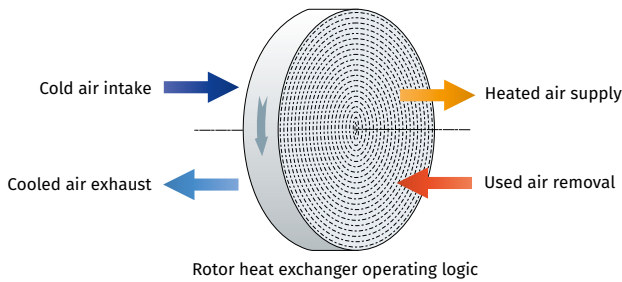
- Two built-in filters with G4 and F7 filtration class provide efficient supply air filtration. Optionally, a H13 supply air filter may be used. The G4 filter is used for extract air filtration.

Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and totally controllable speed range.
- Dynamically balanced impellers.

Rotary heat exchanger

- The rotary heat exchanger is a short rotating cylinder filled with aluminium band layered in such a way that both supply and exhaust air pass through it. The band the heat exchanger is made of first contacts the supply air flow and then the exhaust air flow. As a result it is heated and cooled in turns transferring heat and moisture from the warm air flow to the cold one. The advantages of the rotary heat exchanger compared to plate heat exchangers are the absence of condensate, comfortable humidity level maintenance and low freezing danger.



Heater

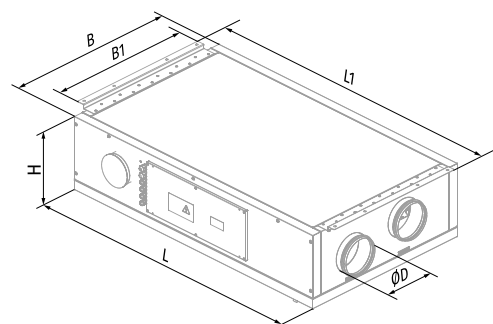
- The **KOMFORT Roto EC DE(D2E)** units are equipped with the electric heater. If the necessary temperature level of the supply air cannot be achieved through heat recovery, the heater turns on automatically and heats the air supplied to the premise. The heaters incorporate protective measures securing the safe unit operation.

Designation key

Serie	Unit type	Motor type	Mounting type	Modification	Heater type	Nominal air flow [m ³ /h]	Service side	Control
KOMFORT	Roto: rotary heat exchanger	EC: electronically commutated motor	D: Suspended mounting, horizontally oriented spigots	1: Standard (insulation 40 mm) 2: Low-profile (insulation 20 mm)	-: no heater E: electric heater	180; 350	R: Right L: Left	S17: thTune control panel S18: pGD1 control panel

Overall dimensions [mm]

Model	D	B	B1	H	L	L1
KOMFORT Roto EC D180	124	643	643	305.3	1003	1099.6
KOMFORT Roto EC D2-180	124	643	643	247	1003	1098.6
KOMFORT Roto EC D350	159	770	600	318.3	1270	1367
KOMFORT Roto EC D2-350	159	770	600	225	1362	1475



Automation

- The **KOMFORT Roto EC D S17** units are equipped with the thTune control panel with an LCD display.



- The **KOMFORT Roto EC D S18** units are equipped with the pGD1 control panel with an LCD display.



The thTune and pGD1 panels are interchangeable. The standard delivery set includes a 10 m cable for connection to the control panel.

Automation functions

- Turning the unit on/off.
- Turning on the operation modes: Automatic mode, Ventilation mode (can be enabled only from the pGD1 control panel).
- Maintaining a pre-set room temperature by activating/deactivating the rotary heat exchanger.
- Automatic reduction of the supply and exhaust ventilation air flow rate to obtain the user-defined minimum allowable supply air temperature.
- Supply and exhaust fan control.
- Setting day- and week-scheduled operation of the unit.
- Controlling the electric actuators of the supply and exhaust air dampers.
- System shutdown on signal from fire fighting system.
- When connecting external electrical heating elements and/or CCU to the unit the activation signal controls their operation if cooling/heating is required.
- Filter clogging indication by motor meter.

Mounting

- The air handling unit is designed for wall, wand or floor mounting.

Technical data

Parameters	KOMFORT Roto EC D2-180	KOMFORT Roto EC D2E180	KOMFORT Roto EC D180	KOMFORT Roto EC DE180	KOMFORT Roto EC D2-350	KOMFORT Roto EC D2E350	KOMFORT Roto EC D350	KOMFORT Roto EC DE350
Voltage [V / 50 (60) Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Max. power without electric heater [W]	80	80	60	60	175	175	160	160
Max. unit current without electric heater [A]	0.6	0.6	0.5	0.5	1.2	1.2	1.2	1.2
Max. power with electric heater [W]	-	780	-	760	-	1575	-	1560
Max. current with electric heater [A]	-	3.4	-	3.3	-	6.8	-	6.8
Maximum air flow [m ³ /h (l/s)]	230 (64)	230 (64)	210 (58)	210 (58)	400 (111)	400 (111)	430 (119)	430 (119)
RPM [min ⁻¹]	4480	4480	3770	3770	3200	3200	3570	3570
Sound pressure level at 3 m [dBA]	23	23	21	21	33	33	31	21
Transported air temperature [°C]	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60	-25...+60
Casing material	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel	polymer coated steel
Insulation	20 mm, mineral wool	20 mm, mineral wool	40 mm, mineral wool	40 mm, mineral wool	20 mm, mineral wool	20 mm, mineral wool	40 mm, mineral wool	40 mm, mineral wool
Extract filter	G4	G4	G4	G4	G4	G4	G4	G4
Supply filter	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)	G4, F7 (Option: H13)
Connected air duct diameter [mm]	125	125	125	125	160	160	160	160
Weight [kg]	53	54	61	62	78	79	81	82
Heat recovery efficiency [%]*	66-76	66-76	71-77	71-77	68-77	68-77	68-78	68-78
Heat exchanger type	rotary	rotary	rotary	rotary	rotary	rotary	rotary	rotary
Heat exchanger material	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum
SEC class	A	A	A	A	A	A	A	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018

* Heat recovery efficiency is specified in compliance with EN 13141-7.

KOMFORT ROTO EC D2-180

Sound power level, A-filter applied.

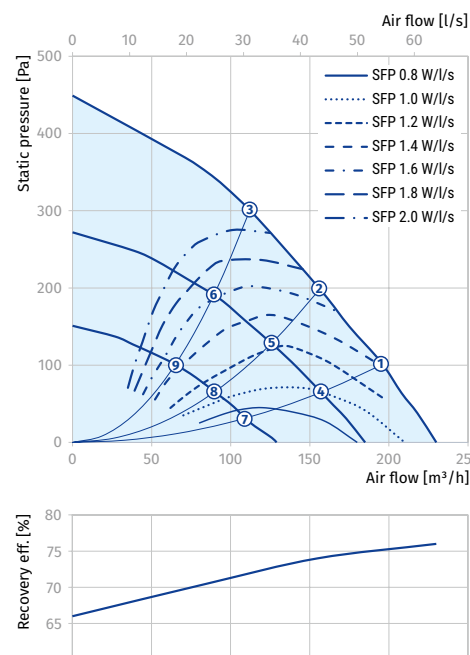
Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	58	21	42	45	56	53	42	32	21		
L _{WA} to supply outlet [dBA]	59	21	43	45	56	53	42	32	21		
L _{WA} to exhaust inlet [dBA]	53	20	38	42	52	44	36	29	18		
L _{WA} to exhaust outlet [dBA]	54	20	38	43	53	44	36	29	18		
L _{WA} to environment [dBA]	43	10	28	39	38	35	32	31	29	23	33

* Data provided for point 1 of the air flow diagram

KOMFORT ROTO EC D2(E)-180

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1 m) [dBA]
1	76	23 (33)
2	73	23 (33)
3	65	22 (32)
4	51	21 (31)
5	51	19 (29)
6	49	18 (28)
7	46	18 (28)
8	46	17 (27)
9	45	17 (27)



KOMFORT ROTO EC D180

Sound power level, A-filter applied.

Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	55	18	39	42	53	50	40	30	19		
LWA to supply outlet [dBA]	72	31	46	59	68	68	60	58	46		
LWA to exhaust inlet [dBA]	50	17	34	39	49	41	34	27	17		
LWA to exhaust outlet [dBA]	65	30	41	55	64	57	52	51	40		
LWA to environment [dBA]	41	8	25	36	35	33	30	29	27	21	31

* Data provided for point 1 of the air flow diagram

KOMFORT ROTO EC D(E)-180

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1m) [dBA]
1	60	21 (31)
2	59	21 (31)
3	56	20 (30)
4	40	18 (28)
5	39	17 (27)
6	37	17 (27)
7	28	16 (26)
8	28	16 (26)
9	28	16 (26)

KOMFORT ROTO EC D2-350

Sound power level, A-filter applied.

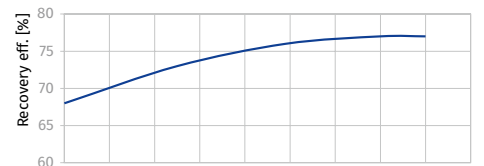
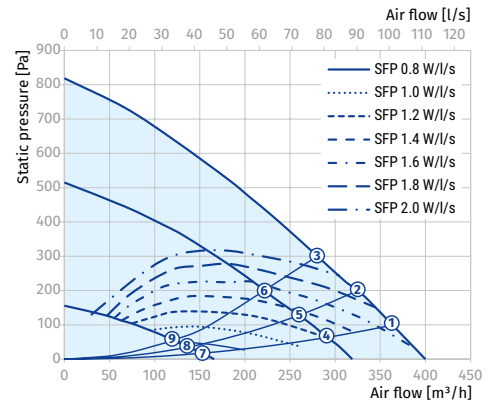
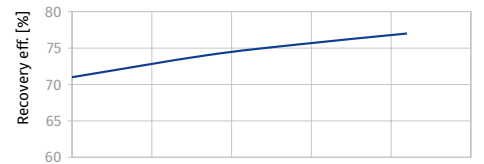
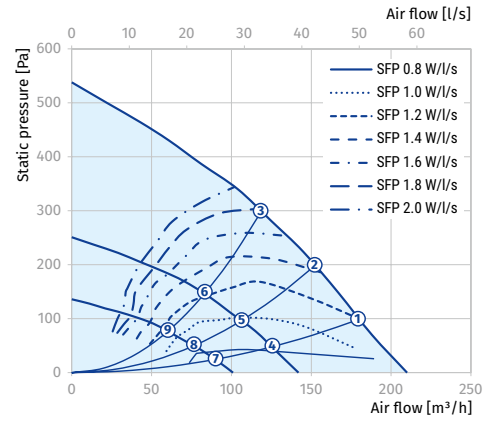
Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
LWA to supply inlet [dBA]	59	26	45	53	54	52	48	43	34		
LWA to supply outlet [dBA]	83	44	58	67	75	75	79	75	71		
LWA to exhaust inlet [dBA]	54	25	40	50	50	43	41	38	30		
LWA to exhaust outlet [dBA]	74	42	52	63	70	63	68	66	62		
LWA to environment [dBA]	53	18	35	46	49	48	43	37	33	33	43

* Data provided for point 1 of the air flow diagram

KOMFORT ROTO EC D2(E)-350

Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1m) [dBA]
1	172	33 (43)
2	171	33 (43)
3	167	32 (42)
4	125	31 (41)
5	124	28 (38)
6	122	27 (37)
7	98	27 (37)
8	97	23 (33)
9	97	23 (33)



Calculation of the exhaust air temperature:

$$t = t_{\text{outd}} + k_{\text{hr}} \times (t_{\text{extr}} - t_{\text{outd}}) / 100,$$

where

t_{outd} – outdoor air temperature [°C],

t_{extr} – extract air temperature [°C],

k_{hr} – heat exchanger efficiency (according to the diagram) [%]

KOMFORT ROTO EC D350

Sound power level, A-filter applied.

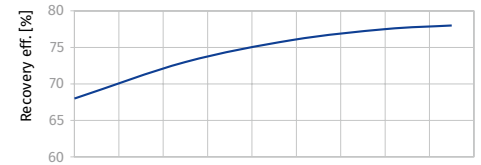
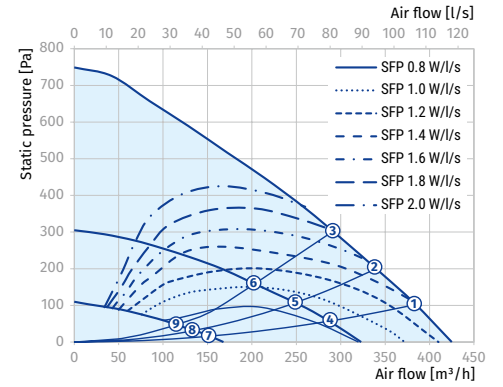
Sound power level, A-weighted	General	Octave frequency band [Hz]								LpA, 3 m [dBA]	LpA, 1 m [dBA]
		63	125	250	500	1000	2000	4000	8000		
L _{WA} to supply inlet [dBA]	56	24	43	51	52	50	46	42	33		
L _{WA} to supply outlet [dBA]	80	41	55	65	72	72	76	72	69		
L _{WA} to exhaust inlet [dBA]	52	23	38	47	48	42	39	37	29		
L _{WA} to exhaust outlet [dBA]	72	40	50	61	67	61	65	64	60		
L _{WA} to environment [dBA]	51	16	33	44	47	46	41	36	32	31	41

* Data provided for point 1 of the air flow diagram

KOMFORT ROTO EC D(E)-350













Total power. Total sound pressure level.

Point	Total power of the unit [W]	Sound pressure level at 3 m (1m) [dBA]
1	154	31 (41)
2	151	31 (41)
3	149	30 (40)
4	116	27 (37)
5	116	26 (36)
6	115	26 (36)
7	76	24 (34)
8	75	21 (31)
9	63	21 (31)



AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

Accessories

		KOMFORT Roto EC D2(E)180	KOMFORT Roto EC D(E)180	KOMFORT Roto EC D2(E)350	KOMFORT Roto EC D(E)350
G4 panel filter		FP 280x205x48 G4	FP 260x260x48 G4	FP 372x210x48 G4	FP 320x270x48 G4
F7 panel filter		FP 280x205x48 F7	FP 260x260x48 F7	FP 372x210x48 F7	FP 320x270x48 F7
H13 panel filter		FP 280x205x48 H13	FP 260x260x48 H13	FP 372x210x48 H13	FP 320x270x48 H13
VOC sensor		DPWQ30600	DPWQ30600	DPWQ30600	DPWQ30600
External CO ₂ sensor		DPWQ40200	DPWQ40200	DPWQ40200	DPWQ40200
Humidity sensor		DPWC11200	DPWC11200	DPWC11200	DPWC11200
Humidity sensor (NO contact)		HR-S	HR-S	HR-S	HR-S
Internal humidity sensor		FS2	FS2	FS2	FS2
Kitchen hood		DAH 251-13	DAH 251-13	DAH 251-13	DAH 251-13
Backdraft air damper		VRV 125	VRV 125	VRV 160	VRV 160
Air damper		VKA 125	VKA 125	VKA 160	VKA 160
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

AIR HANDLING UNITS WITH ROTARY HEAT EXCHANGER

BLAUBOX E

Supply ventilation units

Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with Ø100 up to 315 mm round air ducts.



Air flow:
up to 1520 m³/h
422 l/s

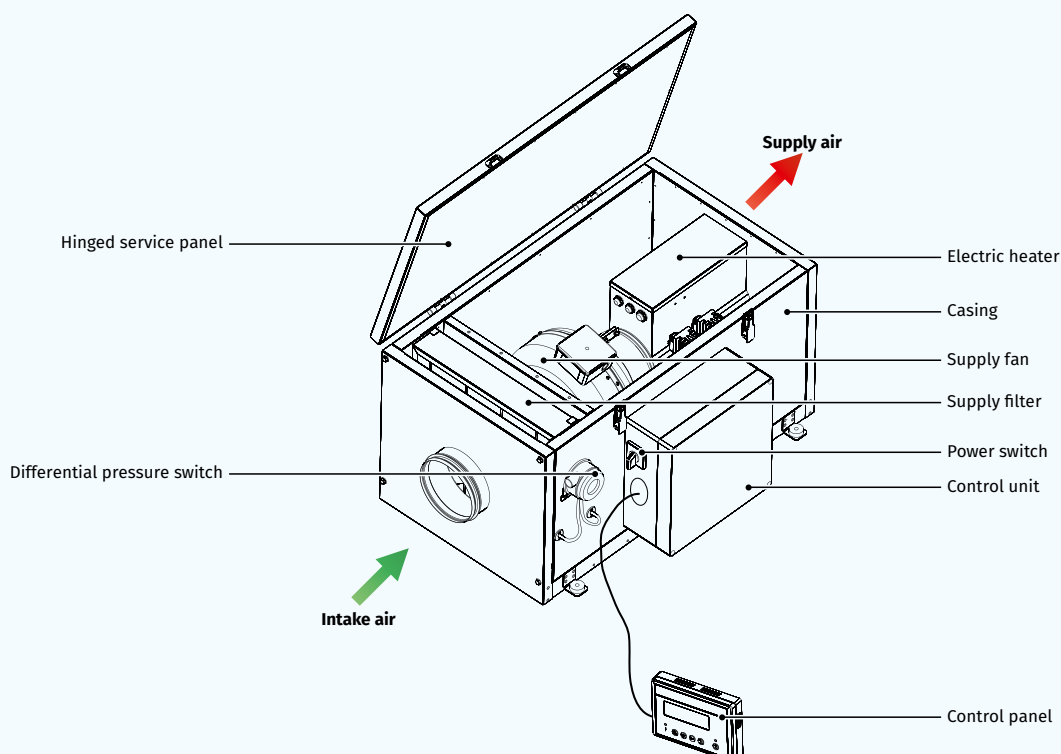


Design

- The casing is made of double-skinned aluzinc panels, internally filled with mineral wool layer of 25 mm for heat and sound insulation.
- The mounting brackets with anti-vibration rubber mounts on the casing bottom ensure easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- The hinged panel of the casing ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fans

- Asynchronous external rotor motor and centrifugal impeller with backward curved blades are used for air supply.
- Single- or three-phase motor modification depending on the fan model type.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impeller.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.



Air heater

- The unit is equipped with an electric heater for operation during cold seasons at low outside temperature.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Air filtration

- The built-in G4 supply filter provides air filtration.

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Activating/deactivating the unit
 - Setting low, medium and high speeds for the supply fan as well as air flow control.
 - Setting and maintaining supply air temperature
 - Setting day- or week-scheduled

Automation functions:

- Filter clogging control with a differential pressure switch
- Overheating protection of the electric heating elements
- Disabling heater activation during the fan shutoff
- Set algorithms are tested when the unit is turned on and off

Mounting

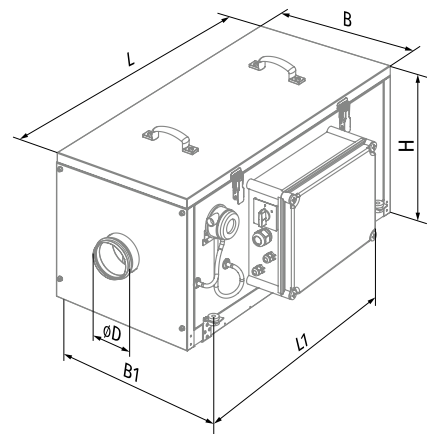
- The unit is suitable for indoor mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

Designation key

Serie	Heater type	Nominal air flow [m³/h]	Heater power [kW]
BLAUBOX	E: electric heater	200; 300; 400; 800; 1000; 1200; 1500	– 1.8; 2.4; 3.4; 3.6; 5.1; 6; 9

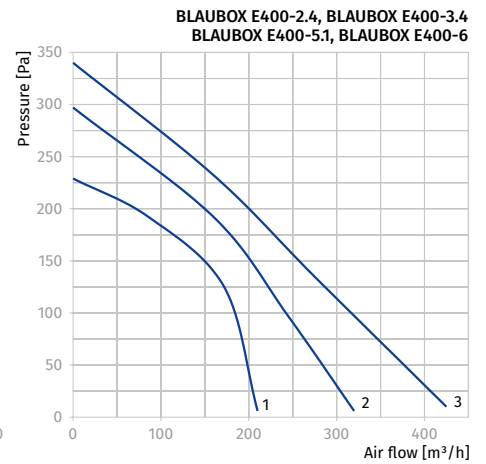
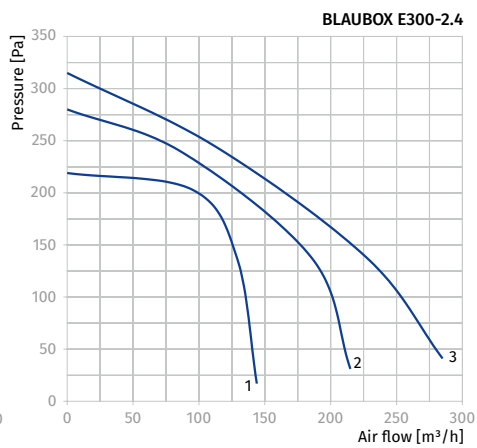
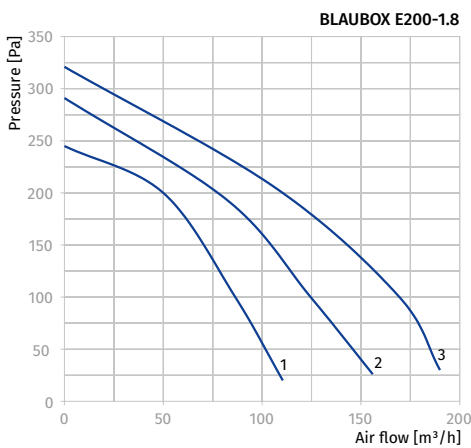
Overall dimensions [mm]

Model	D	B	B1	H	L	L1
BLAUBOX E200-1.8	99	382	421.5	408	800	647
BLAUBOX E300-2.4	124	382	421.5	408	800	647
BLAUBOX E400-2.4	149	455	496.5	438	800	647
BLAUBOX E400-3.4	149	455	496.5	438	800	647
BLAUBOX E400-5.1	149	455	496.5	438	800	647
BLAUBOX E400-6	149	455	496.5	438	800	647
BLAUBOX E800-3.4	199	487	526.5	513	835	684
BLAUBOX E800-5.1	199	487	526.5	513	835	684
BLAUBOX E800-6	199	487	526.5	513	835	684
BLAUBOX E1000-3.6	249	487	526.5	513	835	684
BLAUBOX E1000-6	249	487	526.5	513	835	684
BLAUBOX E1000-9	249	487	526.5	513	835	684
BLAUBOX E1200-6	314	527	566.5	548	900	750
BLAUBOX E1200-9	314	527	566.5	548	900	750
BLAUBOX E1500-6	314	527	566.5	548	900	750
BLAUBOX E1500-9	314	527	566.5	548	900	750

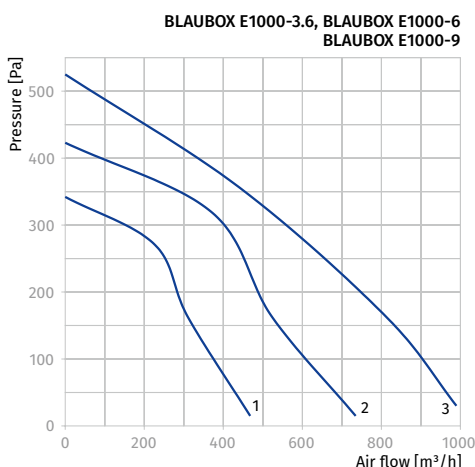
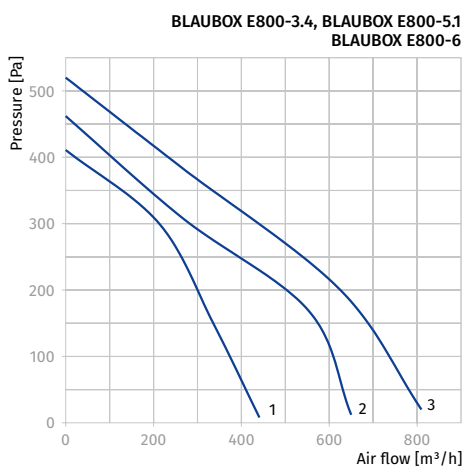


Technical data

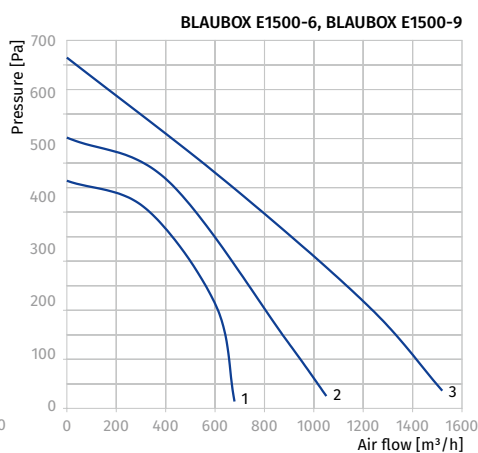
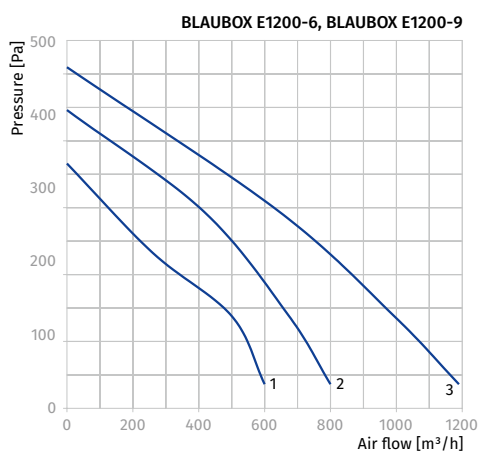
Parameters	BLAUBOX E200-1.8	BLAUBOX E300-2.4	BLAUBOX E400-2.4	BLAUBOX E400-3.4	BLAUBOX E400-5.1	BLAUBOX E400-6
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	3 ~ 400	3 ~ 400
Max. power without electric heater [kW]	0.073	0.075	0.098	0.098	0.098	0.098
Max. current without electric heater [A]	0.32	0.33	0.43	0.43	0.43	0.43
Max. power with electric heater [kW]	1.873	2.475	2.498	3.498	5.198	6.098
Max. current with electric heater [A]	8.12	10.73	10.83	15.23	7.83	9.13
Electric heater power [kW]	1.8	2.4	2.4	3.4	5.1	6.0
Electric heater current [A]	7.8	10.4	10.4	14.8	7.4	8.7
Number of electrical heating elements	3	3	2	2	3	3
Maximum air flow [m ³ /h (l/s)]	190 (53)	285 (79)	425 (118)	425 (118)	425 (118)	425 (118)
RPM [min ⁻¹]	2830	2800	2705	2705	2705	2705
Sound pressure level at 3 m [dBA]	27	28	29	29	29	29
Transported air temperature [°C]	-25...+55	-25...+55	-25...+55	-25...+55	-25...+55	-25...+55
Casing material	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Filter	G4	G4	G4	G4	G4	G4
Connected air duct diameter [mm]	100	125	150	150	150	150
Weight [kg]	50	50	50	50	50	50
SEC class	A	A	A	A	A	A
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018












Parameters	BLAUBOX E800-3.4	BLAUBOX E800-5.1	BLAUBOX E800-6	BLAUBOX 1000-3.6	BLAUBOX E1000-6	BLAUBOX E1000-9
Voltage [V / 50 Hz]	1 ~ 230	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Max. power without electric heater [kW]	0.193	0.193	0.193	0.194	0.194	0.194
Max. current without electric heater [A]	0.84	0.84	0.84	0.84	0.84	0.84
Max. power with electric heater [kW]	3.593	5.293	6.193	3.794	6.194	9.194
Max. current with electric heater [A]	15.64	8.24	9.54	6.15	9.55	13.85
Electric heater power [kW]	3.4	5.1	6.0	3.6	6.0	9.0
Electric heater current [A]	14.8	7.4	8.7	5.3	8.7	13.0
Number of electrical heating elements	2	3	3	3	3	3
Maximum air flow [m³/h (l/s)]	810 (225)	810 (225)	810 (225)	990 (275)	990 (275)	990 (275)
RPM [min ⁻¹]	2780	2780	2780	2780	2780	2780
Sound pressure level at 3 m [dBA]	30	30	30	30	30	30
Transported air temperature [°C]	-25...+45	-25...+45	-25...+45	-25...+50	-25...+50	-25...+50
Casing material	aluminum	aluminum	aluminum	aluminum	aluminum	aluminum
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Filter	G4	G4	G4	G4	G4	G4
Connected air duct diameter [mm]	200	200	200	250	250	250
Weight [kg]	52	52	52	52	52	52
SEC class	C	C	C	C	C	C
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Parameters	BLAUBOX E1200-6	BLAUBOX E1200-9	BLAUBOX E1500-6	BLAUBOX E1500-9
Voltage [V / 50 Hz]	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Max. power without electric heater [kW]	0.171	0.171	0.296	0.296
Max. current without electric heater [A]	0.77	0.77	1.34	1.34
Max. power with electric heater [kW]	6.171	9.171	6.296	9.296
Max. current with electric heater [A]	9.47	13.77	10.04	14.34
Electric heater power [kW]	6.0	9.0	6.0	9.0
Electric heater current [A]	8.7	13.0	8.7	13.0
Number of electrical heating elements	3	3	3	3
Maximum air flow [m ³ /h (l/s)]	1190 (331)	1190 (331)	1520 (422)	1520 (422)
RPM [min ⁻¹]	2600	2600	2720	2720
Sound pressure level at 3 m [dBA]	30	30	30	30
Transported air temperature [°C]	-25...+50	-25...+50	-25...+45	-25...+45
Casing material	aluminum	aluminum	aluminum	aluminum
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Filter	G4	G4	G4	G4
Connected air duct diameter [mm]	315	315	315	315
Weight [kg]	62	62	62	62
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Accessories

		BLAUBOX E200	BLAUBOX E300	BLAUBOX E400	BLAUBOX E800	BLAUBOX E1000	BLAUBOX E1200	BLAUBOX E1500
G4 panel filter		FP 335x322x70 G4	FP 335x322x70 G4	FP 397x364x70 G4	FP 439x428x70 G4	FP 439x428x70 G4	FP 475x470x70 G4	FP 475x470x70 G4
Silencer		SD 100	SD 125	SD 150	SD 200	SD 250	SD 315	SD 315
Silencer		SDF 100	SDF 125	SDF 150	SDF 200	SDF 250	SDF 315	SDF 315
Flexible anti-vibration connector		EVA 100	EVA 125	EVA 150	EVA 200	EVA 250	EVA 315	EVA 315
Clamp		KZ 100	KZ 125	KZ 150	KZ 200	KZ 250	KZ 315	KZ 315
Backdraft air damper		VRV 100	VRV 125	VRV 150	VRV 200	VRV 250	VRV 315	VRV 315
Air damper		VKA 100	VKA 125	VKA 150	VKA 200	VKA 250	VKA 315	VKA 315
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230	TF230	TF230

BLAUBOX ME

Supply ventilation units

Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.



Air flow:
up to 3500 m³/h
972 l/s



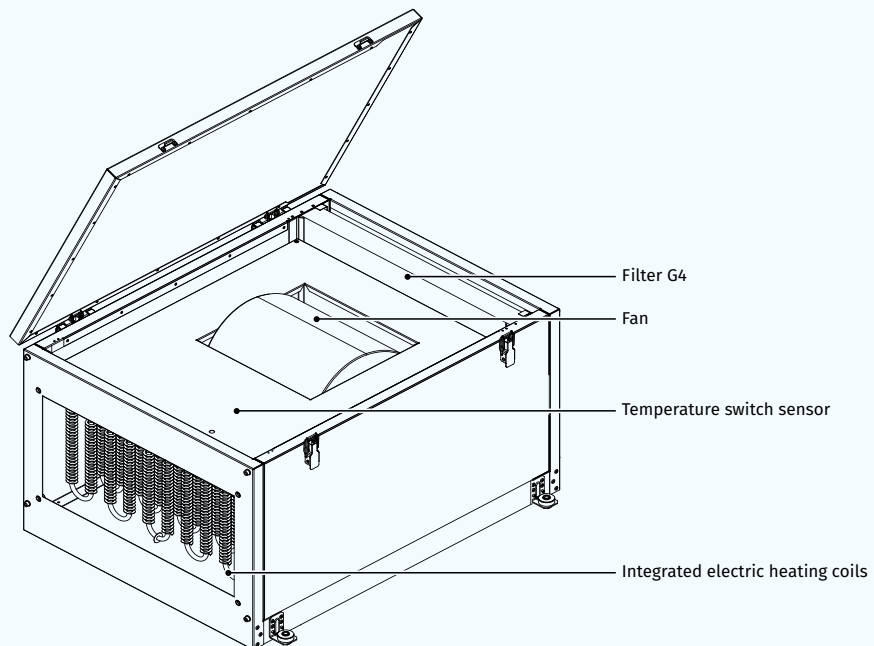
Design

- The casing is made of double-skinned aluzinc panels, internally filled with mineral wool layer of 25 mm for heat- and sound-insulation.
- The mounting brackets with anti-vibration rubber mounts on the casing bottom ensure easy installation.
- The hinged panel of the casing ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fans

- Asynchronous external rotor motor and centrifugal double-inlet impeller with forward curved blades is used for air supply.
- Single- or three-phase motor modification depending on the fan model type.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impeller.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.

SUPPLY VENTILATION UNITS



Air heater

- The unit is equipped with an electric heater for operation during cold seasons at low outside temperature.
- The heating elements are extra ribbed for larger heat exchange surface.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Air filtration

- The built-in G4 supply filter provides air filtration.

Control and automation

- The unit incorporates an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.

Control panel functions:

- Activating/deactivating the unit.
- Setting low, medium and high speeds for the supply fan as well as air flow control.
- Setting and maintaining supply air temperature.
- Setting or week-scheduled operation of the unit.

Automation functions:

- Filter clogging control with a differential pressure switch.
- Overheating protection of the electric heating elements.
- Disabling heater activation during the fan shutdown.

Mounting

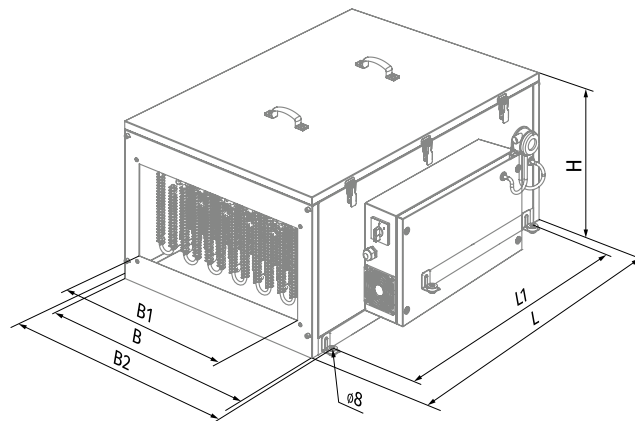
- The unit is suitable for indoor mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

Designation key

Serie	Casing modification	Heater type	Nominal air flow [m³/h]	Electric heater power [kW]
BLAUBOX	M: single-block unit	E: electric heater	800; 1200; 2000; 2500; 3200; 3500	— 3.3; 9.9; 18; 25.2

Overall dimensions [mm]

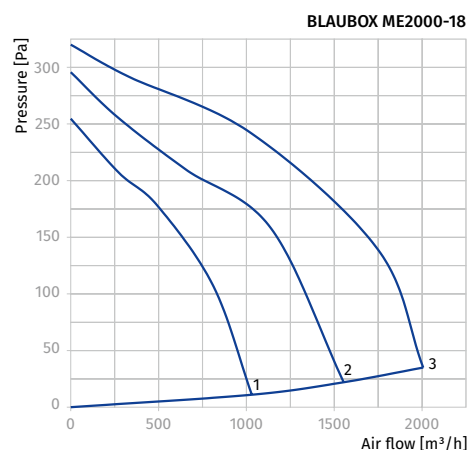
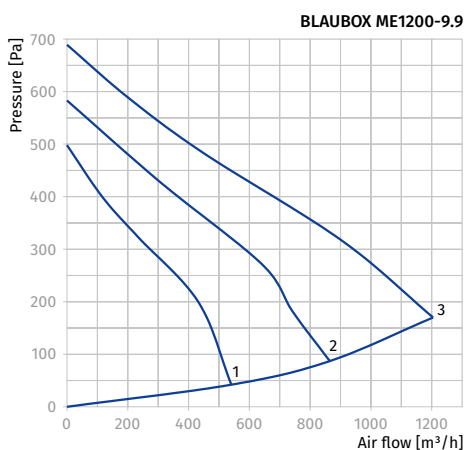
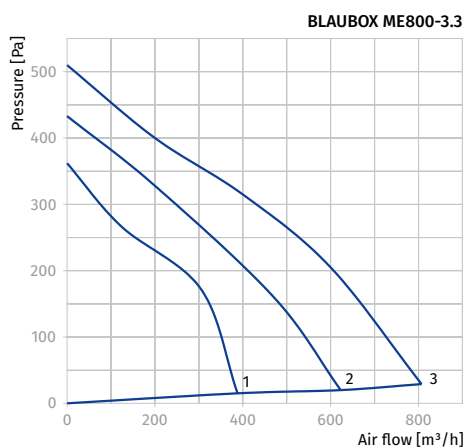
Model	B	B1	B2	H	L	L1
BLAUBOX ME800-3.3	500	400	549	352	650	530
BLAUBOX ME1200-9.9	500	400	549	352	650	530
BLAUBOX ME2000-18	600	500	649	480	800	680
BLAUBOX ME2500-18	600	500	649	480	800	680
BLAUBOX ME3200-25.2	710	600	759	530	1000	880
BLAUBOX ME3500-25.2	710	600	759	530	1000	880



Technical data

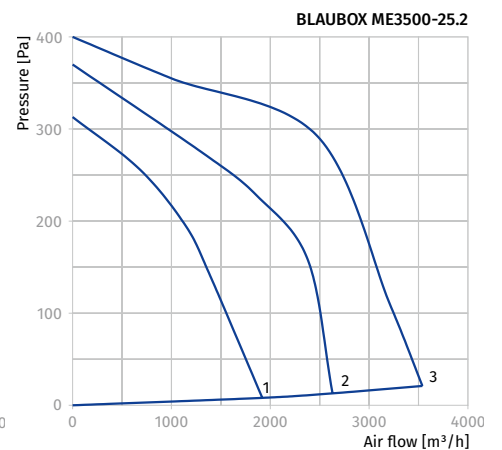
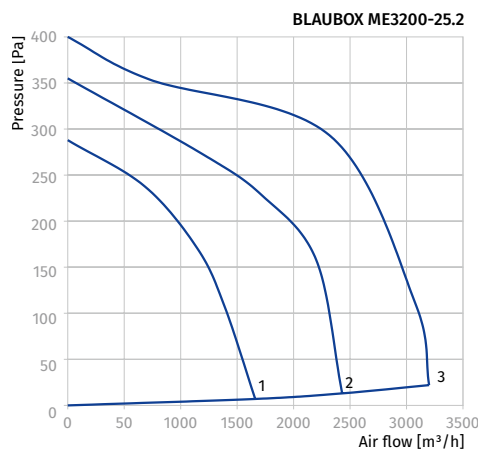
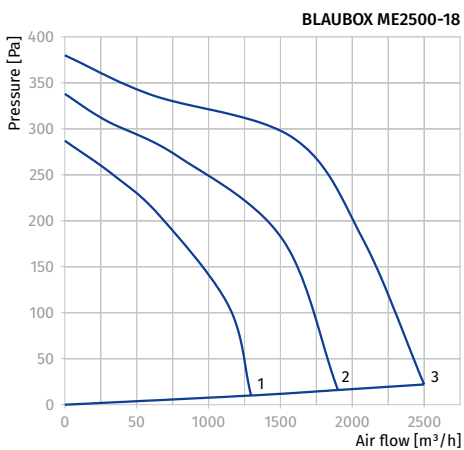
Parameters	BLAUBOX ME800-3.3	BLAUBOX ME1200-9.9	BLAUBOX ME2000-18
Voltage [V / 50 Hz]	1 ~ 230	3 ~ 400	3 ~ 400
Max. power without electric heater [kW]	0.245	0.410	490
Max. current without electric heater [A]	1.08	1.8	2.15
Max. power with electric heater [kW]	3.55	9.94	18.49
Max. current with electric heater [A]	15.38	16.1	28.15
Electric heater power [kW]	3.3	9.9	18.0
Electric heater current [A]	14.3	14.3	26.0
Maximum air flow [m ³ /h (l/s)]	800 (222)	1200 (333)	2000 (556)
RPM [min ⁻¹]	1650	1850	1100
Sound pressure level at 3 m [dBA]	35	38	40
Transported air temperature [°C]	-25...+45	-25...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Filter	G4	G4	G4
Connected air duct size [mm]	400x200	400x200	500x250
Weight [kg]	36.2	38.9	61.5
SEC class*	D	NRVU**	NRVU**
ErP	2016, 2018	2016, 2018	2016, 2018

* The EC norm 1254/2014 does not apply if maximum air flow is >1000 m³/h
 **Nonresidential Ventilation Unit.



Parameters	BLAUBOX ME2500-18	BLAUBOX ME3200-25.2	BLAUBOX ME3500-25.2
Voltage [V / 50 Hz]	3 ~ 400	3 ~ 400Y	3 ~ 400Y
Max. power without electric heater [kW]	650	1.27	1.27
Max. current without electric heater [A]	2.84	2.3	2.3
Max. power with electric heater [kW]	18.65	26.47	26.47
Max. current with electric heater [A]	28.84	38.7	38.7
Electric heater power [kW]	18.0	25.2	25.2
Electric heater current [A]	26.0	36.4	36.4
Maximum air flow [m³/h (l/s)]	2500 (695)	3200 (889)	3500 (972)
RPM [min ⁻¹]	1000	1200	1200
Sound pressure level at 3 m [dBA]	45	53	53
Transported air temperature [°C]	-25...+45	-25...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Filter	G4	G4	G4
Connected air duct size [mm]	500x300	600x300	600x350
Weight [kg]	62	69.4	69.3
SEC class	NRVU**	NRVU**	NRVU**
ErP	2016, 2018	2016, 2018	2016, 2018

* The EC norm 1254/2014 does not apply if maximum air flow is >1000 m³/h
 **Nonresidential Ventilation Unit.



Accessories

		BLAUBOX ME800-3.3	BLAUBOX ME1200-9.9	BLAUBOX ME2000-18	BLAUBOX ME2500-18	BLAUBOX ME3200-25.2	BLAUBOX ME3500-25.2
G4 panel filter		FP 442x275x47 G4	FP 442x275x47 G4	FP 390x545x47 G4	FP 390x545x47 G4	FP 475x470x70 G4	FP 475x470x70 G4
Silencer		SD 40x20	SD 40x20	SD 50x25	SD 50x30	SD 60x30	SD 60x35
Duct cooling unit		KFK 40x20-3	KFK 40x20-3	KFK 50x25-3	KFK 50x30-3	KFK 60x30-3	KFK 60x35-3
Mixing set		WMG	WMG	WMG	WMG	WMG	WMG
Air flow dampers		SL 40x20	SL 40x20	SL 50x25	SL 50x30	SL 60x30	SL 60x35
Flexible anti-vibration connector		EVA 40x20	EVA 40x20	EVA 50x25	EVA 50x30	EVA 60x30	EVA 60x35
Electric actuator		LF230	LF230	LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230	TF230	TF230

BLAUBOX MW

Supply ventilation units

Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with 400x200 up to 800x500 mm rectangular air ducts.



Air flow:
up to 6500 m³/h
1806 l/s

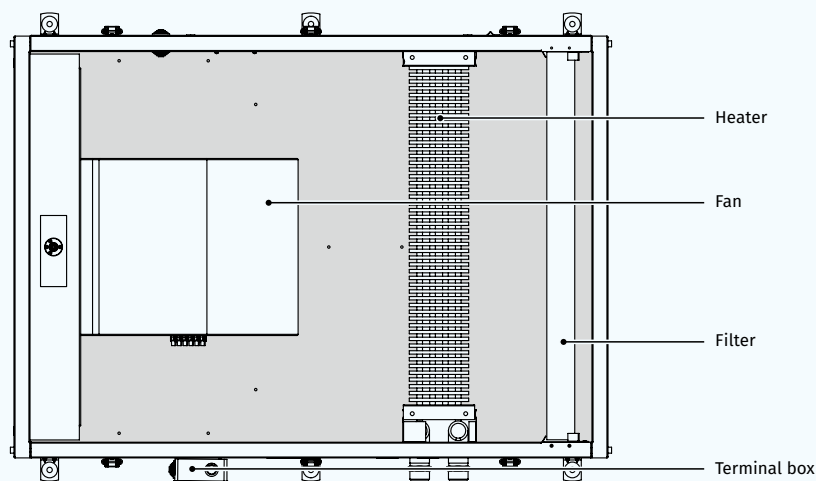


Design

- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The hinged casing side panel ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fan

- Asynchronous external rotor motor and centrifugal double-intake impeller with forward curved blades is used for air supply.
- Single- or three-phase motor modification depending on the fan model type.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impeller.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.



Air heater

- The units are equipped with a water (glycol) heater for operation during cold seasons at low outside temperature.
- The air temperature sensor downstream of the water heater and the return heat medium sensor ensure freezing protection of the water heater. If any of these sensors detects a temperature point below the set minimum value, the signal is sent automatically to the control unit to troubleshoot cooling.

Air filtration

- The built-in G4 supply filter provides air filtration.

Control and automation

- The units incorporate an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply fan. Air flow control.
 - The models with a water mixing unit have the function of setting and maintaining the supply air temperature by means of controlling the heat medium control valve.

Automation functions:

- Supply air temperature control by means of controlling the heat medium control valve.
- Control of the supply air damper actuator (separate order).
- Control of the external circulation pump on the heat medium feed line.
- Regulation of heat medium flow in the water heater in case of the differential pressure of the return heat medium below 40 kPa.
- Water heater freezing protection with the mixing unit and the circulation pump.
- Control of the cooler with respect to the set indoor air temperature (separate order).
- Supply fan control.
- Supply filter clogging control.
- Shutdown of the unit on signal from the fire alarm panel.

Mounting

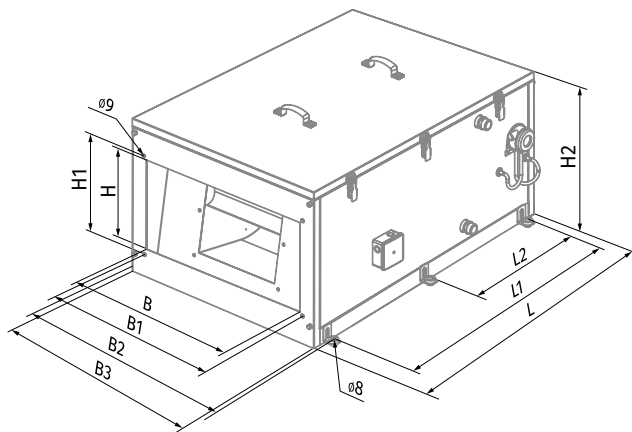
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

Designation key

Serie	Casing modification	Heater type	Nominal air flow [m³/h]	Number of water coil rows
BLAUBOX	M: single-block unit	W: water heater	750; 1200; 1800; 2100; 3000; 3200; 6500	- 4

Overall dimensions [mm]

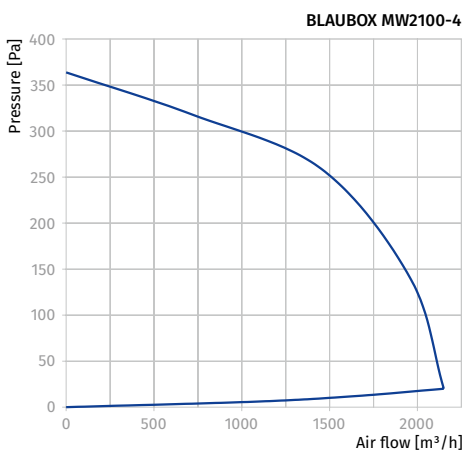
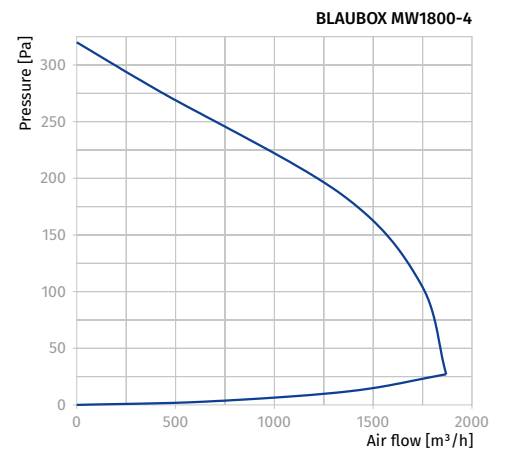
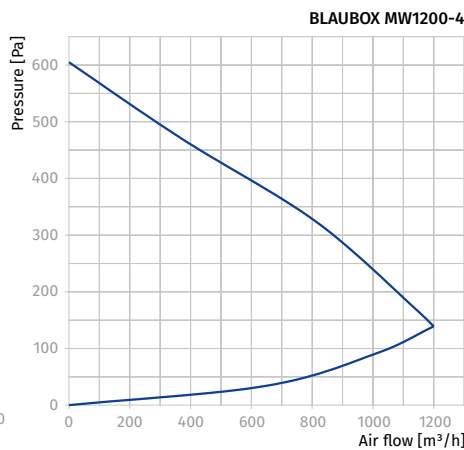
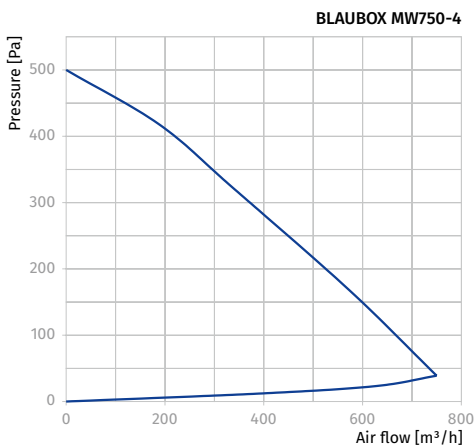
Model	B	B1	B2	B3	H	H1	H2	L	L1	L2
BLAUBOX MW750-4	400	420	549	500	200	220	352	650	530	-
BLAUBOX MW1200-4	400	420	549	500	200	220	352	650	530	-
BLAUBOX MW1800-4	500	520	649	600	250	270	480	800	680	-
BLAUBOX MW2100-4	500	520	649	600	300	320	480	800	680	-
BLAUBOX MW3000-4	600	620	759	710	300	320	530	1000	880	440
BLAUBOX MW3200-4	600	620	759	710	350	370	530	1000	880	440
BLAUBOX MW6500-4	800	820	971	925	500	520	670	1299	720	360



Technical data

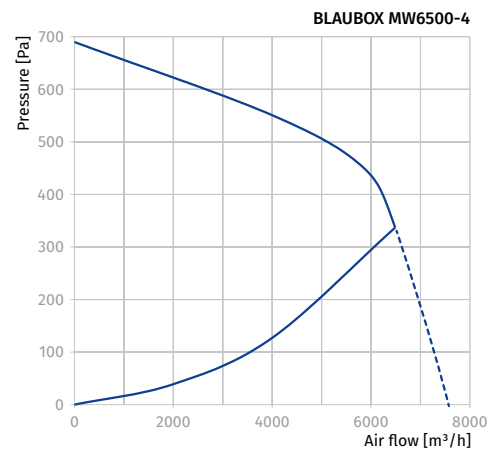
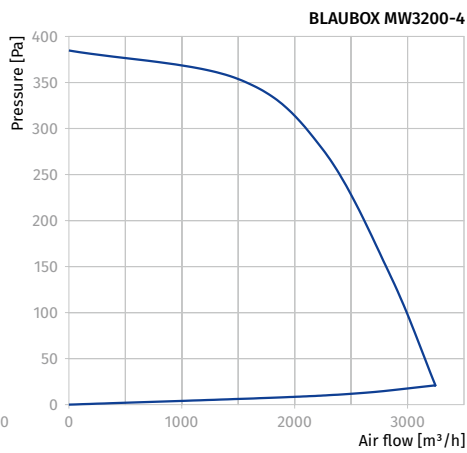
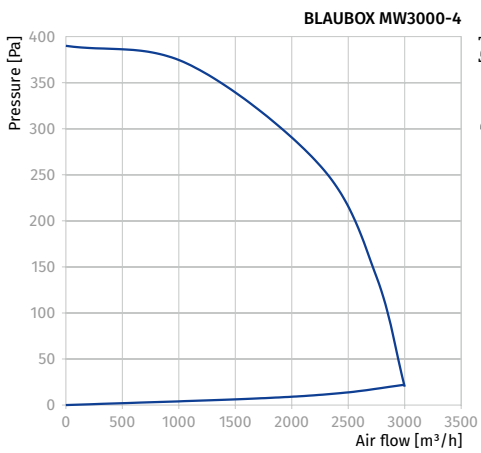
Parameters	BLAUBOX MW750-4	BLAUBOX MW1200-4	BLAUBOX MW1800-4	BLAUBOX MW2100-4
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Number of water (glycol) coil rows	4	4	4	4
Power [kW]	0.245	0.410	0.490	0.650
Current [A]	1.08	1.8	2.15	2.84
Maximum air flow [m ³ /h (l/s)]	750 (208)	1200 (333)	1870 (519)	2150 (597)
RPM [min ⁻¹]	1650	1850	1100	1000
Sound pressure level at 3 m [dBA]	35	38	40	45
Transported air temperature [°C]	-25...+45	-25...+45	-25...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Supply filter	G4	G4	G4	G4
Connected air duct diameter [mm]	400x200	400x200	500x250	500x300
Weight [kg]	41.3	42.8	62.5	63
SEC class	D	NRVU*	NRVU*	NRVU*
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018

*Nonresidential Ventilation Unit.



