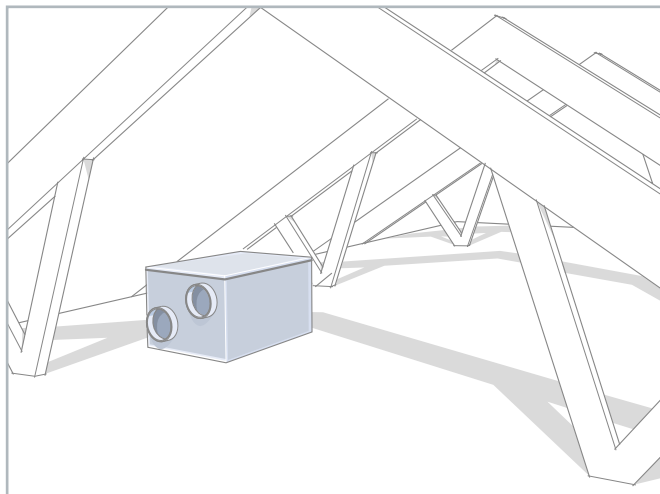
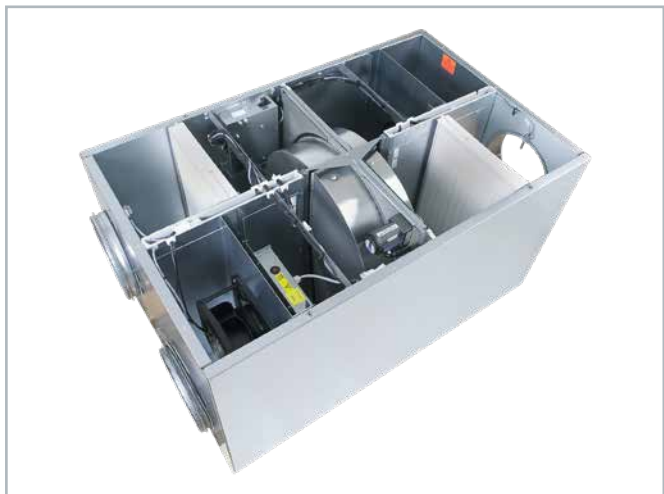


# HEAT RECOVERY UNIT VILLAMASTER RDAF

TECHNICAL CATALOGUE



## HEAT RECOVERY UNIT RDAF



Heat recovery units RDAF Mini, Midi and Maxi are a further development of our RDAE unit. This series of units is designed to be energy-efficient with low  $SFP_v$  values. The unit has a rotary heat exchanger with stepless speed control, which results in very precise temperature control. The unit can be supplemented with an optional function that automatically limits the rotary heat exchanger's moisture recovery at high indoor humidity levels.

The RDAF unit is fitted with Fläkt Woods' ISYteq Mini control system, supplemented with a ISYteq Touch 3.5 graphic control panel.

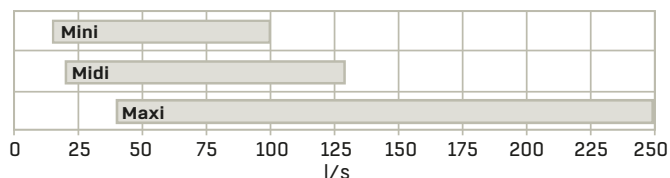
The unit is primarily intended for single-family houses and small premises, and for installation in cool spaces such as attics. The connections are located at the ends of the unit. The units do not need draining, which is an advantage, especially if replacing an older unit.

The RDAF is supplied with a 2 metre cable for the control panel.

### ENERGY SAVINGS

The RDAF is an energy-effective heat recovery unit with a low  $SFP_v$  value, which ensures low energy consumption. The energy savings are achieved by using a speed-controlled rotary heat exchanger with thermal efficiency up to 86% (conditions according to EN 308) as well as plenum fans with B wheels powered by high-efficiency EC motors with only 50–60% of the energy consumption of equivalent AC motors.

### FLOW DIAGRAM



### ENERGY CLASS



**Compliant with energy class A+ in cold climate conditions (Scandinavia). If configured for on-demand control, the unit is compliant with energy class A for RDAF Midi and RDAF Maxi or energy class B for RDAF Mini in average climate conditions (Central Europe). Ecodesign Directive 1253/2014.**

### PRODUCT DATA

- Three sizes, recommended for homes with maximum areas of:  
**Mini**, 200 m<sup>2</sup> (75 l/s),  
**Midi**, 270 m<sup>2</sup> (100 l/s),  
**Maxi**, 500 m<sup>2</sup> (180 l/s)
- Thermal efficiency up to 86%.
- Speed-controlled rotary heat exchanger
- Low  $SFP_v$  value
- Plenum fans with high-efficiency EC motors
- Individually adjustable fans
- Filter, class (F7) ePM<sub>1</sub> 50%/(M5) ISO Coarse 85%
- No drainage required
- Service-friendly and easy to install
- Modbus RS485
- Automatic limitation of moisture recovery (optional)
- ISYteq Touch 3.5 graphic control panel (optional)

