

RoofVent® RH | RC | RHC | R

Operating instructions



RoofVent® RH
RoofVent® RC
RoofVent® RHC
RoofVent® R

Original operating manual
4214745-en-05

Hoval

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1 Use

1.1 Intended use

RoofVent® units are supply and extract air handling units for heating and cooling spaces up to 25 m in height with central heat and cold supply. They have the following functions:

- Fresh air supply
- Extract air removal
- Heating (with connection to a hot water supply)
 - RoofVent® RH, RC, RHC only
- Cooling (with connection to a water chiller)
 - RoofVent® RC, RHC only
- Energy recovery with highly efficient plate heat exchanger
- Filtering of the fresh air and the extract air
- Air distribution with adjustable Air-Injector

RoofVent® units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of ventilation systems. They are systems of the 'non-residential ventilation unit' (NRVU) and 'bidirectional ventilation unit' (BVU) type.

Intended use also includes compliance with the operating instructions. Any usage over and above this use is considered to be not as intended. The manufacturer can accept no liability for damage resulting from improper use.

1.2 User group

The units are only allowed to be installed, operated and maintained by authorised and instructed personnel who are well acquainted with the units and are informed about possible dangers.

The operating instructions are for operating engineers and technicians as well as specialists in building, heating and ventilation technology.

2 Safety

2.1 Symbols



Caution

This symbol warns against risk of injury. Please heed all instructions designated by this symbol to prevent injuries and/or death.



Attention

This symbol warns against property damage. Please heed the respective instructions to prevent risk of damage to the unit and its functions.



Notice

This symbol denotes information about the economic use of the equipment or special tips.

2.2 Operational safety

The unit is built to conform to the state-of-the-art and is operationally safe. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Parts (e.g. tools) can fall down below when working on the ventilation unit.
- Dangers from working on the roof
- Damage to devices or components due to lightning
- Malfunctions as a result of defective parts
- Hazards from hot water when working on the hot water supply
- Water penetration through the roof unit if the access panels are not closed correctly

Therefore:

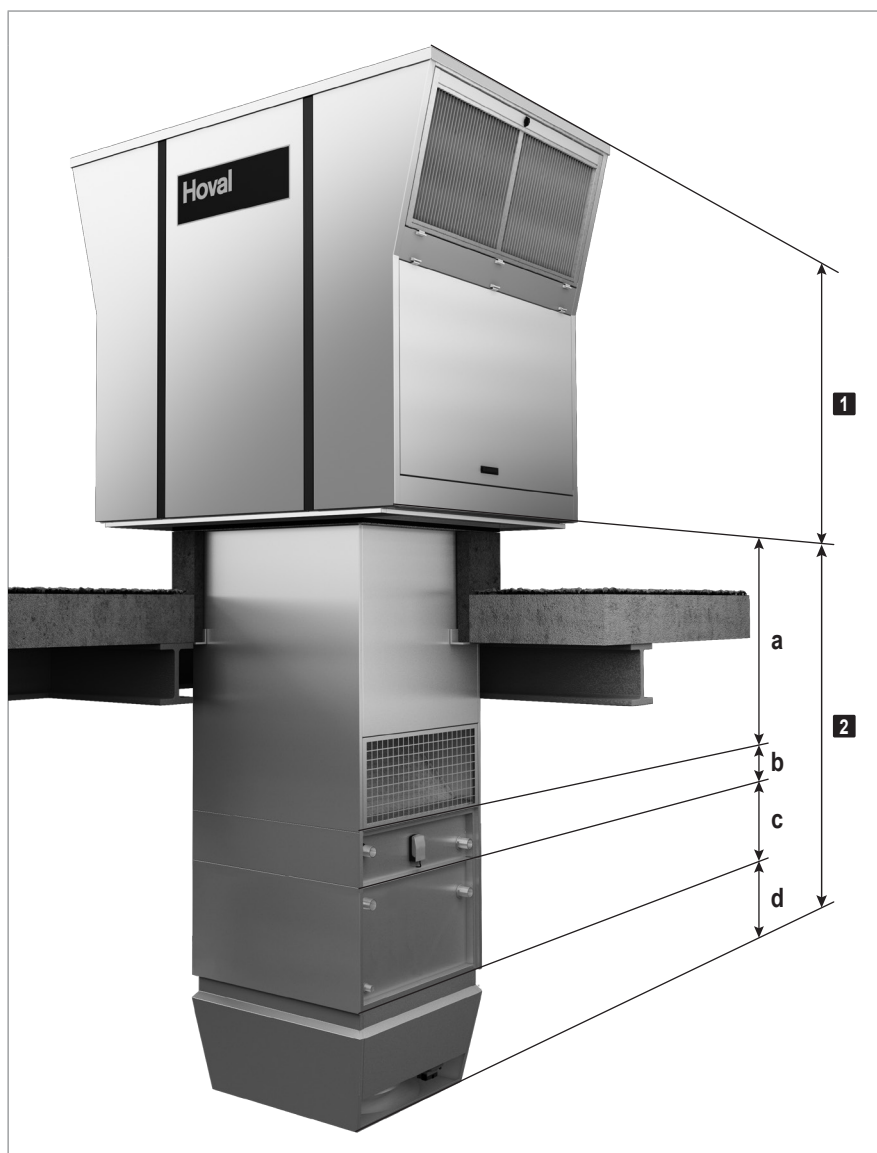
- Please read the operating instructions before unpacking, installing, commissioning and before maintaining the equipment.
- Store the operating instructions so that they are easily accessible.
- Observe any attached information and warning signs.
- Immediately replace damaged or removed informational and warning signs.
- Follow the local safety and accident prevention regulations at all times.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- The unit may only be installed, operated and serviced by authorised, trained and instructed skilled personnel:
 - Specialists as defined by these operating instructions are those persons who, based on their training, knowledge and experience as well as their knowledge of the relevant regulations and guidelines, can carry out the work assigned to them and recognise potential hazards.
- Unauthorised reconfiguration or modification of the unit is not permitted.