Parameters	BLAUBOX MW3000-4	BLAUBOX MW3200-4	BLAUBOX MW6500-4
Voltage [V / 50 Hz]	3 ~ 400Y	3 ~ 400Y	3 ~ 400
Number of water (glycol) coil rows	4	4	4
Power [kW]	1.27	1.27	1.80
Current [A]	2.3	2.3	4.5
Maximum air flow [m³/h (l/s)]	3000 (833)	3250 (903)	6500 (1806)
RPM [min ⁻¹]	1200	1200	1400
Sound pressure level at 3 m [dBA]	53	53	55
Transported air temperature [°C]	-40...+45	-40...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc
Insulation	25 mm, mineral wool	25 mm, mineral wool	25 mm, mineral wool
Supply filter	G4	G4	G4
Connected air duct diameter [mm]	600x300	600x350	800x500
Weight [kg]	73.2	73.1	136
SEC class	NRVU*	NRVU*	NRVU*
ErP	2016, 2018	2016, 2018	2016, 2018

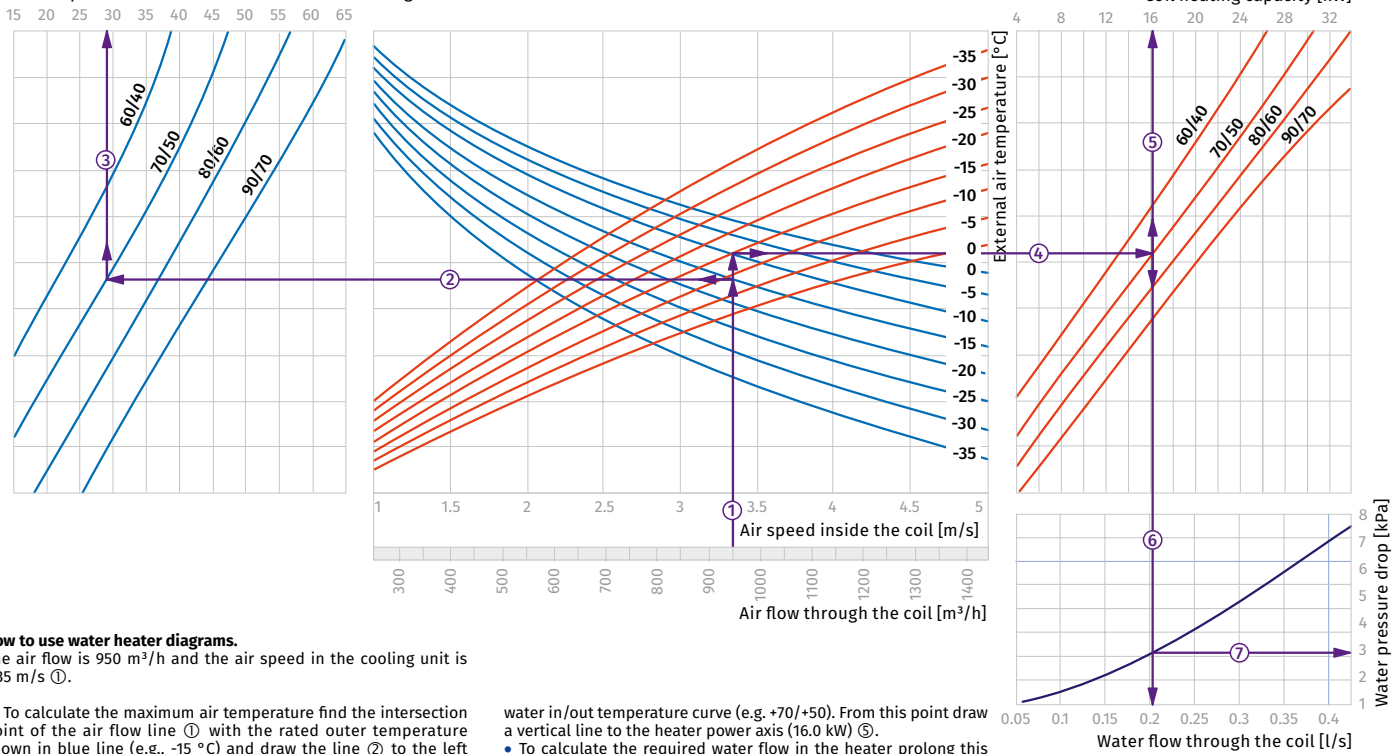
*Nonresidential Ventilation Unit.



Hot water coil calculation diagram

BLAUBOX MW750-4 / BLAUBOX MW1200-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the cooling unit is 3.35 m/s ①.

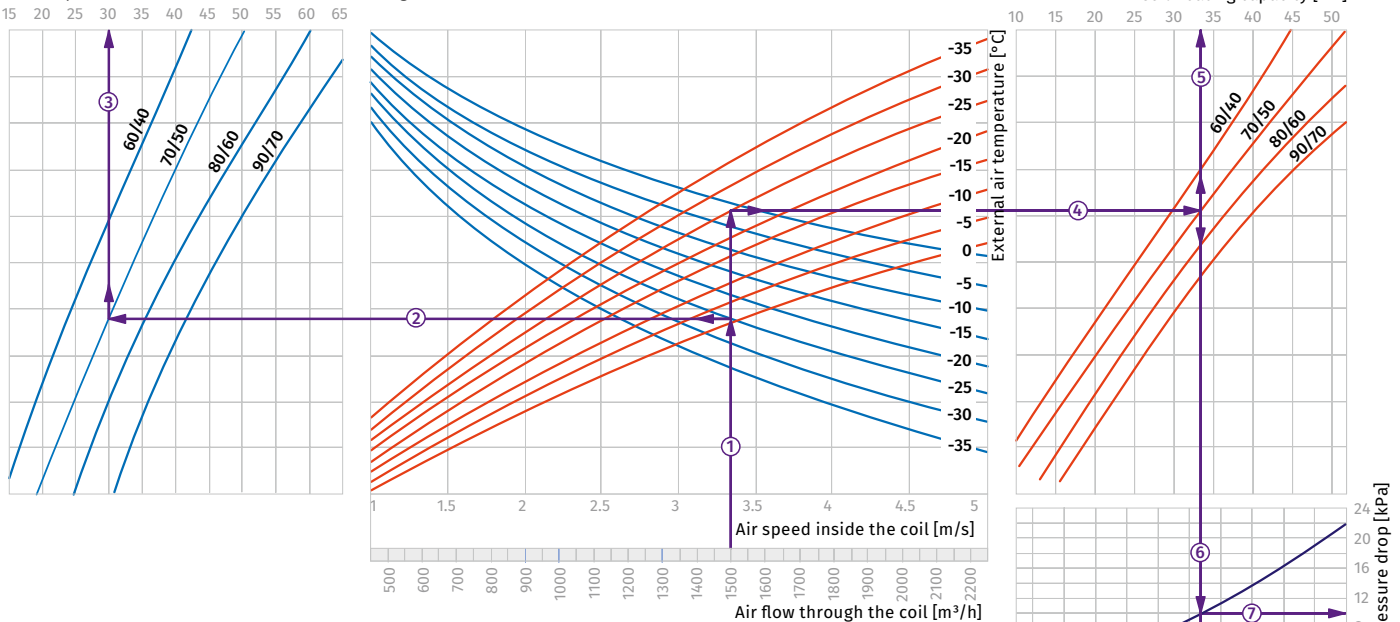
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+29°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., -15 °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 (16.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.2 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 (2.1 kPa).

BLAUBOX MW1800-4 / BLAUBOX MW2100-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 1500 m³/h and the air speed in the cooling unit is 3.5 m/s ①.

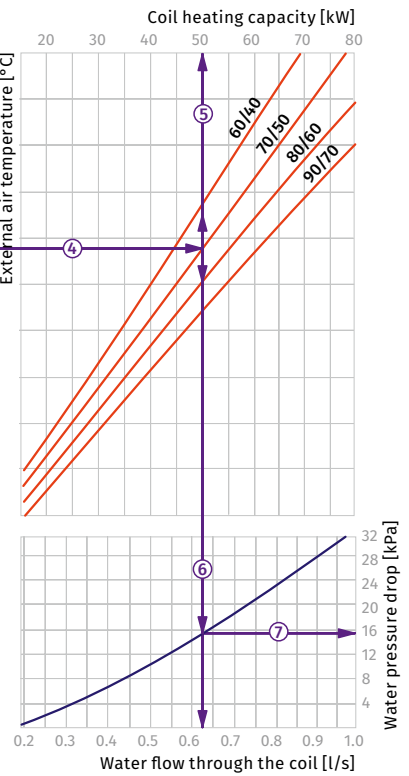
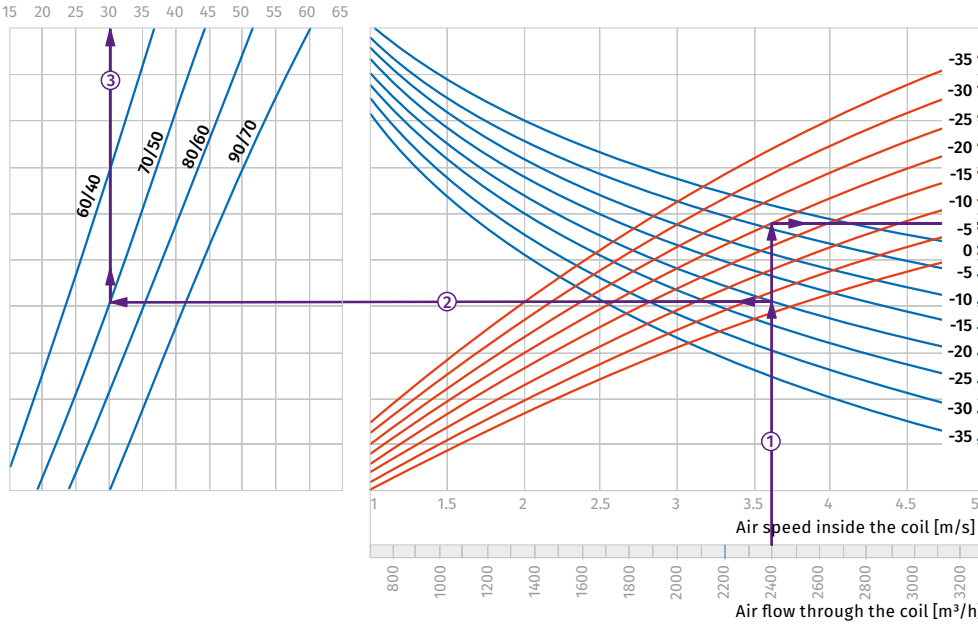
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+30°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., -25 °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 (33.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.42 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 (10.0 kPa).

BLAUBOX MW3000-4 / BLAUBOX MW3200-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 2400 m³/h and the air speed in the cooling unit is 3.61 m/s ①.

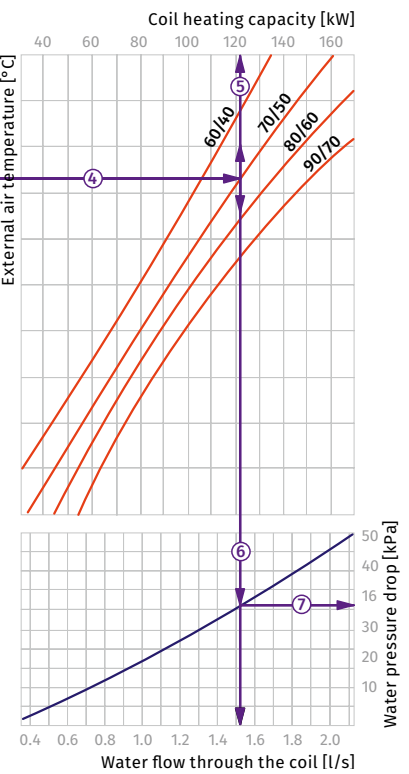
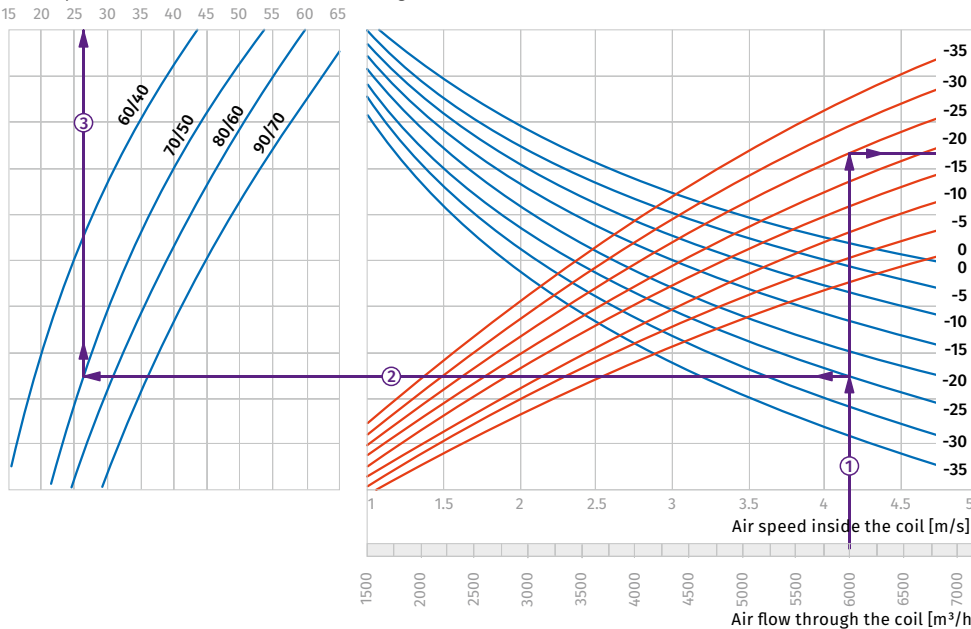
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+30°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., -20 °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 (50.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.62 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 (15.0 kPa).

BLAUBOX MW6500-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.



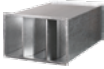







The air flow is 6000 m³/h and the air speed in the cooling unit is 4.15 m/s ①.











- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °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., -25 °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 (121.0 kW) ⑤.

• To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.52 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 (31.0 kPa).

Accessories

		BLAUBOX MW750-4	BLAUBOX MW1200-4	BLAUBOX MW1800-4	BLAUBOX MW2100-4
G4 panel filter		FP 442x275x47 G4	FP 442x275x47 G4	FP 390x545x47 G4	FP 390x545x47 G4
G4 pocket filter		-	-	-	-
Silencer		SD 40x20	SD 40x20	SD 50x25	SD 50x30
Duct cooling unit		KFK 40x20-3	KFK 40x20-3	KFK 50x25-3	KFK 50x30-3
Duct cooling unit		KWK 40x20-3	KWK 40x20-3	KWK 50x25-3	KWK 50x30-3
Mixing set		WMG	WMG	WMG	WMG
Air flow dampers		SL 40x20	SL 40x20	SL 50x25	SL 50x30
Flexible anti-vibration connector		EVA 40x20	EVA 40x20	EVA 50x25	EVA 50x30
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

		BLAUBOX MW3000-4	BLAUBOX MW3200-4	BLAUBOX MW6500-4
G4 panel filter		FP 653x440x47 G4	FP 653x440x47 G4	-
G4 pocket filter		-	-	FPT 868x573x27 G4
Silencer		SD 60x30	SD 60x35	SD 80x50
Duct cooling unit		KFK 60x30-3	KFK 60x35-3	KFK 80x50-3
Duct cooling unit		KWK 60x30-3	KWK 60x35-3	KWK 80x50-3
Mixing set		WMG	WMG	WMG
Air flow dampers		SL 60x30	SL 60x35	SL 80x50
Flexible anti-vibration connector		EVA 60x30	EVA 60x35	EVA 80x50
Electric actuator		LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230

BLAUBOX DE

Supply suspended ventilation units

Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with 400x200, 500x300 and 600x350 mm rectangular air ducts.



Air flow:
up to 3350 m³/h
931 l/s

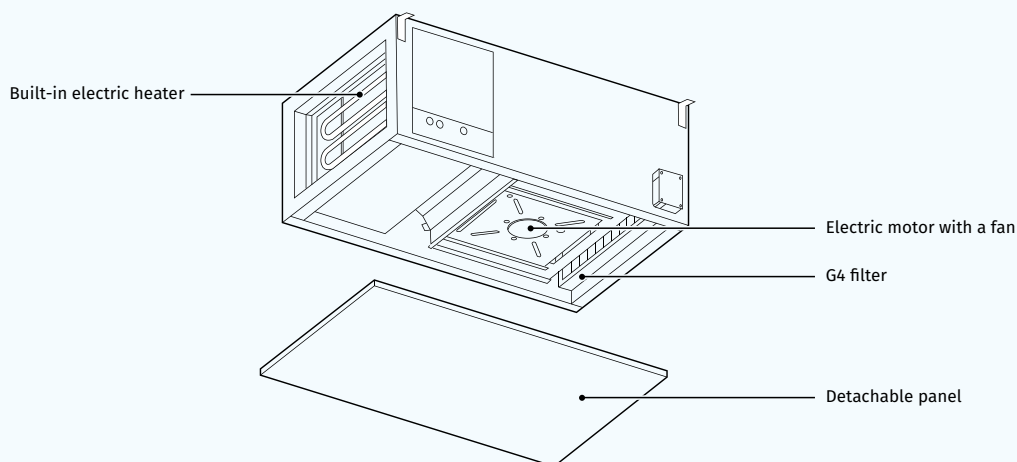


Design

- The casing is made of double-skinned aluzinc panels, internally filled with 50 mm mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The hinged casing panel ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fan

- Asynchronous external rotor motor and centrifugal high-pressure impeller with backward curved blades is used for air supply.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impeller.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.



Air heater

- The units are equipped with an electric heater for operation during cold seasons at low outside temperature.
- Two integrated overheat protection thermostats, one actuated at +60 °C with automatic restart and the other one actuated at +90 °C with manual restart.

Automation functions:

- Overheating protection of the electric heating elements.
- Disabling heater activation during the fan shutoff.
- Filter clogging control with a pressostat.
- All the operation parameters are individually adjustable.

Air filtration

- The built-in G4 supply filter provides air filtration.

Control and automation

- The units incorporate an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply fan. Air flow control.
 - Supply air setting and maintaining.
 - Display of indoor air temperature.
 - Display of errors (alarms) and filter replacement indication.
 - Setting or week-scheduled operation of the unit.

Mounting

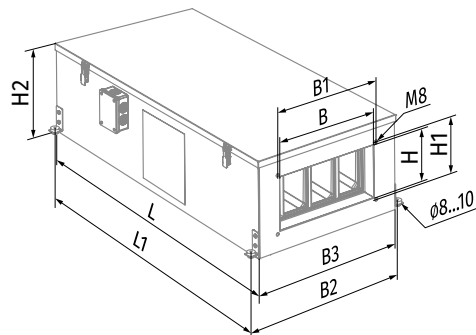
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- Wiring via the terminal block in the terminal box.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

Designation key

Serie	Casing modification	Heater type	Nominal air flow [m³/h]	Electric heater power [kW]
BLAUBOX	D: Suspended mounting	E: electric heater	1300; 2500; 3300	– 12; 18; 21

Overall dimensions [mm]

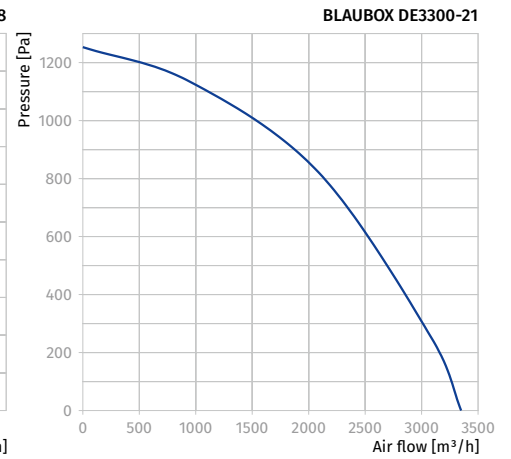
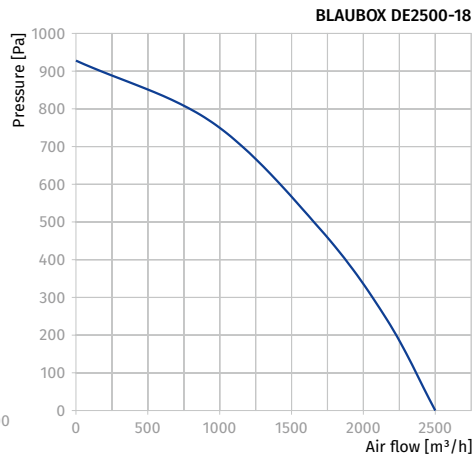
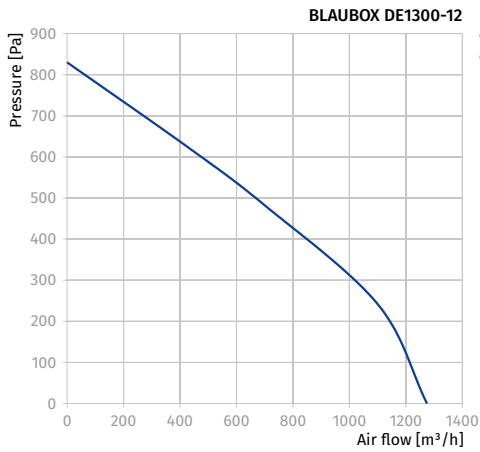
Model	B	B1	B2	B3	H	H1	H2	L	L1
BLAUBOX DE1300-12	400	420	624	582	200	220	374	1145	1106
BLAUBOX DE2500-18	500	520	689	646	300	320	447	1250	1212
BLAUBOX DE3300-21	600	620	888	744	350	370	500	1252	1212








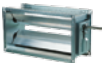



Technical data

Parameters	BLAUBOX DE1300-12	BLAUBOX DE2500-18	BLAUBOX DE3300-21
Voltage [V / 50 Hz]	3 ~ 400	3 ~ 400	3 ~ 400
Power [kW]	0.32	0.62	1.33
Current [A]	0.55	1.05	2.4
Electric heater power [kW]	12.0	18.0	21.0
Electric heater current [A]	17.4	26.0	30.0
Unit power [kW]	12.32	18.62	22.33
Unit current [A]	17.95	27.05	32.4
Maximum air flow [m ³ /h (l/s)]	1275 (354)	2500 (695)	3350 (931)
RPM [min ⁻¹]	2700	2690	2730
Sound pressure level at 3 m [dBA]	51	54	57
Transported air temperature [°C]	-25...+55	-25...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc
Insulation	50 mm, mineral wool	50 mm, mineral wool	50 mm, mineral wool
Filter	G4	G4	G4
Connected air duct diameter [mm]	400x200	500x300	600x350
Weight [kg]	56	61	91
ErP	2016, 2018	2016, 2018	2016, 2018

SUPPLY VENTILATION UNITS



Accessories

		BLAUBOX DE1300-12	BLAUBOX DE2500-18	BLAUBOX DE3300-21
G4 panel filter		FP 442x275x47 G4	FP 442x275x47 G4	FP 390x545x47 G4
Silencer		SD 40x20	SD 50x30	SD 60x35
Duct cooling unit		KFK 40x20-3	KFK 50x30-3	KFK 60x35-3
Duct cooling unit		KWK 40x20-3	KWK 50x30-3	KWK 60x35-3
Mixing set		WMG	WMG	WMG
Air flow dampers		SL 40x20	SL 50x30	SL 560x35
Flexible anti-vibration connector		EVA 40x20	EVA 50x30	EVA 60x35
Electric actuator		LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230

BLAUBOX DW

Supply suspended ventilation units

Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with 400x200 up to 700x400 mm rectangular air ducts.



Air flow:
up to 4100 m³/h
1139 l/s



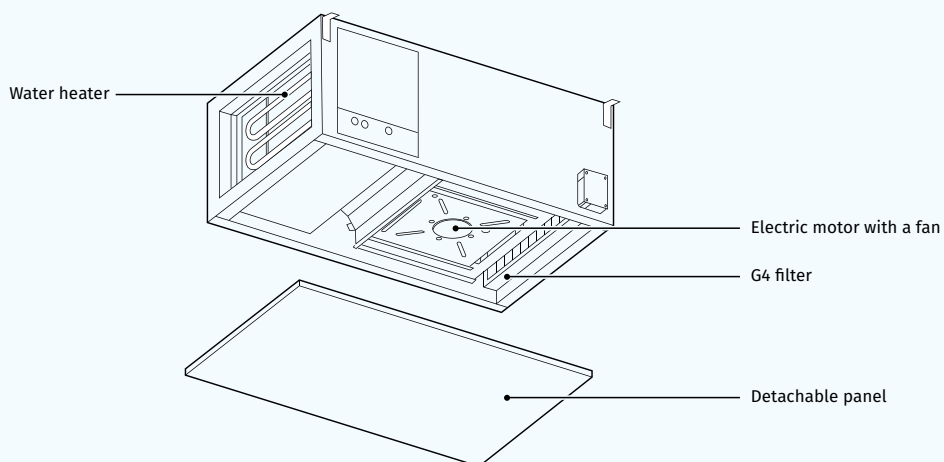
Design

- The casing is made of double-skinned aluzinc panels, internally filled with 50 mm mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The hinged casing panel ensures easy access to the internals for cleaning, filter replacement and other maintenance operations.

Fan

- Asynchronous external rotor motor and centrifugal high-pressure impeller with backward curved blades is used for air supply.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impeller.
- Equipped with ball bearings for longer service life.
- Reliable and quiet operation.

SUPPLY VENTILATION UNITS



Air heater

- The units are equipped with a water (glycol) heater for operation during cold seasons at low outside temperature.
- The air temperature sensor downstream of the water heater and the return heat medium sensor ensure freezing protection of the water heater. If any of these sensors detects a temperature point below the set minimum value, the signal is sent automatically to the control unit to troubleshoot cooling.

Air filtration

- The built-in G4 supply filter provides air filtration.
- Optionally a F7 filter may be installed for efficient filtration.

Control and automation

- The units incorporate an integrated control system with a wall-mounted control panel and LCD display.
- The standard delivery set includes a 10 m cable for connection of the unit and the control panel.
- **Control panel functions:**
 - Activating/deactivating the unit.
 - Setting low, medium and high speeds for the supply fan. Air flow control.
 - Setting and maintaining of indoor air temperature.

- Display of the indoor air temperature.
- Supply filter clogging control according to the pressostat.
- Alarm indication.
- **Automation functions:**
 - Control of the supply air damper actuator (separate order).
 - Smooth rotation speed control of the fan (3 ~ 400 V, 50 Hz).
 - Water heater control.
 - Generation of the activation signal for the exhaust fan if available in the system.
 - Shutdown of the unit on signal from the fire alarm panel.
 - Control of the cooler with respect to the set indoor air temperature (separate order).
- All the operation parameters are individually adjustable.

Mounting

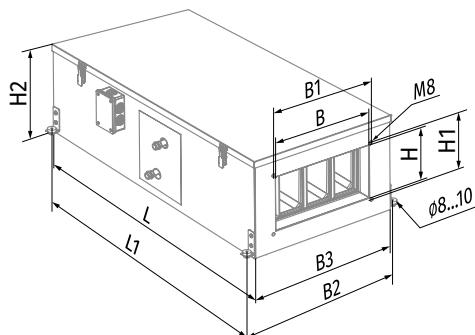
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

Designation key

Serie	Casing modification	Heater type	Nominal air flow [m³/h]	Number of water coil rows
BLAUBOX	D: Suspended mounting	W: water heater	800; 1200; 1800; 2500; 3200; 3500; 5000	– 2; 3; 4

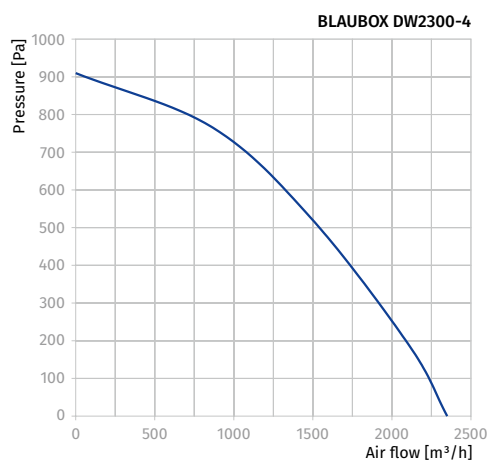
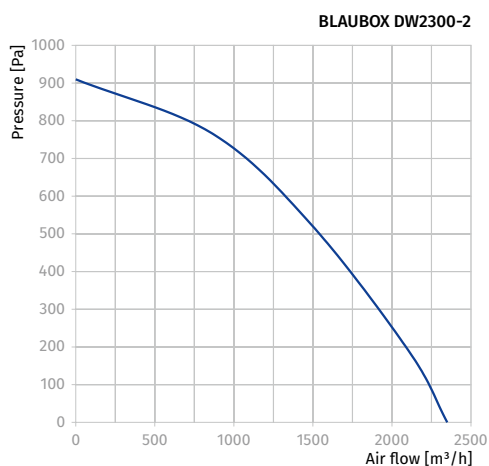
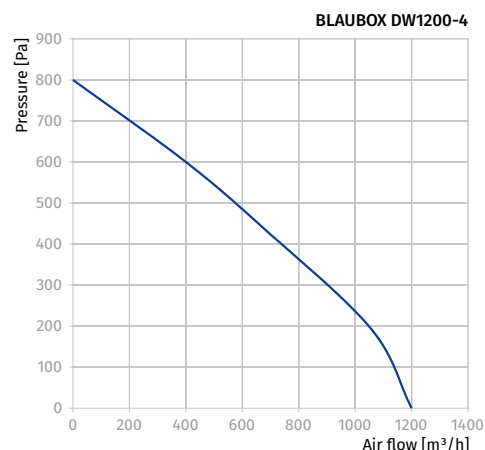
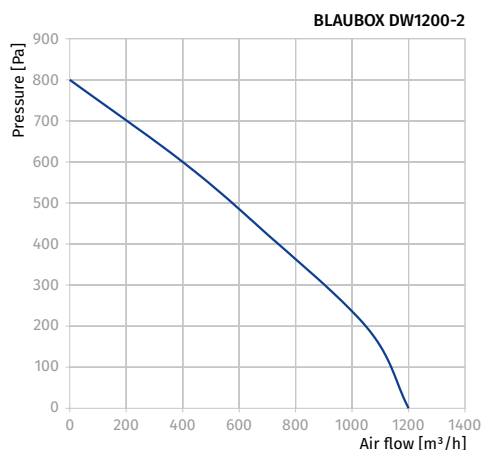
Overall dimensions [mm]

Model	B	B1	B2	B3	H	H1	H2	L	L1
BLAUBOX DW1200-2	400	420	624	582	200	220	374	1145	1106
BLAUBOX DW1200-4	400	420	624	582	200	220	374	1145	1106
BLAUBOX DW2300-2	500	520	689	646	300	320	447	1250	1212
BLAUBOX DW2300-4	500	520	689	646	300	320	447	1250	1212
BLAUBOX DW3200-2	600	620	787	744	350	370	500	1252	1212
BLAUBOX DW3200-4	600	620	787	744	350	370	500	1252	1212
BLAUBOX DW4100-2	700	720	888	844	400	420	546	1302	1262
BLAUBOX DW4100-3	700	720	888	844	400	420	546	1302	1262

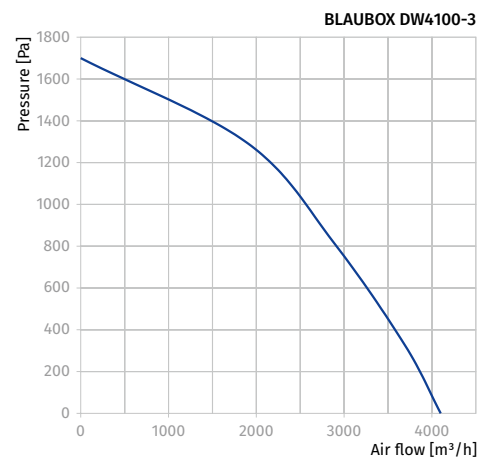
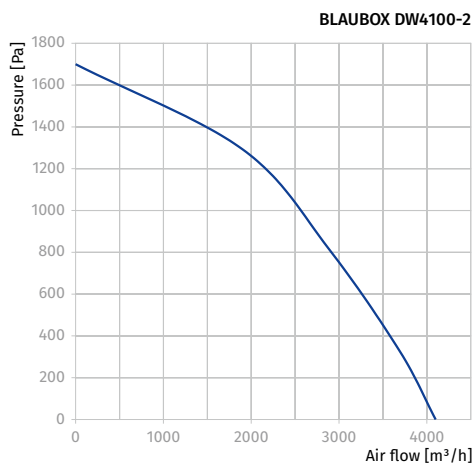
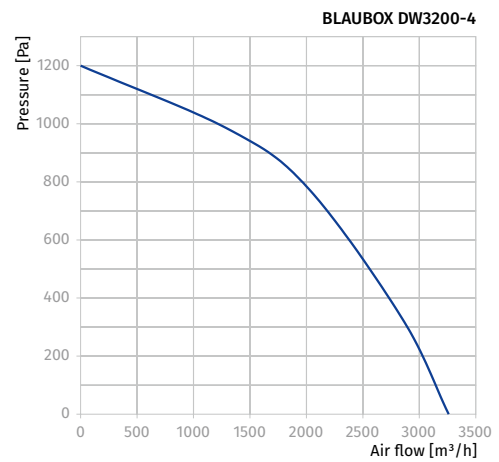
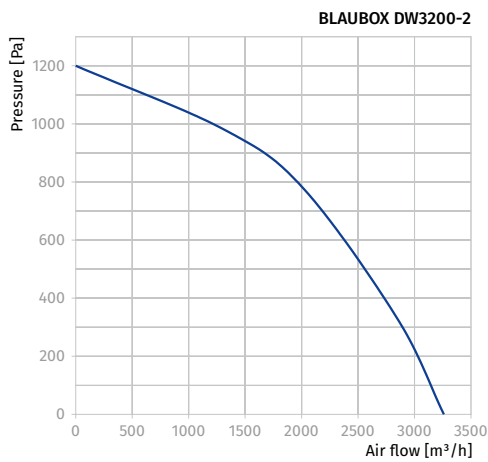


Technical data

Parameters	BLAUBOX DW1200-2	BLAUBOX DW1200-4	BLAUBOX DW2300-2	BLAUBOX DW2300-4
Voltage [V / 50 Hz]	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Number of water (glycol) coil rows	2	4	2	4
Power [kW]	0.32	0.32	0.62	0.62
Current [A]	0.55	0.55	1.05	1.05
Maximum air flow [m ³ /h (l/s)]	1200 (333)	1200 (333)	2350 (653)	2350 (653)
RPM [min ⁻¹]	2700	2700	2690	2690
Sound pressure level at 3 m [dBA]	51	51	54	54
Transported air temperature [°C]	-25...+55	-25...+55	-25...+45	-25...+45
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	50 mm, mineral wool	50 mm, mineral wool	50 mm, mineral wool	50 mm, mineral wool
Supply filter	G4 (Option: F7)	G4 (Option: F7)	G4 (Option: F7)	G4 (Option: F7)
Connected air duct diameter [mm]	400x200	400x200	500x300	500x300
Weight [kg]	55	57	61	63
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



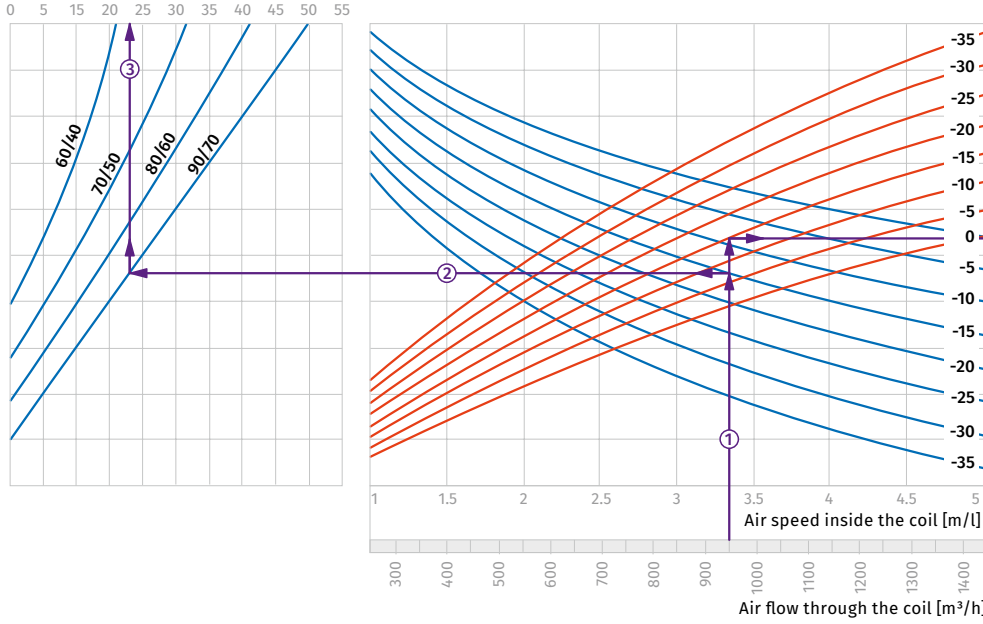
Parameters	BLAUBOX DW3200-2	BLAUBOX DW3200-4	BLAUBOX DW4100-2	BLAUBOX DW4100-3
Voltage [V / 50 Hz]	3 ~ 400	3 ~ 400	3 ~ 400	3 ~ 400
Number of water (glycol) coil rows	2	4	2	3
Power [kW]	1.33	1.33	2.3	2.3
Current [A]	2.4	2.4	4.3	4.3
Maximum air flow [m³/h (l/s)]	3260 (906)	3260 (906)	4100 (1139)	4100 (1139)
RPM [min ⁻¹]	2730	2730	2840	2840
Sound pressure level at 3 m [dBA]	57	57	75	75
Transported air temperature [°C]	-25...+45	-25...+45	-25...+70	-25...+70
Casing material	aluzinc	aluzinc	aluzinc	aluzinc
Insulation	50 mm, mineral wool	50 mm, mineral wool	50 mm, mineral wool	50 mm, mineral wool
Supply filter	G4 (Option: F7)	G4 (Option: F7)	G4 (Option: F7)	G4 (Option: F7)
Connected air duct diameter [mm]	600x350	600x350	700x400	700x400
Weight [kg]	91	94	107	110
ErP	2016, 2018	2016, 2018	2016, 2018	2016, 2018



Hot water coil calculation diagram

BLAUBOX DW1200-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

The air flow is 950 m³/h and the air speed in the cooling unit is 3.35 m/s ①.

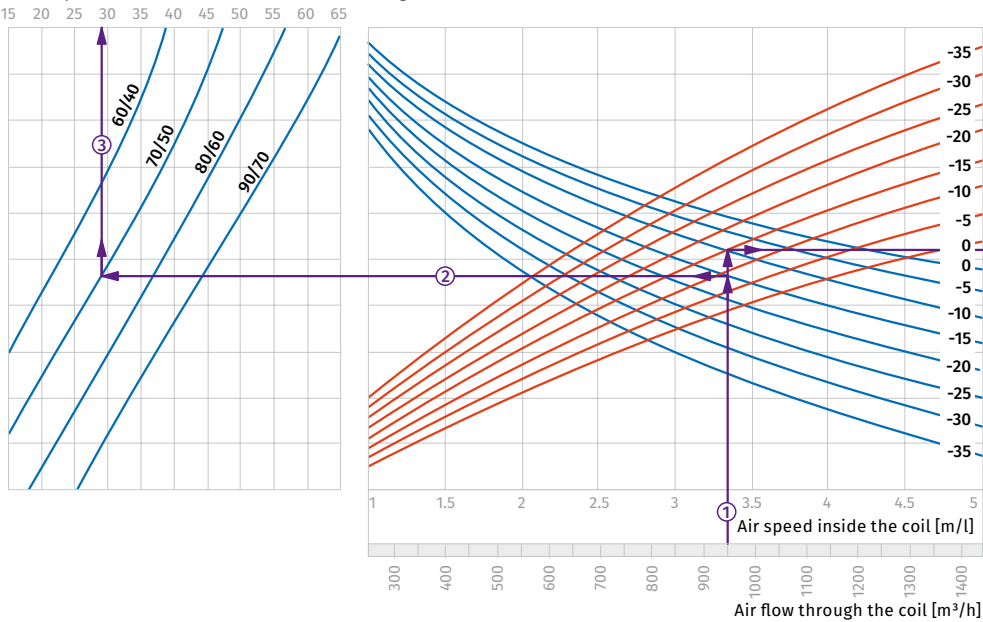
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+23 °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., -15 °C) and draw the line ④ to the right until it crosses the

- water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the heater power axis (13.5 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.14 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 (1.5 kPa).

SUPPLY VENTILATION UNITS

BLAUBOX DW1200-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

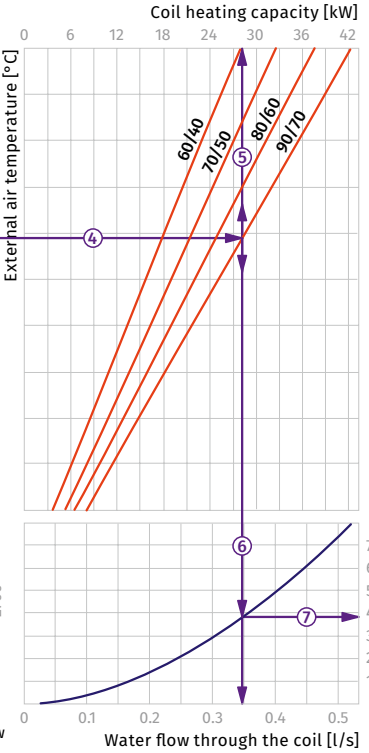
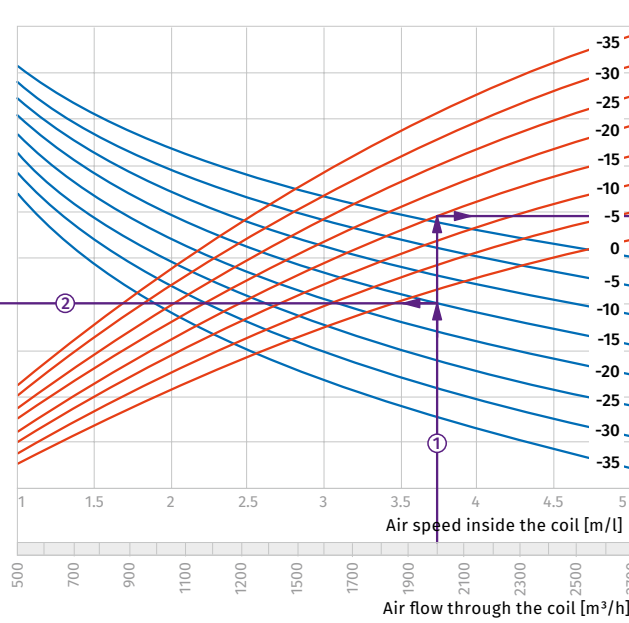
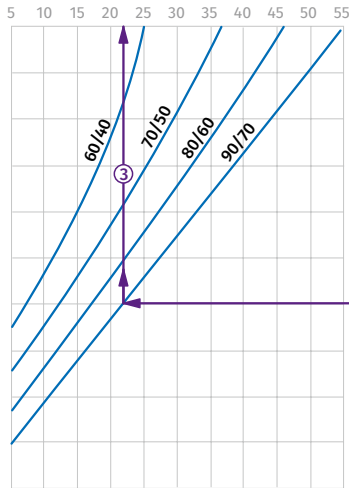
The air flow is 350 m³/h and the air speed in the cooling unit is 3.35 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °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 (+29 °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., -15 °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 (16.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.2 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 (2.1 kPa).

BLAUBOX DW2300-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

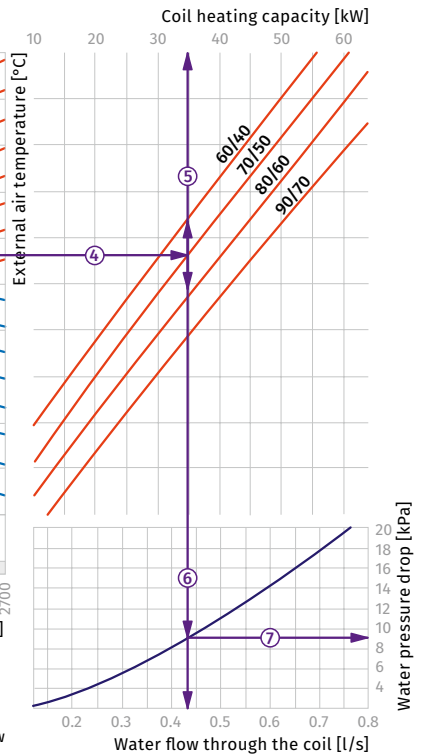
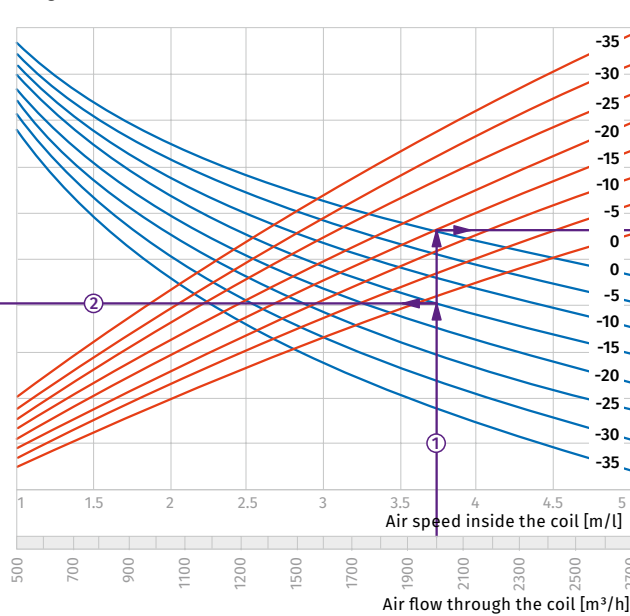
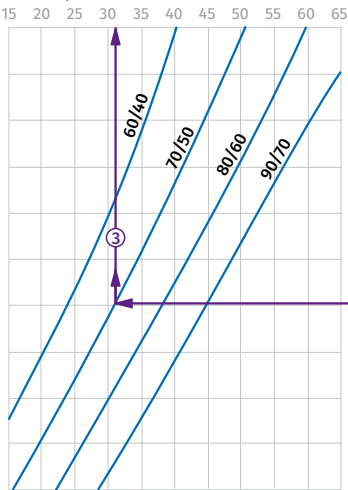
The air flow is 2000 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22 °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., -15 °C) and draw the line ④ to the right until it crosses the

- water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the heater power axis (28.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.35 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 (3.8 kPa).

BLAUBOX DW2300-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

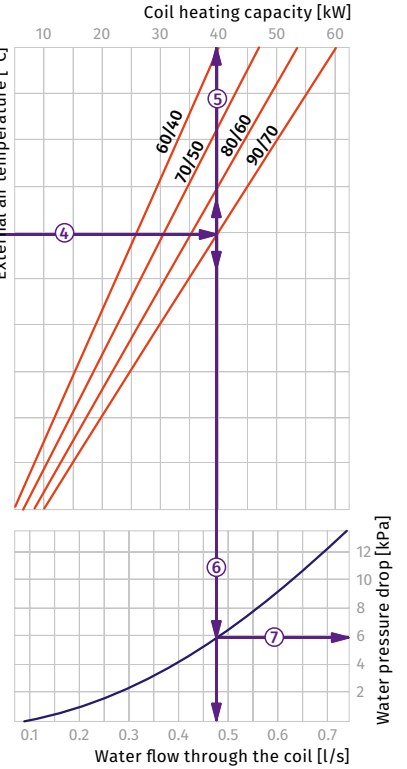
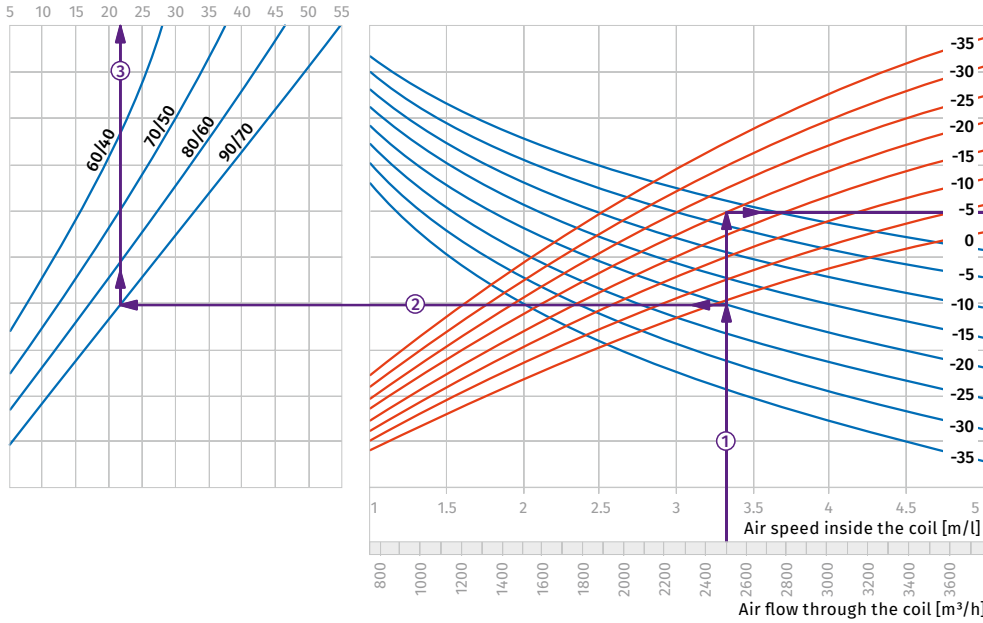
The air flow is 2000 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °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 (+31 °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., -15 °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 (35.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.43 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 (9.0 kPa).

BLAUBOX DW3200-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

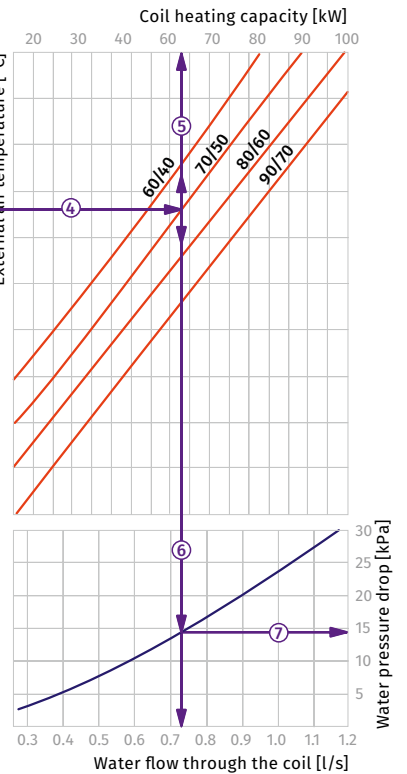
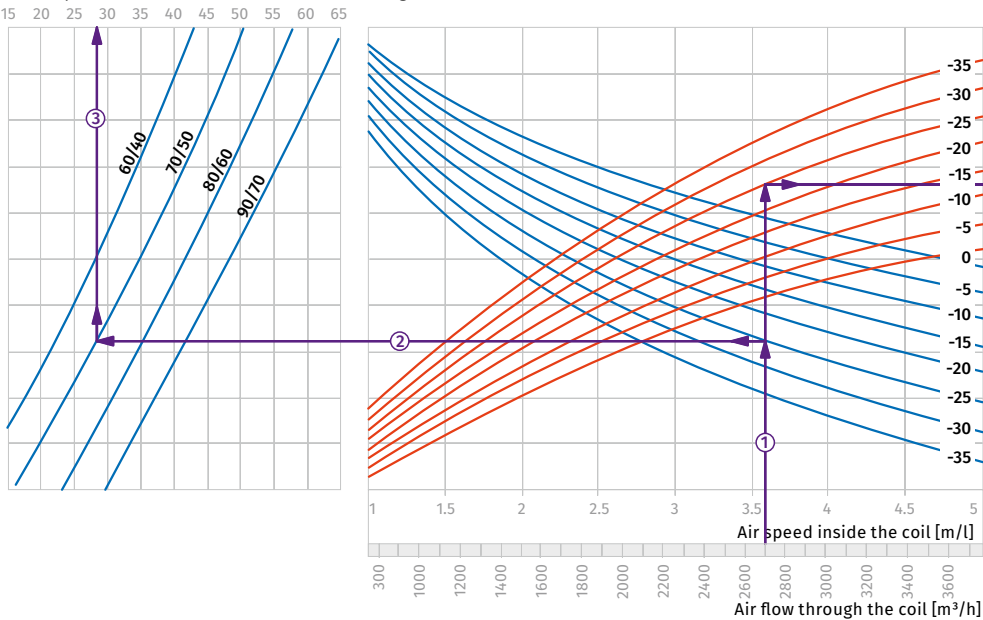
The air flow is 2500 m³/h and the air speed in the cooling unit is 3.32 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22 °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., -20 °C) and draw the line ④ to the right until it crosses the

- water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the heater power axis (40.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.47 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 (6.0 kPa).

BLAUBOX DW3200-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

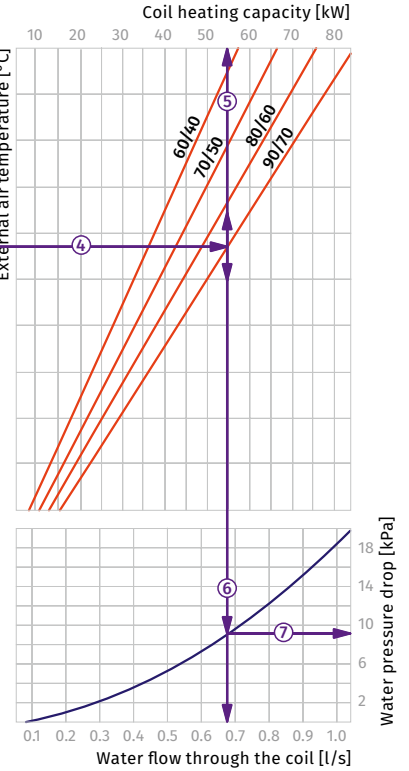
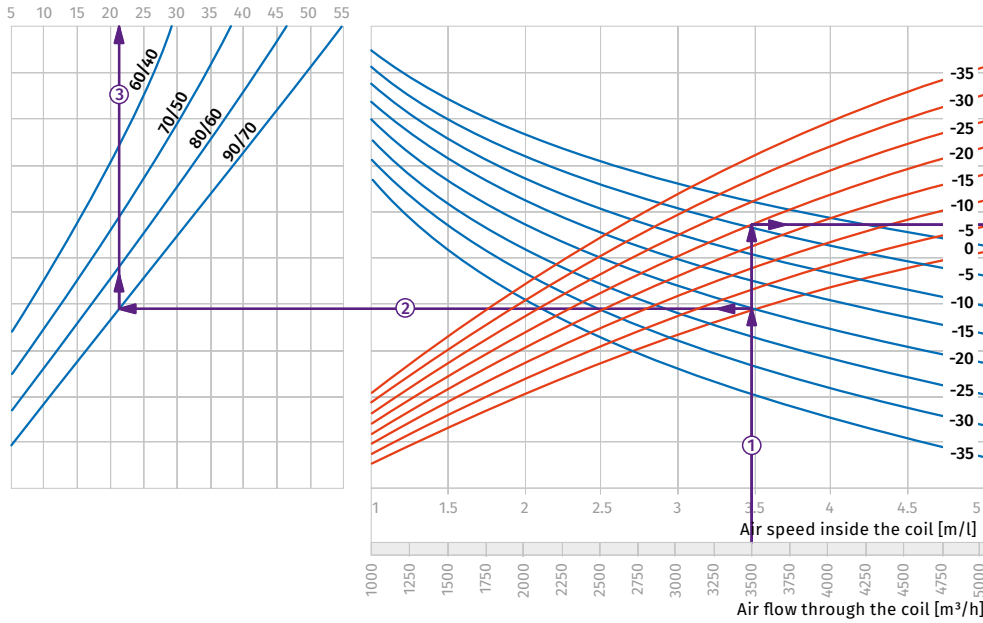
The air flow is 2700 m³/h and the air speed in the cooling unit is 3.59 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °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., -25 °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 (58.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.73 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 (14.0 kPa).