### VVS AMA CODE

QAB

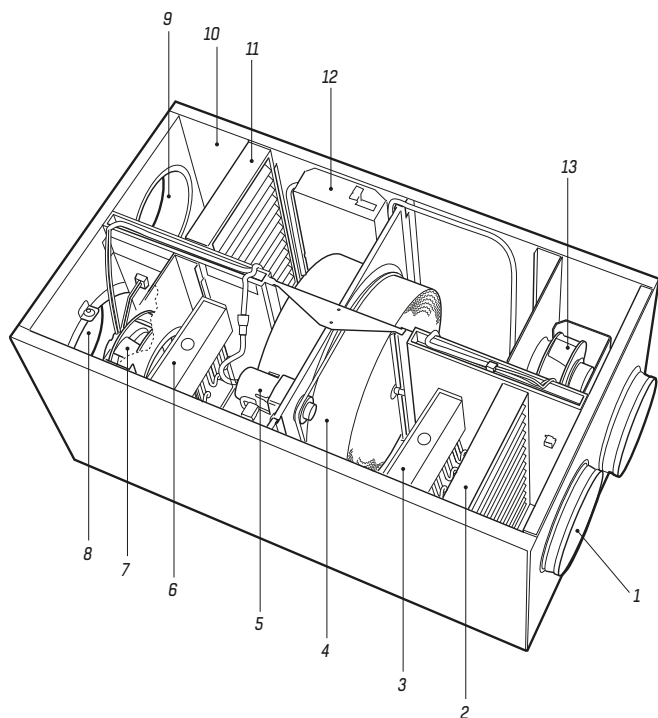
### PRODUCT CODE EXAMPLE:

RDAF-2-1-1-2-0-5-2

Heat recovery unit RDAF Midi with post-heating, moisture control, and Ethernet connection.

## DESCRIPTION, ELECTRICAL DATA

### THE UNIT'S MAIN COMPONENTS



- |  |                         |                        |
|--|-------------------------|------------------------|
| 1. Outdoor air sensor                        | 5. Heat exchanger motor | 10. Casing             |
| 2. Supply air filter                         | 6. Postheater           | 11. Extract air filter |
| 3. Preheater (RDAF Maxi has duct air heater) | 7. Supply air fan       | 12. Control unit       |
| 4. Heat exchanger                            | 8. Supply air sensor    | 13. Extract air fan    |
|  | 9. Extract air sensor   |                        |

### CASING

The outer casing on the Midi and Mini is made of white painted sheet metal. The casing on the Maxi is made of galvanised sheet metal. The inner casing is made of galvanised sheet metal with a 25 mm intermediate layer of insulating mineral wool.

The unit's hatch is locked with a bolt.

### FAN

The fan has B wheels and is powered by energy-efficient EC motors. They are easy to remove for service and maintenance. The speed of the fans can be adjusted steplessly independently of each other.

### HEAT EXCHANGER

The unit is equipped with a rotary heat exchanger made of aluminium, which has a temperature efficiency of up to 86%. The heat exchanger has stepless speed control and is automatically controlled via an integrated control unit. Automatic defrosting is included as standard. The heat exchanger can be removed for cleaning.

RDAF	Airflow, l/s							
	25	50	75	100	125	150	175	200
Mini	86	84	82	80	–	–	–	–
Midi	–	85	83.5	82	80	–	–	–
Maxi	–	–	86	85	84	83.3	82.5	81.5
Thermal efficiency, %								

The table above shows each unit's temperature efficiency in % at a given flow, with conditions according to EN 308.

### PREHEATER AND POSTHEATER

The unit can be fitted with an electric post-heater (optional) to provide supplementary heating at low outdoor temperatures. In regions where the dimensioned outdoor temperature (DUT 5) is lower than -25 °C, the unit should be supplemented with a preheater (optional). In many cases, heaters can be retrofitted to the unit. However, this does not apply to the preheater for the RDAF Maxi, generation 1.

### FILTERS

The unit is fitted with class (F7) ePM<sub>1</sub> 50% filters for the supply air and class (M5) ISO Coarse 85% filters for the extract air.

### PACKAGING

The unit is delivered on a pallet with a corrugated cardboard

cover for protection. Operation, maintenance and assembly instructions are included.