3 Construction and operation

3.1 Construction

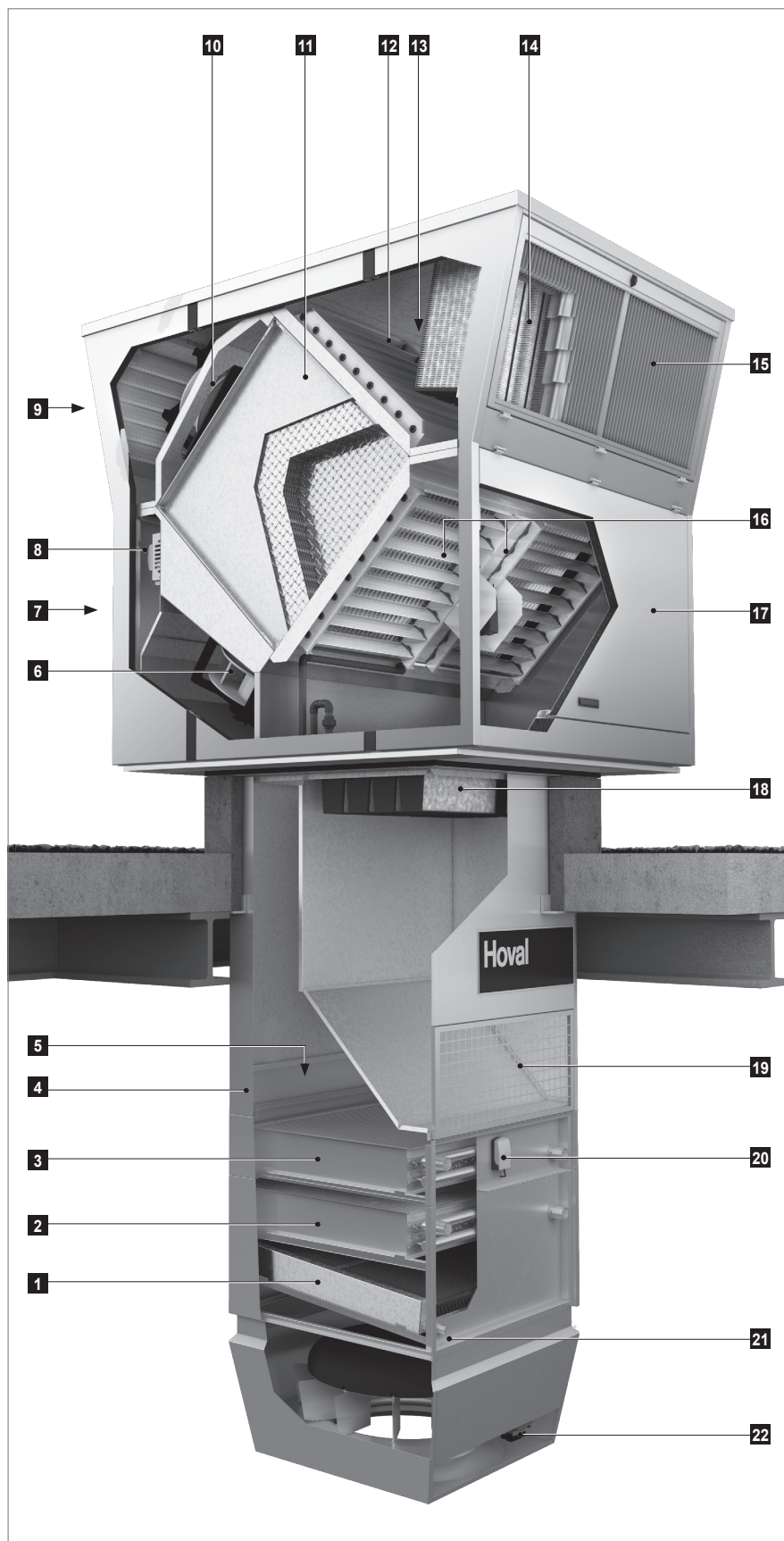
RoofVent® units consist of the following components:

- Roof unit with energy recovery
- Below-roof unit



- 1** Roof unit with energy recovery
- 2** Below-roof unit
 - a** Connection module
 - b** Heating section (RoofVent® RH, RHC only)
 - c** Cooling section (RoofVent® RC, RHC only)
 - d** Air-Injector

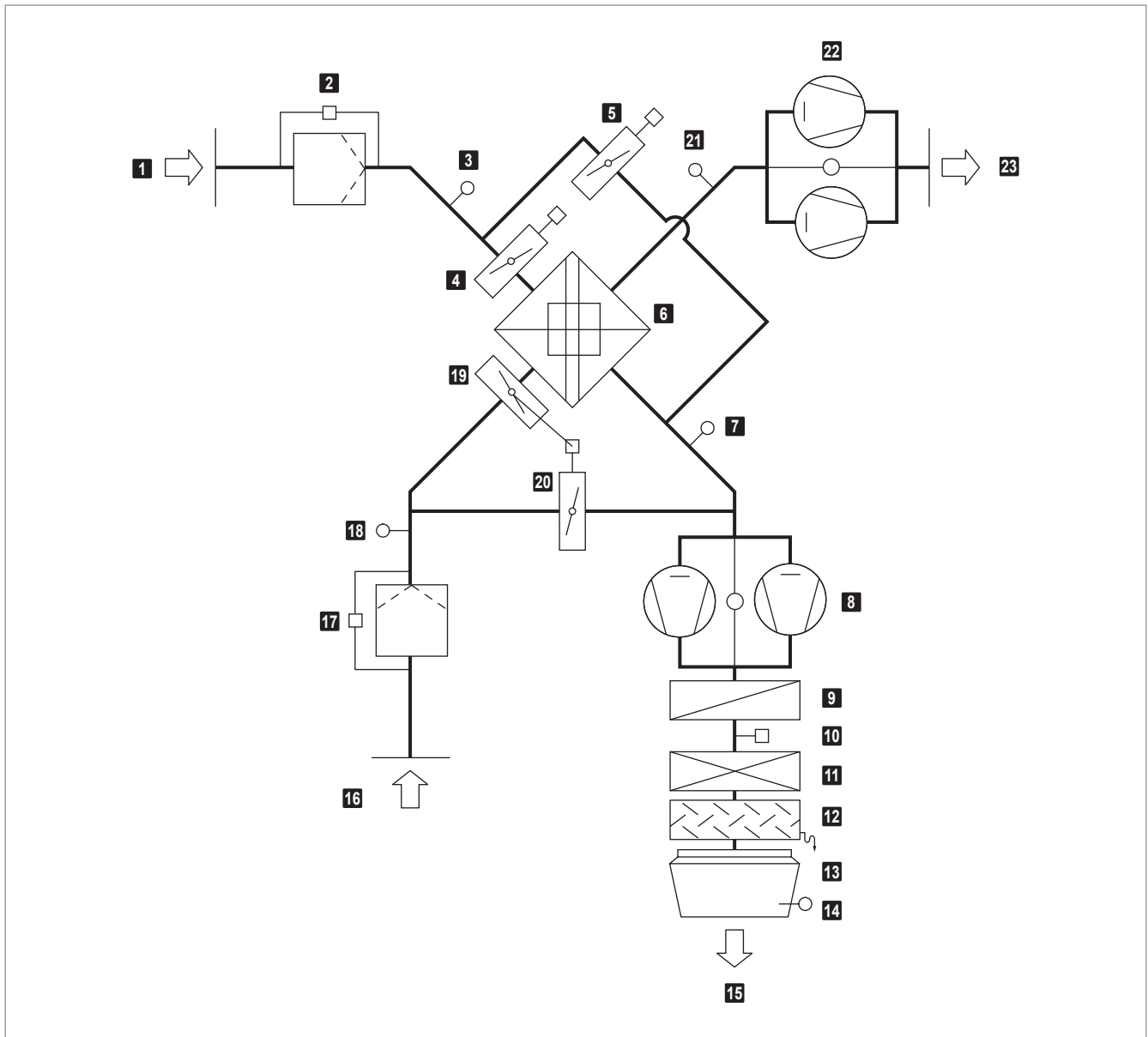
Fig. 1: Components



- 1** Condensate separator (RoofVent® RC, RHC only)
- 2** Cooling coil (RoofVent® RC, RHC only)
- 3** Heating coil (RoofVent® RH, RHC only)
- 4** Access panel, coil
- 5** Access panel, connection box
- 6** Supply air fans
- 7** Supply air access door
- 8** Control block
- 9** Exhaust air access door
- 10** Exhaust air fans
- 11** Plate heat exchanger with bypass (for performance control and as recirculation bypass)
- 12** Fresh air damper with actuator
- 13** Bypass damper with actuator
- 14** Fresh air filter
- 15** Fresh air access door
- 16** Extract air and recirculation dampers with actuator
- 17** Extract air access door
- 18** Extract air filter
- 19** Extract air grille
- 20** Frost controller (RoofVent® RH, RC, RHC only)
- 21** Condensate connection (RoofVent® RC, RHC only)
- 22** Actuator Air-Injector

Fig. 2: Construction

3.2 Function diagram



- | | |
|---|--|
| 1 Fresh air | 13 Air-Injector with actuator |
| 2 Fresh air filter with differential pressure switch | 14 Supply air temperature sensor |