BLAUBOX DW4100-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

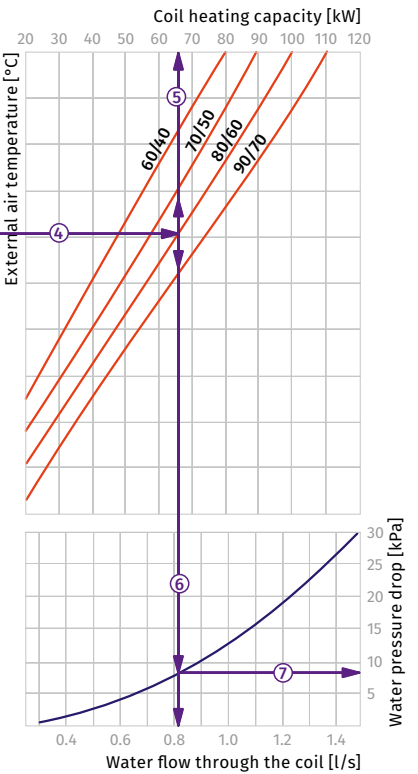
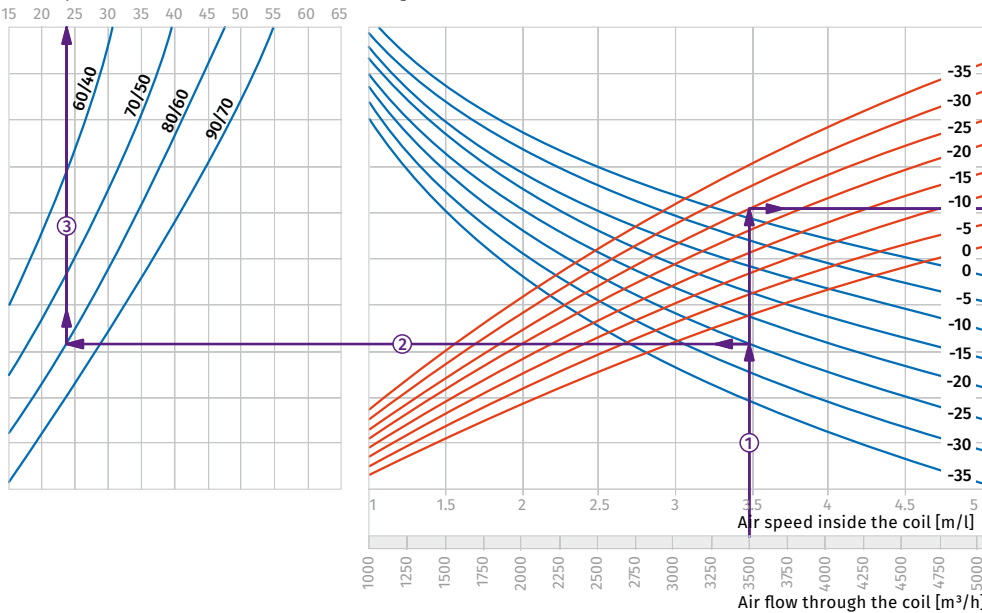
The air flow is 3500 m³/h and the air speed in the cooling unit is 3.48 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22 °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., -20 °C) and draw the line ④ to the right until it crosses the

- water in/out temperature curve (e.g. +90/+70). From this point draw a vertical line to the heater power axis (55.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.68 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 (9.2 kPa).

BLAUBOX DW4100-3

Air temperature downstream of the water heating coils [°C]








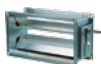



How to use water heater diagrams.










The air flow is 3500 m³/h and the air speed in the cooling unit is 3.48 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g. +80/+60). From this point draw a vertical line to the supply air temperature downstream of the heater (+24 °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., -25 °C) and draw the line ④ to the right until it crosses the

- water in/out temperature curve (e.g. +80/+60). From this point draw a vertical line to the heater power axis (65.0 kW) ⑤.
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.81 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 (8.0 kPa).

Accessories

		BLAUBOX DW1200-2	BLAUBOX DW1200-4	BLAUBOX DW2300-2	BLAUBOX DW2300-4
G4 pocket filter		FPT 474x269x27 G4	FPT 538x342x27 G4	FPT 474x269x27 G4	FPT 538x342x27 G4
Silencer		SD 40x20	SD 40x20	SD 50x30	SD 50x30
Duct cooling unit		KFK 40x20-3	KFK 40x20-3	KFK 50x30-3	KFK 50x30-3
Duct cooling unit		KWK 40x20-3	KWK 40x20-3	KWK 50x30-3	KWK 50x30-3
Mixing set		WMG	WMG	WMG	WMG
Air flow dampers		SL 40x20	SL 40x20	SL 50x30	SL 50x30
Flexible anti-vibration connector		EVA 40x20	EVA 40x20	EVA 50x30	EVA 50x30
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

		BLAUBOX DW3200-2	BLAUBOX DW3200-4	BLAUBOX DW4100-2	BLAUBOX DW4100-3
G4 pocket filter		FPT 637x395x27 G4	FPT 637x395x27 G4	FPT 737x441x27 G4	FPT 737x441x27 G4
Silencer		SD 60x35	SD 60x35	SD 80x50	SD 80x50
Duct cooling unit		KFK 60x35-3	KFK 60x35-3	KFK 70x40-3	KFK 70x40-3
Duct cooling unit		KWK 60x35-3	KWK 60x35-3	KWK 70x40-3	KWK 70x40-3
Mixing set		WMG	WMG	WMG	WMG
Air flow dampers		SL 60x35	SL 60x35	SL 70x40	SL 70x40
Flexible anti-vibration connector		EVA 60x35	EVA 60x35	EVA 70x40	EVA 70x40
Electric actuator		LF230	LF230	LF230	LF230
Electric actuator		TF230	TF230	TF230	TF230

EVH

Electric duct heater for heat exchanger protection

Features

- Heat exchanger freeze protection by means of preheating of the intake air.
- Maintains the duct air temperature at a point that prevents the heat exchanger freezing.
- Compatible with Ø125 up to 200 mm air ducts.



Design

- The casing is internally filled with 20 mm layer of non-flammable mineral wool.
- The casing and the junction box are made of galvanized steel.
- Heating elements are made of stainless steel.
- Airtight connection to air ducts due to rubber seals.

Control

- Equipped with a power cable.
- The signal cable for connection to the controller of the air handling unit.
- Equipped with a triac power regulator. Regulation is carried out via switching-on and switching-off the full load. Load commutation is

carried out by the semiconductor device (triac). The switching unit has no wearing mechanical elements.

- Equipped with overheat thermostats:**
 - main protection with automatic restart at +50 °C;
 - emergency protection with manual restart at +90 °C.

Mounting

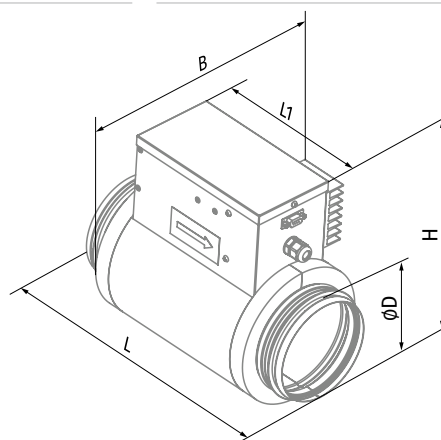
- Fixation to round air ducts by means of clamps (included in the delivery).
- In case of horizontal mounting position the control box cover must be directed upwards only. Permitted deviation up to 90°. The control box cover may not be positioned downwards!

Designation key

Serie	Connected air duct diameter [mm]	Heater power [kW]	Number of phases
EVH	125; 160; 200	— 0,6; 0,8; 1,2; 1,7; 2,0	— 1: single-phase

Overall dimensions [mm]

Model	D	B	H	L	L1
EVH 125-0,6-1	124	155	251	306	190
EVH 125-0,8-1	124	155	251	306	190
EVH 160-1,2-1	159	175	293	306	190
EVH 160-1,7-1	159	175	293	306	190
EVH 160-2,0-1	159	175	293	306	190
EVH 200-1,2-1	199	195	337	306	190
EVH 200-1,7-1	199	195	337	306	190
EVH 200-2,0-1	199	195	337	306	190

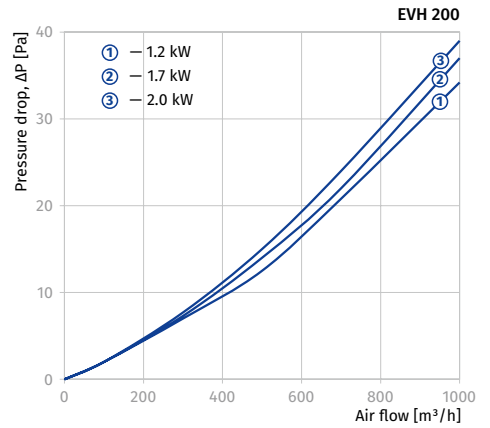
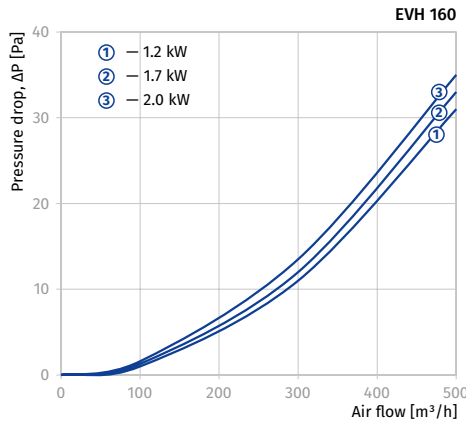
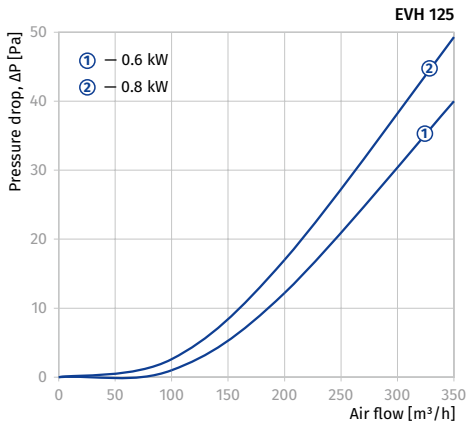


Compatibility chart

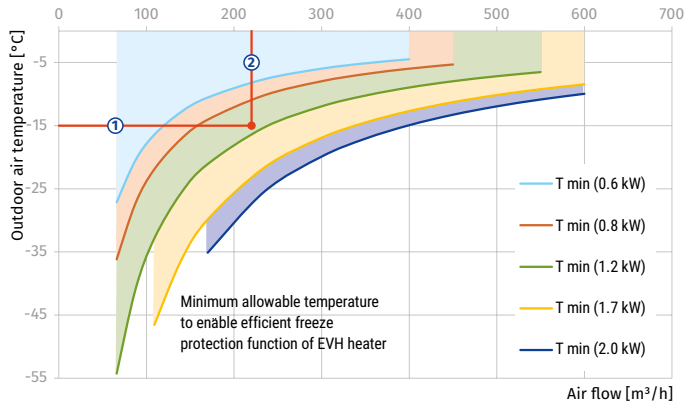
Heater model (connected air duct diameter)	Unit model
EVH 125	KOMFORT EC S160 S11
EVH 125	KOMFORT EC DB160 S11
EVH 160	KOMFORT EC DB350 S11
EVH 160	KOMFORT EC SB350 S11
EVH 200	KOMFORT EC SB550 S11

Technical data

Parameters	EVH 125-0,6-1	EVH 125-0,8-1	EVH 160-1,2-1	EVH 160-1,7-1	EVH 160-2,0-1	EVH 200-1,2-1	EVH 200-1,7-1	EVH 200-2,0-1
Min. air flow [m³/h (l/s)]	66 (18)	66 (18)	109 (30)	109 (30)	109 (30)	170 (47)	170 (47)	170 (47)
Power [kW]	0.6	0.6	1.2	1.7	2.0	1,2	1.7	2.0
Current [A]	2.6	3.5	5.2	7.4	8.7	5,2	7.4	8.7
Weight [kg]	2.1	2.1	2.5	2.5	2.5	2,8	2.8	2.8



Heater capacity selection diagram



○ EVH heater parameters calculation example:

- It is necessary to select EVH freeze protection heater for the Komfort EC SB350 A14 unit. Design outdoor air temperature in cold season is -15 °C. Design capacity is 220 m³/h.
- Identify the interception point of the air flow line (1) with the outdoor temperature line (2). In this case the heater with the capacity of 1200 W will assure efficient freeze protection of the heat exchanger. Select the EVH 160-1,2-1 heater with the diameter corresponding to the diameter of the spigot of the Komfort EC SB350 A14 unit.

ENH

Duct heater for supply air post-heating with external control

Features

- The heater is designed for integration into a ventilation system and joint operation with an air handling unit equipped with a control system used to switch on the heater and control its operation.
- The heater maintains the supply duct air temperature at a point set by the unit controller.



Design

- The casing, the junction box and the heater cover are made of galvanized steel with the heating elements in stainless steel. The heater casing is additionally heat-insulated with 20 mm non-flammable mineral wool layer. The heaters are equipped with rubber seals for airtight connection to the air ducts.
- The ENH duct heaters are equipped with a power and a signal cable for connection of the heater to the air handling unit controller.
- The temperature is controlled by a triac power controller by means of switching the full load on and off. Load commutation is carried out by the semiconductor device (triac). The heaters are equipped with overheat thermostats:
 - main overheat protection with automatic reset at +50 °C
 - emergency overheat protection with manual reset at +90 °C.

Mounting

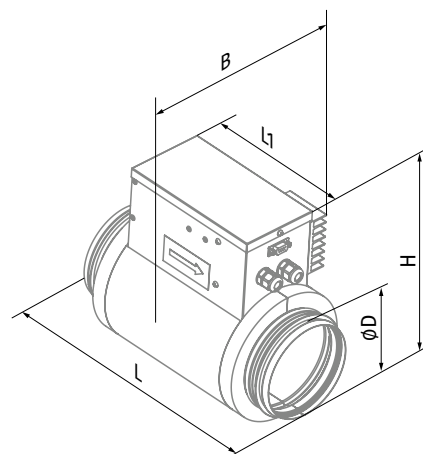
- The heater design ensures its mounting on the round ducts in any position by means of clamps (included in delivery). The air flow direction shall match the direction of the arrow on the heater casing. The heater is connected to the air handling unit controller using the cable with connectors. In case of horizontal mounting the control box must be installed with the cover upwards. Swivel range from the normal position up to max. 90°. Do not install the control box with the cover downwards.

Designation key

Serie	Connected air duct diameter [mm]	Heater power [kW]	Number of phases
ENH	125; 160; 200	– 0,6; 0,8; 1,2; 1,7; 2,0	– 1: single-phase

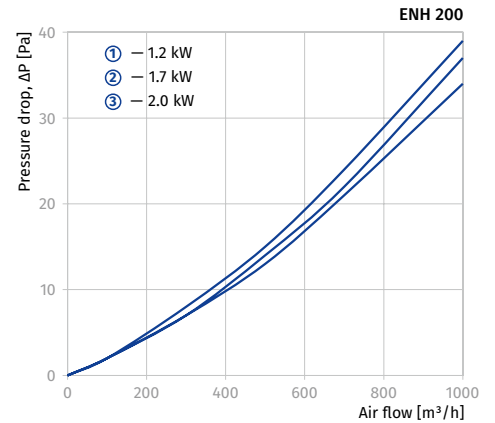
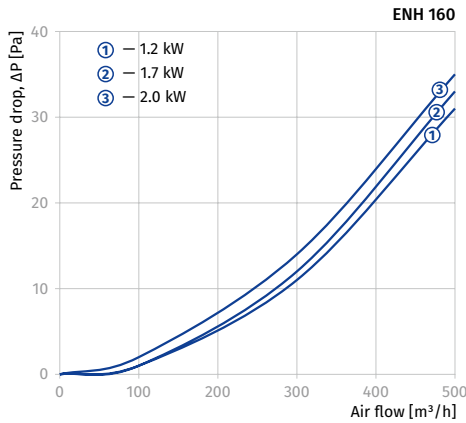
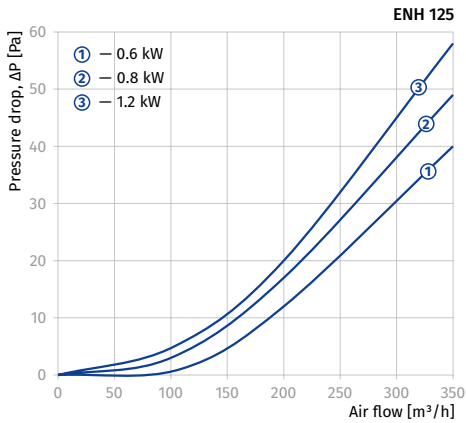
Overall dimensions [mm]

Model	D	B	H	L	L1
ENH 125-0.6-1	124	155	251	306	190
ENH 125-0.8-1	124	155	251	306	190
ENH 125-1.2-1	124	155	251	306	190
ENH 160-1.2-1	159	175	293	306	190
ENH 160-1.7-1	159	175	293	306	190
ENH 160-2.0-1	159	175	293	306	190
ENH 200-1.2-1	199	195	337	306	190
ENH 200-1.7-1	199	195	337	306	190
ENH 200-2.0-1	199	195	337	306	190

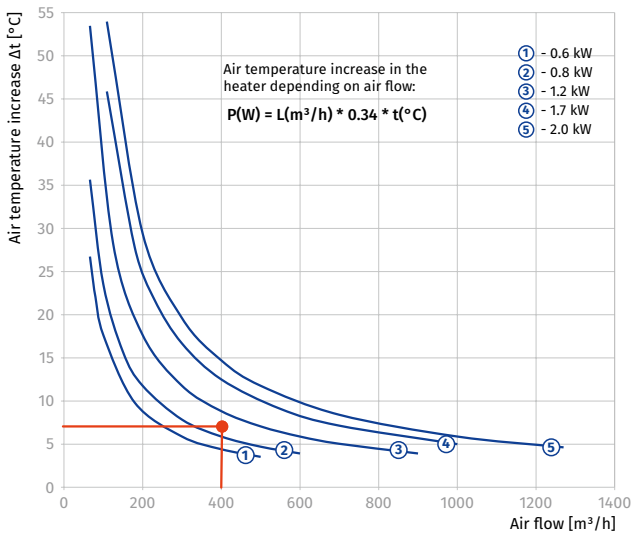


Technical data

Parameters	ENH 125-0.6-1	ENH 125-0.8-1	ENH 125-1.2-1	ENH 160-1.2-1	ENH 160-1.7-1	ENH 160-2.0-1	ENH 200-1.2-1	ENH 200-1.7-1	ENH 200-2.0-1
Min. air flow [m³/h (l/s)]	66 (18)	66 (18)	66 (18)	109 (30)	109 (30)	109 (30)	170 (47)	170 (47)	170 (47)
Power [kW]	0.6	0.8	1.2	1.2	1.7	2.0	1.2	1.7	2.0
Current [A]	2.6	3.5	5.2	5.2	7.4	8.7	5.2	7.4	8.7
Weight [kg]	2.1	2.1	2.1	2.5	2.5	2.5	2.8	2.8	2.8



Heater capacity selection diagram



• The ENH heater parameters calculation example:

- It is necessary to select a heater for supply air post-heating to a temperature of +24 °C, provided the temperature downstream of the heat exchanger is +17 °C. Therefore it is essential to increase temperature by 7 °C. The ventilation system incorporates the KOMFORT EC SB350 S19. Rated air capacity 400 m³/h.
- Determine the intersection of the post-heating temperature line (+7 °C) and the rated air capacity line (400 m³/h). In this case the 1200 W heater capacity provides necessary post-heating (+7 °C). The ENH 160-1.2-1 kW with the diameter matching the spigot diameter of the air handling unit KOMFORT EC SB350 S19 is a suitable model.

Compatibility chart

Heater model (connected air duct diameter)	Unit model
ENH 125	KOMFORT EC S160(-E) KOMFORT EC SB160(-E) KOMFORT EC S200(-E) KOMFORT EC SB200(-E)
ENH 160	KOMFORT EC S250(-E) KOMFORT EC SB250(-E) KOMFORT EC SB350(-E)
ENH 200	KOMFORT EC SB550(-E)

EKH

Duct electrical heaters for round ducts

Features

- For warming up of supply air in heating, ventilation and air conditioning systems installed in various premises.
- Compatible with Ø100 to 315 mm round air ducts.



Design

- Galvanized steel case and junction box.
- Heating elements made of stainless steel.
- Airtight connection with air ducts due to rubber seals.
- Several power options for each standard size.
- For higher heating capacity several heaters may be installed in Series.
- Equipped with overheat protection thermostats:
 - basic protection with automatic restart at +50 °C;
 - emergency protection with manual restart at +90 °C.

Mounting

- Fixing to round ducts with clamps.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

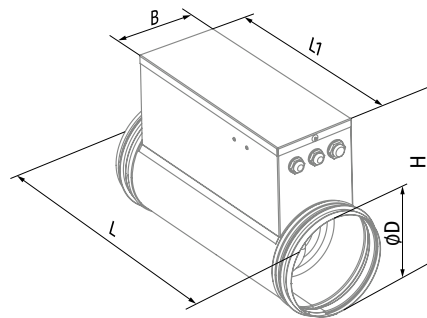
- Recommended distance between the heater and other system components must be not less than two connecting diameters for air flow stabilization.
- Duct heaters are rated for minimum air flow speed 1.5 m/s and maximum air temperature supplied to the units 40 °C. In case of speed regulation with a speed controller the minimum air speed through the heater must be provided.
- For correct and safe heater operation an automatic control and protection system is recommended including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - power cut-off in case of supply fan shutdown or low air flow speed as well as in case of actuating the overheat protection thermostats;
 - heat removal from the heating elements after ventilation system shutdown.

Designation key

Serie	Connected air duct diameter [mm]	Heater power [kW]
EKH	100; 125; 150; 160; 200; 250; 315	– 0,6; 0,8; 1,2; 1,6; 1,8; 2,4; 3; 3,4; 3,6; 5,1; 6; 9

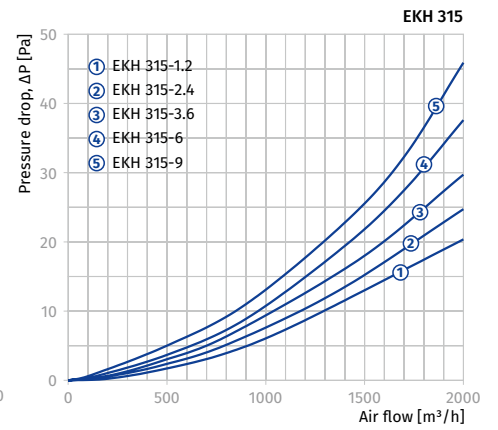
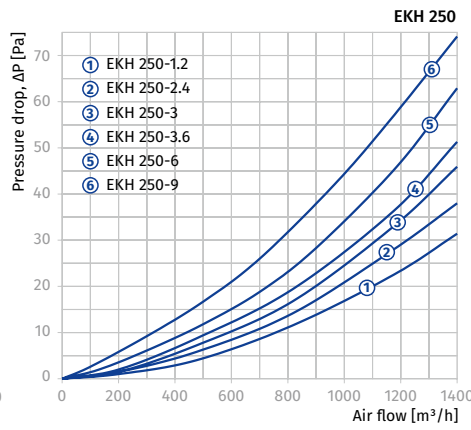
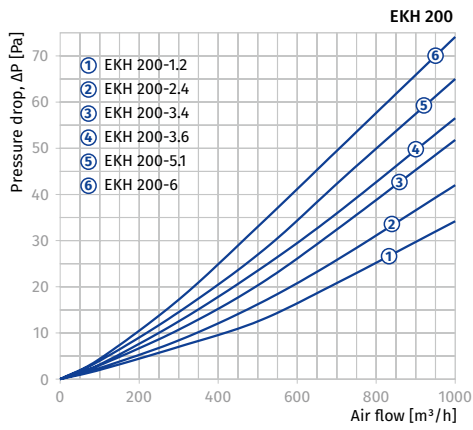
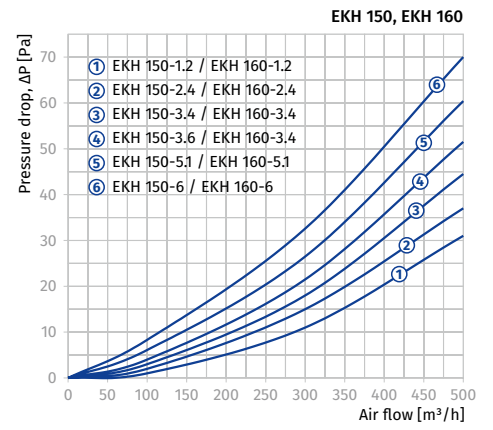
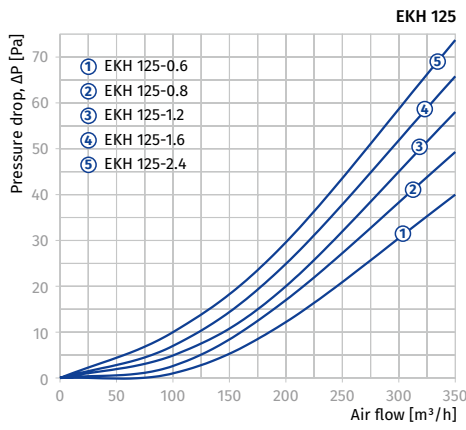
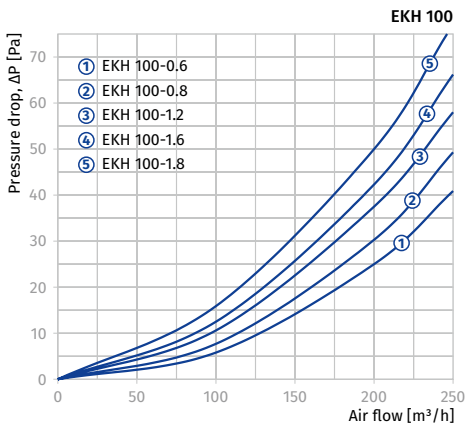
Overall dimensions [mm]

Model	D	B	H	L	L1
EKH 100-0.6	99	94	207	306	226
EKH 100-0.8	99	94	207	306	226
EKH 100-1.2	99	94	207	306	226
EKH 100-1.6	99	94	207	306	226
EKH 100-1.8	99	94	207	376	296
EKH 125-0.6	124	103	230	306	226
EKH 125-0.8	124	103	230	306	226
EKH 125-1.2	124	103	230	306	226
EKH 125-1.6	124	103	230	306	226
EKH 125-2.4	124	103	230	376	296
EKH 150-1.2	149	120	255	306	226
EKH 150-2.4	149	120	255	306	226
EKH 150-3.4	149	120	255	306	226
EKH 150-3.6	149	120	255	376	296
EKH 150-5.1	149	120	255	376	296
EKH 150-6	149	120	255	376	296
EKH 160-1.2	159	120	267	306	226
EKH 160-2.4	159	120	267	306	226
EKH 160-3.4	159	120	267	306	226
EKH 160-3.6	159	120	267	376	296
EKH 160-5.1	159	120	267	376	296
EKH 160-6	159	120	267	376	296
EKH 200-1.2	199	150	302	294	214
EKH 200-2.4	199	150	302	294	214
EKH 200-3.4	199	150	302	294	214
EKH 200-3.6	199	150	302	376	296
EKH 200-5.1	199	150	302	376	296
EKH 200-6	199	150	302	376	296
EKH 250-1.2	249	150	356	306	226
EKH 250-2.4	249	150	356	306	226
EKH 250-3	249	150	356	306	226
EKH 250-3.6	249	150	356	376	296
EKH 250-6	249	150	356	376	296
EKH 250-9	249	150	356	376	296
EKH 315-1.2	313	150	425	294	214
EKH 315-2.4	313	150	425	294	214
EKH 315-3.6	313	150	425	376	296
EKH 315-6	313	150	425	376	296
EKH 315-9	313	150	425	376	296

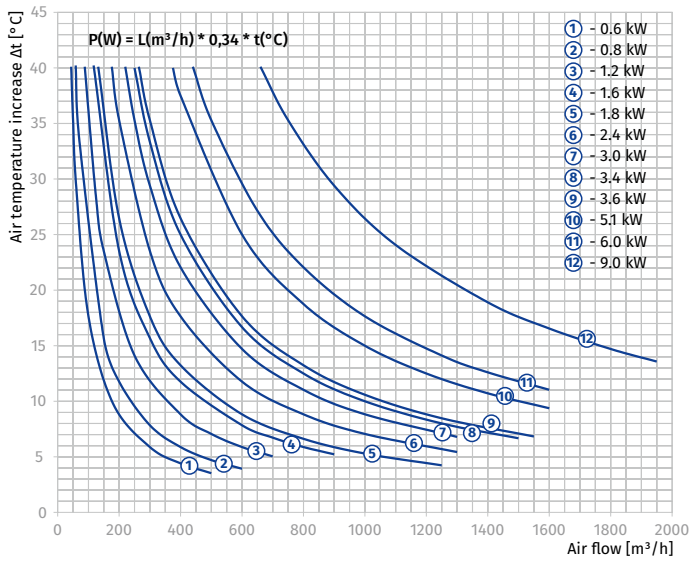


Technical data

Model	Minimum air flow [m³/h (l/s)]	Current [A]	Voltage [V]	Power [kW]	Number of heating coils x capacity [kW]	Phase	Weight [kg]
EKH 100-0.6	60 (17)	2.6	230	0.6	1x0.6	1	2.6
EKH 100-0.8	80 (22)	3.5	230	0.8	1x0.8	1	2.6
EKH 100-1.2	90 (25)	5.2	230	1.2	2x0.6	1	2.9
EKH 100-1.6	120 (33)	7.0	230	1.6	2x0.8	1	2.9
EKH 100-1.8	130 (36)	7.8	230	1.8	3x0.6	1	3.1
EKH 125-0.6	60 (17)	2.6	230	0.6	1x0.6	1	2.4
EKH 125-0.8	80 (22)	3.5	230	0.8	1x0.8	1	2.4
EKH 125-1.2	90 (25)	5.2	230	1.2	2x0.6	1	2.7
EKH 125-1.6	120 (33)	7.0	230	1.6	2x0.8	1	2.7
EKH 125-2.4	150 (42)	7.8	230	2.4	3x0.8	1	3.0
EKH 150-1.2	120 (33)	5.2	230	1.2	1x1.2	1	2.5
EKH 150-2.4	150 (42)	10.4	230	2.4	2x1.2	1	3.1
EKH 150-3.4	220 (61)	14.7	230	3.4	2x1.7	1	3.1
EKH 150-3.6	265 (74)	5.2	400	3.6	3x1.2	3	4.1
EKH 150-5.1	320 (89)	7.4	400	5.1	3x1.7	3	4.1
EKH 150-6	360 (100)	8.7	400	6.0	3x2.0	3	4.1
EKH 160-1.2	150 (42)	5.2	230	1.2	1x1.2	1	2.1
EKH 160-2.4	180 (50)	10.4	230	2.4	2x1.2	1	2.9
EKH 160-3.4	250 (69)	14.8	230	3.4	2x1.7	1	3.2
EKH 160-3.6	265 (74)	5.2	400	3.6	3x1.2	3	3.9
EKH 160-5.1	375 (104)	7.4	400	5.1	3x1.7	3	3.9
EKH 160-6	440 (122)	8.7	400	6.0	3x2.0	3	3.9
EKH 200-1.2	150 (42)	5.2	230	1.2	1x1.2	1	2.4
EKH 200-2.4	180 (50)	10.4	230	2.4	2x1.2	1	3.2
EKH 200-3.4	250 (69)	14.8	230	3.4	2x1.7	1	3.3
EKH 200-3.6	265 (74)	5.2	400	3.6	3x1.2	3	4.1
EKH 200-5.1	375 (104)	7.4	400	5.1	3x1.7	3	4.1
EKH 200-6	440 (122)	8.7	400	6.0	3x2.0	3	4.1
EKH 250-1.2	180 (50)	5.2	230	1.2	1x1.2	1	2.4
EKH 250-2.4	180 (50)	10.4	230	2.4	2x1.2	1	2.6
EKH 250-3	375 (104)	13.0	230	3.0	1x3.0	1	2.4
EKH 250-3.6	375 (104)	5.2	400	3.6	3x1.2	3	2.9
EKH 250-6	440 (122)	8.7	400	6.0	3x2.0	3	2.9
EKH 250-9	660 (183)	13.0	400	9.0	3x3.0	3	2.9
EKH 315-1.2	180 (50)	5.2	230	1.2	1x1.2	1	2.6
EKH 315-2.4	265 (74)	10.4	230	2.4	2x1.2	1	2.8
EKH 315-3.6	375 (104)	5.2	400	3.6	3x1.2	3	3.1
EKH 315-6	440 (122)	8.7	400	6.0	3x2.0	3	3.1
EKH 315-9	660 (183)	13.0	400	9.0	3x3.0	3	3.1



Air temperature increase as a function of air flow

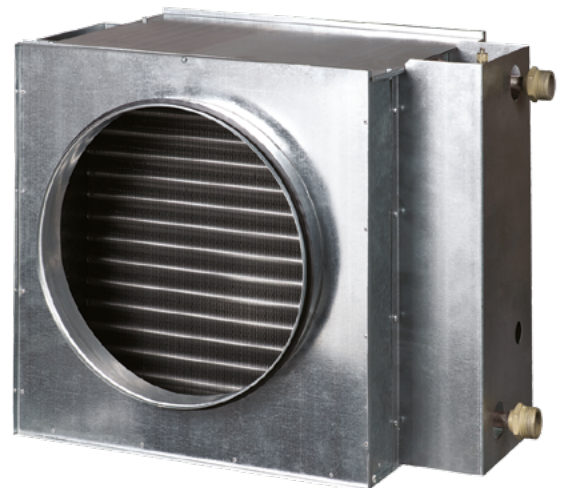


WKH

Duct water heaters for round ducts

Features

- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor Features use antifreezing mixture (ethylene glycol solution).
- Compatible with $\varnothing 100$ to 315 mm round air ducts.



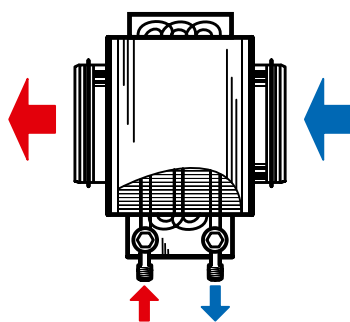
Design

- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Airtight connection with air ducts due to rubber seals.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two- or four-row coil modifications.
- Suitable for operation at maximum operating pressure 1.6 MPa (16 bar) and maximum operating temperature +100 °C.

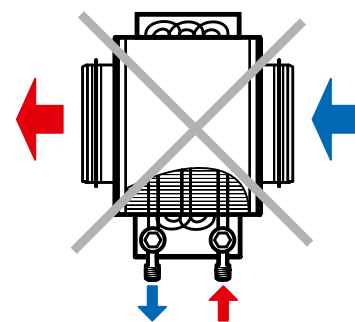
Mounting

- Fixing to round ducts with clamps.
- Any mounting position that ensures the heater deaeration.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.

- Install the heater in front or behind the fan. In case of mounting behind the fan ensure a distance of not less than two connecting diameters for air flow stabilization and keep the maximum permissible air temperature inside the fan.
- Connect the heater on counter-flow basis, otherwise its capacity drops by 5-15 %. All the nomographic charts are rated for counter-flow connection.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - ventilation system start-up with pre-heated heater;
 - use of air dampers fitted with a spring return actuator;
 - fan turns off in case of freezing danger for the heater.



Connection against air flow



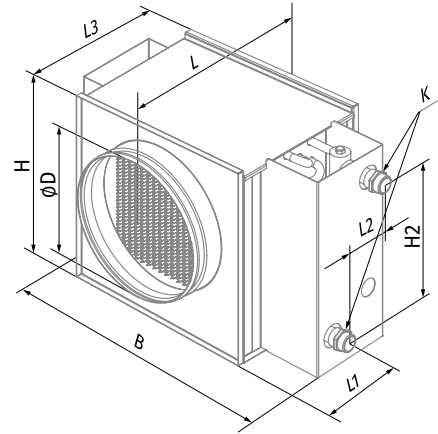
Connection along air flow

Designation key

Serie	Connected air duct diameter [mm]	Number of water (glycol) coil rows
WKH	100; 125; 150; 160; 200; 250; 315	- 2; 4

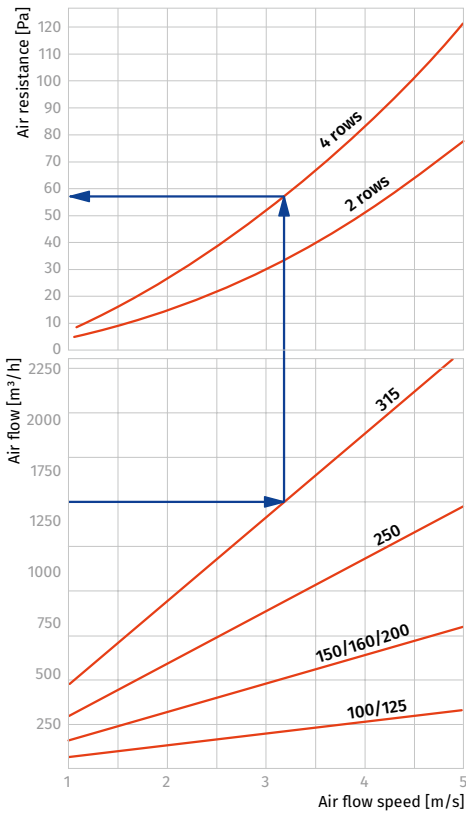
Overall dimensions [mm]

Model	D	B	H	H2	L	L1	L2	L3	K	Number of water coil rows	Weight [kg]
WKH 100-2	100	350	240	150	300	82	43	220	G 3/4"	2	4.5
WKH 100-4	100	350	240	150	300	78	65	220	G 3/4"	4	5.2
WKH 125-2	125	350	240	150	300	82	43	220	G 3/4"	2	4.5
WKH 125-4	125	350	240	150	300	78	65	220	G 3/4"	4	5.2
WKH 150-2	150	400	290	200	300	82	43	220	G 3/4"	2	7.5
WKH 150-4	150	400	290	200	300	78	65	220	G 3/4"	4	8.2
WKH 160-2	160	400	290	200	300	82	43	220	G 3/4"	2	7.5
WKH 160-4	160	400	290	200	300	78	65	220	G 3/4"	4	8.2
WKH 200-2	200	400	290	200	300	82	43	220	G 3/4"	2	7.5
WKH 200-4	200	400	290	200	300	78	65	220	G 3/4"	4	8.2
WKH 250-2	250	470	360	270	350	107	43	270	G 1"	2	10.3
WKH 250-4	250	470	360	270	350	103	65	270	G 1"	4	10.8
WKH 315-2	315	550	440	350	450	157	43	370	G 1"	2	11.5
WKH 315-4	315	550	440	350	450	153	65	370	G 1"	4	12.2



WKH ROUND HEATERS

Air pressure loss for water heaters WKH

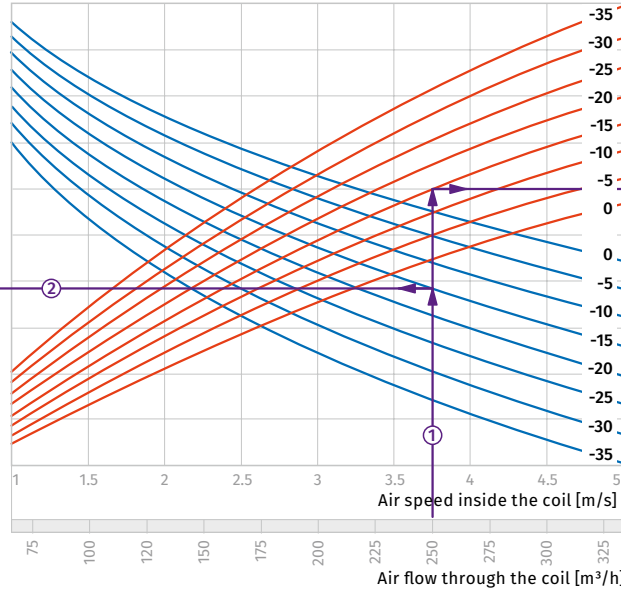
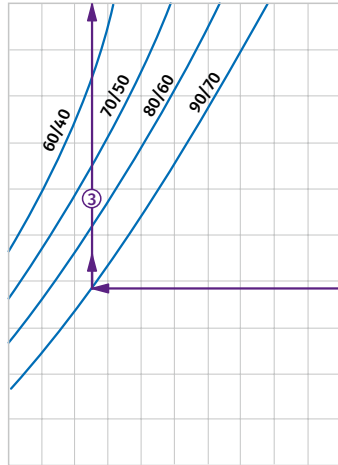


Water heaters calculation diagram

WKH 100-2 / WKH 125-2

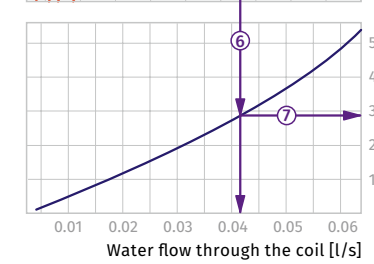
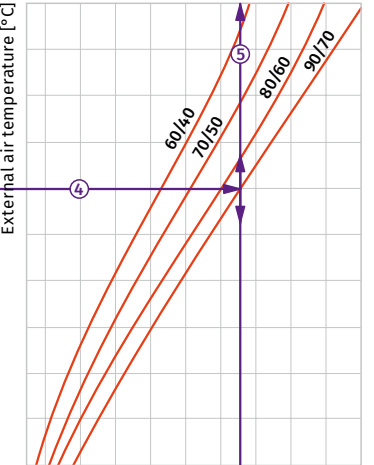
Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



Coil heating capacity [kW]

0.5 1 1.5 2 2.5 3 3.5 4 4.5 5



How to use water heater diagrams.

System Parameters: Air flow = 250 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 250 m³/h and the air speed in the heater is 3.75 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+17.50 °C) ③.

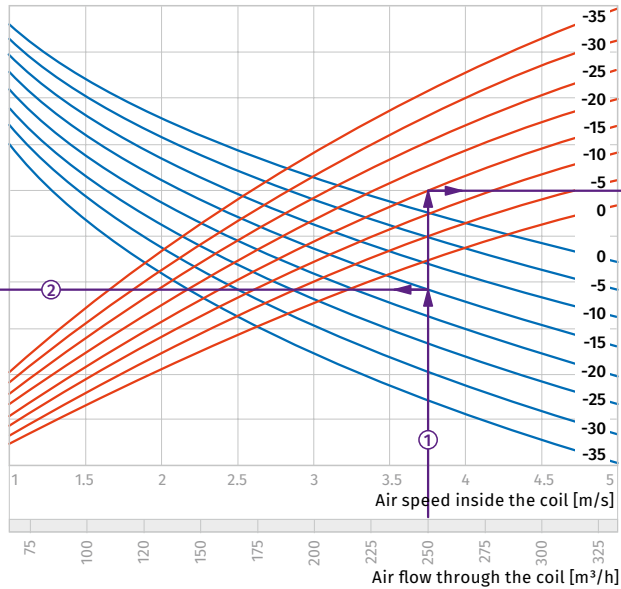
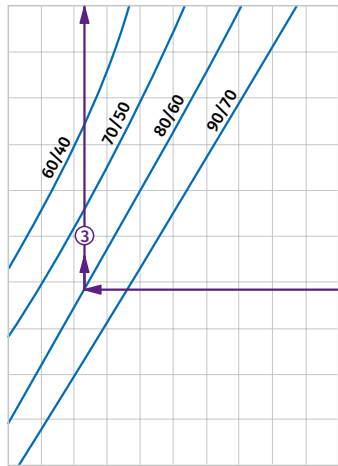
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (3.25 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 (2.9 kPa).

WKH 100-4 / WKH 125-4

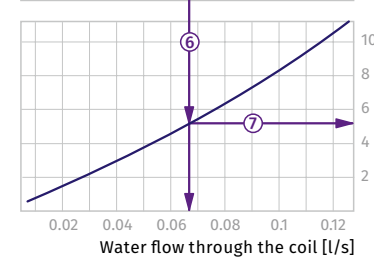
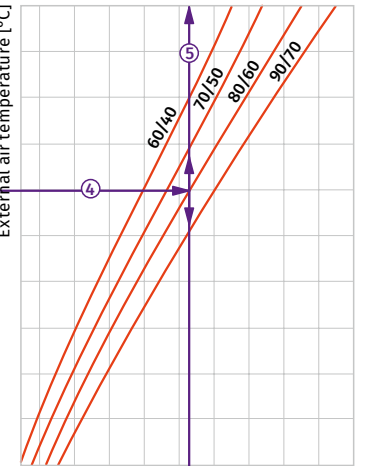
Air temperature downstream of the water heating coils [°C]

15 20 25 30 35 40 45 50 55 60 65



Coil heating capacity [kW]

1 2 3 4 5 6 7 8 9 10



How to use water heater diagrams.

System Parameters: Air flow = 250 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +80/+60 °C.
The air flow is 250 m³/h and the air speed in the heater is 3.75 m/s ①.

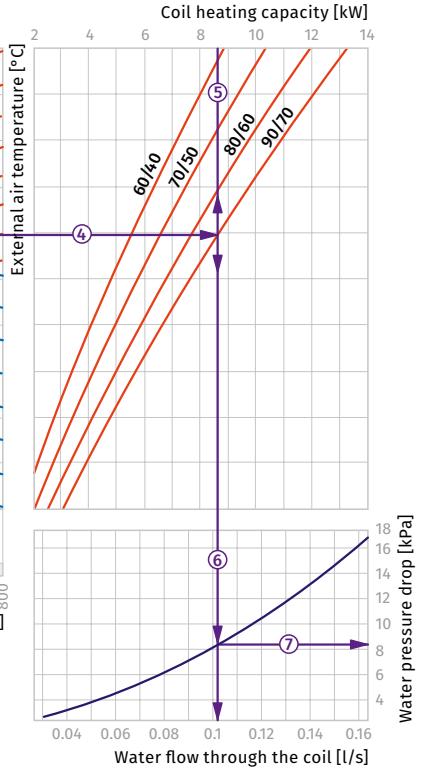
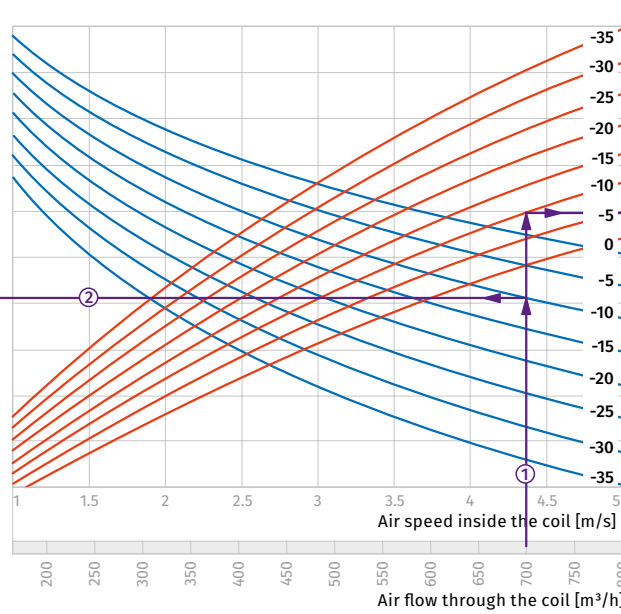
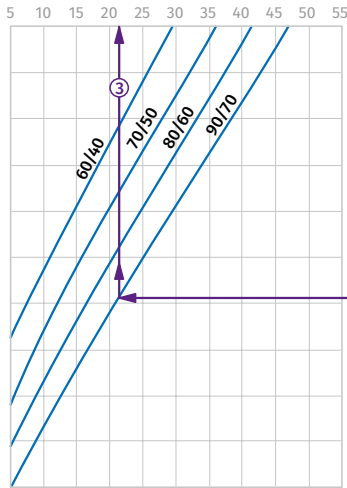
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +80/+60). From this point draw a vertical line to 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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +80/+60). From this point draw a vertical line to the heater power axis (5.2 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.067 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 (5.2 kPa).

WKH 150-2 / WKH 160-2 / WKH 200-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 700 m³/h.
 Outside air temperature = -10 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 700 m³/h and the air speed in the heater is 4.4 m/s ①.

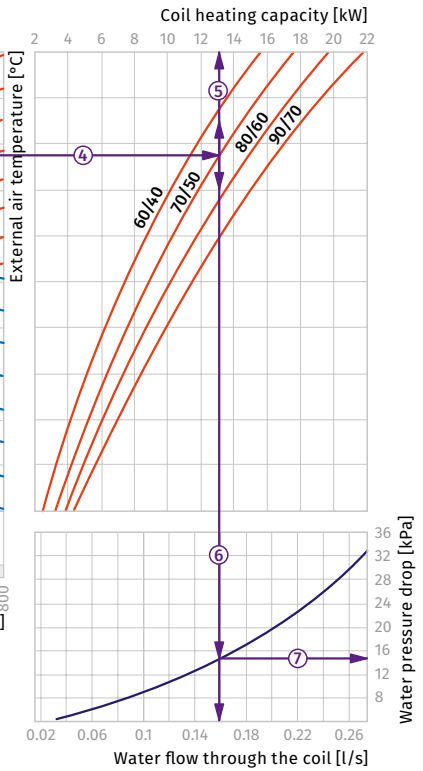
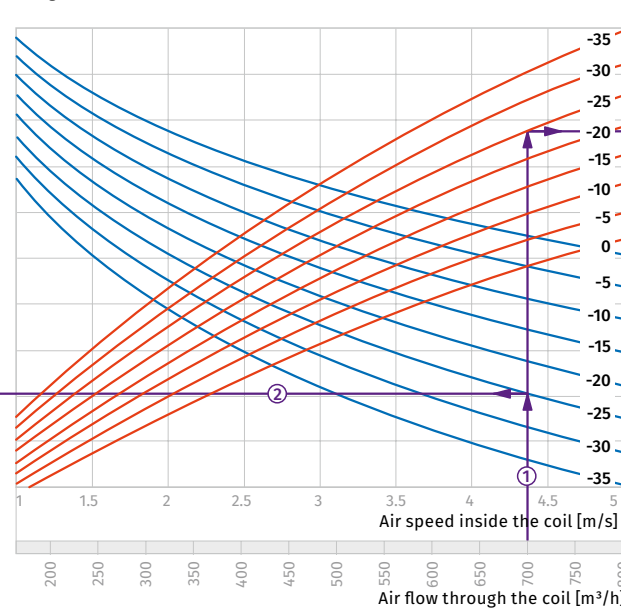
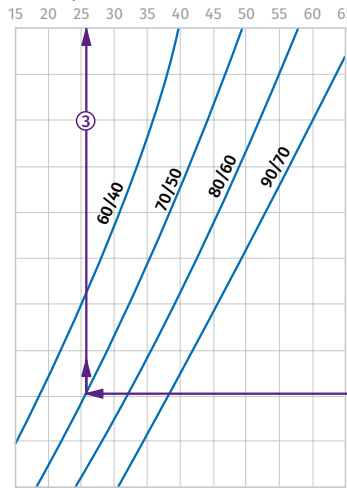
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -10 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+21 °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., -10 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (8.6 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ 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 (8.2 kPa).

WKH 150-4 / WKH 160-4 / WKH 200-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 700 m³/h.
 Outside air temperature = -25 °C.
 Water temperature (in/out) = +70/+50 °C.
 The air flow is 700 m³/h and the air speed in the heater is 4.4 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °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.

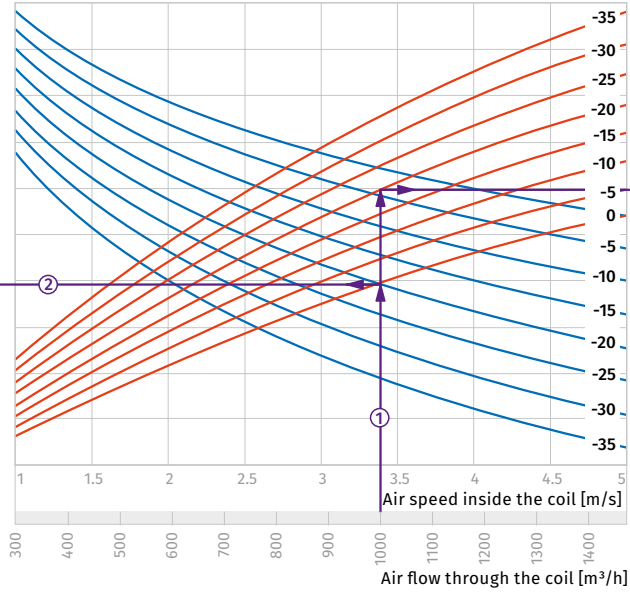
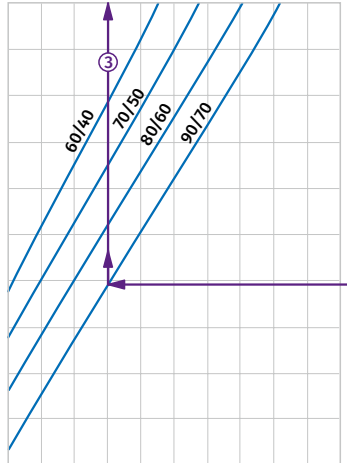
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -25 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the heater power axis (13.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.16 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 (15 kPa).

WKH 250-2

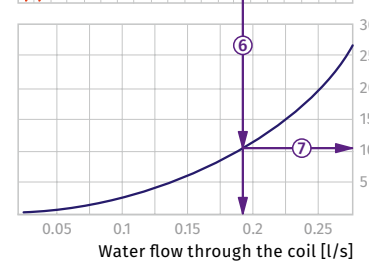
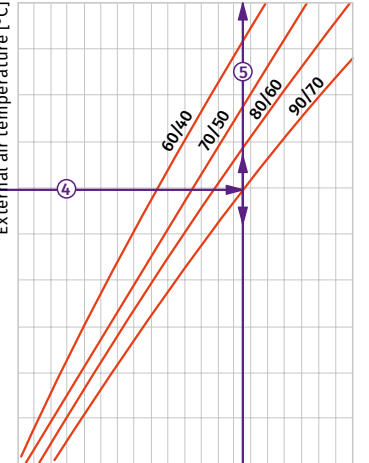
Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



Coil heating capacity [kW]

2 4 6 8 10 12 14 16 18 20 22



How to use water heater diagrams.

System Parameters: Air flow = 1000 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 1000 m³/h and the air speed in the heater is 3.4 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+20 °C) ③.

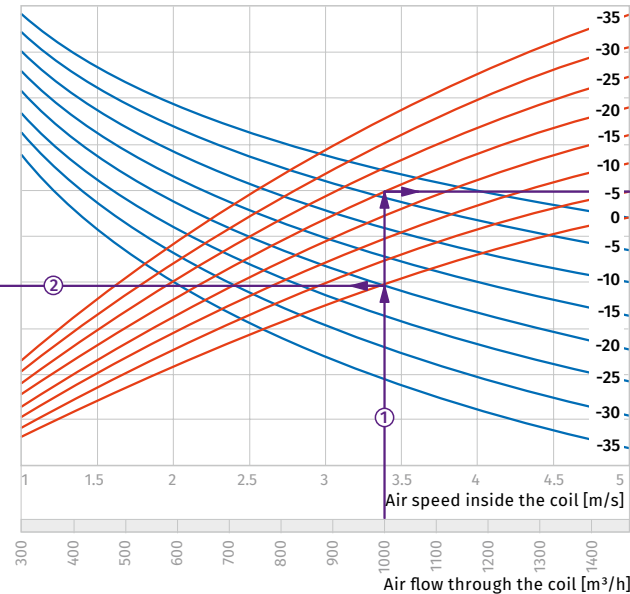
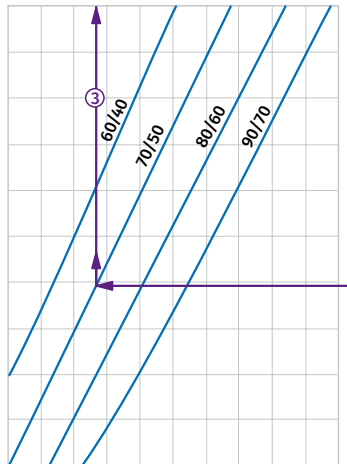
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (15.5 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.19 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 (11.0 kPa).

