BLAUBERG Ventilatoren

# AIR HANDLING UNITS

CATALOGUE 2019

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# 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 %

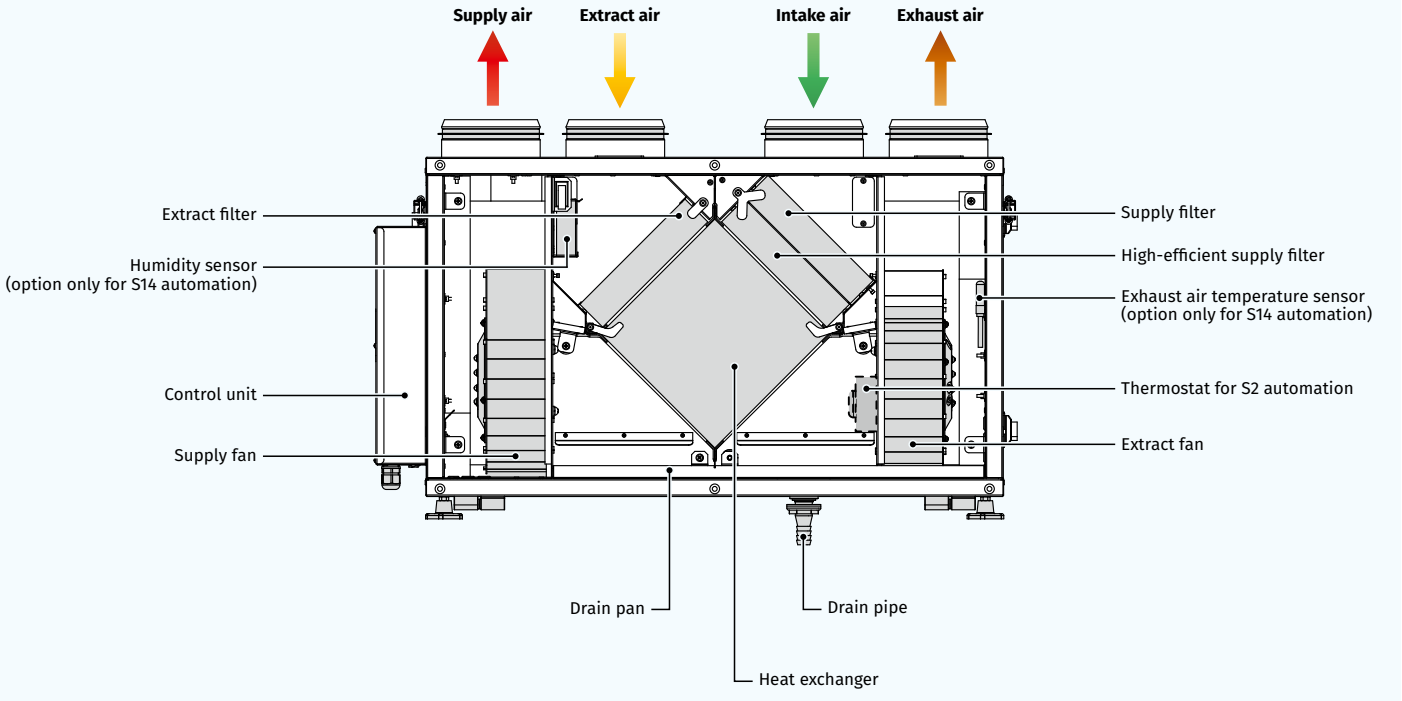
EC motor · ErP 2016 · ErP 2018

### Design

- The casing of **KOMFORT Ultra EC S2 300 ... 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

- 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.



## Heat recovery

- The **KOMFORT Ultra EC S2 300-H ... white** unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT Ultra EC S2 300-E ... white** unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

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

## Control and automation

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

**The 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-H(E) S14 white 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.
- 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 ... white** unit is also suitable for ceiling mounting.
- The **KOMFORT Ultra EC S2 300-H ... white** unit mounting position must provide condensate collection and drainage.
- While mounting provide free access to the service panel for filter replacement and servicing.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

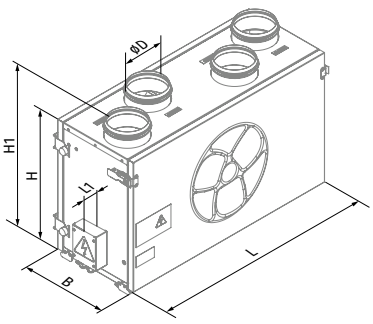


## Designation key

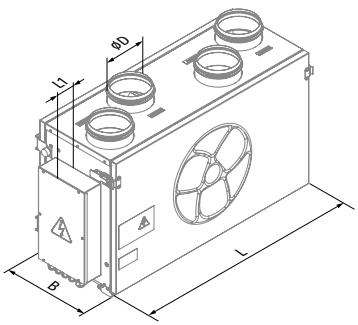
| Serie | Unit type | Motor type | Spigot modification | Casing | Nominal air flow [m³/h] | | Heat exchanger type | Control | Casing |
|---|---|---|---|---|---|---|---|---|---|
| KOMFORT | **Ultra:** compact unit | **EC:** electronically commutated motor | **S:** vertical spigot orientation | **2:**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

## Overall dimensions [mm]

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




KOMFORT Ultra EC S2 300-H(E) S2 white




KOMFORT Ultra EC S2 300-H(E) S14 white

## Technical data

| Parameters | KOMFORT Ultra EC S2 300-H S2 white<br>KOMFORT Ultra EC S2 300-H S14 white | KOMFORT Ultra EC S2 300-E S2 white<br>KOMFORT Ultra EC S2 300-E S14 white |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| 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...+40 | -25...+40 |
| Insulation | 20 mm mineral wool | 20 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | G4, F8 | G4, F8 |
| 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 | polysterene | enthalpy |
| SEC class for S2 automation | B | C |
| SEC class for S14 automation | A | A |
| ErP | 2016, 2018 | 2016, 2018 |

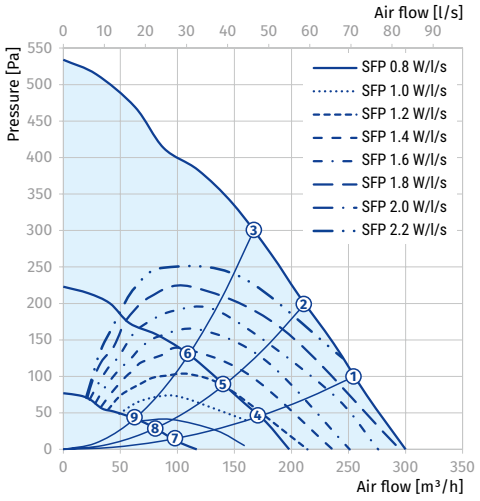
* Heat recovery efficiency is specified in compliance with the EN 13141-7.

| Sound power level, A-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] | **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** |

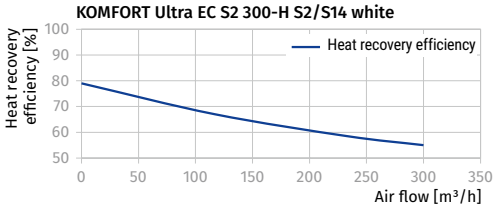
Data provided for point 1 of the air flow diagram

**Total power. Total sound pressure level.**

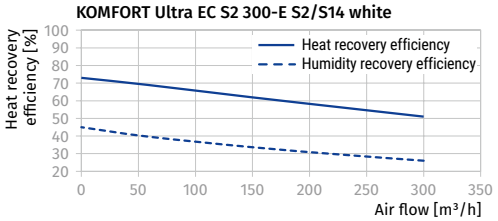
| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 150 | 33 (43) |
| 2 | 138 | 33 (43) |
| 3 | 121 | 32 (42) |
| 4 | 52 | 31 (41) |
| 5 | 48 | 28 (38) |
| 6 | 41 | 27 (37) |
| 7 | 17 | 27 (37) |
| 8 | 16 | 23 (33) |
| 9 | 14 | 23 (33) |




**KOMFORT Ultra EC S2 300-H S2/S14 white**




**KOMFORT Ultra EC S2 300-E S2/S14 white**




COMPACT HEAT RECOVERY AIR HANDLING UNITS

## Accessories

| | | KOMFORT Ultra EC S2 300-H S2 white<br>KOMFORT Ultra EC S2 300-E S2 white | KOMFORT Ultra EC S2 300-H S14 white<br>KOMFORT Ultra EC S2 300-E S14 white |
|---|---|---|---|
| **G4 panel filter** |  | FP 240x184x40 G4 | FP 240x184x40 G4 |
| **F8 panel filter** |  | FP 240x184x40 F8 | FP 240x184x40 F8 |
| **Internal humidity sensor** |  | – | FS2 |
| **$CO_2$ sensor with indication** |  | – | CD-1 |
| **$CO_2$ sensor** |  | – | CD-2 |
| **Humidity sensor** |  | – | HR-S |
| **Silencer** |  | SD 125 | SD 125 |
| **Silencer** |  | SDF 125 | SDF 125 |
| **Backdraft air damper** |  | VRV 125 | VRV 125 |
| **Air damper** |  | – | VKA 125 |
| **Electric actuator** |  | – | LF230 |
| **Summer block** |  | SB C4 200/240 | SB C4 200/240 |

# 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 %

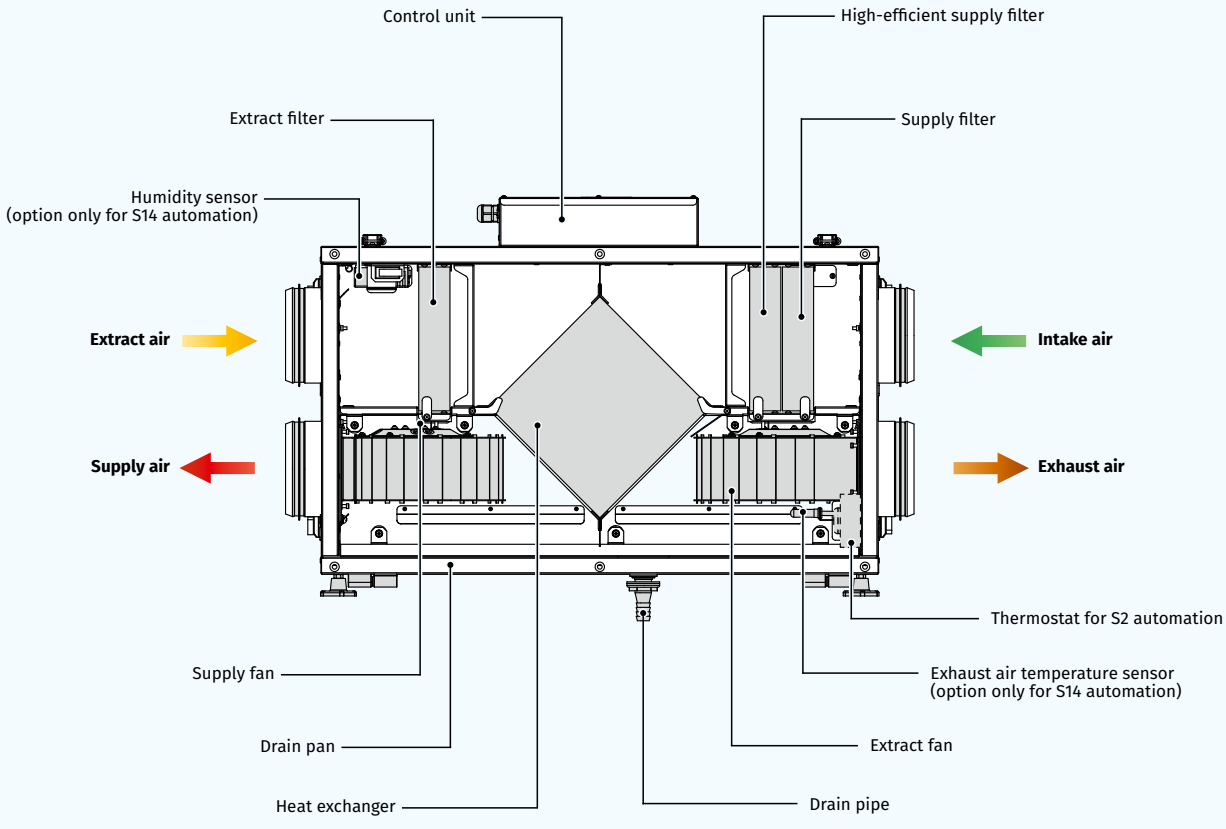
EC motor · ErP 2016 · ErP 2018

### Design

- The casing of **KOMFORT Ultra EC L2 300 ... 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 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.



## Heat recovery

- The **KOMFORT Ultra EC L2 300-H ... white** unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT Ultra EC L2 300-E ... white** unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

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

## Control and automation

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

**The 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-H(E) S14 white 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
- 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 ... white** unit is also suitable for ceiling mounting.
- The **KOMFORT Ultra EC L2 300-H ... white** unit mounting position must provide condensate collection and drainage.
- While mounting provide free access to the service panel for filter replacement and servicing.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

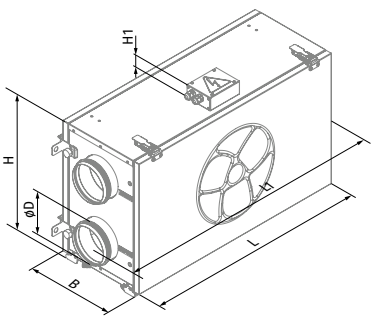


## Designation key

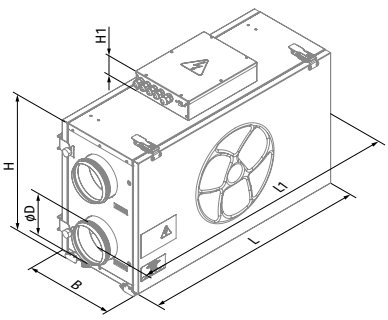
| Serie | Unit type | Motor type | Spigot modification | Casing | Nominal air flow [m³/h] | | Heat exchanger type | Control | Casing |
|---|---|---|---|---|---|---|---|---|---|
| KOMFORT | **Ultra:** compact unit | **EC:** electronically commutated motor | **L:** horizontal spigot orientation | **2:**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

## Overall dimensions [mm]

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




KOMFORT Ultra EC L2 300-H(E) S2 white




KOMFORT Ultra EC L2 300-H(E) S14 white

## Technical data

| Parameters | KOMFORT Ultra EC L2 300-H S2 white<br>KOMFORT Ultra EC L2 300-H S14 white | KOMFORT Ultra EC L2 300-E S2 white<br>KOMFORT Ultra EC L2 300-E S14 white |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| 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...+40 | -25...+40 |
| Insulation | 20 mm mineral wool | 20 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | G4, F8 | G4, F8 |
| 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 | polysterene | enthalpy |
| SEC class for S2 automation | B | C |
| SEC class for S14 automation | A | A |
| ErP | 2016, 2018 | 2016, 2018 |

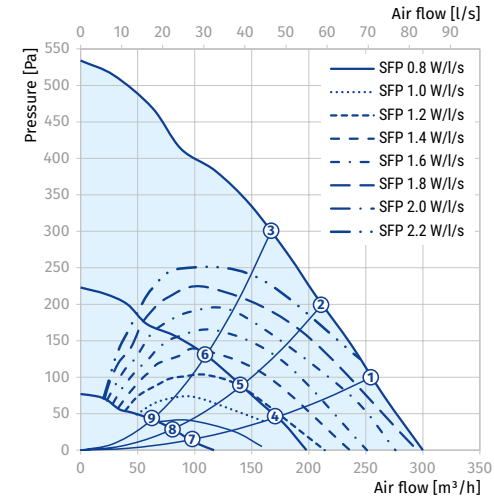
* Heat recovery efficiency is specified in compliance with the EN 13141-7.

| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ 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** |

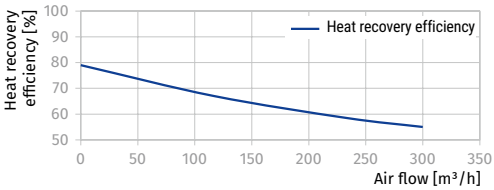
Data provided for point 1 of the air flow diagram

**Total power. Total sound pressure level.**

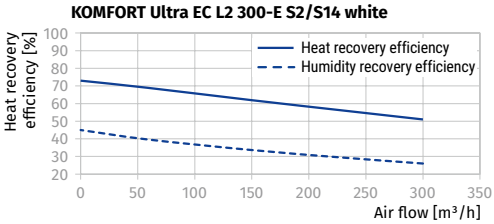
| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 150 | 33 (43) |
| 2 | 138 | 33 (43) |
| 3 | 121 | 32 (42) |
| 4 | 52 | 31 (41) |
| 5 | 48 | 28 (38) |
| 6 | 41 | 27 (37) |
| 7 | 17 | 27 (37) |
| 8 | 16 | 23 (33) |
| 9 | 14 | 23 (33) |




**KOMFORT Ultra EC L2 300-H S2/S14 white**




**KOMFORT Ultra EC L2 300-E S2/S14 white**



## Accessories

| | | KOMFORT Ultra EC L2 300-H S2 white<br>KOMFORT Ultra EC L2 300-E S2 white | KOMFORT Ultra EC L2 300-H S14 white<br>KOMFORT Ultra EC L2 300-E S14 white |
|---|---|---|---|
| **G4 panel filter** |  | FP 240x184x40 G4 | FP 240x184x40 G4 |
| **F8 panel filter** |  | FP 240x184x40 F8 | FP 240x184x40 F8 |
| **Internal humidity sensor** |  | – | FS2 |
| **$CO_2$ sensor with indication** |  | – | CD-1 |
| **$CO_2$ sensor** |  | – | CD-2 |
| **Humidity sensor** |  | – | HR-S |
| **Silencer** |  | SD 125 | SD 125 |
| **Silencer** |  | SDF 125 | SDF 125 |
| **Backdraft air damper** |  | VRV 125 | VRV 125 |
| **Air damper** |  | – | VKA 125 |
| **Electric actuator** |  | – | LF230 |
| **Summer block** |  | SB C4 200/240 | SB C4 200/240 |

# 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 %

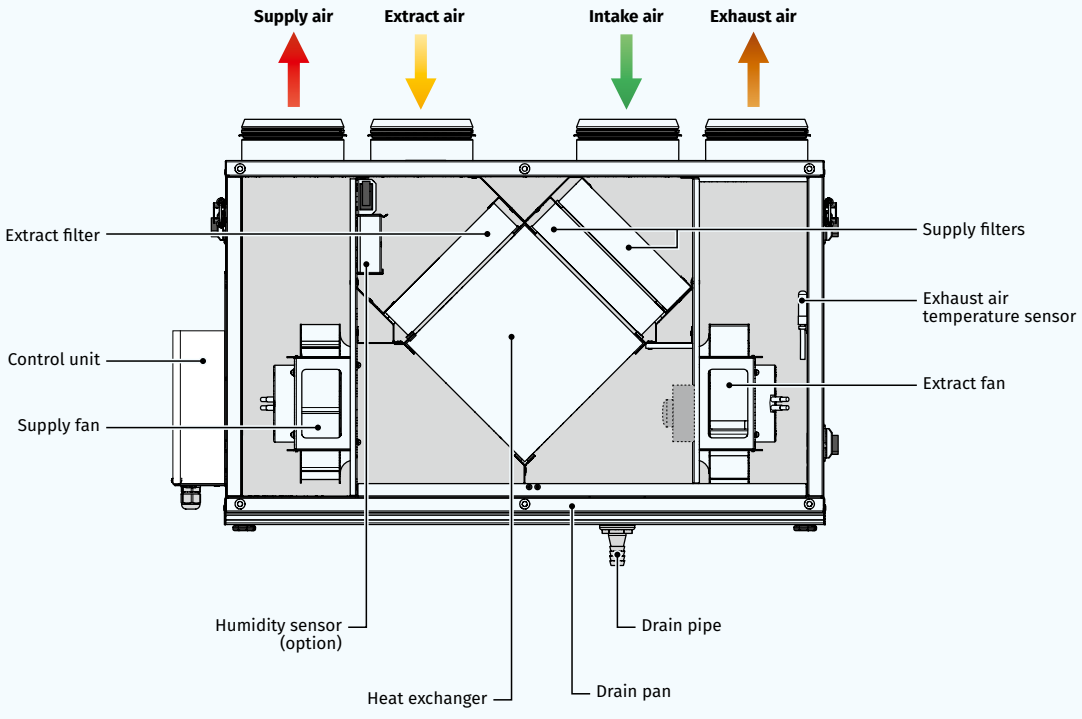
ErP 2016

### Design

- The casing of **KOMFORT Ultra S250-H(E) 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-H(E) 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.

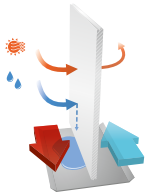
### Fans

- 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 (white)** unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.



The **KOMFORT Ultra S250-E S12 (white)** unit is equipped with an enthalpy plate cross-flow heat exchanger for energy (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

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

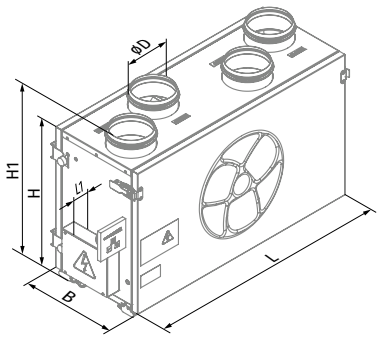
- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra S250-E S12 (white)** unit is also suitable for ceiling mounting.
- While mounting provide free access to the service panel for filter replacement and servicing.
- The **KOMFORT Ultra S250-H S12 (white)** 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.

## Designation key

| Serie | Unit type | Spigot modification | Nominal air flow [m³/h] | | Heat exchanger type | Control | Casing |
|---|---|---|---|---|---|---|---|
| KOMFORT | **Ultra:** compact unit | **S:** vertical spigot orientation | **250** | – | **H:** heat recovery<br>**E:** energy recovery | **S12:** speed controller SGS E1 | **_:** aluzinc<br>**white:** white-painted steel |

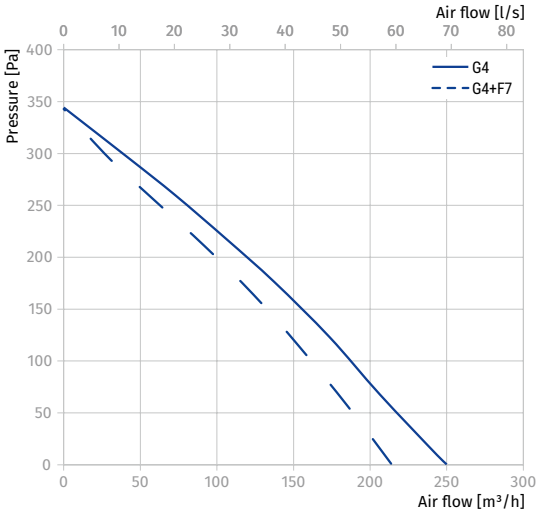
## Overall dimensions [mm]

| Model | D | B | H | H1 | L | L1 |
|---|---|---|---|---|---|---|
| KOMFORT Ultra S250-H(E) S12 (white) | 125 | 300 | 443 | 490 | 713 | 43 |

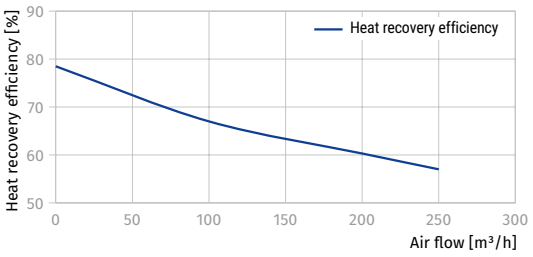


## Technical data

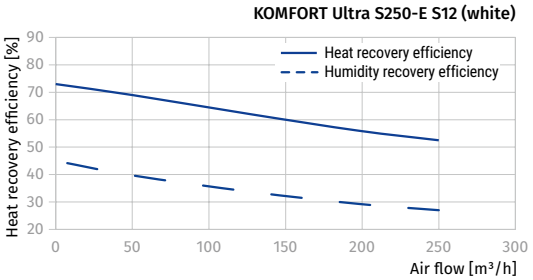
| Parameters | KOMFORT Ultra S250-H S12<br>KOMFORT Ultra S250-H S12 white | KOMFORT Ultra S250-E S12<br>KOMFORT Ultra S250-E S12 white |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 148 | 148 |
| Current [A] | 0.78 | 0.78 |
| Maximum air flow [m³/h (l/s)] | 250 (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 filter | G4 | G4 |
| Supply 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 | polysterene | enthalpy |
| SEC class | B | B |
| ErP | 2016 | 2016 |




**KOMFORT Ultra S250-H S12 (white)**




**KOMFORT Ultra S250-E S12 (white)**



## Accessories

| | | KOMFORT Ultra S250-H S12<br>KOMFORT Ultra S250-H S12 white | KOMFORT Ultra S250-E S12<br>KOMFORT Ultra S250-E S12 white |
|---|---|---|---|
| **G4 panel filter** |  | FP 240x184x40 G4 | FP 240x184x40 G4 |
| **F8 panel filter** |  | FP 240x184x40 F8 | FP 240x184x40 F8 |
| **Silencer** |  | SD 125 | SD 125 |
| **Silencer** |  | SDF 125 | SDF 125 |
| **Backdraft air damper** |  | VRV 125 | VRV 125 |
| **Air damper** |  | VK 125 | VK 125 |
| **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 %

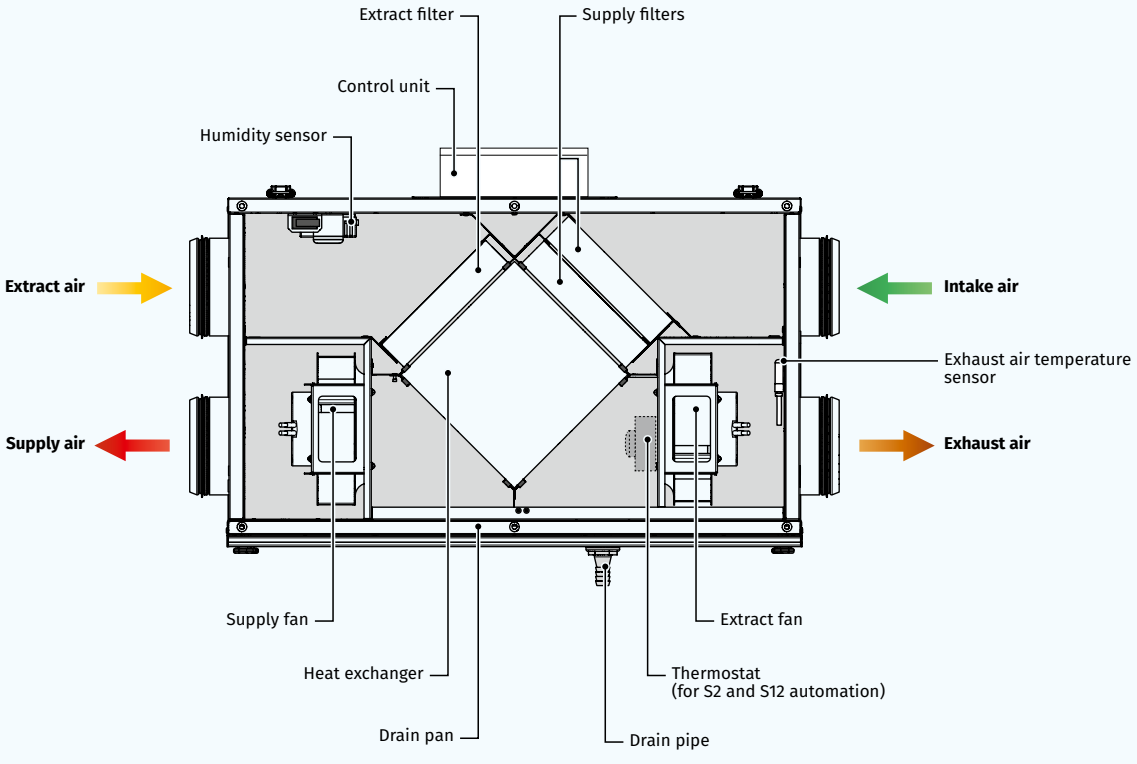
ErP 2016

### Design

- The casing of **KOMFORT Ultra L250 S12-H(E)** 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-H(E) 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 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 unit internals for service works including cleaning, filter replacement, etc.

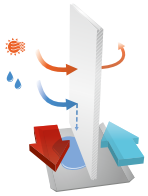
### Fans

- 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 (white)** unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.



- The **KOMFORT Ultra L250-E S12 (white)** unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

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

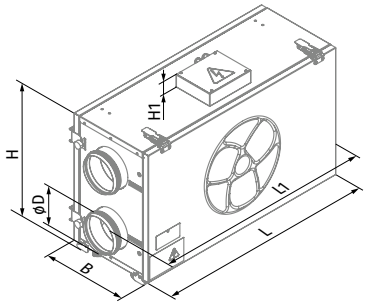
- The units can be fixed to the wall or mounted on the floor using the mounting brackets. The **KOMFORT Ultra L250-E S12 (white)** unit is also suitable for ceiling mounting.
- The **KOMFORT Ultra L250-H S12 (white)** unit mounting position must provide condensate collection and drainage.
- While mounting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

## Designation key

| Serie | Unit type | Spigot modification | Nominal air flow [m³/h] | | Heat exchanger type | Control | Casing |
|---|---|---|---|---|---|---|---|
| KOMFORT | **Ultra:** compact unit | **L:** horizontal spigot orientation | **250** | – | **H:** heat recovery<br>**E:** energy recovery | **S12:** speed controller SGS E1 | **_:** aluzinc<br>**white:** white-painted steel |

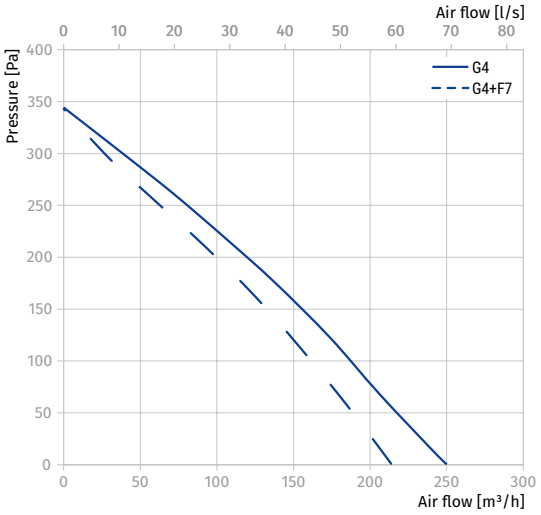
## Overall dimensions [mm]

| Model | D | B | H | H1 | L | L1 |
|---|---|---|---|---|---|---|
| KOMFORT Ultra L250-H(E) S12 (white) | 125 | 300 | 443 | 43 | 713 | 810 |

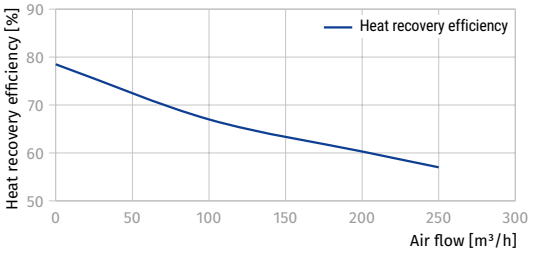


## Technical data

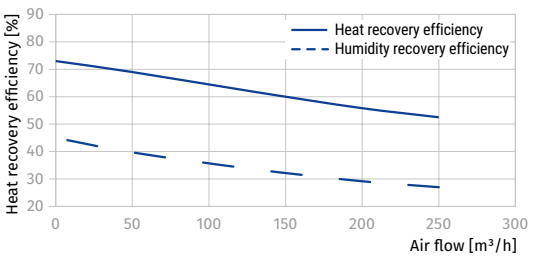
| Parameters | KOMFORT Ultra L250-H S12<br>KOMFORT Ultra L250-H S12 white | KOMFORT Ultra L250-E S12<br>KOMFORT Ultra L250-E S12 white |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 148 | 148 |
| Current [A] | 0.78 | 0.78 |
| Maximum air flow [m³/h (l/s)] | 250 (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 filter | G4 | G4 |
| Supply 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 | polysterene | enthalpy |
| SEC class | B | B |
| ErP | 2016 | 2016 |




**KOMFORT Ultra L250-H S12 (white)**




**KOMFORT Ultra L250-E S12 (white)**



## Accessories

| | | KOMFORT Ultra L250-H S12<br>KOMFORT Ultra L250-H S12 white | KOMFORT Ultra L250-E S12<br>KOMFORT Ultra L250-E S12 white |
|---|---|---|---|
| **G4 panel filter** |  | FP 240x184x40 G4 | FP 240x184x40 G4 |
| **F8 panel filter** |  | FP 240x184x40 F8 | FP 240x184x40 F8 |
| **Silencer** |  | SD 125 | SD 125 |
| **Silencer** |  | SDF 125 | SDF 125 |
| **Backdraft air damper** |  | VRV 125 | VRV 125 |
| **Air damper** |  | VK 125 | VK 125 |
| **Summer block** |  | SB C4 200/240 | SB C4 200/240 |

# 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 %

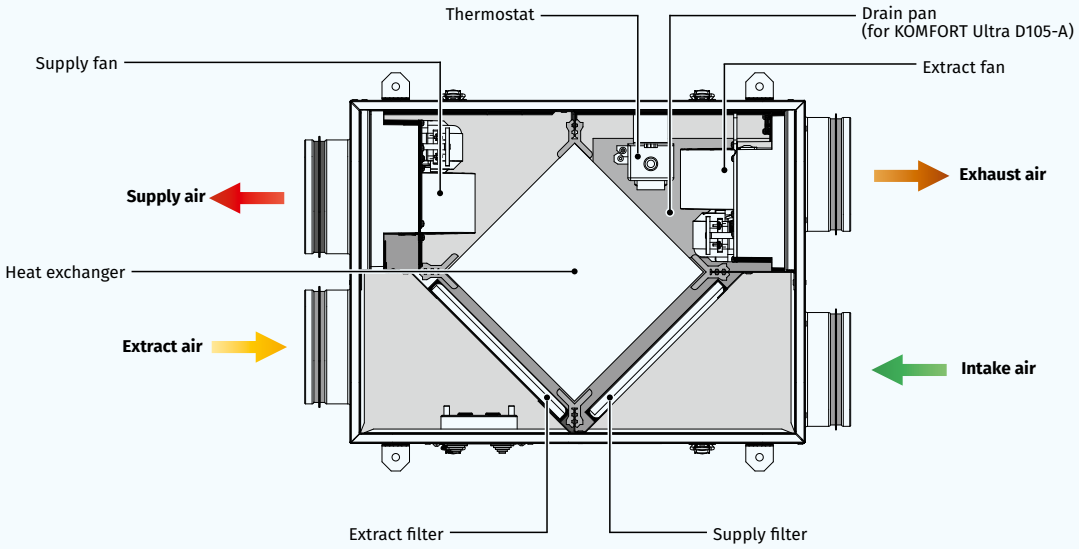
ErP 2016 ErP 2018

### Design

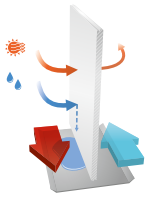
- The compact casing is made of double-skinned aluzinc panels, internally filled with 15 mm PE foam film layer for heat and sound insulation.
- The casing has mounting angles for easy installation.
- The spigots for connection to the air ducts are located at the side of the unit and are rubber sealed 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.



## Heat recovery



- The **KOMFORT Ultra D105-A** unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT Ultra D105** unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FROST PROTECTION

- 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

- The unit has three speeds. Air flow control by the external speed switch CDP-3/5.

## Mounting

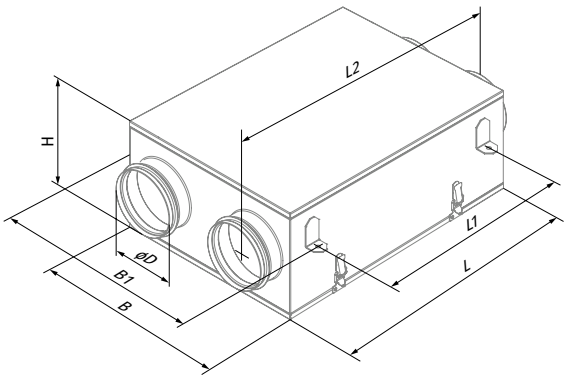
- Indoor installation in horizontal position.
- Mounting in a false ceiling is possible due to compact casing size.
- A small air distribution network for central ventilation may be arranged based on the unit.
- The correct mounted unit must provide free access to the hinged side panel for servicing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

## Designation key

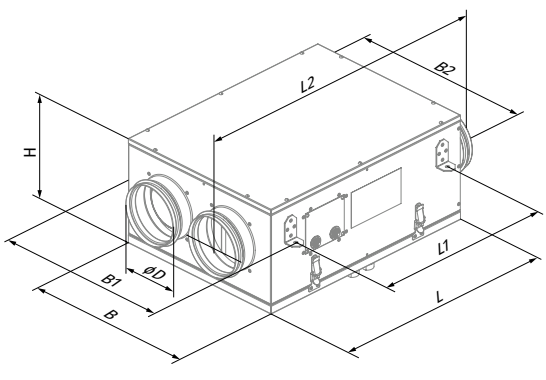
| Serie | Unit type | Mounting type | Nominal air flow [m³/h] | Heat exchanger material |
|---|---|---|---|---|
| KOMFORT | **Ultra:** compact unit | **D:** suspended mounting, horizontally oriented spigots | **105** | **_:** enthalpy<br>**–A:** polystyrene |

## 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 |



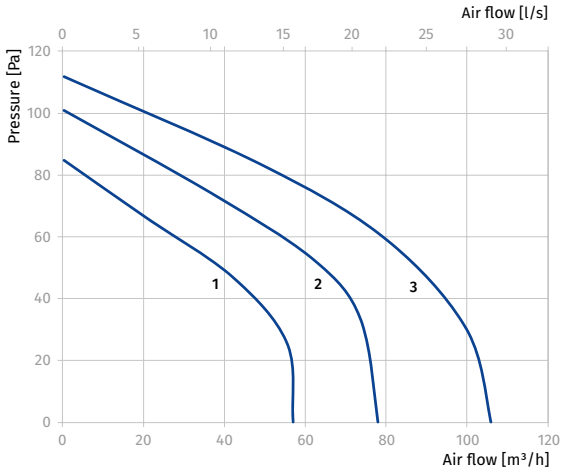

KOMFORT Ultra D105

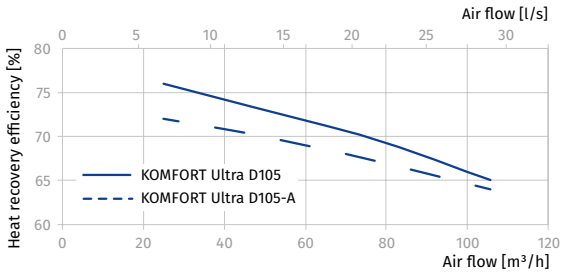



KOMFORT Ultra D105-A

## Technical data

| Parameters | KOMFORT Ultra D105 | | | KOMFORT Ultra D105-A | | |
|---|---|---|---|---|---|---|
| Speed | I | II | III | I | II | III |
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| 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...+40 | | | -25...+40 | | |
| 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 recovery efficiency [%] | 65–76 | | | 64–72 | | |
| Humidity recovery efficiency [%] | up to 45 | | | – | | |
| Heat exchanger type | cross-flow | | | cross-flow | | |
| Heat exchanger material | enthalpy | | | polystyrene | | |
| SEC class | D | | | D | | |
| ErP | 2016, 2018 | | | 2016, 2018 | | |



## Accessories

| | | KOMFORT Ultra D105 | KOMFORT Ultra D105-A |
|---|---|---|---|
| **G4 panel filter** |  | FP 240x202x8 G4 | FP 205x198x8 G4 |
| **Silencer** |  | SD 125 | SD 125 |
| **Silencer** |  | SDF 125 | SDF 125 |
| **Backdraft air damper** |  | VRV 125 | VRV 125 |
| **Air damper** |  | VK 125 | VK 125 |
| **Summer block** |  | SB C4 200/190 | SB C4 200/190 |

# KOMFORT EC S5(B)270(-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 recovery minimizes ventilation heat losses during cold season and reduces air conditioner load during hot season.
- Controllable air exchange provides the best 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 %

EC motor · ErP 2016 · ErP 2018

### Design

- The casing is made of expanded polypropylene (EPP) plates, 15-26 mm thick, possessing high heat- and sound-insulating properties.
- The unit is equipped with service panels for convenient maintenance of filters and heat exchanger.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.

### Fans

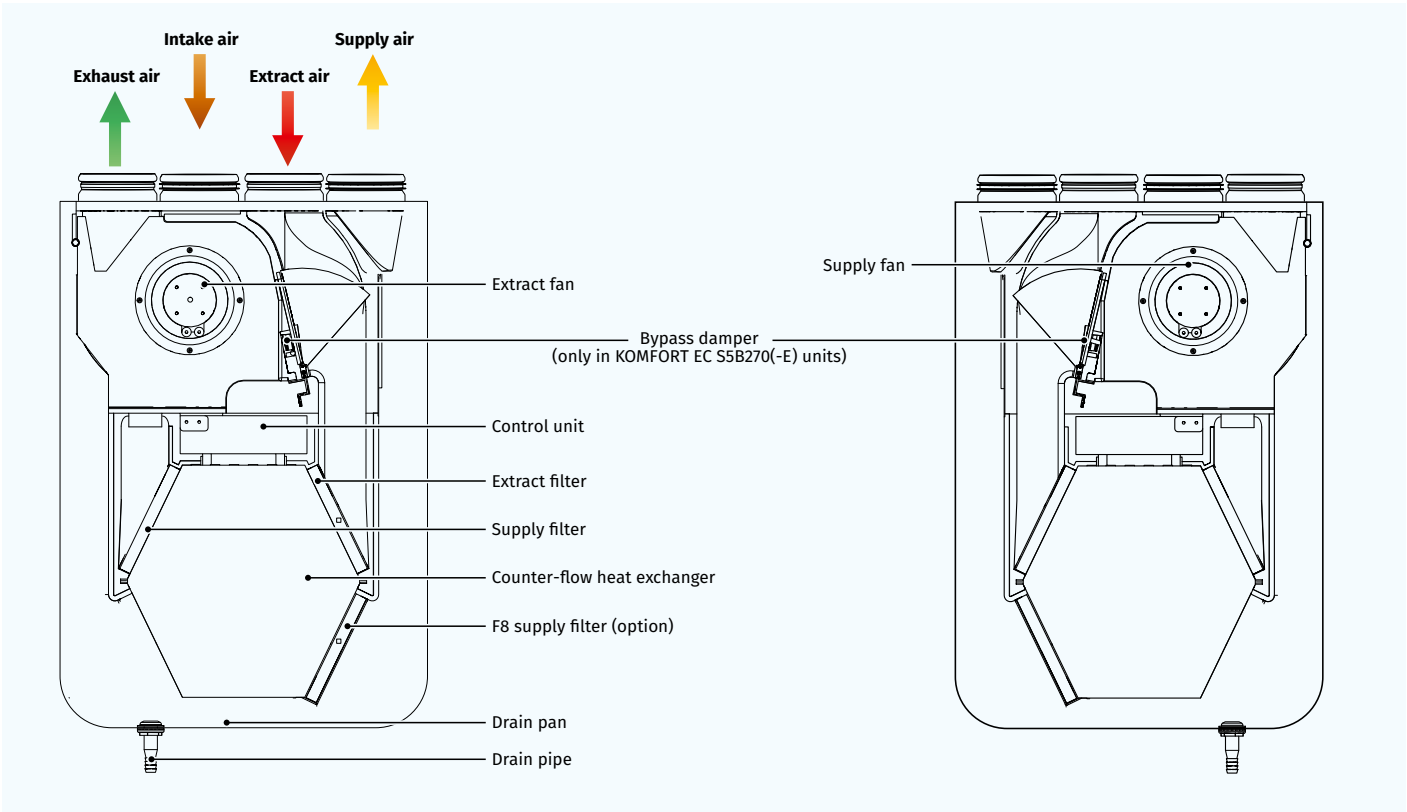
- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured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

### Air filtration

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

### Bypass

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



## Heat recovery

- The **KOMFORT EC S5(B)270** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.


- The **KOMFORT EC S5(B)270-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.


- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

## Mounting

- The ventilation units are designed for wall and floor mounting.
- Due to universal casing design both left and right mounting is possible.

## Control and automation

- The **KOMFORT EC S5B270(-E) S21** units are equipped with a built-in automation system. The remote control panel is not included in the delivery set (sold separately).
- Unit control via Wi-Fi using the mobile application **Blauberg AHU**.

Download the **Blauberg AHU** app for Android

Download the **Blauberg AHU** app for iOS

- The **KOMFORT EC S5B270 (-E) S14** units are equipped with an integrated automation system and the S14 wall mounted sensor control panel with LED-indication.
- The **KOMFORT EC S5 270 (-E) S2** units are equipped with the CDT E/0-10 speed controller.

## Automation functions

| Functions | KOMFORT EC S5B270(-E) S21 | KOMFORT EC S5B270(-E) S14 | KOMFORT EC S5 270(-E) S2 |
|---|---|---|---|
| Unit control via Wi-Fi using the mobile application | + | - | - |
| Unit control via remote control panel | S22 control panel (option)  | S14 control panel  | CDT E/0-10 speed controller  |
| Control via a wired remote LCD control panel | S25 control panel (option)  | - | - |
| Unit control via remote wireless control panel | S22 WiFi control panel (option)  | - | - |
| Speed switch | + | + | + |
| Filter replacement indication | according to filter timer | according to filter timer | - |
| Alarm indication | full description of the alarm in the mobile application | LED indication about alarms | - |
| Week scheduled operation | + | - | - |
| Bypass | automatic | - | - |
| | manual | manual | - |
| Timer | + | - | - |
| Boost mode | + | - | - |
| Kamin mode | + | - | - |
| Freeze protection | using cyclical stops of the supply fan | using cyclical stops of the supply fan | using cyclical stops of the supply fan |
| | using preheating (option) | - | - |
| Reheater connection | option | - | - |
| Cooler connection | option | - | - |
| Minimum supply air temperature control | + | - | - |
| Humidity control | option | option | - |
| $CO_2$ control | option | option | - |
| VOC control | option | - | - |
| PM2.5 control | option | - | - |
| Fire alarm sensor connection | option | option | - |

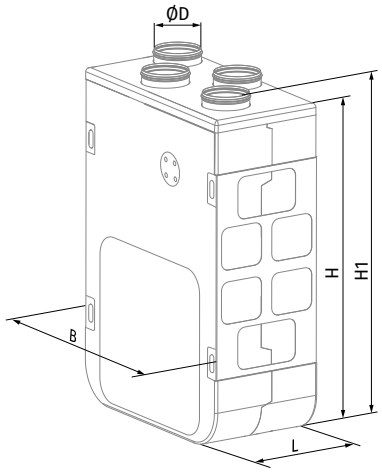
option: the functionality is available when purchasing the appropriate accessory (see the "Accessories" section)

## 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 | **_ :** without a bypass<br>**B:** integrated bypass | **270** | **_:** heat recovery<br>**–E:** energy recovery | **S21**<br>**S14**<br>**S2** |

## Overall dimensions [mm]

| Model | D | B | H | H1 | L |
|---|---|---|---|---|---|
| **KOMFORT EC S5(B)270(-E)** | 125 | 590 | 852 | 893 | 316 |



## Technical data

| Parameters | KOMFORT EC S5B270 S21<br>KOMFORT EC S5B270 S14<br>KOMFORT EC S5 270 S2 | KOMFORT EC S5B270-E S14<br>KOMFORT EC S5B270-E S21<br>KOMFORT EC S5 270-E S2 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 162 | 162 |
| Current [A] | 1.2 | 1.2 |
| Maximum air flow [m³/h (l/s)] | 300 (83) | 300 (83) |
| RPM [min⁻¹] | 3200 | 3200 |
| Sound pressure level at 3 m [dBA] | 34 | 34 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| 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 |
| SEC class for S21 and S14 automation | A+ | A |
| SEC class for S2 automation | B | B |
| ErP | 2016, 2018 | 2016, 2018 |

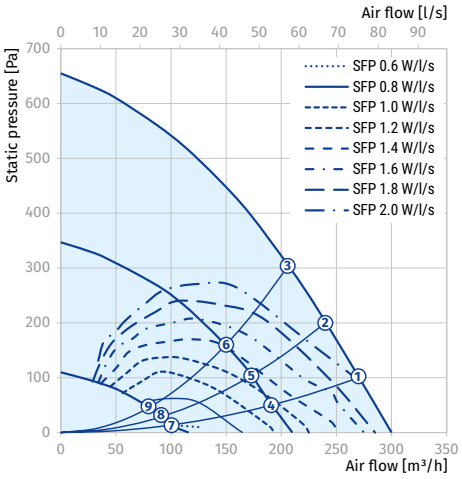
| Sound power level, A-weighted | Total | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **82** | 65 | 63 | 65 | 80 | 74 | 74 | 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

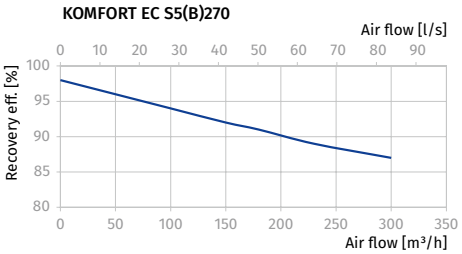
| Point | Unit power [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 153 | 34 (44) |
| 2 | 150 | 34 (44) |
| 3 | 142 | 33 (43) |
| 4 | 62 | 30 (40) |
| 5 | 60 | 29 (39) |
| 6 | 59 | 28 (38) |
| 7 | 17 | 27 (37) |
| 8 | 17 | 23 (33) |
| 9 | 16 | 23 (33) |

**BRE**

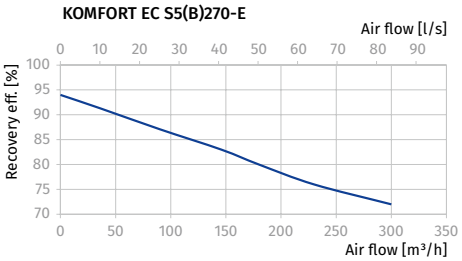
| Exhaust spigot configuration | Air flow rate [l/s] | Specific fan power [W/l/s] | Heat exchange efficiency [%] |
|---|---|---|---|
| Kitchen + 1 additional wet room | 21 | 0.73 | 85 |
| Kitchen + 2 additional wet rooms | 29 | 0.86 | 84 |
| Kitchen + 3 additional wet rooms | 37 | 1.08 | 82 |
| Kitchen + 4 additional wet rooms | 45 | 1.39 | 81 |




**KOMFORT EC S5(B)270**




**KOMFORT EC S5(B)270-E**




**Calculation of air temperature downstream of the heat exchanger:**

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

**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(-E) S21 | KOMFORT EC S5B270(-E) S14 |
|---|---|---|---|
| **G4 panel filter** |  | FP 264x182x18 G4 | FP 264x182x18 G4 |
| **F8 panel filter** |  | FP 264x182x18 F8 | FP 264x182x18 F8 |
| **Control panel** |  | S22 | – |
| **Wi-Fi control panel** |  | S22 Wi-Fi | – |
| **Control panel** |  | S25 | – |
| **Internal humidity sensor** |  | FS2 | FS2 |
| **Humidity sensor** |  | HR-S | HR-S |
| **$CO_2$ sensor** |  | CD-2 | CD-2 |
| **$CO_2$ sensor with indication** |  | CD-1 | CD-1 |
| **VOC sensor** |  | DPWQ30600 | – |
| **$CO_2$ sensor** |  | DPWQ40200 | – |
| **Humidity sensor** |  | DPWC11200 | – |
| **Electric preheater** |  | EVH 125 | – |
| **Electric reheater** |  | ENH 125 | – |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 125 | VKA 125 |
| **Electric actuator** |  | LF230 | LF230 |

| | | KOMFORT EC S5 270(-E) S2 |
|---|---|---|
| **G4 panel filter** |  | FP 264x182x18 G4 |
| **F8 panel filter** |  | FP 264x182x18 F8 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 |

# KOMFORT S5 230(-E) S3/S4

## 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 recovery minimizes ventilation heat losses during cold season and reduces air conditioner load during hot season.
- Controllable air exchange provides the best indoor microclimate.
- Compatible with round Ø125 mm air ducts.

**Air flow:**
up to 230 m³/h
64 l/s

**Heat recovery efficiency:**
up to 98 %

EC motor

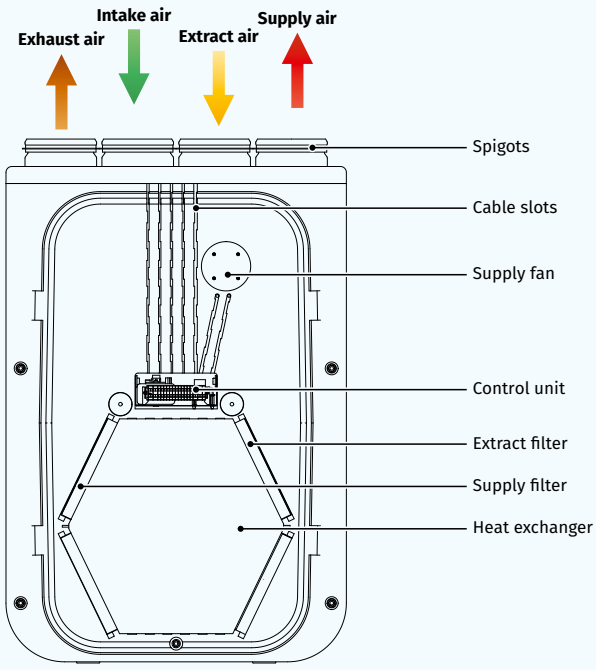
ErP 2016

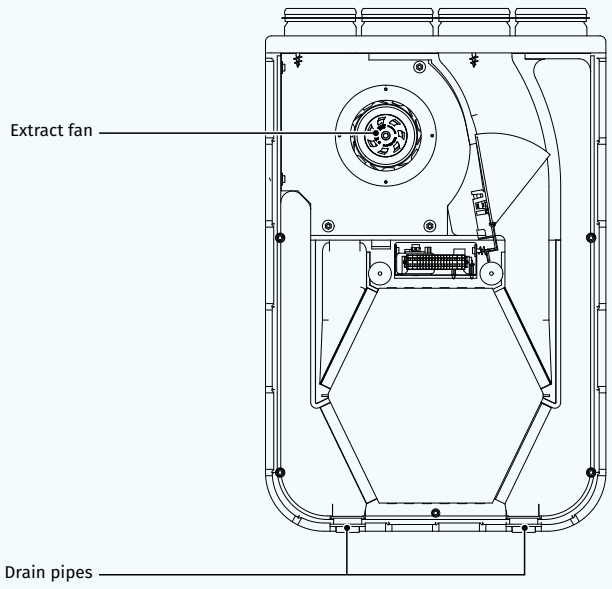
### Design

- The casing is made of expanded polypropylene (EPP) plates, 15-30 mm thick, possessing high heat- and sound-insulating properties.
- The unit is equipped with service panels for convenient maintenance of filters and heat exchanger.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.

### Fans

- Single-phase three-speed external rotor motors with centrifugal impellers and forward curved blades.
- Integrated motor overheating protection with automatic restart.



## Heat recovery

- The **KOMFORT S5 230** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT S5 230-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FREEZE PROTECTION

- The freeze protection of the heat exchanger is activated by shutdown on the supply fan as follows: in case of freezing danger communicated by the temperature sensor the supply fan turns off for the time required for defrosting of the heat exchanger with the warm extract air flow. After freezing danger is no longer imminent, the unit reverts to the standard operation mode.

## 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

- The units have integrated control system based on the mechanical three-speed speed switch CDP-3/5 **(KOMFORT S5 230 S3)** or sensor three-speed speed switch SGR-3/1 **(KOMFORT S5 230 S4)** and power cable with mains plug.
- The control unit is integrated in the unit casing.
- The power and ground cables are connected to the control unit via the cable glands on the side of the unit.

## Mounting

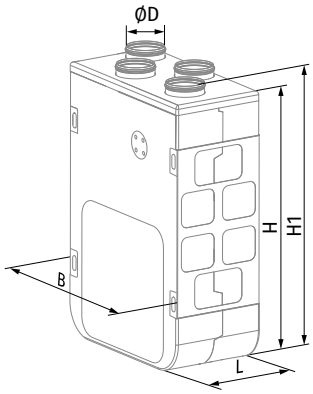
- The units are designed for wall and floor mounting.
- The universal casing design provides left- and right-sided mounting.

## Designation key

| Serie | Spigot modification | Casing modification | Nominal air flow [m³/h] | Heat exchanger type | Control |
|---|---|---|---|---|---|
| KOMFORT | **S:** vertically oriented spigots | **5:** expanded polypropylene | **230** | **_:** heat recovery<br>**–E:** energy recovery | **S3:** mechanical speed switch CDP-3/5<br>**S4:** sensor speed switch SGR-3/1 |

## Overall dimensions [mm]

| Model | D | B | H | H1 | L |
|---|---|---|---|---|---|
| KOMFORT S5 230(-E) S3/S4 | 125 | 590 | 852 | 893 | 316 |

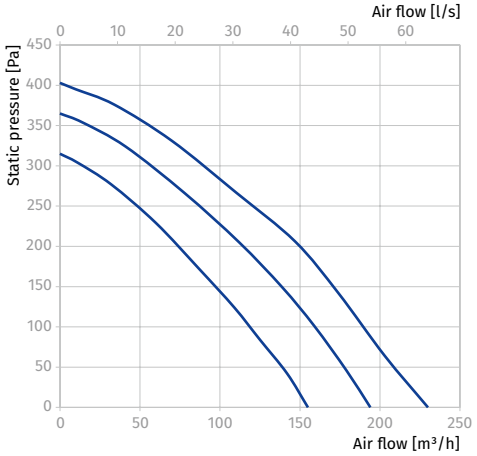


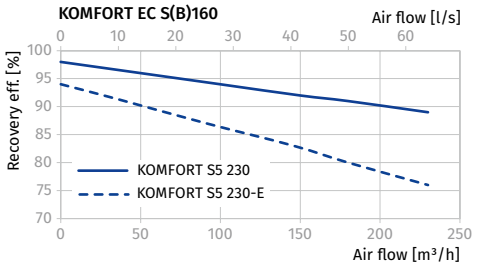
## Technical data

| Parameters | KOMFORT S5 230 S3<br>KOMFORT S5 230 S4 | KOMFORT S5 230-E S3<br>KOMFORT S5 230-E S4 |
|---|---|---|
| Supply voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 163 | 163 |
| Current [A] | 0.7 | 0.7 |
| Maximum air flow [m³/h (l/s)] | 230 (64) | 230 (64) |
| RPM [min⁻¹] | 2720 | 2720 |
| Sound pressure level at a distance of 3 m [dBA] | 35 | 35 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| 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 |
| SEC class | B | C |
| ErP | 2016 | 2016 |

| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ 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] | **82** | 64 | 67 | 71 | 81 | 77 | 79 | 75 | 67 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **70** | 51 | 64 | 62 | 68 | 60 | 60 | 50 | 42 | | |
| $L_{WA}$ to environment [dBA] | **56** | 39 | 47 | 46 | 54 | 46 | 46 | 44 | 40 | **35** | **45** |

Data provided for point 1 of the air flow diagram




**Calculation of air temperature downstream of the heat exchanger:**

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

**where**

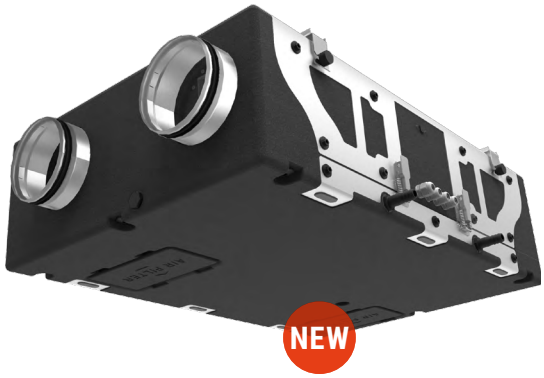
$t_{outd}$ – outdoor air temperature [°C]
$t_{extr}$ – extract air temperature [°C]
$k_{hr}$ – heat exchanger efficiency (according to the diagram) [%]

## Accessories

| | | KOMFORT S5 230 S3<br>KOMFORT S5 230 S4 | KOMFORT S5 230-E S3<br>KOMFORT S5 230-E S4 |
|---|---|---|---|
| **G4 panel filter** |  | FP 264×182×18 G4 | FP 264×182×18 G4 |
| **F8 panel filter** |  | FP 264×182×18 F8 | FP 264×182×18 F8 |
| **Syphon kit** |  | SFK 20x32 | – |

# KOMFORT EC D5(B)180(-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 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 %

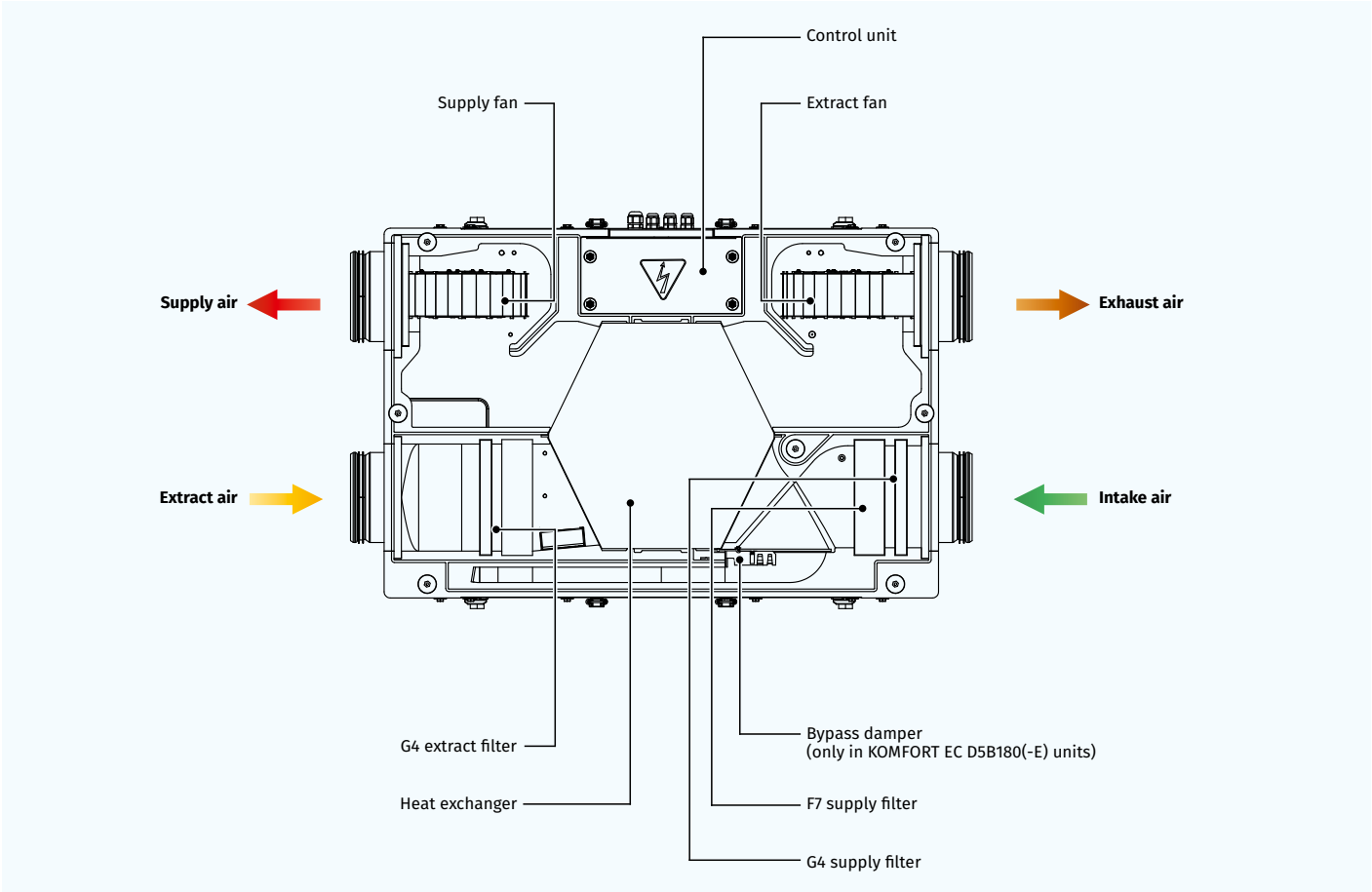
EC motor · ErP 2016 · ErP 2018

### Design

- The casing is made of expanded polypropylene (EPP) 15-30 mm thick with high heat- and sound-insulating properties.
- The spigots are located at the side 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 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.



## Air filtration

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

## Heat recovery

- The **KOMFORT EC D5(B)180** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.


- The **KOMFORT EC D5(B)180-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for energy (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.


- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

## 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.
- Sufficient service access for maintenance and filter replacement must be provided.

## Control and automation

- The **KOMFORT EC D5B180(-E) S21** units are equipped with a built-in automation system. The remote control panel is not included in the delivery set (sold separately).
- Unit control via Wi-Fi using the mobile application **Blauberg AHU**.

Download the **Blauberg AHU** app for Android

Download the **Blauberg AHU** app for iOS

- The **KOMFORT EC D5B180(-E) S14** units are equipped with an integrated automation system and an S14 wall mounted sensor control panel with LED-indication.
- The **KOMFORT EC D5 180(-E) S2** units are equipped with a CDT E/0-10 speed regulator.

## Automation functions

| Functions | KOMFORT EC D5B180(-E) S21 | KOMFORT EC D5B180(-E) S14 | KOMFORT EC D5 180(-E) S2 |
|---|---|---|---|
| Unit control via Wi-Fi using the mobile application | + | - | - |
| Unit control via remote control panel | S22 control panel (option)  | S14 control panel  | CDT E/0-10 speed controller  |
| Control via a wired remote LCD control panel | S25 control panel (option)  | - | - |
| Unit control via remote wireless control panel | S22 WiFi control panel (option)  | - | - |
| Speed switch | + | + | + |
| Filter replacement indication | according to filter timer | according to filter timer | - |
| Alarm indication | full description of the alarm in the mobile application | LED indication about alarms | - |
| Week scheduled operation | + | - | - |
| Bypass | automatic | - | - |
| | manual | manual | - |
| Timer | + | - | - |
| Boost mode | + | - | - |
| Kamin mode | + | - | - |
| Freeze protection | using cyclical stops of the supply fan | using cyclical stops of the supply fan | using cyclical stops of the supply fan |
| | using preheating (option) | - | - |
| Reheater connection | option | - | - |
| Cooler connection | option | - | - |
| Minimum supply air temperature control | + | - | - |
| Humidity control | option | option | - |
| $CO_2$ control | option | option | - |
| VOC control | option | - | - |
| PM2.5 control | option | - | - |
| Fire alarm sensor connection | option | option | - |

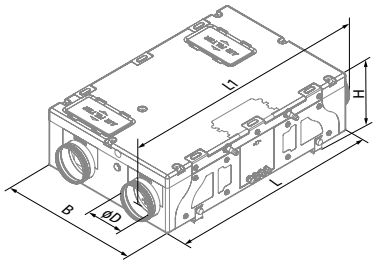
option: the functionality is available when purchasing the appropriate accessory (see the "Accessories" section)

## Designation key

| Serie | Motor type | Spigot orientation | 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 | **_ :** without a bypass<br>**B:** integrated bypass | **180** | **_:** heat recovery<br>**–E:** energy recovery | **S21**<br>**S14**<br>**S2** |

## Overall dimensions [mm]

| Model | D | B | L | L1 | H |
|---|---|---|---|---|---|
| **KOMFORT EC D5(B)180(-E)** | 150 | 600 | 900 | 1009 | 264 |



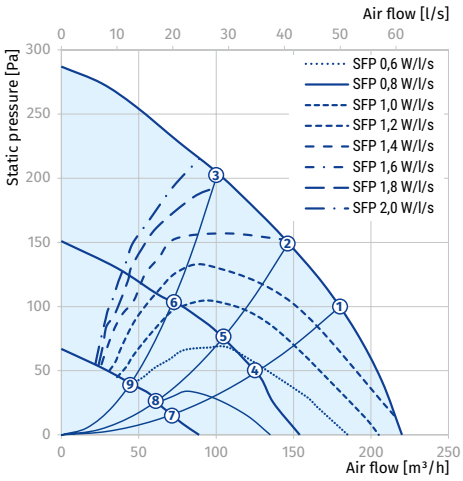
## Technical data

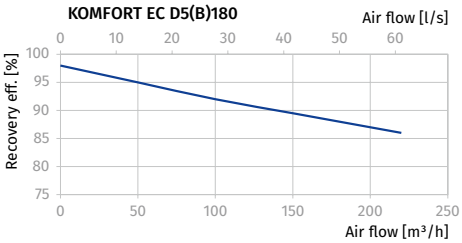
| Parameters | KOMFORT EC D5B180 S21<br>KOMFORT EC D5B180 S14<br>KOMFORT D5 180 S2 | KOMFORT EC D5B180-E S21<br>KOMFORT EC D5B180-E S14<br>KOMFORT D5 180 S2 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 87 | 87 |
| Current [A] | 0.71 | 0.71 |
| Maximum air flow [m³/h (l/s)] | 220 (61) | 220 (61) |
| RPM [min⁻¹] | 2200 | 2200 |
| Sound pressure level at 3 m [dBA] | 33 | 33 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| 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 |
| SEC class for S21 and S14 automation | A+ | A+ |
| SEC class for S2 automation | A | A |
| ErP | 2016, 2018 | 2016, 2018 |

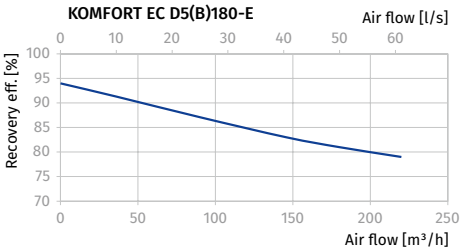
| Sound power level, A-weighted | Total | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **59** | 27 | 46 | 54 | 55 | 53 | 48 | 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

| Point | Unit power [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) |




### BRE

| Exhaust spigot configuration | Air flow rate [l/s] | Specific fan power [W/l/s] | Heat exchange efficiency [%] |
|---|---|---|---|
| Kitchen + 1 additional wet room | 21 | 0.90 | 0.88 |
| Kitchen + 2 additional wet rooms | 29 | 1.00 | 0.86 |
| Kitchen + 3 additional wet rooms | 37 | 1.20 | 0.85 |

**Calculation of air temperature downstream of the heat exchanger:**

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

**where**

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

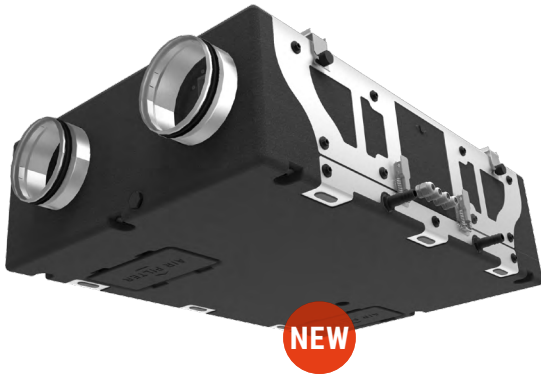
## Accessories

| | | KOMFORT EC D5(B)180(-E) S21 | KOMFORT EC D5(B)180(-E) S14 |
|---|---|---|---|
| **G4 panel filter** |  | FP 214x186x18 G4 | FP 214x186x18 G4 |
| **F8 panel filter** |  | FP 214x186x48 F7 | FP 214x186x48 F7 |
| **Wired control panel** |  | S22 | – |
| **Wireless control panel** |  | S22 Wi-Fi | – |
| **Wired control panel** |  | S25 | – |
| **Internal humidity sensor** |  | FS2 | FS2 |
| **Humidity sensor** |  | HR-S | HR-S |
| **$CO_2$ sensor** |  | CD-2 | CD-2 |
| **$CO_2$ sensor with indication** |  | CD-1 | CD-1 |
| **VOC sensor** |  | DPWQ30600 | – |
| **$CO_2$ sensor** |  | DPWQ40200 | – |
| **Humidity sensor** |  | DPWC11200 | – |
| **Electrical preheater** |  | EVH 150 | – |
| **Electrical reheater** |  | ENH 150 | – |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 150 | VKA 150 |
| **Electric actuator** |  | LF230 | LF230 |

| | | KOMFORT EC D5 180(-E) S2 |
|---|---|---|
| **G4 panel filter** |  | FP 214x186x18 G4 |
| **F8 panel filter** |  | FP 214x186x48 F7 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 |

# KOMFORT D5 180 S3/S4

## 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 heat losses in cold climate conditions and load for air conditioning systems in hot climate conditions due to heat and humidity recovery.
- Control of air exchange for creating comfortable 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 %

ErP 2016

### Design

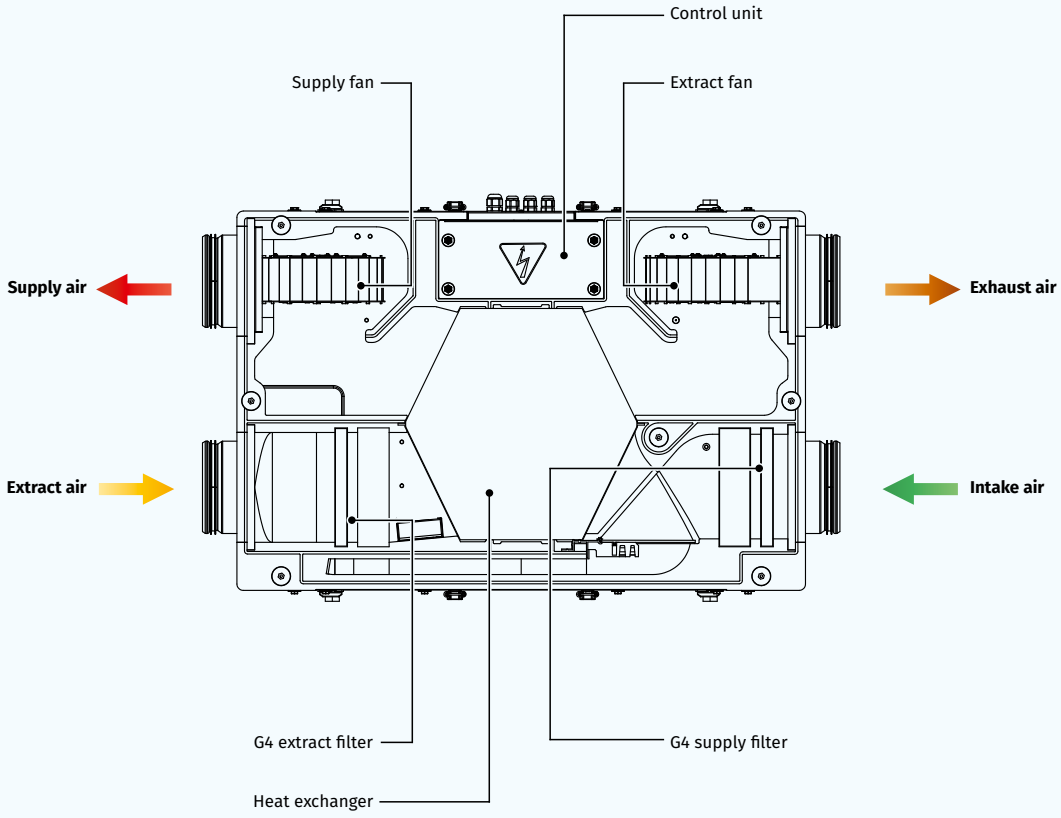
- The casing is made of 15-30 mm thick expanded polypropylene (EPP) with high heat and sound-insulating properties.
- The spigots are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.

### Fans

- Single-phase three-speed external rotor motors with centrifugal impellers and forward curved blades.
- Integrated motor overheating protection with automatic restart.

### Air filtration

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



## Heat recovery

- The **KOMFORT D5 180** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT D5 180-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FREEZE PROTECTION

- The freeze protection of the heat exchanger is activated by shutdown on the supply fan as follows: in case of freezing danger communicated by the temperature sensor the supply fan turns off for the time required for defrosting of the heat exchanger with the warm extract air flow. After freezing danger is no longer imminent, the unit reverts to the standard operation mode.

## Control and automation

- The units have integrated control system based on the mechanical three-speed speed switch CDP-3/5 **(KOMFORT D5 180 S3)** or sensor three-speed speed switch SGR-3/1 **(KOMFORT D5 180 S4)** and power cable with mains plug.
- The control unit is integrated in the unit casing.
- The power and ground cables are connected to the control unit via the cable glands on the side of the unit.

## Mounting

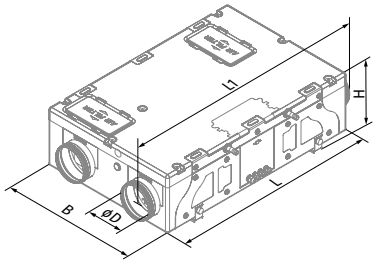
- The units are designed for suspended ceiling, wall and horizontal floor mounting.
- The correct mounted unit must provide service access for maintenance and filter replacement.

## Designation key

| Serie | Mounting type | Casing modification | Nominal air flow [m³/h] | Heat exchanger type | Control |
|---|---|---|---|---|---|
| KOMFORT | **D:** suspended mounting, horizontally oriented spigots | **5:** expanded polypropylene | **180** | **_:** heat recovery<br>**–E:** energy recovery | **S3:** mechanical speed switch CDP-3/5<br>**S4:** sensor speed switch SGR-3/1 |

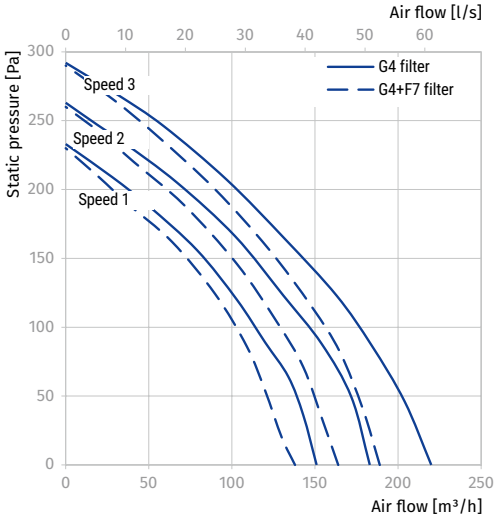
## Overall dimensions [mm]

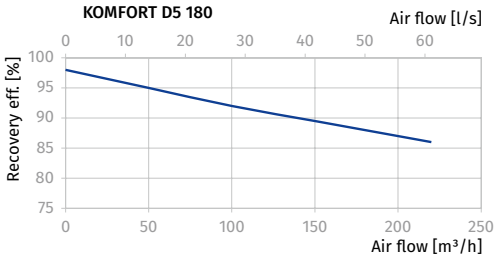
| Model | D | B | L | L1 | H |
|---|---|---|---|---|---|
| KOMFORT D5180(-E) S3/S4 | 150 | 600 | 900 | 1009 | 264 |

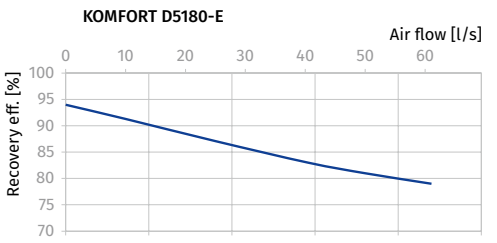


## Technical data

| Parameters | KOMFORT D5 180 S3<br>KOMFORT D5 180 S4 | KOMFORT D5180-E S3<br>KOMFORT D5180-E S4 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 117 | 117 |
| Current [A] | 0.54 | 0.54 |
| Maximum air flow [m³/h (l/s)] | 220 | 220 |
| RPM [min⁻¹] | 2317 | 2317 |
| Sound pressure level at 3 m [dBA] | 35 | 35 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | EPP | EPP |
| Insulation | 15-30 mm EPP | 15-30 mm EPP |
| Extract filter | G4 | G4 |
| Supply filter | G4 (option: F7) | G4 (option: F7) |
| Connected air duct diameter [mm] | 150 | 150 |
| Weight [kg] | 14 | 14 |
| Heat recovery efficiency [%] | 86-98% | 79-94% |
| Heat exchanger type | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | enthalpy |
| SEC class | D | D |
| ErP | 2016 | 2016 |




**Calculation of air temperature downstream of the heat exchanger:**

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

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

## Accessories

| | | KOMFORT D5 180 S3<br>KOMFORT D5 180 S4 | KOMFORT D5180-E S3<br>KOMFORT D5180-E S4 |
|---|---|---|---|
| **G4 panel filter** |  | FP 214×186×18 G4 | FP 214×186×18 G4 |
| **F7 panel filter** |  | FP 214×186×48 F7 | FP 214×186×48 F7 |
| **Syphon kit** |  | SFK 20x32 | – |

# KOMFORT EC S(B)(-E) S14/S21

## Heat and humidity recovery air handling units

### Features

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

**Air flow:**
up to 690 m³/h
192 l/s

**Heat recovery efficiency:**
up to 93%

EC motor · ErP 2016 · ErP 2018

### Design

- The casing is made of double-skinned polymer-coated steel panels, internally filled with 20, 25, 30, 40 mm (depending on the unit model) mineral wool layer for heat- and sound-insulation.
- The unit is equipped with a hinged service panel to enable convenient access for maintenance or repair operations.
- The spigots are located at the top of the unit and are equipped with rubber seals for airtight connection to the air ducts.

### Fans

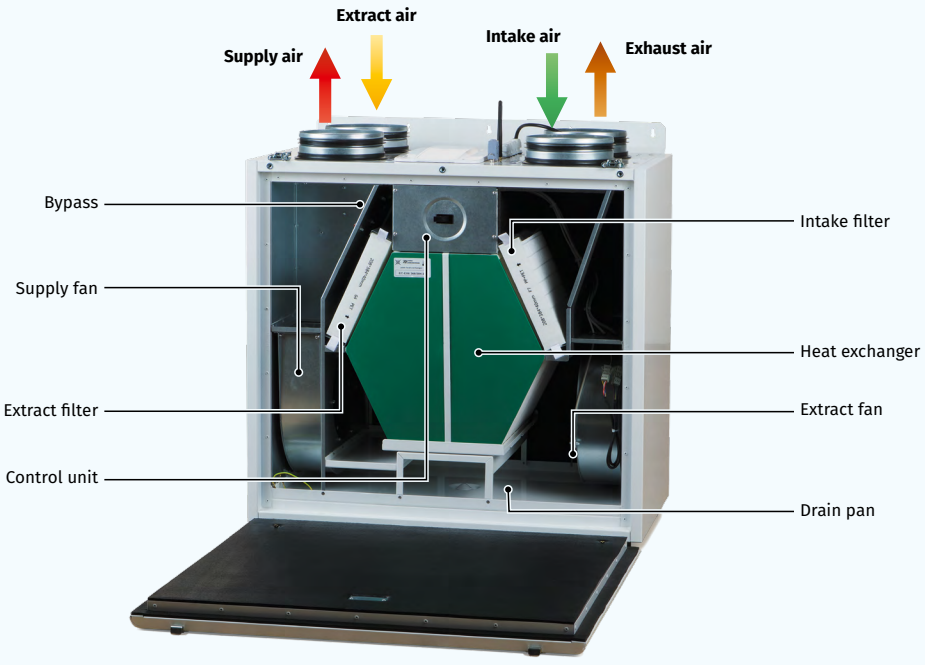
- The units are equipped with high-efficient EC motors with an external rotor and a centrifugal impeller with backward curved blades.
- EC motors have the best power consumption to air capacity ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and optimum control across the entire speed range.
- The impellers are dynamically balanced.

### Air filtration

- The built-in F7 filter provides efficient supply air filtration. The G4 filter is used for extract air cleaning.
- The G3 filters are used for supply and exhaust air filtration in the **KOMFORT EC S(B)200** units.
- Supply air in the **KOMFORT EC S(B)250** units is purified by the G4 and F7 filters. The G4 filter is used for extract air cleaning.

### Bypass

- The **KOMFORT EC SB(-E)** units are equipped with a bypass for ventilation (air cooling by the cool air from outside).



## Heat recovery

- The **KOMFORT EC S(B)** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT EC S(B)-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

## Mounting

- The units are designed for wall or floor mounting.
- Universal casing design provides either left-handed or right-handed unit installation.

## Control and automation

- The **KOMFORT EC S(B)(-E) S21** units are equipped with a build-in automation system. The remote control panel is not included in the delivery set (available separately).
- The unit can be controlled by the **Blauberg AHU** mobile application via Wi-Fi.

Download the **Blauberg AHU** app for Android

Download the **Blauberg AHU** app for iOS

- The **KOMFORT EC S(B)(-E) S14** units have an integrated automation system with a wall-mounted control panel S14 with a LED indication.
- The **KOMFORT EC S(B)200** and **KOMFORT EC S250** are available only with an S14 automation.

## Automation functions

| Functions | KOMFORT EC S(B)(-E) S21 | KOMFORT EC S(B)(-E) S14 |
|---|---|---|
| Control via Wi-Fi using a mobile application | + | - |
| Control via a wired remote control panel | S22 panel (option)  | S14 panel  |
| Control via a wired remote LCD control panel | S25 panel (option)  | - |
| Control via a wireless remote control panel | S22 Wi-Fi panel (option)  | - |
| Speed selection | + | + |
| Filter replacement indication | according to filter timer | according to filter timer |
| | according to filter clogging differential pressure switch readings (KOMFORT EC SB550) | - |
| Alarm indication | full alarm description in the mobile application | LED alarm indication |
| Week-scheduled operation | + | - |
| Bypass | automatic | - |
| | manual | manual |
| Timers | + | - |
| Boost mode | + | - |
| Kamin mode | + | - |
| Freeze protection | through cyclic stops of the supply fan | through cyclic stops of the supply fan |
| | through preheating (option) | - |
| Reheater connection | option | - |
| Cooler connection | option | - |
| Minimum supply air temperature control | + | - |
| Humidity control | option | option |
| $CO_2$ controller | option | option |
| VOC controller | option | - |
| PM2.5 control | option | - |
| Fire alarm sensor connection | option | option |

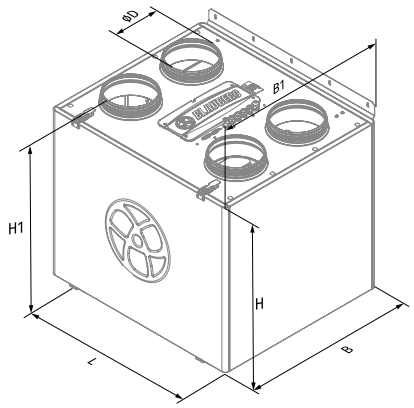
option: function is available when purchasing the appropriate accessory (see the "Accessories" section).