### ELECTRICAL DATA

Voltage: 230 V, single phase 50 Hz

Size	Fan motors <sup>1)</sup> Output, W	Preheater Output, W	Postheater Output, W	Rated output, W
Mini	166	1000	1000	2186
Midi	192	1000	1000	2212
Maxi	340	2100 <sup>2)</sup>	1000	3460

<sup>1)</sup> Refers to two fan motors

<sup>2)</sup> Duct air heater. Cannot be retrofitted on RDAF Maxi, generation 1

## CONTROL EQUIPMENT

### GENERAL

The unit is equipped with an electronic ISYteq Mini control unit. The control unit is integrated into the unit and controls the operation of the fans, the rotary heat exchanger and (if applicable) the postheater.

### FAN CONTROL

Three operating modes can be selected via the control panel (accessory):

- "AWAY" (low speed) is only used when the premises are left empty for a long time, for instance during a holiday
- "HOME" (normal speed) is used for normal ventilation flow
- "FORCED" (high speed) is used when there is a greater need for ventilation (automatically reverts to normal after 120 minutes)

The unit can also be operated without a control panel, but only in one operating mode.

The speed of the fans can be adjusted independently of each other. The ISYteq Touch 3.5 control panel (accessory) is used for adjustment, and shows all parameters in plain text.

### TEMPERATURE CONTROL

The control unit regulates the rotary heat exchanger and (if applicable) the postheater to maintain the set temperature. The supply air temperature is adjusted towards the desired setpoint value in two steps.

First this is done by means of energy recovery from the rotary heat exchanger and then, if this is not enough, by using the postheater. The electric postheater is only activated when the rotary heat exchanger is operating.

During cold periods, when frost may form in the rotor, the control unit activates a defrosting function. This happens when the outdoor temperature is below -10 °C.

If there is a preheater, it is activated when the outdoor temperature is below -12 °C.

### COOLING RECOVERY

In the summer, if the extract air is cooler than the outdoor air, the rotary heat exchanger starts to recover cooling from the cooler extract air. This primarily applies if there is some type of cooling appliance in the house.

### MOISTURE CONTROL (ACCESSORY)

This function automatically limits the rotary heat exchanger's moisture recovery at high indoor humidity levels.

The moisture control function can also be ordered retrospectively to supplement the unit, using the following product code: RDKZ-51-1.

### CO<sub>2</sub> CONTROL (ACCESSORY)

This function is primarily used if the unit is installed in non-residential premises. The fan speed is automatically adjusted to achieve the desired CO<sub>2</sub> level.

The CO<sub>2</sub> control function can also be ordered retrospectively to supplement the unit, using the following product code: RDKZ-52-6. This function requires a ISYteq Touch 3.5 panel (accessory).

### ETHERNET CONNECTION (ACCESSORY)

This function can be used to connect the unit to an existing network. The unit has an integrated web server, which makes it possible to read and change certain parameters via a web browser.

The connection can also be used for connection to a superior system via Modbus TCP/IP.

This function can also be ordered retrospectively to supplement the unit, using the following product code: RDKZ-53-5.

### ALARMS

The system gives alarms for filter change, temperature, rotor and sensor error. In ISYteq Touch 3.5 (accessory), an alarm can easily be acknowledged and read in plain text.