WKH 250-4

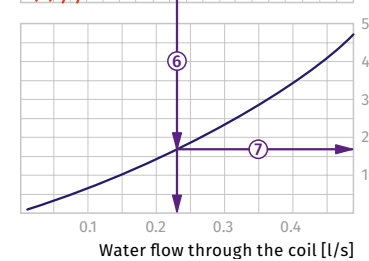
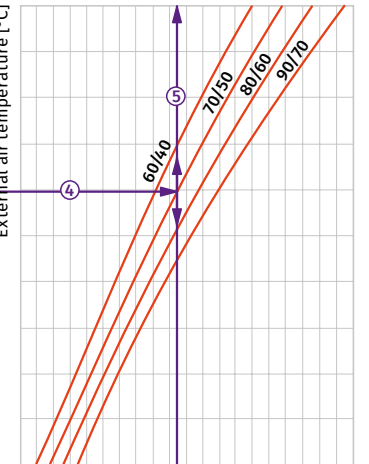
Air temperature downstream of the water heating coils [°C]

15 20 25 30 35 40 45 50 55 60 65



Coil heating capacity [kW]

0 4 8 12 16 20 24 28 32 36 40



How to use water heater diagrams.

System Parameters: Air flow = 1000 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 1000 m³/h and the air speed in the heater is 3.4 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °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.

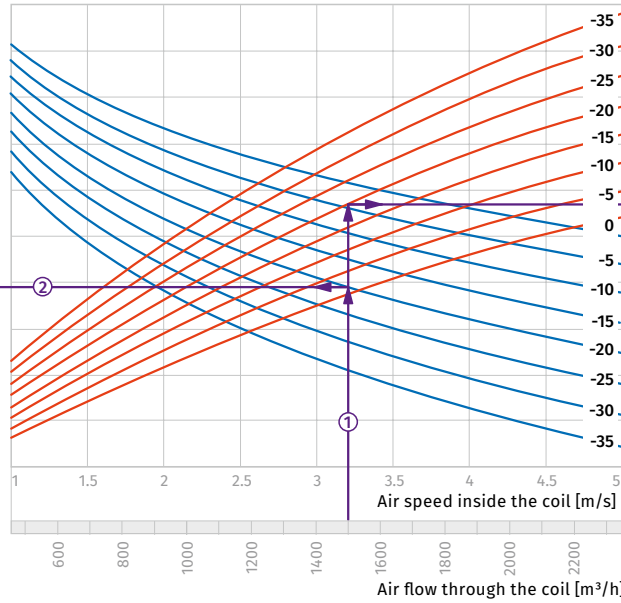
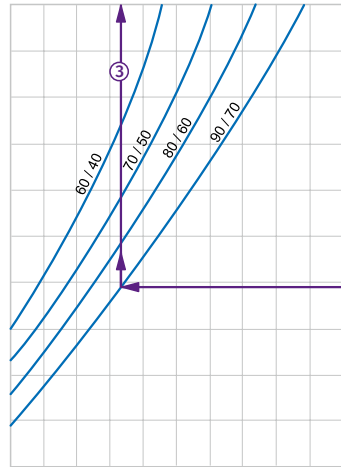
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the heater power axis (19.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.23 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 (17.0 kPa).

WKH 315-2

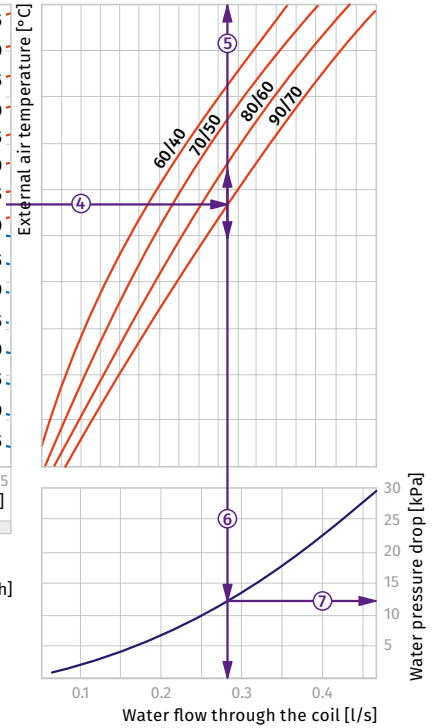
Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



Coil heating capacity [kW]

8 12 16 20 24 28 32 36



How to use water heater diagrams.

System Parameters: Air flow = 1500 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 1000 m³/h and the air speed in the heater is 3.2 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+21 °C) ③.

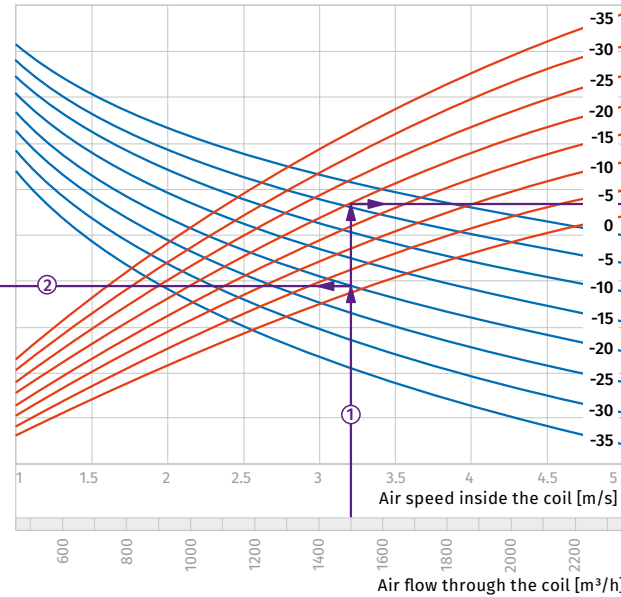
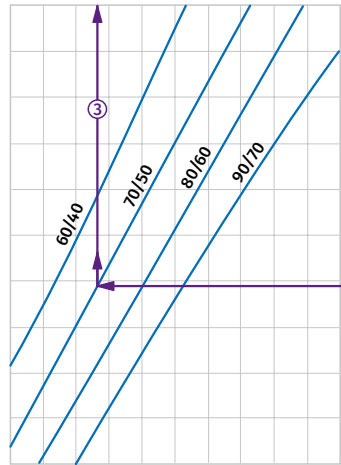
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (23.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.28 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 (12.5 kPa).

WKH 315-4

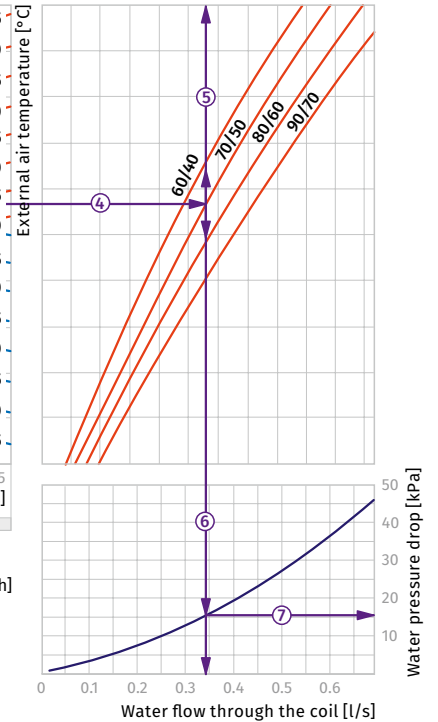
Air temperature downstream of the water heating coils [°C]

15 20 25 30 35 40 45 50 55 60 65



Coil heating capacity [kW]

0 10 20 30 40 50



How to use water heater diagrams.

System Parameters: Air flow = 1500 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +70/+50 °C.
 The air flow is 1000 m³/h and the air speed in the heater is 3.2 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °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., -20 °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 (28.0 kW) ⑤.

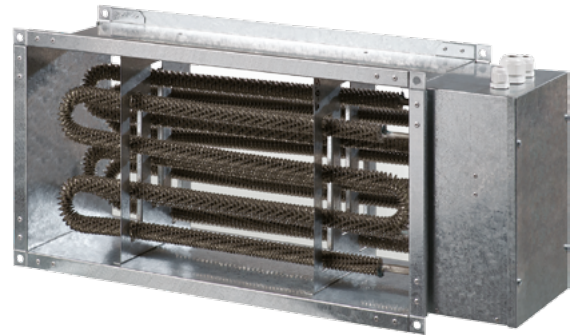
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.34 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (16.0 kPa).

EKH

Duct electrical heaters for rectangular ducts

Features

- For warming up of supply air in heating, ventilation and air conditioning systems installed in various premises.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.



Design

- Galvanized steel case and junction box.
- Heating elements are made of stainless steel and have additional ribbing to increase heat exchange surface.
- Several power options for each standard size.
- For higher heating capacity several heaters may be installed in Series.
- Equipped with overheat protection thermostats:
 - basic protection with automatic restart at +50 °C;
 - emergency protection with manual restart at +90 °C.

Mounting

- Fixing to rectangular ducts with flange connection.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.
- Recommended distance between the heater and other system components must be not less than one air heater diagonal for air flow stabilization.

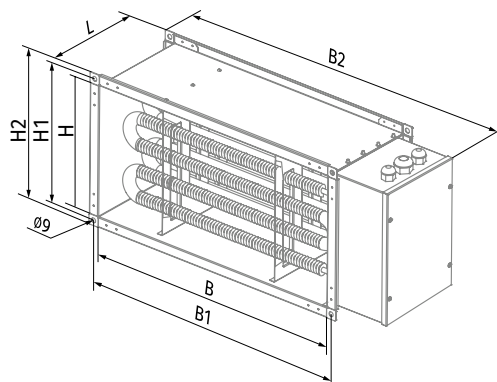
- Duct heaters are rated for minimum air flow speed 1.5 m/s and maximum operating air temperature supplied to the units 40 °C. In case of speed regulation with a speed controller the minimum air speed through the heater must be provided.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - power cut-off in case of the supply fan shutdown or low air flow speed as well as in case of actuating the overheat protection thermostats;
 - heat removal from the heating elements after ventilation system shutdown.

Designation key

Serie	Flange size (WxH) [cm]	Heater power [kW]
EKH	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50	– 4,5; 6; 7,5; 9; 10,5; 12; 15; 18; 21; 24; 27; 36; 45; 54

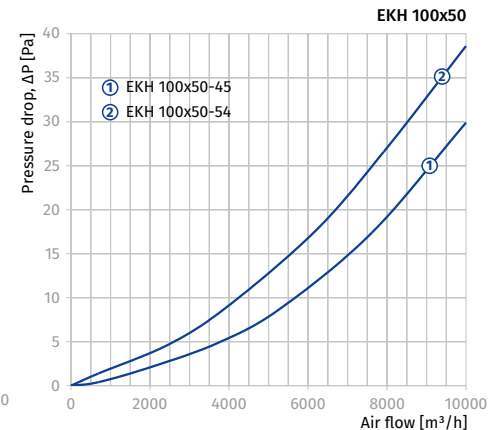
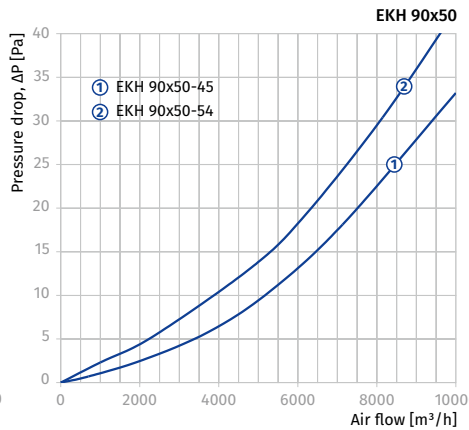
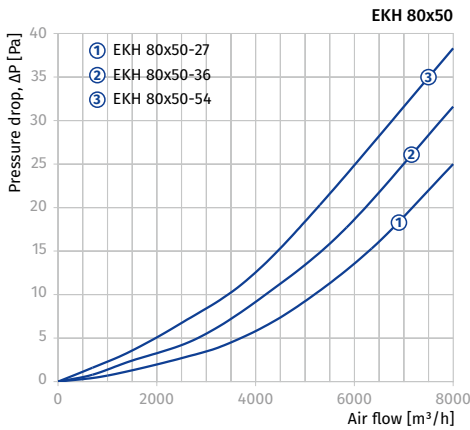
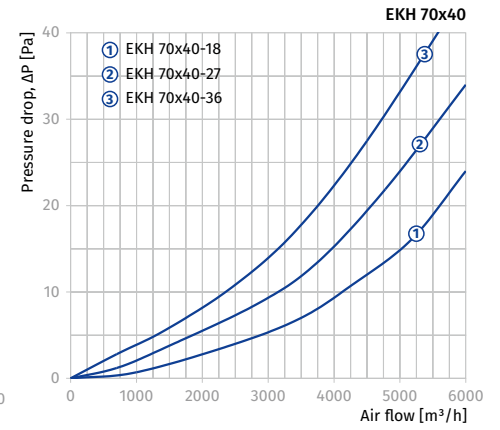
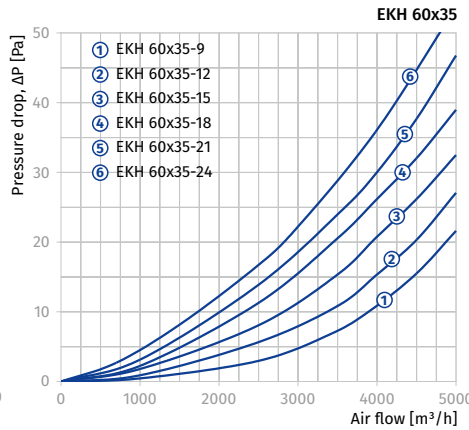
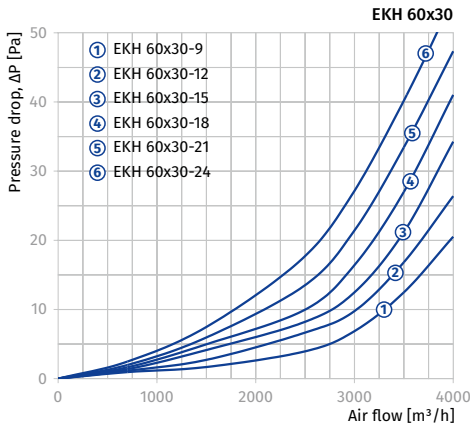
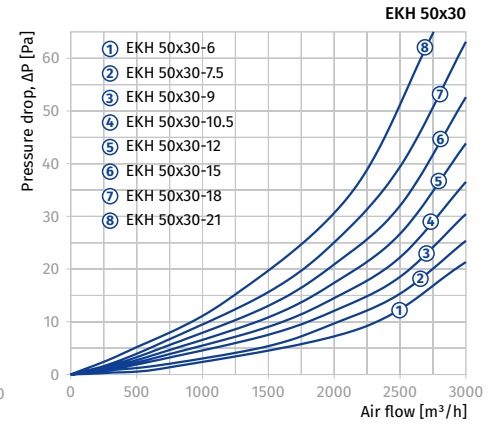
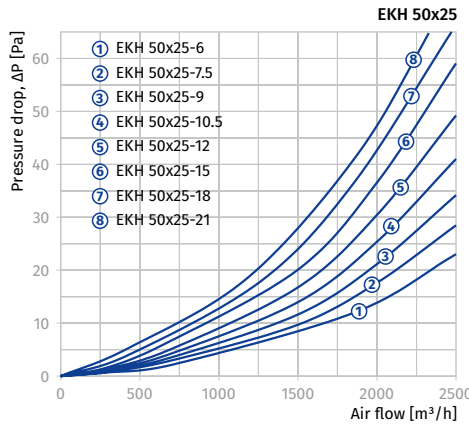
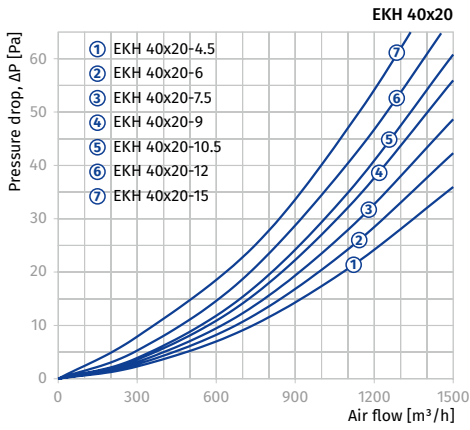
Overall dimensions [mm]

Model	B	B1	B2	H	H1	H2	L
EKH 40x20-4.5	400	420	540	200	220	240	200
EKH 40x20-6	400	420	540	200	220	240	200
EKH 40x20-7.5	400	420	540	200	220	240	200
EKH 40x20-9	400	420	540	200	220	240	200
EKH 40x20-10.5	400	420	540	200	220	240	200
EKH 40x20-12	400	420	540	200	220	240	200
EKH 40x20-15	400	420	540	200	220	240	200
EKH 50x25-6	500	520	640	250	270	290	200
EKH 50x25-7.5	500	520	640	250	270	290	200
EKH 50x25-9	500	520	640	250	270	290	200
EKH 50x25-10.5	500	520	640	250	270	290	200
EKH 50x25-12	500	520	640	250	270	290	200
EKH 50x25-15	500	520	640	250	270	290	200
EKH 50x25-18	500	520	640	250	270	290	200
EKH 50x25-21	500	520	640	250	270	290	200
EKH 50x30-6	500	520	640	300	320	340	200
EKH 50x30-7.5	500	520	640	300	320	340	200
EKH 50x30-9	500	520	640	300	320	340	200
EKH 50x30-10.5	500	520	640	300	320	340	200
EKH 50x30-12	500	520	640	300	320	340	200
EKH 50x30-15	500	520	640	300	320	340	200
EKH 50x30-18	500	520	640	300	320	340	200
EKH 50x30-21	500	520	640	300	320	340	200
EKH 60x30-9	600	620	740	300	320	340	200
EKH 60x30-12	600	620	740	300	320	340	200
EKH 60x30-15	600	620	740	300	320	340	200
EKH 60x30-18	600	620	740	300	320	340	200
EKH 60x30-21	600	620	740	300	320	340	200
EKH 60x30-24	600	620	740	300	320	340	200
EKH 60x35-9	600	620	740	350	370	390	200
EKH 60x35-12	600	620	740	350	370	390	200
EKH 60x35-15	600	620	740	350	370	390	200
EKH 60x35-18	600	620	740	350	370	390	200
EKH 60x35-21	600	620	740	350	370	390	200
EKH 60x35-24	600	620	740	350	370	390	200
EKH 70x40-18	700	720	840	400	420	440	390
EKH 70x40-27	700	720	840	400	420	440	510
EKH 70x40-36	700	720	840	400	420	440	750
EKH 80x50-27	800	820	940	500	520	540	390
EKH 80x50-36	800	820	940	500	520	540	510
EKH 80x50-54	800	820	940	500	520	540	750
EKH 90x50-45	900	920	1040	500	520	540	750
EKH 90x50-54	900	920	1040	500	520	540	750
EKH 100x50-45	1000	1020	1140	500	520	540	750
EKH 100x50-54	1000	1020	1140	500	520	540	750

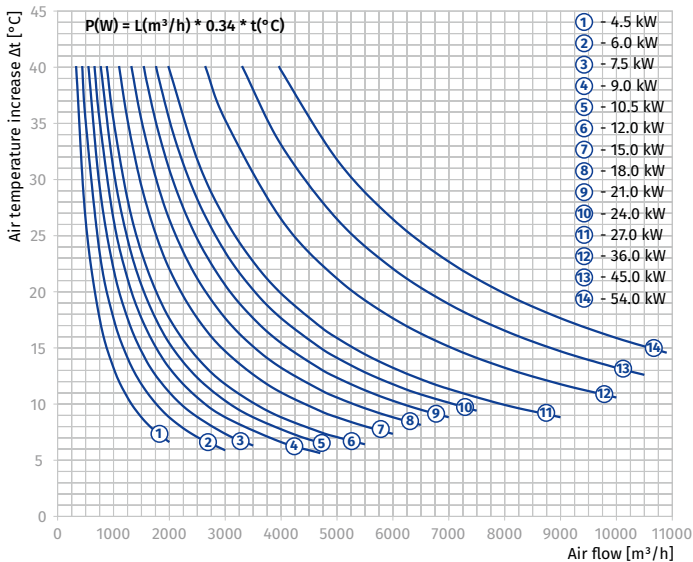


Technical data

Model	Minimum air flow [m ³ /h (l/s)]	Current [A]	Voltage [V]	Power [kW]	Number of heating coils x capacity [kW]	Weight [kg]
EKH 40x20-4.5	330 (92)	6.5	400	4.5	3x1.5	6.5
EKH 40x20-6	440 (122)	8.7	400	6.0	3x2.0	6.5
EKH 40x20-7.5	550 (153)	10.9	400	7.5	3x2.5	6.5
EKH 40x20-9	660 (183)	13.0	400	9.0	3x3.0	6.5
EKH 40x20-10.5	770 (214)	15.2	400	10.5	3x3.5	6.5
EKH 40x20-12	880 (244)	17.4	400	12.0	3x4.0	6.5
EKH 40x20-15	1100 (306)	21.7	400	15.0	3x5.0	6.5
EKH 50x25-6	440 (122)	8.7	400	6.0	3x2.0	7.65
EKH 50x25-7.5	550 (153)	10.9	400	7.5	3x2.5	7.65
EKH 50x25-9	660 (183)	13.0	400	9.0	3x3.0	7.65
EKH 50x25-10.5	770 (214)	15.2	400	10.5	3x3.5	7.65
EKH 50x25-12	880 (244)	17.4	400	12.0	3x4.0	7.65
EKH 50x25-15	1100 (306)	21.7	400	15.0	3x5.0	7.65
EKH 50x25-18	1320 (367)	26.0	400	18.0	3x6.0	7.65
EKH 50x25-21	1540 (428)	30.0	400	21.0	3x7.0	7.65
EKH 50x30-6	440 (122)	8.7	400	6.0	3x2.0	8.2
EKH 50x30-7.5	550 (153)	10.9	400	7.5	3x2.5	8.2
EKH 50x30-9	660 (183)	13.0	400	9.0	3x3.0	8.2
EKH 50x30-10.5	770 (214)	15.2	400	10.5	3x3.5	8.2
EKH 50x30-12	880 (244)	17.4	400	12.0	3x4.0	8.2
EKH 50x30-15	1100 (306)	21.7	400	15.0	3x5.0	8.2
EKH 50x30-18	1320 (367)	26.0	400	18.0	3x6.0	8.2
EKH 50x30-21	1540 (428)	30.0	400	21.0	3x7.0	8.2
EKH 60x30-9	660 (183)	13.0	400	9.0	3x3.0	9.4
EKH 60x30-12	880 (244)	17.4	400	12.0	3x4.0	9.4
EKH 60x30-15	1100 (306)	21.7	400	15.0	3x5.0	9.4
EKH 60x30-18	1320 (367)	26.0	400	18.0	3x6.0	9.4
EKH 60x30-21	1540 (428)	30.0	400	21.0	3x7.0	9.4
EKH 60x30-24	1760 (489)	34.7	400	24.0	3x8.0	9.4
EKH 60x35-9	660 (183)	13.0	400	9.0	3x3.0	9.75
EKH 60x35-12	880 (244)	17.4	400	12.0	3x4.0	9.75
EKH 60x35-15	1100 (306)	21.7	400	15.0	3x5.0	9.75
EKH 60x35-18	1320 (367)	26.0	400	18.0	3x6.0	9.75
EKH 60x35-21	1540 (428)	30.0	400	21.0	3x7.0	9.75
EKH 60x35-24	1760 (489)	34.7	400	24.0	3x8.0	9.75
EKH 70x40-18	1320 (367)	26.0	400	18.0	6x3.0	14.0
EKH 70x40-27	1980 (550)	39.0	400	27.0	9x3.0	18.5
EKH 70x40-36	2640 (733)	52.0	400	36.0	12x3.0	25.0
EKH 80x50-27	1980 (550)	39.0	400	27.0	9x3.0	19.0
EKH 80x50-36	2640 (733)	52.0	400	36.0	12x3.0	23.5
EKH 80x50-54	3960 (1100)	78.0	400	54.0	18x3.0	30.0
EKH 90x50-45	3300 (317)	65.0	400	45.0	15x3.0	31.0
EKH 90x50-54	3960 (1100)	78.0	400	54.0	18x3.0	33.5
EKH 100x50-45	3300 (317)	65.0	400	45.0	15x3.0	33.0
EKH 100x50-54	3960 (1100)	78.0	400	54.0	18x3.0	36.0



Air temperature increase as a function of air flow



WKH

Duct water heaters for rectangular ducts

Features

- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor Features use antifreezing mixture (ethylene glycol solution).
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.



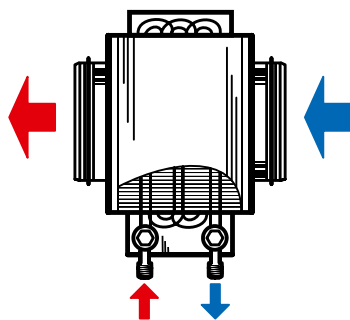
Design

- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two, three- or four-row tube modifications.
- Suitable for operation at maximum operating pressure 1.6 MPa (16 bar) and maximum transported air temperature +100 °C.

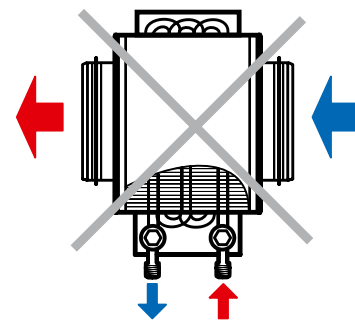
Mounting

- Fixing to rectangular ducts with flange connection.
- Any mounting position that ensures the heater deaeration.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.
- Install the heater in front or behind the fan. In case of mounting behind the fan ensure the distance no less than 1-1.5 m for air flow stabilization and keep the maximum permissible air temperature inside the fan.

- Connect the heater on counter-flow basis, otherwise its capacity drops by 5-15 %. All the nomographic charts are rated for counter-flow connection.
- For correct and safe heater operation an automatic control and protection system is recommended, including the following functions:
 - regulation of the heating capacity and temperature of the air heated up;
 - filter clogging control by a differential air pressure sensor;
 - ventilation system start-up with pre-heated heater;
 - use of air dampers with a servo actuator with a return spring;
 - fan turning off in case of the heater freezing danger.



Connection against air flow



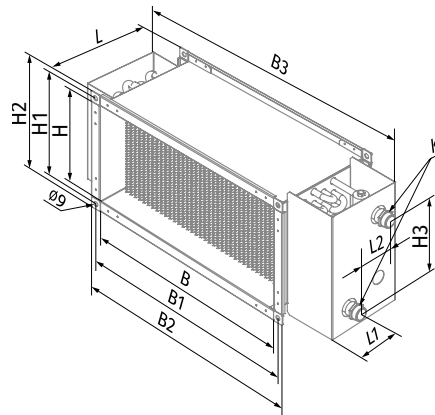
Connection along air flow

Designation key

Serie	Flange size (WxH) [cm]	Number of water (glycol) coil rows
WKH	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50	– 2; 3; 4

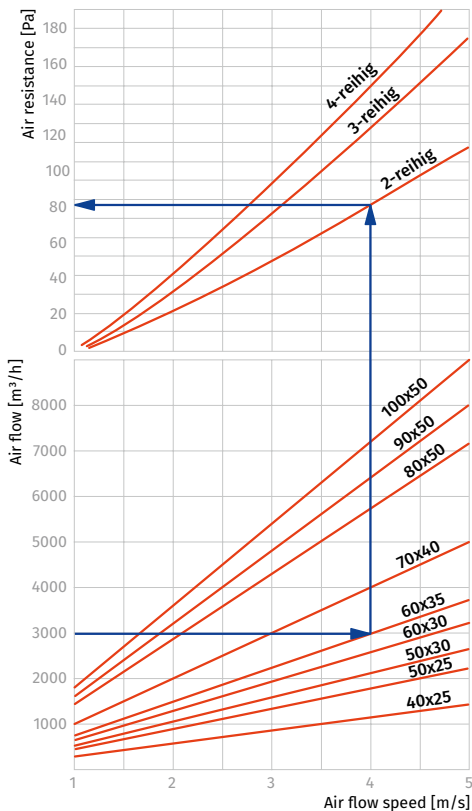
Overall dimensions [mm]

Model	B	B1	B2	B3	H	H1	H2	H3	L	L1	L2	K	Number of water coil rows	Weight [kg]
WKH 40x20-2	400	420	440	565	200	220	240	150	200	43	43	G 3/4"	2	7.6
WKH 40x20-4	400	420	440	565	200	220	240	150	200	38	65	G 3/4"	4	8.1
WKH 50x25-2	500	520	540	665	250	270	290	200	200	43	43	G 3/4"	2	15.8
WKH 50x25-4	500	520	540	665	250	270	290	200	200	38	65	G 3/4"	4	16.3
WKH 50x30-2	500	520	540	665	300	320	340	250	200	43	43	G 1"	2	11.5
WKH 50x30-4	500	520	540	665	300	320	340	250	200	38	65	G 1"	4	12.0
WKH 60x30-2	600	620	640	765	300	320	340	250	200	43	43	G 1"	2	21.8
WKH 60x30-4	600	620	640	765	300	320	340	250	200	38	65	G 1"	4	22.3
WKH 60x35-2	600	620	640	765	350	370	390	300	200	43	43	G 1"	2	22.4
WKH 60x35-4	600	620	640	765	350	370	390	300	200	38	65	G 1"	4	22.9
WKH 70x40-2	700	720	740	895	400	420	440	350	200	36	47	G 1"	2	27.8
WKH 70x40-3	700	720	740	895	400	420	440	350	200	42	58	G 1"	3	28.4
WKH 80x50-2	800	820	840	995	500	520	540	450	200	36	47	G 1"	2	36.5
WKH 80x50-3	800	820	840	995	500	520	540	450	200	42	58	G 1"	3	37.2
WKH 90x50-2	900	920	940	1065	500	520	540	450	200	36	47	G 1"	2	40.4
WKH 90x50-3	900	920	940	1065	500	520	540	450	200	42	58	G 1"	3	41.2
WKH 100x50-2	1000	1020	1040	1195	500	520	540	450	200	36	47	G 1"	2	44.3
WKH 100x50-3	1000	1020	1040	1195	500	520	540	450	200	42	58	G 1"	3	45.2



WKH rectangular heaters

Air pressure loss for water heaters WKH

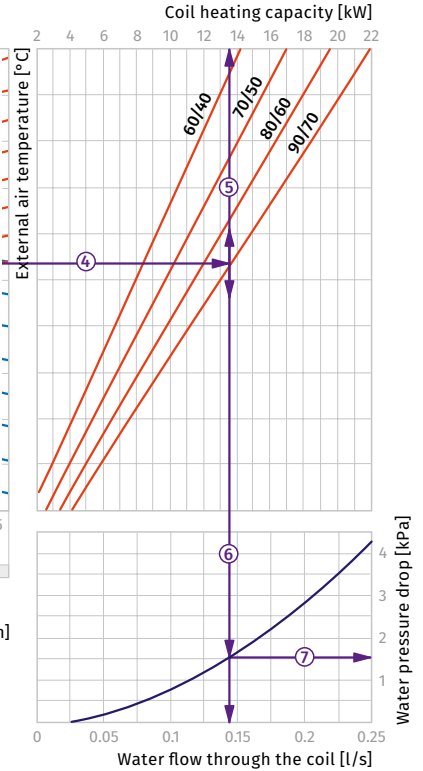
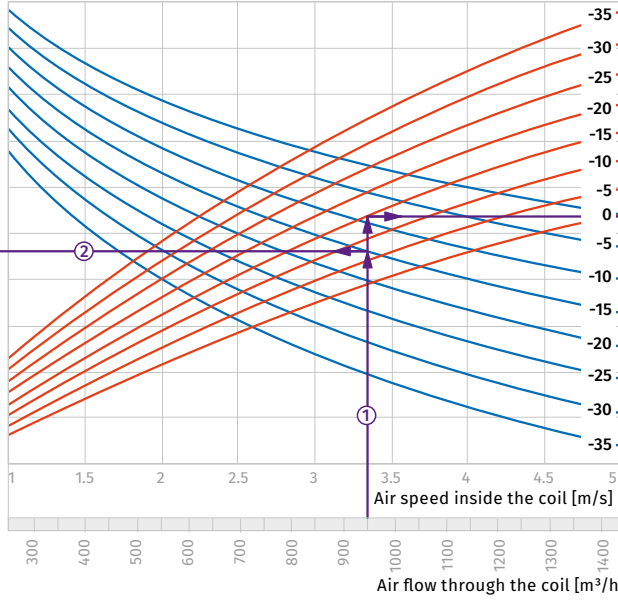
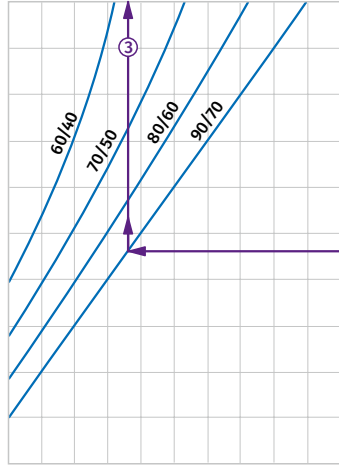


Water heaters calculation diagram

WKH 40x20-2

Air temperature downstream of the water heating coils [°C]

5 10 15 20 25 30 35 40 45 50 55



How to use water heater diagrams.

System Parameters: Air flow = 950 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+23 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (13.5 kW) ⑤.

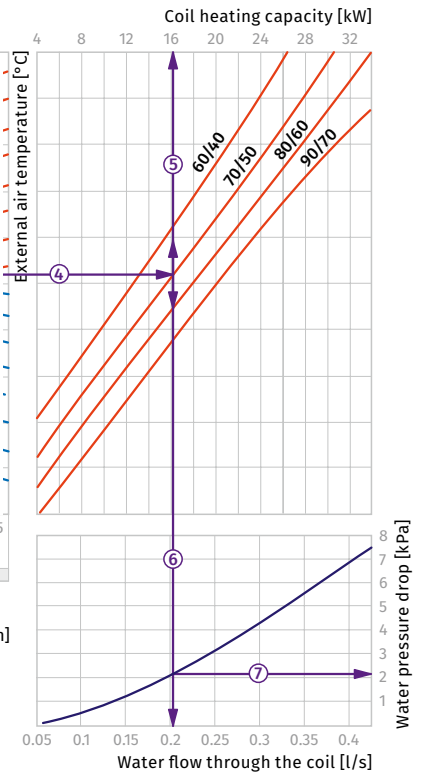
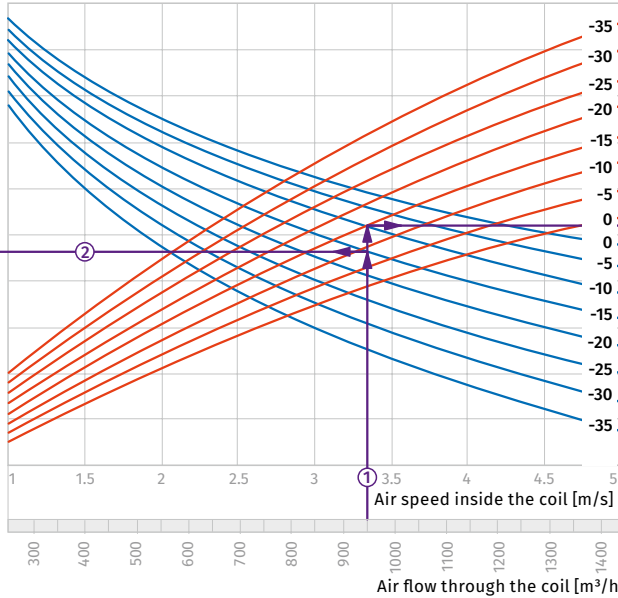
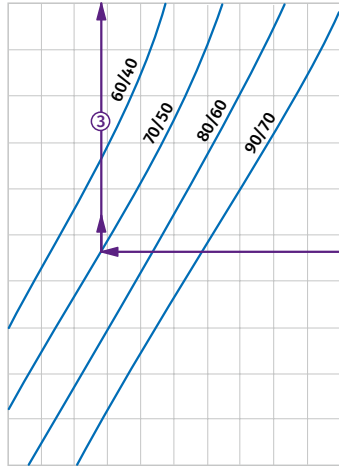
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.14 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (1.5 kPa).

HEATERS

WKH 40x20-4

Air temperature downstream of the water heating coils [°C]

15 20 25 30 35 40 45 50 55 60 65



How to use water heater diagrams.

System Parameters: Air flow = 250 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

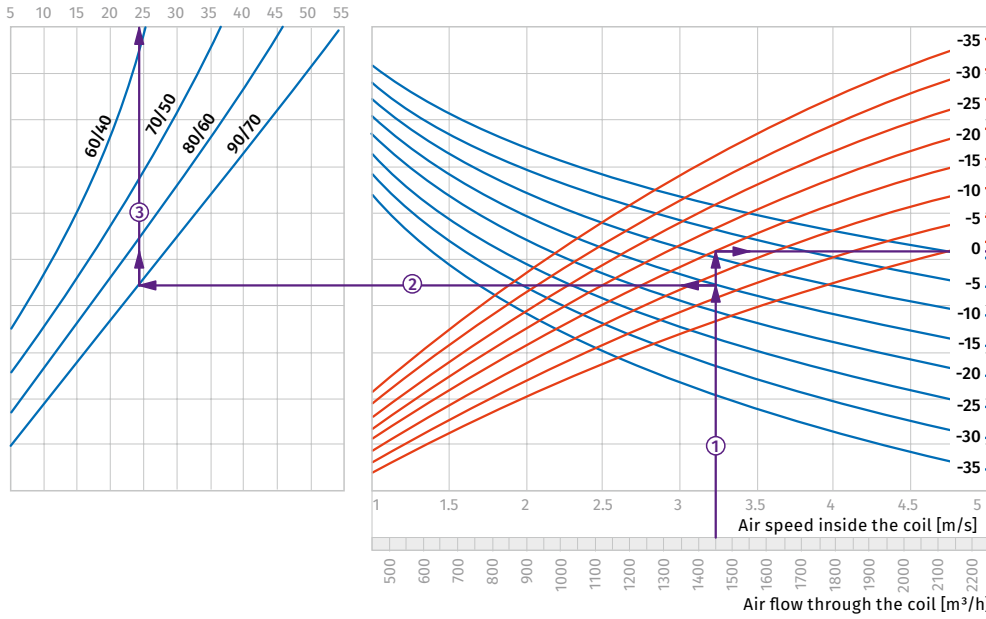
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+29 °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., -15 °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 (16.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.2 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 (2.1 kPa).

WKH 50x25-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 1450 m³/h.
 Outside air temperature = -15 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 1450 m³/h and the air speed in the heater is 3.2 m/s ①.

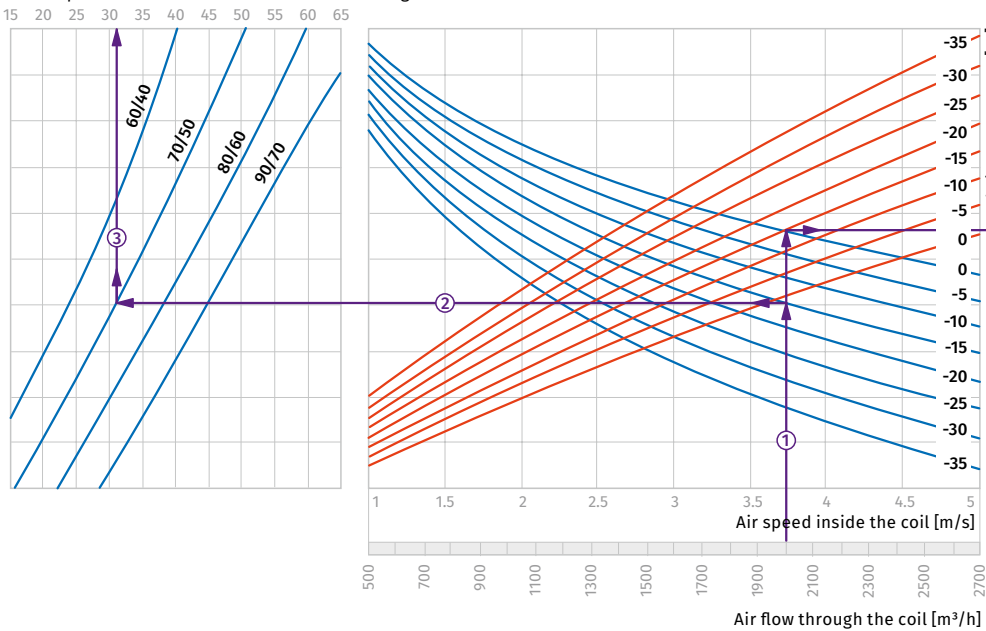
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+24 °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., -15 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (21.5 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.27 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 (3.2 kPa).

WKH 50x30-4

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 2000 m³/h.
 Outside air temperature = -15 °C.
 Water temperature (in/out) = +70/+50 °C.
 The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

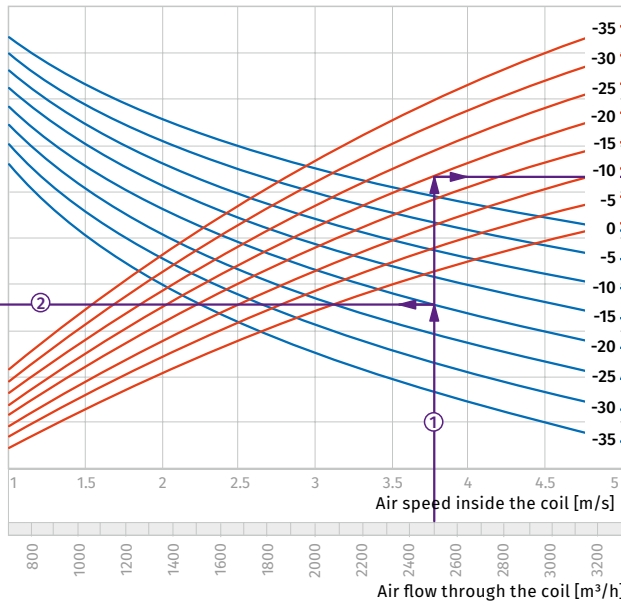
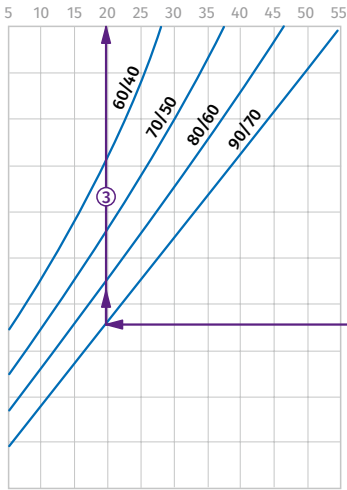
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -15 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+31 °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., -15 °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 (35.0 kW) ⑤.

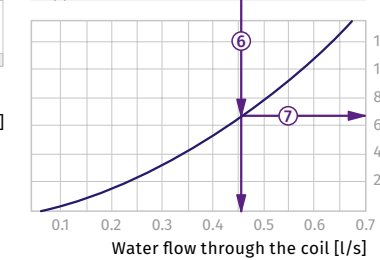
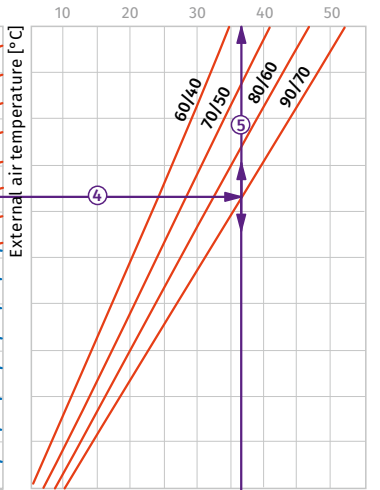
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.43 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (9.0 kPa).

WKH 60x30-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 2500 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 2500 m³/h and the air speed in the heater is 3.75 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+20 °C) ③.

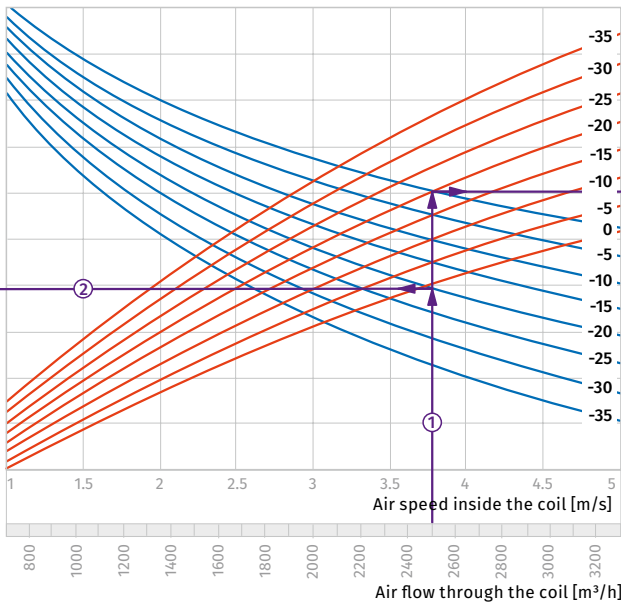
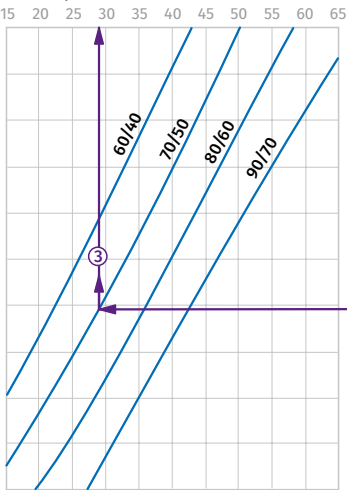
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (37.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.46 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 (6.7 kPa).

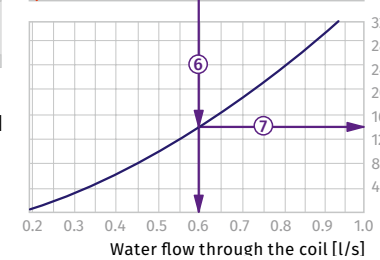
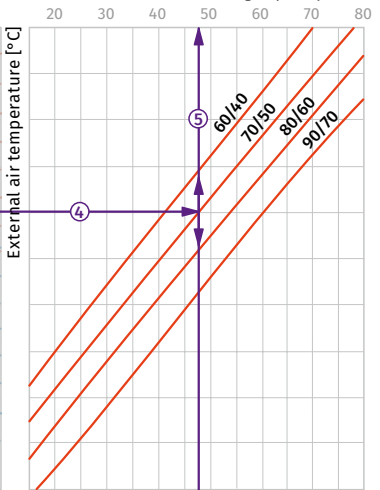
HEATERS

WKH 60x30-4

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 2500 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 2500 m³/h and the air speed in the heater is 3.75 m/s ①.

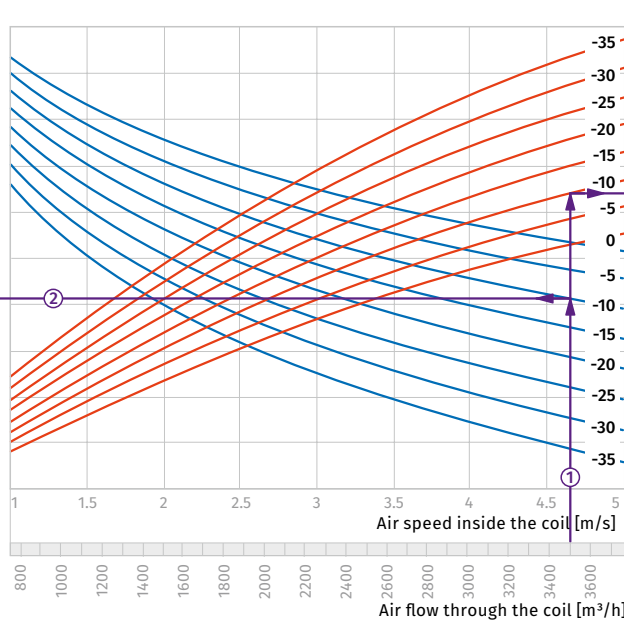
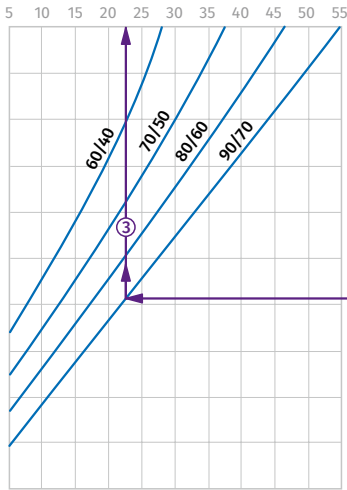
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+29 °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., -20 °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 (48.0 kW) ⑤.

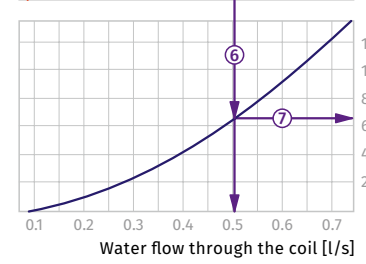
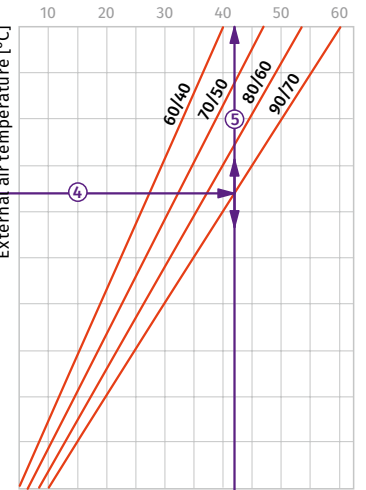
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.6 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (14.0 kPa).

WKH 60x35-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



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.
 The air flow is 2500 m³/h and the air speed in the heater is 4.65 m/s ①.

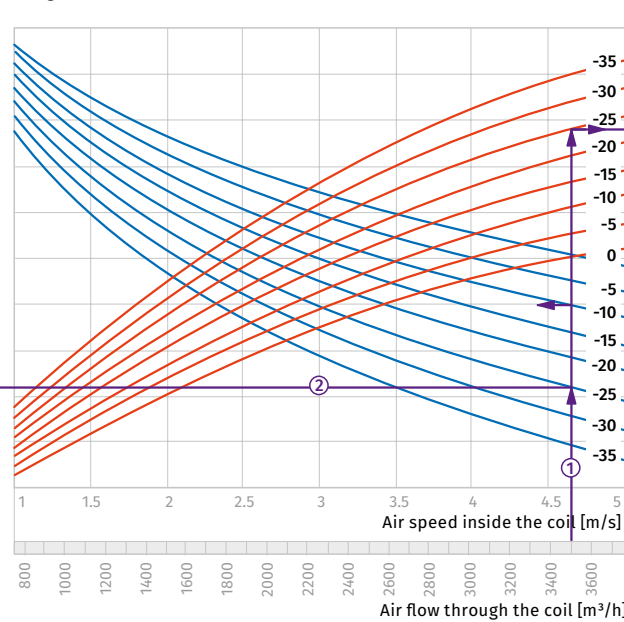
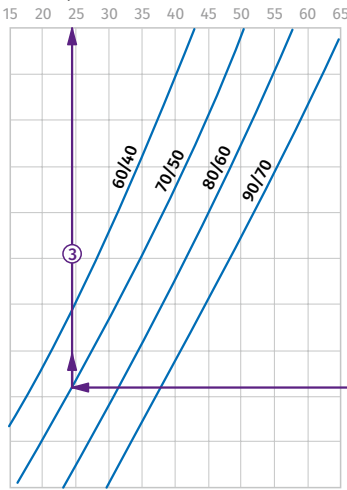
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -10 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+22.5 °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., -10 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (42.0 kW) ⑤.

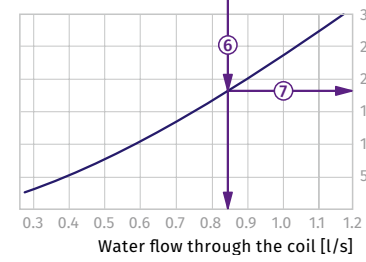
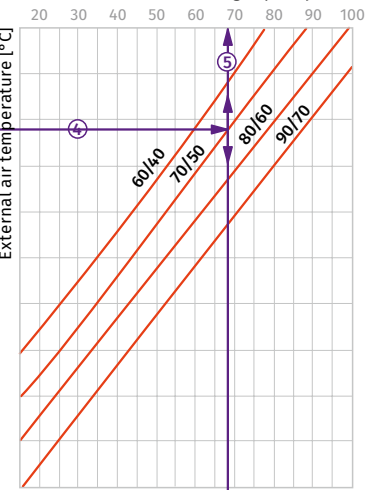
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.5 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (6.5 kPa).

WKH 60x35-4

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 3500 m³/h.
 Outside air temperature = -25 °C.
 Water temperature (in/out) = +70/+50 °C.
 The air flow is 3500 m³/h and the air speed in the heater is 4.65 m/s ①.

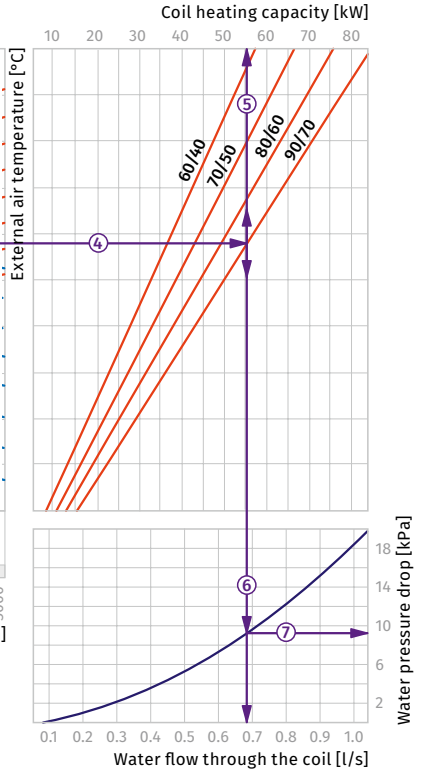
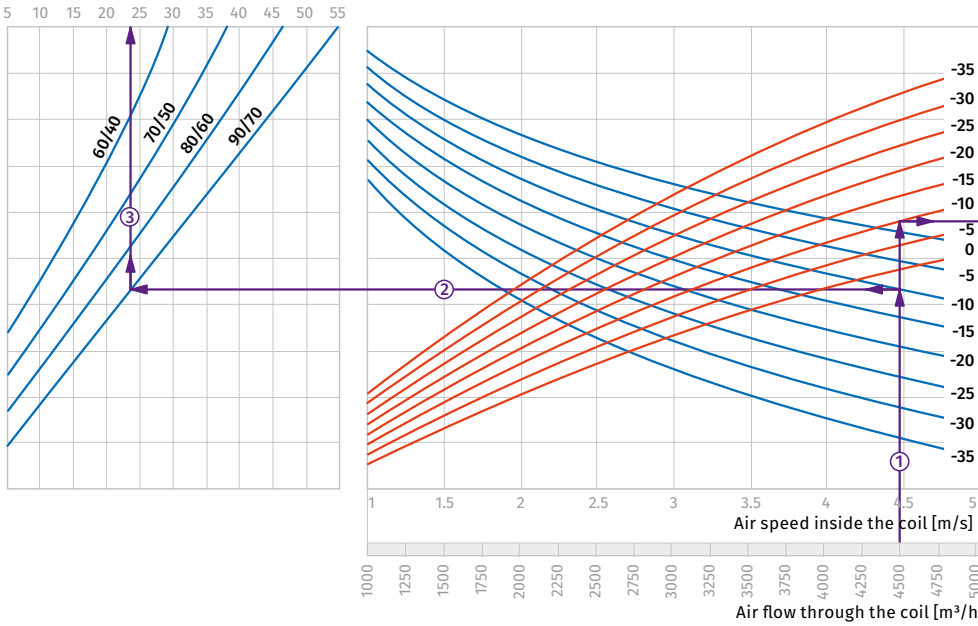
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -25 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +70/+50). From this point draw a vertical line to the supply air temperature downstream of the heater (+24 °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., -25 °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 (68.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.84 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 (18.0 kPa).