## Designation key

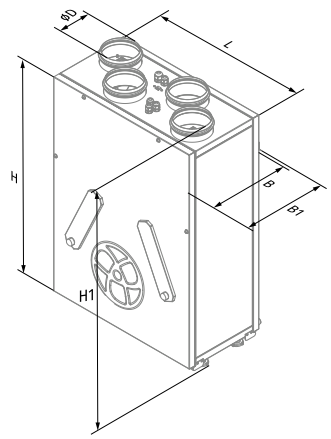
| Series | Motor type | Spigot modification | Bypass | Nominal air flow, [m³/h] | Heat exchanger type | Automation |
|---|---|---|---|---|---|---|
| KOMFORT | **EC:** electronically commutated motor | **S:** vertical | **_:** no bypass<br>**B:** with a bypass | **160; 200; 250; 350; 550** | **_:** heat recovery<br>**-E:** heat and humidity recovery | **S21**<br>**S14** |

## Overall dimensions [mm]

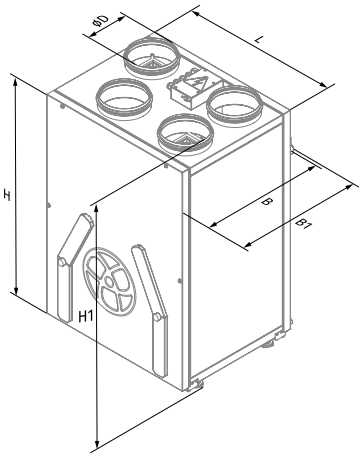
| Model | Ø D | Ø D1 | B | B1 | H | H1 | L |
|---|---|---|---|---|---|---|---|
| KOMFORT EC S160(-E) S14/S21 | 125 | 18 | 330 | 340 | 665 | 550 | 600 |
| KOMFORT EC SB160(-E) S14/S21 | 125 | 18 | 330 | 340 | 665 | 580 | 600 |
| KOMFORT EC S200(-E) S14 | 124 | 18 | 290 | 326 | 858 | 771 | 564 |
| KOMFORT EC SB200(-E) S14/S21 | 124 | 18 | 290 | 326 | 858 | 771 | 564 |
| KOMFORT EC S250(-E) S14 | 160 | 18 | 450 | 489 | 881 | 788 | 567 |
| KOMFORT EC SB250(-E) S14/21 | 160 | 18 | 450 | 489 | 881 | 788 | 567 |
| KOMFORT EC SB350(-E) S14/S21 | 160 | 18 | 583 | 600 | 760 | 675 | 730 |
| KOMFORT EC SB550(-E) S14/S21 | 200 | 18 | 720 | 730 | 760 | 675 | 823 |




**KOMFORT EC S160(-E) S14/S21**
**KOMFORT EC SB160(-E) S14/S21**
**KOMFORT EC S2B300(-E) S14/S21**
**KOMFORT EC SB350(-E) S14/S21**
**KOMFORT EC SB550(-E) S14/S21**




**KOMFORT EC S200(-E) S14**
**KOMFORT EC SB200(-E) S14/S21**




**KOMFORT EC S250(-E) S14**
**KOMFORT EC SB250(-E) S14/S21**

## Technical data

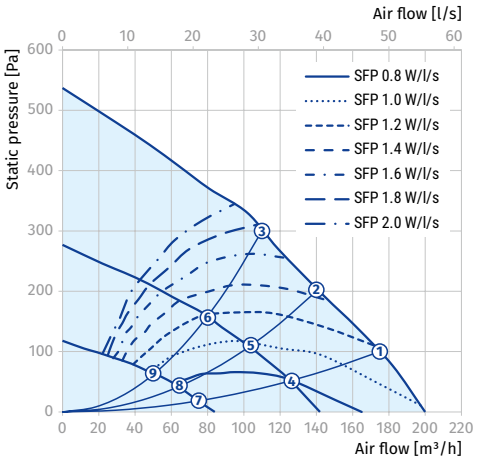
| Parameters | KOMFORT EC S160 S14<br>KOMFORT EC S160 S21 | KOMFORT EC S160-E S14<br>KOMFORT EC S160-E S21 | KOMFORT EC SB160 S14<br>KOMFORT EC SB160 S21 | KOMFORT EC SB160-E S14<br>KOMFORT EC SB160-E S21 |
|---|---|---|---|---|
| Supply voltage, 50 (60) Hz [V] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 57 | 57 | 57 | 57 |
| Current [A] | 0.5 | 0.5 | 0.5 | 0.5 |
| Maximum air flow [m³/h (l/s)] | 200 (56) | 200 (56) | 200 (56) | 200 (56) |
| RPM [min⁻¹] | 3770 | 3770 | 3770 | 3770 |
| Sound pressure level at a distance of 3 m [dBA] | 24 | 24 | 24 | 24 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 (option: G4) | F7 (option: G4) | F7 (option: G4) | F7 (option: G4) |
| Connected air duct diameter [mm] | 125 | 125 | 125 | 125 |
| Weight [kg] | 34 | 34 | 36 | 36 |
| Heat recovery efficiency [%] | 85–93 | 76–92 | 85–93 | 76–92 |
| Heat exchanger type | counter-flow | counter-flow | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | polystyrene | polystyrene | enthalpy |
| SEC class | A+ | A | A+ | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

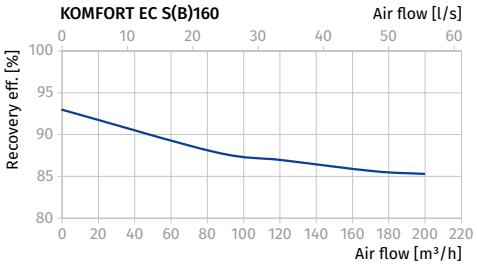
### KOMFORT EC S(B)160(-E)

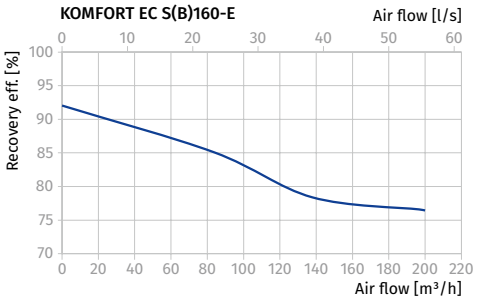
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **52** | 28 | 46 | 49 | 41 | 35 | 33 |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

Data provided for point 1 of the air flow diagram

| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 57 | 24 (34) |
| 2 | 56 | 23 (33) |
| 3 | 54 | 23 (33) |
| 4 | 28 | 20 (30) |
| 5 | 27 | 20 (30) |
| 6 | 26 | 20 (30) |
| 7 | 14 | 13 (23) |
| 8 | 13 | 13 (23) |
| 9 | 13 | 13 (23) |




**Calculation of air temperature downstream of the heat exchanger:**

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

**where**

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

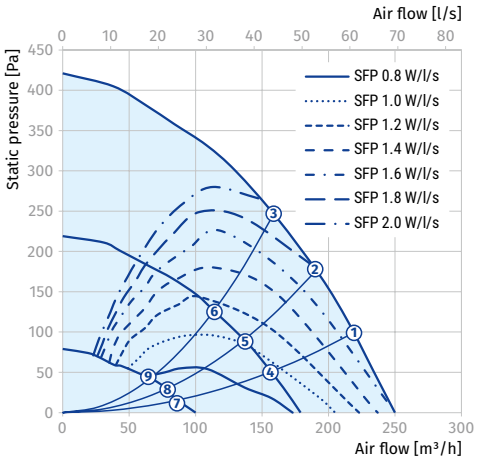
| Parameters | KOMFORT EC S200 S14 | KOMFORT EC S200-E S14 | KOMFORT EC SB200 S14 | KOMFORT EC SB200-E S14 |
|---|---|---|---|---|
| Supply voltage, 50 (60) Hz [V] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 112 | 112 | 112 | 112 |
| Current [A] | 0.9 | 0.9 | 0.9 | 0.9 |
| Maximum air flow [m³/h (l/s)] | 250 (69) | 250 (69) | 250 (69) | 250 (69) |
| RPM [min⁻¹] | 2050 | 2050 | 2050 | 2050 |
| Sound pressure level at a distance of 3 m [dBA] | 24 | 24 | 24 | 24 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | polystyrene | enthalpy |
| SEC class | A+ | A | A+ | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |



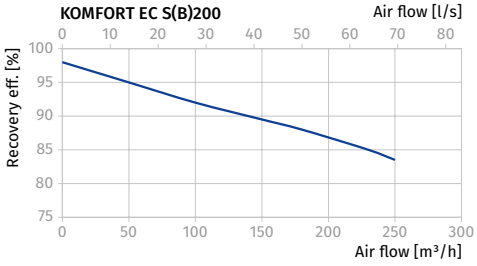
## KOMFORT EC S(B)200 (-E)

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

Data provided for point 1 of the air flow diagram

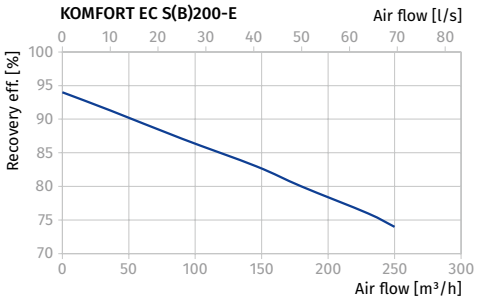



| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 103 | 24 (34) |
| 2 | 95 | 23 (33) |
| 3 | 88 | 23 (33) |
| 4 | 42 | 19 (29) |
| 5 | 38 | 18 (28) |
| 6 | 36 | 18 (28) |
| 7 | 16 | 12 (22) |
| 8 | 15 | 12 (22) |
| 9 | 15 | 11 (21) |




**BRE**

| Exhaust spigot configuration | Air flow [l/s] | Specific fan power input [W/l/s] | Heat exchange efficiency [%] |
|---|---|---|---|
| Kitchen + 1 additional room with high level of humidity | 21 | 0.67 | 87 |
| Kitchen + 2 additional rooms with high levels of humidity | 29 | 0.69 | 85 |
| Kitchen + 3 additional rooms with high levels of humidity | 37 | 0.88 | 84 |
| Kitchen + 4 additional rooms with high levels of humidity | 45 | 1.13 | 83 |
| Kitchen + 5 additional rooms with high levels of humidity | 53 | 1.37 | 83 |

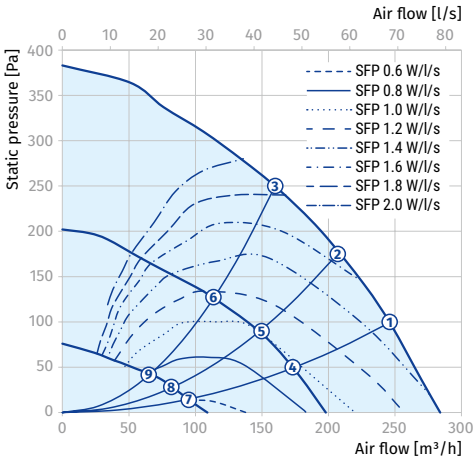


| Parameters | KOMFORT EC S250 S14 | KOMFORT EC S250-E S14 | KOMFORT EC SB250 S14<br>KOMFORT EC SB250 S21 | KOMFORT EC SB250-E S14<br>KOMFORT EC SB250-E S21 |
|---|---|---|---|---|
| Supply voltage, 50 (60) Hz [V] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 115 | 115 | 115 | 115 |
| Current [A] | 0.9 | 0.9 | 0.9 | 0.9 |
| Maximum air flow [m³/h (l/s)] | 290 (81) | 290 (81) | 290 (81) | 290 (81) |
| RPM [min⁻¹] | 2050 | 2050 | 2050 | 2050 |
| Sound pressure level at a distance of 3 m [dBA] | 25 | 25 | 25 | 25 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | 78–90 | 85–94 | 78–90 |
| Heat exchanger type | counter-flow | counter-flow | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | enthalpy | polystyrene | enthalpy |
| SEC class | A+ | A | A+ | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

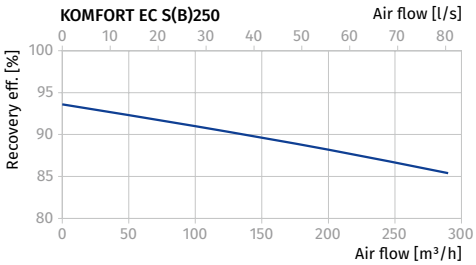
## KOMFORT EC S(B)250 (-E)

| Sound power level, A-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] | **52** | 28 | 46 | 50 | 41 | 36 | 33 | 36 | 29 | | |
| $L_{WA}$ to supply outlet [dBA] | **61** | 33 | 53 | 60 | 48 | 38 | 37 | 43 | 36 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **52** | 28 | 46 | 50 | 42 | 36 | 33 | 35 | 30 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **62** | 32 | 51 | 61 | 49 | 37 | 37 | 42 | 33 | | |
| $L_{WA}$ to environment [dBA] | **45** | 25 | 41 | 42 | 35 | 32 | 28 | 27 | 22 | **25** | **35** |

Data provided for point 1 of the air flow diagram

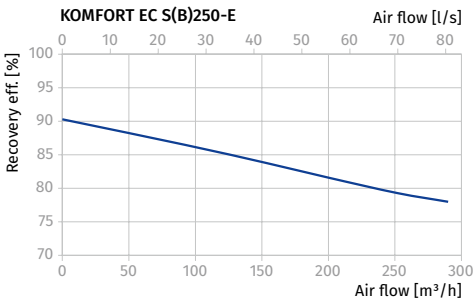



| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 106 | 25 (35) |
| 2 | 95 | 24 (34) |
| 3 | 82 | 24 (34) |
| 4 | 44 | 20 (30) |
| 5 | 40 | 19 (29) |
| 6 | 36 | 19 (29) |
| 7 | 16 | 13 (23) |
| 8 | 15 | 12 (22) |
| 9 | 15 | 12 (22) |




**BRE**

| Exhaust spigot configuration | Air flow [l/s] | Specific fan power input [W/l/s] | Heat exchange efficiency [%] |
|---|---|---|---|
| Kitchen + 1 additional room with high level of humidity | 21 | 0.65 | 92 |
| Kitchen + 2 additional rooms with high levels of humidity | 29 | 0.68 | 91 |
| Kitchen + 3 additional rooms with high levels of humidity | 37 | 0.77 | 90 |
| Kitchen + 4 additional rooms with high levels of humidity | 45 | 0.94 | 89 |
| Kitchen + 5 additional rooms with high levels of humidity | 53 | 1.12 | 88 |
| Kitchen + 6 additional rooms with high levels of humidity | 61 | 1.35 | 87 |
| Kitchen + 7 additional rooms with high levels of humidity | 69 | 1.70 | 86 |



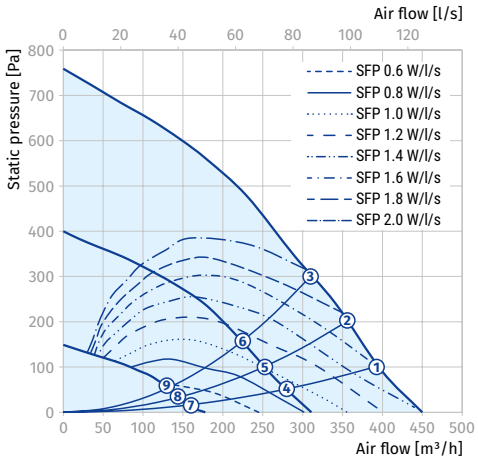
| Parameters | KOMFORT EC SB350 S14<br>KOMFORT EC SB350 S21 | KOMFORT EC SB350-E S14<br>KOMFORT EC SB350-E S21 |
|---|---|---|
| Supply voltage, 50 (60) Hz [V] | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 178 | 178 |
| Current [A] | 1.4 | 1.4 |
| Maximum air flow [m³/h (l/s)] | 450 (125) | 450 (125) |
| RPM [min⁻¹] | 3200 | 3200 |
| Sound pressure level at a distance of 3 m [dBA] | 28 | 28 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | polymer-coated steel | polymer-coated steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | F7 (option: G4) | F7 (option: G4) |
| Connected air duct diameter [mm] | 160 | 160 |
| Weight [kg] | 64 | 64 |
| Heat recovery efficiency [%] | 85–92 | 73–91 |
| Heat exchanger type | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | enthalpy |
| SEC class | A+ | A |
| ErP | 2016, 2018 | 2016, 2018 |

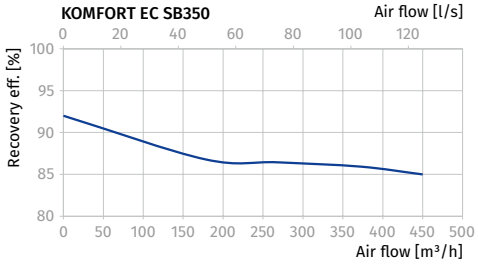
## KOMFORT EC SB350(-E)

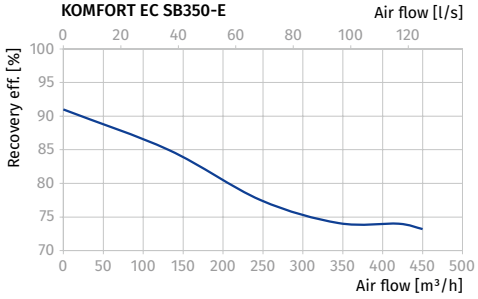
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **56** | 50 | 46 | 53 | 45 | 39 | 34 |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

Data provided for point 1 of the air flow diagram

| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 177 | 28 (38) |
| 2 | 175 | 27 (37) |
| 3 | 170 | 27 (37) |
| 4 | 71 | 23 (33) |
| 5 | 71 | 22 (32) |
| 6 | 69 | 22 (32) |
| 7 | 21 | 15 (25) |
| 8 | 21 | 14 (24) |
| 9 | 21 | 14 (24) |

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CERTIFIED COMPONENT
Passive House Institute

**KOMFORT EC SB350**

HEAT RECOVERY AIR HANDLING UNITS

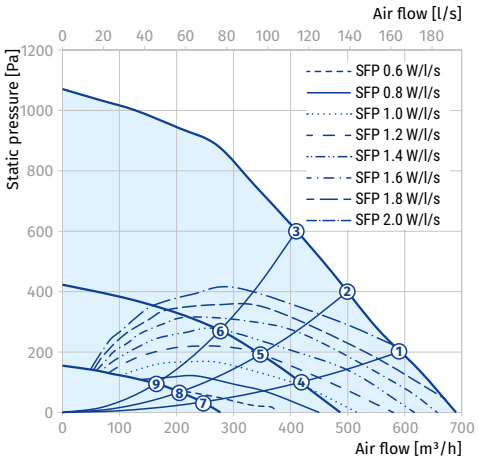
| Parameters | KOMFORT EC SB550 S14<br>KOMFORT EC SB550 S21 | KOMFORT EC SB550-E S14<br>KOMFORT EC SB550-E S21 |
|---|---|---|
| Supply voltage, 50 (60) Hz [V] | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 337 | 337 |
| Current [A] | 2.4 | 2.4 |
| Maximum air flow [m³/h (l/s)] | 690 (192) | 690 (192) |
| RPM [min⁻¹] | 2860 | 2860 |
| Sound pressure level at a distance of 3 m [dBA] | 26 | 26 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | polymer-coated steel | polymer-coated steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | F7 (option: G4) | F7 (option: G4) |
| Connected air duct diameter [mm] | 200 | 200 |
| Weight [kg] | 82 | 82 |
| Heat recovery efficiency [%] | 84–92 | 73–91 |
| Heat exchanger type | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | enthalpy |
| SEC class | A+ | A |
| ErP | 2016, 2018 | 2016, 2018 |

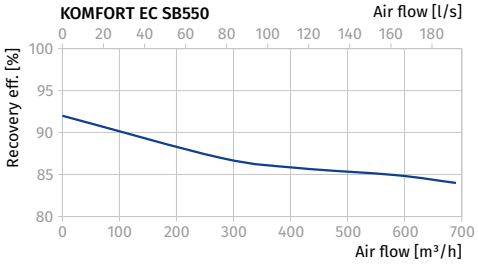
## KOMFORT EC SB550(-E)

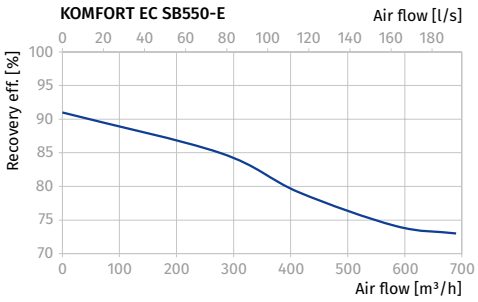
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **54** | 47 | 42 | 50 | 44 | 41 | 39 |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

Data provided for point 1 of the air flow diagram

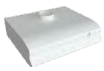
| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 337 | 26 (36) |
| 2 | 337 | 26 (36) |
| 3 | 337 | 25 (35) |
| 4 | 118 | 24 (34) |
| 5 | 113 | 24 (34) |
| 6 | 107 | 22 (32) |
| 7 | 34 | 15 (25) |
| 8 | 66 | 14 (24) |
| 9 | 32 | 13 (23) |



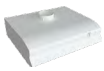



## Accessories

| | | KOMFORT EC S160(-E) S14 | KOMFORT EC S160(-E) S21 | KOMFORT EC SB160(-E) S14 |
|---|---|---|---|---|
| **G3 panel filter** |  | – | – | – |
| **G4 panel filter** |  | FP 285x195x10 G4 | FP 285x195x10 G4 | FP 285x195x10 G4 |
| **F7 panel filter** |  | FP 285x195x10 F7 | FP 285x195x10 F7 | FP 285x195x10 F7 |
| **Control panel** |  | – | S22 | – |
| **Wi-Fi control panel** |  | – | S22 Wi-Fi | – |
| **Control panel** |  | – | S25 | – |
| **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 |
| **VOC sensor** |  | – | DPWQ30600 | – |
| **$CO_2$ sensor** |  | – | DPWQ40200 | – |
| **Humidity sensor** |  | – | DPWC11200 | – |
| **Kitchen exhaust hood** |  | DAH 251-13 | DAH 251-13 | DAH 251-13 |
| **Electric preheater** |  | – | EVH 125 | – |
| **Electric reheater** |  | – | ENH 125 | – |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 125 | VKA 125 | VKA 125 |
| **Electric actuator** |  | LF230 | LF230 | LF230 |
| **Summer block** |  | SB C6 366/285 | SB C6 366/285 | – |

| | | KOMFORT EC SB160(-E) S21 | KOMFORT EC S200(-E) S14 | KOMFORT EC SB200(-E) S14 |
|---|---|---|---|---|
| **G3 panel filter** |  | – | FP 264x195x18 G3 | FP 264x195x18 G3 |
| **G4 panel filter** |  | FP 285x195x10 G4 | – | – |
| **F7 panel filter** |  | FP 285x195x10 F7 | – | – |
| **Control panel** |  | S22 | – | – |
| **Wi-Fi control panel** |  | S22 Wi-Fi | – | – |
| **Control panel** |  | S25 | – | – |
| **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 |
| **VOC sensor** |  | DPWQ30600 | – | – |
| **$CO_2$ sensor** |  | DPWQ40200 | – | – |
| **Humidity sensor** |  | DPWC11200 | – | – |
| **Kitchen exhaust hood** |  | DAH 251-13 | DAH 251-13 | DAH 251-13 |
| **Electric preheater** |  | EVH 125 | – | – |
| **Electric reheater** |  | ENH 125 | – | – |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 125 | VKA 125 | VKA 125 |
| **Electric actuator** |  | LF230 | LF230 | LF230 |
| **Summer block** |  | – | SB C6 366/240 | – |

| | | KOMFORT EC S250(-E) S14 | KOMFORT EC SB250(-E) S14 | KOMFORT EC SB250(-E) S21 |
|---|---|---|---|---|
| **G3 panel filter** |  | – | – | – |
| **G4 panel filter** |  | FP 417x200x18 G4 | FP 417x200x18 G4 | FP 417x200x18 G4 |
| **F7 panel filter** |  | FP 417x184x18 F7 | FP 417x184x18 F7 | FP 417x184x18 F7 |
| **Control panel** |  | – | – | S22 |
| **Wi-Fi control panel** |  | – | – | S22 Wi-Fi |
| **Control panel** |  | – | – | S25 |
| **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 |
| **VOC sensor** |  | – | – | DPWQ30600 |
| **$CO_2$ sensor** |  | – | – | DPWQ40200 |
| **Humidity sensor** |  | – | – | DPWC11200 |
| **Kitchen exhaust hood** |  | DAH 251-13 | DAH 251-13 | DAH 251-13 |
| **Electric preheater** |  | – | – | EVH 160 |
| **Electric reheater** |  | – | – | ENH 160 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 160 | VKA 160 | VKA 160 |
| **Electric actuator** |  | LF230 | LF230 | LF230 |
| **Summer block** |  | SB C6 366/384 | – | – |

| | | KOMFORT EC SB350(-E) S14 | KOMFORT EC SB350(-E) S21 | KOMFORT EC SB550(-E) S14 | KOMFORT EC SB550(-E) S21 |
|---|---|---|---|---|---|
| **G3 panel filter** |  | – | – | – | – |
| **G4 panel filter** |  | FP 500x196x40 G4 | FP 500x196x40 G4 | FP 630x198x40 G4 | FP 630x198x40 G4 |
| **F7 panel filter** |  | FP 500x196x40 F7 | FP 500x196x40 F7 | FP 630x198x40 F7 | FP 630x198x40 F7 |
| **Control panel** |  | – | S22 | – | S22 |
| **Wi-Fi control panel** |  | – | S22 Wi-Fi | – | S22 Wi-Fi |
| **Control panel** |  | – | S25 | – | S25 |
| **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 |
| **VOC sensor** |  | – | DPWQ30600 | – | DPWQ30600 |
| **$CO_2$ sensor** |  | – | DPWQ40200 | – | DPWQ40200 |
| **Humidity sensor** |  | – | DPWC11200 | – | DPWC11200 |
| **Kitchen exhaust hood** |  | DAH 251-13 | DAH 251-13 | DAH 251-13 | DAH 251-13 |
| **Electric preheater** |  | – | EVH 160 | – | EVH 200 |
| **Electric reheater** |  | – | ENH 160 | – | ENH 200 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 160 | VKA 160 | VKA 200 | VKA 200 |
| **Electric actuator** |  | LF230 | LF230 | LF230 | LF230 |
| **Summer block** |  | – | – | – | – |

# KOMFORT EC S(B)(-E) S11

## Heat and humidity recovery air handling units

### Features

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

**Air flow:**
up to 750 m³/h
208 l/s

**Heat recovery efficiency:**
up to 98%

EC motor · ErP 2016 · ErP 2018

### Design

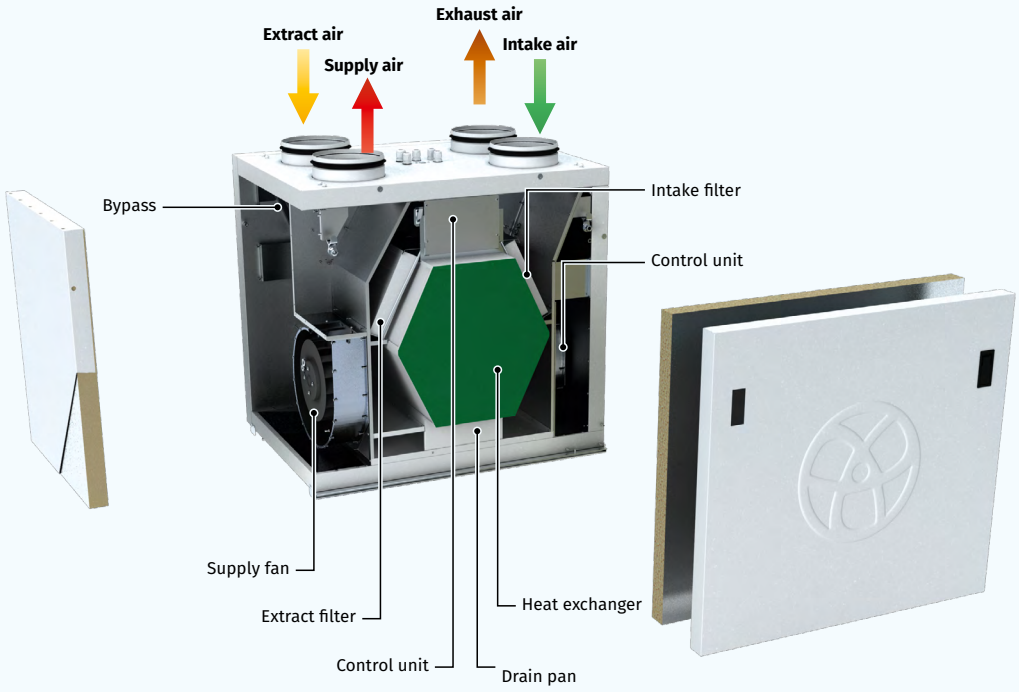
- The casing is made of double-skinned polymer-coated steel panels, internally filled with mineral wool layer.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.
- Depending on the unit model, the units may be equipped either with a hinged service panel to enable convenient access for maintenance operations or with a separate door for quick access to filters **KOMFORT EC S(B)250(-E) S11**.

### Air filtration

- Two built-in G4 and F7 filters provide efficient supply air filtration. The G4 filter is used for extract air filtration.
- Supply air in the **KOMFORT EC S(B)250** units is purified by the G4 and F7 filters. The G4 filter is used for extract air cleaning.

### Fans

- The units are equipped with high-efficient EC motors with an external rotor and a centrifugal impeller with backward curved blades.
- EC motors have the best power consumption to air capacity ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low noise level and optimum control across the entire speed range.
- The impellers are dynamically balanced.



## Heat recovery

- The **KOMFORT EC S(B) ... S11** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT EC S(B)-E ... S11** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Bypass

- The **KOMFORT EC SB ... (-E) S11** units are equipped with a 100 % bypass for summer ventilation (air cooling by the cool air from outside).

## Control and automation

- The units incorporate an integrated control system with the S11 wall-mounted control panel with an LCD display.

- **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).

## Mounting

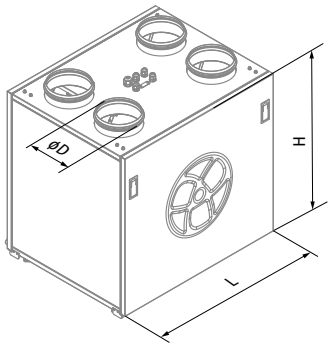
- The units can be fixed to the wall or mounted on the floor using the mounting brackets.
- While mounting provide free access to the service panel for filter replacement and servicing.
- Due to universal casing design both left and right mounting is possible. It requires swapping the service and the back panel.

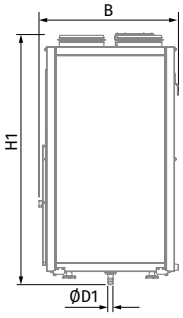
## Designation key

| Serie | Motor type | Spigot modification | Casing modification | Bypass | Nominal air flow [m³/h] | Heat exchanger type | Control |
|---|---|---|---|---|---|---|---|
| KOMFORT | **EC:** electronically commutated motor | **S:** vertically oriented spigots | **_:** standard | **_ :** without a bypass<br>**B:** integrated bypass | **160; 250; 300; 350; 550** | **_:** heat recovery<br>**–E:** energy recovery | **S11:** sensor LCD control panel |

## Overall dimensions [mm]

| Model | D | D1 | B | H | H1 | L |
|---|---|---|---|---|---|---|
| KOMFORT EC S160(-E) S11 | 125 | 18 | 348 | 550 | 650 | 600 |
| KOMFORT EC SB160(-E) S11 | 125 | 18 | 348 | 580 | 690 | 600 |
| KOMFORT EC S(B)250(-E) S11 | 160 | 18 | 489 | 788 | 881 | 567 |
| KOMFORT EC SB350(-E) S11 | 160 | 18 | 610 | 675 | 758 | 730 |
| KOMFORT EC SB550(-E) S11 | 200 | 18 | 741 | 675 | 758 | 828 |



## Technical data

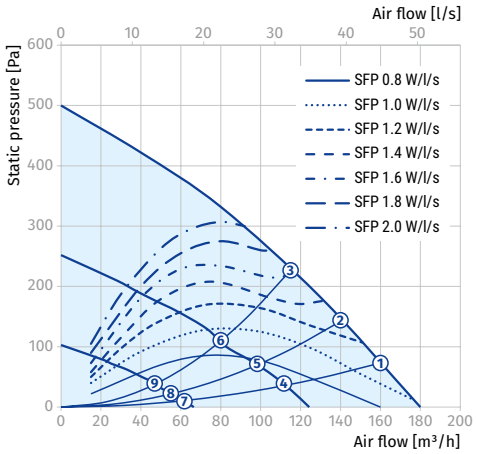
| Parameters | KOMFORT EC S160 S11 | KOMFORT EC S160-E S11 | KOMFORT EC SB160 S11 | KOMFORT EC SB160-E S11 |
|---|---|---|---|---|
| Supply voltage [V / 50 (60) Hz] | 220-240 | 220-240 | 220-240 | 220-240 |
| Power [W] | 51 | 51 | 51 | 51 |
| Current [A] | 0.4 | 0.4 | 0.4 | 0.4 |
| Maximum air flow [m³/h (l/s)] | 180 (50) | 180 (50) | 180 (50) | 180 (50) |
| RPM [min⁻¹] | 3770 | 3770 | 3770 | 3770 |
| Sound pressure level at a distance of 3 m [dBA] | 24 | 24 | 24 | 24 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 (option: G4) | F7 (option: G4) | F7 (option: G4) | F7 (option: G4) |
| 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 | polystyrene | enthalpy |
| SEC class | A | A | A | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |



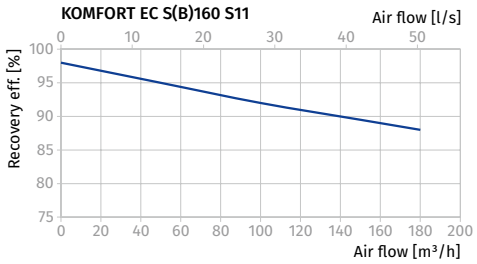
### KOMFORT EC S(B)160(-E) S11

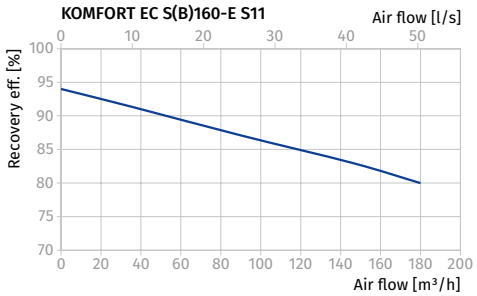
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ to supply inlet [dBA] | **52** | 28 | 46 | 49 | 41 | 35 | 33 | 36 | 29 | | |
| $L_{WA}$ to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

Data provided for point 1 of the air flow diagram




| 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 air temperature downstream of the heat exchanger:**

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

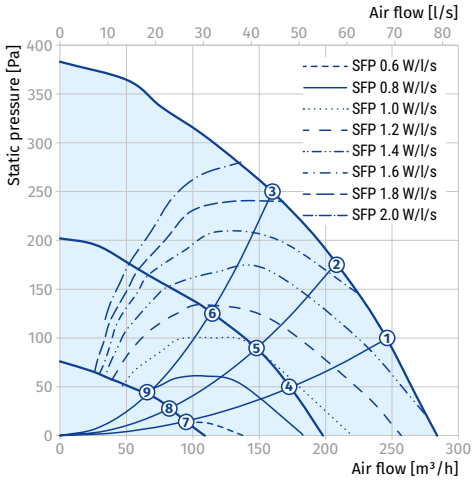
**where**
$t_{outd}$ – outdoor air temperature [°C]
$t_{extr}$ – extract air temperature [°C]
$k_{hr}$ – heat exchanger efficiency (according to the diagram) [%]

| Parameters | KOMFORT EC S250 S11 | KOMFORT EC S250-E S11 | KOMFORT EC SB250 S11 | KOMFORT EC SB250-E S11 |
|---|---|---|---|---|
| Supply voltage [V / 50 (60) Hz] | 220-240 | 220-240 | 220-240 | 220-240 |
| Power [W] | 115 | 115 | 115 | 115 |
| Current [A] | 0.9 | 0.9 | 0.9 | 0.9 |
| Maximum air flow [m³/h (l/s)] | 290 (81) | 290 (81) | 290 (81) | 290 (81) |
| RPM [min⁻¹] | 2050 | 2050 | 2050 | 2050 |
| Sound pressure level at a distance of 3 m [dBA] | 25 | 25 | 25 | 25 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | 78–90 | 85–94 | 78–90 |
| Heat exchanger type | counter-flow | counter-flow | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | enthalpy | polystyrene | enthalpy |
| SEC class | A | A | A | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

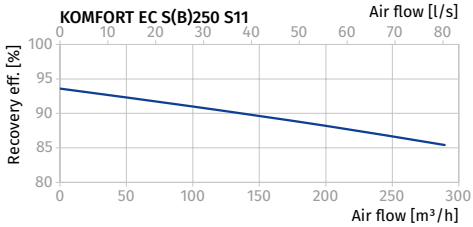
## KOMFORT EC S(B)250 (-E) S11

| 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] | **52** | 28 | 46 | 50 | 41 | 36 | 33 | 36 | 29 | | |
| $L_{WA}$ to supply outlet [dBA] | **61** | 33 | 53 | 60 | 48 | 38 | 37 | 43 | 36 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **52** | 28 | 46 | 50 | 42 | 36 | 33 | 35 | 30 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **62** | 32 | 51 | 61 | 49 | 37 | 37 | 42 | 33 | | |
| $L_{WA}$ to environment [dBA] | **45** | 25 | 41 | 42 | 35 | 32 | 28 | 27 | 22 | **25** | **35** |

Data provided for point 1 of the air flow diagram

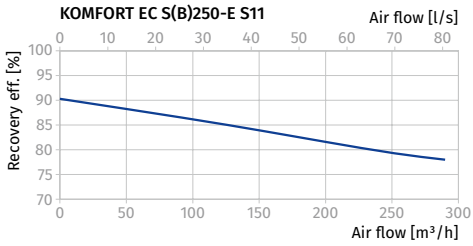



| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 106 | 25 (35) |
| 2 | 95 | 24 (34) |
| 3 | 82 | 24 (34) |
| 4 | 44 | 20 (30) |
| 5 | 40 | 19 (29) |
| 6 | 36 | 19 (29) |
| 7 | 16 | 13 (23) |
| 8 | 15 | 12 (22) |
| 9 | 15 | 12 (22) |




**BRE**

| Exhaust spigot configuration | Air flow [l/s] | Specific fan power input [W/l/s] | Heat exchange efficiency [%] |
|---|---|---|---|
| Kitchen + 1 additional room with high level of humidity | 21 | 0,65 | 92 |
| Kitchen + 2 additional rooms with high levels of humidity | 29 | 0,68 | 91 |
| Kitchen + 3 additional rooms with high levels of humidity | 37 | 0,77 | 90 |
| Kitchen + 4 additional rooms with high levels of humidity | 45 | 0,94 | 89 |
| Kitchen + 5 additional rooms with high levels of humidity | 53 | 1,12 | 88 |
| Kitchen + 6 additional rooms with high levels of humidity | 61 | 1,35 | 87 |
| Kitchen + 7 additional rooms with high levels of humidity | 69 | 1,70 | 86 |



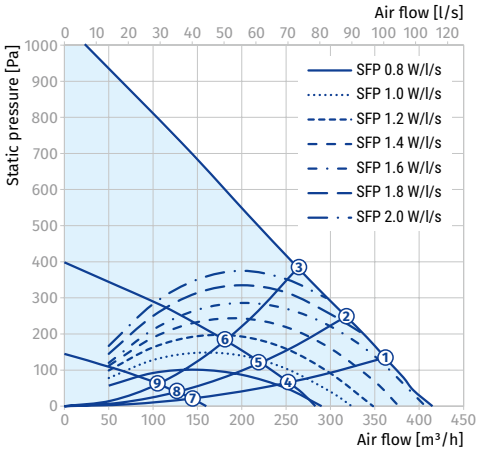
| Parameters | KOMFORT EC SB350 S11 | KOMFORT EC SB350-E S11 |
|---|---|---|
| Supply voltage [V / 50 (60) Hz] | 220-240 | 220-240 |
| Power [W] | 170 | 170 |
| Current [A] | 1.3 | 1.3 |
| Maximum air flow [m³/h (l/s)] | 415 (115) | 415 (115) |
| RPM [min⁻¹] | 3200 | 3200 |
| Sound pressure level at a distance of 3 m [dBA] | 28 | 28 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | polymer-coated steel | polymer-coated steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | F7 (option: G4) | F7 (option: G4) |
| 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 |
| SEC class | A | A |
| ErP | 2016, 2018 | 2016, 2018 |

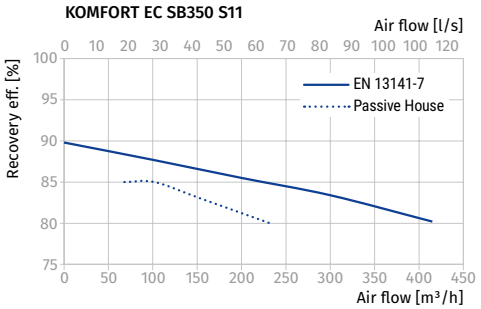
## KOMFORT EC SB350(-E) S11

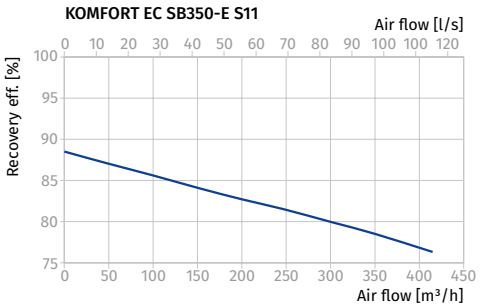
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **56** | 50 | 46 | 53 | 45 | 39 | 34 |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

Data provided for point 1 of the air flow diagram

| 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 S11

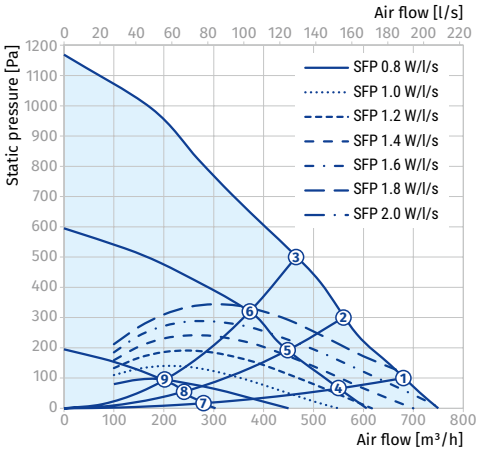
| Parameters | KOMFORT EC SB550 S11 | KOMFORT EC SB550-E S11 |
|---|---|---|
| Supply voltage [V / 50 (60) Hz] | 220-240 | 220-240 |
| Power [W] | 333 | 333 |
| Current [A] | 2.3 | 2.3 |
| Maximum air flow [m³/h (l/s)] | 750 (208) | 750 (208) |
| RPM [min⁻¹] | 3230 | 3230 |
| Sound pressure level at a distance of 3 m [dBA] | 26 | 26 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | polymer-coated steel | polymer-coated steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | F7 (option: G4) | F7 (option: G4) |
| 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 |
| SEC class | A | A |
| ErP | 2016, 2018 | 2016, 2018 |

## KOMFORT EC SB550(-E) S11

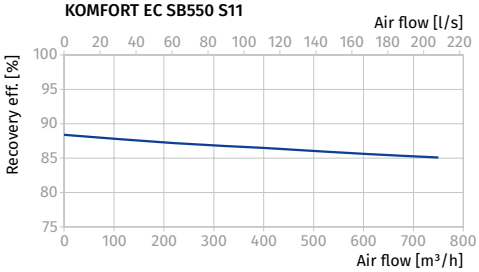
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **54** | 47 | 42 | 50 | 44 | 41 | 39 |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

Data provided for point 1 of the air flow diagram

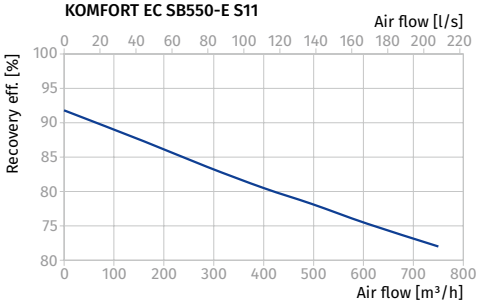
| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 332 | 26 (36) |
| 2 | 331 | 26 (36) |
| 3 | 332 | 25 (35) |
| 4 | 133 | 24 (34) |
| 5 | 129 | 24 (34) |
| 6 | 126 | 22 (32) |
| 7 | 32 | 15 (25) |
| 8 | 31 | 14 (24) |
| 9 | 30 | 13 (23) |




KOMFORT EC SB550 S11




KOMFORT EC SB550-E S11



## Accessories

| | | KOMFORT EC S160(-E) S11 | KOMFORT EC SB160(-E) S11 | KOMFORT EC S250(-E) S11 | KOMFORT EC SB250(-E) S11 |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 285x195x10 G4 | FP 285x195x10 G4 | FP 417x200x18 G4 | FP 417x200x18 G4 |
| **F7 panel filter** |  | FP 285x195x10 F7 | FP 285x195x10 F7 | FP 417x184x18 F7 | FP 417x184x18 F7 |
| **Internal humidity sensor** |  | FS1 | FS1 | FS1 | FS1 |
| **Electric preheater** |  | EVH 125 | EVH 125 | EVH 160 | EVH 160 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 125 | VKA 125 | VKA 160 | VKA 160 |
| **Electric actuator** |  | LF230 | LF230 | LF230 | LF230 |
| **Summer block** |  | SB C6 366/285 | SB C6 366/285 | SB C6 366/384 | – |

| | | KOMFORT EC SB350(-E) S11 | KOMFORT EC SB550(-E) S11 |
|---|---|---|---|
| **G4 panel filter** |  | FP 500x196x40 G4 | FP 630x198x40 G4 |
| **F7 panel filter** |  | FP 500x196x40 F7 | FP 630x198x40 F7 |
| **Internal humidity sensor** |  | FS1 | FS1 |
| **Electric preheater** |  | EVH 160 | EVH 200 |
| **Syphon kit** (for the units without an enthalpy heat exchanger) |  | SFK 20x32 | SFK 20x32 |
| **Air damper** |  | VKA 160 | VKA 200 |
| **Electric actuator** |  | 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 %

EC motor · ErP 2016 · ErP 2018

### 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

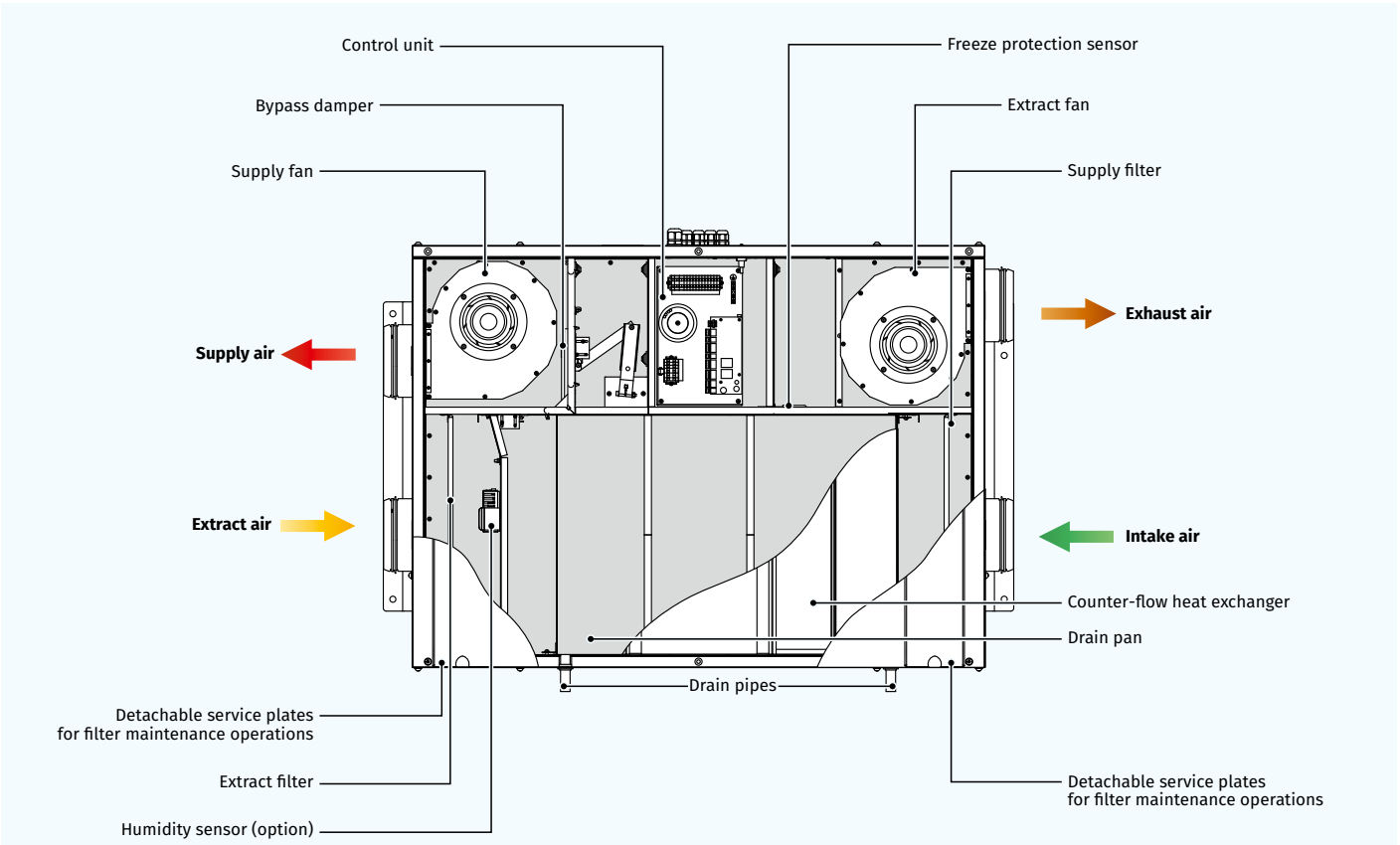
- High-efficient external rotor EC motors and centrifugal impellers with backward curved blades are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured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

### Bypass

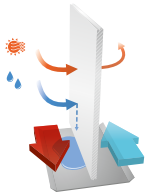
- The units are equipped with the 100 % bypass for summer ventilation (room cooling by the cool intake air).

### Air filtration

- Built-in F7 filter provide efficient supply air filtration.
- The G4 filter is used for extract air filtration.



## Heat recovery



- The unit is equipped with a plate counter-flow aluminium heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard 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).

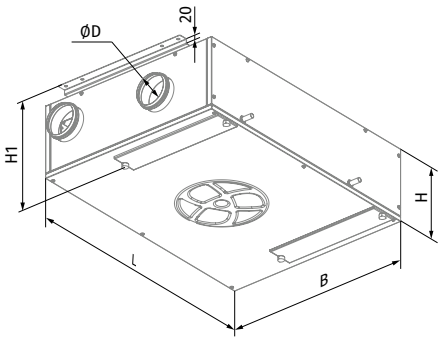


## Designation key

| 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<br>**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 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 50 | 101 | 170 |
| Current [A] | 0.4 | 0.8 | 1.3 |
| Maximum air flow [m³/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...+40 | -25...+40 | -25...+40 |
| 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 |



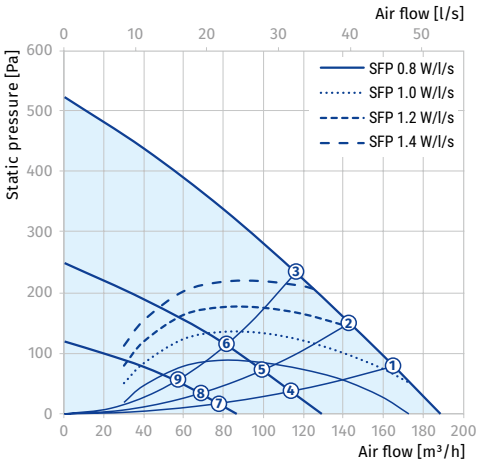
### KOMFORT EC DB160

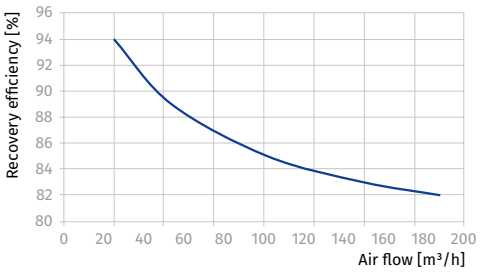
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ to supply inlet [dBA] | **53** | 32 | 45 | 50 | 45 | 38 | 34 | 36 | 29 | | |
| $L_{WA}$ to 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) [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) |



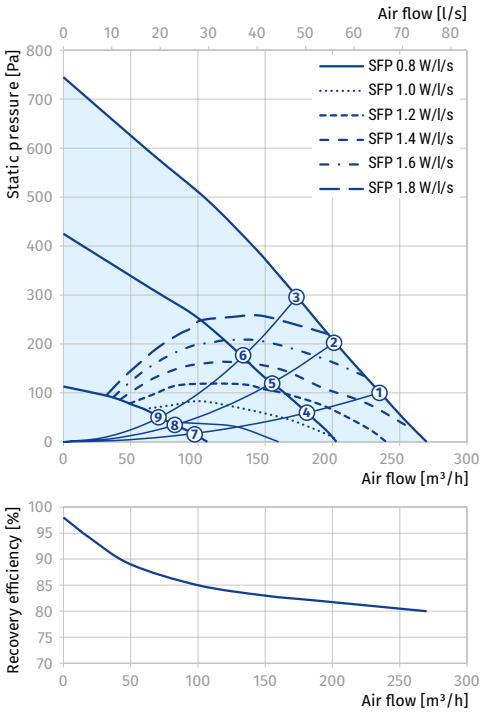
## KOMFORT EC DB250

| Sound power level, A-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] | **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) [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) |



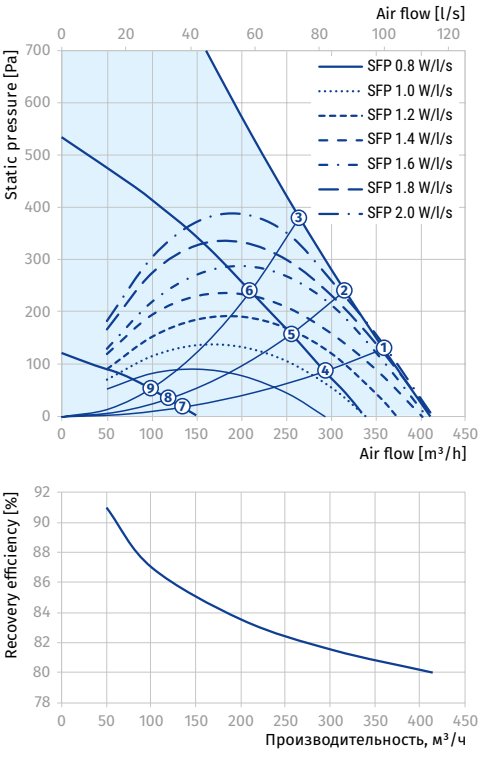

## KOMFORT EC DB350

| Sound power level, A-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] | **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) [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) |



## 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 %

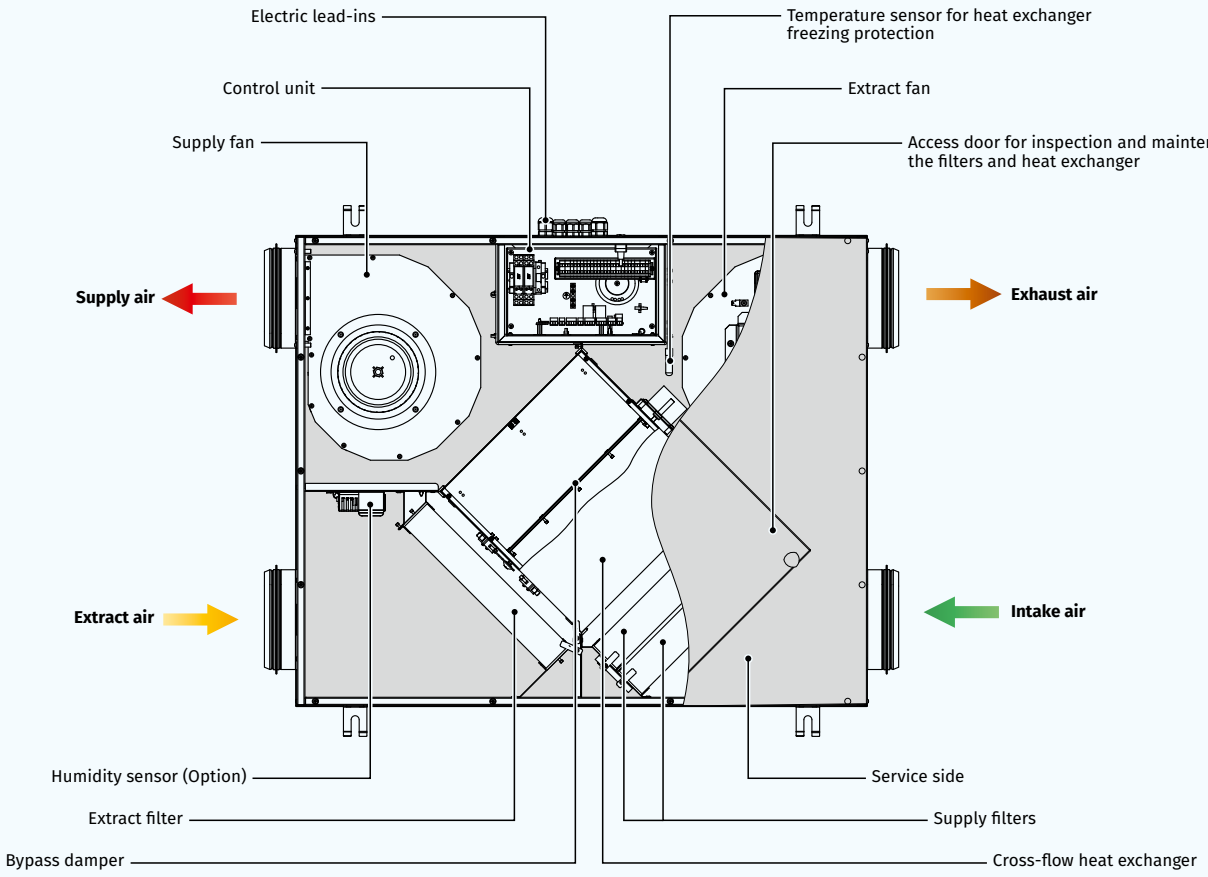
EC motor · ErP 2016 · ErP 2018

### 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 DB100 S14, 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

- The unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FROST PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

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

## Bypass

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

## Control and automation

- 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.
- The standard delivery set includes a 10 m cable for connection of the unit to the control panel.
- **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.
- **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
  - External relay control unit and humidity level control.
  - Software version upgrading.

## Mounting

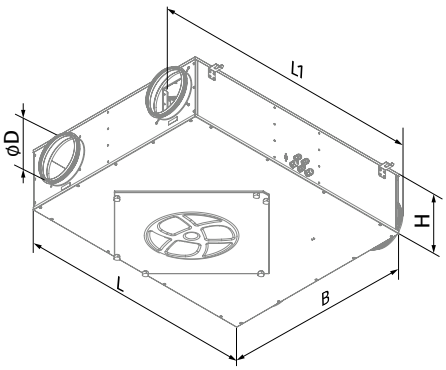
- Due to a low casing height the air handling units are a perfect solution for space-restricted installation above suspended ceilings.
- The unit mounting position must provide access for service maintenance.

## 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 | **100; 150; 250; 350** | **S14:** sensor control panel with LED indication |

## Overall dimensions [mm]

| Model | D | B | H | L | L1 |
|---|---|---|---|---|---|
| KOMFORT ERV EC DB100 S14 | 99 | 479 | 204 | 601 | 734 |
| 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 |

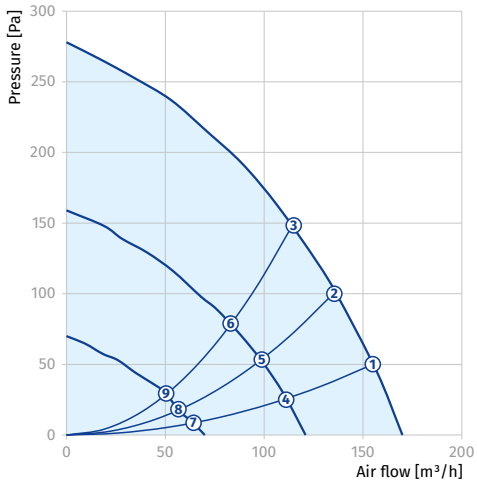


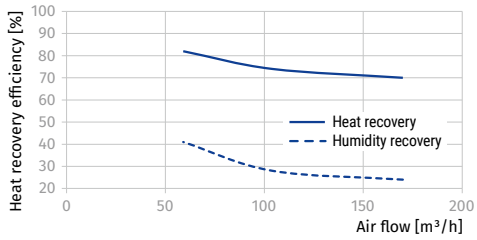
## Technical data

| Parameters | KOMFORT ERV EC DB100 S14 | 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 | 1 ~ 220-240 |
| Power [W] | 66 | 83 | 84 | 171 |
| Current [A] | 0,5 | 0,7 | 0,7 | 1,3 |
| Maximum air flow [m³/h (l/s)] | 170 (47) | 215 (60) | 300 (83) | 430 (119) |
| RPM [min⁻¹] | 2800 | 2000 | 2000 | 3200 |
| Sound pressure level at 3 m [dBA] | 30 | 32 | 36 | 46 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| Extract filter | G4 | G4 | G4 | G4 |
| Supply filter | G4 + F8 (PM2.5 > 93 %) | G4 + F8 (PM2.5 > 93 %) | G4 + F8 (PM2.5 > 83 %) | G4 + F8 (PM2.5 > 87%) |
| Connected air duct diameter [mm] | 100 | 100 | 150 | 150 |
| Weight [kg] | 17 | 26 | 29 | 42 |
| Heat recovery efficiency [%]* | 70–82 | 68–82 | 63–73 | 68–85 |
| Humidity recovery efficiency [%] | 24–41 | 22–41 | 16–27 | 19–34 |
| Heat exchanger type | cross-flow | cross-flow | cross-flow | cross-flow |
| Heat exchanger material | enthalpy | enthalpy | enthalpy | enthalpy |
| SEC class | A | A | A | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

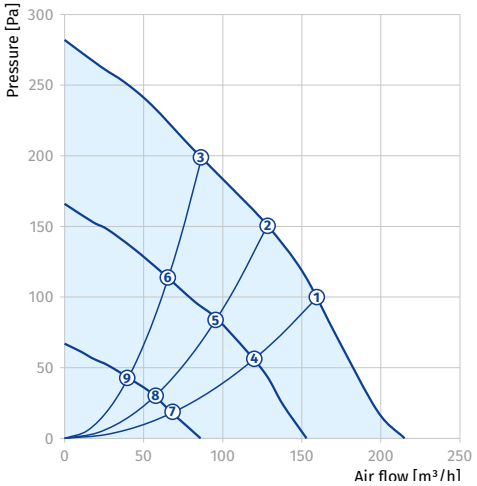
* Heat recovery efficiency is specified in compliance with EN 13141-7.

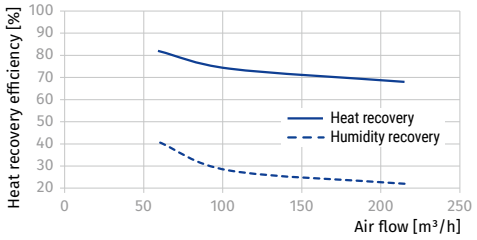
KOMFORT ERV EC DB100 S14




KOMFORT ERV EC DB150 S14

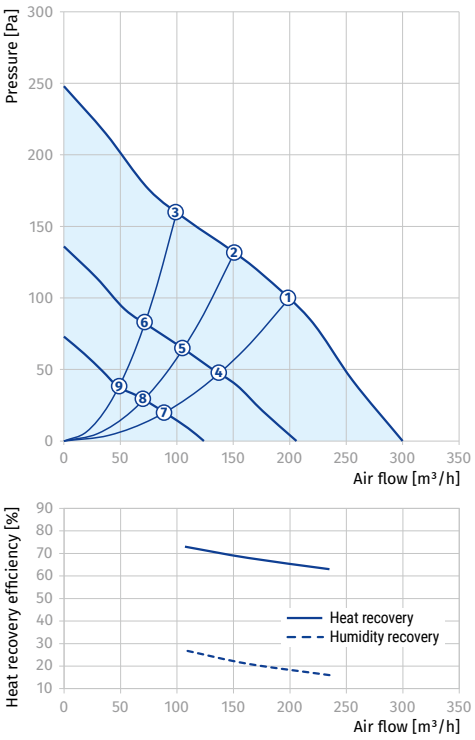


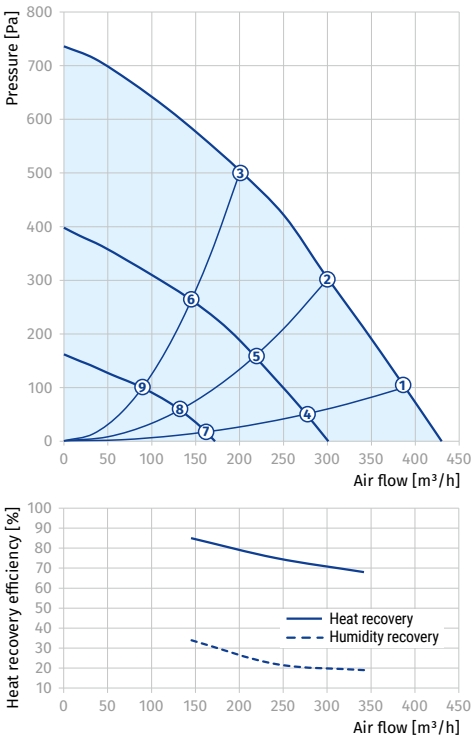

### Total power of the unit [W]

| Point | KOMFORT ERV EC DB100 S14 | KOMFORT ERV EC DB150 S14 | KOMFORT ERV EC DB250 S14 | KOMFORT ERV EC DB350 S14 |
|---|---|---|---|---|
| 1 | 62 | 64 | 80 | 147 |
| 2 | 55 | 61 | 67 | 145 |
| 3 | 48 | 55 | 59 | 144 |
| 4 | 30 | 26 | 43 | 75 |
| 5 | 27 | 24 | 34 | 73 |
| 6 | 25 | 23 | 28 | 70 |
| 7 | 13 | 13 | 23 | 21 |
| 8 | 13 | 13 | 22 | 21 |
| 9 | 12 | 13 | 19 | 20 |

KOMFORT ERV EC DB250 S14




KOMFORT ERV EC DB350 S14




## Accessories

| | KOMFORT ERV EC DB100 S14 | KOMFORT ERV EC DB150 S14 | KOMFORT ERV EC DB250 S14 | KOMFORT ERV EC DB350 S14 |
|---|---|---|---|---|
| **G4 panel filter** | FP 200x191x20 G4 | FP 300x220x48 G4 | FP 300x220x48 G4 | FP 300x270x48 G4 |
| **F8 panel filter** | FP 200x191x40 F8 | FP 300x220x48 F8 | FP 300x220x48 F8 | FP 300x270x48 F8 |
| **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 |
| **Air damper** | VKA 100 | VKA 100 | VKA 150 | VKA 150 |
| **Electric actuator** | LF230 | LF230 | LF230 | LF230 |

# KOMFORT ERV D S20

## 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 %

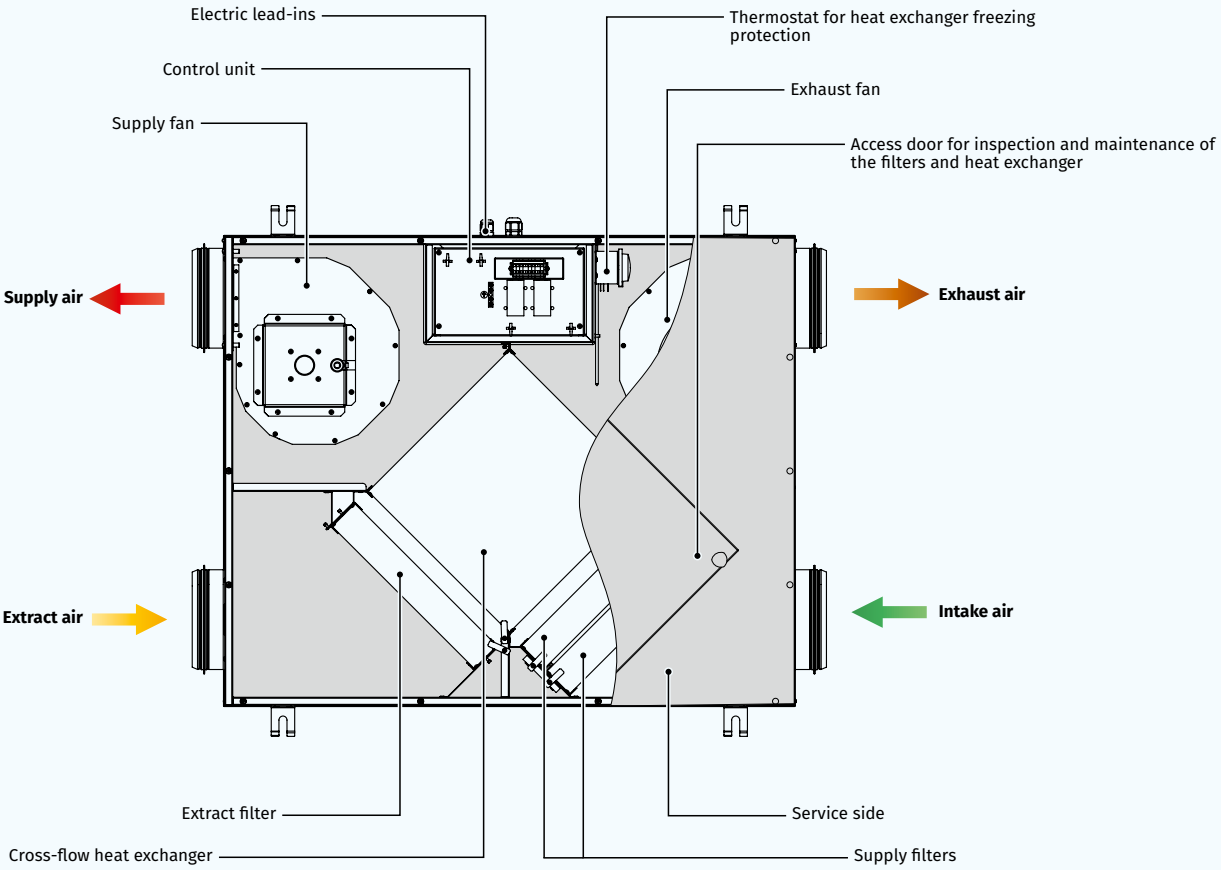
ErP 2016

### 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 rubbed sealed for airtight connection to the air ducts.
- The mounting brackets on the casing ensure easy installation underthe 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

- The unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FROST PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Control and automation

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

## Air filtration

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

## Mounting

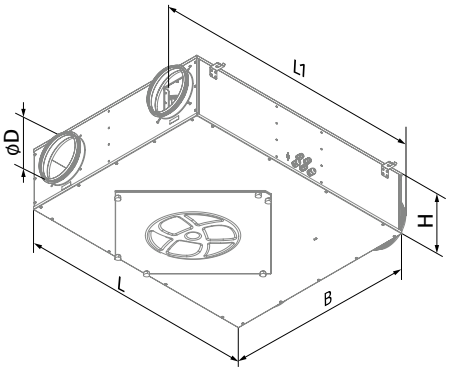
- Due to the low casing height the unit is the ideal solution for mounting in the limited space behind the suspended ceiling.
- The installation place must be easily accessible for servicing.

## 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 |



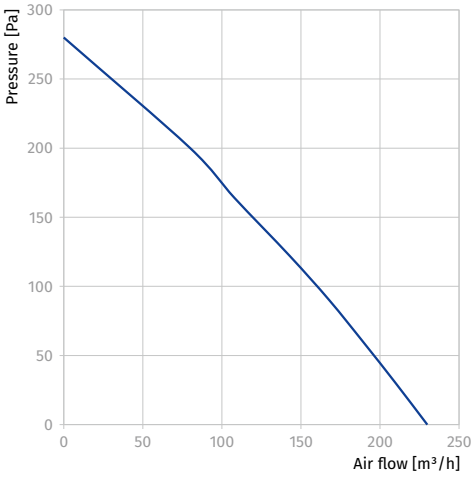
## Technical data

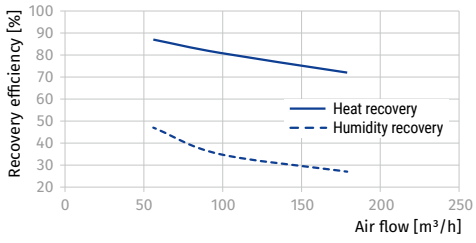
| Parameters | KOMFORT ERV D150 S20 | KOMFORT ERV D250 S20 | KOMFORT ERV D350 S20 |
|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 125 | 250 | 310 |
| Current [A] | 0.6 | 1.1 | 1.4 |
| Maximum air flow [m³/h (l/s)] | 230 (64) | 370 (103) | 400 (111) |
| 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 | enthalpy | enthalpy | enthalpy |
| SEC class | D | E | E |
| ErP | 2016 | 2016 | 2016 |

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

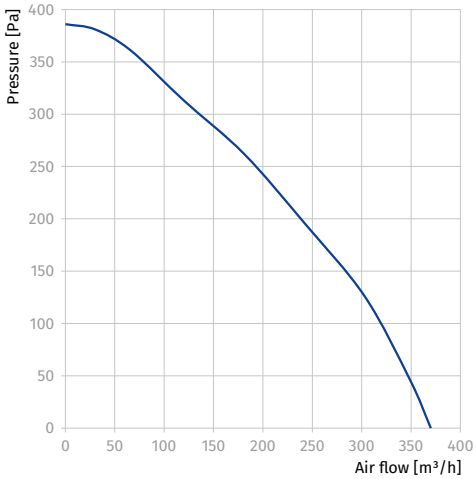


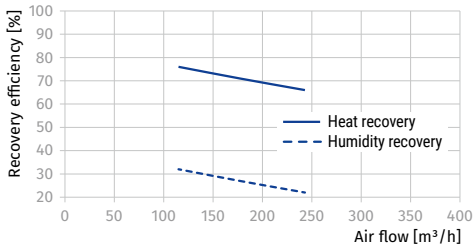
KOMFORT ERV D150 S20



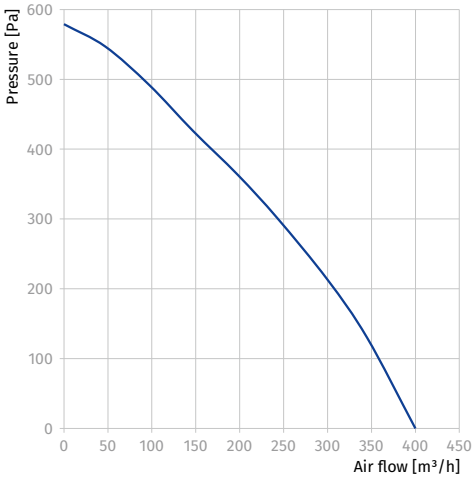



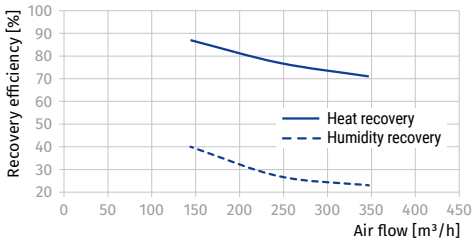

KOMFORT ERV D250 S20




KOMFORT ERV D350 S20



## Accessories

| | | KOMFORT ERV D150 S20 | KOMFORT ERV D250 S20 | KOMFORT ERV D350 S20 |
|---|---|---|---|---|
| **G4 panel filter** |  | FP 300x220x48 G4 | FP 300x220x48 G4 | FP 300x270x48 G4 |
| **F8 panel filter** |  | FP 300x220x48 F8 | FP 300x220x48 F8 | FP 300x270x48 F8 |

# KOMFORT ERV D S3/S4

## Suspended 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 for air conditioning systems in hot climate and heat losses in cold climate conditions due to heat and humidity recovery.
- Quality air exchange control for arrangement of comfortable indoor climate.
- Compatible with round Ø 100 or 150 mm air ducts.

**Air flow:**
up to 500 m³/h
139 l/s

**Heat recovery efficiency:**
up to 87 %

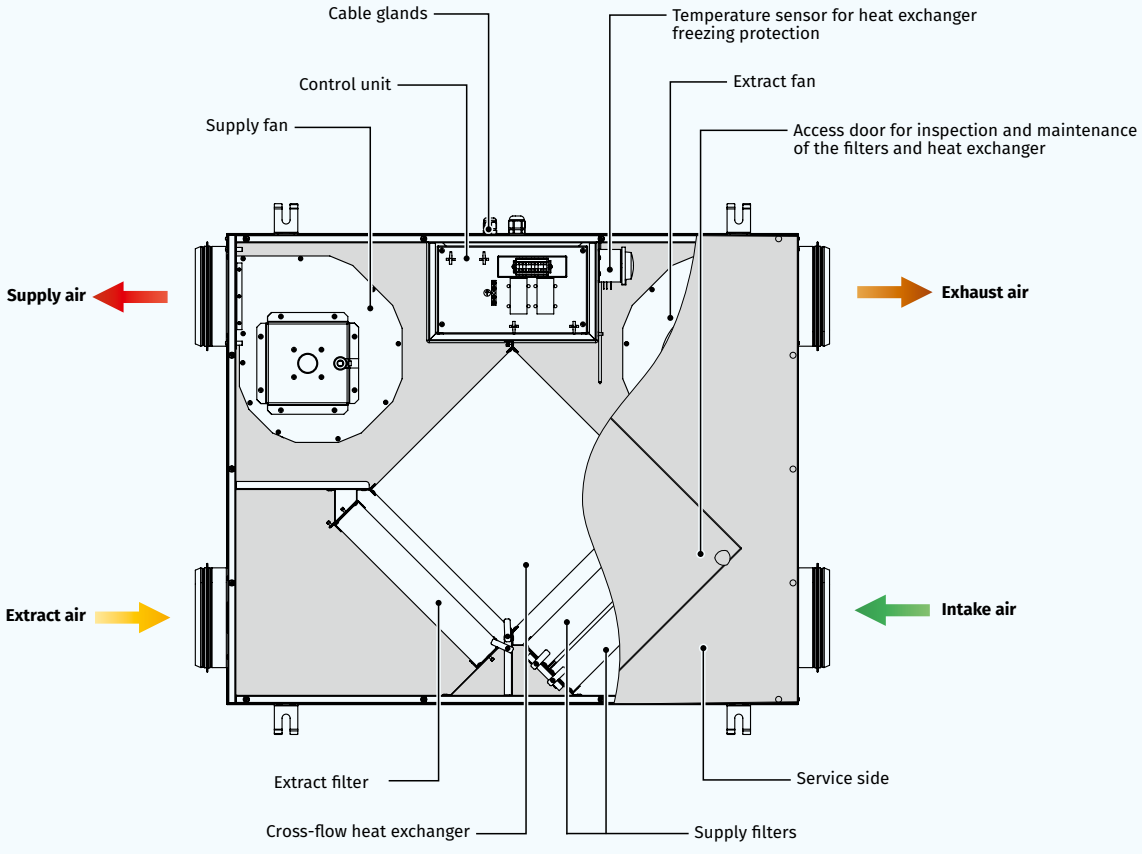
ErP 2016

### Design

- The casing is made of polymer-coated steel panels, internally filled with 5-10 mm thick expanded polyurethane layer.
- The bottom 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

- Asynchronous external rotor motors are used for air supply and exhaust.
- The units are equipped with single-phase three-speed external rotor motors with centrifugal impellers and forward curved blades.
- Integrated motor overheating protection with automatic restart.
- Ball bearings ensure long service life.
- The impellers are dynamically balanced.
- Featured with reliable and low-noise operation.



## Air filtration

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

## Heat recovery

- The unit is equipped with an enthalpy plate cross-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FROST PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Control and automation

- The units have integrated control system based on the mechanical three-speed speed switch CDP-3/5 **(KOMFORT ERV D... S3)** or sensor three-speed speed switch SGR-3/1 **(KOMFORT ERV D... S4)**, and power cable with mains plug.
- The control unit is integrated in the unit casing.
- The power and ground cables are connected to the control unit via the cable glands on the side of the unit.

## Mounting

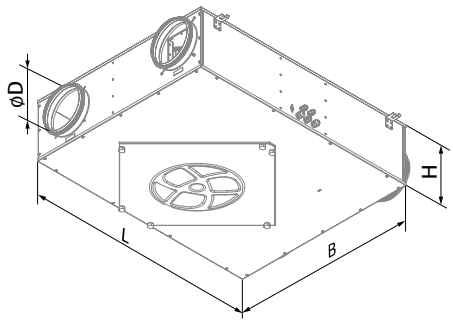
- Due to a low casing height the air handling units are a perfect solution for space-restricted installations above suspended ceilings.
- The unit mounting position must provide access for service maintenance.

## Designation key

| Series | Unit type | Mounting type | Nominal air flow [m³/h] | Control |
|---|---|---|---|---|
| KOMFORT | **ERV:** energy recovery unit | **D:** suspended mounting, horizontally oriented spigots | 100; 200; 300; 450 | **S3:** mechanical speed switch CDP-3/5<br>**S4:** sensor speed switch SGR-3/1 |

## Overall dimensions [mm]

| Model | D | B | H | L |
|---|---|---|---|---|
| KOMFORT ERV D100 S3/S4 | 100 | 481 | 203 | 600 |
| KOMFORT ERV D200 S3/S4 | 100 | 704 | 227 | 854 |
| KOMFORT ERV D300 S3/S4 | 150 | 704 | 227 | 854 |
| KOMFORT ERV D450 S3/S4 | 150 | 704 | 227 | 1020 |

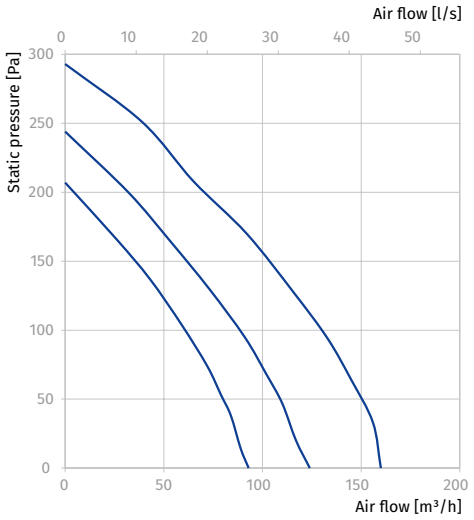


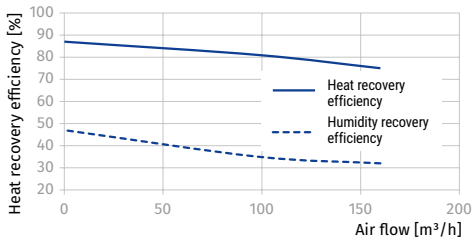
## Technical data

| Parameters | KOMFORT ERV D100 S3<br>KOMFORT ERV D100 S4 | KOMFORT ERV D200 S3<br>KOMFORT ERV D200 S4 |
|---|---|---|
| Voltage [V / 50 Hz] | 1~220-240 | 1~220-240 |
| Power [W] | 76 | 141 |
| Current [A] | 0.33 | 0.63 |
| Maximum air flow [m³/h (l/s)] | 160 (44) | 280 (78) |
| RPM [min⁻¹] | 2750 | 2840 |
| Sound pressure level at 3 m [dBA] | 47 | 49 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Insulation | 5-10 mm expanded polyurethane | 5-10 mm expanded polyurethane |
| Extract filter | G4 | G4 |
| Supply filter | G4 and F8 (PM2.5 > 93 %) | G4 and F8 (PM2.5 > 93 %) |
| Connected air duct diameter [mm] | 100 | 100 |
| Weight [kg] | 17 | 24 |
| Heat recovery efficiency [%]* | 75–87 | 72–87 |
| Humidity recovery efficiency [%] | 32–47 | 27–47 |
| Heat exchanger type | cross-flow | cross-flow |
| Heat exchanger material | enthalpy | enthalpy |
| SEC class | D | D |
| ErP | 2016 | 2016 |

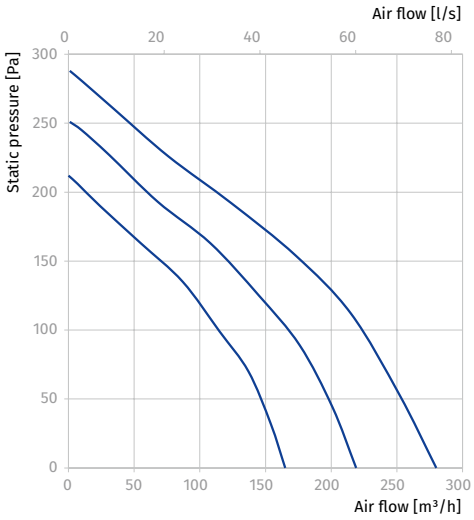
* Heat recovery efficiency is specified in compliance with EN 13141-7.

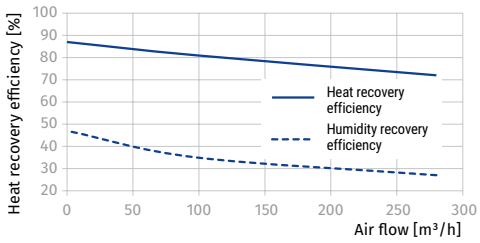
**KOMFORT ERV D100 S3/S4**




**KOMFORT ERV D200 S3/S4**

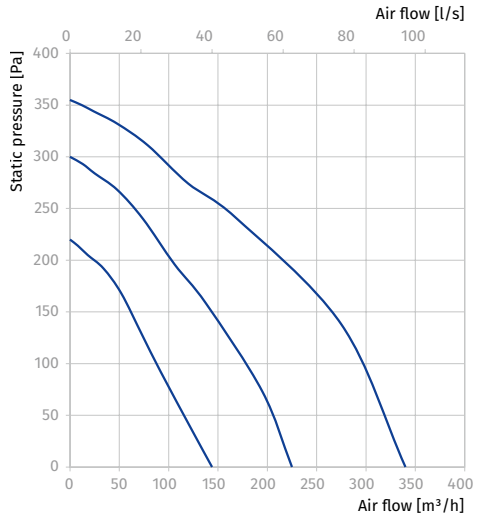


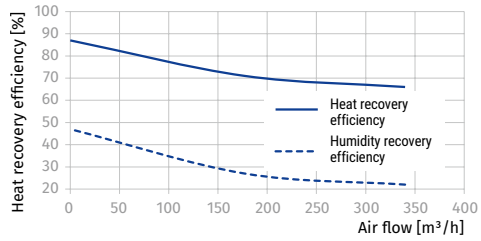



| Parameters | KOMFORT ERV D300 S3<br>KOMFORT ERV D300 S4 | KOMFORT ERV D450 S3<br>KOMFORT ERV D450 S4 |
|---|---|---|
| Voltage [V / 50 Hz] | 1~220-240 | 1~220-240 |
| Power [W] | 193 | 354 |
| Current [A] | 0.84 | 1.54 |
| Maximum air flow [m³/h (l/s)] | 340 (94) | 500 (139) |
| RPM [min⁻¹] | 2720 | 2870 |
| Sound pressure level at 3 m [dBA] | 52 | 57 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Insulation | 5-10 mm expanded polyurethane | 5-10 mm expanded polyurethane |
| Extract filter | G4 | G4 |
| Supply filter | G4 and F8 (PM2.5 > 93 %) | G4 and F8 (PM2.5 > 93 %) |
| Connected air duct diameter [mm] | 150 | 150 |
| Weight [kg] | 27 | 39 |
| Heat recovery efficiency [%]* | 66–87 | 71–87 |
| Humidity recovery efficiency [%] | 22–47 | 23–40 |
| Heat exchanger type | cross-flow | cross-flow |
| Heat exchanger material | enthalpy | enthalpy |
| SEC class | E | E |
| ErP | 2016 | |

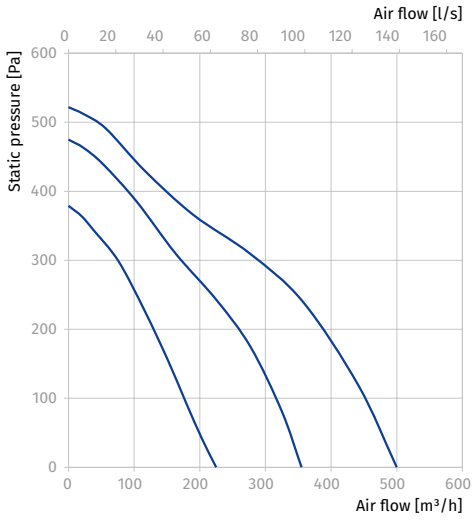
* Heat recovery efficiency is specified in compliance with EN 13141-7.

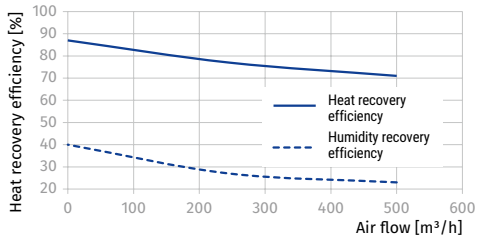
KOMFORT ERV D300 S3/S4




KOMFORT ERV D450 S3/S4






## Accessories

| | KOMFORT ERV D100 S3<br>KOMFORT ERV D100 S4 | KOMFORT ERV D200 S3<br>KOMFORT ERV D200 S4 | KOMFORT ERV D300 S3<br>KOMFORT ERV D300 S4 | KOMFORT ERV D450 S3<br>KOMFORT ERV D450 S4 |
|---|---|---|---|---|
| G4 panel filter | FP 200x191x20 G4 | FP 300x220x48 G4 | FP 300x220x48 G4 | FP 300x270x48 G4 |
| F8 panel filter | FP 200x191x20 F8 | FP 300x220x48 F8 | FP 300x220x48 F8 | FP 300x270x48 F8 |
| Summer block | SB C4 300/220 | SB C4 300/220 | SB C4 300/270 | 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 %



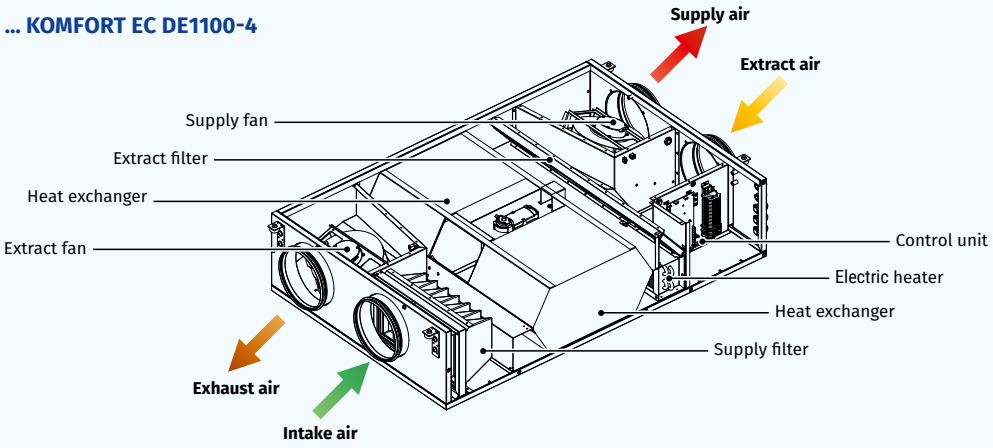
### Design

- 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.

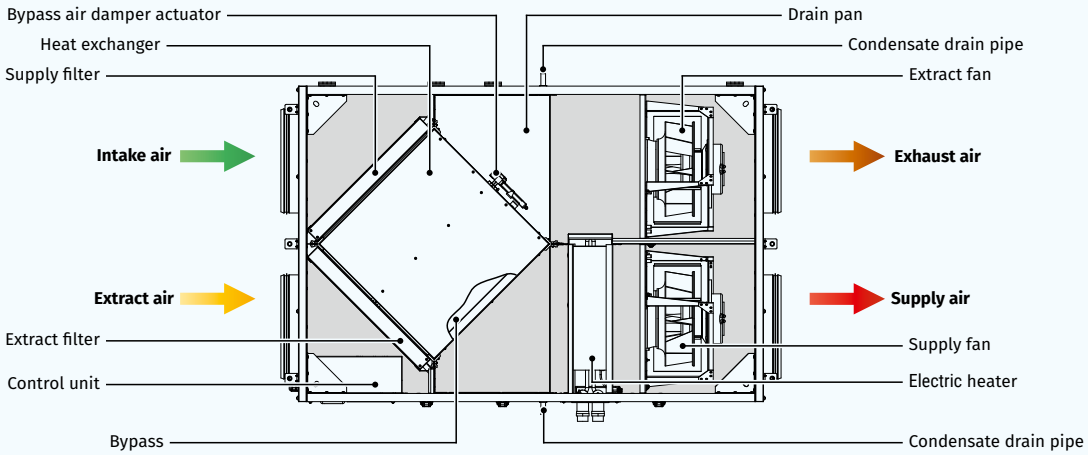
### Fans

- 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

- The unit is equipped with a plate cross-flow **(KOMFORT EC DE400/700/1100)** or a plate counter-flow **(KOMFORT EC DE2000/4000)** aluminium heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FREEZE PROTECTION

- 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.

## 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

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

## 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 FS1 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

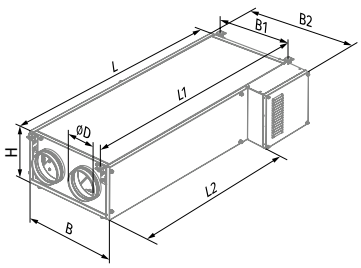
- Ceiling mounting with fixing brackets.
- The correct mounted unit must provide free condensate collection and drainage as well as good access for servicing and filter replacement.
- **Access for maintenance:**
  - **KOMFORT EC DE400/700/1100:** on the right or left side panel.
  - **KOMFORT EC DE2000/4000:**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

## Designation key

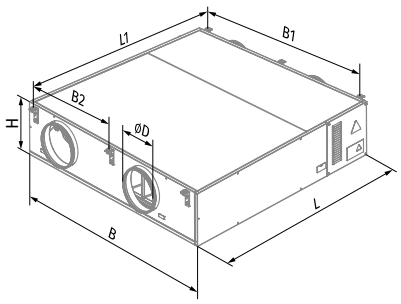
| Serie | Motor type | Mounting type | Heater type | Nominal air flow [m³/h] | | Heater power [kW] | | Service side |
|---|---|---|---|---|---|---|---|---|
| KOMFORT | **EC:** electronically commutated motor | **D:** suspended mounting, horizontally oriented spigots | **E:** electric heater | **400; 700; 1100; 2000; 4000** | — | **1.5; 2; 3.3; 12; 21** | – | **L:** Left<br>**R:** Right |

## Overall dimensions [mm]

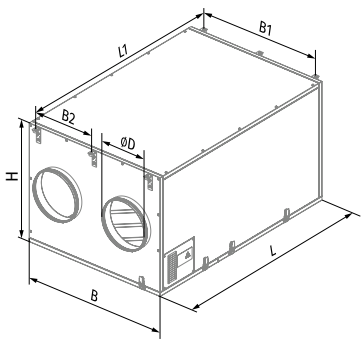
| Model | D | B | B1 | B2 | H | L | L1 | L2 |
|---|---|---|---|---|---|---|---|---|
| KOMFORT EC DE400-1.5 | 160 | 485 | 415 | 554 | 281 | 1238 | 1291 | 924 |
| KOMFORT EC DE700-2 | 200 | 827 | 711 | – | 280 | 1238 | 1291 | – |
| KOMFORT EC DE1100-3.3 | 250 | 1351 | 1215 | 608 | 318 | 1349 | 1402 | – |
| 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



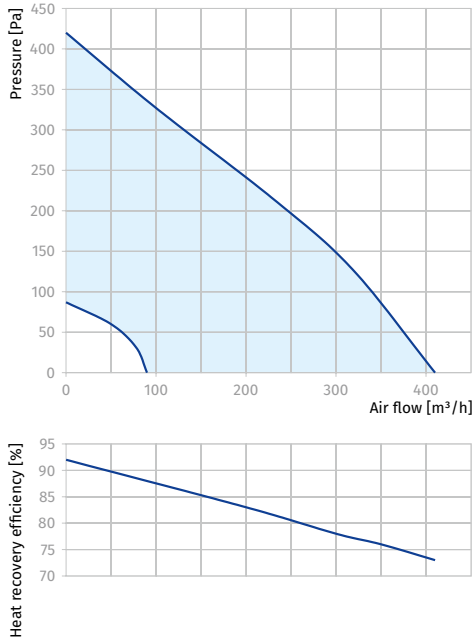

KOMFORT EC DE2000-12
KOMFORT EC DE4000-21

## Technical data

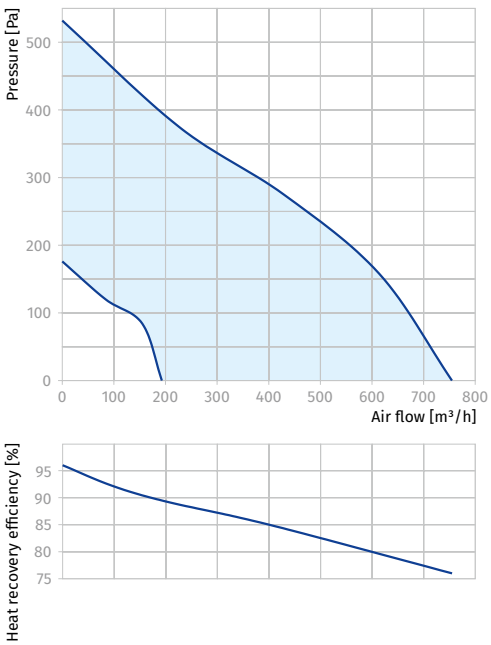
| Parameters | KOMFORT EC DE400-1.5 | KOMFORT EC DE700-2 | KOMFORT EC DE1100-3.3 | KOMFORT EC DE2000-12 | KOMFORT EC DE4000-21 |
|---|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 3 ~ 400 | 3 ~ 400 |
| Max. unit power without electric heater [W] | 200 | 270 | 400 | 840 | 1980 |
| Max. unit current without electric heater [A] | 1.62 | 1.6 | 2.26 | 5 | 3.4 |
| Electric heater power [W] | 1500 | 2000 | 3300 | 12000 | 21000 |
| Electric heater current [A] | 6.5 | 8.7 | 14.3 | 17.4 | 30.0 |
| Max. power with electric heater [W] | 1700 | 2270 | 3700 | 12870 | 23000 |
| Max. current with electric heater [A] | 8.12 | 10.3 | 16.56 | 22.4 | 33.4 |
| Maximum air flow [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | NRVU** | NRVU** | NRVU** |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016 | 2016 |

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

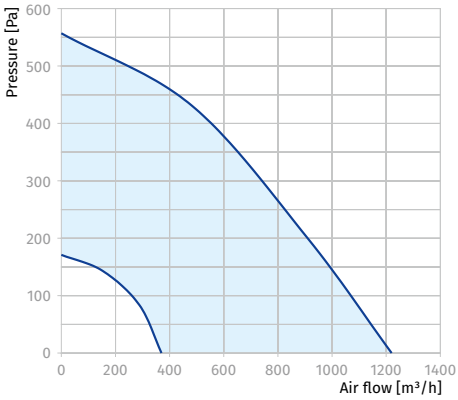
**KOMFORT EC DE400-1.5**



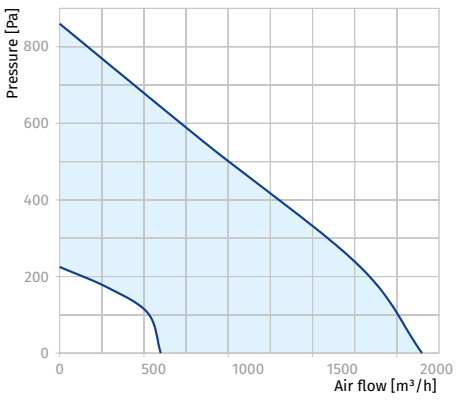

**KOMFORT EC DE700-2**



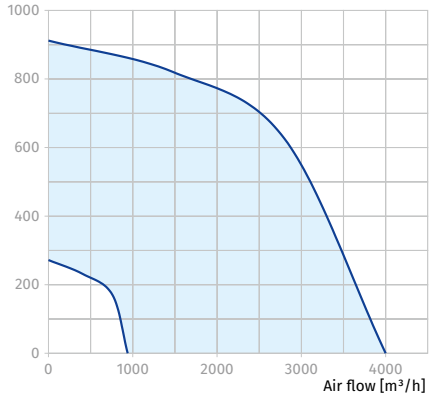
KOMFORT EC DE1100-3.3



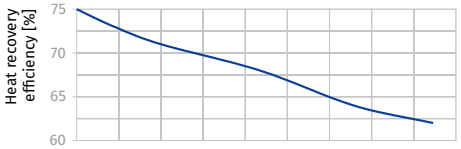

KOMFORT EC DE2000-12

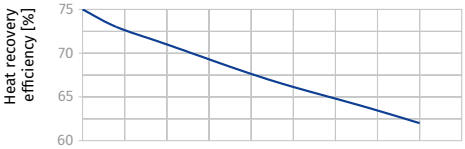



KOMFORT EC DE4000-21








## Accessories

| | KOMFORT EC DE400-1.5 | KOMFORT EC DE700-2 | KOMFORT EC DE1100-3.3 | KOMFORT EC DE2000-12 | KOMFORT EC DE4000-21 |
|---|---|---|---|---|---|
| **G4 panel filter**  | FP 440x128x20 G4 | FP 782x128x20 G4 | FP 647x274x20 G4 | FP 708x480x48 G4 | FP 827x741x48 G4 |
| **G4 pocket filter**  | FPT 208x236x27 G4 | FPT 392x236x27 G4 | FPT 647x274x27 G4 | – | – |
| **F7 pocket filter**  | FPT 208x236x27 F7 | FPT 392x236x27 F7 | FPT 647x274x27 F7 | – | – |
| **Silencer**  | SD 160 | SD 200 | SD 250 | SD 315 | SD 400 |
| **Silencer**  | SDF 160 | SDF 200 | SDF 250 | SDF 315 | SDF 400 |
| **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 %

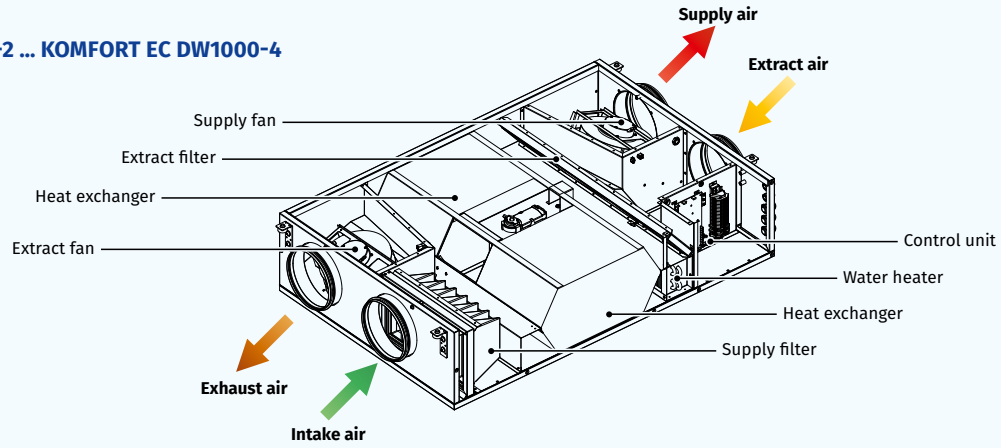
### Design

- 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.