## RDAF MINI - AIRFLOW, PRESSURE DROP, SFP<sub>v</sub>, SOUND DATA

### MINI - SUPPLY AIR FAN

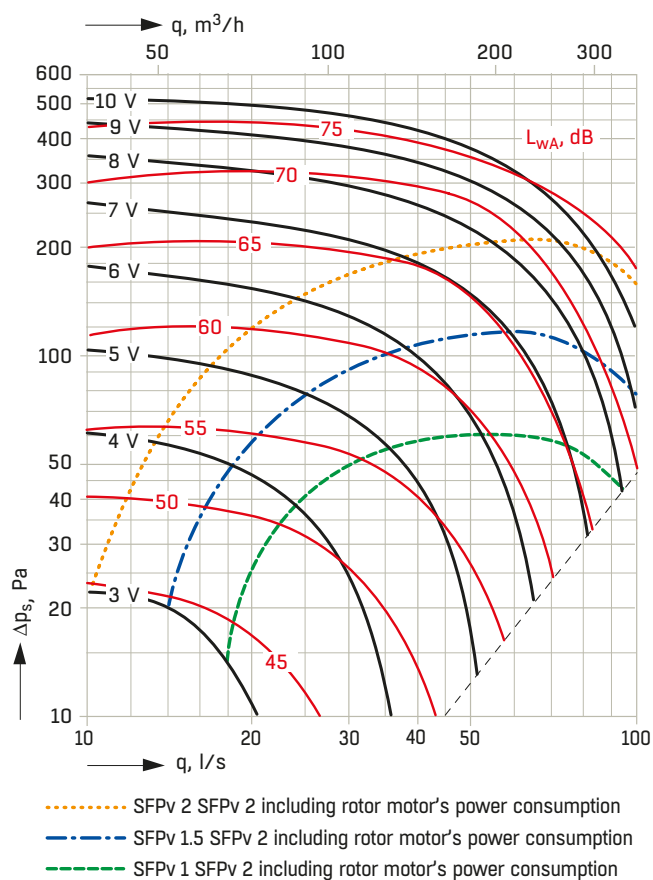


Diagram 1. a) Supply air fan, setting control voltage (V)  
b) Sound to duct,  $L_{WA}$ , (dB) for supply air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT

The sound power level  $L_w$  (dB) in octave bands to the supply air and exhaust air ducts is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path - correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Supply air / Exhaust air	-5	0	+5	-3	-9	-10	-15	-21

### MINI - EXTRACT AIR FAN

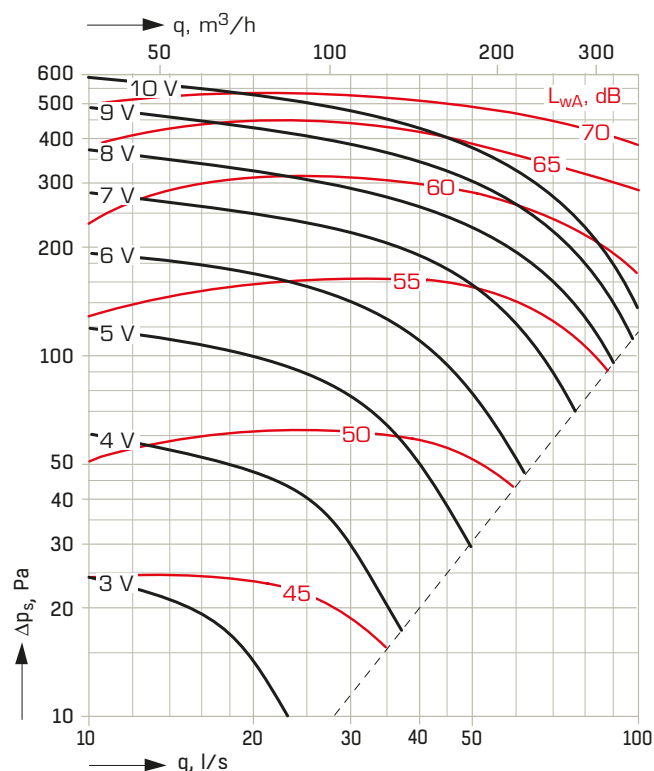


Diagram 2. a) Extract air fan, setting control voltage (V)  
b) Sound to duct  $L_{wA}$  (dB) for extract air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT AND ROOM

The sound power level  $L_w$  (dB) in octave bands to the extract air and outdoor air ducts and to the room is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path- correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Extract air/ Outdoor air	-5	+8	+7	-5	-14	-14	-24	-30
To room	-13	-6	-2	-22	-28	-28	-34	-33

Sound to room =  $L_{wA}$  from the extract air fan diagram minus 14 dB gives the sound pressure level,  $L_{p10A}$  dB(A) at 10 m<sup>2</sup> room absorption.

## SOUND LEVEL

The sound level  $L_{p10A}$  (dB) is shown for a room with a 10 m<sup>2</sup> sound absorption area. To obtain the actual sound level, add the dB(A) values below (including sign):

Room area m <sup>2</sup>	Normally furnished room	Heavily furnished room, e.g. kitchen
5	+2 dB(A)	+7 dB(A)
10	0 dB(A)	+4 dB(A)
15	-1 dB(A)	+1 dB(A)