| 3 Temperature sensor air inlet ER (optional) | 15 Supply air |
| 4 Fresh air damper with actuator | 16 Extract air |
| 5 Bypass damper with actuator | 17 Extract air filter with differential pressure switch |
| 6 Plate heat exchanger | 18 Extract air temperature sensor |
| 7 Temperature sensor air outlet ER (optional) | 19 Extract air damper with actuator |
| 8 Supply air fans with flow monitoring | 20 Recirculation damper (opposed to the extract air damper) |
| 9 Heating coil (RoofVent® RH, RHC only) | 21 Exhaust air temperature sensor |
| 10 Frost controller (RoofVent® RH, RC, RHC only) | 22 Exhaust air fans with flow rate monitoring |
| 11 Cooling coil (RoofVent® RC, RHC only) | 23 Exhaust air |
| 12 Condensate separator (RoofVent® RC, RHC only) | |

Fig. 3: RoofVent® function diagram

3.3 Operating modes

The units have the following operating modes:

- Ventilation
- Ventilation (reduced)
- Air quality
- Recirculation
- Exhaust air
- Supply air
- Standby

The TopTronic® C control system regulates these operating modes automatically for each control zone in accordance with the specifications in the calendar. The following points also apply:

- The operating mode of a control zone can be switched over manually.
- Each RoofVent® unit can operate individually in a local operating mode: Off, Recirculation, Supply air, Exhaust air, Ventilation.