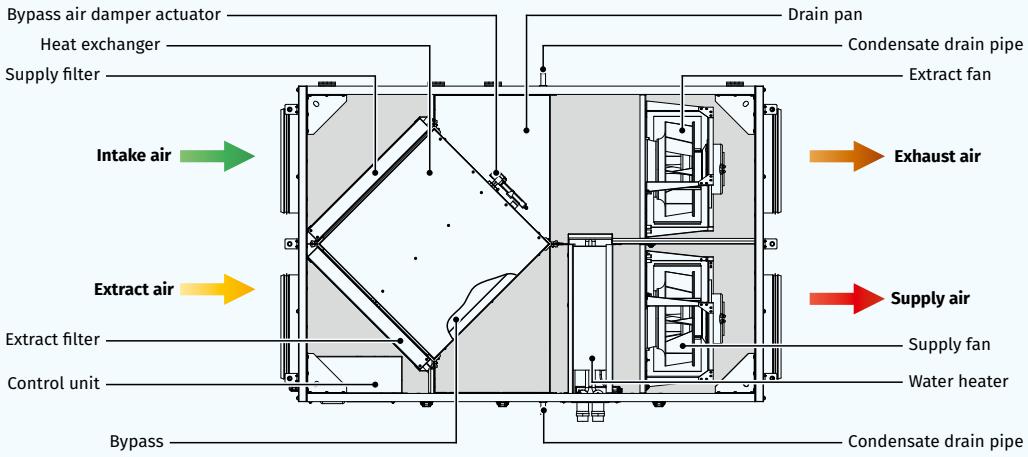
### Fans

- 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.

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




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



## Heat recovery

- The unit is equipped with a plate cross-flow **(KOMFORT EC DW600/1000)** or a plate counter-flow **(KOMFORT EC DW2000/2800)** aluminium heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

### FREEZE PROTECTION

- 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.

## 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.
- Heat medium temperature control ensures 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 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).

## 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.

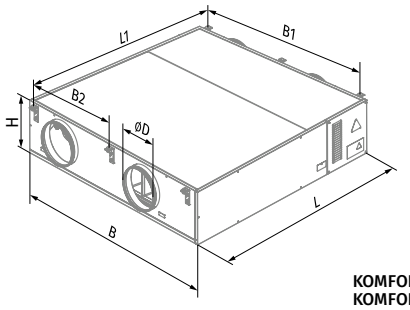


## Designation key

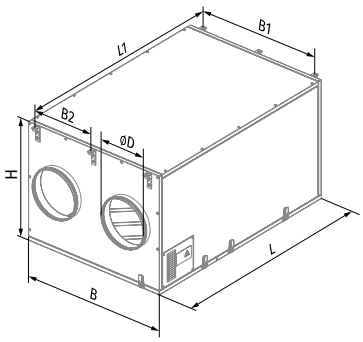
| Serie | Motor type | Mounting type | Heater type | Nominal air flow [m³/h] | | Number of water coil rows | | Service side |
|---|---|---|---|---|---|---|---|---|
| KOMFORT | **EC:** electronically commutated motor | **D:** suspended mounting, horizontally oriented spigots | **W:** water heater | **600; 1000; 2000; 3800** | — | **2; 4** | – | **L:** Left<br>**R:** Right |

## 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



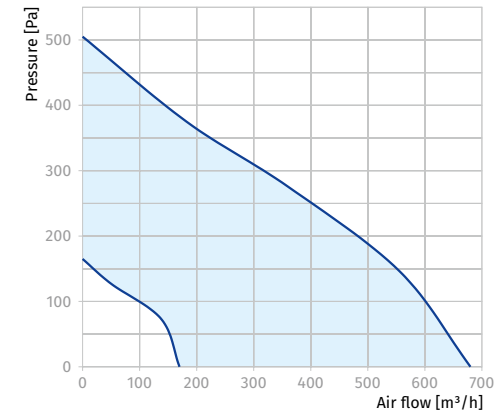

KOMFORT EC DW2000-2
KOMFORT EC DW3800-2

## 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 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 3 ~ 400 |
| Number of water (glycol) coil rows | 2 | 4 | 2 | 2 |
| Power [W] | 270 | 400 | 840 | 1990 |
| Current [A] | 1.60 | 2.26 | 5.00 | 3.40 |
| Maximum air flow [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 |

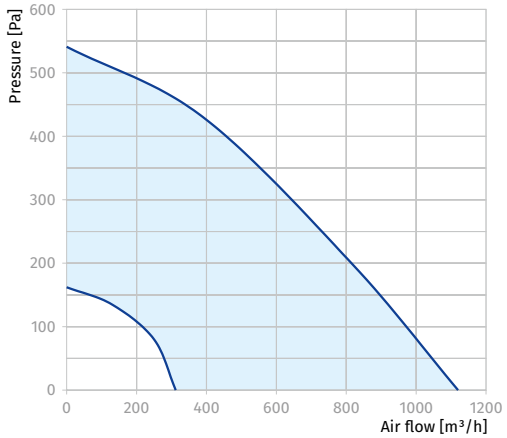
* Heat recovery efficiency is specified in compliance with the EN308 EU norms.
**Nonresidential Ventilation Unit.

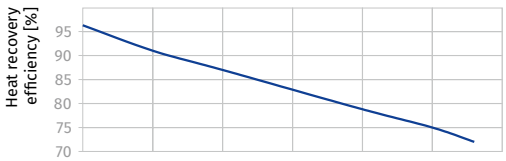
**KOMFORT EC DW600-2**



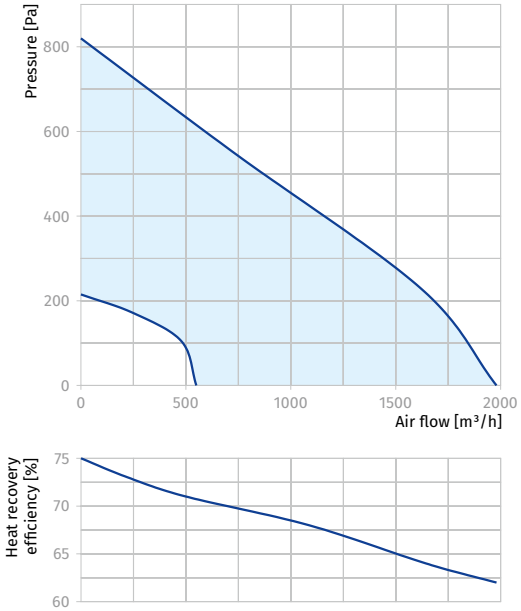


**KOMFORT EC DW1000-4**

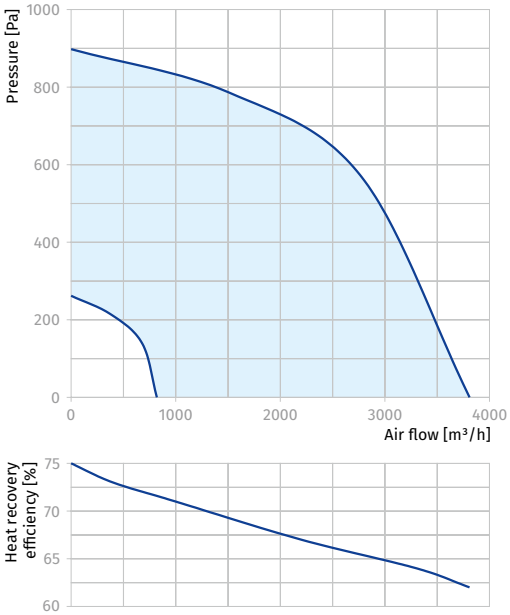


KOMFORT EC DW2000-2

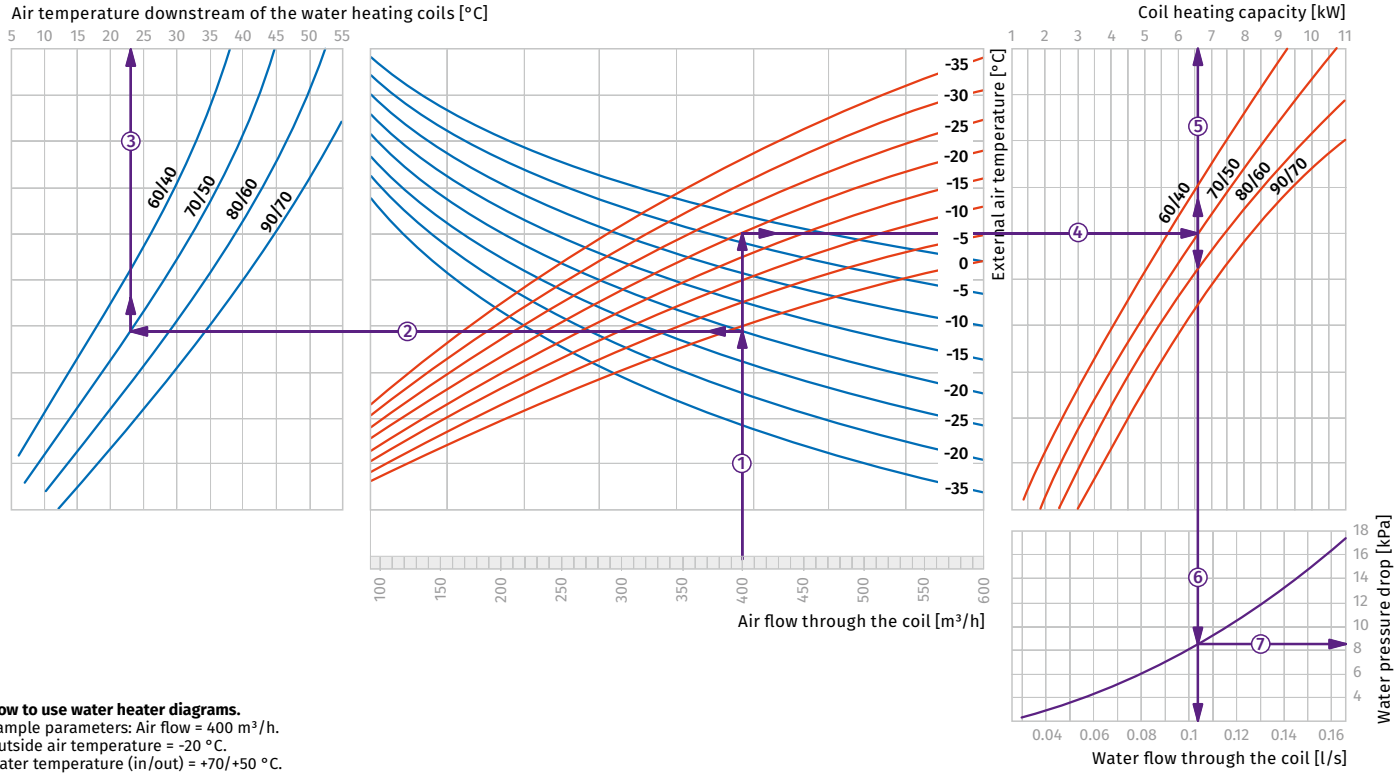



KOMFORT EC DW3800-2




## Hot water coil calculation diagram

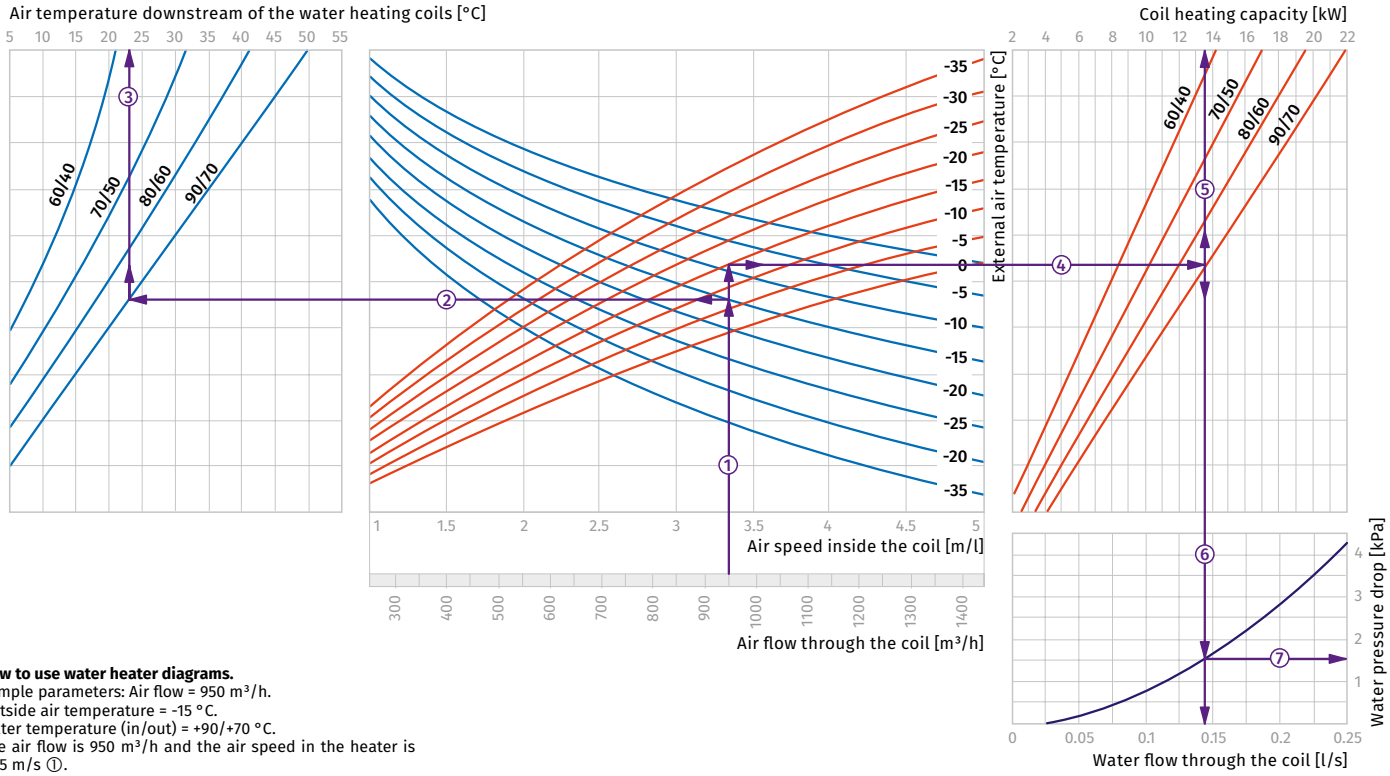
### KOMFORT EC DW600-2




**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 ⑥ 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).

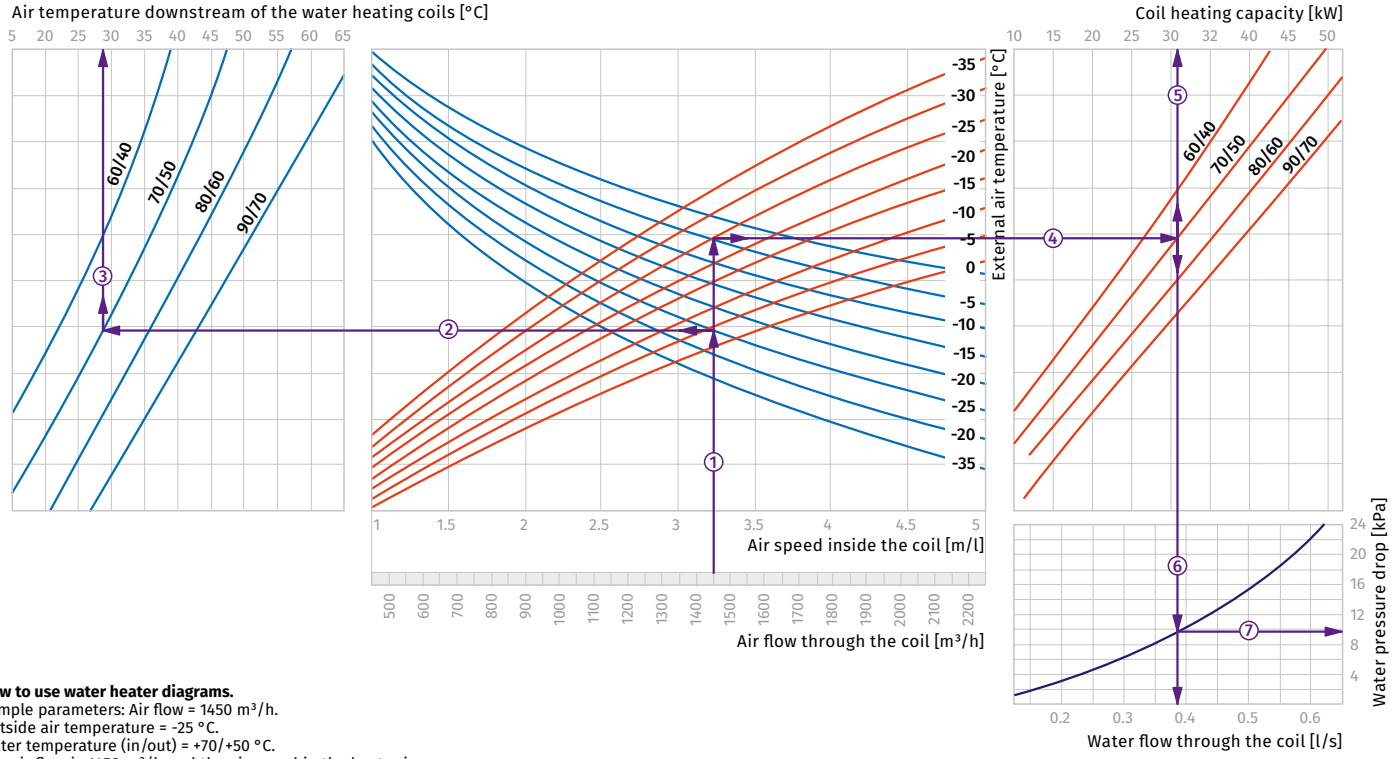
## KOMFORT EC DW1000-4




**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).

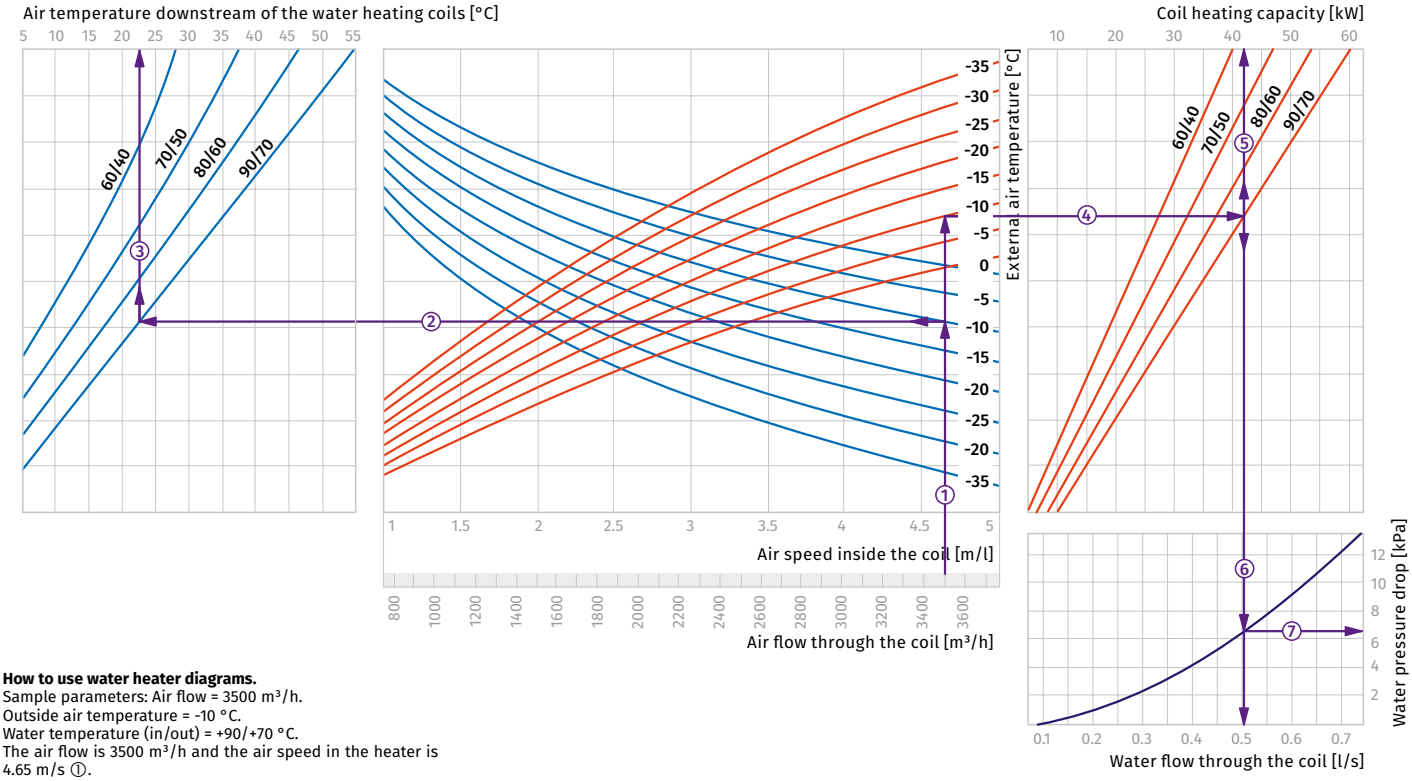
## KOMFORT EC DW2000-2




**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




**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 panel filter** |  | FP 782x128x20 G4 | FP 647x274x20 G4 | FP 708x480x48 G4 | FP 827x741x48 G4 |
| **G4 pocket filter** |  | FPT 392x236x27 G4 | FPT 647x274x27 G4 | – | – |
| **Silencer** |  | SD 200 | SD 250 | SD 315 | SD 400 |
| **Silencer** |  | SDF 200 | SDF 250 | SDF 315 | SDF 400 |
| **Water mixing unit** |  | WMG | WMG | WMG | WMG |
| **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 |

# KOMFORT EC LB

## Heat recovery air handling units

### 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 Ø160, 200 or 250 mm air ducts.

**Air flow:**
up to 830 m³/h
231 l/s

**Heat recovery efficiency:**
up to 98 %

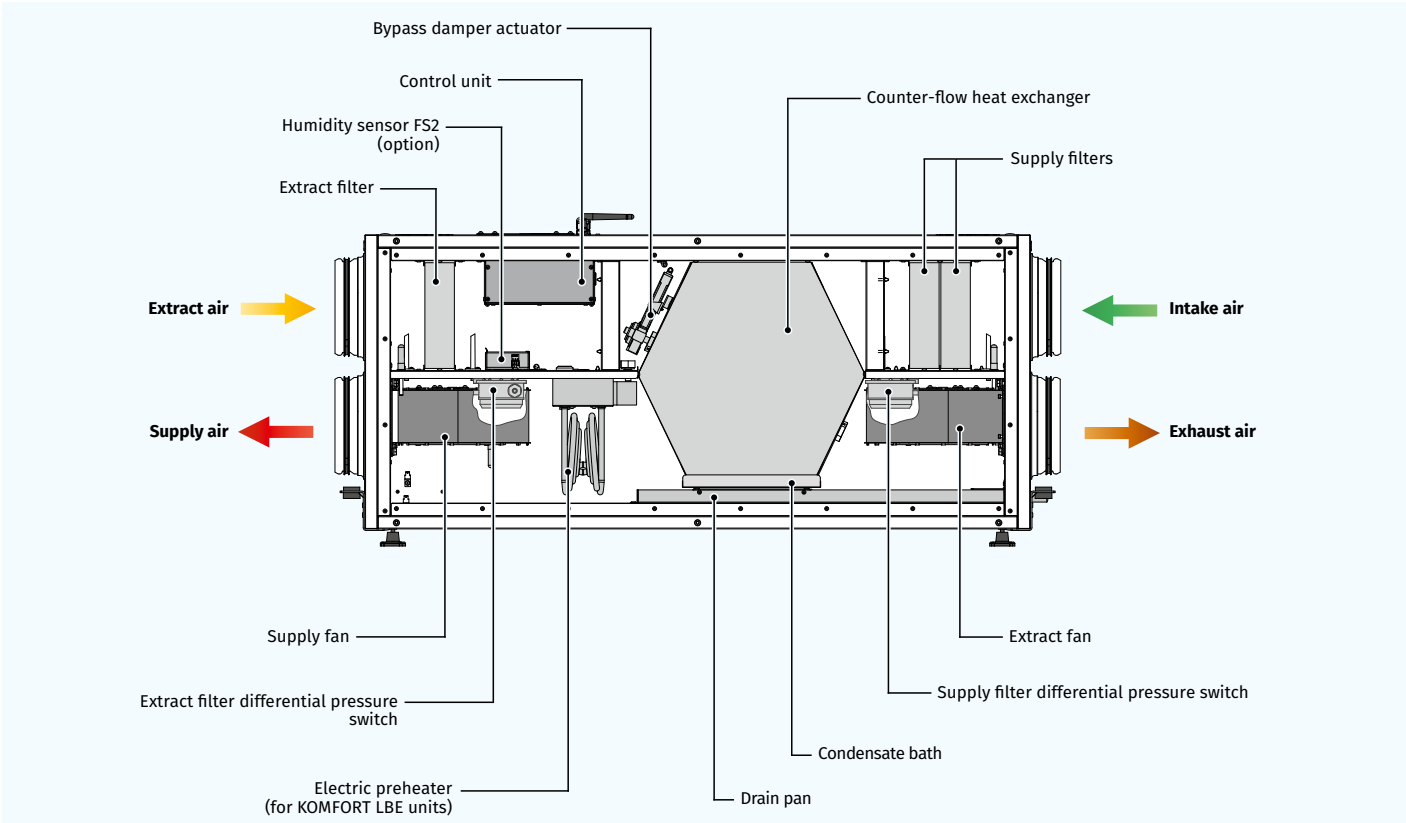
EC motor · ErP 2016 · ErP 2018

### Design

- The casing is made of double-skinned aluzinc panels, internally filled with mineral wool layer 40 mm for heat- and sound-insulation.
- The casing has mounting brackets with anti-vibration rubber mounts for easy installation.
- The unit is equipped with service hatches on the side panels for easy maintenance of filters. This design enables the left-hand and right-hand installation of the unit.
- The spigots are located at the sides of the unit and are equipped with rubber seals for airtight connection to the air ducts.

### Fans

- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- The forward curved blades in **KOMFORT EC LB(E)300/LB(E)400** provide permanent air flow.
- The **KOMFORT EC LB(E)700** model has impellers with backward curved blades.
- EC motors have the best power consumption to air capacity 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

- The **KOMFORT EC LB(E)...** unit is equipped with a plate counter-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The **KOMFORT EC LB(E)...-E** unit is equipped with an enthalpy plate counter-flow heat exchanger for enegry (heat and humidity) recovery. Due to humidity recovery condensate is not generated in the enthalpy heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.

## Air filtration

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

## Air heater

- The **KOMFORT EC LBE S21** units are equipped with an electric heater for additional heating of supply air downstream of the heat exchanger.
- The **KOMFORT EC LB S21** units are not equipped with built-in heaters but both a preheater and a reheater can be purchased separately.

## Bypass

- The **KOMFORT EC LB(E) S21** model is equipped with a bypass which is automatically opened in summer if there is a need to cool down the ventilated area with cool intake air.
- The **KOMFORT EC LB S14** unit is equipped with a bypass that is opened manually.
- If the unit is equipped with an electric heater, the bypass is used for freeze protection of the heat exchanger.

## Mounting

- Mounting on floor or ceiling with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage as well as access to service mounting and filter replacement.

## Control and automation

- **KOMFORT EC LB... S21** units are equipped with a build-in automation system. The remote control panel is not included in the delivery set (purchased separately).
- The unit can be controlled via the **Blauberg AHU** mobile application via Wi-Fi.

Download the **Blauberg AHU** app for Android

Download the **Blauberg AHU** app for iOS

- The **KOMFORT EC LB S14** units have an integrated control system with a wall-mounted control panel S14 with a LED indication.

## Automation functions

| Functions | KOMFORT EC LB(E) S21 | KOMFORT EC LB S14 |
|---|---|---|
| Control via Wi-Fi using a mobile application | + | - |
| Control via a wired remote control panel | S22 panel (option)  | S14 panel  |
| | S25 control panel (option)  | - |
| Control via a wireless remote control panel | S22 WiFi panel (option)  | - |
| Speed selection | + | + |
| Filter replacement indication | according to hour meter readings | according to hour meter readings |
| | according to filter clogging differential pressure switch readings | - |
| Alarm indication | full alarm description in the mobile application | LED alarm indication |
| Week-scheduled operation | + | - |
| Bypass | automatic | - |
| | manual | manual |
| Timers | + | - |
| Boost mode | + | - |
| Kamin mode | + | - |
| Freeze protection | through cyclic stops of the supply fan | through cyclic stops of the supply fan |
| | through preheating (option) | - |
| | using a bypass | - |
| Reheater connection | option | - |
| Cooler connection | option | - |
| Minimum supply air temperature control | + | - |
| Humidity control | option | option |
| CO2 controller | option | option |
| VOC controller | option | - |
| PM2.5 control | option | - |
| Fire alarm sensor connection | option | option |

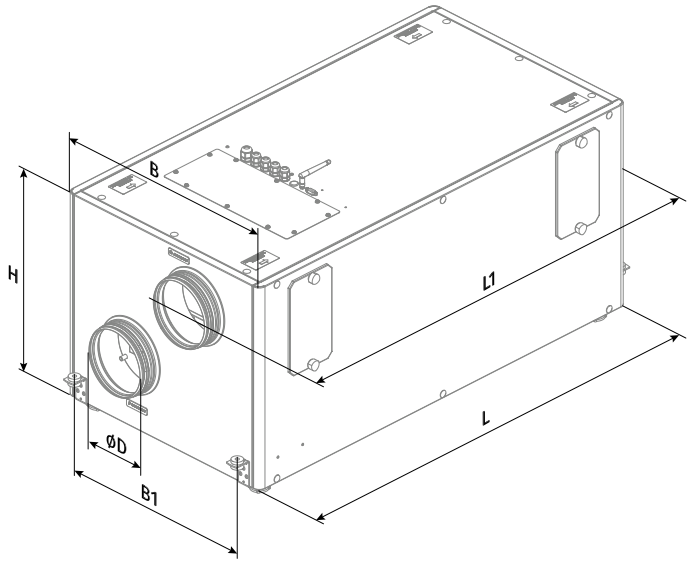
option: function is available when purchasing the appropriate accessory (see the "Accessories" section).

## Designation key

| Series | 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 | **B:** with a bypass | **_:** without a heater<br>**E:** electric heater | **300; 400; 700** | **_:** heat recovery<br>**–E:** energy recovery | **S21**<br>**S14** |

## Overall dimensions [mm]

| Model | D | B | B1 | H | L | L1 |
|---|---|---|---|---|---|---|
| KOMFORT EC LB300(-E) S21/S14 | 157 | 566 | 480 | 479 | 1083 | 1180 |
| KOMFORT EC LBE300(-E) S21/S14 | 157 | 566 | 480 | 479 | 1083 | 1180 |
| KOMFORT EC LB400(-E) S21/S14 | 197 | 682 | 596 | 504 | 1094 | 1191 |
| KOMFORT EC LBE400(-E) S21/S14 | 197 | 682 | 596 | 504 | 1094 | 1191 |
| KOMFORT EC LB700(-E) S21/S14 | 247 | 866 | 700 | 601 | 1282 | 1379 |
| KOMFORT EC LBE700(-E) S21/S14 | 247 | 866 | 700 | 601 | 1282 | 1379 |



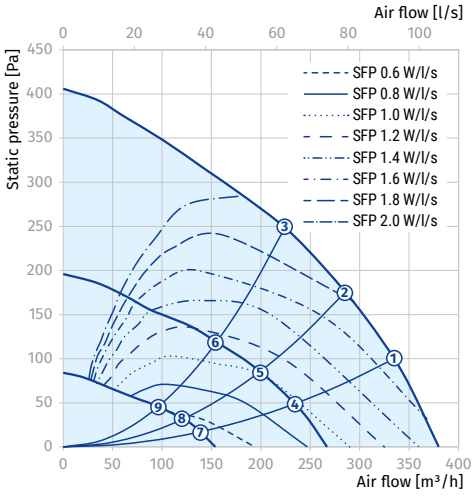
## Technical data

| Parameters | KOMFORT EC LB300 S21<br>KOMFORT EC LB300 S14 | KOMFORT EC LBE300 S21 | KOMFORT EC LB300-E S21<br>KOMFORT EC LB300-E S14 | KOMFORT EC LBE300-E S21 |
|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power (without a heater) [W] | 182 | 182 | 182 | 182 |
| Current (without a heater) [A] | 1.4 | 1.4 | 1.4 | 1.4 |
| Electric heater power [W] | – | 2800 | – | 2800 |
| Electric heater current [A] | – | 12.2 | – | 12.2 |
| Power (with a heater) [W] | 182 | 2982 | 182 | 2982 |
| Current (with a heater) [A] | 1.4 | 13.6 | 1.4 | 13.6 |
| Maximum air flow [m³/h (l/s)] | 380 (106) | 380 (106) | 380 (106) | 380 (106) |
| RPM [min⁻¹] | 2100 | 2100 | 2100 | 2100 |
| Sound pressure level at a distance of 3 m [dBA] | 24 | 24 | 24 | 24 |
| Transported air temperature [°C] | -25...+60 | -25...+60 | -25...+60 | -25...+60 |
| Casing material | galvanized steel | galvanized steel | galvanized steel | galvanized steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool | 40 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] | 63.1 | 64.3 | 63.1 | 64.3 |
| Heat recovery efficiency [%] | 80–98 | 80–98 | 74–89 | 74–89 |
| Heat exchanger type | counter-flow | counter-flow | enthalpy | enthalpy |
| Heat exchanger material | polystyrene | polystyrene | enthalpy | enthalpy |
| SEC class | A+ | A+ | A | A |

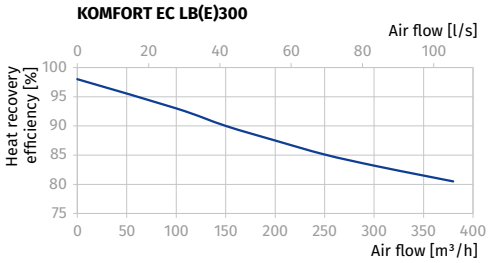
| Sound power level, A-weighted | Gen. | Octave band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ to supply inlet [dBA] | **67** | 50 | 55 | 56 | 62 | 60 | 62 | 56 | 50 | | |
| $L_{WA}$ to supply outlet [dBA] | **53** | 42 | 47 | 46 | 46 | 44 | 39 | 29 | 21 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **68** | 56 | 54 | 61 | 62 | 59 | 61 | 56 | 50 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **55** | 42 | 47 | 51 | 48 | 46 | 43 | 31 | 22 | | |
| $L_{WA}$ to environment [dBA] | **45** | 34 | 35 | 40 | 39 | 32 | 36 | 31 | 27 | **24** | **34** |

* Data for point 1 in the performance diagram

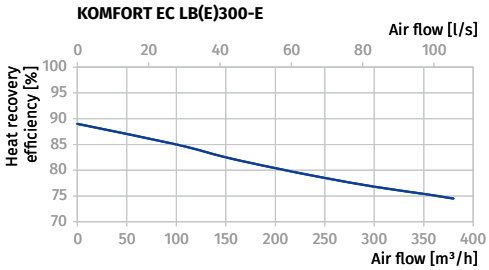
| Point | Power [W] | Sound pressure level at 3 m distance [dBA] |
|---|---|---|
| 1 | 155 | 24 (34) |
| 2 | 143 | 23 (33) |
| 3 | 119 | 23 (33) |
| 4 | 61 | 20 (30) |
| 5 | 56 | 20 (30) |
| 6 | 46 | 20 (30) |
| 7 | 20 | 13 (23) |
| 8 | 19 | 13 (23) |
| 9 | 18 | 13 (23) |




**KOMFORT EC LB(E)300**




**KOMFORT EC LB(E)300-E**



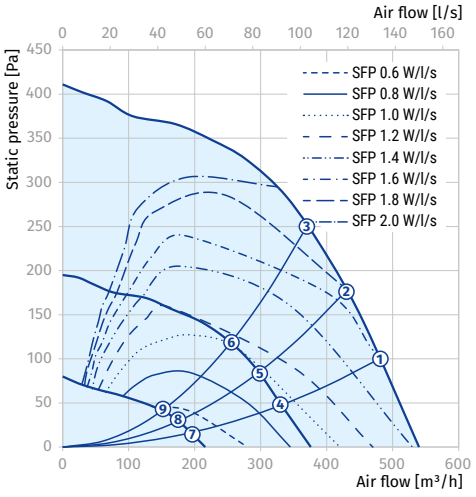
## Technical data

| Parameters | KOMFORT EC LB400 S21<br>KOMFORT EC LB400 S14 | KOMFORT EC LBE400 S21 | KOMFORT EC LB400-E S21<br>KOMFORT EC LB400-E S14 | KOMFORT EC LBE400-E S21 |
|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power (without a heater) [W] | 289 | 289 | 289 | 289 |
| Current (without a heater) [A] | 2.1 | 2.1 | 2.1 | 2.1 |
| Electric heater power [W] | – | 2800 | – | 2800 |
| Electric heater current [A] | – | 12.2 | – | 12.2 |
| Power (with a heater) [W] | 289 | 3089 | 289 | 3089 |
| Current (with a heater) [A] | 2.1 | 14.3 | 2.1 | 14.3 |
| Maximum air flow [m³/h (l/s)] | 540 (150) | 540 (150) | 540 (150) | 540 (150) |
| RPM [min⁻¹] | 2600 | 2600 | 2600 | 2600 |
| Sound pressure level at a distance of 3 m [dBA] | 27 | 27 | 27 | 27 |
| Transported air temperature [°C] | -25...+60 | -25...+60 | -25...+60 | -25...+60 |
| Casing material | galvanized steel | galvanized steel | galvanized steel | galvanized steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 | G4 | G4 |
| Supply filter | G4+F7 | G4+F7 | G4+F7 | G4+F7 |
| Connected air duct diameter [mm] | 200 | 200 | 200 | 200 |
| Weight [kg] | 74.8 | 76 | 74.8 | 76 |
| Heat recovery efficiency [%] | 84–98 | 84–98 | 78–89 | 78–89 |
| Heat exchanger type | counter-flow | counter-flow | counter-flow | counter-flow |
| Heat exchanger material | polystyrene | polystyrene | enthalpy | enthalpy |
| SEC class | A+ | A+ | A | A |

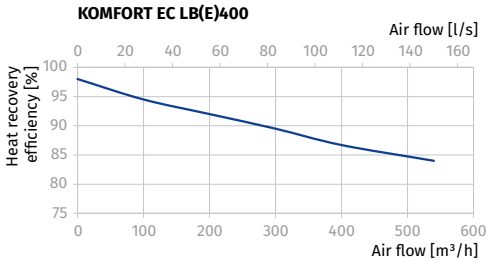
| Sound power level, A-weighted | Gen. | Octave band [Hz] 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $L_{WA}$ to supply inlet [dBA] | **71** | 52 | 57 | 57 | 68 | 64 | 64 | 59 | 53 | | |
| $L_{WA}$ to supply outlet [dBA] | **56** | 44 | 49 | 47 | 52 | 47 | 41 | 31 | 24 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **70** | 52 | 56 | 60 | 66 | 62 | 64 | 60 | 53 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **58** | 39 | 49 | 52 | 53 | 49 | 46 | 35 | 24 | | |
| $L_{WA}$ to environment [dBA] | **48** | 32 | 37 | 40 | 45 | 36 | 38 | 35 | 30 | **27** | **37** |

* Data for point 1 in the performance diagram

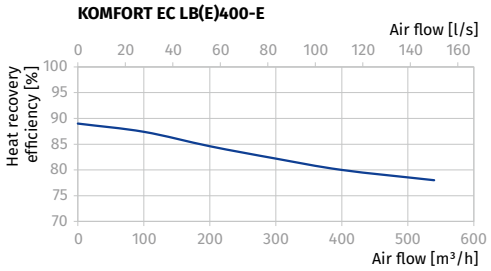
| Point | Power [W] | Sound pressure level at 3 m distance [dBA] |
|---|---|---|
| 1 | 240 | 27 (37) |
| 2 | 215 | 26 (36) |
| 3 | 196 | 26 (36) |
| 4 | 89 | 21 (31) |
| 5 | 80 | 21 (31) |
| 6 | 72 | 20 (30) |
| 7 | 27 | 19 (29) |
| 8 | 26 | 19 (29) |
| 9 | 24 | 17 (27) |




**KOMFORT EC LB(E)400**




**KOMFORT EC LB(E)400-E**



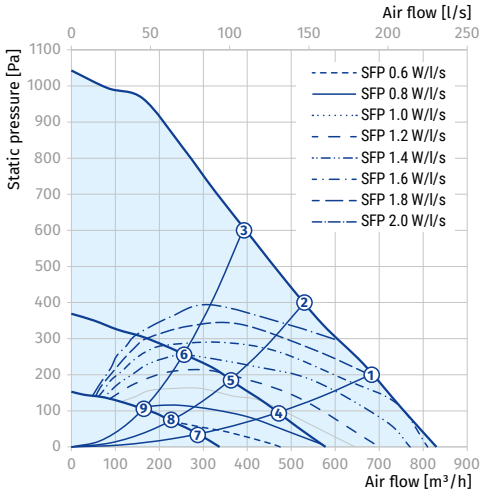
## Technical data

| Parameters | KOMFORT EC LB700 S21<br>KOMFORT EC LB700 S14 | KOMFORT EC LBE700 S21 | KOMFORT EC LB700-E S21<br>KOMFORT EC LB700-E S14 | KOMFORT EC LBE700-E S21 |
|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power (without a heater) [W] | 336 | 336 | 336 | 336 |
| Current (without a heater) [A] | 2.4 | 2.4 | 2.4 | 2.4 |
| Electric heater power [W] | - | 3600 | - | 3600 |
| Electric heater current [A] | - | 15.6 | - | 15.6 |
| Power (with a heater) [W] | 336 | 3936 | 336 | 3936 |
| Current (with a heater) [A] | 2.4 | 18.0 | 2.4 | 18.0 |
| Maximum air flow [m³/h (l/s)] | 830 (231) | 830 (231) | 830 (231) | 830 (231) |
| RPM [min⁻¹] | 3200 | 3200 | 3200 | 3200 |
| Sound pressure level at a distance of 3 m [dBA] | 31 | 31 | 31 | 31 |
| Transported air temperature [°C] | -25...+60 | -25...+60 | -25...+60 | -25...+60 |
| Casing material | galvanized steel | galvanized steel | galvanized steel | galvanized steel |
| Insulation | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 | G4 | G4 |
| Supply filter | G4+F7 | G4+F7 | G4+F7 | G4+F7 |
| Connected air duct diameter [mm] | 250 | 250 | 250 | 250 |
| Weight [kg] | 107 | 108.4 | 107 | 108.4 |
| Heat recovery efficiency [%] | 80–98 | 80–98 | 74–89 | 74–89 |
| Heat exchanger type | counter-flow | counter-flow | enthalpy | enthalpy |
| Heat exchanger material | polystyrene | polystyrene | enthalpy | enthalpy |
| SEC class | A+ | A+ | A | A |

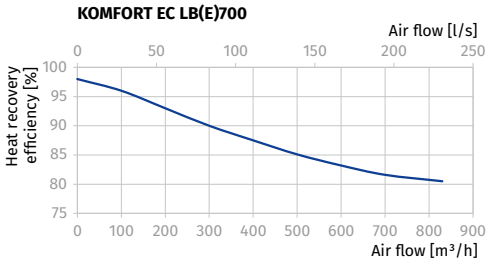
| Sound power level, A-weighted | Gen. | Octave band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **76** | 56 | 61 | 61 | 73 | 69 | 69 | 64 | 57 | | |
| $L_{WA}$ to supply outlet [dBA] | **60** | 49 | 53 | 52 | 56 | 51 | 44 | 34 | 26 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **74** | 56 | 60 | 65 | 70 | 66 | 68 | 64 | 56 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **61** | 42 | 53 | 56 | 56 | 52 | 49 | 37 | 25 | | |
| $L_{WA}$ to environment [dBA] | **51** | 35 | 40 | 43 | 49 | 39 | 40 | 37 | 32 | **31** | **41** |

* Data for point 1 in the performance diagram

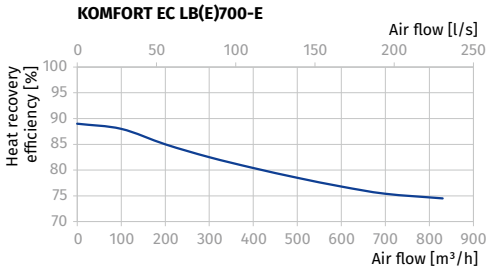
| Point | Power [W] | Sound pressure level at 3 m distance [dBA] |
|---|---|---|
| 1 | 336 | 31 (41) |
| 2 | 336 | 30 (40) |
| 3 | 336 | 29 (39) |
| 4 | 123 | 25 (35) |
| 5 | 115 | 25 (35) |
| 6 | 96 | 24 (34) |
| 7 | 41 | 23 (33) |
| 8 | 38 | 23 (33) |
| 9 | 36 | 20 (30) |




**KOMFORT EC LB(E)700**




**KOMFORT EC LB(E)700-E**



## Accessories

| | | KOMFORT EC LB 300(-E) S21 | KOMFORT EC LB 300(-E) S14 | KOMFORT EC LBE 300(-E) S21 |
|---|---|---|---|---|
| **Panel filter G4** |  | FP 484x178x48 G4 | FP 484x178x48 G4 | FP 484x178x48 G4 |
| **Panel filter F7** |  | FP 484x178x48 F7 | FP 484x178x48 F7 | FP 484x178x48 F7 |
| **Control panel** |  | S22 | – | S22 |
| **Wi-Fi control panel** |  | S22 Wi-Fi | – | S22 Wi-Fi |
| **Wired control panel** |  | S25 | – | S25 |
| **Indoor 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 |
| **VOC sensor** |  | DPWQ30600 | – | DPWQ30600 |
| **$CO_2$ sensor** |  | DPWQ40200 | – | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | – | DPWC11200 |
| **Reheater** |  | ENH 160 | – | – |
| **Preheater** |  | EVH 160 | – | EVH 160 |
| **Silencer** |  | SD 160 | SD 160 | SD 160 |
| **Silencer** |  | SDF 160 | SDF 160 | SDF 160 |
| **Non-return valve** |  | VRV 160 | VRV 160 | VRV 160 |
| **Air damper** |  | VKA 160 | VKA 160 | VKA 160 |
| **Drain pump** |  | CP-2 | CP-2 | CP-2 |
| **Air damper actuator** |  | LF230 | LF230 | LF230 |
| **Air damper actuator** |  | TF230 | TF230 | TF230 |

| | | KOMFORT EC LB 400(-E) S21 | KOMFORT EC LB 400(-E) S14 | KOMFORT EC LBE 400(-E) S21 |
|---|---|---|---|---|
| **Panel filter G4** |  | FP 600x205x48 G4 | FP 600x205x48 G4 | FP 600x205x48 G4 |
| **Panel filter F7** |  | FP 600x205x48 F7 | FP 600x205x48 F7 | FP 600x205x48 F7 |
| **Control panel** |  | S22 | – | S22 |
| **Wi-Fi control panel** |  | S22 Wi-Fi | – | S22 Wi-Fi |
| **Wired control panel** |  | S25 | – | S25 |
| **Indoor 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 |
| **VOC sensor** |  | DPWQ30600 | – | DPWQ30600 |
| **$CO_2$ sensor** |  | DPWQ40200 | – | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | – | DPWC11200 |
| **Reheater** |  | ENH 200 | – | – |
| **Preheater** |  | EVH 200 | – | EVH 200 |
| **Silencer** |  | SD 200 | SD 200 | SD 200 |
| **Silencer** |  | SDF 200 | SDF 200 | SDF 200 |
| **Non-return valve** |  | VRV 200 | VRV 200 | VRV 200 |
| **Air damper** |  | VKA 200 | VKA 200 | VKA 200 |
| **Drain pump** |  | CP-2 | CP-2 | CP-2 |
| **Air damper actuator** |  | TF230 | TF230 | TF230 |
| **Air damper actuator** |  | TF230 | TF230 | TF230 |

| | | KOMFORT EC LB 700(-E) S21 | KOMFORT EC LB 700(-E) S14 | KOMFORT EC LBE 700(-E) S21 |
|---|---|---|---|---|
| **Panel filter G4** |  | FP 784x253x48 G4 | FP 784x253x48 G4 | FP 784x253x48 G4 |
| **Panel filter F7** |  | FP 784x253x48 F7 | FP 784x253x48 F7 | FP 784x253x48 F7 |
| **Control panel** |  | S22 | – | S22 |
| **Wi-Fi control panel** |  | S22 Wi-Fi | – | S22 Wi-Fi |
| **Wired control panel** |  | S25 | – | S25 |
| **Indoor 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 |
| **VOC sensor** |  | DPWQ30600 | – | DPWQ30600 |
| **$CO_2$ sensor** |  | DPWQ40200 | – | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | – | DPWC11200 |
| **Reheater** |  | ENH 250 | – | – |
| **Preheater** |  | EVH 250 | – | EVH 250 |
| **Silencer** |  | SD 250 | SD 250 | SD 250 |
| **Silencer** |  | SDF 250 | SDF 250 | SDF 250 |
| **Non-return valve** |  | VRV 250 | VRV 250 | VRV 250 |
| **Air damper** |  | VKA 250 | VKA 250 | VKA 250 |
| **Drain pump** |  | CP-2 | CP-2 | CP-2 |
| **Air damper actuator** |  | LF230 | LF230 | LF230 |
| **Air damper actuator** |  | TF230 | TF230 | TF230 |

# 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 %

ErP 2016

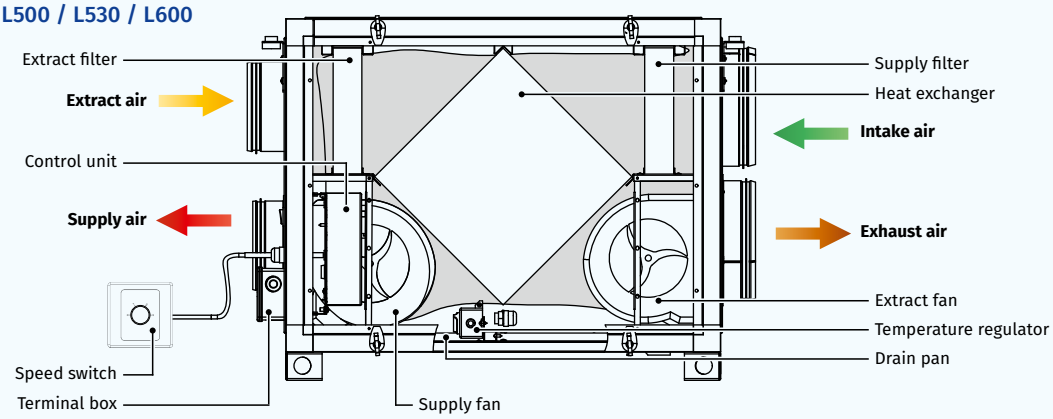
### Design

- 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.

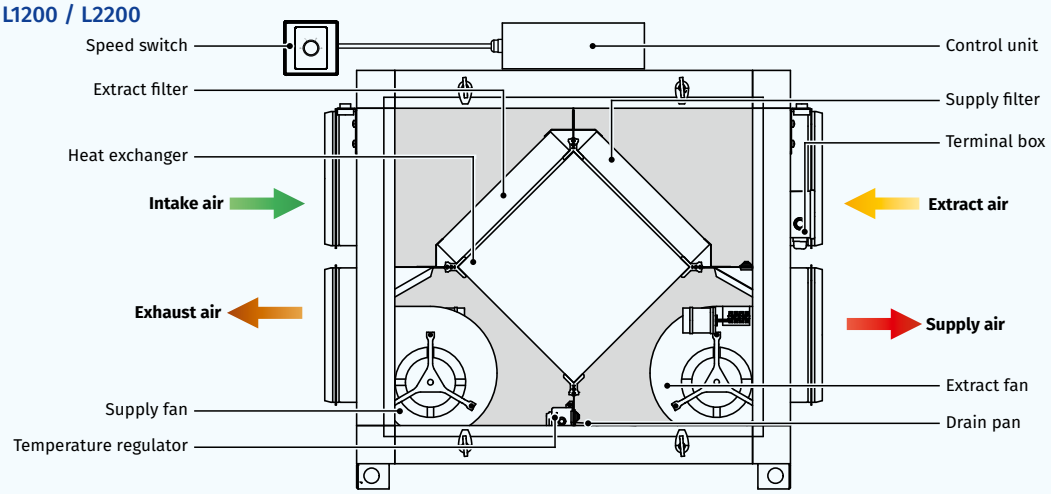
### Fans

- 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.

### KOMFORT L350 / L500 / L530 / L600




### KOMFORT L1200 / L2200



## Heat recovery

- The unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.

- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- The integrated automatic freeze protection is used to prevent freezing of the heat exchanger in the cold season. The supply fan turns off according to the temperature sensor to get the heat exchanger warmed up with extract air. After that the supply fan turns on and the unit continues to run in the standard mode.

## Air filtration

- The built-in G4 supply filter and G4 extract filter provide 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

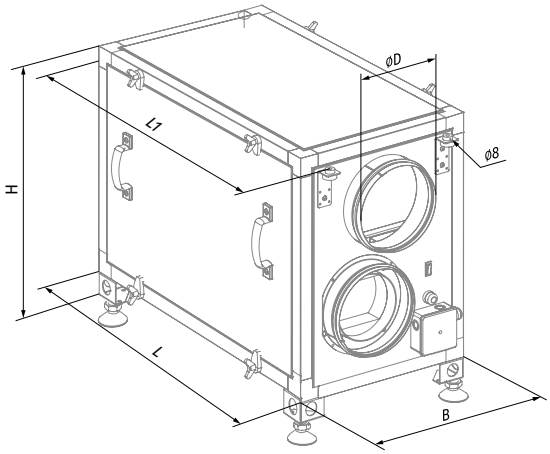
- Mounting to floor, ceiling or wall with fixing brackets.
- The correct mounted unit must provide condensate collecting and drainage and free access to the hinged side panel for servicing and filter replacement.

## 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 |



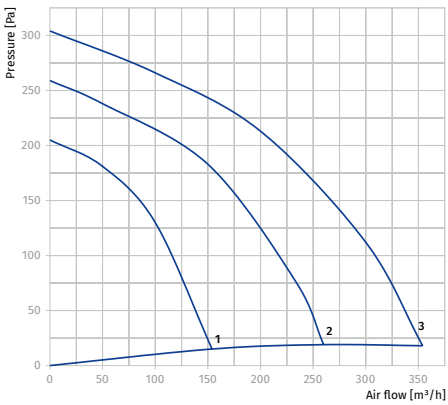
## Technical data

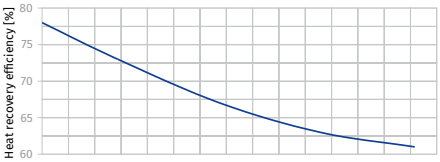
| Parameters | KOMFORT L350 | KOMFORT L500 | KOMFORT L530 | KOMFORT L600 | KOMFORT L1200 | KOMFORT L2200 |
|---|---|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 260 | 300 | 300 | 390 | 820 | 1300 |
| Current [A] | 1.2 | 1.32 | 1.32 | 1.72 | 3.6 | 5.68 |
| Maximum air flow [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 | -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 | G4 | G4 | G4 | G4 | G4 | G4 |
| 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 | polystyrene | polystyrene | polystyrene | polystyrene | polystyrene | polystyrene |
| 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.

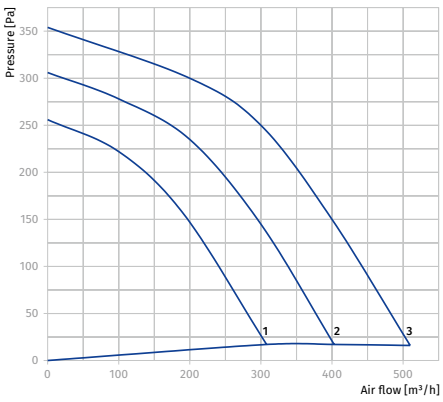


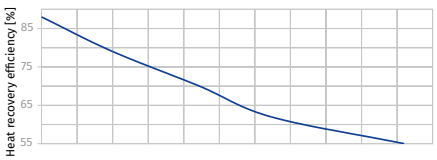
**KOMFORT L350**




**KOMFORT L500**

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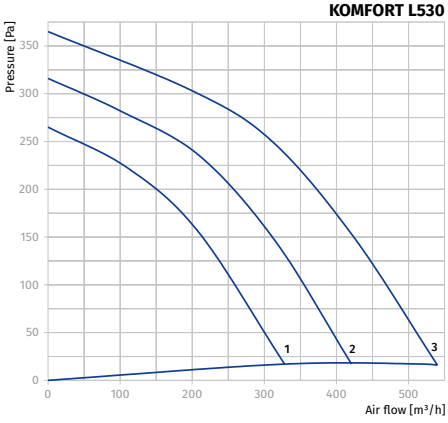


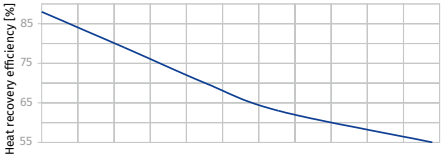

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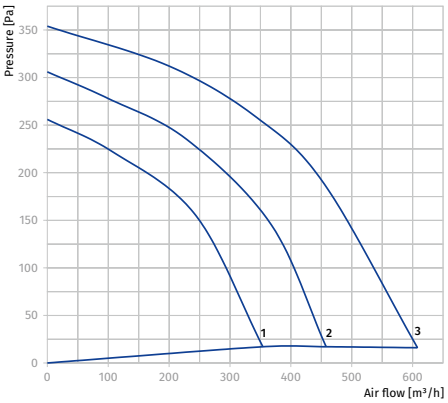
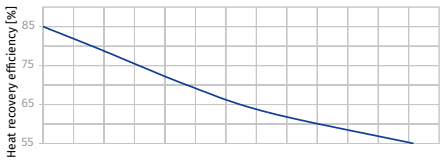
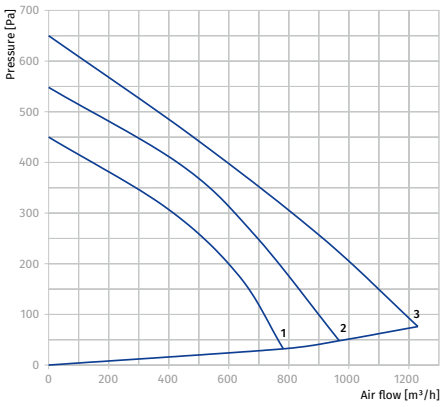
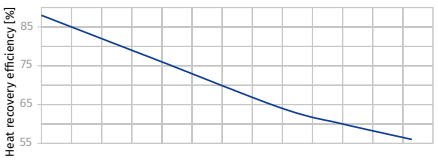


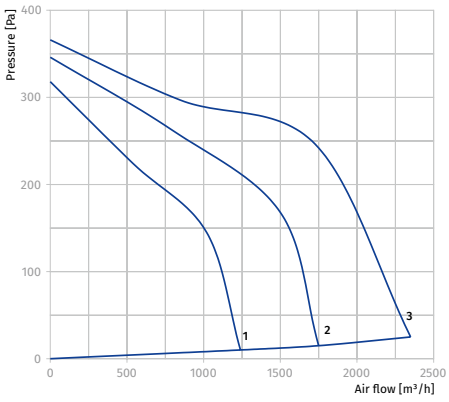



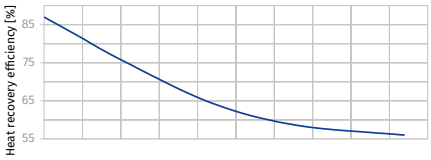

**KOMFORT L1200**




**KOMFORT L2200**




## Accessories

| | | KOMFORT L350 | KOMFORT L500 | KOMFORT L530 | KOMFORT L600 | KOMFORT L1200 | KOMFORT L2200 |
|---|---|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 378x210x47 G4 | FP 438x215x48 G4 | FP 438x215x48 G4 | FP 438x215x48 G4 | FP 450x295x48 G4 | FP 750x295x48 G4 |
| **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** |  | VK 125 | VK 150 | VK 160 | VK 200 | VK 250 | VK 315 |
| **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 %

ErP 2016

### Design

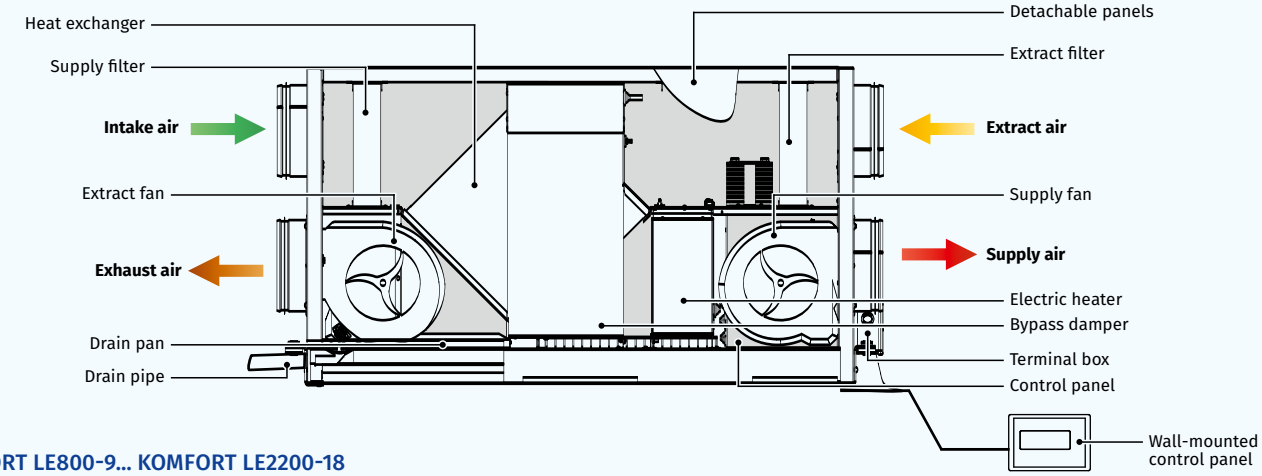
- The casing is made of double-skinned aluzinc panels, internally filled with 25 mm mineral wool layer for heat and sound insulation.
- The casing has fixing brackets with vibration absorbing connectors for easy installation.
- The spigots for connection to the air ducts are located at the side of the 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

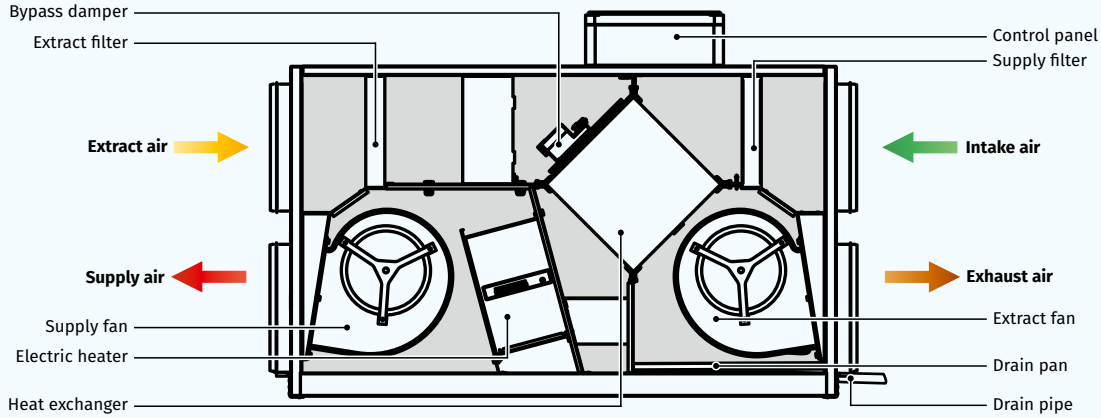
- Asynchronous external rotor motors and centrifugal double-intake impellers with forward curved blades are used for air supply and exhaust.
- Integrated motor overheating protection with automatic restart.
- Dynamically balanced impellers.
- Equipped with ball bearings for longer service life.
- Reliable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

HEAT RECOVERY AIR HANDLING UNITS

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




### KOMFORT LE800-9... KOMFORT LE2200-18



## Heat recovery

- The unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- 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.

## 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

- 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 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.

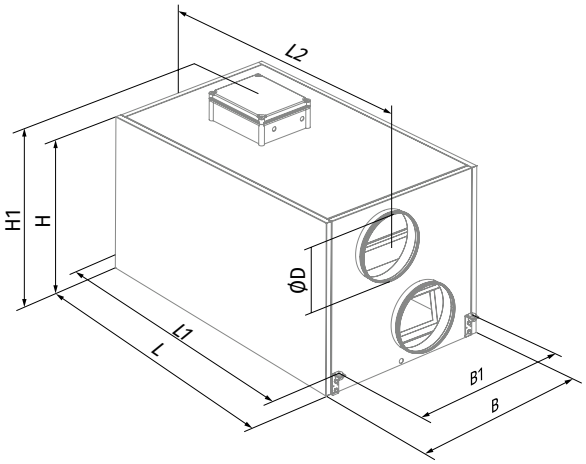


## Designation key

| 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 |

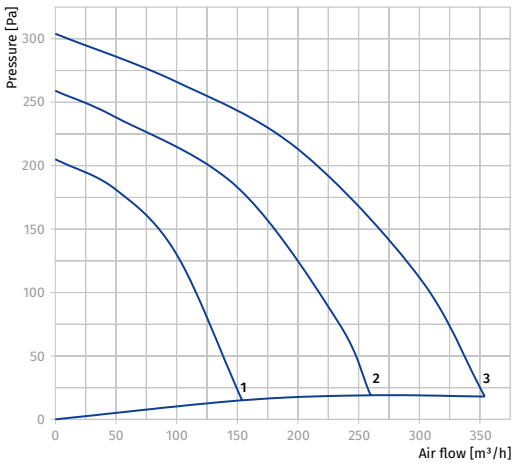


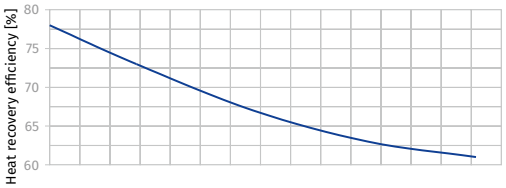
## Technical data

| Parameters | KOMFORT LE350-3 | KOMFORT LE500-3 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 3260 | 3300 |
| Heater power [W] | 3000 | 3000 |
| Power without heater [W] | 260 | 300 |
| Current [A] | 14.2 | 14.32 |
| Electric heater current [A] | 13 | 13 |
| Current without heater [A] | 1.2 | 1.32 |
| Maximum air flow [m³/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...+40 | -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] | 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 | polystyrene | polystyrene |
| SEC class | E | E |
| ErP | 2016 | 2016 |

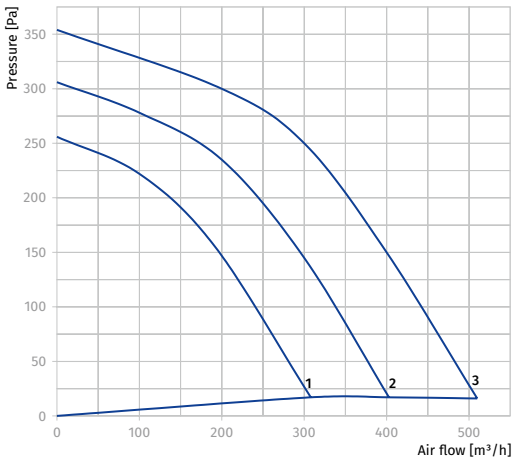
* Heat recovery efficiency is specified in compliance with the EN308 EU norms.

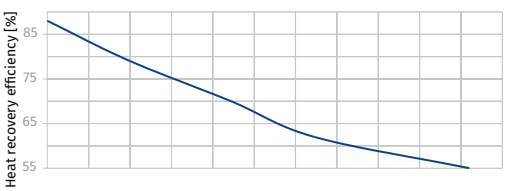
**KOMFORT LE350-3**




**KOMFORT LE500-3**

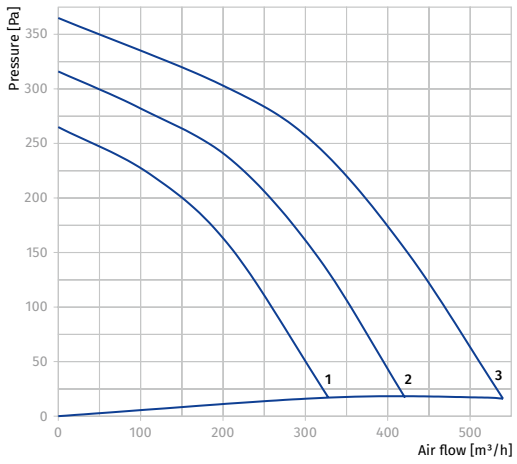


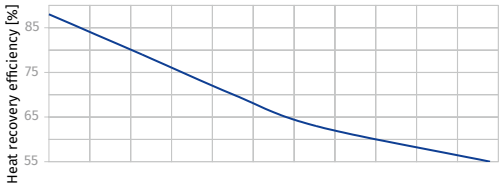



| Parameters | KOMFORT LE530-4 | KOMFORT LE600-4 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 4300 | 4390 |
| Heater power [W] | 4000 | 4000 |
| Power without heater [W] | 300 | 390 |
| Current [A] | 18.72 | 19.1 |
| Electric heater current [A] | 17.4 | 17.4 |
| Current without heater [A] | 1.32 | 1.72 |
| 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...+40 | -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] | 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 | polystyrene | polystyrene |
| SEC class | E | E |
| ErP | 2016 | 2016 |

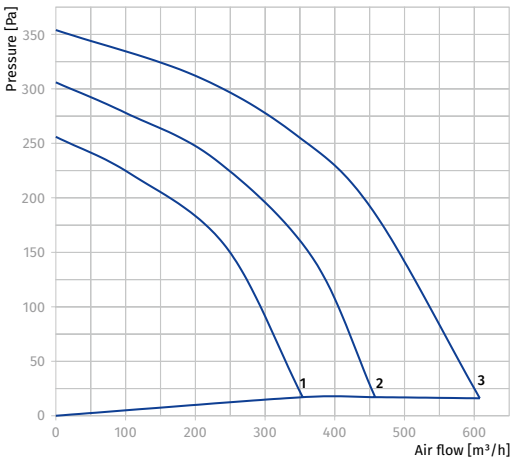
* Heat recovery efficiency is specified in compliance with the EN308 EU norms.

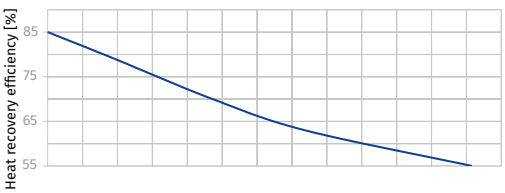
**KOMFORT LE530-4**




**KOMFORT LE600-4**

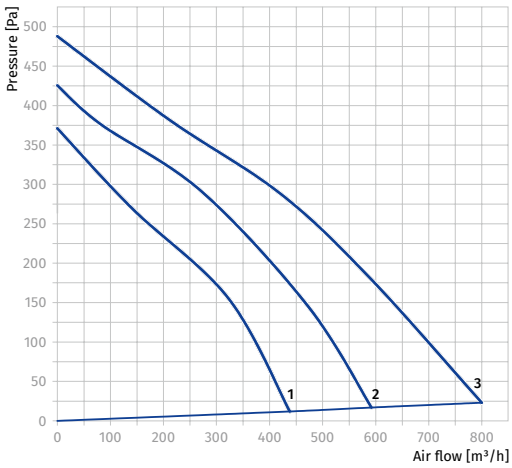


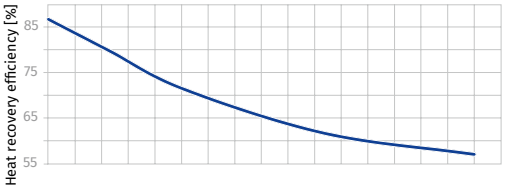



| Parameters | KOMFORT LE800-9 | KOMFORT LE1200-9 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 3 ~400 | 3 ~400 |
| Power [W] | 9490 | 9800 |
| Heater power [W] | 9000 | 9000 |
| Power without heater [W] | 490 | 820 |
| Current [A] | 15.16 | 16.6 |
| Electric heater current [A] | 13.0 | 13.0 |
| Current without heater [A] | 2.16 | 3.6 |
| Maximum air flow [m³/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...+40 | -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 | polystyrene | polystyrene |
| SEC class | E | NRVU** |
| ErP | 2016 | – |

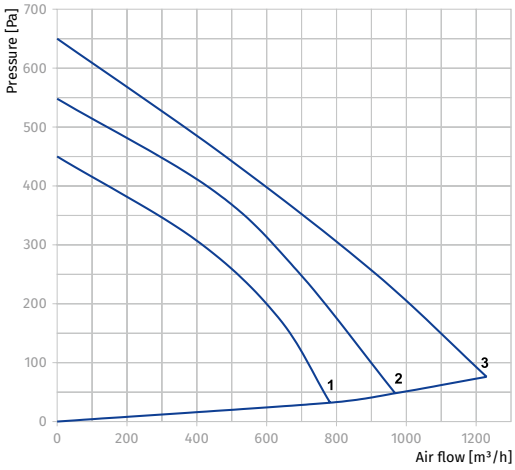
* Heat recovery efficiency is specified in compliance with the EN308 EU norms.
** Nonresidential Ventilation Unit.

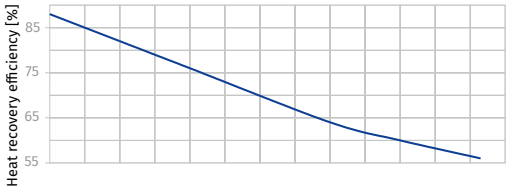
**KOMFORT LE800-9**




**KOMFORT LE1200-9**

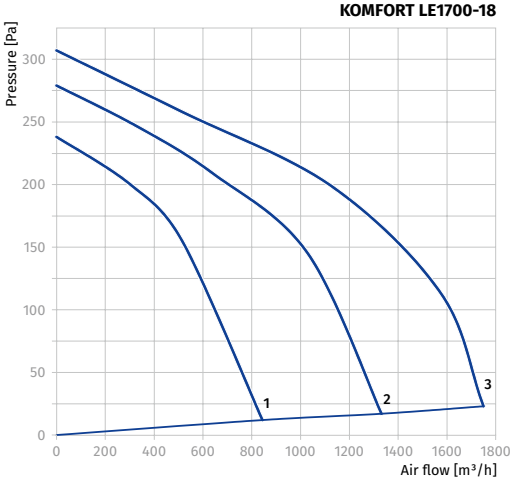


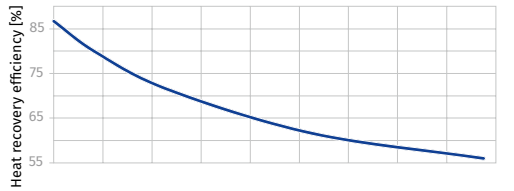



| Parameters | KOMFORT LE1700-18 | KOMFORT LE2200-18 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 3 ~ 400 | 3 ~ 400 |
| Power [W] | 26000 | 26000 |
| Heater power [W] | 18000 | 18000 |
| Power without heater [W] | 980 | 1300 |
| Current [A] | 30.3 | 31.7 |
| Electric heater current [A] | 17.4 | 17.4 |
| Current without heater [A] | 4.3 | 5.68 |
| 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...+40 | -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 | polystyrene | polystyrene |
| SEC class | NRVU** | NRVU** |
| ErP | – | – |

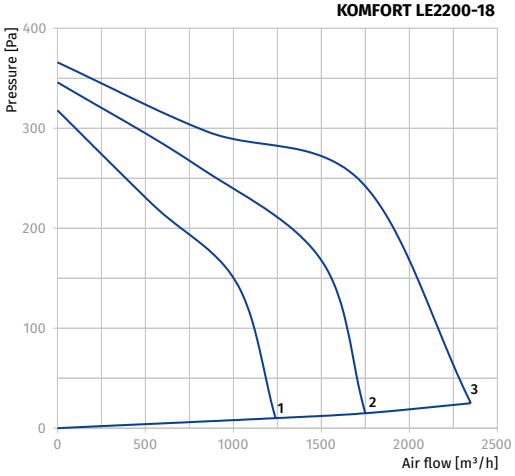
* Heat recovery efficiency is specified in compliance with the EN308 EU norms.
** Nonresidential Ventilation Unit.

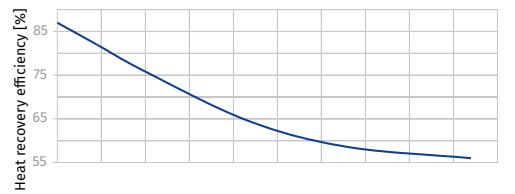
**KOMFORT LE1700-18**




**KOMFORT LE2200-18**



## Accessories

| | | KOMFORT LE350-3 | KOMFORT LE500-3 | KOMFORT LE530-4 | KOMFORT LE600-4 |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 438x215x48 G4 | FP 438x215x48 G4 | FP 438x215x48 G4 | FP 438x215x48 G4 |
| **Silencer** |  | SD 125 | SD 150 | SD 160 | SD 200 |
| **Silencer** |  | SDF 125 | SDF 150 | SDF 160 | SDF 200 |
| **Backdraft air damper** |  | VRV 125 | VRV 150 | VRV 160 | VRV 200 |
| **Air damper** |  | VK 125 | VK 150 | VK 160 | VK 200 |
| **Summer block** |  | SB C4 300/300 | SB C4 300/300 | SB C4 300/300 | SB C4 300/300 |

| | | KOMFORT LE800-9 | KOMFORT LE1200-9 | KOMFORT LE1700-18 | KOMFORT LE2200-18 |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 550x253x48 G4 | FP 550x253x48 G4 | FP 780x273x48 G4 | FP 780x273x48 G4 |
| **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** |  | VK 250 | VK 250 | VK 315 | VK 315 |
| **Summer block** |  | SB C4 300/384 | SB C4 300/384 | SB C4 300/300 (2 pcs.) | SB C4 300/300 (2 pcs.) |

# 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 %

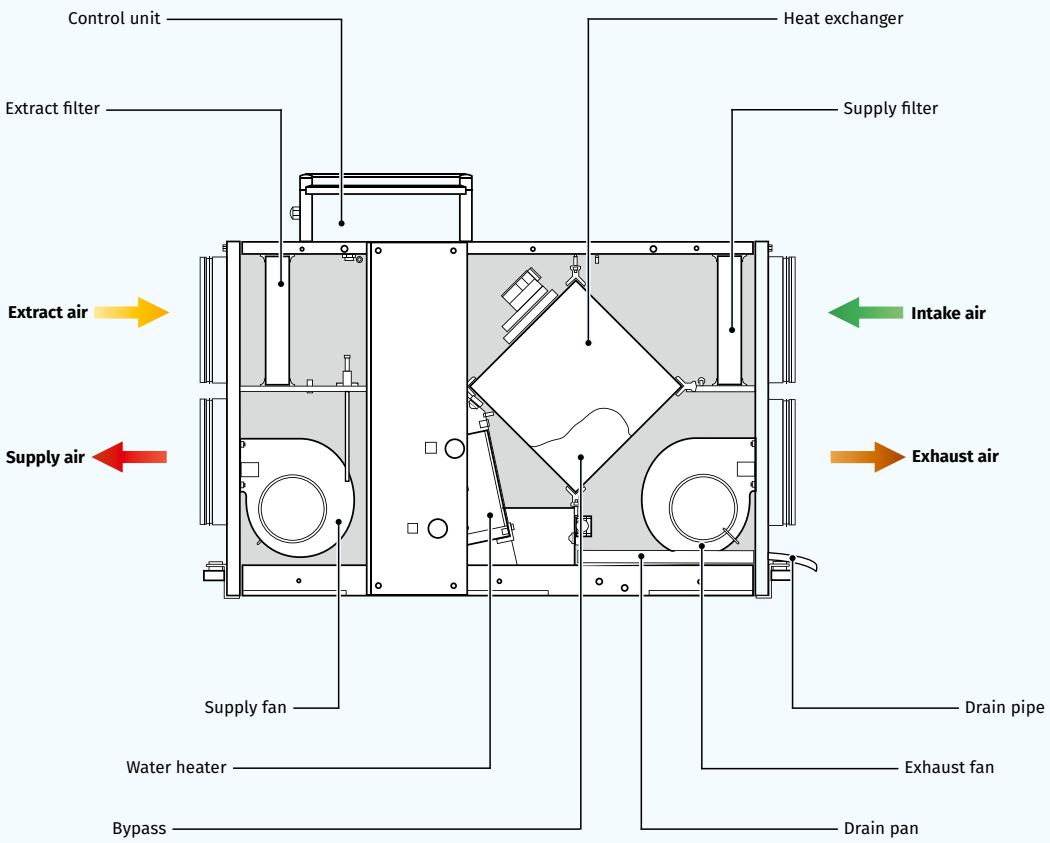
ErP 2016

### 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

- The unit is equipped with a plate cross-flow polystyrene heat exchanger for heat recovery. In the unit condensate is collected and drained to the drain pan under the heat exchanger.
- The air flows are completely separated in the heat exchanger. Thus smells and contaminants are not transferred from the extract air to the supply air.
- Heat recovery is based on heat and/or humidity transfer through the heat exchanger plates. 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 ventilation heat losses and heating costs respectively.
- In the warm season the heat exchanger performs reverse and intake air is cooled in the heat exchanger by the cool extract air. That reduces operation load on air conditioners and saves electricity.
- When the indoor and outdoor temperature difference is insignificant, heat recovery is not reasonable. In this case the heat exchanger can be temporary replaced with a summer block for the warm season (available as a specially ordered accessory).

### FREEZE PROTECTION

- 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.

## 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.
- Heat medium temperature control ensures 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 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 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.