## RDAF MIDI - AIRFLOW, PRESSURE DROP, SFPv, SOUND DATA

### MIDI SUPPLY AIR FAN

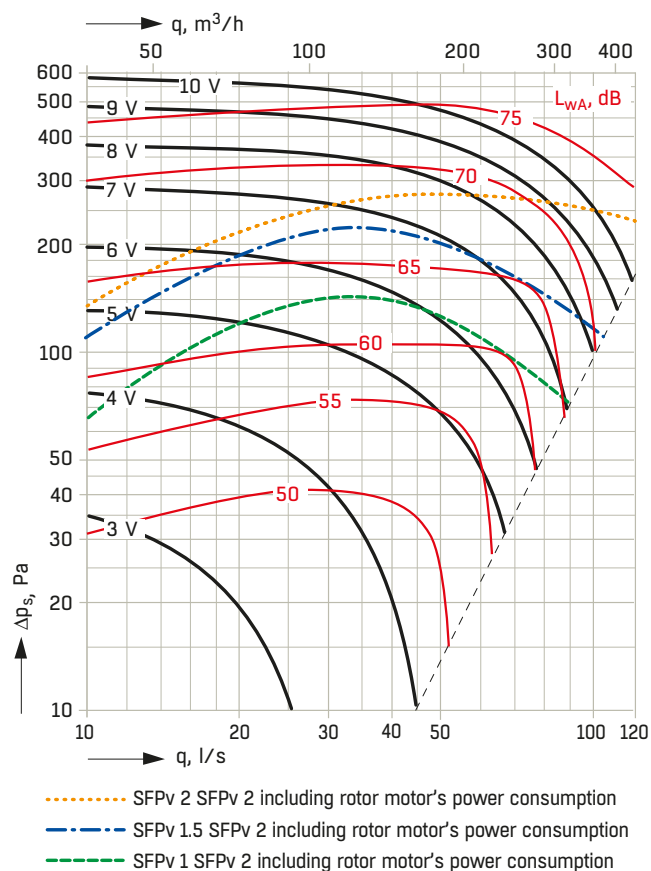


Diagram 3. a) Supply air fan, setting control voltage (V)  
b) Sound to duct,  $L_{WA}$  (dB) for supply air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT

The sound power level  $L_w$  (dB) in octave bands to the supply air and exhaust air ducts is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path - correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Supply air / Exhaust air	-2	-1	+5	-3	-9	-8	-14	-21

### MIDI EXTRACT AIR FAN

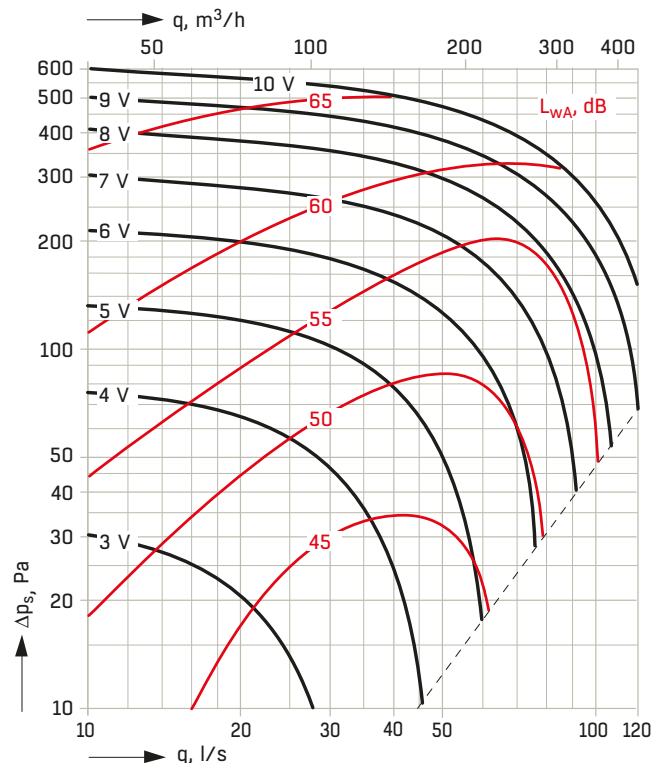


Diagram 4. a) Extract air fan, setting control voltage (V)  
b) Sound to duct  $L_{WA}$  (dB) for extract air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT AND ROOM

The sound power level  $L_w$  (dB) in octave bands to the extract air and outdoor air ducts and to the room is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path- correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Extract air/ Outdoor air	-3	+8	+7	-6	-12	-14	-21	-32
To room	-10	-3	+1	-19	-25	-25	-31	-30

Sound to room =  $L_{WA}$  from the extract air fan diagram minus 14 dB gives the sound pressure level,  $L_{p10A}$  dB(A) at 10 m<sup>2</sup> room absorption.

### SOUND LEVEL

The sound level  $L_{p10A}$  (dB) is shown for a room with a 10 m<sup>2</sup> sound absorption area. To obtain the actual sound level, add the dB(A) values below (including sign):

Room area m <sup>2</sup>	Normally furnished room	Heavily furnished room, e.g. kitchen
5	+2 dB(A)	+7 dB(A)
10	0 dB(A)	+4 dB(A)
15	-1 dB(A)	+1 dB(A)