WKH 70x40-2

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 4500 m³/h.
Outside air temperature = -10 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 2500 m³/h and the air speed in the heater is 4.45 m/s ①.

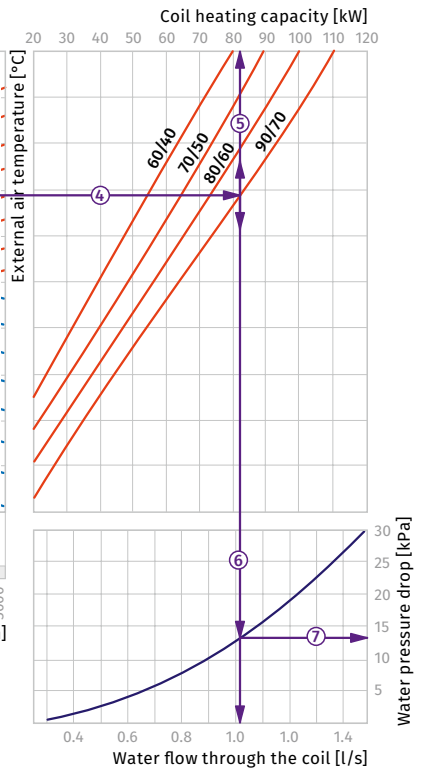
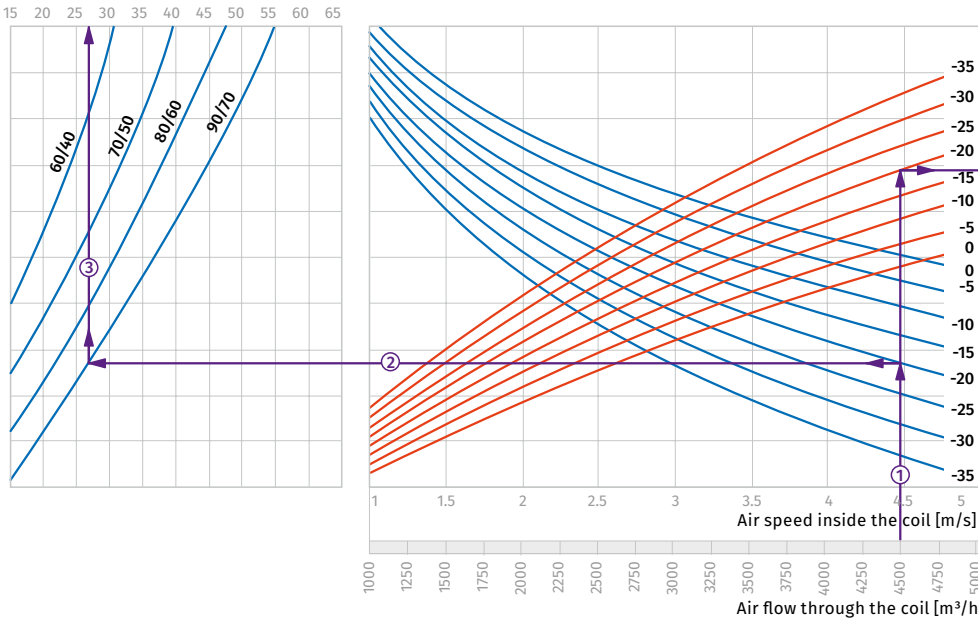
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -10 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+24 °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., -10 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (55.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.68 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 (9.2 kPa).

WKH 70x40-3

Air temperature downstream of the water heating coils [°C]



How to use water heater diagrams.

System Parameters: Air flow = 4500 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 2500 m³/h and the air speed in the heater is 4.45 m/s ①.

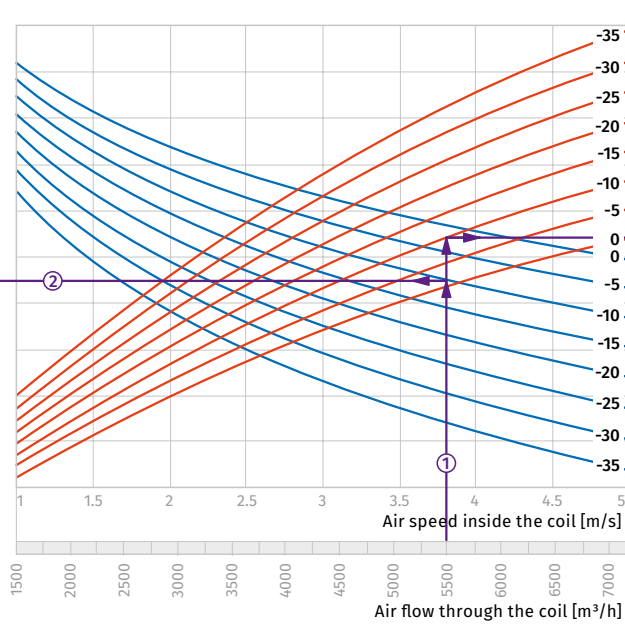
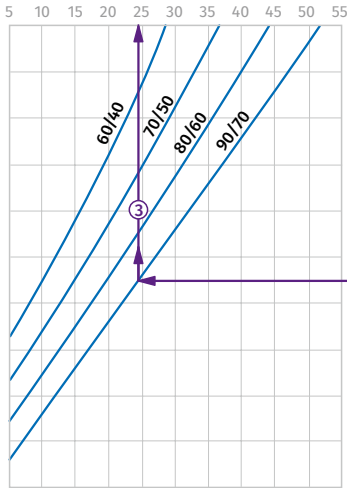
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to 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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (82.0 kW) ⑤.

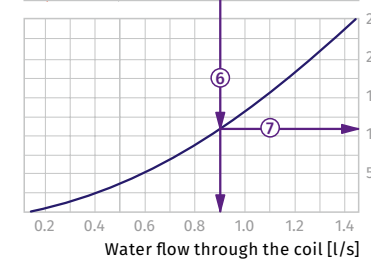
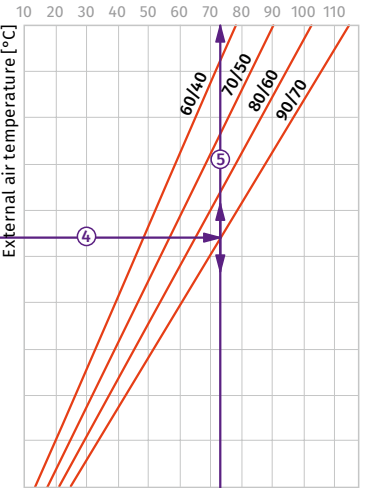
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.02 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (13.0 kPa).

WKH 80x50-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 5500 m³/h.
 Outside air temperature = -10 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 5500 m³/h and the air speed in the heater is 3.8 m/s ①.

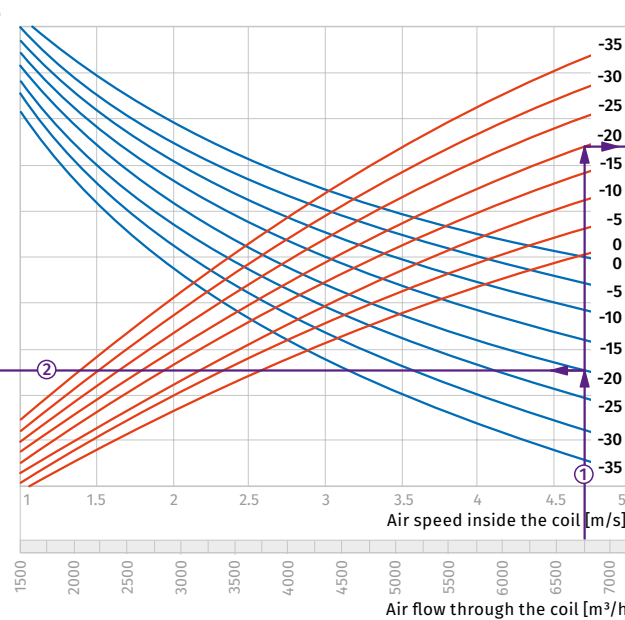
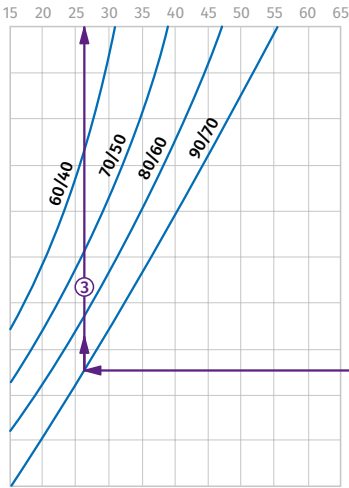
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -10 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+24.5 °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., -10 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (73.0 kW) ⑤.

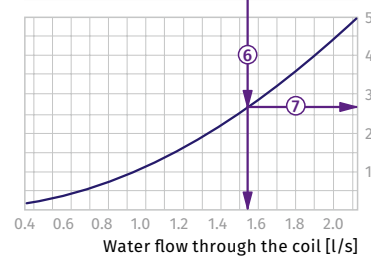
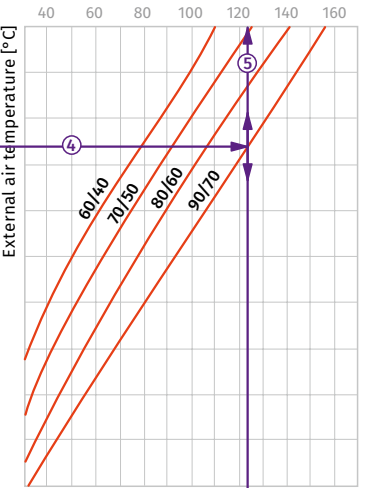
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (0.9 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (11.0 kPa).

WKH 80x50-3

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 6750 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 6750 m³/h and the air speed in the heater is 4.7 m/s ①.

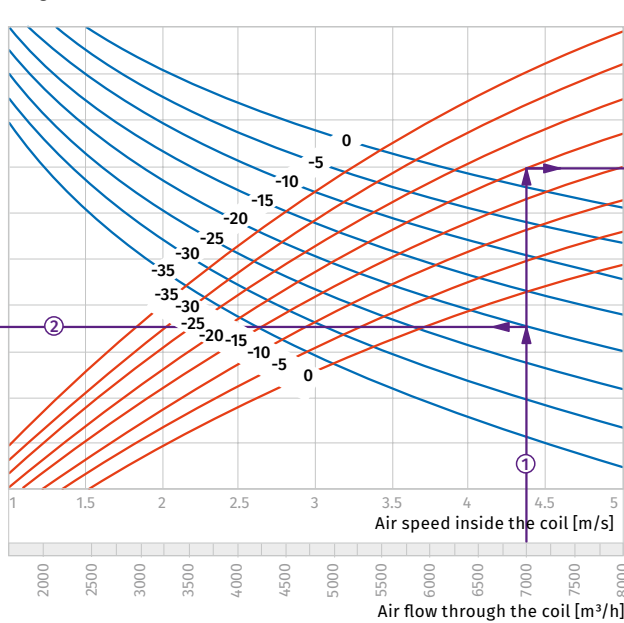
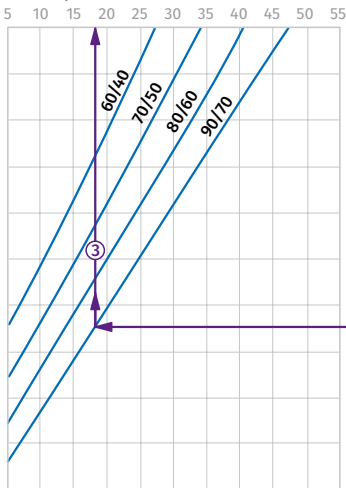
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to 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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (123.0 kW) ⑤.

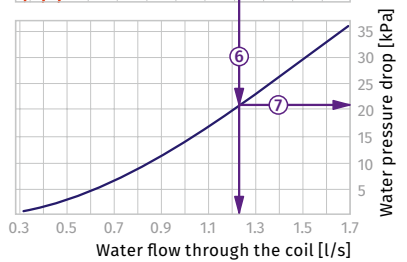
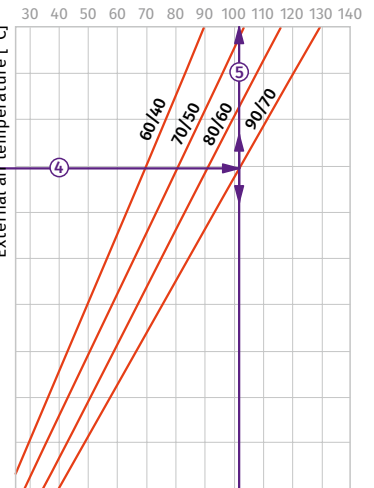
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.54 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (27.0 kPa).

WKH 90x50-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 7000 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 7000 m³/h and the air speed in the heater is 4.4 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+18 °C) ③.

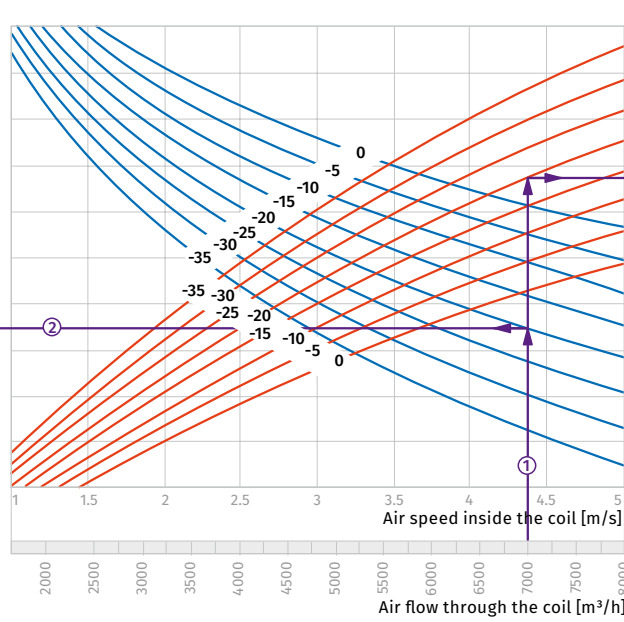
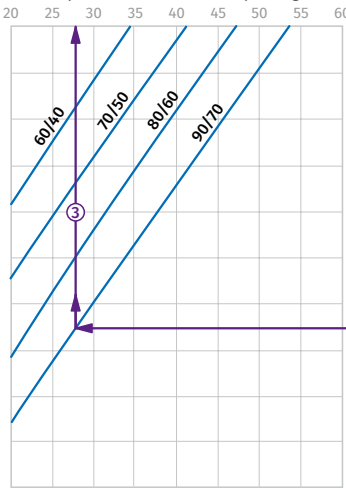
- To calculate the heater power find the intersection point of the air flow ① with the rated winter temperature shown in red line (e.g., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (102.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.23 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 (21.0 kPa).

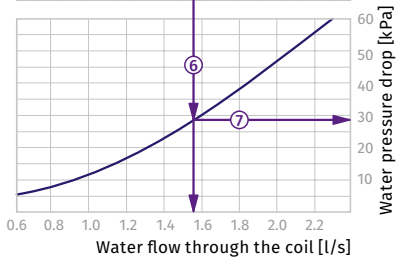
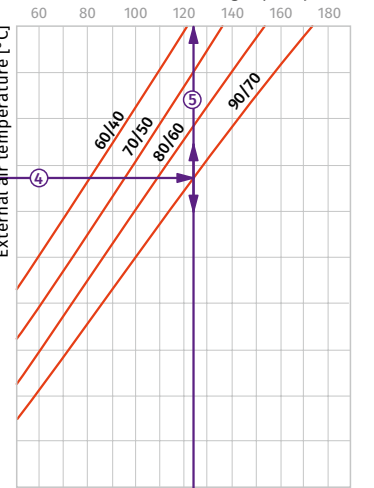
HEATERS

WKH 90x50-3

Air temperature after heater passage [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 7000 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 7000 m³/h and the air speed in the heater is 4.4 m/s ①.

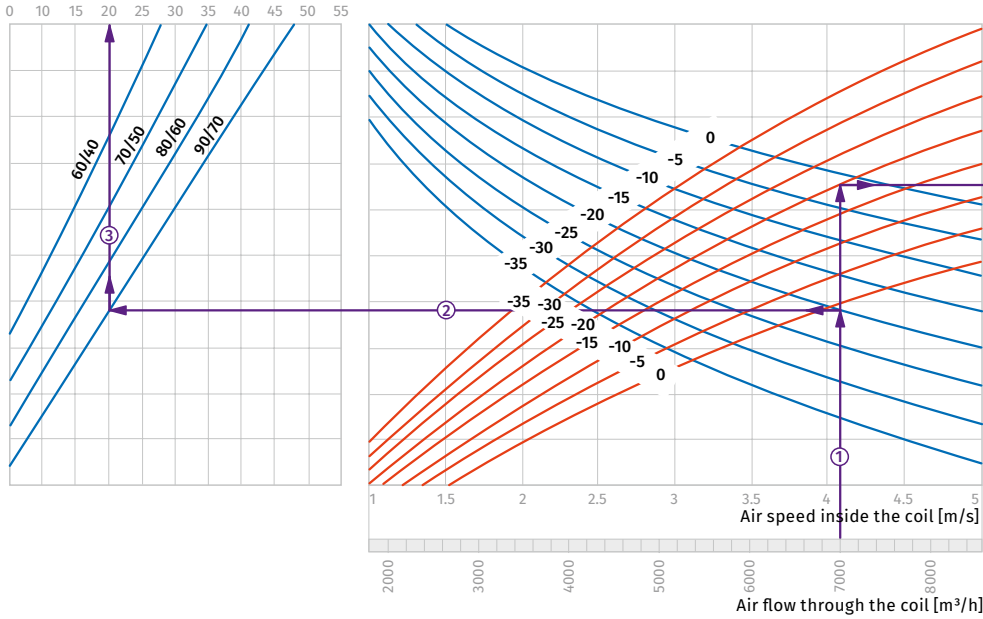
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to 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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (124.0 kW) ⑤.

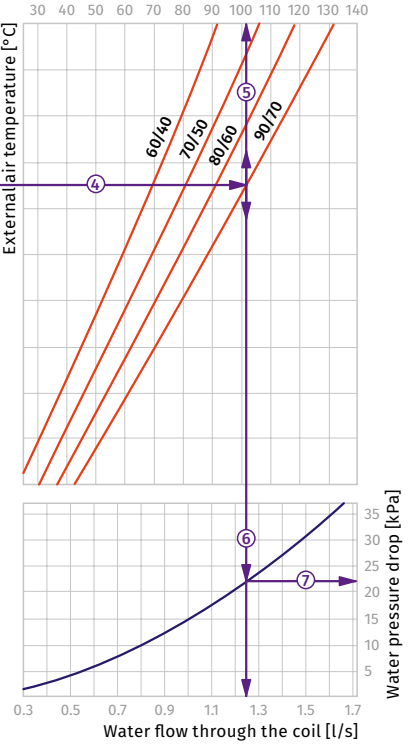
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.55 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (28.0 kPa).

WKH 100x50-2

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 7000 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 7000 m³/h and the air speed in the heater is 4.1 m/s ①.

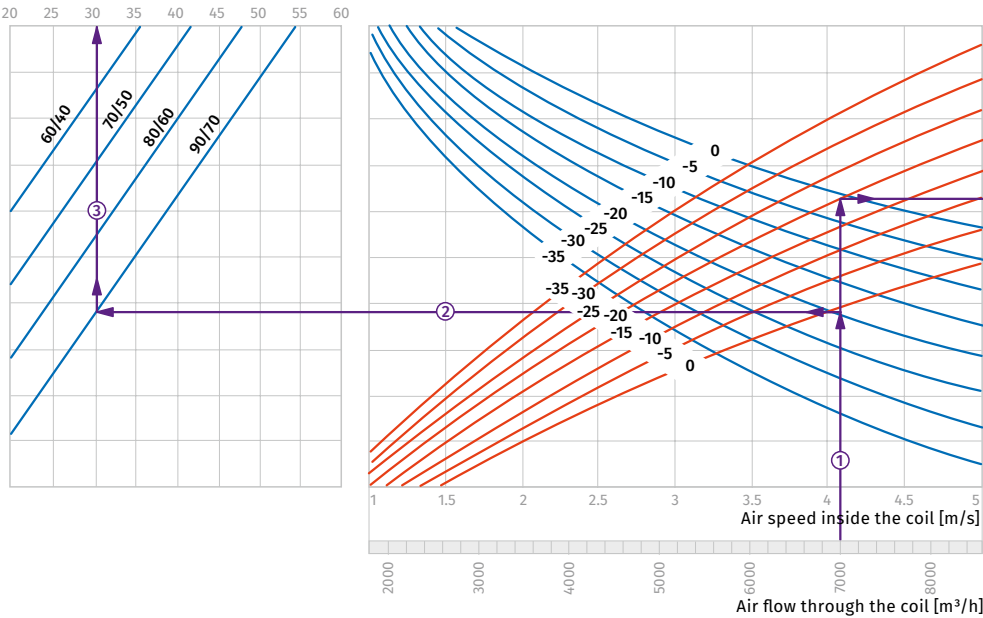
- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+20 °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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (101.0 kW) ⑤.

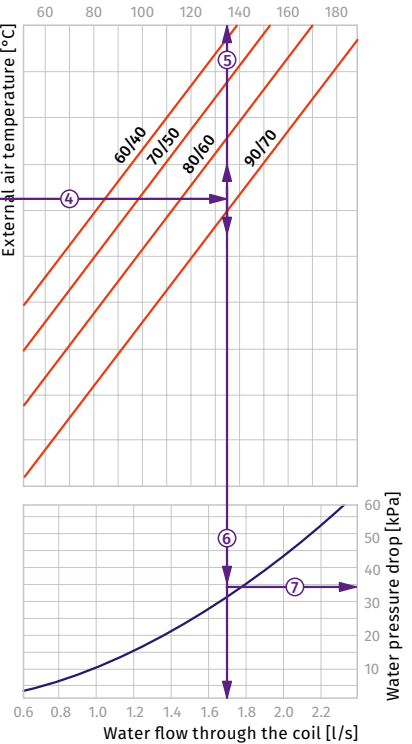
- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.25 l/s).
- To calculate the water pressure drop in the heater find the intersection point of the line ⑥ with the pressure loss curve and prolong the line ⑦ to the right on the water pressure drop axis (22.0 kPa).

WKH 100x50-3

Air temperature downstream of the water heating coils [°C]



Coil heating capacity [kW]



How to use water heater diagrams.

System Parameters: Air flow = 7000 m³/h.
 Outside air temperature = -20 °C.
 Water temperature (in/out) = +90/+70 °C.
 The air flow is 7000 m³/h and the air speed in the heater is 4.1 m/s ①.

- To calculate the maximum air temperature find the intersection point of the air flow line ① with the rated outer temperature shown in blue line (e.g., -20 °C) and draw the line ② to the left until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the supply air temperature downstream of the heater (+30 °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., -20 °C) and draw the line ④ to the right until it crosses the water in/out temperature curve (e.g., +90/+70). From this point draw a vertical line to the heater power axis (135.0 kW) ⑤.

- To calculate the required water flow in the heater prolong this line ⑥ downwards to the water flow axis (1.7 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 (34.0 kPa).

KWK

Duct water cooling units for rectangular air ducts

Features

- Supply air cooling for ventilation systems in various premises.
- Suitable for installation into supply ventilation or into air handling units to provide air cooling.



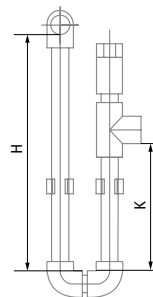
Design

- Galvanized steel casing.
- The cooling elements are made of copper tubes and aluminum plates.
- Available in three-coil modifications and rated for maximum operating pressure 1.5 MPa (15 bar).
- Polypropylene droplet separator and drain pan for condensate drainage and removal included.
- Droplet separator is efficient at an air flow not exceeding 4 m/s.

Mounting

- Only horizontal mounting by means of flanged connection. Air evacuation and condensate drainage must be provided.
- Air filter installation upstream of the cooling unit to prevent the unit soiling.
- Installation position must ensure uniform air flow distribution in the section.
- Mounting upstream or downstream of the supply fan. The minimum air duct length downstream of the fan must be 1-1.5 m to ensure air flow stabilization.
- The maximum cooling capacity is attained if the cooling unit is connected on counter-flow basis. The attached charts are valid for counter-flow connection.
- If water is used as a cooling agent, the cooling unit is suitable for indoor use only with the ambient temperature not below 0 °C.
- If antifreezing solution, for example, ethylene glycol solution, is used as a cooling agent, the cooling unit is suitable for outdoor use as well.

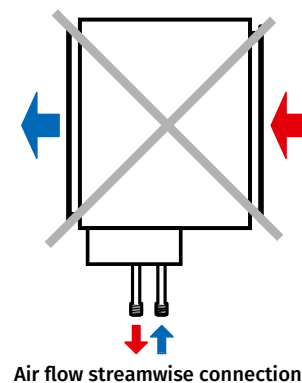
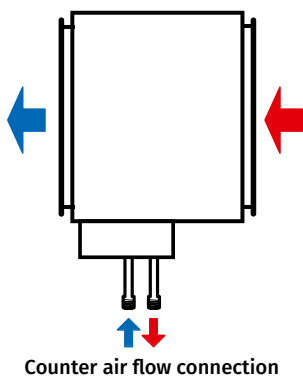
- While mounting the cooling unit provide condensate drainage through the U-trap. The U-trap height must be selected with respect to the total fan pressure, refer to the table and diagram below.



H [mm]	K [mm]	P [Pa]
100	55	600
200	105	1100
260	140	1400

H – U-trap height
K – drain height
P – total fan pressure

- For a proper and safe operation of the cooling unit it should be connected to a control system for integral control and automatic cooling capacity regulation.

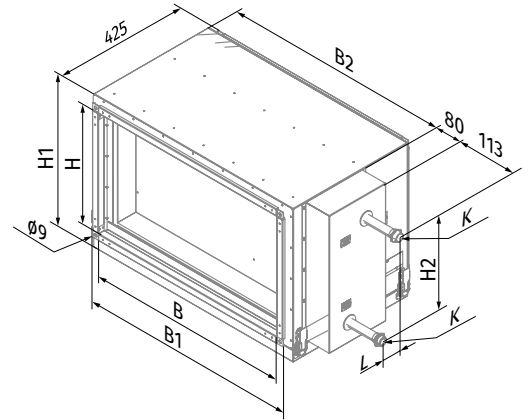


Designation key

Serie	Flange size (WxH) [cm]	Number of water (glycol) coil rows
KWK	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50	- 3

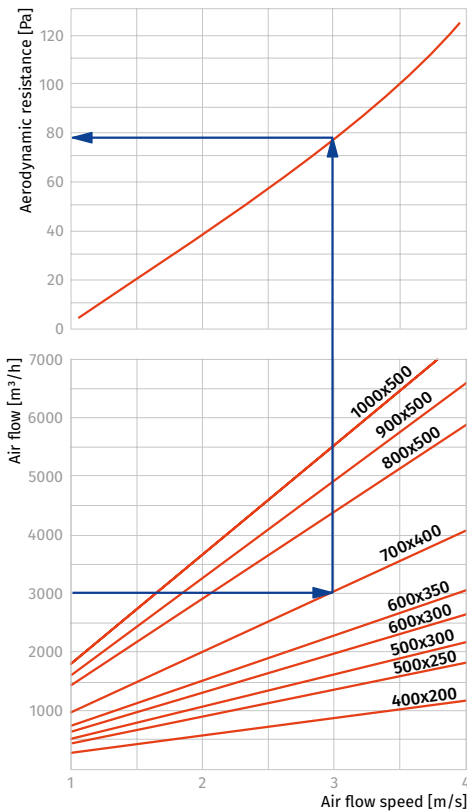
Overall dimensions [mm]

Model	B	B1	B2	H	H1	H2	L	K
KWK 40x20-3	400	440	470	200	295	124	56	G 3/4"
KWK 50x25-3	500	540	570	250	345	188	45	G 3/4"
KWK 50x30-3	500	540	570	300	395	252	56	G 3/4"
KWK 60x30-3	600	640	670	300	395	252	56	G 3/4"
KWK 60x35-3	600	640	670	350	445	268	56	G 3/4"
KWK 70x40-3	700	740	770	400	495	314	56	G 3/4"
KWK 80x50-3	800	840	870	500	595	442	56	G 3/4"
KWK 90x50-3	900	940	970	500	595	442	56	G 3/4"
KWK 100x50-3	1000	1040	1070	500	595	442	56	G 1"



KWK

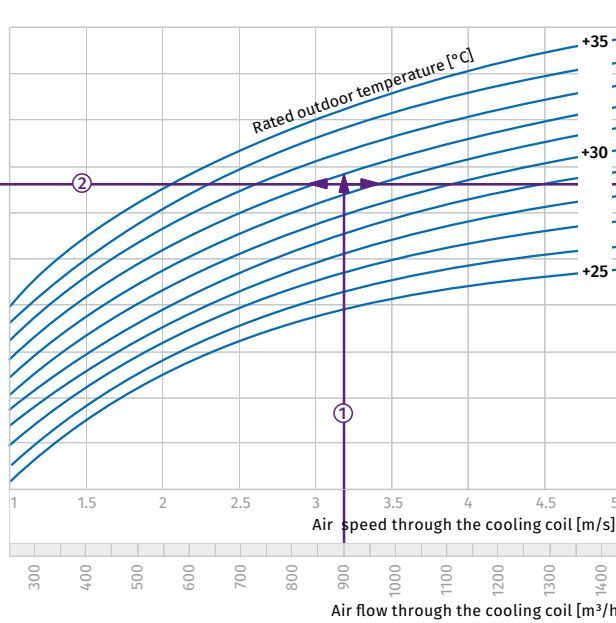
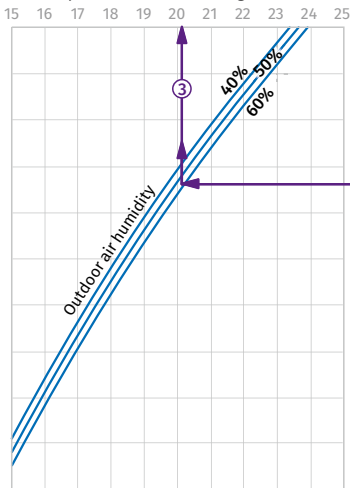
Pressure losses in water cooling coils



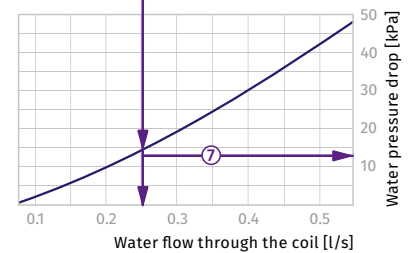
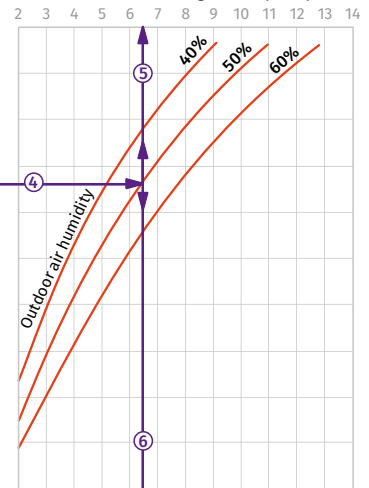
DX cooling unit calculation diagram

KWK 40x20-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 900 m³/h and the air speed in the cooling unit is 3.2 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.1 °C) ③.

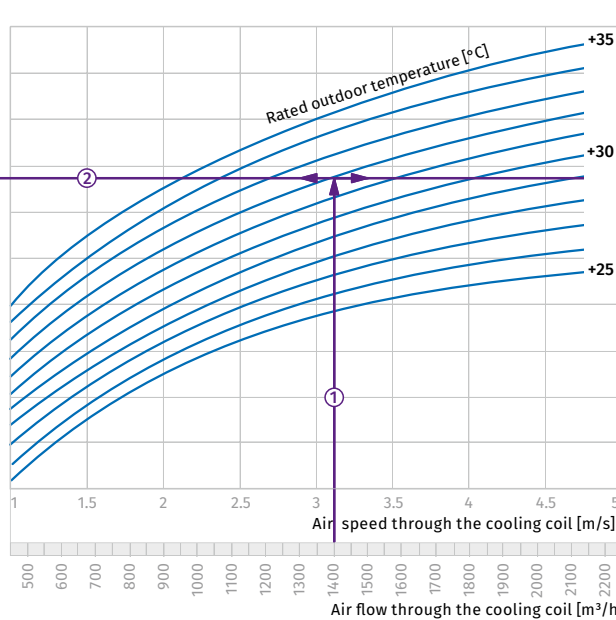
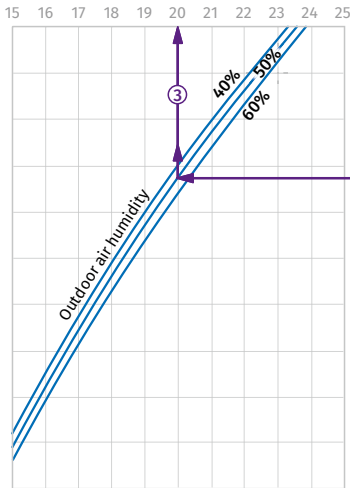
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (6.5 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (0.26 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (15.0 kPa).

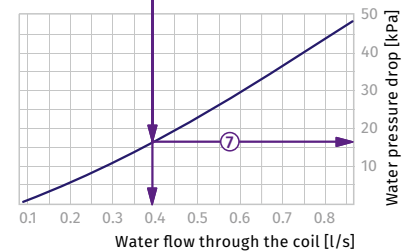
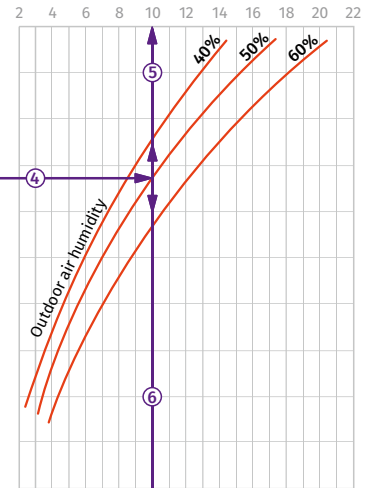
COOLERS

KWK 50x25-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

Sample parameters: Air flow = 1400 m³/h
The air flow is 1400 m³/h and the air speed in the cooling unit is 3.1 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20 °C) ③.

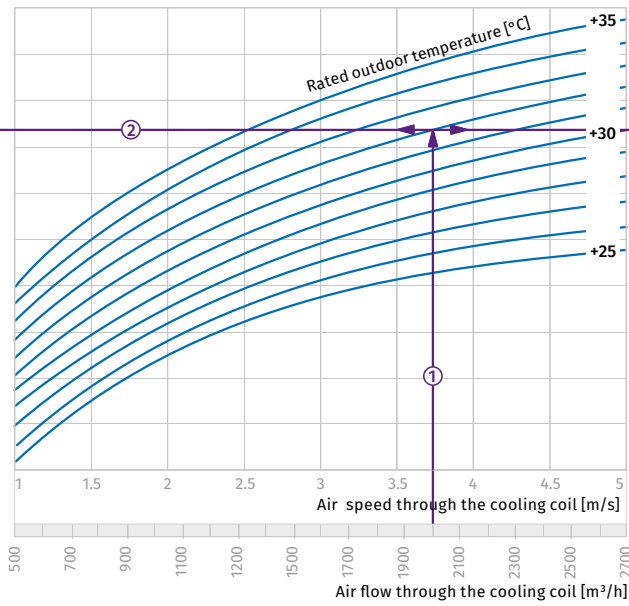
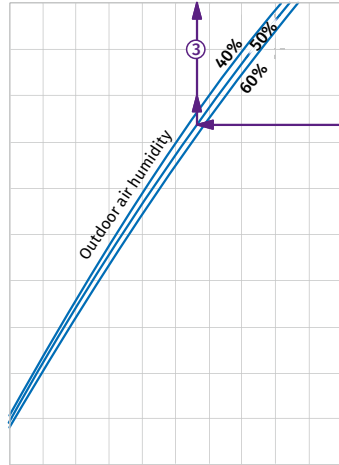
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (10.0 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (0.4 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (17.0 kPa).

KWK 50x30-3

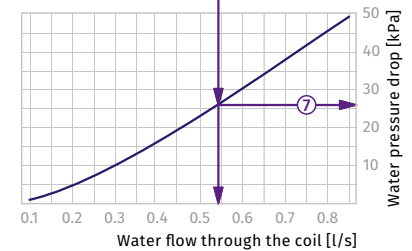
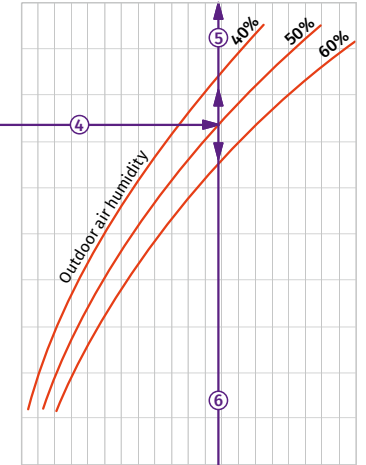
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

2 4 6 8 10 12 14 16 18 20 22



How to use water heater diagrams.

Sample parameters: Air flow = 2000 m³/h

The air flow is 2000 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.6 °C) ③.

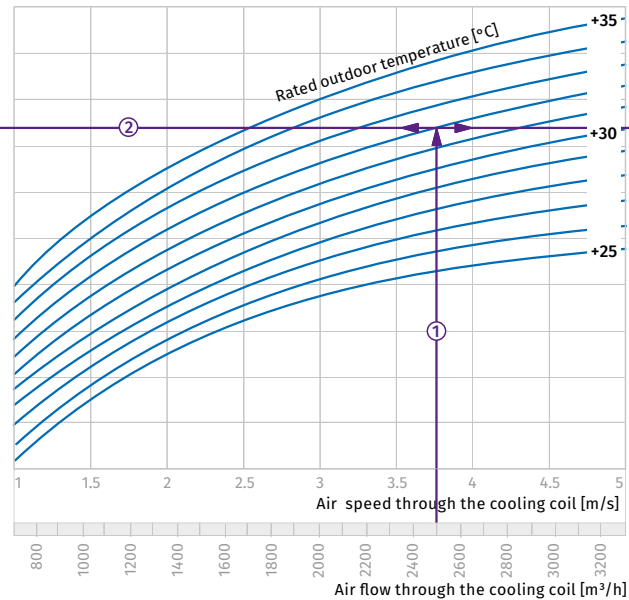
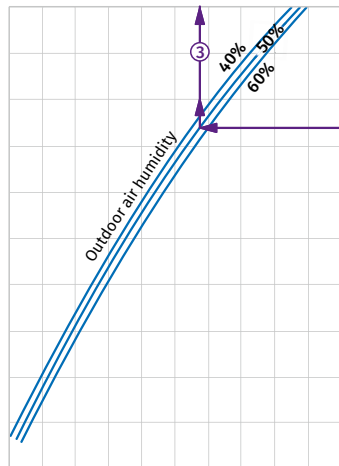
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (13.6 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (0.54 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (27.0 kPa).

KWK 60x30-3

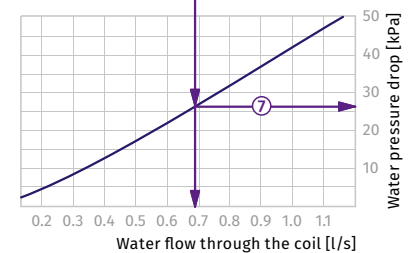
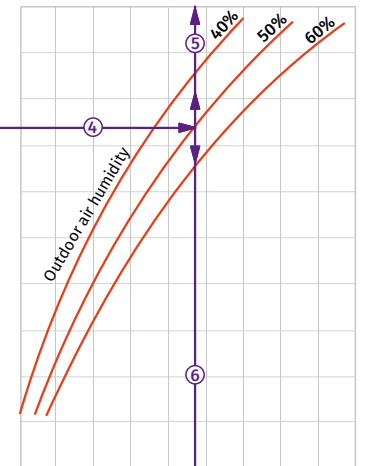
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

3 6 9 12 15 18 21 24 27 30



How to use water heater diagrams.

Sample parameters: Air flow = 2500 m³/h

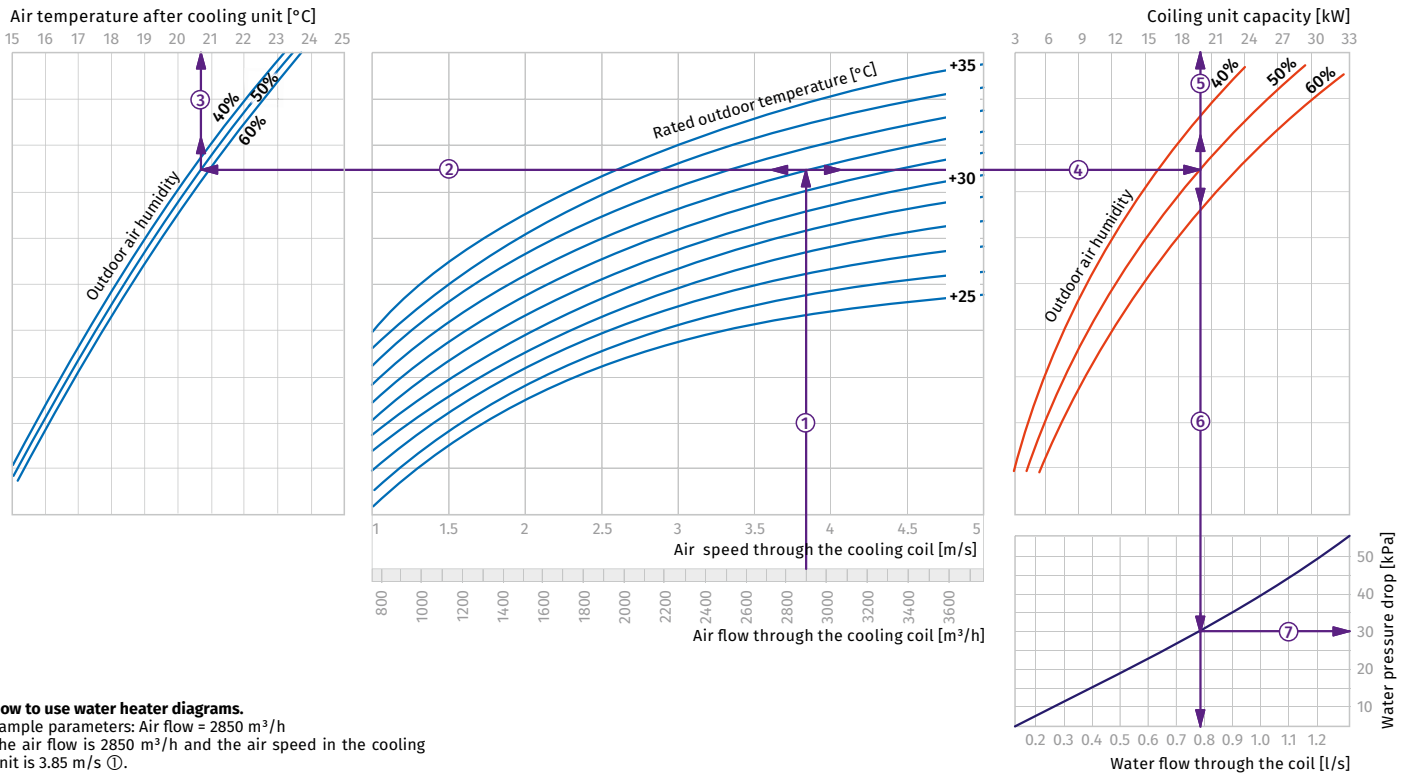
The air flow is 2500 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.7 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (17.0 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (0.68 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (27.0 kPa).

KWK 60x35-3



How to use water heater diagrams.

Sample parameters: Air flow = 2850 m³/h
The air flow is 2850 m³/h and the air speed in the cooling unit is 3.85 m/s ①.

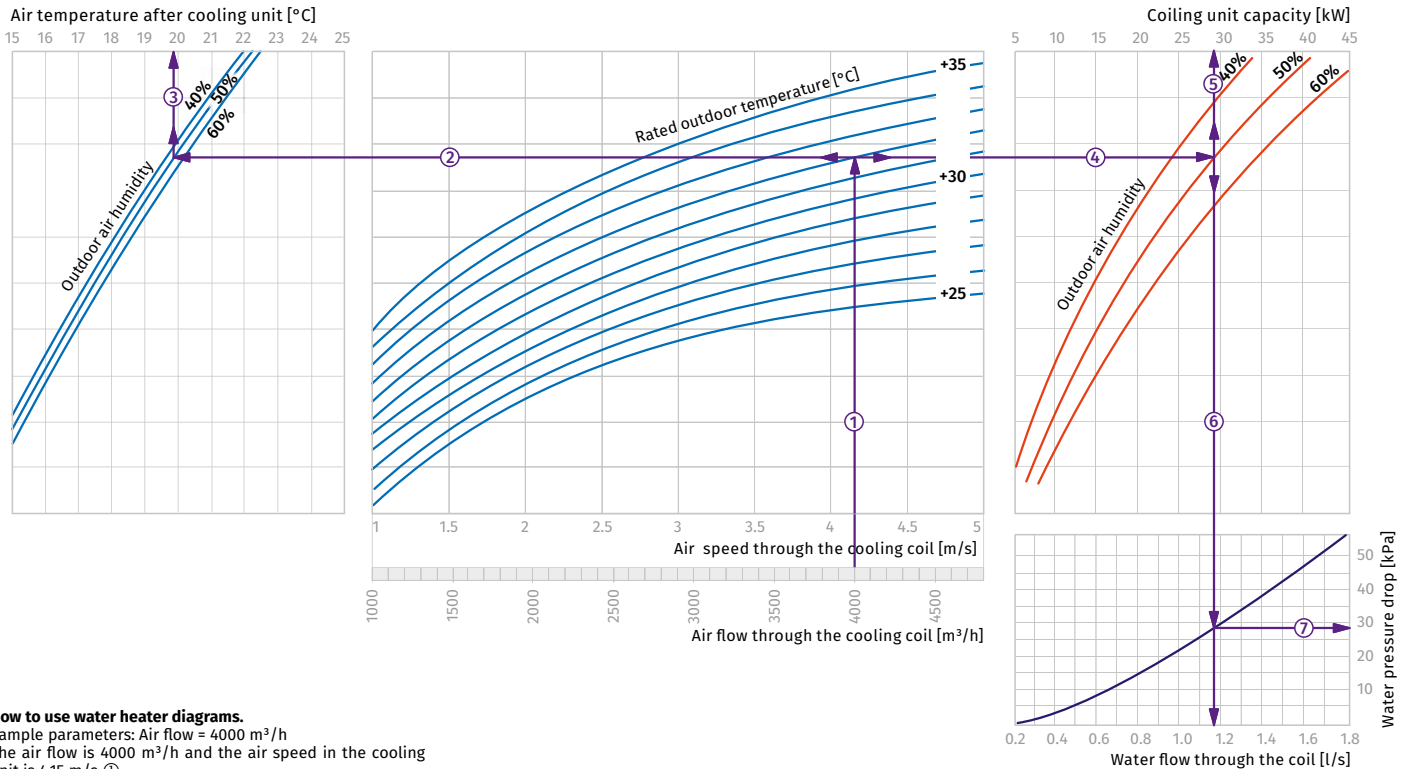
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.7 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (19.8 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (0.78 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (30 kPa).

COOLERS

KWK 70x40-3



How to use water heater diagrams.

Sample parameters: Air flow = 4000 m³/h
The air flow is 4000 m³/h and the air speed in the cooling unit is 4.15 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.8 °C) ③.

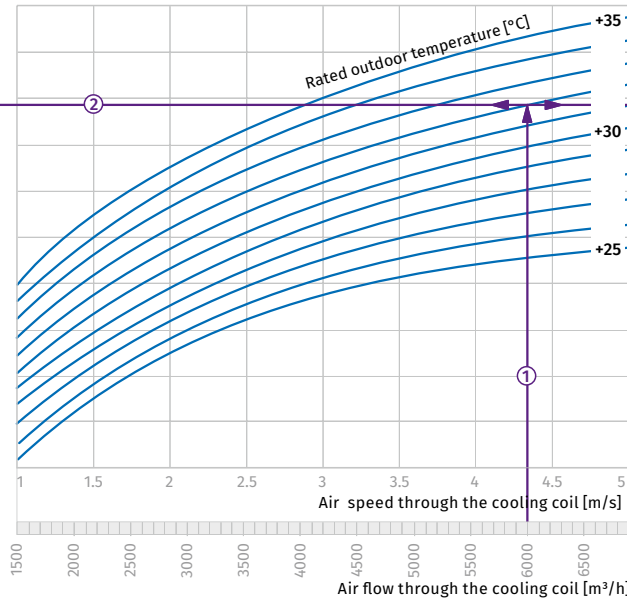
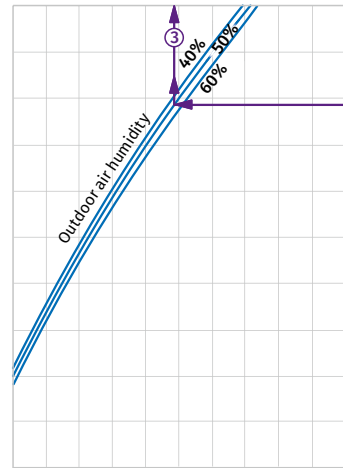
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (28.5 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (1.14 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (28 kPa).

KWK 80x50-3

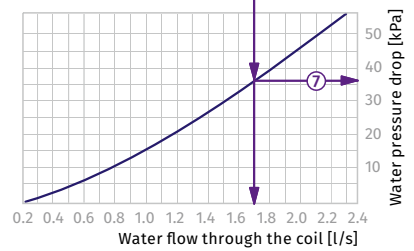
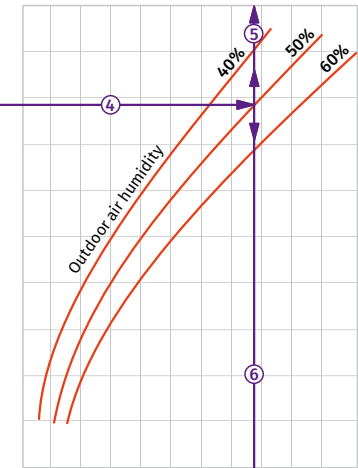
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

5 10 15 20 25 30 35 40 45 50 55 60



How to use water heater diagrams.

Sample parameters: Air flow = 6000 m³/h
The air flow is 6000 m³/h and the air speed in the cooling unit is 4.35 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.9 °C) ③.

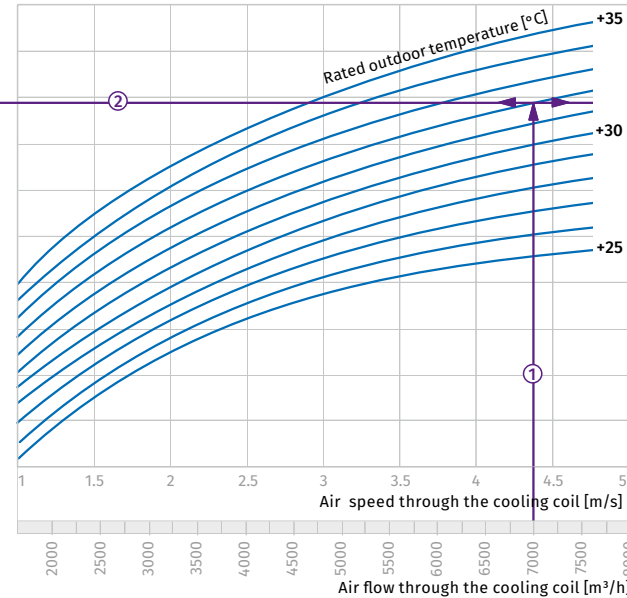
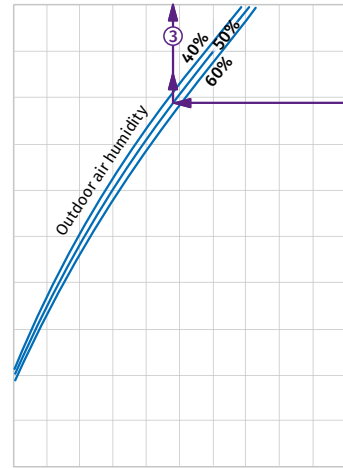
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (43 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (1.7 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (36 kPa).

KWK 90x50-3

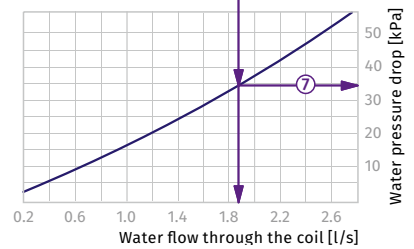
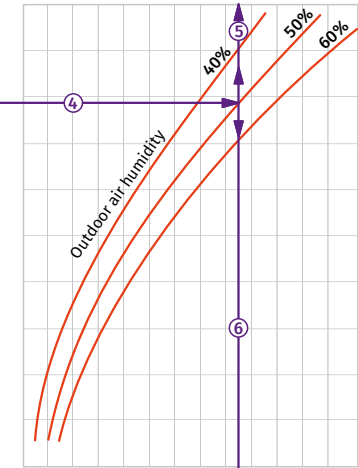
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

10 20 30 40 50 60 70



How to use water heater diagrams.

Sample parameters: Air flow = 7000 m³/h
The air flow is 7000 m³/h and the air speed in the cooling unit is 4.4 m/s ①.