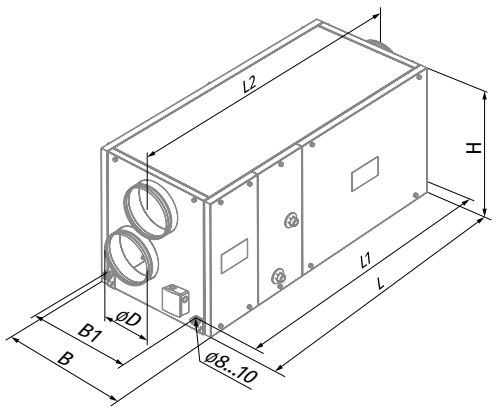


## Designation key

| 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** | – | **4** |

## Overall dimensions [mm]

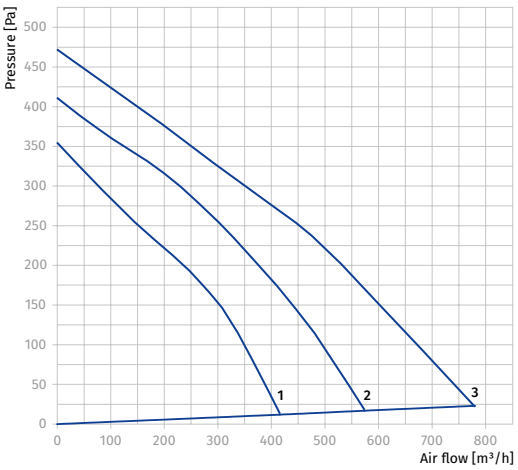
| Model | D | B | B1 | H | L | L1 | L2 |
|---|---|---|---|---|---|---|---|
| KOMFORT LW800 | 249 | 613 | 460 | 698 | 1071 | 1117 | 1171 |
| KOMFORT LW1100 | 249 | 613 | 460 | 698 | 1071 | 1117 | 1171 |
| KOMFORT LW1700 | 314 | 842 | 581 | 814 | 1345 | 1388 | 1445 |
| KOMFORT LW2100 | 314 | 842 | 581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

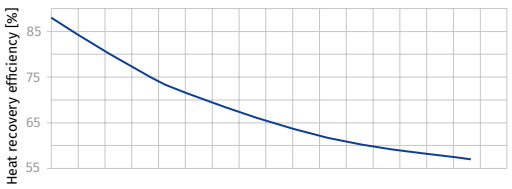


## Technical data

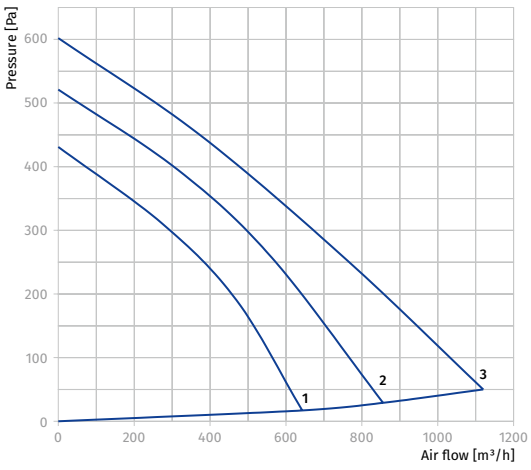
| Parameters | KOMFORT LW800-4 | KOMFORT LW1100-4 |
|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Number of water heater rows | 4 | 4 |
| Power [W] | 490 | 820 |
| Current [A] | 2.16 | 3.6 |
| Max. air flow [m³/h (l/s)] | 780 (217) | 1100 (306) |
| RPM [min⁻¹] | 1650 | 1850 |
| Sound pressure level at 3 m distance [dBA] | 48 | 60 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | aluzinc | aluzinc |
| Insulation | 50 mm mineral wool | 50 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | G4 | G4 |
| 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 | polystyrene | polystyrene |
| ErP | 2016 | – |

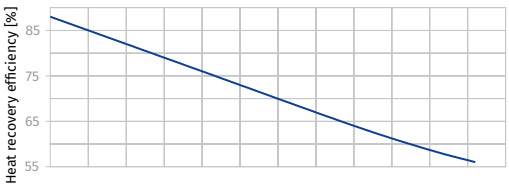
**KOMFORT LW800-4**



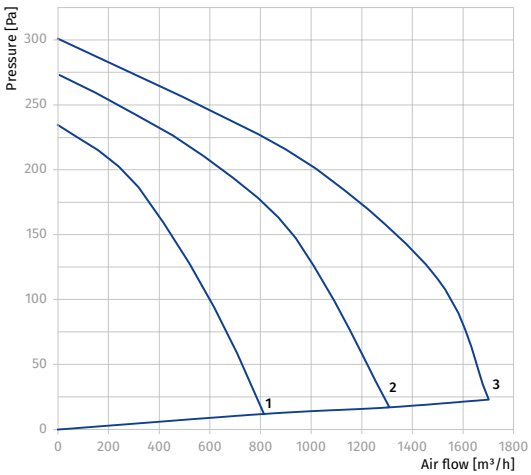

**KOMFORT LW1100-4**

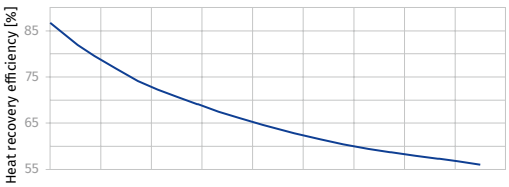


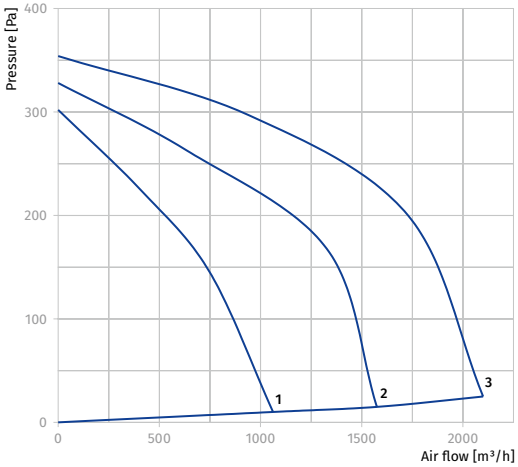
| Parameters | KOMFORT LW1700-4 | KOMFORT LW2100-4 |
|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Number of water heater rows | 4 | 4 |
| Power [W] | 980 | 1300 |
| Current [A] | 4.3 | 5.68 |
| Max. air flow [m³/h (l/s)] | 1700 (472) | 2100 (583) |
| RPM [min⁻¹] | 1100 | 1150 |
| Sound pressure level at 3 m distance [dBA] | 49 | 65 |
| Transported air temperature [°C] | -25...+40 | -25...+40 |
| Casing material | aluzinc | aluzinc |
| Insulation | 50 mm mineral wool | 50 mm mineral wool |
| Extract filter | G4 | G4 |
| Supply filter | G4 | G4 |
| 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 | polystyrene | polystyrene |
| ErP | – | – |

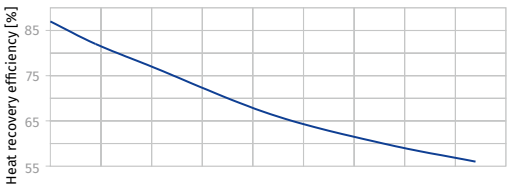
**KOMFORT LW1700-4**



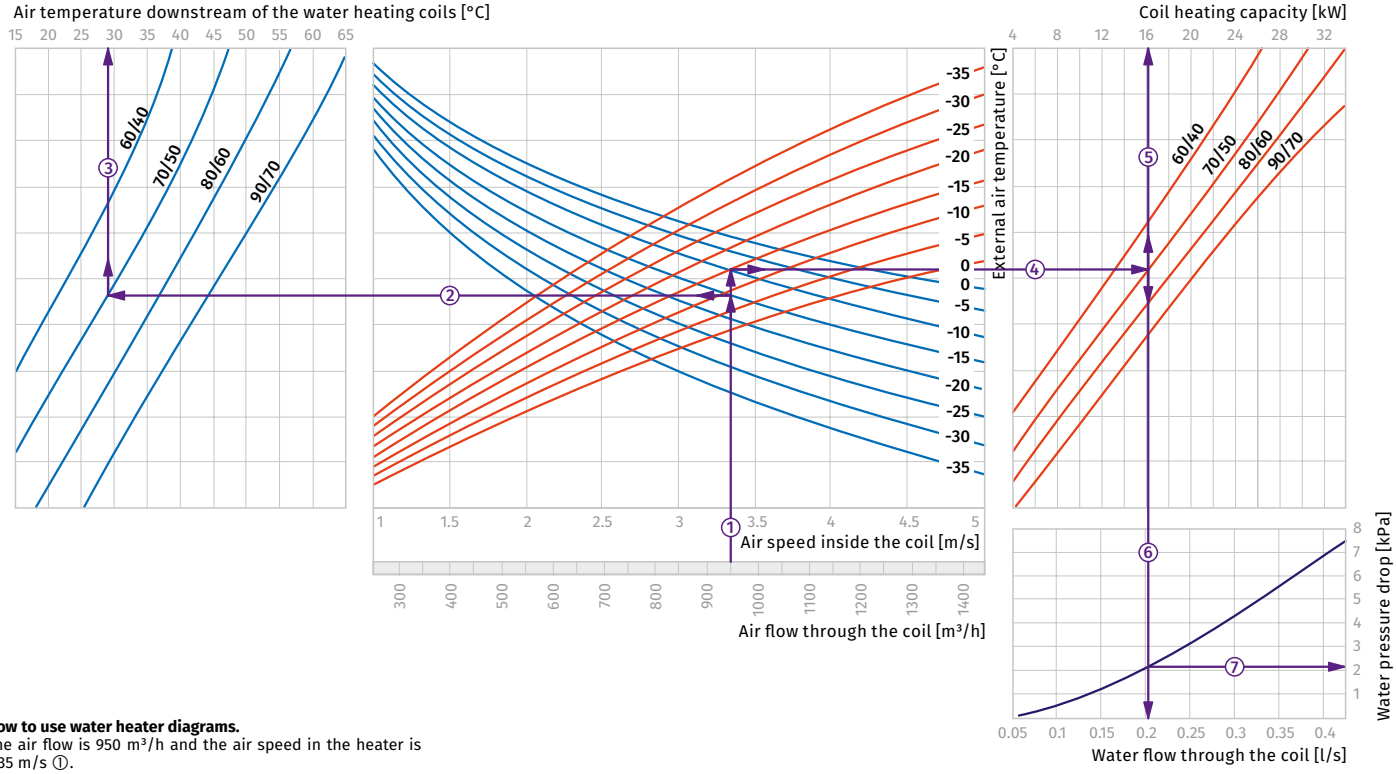

**KOMFORT LW2100-4**



## Hot water coil calculation diagram

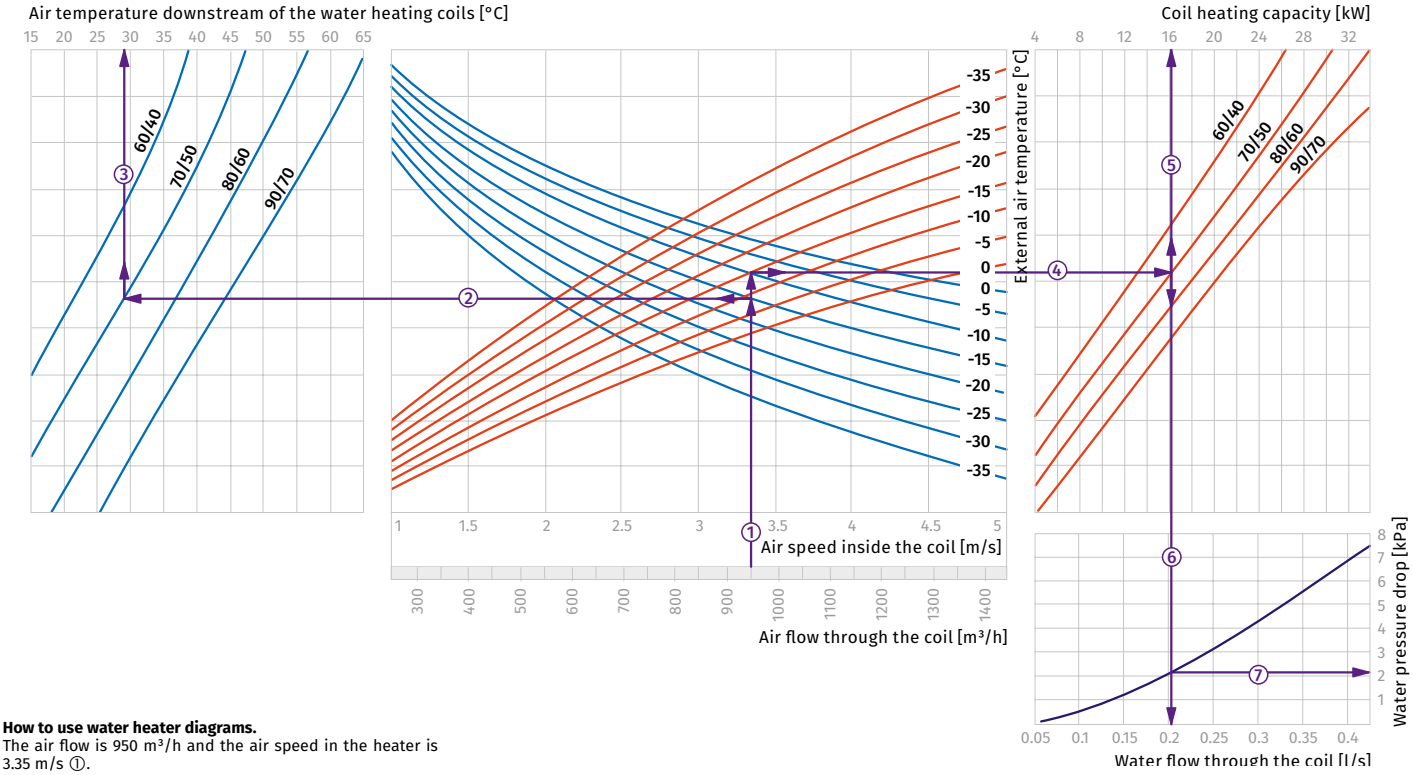
### KOMFORT LW800-4




**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).

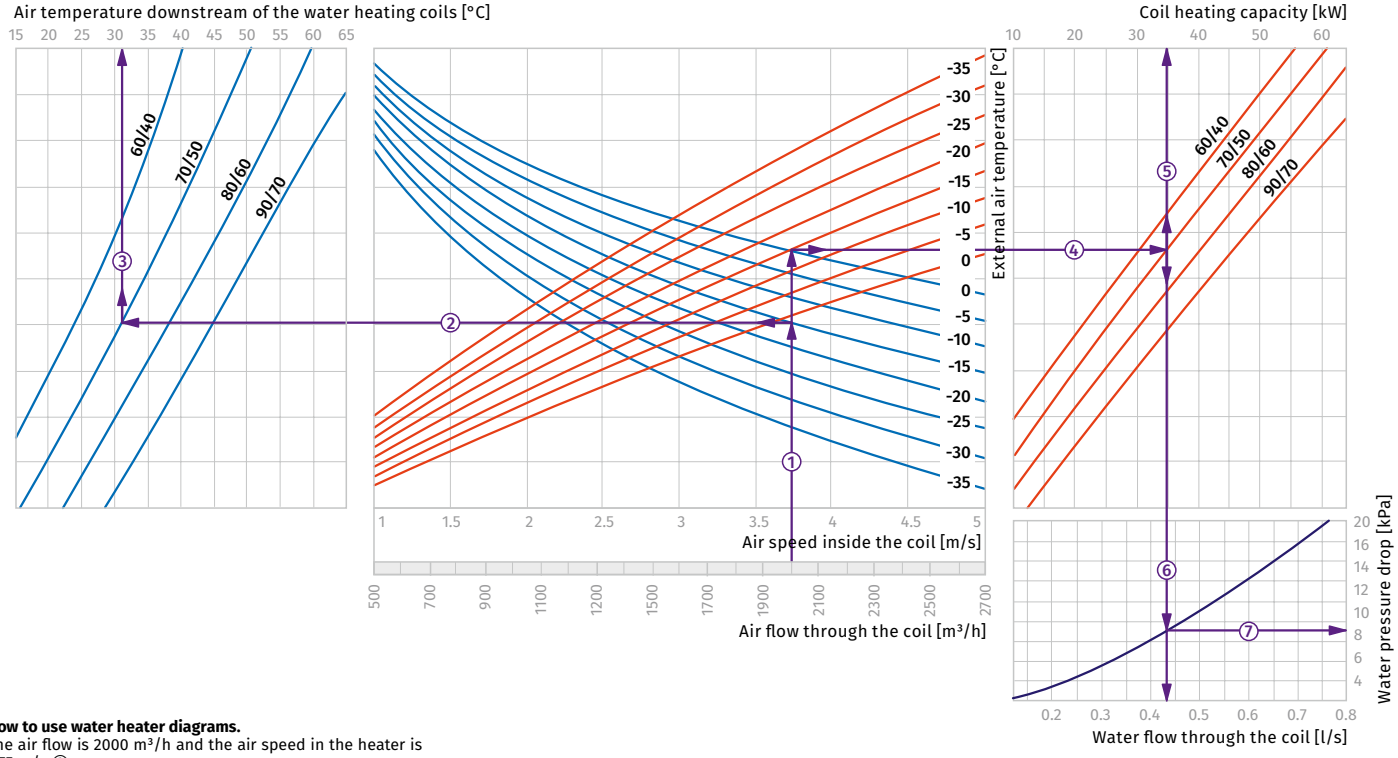
### KOMFORT LW1100-4




**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).

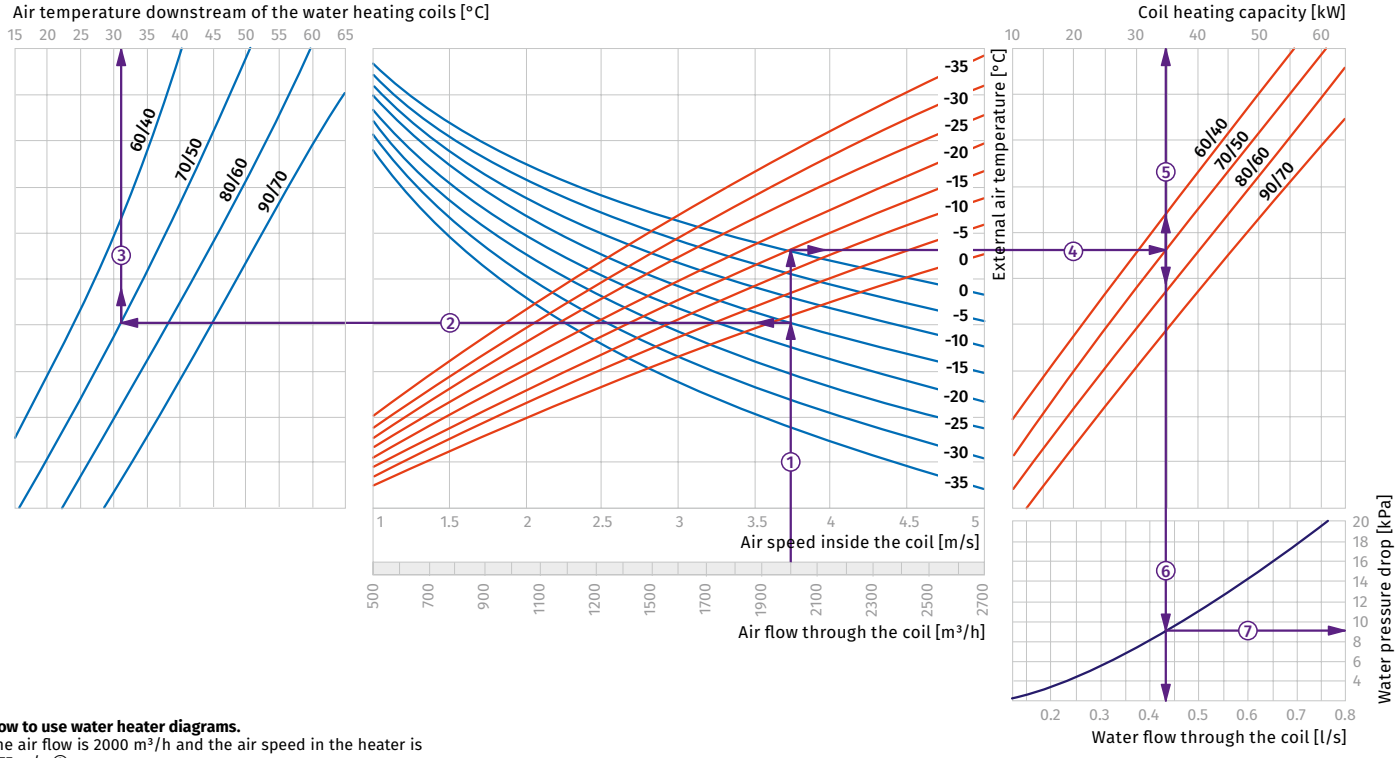
## KOMFORT LW1400-4




**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 LW2100-4




**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 LW800-4 | KOMFORT LW1100-4 | KOMFORT LW1700-4 | KOMFORT LW2100-4 |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 550x253x48 G4 | FP 550x253x48 G4 | FP 780x273x48 G4 | FP 780x273x48 G4 |
| **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** |  | VK 250 | VK 250 | VK 315 | VK 315 |
| **Summer block** |  | SB C4 300/384 | SB C4 300/384 | SB C4 300/300 (2 pcs.) | SB C4 300/300 (2 pcs.) |

# 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 %

EC motor · ErP 2016 · ErP 2018

### Design

- The fan casing is made of polymer coated steel and is heat- and sound-insulated with mineral wool.
- The spigots are located at the top of the unit and are rubber sealed for airtight connection to the air ducts.
- 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

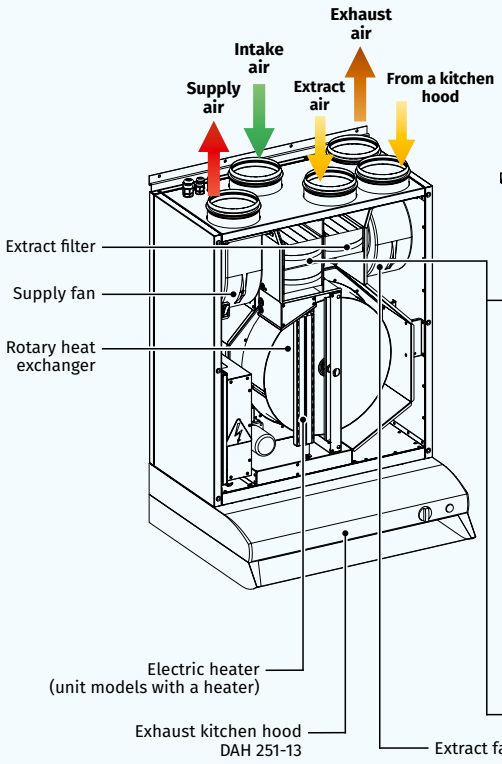
- High-efficient external rotor EC motors and centrifugal impellers are used for air supply and exhaust.
- EC motors have the best power consumption to air flow ratio and meet the latest demands concerning energy saving and high-efficient ventilation.
- EC motors are featured with high performance, low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

### Kitchen hood

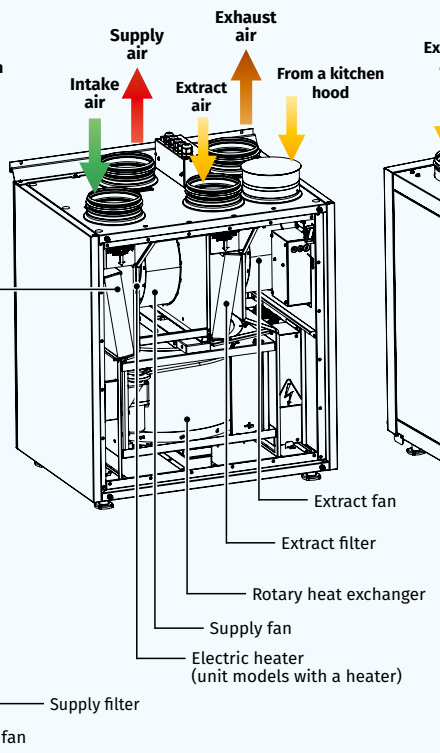
- All units are equipped with a 5th spigot for connection to the kitchen hood air duct.
- The distinctive feature of **KOMFORT Roto EC S2(E)200** is the possibility to connect the kitchen hood DAH 251-13 (ordered separately) directly to the unit.

HEAT RECOVERY AIR HANDLING UNITS

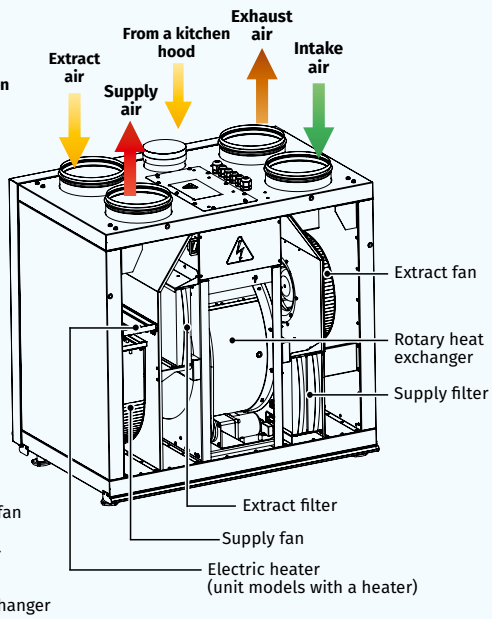
**KOMFORT ROTO EC S2(E)200**




**KOMFORT ROTO EC S2(E)280**




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

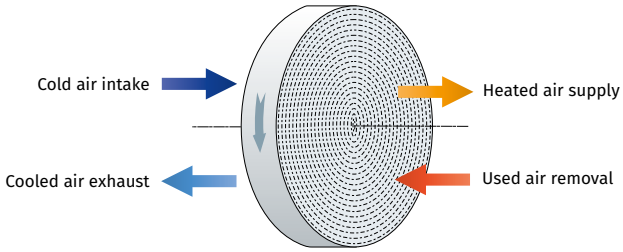


## Air filtration

- Two built-in G4 and F7 filters provide efficient supply air filtration. The unit **KOMFORT ROTO EC S2(E)280** features F7 filter.
- The G4 filter is used for extract air filtration.

## Heat recovery

- The unit has a high-efficient rotary aluminium heat exchanger.
- The rotary regenerator is a short, rotating cylinder, filled with corrugated aluminium sheet layers. The air streams flow through them.
- The band layers of the heat regenerator first come in contact with the supply and then with extract air flows.
- Therefore the band is alternatively warmed up and cooled down and the extract air heat and humidity are transferred to the cold intake air. This way heat recovery reduces heat losses in the cold season and reduces operation load for air conditioner in the warm season.
- The advantages of the rotary regenerator as compared to the plate heat exchangers include no condensate generation, maintaining comfort air humidity and high freeze resistance.




Rotor heat exchanger operating logic

## 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.

## 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

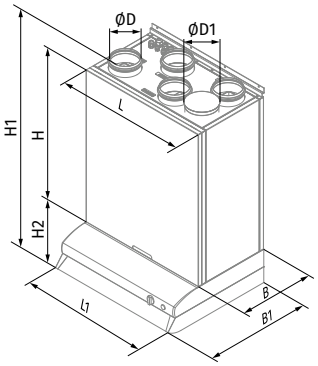
- The units are designed for wall mounting.
- The access for unit and filter maintenance is available from the front panel.
- During mounting stage the front and the back pan-els can be reversed providing either left-handed or right-handed unit mounting.

## Designation key

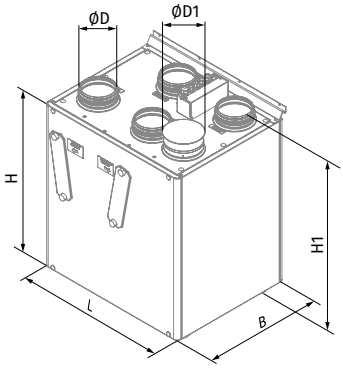
| Serie | Unit type | Motor type | Spigot modification | Insulation | Heater type | Nominal air flow [m³/h] | Control |
|---|---|---|---|---|---|---|---|
| KOMFORT | **Roto:** rotary heat exchanger | **EC:** electronically commutated motor | **S:** vertical spigot orientation | **_:** 40 mm<br>**2:**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

## Overall dimensions [mm]

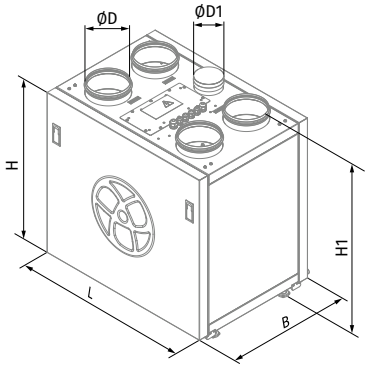
| Model | D | D1 | B | B1 | H | H1 | H2 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|
| KOMFORT Roto EC S2(E)200 S17/S18 | 125 | 125 | 347 | 510 | 700 | 901 | 135 | 598 | 600 |
| KOMFORT Roto EC S2(E)280 S17/S18 | 125 | 125 | 482 | – | 630 | 754 | – | 598 | – |
| KOMFORT Roto EC S(E)400 S17/S18 | 160 | 100 | 528 | – | 675 | 755 | – | 740 | – |
| KOMFORT Roto EC S(E)600 S17/S18 | 200 | 125 | 628 | – | 772 | 852 | – | 819 | – |




KOMFORT ROTO EC S2(E)200
+ DAH 251-13




KOMFORT ROTO EC S2(E)280




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

## Technical data

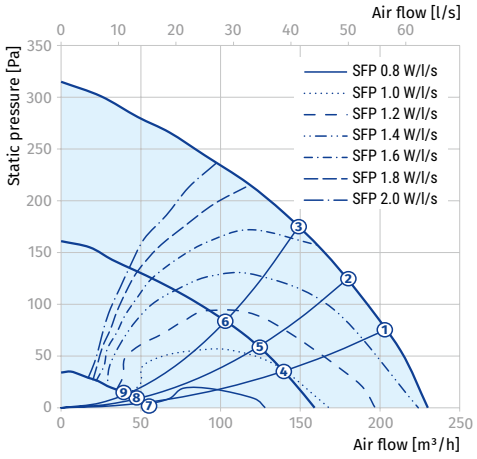
| Parameters | KOMFORT Roto EC S2 200 S17<br>KOMFORT Roto EC S2 200 S18 | KOMFORT Roto EC S2E200 S17<br>KOMFORT Roto EC S2E200 S18 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 95 | 795 |
| Heater power [W] | – | 700 |
| Power without heater [W] | 95 | 95 |
| Current [A] | 0.8 | 3.8 |
| Electric heater current [A] | – | 3 |
| Current without heater [A] | 0.8 | 0.8 |
| 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...+40 | -25...+40 |
| 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

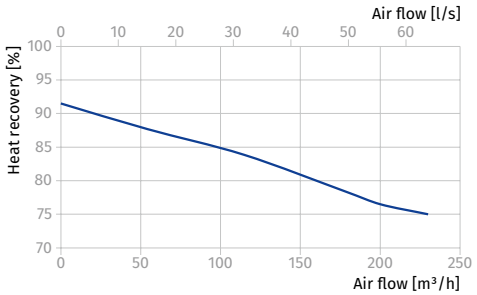
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| LWA to supply inlet [dBA] | **74** | 53 | 59 | 69 | 71 | 66 | 63 | 54 | 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 air temperature downstream of the heat exchanger:**

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

**where**

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

| Parameters | KOMFORT Roto EC S280 S17<br>KOMFORT Roto EC S280 S18 | KOMFORT Roto EC SE280 S17<br>KOMFORT Roto EC SE280 S18 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 195 | 845 |
| Heater power [W] | – | 650 |
| Power without heater [W] | 195 | 195 |
| Current [A] | 1.9 | 4.7 |
| Electric heater current [A] | – | 2.8 |
| Current without heater [A] | 1.9 | 1.9 |
| 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...+40 | -25...+40 |
| 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.

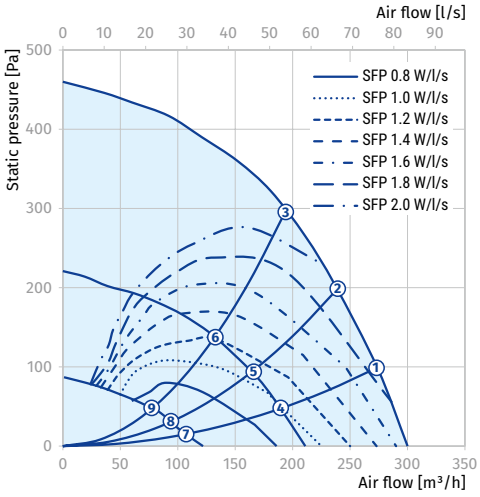
## KOMFORT ROTO EC S(E)280

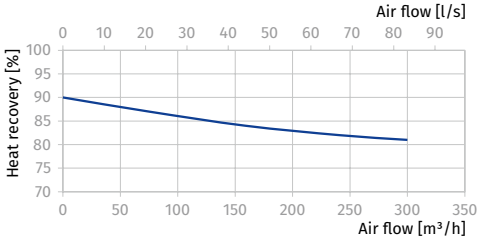
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **54** | 47 | 42 | 50 | 44 | 41 | 39 | 39 | 31 | | |
| $L_{WA}$ to supply outlet [dBA] | **69** | 63 | 56 | 65 | 59 | 55 | 50 | 52 | 46 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **54** | 47 | 41 | 51 | 43 | 33 | 31 | 34 | 30 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **65** | 61 | 50 | 61 | 55 | 46 | 43 | 46 | 40 | | |
| $L_{WA}$ 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) |



| Parameters | KOMFORT Roto EC S400 S17<br>KOMFORT Roto EC S400 S18 | KOMFORT Roto EC SE400 S17<br>KOMFORT Roto EC SE400 S18 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 200 | 1600 |
| Heater power [W] | – | 1400 |
| Power without heater [W] | 200 | 200 |
| Current [A] | 1.4 | 7.5 |
| Electric heater current [A] | – | 6.1 |
| Current without heater [A] | 1.4 | 1.4 |
| 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...+40 | -25...+40 |
| 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.

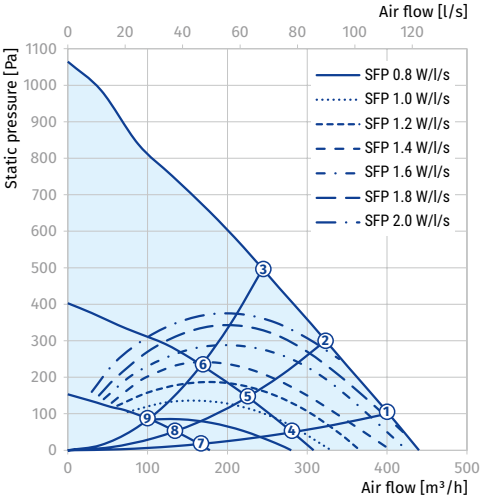
## KOMFORT ROTO EC S(E)400

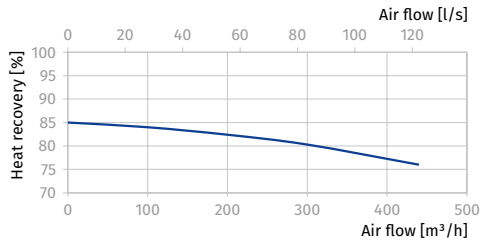
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **59** | 27 | 46 | 54 | 55 | 53 | 48 | 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 S17<br>KOMFORT Roto EC S600 S18 | KOMFORT Roto EC SE600 S17<br>KOMFORT Roto EC SE600 S18 |
|---|---|---|
| Voltage [V / 50 (60) Hz] | 1 ~ 220-240 | 1 ~ 220-240 |
| Power [W] | 405 | 3205 |
| Heater power [W] | – | 2800 |
| Power without heater [W] | 405 | 405 |
| Current [A] | 2.6 | 14.8 |
| Electric heater current [A] | – | 12.2 |
| Current without heater [A] | 2.6 | 2.6 |
| 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...+40 | -25...+40 |
| 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.

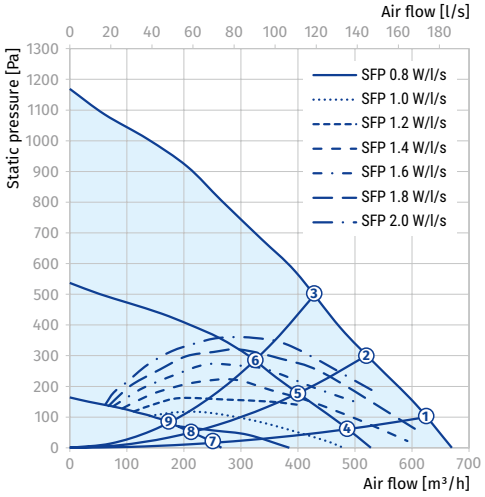
## KOMFORT ROTO EC S(E)600

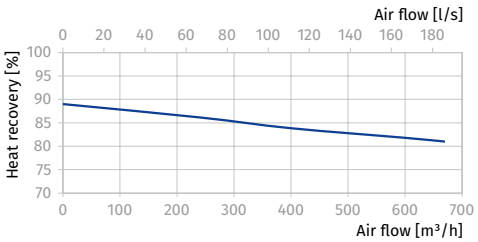
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA 3 m [dBA] | LpA 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **82** | 65 | 63 | 65 | 80 | 74 | 74 |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

Data provided for point 1 of the air flow diagram

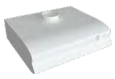
**Total power. Total sound pressure level.**

| 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 S17<br>KOMFORT Roto EC S2(E)200 S18 | KOMFORT Roto EC S2(E)280 S17<br>KOMFORT Roto EC S2(E)280 S18 | KOMFORT Roto EC S(E)400 S17<br>KOMFORT Roto EC S(E)400 S18 | KOMFORT Roto EC S(E)600 S17<br>KOMFORT Roto EC S(E)600 S18 |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 284x103x60 G4 | FP 400x196x40 G4 | FP 436x196x40 G4 | FP 536x220x40 G4 |
| **F7 panel filter** |  | FP 284x103x60 F7 | FP 400x196x40 F7 | FP 436x196x40 F7 | FP 536x220x40 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 Ø 160 and 250 mm air ducts.

**Air flow:**
up to 955 m³/h
265 l/s

**Heat recovery efficiency:**
up to 85 %

EC motor

HEAT PUMP



### 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

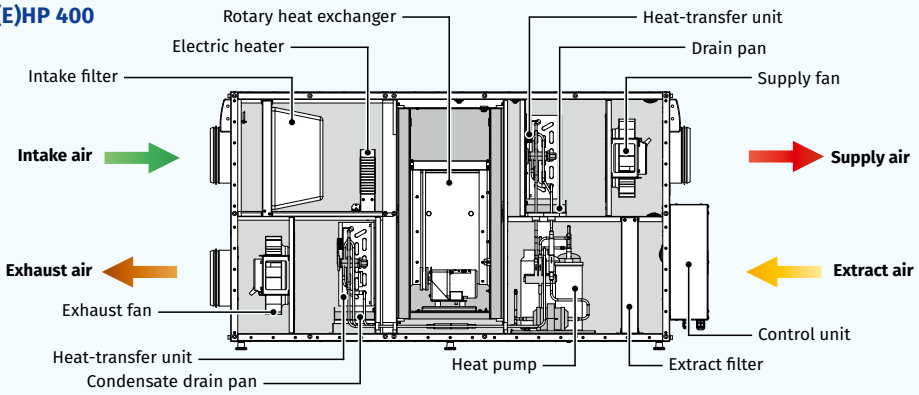
### Fans

- 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.

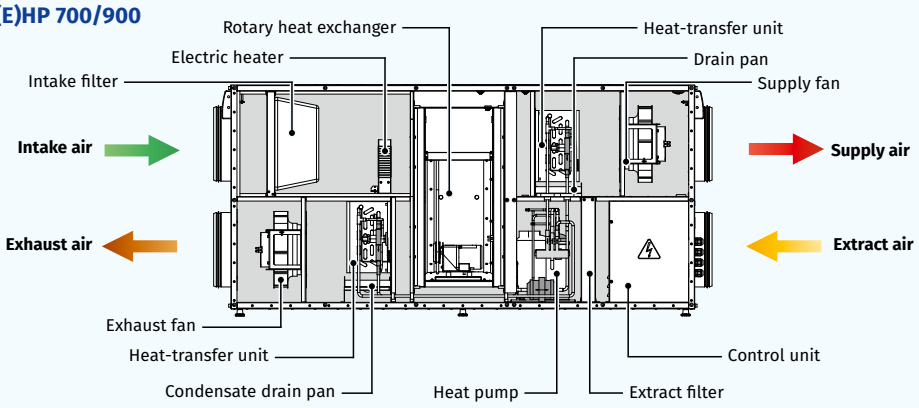
### Air filtration

- The built-in 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 ROTO EC L(E)HP 400**




**KOMFORT ROTO EC L(E)HP 700/900**

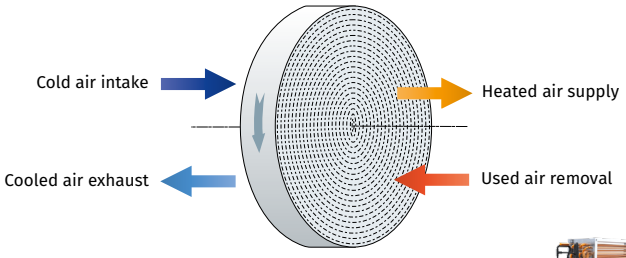


## Two-stage heat energy recovery system

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

## Heat recovery

- The unit has a high-efficient rotary aluminium heat exchanger.
- The rotary regenerator is a short, rotating cylinder, filled with corrugated aluminium sheet layers. The air streams flow through them.
- The band layers of the heat regenerator first come in contact with the supply and then with extract air flows.
- Therefore the band is alternatively warmed up and cooled down and the extract air heat and humidity are transferred to the cold intake air. This way heat recovery reduces heat losses in the cold season and reduces operation load for air conditioner in the warm season.
- The advantages of the rotary regenerator as compared to the plate heat exchangers include no condensate generation, maintaining comfort air humidity and high freeze resistance.
-




Rotor heat exchanger operating logic

## Heat pump

- 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.
- 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.
- The heat pump is equipped with an array of protection systems including low and high pressure protection, freeze protection (automatic defrosting) and compressor overheating protection.
- 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

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

## Control and automation

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

## Unit operation modes

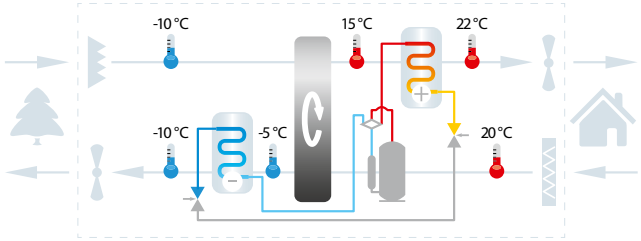
- **«Auto» mode:** The unit runs in the automatic supply and exhaust mode maintaining a user-defined room temperature.
- **«Heating» mode:** The unit ensures supply and exhaust ventilation of the treated space maintaining the room temperature above a pre-set threshold. As soon as the room temperature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

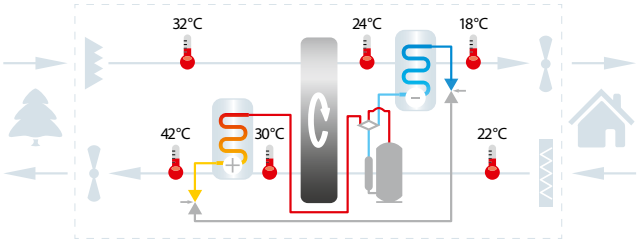
- **Limit Function:** Reduces air flow automatically to maintain a user-defined temperature. If the unit cannot execute the user-defined room temperature setting after running in the «Auto» or «Heating» mode for 20 minutes the air flow rate (fan speed) is reduced automatically. The unit reverts to the 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.
- **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.
- **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.
- **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.
- **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)

- **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.
- **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.
- **Ozone Protection:** The heat pump utilizes the R410A high-tech two-component cooling agent which does not deplete the ozone layer.
- **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
- **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
- **Autorestart:** The unit memorizes the current operation mode and restores it after a power outage.
- **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.
- **$CO_2$ Control:** Maintains the $CO_2$ level in the treated space below a user-defined value. If the $CO_2$ 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 $CO_2$ control sensor with a 0-10 V output signal (purchased separately).
- **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).
- **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



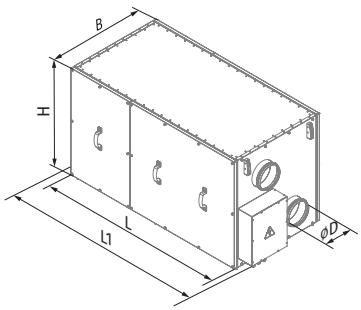

Unit operation in heat recovery and air cooling ventilation mode

## Designation key

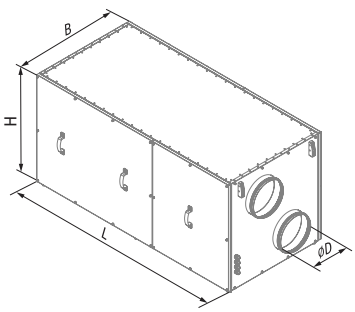
| Serie | Unit type | Motor type | Spigot modification | Heater type | Modification | Nominal air flow [m³/h] | Control |
|---|---|---|---|---|---|---|---|
| KOMFORT | **Roto:** rotary heat exchanger | **EC:** electronically commutated motor | **L:** horizontal spigot orientation | **_:** without heater<br>**E:** electric heater | **HP:** heat pump | **400; 700; 900** | **S17:** thTune control panel<br>**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



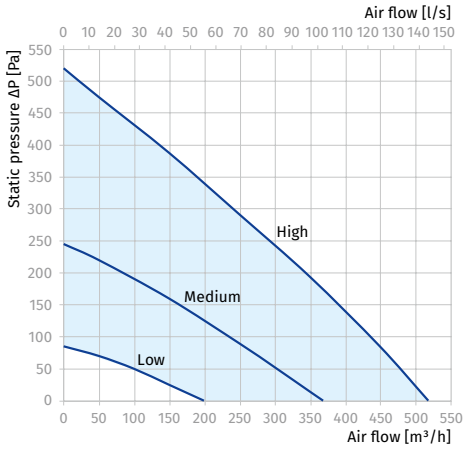

KOMFORT Roto EC L(E)HP 700
KOMFORT Roto EC L(E)HP 900

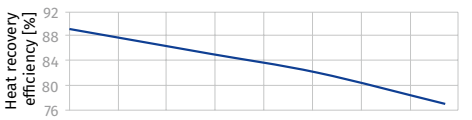
## Technical data

| Gen. parameters | KOMFORT Roto EC LHP 400 S17/S18 | KOMFORT Roto EC LHP 700 S17/S18 | KOMFORT Roto EC LHP 900 S17/S18 | KOMFORT Roto EC LEHP 400 S17/S18 | KOMFORT Roto EC LEHP 700 S17/S18 | KOMFORT Roto EC LEHP 900 S17/S18 |
|---|---|---|---|---|---|---|
| **Maximum air flow [m³/h]** | 520 (53) | 830 (231) | 955 (265) | 520 (53) | 830 (231) | 955 (265) |
| **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 (Option: F7) | G4 (Option: F7) | G4 (Option: F7) | G4 (Option: F7) | G4 (Option: F7) | G4 (Option: F7) |
| **Electrical parameters** | | | | | | |
| **Air-handling unit supply voltage [V / 50 Hz]** | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| **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 [W] at $t_0$ = +7 °C; $t_k$ = +45 °C*** | 1560 | 2600 | 3250 | 1560 | 2600 | 3250 |
| **Heat output in "Cooling" mode [W] at $t_0$ = +7 °C; $t_k$ = +45 °C*** | 1200 | 2000 | 2500 | 1200 | 2000 | 2500 |
| **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 |

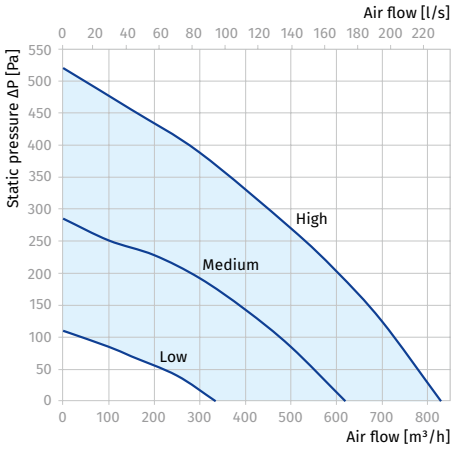
* $t_0$ – coolant boiling temperature; $t_k$ – coolant condensation temperature.

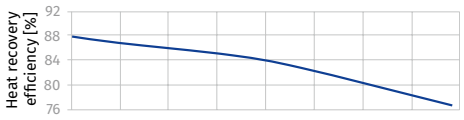
**KOMFORT Roto EC L(E)HP 400**



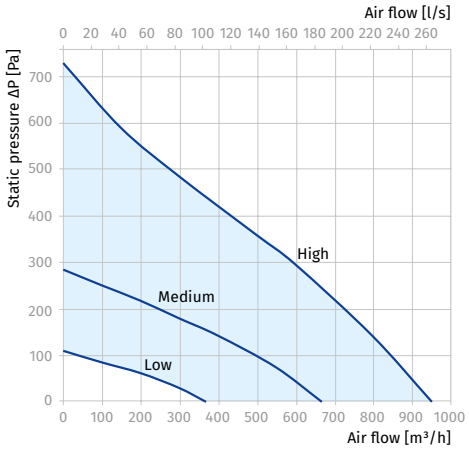




**KOMFORT Roto EC L(E)HP 700**




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

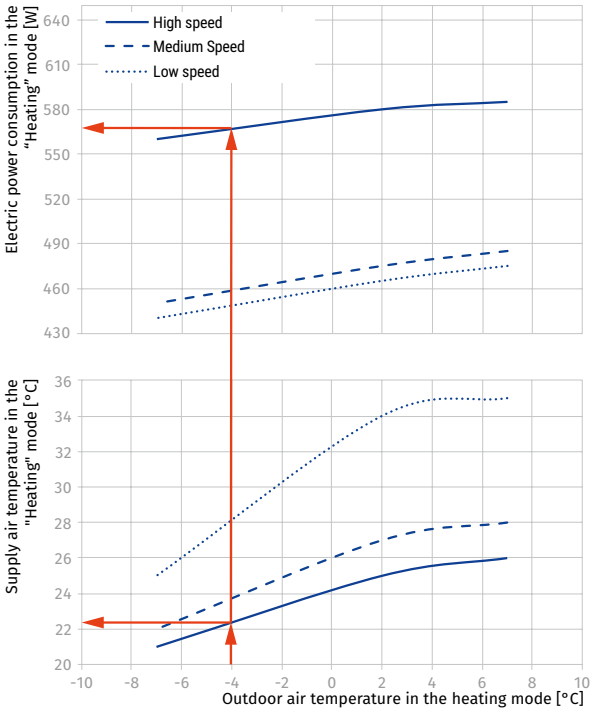



## Heat pump characteristics in the “HEATING” mode

### 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*, [W/W] | COP*, [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.

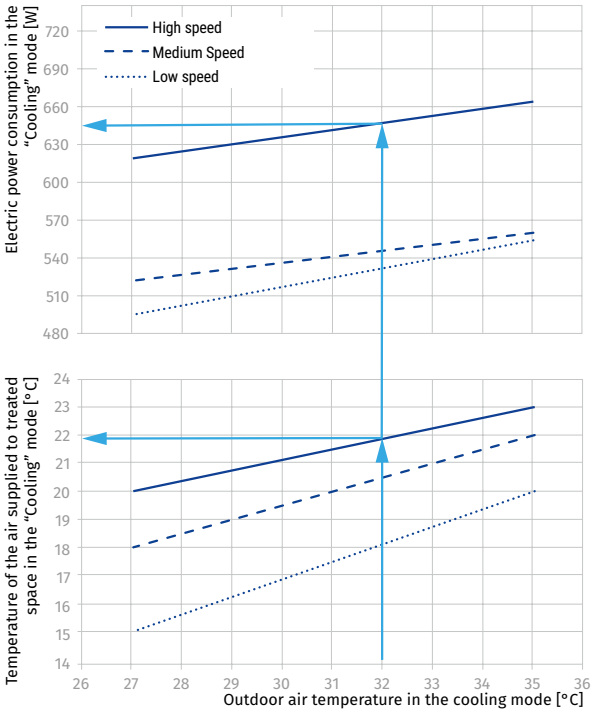


## Heat pump characteristics in the “COOLING” mode

### 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.

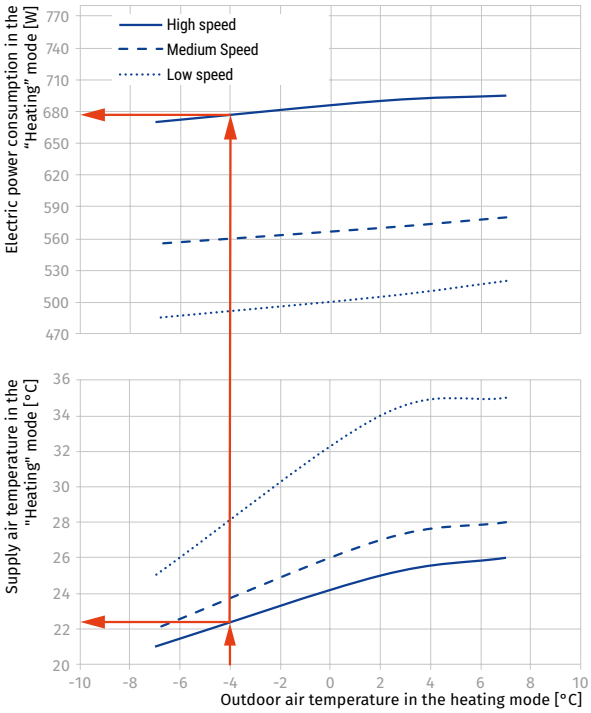


## Heat pump characteristics in the “HEATING” mode

### 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*, [W/W] | COP*, [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.

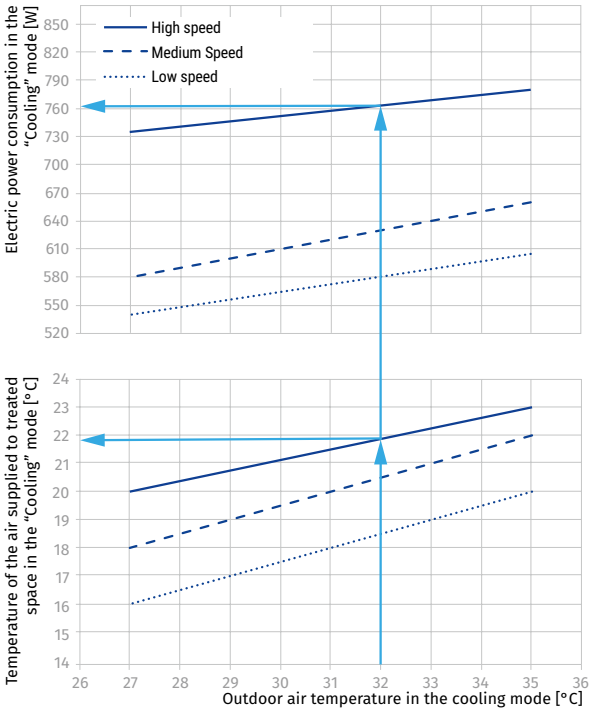


## Heat pump characteristics in the “COOLING” mode

### 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.

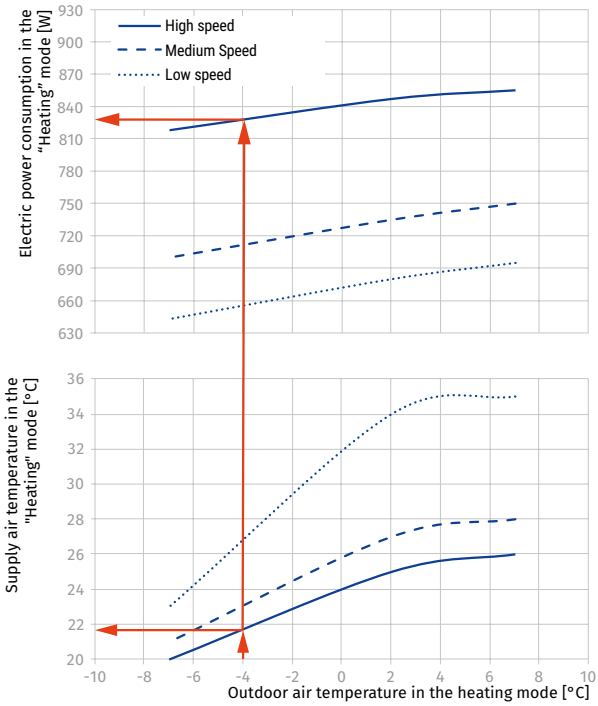


## Heat pump characteristics in the “HEATING” mode

### 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*, [W/W] | COP*, [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.

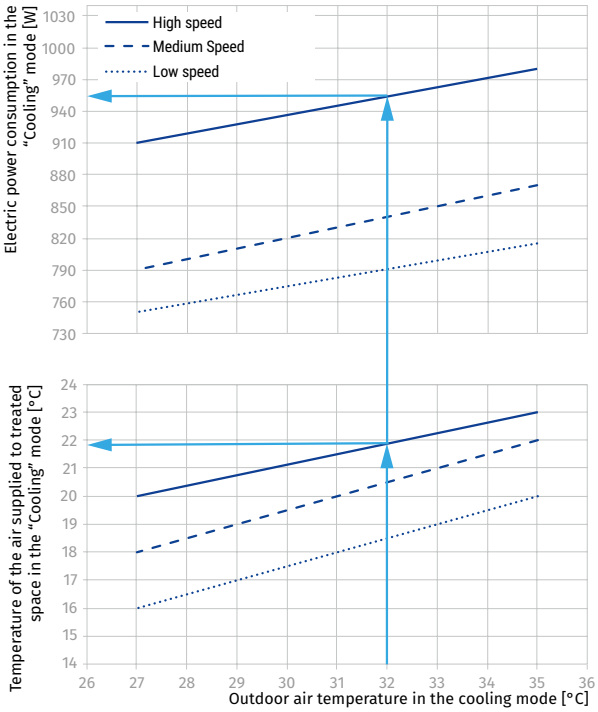


## Heat pump characteristics in the “COOLING” mode

### 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 S17/S18 | KOMFORT Roto EC L(E)HP 700 S17/S18 | KOMFORT Roto EC L(E)HP 900 S17/S18 |
|---|---|---|---|---|
| **G4 panel filter** |  | FP 600x332x48 G4 | FP 700x352x48 G4 | FP 700x352x48 G4 |
| **G4 pocket filter** |  | FPT 600x330x27 G4 | FPT 700x351x27 G4 | FPT 700x351x27 G4 |
| **F7 pocket filter** |  | FPT 600x330x27 F7 | FPT 700x351x27 F7 | FPT 700x351x27 F7 |
| **Backdraft air damper** |  | VRV 160 | VRV 250 | VRV 250 |
| **Air damper** |  | VKA 160 | VKA 250 | VKA 250 |
| **Internal humidity sensor** |  | FS2 | FS2 | FS2 |
| **Humidity sensor** |  | HR-S | HR-S | HR-S |
| **VOC sensor** |  | DPWQ30600 | DPWQ30600 | DPWQ30600 |
| **External $CO_2$ sensor** |  | DPWQ40200 | DPWQ40200 | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | DPWC11200 | DPWC11200 |
| **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 Ø160, 250 or 315 mm air ducts. **KOMFORT Roto EC LE/LW 2000** are designed for connection to 500x300 mm rectangular air ducts.

**Air flow:**
up to 2250 m³/h
625 l/s

**Heat recovery efficiency:**
up to 95 %

EC motor · ErP 2016 · ErP 2018

### 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

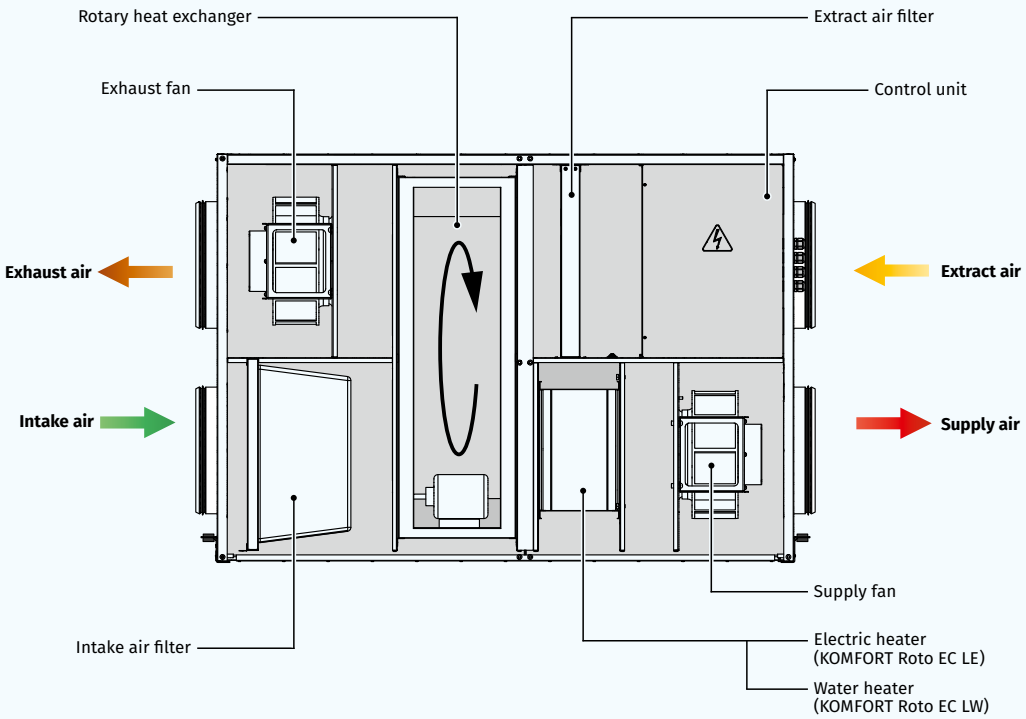
- The built-in G4 supply filter and G4 extract filter provide air filtration.

### 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.

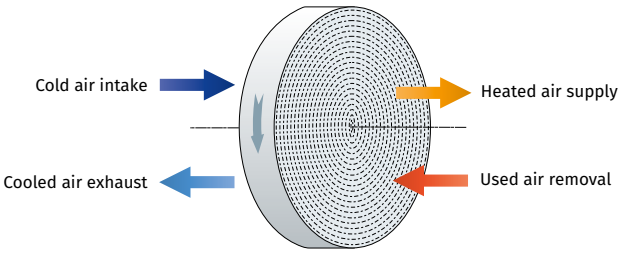
### Mounting

- 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.



## Heat recovery

- The unit has a high-efficient rotary aluminium heat exchanger.
- The rotary regenerator is a short, rotating cylinder, filled with corrugated aluminium sheet layers. The air streams flow through them.
- The band layers of the heat regenerator first come in contact with the supply and then with extract air flows.
- Therefore the band is alternatively warmed up and cooled down and the extract air heat and humidity are transferred to the cold intake air. This way heat recovery reduces heat losses in the cold season and reduces operation load for air conditioner in the warm season.
- The advantages of the rotary regenerator as compared to the plate heat exchangers include no condensate generation, maintaining comfort air humidity and high freeze resistance.




Rotor heat exchanger operating logic

## 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

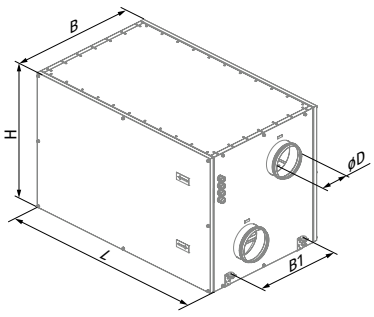
- **KOMFORT Roto EC LE S17** and **KOMFORT Roto EC LW S17** are equipped with the th-Tune control panel.
- **KOMFORT Roto EC LE S18** and **KOMFORT Roto EC LW S18** are equipped with the pGD1 control panel.
- **Automation functions:**
  - Fan speed selection: low, high or medium.
  - Speed setting from 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

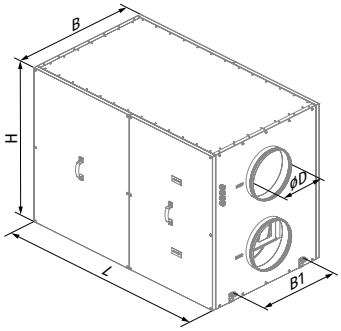
| Series | Unit type | Motor type | Spigot modification | Heater type | Nominal air flow [m³/h] | | Heater parameters | Control |
|---|---|---|---|---|---|---|---|---|
| KOMFORT | **Roto:** rotary heat exchanger | **EC:** electronically commutated motor | **L:** horizontal spigot orientation | **E:**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

## Overall dimensions [mm]

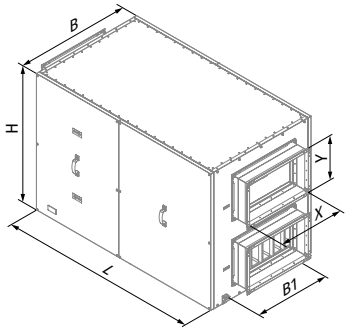
| Model | D | B | B1 | H | L | X | Y |
|---|---|---|---|---|---|---|---|
| KOMFORT Roto EC LE/LW 400 | 159 | 648 | 440 | 670 | 1050 | – | – |
| KOMFORT Roto EC LE/LW 700 | 249 | 745 | 580 | 700 | 1210 | – | – |
| KOMFORT Roto EC LE/LW1000 | 249 | 745 | 580 | 700 | 1210 | – | – |
| KOMFORT Roto EC LE/LW1200 | 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



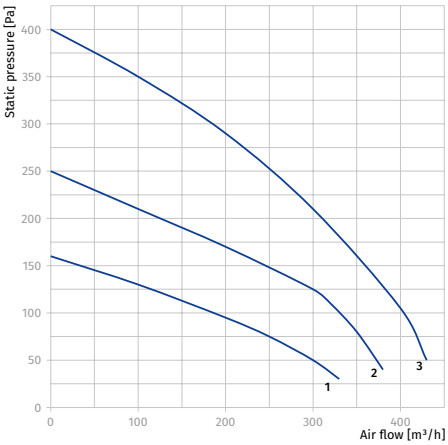

KOMFORT Roto EC LE/LW2000

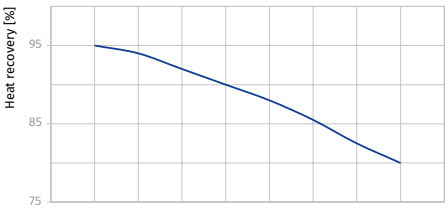
## Technical data

| 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 |
| Motor max. power [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 [W] | 2000 | 3300 | 4500 | 6000 | 9000 | 12000 |
| 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 [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | – | – | – |

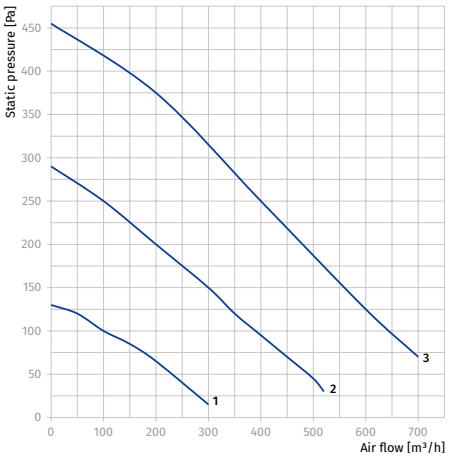
* Nonresidential Ventilation Unit.

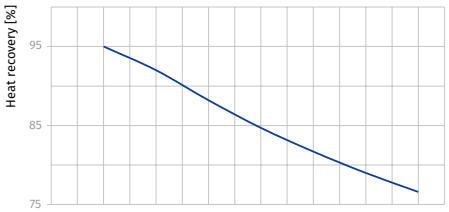
**KOMFORT Roto EC LE400-2**



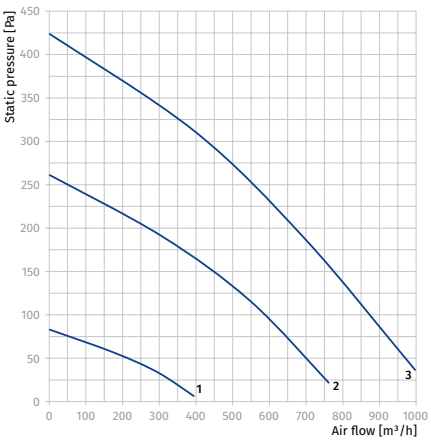



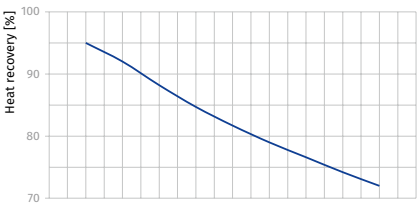

**KOMFORT Roto EC LE700-3.3**



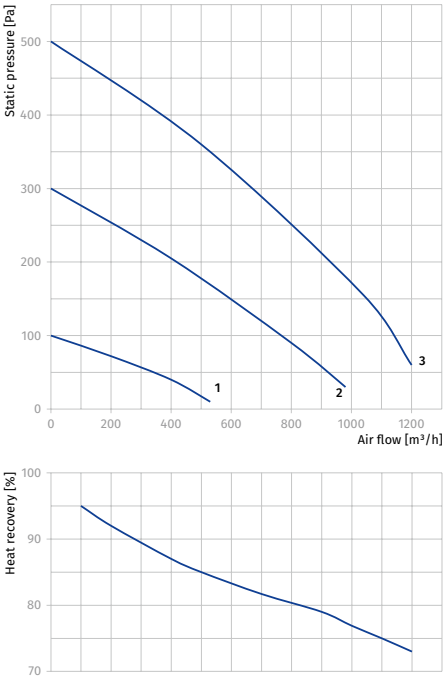




**KOMFORT Roto EC LE1000-4.5**

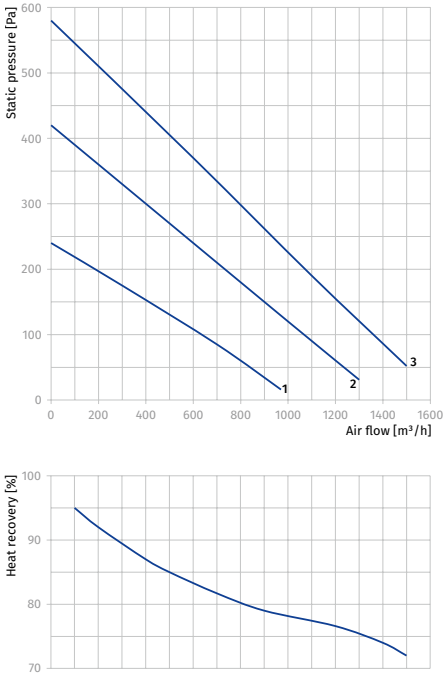


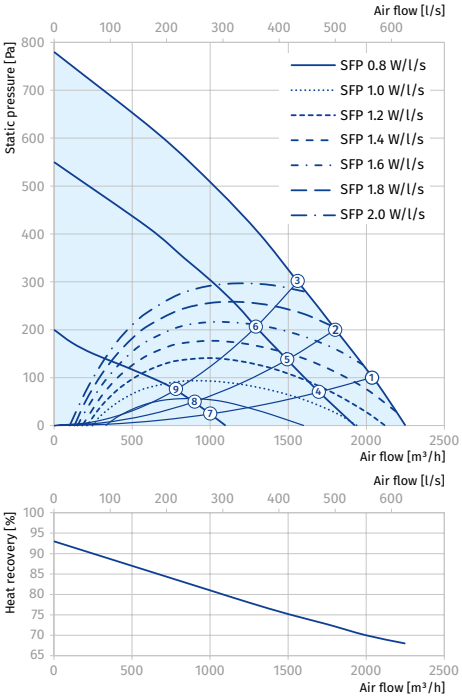
**KOMFORT Roto EC LE1200-6**




**KOMFORT Roto EC LE1500-9**




**KOMFORT Roto EC LE2000-12**



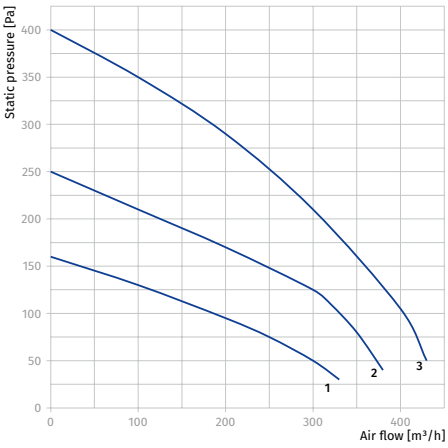

**Total power of the unit, W**

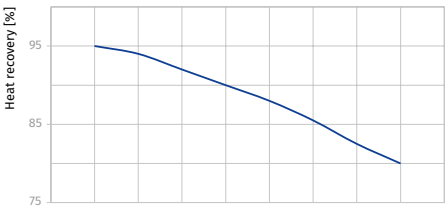
| Point | KOMFORT Roto EC LE2000-12 |
|---|---|
| 1 | 874 |
| 2 | 893 |
| 3 | 905 |
| 4 | 545 |
| 5 | 562 |
| 6 | 568 |
| 7 | 181 |
| 8 | 182 |
| 9 | 184 |

| 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 ~ 220-240 | 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 [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | – | – | – |

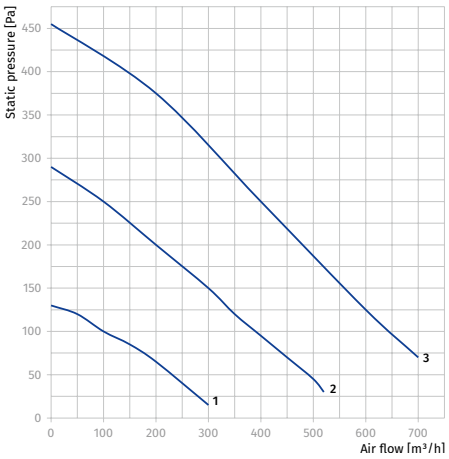
* Nonresidential Ventilation Unit.

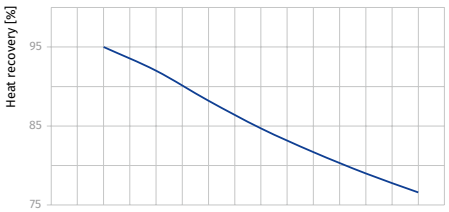
**KOMFORT Roto EC LW400-2**



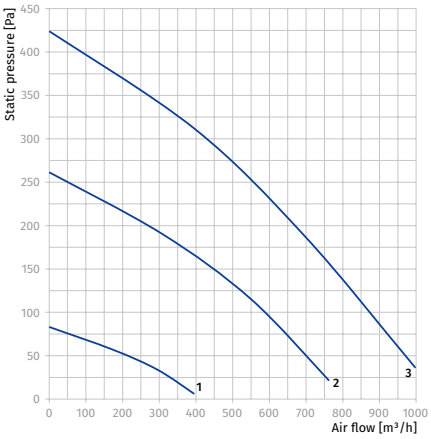



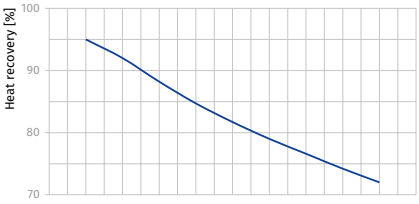

**KOMFORT Roto EC LW700-3.3**



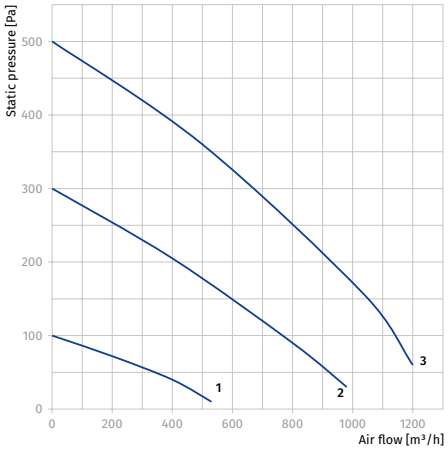



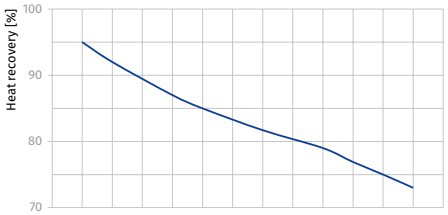

**KOMFORT Roto EC LW1000-4.5**



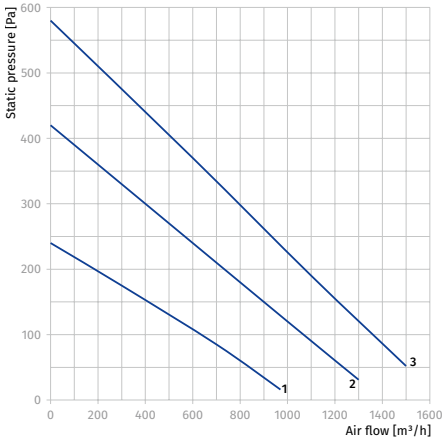



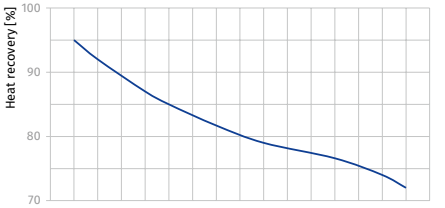
**KOMFORT Roto EC LW1200-6**



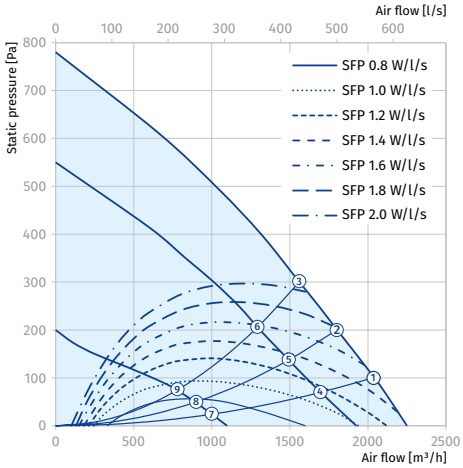



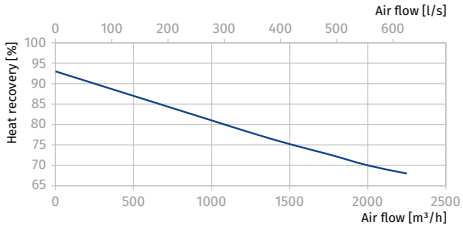

**KOMFORT Roto EC LW1500-9**




**KOMFORT Roto EC LE2000-12**



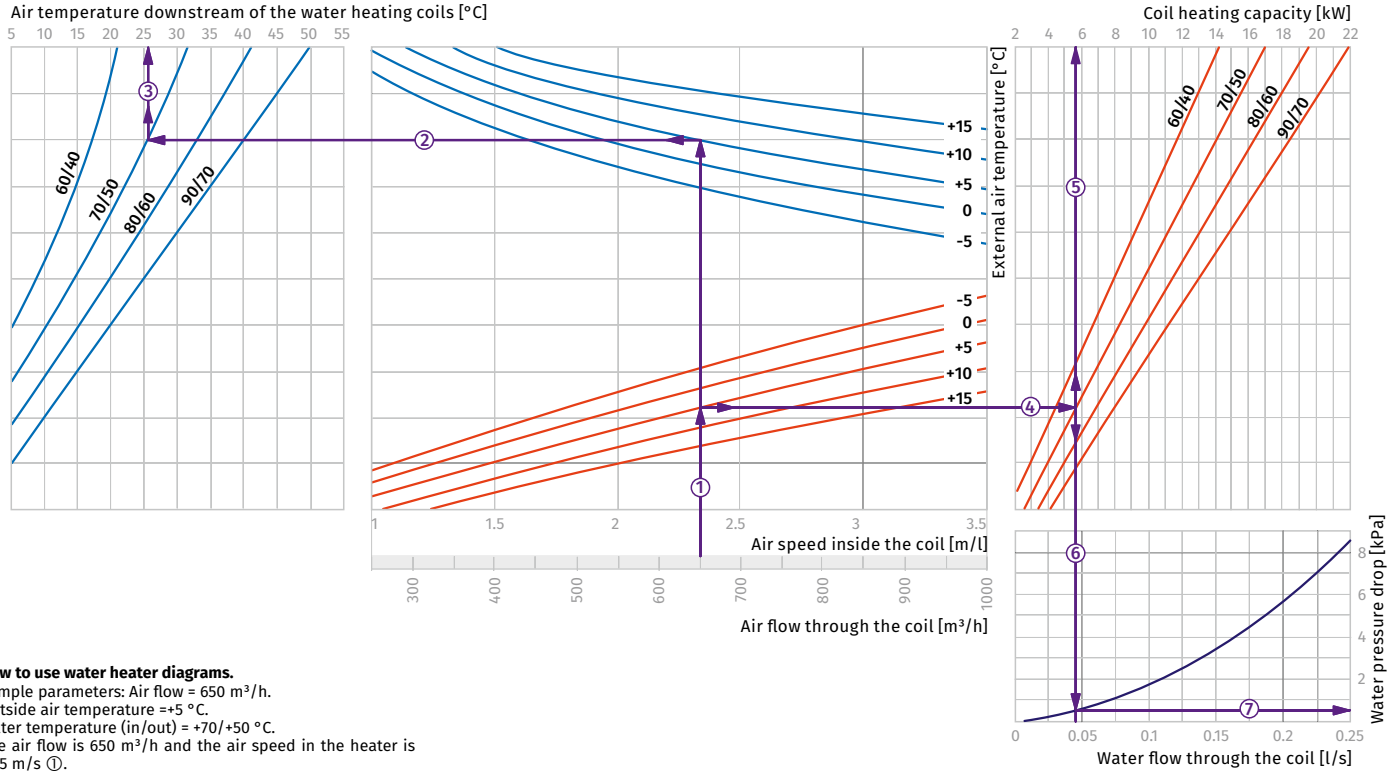




**Total power of the unit, W**

| 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



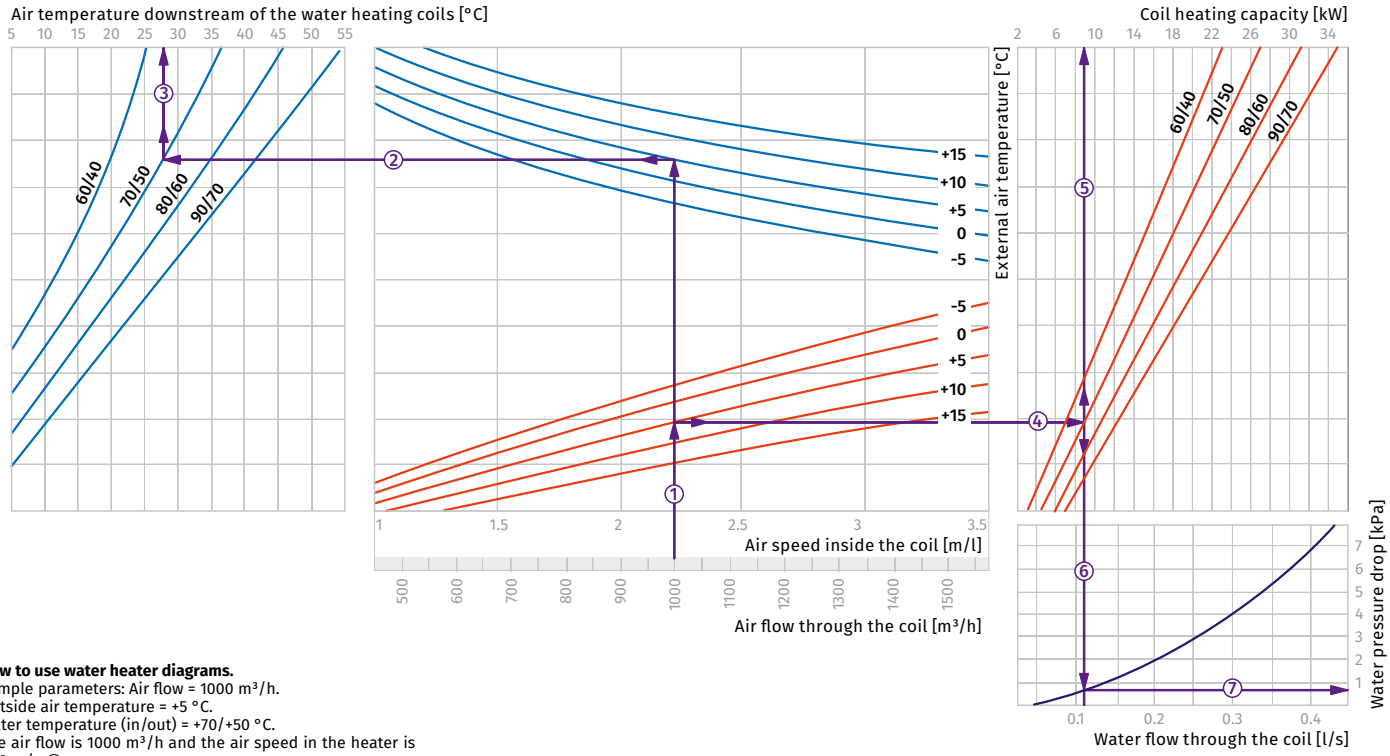

**How to use water heater diagrams.**
Sample parameters: Air flow = 650 m³/h.
Outside air temperature =+5 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 650 m³/h and the air speed in the heater is 2.35 m/s ①.

- 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



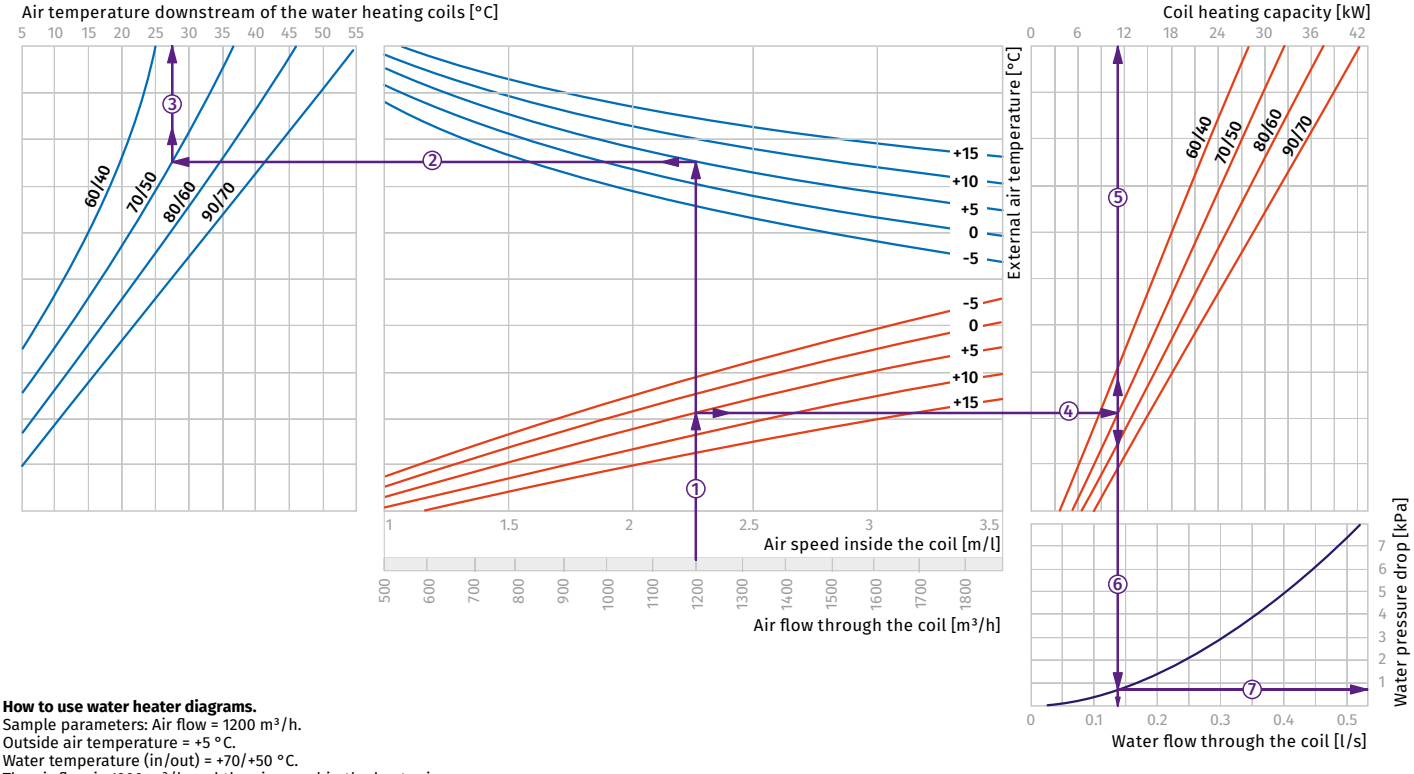

**How to use water heater diagrams.**
Sample parameters: Air flow = 1000 m³/h.
Outside air temperature = +5 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 1000 m³/h and the air speed in the heater is 2.22 m/s ①.

- 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




**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 S17/S18 | KOMFORT Roto EC LE700-3.3 S17/S18 | KOMFORT Roto EC LE1000-4.5 S17/S18 | KOMFORT Roto EC LE1200-6 S17/S18 | KOMFORT Roto EC LE1500-9 S17/S18 | KOMFORT Roto EC LE2000-12 S17/S18 |
|---|---|---|---|---|---|---|---|
| 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 S17/S18 | KOMFORT Roto EC LW700-2 S17/S18 | KOMFORT Roto EC LW1000-2 S17/S18 | KOMFORT Roto EC LW1200-2 S17/S18 | KOMFORT Roto EC LW1500-2 S17/S18 | KOMFORT Roto EC LW2000-2 S17/S18 |
|---|---|---|---|---|---|---|---|
| **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 |
| **Water mixing unit** |  | 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 |

# KOMFORT Roto EC D/DE

## 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 Ø160 and 200 mm air ducts.
- Additional spigot for kitchen hood air duct connection.

**Air flow:**
up to 710 m³/h
197 l/s

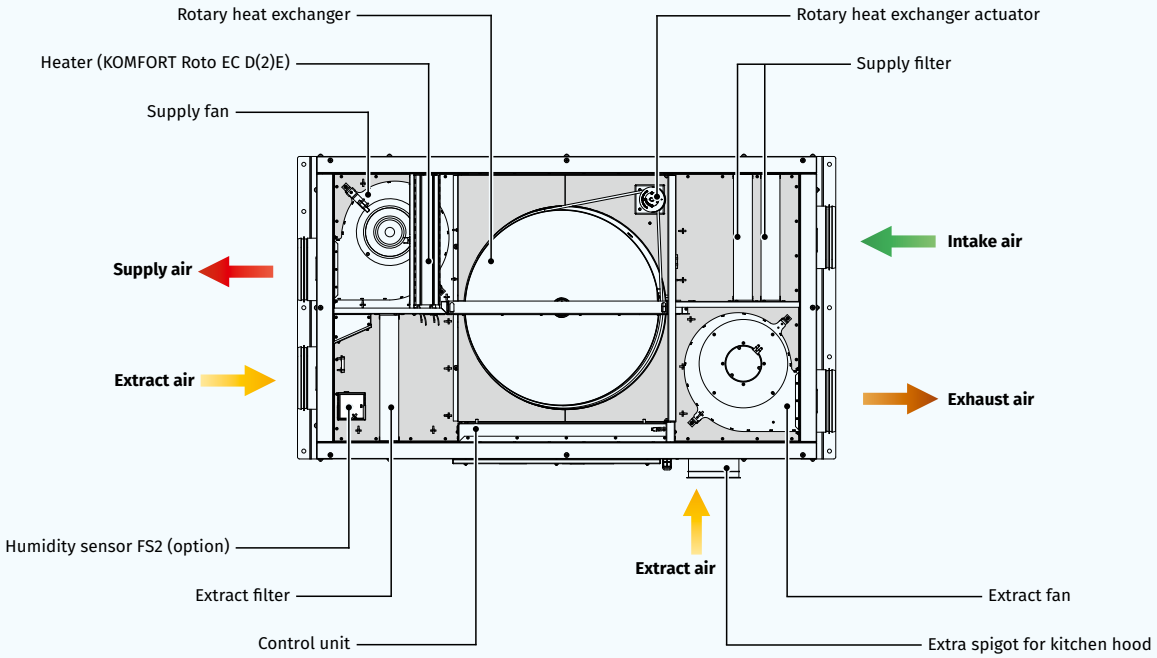
**Heat recovery efficiency:**
up to 87 %

EC motor · ErP 2016 · ErP 2018

### Design

- The fan casing is made of galvanized steel soundproofed on the inside with mineral wool.
- The spigots are located at the side of the unit and are rubber sealed for airtight connection to the air ducts.
- **KOMFORT Roto EC D(2) –** model without electric heater.
- **KOMFORT Roto EC D(2)E –** model with electric heater.
- The insulation of **KOMFORT Roto EC D(E)** is 40 mm, for **KOMFORT Roto EC D2(E)** is 20 mm.
- Unit maintenance is performed from the bottom panel side.
- The distinctive feature of **KOMFORT Roto EC D2(E)** is a low casing profile.


### 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.

## Air filtration

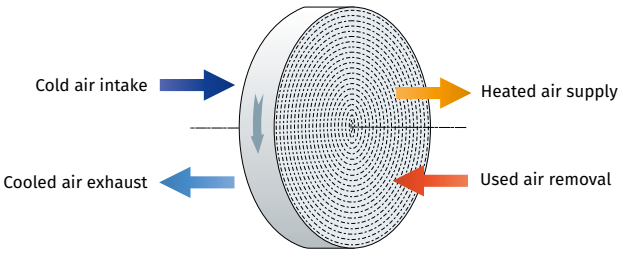
- Two built-in filters with G4 and F7 filtration class provide efficient supply air filtration. Optionally, a H13 supply air filter may be used.
- The G4 filter is used for extract air filtration.

## Motors

- 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 unit has a high-efficient rotary aluminium heat exchanger.
- The rotary regenerator is a short, rotating cylinder, filled with corrugated aluminium sheet layers. The air streams flow through them.
- The band layers of the heat regenerator first come in contact with the supply and then with extract air flows.
- Therefore the band is alternatively warmed up and cooled down and the extract air heat and humidity are transferred to the cold intake air. This way heat recovery reduces heat losses in the cold season and reduces operation load for air conditioner in the warm season.
- The advantages of the rotary regenerator as compared to the plate heat exchangers include no condensate generation, maintaining comfort air humidity and high freeze resistance.




Rotor heat exchanger operating logic

## Heater

- The **KOMFORT Roto EC D(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.