## RDAF MAXI - AIRFLOW, PRESSURE DROP, SFPv, SOUND DATA

### MAXI SUPPLY AIR FAN

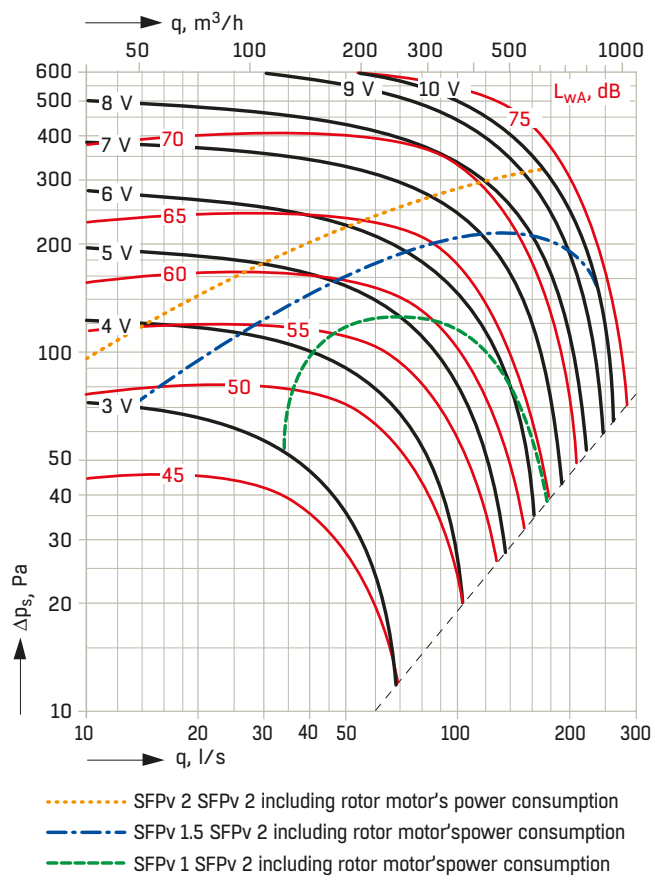


Diagram 5. a) Supply air fan, setting control voltage (V)  
b) Sound to duct,  $L_{WA}$  (dB) for supply air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT

The sound power level  $L_w$  (dB) in octave bands to the supply air and exhaust air ducts is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path - correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Supply air / Exhaust air	-9	-5	+3	-10	-7	-5	-12	-11

### MAXI EXTRACT AIR FAN

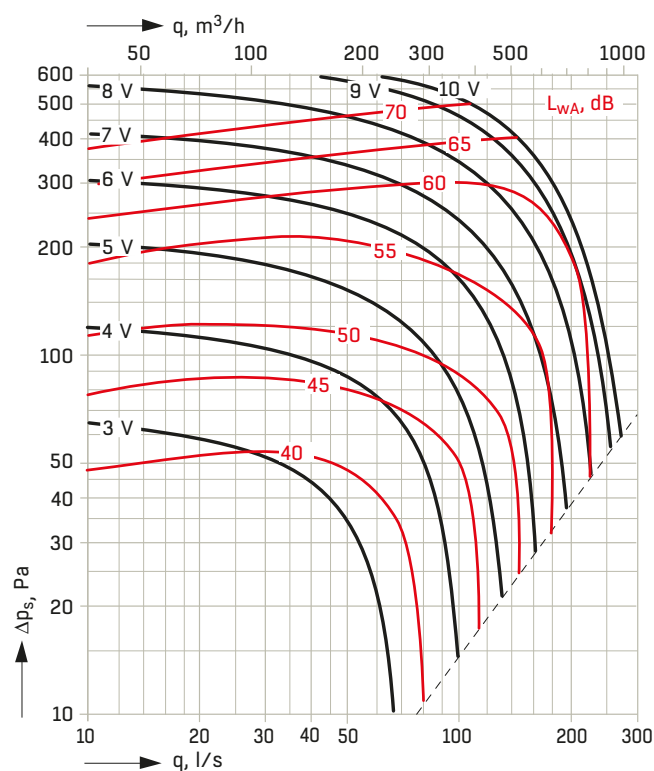


Diagram 6. a) Extract air fan, setting control voltage (V)  
b) Sound to duct  $L_{WA}$  (dB) for extract air fan

### SOUND POWER LEVEL IN OCTAVE BANDS TO DUCT AND ROOM

The sound power level  $L_w$  (dB) in octave bands to the extract air and outdoor air ducts and to the room is obtained by adding the correction factor as per the table below (including sign) to the sound power level  $L_{WA}$  reading in the fan diagram above.

Sound path- correction, dB	Octave band, mid-frequency Hz							
	63	125	250	500	1000	2000	4000	8000
Extract air/ Outdoor air	-4	+2	+5	-6	-7	-10	-16	-21
To room	-4	+3	+7	-13	-19	-19	-25	-24

Sound to room =  $L_{WA}$  from the extract air fan diagram minus 14 dB gives the sound pressure level,  $L_{p10A}$  dB(A) at 10 m<sup>2</sup> room absorption.