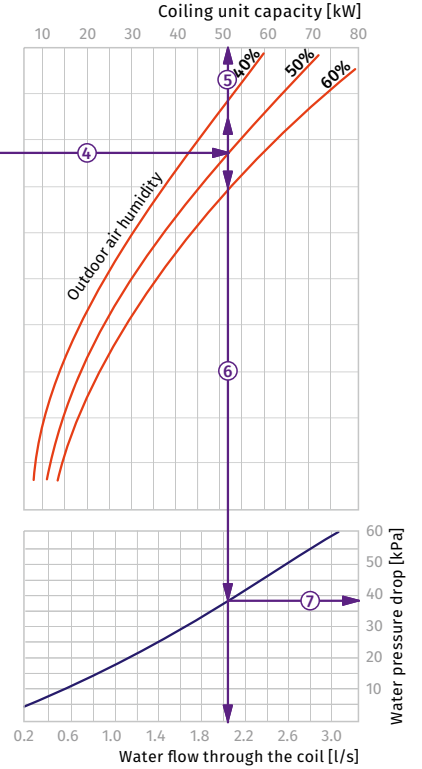
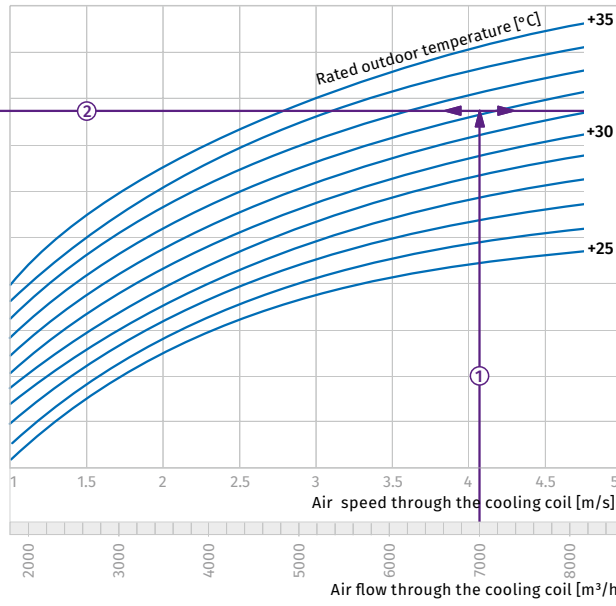
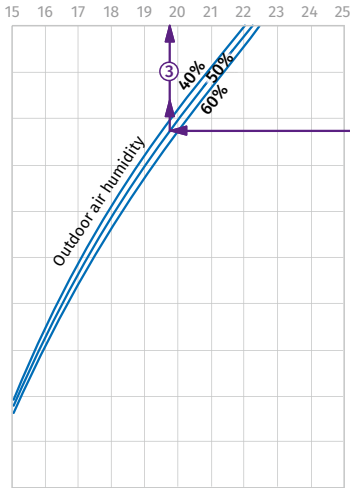
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.7 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (47 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (1.9 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (34 kPa).

KWK 100x50-3

Air temperature after cooling unit [°C]



How to use water heater diagrams.

Sample parameters: Air flow = 7000 m³/h

The air flow is 7000 m³/h and the air speed in the cooling unit is 4.1 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.6 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (52 kW) ⑤.

- To calculate the required water flow in the cooling unit prolong this line ⑥ downwards to the water flow axis (2.05 l/s).
- To calculate the water pressure drop in the cooling unit 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 axis (37 kPa).

KFK

Duct DX cooling units for rectangular air ducts

Features

- Supply air cooling for ventilation systems in various premises.
- Suitable for installation into supply or air handling units to provide air cooling.

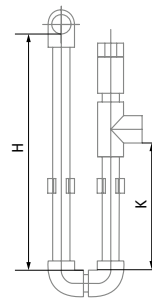


Design

- Galvanized steel casing.
- The cooling elements are made of copper tubes and aluminum plates.
- Available in three-coil modifications and rated for operation with R123, R134a, R152a, R404a, R407c, R410a, R507, R12, R22 refrigerants.
- Polypropylene droplet separator and drain pan for condensate drainage and removal included.
- Droplet separator operates efficiently at air flow below 4 m/s.

Mounting

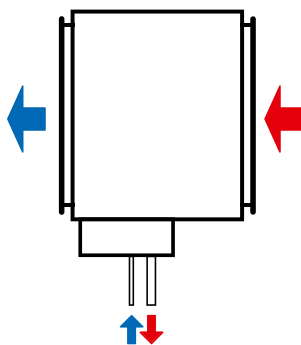
- Only horizontal mounting by means of flanged connection. Condensate drainage must be provided.
- Air filter must be installed upstream of the cooling unit to prevent the unit soiling.
- Mounting position must ensure uniform air flow distribution through the entire cross section.
- Installation upstream or downstream of the supply fan. The minimum air duct length downstream of the fan must be 1-1.5 m to ensure air flow stabilization.
- The maximum cooling capacity is attained if the cooling unit is connected on counter-flow basis. The attached charts are valid for counter-flow connection.
- While mounting the cooling unit provide condensate drainage through the U-trap. The U-trap height must be selected with respect to the total fan pressure, refer to the table and diagram below.



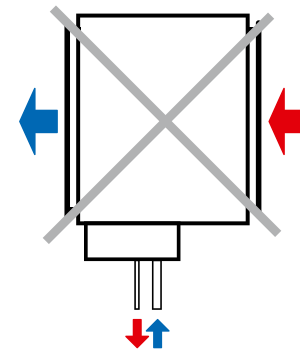
H [mm]	K [mm]	P [Pa]
100	55	600
200	105	1100
260	140	1400

H – U-trap height
K – drainage height
P – total fan pressure

- For a proper and safe operation of the cooling unit it should be connected to a control system for integral control and automatic cooling capacity regulation.



Counter air flow connection



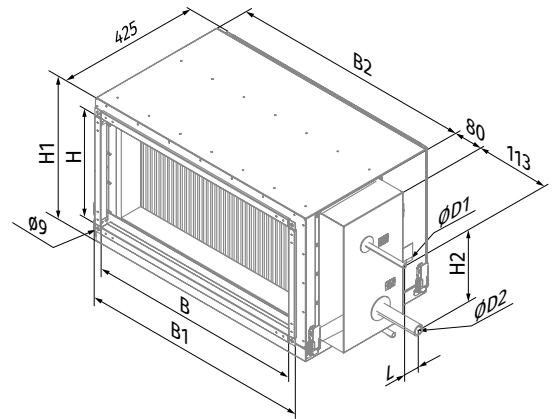
Air flow streamwise connection

Designation key

Serie	Flange size (WxH) [cm]	Number of water (glycol) coil rows
KFK	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50	- 3

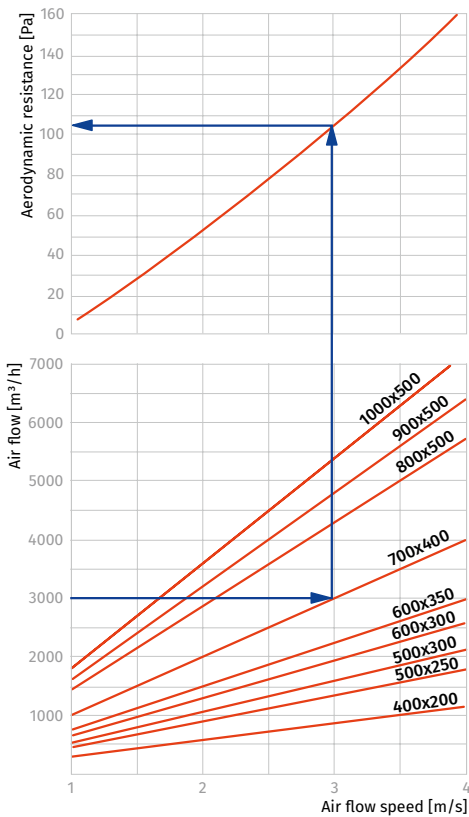
Overall dimensions [mm]

Model	D	D1	B	B1	B2	H	H1	H2	L
KFK 40x20-3	12	22	400	440	470	200	295	103	44
KFK 50x25-3	12	22	500	540	570	250	345	155	44
KFK 50x30-3	12	22	500	540	570	300	395	210	33
KFK 60x30-3	18	28	600	640	670	300	395	199	44
KFK 60x35-3	18	28	600	640	670	350	445	199	44
KFK 70x40-3	22	28	700	740	770	400	495	224	44
KFK 80x50-3	22	28	800	840	870	500	595	340	44
KFK 90x50-3	22	28	900	940	970	500	595	340	44
KFK 100x50-3	22	28	1000	1040	1070	500	595	325	44



KFK

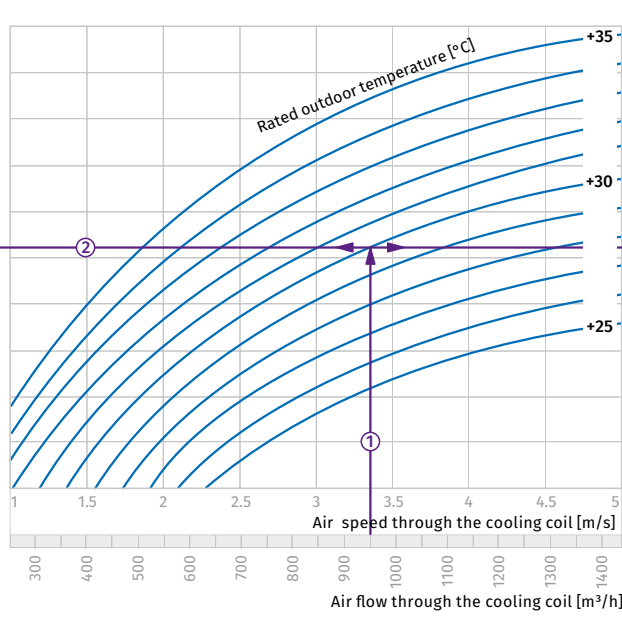
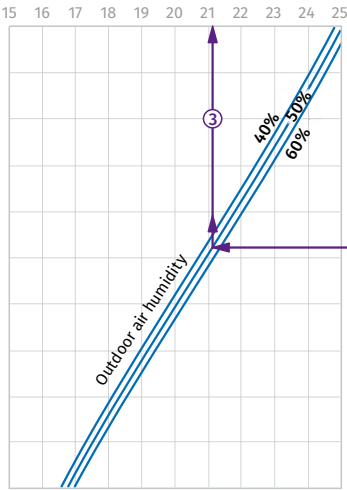
Air pressure losses in DX cooling coils



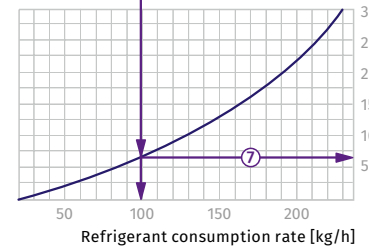
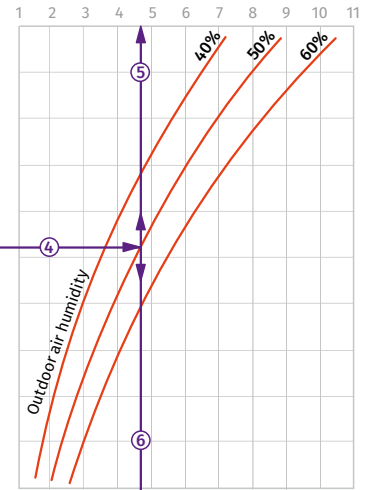
Water cooling unit calculation diagram

KFK 40x20-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 900 m³/h and the air speed in the cooling unit is 3.2 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50%). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.1 °C) ③.

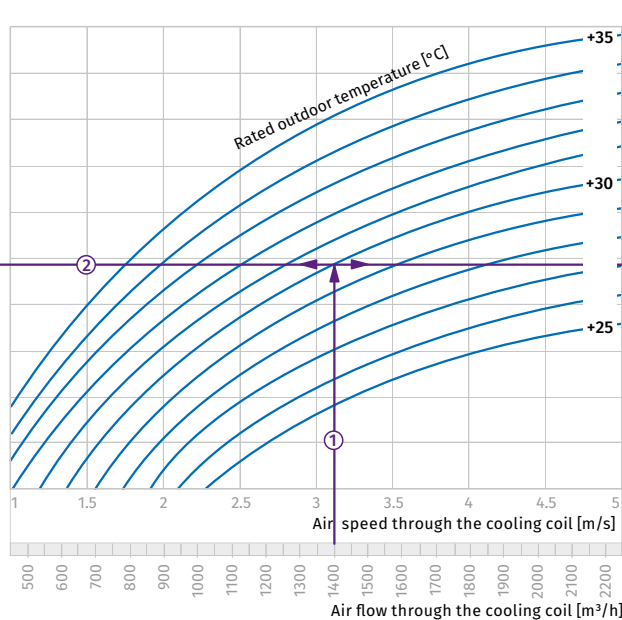
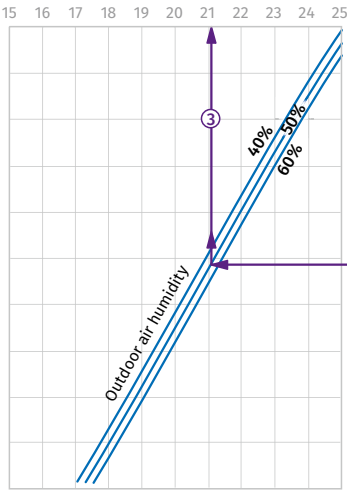
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (6.5 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (100 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (6.5 kPa).

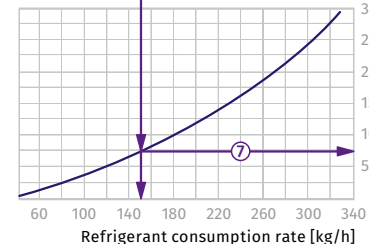
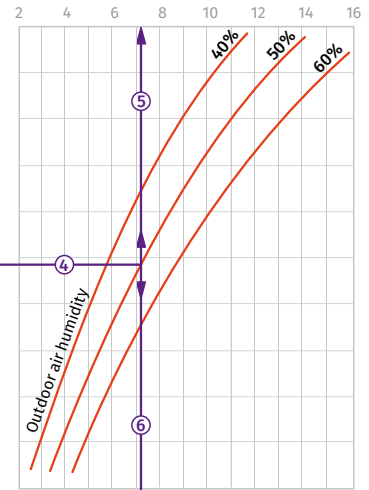
COOLERS

KFK 50x25-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 1400 m³/h and the air speed in the cooling unit is 3.1 m/s ①.

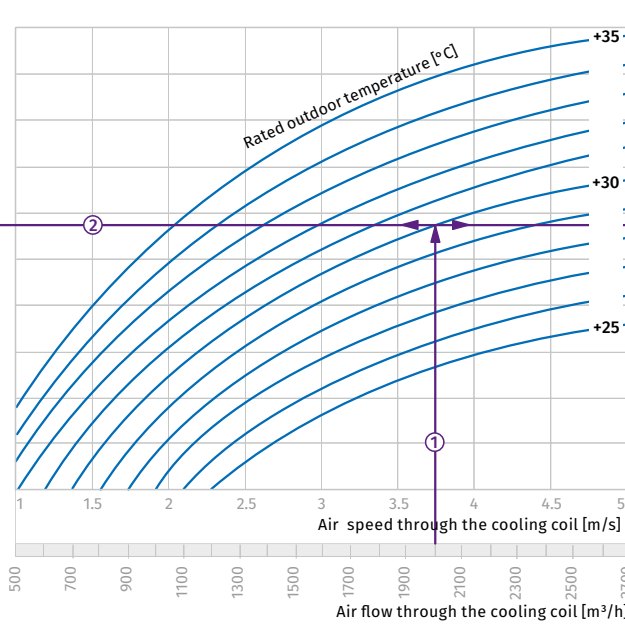
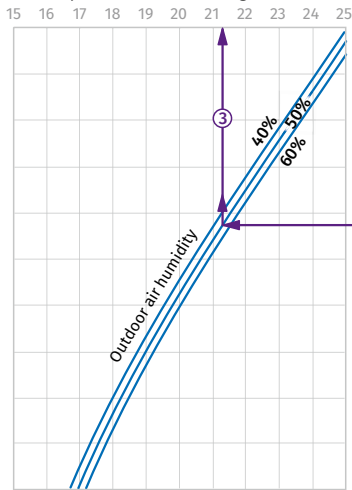
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outdoor summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50%). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (10.0 kW) ⑤.

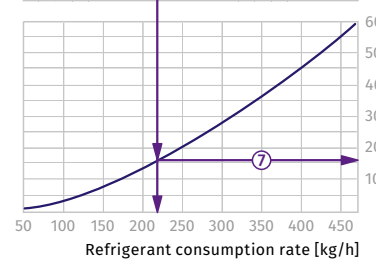
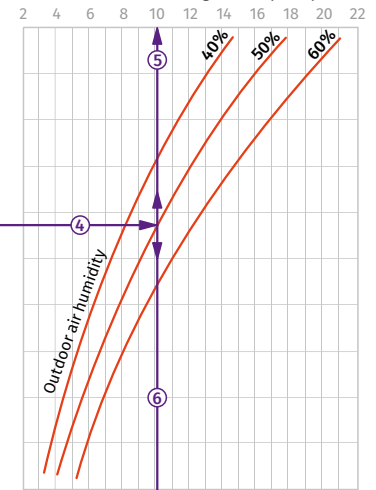
- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (152 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (7.5 kPa).

KFK 50x30-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 2000 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

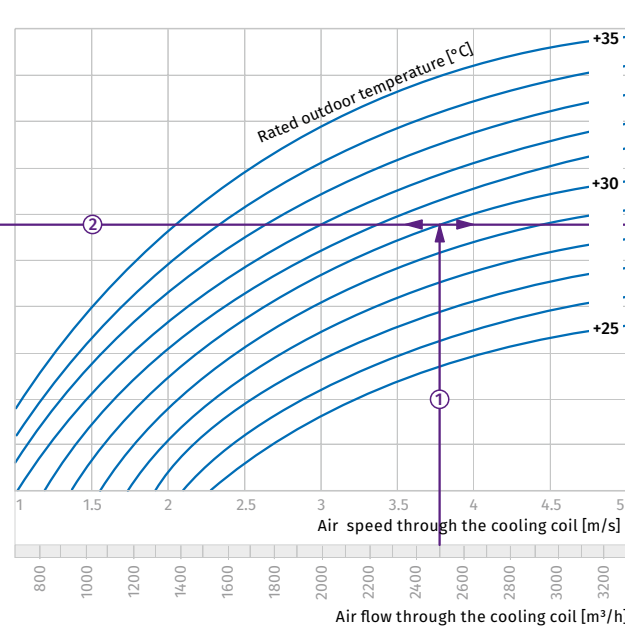
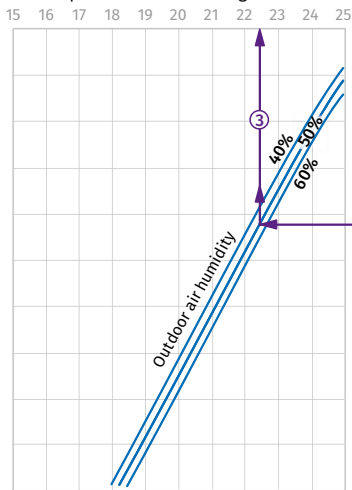
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50%). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.6 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50%). From this point draw a vertical line to the cooling unit power axis (13.6 kW) ⑤.

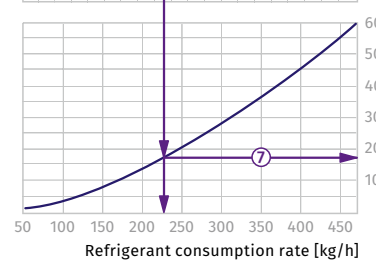
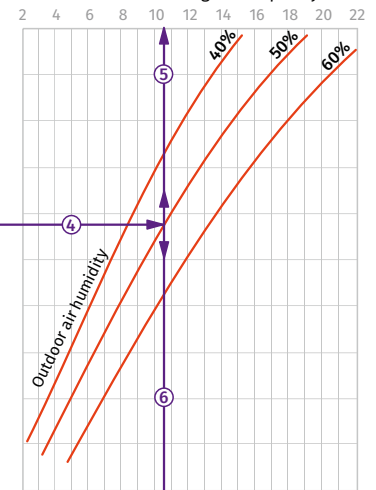
- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (215 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (16.0 kPa).

KFK 60x30-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 2500 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

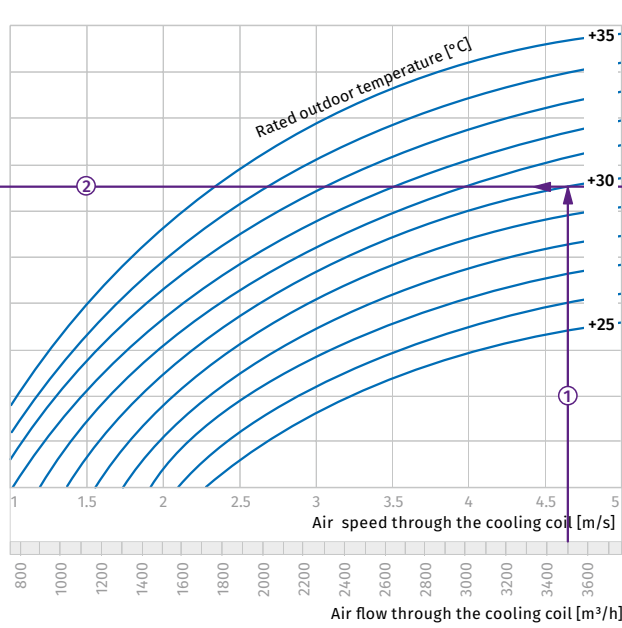
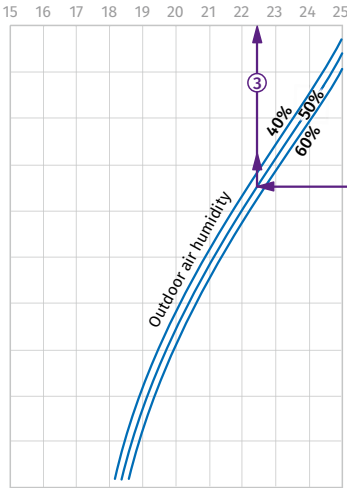
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50%). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.7 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50%). From this point draw a vertical line to the cooling unit power axis (17.0 kW) ⑤.

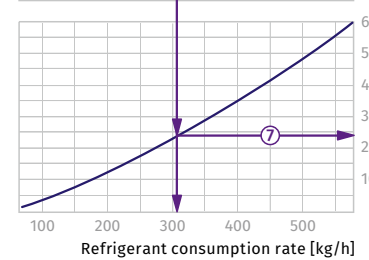
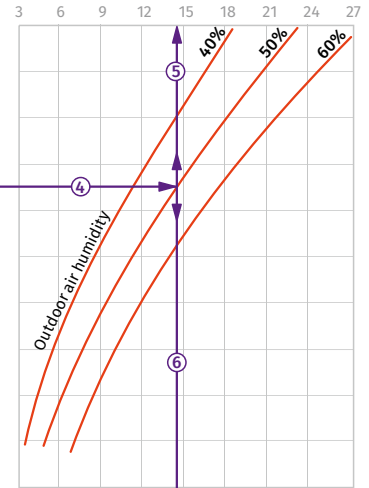
- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (225 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (17 kPa).

KFK 60x35-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 2850 m³/h and the air speed in the cooling unit is 3.85 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+20.7 °C) ③.

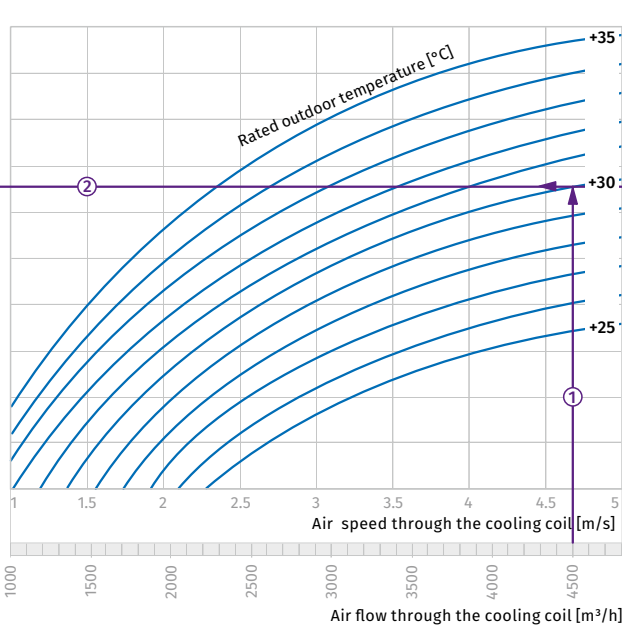
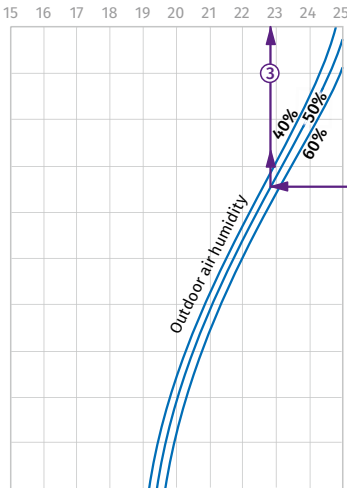
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (19.8 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (310 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (24.0 kPa).

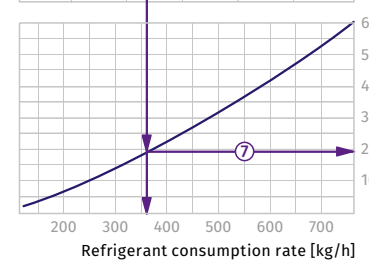
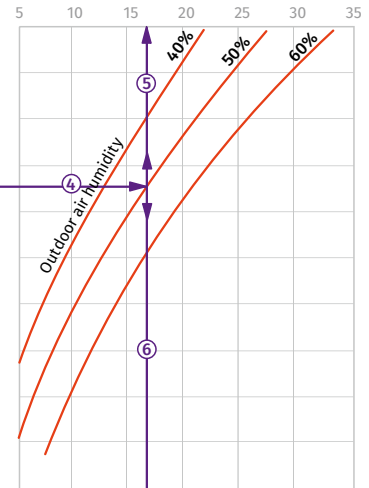
COOLERS

KFK 70x40-3

Air temperature after cooling unit [°C]



Coiling unit capacity [kW]



How to use water heater diagrams.

The air flow is 4000 m³/h and the air speed in the cooling unit is 4.15 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.8 °C) ③.

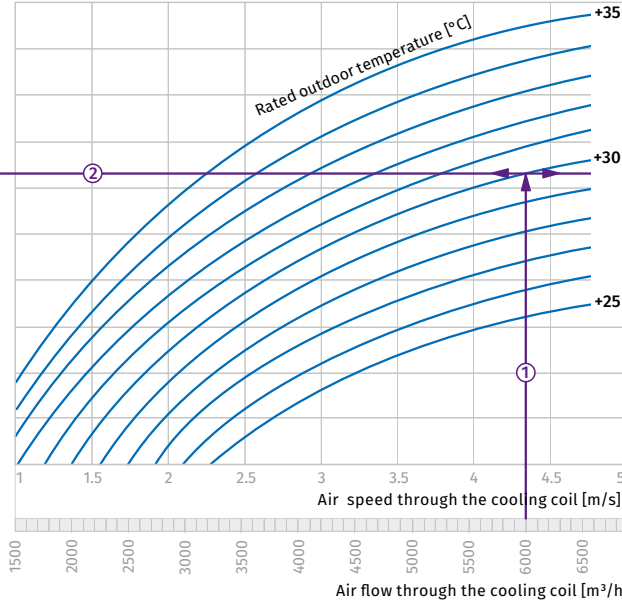
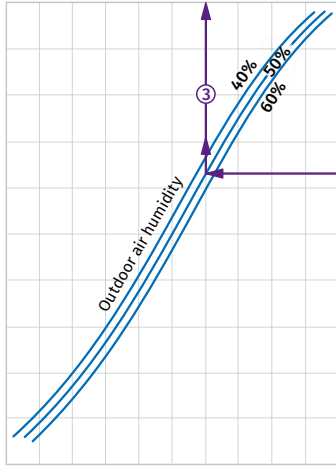
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (28.5 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (360kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (19.0 kPa).

KFK 80x50-3

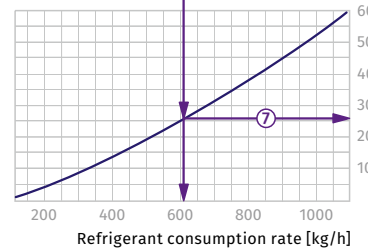
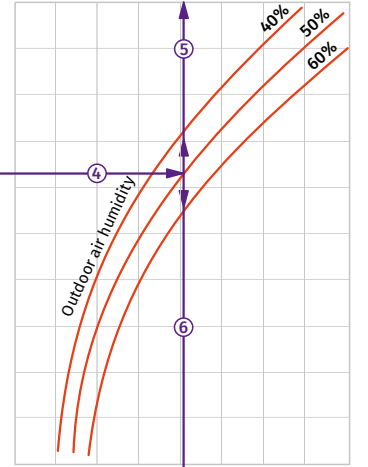
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

5 10 15 20 25 30 35 40 45



How to use water heater diagrams.

The air flow is 6000 m³/h and the air speed in the cooling unit is 4.35 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.9 °C) ③.

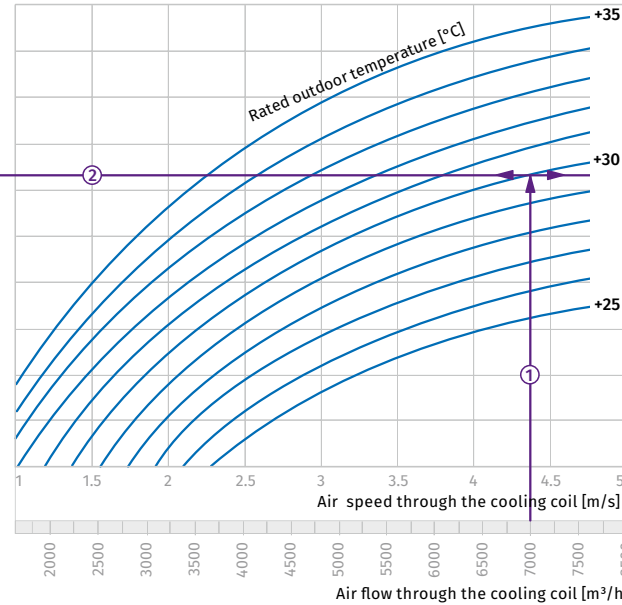
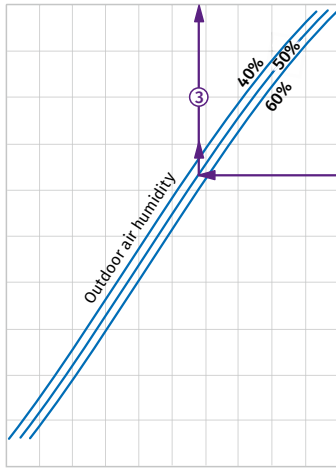
- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (43 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (605 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (26.0 kPa).

KFK 90x50-3

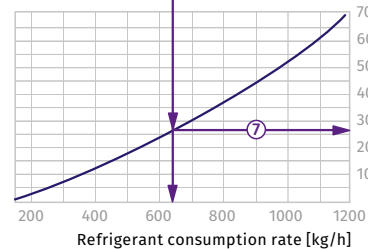
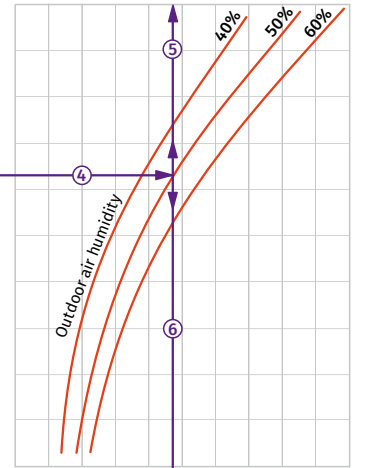
Air temperature after cooling unit [°C]

15 16 17 18 19 20 21 22 23 24 25



Coiling unit capacity [kW]

5 10 15 20 25 30 35 40 45 50 55



How to use water heater diagrams.

The air flow is 7000 m³/h and the air speed in the cooling unit is 4.4 m/s ①.

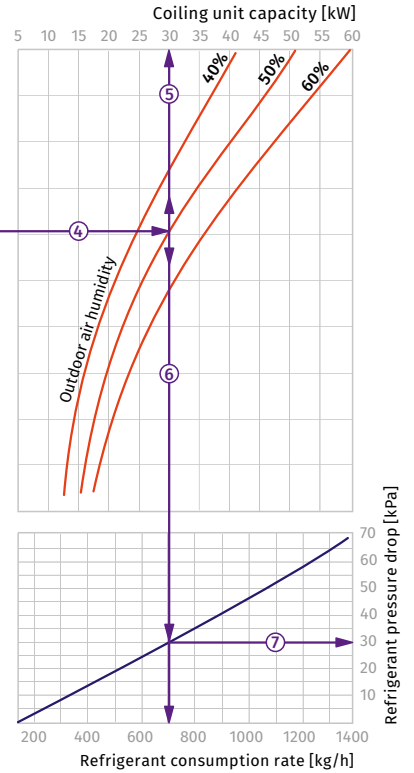
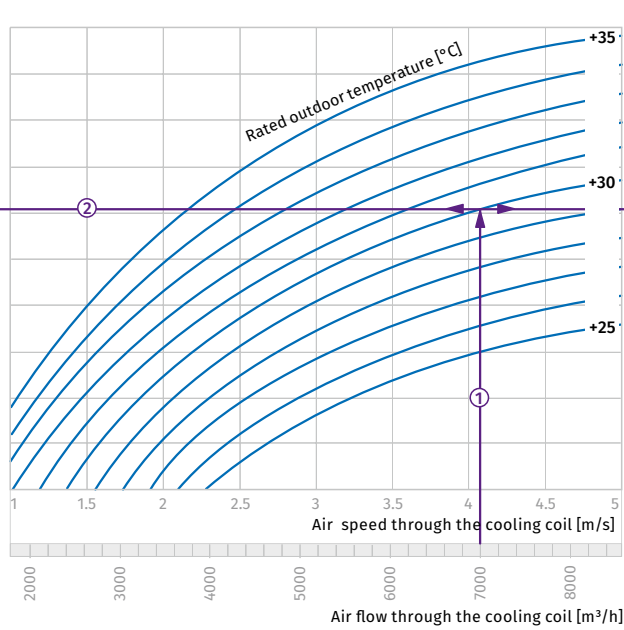
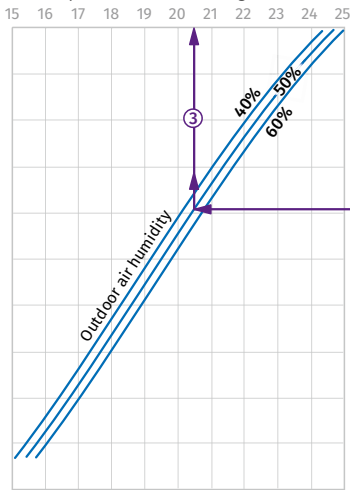
- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.7 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50 %). From this point draw a vertical line to the cooling unit power axis (47 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (640 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (26.0 kPa).

KFK 100x50-3

Air temperature after cooling unit [°C]



How to use water heater diagrams.

The air flow is 7000 m³/h and the air speed in the cooling unit is 4.1 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated outer summer temperature shown in blue line (e.g., +32 °C) and draw the line ② to the left until it crosses the outdoor air humidity curve (e.g. 50 %). From this point draw a vertical line to the supply air temperature downstream of the cooling unit (+19.6 °C) ③.

- To calculate the power of the cooling unit find the intersection point of the air flow ① with the rated summer temperature (e.g., +32 °C) and draw the line ④ to the right until it crosses the air humidity curve (e.g., 50%). From this point draw a vertical line to the cooling unit power axis (52 kW) ⑤.

- To define the necessary refrigerant flow through the cooling unit drop a perpendicular ⑥ on the axis which corresponds to refrigerant flow through the cooling unit (710 kg/h).
- To define refrigerant pressure drop in the cooling unit find the intersection point of line ⑥ with the pressure drop chart and draw a perpendicular ⑦ to the right until it crosses the refrigerant pressure axis (30.0 kPa).

SD

Silencers for round ducts

Features

- For attenuation of noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with Ø100 mm up to 315 mm round air ducts.



Design

- Galvanized steel case is filled with non-flammable sound-absorbing material with protecting covering against fiber blowing.
- Airtight connection with air ducts due to connecting flanges with rubber seals.
- A great variety of standard ranges with several length options.

Mounting

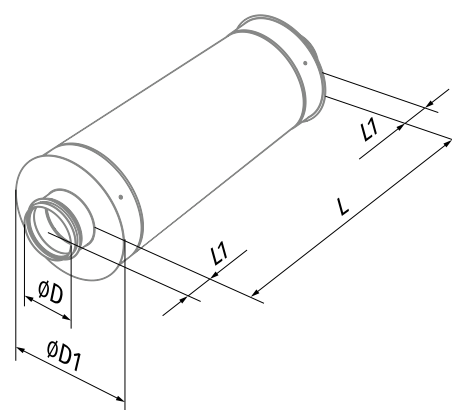
- Fixing to round ducts with clamps.
- Any mounting position.
- For better sound absorption install the silencers in Series.

Designation key

Serie	Connected air duct diameter [cm]	Length
SD	100; 125; 150; 160; 200; 250; 315	600; 900; 1200

Overall dimensions [mm]

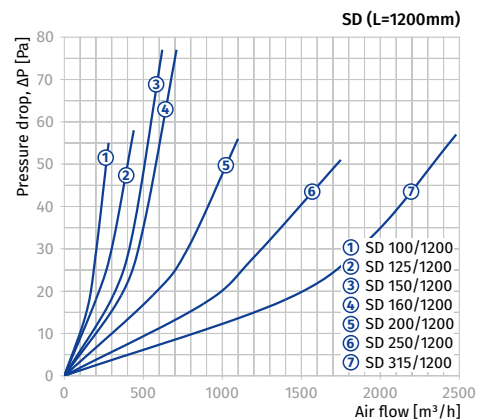
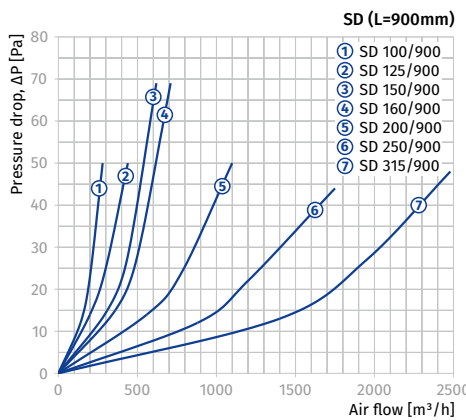
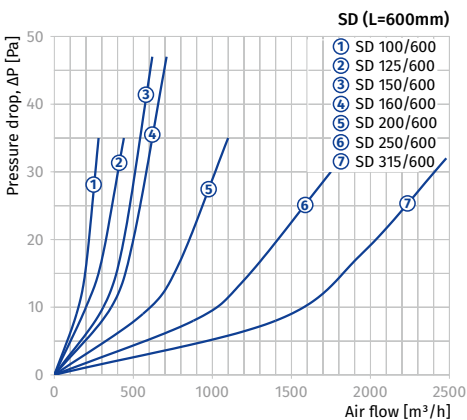
Model	D	D1	L	L1	Weight [kg]
SD 100/600	99	200	600	50	2.2
SD 100/900	99	200	900	50	3.2
SD 100/1200	99	200	1200	50	4.3
SD 125/600	124	225	600	50	2.7
SD 125/900	124	225	900	50	4.1
SD 125/1200	124	225	1200	50	5.4
SD 150/600	149	250	600	50	2.8
SD 150/900	149	250	900	50	4.2
SD 150/1200	149	250	1200	50	5.6
SD 160/600	159	260	600	50	3.1
SD 160/900	159	260	900	50	4.6
SD 160/1200	159	260	1200	50	6.2
SD 200/600	199	300	600	50	3.5
SD 200/900	199	300	900	50	5.3
SD 200/1200	199	300	1200	50	7.1
SD 250/600	249	350	600	50	4.2
SD 250/900	249	350	900	50	6.2
SD 250/1200	249	350	1200	50	8.3
SD 315/600	314	415	600	50	4.7
SD 315/900	314	415	900	50	7.1
SD 315/1200	314	415	1200	50	9.4



Noise level reduction, dB (octave-frequency band [Hz])

Model	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SD 100/600	4	8	10	20	34	30	13	14
SD 100/900	5	10	15	23	44	30	16	15
SD 100/1200	6	11	19	28	50	34	20	18
SD 125/600	3	5	6	15	28	17	10	9
SD 125/900	4	9	12	22	43	22	16	12
SD 125/1200	4	9	16	27	48	27	21	17
SD 150/600	2	4	8	16	32	11	7	7
SD 150/900	3	5	9	18	36	25	13	14
SD 150/1200	4	8	14	25	43	30	18	19
SD 160/600	2	4	8	17	33	11	7	7
SD 160/900	2	5	10	19	37	25	13	15
SD 160/1200	4	10	14	24	42	30	19	20
SD 200/600	2	4	6	10	27	13	7	7
SD 200/900	3	7	11	20	39	23	8	7
SD 200/1200	4	10	14	23	40	26	13	12
SD 250/600	4	5	6	11	22	12	7	6
SD 250/900	4	5	7	16	32	20	12	10
SD 250/1200	4	6	8	17	34	22	14	12
SD 315/600	2	4	5	10	17	9	6	5
SD 315/900	3	5	8	17	30	14	10	8
SD 315/1200	4	7	11	22	36	18	14	10

SILENCERS



SDF

Flexible silencers for round ducts

Features

- For attenuation of noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with $\varnothing 100$ mm up to 315 mm round air ducts.



Design

- Consists of outer and inner flexible spiral seam air ducts made of aluminium alloy and filled with non-flammable sound-absorbing material.
- Internal surface is perforated and covered with protection coating to prevent fiber blowing-out.
- A great variety of standard ranges with several length options.

Mounting

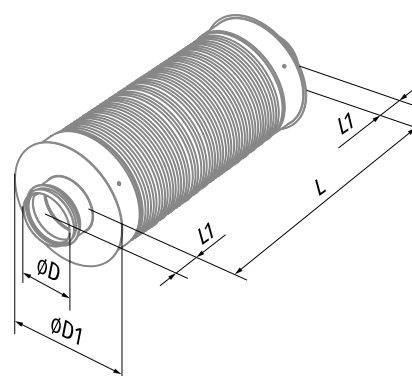
- Fixing to round ducts with clamps.
- Any mounting position.
- For better sound absorption install the silencers in Series.
- Fixing on both ends and in the middle to prevent sagging.

Designation key

Serie	Connected air duct diameter [mm]	Length
SDF	100; 125; 150; 160; 200; 250; 315	600; 900; 1200

Overall dimensions [mm]

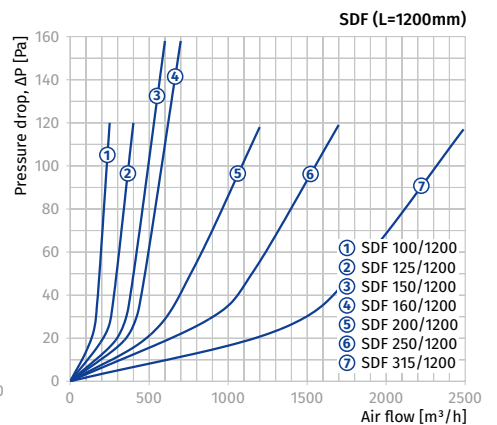
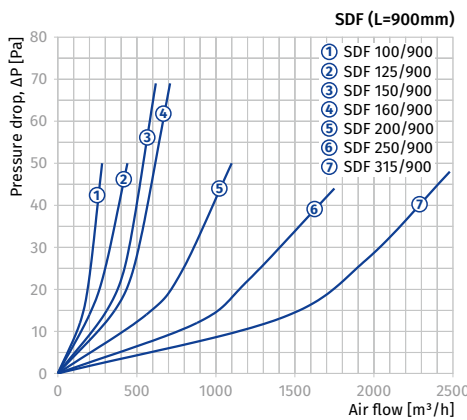
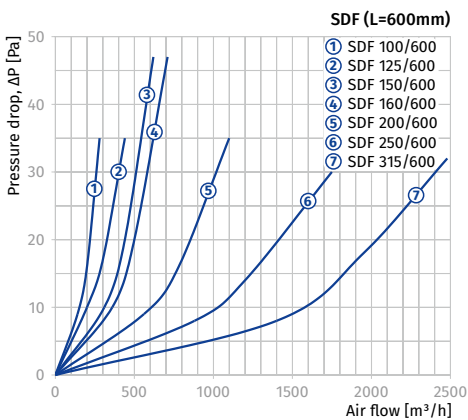
Model	D	D1	L	L1	Weight [kg]
SDF 100/600	99	220	600	55	1.6
SDF 100/900	99	220	900	55	2.4
SDF 100/2000	99	220	2000	55	5.2
SDF 125/600	124	270	600	55	2.0
SDF 125/900	124	270	900	55	3.0
SDF 125/2000	124	270	2000	55	6.6
SDF 150/600	149	270	600	55	2.1
SDF 150/900	149	270	900	55	3.1
SDF 150/2000	149	270	2000	55	6.8
SDF 160/600	159	270	600	55	2.1
SDF 160/900	159	270	900	55	3.2
SDF 160/2000	159	270	2000	55	7.0
SDF 200/600	199	320	600	55	2.6
SDF 200/900	199	320	900	55	3.9
SDF 200/2000	199	320	2000	55	8.6
SDF 250/600	249	370	600	55	3.0
SDF 250/900	249	370	900	55	4.5
SDF 250/2000	249	370	2000	55	10.1
SDF 315/600	314	420	600	55	3.4
SDF 315/900	314	420	900	55	5.1
SDF 315/2000	314	420	2000	55	11.4



Noise level reduction, dB (octave-frequency band [Hz])

Model	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SDF 100/600	6	8	13	22	28	34	17	20
SDF 100/900	8	10	15	25	33	40	21	23
SDF 100/2000	10	15	24	48	53	51	39	36
SDF 125/600	4	7	14	20	31	31	13	12
SDF 125/900	5	9	16	23	36	37	17	16
SDF 125/2000	7	15	23	47	55	50	28	25
SDF 150/600	3	7	12	32	40	40	19	20
SDF 150/900	4	8	14	40	48	49	26	25
SDF 150/2000	5	10	21	42	50	48	26	25
SDF 160/600	3	7	12	20	25	24	10	12
SDF 160/900	3	8	13	21	28	28	13	16
SDF 160/2000	5	11	20	40	48	48	25	25
SDF 200/600	2	5	12	20	26	21	10	10
SDF 200/900	3	6	12	22	28	24	12	13
SDF 200/2000	4	11	22	42	51	34	19	23
SDF 250/600	2	3	8	16	22	13	10	10
SDF 250/900	2	4	9	18	25	16	11	12
SDF 250/2000	3	6	16	30	39	27	17	22
SDF 315/600	2	4	9	18	21	12	7	9
SDF 315/900	2	5	11	21	24	14	8	10
SDF 315/2000	4	7	17	34	39	24	14	18

SILENCERS

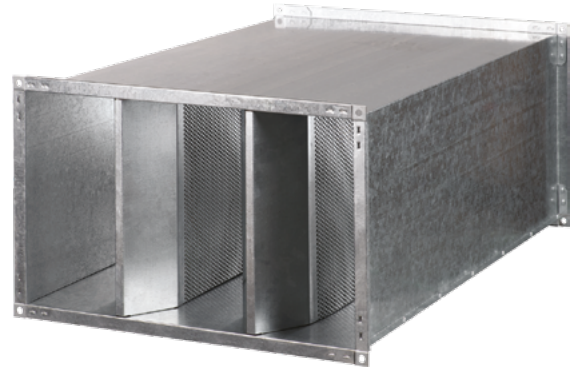


SD

Silencers for rectangular ducts

Features

- For attenuation of the noise produced by a ventilation system and spreaded along ventilation ductworks.
- Used jointly with sound-insulated fans in premises with high requirements to noise level produced by ventilation equipment.
- Compatible with 400x200 mm up to 1000x500 mm rectangular air ducts.



Design

- Galvanized steel case and sleeves.
- The plates are filled with non-flammable sound-absorption material with protecting coating to prevent fiber blowing.

Mounting

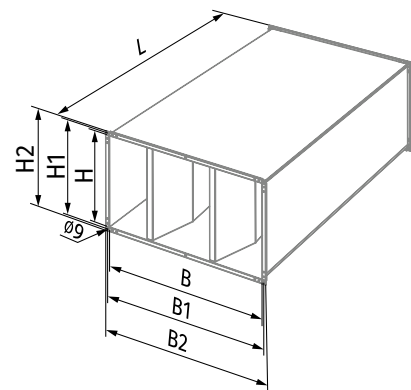
- Fixing to rectangular ducts with flange connection.
- For maximum sound absorption capacity provide a straight air duct section at least 1 m long towards the silencer.
- For better sound absorption install the silencers in Series

Designation key

Serie	Flange size (WxH) [mm]
SD	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

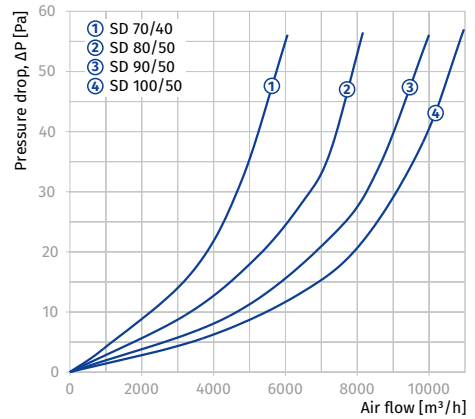
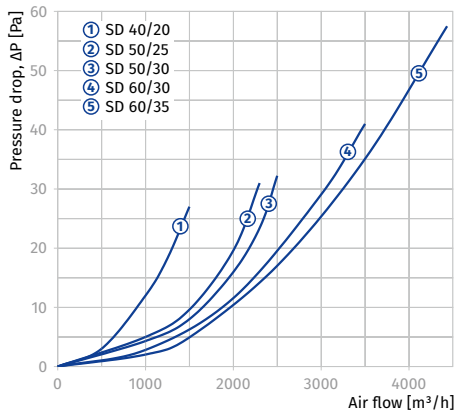
Overall dimensions [mm]

Model	B	B1	B2	H	H1	H2	L	Weight [kg]
SD 40x20	400	420	440	200	220	240	950	18.5
SD 50x25	500	520	540	250	270	290	950	20.5
SD 50x30	500	520	540	300	320	340	950	24.5
SD 60x30	600	620	640	300	320	340	950	26.5
SD 60x35	600	620	640	350	370	390	950	28.7
SD 70x40	700	720	740	400	420	440	1010	36.7
SD 80x50	800	820	840	500	520	540	1010	50.0
SD 90x50	900	920	940	500	520	540	1010	51.7
SD 100x50	1000	1020	1040	500	520	540	1010	57.3



Noise level reduction, dB (octave-frequency band [Hz])

Model	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
SD 40x20	3	7	10	23	27	30	25	22
SD 50x25	3	6	11	22	26	25	27	22
SD 50x30	3	6	10	23	24	25	23	18
SD 60x30	3	6	10	21	24	30	24	17
SD 60x35	3	5	11	22	25	29	24	21
SD 70x40	4	7	10	15	22	19	21	18
SD 80x50	5	6	11	17	21	20	22	20
SD 90x50	3	6	10	16	20	20	21	15
SD 100x50	4	6	11	16	21	21	23	17



VK

Air dampers for round ducts

Features

- For manual regulation of air flow volume in the air ducts.
- Compatible with Ø80 to 450 mm round air ducts.



Design

- The casing and the rotary blade are made of galvanized steel.
- Airtight connection to air ducts due to rubber seals.
- Air flow manual regulation with a metal handle equipped with a lever and a locking device for fixing the position of the rotary blades.

Mounting

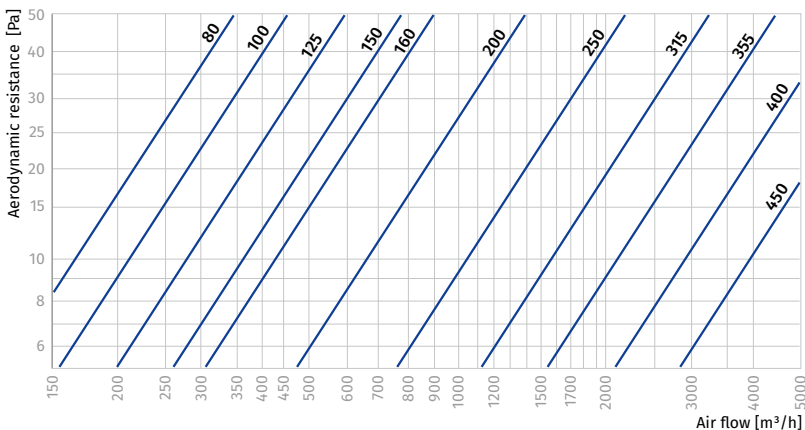
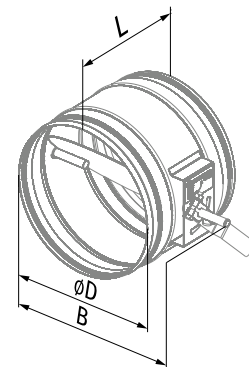
- Fixing to round ducts with clamps.

Designation key

Serie	Connected air duct diameter [mm]
VK	80; 100; 125; 150; 160; 200; 250; 315; 355; 400; 450

Overall dimensions [mm]

Model	D	B	L	Weight [kg]
VK 80	79	140	160	0.43
VK 100	99	170	160	0.55
VK 125	124	195	160	0.69
VK 150	149	220	160	0.83
VK 160	159	230	160	0.90
VK 200	199	270	160	1.14
VK 250	249	320	200	1.65
VK 315	314	385	250	2.45
VK 355	348	425	300	3.21
VK 400	399	470	350	3.90
VK 450	449	520	400	5.1



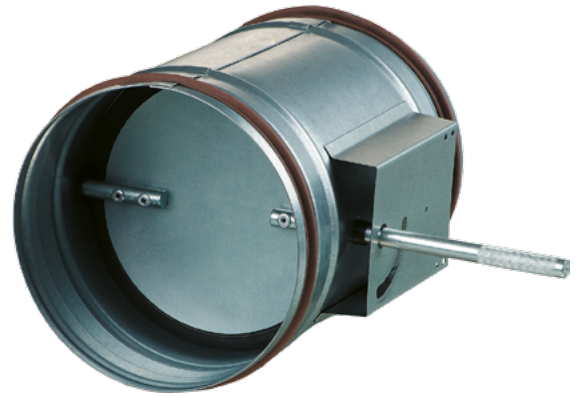
AIR DAMPERS

VKA

Air dampers for round ducts

Features

- For automatic shutoff of air ducts installed in ventilation systems of various premises.
- Compatible with Ø80 to 450 mm round air ducts.



Design

- The casing and the rotary blade are made of galvanized steel.
- Airtight connection to air ducts due to rubber seals.
- A shaft and a mounting pad are provided for BELIMO electric actuator. Compatible actuators are shown in the table below.

Mounting

- Fixing to round ducts with clamps.
- While mounting provide enough space for accessing the electric actuator.