## Control and 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.

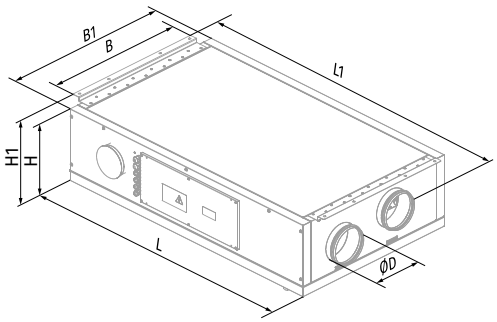


## Designation key

| Serie | Unit type | Motor type | Mounting type | Modification | Heater type | Nominal air flow [m³/h] | Service side | Control |
|---|---|---|---|---|---|---|---|---|
| KOMFORT | **Roto:** rotary heat exchanger | **EC:** electronically commutated motor | **D:** Suspended mounting, horizontally oriented spigots | **_:** Standard (insulation 40 mm)<br>**2:** Low-profile (insulation 20 mm) | **_:** no heater<br>**E:** electric heater | **250; 350; 650** | **R:** Right<br>**L:** Left | **S17:** thTune control panel<br>**S18:** pGD1 control panel |

## Overall dimensions [mm]

| Model | D | B | B1 | H | H1 | L | L1 |
|---|---|---|---|---|---|---|---|
| KOMFORT Roto EC D(E)250 | 160 | 643 | 688 | 308 | 345 | 1003 | 1100 |
| KOMFORT Roto EC D2(E)250 | 160 | 618 | 666 | 225 | 245 | 1002 | 1097 |
| KOMFORT Roto EC D(E)350 | 160 | 770 | 818 | 318 | 361 | 1270 | 1365 |
| KOMFORT Roto EC D2(E)350 | 160 | 798 | 847 | 225 | 245 | 1362 | 1457 |
| KOMFORT Roto EC D(E)650 | 200 | 897 | 932 | 409 | 422 | 1445 | 1542 |



## Technical data

| Parameters | KOMFORT Roto EC D2-250 S17/S18 | KOMFORT Roto EC D2E250 S17/S18 | KOMFORT Roto EC D250 S17/S18 | KOMFORT Roto EC DE250 S17/S18 |
|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 128 | 828 | 135 | 835 |
| Heater power [W] | – | 700 | – | 700 |
| Power without heater [W] | 128 | 128 | 135 | 135 |
| Current [A] | 0.9 | 4.0 | 1.0 | 4.1 |
| Electric heater current [A] | – | 3.1 | – | 3.1 |
| Current without heater [A] | 0.9 | 0.9 | 1.0 | 1.0 |
| Maximum air flow [m³/h (l/s)] | 300 (83) | 300 (83) | 310 (86) | 310 (86) |
| RPM [min⁻¹] | 2200 | 2200 | 2200 | 2200 |
| Sound pressure level at 3 m [dBA] | 23 | 23 | 21 | 21 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| Casing material | painted steel | painted steel | painted steel | painted steel |
| Insulation | 20 mm mineral wool | 20 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | G4 | G4 | G4 | G4 |
| Supply filter | G4, F7 (Option: H13) | G4, F7 (Option: H13) | G4, F7 (Option: H13) | G4, F7 (Option: H13) |
| Connected air duct diameter [mm] | 160 | 160 | 160 | 160 |
| Weight [kg] | 53 | 54 | 55 | 56 |
| Heat recovery efficiency [%]* | 72–87 | 72–87 | 71–87 | 71–87 |
| Heat exchanger type | rotary | rotary | rotary | rotary |
| Heat exchanger material | aluminum | aluminum | aluminum | aluminum |
| SEC class | A | A | A | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

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

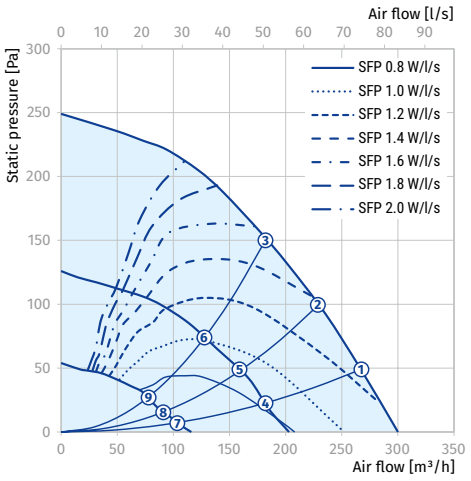
### KOMFORT ROTO EC D2(E)250

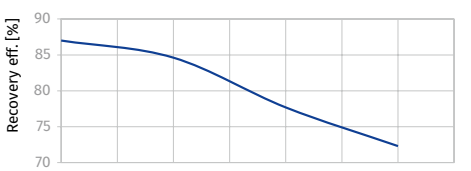
| Sound power level, A-weighted | Gen. | Octave frequency band [Hz] | | | | | | | | LpA, 3 m [dBA] | LpA, 1 m [dBA] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| $L_{WA}$ to supply inlet [dBA] | **58** | 21 | 42 | 45 | 56 | 53 | 42 | 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

**Total power. Total sound pressure level.**

| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 93 | 23 (33) |
| 2 | 89 | 23 (33) |
| 3 | 77 | 22 (32) |
| 4 | 41 | 21 (31) |
| 5 | 39 | 19 (29) |
| 6 | 38 | 18 (28) |
| 7 | 17 | 18 (28) |
| 8 | 17 | 17 (27) |
| 9 | 16 | 17 (27) |

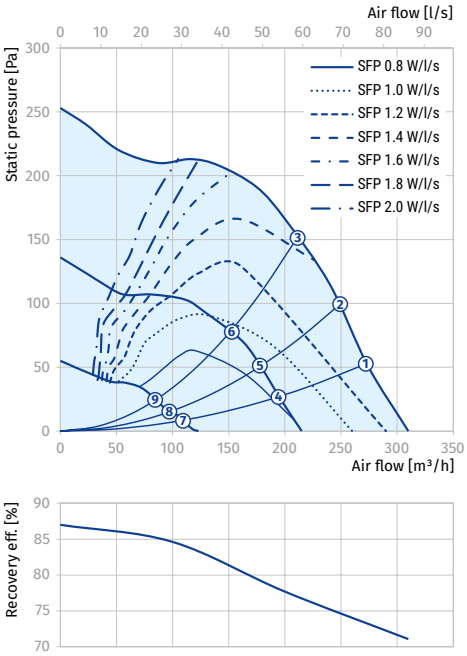


## KOMFORT ROTO EC D(E)250

| 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] | **55** | 18 | 39 | 42 | 53 | 50 | 40 | 30 | 19 | | |
| $L_{WA}$ to supply outlet [dBA] | **72** | 31 | 46 | 59 | 68 | 68 | 60 | 58 | 46 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **50** | 17 | 34 | 39 | 49 | 41 | 34 | 27 | 17 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **65** | 30 | 41 | 55 | 64 | 57 | 52 | 51 | 40 | | |
| $L_{WA}$ to environment [dBA] | **41** | 8 | 25 | 36 | 35 | 33 | 30 | 29 | 27 | **21** | **31** |

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** | 101 | 21 (31) |
| **2** | 115 | 21 (31) |
| **3** | 80 | 20 (30) |
| **4** | 45 | 18 (28) |
| **5** | 42 | 17 (27) |
| **6** | 40 | 17 (27) |
| **7** | 17 | 16 (26) |
| **8** | 17 | 16 (26) |
| **9** | 16 | 16 (26) |

**Calculation of air temperature downstream of the heat exchanger:**

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

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

| Parameters | KOMFORT Roto EC D2-350 S17/S18 | KOMFORT Roto EC D2E350 S17/S18 | KOMFORT Roto EC D350 S17/S18 | KOMFORT Roto EC DE350 S17/S18 | KOMFORT Roto EC D650 S17/S18 | KOMFORT Roto EC DE650 S17/S18 |
|---|---|---|---|---|---|---|
| Voltage [V / 50 (60) Hz] | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 | 1~ 220-240 |
| Power [W] | 200 | 1600 | 185 | 1585 | 367 | 3167 |
| Heater power [W] | – | 1400 | – | 1400 | – | 2800 |
| Power without heater [W] | 200 | 200 | 185 | 185 | 367 | 367 |
| Current [A] | 1.3 | 6.9 | 1.3 | 6.9 | 2.5 | 13.7 |
| Electric heater current [A] | – | 5.6 | – | 5.6 | – | 11.2 |
| Current without heater [A] | 1.3 | 1.3 | 1.3 | 1.3 | 2.5 | 2.5 |
| Maximum air flow [m³/h (l/s)] | 400 (111) | 400 (111) | 430 (119) | 430 (119) | 710 (197) | 710 (197) |
| RPM [min⁻¹] | 3200 | 3200 | 3570 | 3570 | 3600 | 3600 |
| Sound pressure level at 3 m [dBA] | 33 | 33 | 31 | 31 | 36 | 36 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 | -25...+40 |
| Casing material | painted steel | painted steel | painted steel | painted steel | painted steel | painted steel |
| Insulation | 20 mm mineral wool | 20 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool | 40 mm mineral wool |
| Extract filter | 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) |
| Connected air duct diameter [mm] | 160 | 160 | 160 | 160 | 200 | 200 |
| Weight [kg] | 78 | 79 | 81 | 82 | 102 | 104 |
| Heat recovery efficiency [%]* | 73–87 | 73–87 | 72–87 | 72–87 | 80–87 | 80–87 |
| Heat exchanger type | rotary | rotary | rotary | rotary | rotary | rotary |
| Heat exchanger material | aluminum | aluminum | aluminum | aluminum | aluminum | aluminum |
| SEC class | A | A | A | A | A | A |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

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

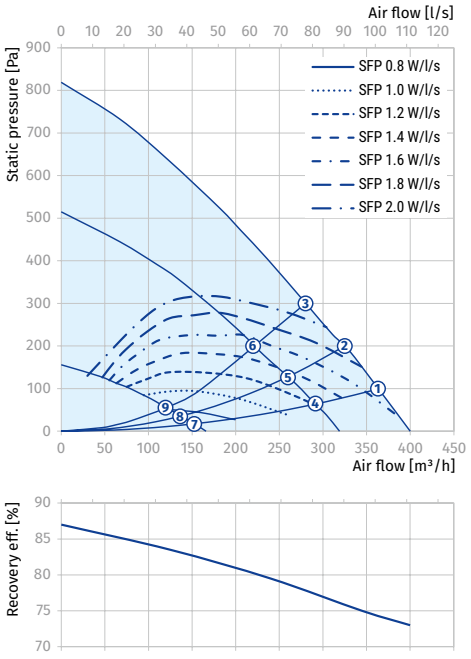
## KOMFORT ROTO EC D2(E)350

| 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] | **59** | 26 | 45 | 53 | 54 | 52 | 48 | 43 | 34 | | |
| $L_{WA}$ to supply outlet [dBA] | **83** | 44 | 58 | 67 | 75 | 75 | 79 | 75 | 71 | | |
| $L_{WA}$ to exhaust inlet [dBA] | **54** | 25 | 40 | 50 | 50 | 43 | 41 | 38 | 30 | | |
| $L_{WA}$ to exhaust outlet [dBA] | **74** | 42 | 52 | 63 | 70 | 63 | 68 | 66 | 62 | | |
| $L_{WA}$ to environment [dBA] | **53** | 18 | 35 | 46 | 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 | 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) |



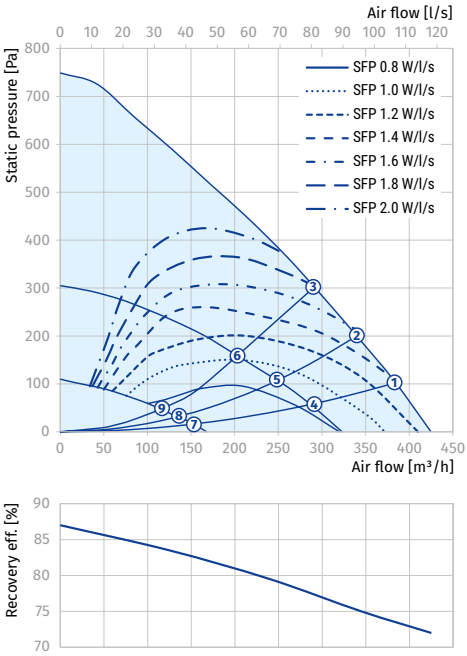
## KOMFORT ROTO EC D(E)350

| 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] | **56** | 24 | 43 | 51 | 52 | 50 | 46 | 42 | 33 | | |
| LwA to supply outlet [dBA] | **80** | 41 | 55 | 65 | 72 | 72 | 76 | 72 | 69 | | |
| LwA to exhaust inlet [dBA] | **52** | 23 | 38 | 47 | 48 | 42 | 39 | 37 | 29 | | |
| LwA to exhaust outlet [dBA] | **72** | 40 | 50 | 61 | 67 | 61 | 65 | 64 | 60 | | |
| LwA to environment [dBA] | **51** | 16 | 33 | 44 | 47 | 46 | 41 | 36 | 32 | **31** | **41** |

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 | 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) |



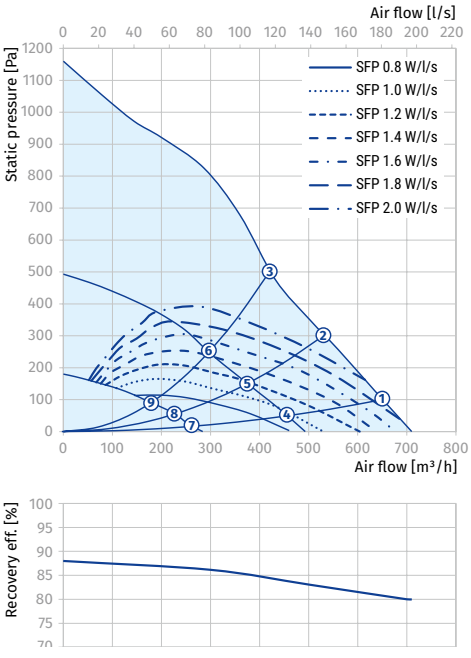

## KOMFORT ROTO EC D(E)650

| 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] | **79** | 56 | 62 | 64 | 74 | 72 | 74 | 71 | 66 | | |
| LwA to supply outlet [dBA] | **68** | 48 | 51 | 57 | 67 | 52 | 49 | 42 | 30 | | |
| LwA to exhaust inlet [dBA] | **81** | 55 | 60 | 64 | 77 | 73 | 75 | 71 | 66 | | |
| LwA to exhaust outlet [dBA] | **67** | 47 | 51 | 58 | 65 | 58 | 57 | 48 | 39 | | |
| LwA to environment [dBA] | **57** | 30 | 46 | 45 | 55 | 46 | 47 | 39 | 38 | **36** | **46** |

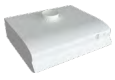
Data provided for point 1 of the air flow diagram

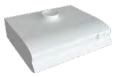
**Total power. Total sound pressure level.**

| Point | Total power of the unit [W] | Sound pressure level at 3 m (1 m) [dBA] |
|---|---|---|
| 1 | 342 | 36 (46) |
| 2 | 342 | 36 (46) |
| 3 | 342 | 35 (45) |
| 4 | 122 | 31 (41) |
| 5 | 122 | 29 (39) |
| 6 | 122 | 29 (39) |
| 7 | 34 | 27 (37) |
| 8 | 33 | 24 (34) |
| 9 | 33 | 24 (34) |



## Accessories

| | | KOMFORT Roto EC D2(E)250 S17<br>KOMFORT Roto EC D2(E)250 S18 | KOMFORT Roto EC D(E)250 S17<br>KOMFORT Roto EC D(E)250 S18 | KOMFORT Roto EC D2(E)350 S17<br>KOMFORT Roto EC D2(E)350 S18 |
|---|---|---|---|---|
| **G4 panel filter** |  | FP 280x205x48 G4 | FP 260x260x48 G4 | FP 372x210x48 G4 |
| **F7 panel filter** |  | FP 280x205x48 F7 | FP 260x260x48 F7 | FP 372x210x48 F7 |
| **H13 panel filter** |  | FP 280x205x48 H13 | FP 260x260x48 H13 | FP 372x210x48 H13 |
| **VOC sensor** |  | DPWQ30600 | DPWQ30600 | DPWQ30600 |
| **External $CO_2$ sensor** |  | DPWQ40200 | DPWQ40200 | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | DPWC11200 | DPWC11200 |
| **Humidity sensor** |  | HR-S | HR-S | HR-S |
| **Internal humidity sensor** |  | FS2 | FS2 | FS2 |
| **Kitchen hood** |  | DAH 251-13 | DAH 251-13 | DAH 251-13 |
| **Backdraft air damper** |  | VRV 160 | VRV 160 | VRV 160 |
| **Air damper** |  | VKA 160 | VKA 160 | VKA 160 |
| **Electric actuator** |  | LF230 | LF230 | LF230 |
| **Electric actuator** |  | TF230 | TF230 | TF230 |

| | | KOMFORT Roto EC D(E)350 S17<br>KOMFORT Roto EC D(E)350 S18 | KOMFORT Roto EC D(E)650 S17<br>KOMFORT Roto EC D(E)650 S18 |
|---|---|---|---|
| **G4 panel filter** |  | FP 320x270x48 G4 | FP 378x332x48 G4 |
| **F7 panel filter** |  | FP 320x270x48 F7 | FP 378x332x48 F7 |
| **H13 panel filter** |  | FP 320x270x48 H13 | FP 378x332x48 H13 |
| **VOC sensor** |  | DPWQ30600 | DPWQ30600 |
| **External $CO_2$ sensor** |  | DPWQ40200 | DPWQ40200 |
| **Humidity sensor** |  | DPWC11200 | DPWC11200 |
| **Humidity sensor** |  | HR-S | HR-S |
| **Internal humidity sensor** |  | FS2 | FS2 |
| **Kitchen hood** |  | DAH 251-13 | DAH 251-13 |
| **Backdraft air damper** |  | VRV 160 | VRV 200 |
| **Air damper** |  | VKA 160 | VKA 200 |
| **Electric actuator** |  | LF230 | LF230 |
| **Electric actuator** |  | TF230 | TF230 |

# BLAUBOX E PRO

## Supply ventilation units

### Features

- Ventilation units for efficient supply ventilation in various premises.
- Controllable air supply, heating and filtration.
- Compatible with Ø 100 up to 315 mm round air ducts.

**Air flow:**
up to 1520 m³/h
422 l/s

ErP 2016 ErP 2018

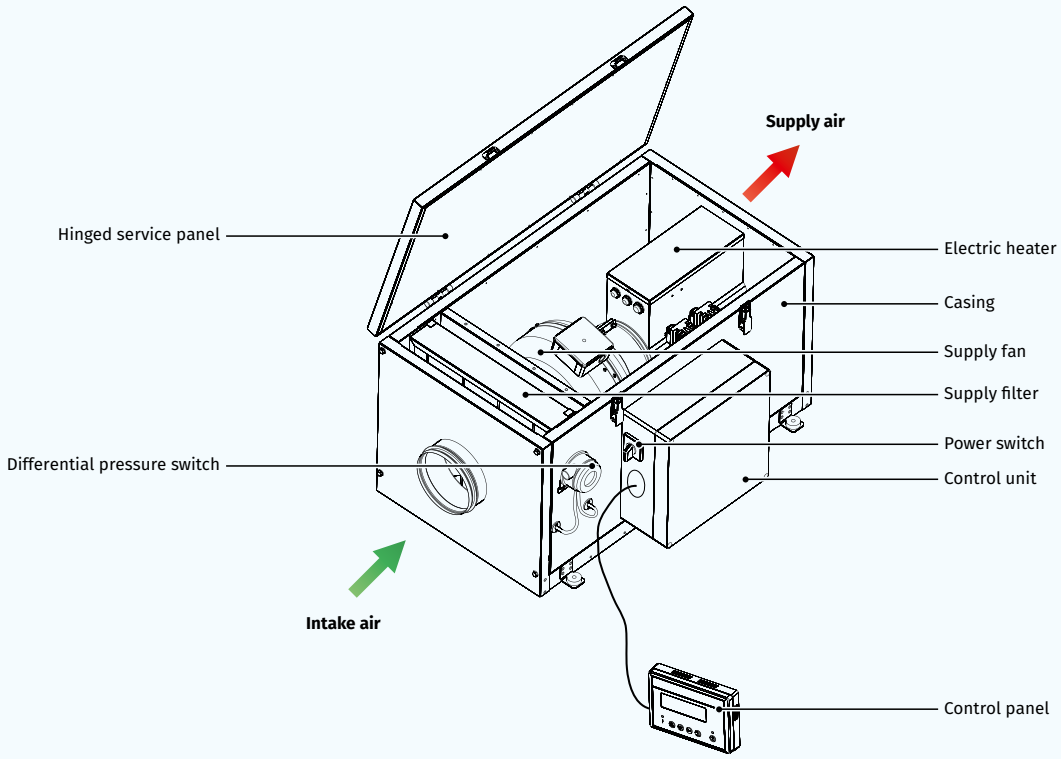


### Design

- 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 with 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

## Mounting

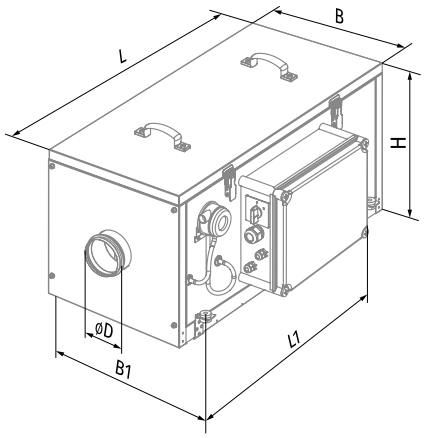
- The unit is suitable for indoor mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

## Designation key

| Serie | Heater type | Nominal air flow [m³/h] | | Heater power [kW] | Control |
|---|---|---|---|---|---|
| BLAUBOX | **E:** electric heater | **200; 300; 400; 800; 1000; 1200; 1500** | — | **1.8; 2.4; 3.4; 3.6; 5.1; 6; 9** | **Pro:** with control panel |

## Overall dimensions [mm]

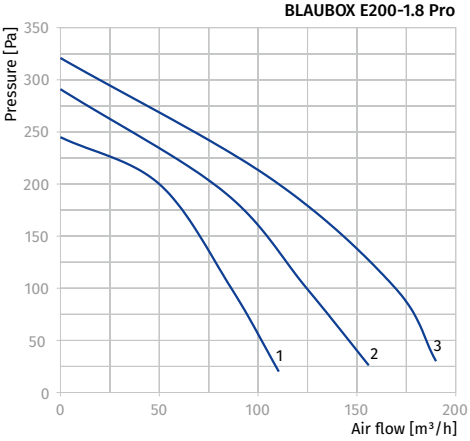
| Model | D | B | B1 | H | L | L1 |
|---|---|---|---|---|---|---|
| BLAUBOX E200-1.8 Pro | 99 | 382 | 421.5 | 408 | 800 | 647 |
| BLAUBOX E300-2.4 Pro | 124 | 382 | 421.5 | 408 | 800 | 647 |
| BLAUBOX E400-2.4 Pro | 149 | 455 | 496.5 | 438 | 800 | 647 |
| BLAUBOX E400-3.4 Pro | 149 | 455 | 496.5 | 438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



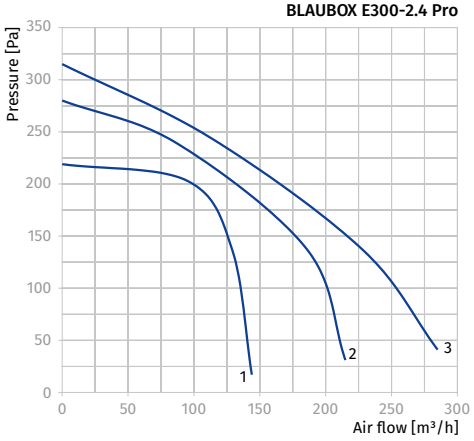
## Technical data

| Parameters | BLAUBOX E200-1.8 Pro | BLAUBOX E300-2.4 Pro | BLAUBOX E400-2.4 Pro | BLAUBOX E400-3.4 Pro | BLAUBOX E400-5.1 Pro | BLAUBOX E400-6 Pro |
|---|---|---|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 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 [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 | -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 | 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 |

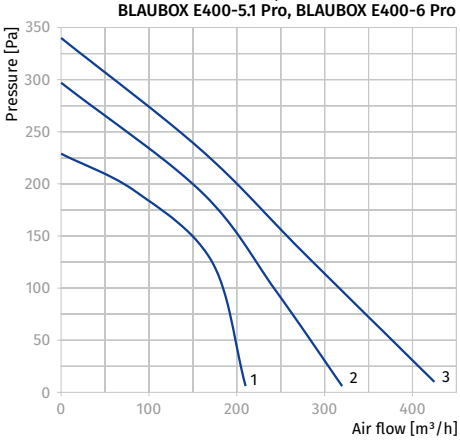
BLAUBOX E200-1.8 Pro




BLAUBOX E300-2.4 Pro

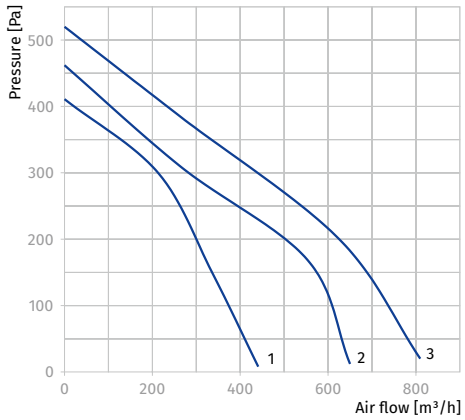



BLAUBOX E400-2.4 Pro, BLAUBOX E400-3.4 Pro
BLAUBOX E400-5.1 Pro, BLAUBOX E400-6 Pro

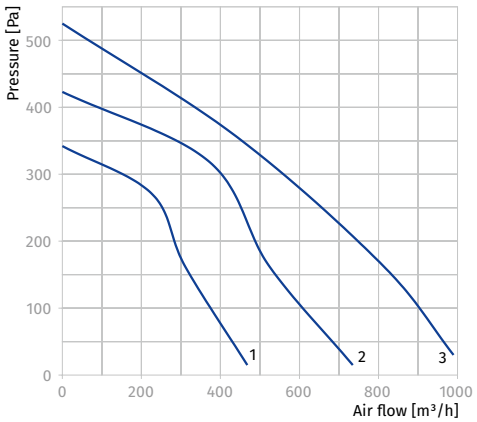


| Parameters | BLAUBOX E800-3.4 Pro | BLAUBOX E800-5.1 Pro | BLAUBOX E800-6 Pro | BLAUBOX 1000-3.6 Pro | BLAUBOX E1000-6 Pro | BLAUBOX E1000-9 Pro |
|---|---|---|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 |
| Max. power without electric heater [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...+40 | -25...+40 | -25...+40 | -25...+40 | -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 | 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 |

**BLAUBOX E800-3.4 Pro, BLAUBOX E800-5.1 Pro BLAUBOX E800-6 Pro**

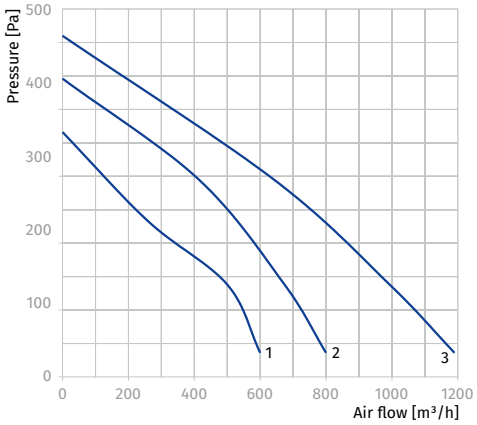



**BLAUBOX E1000-3.6 Pro, BLAUBOX E1000-6 Pro BLAUBOX E1000-9 Pro**

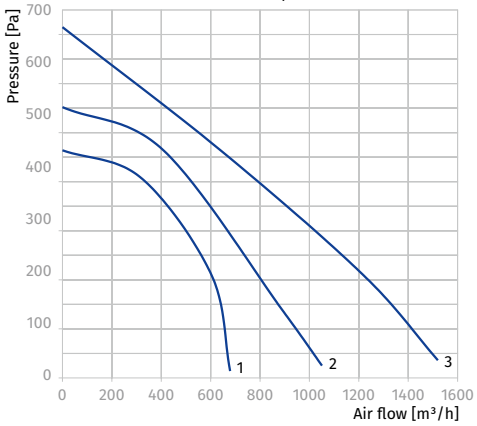


| Parameters | BLAUBOX E1200-6 Pro | BLAUBOX E1200-9 Pro | BLAUBOX E1500-6 Pro | BLAUBOX E1500-9 Pro |
|---|---|---|---|---|
| Voltage [V / 50 Hz] | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 |
| Max. power without electric heater [kW] | 0.171 | 0.171 | 0.296 | 0.296 |
| Max. current without electric heater [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 [m³/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…+40 | -25…+40 | -25…+40 | -25…+40 |
| Casing material | aluzinc | aluzinc | aluzinc | aluzinc |
| 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 |

**BLAUBOX E1200-6 Pro, BLAUBOX E1200-9 Pro**




**BLAUBOX E1500-6 Pro, BLAUBOX E1500-9 Pro**



## Accessories

| | | BLAUBOX E200 Pro | BLAUBOX E300 Pro | BLAUBOX E400 Pro | BLAUBOX E800 Pro | BLAUBOX E1000 Pro | BLAUBOX E1200 Pro | BLAUBOX E1500 Pro |
|---|---|---|---|---|---|---|---|---|
| **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 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 | LF230 | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 | TF230 | TF230 | TF230 | TF230 |

# BLAUBOX ME PRO

## 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

ErP 2016 ErP 2018

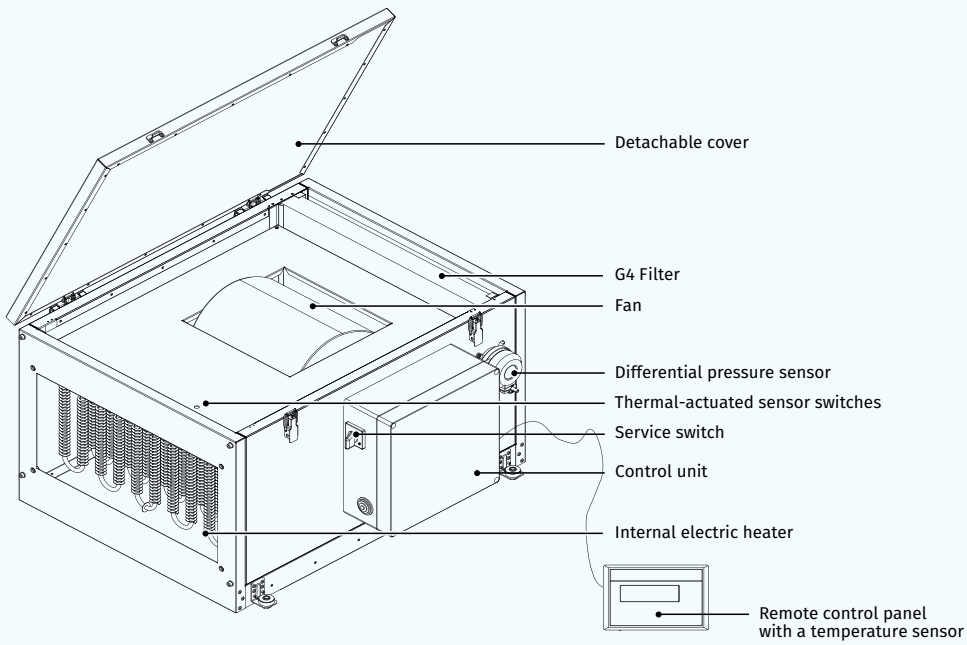
### Design

- 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.





## 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 shutoff.

## Mounting

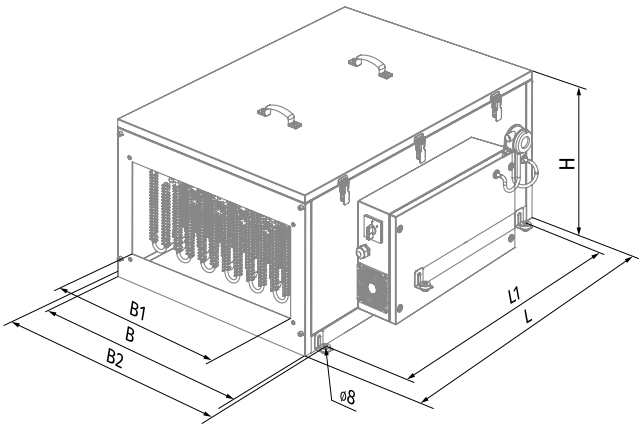
- The unit is suitable for indoor mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

## Designation key

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

## Overall dimensions [mm]

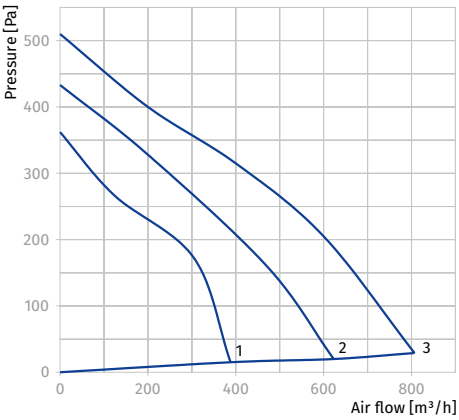
| Model | B | B1 | B2 | H | L | L1 |
|---|---|---|---|---|---|---|
| BLAUBOX ME800-3.3 Pro | 500 | 400 | 549 | 352 | 650 | 530 |
| BLAUBOX ME1200-9.9 Pro | 500 | 400 | 549 | 352 | 650 | 530 |
| BLAUBOX ME2000-18 Pro | 600 | 500 | 649 | 480 | 800 | 680 |
| BLAUBOX ME2500-18 Pro | 600 | 500 | 649 | 480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



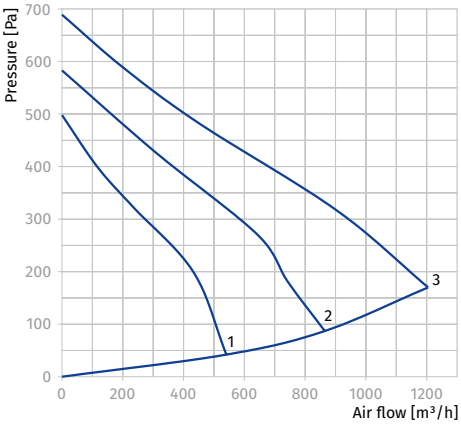
## Technical data

| Parameters | BLAUBOX ME800-3.3 Pro | BLAUBOX ME1200-9.9 Pro | BLAUBOX ME2000-18 Pro |
|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 3 ~ 400 | 3 ~ 400 |
| Max. power without electric heater [kW] | 0.245 | 0.410 | 0.49 |
| 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 [m³/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...+40 | -25...+40 | -25...+40 |
| 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 | - | - |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 |

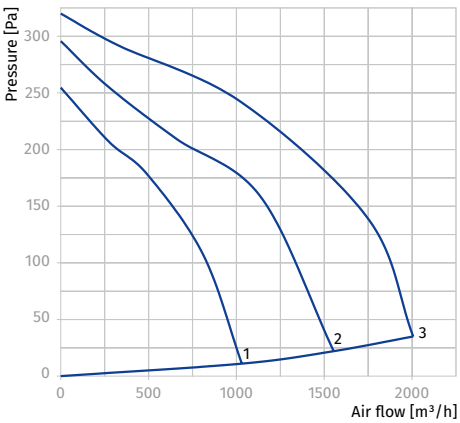
**BLAUBOX ME800-3.3 Pro**




**BLAUBOX ME1200-9.9 Pro**

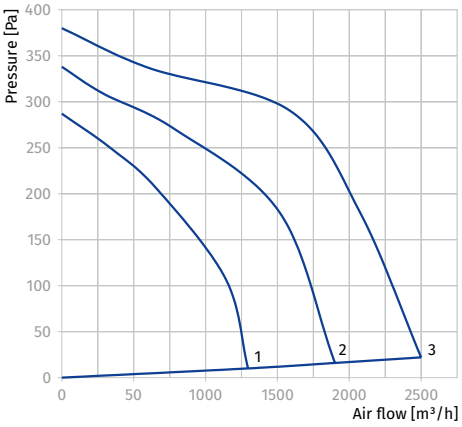



**BLAUBOX ME2000-18 Pro**

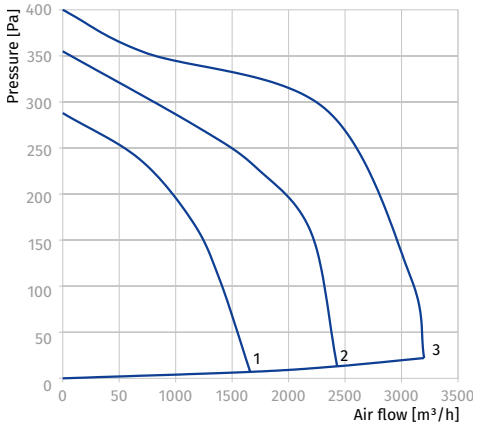


| Parameters | BLAUBOX ME2500-18 Pro | BLAUBOX ME3200-25.2 Pro | BLAUBOX ME3500-25.2 Pro |
|---|---|---|---|
| Voltage [V / 50 Hz] | 3 ~ 400 | 3 ~ 400Y | 3 ~ 400Y |
| Max. power without electric heater [kW] | 0.65 | 1.27 | 1.27 |
| Max. current without electric heater [A] | 2.84 | 2.3 | 2.3 |
| Max. 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...+40 | -25...+40 | -25...+40 |
| 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 | - | - | - |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 |

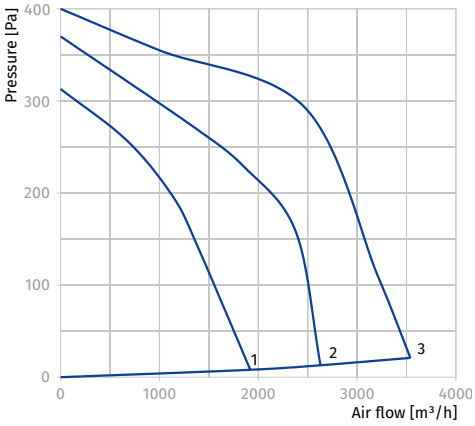
**BLAUBOX ME2500-18 Pro**




**BLAUBOX ME3200-25.2 Pro**




**BLAUBOX ME3500-25.2 Pro**



## Accessories

| | | BLAUBOX ME800-3.3 Pro | BLAUBOX ME1200-9.9 Pro | BLAUBOX ME2000-18 Pro | BLAUBOX ME2500-18 Pro | BLAUBOX ME3200-25.2 Pro | BLAUBOX ME3500-25.2 Pro |
|---|---|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 442x275x47 G4 | FP 442x275x47 G4 | FP 545x390x47 G4 | FP 545x390x47 G4 | FP 653x440x47 G4 | FP 653x440x47 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 |
| **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 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 | TF230 | TF230 | TF230 |

# BLAUBOX MW PRO

## 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

ErP 2016 ErP 2018

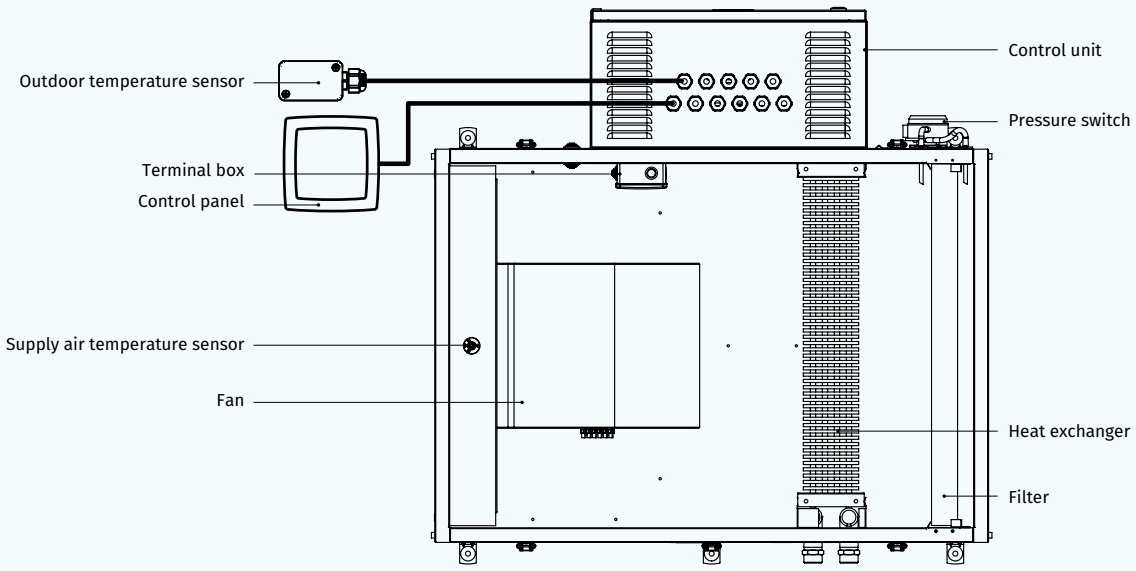
### Design

- 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

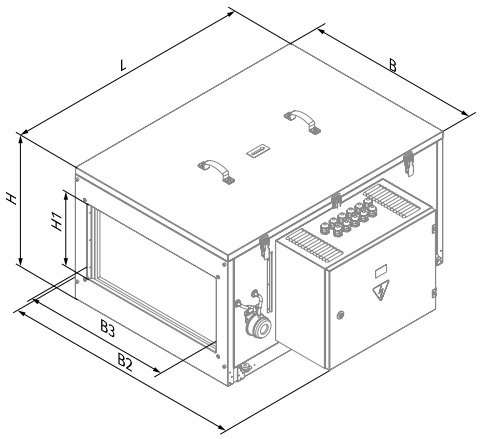
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

## Designation key

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

## Overall dimensions [mm]

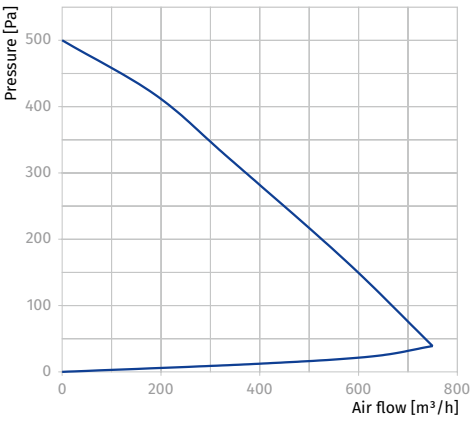
| Model | B3 | B | B2 | H1 | H | L |
|---|---|---|---|---|---|---|
| **BLAUBOX MW750-4 Pro** | 400 | 500 | 674 | 200 | 352 | 650 |
| **BLAUBOX MW1200-4 Pro** | 400 | 500 | 674 | 200 | 352 | 650 |
| **BLAUBOX MW1800-4 Pro** | 500 | 600 | 775 | 250 | 480 | 800 |
| **BLAUBOX MW2100-4 Pro** | 500 | 600 | 775 | 300 | 480 | 800 |
| **BLAUBOX MW3000-4 Pro** | 600 | 710 | 1000 | 300 | 530 | 1000 |
| **BLAUBOX MW3200-4 Pro** | 600 | 710 | 1000 | 350 | 530 | 1000 |
| **BLAUBOX MW6500-4 Pro** | 800 | 925 | 1212 | 500 | 670 | 1299 |



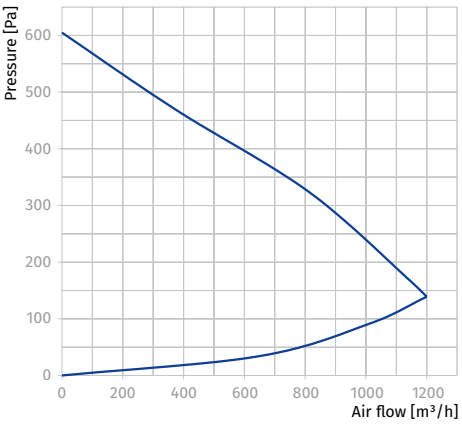
## Technical data

| Parameters | BLAUBOX MW750-4 Pro | BLAUBOX MW1200-4 Pro | BLAUBOX MW1800-4 Pro | BLAUBOX MW2100-4 Pro |
|---|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| 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 [m³/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...+40 | -25...+40 | -25...+40 | -25...+40 |
| 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 | - | - | - |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

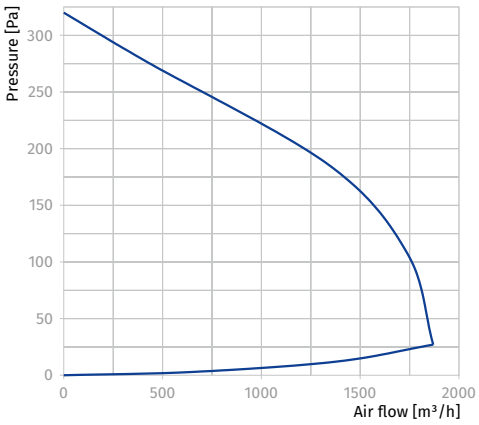
**BLAUBOX MW750-4 Pro**



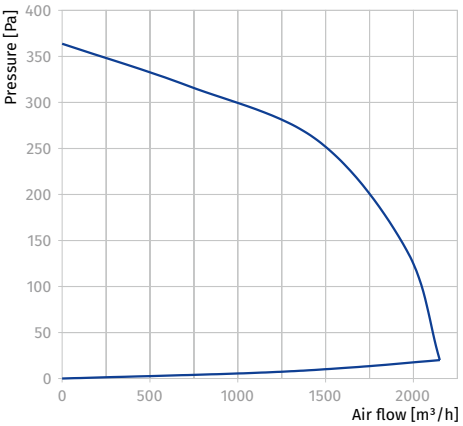

**BLAUBOX MW1200-4 Pro**




**BLAUBOX MW1800-4 Pro**

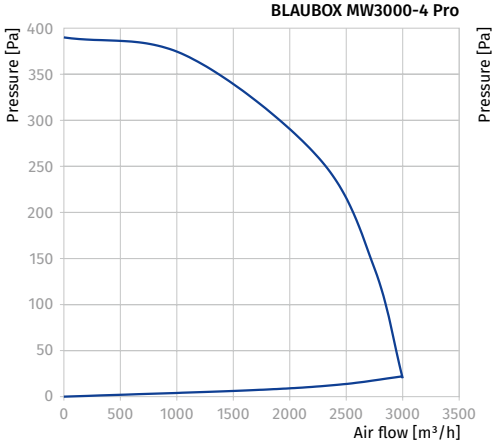



**BLAUBOX MW2100-4 Pro**

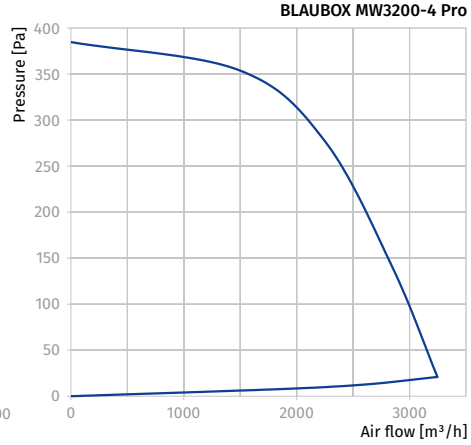


| Parameters | BLAUBOX MW3000-4 Pro | BLAUBOX MW3200-4 Pro | BLAUBOX MW6500-4 Pro |
|---|---|---|---|
| Voltage [V / 50 Hz] | 3 ~ 400Y | 3 ~ 400Y | 3 ~ 400 |
| Number of water (glycol) coil rows | 4 | 4 | 4 |
| Power [kW] | 1.27 | 1.27 | 1.80 |
| Current [A] | 2.3 | 2.3 | 4.5 |
| Maximum air flow [m³/h (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...+40 |
| 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 | - | - | - |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 |

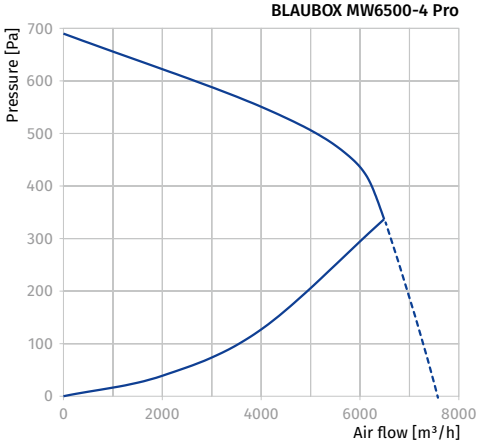
BLAUBOX MW3000-4 Pro




BLAUBOX MW3200-4 Pro

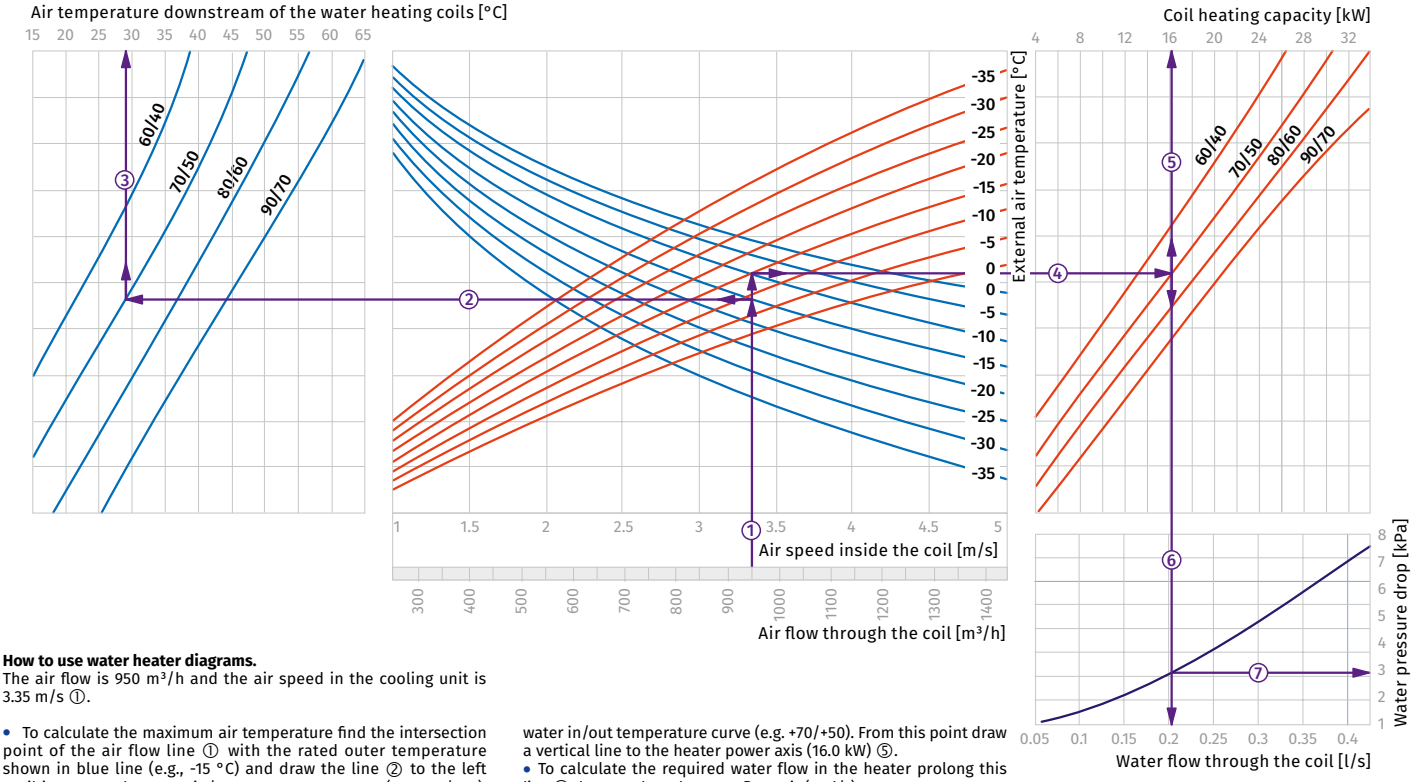



BLAUBOX MW6500-4 Pro



## Hot water coil calculation diagram

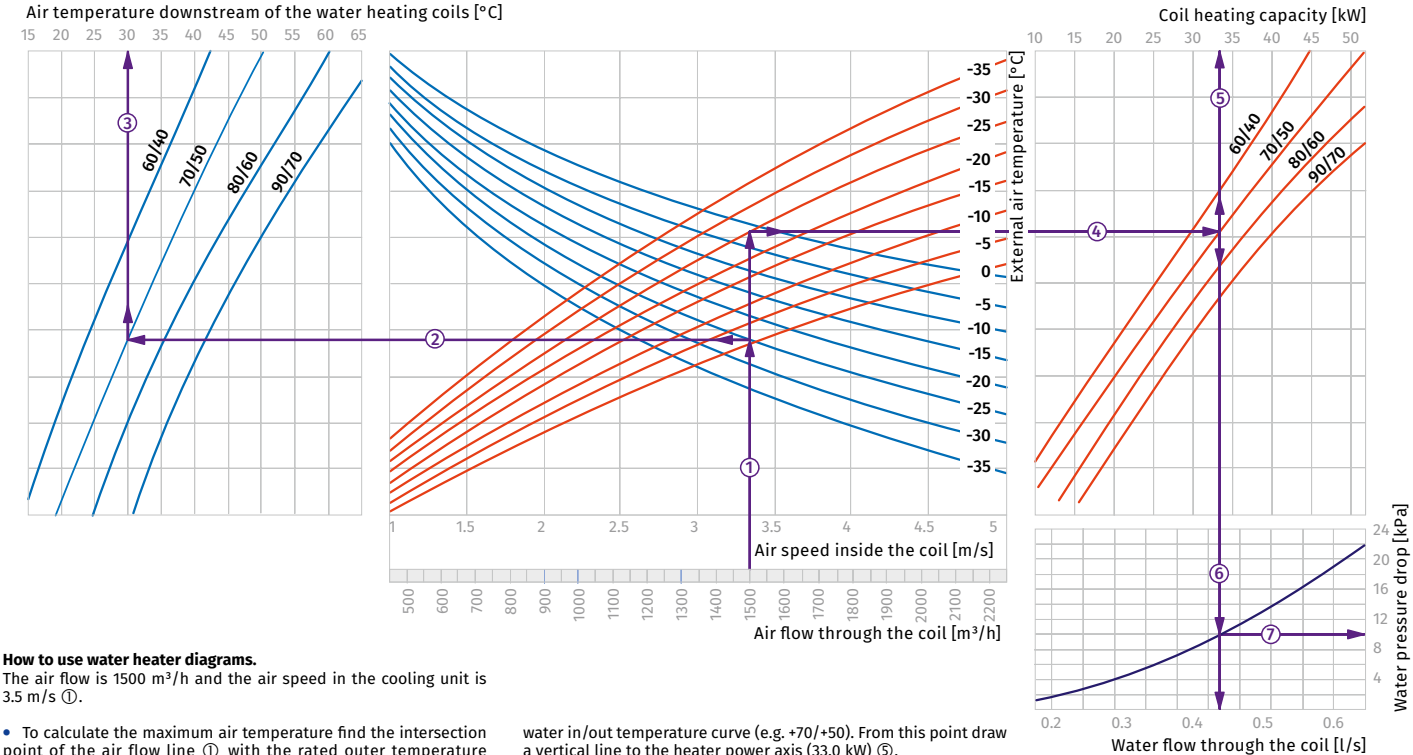
### BLAUBOX MW750-4 PRO / BLAUBOX MW1200-4 PRO




**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).

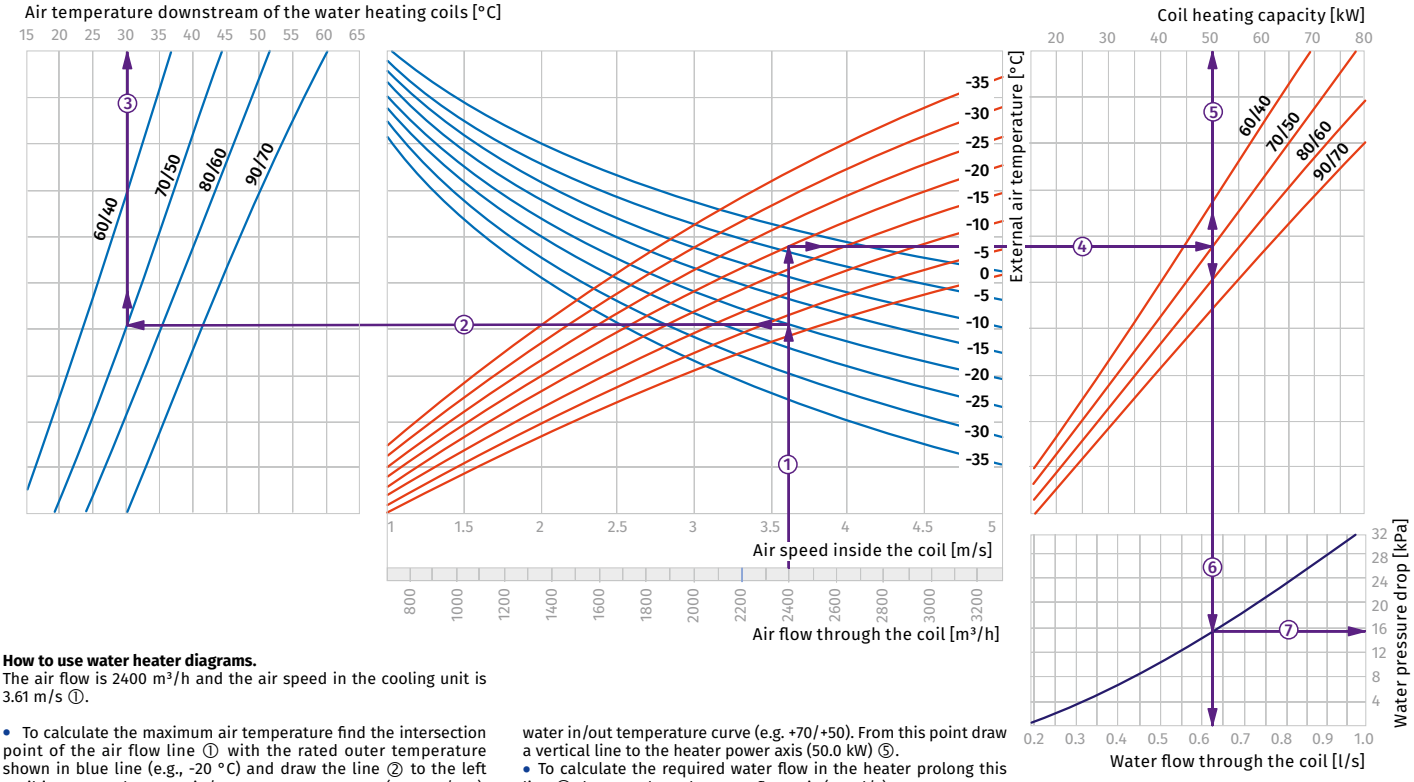
### BLAUBOX MW1800-4 PRO / BLAUBOX MW2100-4 PRO




**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).

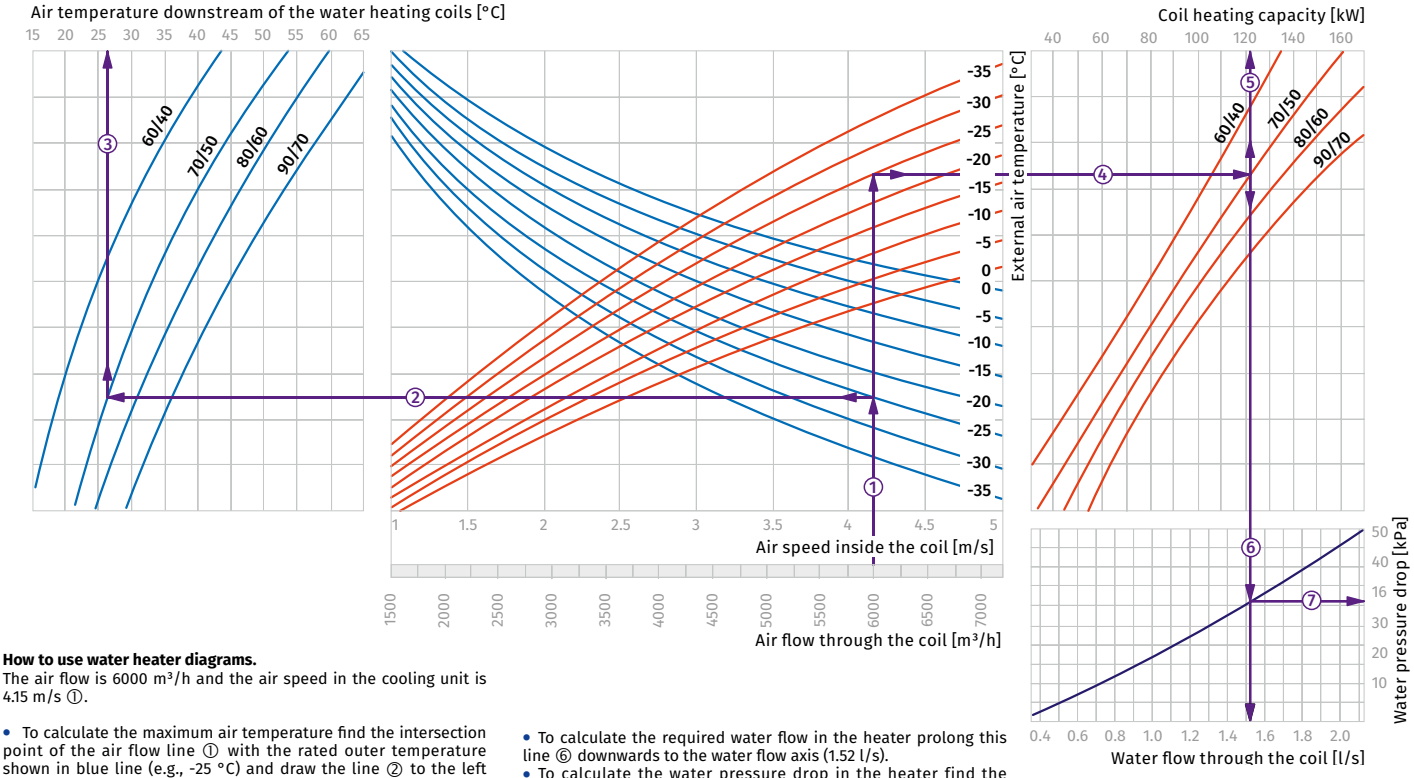
## BLAUBOX MW3000-4 PRO / BLAUBOX MW3200-4 PRO




**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 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 PRO




**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 Pro | BLAUBOX MW1200-4 Pro | BLAUBOX MW1800-4 Pro | BLAUBOX MW2100-4 Pro |
|---|---|---|---|---|---|
| **G4 panel filter** |  | FP 442x275x47 G4 | FP 442x275x47 G4 | FP 545x390x47 G4 | FP 545x390x47 G4 |
| **G4 pocket filterr** |  | – | – | – | – |
| **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 |
| **Water mixing unit** |  | 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 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 | TF230 |

| | | BLAUBOX MW3000-4 Pro | BLAUBOX MW3200-4 Pro | BLAUBOX MW6500-4 Pro |
|---|---|---|---|---|
| **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 |
| **Water mixing unit** |  | WMG | WMG | WMG |
| **Air flow dampers** |  | SL 60x30 | SL 60x35 | SL 80x50 |
| **Flexible anti-vibration connector** |  | EVA 60x30 | EVA 60x35 | EVA 80x50 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 |

# BLAUBOX DE PRO

## 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

ErP 2016 ErP 2018

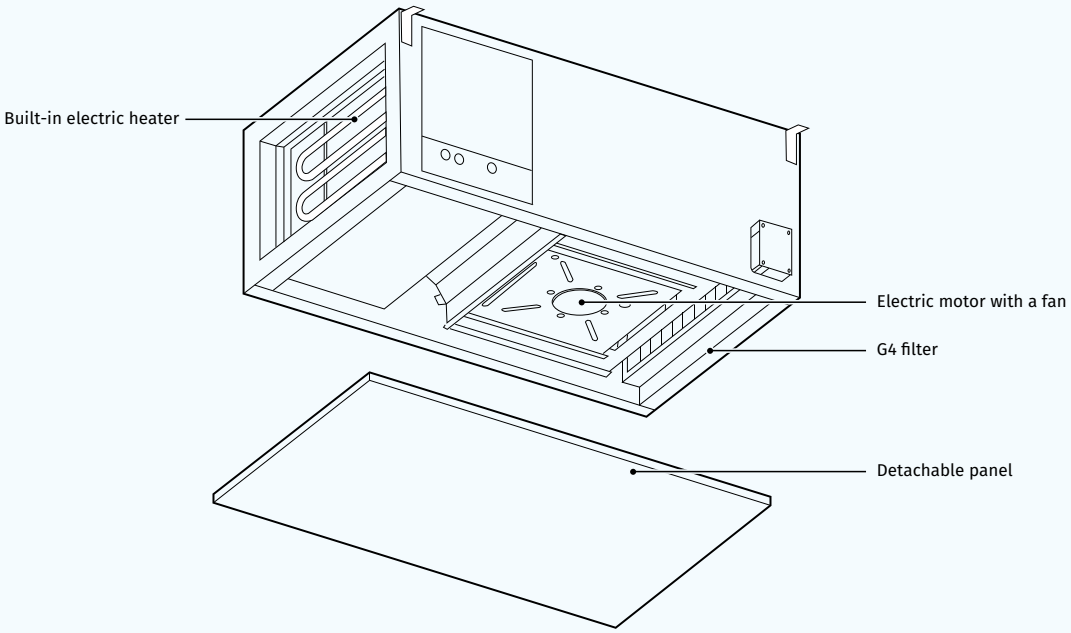
### Design

- 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

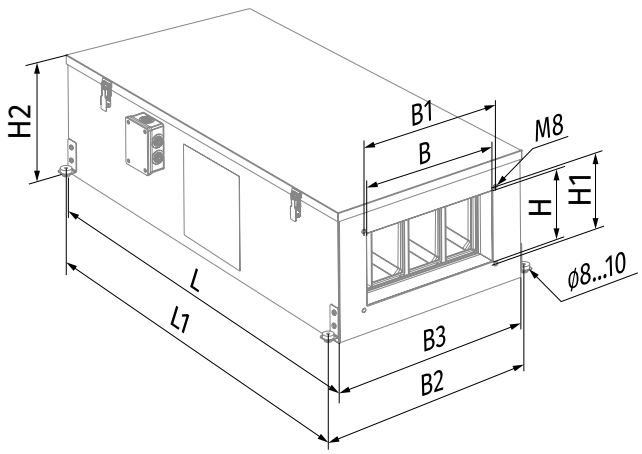
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- Wiring via the terminal block in the terminal box.
- The correct mounted unit must provide free access to the hinged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

## Designation key

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

## Overall dimensions [mm]

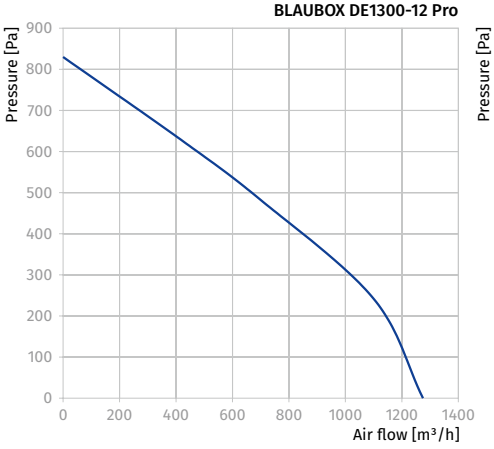
| Model | B | B1 | B2 | B3 | H | H1 | H2 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|
| **BLAUBOX DE1300-12 Pro** | 400 | 420 | 624 | 582 | 200 | 220 | 374 | 1145 | 1106 |
| **BLAUBOX DE2500-18 Pro** | 500 | 520 | 689 | 646 | 300 | 320 | 447 | 1250 | 1212 |
| **BLAUBOX DE3300-21 Pro** | 600 |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



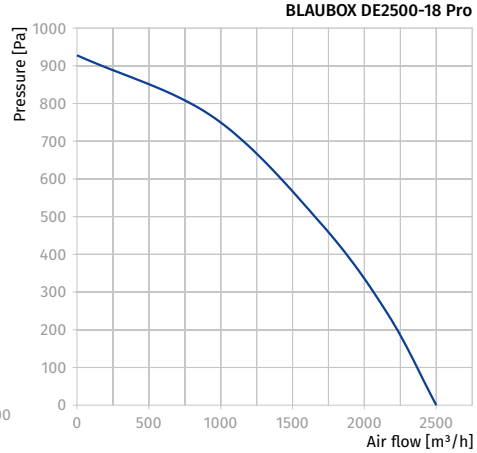
## Technical data

| Parameters | BLAUBOX DE1300-12 Pro | BLAUBOX DE2500-18 Pro | BLAUBOX DE3300-21 Pro |
|---|---|---|---|
| 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 [m³/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...+40 | -25...+40 | -25...+40 |
| 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 |

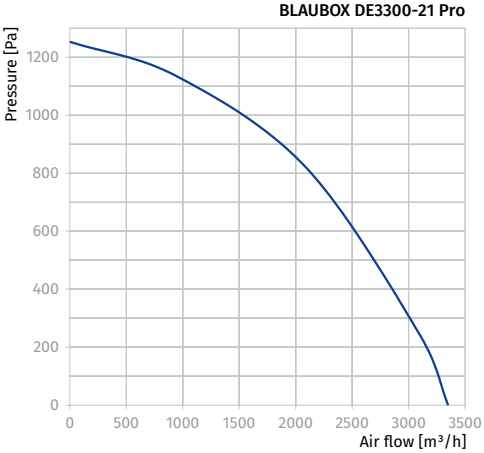
BLAUBOX DE1300-12 Pro




BLAUBOX DE2500-18 Pro




BLAUBOX DE3300-21 Pro



## Accessories

| | | BLAUBOX DE1300-12 Pro | BLAUBOX DE2500-18 Pro | BLAUBOX DE3300-21 Pro |
|---|---|---|---|---|
| **G4 panel filter** |  | FP 442x275x47 G4 | FP 442x275x47 G4 | FP 545x390x47 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 |
| **Air flow dampers** |  | SL 40x20 | SL 50x30 | SL 560x35 |
| **Flexible anti-vibration connector** |  | EVA 40x20 | EVA 50x30 | EVA 60x35 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 |

# BLAUBOX DW PRO

## 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

ErP 2016 ErP 2018

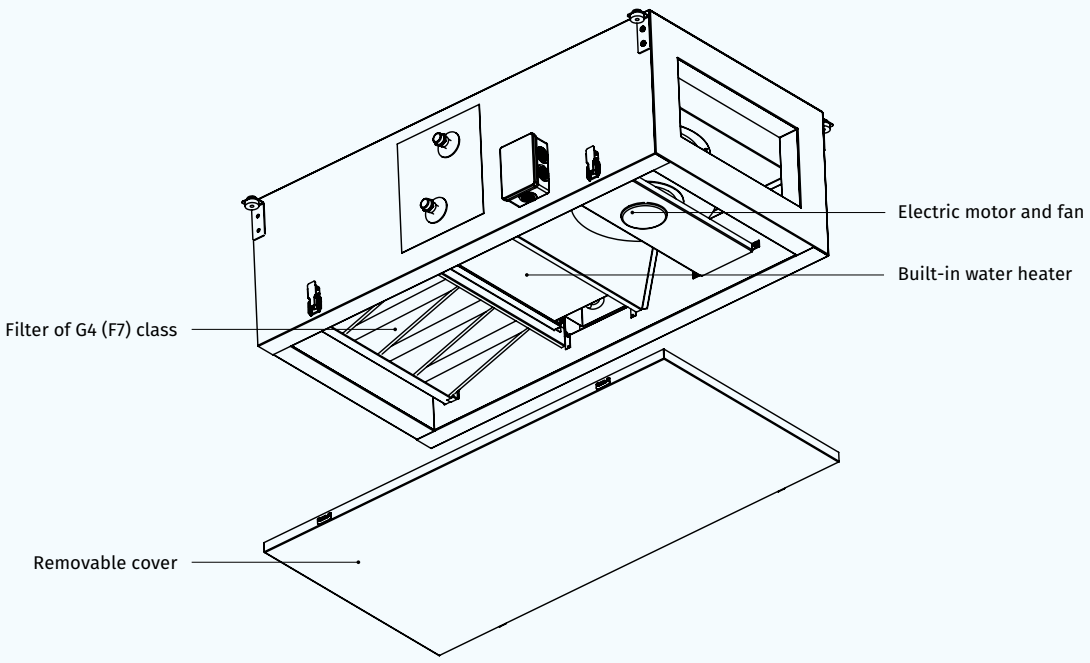
### Design

- 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 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

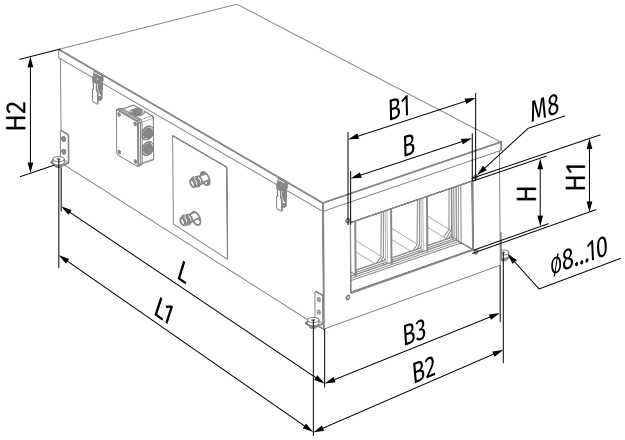
- The unit is suitable for mounting on the floor, ceiling mounting or wall mounting with fixing brackets in any mounting position except for the vertical one with air flow downwards.
- The correct mounted unit must provide free access to the hinged panel for servicing and filter replacement.

## Designation key

| Serie | Casing modification | Heater type | Nominal air flow [m³/h] | | Number of water coil rows | Control |
|---|---|---|---|---|---|---|
| BLAUBOX | **D:** Suspended mounting | **W:** water heater | **1200; 2300; 3200; 4100** | – | **3; 4** | **Pro:** with control panel |

## Overall dimensions [mm]

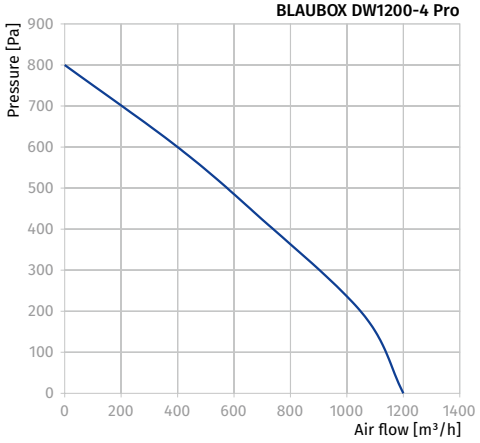
| Model | B | B1 | B2 | B3 | H | H1 | H2 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|
| BLAUBOX DW1200-4 Pro | 400 | 420 | 624 | 582 | 200 | 220 | 374 | 1145 | 1106 |
| BLAUBOX DW2300-4 Pro | 500 | 520 | 689 | 646 | 300 | 320 | 447 | 1250 | 1212 |
| BLAUBOX DW3200-4 Pro | 600 | 620 | 787 | 744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



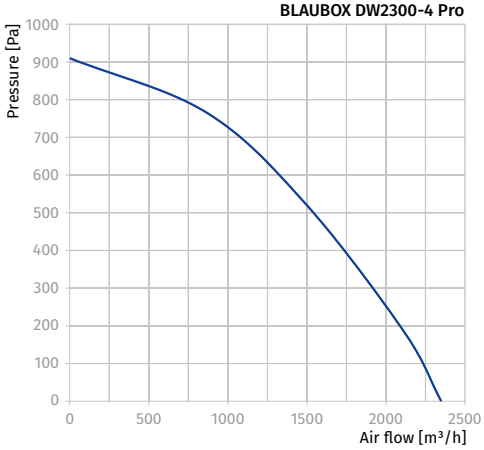
## Technical data

| Parameters | BLAUBOX DW1200-4 Pro | BLAUBOX DW2300-4 Pro | BLAUBOX DW3200-4 Pro | BLAUBOX DW4100-3 Pro |
|---|---|---|---|---|
| Voltage [V / 50 Hz] | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 | 3 ~ 400 |
| Number of water (glycol) coil rows | 4 | 4 | 4 | 3 |
| Power [kW] | 0.32 | 0.62 | 1.33 | 2.3 |
| Current [A] | 0.55 | 1.05 | 2.4 | 4.3 |
| Maximum air flow [m³/h (l/s)] | 1200 (333) | 2350 (653) | 3260 (906) | 4100 (1139) |
| RPM [min⁻¹] | 2700 | 2690 | 2730 | 2840 |
| Sound pressure level at 3 m [dBA] | 51 | 54 | 57 | 75 |
| Transported air temperature [°C] | -25...+40 | -25...+40 | -25...+40 | -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] | 400x200 | 500x300 | 600x350 | 700x400 |
| Weight [kg] | 57 | 63 | 94 | 110 |
| ErP | 2016, 2018 | 2016, 2018 | 2016, 2018 | 2016, 2018 |

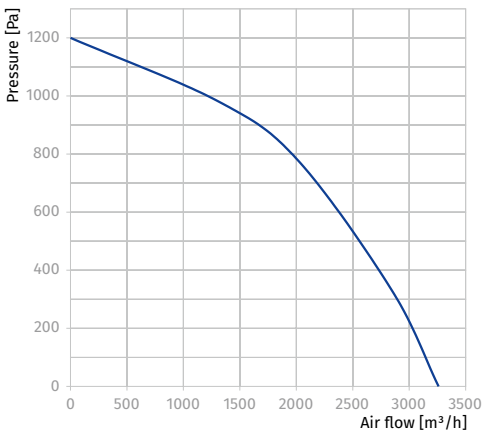
**BLAUBOX DW1200-4 Pro**



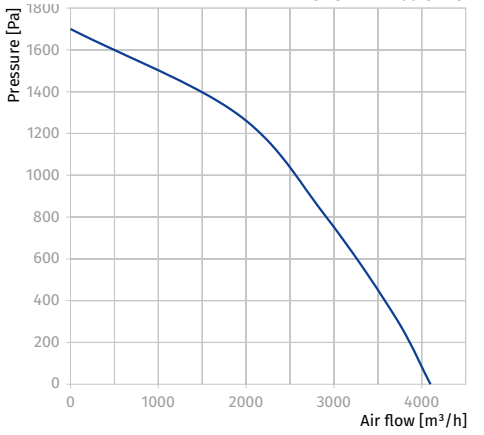

**BLAUBOX DW2300-4 Pro**



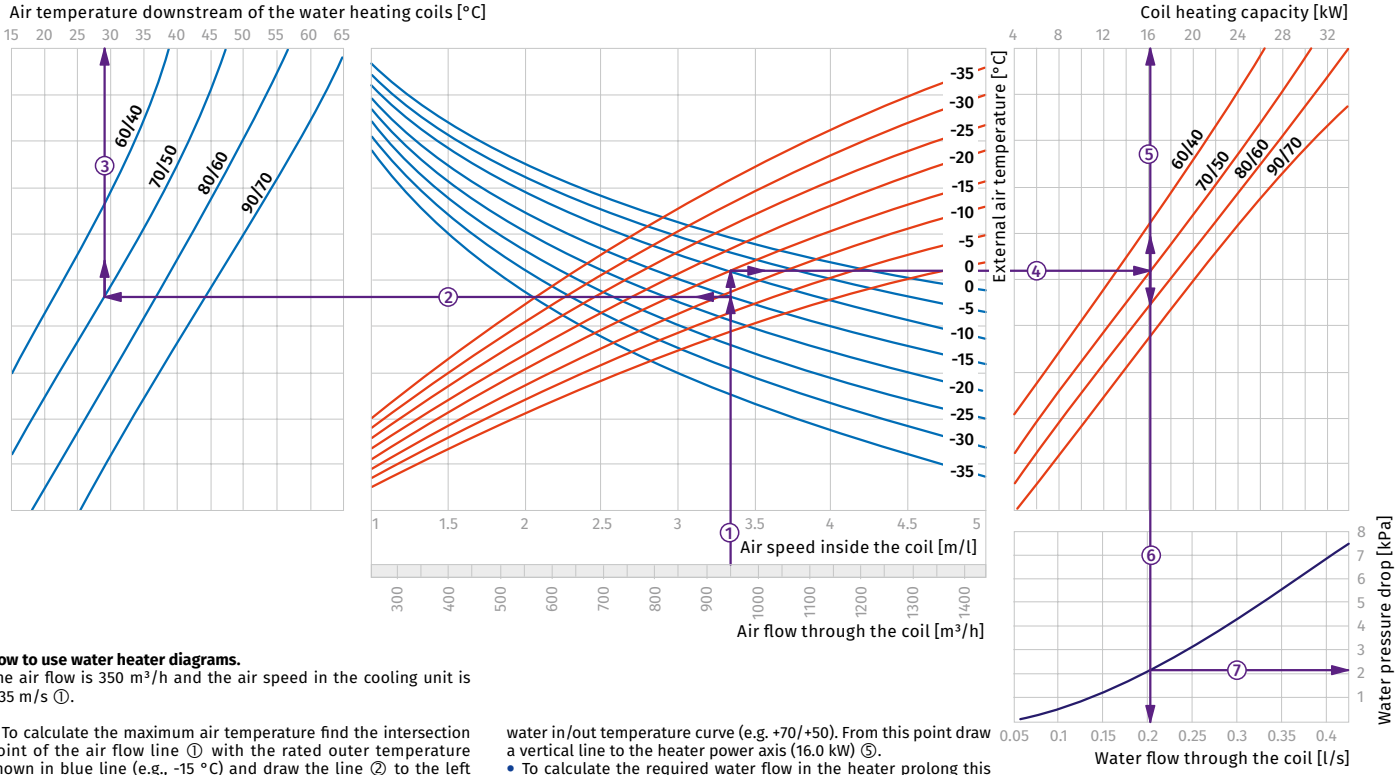

**BLAUBOX DW3200-4 Pro**




**BLAUBOX DW4100-3 Pro**



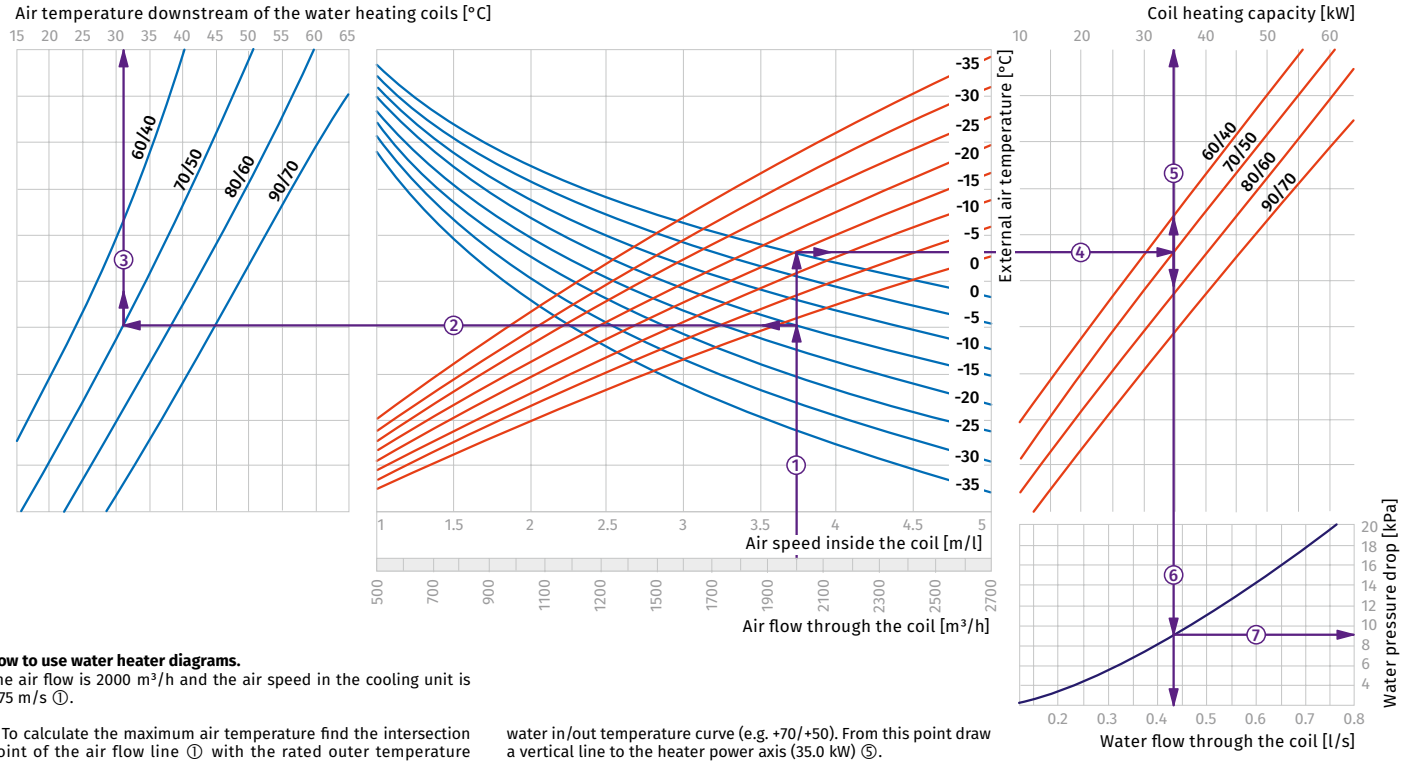
## BLAUBOX DW1200-4 PRO




**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).

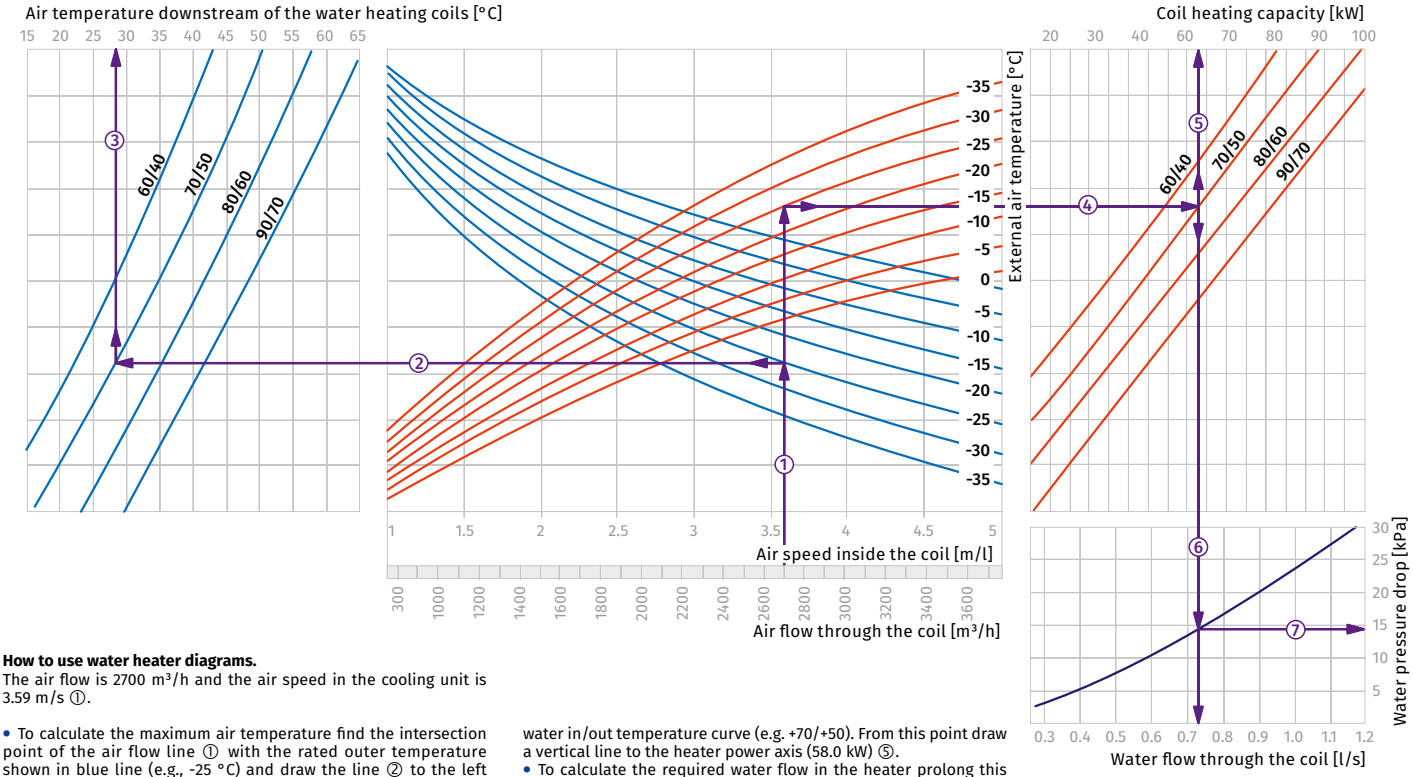
## BLAUBOX DW2300-4 PRO




**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).

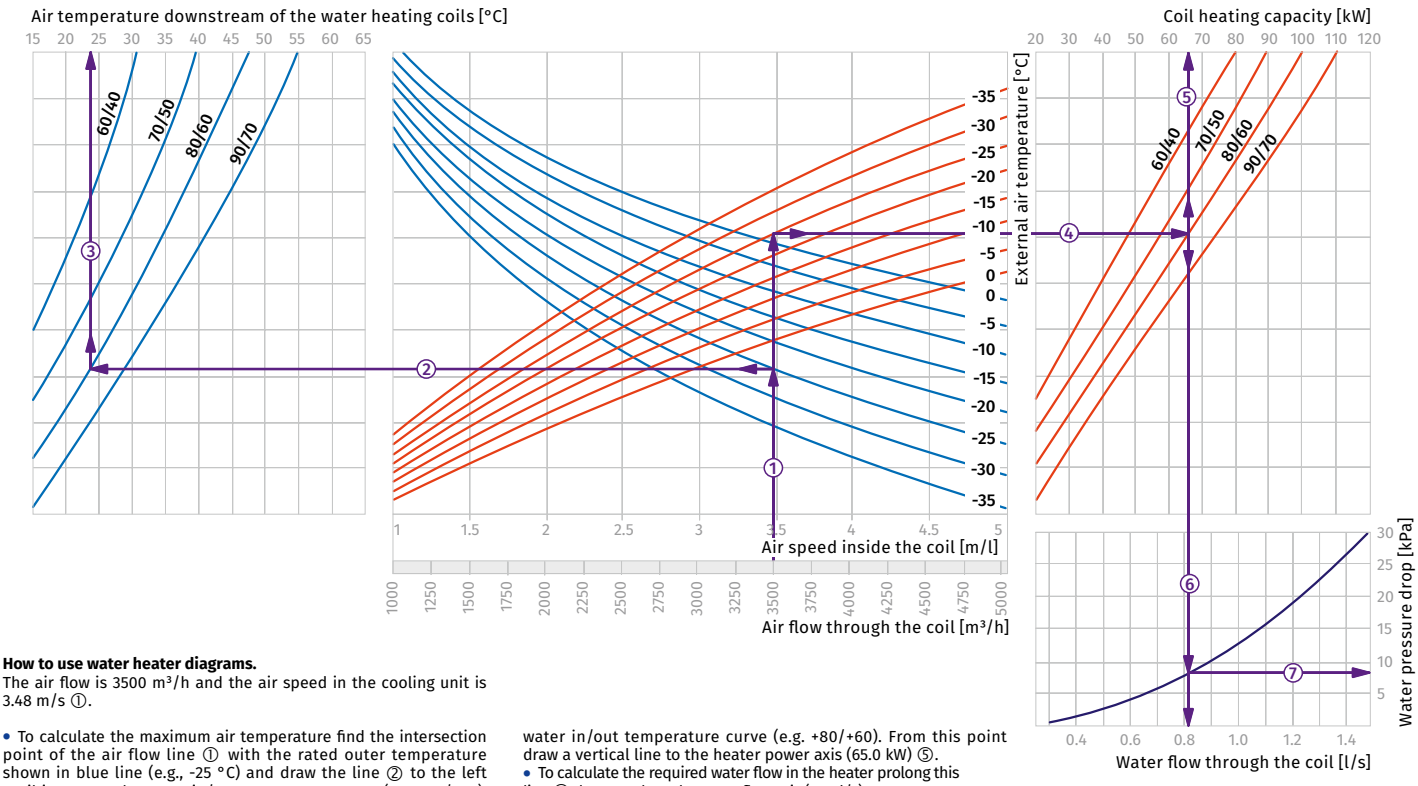
## BLAUBOX DW3200-4 PRO




**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 DW4100-3 PRO




**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

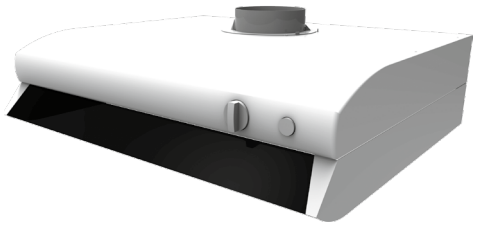
| | | BLAUBOX DW1200-4 Pro | BLAUBOX DW2300-4 Pro | BLAUBOX DW3200-4 Pro | BLAUBOX DW4100-3 Pro |
|---|---|---|---|---|---|
| **G4 pocket filter** |  | FPT 538x342x27 G4 | FPT 538x342x27 G4 | FPT 637x395x27 G4 | FPT 737x441x27 G4 |
| **Silencer** |  | SD 40x20 | SD 50x30 | SD 60x35 | SD 80x50 |
| **Duct cooling unit** |  | KFK 40x20-3 | KFK 50x30-3 | KFK 60x35-3 | KFK 70x40-3 |
| **Duct cooling unit** |  | KWK 40x20-3 | KWK 50x30-3 | KWK 60x35-3 | KWK 70x40-3 |
| **Water mixing unit** |  | WMG | WMG | WMG | WMG |
| **Air flow dampers** |  | SL 40x20 | SL 50x30 | SL 60x35 | SL 70x40 |
| **Flexible anti-vibration connector** |  | EVA 40x20 | EVA 50x30 | EVA 60x35 | EVA 70x40 |
| **Air damper electric actuator** |  | LF230 | LF230 | LF230 | LF230 |
| **Air damper electric actuator** |  | TF230 | TF230 | TF230 | TF230 |

# DAH 251-15

## Kitchen exhaust hood

### Features

- The kitchen exhaust hood is designed to clean air from combustion products, fumes, fumes and cooking smells.
- As the kitchen hood turns on, the air damper opens and the high speed activation signal is sent to the air handling unit.
- The kitchen exhaust hood is equipped with a light and a polyester filter.
- The kitchen exhaust hood is supplied with a cable and a mains plug.



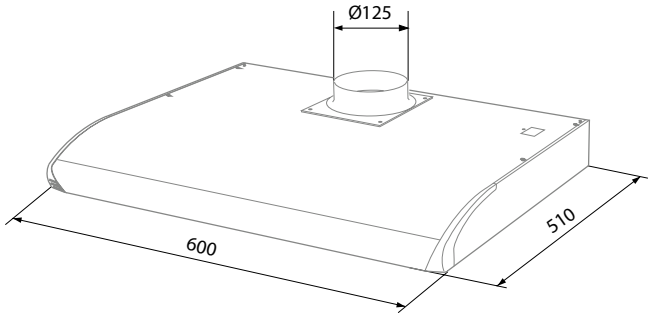
### Mounting

- The installation steps are described in the operation manual.
- The mounting accessories and screws are included with the unit.

### Technical data

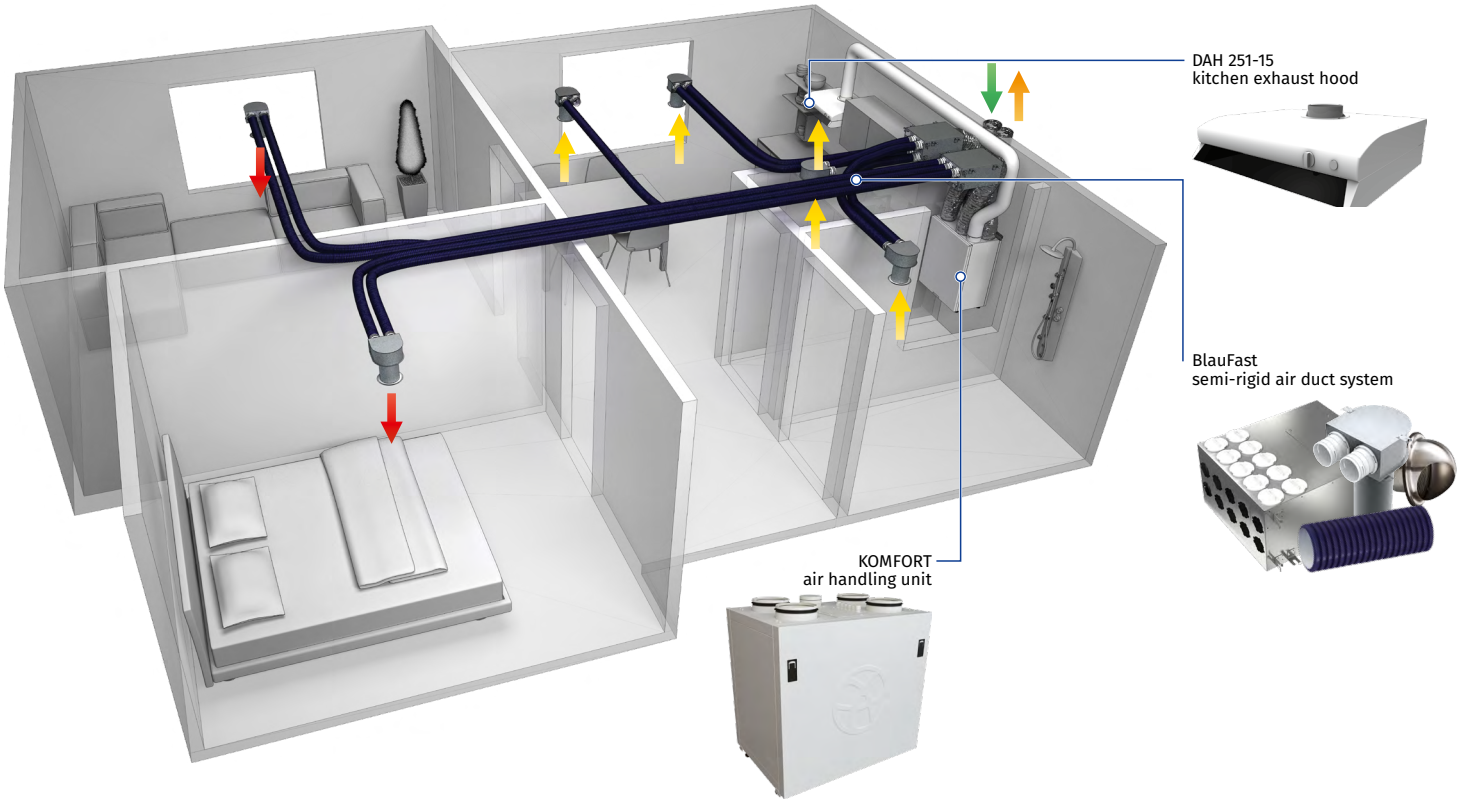
| Parametrs | DAH 251-15 |
|---|---|
| Voltage [V/50-60 Hz] | 230 |
| Power consumption [W] | 11 |

### Overall dimensions [mm]



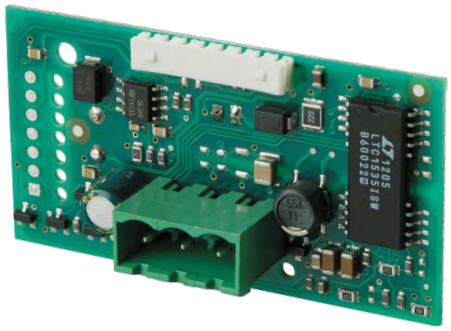

### Mounting example

**DAH 251-15** kitchen hood is suitable for direct connection to **KOMFORT Roto E S(E) 200 S17/S18** unit.



# PCOS004850

## Module for Modbus connection



### Features

- The PSOS004850 control module is designed for connection of the pCO series controllers (except for pCOB) to ventilation control systems in compliance with RS485 communication protocol.
- The PSOS004850 control module enables integration of the unit into a building management system.