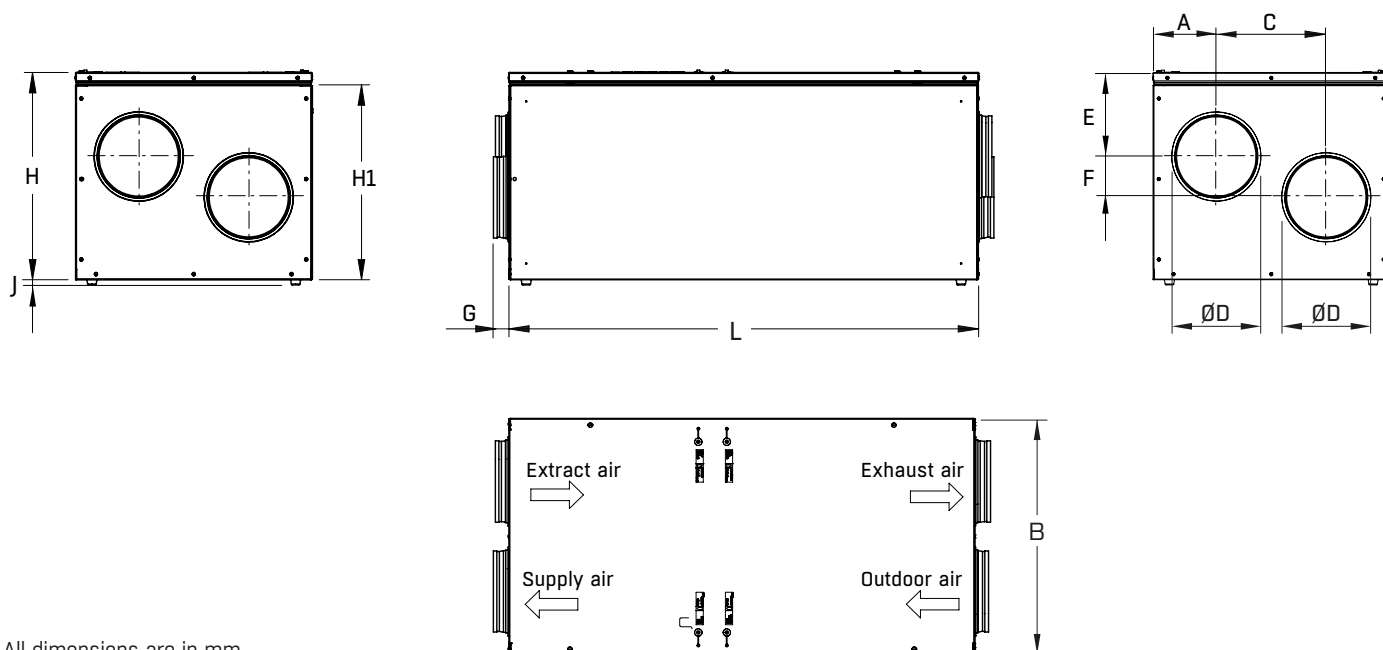
### SOUND LEVEL

The sound level  $L_{p10A}$  (dB) is shown for a room with a 10 m<sup>2</sup> sound absorption area. To obtain the actual sound level, add the dB(A) values below (including sign):

Room area m <sup>2</sup>	Normally furnished room	Heavily furnished room, e.g. kitchen
5	+2 dB(A)	+7 dB(A)
10	0 dB(A)	+4 dB(A)
15	-1 dB(A)	+1 dB(A)



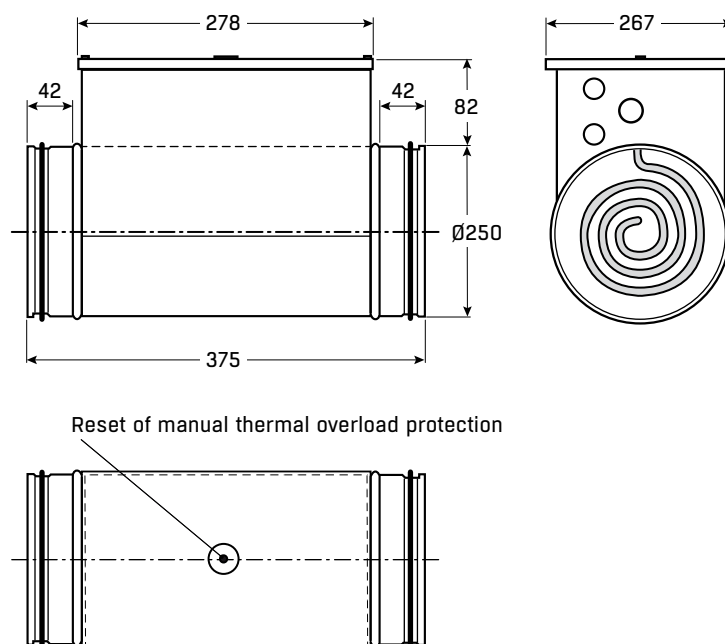
## DIMENSIONS AND WEIGHT



All dimensions are in mm.