Code	Operating mode	Description
VE	Ventilation The unit blows fresh air into the room and exhausts polluted room air. The room temperature set value day is active. Depending on the temperature conditions, the system continuously controls: <ul style="list-style-type: none"> ■ the energy recovery ■ the heating/cooling 	Supply air fan on *) Exhaust air fan on *) Energy recovery 0-100 % Extract air damper open Recirculation damper closed Heating/cooling 0-100 % *) Adjustable flow rate
VEL	Ventilation (reduced) As VE, but the unit only operates with the set minimum values for the supply and exhaust air volumes	Supply air fan MIN Exhaust air fan MIN Energy recovery 0-100 % Extract air damper open Recirculation damper closed Heating/cooling 0-100 %
AQ	Air quality This is the operating mode for demand-controlled ventilation of the room. The room temperature set value day is active. Depending on the temperature conditions, the system continuously controls: <ul style="list-style-type: none"> ■ the energy recovery ■ the heating/cooling Depending on the room air quality or room air humidity, the system operates in one of the following operating states:	
AQ_REC	<ul style="list-style-type: none"> ■ Air quality Recirculation: When air quality is good and air humidity appropriate, the unit heats or cools in recirculation operation. 	Like REC
AQ_ECO	<ul style="list-style-type: none"> ■ Air quality Mixed air: When ventilation requirements are medium, the unit heats or cools in mixed air operation. The supply and exhaust air volume is based on the air quality. 	Supply air fan MIN-MAX Exhaust air fan MIN-MAX Energy recovery 0-100 % Extract air damper 50 % Recirculation damper 50 % Heating/cooling 0-100 %
AQ_VE	<ul style="list-style-type: none"> ■ Air quality Ventilation: When ventilation requirements are high or the room air humidity is too high, the unit heats or cools in pure ventilation operation. The supply and exhaust air volume is based on the air quality. 	Supply air fan MIN-MAX Exhaust air fan MIN-MAX Energy recovery 0-100 % Extract air damper open Recirculation damper closed Heating/cooling 0-100 %
REC	Recirculation On/Off recirculation operation with TempTronic algorithm: During heat or cool demand, the unit draws in room air, heats or cools it and blows it back into the room. The room temperature set value day is active. The flow rate is controlled in 2 stages.	Supply air fan 0 / 50 / 100 % *) Exhaust air fan off Energy recovery 0 % Extract air damper closed Recirculation damper open Heating/cooling on *)
DES	<ul style="list-style-type: none"> ■ Destratification: To avoid heat build-up under the ceiling, it may be appropriate to switch on the fan when there is no heat demand (either in permanent operation or in on/off operation depending on the temperature stratification). 	*) Depending on heat or cool demand

Code	Operating mode	Description
EA	Exhaust air The unit extracts spent room air. There is no room temperature control. Unfiltered fresh air enters the room through open windows and doors or another system provides air supply.	Supply air fan off Exhaust air fan on *) Energy recovery 0 % Extract air damper open Recirculation damper closed Heating/cooling off *) Adjustable flow rate
SA	Supply air The unit blows fresh air into the room. The room temperature set value day is active. Depending on the temperature conditions, the system controls the heating/cooling. Spent room air passes through open windows and doors or another system provides extraction.	Supply air fan on *) Exhaust air fan off Energy recovery 0 % **) Extract air damper open Recirculation damper closed Heating/cooling 0-100 % *) Adjustable flow rate **) Fresh air and bypass dampers are open
ST	Standby The unit is normally switched off. The following functions remain active:	
CPR	■ Cooling protection: If the room temperature drops below the set value for cooling protection, the unit heats up the room in recirculation operation.	Supply air fan MAX Exhaust air fan off Energy recovery 0 % Extract air damper closed
OPR	■ Overheating protection: If the room temperature rises above the set value for overheating protection, the unit cools down the room in recirculation operation. If the temperatures also permit fresh air cooling, the units automatically switches to night cooling (NCS) to save energy.	Recirculation damper open Heating/cooling on
NCS	■ Night cooling: If the room temperature exceeds the set value for night cooling and the current fresh air temperature permits it, the unit blows cool fresh air into the room and extracts warmer room air.	Supply air fan on *) Exhaust air fan on *) Energy recovery 0 % Extract air damper open Recirculation damper closed Heating/cooling off *) Adjustable flow rate
L_OFF	Off (local operating mode) The unit is switched off. Frost protection remains active.	Supply air fan off Exhaust air fan off Energy recovery 0 % Extract air damper closed Recirculation damper open Heating/cooling off
-	Forced heating The unit draws in room air, warms it and blows it back into the room. For example, forced heating is suitable for heating the hall before taking the control system into operation or if the controller fails during the heating period. Connecting a room thermostat makes it possible to specify a room temperature set value. Forced heating can be activated and set as required by the Hoval service technician.	Supply air fan MAX Exhaust air fan off Energy recovery 0 % Extract air damper closed Recirculation damper open Heating/cooling on

Table 1: Operating modes of RoofVent® units (heating and cooling vary depending on unit type)

The following operating modes do not apply for RoofVent® R units:

- Air quality Recirculation (AQ_REC)
- Recirculation (REC)
- Destratification (DES)

4 Type code

RHC - 9 B C - RX / ST . -- / V0 . D1 . LU / AF . SI / Y . KP . -- . SD / TC . EM . PH . RF

Unit type

RoofVent® RH | RC | RHC | R

Unit size

6 or 9

Heating section

- without heating section
- B with coil type B
- C with coil type C
- D with coil type D