### Compatibility

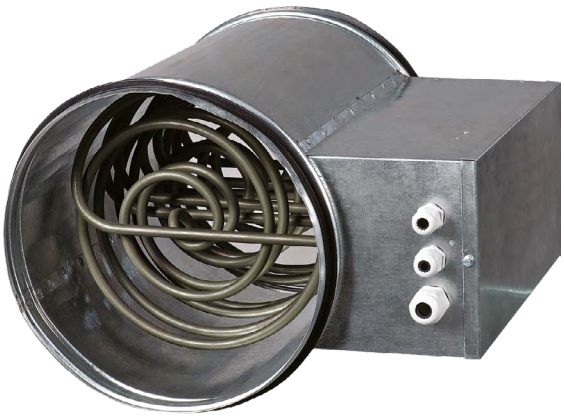
- The PSOS004850 control module is compatible with all the air handling units of KOMFORT Roto and CIVIC series with S17 and S18 controllers.

### Technical data

| Parameters | Values |
|---|---|
| **Cable cross section, mm²** | 0,2 - 2,5. Two-wire shielded twisted pair cable AWG20/22 |
| **Operating conditions** | from -10 up to + 60 °C, relative humidity 90 % |
| **Storage conditions** | from -10 up to + 70 °C, relative humidity 90 % |
| **Dimensions [mm]** | 60x29x20 |

# 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 Seriess.
- Equipped with overheat protection thermostats:
  - basic protection with automatic restart at +50 °C;
  - emergency protection with manual restart at +90 °C.

### Mounting

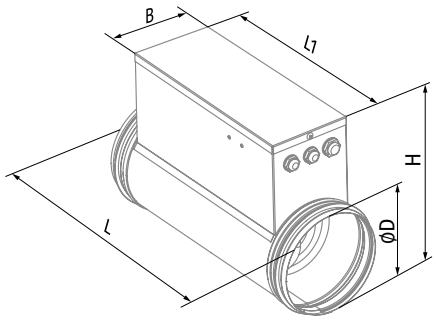
- Fixing to round ducts with clamps.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.
- Recommended distance between the heater and other system components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

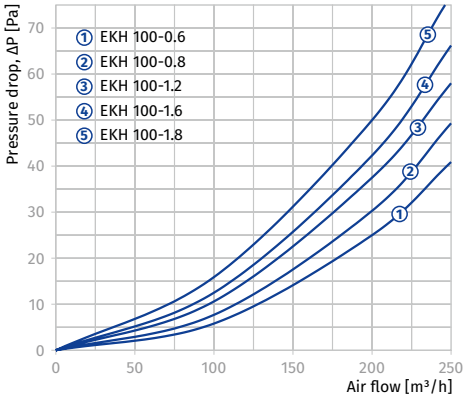
| Model | D | B | H | L | L1 |
|---|---|---|---|---|---|
| EKH 100-0.6 | 99 | 94 | 207 | 306 | 226 |
| EKH 100-0.8 | 99 | 94 | 207 | 306 | 226 |
| EKH 100-1.2 | 99 | 94 | 207 | 306 | 226 |
| EKH 100-1.6 | 99 | 94 | 207 | 306 | 226 |
| EKH 100-1.8 | 99 | 94 | 207 | 376 | 296 |
| EKH 125-0.6 | 124 | 103 | 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 |



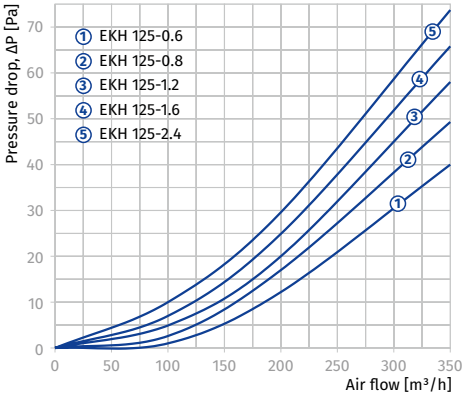
## Technical data

| 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 |

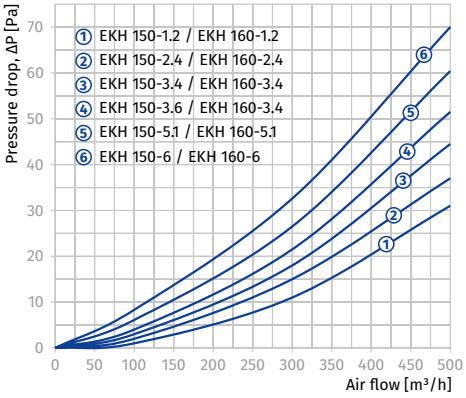
**EKH 100**



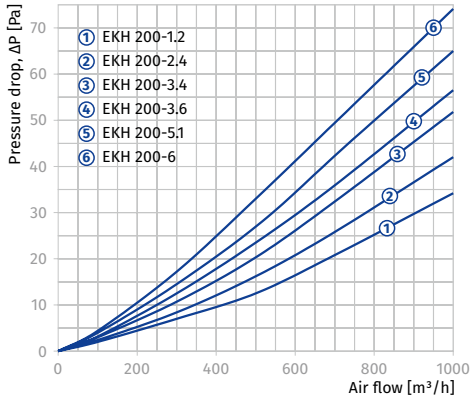

**EKH 125**



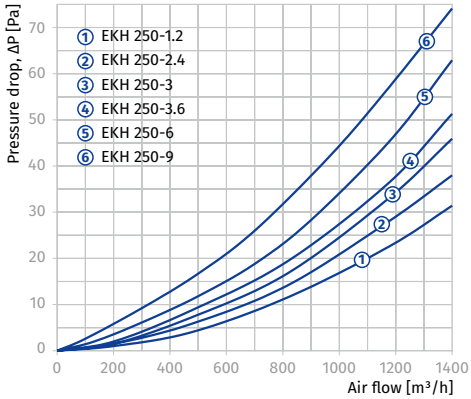

**EKH 150, EKH 160**



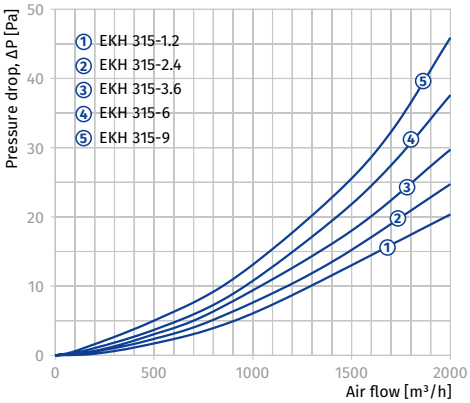

**EKH 200**



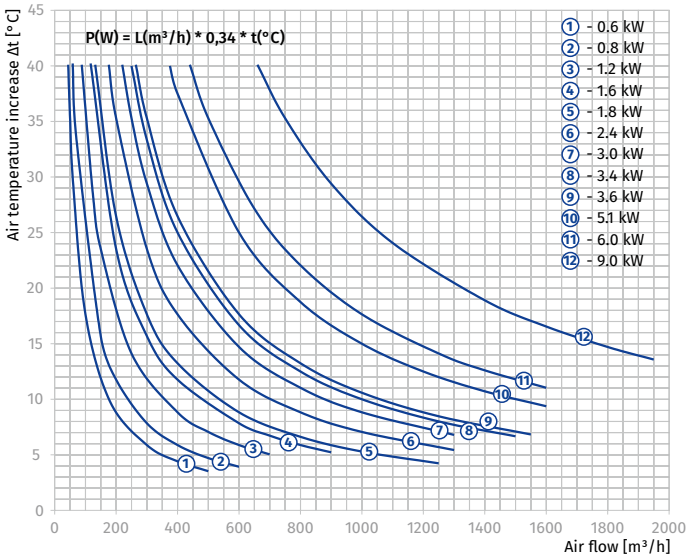

**EKH 250**




**EKH 315**




**Air temperature increase as a function of air flow**



# 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

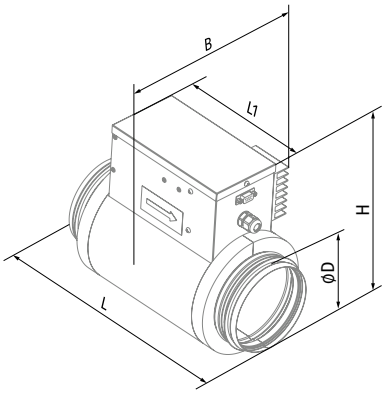
- Fixation to round air ducts by means of clamps (included in the delivery).
- In case of horizontal mounting position the control box cover must be directed upwards only. Permitted deviation up to 90°. The control box cover may not be positioned downwards!

### Compatibility chart

| Heater model | Unit model |
|---|---|
| ENH 125 | KOMFORT with spigot Ø 125 mm and S11, S21 control panel |
| ENH 150 | KOMFORT with spigot Ø 150 mm and S11, S21 control panel |
| ENH 160 | KOMFORT with spigot Ø 160 mm and S11, S21 control panel |
| ENH 200 | KOMFORT with spigot Ø 125 mm and S11, S21 control panel |

### 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 150-0.8-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-1.2-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-1.7-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-2.0-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 160-0.8-1 | 159 | 175 | 293 | 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 |




HEATERS

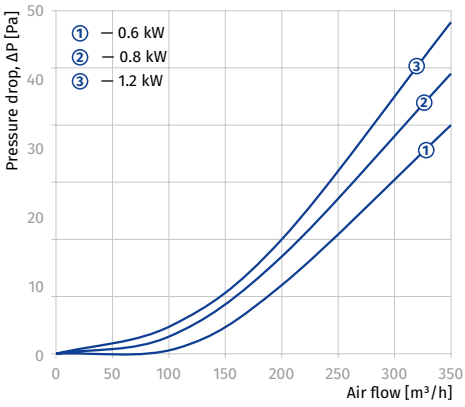
## Designation key

| Serie | Connected air duct diameter [mm] | | Heater power [kW] | | Number of phases |
|---|---|---|---|---|---|
| EVH | 125; 150; 160; 200 | – | 0.6; 0.8; 1.2; 1.7; 2.0 | – | 1: single-phase |

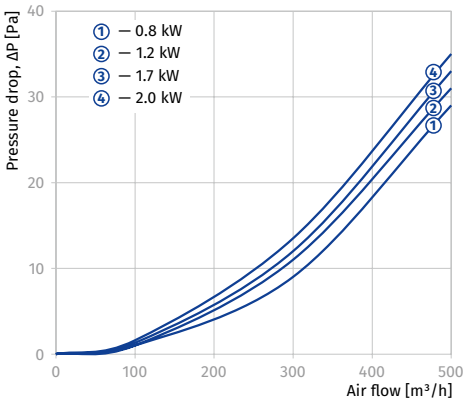
## Technical data

| Parameters | Min. air flow [m³/h (l/s)] | Power [kW] | Current [A] | Weight [kg] |
|---|---|---|---|---|
| EVH 125-0.6-1 | 60 (17) | 0.6 | 2.6 | 2.1 |
| EVH 125-0.8-1 | 80 (22) | 0.8 | 3.5 | 2.1 |
| EVH 125-1.2-1 | 90 (25) | 1.2 | 5.2 | 2.1 |
| EVH 150-0.8-1 | 80 (22) | 0.8 | 3.5 | 2.3 |
| EVH 150-1.2-1 | 90 (25) | 1.2 | 5.2 | 2.3 |
| EVH 150-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.3 |
| EVH 150-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.3 |
| EVH 160-0,8-1 | 80 (22) | 0.8 | 3.5 | 2.5 |
| EVH 160-1.2-1 | 150 (42) | 1.2 | 5.2 | 2.5 |
| EVH 160-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.5 |
| EVH 160-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.5 |
| EVH 200-1.2-1 | 150 (42) | 1.2 | 5.2 | 2.8 |
| EVH 200-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.8 |
| EVH 200-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.8 |

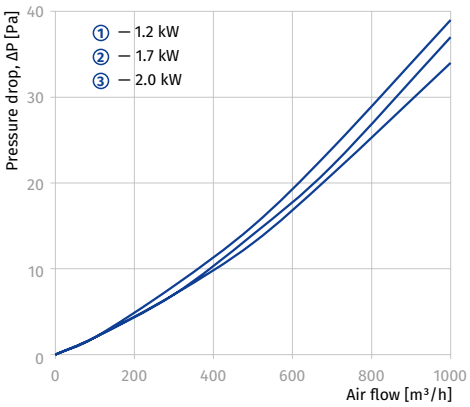
EVH 125



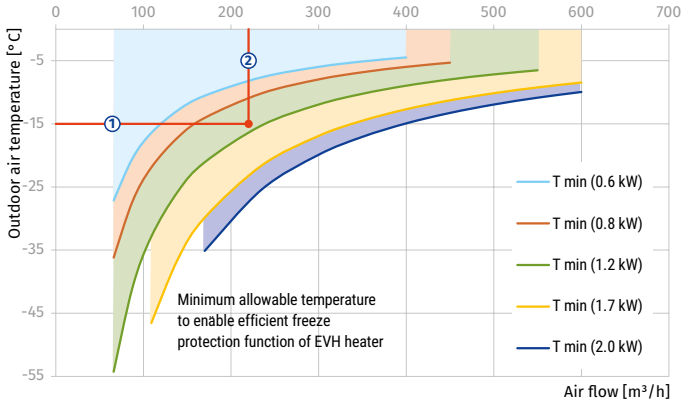

EVH 160




EVH 200




## Heater capacity selection diagram




**EVH heater parameters calculation example:**

- It is necessary to select EVH freeze protection heater for the KOMFORT EC SB350 S21 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 S21 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

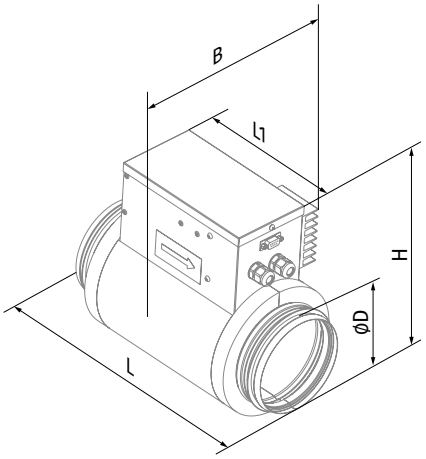
- The heater design ensures its mounting on the round ducts in any position by means of clamps (included in delivery). The air flow direction shall match the direction of the arrow on the heater casing. The heater is connected to the air handling unit controller using the cable with connectors. In case 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.

### Compatibility chart

| Heater model | Unit model |
|---|---|
| ENH 125 S21 | KOMFORT with spigot Ø 125 mm and S21 control panel |
| ENH 150 S21 | KOMFORT with spigot Ø 150 mm and S21 control panel |
| ENH 160 S21 | KOMFORT with spigot Ø 160 mm and S21 control panel |
| ENH 200 S21 | KOMFORT with spigot Ø 125 mm and S21 control panel |

### 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 150-0.8-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-1.2-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-1.7-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 150-2.0-1 | 149 | 170 | 282 | 306 | 190 |
| ENH 160-0.8-1 | 159 | 175 | 293 | 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 |




HEATERS

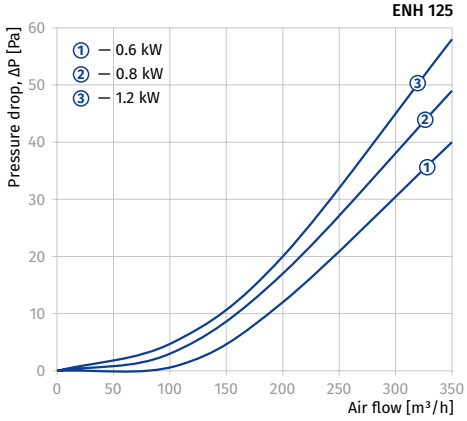
## Designation key

| Serie | Connected air duct diameter [mm] | | Heater power [kW] | | Number of phases | Compatibility with automation |
|---|---|---|---|---|---|---|
| ENH | 125; 160; 150; 200 | – | 0.6; 0.8; 1.2; 1.7; 2.0 | – | 1: single-phase | S21: compatible with S21 automation |

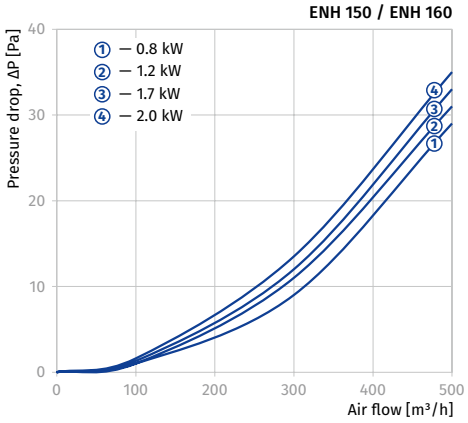
## Technical data

| Parameters | Min. air flow [m³/h (l/s)] | Power [kW] | Current [A] | Weight [kg] |
|---|---|---|---|---|
| ENH 125-0.6-1 | 60 (17) | 0.6 | 2.6 | 2.1 |
| ENH 125-0.8-1 | 80 (22) | 0.8 | 3.5 | 2.1 |
| ENH 125-1.2-1 | 90 (25) | 1.2 | 5.2 | 2.1 |
| ENH 150-0.8-1 | 80 (22) | 0.8 | 3.5 | 2.3 |
| ENH 150-1.2-1 | 90 (25) | 1.2 | 5.2 | 2.3 |
| ENH 150-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.3 |
| ENH 150-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.3 |
| ENH 160-0.8-1 | 80 (22) | 0.8 | 3.5 | 2.5 |
| ENH 160-1.2-1 | 150 (42) | 1.2 | 5.2 | 2.5 |
| ENH 160-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.5 |
| ENH 160-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.5 |
| ENH 200-1.2-1 | 150 (42) | 1.2 | 5.2 | 2.8 |
| ENH 200-1.7-1 | 160 (44) | 1.7 | 7.4 | 2.8 |
| ENH 200-2.0-1 | 170 (47) | 2.0 | 8.7 | 2.8 |

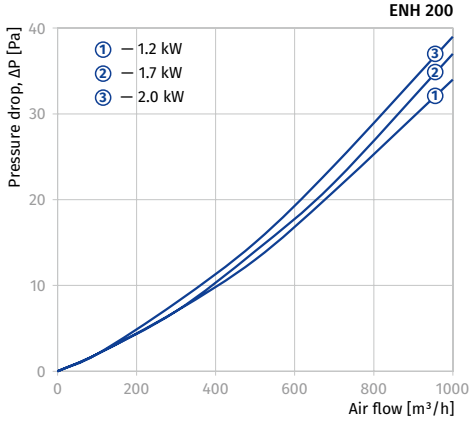
ENH 125



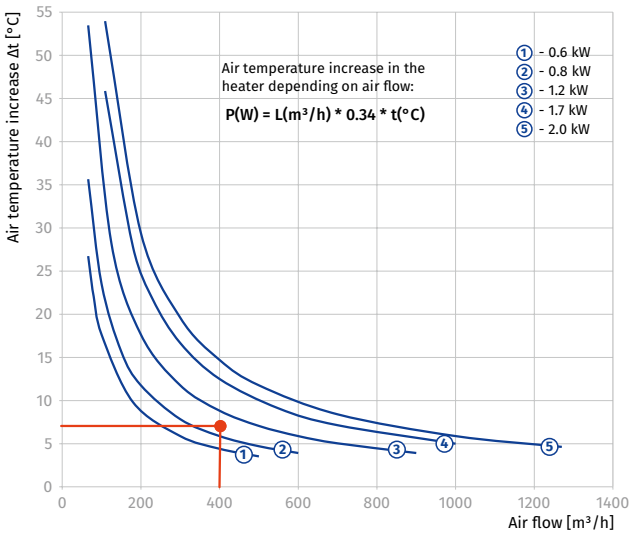

ENH 150 / ENH 160




ENH 200




## 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 S21. 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** with the diameter matching the spigot diameter of the air handling unit KOMFORT EC SB350 S21 is a suitable model.

# WKH

## Duct water heaters for round ducts

### Features

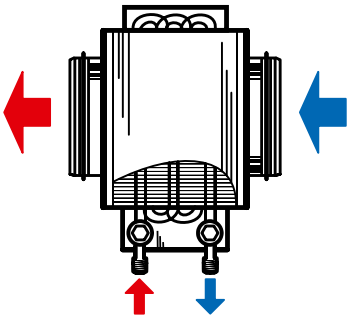
- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor Features use antifreezing mixture (ethylene glycol solution).
- Compatible with Ø100 to 315 mm round air ducts.

### Design

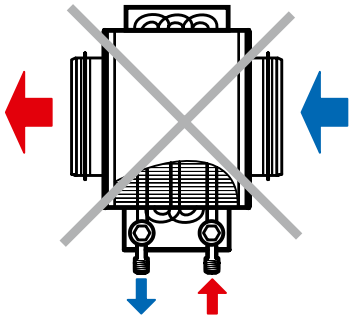
- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Airtight connection with air ducts due to rubber seals.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor 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



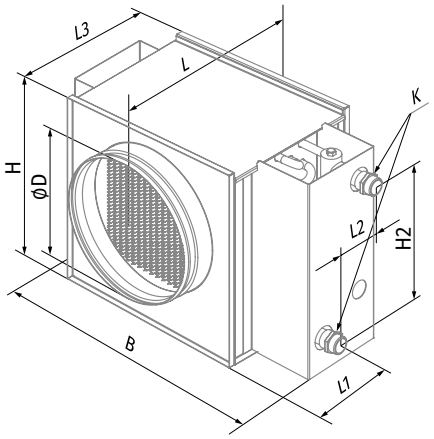
Connection along air flow

## Designation key

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

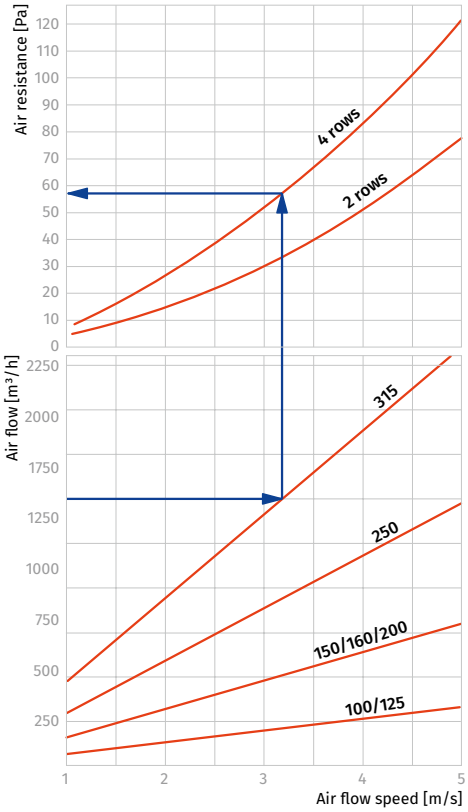
## Overall dimensions [mm]

| 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 |



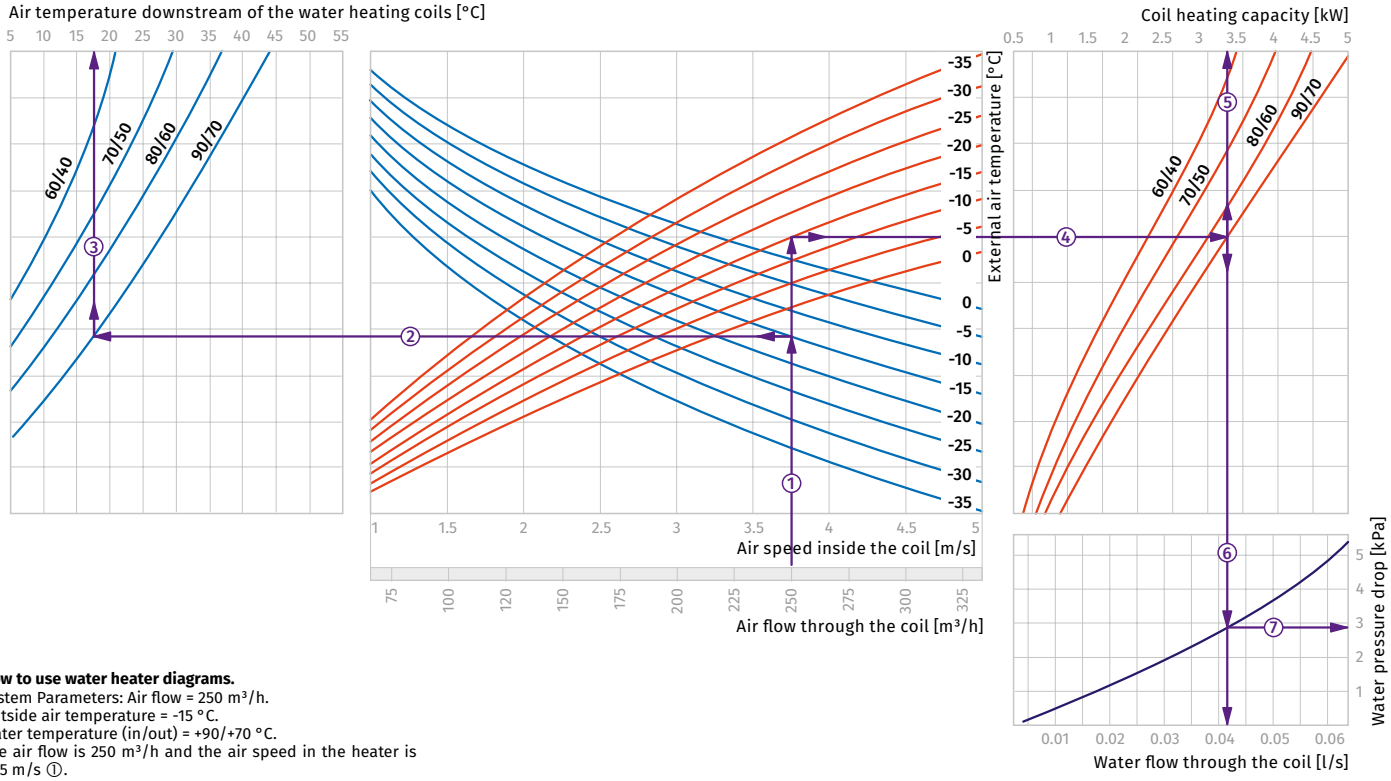

### WKH ROUND HEATERS

**Air pressure loss for water heaters WKH**



# Water heaters calculation diagram

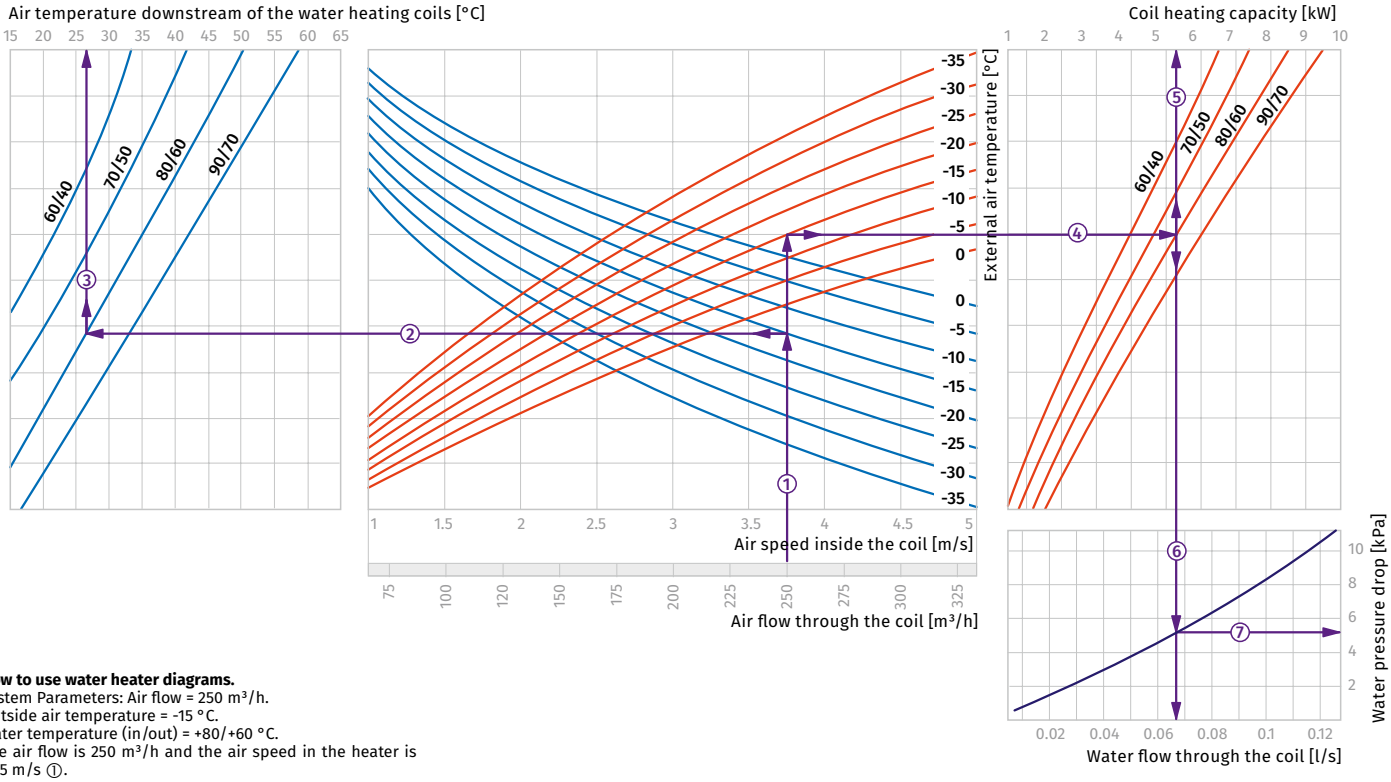
## WKH 100-2 / WKH 125-2




**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 (0.042 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

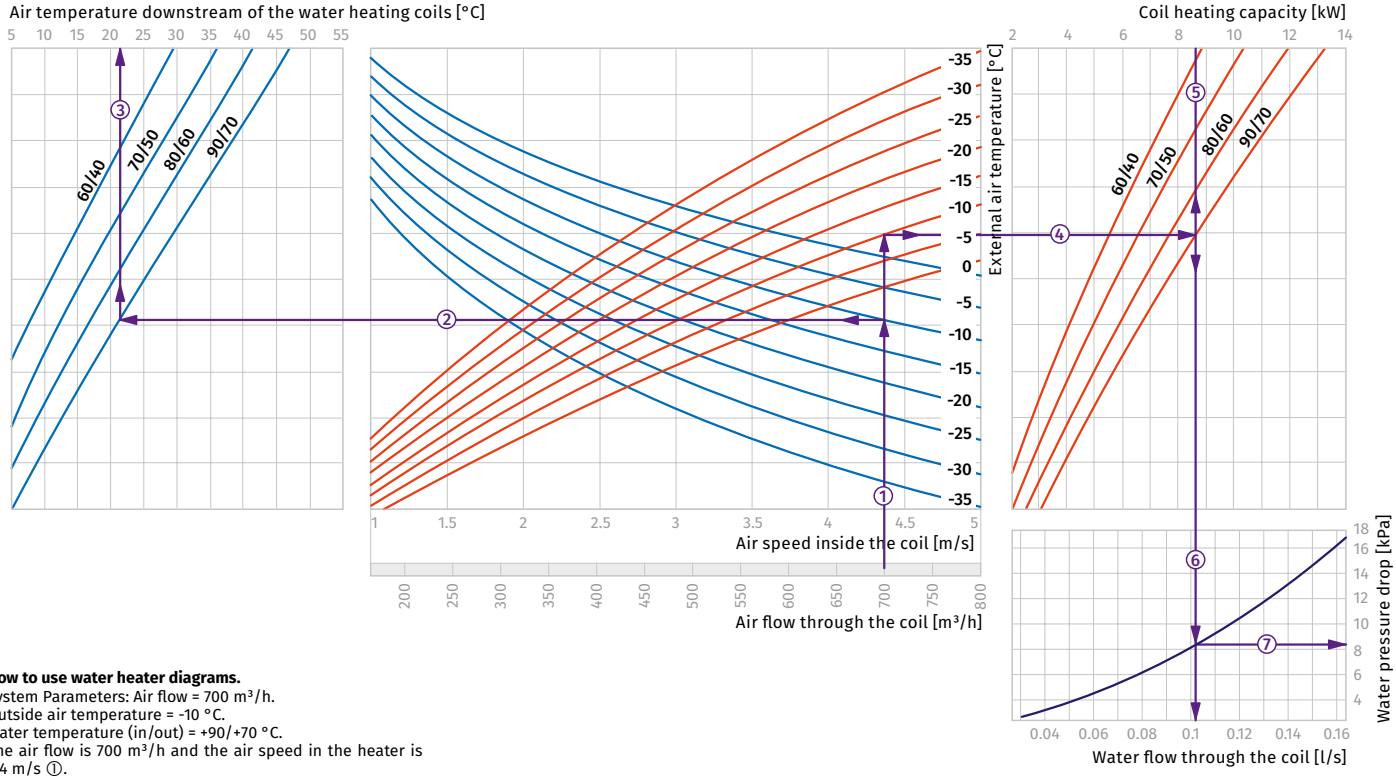



**How to use water heater diagrams.**
System Parameters: Air flow = 250 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +80/+60 °C.
The air flow is 250 m³/h and the air speed in the heater is 3.75 m/s ①.

- 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).

HEATERS

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



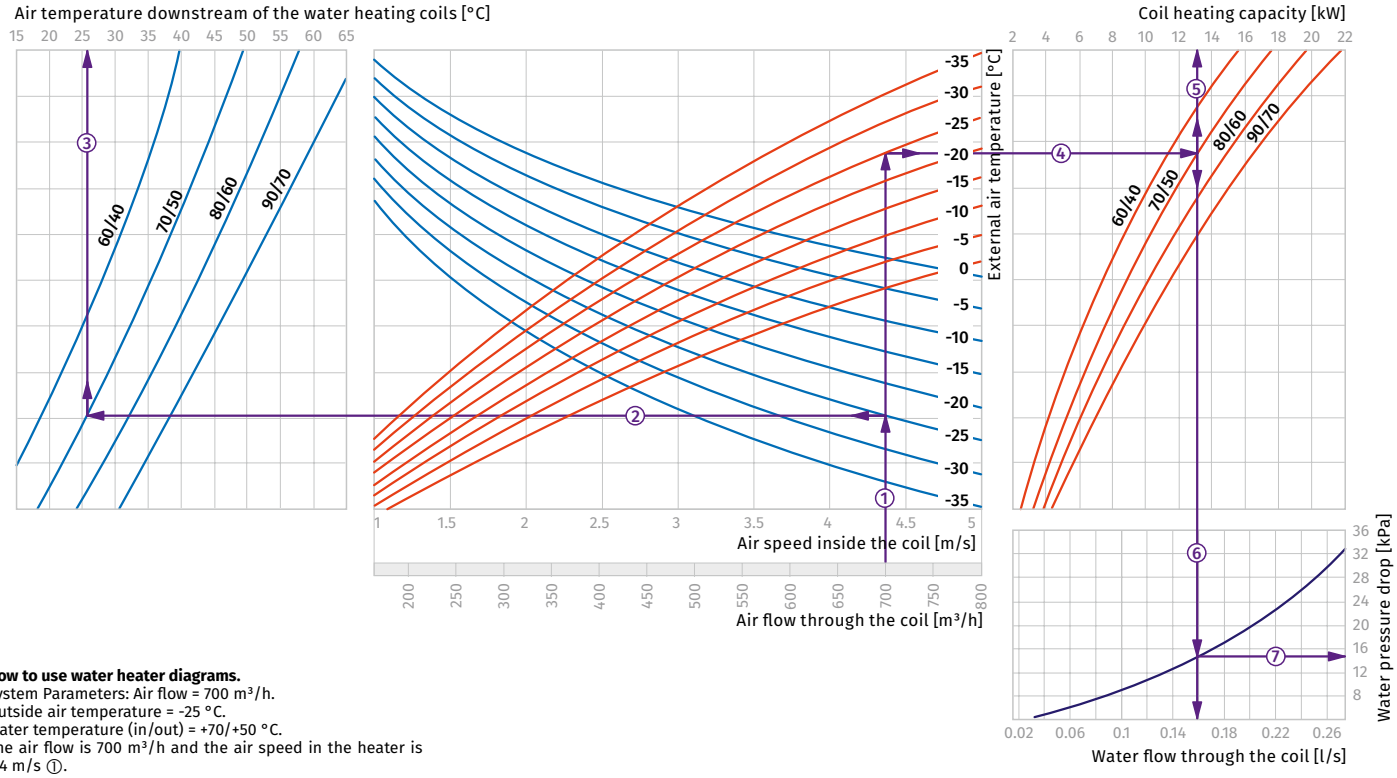

**How to use water heater diagrams.**
System Parameters: Air flow = 700 m³/h.
Outside air temperature = -10 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 700 m³/h and the air speed in the heater is 4.4 m/s ①.

- 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



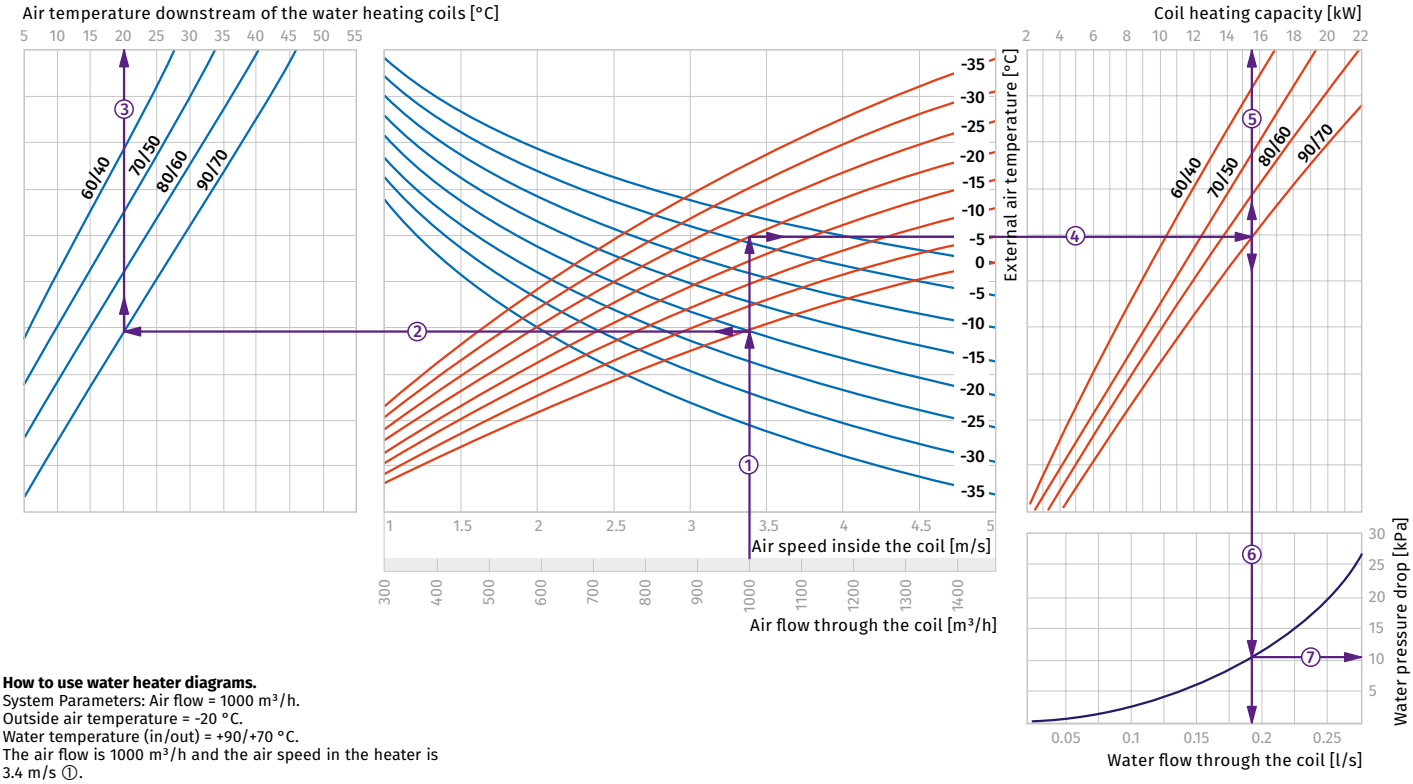

**How to use water heater diagrams.**
System Parameters: Air flow = 700 m³/h.
Outside air temperature = -25 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 700 m³/h and the air speed in the heater is 4.4 m/s ①.

- 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).

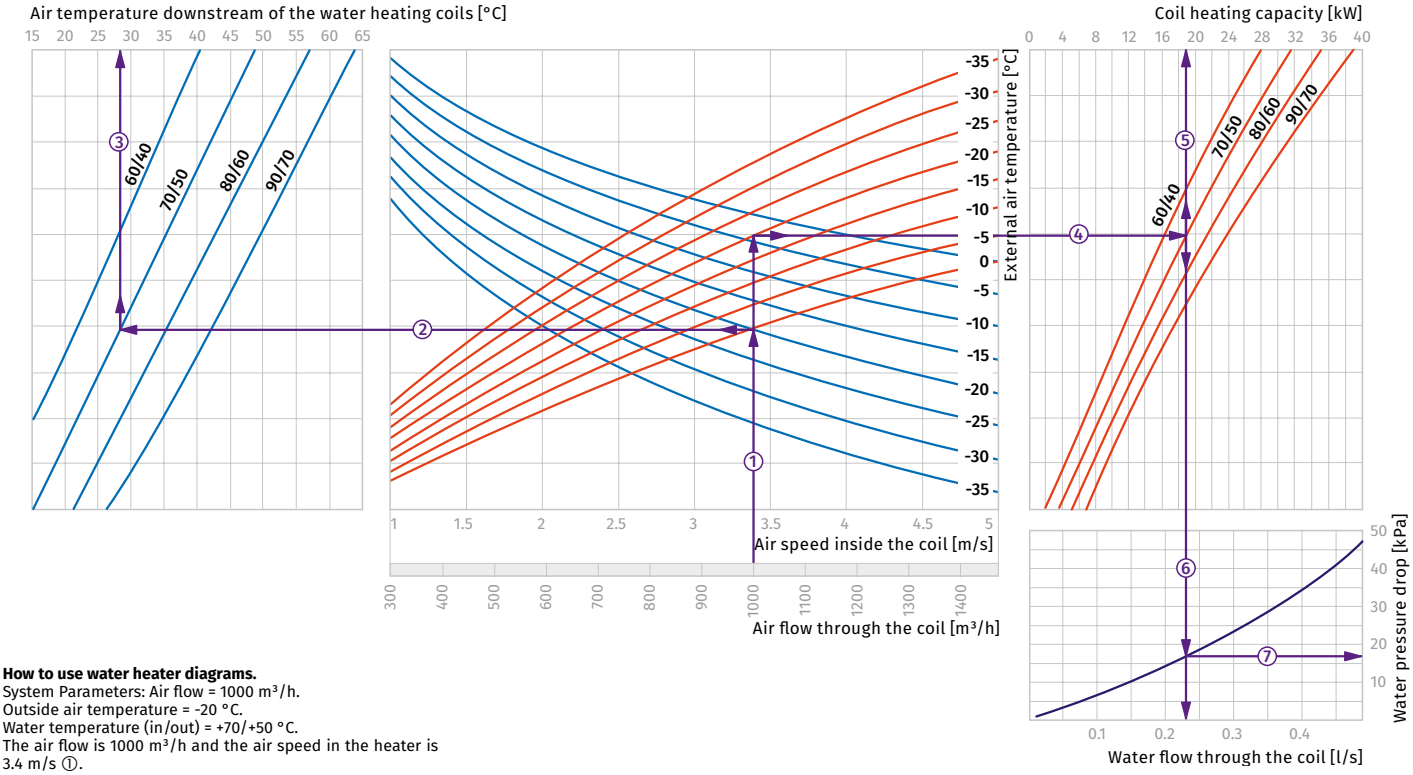
## WKH 250-2




**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).

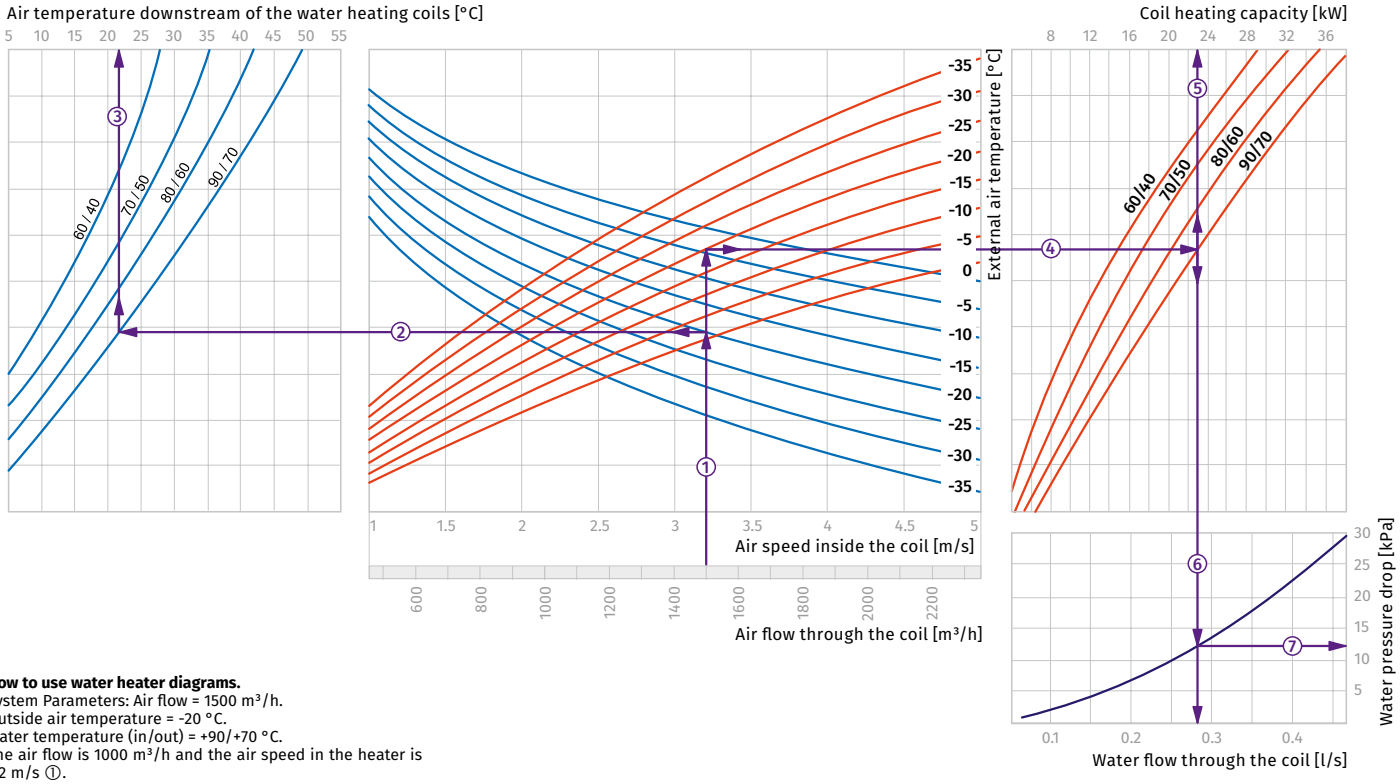
## WKH 250-4




**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).

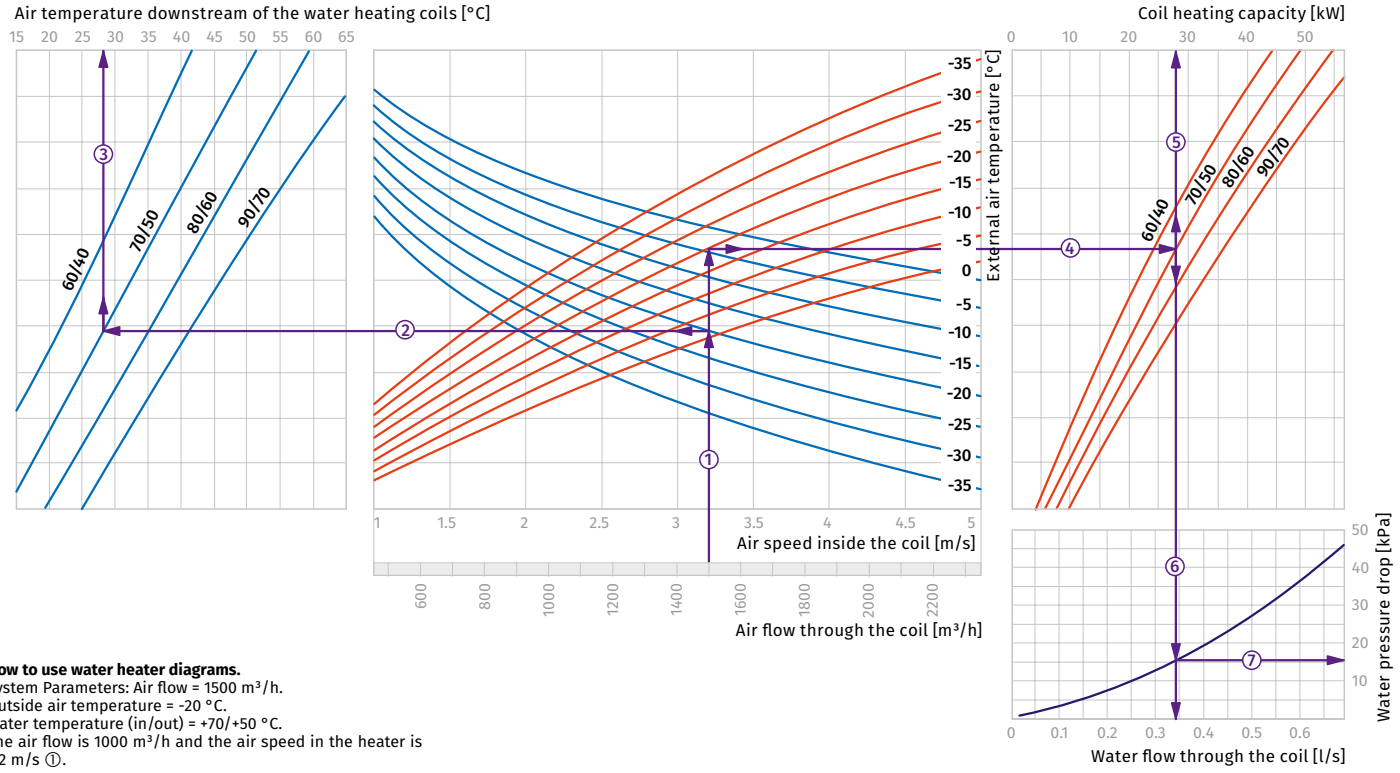
## WKH 315-2




**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




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

### Mounting

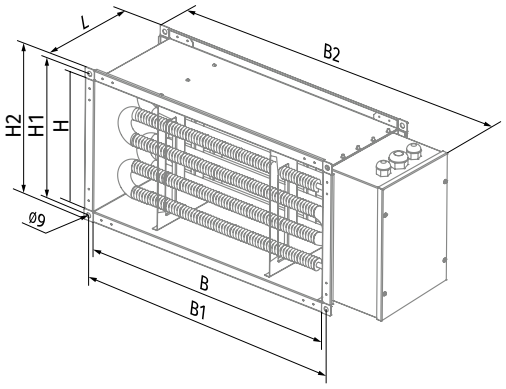
- Fixing to rectangular ducts with flange connection.
- Any mounting position except for the junction box downwards to prevent condensate leakage and short circuit.
- Install a filter upstream to the heater to protect heating elements against dirt ingress.
- Recommended distance between the heater and 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]

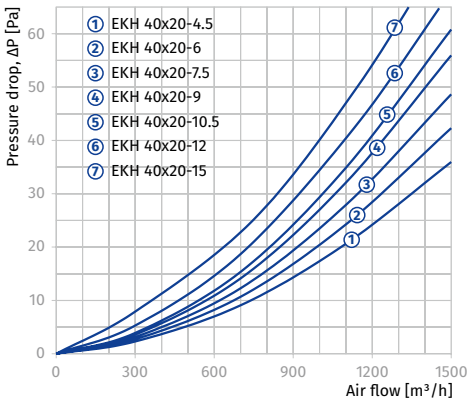
| Model | B | B1 | B2 | H | H1 | H2 | L |
|---|---|---|---|---|---|---|---|
| EKH 40x20-4.5 | 400 | 420 | 540 | 200 | 220 | 240 | 200 |
| EKH 40x20-6 | 400 | 420 | 540 | 200 | 220 | 240 | 200 |
| EKH 40x20-7.5 | 400 | 420 | 540 | 200 | 220 | 240 | 200 |
| EKH 40x20-9 | 400 | 420 | 540 | 200 | 220 | 240 | 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 |



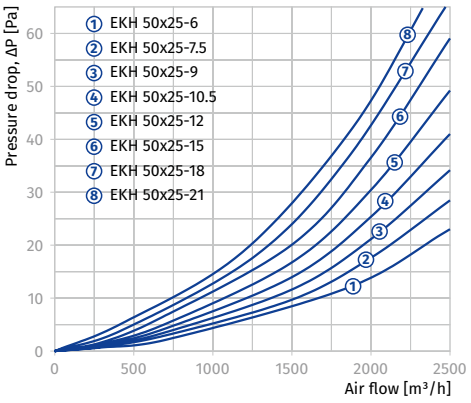
## Technical data

| Model | Minimum air flow [m³/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 |

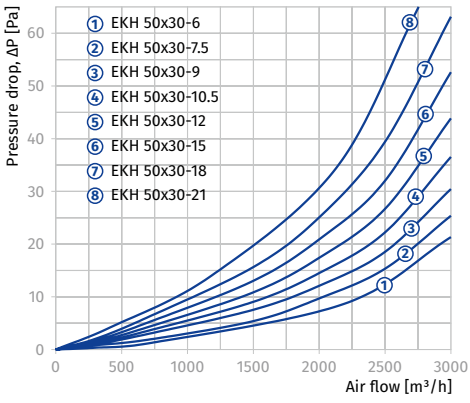
EKH 40x20



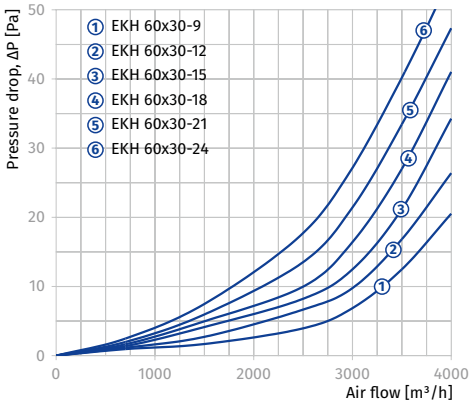

EKH 50x25



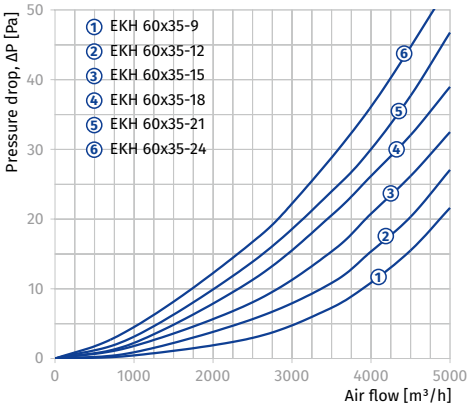

EKH 50x30



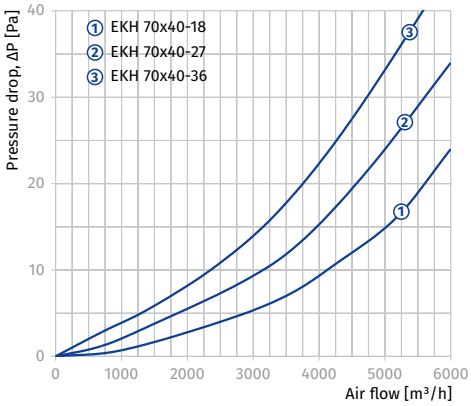

EKH 60x30



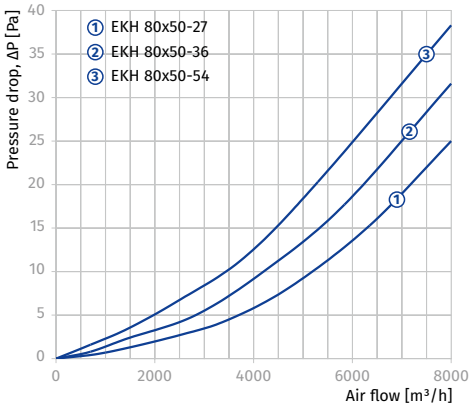

EKH 60x35



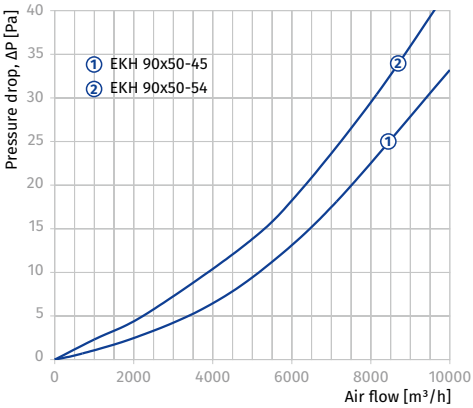

EKH 70x40



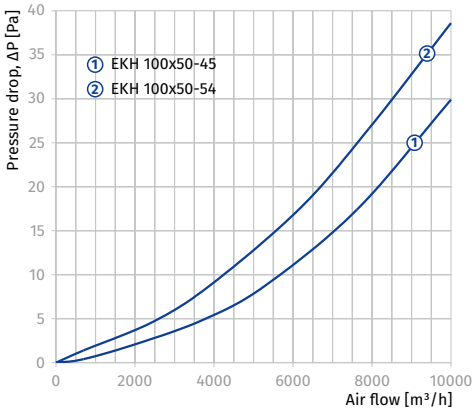

EKH 80x50



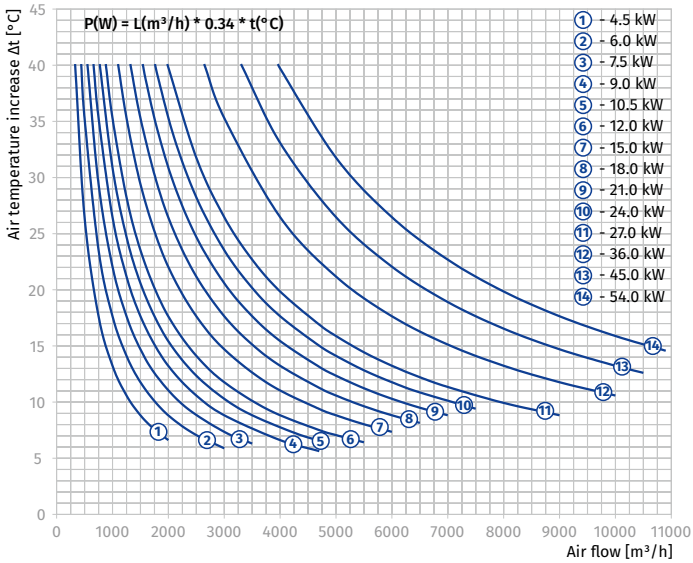

EKH 90x50




EKH 100x50




**Air temperature increase as a function of air flow**



# WKH

## Duct water heaters for rectangular ducts

### Features

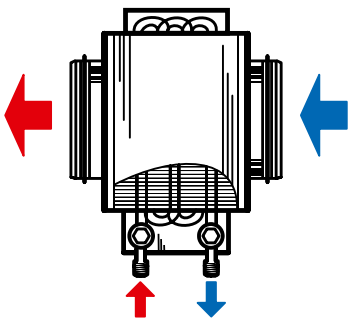
- For warming up of supply air in ventilation systems installed in various premises.
- Suitable for installation in supply or air handling units to warm up the supply air flow.
- For indoor use only if water serves as a heat carrier.
- For outdoor Features use antifreezing mixture (ethylene glycol solution).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

### Design

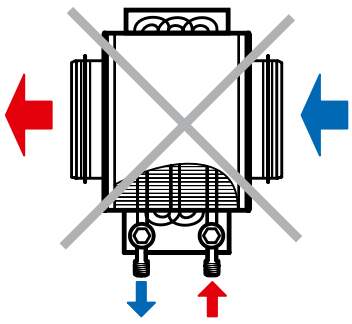
- Galvanized steel case.
- Copper pipe manifold.
- Heat exchange surface made of aluminium plates.
- Equipped with a nipple for the system deaeration.
- Outlet header is equipped with a spigot for installation of an immersion temperature sensor or freezing protection mechanism.
- Available in two, three- 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**



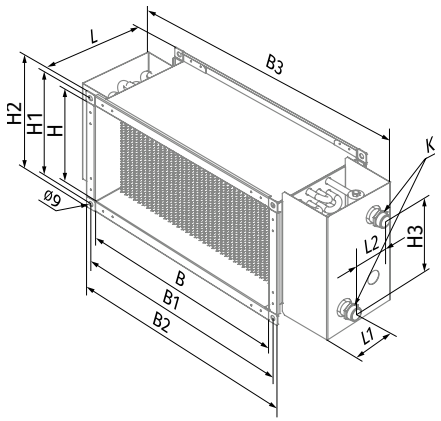
**Connection along air flow**

## 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 |

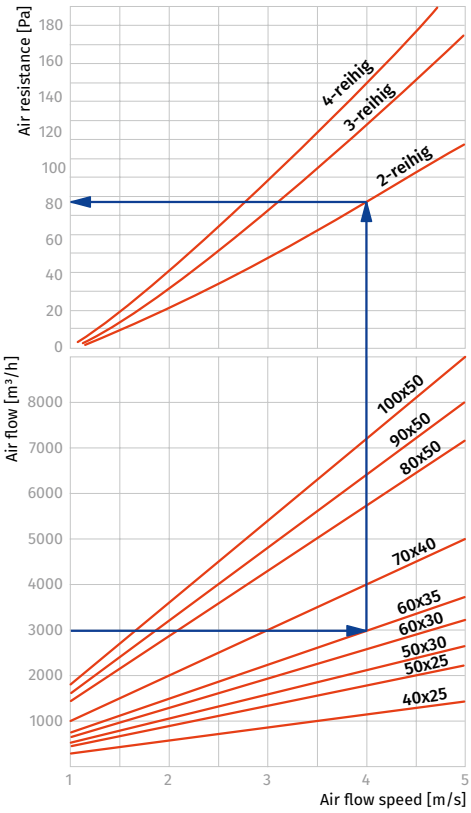
## Overall dimensions [mm]

| 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 |



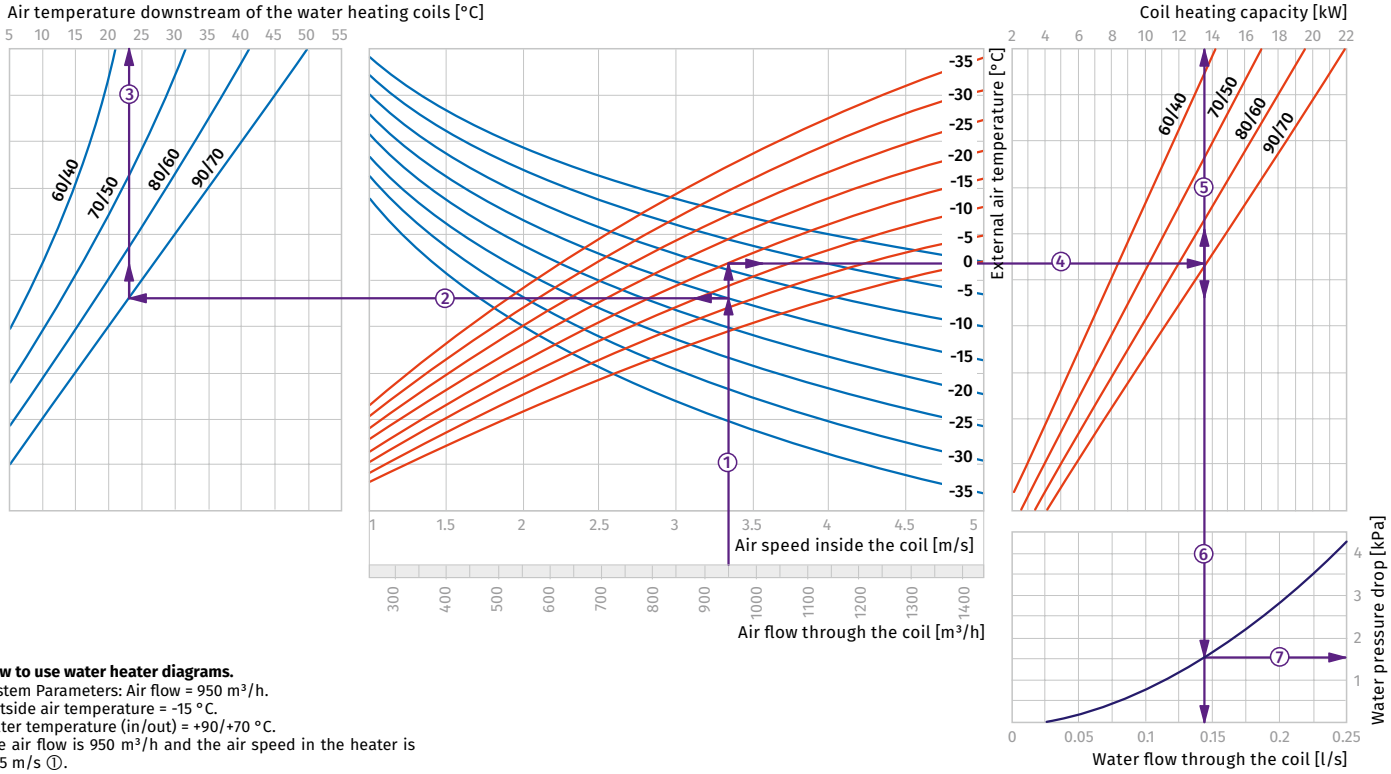

### WKH rectanglar heaters

**Air pressure loss for water heaters WKH**



## Water heaters calculation diagram

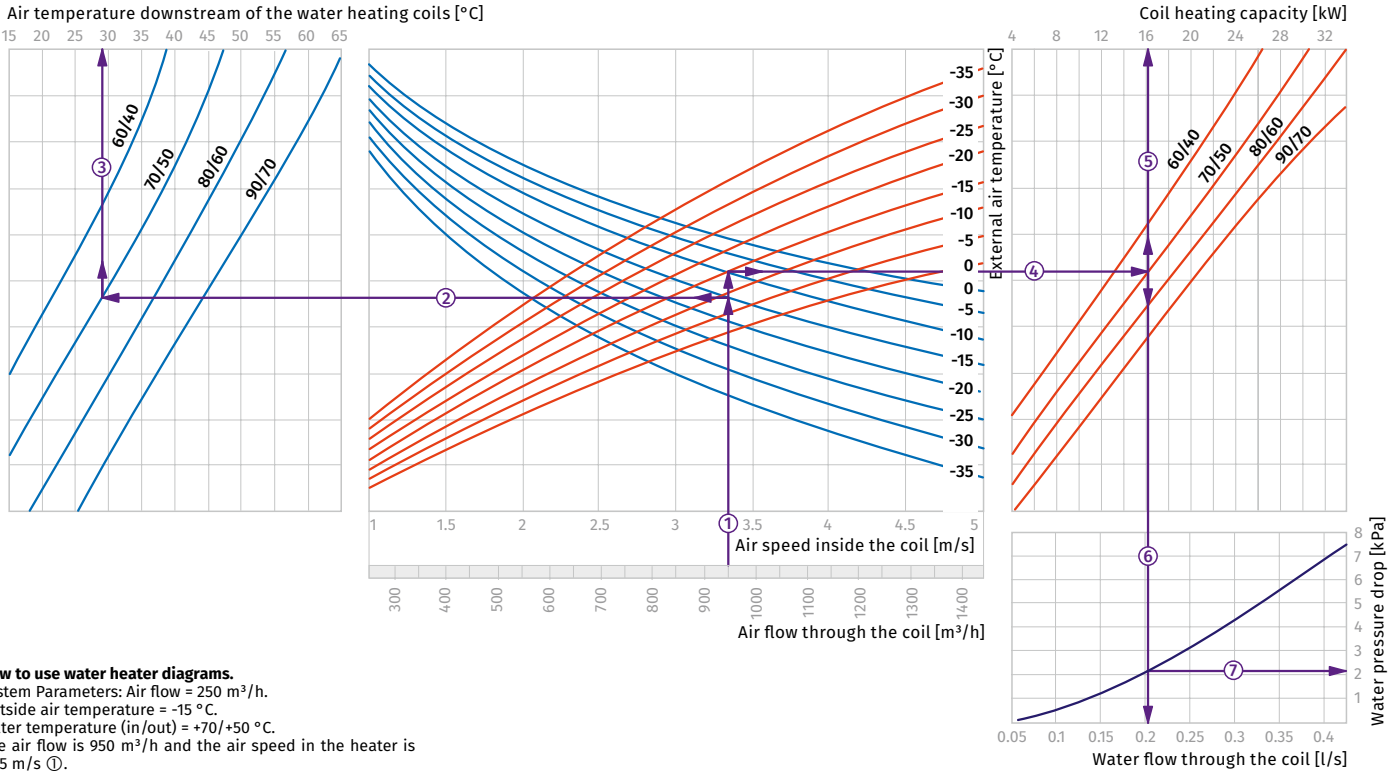
### WKH 40x20-2




**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).

### WKH 40x20-4

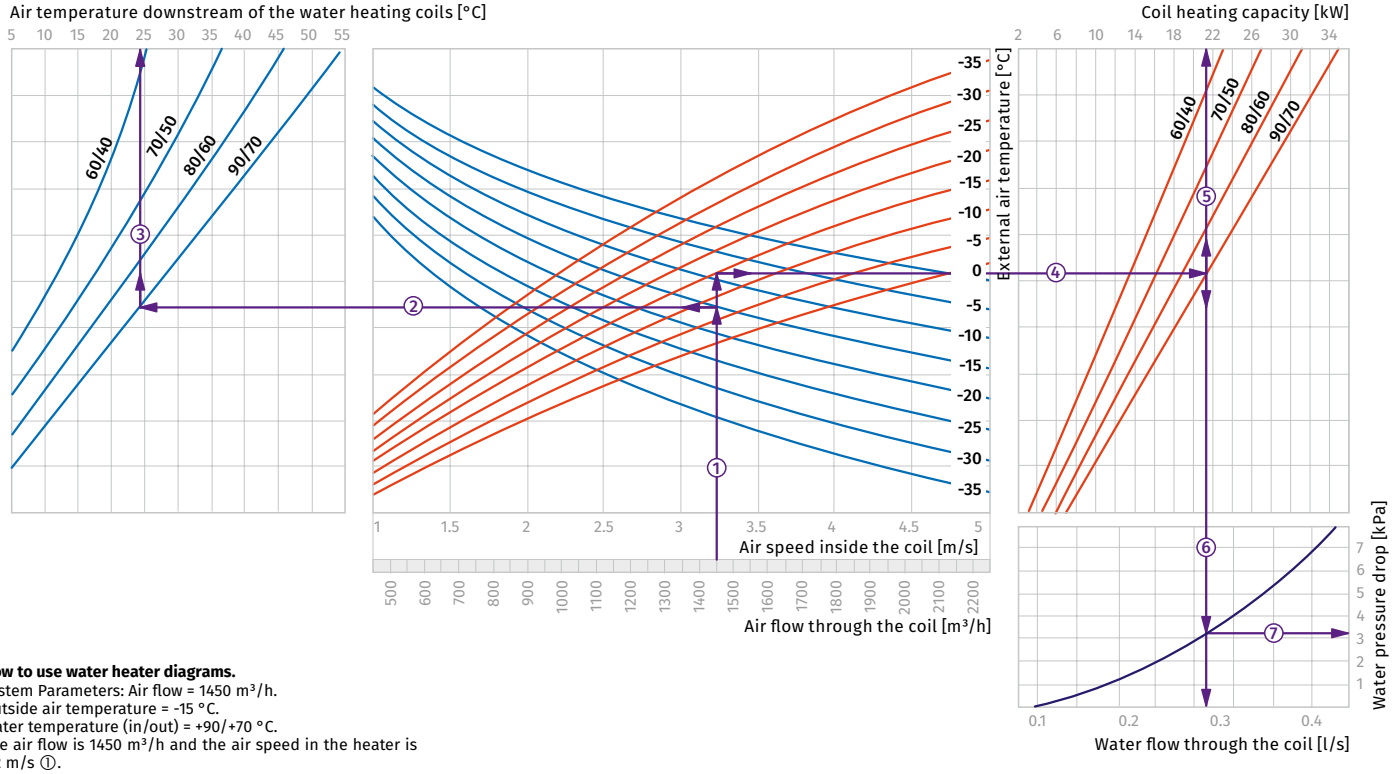



**How to use water heater diagrams.**
System Parameters: Air flow = 250 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 950 m³/h and the air speed in the heater is 3.35 m/s ①.

- 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).

HEATERS

## WKH 50x25-2



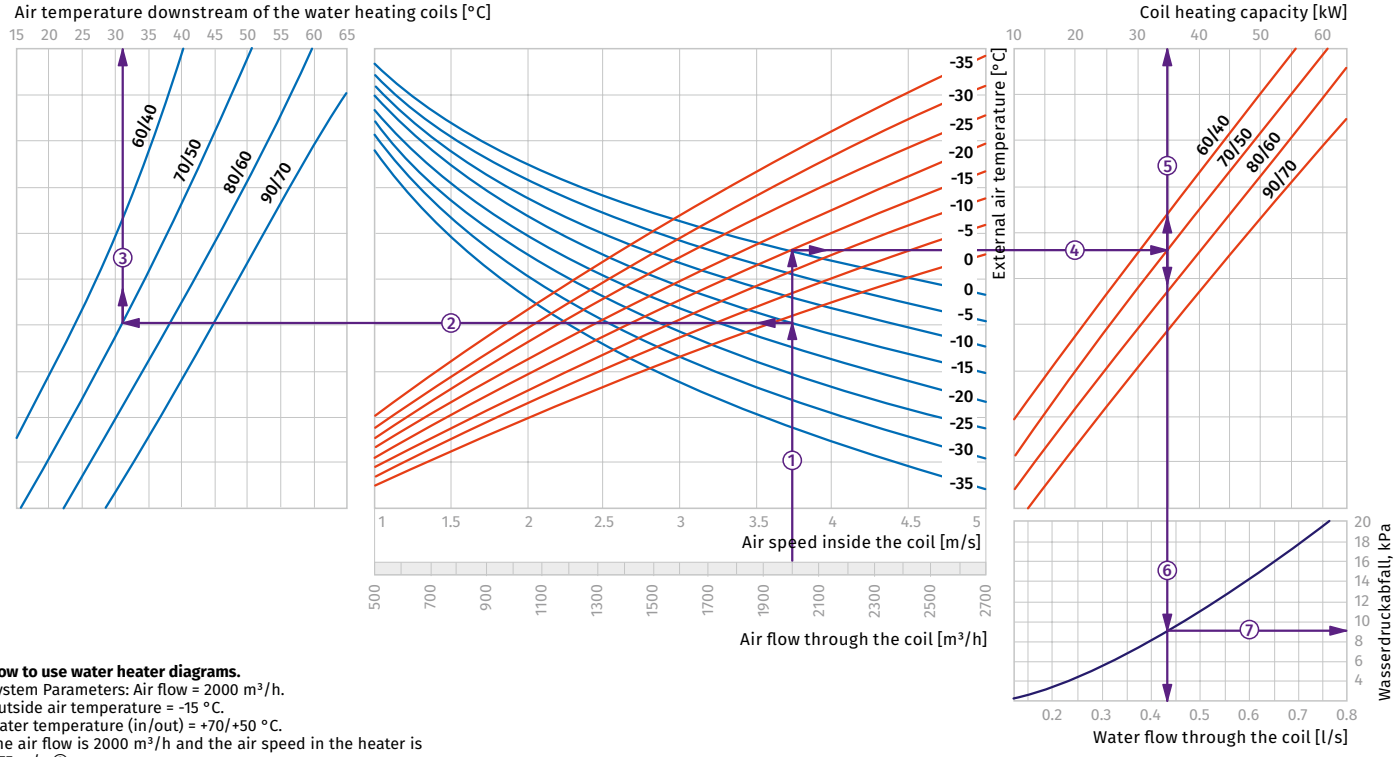

**How to use water heater diagrams.**
System Parameters: Air flow = 1450 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 1450 m³/h and the air speed in the heater is 3.2 m/s ①.

- 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



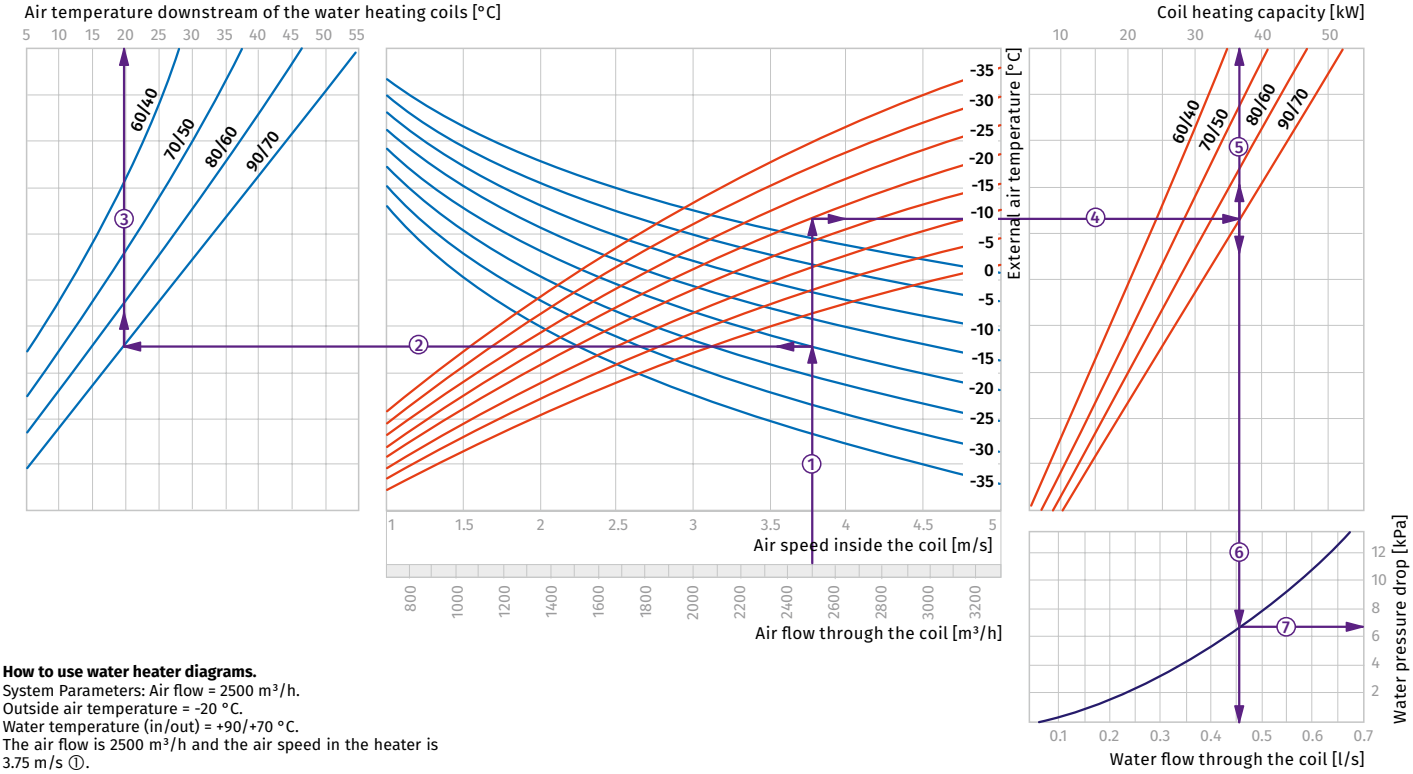

**How to use water heater diagrams.**
System Parameters: Air flow = 2000 m³/h.
Outside air temperature = -15 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 2000 m³/h and the air speed in the heater is 3.75 m/s ①.

- 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).

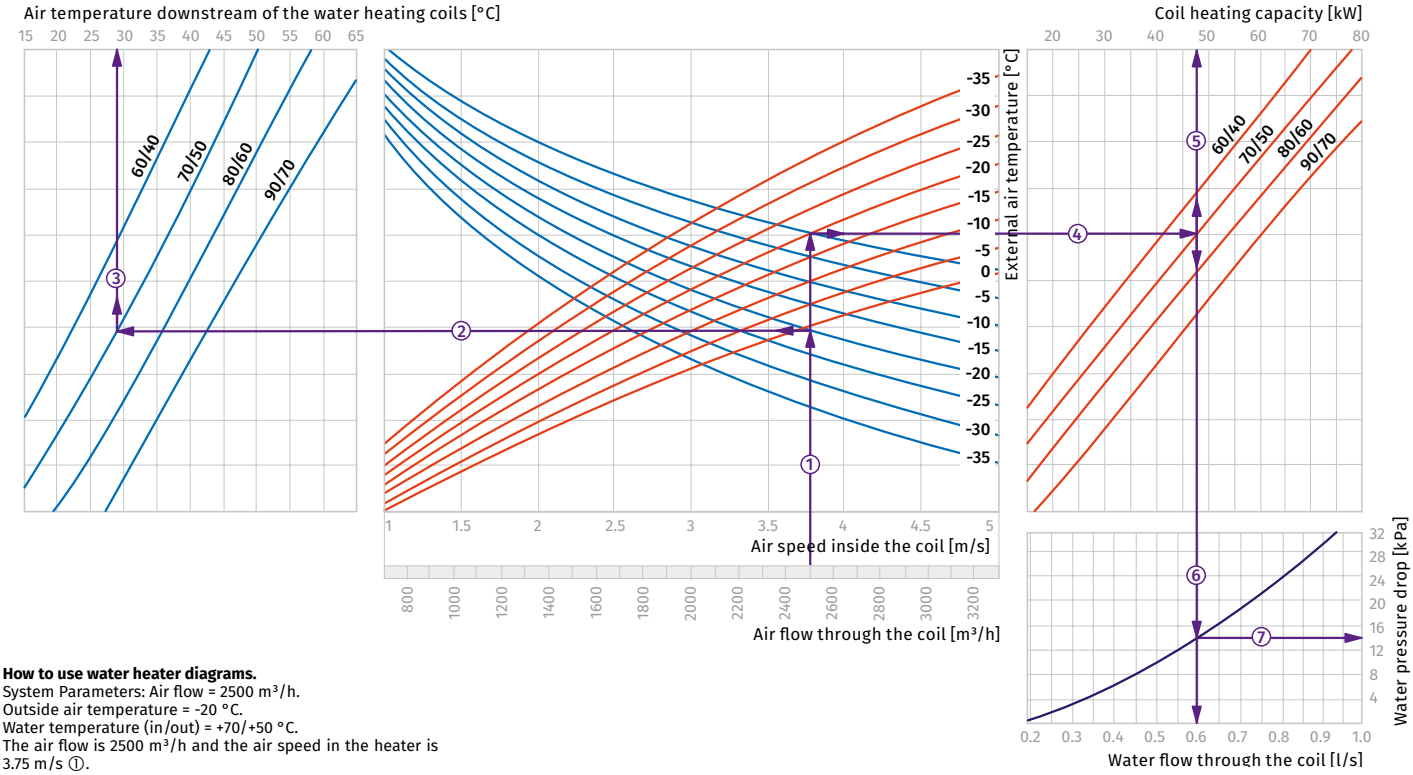
## WKH 60x30-2




**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).

## WKH 60x30-4

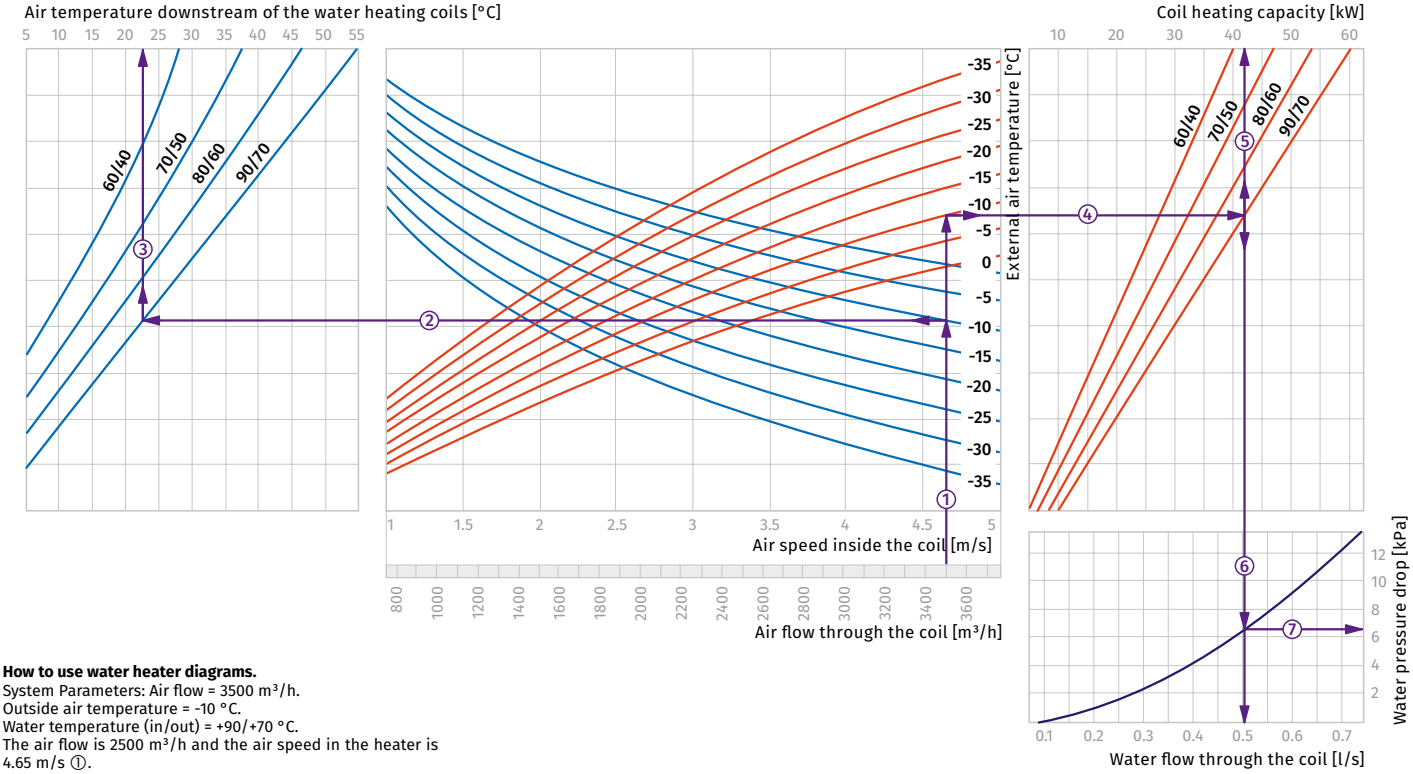



**How to use water heater diagrams.**
System Parameters: Air flow = 2500 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +70/+50 °C.
The air flow is 2500 m³/h and the air speed in the heater is 3.75 m/s ①.

- 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).

HEATERS

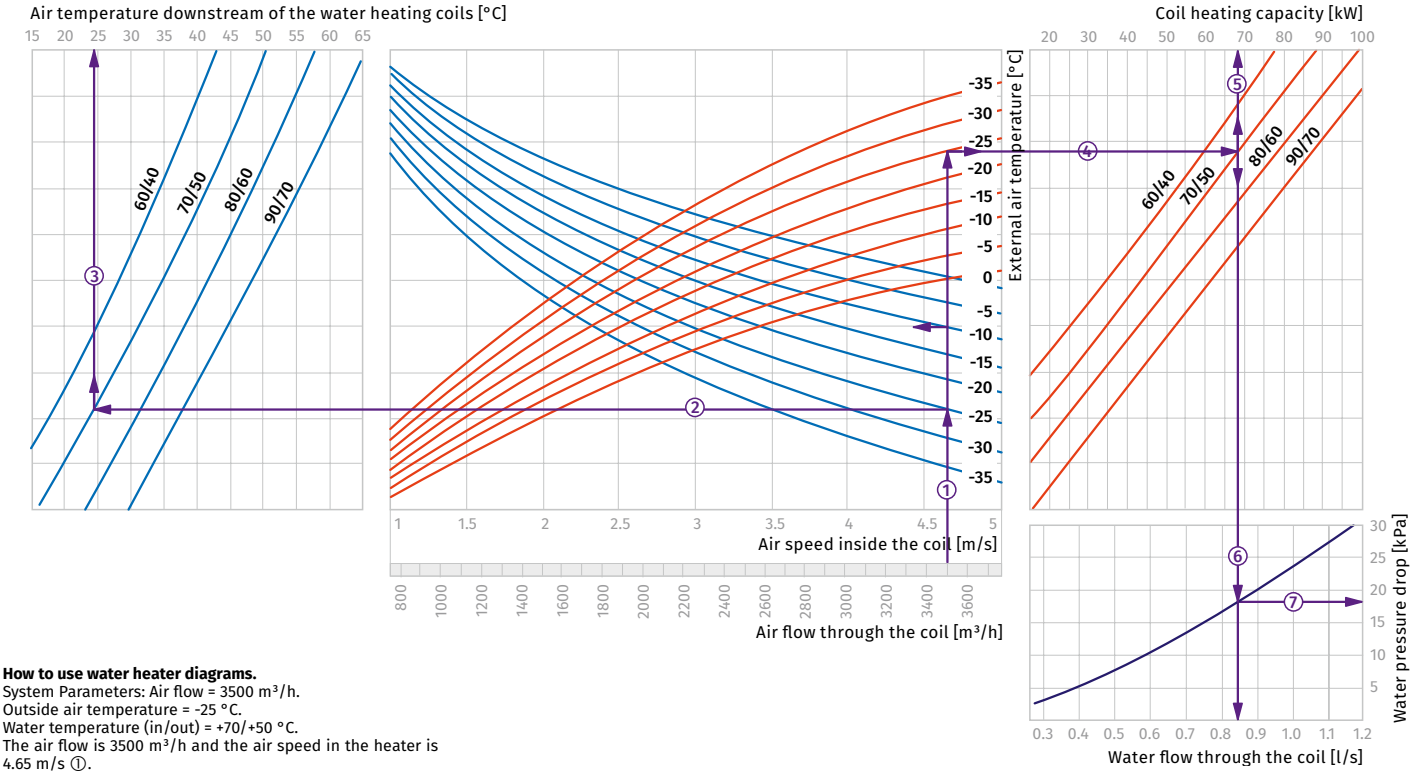
## WKH 60x35-2




**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).

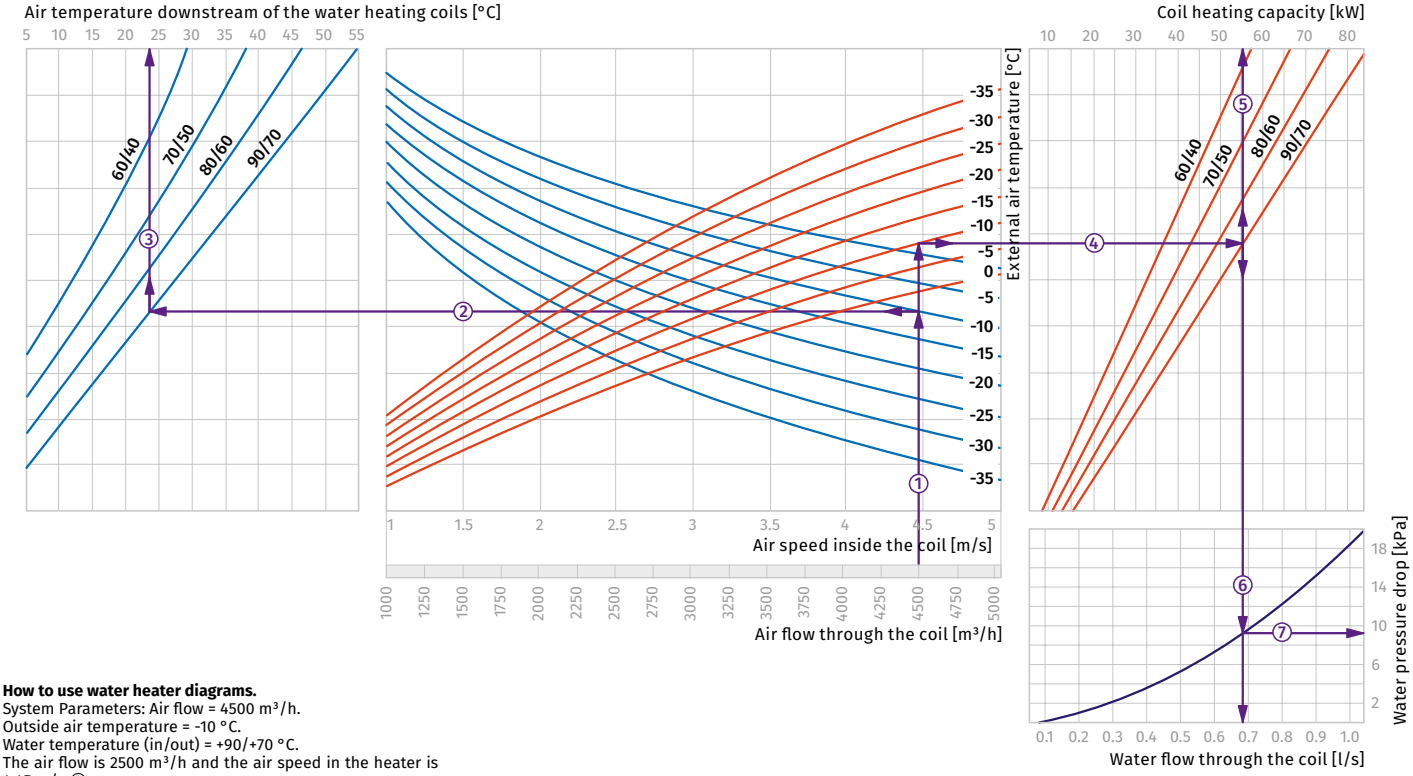
## WKH 60x35-4




**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



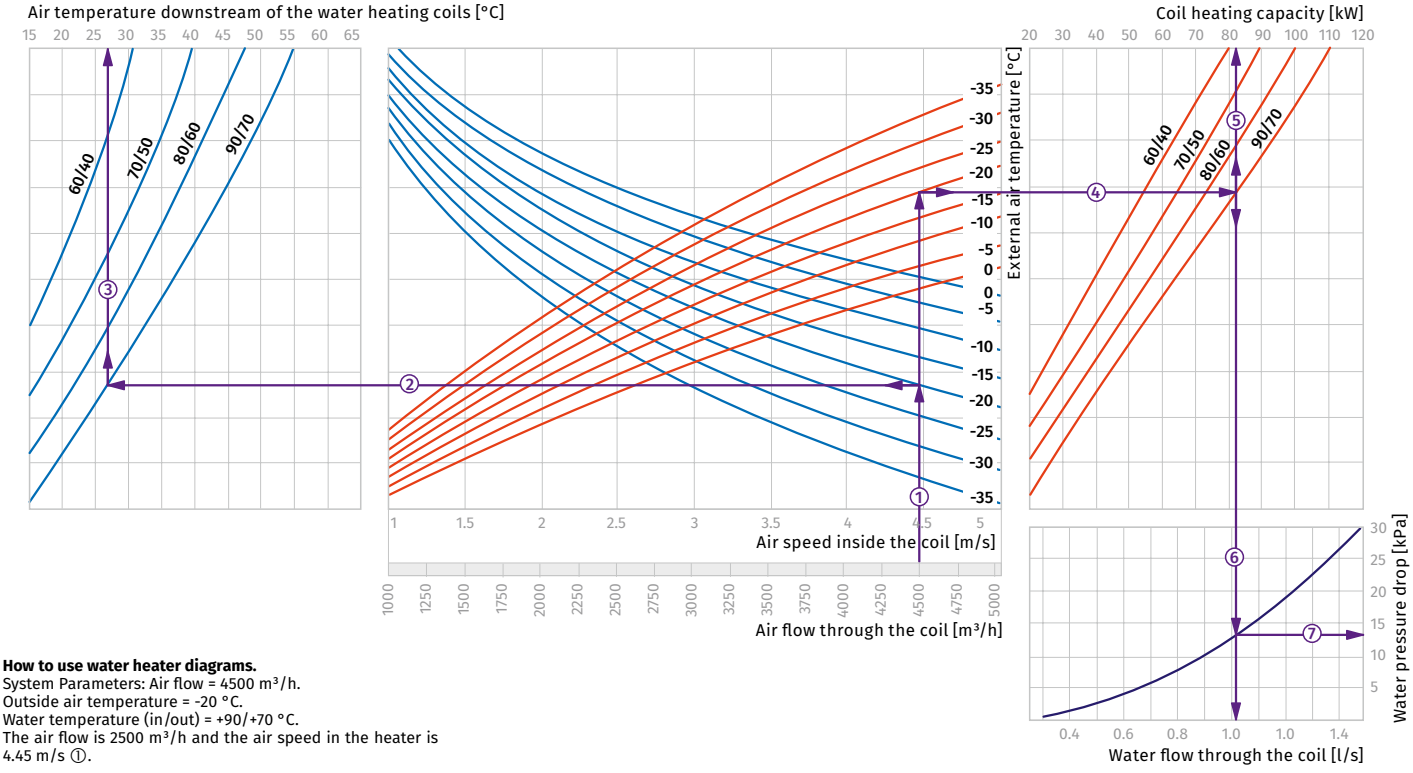

**How to use water heater diagrams.**
System Parameters: Air flow = 4500 m³/h.
Outside air temperature = -10 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 2500 m³/h and the air speed in the heater is 4.45 m/s ①.