Size	L	W	H	H1	A	C	$\varnothing D$	E	F	G	J	Weight, kg
Mini	950	540	475	442	150	240	160	190	100	38	10	57
Midi	1000	580	510	480	155	270	200	207	100	37	10	67
Maxi	1200	750	685	652	198	355	250	247	195	43	10	109

## PREHEATER FOR RDAF MAXI, GENERATION 2.



Weight 6 kg



## PRODUCT CODE, ACCESSORIES

### PRODUCT CODE

#### Heat recovery unit

RDAF-a-b-c-d-e-f-g

Size (a) \_\_\_\_\_

1 = Mini

2 = Midi

3 = Maxi

Heater (b) \_\_\_\_\_

0 = without

1 = postheater electr.

2 = postheater electr. and preheater electr.

Moisture control (c) \_\_\_\_\_

0 = without

1 = with

Filter supply air / extract air (d) \_\_\_\_\_

2 = (F7) ePM<sub>1</sub> 50% compact / (M5) ISO Coarse 85%

Air quality control (e) \_\_\_\_\_

0 = without

6 = CO<sub>2</sub>

Ethernet connection (f) \_\_\_\_\_

0 = without

5 = with

Generation (g) \_\_\_\_\_

2

### ACCESSORIES

#### Control panel

RDKZ-41-b

(required for adjustment and operation)

Variant (b) \_\_\_\_\_

3 = ISYteq Touch 3.5 (touch panel)

#### Extension cable for control panel

RDKZ-43-b-cc-d

Variant (b) \_\_\_\_\_

1 = 6-pin flat cable

Length (cc) \_\_\_\_\_

02 = 2 metres

10 = 10 metres

25 = 25 metres

Generation (d) \_\_\_\_\_

1

#### Electric preheater for retrofitting

RDAZ-80-b

Variant (b) \_\_\_\_\_

1 = RDAF Mini, 1000 W (incl. cable and console)

2 = RDAF Midi, 1000 W (incl. cable and console)

3 = RDAF Maxi, duct air heater 2100 W (incl. relay and internal cables).

NOTE! Only for RDAF Maxi, generation 2.

**Filter kit, mini (F7) ePM<sub>1</sub> 50% / (M5) ISO Coarse 85% (1+1) RDAZ-21-1****Filter kit, midi (F7) ePM<sub>1</sub> 50% / (M5) ISO Coarse 85% (1+1) RDAZ-12****Filter kit, maxi (F7) ePM<sub>1</sub> 50% / (M5) ISO Coarse 85% (1+1) RDAZ-21-3****Combi hood, mini RDAZ-22-1****Combi hood, midi ABRZ-01-1****Combi hood, maxi ABRZ-01-2****Silencer, mini BDER-30-016-090****Silencer, midi BDER-30-020-090****Silencer, maxi BDER-30-025-090**

### ACCESSORIES, DESCRIPTION

#### CONTROL PANEL ISYteq Touch 3.5 - RDKZ-41-3

A user-friendly touch panel for wall mounting. All parameters are shown in plain text. Very easy adjustment and complete alarm management with reading and reset.

**NOTE! Control panel is required for adjustment and operation.**

#### COMBI HOOD RDAZ-22 OR ABRZ-01

Wall-mounted outside wall cowl for outdoor air and exhaust air.

The cowl, which is made of black, plastic-coated sheet metal, prevents air leakage between outdoor air and exhaust air.

#### SILENCER BDER-30

Silencer, insulated with 50 mm mineral wool. Length 900 mm.

Size	Duct diameter	Sound attenuation at mid-frequency, Hz							
		63	125	250	500	1000	2000	4000	8000
Mini	Ø160 mm	2	3	11	29	34	41	27	11
Midi	Ø200 mm	2	7	13	24	31	44	31	20
Maxi	Ø250 mm	2	2	8	19	25	32	12	6

## EXCELLENCE IN SOLUTIONS

FläktGroup is the European market leader for smart and energy efficient Indoor Air and Critical Air solutions to support every application area. We offer our customers innovative technologies, high quality and outstanding performance supported by more than a century of accumulated industry experience. The widest product range in the market, and strong market presence in 65 countries worldwide, guarantee that we are always by your side, ready to deliver Excellence in Solutions.

### PRODUCT FUNCTIONS BY FLÄKTGROUP

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