Designation key

Serie	Connected air duct diameter [mm]
VKA	80; 100; 125; 150; 160; 200; 250; 315; 355; 400; 450

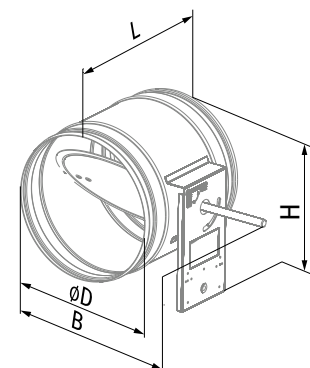
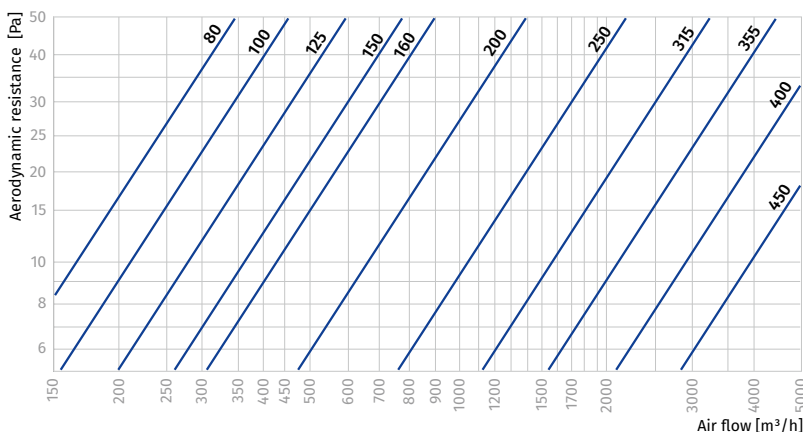
Compatibility table

Compatibility table for shutters with an electrical actuator

Model	Actuator type			
	Electric actuator, 230 V	Electric actuator with spring return, 230 V	Electric actuator, 24 V	Electric actuator with spring return, 24 V
VKA 80	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 100	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 125	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 150	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 160	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 200	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 250	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 315	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 355	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 400	CM230 / LM230A	TF230	CM24 / LM24A	TF24
VKA 450	449	570	400	5.00

Overall dimensions [mm]

Model	D	B	L	Weight [kg]
VKA 80	79	190	220	0.64
VKA 100	99	220	220	0.75
VKA 125	124	245	220	0.91
VKA 150	149	270	220	1.08
VKA 160	159	280	220	1.18
VKA 200	199	320	220	1.45
VKA 250	249	370	220	1.85
VKA 315	314	435	250	2.51
VKA 355	348	475	300	3.26
VKA 400	399	520	350	3.51
VKA 450	449	570	400	5.00



VK

Air dampers for rectangular ducts

Features

- For manual regulation of air flow or shut-off of air ducts.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.



Design

- Galvanized steel case and rotary blade.
- Manual regulation with a metal handle equipped with a lever and a locking device for fixing the position of the rotary blade.

Mounting

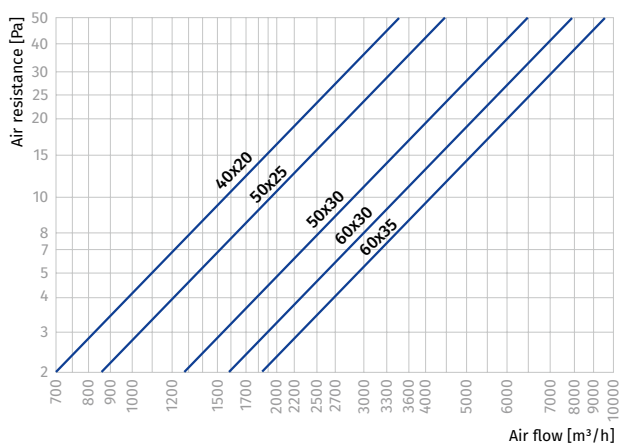
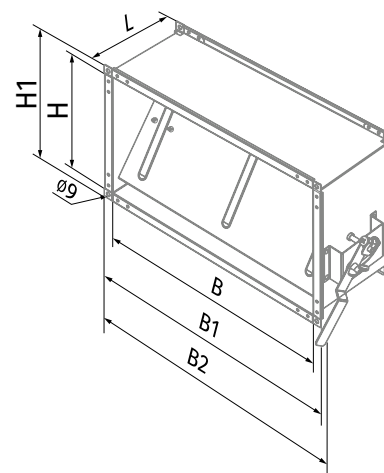
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.

Designation key

Serie	Flange size [cm]
VK	20x40; 50x25; 50x30; 60x30; 60x35

Overall dimensions [mm]

Model	B	B1	B2	H	H1	L	Weight [kg]
VK 40x20	400	440	460	200	240	202	3.0
VK 50x25	500	540	560	250	290	202	3.8
VK 50x30	500	540	560	300	340	202	3.1
VK 60x30	600	640	660	300	340	202	4.2
VK 60x35	600	640	660	350	390	202	5.1



AVK

Air dampers for rectangular ducts

Features

- For automatic regulation of air flow volume or shut-off of air ducts installed in various premises.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.



Design

- Galvanized steel case and rotary blade.
- Automatic control of the regulating mechanism with a servo actuator installed on the damper shaft. Three-point circuit provides regulation of the rotary blade; adjustable with mechanical stop blocks, maximum angle 95°. The servo actuator has overheating protection.
- Switching to manual control mode if required.

Mounting

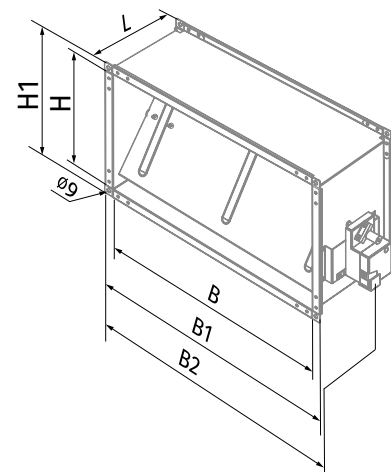
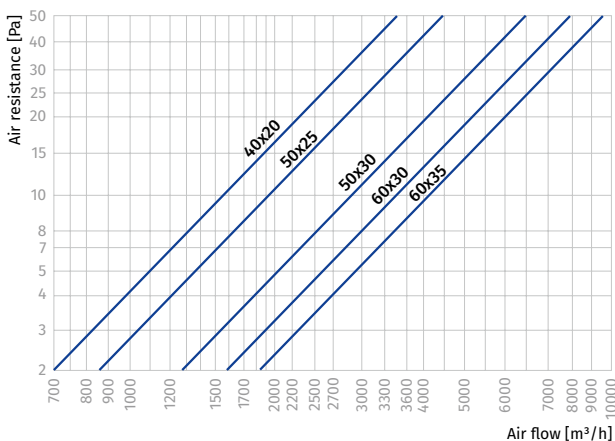
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.
- While mounting provide enough space for accessing the servo actuator.

Designation key

Serie	Flange size [cm]
AVK	40x20; 50x25; 50x30; 60x30; 60x35

Overall dimensions [mm]

Model	B	B1	B2	H	H1	L	Weight [kg]
AVK 40x20	400	440	503	200	240	202	3.6
AVK 50x25	500	540	603	250	290	202	4.4
AVK 50x30	500	540	603	300	340	202	4.8
AVK 60x30	600	640	703	300	340	202	5.4
AVK 60x35	600	640	703	350	390	202	5.8



SL

Air dampers for rectangular ducts

Features

- For manual regulation of air flow volume or shut-off of air ducts installed in ventilation systems of various premises.
- Compatible with 400x200 mm up to 1000x500 mm rectangular air ducts.



Design

- The multi-blade design with the counter-rotated blades.
- The casing is made of galvanized steel.
- The rotary blades from aluminium profile are rotated with the gears.
- Air flow manual regulation with a metal handle equipped with a lever and a locking device to fix position of the rotary blades.
- A shaft and a mounting pad are provided for BELIMO electric actuator. Compatible actuators are shown in the table below.

Mounting

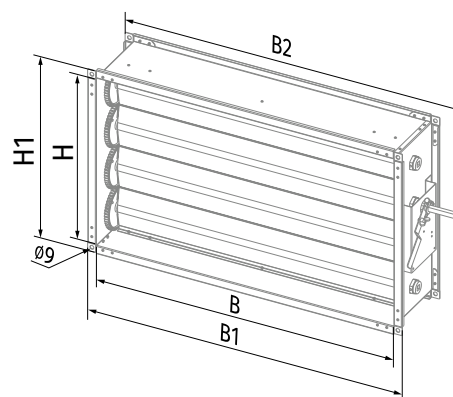
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air flow regulators to the mating flanges of the air ducts or any other ventilation system components.

Designation key

Serie	Flange size [cm]
SL	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

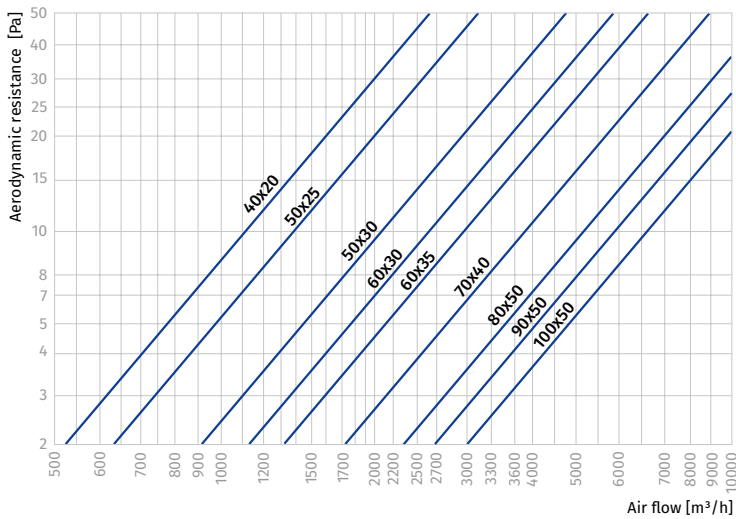
Overall dimensions [mm]

Model	B	B1	B2	H	H1	L	Weight [kg]
SL 40x20	400	440	540	200	240	170	3.5
SL 50x25	500	540	640	250	290	170	4.2
SL 50x30	500	540	640	300	340	170	4.9
SL 60x30	600	640	740	300	340	170	5.4
SL 60x35	600	640	740	350	390	170	5.7
SL 70x40	700	740	840	400	440	170	7.7
SL 80x50	800	840	940	500	540	170	8.8
SL 90x50	900	940	1040	500	540	170	9.6
SL 100x50	1000	1040	1140	500	540	170	10.3



Compatibility table of air dampers with electric actuators

	Actuator type			
	Electric actuator, 230 V	Electric actuator with spring return, 230 V	Electric actuator, 24 V	Electric actuator with spring return, 24 V
SL 40x20	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 50x25	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 50x30	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 60x30	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 60x35	CM230 / LM230A	TF230 / LF230	CM24 / LM24A	TF24 / LF24
SL 70x40	LM230A	LF230	LM24A	LF24
SL 80x50	LM230A	LF230	LM24A	LF24
SL 90x50	LM230A	LF230	LM24A	LF24
SL 100x50	LM230A	LF230	LM24A	LF24



VRVS

Backdraft air dampers for round ducts

Features

- For automatic shut-off of the air ducts and prevention of back drafting when the fan off. Suitable for installation in various premises.
- Compatible with $\varnothing 100$ up to 315 mm round air ducts.



Design

- Galvanized steel case and rotary gravity-actuated blade.
- Airtight connection with the air ducts due to rubber seals.
- The damper blade is opened with air pressure and reset automatically when the fan is off and no air pressure is produced.
- Manual handle with a counterweight to regulate the damper opening-closing sensitivity.

Designation key

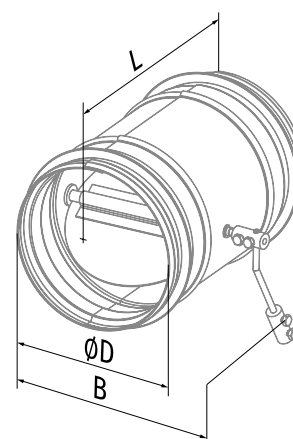
Serie	Connected air duct diameter [mm]
VRVS	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	B	L	Weight [kg]
VRVS 100	99	139	150	0.65
VRVS 125	124	162	170	0.81
VRVS 150	149	194	180	0.97
VRVS 160	159	204	190	1.06
VRVS 200	199	238	220	1.57
VRVS 250	249	290	270	2.2
VRVS 315	314	356	340	3.24

Mounting

- Fixing to round ducts with clamps.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

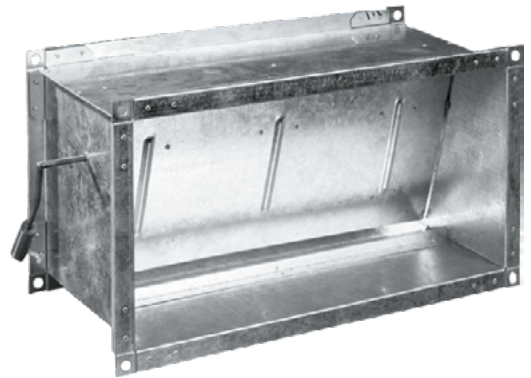


VRVS

Backdraft air dampers for rectangular ducts

Features

- For automatic shut-off of the air ducts and prevention of back drafting when the fan off. Suitable for installation in various premises.
- Compatible with 400x200 up to 600x350 mm rectangular air ducts.



Design

- Galvanized steel case and rotary gravity-actuated blade.
- The damper blade is opened with air pressure and reset automatically when the fan is off and no air pressure is produced.
- Manual handle with a counterweight to regulate the damper opening-closing sensitivity.

Mounting

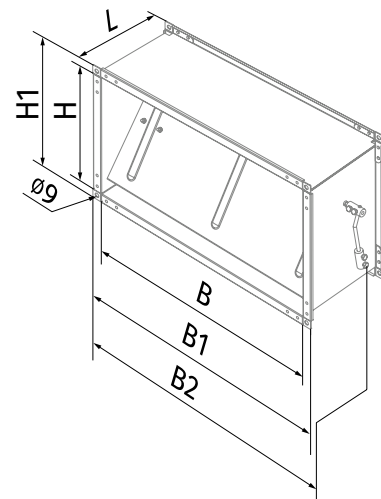
- Fixing to rectangular ducts in upright position.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

Designation key

Serie	Flange size [cm]
VRVS	40x20; 50x25; 50x30; 60x30; 60x35

Overall dimensions [mm]

Model	B	B1	B2	H	H1	L	Weight [kg]
VRVS 40x20	400	440	461	200	240	202	2.9
VRVS 50x25	500	540	561	200	290	202	3.73
VRVS 50x30	500	540	561	300	340	202	4.1
VRVS 60x30	600	640	661	300	340	202	4.64
VRVS 60x35	600	640	661	350	390	202	5.03



AIR DAMPERS

VRV

Backdraft dampers with spring for round ducts

Features

- For automatic shutoff of the air ducts and prevention of back drafting when the fan is off. Suitable for installation in various premises.
- Compatible with $\varnothing 100$ up to 315 mm round air ducts.



Design

- Galvanized steel case.
- Two spring-loaded blades made of aluminium.
- Blades are opened by air pressure and are closed with a spring.

Mounting

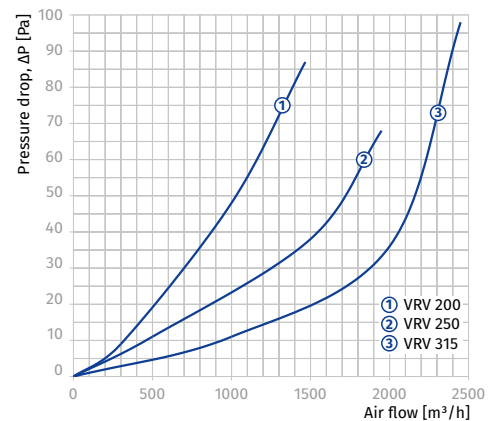
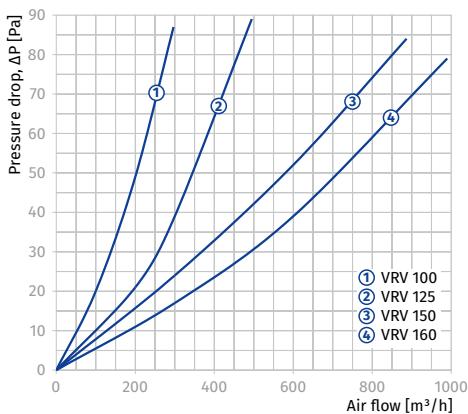
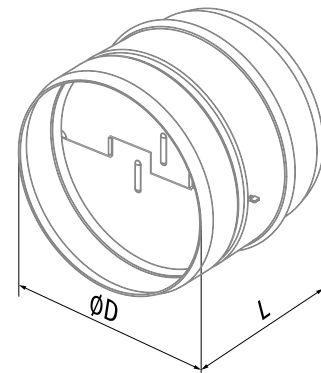
- Fixing to round ducts with clamps.
- Provide vertical position of blade axis.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

Designation key

Serie	Connected air duct diameter [mm]
VRV	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	L	Weight [kg]
VRV 100	99	80	0.18
VRV 125	124	100	0.27
VRV 150	149	115	0.38
VRV 160	159	120	0.42
VRV 200	199	145	0.63
VRV 250	249	165	0.90
VRV 315	314	190	1.31



VG

Gravity air dampers for rectangular ducts

Features

- For automatic shutoff of air ducts installed in various premises when the fan is off.
- Gravitationally actuated.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.



Design

- Galvanized steel case.
- Equipped with pivoted gravity louvre shutters made of PVC built into a frame.
- Louvre shutters are opened by air pressure and are closed automatically when the fan is off.

Designation key

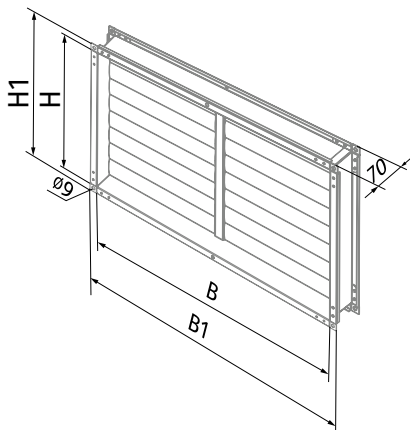
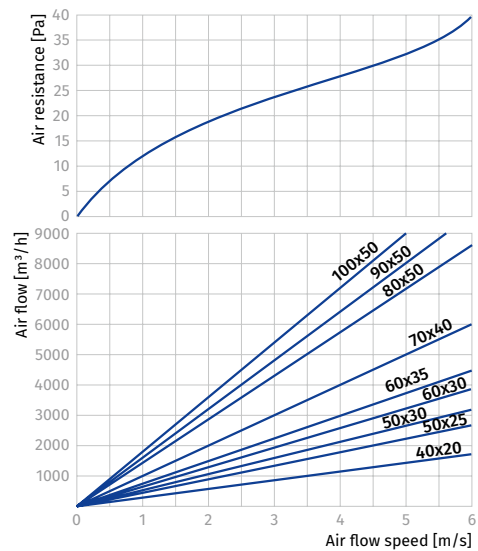
Serie	Flange size [cm]
VG	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

Overall dimensions [mm]

Model	B	B1	H	H1	Weight [kg]
VG 40x20	400	440	200	240	1.29
VG 50x25	500	540	250	290	1.58
VG 50x30	500	540	300	340	1.83
VG 60x30	600	640	300	340	2.05
VG 60x35	600	640	350	390	2.21
VG 70x40	700	740	400	440	3.0
VG 80x50	800	840	500	540	3.6
VG 90x50	900	940	500	540	3.8
VG 100x50	1000	1040	500	540	4.0

Mounting

- Fixing to rectangular ducts in upright position.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.



VG

Gravity air dampers for round ducts

Features

- For automatic shutoff of air ducts installed in various premises when the fan is off.
- Gravitationally actuated.
- Compatible with Ø100 up to 315 mm round air ducts.



Design

- Galvanized steel case.
- Equipped with pivoted gravity louvre shutters made of PVC built inside the inner frame.
- Louvre shutters are opened by air pressure and are closed automatically when the fan is off.
- The spigot is equipped with rubber seals.

Designation key

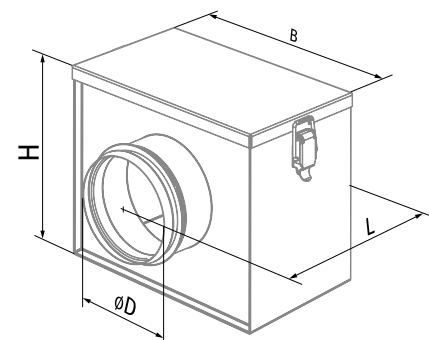
Serie	Connected air duct diameter [mm]
VG	100; 125; 140; 150; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	B	H	L	Weight [kg]
VG 100	99	225	216	232	1.81
VG 125	124	225	216	232	1.79
VG 140	139	225	216	232	1.79
VG 150	149	225	216	232	1.77
VG 160	159	225	216	232	1.69
VG 200	199	295	316	232	2.76
VG 250	249	295	316	232	2.62
VG 315	314	365	366	232	3.23

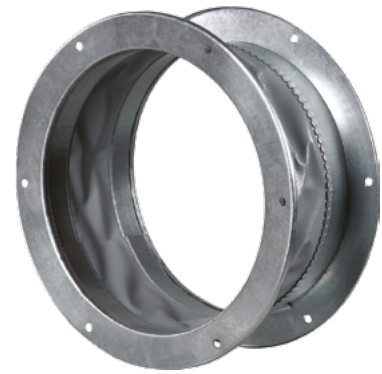
Mounting

- Fixed inside round ventilation ducts.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.



EVAF

Flexible anti-vibration connectors for round ducts



Features

- For damping the vibration generated by fans or ventilation equipment and transferred to air ducts in ventilation systems of various premises.
- For partial compensation of ductworks temperature deformation.
- Compatible with $\varnothing 200$ up to 630 mm round air ducts with flanges.

Design

- Two flanges are made of galvanized steel.
- The connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load carrying structure.

Mounting

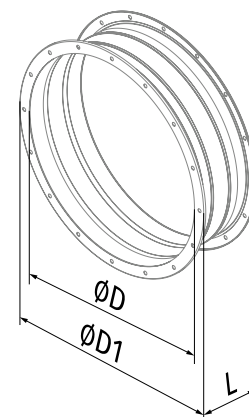
- Flexible vibration damping connectors are fixed to air ducts with flange connection.

Designation key

Serie	Connected air duct diameter [mm]
EVAF	200; 250; 300; 350; 400; 450; 500; 550; 630

Overall dimensions [mm]

Model	D	D1	L	Weight [kg]
EVAF 200	205	255	160	1.29
EVAF 250	260	306	160	1.21
EVAF 300	310	382	160	1.90
EVAF 350	362	421	160	2.06
EVAF 400	412	465	160	2.57
EVAF 450	462	515	160	2.88
EVAF 500	515	570	160	3.81
EVAF 550	565	636	160	4.53
EVAF 630	645	715	160	5.13

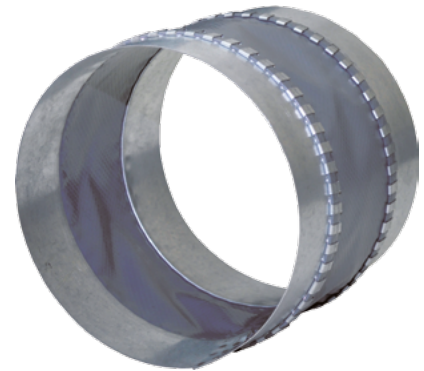


EVA

Flexible anti-vibration connectors for round ducts

Features

- For damping vibration generated by fans or ventilation equipment and transferred to air ducts.
- For partial compensation of ductwork distortion resulting from temperature changes.
- Compatible with $\varnothing 100$ up to 500 mm round air ducts.



Design

- Two galvanized steel flanges.
- Connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load-carrying structure.

Designation key

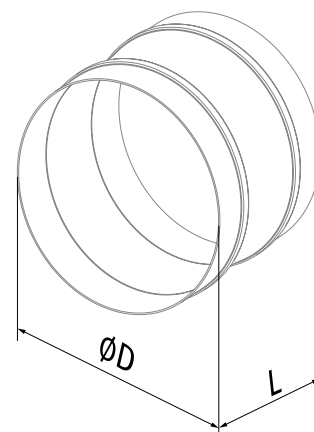
Serie	Connected air duct diameter [mm]
EVA	100; 125; 150; 160; 200; 250; 315; 355; 400; 450; 500

Overall dimensions [mm]

Model	D	L	Weight [kg]
EVA 100	101	130	0.14
EVA 125	126	130	0.17
EVA 150	151	130	0.21
EVA 160	161	130	0.22
EVA 200	201	130	0.28
EVA 250	251	130	0.35
EVA 315	316	130	0.44
EVA 355	356	130	0.50
EVA 400	401	130	0.56
EVA 450	451	130	0.64
EVA 500	501	130	0.71

Mounting

- Flexible vibration damping connectors are fixed to air ducts with clamps.



EVA

Flexible anti-vibration connectors for rectangular ducts



Features

- For damping of vibration generated by fans or ventilation equipment and transferred to air ducts for ventilation systems installed in various premises.
- For partial temperature distortion compensation in the ductworks.
- Compatible with rectangular 400x200 up to 1000x500 mm air ducts.

Design

- Two galvanized steel flanges.
- Connecting vibration-isolating material is made of nylon reinforced polyethylene fabric.
- Not designed for mechanical load and cannot be used as a load-carrying structure.

Designation key

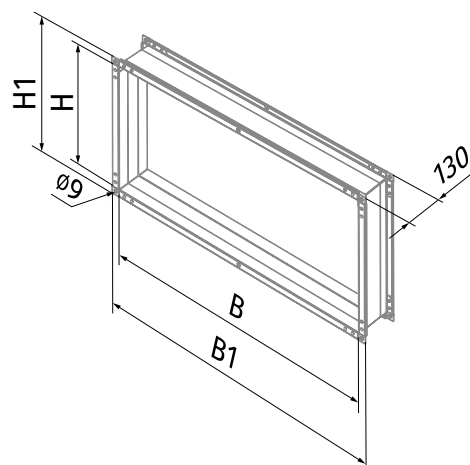
Serie	Flange size (WxH) [cm]
EVA	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

Overall dimensions [mm]

Model	B	B1	H	H1	Weight [kg]
EVA 40x20	400	440	200	240	1.1
EVA 50x25	500	540	250	290	1.4
EVA 50x30	500	540	300	340	1.6
EVA 60x30	600	640	300	340	1.82
EVA 60x35	600	640	350	390	1.95
EVA 70x40	700	740	400	440	2.4
EVA 80x50	800	840	500	540	2.8
EVA 90x50	900	940	500	540	3.0
EVA 100x50	1000	1040	500	540	3.2

Mounting

- Mounting with galvanized bolts and clamps that fix the end flanges of the connector to the mating flanges of the air ducts or any other ventilation system components.



FLEXIBLE ANTI-VIBRATION CONNECTORS

CLEANBOX

Filter box

Features

- For purification of supply air in ventilation and air conditioning systems installed in various premises
- Compatible with \varnothing 100 up to 200 mm round air ducts.
- Suitable for limited mounting space.



Design

- The casing is made of polymer-coated steel.
- Easy access for filter maintenance.

Mounting

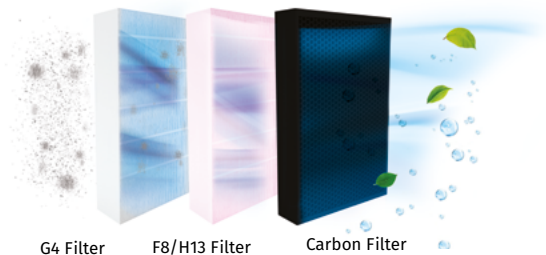
- Due to compact design is the ideal solution for mounting in limited spaces, including the space behind false ceiling.
- Any mounting position.
- Wall or ceiling mounting with fixing brackets supplied as a standard.

Designation key

Serie	Duct diameter [mm]	Filters
CLEANBOX	100; 150; 200	G4; G4/F8; G4/F8/Carbon; G4/H13; G4/H13/Carbon

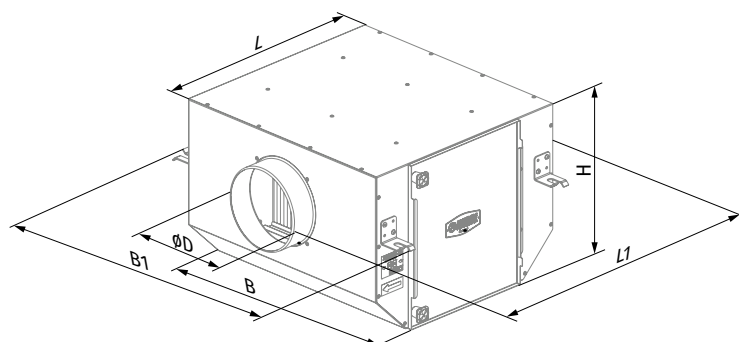
Air filtration

- Built-in filters provide efficient air filtration. Up to three filters can be installed into the casing.
- G4 filter provides primary filtration. At the second stage, the secondary filter F8 or HEPA filter H13 can be installed. F8 filter arrests up to 98 % of PM 2.5 dust particles. H13 filter arrest up to 99 % of PM2.5 dust particles, pollen and bacteria. For additional elimination of odors and gases carbon filter can be installed.
- Quick access to replaceable filters through service panel.

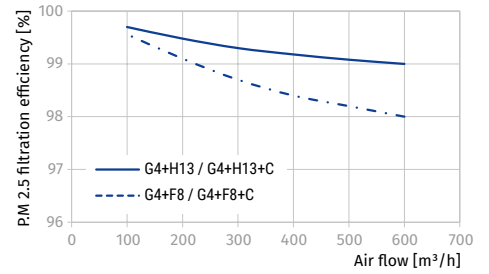
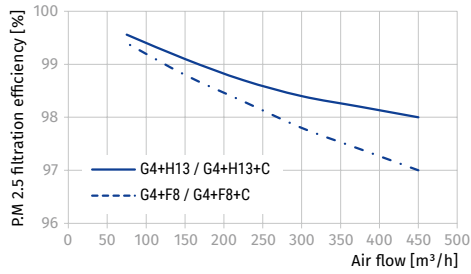
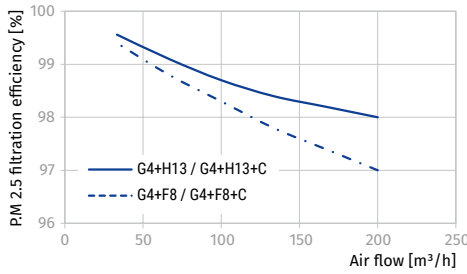
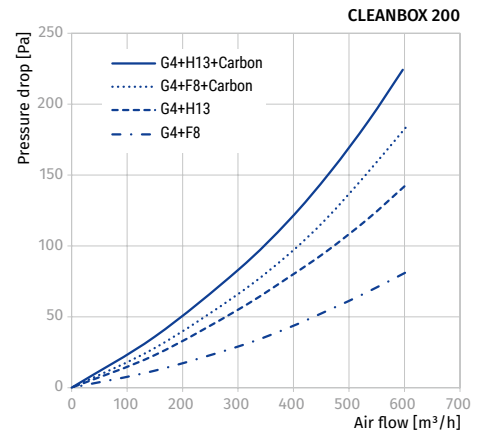
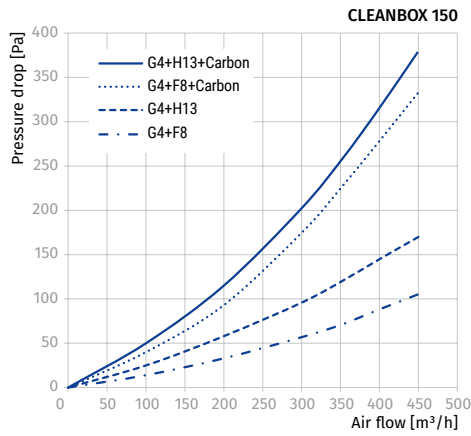
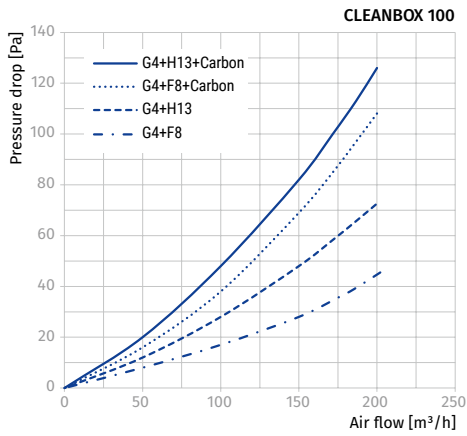


Overall dimensions [mm]





Model	D	B	B1	B2	H	L	L1	L2	Weight [kg]
CleanBox 100 G4/F8	100	415	508	458	249	413.5	513.5	358.5	7.47
CleanBox 100 G4/F8/Carbon	100	415	508	458	249	413.5	513.5	358.5	8.17
CleanBox 100 G4/H13	100	415	508	458	249	413.5	513.5	358.5	7.47
CleanBox 100 G4/H13/Carbon	100	415	508	458	249	413.5	513.5	358.5	8.18
CleanBox 150 G4/F8	150	440	508	483	299	413.5	513.5	358.5	8.47
CleanBox 150 G4/F8/Carbon	150	440	508	483	299	413.5	513.5	358.5	9.04
CleanBox 150 G4/H13	150	440	508	483	299	413.5	513.5	358.5	8.47
CleanBox 150 G4/H13/Carbon	150	440	508	483	299	413.5	513.5	358.5	9.04
CleanBox 200 G4/F8	200	605	508	648	299	413.5	513.5	358.5	10.62
CleanBox 200 G4/F8/Carbon	200	605	508	648	299	413.5	513.5	358.5	11.84
CleanBox 200 G4/H13	200	605	508	648	299	413.5	513.5	358.5	10.62
CleanBox 200 G4/H13/Carbon	200	605	508	648	299	413.5	513.5	358.5	11.84



Technical data



Accessories

	CleanBox 100	CleanBox 150	CleanBox 200
G4 Panel filter	 FP 220x400x47 G4	FP 270x425x47 G4	FP 270x590x47 G4
F8 Panel filter	 FP 220x400x47 F8	FP 270x425x47 F8	FP 270x590x47 F8
H13 Panel filter	 FP 220x400x47 H13	FP 270x425x47 H13	FP 270x590x47 H13
Carbon panel filter	 FP 220x400x47 C	FP 270x425x47 C	FP 270x590x47 C

KFBK

Filter boxes for round ducts

Features

- For purification of supply or extract air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with $\varnothing 100$ up to 315 mm round air ducts.



Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a flat filter cartridge made of synthetic non-woven cloth with filtration class G4.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on the casing.

Designation key

Serie	Connected air duct diameter [mm]
KFBK	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

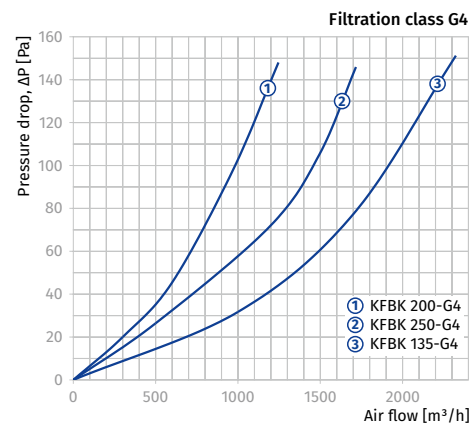
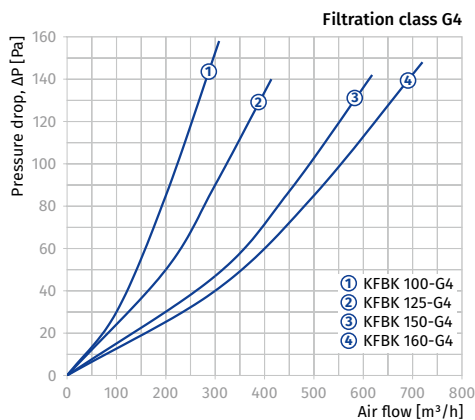
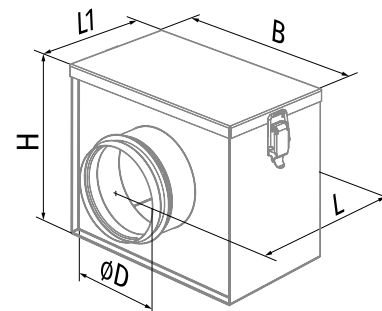
Model	D	B	H	L	L1	Weight [kg]
KFBK 100	99	210	175	215	123	1.4
KFBK 125	124	220	209	235	143	1.7
KFBK 150	149	270	237	250	158	2.5
KFBK 160	159	270	237	250	158	2.3
KFBK 200	199	320	279	275	183	3.1
KFBK 250	249	370	327	325	233	4.5
KFBK 315	314	430	392	425	333	6.7

Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4 replaceable flat filter cartridges made of synthetic non-woven cloth series FP-KFBK.



KFBV

Filter boxes with V-filter for round ducts



Features

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with Ø100 up to 315 mm round air ducts.

Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a V-shaped filter cartridge with increased filter surface made of synthetic non-woven cloth with G4 filtration class.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Designation key

Serie	Connected air duct diameter [mm]
KFBV	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

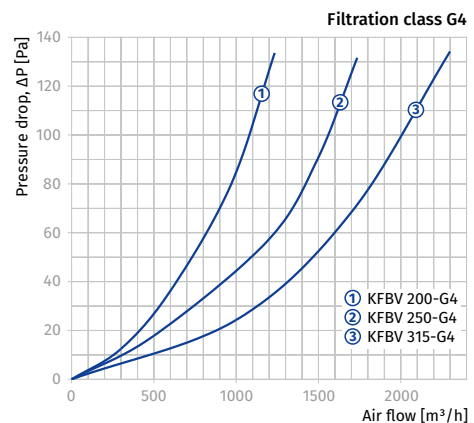
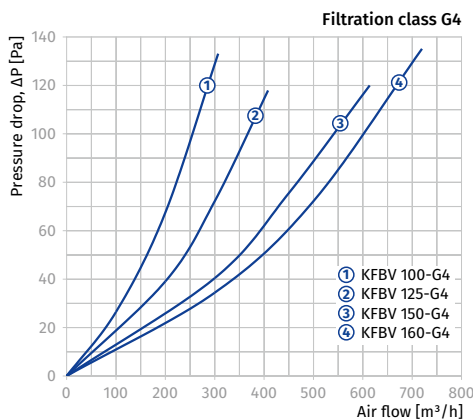
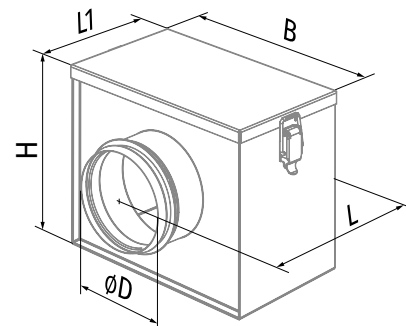
Model	D	B	H	L	L1	Weight [kg]
KFBV 100	99	233	175	215	123	1.4
KFBV 125	124	243	209	235	143	1.7
KFBV 150	149	293	237	250	158	2.2
KFBV 160	159	293	237	250	158	2.2
KFBV 200	199	343	279	275	183	3.1
KFBV 250	249	393	327	325	233	4.2
KFBV 315	314	453	392	425	333	6.3

Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4 replaceable V-shaped filter cartridges made of synthetic non-woven cloth series FP-KFBV.



KFBT

Filter boxes with bag filters for round ducts

Features

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with $\varnothing 100$ up to 315 mm round air ducts.



Design

- Galvanized steel case.
- Airtight connection of the filter-box with air ducts due to connecting flanges with a rubber seal.
- Equipped with a replaceable filter bag made of synthetic non-woven cloth with filtration class G4, F5, F7.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- In case of vertical mounting position provide air stream downwards to avoid filter jamming.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series FP-KFBT.

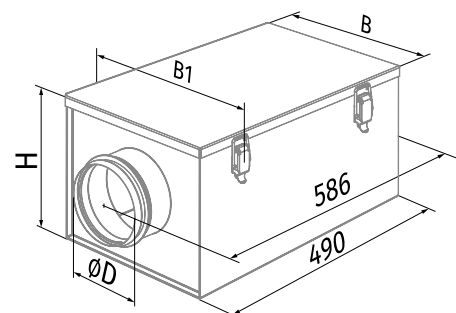


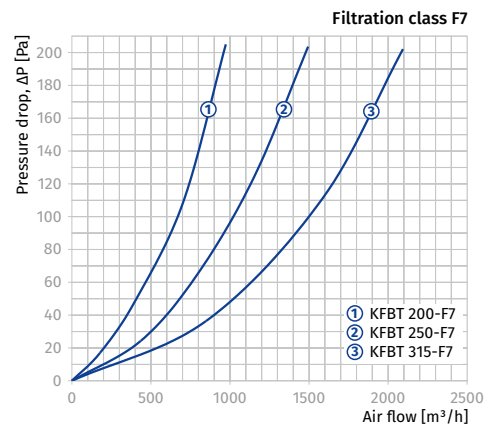
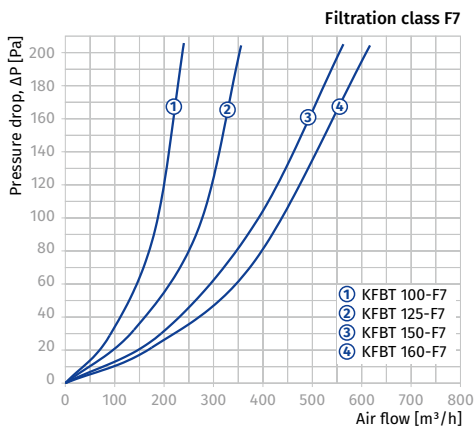
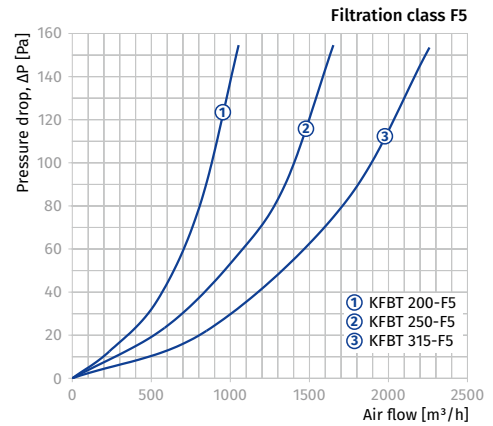
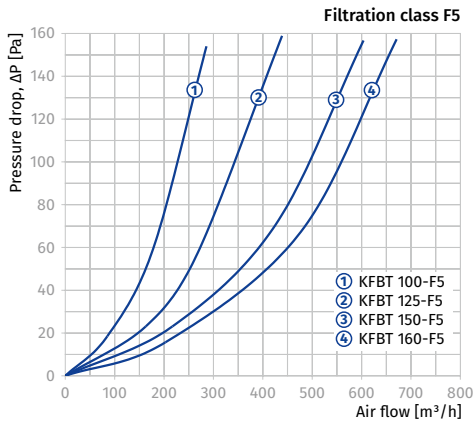
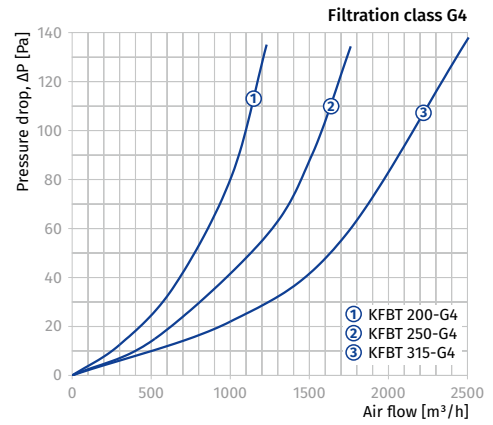
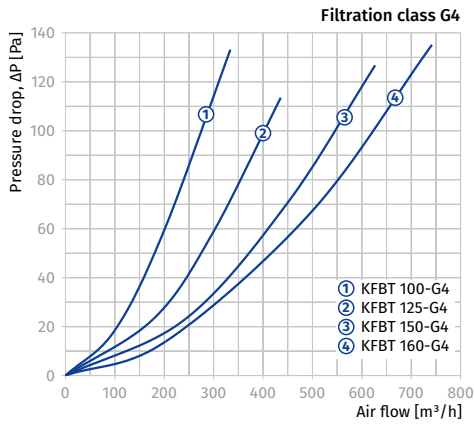
Designation key

Serie	Connected air duct diameter [mm]
KFBT	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	B	B1	H	Weight [kg]
KFBT 100	99	210	230	170	2.41
KFBT 125	124	220	240	206	2.69
KFBT 150	149	270	290	236	3.20
KFBT 160	159	270	290	236	3.26
KFBT 200	199	320	340	276	3.76
KFBT 250	249	370	390	386	4.39
KFBT 315	314	430	450	390	5.17





KFBT

Filter boxes with bag filters for rectangular ducts

Features

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.



Design

- Galvanized steel case.
- Equipped with a replaceable filter bag made of synthetic non-woven cloth with filtration class G4, F5, F7.
- Filter cartridge is fixed on a steel wire frame.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Mounting

- Fixing to rectangular ducts with flange connection.
- Any mounting position.

Designation key

Serie	Flange size (WxH) [mm]
KFBT	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

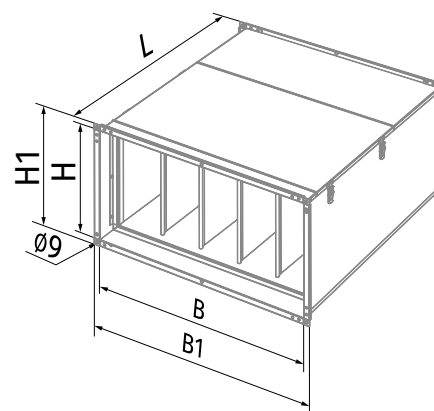
Overall dimensions [mm]

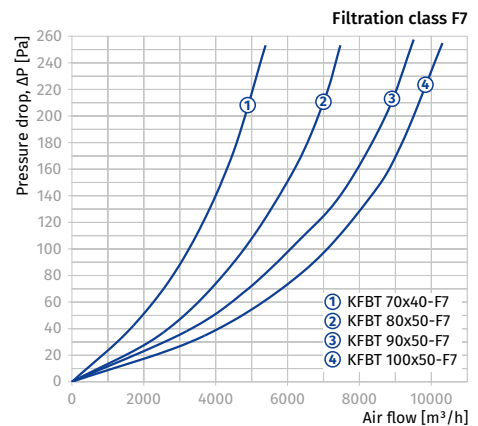
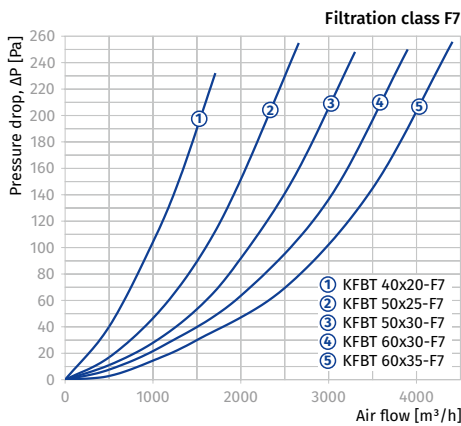
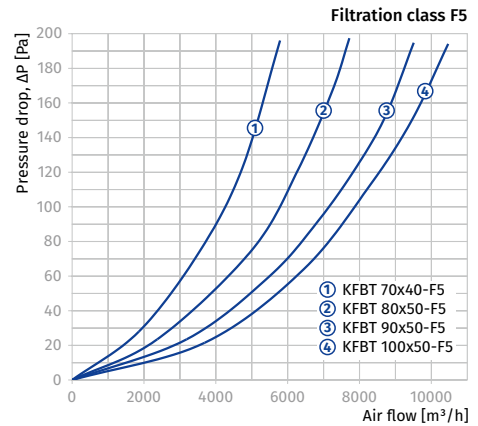
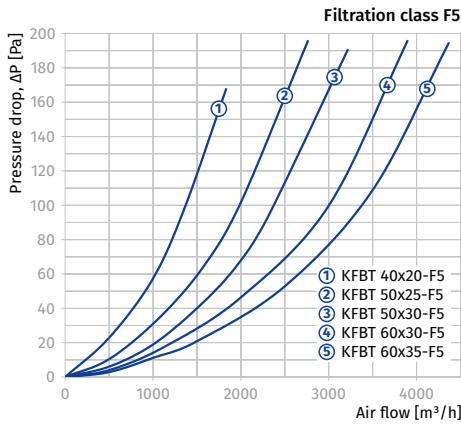
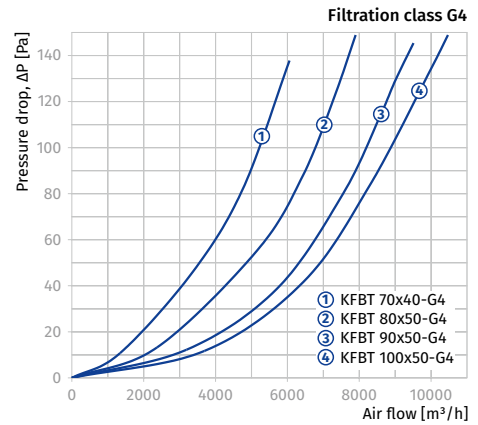
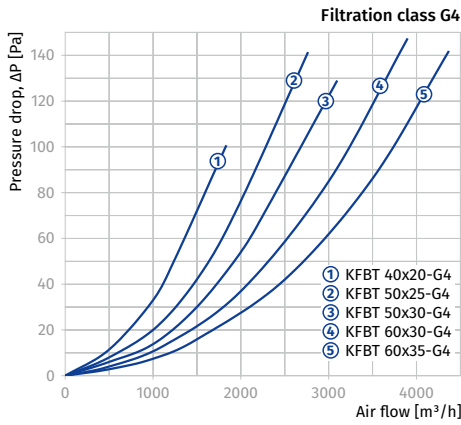
Model	B	B1	H	H1	L	Weight [kg]
KFBT 40x20	400	440	200	240	500	6.2
KFBT 50x25	500	540	250	290	600	7.8
KFBT 50x30	500	540	300	340	600	8.3
KFBT 60x30	600	640	300	340	600	8.9
KFBT 60x35	600	640	350	390	600	9.5
KFBT 70x40	700	740	400	440	720	16.2
KFBT 80x50	800	840	500	540	800	20.4
KFBT 90x50	900	940	500	540	800	21.7
KFBT 100x50	1000	1040	500	540	800	23.5

- In case of vertical mounting position provide air stream downwards to avoid filter jamming.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series FP-KFBT.





KFBK

Filter boxes for rectangular ducts

Features

- For purification of supply or exhaust air in ventilation and air conditioning systems installed in various premises.
- Designed for protection of air ducts, heat exchangers, fans, controls and other ventilation system equipment against dust pollution.
- Prevent contamination of walls and ceilings located near the system.
- Can be used as pre-filters installed upstream to more efficient filters.
- Compatible with 400x200 up to 1000x500 mm rectangular air ducts.



Design

- Galvanized steel case.
- Equipped with a filter cartridge made of synthetic non-woven cloth with filtration class G4.
- Filter cartridge has manifold bending to increase the filtration surface and protected with a metal net against deformation with air pressure.
- Quick access to replaceable filter cartridge due to lever locks on a swivel filter cover.

Designation key

Serie	Flange size (WxH) [mm]
KFBK	40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50

Overall dimensions [mm]

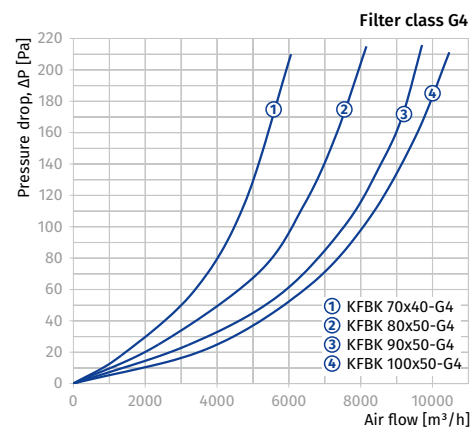
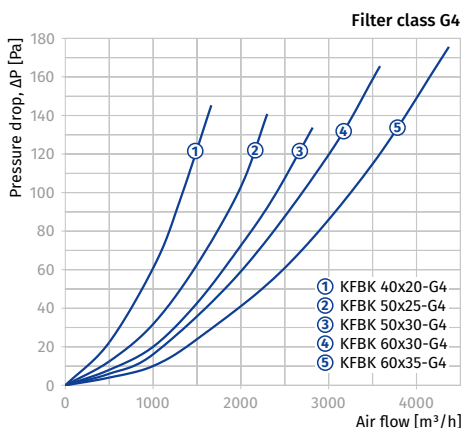
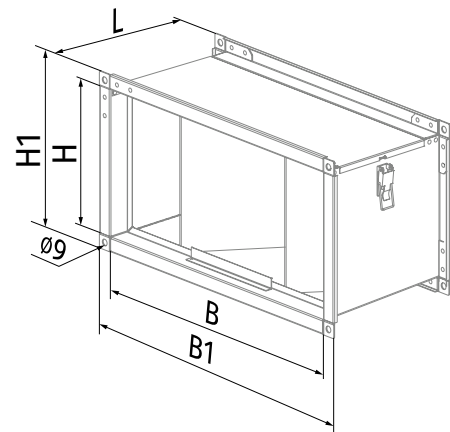
Model	B	B1	H	H1	Weight [kg]
KFBK 40x20	400	440	200	240	2.4
KFBK 50x25	500	540	250	290	4.1
KFBK 50x30	500	540	300	340	4.4
KFBK 60x30	600	640	300	340	5.2
KFBK 60x35	600	640	350	390	5.8
KFBK 70x40	700	740	400	440	6.7
KFBK 80x50	800	840	500	540	7.9
KFBK 90x50	900	940	500	540	8.4
KFBK 100x50	1000	1040	500	540	8.9

Mounting

- Fixing to rectangular ducts with flange connection.
- Installed upstream to heater and fan following the air flow direction.
- While mounting provide extra space for free access to the filter for servicing.

Accessories

- G4 replaceable filter cartridges made of synthetic non-woven cloth series FP-KFBK.



KZ

Clamps for round ducts

Features

- For reliable fixing of ventilation system components.
- Compatible with 100 up to 315 mm round ventilation system components.



Design

- Made of galvanized steel band.
- Sealed with microporous rubber from inside for vibration absorption.

Mounting

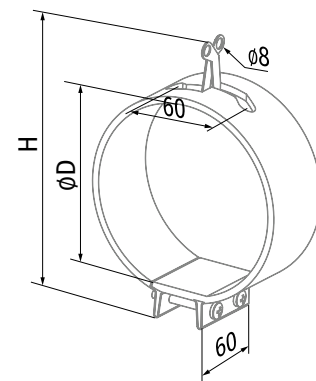
- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with two bolts.

Designation key

Serie	Connected air duct diameter [mm]
KZ	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	H	Weight [kg]
KZ 100	100	172	0.206
KZ 125	125	198	0.232
KZ 150	150	224	0.296
KZ 160	160	232	0.358
KZ 200	200	274	0.42
KZ 250	250	326	0.55
KZ 315	315	380	0.65



KZH

Clamps for round ducts

Features

- For reliable fixing of ventilation system components installed in various premises.
- Compatible with 100 up to 315 mm round ventilation system components.