- 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



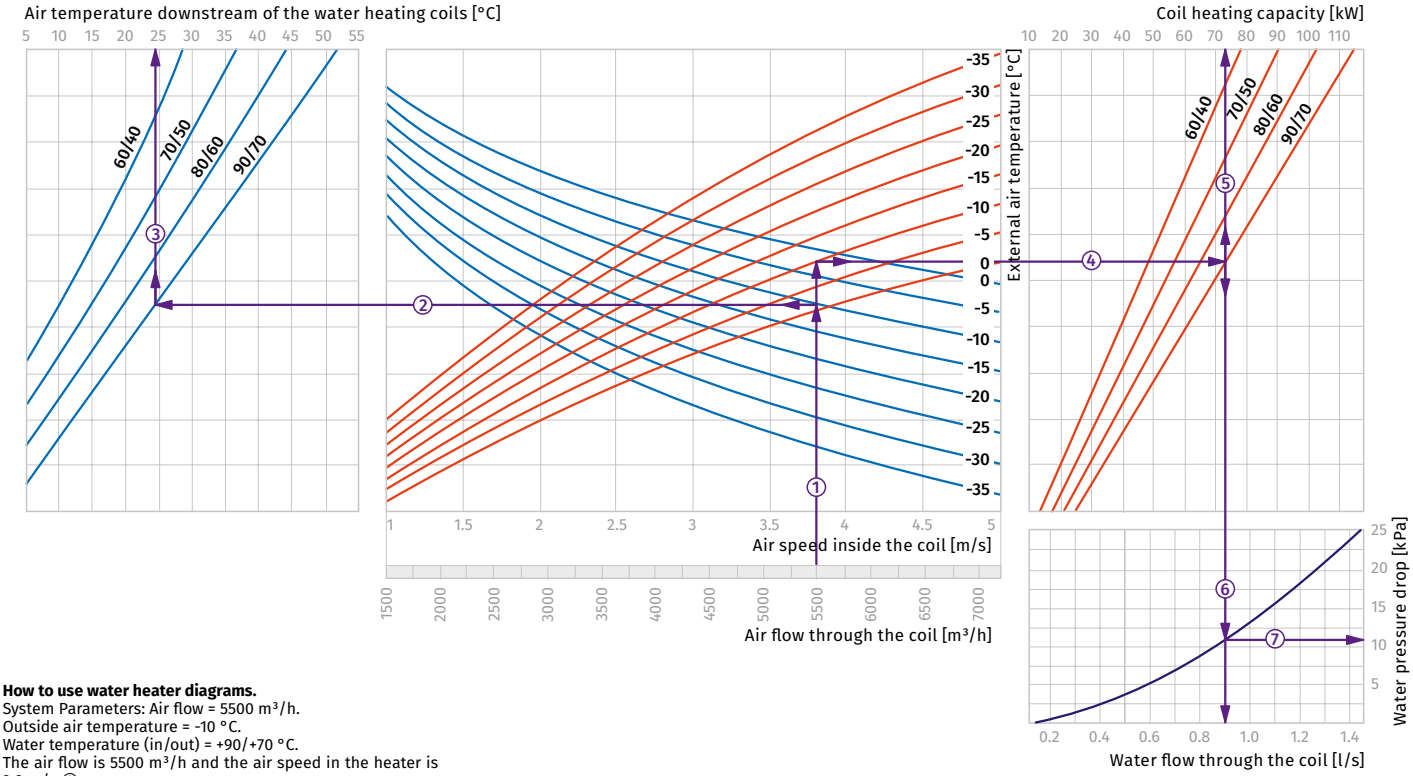

**How to use water heater diagrams.**
System Parameters: Air flow = 4500 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 2500 m³/h and the air speed in the heater is 4.45 m/s ①.

- 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).

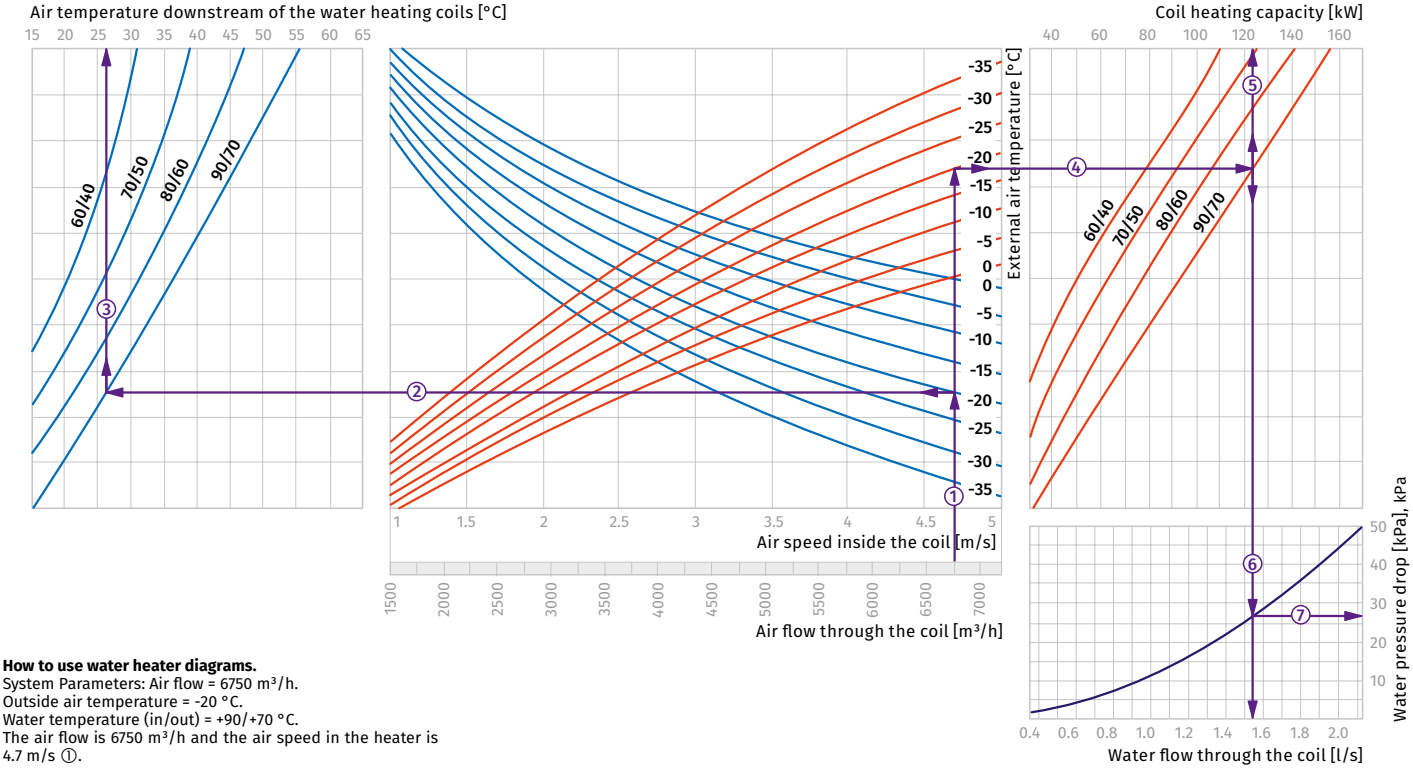
## WKH 80x50-2




**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).

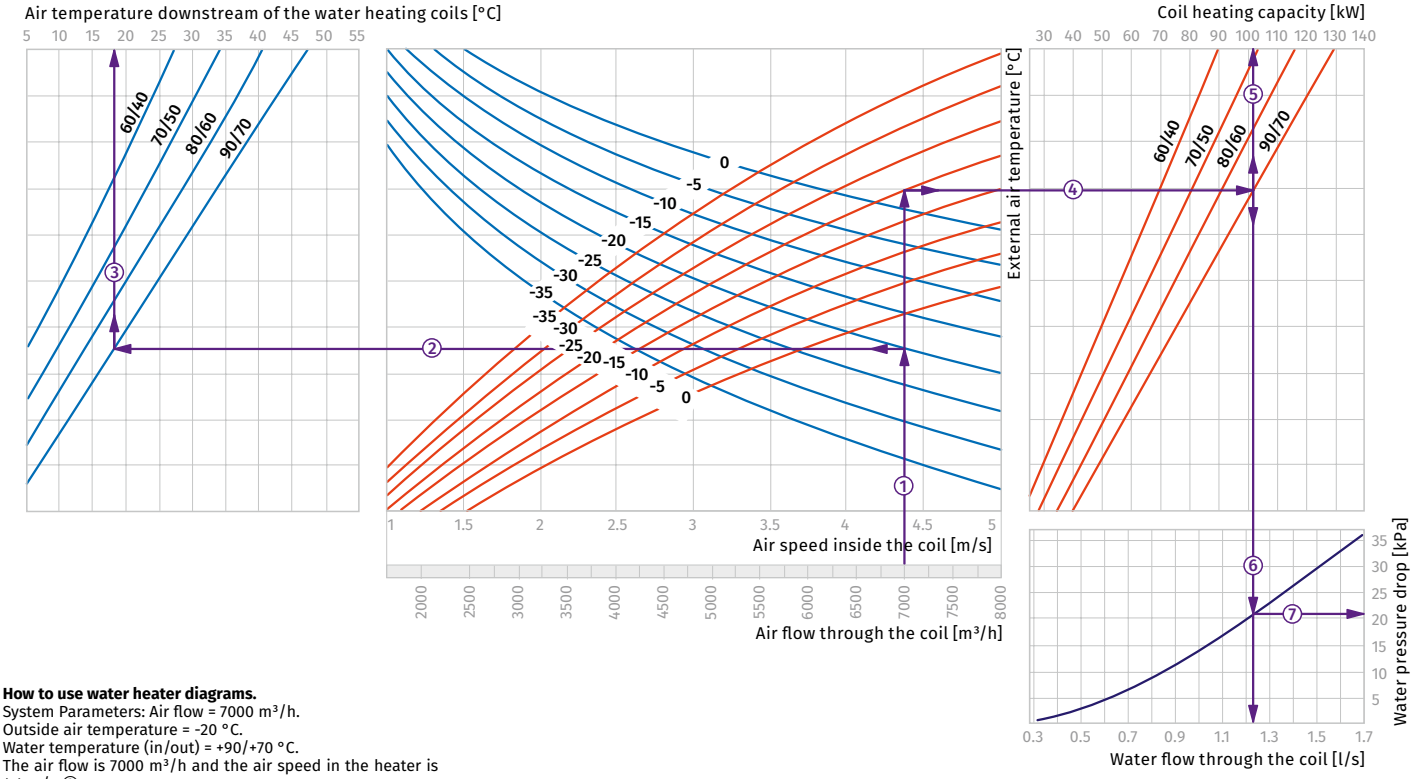
## WKH 80x50-3




**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).

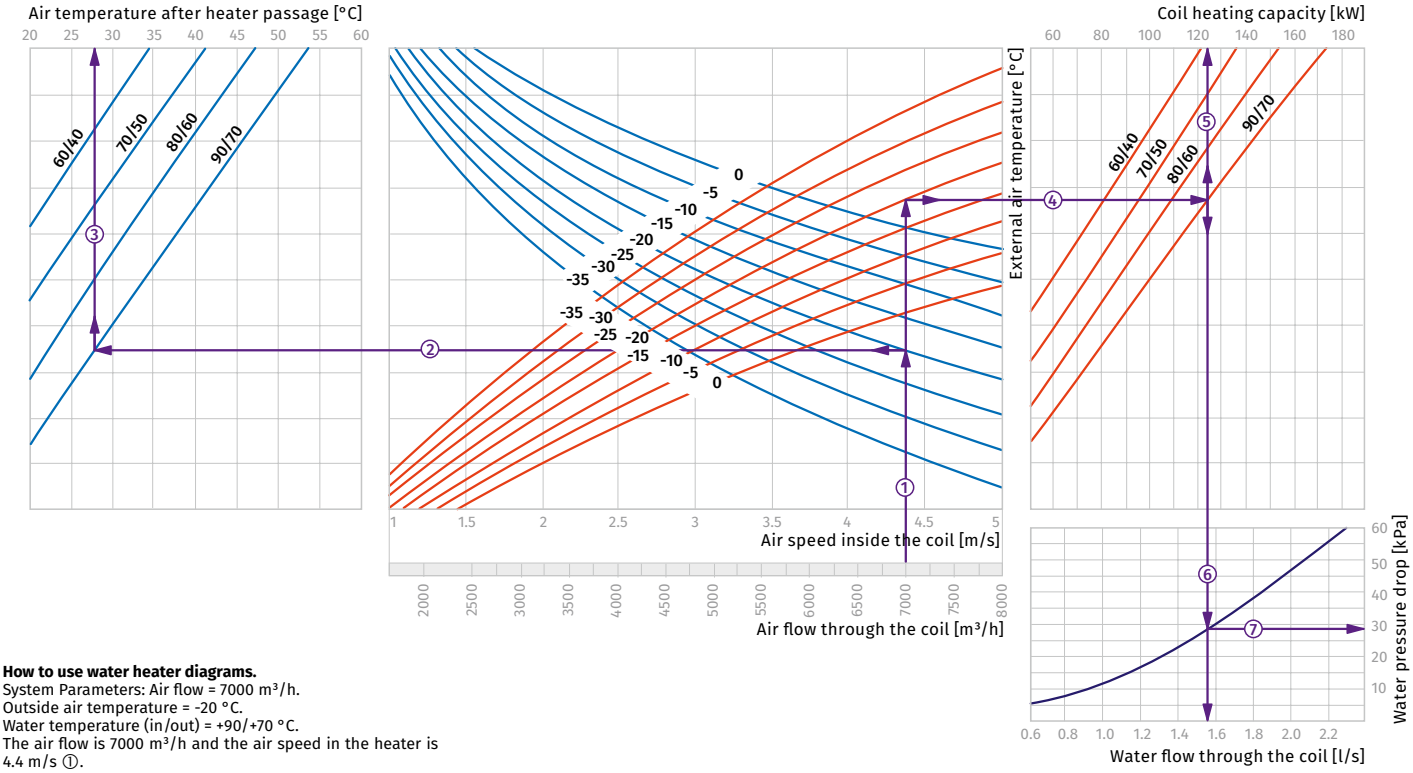
## WKH 90x50-2




**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).

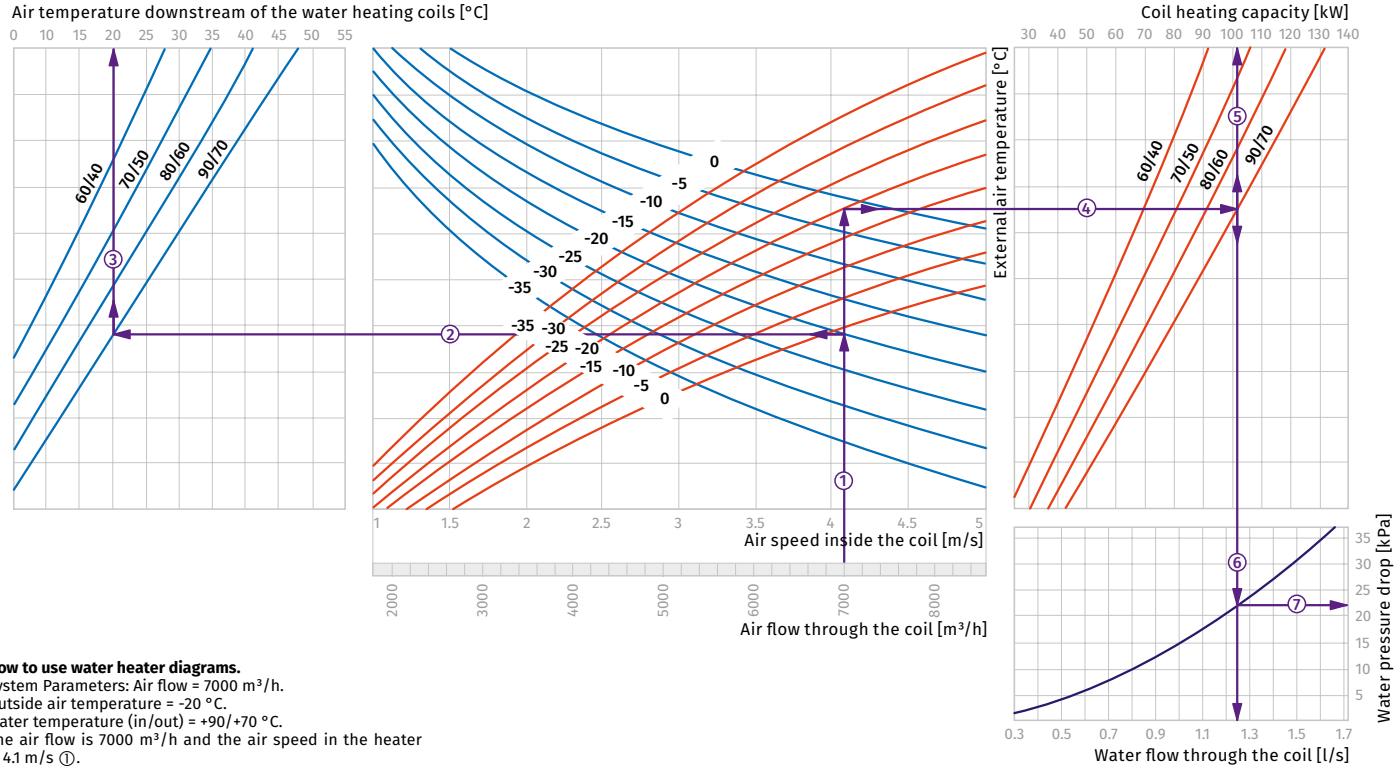
## WKH 90x50-3




**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



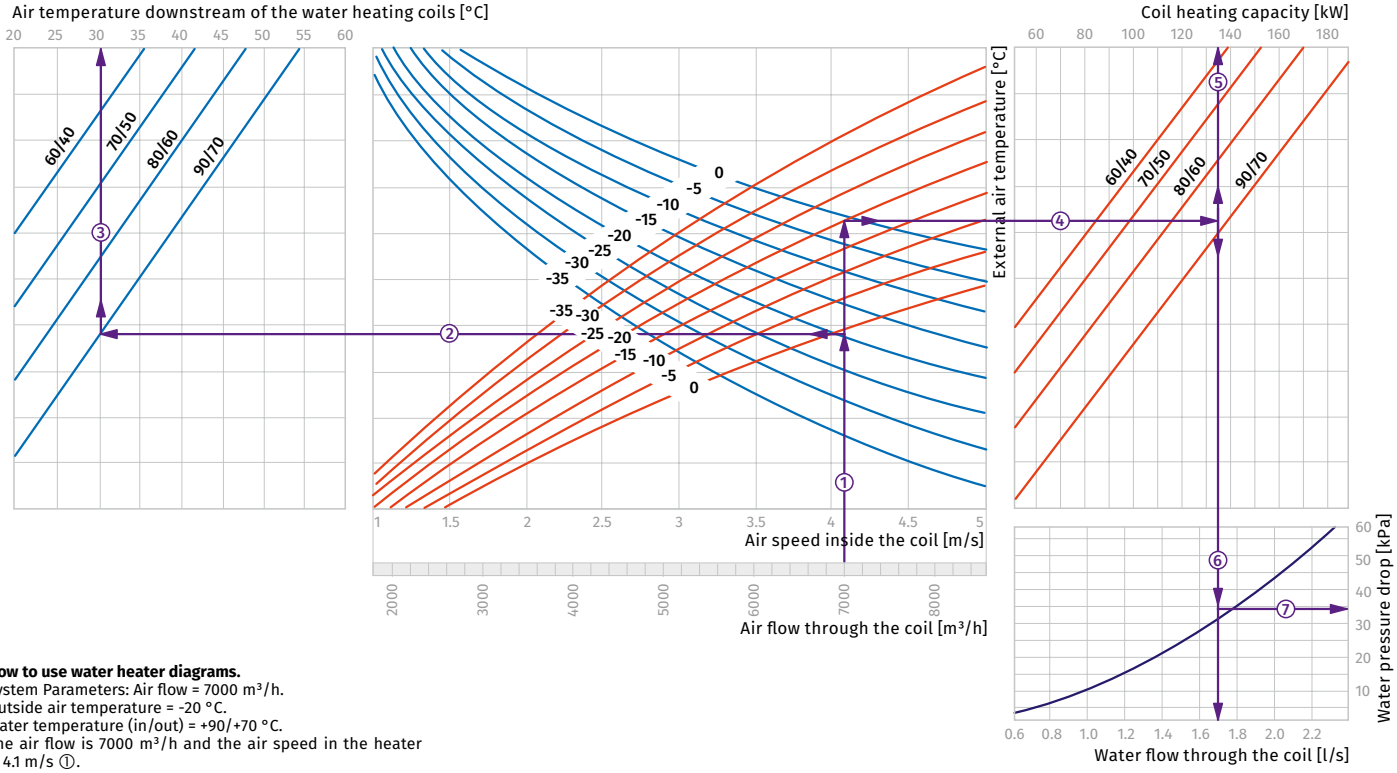

**How to use water heater diagrams.**
System Parameters: Air flow = 7000 m³/h.
Outside air temperature = -20 °C.
Water temperature (in/out) = +90/+70 °C.
The air flow is 7000 m³/h and the air speed in the heater is 4.1 m/s ①.

- 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




**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.

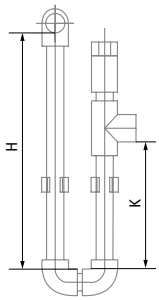
### Design

- 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 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.

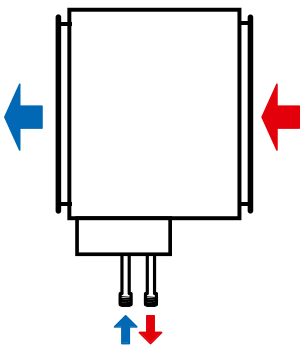
- While mounting the cooling unit provide condensate drainage through the U-trap. The U-trap height must be selected with respect to the total fan pressure, refer to the table and diagram below.



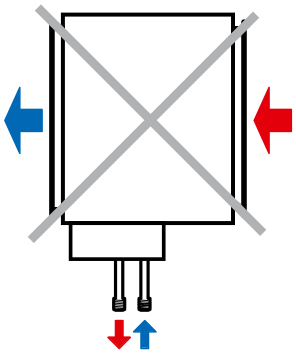

| H [mm] | K [mm] | P [Pa] |
|---|---|---|
| 100 | 55 | 600 |
| 200 | 105 | 1100 |
| 260 | 140 | 1400 |

**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.



**Counter air flow connection**



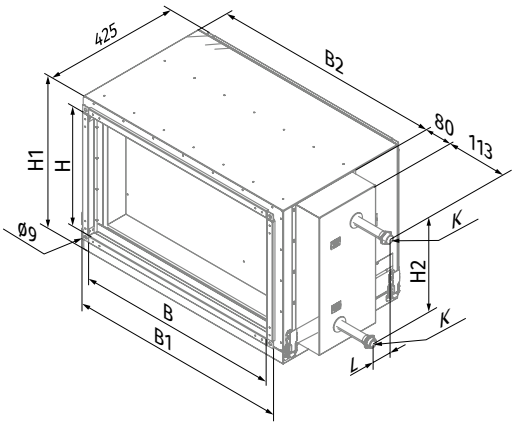
**Air flow streamwise connection**

## Designation key

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

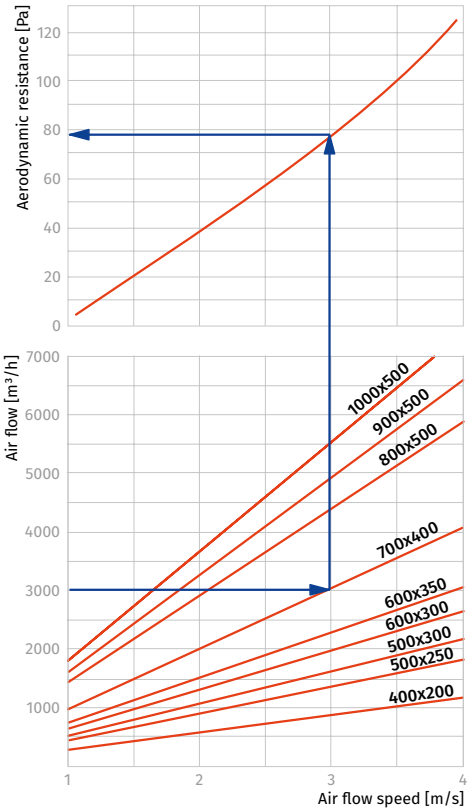
## Overall dimensions [mm]

| 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" |



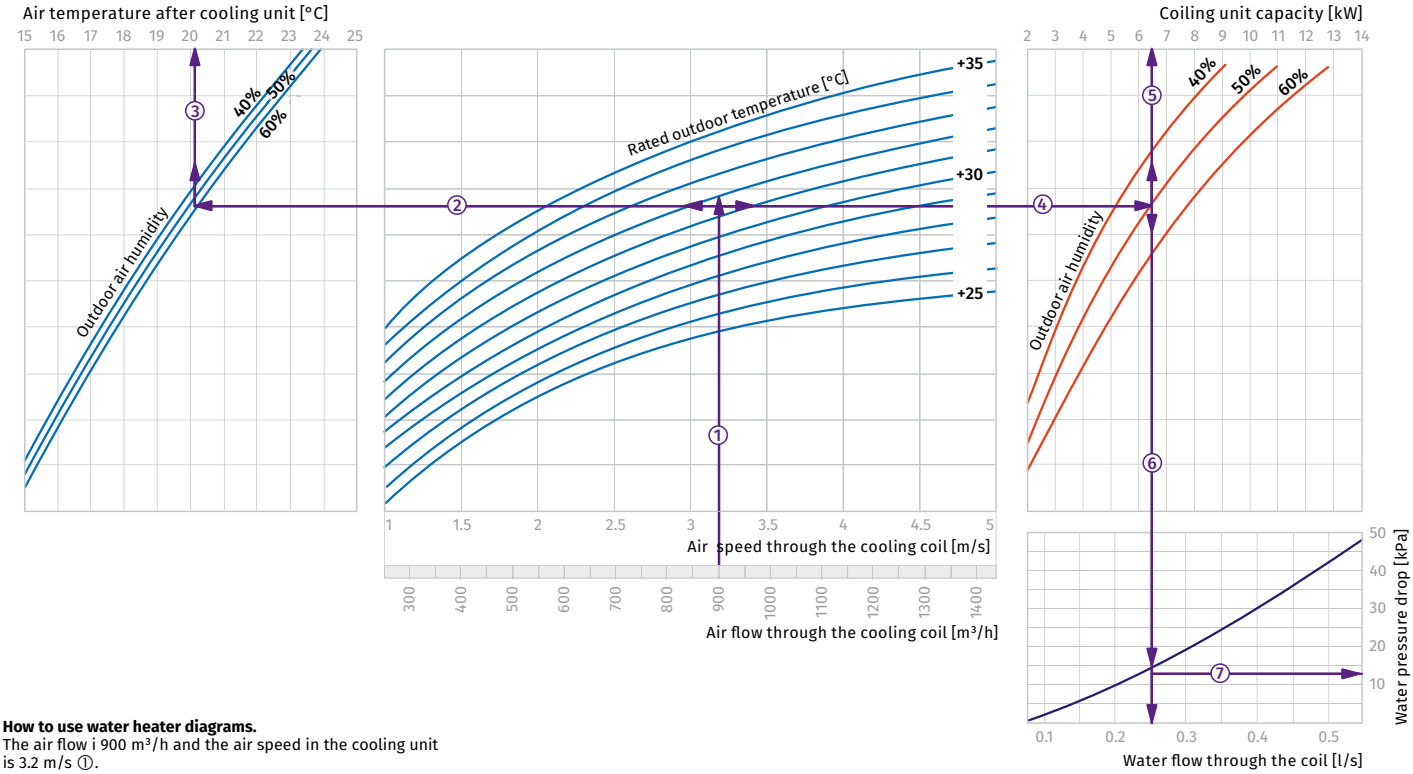

### KWK

Pressure losses in water cooling coils



# DX cooling unit calculation diagram

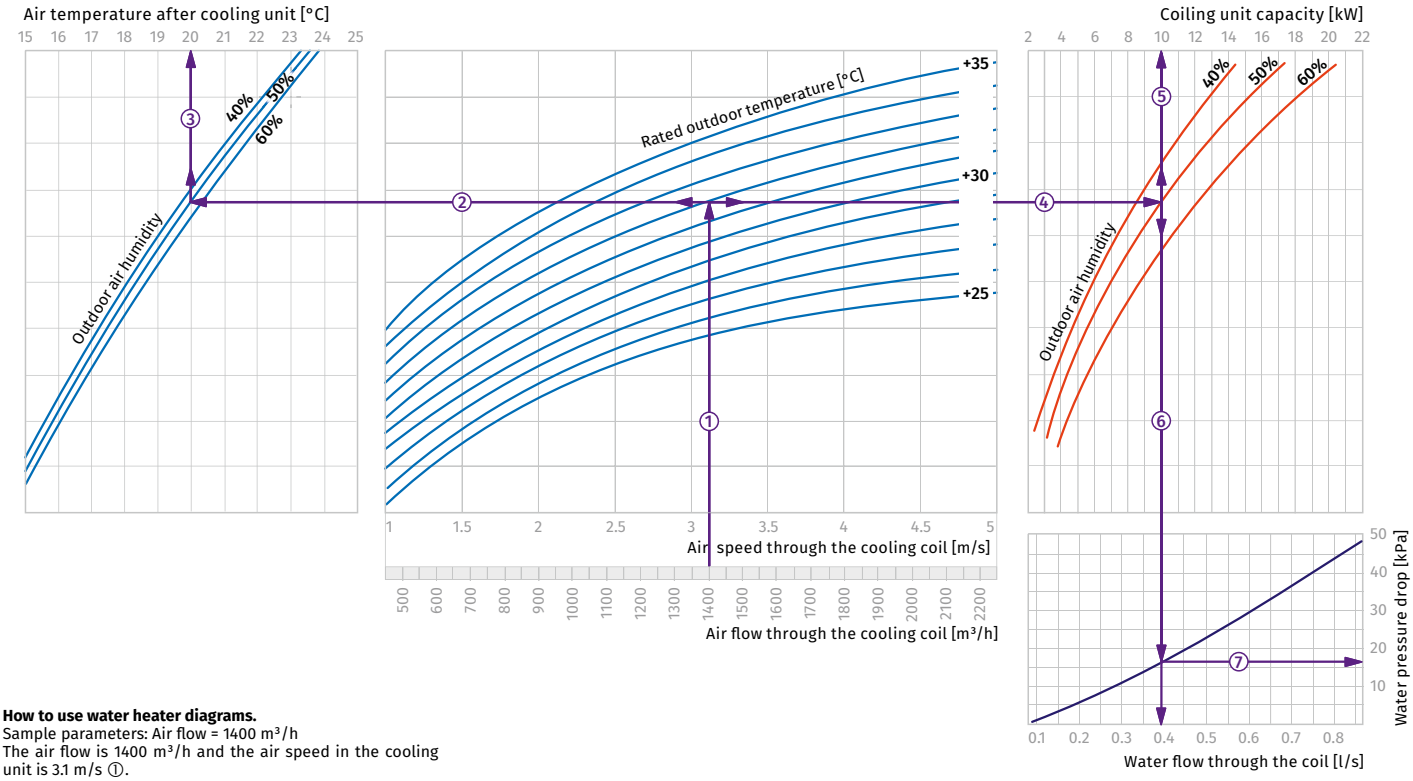
## KWK 40x20-3




**How to use water heater diagrams.**
The air flow i 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 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 (+20.1 °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).

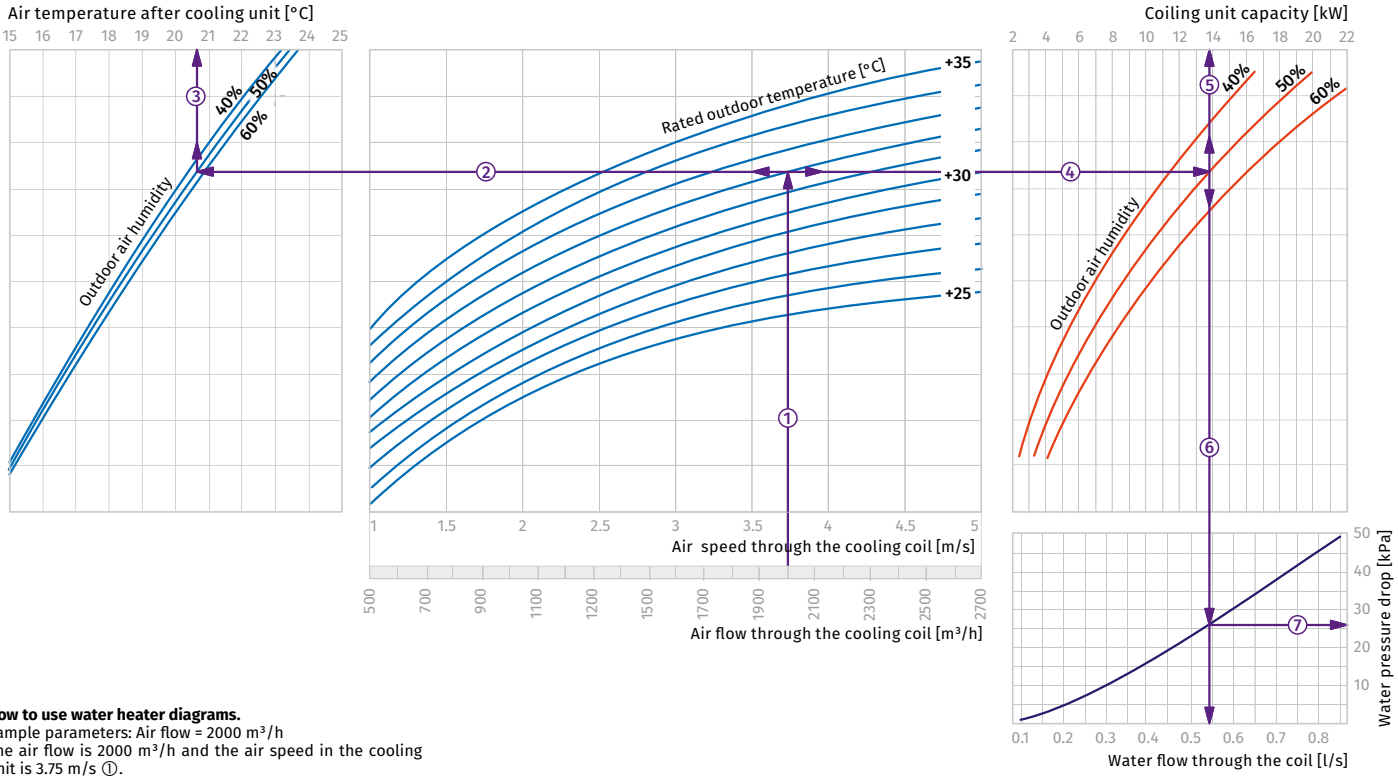
## KWK 50x25-3




**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 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 °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).

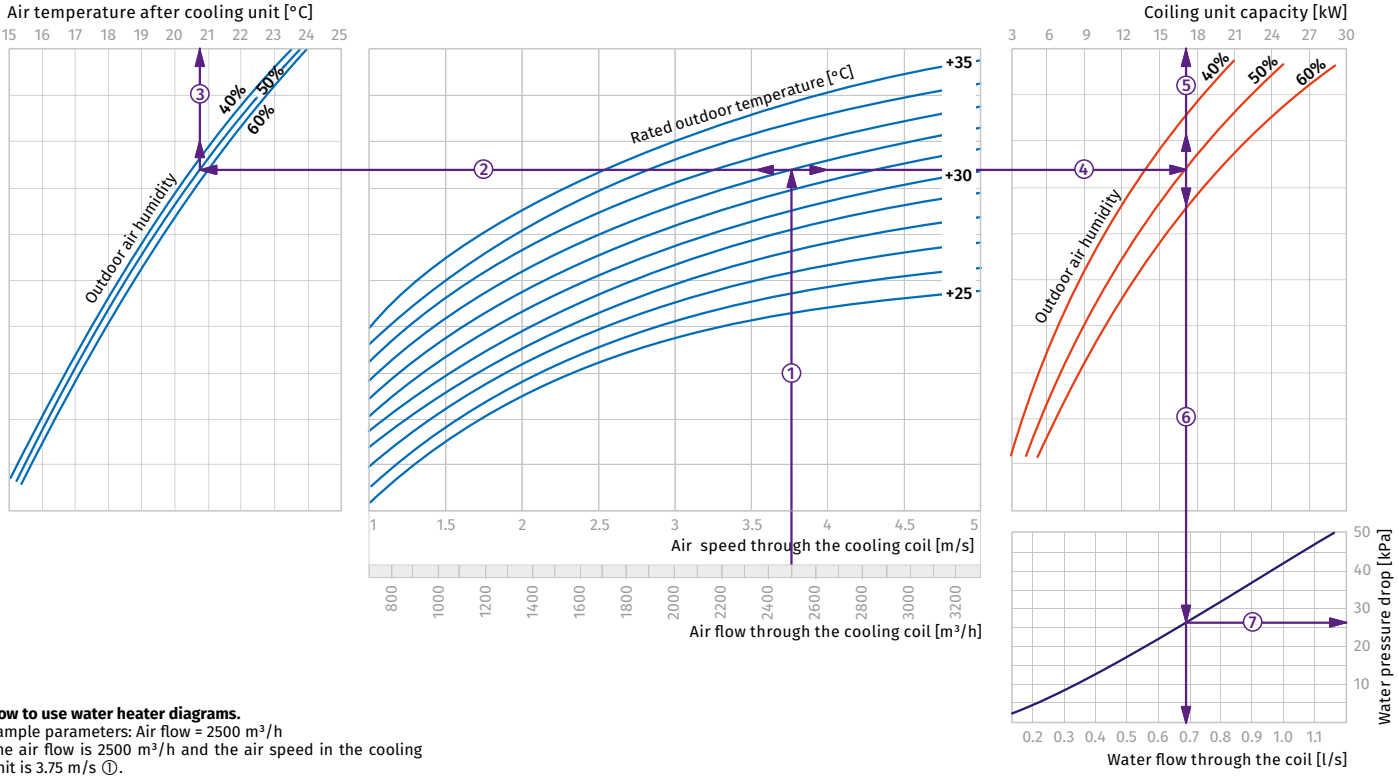
## KWK 50x30-3




**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).

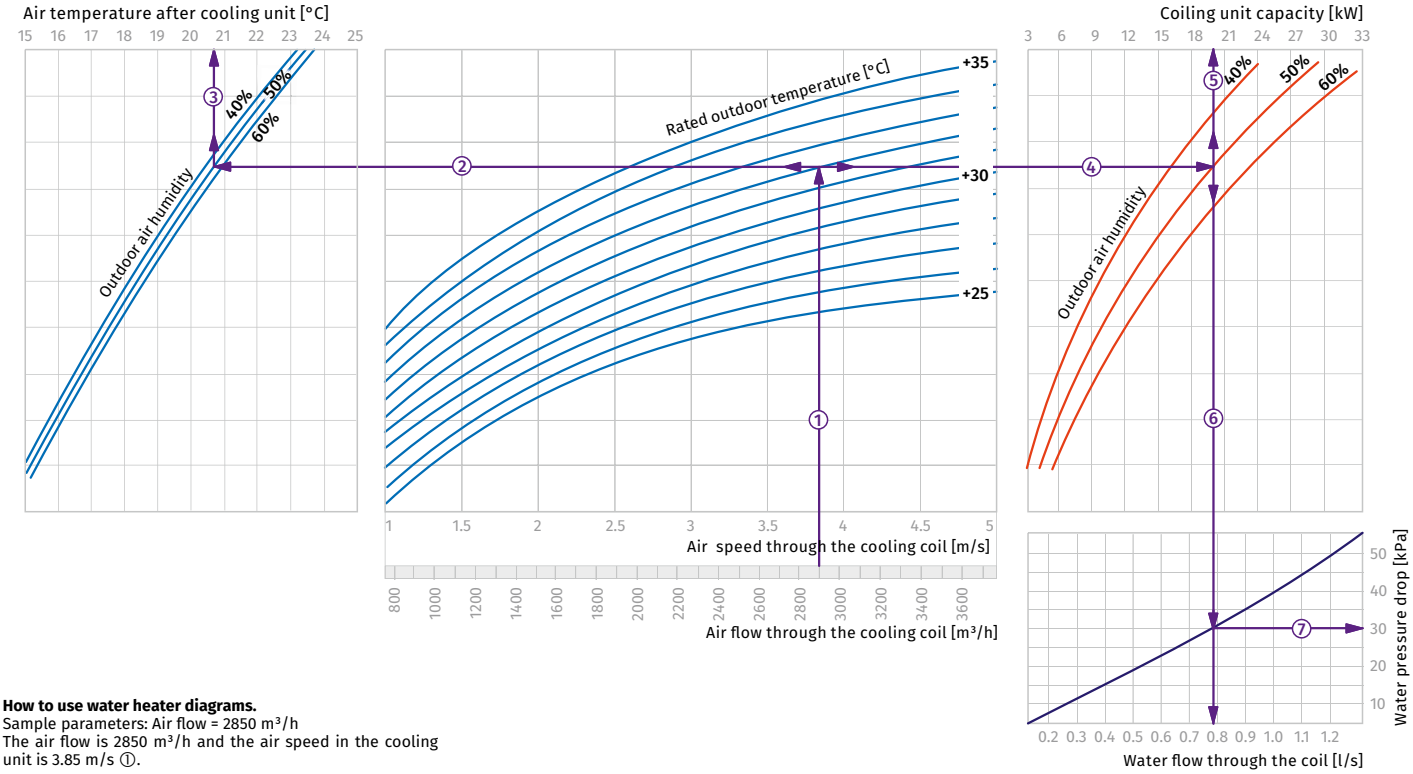
## KWK 60x30-3




**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



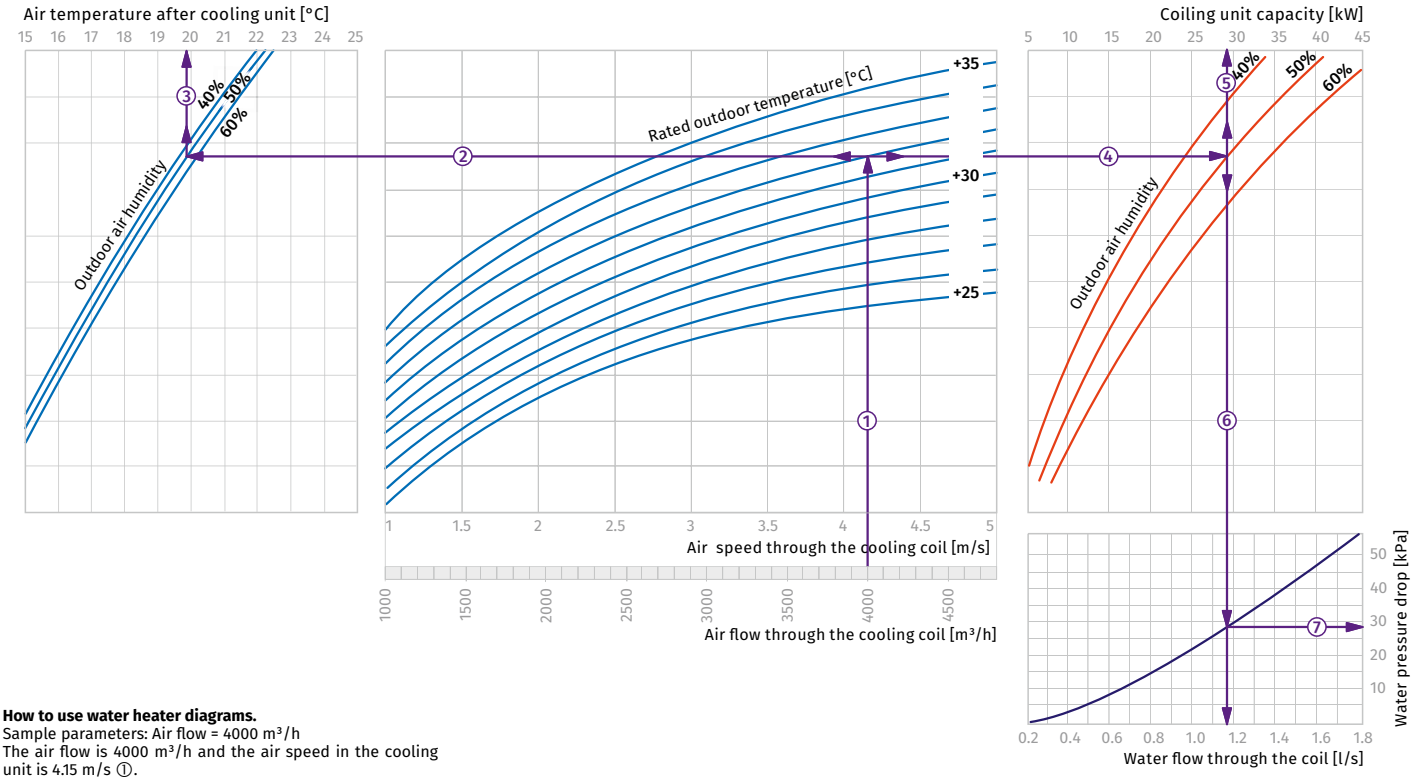

**How to use water heater diagrams.**
Sample parameters: Air flow = 2850 m³/h
The air flow is 2850 m³/h and the air speed in the cooling unit is 3.85 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated 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 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).

## KWK 70x40-3



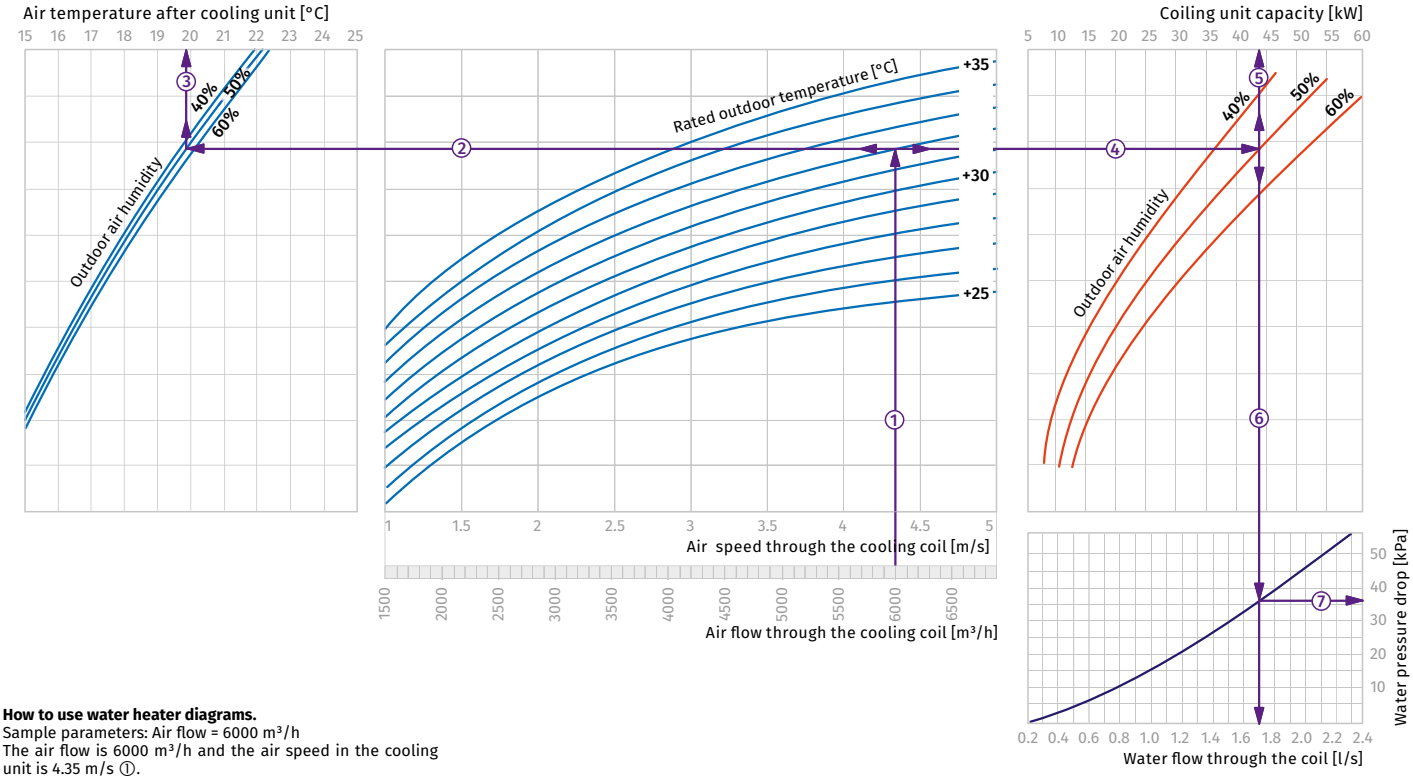

**How to use water heater diagrams.**
Sample parameters: Air flow = 4000 m³/h
The air flow is 4000 m³/h and the air speed in the cooling unit is 4.15 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated 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 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).

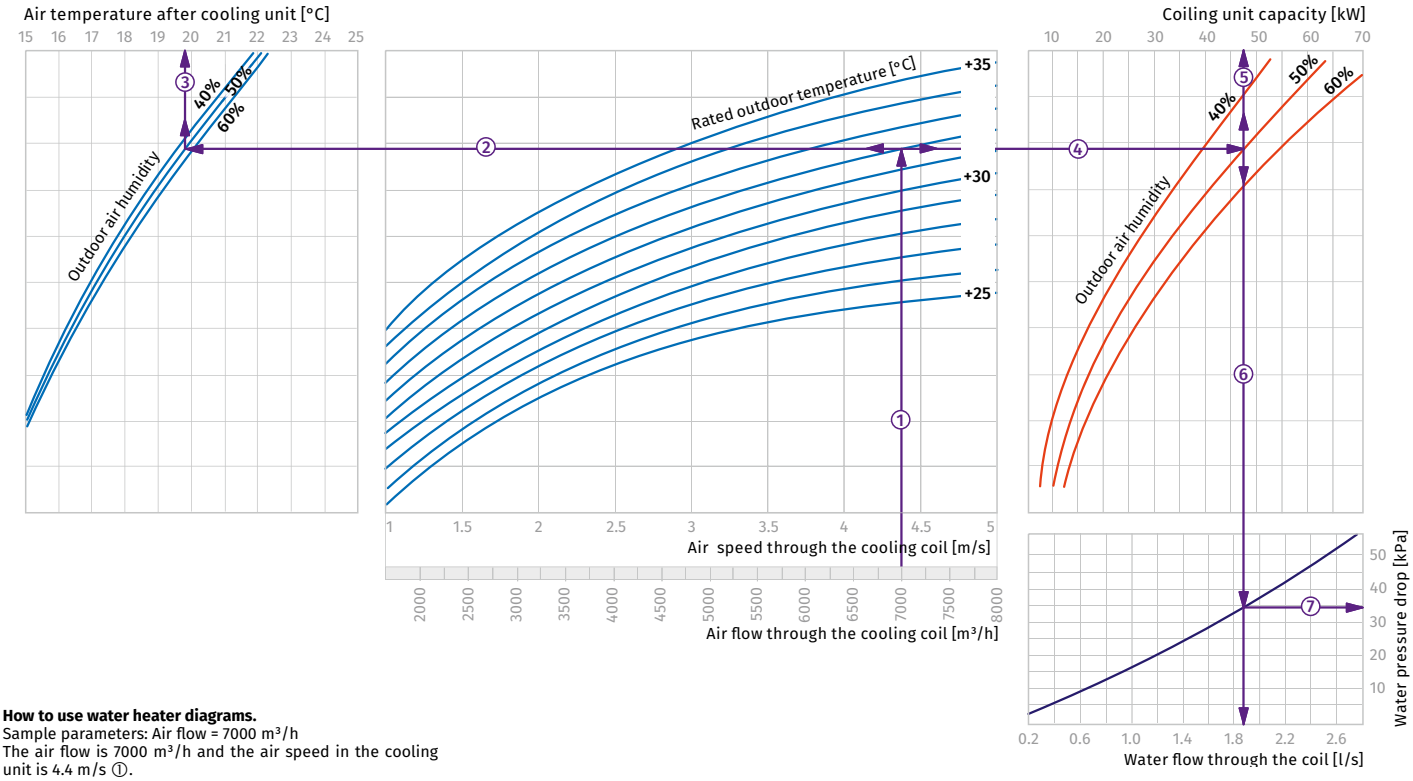
## KWK 80x50-3




**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).

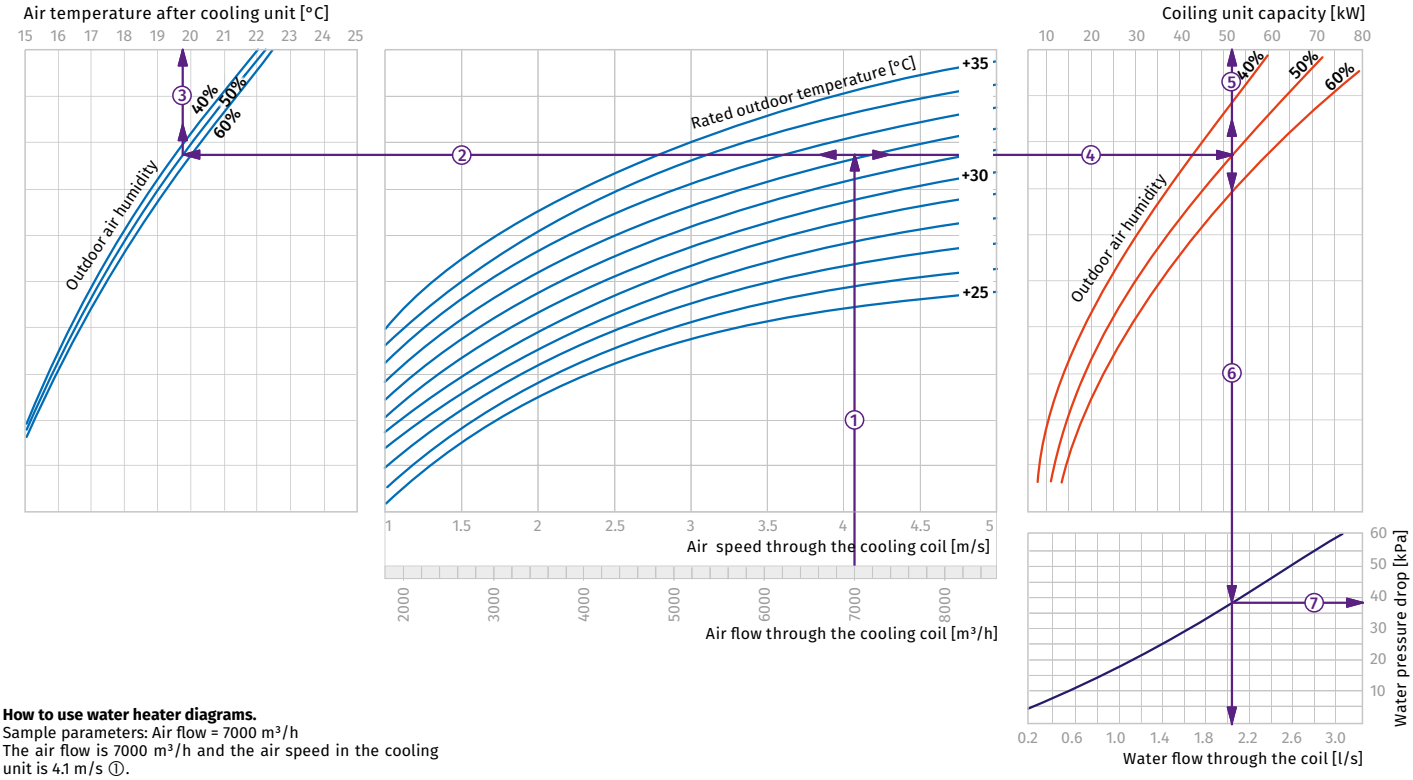
## KWK 90x50-3




**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




**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 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 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

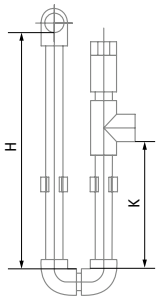
- Supply air cooling for ventilation systems in various premises.
- Suitable for installation into supply or air handling units to provide air cooling.

### 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

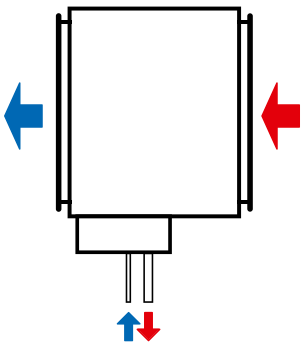
- Only horizontal mounting by means of flanged connection. Condensate drainage must be provided.
- Air filter must be installed upstream of the cooling unit to prevent the unit soiling.
- Mounting position must ensure uniform air flow distribution through the entire cross section.
- Installation upstream or downstream of the supply fan. The minimum air duct length downstream of the fan must be 1 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.



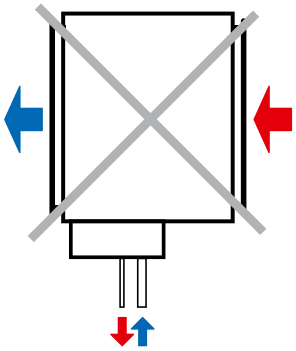

| H [mm] | K [mm] | P [Pa] |
|---|---|---|
| 100 | 55 | 600 |
| 200 | 105 | 1100 |
| 260 | 140 | 1400 |

**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**



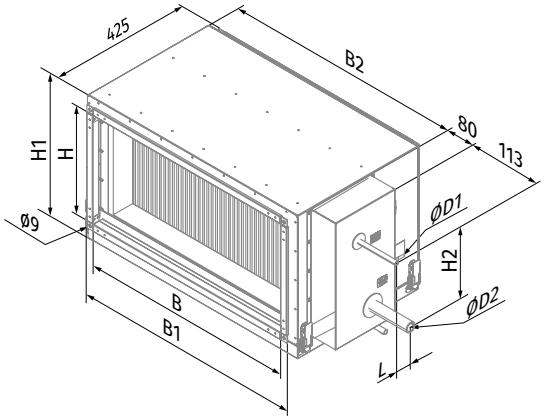
**Air flow streamwise connection**

## Designation key

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

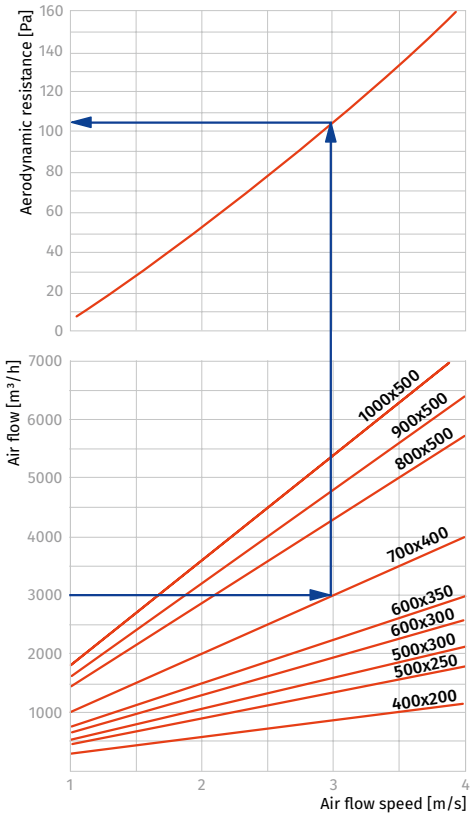
## Overall dimensions [mm]

| 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 |



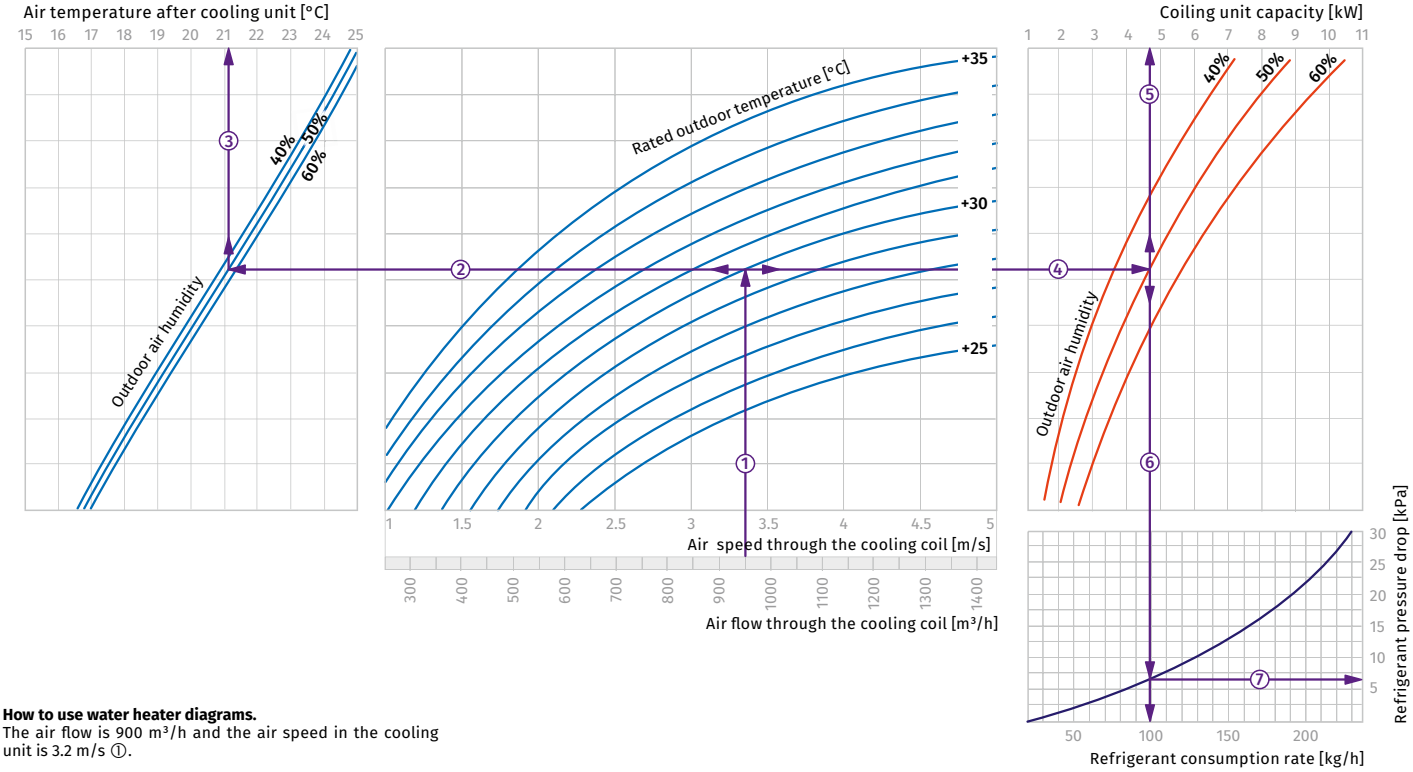

### KFK

**Air pressure lossesin DX cooling coils**



## Water cooling unit calculation diagram

### KFK 40x20-3



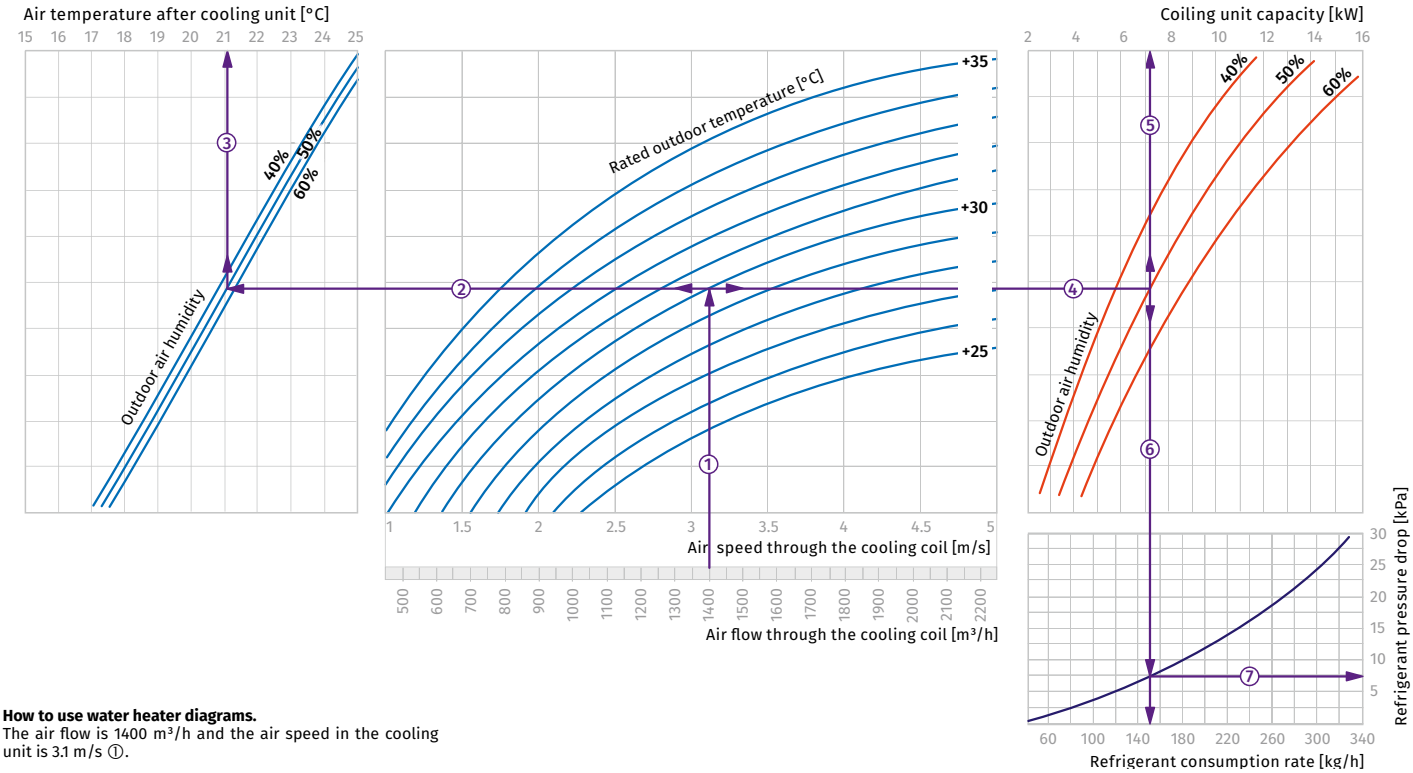

**How to use water heater diagrams.**
The air flow is 900 m³/h and the air speed in the cooling unit is 3.2 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated 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 (+20.1 °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).

### KFK 50x25-3



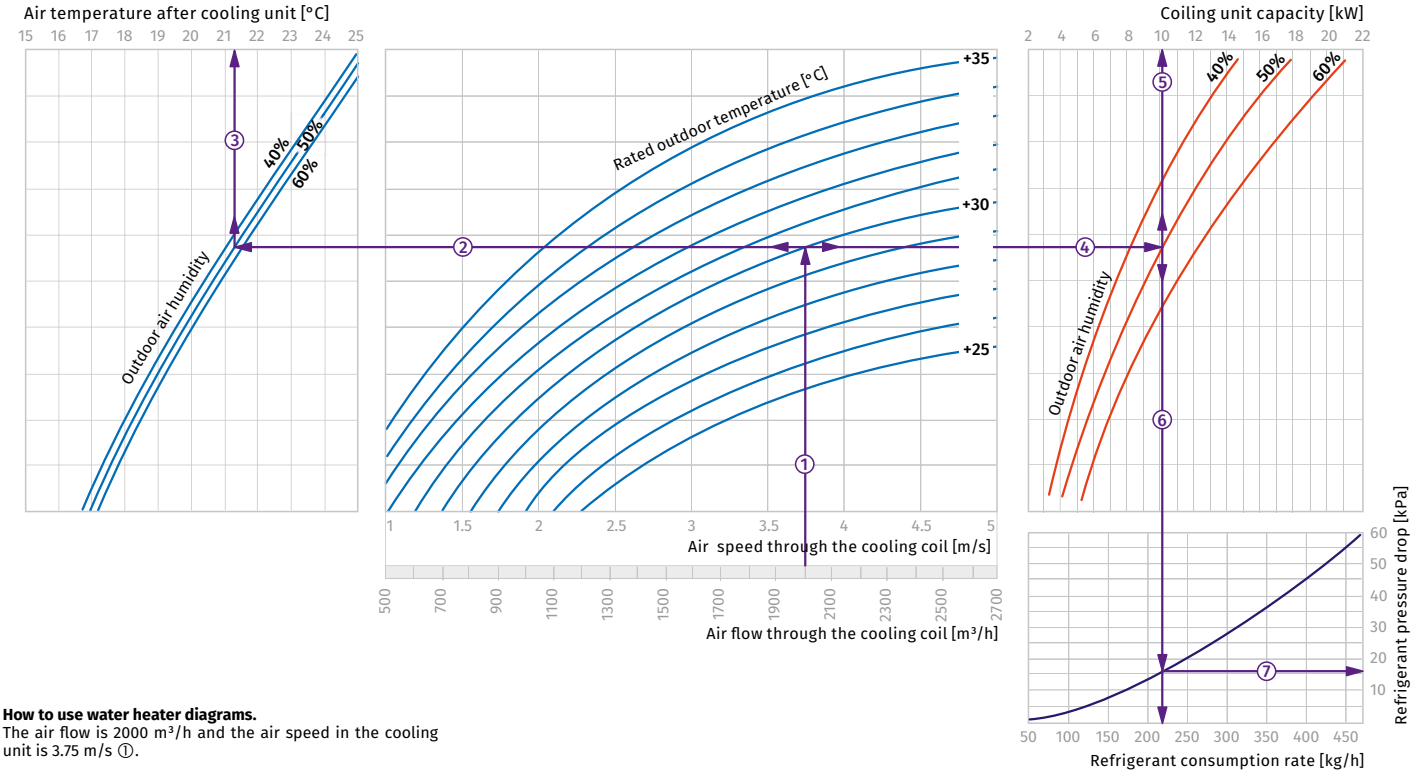

**How to use water heater diagrams.**
The air flow is 1400 m³/h and the air speed in the cooling unit is 3.1 m/s ①.

- To calculate the coldest air temperature find the intersection point of the air flow line ① with the rated 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 °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



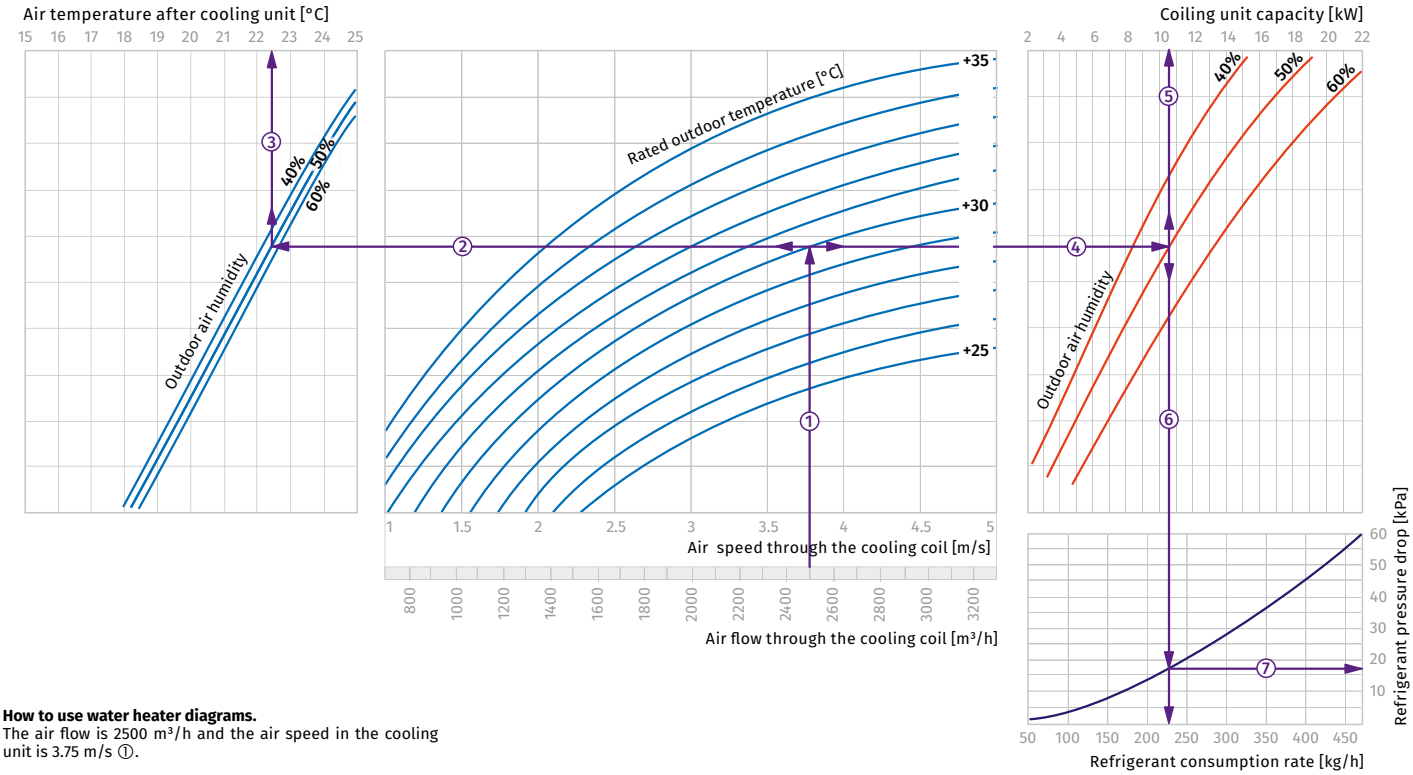

**How to use water heater diagrams.**
The air flow is 2000 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- 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



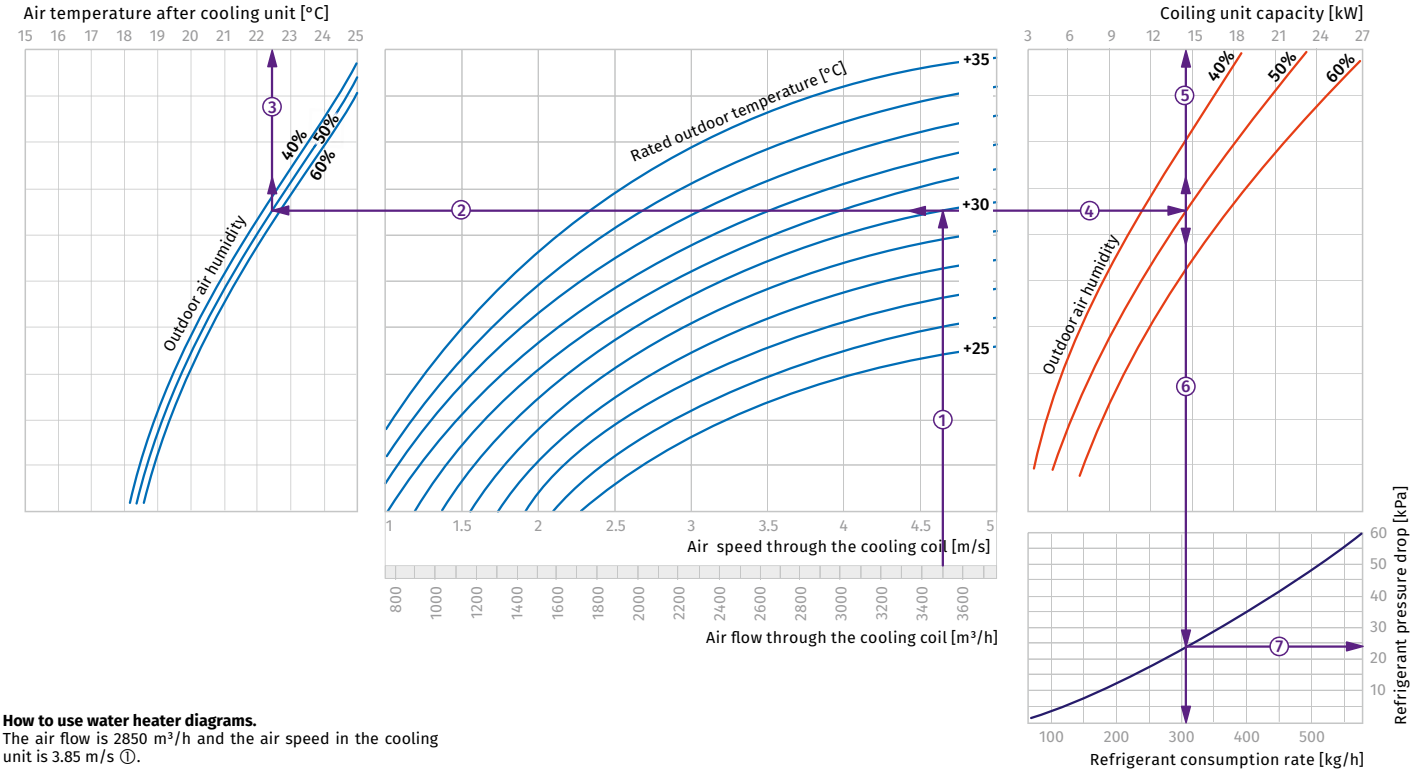

**How to use water heater diagrams.**
The air flow is 2500 m³/h and the air speed in the cooling unit is 3.75 m/s ①.

- 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).

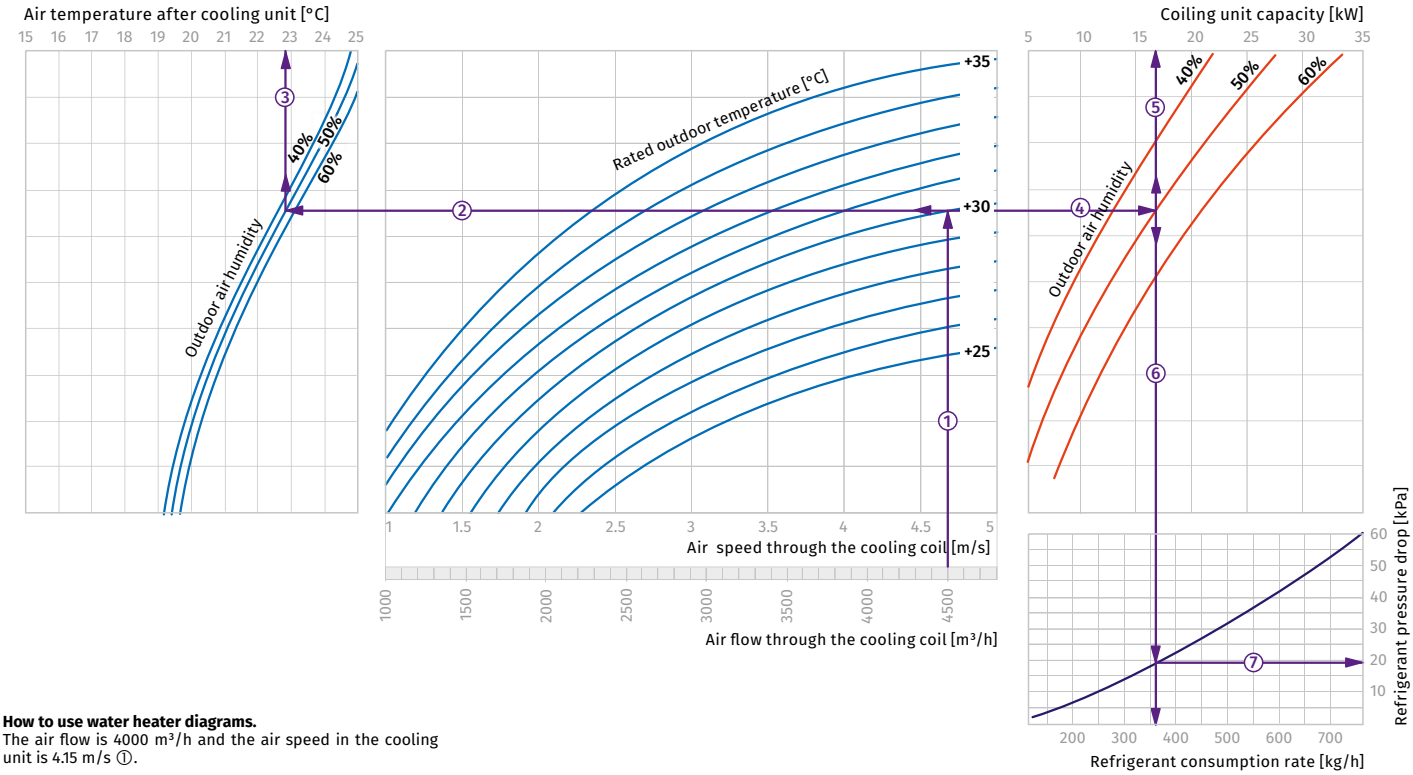
## KFK 60x35-3




**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).

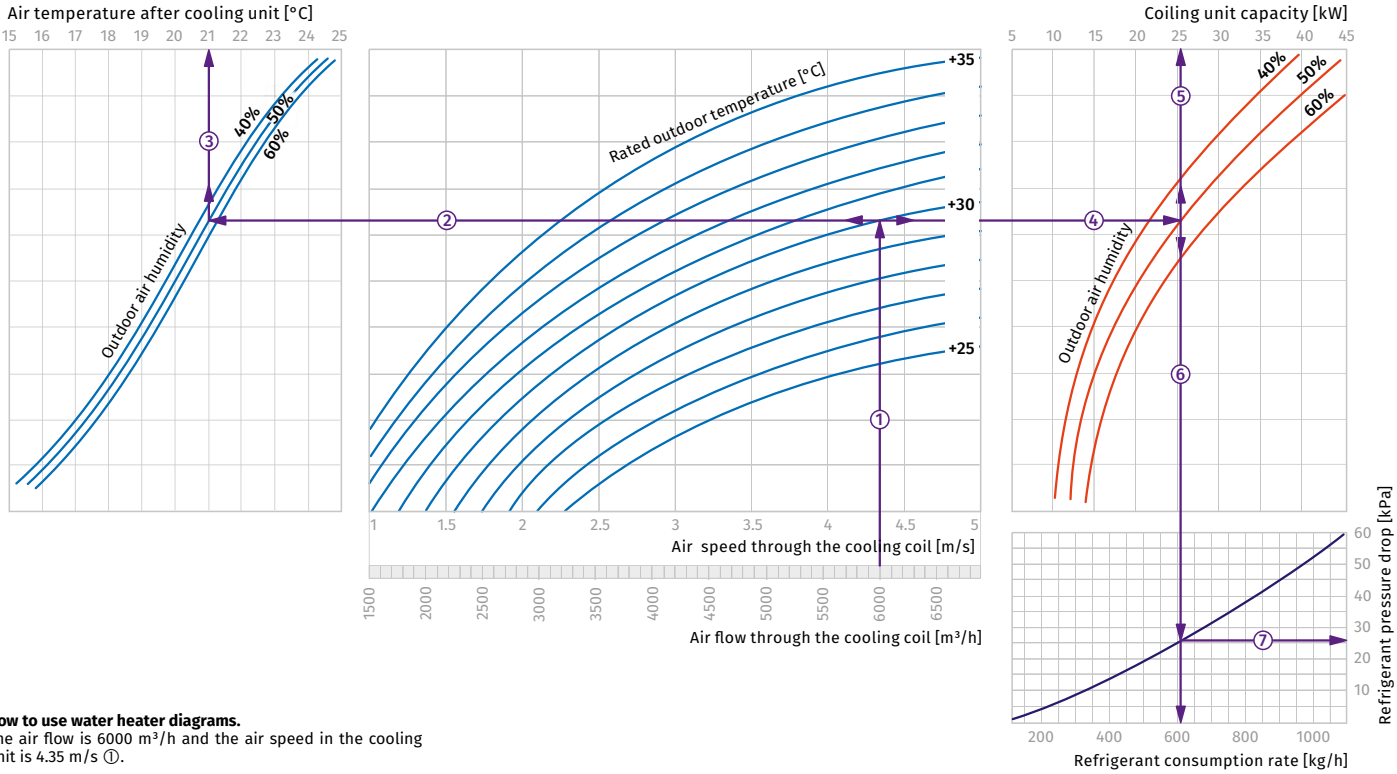
## KFK 70x40-3




**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



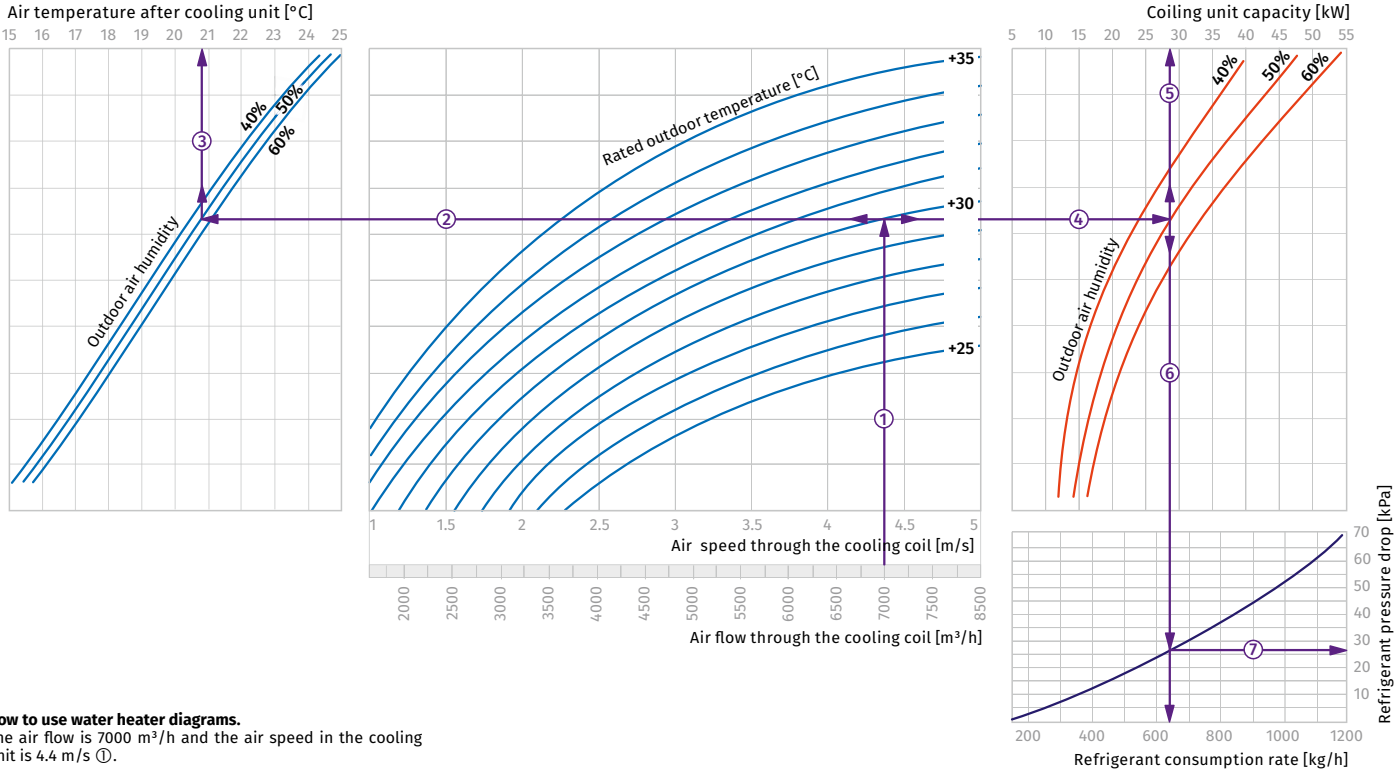

**How to use water heater diagrams.**
The air flow is 6000 m³/h and the air speed in the cooling unit is 4.35 m/s ①.

- 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



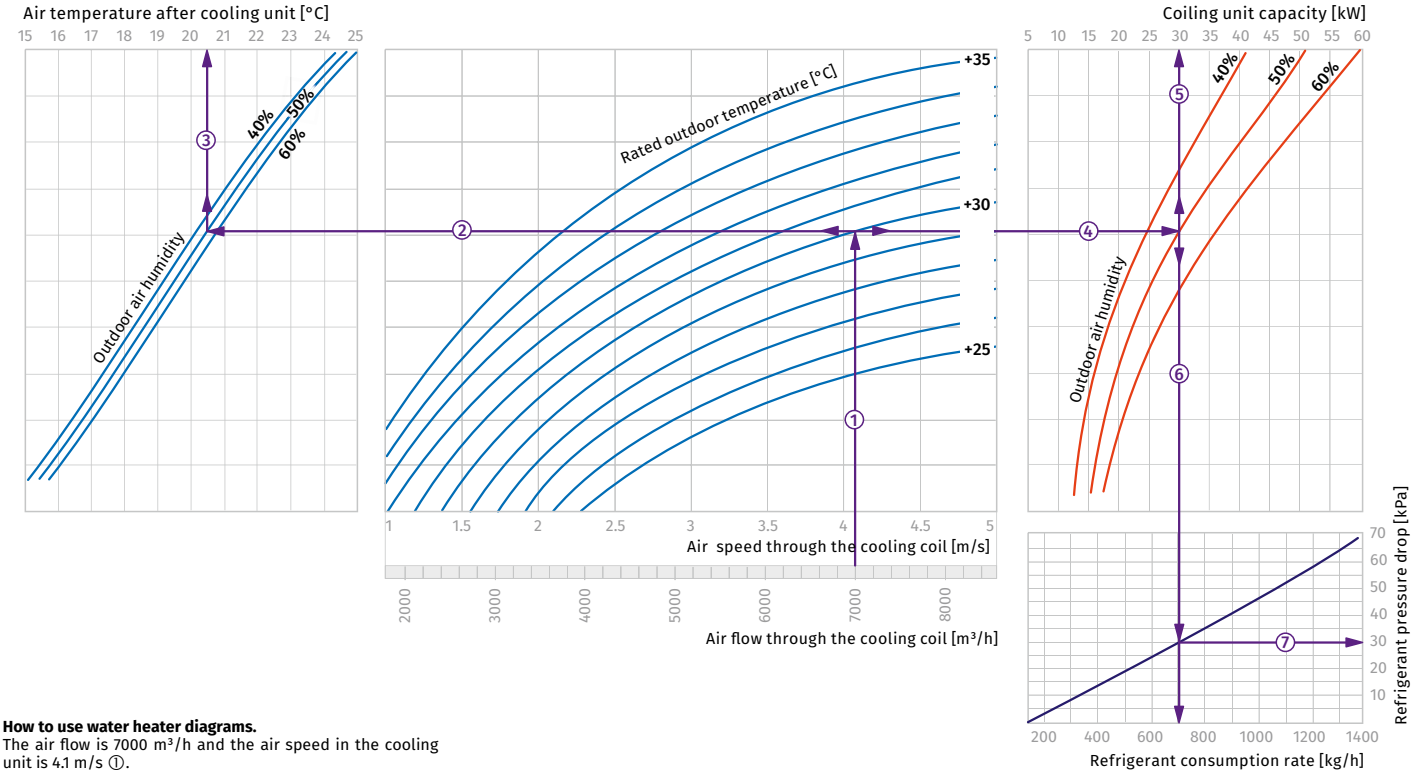

**How to use water heater diagrams.**
The air flow is 7000 m³/h and the air speed in the cooling unit is 4.4 m/s ①.

- 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




**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

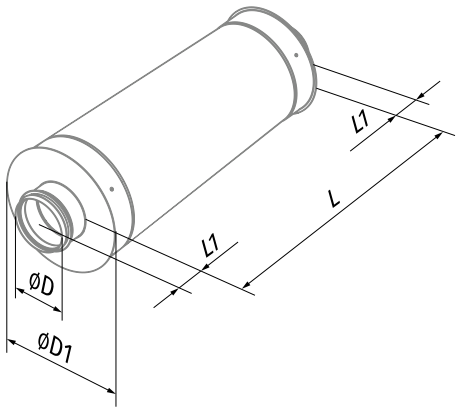
- Fixing to round ducts with clamps.
- Any mounting position.
- For better sound absorption install the silencers in Seriess.

### Designation key

| Serie | Connected air duct diameter [cm] | | Length |
|---|---|---|---|
| SD | 100; 125; 150; 160; 200; 250; 315 | / | 600; 900; 1200 |

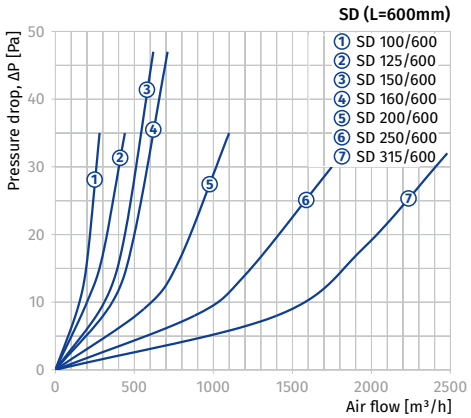
### Overall dimensions [mm]

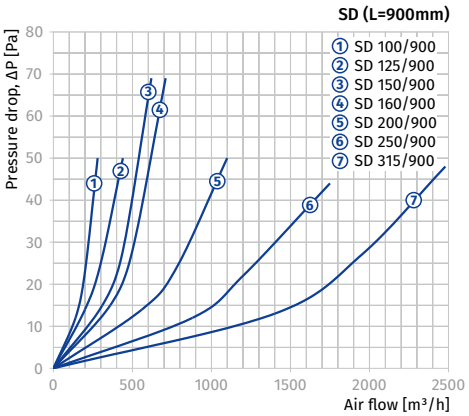
| Model | D | D1 | L | L1 | Weight [kg] |
|---|---|---|---|---|---|
| SD 100/600 | 99 | 200 | 600 | 50 | 2.2 |
| SD 100/900 | 99 | 200 | 900 | 50 | 3.2 |
| SD 100/1200 | 99 | 200 | 1200 | 50 | 4.3 |
| SD 125/600 | 124 | 225 | 600 | 50 | 2.7 |
| SD 125/900 | 124 | 225 | 900 | 50 | 4.1 |
| SD 125/1200 | 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 |

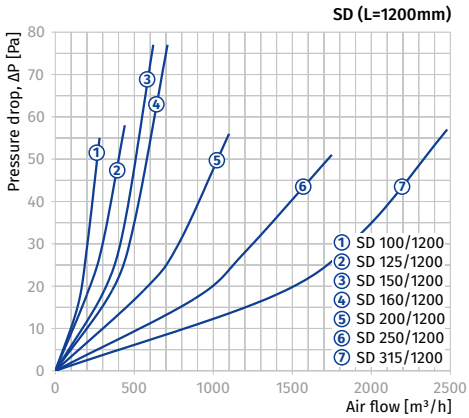


## Noise level reduction, dB (octave-frequency band [Hz])

| 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 |



# 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 Ø100 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 Seriess.
- Fixing on both ends and in the middle to prevent sagging.

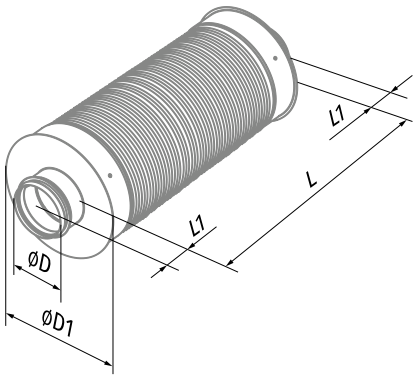
SILENCERS

### Designation key

| Serie | Connected air duct diameter [mm] | | Length |
|---|---|---|---|
| SDF | 100; 125; 150; 160; 200; 250; 315 | / | 600; 900; 1200 |

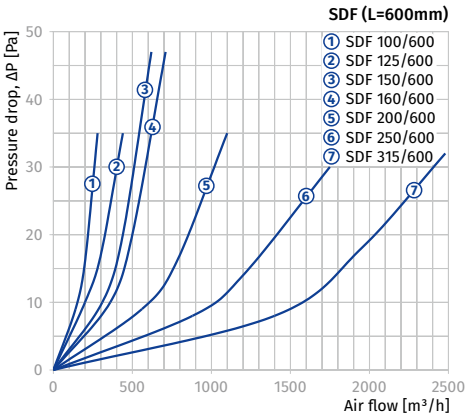
### Overall dimensions [mm]

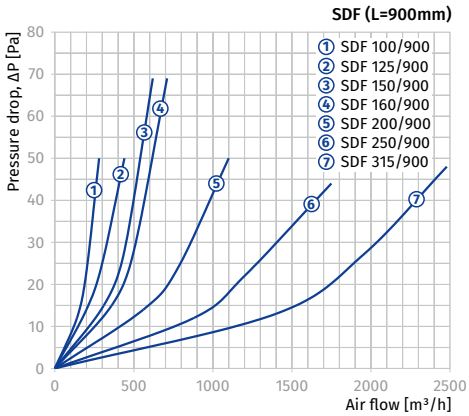
| Model | D | D1 | L | L1 | Weight [kg] |
|---|---|---|---|---|---|
| SDF 100/600 | 99 | 220 | 600 | 55 | 1.6 |
| SDF 100/900 | 99 | 220 | 900 | 55 | 2.4 |
| SDF 100/2000 | 99 | 220 | 2000 | 55 | 5.2 |
| SDF 125/600 | 124 | 270 | 600 | 55 | 2.0 |
| SDF 125/900 | 124 | 270 | 900 | 55 | 3.0 |
| SDF 125/2000 | 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 |

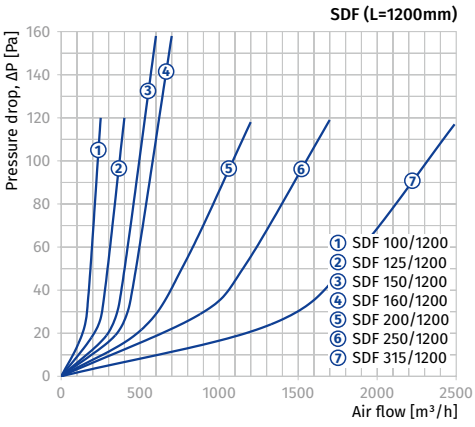


## Noise level reduction, dB (octave-frequency band [Hz])

| 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 |



# 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

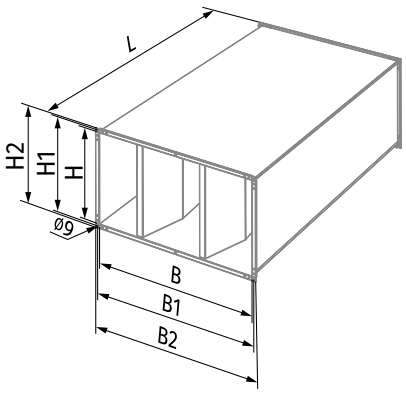
- Fixing to rectangular ducts with flange connection.
- For maximum sound absorption capacity provide a straight air duct section at least 1 m long towards the silencer.
- For better sound absorption install the silencers in Seriess

### Designation key

| Serie | Flange size (WxH) [mm] |
|---|---|
| SD | 40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50 |

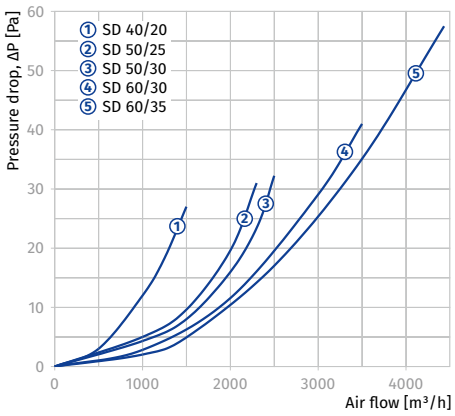
### Overall dimensions [mm]

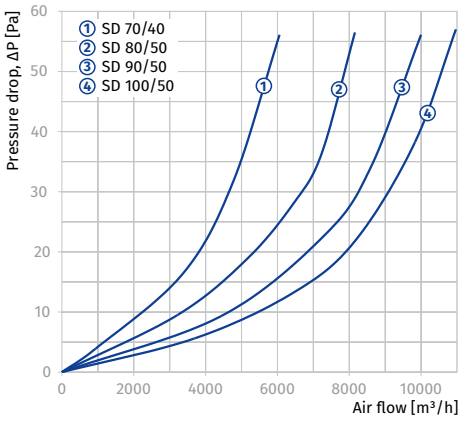
| Model | B | B1 | B2 | H | H1 | H2 | L | Weight [kg] |
|---|---|---|---|---|---|---|---|---|
| SD 40x20 | 400 | 420 | 440 | 200 | 220 | 240 | 950 | 18.5 |
| SD 50x25 | 500 | 520 | 540 | 250 | 270 | 290 | 950 | 20.5 |
| SD 50x30 | 500 | 520 | 540 | 300 | 320 | 340 | 950 | 24.5 |
| SD 60x30 | 600 | 620 | 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

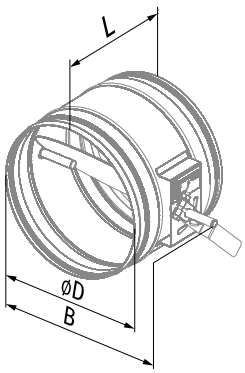
- Fixing to round ducts with clamps.

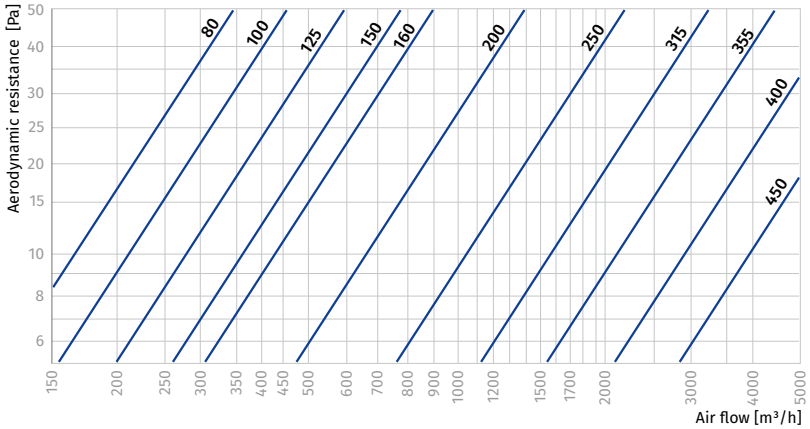
### Designation key

| Serie | Connected air duct diameter [mm] |
|---|---|
| VK | 80; 100; 125; 150; 160; 200; 250; 315; 355; 400; 450 |

### Overall dimensions [mm]

| Model | Ø D | B | L | Weight [kg] |
|---|---|---|---|---|
| VK 80 | 79 | 140 | 200 | 0.57 |
| VK 100 | 99 | 170 | 200 | 0.68 |
| VK 125 | 124 | 195 | 200 | 0.82 |
| VK 150 | 149 | 220 | 200 | 0.95 |
| VK 160 | 159 | 230 | 200 | 1.01 |
| VK 200 | 199 | 270 | 200 | 1.29 |
| VK 250 | 249 | 320 | 200 | 1.64 |
| VK 315 | 314 | 385 | 240 | 2.51 |
| VK 355 | 348 | 425 | 240 | 2.84 |
| VK 400 | 399 | 470 | 240 | 3.38 |
| VK 450 | 449 | 520 | 240 | 3.94 |



# 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 |

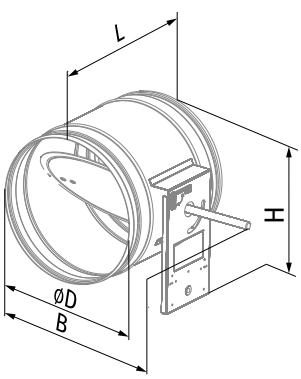
### Overall dimensions [mm]

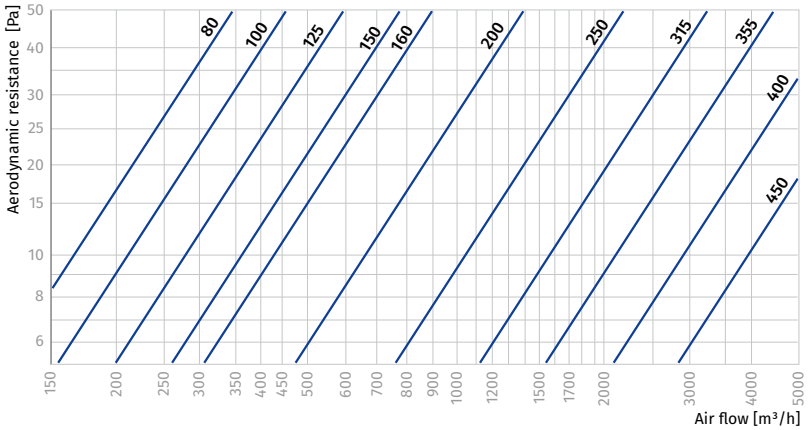
| Model | Ø D | B | L | H | Weight [kg] |
|---|---|---|---|---|---|
| VKA 80 | 79 | 190 | 200 | 170 | 0.6 |
| VKA 100 | 99 | 220 | 200 | 180 | 0.72 |
| VKA 125 | 124 | 245 | 200 | 195 | 0.86 |
| VKA 150 | 149 | 270 | 200 | 205 | 1.01 |
| VKA 160 | 159 | 280 | 200 | 210 | 1.07 |
| VKA 200 | 199 | 320 | 200 | 230 | 1.33 |
| VKA 250 | 249 | 370 | 200 | 255 | 1.68 |
| VKA 315 | 314 | 435 | 240 | - | 2.44 |
| VKA 355 | 348 | 475 | 240 | - | 2.75 |
| VKA 400 | 399 | 520 | 240 | - | 3.26 |
| VKA 450 | 449 | 570 | 240 | - | 3.78 |

### 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 400 | CM230 / LM230A | TF230 | CM24 / LM24A | TF24 |



# 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

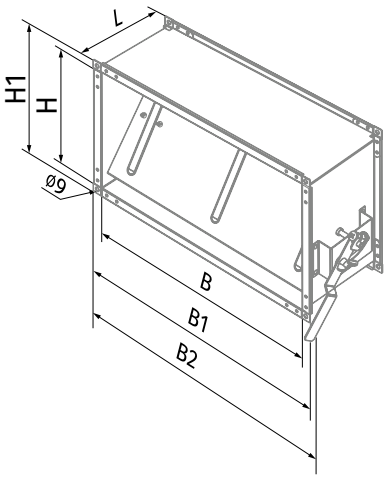
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.

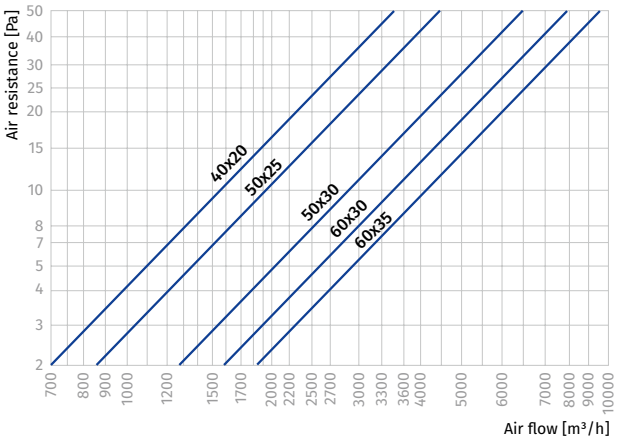
### Designation key

| 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

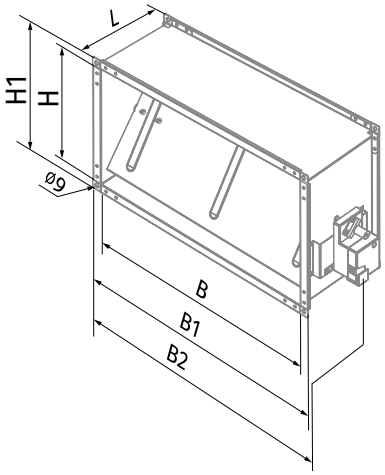
- Fixing to rectangular ducts with flange connection.
- Mounting with galvanized bolts and clamps that fix the end flanges of the air shutter to the mating flanges of the air ducts or any other ventilation system components.
- While mounting provide enough space for accessing the servo actuator.

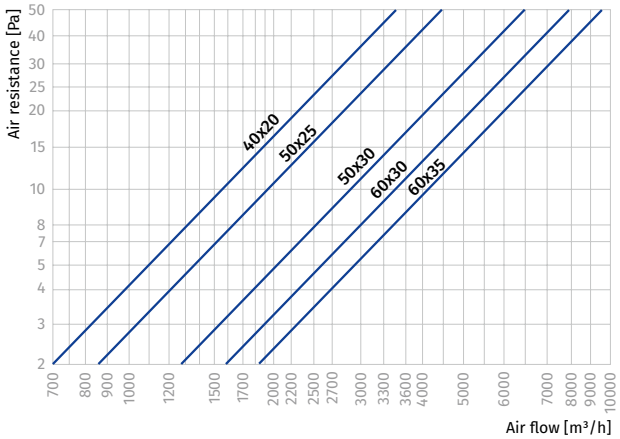
### Designation key

| 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.

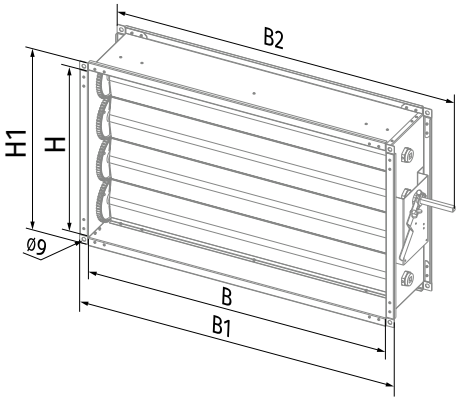


### Designation key

| Serie | Flange size [cm] |
|---|---|
| SL | 40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50 |

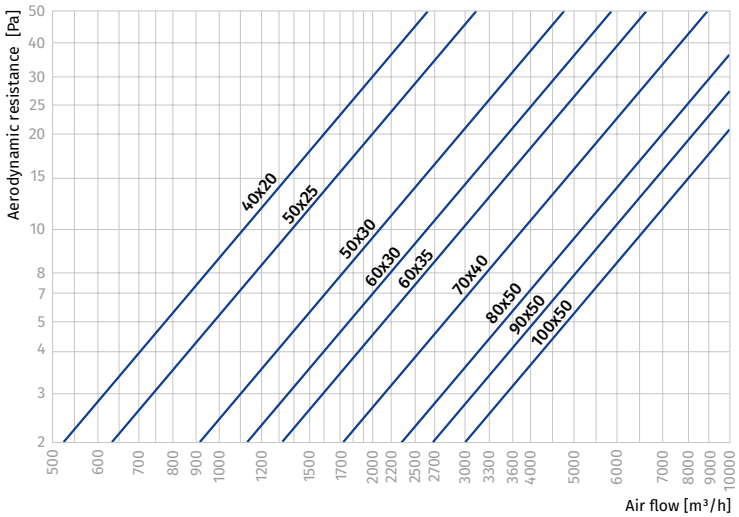
### Overall dimensions [mm]

| 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 Ø100 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.

### Mounting

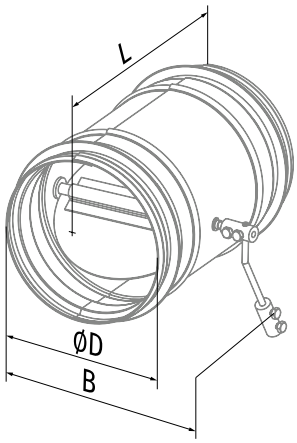
- Fixing to round ducts with clamps.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

### 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 |



# 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

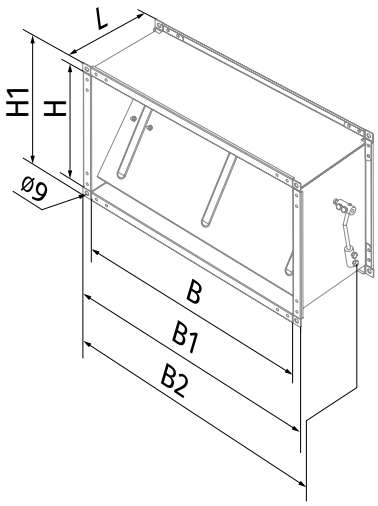
- Fixing to rectangular ducts in upright position.
- Provide free gravity actuated movement of the blade.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

### 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 |



# 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 Ø100 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

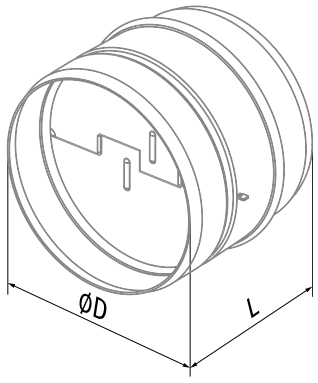
- Fixing to round ducts with clamps.
- Provide vertical position of blade axis.
- Install the backdraft damper into the ventilation system with respect to the air flow direction.

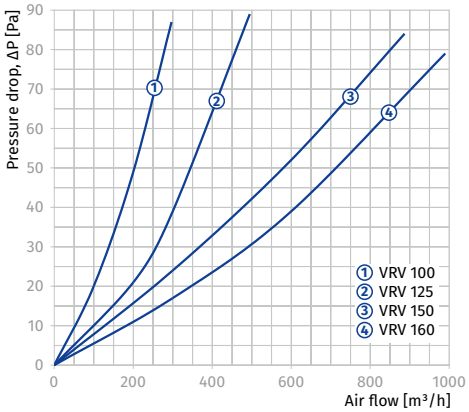
### Designation key

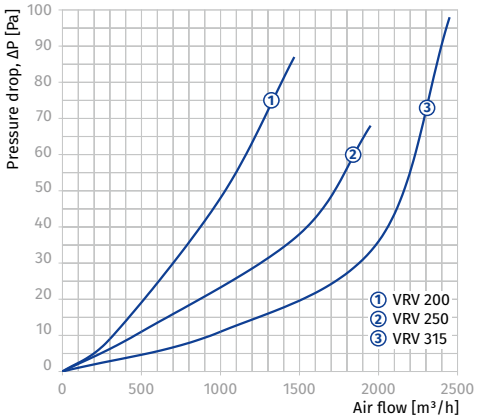
| Serie | Connected air duct diameter [mm] |
|---|---|
| VRV | 100; 125; 150; 160; 200; 250; 315 |

### 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.

### Mounting

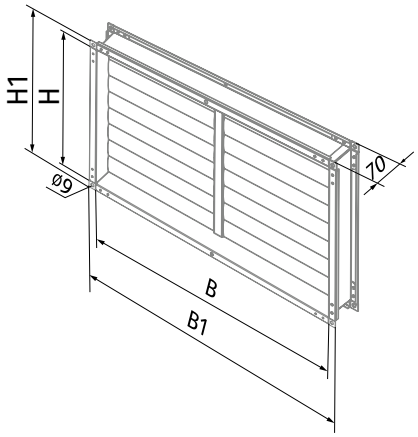
- Fixing to rectangular ducts in upright position.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.

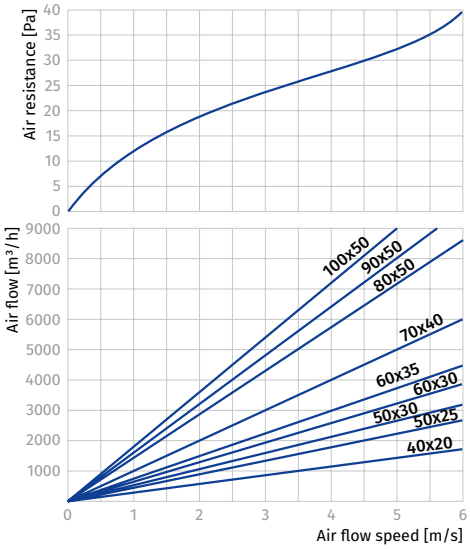
### Designation key

| 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 |



# 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.

### Mounting

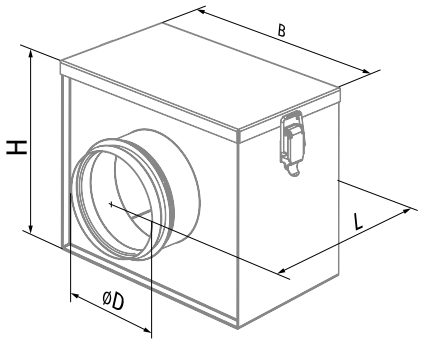
- Fixed inside round ventilation ducts.
- Provide free gravity actuating of the louvre shutters.
- While mounting into the ventilation system match air flow direction.

### 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 |



# 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 ductworksdistortion resulting from temperature changes.
- Compatible with Ø100 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.

### Mounting

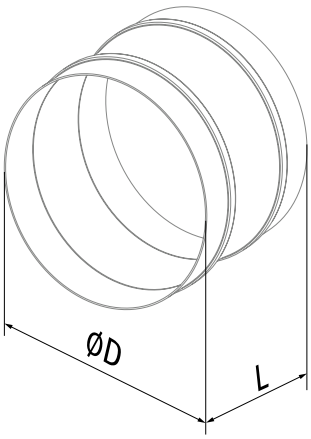
- Flexible vibration damping connectors are fixed to air ducts with clamps.

### 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 |



# 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 Ø200 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

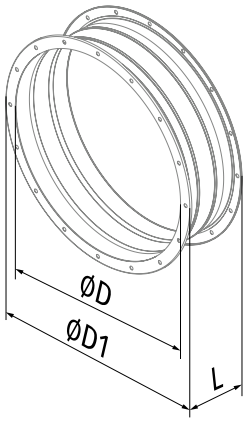
- Flexible vibration damping connectors are fixed to air ducts with flange connection.

### 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 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.

### Mounting

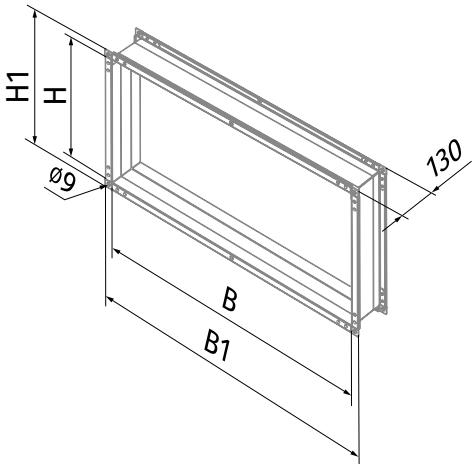
- Mounting with galvanized bolts and clamps that fix the end flanges of the connector to the mating flanges of the air ducts or any other ventilation system components.

### 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 |



# CleanBox

## Filter boxes for round ducts

### Use

- For purification of supply air in ventilation and air conditioning systems installed in various premises
- Compatible with Ø100 up to 200 mm round air ducts.
- Suitable for limited mounting space.

### Design

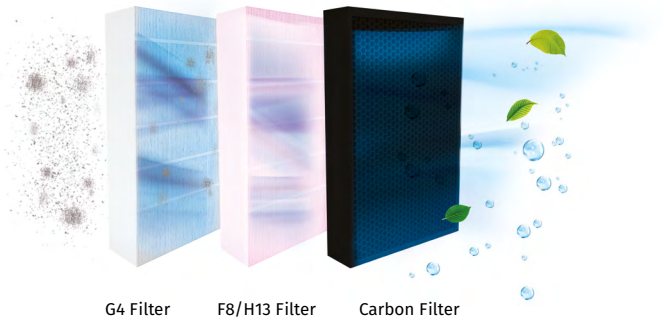
- The casing is made of polymer-coated steel.
- Easy access for filter maintenance.

### 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.

### Air filtration

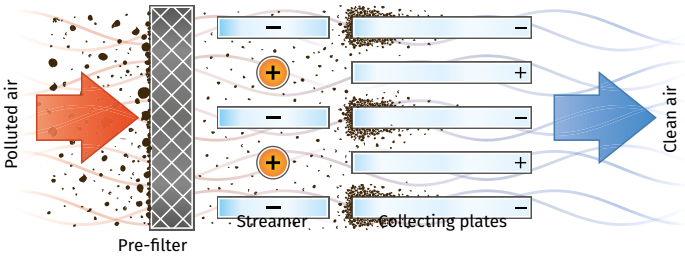
- Built-in filters provide efficient air filtration. Up to three filters can be installed into the casing.
- G4 filter provides primary filtration. At the second stage, the secondary filter F8 or HEPA filter H13 can be installed. F8 filter arrests up to 98 % of PM 2.5 dust particles. H13 filter arrest 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.



G4 Filter F8/H13 Filter Carbon Filter

### Electrostatic filter

- The **CleanBox ES** is equipped with an electrostatic filter that enables purification of air from fine dust and soot, spray, smoke and other particles with the size of 0.01 microns and less.
- Max. filter cleaning efficiency 98 %.
- The electrostatic filters rely on gravity of oppositely charged objects.
- The polluted air stream flows through the spray charging unit for the particles ionization.
- Ionized particles are moved by the airstream and accumulated on the collecting plates which are oppositely charged.



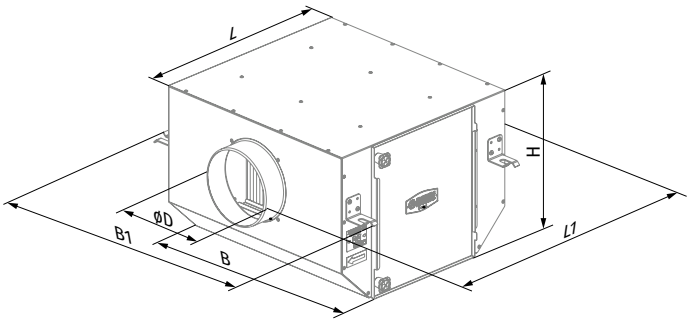

- The filter cleaning interval depends on the inlet air pollution density and may vary from 7 up to 21 days.
- The filter cleaning interval is determined by the visual inspection of the filters.
- Vacuum cleaning is allowed.

**Designation key**

| Series | Duct diameter [mm] | Filters |
|---|---|---|
| CleanBox | 100; 150; 200 | G4; G4-F8; G4-F8-Carbon; G4-H13; G4-H13-Carbon; ES |

## Overall dimensions

| Type | ØD | L | H | B | L1 | B1 | L2 | B2 | Weight [kg] |
|---|---|---|---|---|---|---|---|---|---|
| CleanBox 100 G4-F8 | 100 | 413.5 | 249 | 415 | 513.5 | 508 | 358.5 | 458 | 7.47 |
| CleanBox 100 G4-F8-Carbon | 100 | 413.5 | 249 | 415 | 513.5 | 508 | 358.5 | 458 | 8.17 |
| CleanBox 100 G4-H13 | 100 | 413.5 | 249 | 415 | 513.5 | 508 | 358.5 | 458 | 7.47 |
| CleanBox 100 G4-H13-Carbon | 100 | 413.5 | 249 | 415 | 513.5 | 508 | 358.5 | 458 | 8.18 |
| CleanBox 100 ES | 100 | 514 | 250 | 458 | 614 | 551 | 456 | 502 | 11.5 |
| CleanBox 150 G4-F8 | 150 | 413.5 | 299 | 440 | 513.5 | 508 | 358.5 | 483 | 8.47 |
| CleanBox 150 G4-F8-Carbon | 150 | 413.5 | 299 | 440 | 513.5 | 508 | 358.5 | 483 | 9.04 |
| CleanBox 150 G4-H13 | 150 | 413.5 | 299 | 440 | 513.5 | 508 | 358.5 | 483 | 8.47 |
| CleanBox 150 G4-H13-Carbon | 150 | 413.5 | 299 | 440 | 513.5 | 508 | 358.5 | 483 | 9.04 |
| CleanBox 150 ES | 150 | 514 | 300 | 458 | 614 | 551 | 456 | 502 | 12.7 |
| CleanBox 200 G4-F8 | 200 | 413.5 | 299 | 605 | 513.5 | 508 | 358.5 | 648 | 10.62 |
| CleanBox 200 G4-F8-Carbon | 200 | 413.5 | 299 | 605 | 513.5 | 508 | 358.5 | 648 | 11.84 |
| CleanBox 200 G4-H13 | 200 | 413.5 | 299 | 605 | 513.5 | 508 | 358.5 | 648 | 10.62 |
| CleanBox 200 G4-H13-Carbon | 200 | 413.5 | 299 | 605 | 513.5 | 508 | 358.5 | 648 | 11.84 |
| CleanBox 200 ES | 200 | 514 | 300 | 658 | 614 | 751 | 456 | 702 | 16.8 |




## Application

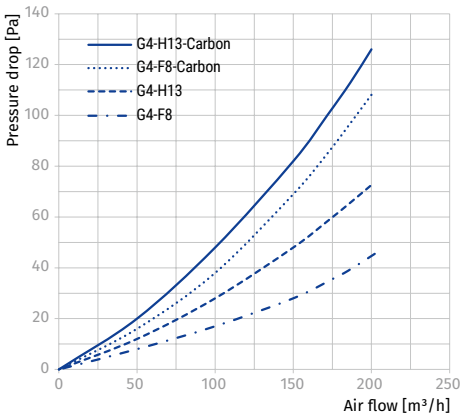

## Replaceble filters

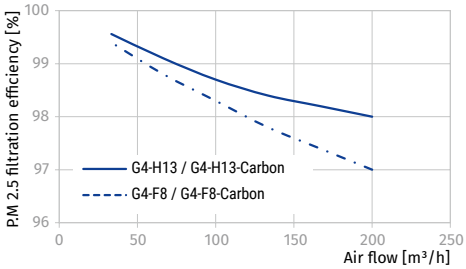
| | | CleanBox 100 (ES*) | CleanBox 150 (ES*) | CleanBox 200 (ES*) |
|---|---|---|---|---|
| G4 Panel filter |  | FP 220x400x47 G4 | FP 270x425x47 G4 | FP 270x590x47 G4 |
| F8 Panel filter |  | FP 220x400x47 F8 | FP 270x425x47 F8 | FP 270x590x47 F8 |
| H13 Panel filter |  | FP 220x400x47 H13 | FP 270x425x47 H13 | FP 270x590x47 H13 |
| Carbon panel filter |  | FP 220x400x47 C | FP 270x425x47 C | FP 270x590x47 C |

* By default models with electrostatic filters ES are equipped with pre-filters G4.
The G4 filter can be replaced by either F8, H13 or a carbon filter on request.

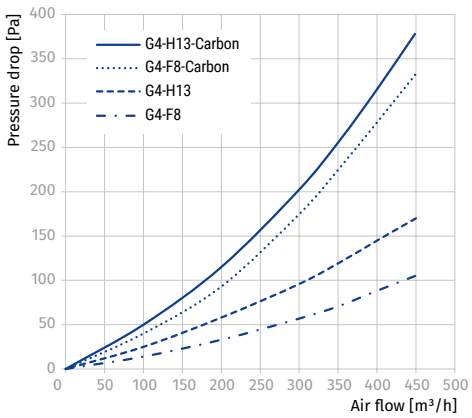
## Technical data

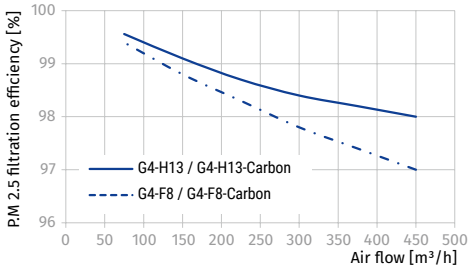
### CLEANBOX 100




### CLEANBOX 150

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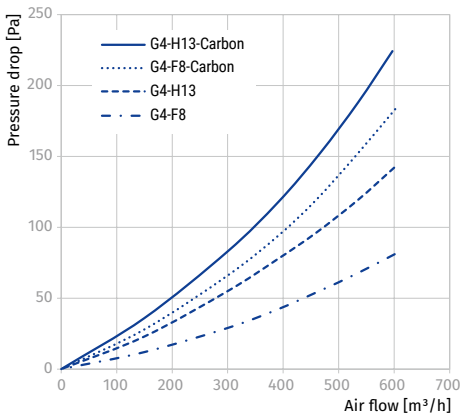
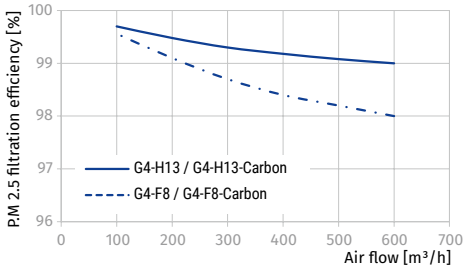
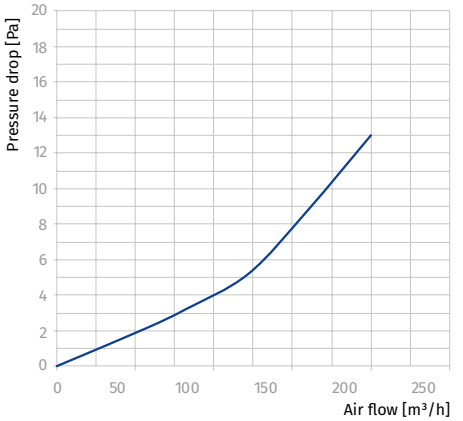
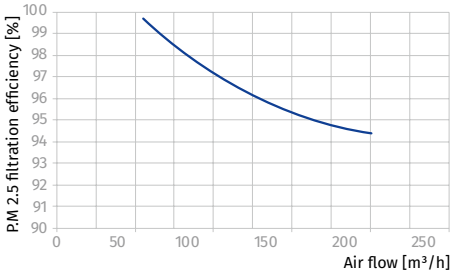


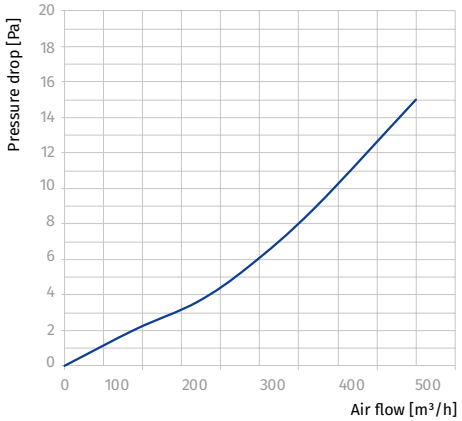



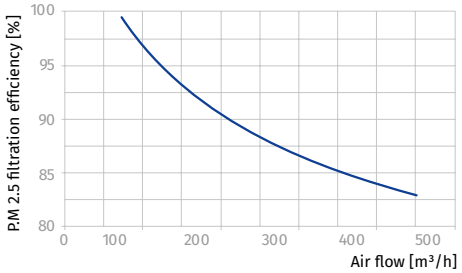

### CLEANBOX 100 ES



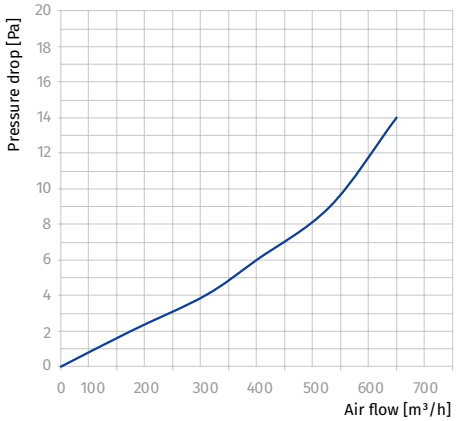



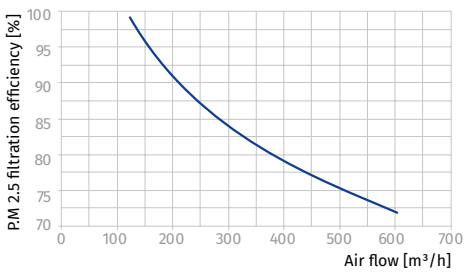

### CLEANBOX 150 ES




### CLEANBOX 200 ES



# 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 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 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.

### Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

### Accessories

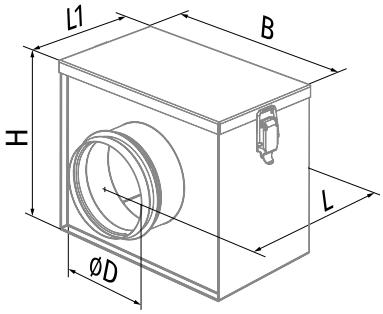
- G4 replaceable flat filter cartridges made of synthetic non-woven cloth series FP-KFBK.

### Designation key

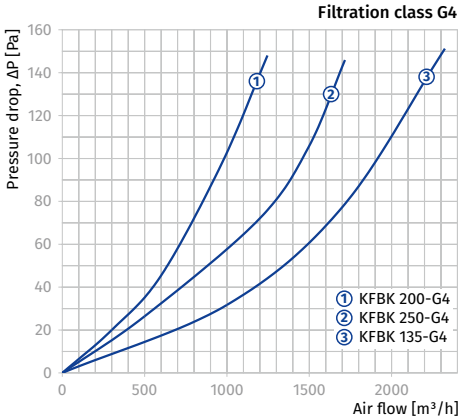
| Serie | Connected air duct diameter [mm] |
|---|---|
| KFBK | 100; 125; 150; 160; 200; 250; 315 |

### 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 |








FILTER BOXES

# 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.

### Mounting

- Fixing to round ducts with clamps.
- Any mounting position.
- While mounting provide extra space for free access to the filter for servicing.

### Accessories

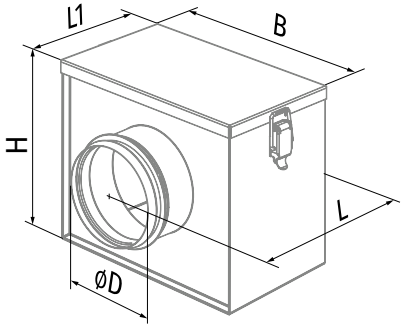
- G4 replaceable V-shaped filter cartridges made of synthetic non-woven cloth series FP-KFBV.

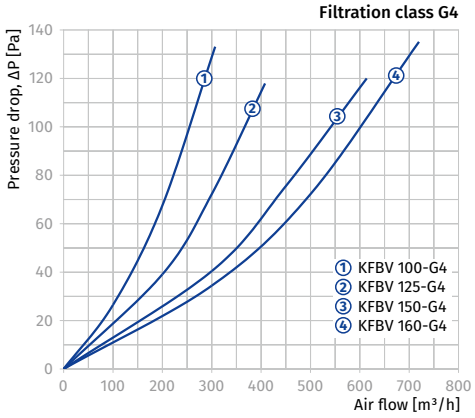
### Designation key

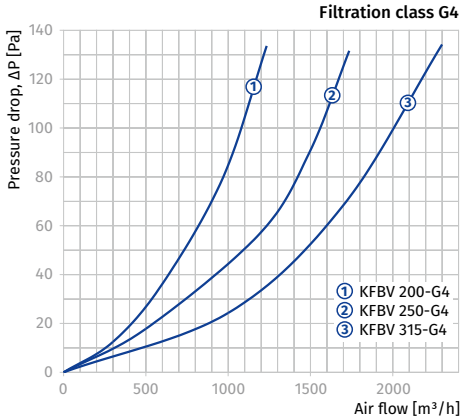
| Serie | Connected air duct diameter [mm] |
|---|---|
| KFBV | 100; 125; 150; 160; 200; 250; 315 |

### 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 |



# 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 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 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

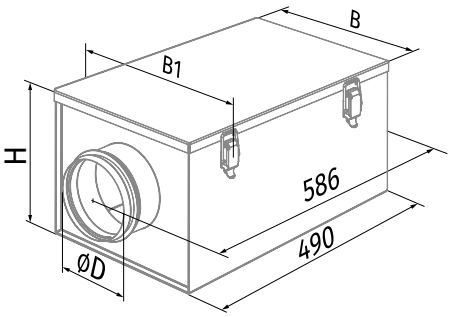
- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series FP-KFBT.

### Designation key

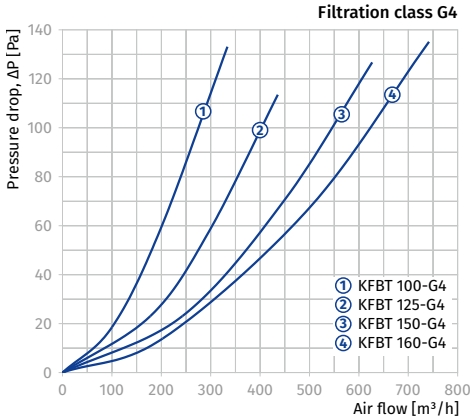
| Serie | Connected air duct diameter [mm] |
|---|---|
| KFBT | 100; 125; 150; 160; 200; 250; 315 |

### Overall dimensions [mm]

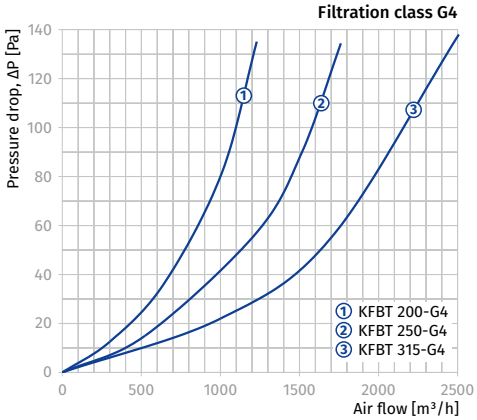
| Model | D | B | B1 | H | Weight [kg] |
|---|---|---|---|---|---|
| KFBT 100 | 99 | 210 | 230 | 170 | 2.41 |
| KFBT 125 | 124 | 220 | 240 | 206 | 2.69 |
| KFBT 150 | 149 | 270 | 290 | 236 | 3.20 |
| KFBT 160 | 159 | 270 | 290 | 236 | 3.26 |
| KFBT 200 | 199 | 320 | 340 | 276 | 3.76 |
| KFBT 250 | 249 | 370 | 390 | 386 | 4.39 |
| KFBT 315 | 314 | 430 | 450 | 390 | 5.17 |



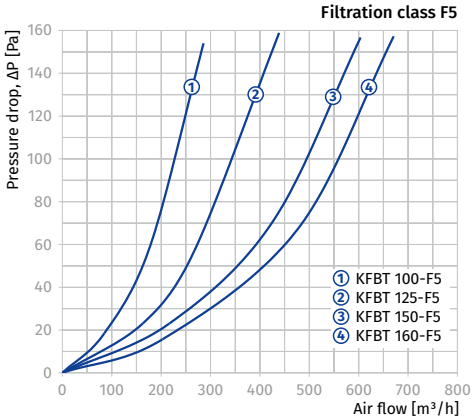
**Filtration class G4**



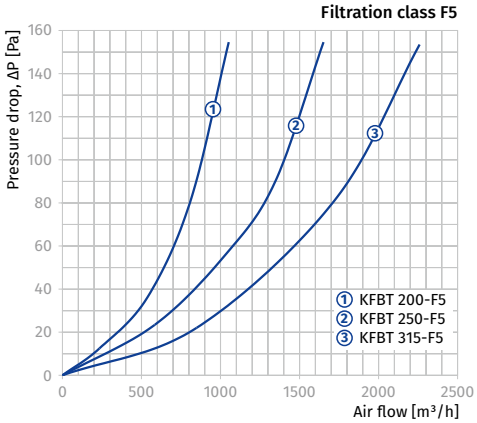

**Filtration class G4**



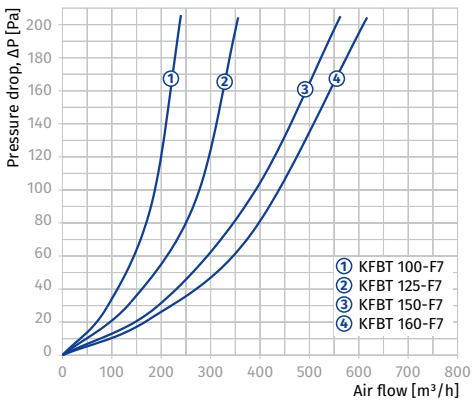

**Filtration class F5**



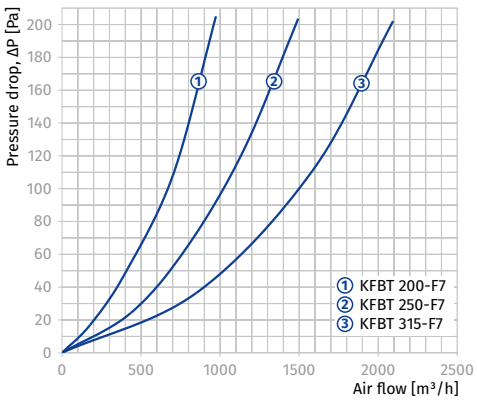

**Filtration class F5**




**Filtration class F7**




**Filtration class F7**



# 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.
- 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

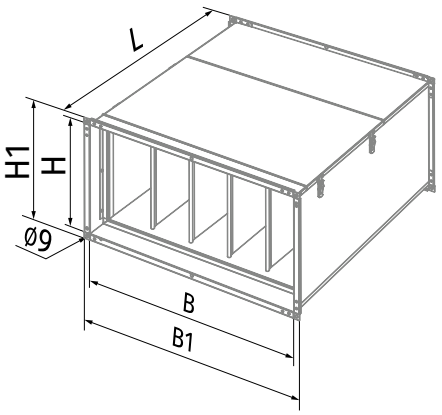
- G4, F5, F7 replaceable filter bags made of synthetic non-woven cloth series FP-KFBT.

### Designation key

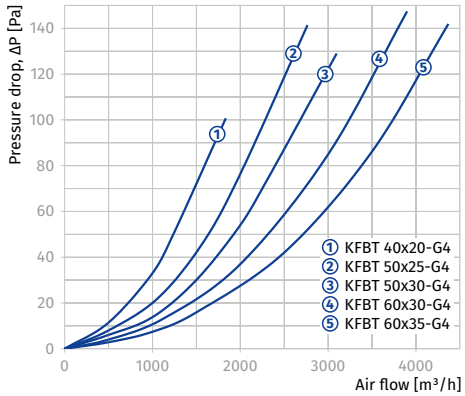
| Serie | Flange size (WxH) [mm] |
|---|---|
| KFBT | 40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50 |

### Overall dimensions [mm]

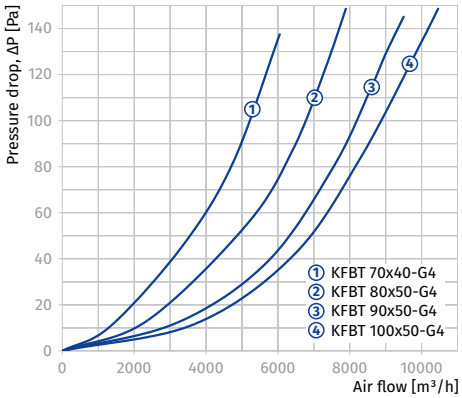
| Model | B | B1 | H | H1 | L | Weight [kg] |
|---|---|---|---|---|---|---|
| KFBT 40x20 | 400 | 440 | 200 | 240 | 500 | 6.2 |
| KFBT 50x25 | 500 | 540 | 250 | 290 | 600 | 7.8 |
| KFBT 50x30 | 500 | 540 | 300 | 340 | 600 | 8.3 |
| KFBT 60x30 | 600 | 640 | 300 | 340 | 600 | 8.9 |
| KFBT 60x35 | 600 | 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 |



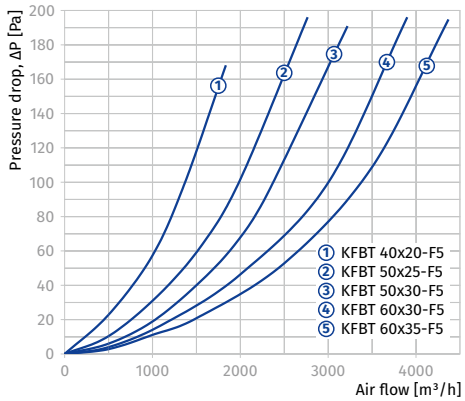
**Filtration class G4**



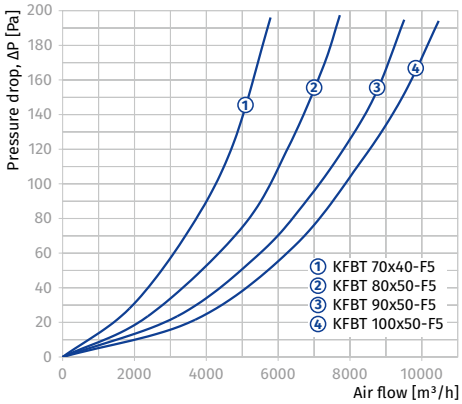

**Filtration class G4**



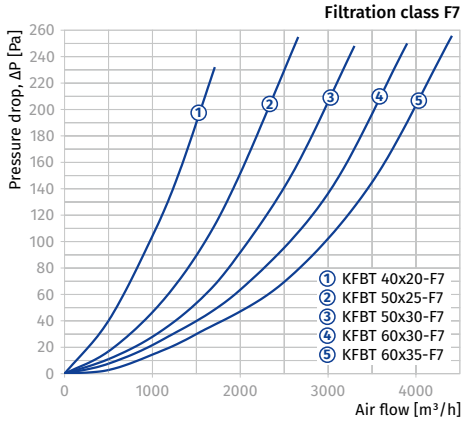

**Filtration class F5**



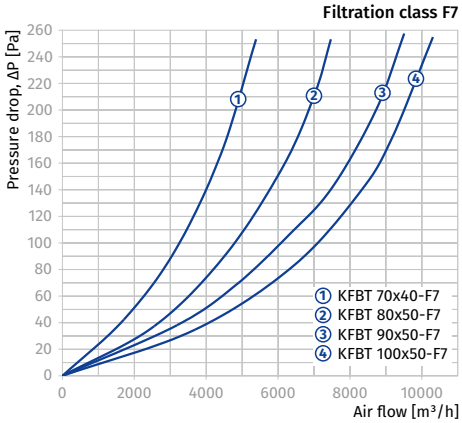

**Filtration class F5**




**Filtration class F7**




**Filtration class F7**



# 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.

### Mounting

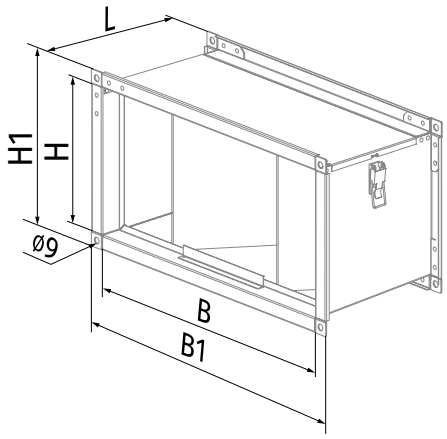
- Fixing to rectangular ducts with flange connection.
- Installed upstream to heater and fan following the air flow direction.
- While mounting provide extra space for free access to the filter for servicing.

### Accessories

- G4 replaceable filter cartridges made of synthetic non-woven cloth series FP-KFBK.

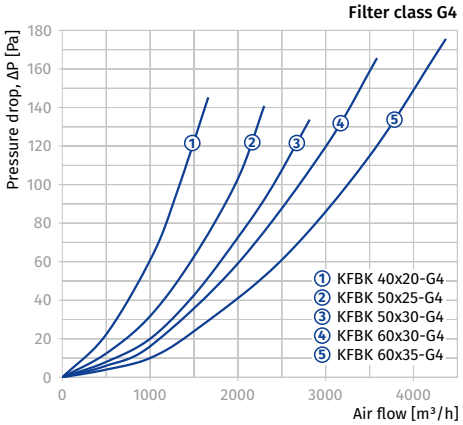
### Designation key

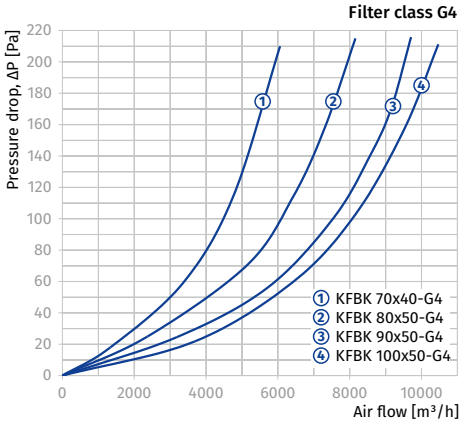
| Serie | Flange size (WxH) [mm] |
|---|---|
| KFBK | 40x20; 50x25; 50x30; 60x30; 60x35; 70x40; 80x50; 90x50; 100x50 |




### 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 |



# 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

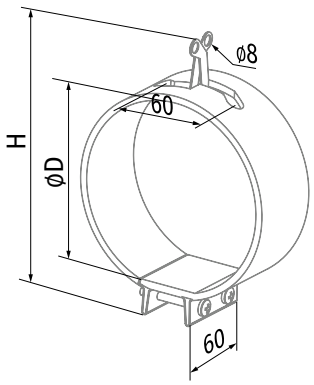
- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with two bolts.

### 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 |




CLAMPS

# 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

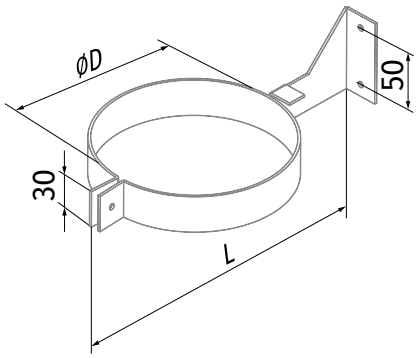
- Fixed on round ventilation system components.
- Round ventilation system components are fixed by a clamp with a bolt.
- For installation on wall or ceiling use a mounting bracket fixed with dowels.

### 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

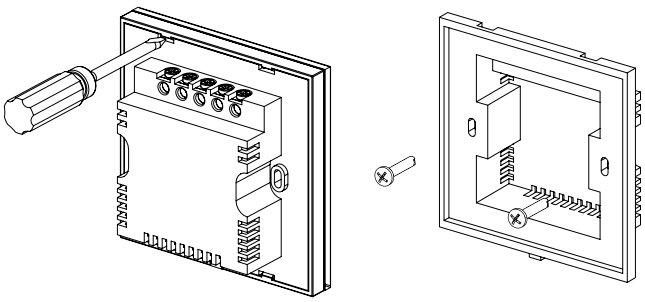
- Casing made of high-quality plastic.
- Glass sensor operating panel with three touch buttons for speed selection with light indication.
- Wall flush mounting.
- IP30 ingress protection rating.

## Control

- Required speed is activated by touching the respectively marked speed button.
- The fan is turned off by touching the current speed button.

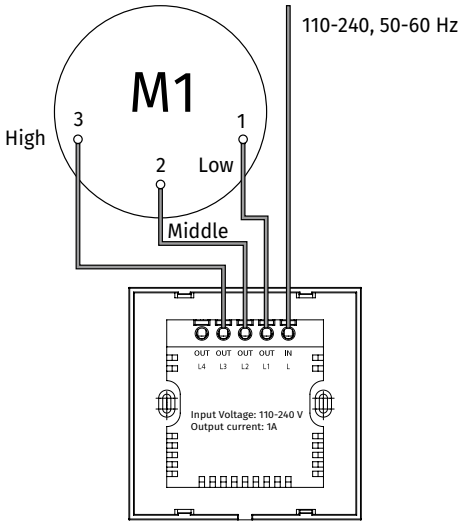
## Mounting

- Designed for wall mounting in a flush mounting box.

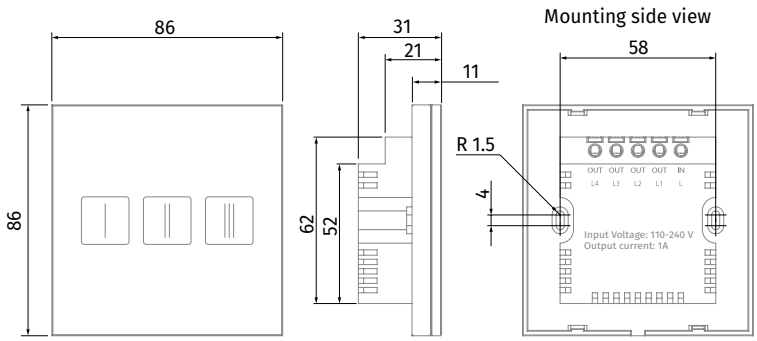


## Technical data

| Parameters | SGR-3/1 |
|---|---|
| Voltage 50-60 Hz [V] | 110-240 |
| Max. current load [A] | 1 |
| Number of speeds | 3 |
| Cable cross section [mm²] | 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]



# SGS E1 / SGS E2.5

## Sensor speed controller

## Features

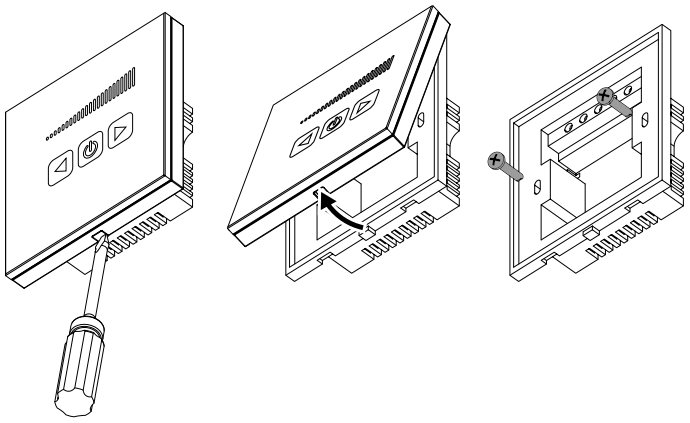
- On/off switch and speed control for single-phase voltage controlled fans.

## 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.

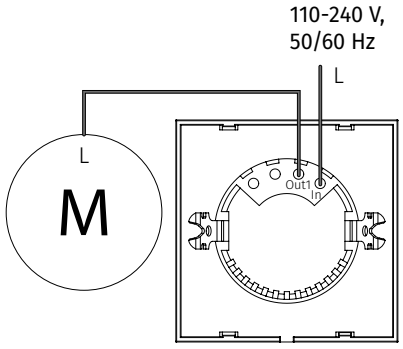
## Mounting

- Designed for wall mounting in a flush mounting box.



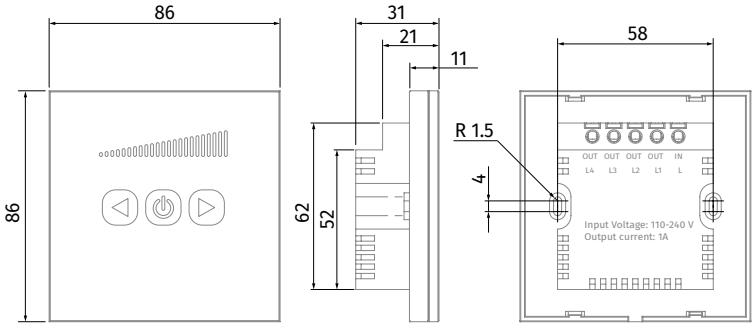
## Technical data

| Parameters | SGS E1 | SGS E2.5 |
|---|---|---|
| Voltage 50-60 Hz [V] | 230 | 230 |
| Max. current load [A] | 1 | 2.5 |
| Cable cross section [mm²] | from 0.35 up to 1 | from 0.35 up to 1 |
| Temperature range [°C] | from -10 up to +45 | from -10 up to +45 |
| Operating humidity range [%] | from 5 up to 80 (no condensation) | from 5 up to 80 (no condensation) |
| Service life | 100 000 operations | 100 000 operations |
| Ingress Protection | IP30 | IP30 |
| Weight [g] | 138 | 138 |




M – ventilation equipment motor

## Overall dimensions [mm]



# 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 ~ 220-240 | 1 ~ 220-240 |
| 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

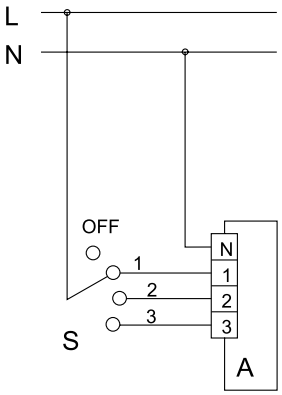



**Diagram 1.** The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off.

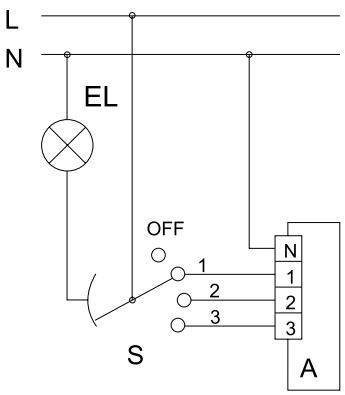



**Diagram 2.** The external switch S (CDP-3/5) switches the fan to one of three speeds and switches it off with parallel switching on/off the light in the room.

# 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

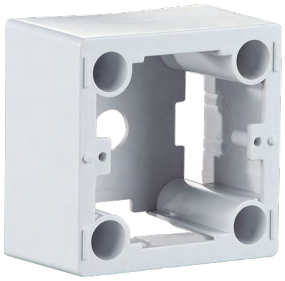
- Input circuit protected with a thermal fuse.
- Equipped with a transient filter.

### 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 ~ 220-240 |
| 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

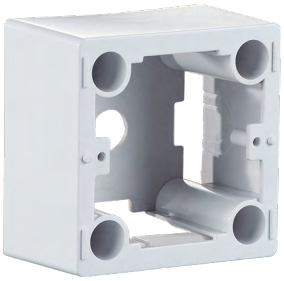
- Switching on/off by the control knob.
- Speed control from minimum to maximum value.
- Featured with high efficiency and control accuracy.

### Mounting

- Indoor wall flush mounting in a mounting box.
- Suitable for installation in standard electric junction boxes.

### Options

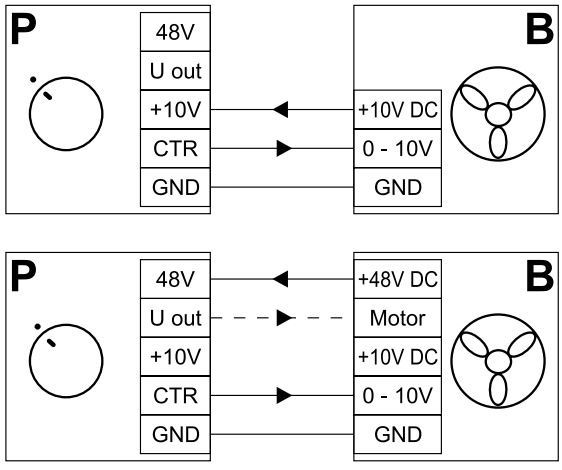
- Mounting box EDR-E for wall surface mounting available upon separate order.



### Technische Daten

| Parameters | CDT E1.8 |
|---|---|
| Voltage [V] | 10-48 DC |
| Control signal [V] | 0-10 |
| Maximum current [mA] | 5 |
| Overall dimensions AxBxC [mm] | 78x78x63 |
| Maximum ambient temperature [°C] | 35 |
| Ingress Protection | IP40 |
| Weight [kg] | 0.12 |

### Wiring diagram



# CDTE 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

- Casing made of high-quality plastic.
- Surface box for mounting.
- IP40 ingress protection rating.

### Control

- Switching on/off by control knob.
- Smooth speed control from minimum to maximum value. The minimum rotation 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.
- Featured with high efficiency and control accuracy.

### Protection

- Input circuit protected with a thermal fuse.
- Equipped with a transient filter.

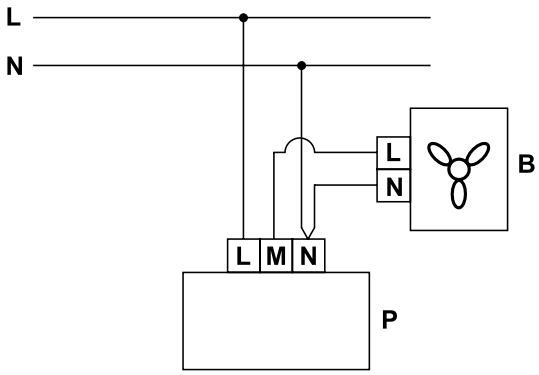
### Mounting

- Indoor wall mounting.

### Technical data

| Parameters | CDTE E1.8 |
|---|---|
| Voltage 50/60 Hz [V] | 1 ~ 220-240 |
| 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.

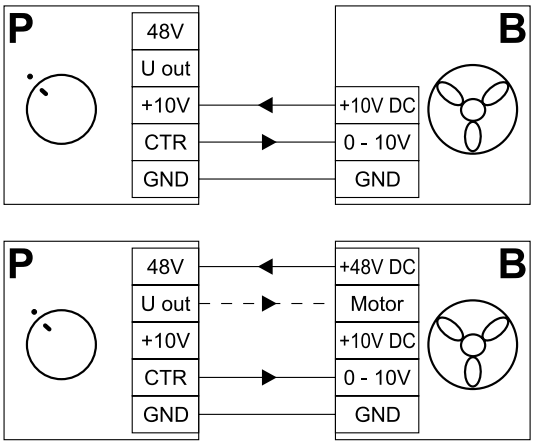
### Mounting

- Indoor wall mounting.

### Technical data

| Parameters | CDTE E/0-10 |
|---|---|
| Voltage [V] | 10-48 DC |
| 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.

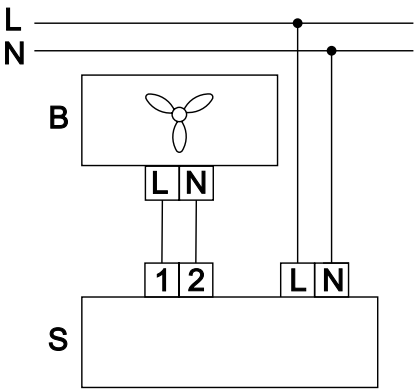
### Protection

- 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).

### Wiring diagram




### Technical data

| Parameters | CDT(E) E1 | CDT(E) E1.5 | CDT(E) E2 | CDT(E) E2.5 |
|---|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| 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 |

# 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 pastic. 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.

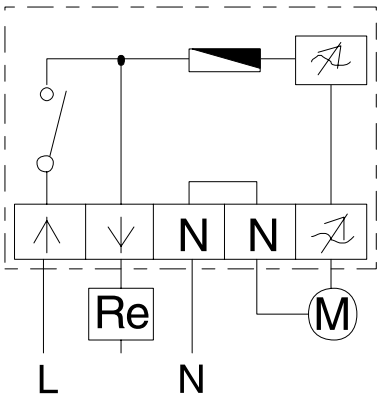
### Mounting

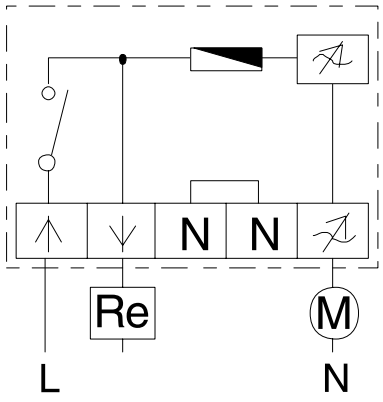
- The universal design of the controller enables its mounting either on the wall or through the wall, suitable for installation into standard round electric junction boxes.

### Technical data

| Parameters | CDT1 E0.5 | CDT1 E1.5 | CDT1 E2.5 | CDT1 E4.0 |
|---|---|---|---|---|
| Voltage [V / 50 Hz] | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 |
| 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 |

### Wiring diagram



# DPWQ30600

## VOC sensor


### Features

- Self-calibrating processor-controlled VOC sensor provides air quality measurement.
- The device is used for quantitative assessment of indoor air saturation with contaminants (e.g. cigarette smoke, expired air, and solvent and detergent vapours).
- Enables setting the sensitivity level relative to an expected maximum air pollution level.
- Enables on-demand ventilation which results in considerable energy savings as air is exchanged only upon reaching the pre-set level of air pollution.

### 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.

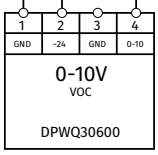
### Technical data

| 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

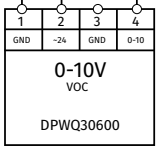
### KOMFORT Roto EC D/S

| 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 |



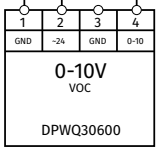

### Civic EC L

| 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 | 0-10V | TACH | NO | GND | GND | ~24V | ~24V | NO | L | L | L | L | L | 0-10V |



# DPWC11200

## Humidity and temperature sensor


### 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.

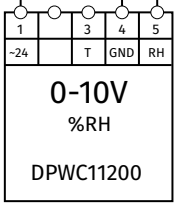
### Technical data

| 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

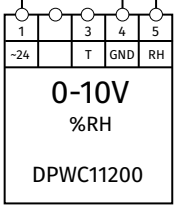
### Komfort Roto EC D/S

| 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 |



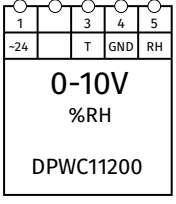

### Civic EC L

| 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 |



# DPWQ40200

## $CO_2$ 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

- **DPWQ40200** $CO_2$ 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 $CO_2$ 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.



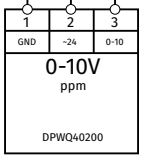
### Technical data

| 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

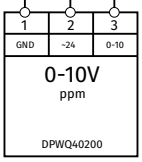
### KOMFORT Roto EC D/S

| 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 |



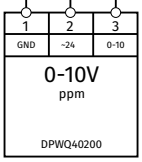

### Civic EC L

| 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 | 0-10V | TACH | NO | GND | GND | ~24V | ~24V | NO | L | L | L | L | L | 0-10V |



# CD-1 / CD-2

## $CO_2$ sensors


## Features

- Indoor carbon dioxide concentration measurement.
- Air flow control depending on $CO_2$ 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 fo 2–10 V/ 0–20 mA/4–20 mA. The relay output is used to turn the fan on/off depending on indoor $CO_2$ 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 $CO_2$ concentration and a touch button for operation mode switching (mode 1: on, mode 2: off, mode 3: operation according to $CO_2$ concentration). The button is used to turn the fan on or turn it off when $CO_2$-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.

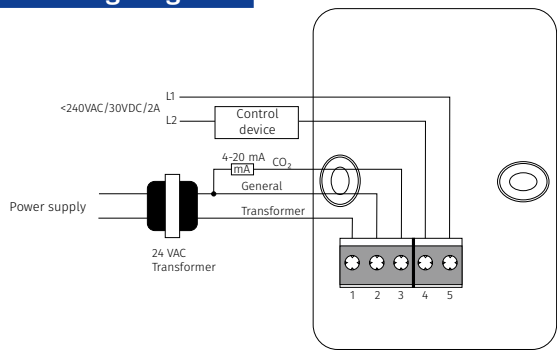
## Mounting and power supply

- 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 |
| $CO_2$-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 $CO_2$ concentration indication (for CD-1 model) | 1st green indicator lights when $CO_2$ concentration is below 600 ppm<br>1st and 2nd green indicators light when $CO_2$ concentration is 600–800 ppm<br>1st yellow indicator lights when $CO_2$ concentration is 800–1200 ppm<br>1st and 2nd yellow indicators light when $CO_2$ concentration is 1200–1400 ppm<br>1st red indicator lights when $CO_2$ concentration is 1400–1600 ppm<br>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




SENSORS

# 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.

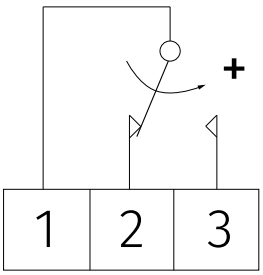

### Design

- 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 | Closing contact between terminals 1 and 2 |
| Dehumidification | 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 |

# 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

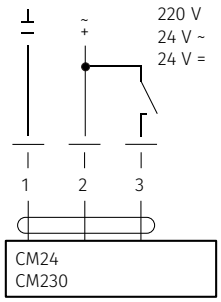
- The electric actuator is provided with a 2 Nm actuating torque and an overload protection.
- The actuator is installed directly on the air damper shaft.
- The angle of rotation is adjusted by mechanical end stops.

## Control

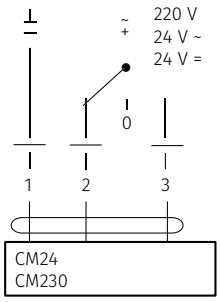
- The air flow control damper can be controlled by means of the three-point or open-close controlling.

## Wiring diagram

Open-Close controlling



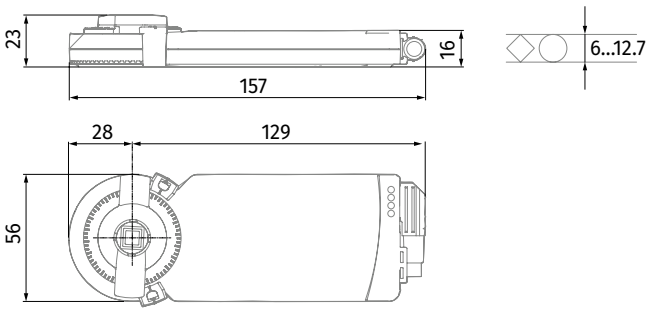

3 point controlling




## Technical data

| Parameters | CM24 | CM230 |
|---|---|---|
| Voltage | 24 V ~ 50/60 Hz,<br>24 V= | 230 V ~ 50/60 Hz |
| Nominal voltage range [V] | 19.2...28,8 ~<br>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 mm² | |
| Positioning accuracy | ± 5 % | ± 5 % |
| Direction of rotation | determined by terminal connection | |
| Torque [Nm] | 2 (at nominal voltage) | |
| Angle of rotation:<br>– no end stop<br>– 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<br>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]




ELECTRIC ACTUATORS

# BELIMO TF230/TF24

## Electric actuators

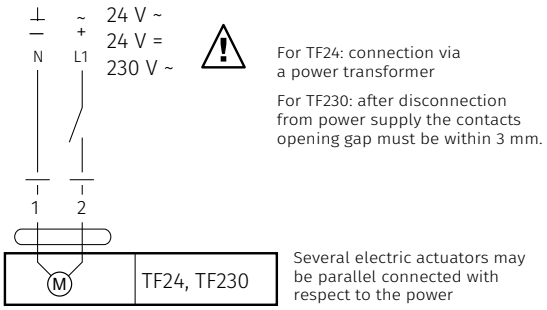
## Features

- 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

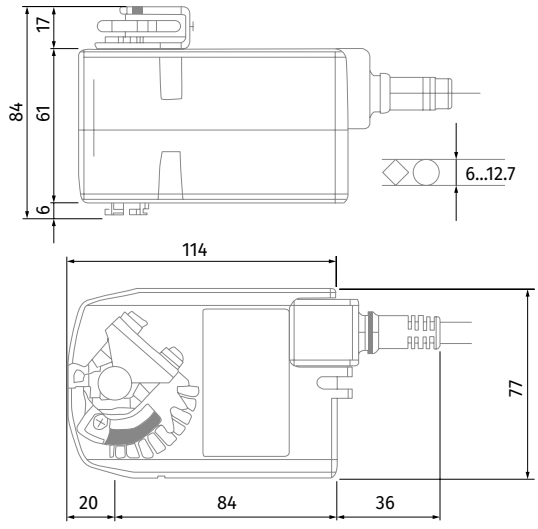



For TF24: connection via a power transformer

For TF230: 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

## 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 mm² | |
| 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 |

# BELIMO LF230/LF24

## Electric actuators

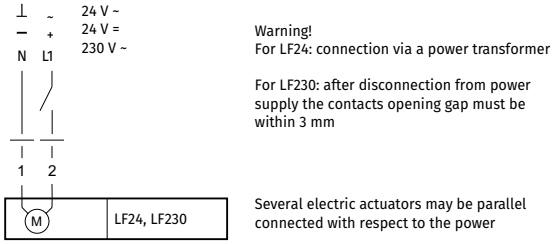
## Features

- 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

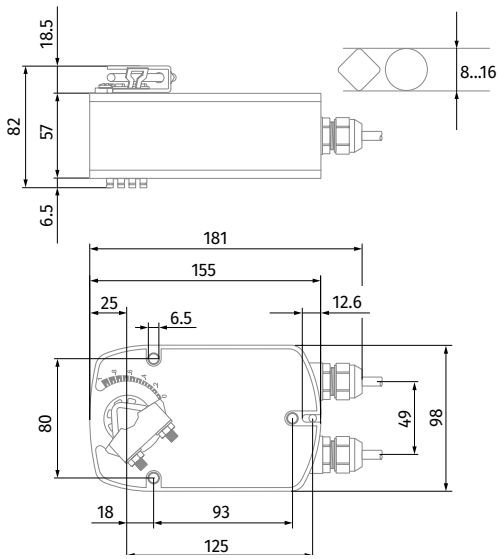



Warning!
For LF24: connection via a power transformer

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

## Overall dimensions [mm]




## 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 mm² | |
| 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 | -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] | 1/4 | 1/4 |

# SFK 20x32

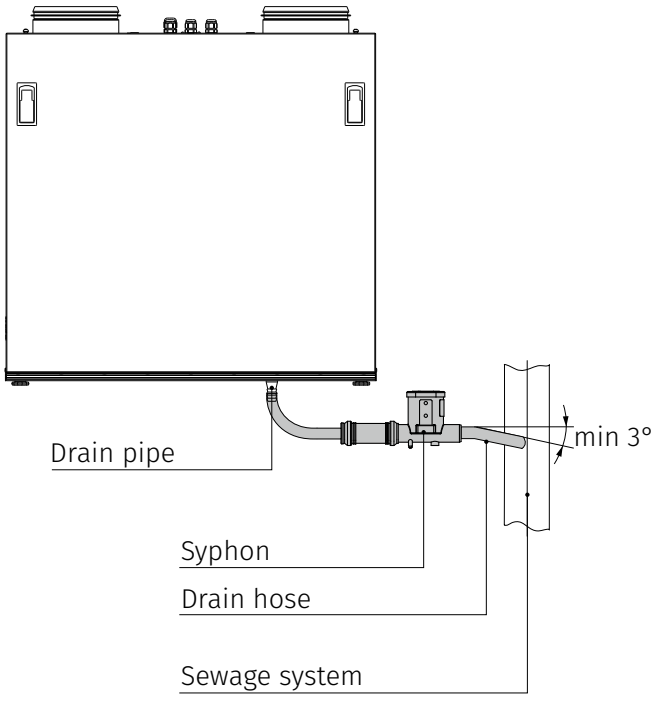
## Hydraulic syphon for condensate drainage

### 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 Ø18 mm.

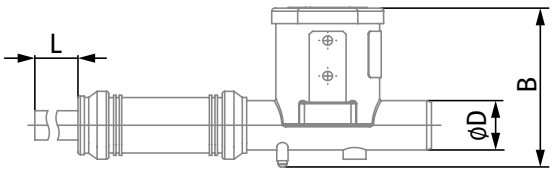
### Design

- 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 |



# CP-2

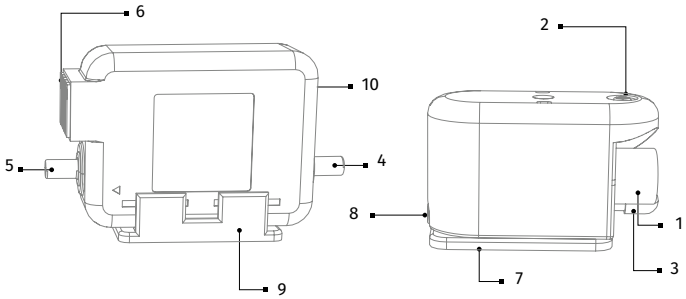
## Drain pump

## Features

- The drain pump provides extraction and discharge of condensate that may form in the heat exchanger during heat recovery.

## Design

**1** – condensate water inlet
**2** – air intake fitting for Ø 4x6 hose
**3** – condensate outlet fitting for Ø 4x6 hose
**4, 8** – fitting for Ø 4x6 connecting hose
**5** – fitting for a drain pipe for Ø 4x6 hose
**6** – removable terminal block
**7** – mounting plate
**9** – pump lock
**10** – removable electric cable socket




## Mounting

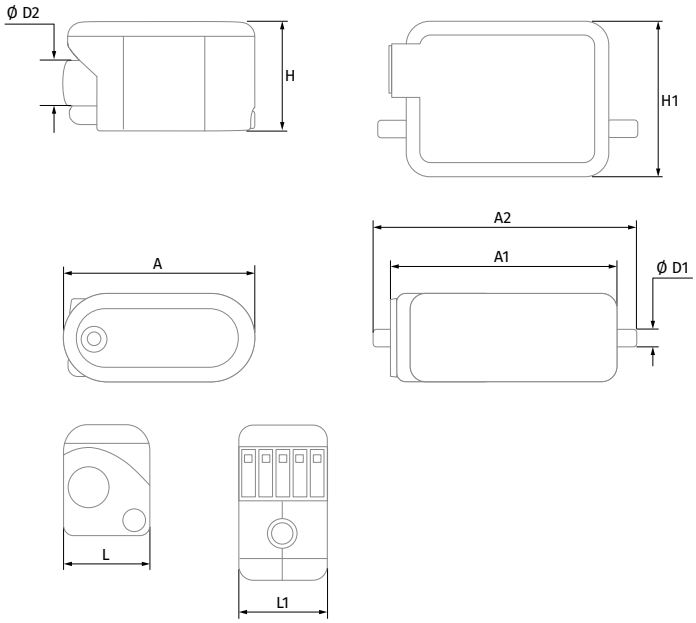
- For CP-2 pump both horizontal and vertical installation is possible. The pump drain pan must be installed in the horizontal position only, in compliance with the user's manual.

## Technical data

| Model | CP-2 |
|---|---|
| Water flow [l/h] | 7 |
| Water suction head [m] | 2 |
| Vertical pressure head [m] | 7 |
| Voltage [V/Hz] | 230/50 |
| Noise level [dBA] | 21 |
| Power [W] | 19 |
| C – NO signal contact parameters [A] | 8 |

## Overall dimensions [mm]

| Model | Ø D2 | Ø D1 | A | A1 | A2 | H | H1 | L | L1 |
|---|---|---|---|---|---|---|---|---|---|
| CP-2 | 18 | 5 | 68 | 68 | 82 | 55 | 38 | 32 | 30 |



# WMG

## Water mixing unit

### 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.

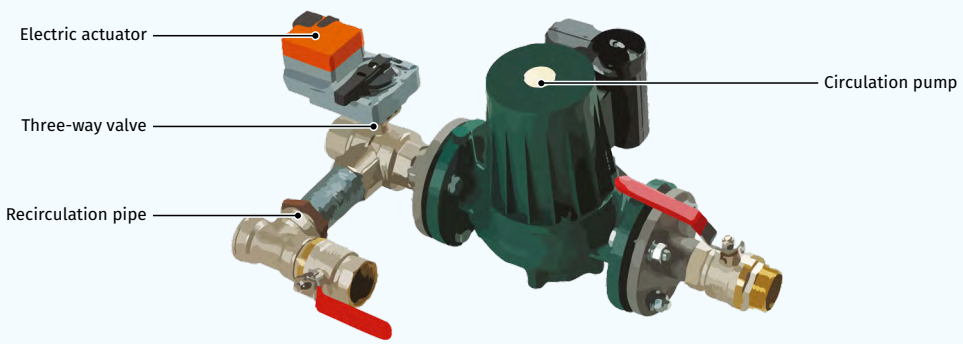
### Design

- 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.



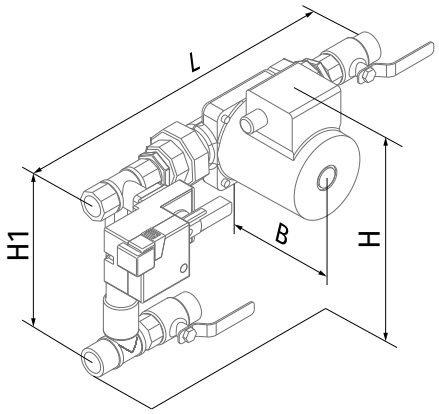


## Designation key

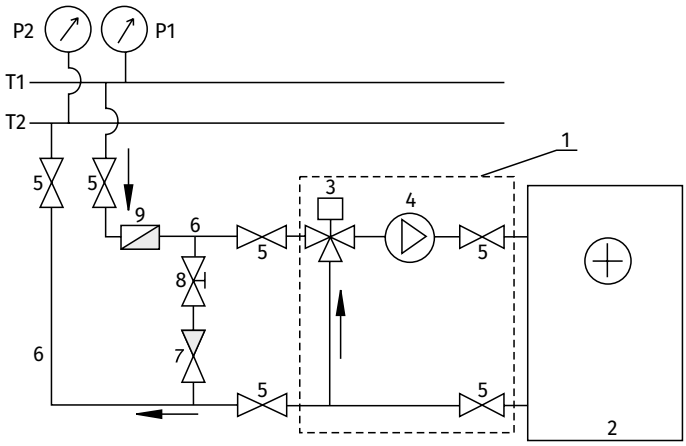
| Serie | Connected spigot diameter | Heat medium transmission factor (Kvs) |
|---|---|---|
| WMG | 3/4"; 1"; 1/4"; 1/2"; 2" | 1.8; 2.4; 3.4; 3.6; 5.1; 6; 9 |

## 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



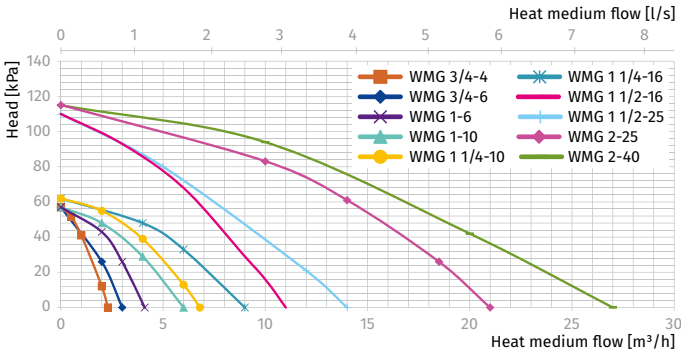
## Technical data

| 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 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 1 ~ 220-240 | 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 $K_{vs} = \frac{V_{100}}{\sqrt{\frac{\Delta pv_{100}}{100}}}$, where $\Delta pv_{100}$ — pressure loss when the heat medium valve is fully opened.
$V_{100}$ — rated heat medium flow at $\Delta pv_{100}$.

### 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.



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