Design

- Made of galvanized steel band.
- Sealed with microporous rubber from inside for vibration absorption.
- Equipped with a mounting bracket for fixing on wall or ceiling.

Mounting

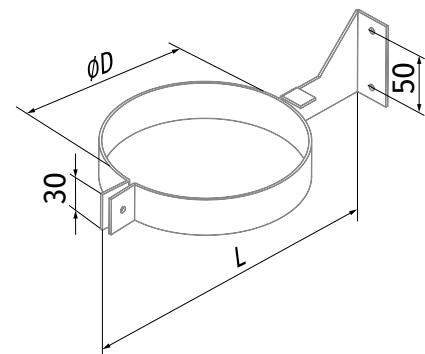
- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with a bolt.
- For installation on wall or ceiling use a mounting bracket fixed with dowels.

Designation key

Serie	Connected air duct diameter [mm]
KZH	100; 125; 150; 160; 200; 250; 315

Overall dimensions [mm]

Model	D	L	Weight [kg]
KZH 100	100	204	0.21
KZH 125	125	229	0.22
KZH 150	150	254	0.25
KZH 160	160	264	0.26
KZH 200	200	304	0.31
KZH 250	250	354	0.35
KZH 315	315	419	0.42



SGR-3/1

Sensor speed switch

Features

- On/off switch and speed selection for multi-speed fans.



Design

- Casing made of high-quality plastic.
- Glass sensor operating panel with three touch buttons for speed selection with light indication.
- Wall flush mounting.
- IP30 ingress protection rating.

Control

- Required speed is activated by touching the respectively marked speed button.
- The fan is turned off by touching the current speed button.

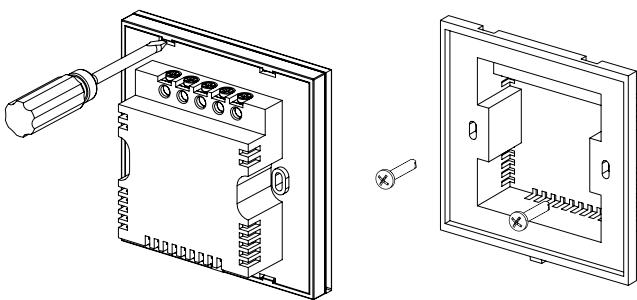
Mounting

- Designed for wall mounting in a flush mounting box.

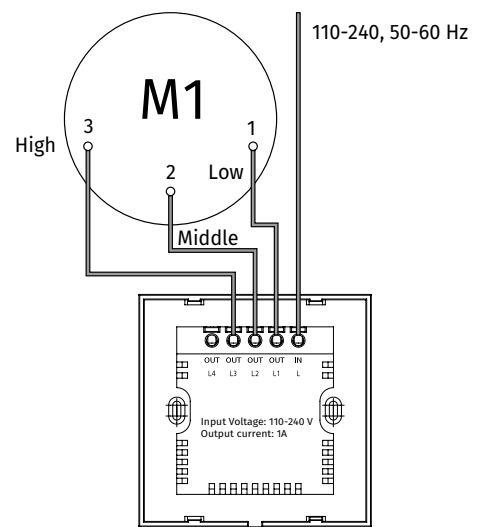
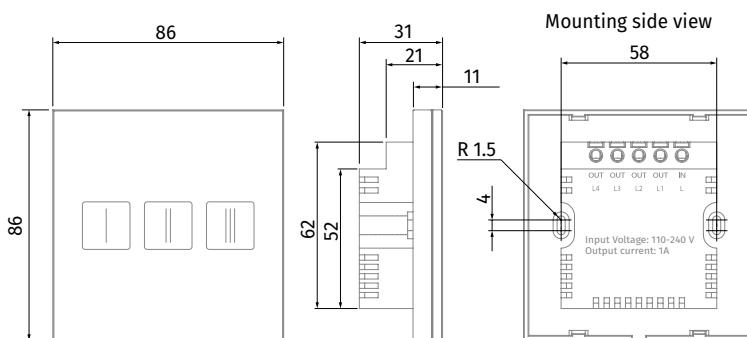
Technical data

Parameters	SGR-3/1
Voltage 50-60 Hz [V]	110-240
Max. current load [A]	1
Number of speeds	3
Cable cross section [mm ²]	from 0.35 up to 1
Temperature range [°C]	from -10 up to +45
Operating humidity range [%]	from 5 up to 80 (no condensation)
Service life	100 000 operations
Ingress Protection	IP30
Weight [g]	138

SPEED CONTROLLERS



Overall dimensions [mm]



SGS E1

Sensor speed controller



Features

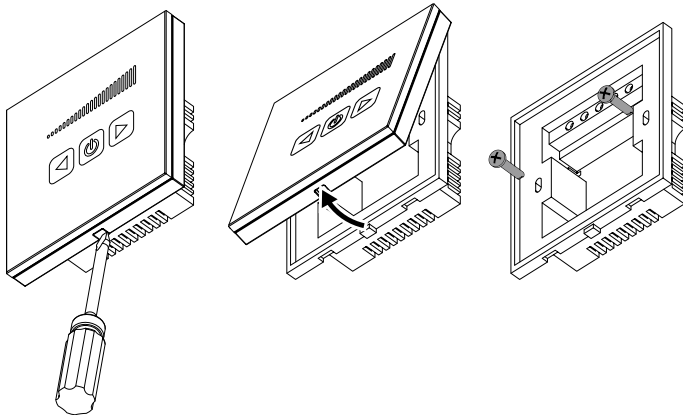
- On/off switch and speed control for single-phase voltage controlled fans.

Design

- Casing made of high-quality plastic.
- Glass sensor panel with an ON/OFF button and two speed control buttons.
- The adjustable speed is displayed with the LED indicator.
- Wall flush mounting.
- IP30 ingress protection rating.

Mounting

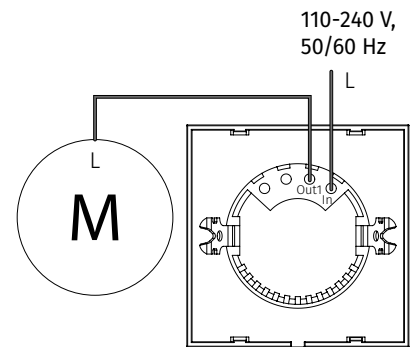
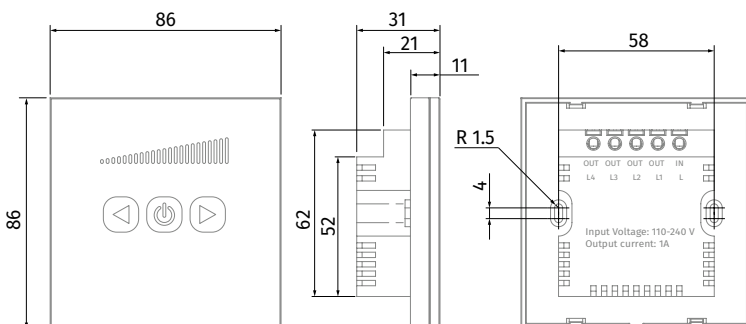
- Designed for wall mounting in a flush mounting box.



Technical data

Parameters	SGS E1
Voltage 50-60 Hz [V]	230
Max. current load [A]	1
Cable cross section [mm ²]	from 0.35 up to 1
Temperature range [°C]	from -10 up to +45
Operating humidity range [%]	from 5 up to 80 (no condensation)
Service life	100 000 operations
Ingress Protection	IP30
Weight [g]	138

Overall dimensions [mm]



M – ventilation equipment motor

CDP-2/5 (3/5)

Multi-speed switch

Features

- On/off switch and speed switch for multi-speed fans.



Design

- Casing made of high-quality plastic.
- Flush wall mounting.
- IP40 ingress protection rating.

Control

- Switching of fan speed according to diagram 1 and switching of fan speed in parallel with switching the light in the room, diagram 2.

Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

Technical data

Parameters	CDP-2/5	CDP-3/5
Voltage 50 Hz [V]	1 ~ 230	1 ~ 230
Rated current [A]	3.0	3.0
Number of speeds	2	3
Overall dimensions AxBxC [mm]	88x88x51	88x88x51
Transported air temperature [°C]	40	40
Ingress Protection	IP40	IP40

Wiring diagram options

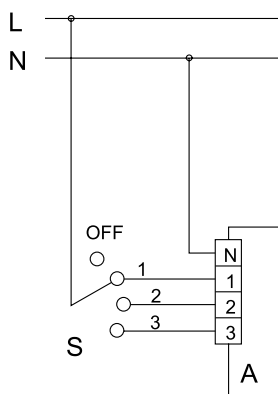


Diagram 1. The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off.

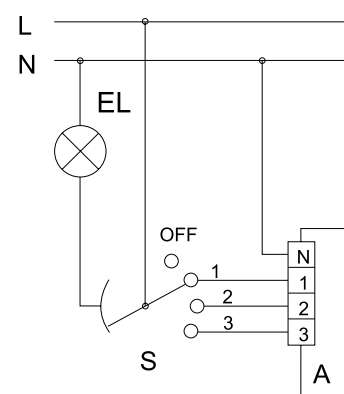


Diagram 2. The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off with parallel switching on/off the light in the room.

CDT E1.8

Thyristor speed controller



Features

- For switching fans on/off and for speed control of single-phase frequency controlled motors. For ventilation systems in various premises.

Design

- The casing is made of high-quality plastic.
- Mounting junction box for wall flush mounting.
- IP40 ingress protection rating.

Control

- Switching on/off by the control knob.
- Smooth speed control from minimum to maximum value. Minimum speed is set by a variable resistor on the control panel.
- Several fans can be controlled from one unit provided that the total current consumption does not exceed the permissible controller current.
- High efficiency and control accuracy.

Protection

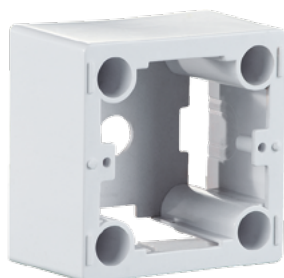
- Input circuit protected with a thermal fuse.
- Equipped with a transient filter.

Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

Options

- Mounting box EDR-E for wall surface mounting available upon separate order.



Technical data

Parameters	CDT E1.8
Voltage 50 Hz [V]	1 ~ 230
Rated current [A]	1.8
Overall dimensions AxBxC [mm]	80x80x63
Transported air temperature [°C]	35
Ingress Protection	IP40
Weight [g]	0.11

CDT E/0-10

Speed control for EC motors

Features

- For switching fans on/off and for speed control of EC motors with 0-10 V control voltage input.



Design

- Casing made of high-quality plastic.
- Mounting junction box for wall flush mounting.
- IP40 ingress protection rating.

Control

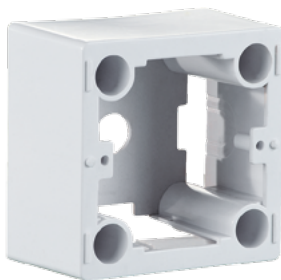
- Switching on/off by the control knob.
- Speed control from minimum to maximum value.
- Featured with high efficiency and control accuracy.

Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

Options

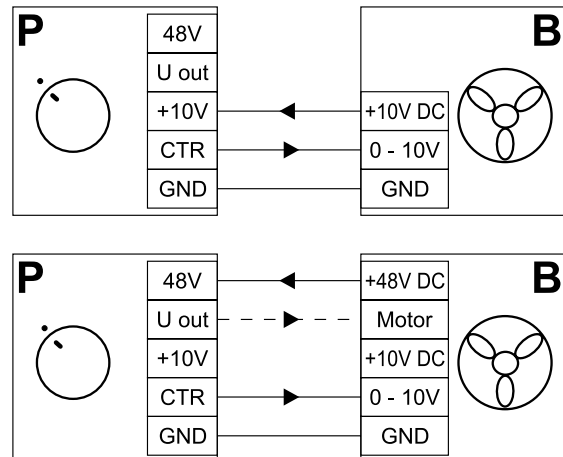
- Mounting box EDR-E for wall surface mounting available upon separate order.



Technische Daten

Parameters	CDT E1.8
Voltage 50 Hz [V]	1 ~ 230
Rated current [A]	1.8
Overall dimensions AxBxC [mm]	80x80x63
Transported air temperature [°C]	35
Ingress Protection	IP40
Weight [g]	0.11

Wiring diagram



CDTE E1.8

Thyristor speed controller



Features

- o For switching fans on/off and for speed control of single-phase frequency controlled motors. For ventilation systems in various premises.

Design

- o Casing made of high-quality plastic.
- o Surface box for mounting.
- o IP40 ingress protection rating.

Control

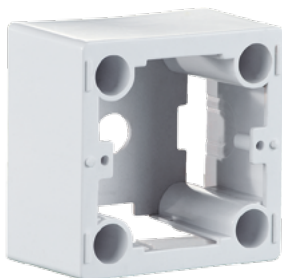
- o Switching on/off by control knob.
- o Smooth speed control from minimum to maximum value. The minimum rotation speed is set by a variable resistor on the control panel.
- o Several fans can be controlled from one unit provided that the total current consumption does not exceed the permissible controller current.
- o Featured with high efficiency and control accuracy.

Protection

- o Input circuit protected with a thermal fuse.
- o Equipped with a transient filter.

Mounting

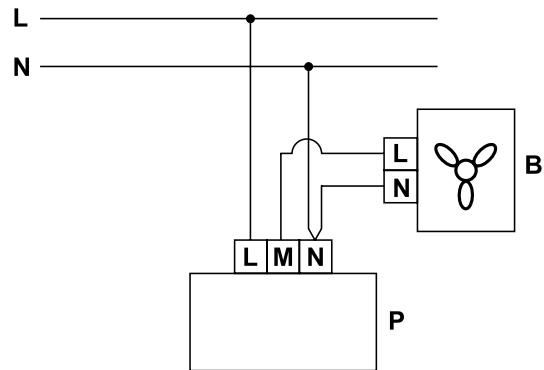
- o Indoor wall mounting.



Technical data

Parameters	CDTE E1.8
Voltage 50/60 Hz [V]	1 ~ 230
Rated current [A]	1.8
Overall dimensions AxBxC [mm]	80x80x64
Transported air temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.11

Wiring diagram



CDTE E/0-10

Speed controller for EC motors

Features

- For switching the fan on/off and for speed control of EC motors with 0-10 V control voltage input.



Design

- Casing made of high-quality plastic.
- Surface box for mounting.
- IP40 ingress protection rating.

Control

- Switching on/off by control knob.
- Speed control from minimum to maximum value.
- Featured with high efficiency and control accuracy.

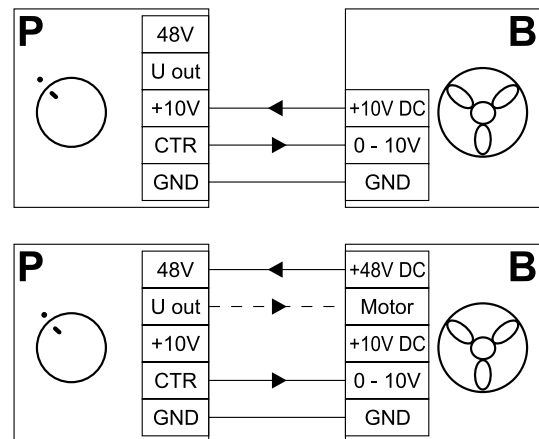
Mounting

- Indoor wall mounting.

Technical data

Parameters	CDTE E/0-10
Voltage [V]	10-48 VDC
Control input [V]	0-10
Overall dimensions AxBxC [mm]	80x80x63
Max. ambient temperature [°C]	35
Ingress Protection	IP40
Weight [kg]	0.12

Wiring diagram



CDT(E) E

Speed controller



Features

- Applied in ventilation systems for speed switching ON/OFF and speed control of the single phase power-controlled motors. Several fans can be controlled synchronously in case their total current does not exceed the maximum permissible values for the controller current.

Design and control

- Controller has the plastic casing with the control knob, ON/OFF button and pilot light. The controller is featured with high efficiency and control accuracy. Regulation starts from the minimum fan stable running voltage value to the maximum one. The minimum rotation speed is set by means of the potentiometer on the PCB.

Protection

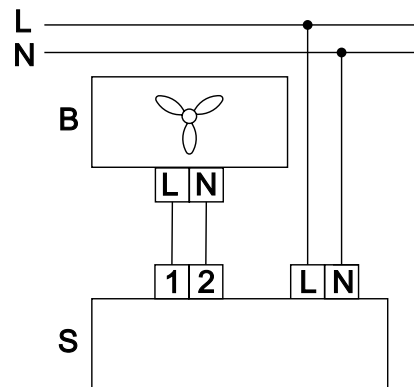
- Input circuit of the speed controller has a thermal fuse for overload protection. The controller is fitted with a transient filter.

Mounting

- The controller is designed for indoor wall mounting either on the wall (CDTE E) or through the wall (CDT E).

Technical data

Parameters	CDT(E) E1	CDT(E) E1.5	CDT(E) E2	CDT(E) E2.5
Voltage [V / 50 Hz]	1~ 230	1~ 230	1~ 230	1~ 230
Rated current [A]	1.0	1.5	2.0	2.5
Overall dimensions LxWxH [mm]	162x80x70	162x80x70	162x80x70	162x80x70
Maximum ambient temperature [°C]	40	40	40	40
Protection rating	IP44	IP44	IP44	IP44
Weight [kg]	0.3	0.3	0.3	0.3



Controller wiring diagram

CDT1 E

Speed controller

Features

- Applied in ventilation systems for speed switching ON/OFF and speed control of single phase power-controlled motors. Several fans can be controlled synchronously in case their total current does not exceed the maximum permissible value of the controller current.



Design and control

- The controller casing is made of plastic. The control knob is equipped with the pilot light. The controller is featured with high efficiency and control accuracy. Switching is effected by means of pressing the control knob. Regulating starts from the minimum to the maximum voltage value for the fan stable running. The minimum speed is set by means of the potentiometer at the PCB. The controller is equipped with extra 230 V terminal for connection and control of the external equipment.

Protection

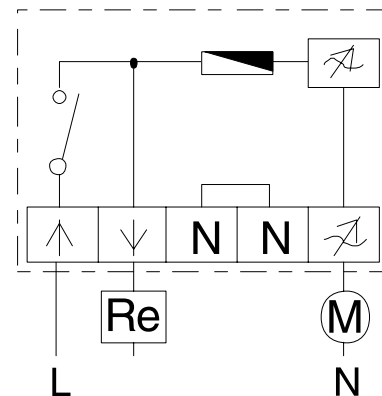
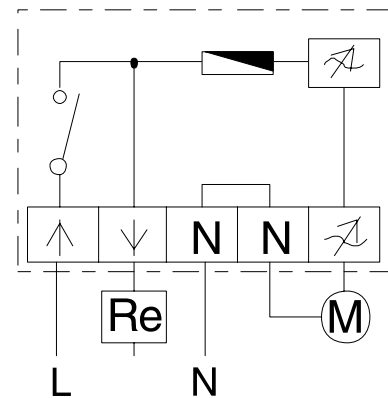
- Input circuit of the speed controller has a thermal fuse for overload protection. The controller is fitted with a transient filter.

Mounting

- The universal design of the controller enables its mounting either on the wall or through the wall, suitable for installation into standard round electric junction boxes.

Technical data

Parameters	CDT1 E0.5	CDT1 E1.5	CDT1 E2.5	CDT1 E4.0
Voltage [V / 50 Hz]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230
Minimum current [A]	0.1	0.15	0.25	0.4
Maximum current [A]	0.5	1.5	2.5	4.0
Overall dimensions LxWxH [mm]	82x82x65	82x82x65	82x82x65	82x82x65
Maximum ambient temperature [°C]	35	35	35	35
Protection rating	IP44	IP44	IP44	IP44
Weight [kg]	0.23	0.24	0.29	0.36



Controller wiring diagram

CD-1/CD-2

CO₂ sensors

Features

- Indoor carbon dioxide concentration measurement.
- Air flow control depending on CO₂ concentration.
- Efficient energy saving device.



Design

- The sensor has two separate outputs, a normally opened dry relay contact and an analogue output 0–10 V that is adjustable for 2–10 V/0–20 mA/4–20 mA. The relay output is used to turn the fan on/off depending on indoor CO₂ concentration and the analogue output is used for smooth fan speed control for a fan with EC motor or a fan with extra speed controller with 0–10 V input. In case of smooth fan speed control the fan speed varies proportionally to carbon dioxide emissions. Due to the relay and analogue outputs the sensor is compatible with any ventilation system. The self-calibration system ensures reliable sensor operation during the sensor service life.

Modifications

- CD-1: integrated LED lights for indication of CO₂ concentration and a touch button for operation mode switching (mode 1: on, mode 2: off, mode 3: operation according to CO₂ concentration). The button is used to turn the fan on or turn it off when CO₂-based ventilation is not required.
- CD-2: no integrated LED-lights and no touch button. This model is recommended for premises requiring permanent ventilation as school classes and other public premises.

Mounting and power supply

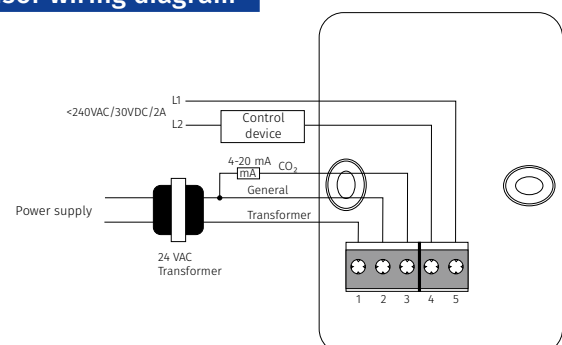
- Wall surface mounting.
- 24 VAC low current power supply.
- The sensor has a socket for AT power unit offered as an accessory (AT-220/25 or AT-120/25 models).



Technical data

Parameters	Value
Power supply / Consumption	24 VAC (50/60 Hz ± 10 %), 24 VDC/1.6 W Max
Gas sensing element	Non-dispersive infrared detector (NDIR) with self-calibration system
CO₂-measuring range	0–2,000 ppm (parts per million)
Accuracy at 25 °C, 2,000 ppm	±30 ppm + 3 % of reading
Response time	max. 2 min
Warm up time for each turning-on	2 hours (first time), 2 minutes (operation)
Analogue output	0–10 VDC (default), 4–20 mA selectable by jumpers
On/Off output	1X2A switch load Four set points selectable by jumpers
6 LED lights for CO₂ concentration indication (for CD-1 model)	1st green indicator lights when CO ₂ concentration is below 600 ppm 1st and 2nd green indicators light when CO ₂ concentration is 600–800 ppm 1st yellow indicator lights when CO ₂ concentration is 800–1200 ppm 1st and 2nd yellow indicators light when CO ₂ concentration is 1200–1400 ppm 1st red indicator lights when CO ₂ concentration is 1400–1600 ppm 1st and 2nd red indicators light when CO ₂ concentration is above 1600 ppm
Operating conditions / Storage regulations	0–50 °C; 0–95 % RH non condensing/0–50 °C
Weight/Dimensions	0.120 kg/100 mm x 80 mm x 30 mm

Sensor wiring diagram



HR-S

Electro-mechanical humidistats



Purpose

- The humidistat is designed for controlling humidification and/or dehumidification in ventilation, air conditioning and heating systems. Can also be used to alarm when the humidity exceeds or falls below a pre-set level.

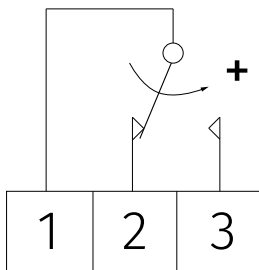
Design

- The single-stage humidistat HR-S uses a synthetic element as sensor medium. The synthetic element stretches as the humidity increases and shrinks as the humidity decreases.

Mounting

- The humidistat is designed for indoor mounting on the wall surface.

Humidistat wiring diagram



Humidification
Dehumidification

Closing contact between terminals 1 and 2
Closing contact between terminals 1 and 3

Technical data

Parameters	HR-S
Switch contact	250 V AC, 5 A
Moisture [%]	20-90
Casing material	Polycarbonate
Temperature range [°C]	0-40
Mounting	Wall surface mounting
Ingress protection	IP30
Dimensions [mm]	86x86x30

DRWQ40200

CO₂ sensor



Features

- Self-calibrating sensor with microprocessor control for measuring carbon dioxide content in the air within the range from 0 to 2,000 million⁻¹ (parts per million).

Design

- DRWQ40200** CO₂ sensor has 2 analogue outputs: 0-10 V and 4-20 mA. An analogue output provides for stepless fan speed control (requires an EC motor fan or a frequency drive).
- With stepless control the fan speed is changed in proportion to carbon dioxide concentration changes. The CO₂ content in the air is measured by means of a non-dispersive infrared analyser (NDIR).

Mounting

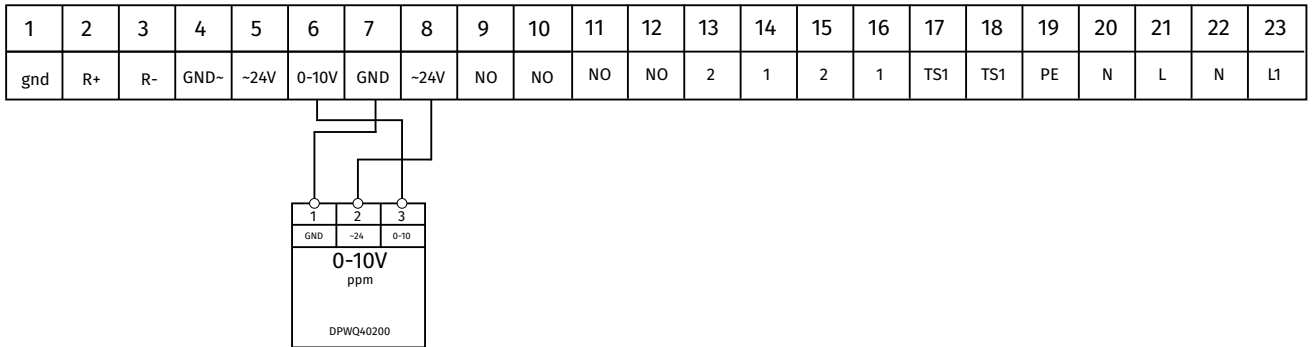
- The sensor is mounted onto a wall or a mounting box inside the serviced space. The unit is powered from a 24 V AC/DC low-current electric mains.

Technical data

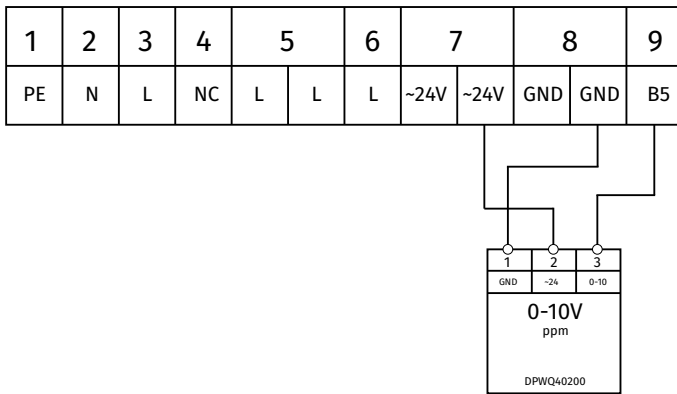
Parameters	Values
Power source	24 V AC/DC
Gas analyser	optical (NDIR)
CO ₂ measurement range	0-2,000 million ⁻¹ (parts per million) of CO ₂
CO ₂ output signal	0-10 V
CO ₂ measurement precision	± 30 million ⁻¹ (parts per million), ± 5% of maximum value
Operating conditions	0-50 °C; 10-90 % relative humidity without condensate
Protection class	IP55
Dimensions	95x97x30 mm

Connection diagram

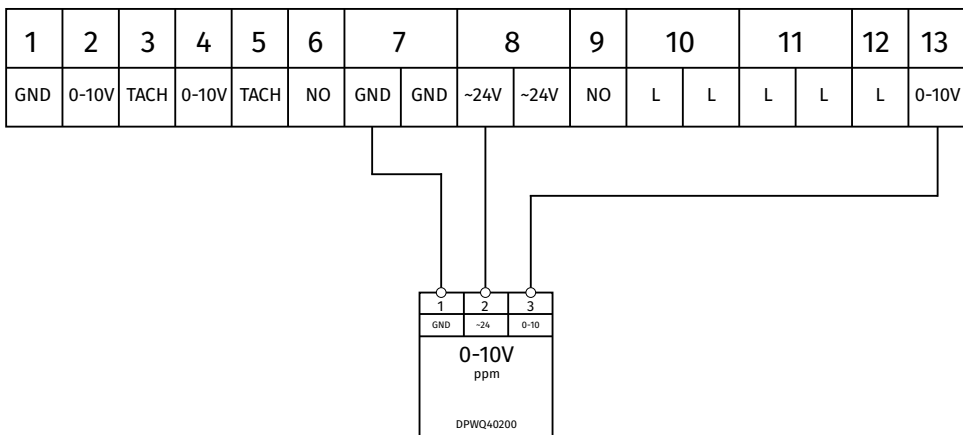
KOMFORT Roto EC D/S



Civic EC L



Civic EC D



DPWC11200

Humidity and temperature sensor

NEW



Features

- The DPWC sensor is intended for temperature, humidification and/or dehumidification control in ventilation, air conditioning and heating systems.

Design

- The **DPWC11200** humidity and temperature sensor has 2 analogue outputs: 0-10 V and 4-20 mA. An analogue output provides for stepless fan speed control (requires an EC motor fan).
- With stepless control the fan speed is changed in proportion to the humidity and temperature level. Being equipped with both relay and analogue outputs the sensor is compatible with most every existing ventilation systems.

Mounting

- The sensor is mounted onto a wall in the serviced space. The unit is powered from a 24 V AC/DC low-current electric mains.

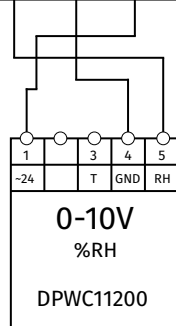
Technical data

Parameters	Values
Power source	8-30 V DC / 12-24 V AC
Analogue outputs	0-10 V and 4-20 mA
Temperature measurement precision	±1,2 °C
Humidity measurement precision	±3 % RH
Operating conditions	-10-60 °C; 10-90 % humidity without condensate
Protection class	IP30
Dimensions	127x80x30 mm

Connection diagram

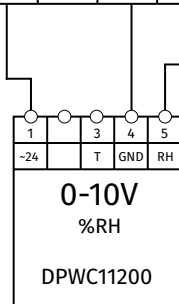
Komfort Roto EC D/S

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
GND	R+	R-	GND~	~24V	0-10V	GND	~24V	NO	NO	NO	NO	2	1	2	1	TS1	TS1	PE	N	L	N	L1



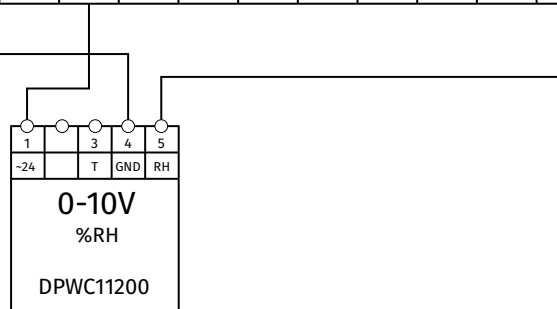
Civic EC L

1	2	3	4	5	6	7	8	9			
PE	N	L	NC	L	L	L	~24V	~24V	GND	GND	B5



Civic EC D

1	2	3	4	5	6	7	8	9	10	11	12	13				
GND	0-10V	TACH	GND~	0-10V	NO	GND	GND	~24V	~24V	NO	L	L	L	L	L	0-10V



DPWQ30600

VOC sensor



Features

- Sensor is intended for temperature, humidification and/or dehumidification control in ventilation, air conditioning and heating systems.

Design

- **DPWQ30600** VOC sensor has 2 analogue outputs: 0-10 V and 4-20 mA. An analogue output provides for stepless fan speed control (requires an EC motor fan or a frequency drive).
- With stepless control the fan speed is changed in proportion to air quality changes.

Mounting

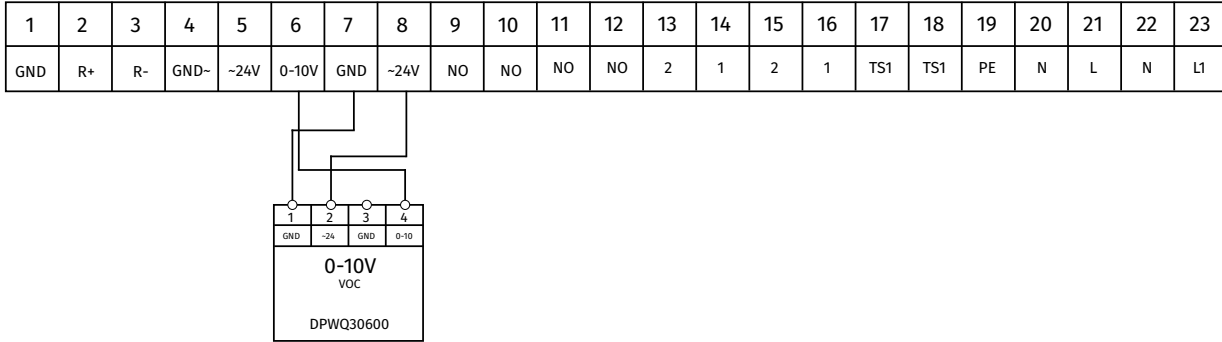
- The sensor is mounted onto a wall or a mounting box inside the serviced space. The unit is powered from a 24 V AC/DC low-current electric mains.

Technical data

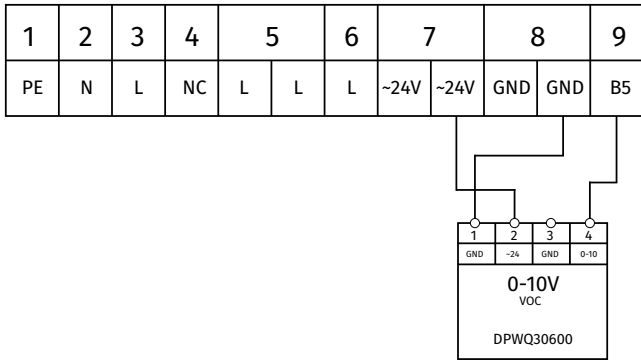
Parameters	Values
Power source	24 V AC/DC
Gas analyser	VOC sensor
Measurement range	0-100 % air quality
Output signal	0-10 V
Measurement precision	±20%
Operating conditions	0-50 °C; 10-90 % relative humidity without condensate
Protection class	IP30
Dimensions	79x81x26 mm

Connection diagram

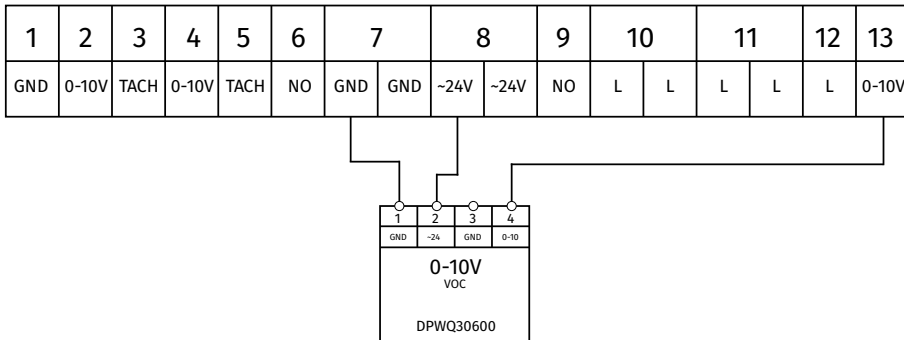
KOMFORT Roto EC D/S



Civic EC L



Civic EC D



BELIMO CM230/CM24

Electric actuators

Features

- For controlling air dampers with cross section up to 0.4 m² installed in various ventilation and air conditioning systems.



Design

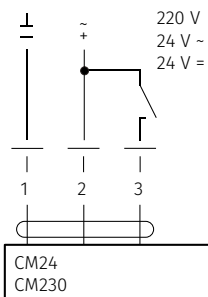
- The electric actuator is provided with a 2 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The angle of rotation is adjusted by mechanical end stops.

Control

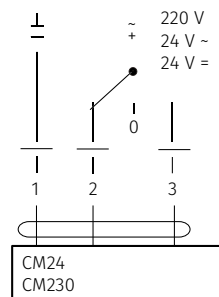
- The air flow control damper can be controlled by means of the three-point or open-close controlling.

Wiring diagram

Open-Close controlling



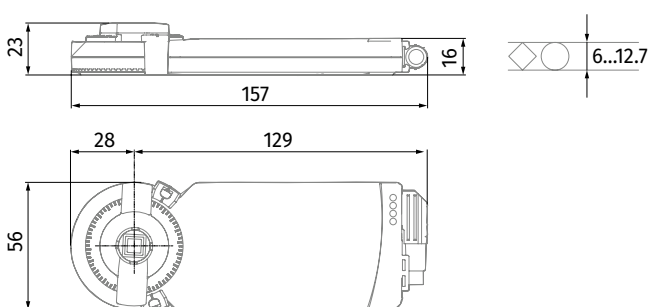
3 point controlling



Technical data

Parameters	CM24	CM230
Voltage	24 V ~ 50/60 Hz, 24 V =	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28,8 ~ 19.2...28,8 =	85...265 ~
Rated power [VA]	1	2
Power consumption in operation / at rest [W]	0.5 / 0.5	1 / 1
Connecting cable	1 m long, 3 x 0.75 mm ²	
Positioning accuracy	± 5 %	± 5 %
Direction of rotation	determined by terminal connection	
Torque [Nm]	2 (at nominal voltage)	
Angle of rotation: - no end stop - with an end stop	endless fixed 315° / adjustable 0...287.5° in 2.5° increments	
Swing time	75 sec / 90°	75 sec / 90°
Position indication	mechanical	mechanical
Ingress protection rating	IP54 at any mounting position	
Electrical protection class	III low voltage II totally insulated	
Operation temperature [°C]	-30...+50	-30...+50
Storage temperature [°C]	-40...+80	-40...+80
Ambient humidity	95 %, no condensation	
Noise level [dBA]	35	35
Maintenance	not required	not required
Weight [kg]	0.13	0.13

Overall dimensions [mm]



BELIMO TF230/TF24

Electric actuators



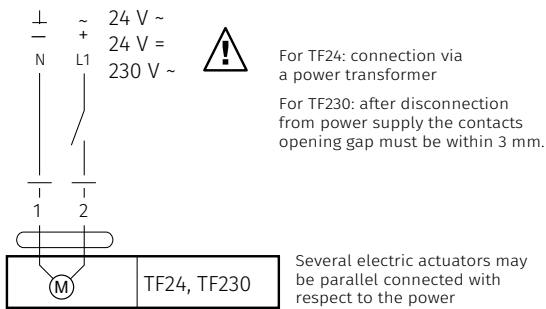
Features

- For controlling air dampers with cross section up to 0.4 m² installed in various ventilation and air conditioning systems and performing protection functions.

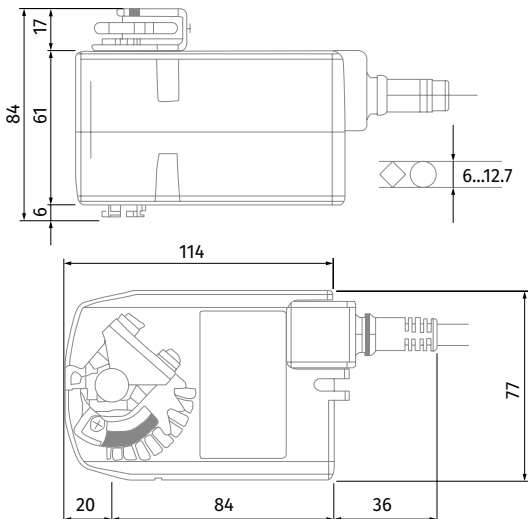
Design

- The electric actuator is provided with a 2 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The actuator is equipped with a return spring, which moves the damper to its operating position while tensioning the return spring at the same time. In case of power supply cut-off, the damper moves back to its safe position by the spring energy.
- The angle of rotation is adjusted by mechanical end stops.

Wiring diagram



Overall dimensions [mm]



Technical data

Parameters	TF24	TF230
Voltage	24 V ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28,8 ~ 21.6...28,8 V=	85...265 ~
Rated power [VA]	4 (max. I 5.8 A at t = 5 ms)	4 (max. I 150 mA at t = 10 ms)
Power consumption in operation / at rest [W]	2 / 1.3	2 / 1.3
Connecting cable	1 m long, 2 x 0.75 mm ²	
Direction of rotation	determined by L/R positioning	
Torque (motor / spring) [Nm]	2 (at nominal voltage) / 2	
Angle of rotation:	max. 95°, adjustable 37...100 % with a mechanical end stop	
Swing time (motor / spring) [sec]	40...75 (0...2 Nm) / < 25 bei -20...50 °C	
Service life	60 000 switching operations	
Ingress protection rating	IP42	IP42
Electrical protection class	III low voltage II totally insulated	III low voltage II totally insulated
Operation temperature [°C]	-30...+50	-30...+50
Storage temperature [°C]	-40...+80	-40...+80
Ambient humidity	95 %, no condensation	
Noise level (motor/ spring) [dBA]	50 / ≈ 62	50 / ≈ 62
Maintenance	not required	not required
Weight [kg]	0.6	0.6

ELECTRIC ACTUATORS

BELIMO LF230/LF24

Electric actuators

Features

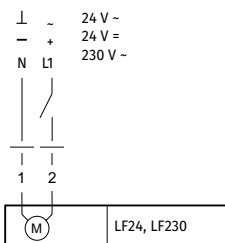
- For controlling air dampers with cross section up to 0.8 m² installed in various ventilation and air conditioning systems and performing protection functions.



Design

- The electric actuator is provided with a 4 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The actuator is equipped with a return spring, which moves the damper to its operating position while tensioning the return spring at the same time. In case of power supply cut-off, the damper moves back to its safe position by the spring energy.
- The angle of rotation is adjusted by mechanical end stops.

Wiring diagram



Warning!
For LF24: connection via a power transformer

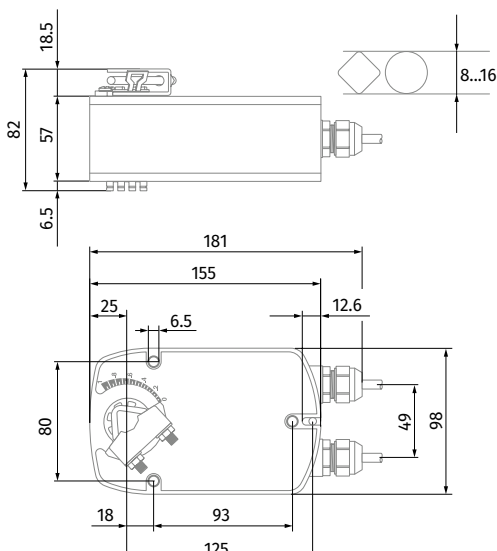
For LF230: after disconnection from power supply the contacts opening gap must be within 3 mm

Several electric actuators may be parallel connected with respect to the power

Technical data

Parameters	LF24	LF230
Voltage	24 V ~ 50/60 Hz, 24 V=	230 V ~ 50/60 Hz
Nominal voltage range [V]	19.2...28.8 ~ 21.6...28.8 V=	198...264 ~
Rated power [VA]	7 (max. I 5.8 A at t = 5 ms)	7 (max. I 150 mA at t = 10 ms)
Power consumption in operation / at rest [W]	5 / 2.5	5 / 3
Connecting cable	1 m long, 2 x 0.75 mm ²	
Direction of rotation	determined by L/R positioning	
Torque (motor / spring) [Nm]	4 (at nominal voltage) / 4	
Angle of rotation	max. 95°, adjustable 37...100 % with a mechanical end stop	
Swing time (motor / spring) [sec]	40...75 (0...4 Nm) / ~ 20 at -20...50 °C	
Service life	60 000 switching operations	
Ingress protection rating	IP54 (installation with cable downwards)	
Electrical protection class	III low voltage II totally insulated	III low voltage II totally insulated
Operation temperature [°C]	-30...+50	
Storage temperature [°C]	-40...+80	
Ambient humidity	95 %, no condensation	
Noise level (motor/ spring) [dBA]	50 / ≈ 62	50 / ≈ 62
Maintenance	not required	
Weight [kg]	1/4	1/4

Overall dimensions [mm]



WMG

Water mixing units for water heating and cooling units

Features

- Smooth heating medium flow regulation and supply air set temperature maintaining in ventilation systems with water heating or cooling coils.
- Compatible with the WKH duct water heating coils and the KWK duct cooling coils.
- Compatible with all water heating or cooling coils installed in BLAUBOX supply units and KOMFORT air handling units.

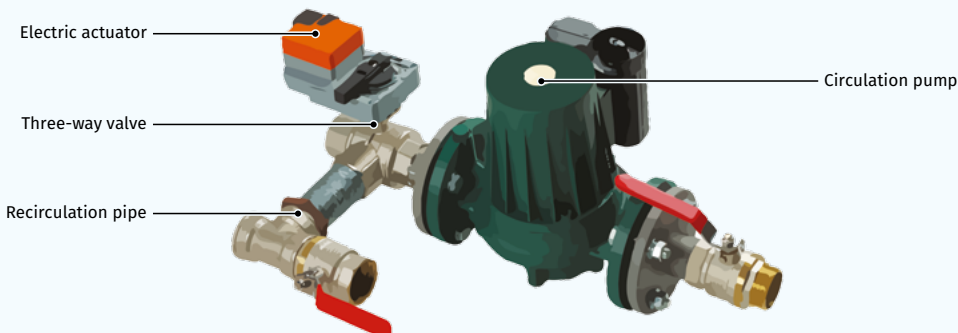


Design

- The water mixing unit consists a circulation pump, a three-way electrically actuated heat medium control valve and a recirculation pipe.
- The three-way valve is designed for smooth mixing of the heat medium stream from the heating (cooling) system and the return heat medium in a required proportion to regulate the heat medium temperature supplied to the water heating or cooling coils.
- The three-way way is actuated with a control 0-10 V signal from the ventilation control system.
- The mixing unit is rated for heat medium operating pressure in the mixing set 10 bar.

Connection to water circuit

- Connection of the mixing unit to the water heating or cooling coils and to the water heating/cooling network through the pipes or flexible hoses of respective diameter, refer to the technical data table.
- In case of applying flexible hoses the mixing unit must be rigidly fixed.
- While installing the mixing unit the motor shaft must be installed horizontally. No mechanical loads from the pipes are allowed.

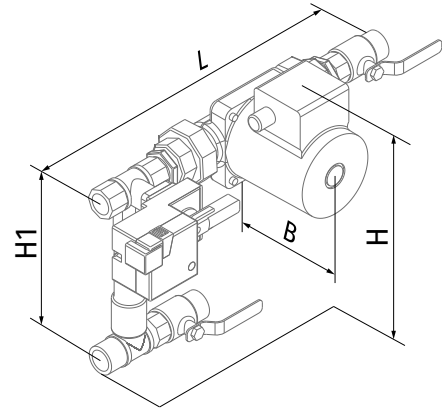


Designation key

Serie	Connected spigot diameter	Heat medium transmission factor (Kvs)
WMG	3/4"; 1"; 1 1/4"; 1 1/2"; 2"	1.8; 2.4; 3.4; 3.6; 5.1; 6; 9

Overall dimensions [mm]

Model	B	H	H1	L
WMG 3/4-4	150	290	180	460
WMG 3/4-6	150	290	180	460
WMG 1-6	175	320	210	490
WMG 1-10	175	320	210	490
WMG 1 1/4-10	175	355	240	500
WMG 1 1/4-16	175	355	240	500
WMG 1 1/2-16	266	420	255	610
WMG 1 1/2-25	266	420	255	610
WMG 2-25	312	474	290	660
WMG 2-40	312	474	290	660



Recommended connection to water network

T1 and T2: heat medium supply and return pipeline

P1 and P2: water pressure gauges for supply and return pipes

1: mixing unit

2: water heater

3: electrically actuated three-way valve

4: circulation pump

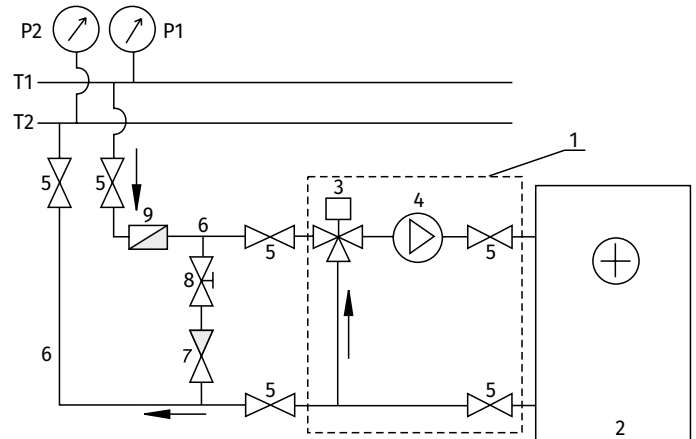
5: shut-off valve

6: supply and return pipes from the heat distribution system to the water heater

7: non-return valve

8: balancing valve

9: coarse filter



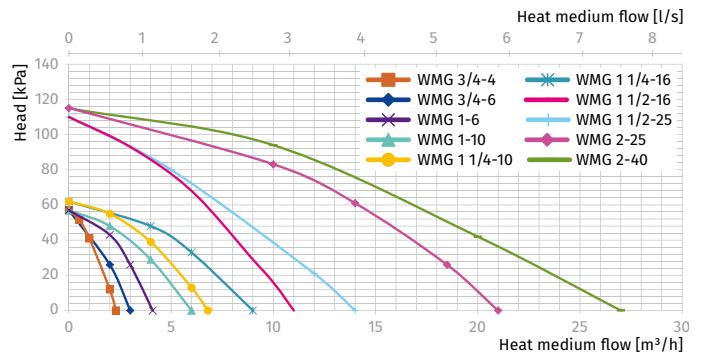
Technical data

Parameters	WMG 3/4-4	WMG 3/4-6	WMG 1-6	WMG 1-10	WMG 1 1/4-10	WMG 1 1/4-16	WMG 1 1/2-16	WMG 1 1/2-25	WMG 2-25	WMG 2-40
Circulation pump	DAB VA65/180		DAB A50/180XM		DAB A56/180XM		DAB BPH 120/250.40M		DAB BPH 120/280.50T	
Three-way valve control way	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V	0...10 V
Electrically actuated three-way valve	R317	R318	R322	R323	R329	R331	R338	R339G	R348	R349G
Three-way valve actuator Belimo	LR24A-SR	LR24A-SR	LR24A-SR	LR24A-SR	LR24A-SR	LR24A-SR	NR24A-SR	SR24A-SR	NR24A-SR	SR24A-SR
Connection type	Threaded connection						Flanged connection			
Three-way valve nominal diameter	DN 20	DN 20	DN 25	DN 25	DN 32	DN 32	DN 40	DN 40	DN 50	DN 50
Three-way valve heat medium transmission factor (Kvs*)	4	6.3	6.3	10	10	16	16	25	25	40
Max. mixing unit flow capacity [m³/h]	2.3	3.0	4.1	6.0	6.8	9.0	11.0	14.0	21.0	27.0
Developed head [kPa]	57	57	57	57	62	62	110	110	115	115
Connected spigot diameter	3/4"	3/4"	1"	1"	1 1/4"	1 1/4"	1 1/2"	1 1/2"	2"	2"
Transported heat medium temperature [°C]	-10...+110	-10...+110	-10...+110	-10...+110	-10...+110	-10...+110	-10...+120	-10...+120	-10...+120	-10...+120
Max. glycol content in the transported heat medium [%]	30	30	30	30	30	30	30	30	30	30
Number of pump speeds	3	3	3	3	3	3	3	3	3	3
Phase / Pump supply voltage / 50 Hz [V]	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	1 ~ 230	3 ~ 400	3 ~ 400
Max. pump power [W]	78	78	184	184	271	271	510	510	898	898
Weight [kg]	4.1	4.1	6.8	6.8	7.4	7.4	23.0	23.0	31.0	31.0

Heat medium transmission factor $K_{vs} = \frac{V_{100}}{\sqrt{\frac{\Delta p_{V_{100}}}{100}}}$, where $\Delta p_{V_{100}}$ – pressure loss when the heat medium valve is fully opened.
 V_{100} – rated heat medium flow at $\Delta p_{V_{100}}$.

Mixing unit calculation diagram

Mixing unit selection: find the required heat medium flow through the heating (cooling) unit as well as heat medium pressure drop (available head). These parameters are determined using the heating or cooling unit calculation diagram for each water heating or cooling unit.



SFK 20x32

Hydraulic syphon for condensate drainage

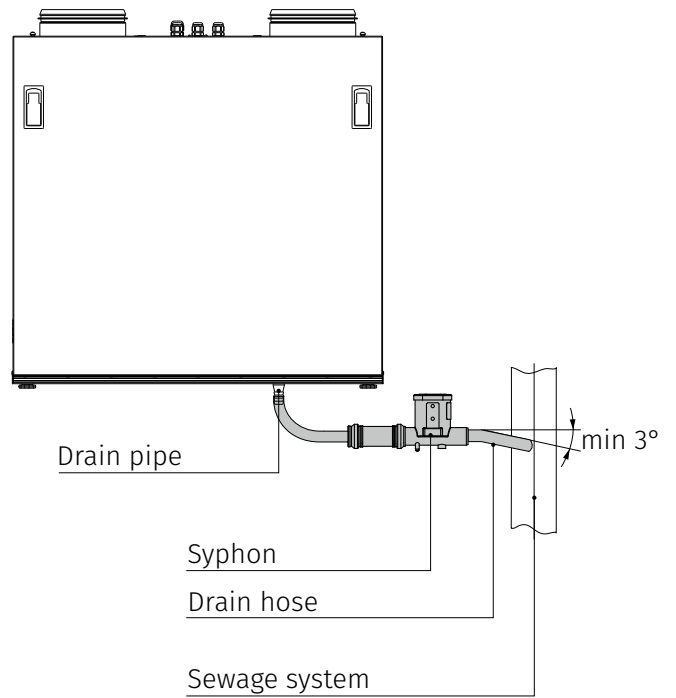
Features

- The hydraulic syphon kit for water heat exchangers SFK 20x32 is designed for condensate drainage from heat exchangers and coolers in ventilation and air conditioning systems.
- The syphon must be connected to a drain pan pipe $\varnothing 18$ mm.



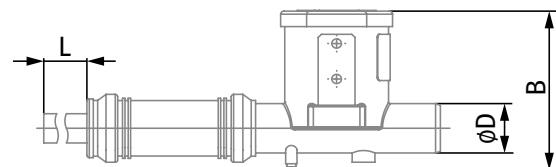
Design

- When the condensate is drained from the ventilation unit, it passes the drain pipe through the flexible PVC hose, the connection coupling and reaches the syphon with the mechanical locking device that does not let sewage system odours out after the hydraulic seal dries out. Then the condensate is moved to the sewage system.
- The SFK 20x32 kit consists of:
 - Coupling 32/32
 - Rubber sleeve 32/20
 - Syphon
 - PVC hose 15x2 of 1000 mm length



Overall dimensions [mm]

Model	D	B	L
SFK 20x32	32	103	1000





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