Heating/cooling section

- without heating/cooling section
- C with coil type C
- D with coil type D

Heat recovery

RX Temperature efficiency ErP 2018

Design

- ST Standard
- OE Oil-proof design
- KA Corrosion-protected design for high extract air humidity

Connection module

- V0 Standard
- V1 Length + 250 mm
- V2 Length + 500 mm
- V3 Length + 1000 mm

Air outlet

- D1 Design with 1 Air-Injector
- D2 Design with 2 Air-Injectors
- D0 Design without Air-Injector

Paint finish

- without
- LU Paint finish of below-roof unit

Silencers outside

- without
- AF Fresh air and exhaust air silencer

RHC - 9 B C -RX / ST . -- / V0 . D1 . LU / AF . SI / Y . KP . -- . SD / TC . EM . PH . RF

Silencers inside

- without
- SI Supply air and extract air silencer

Hydraulics

- without
- Y Hydraulic assembly diverting system
- M Mixing valve

Condensate pump

- without
- KP Condensate pump

Socket

- without
- SD Socket in the unit
- CH Socket in the unit Switzerland

Control system

- TC TopTronic® C

Energy monitoring

- without
- EM Energy monitoring

Pump control

- without
- PH Heating pump
- PK Heating or cooling pump
- PP Heating pump and cooling pump

Return temperature sensor

- without
- RF Return temperature sensor

Table 2: Type code

5 Technical data

5.1 Application limits

Fresh air temperature	min.	°C	-30	
Extract air temperature	max.	°C	50	
Extract air relative humidity	max.	%	60	
Moisture content of extract air	max.	g/kg	12.5	
Supply air temperature	max.	°C	60	
Temperature of the heating medium ¹⁾	max.	°C	90	
Pressure of the heating medium	max.	kPa	800	
Air flow rate	Size 6:	min.	m ³ /h	3100
	Size 9:	min.	m ³ /h	5000
Condensate quantity	Size 6:	max.	kg/h	90
	Size 9:	max.	kg/h	150

¹⁾ Design for higher temperatures on request

Table 3: Application limits



Notice

Use units in the design for high extract air humidity if the humidity in the room increases by more than 2 g/kg.

5.2 Heat recovery system (HRS)

Unit size		6	9
Temperature efficiency, dry	%	77	78
Temperature efficiency, wet	%	89	90

Table 4: Thermal transfer level of the plate heat exchanger

5.3 Air filtration

Filter	Fresh air	Extract air
Class acc. to ISO 16890	ePM ₁ 55 %	ePM ₁₀ 65 %
Class acc. to EN 779	F7	M5
Factory setting of differential pressure switches	250 Pa	350 Pa

Table 5: Air filtration

5.4 Electrical connection

Unit size		6	9
Supply voltage	V AC	3 × 400	3 × 400
Permitted voltage tolerance	%	± 5	± 5
Frequency	Hz	50	50
Connected load	kW	4.6	8.6
Current consumption max.	A	7.8	14.4
Series fuse	A	13.0	20.0

Table 6: Electrical connection

5.5 Air flow rate

Unit size		6	9
Nominal air flow rate	m ³ /h	5500	8000
Floor area covered	m ²	480	797

Table 7: Air flow rate

5.6 Sound data

Unit type		RH		RC		RHC		R	
Unit size		6	9	6	9	6	9	6	8
Casing sound power level	dB(A)	73	72	74	73	73	73	73	72

Table 8: Sound data

5.7 Heat output

Size	Type	Q	Q _{TG}	H _{max}	t _s	Δp _w	m _w
		kW	kW	m	°C	kPa	l/h
6	B	49.1	38.5	11.7	38.8	14	2108
	C	78.7	68.2	9.0	54.8	16	3383
9	B	71.2	56.8	12.0	39.1	10	3059
	C	116.8	102.4	9.2	56.0	15	5017
	D	–	–	–	–	–	–

Legend:
 Type = Type of coil
 Q = Coil heat output
 Q_{TG} = Output to cover fabric heat losses
 H_{max} = Maximum mounting height
 t_s = Supply air temperature
 Δp_w = Water pressure drop
 m_w = Water quantity

Reference: Heating medium: 80/60 °C | Fresh air: –15 °C | Room air: 18 °C | Extract air: 20 °C / 20 %rh
 – These operating conditions are not permissible, because the maximum supply air temperature of 60 °C is exceeded.

Table 9: RoofVent® RH / RC / RHC heat output

5.8 Cooling capacities

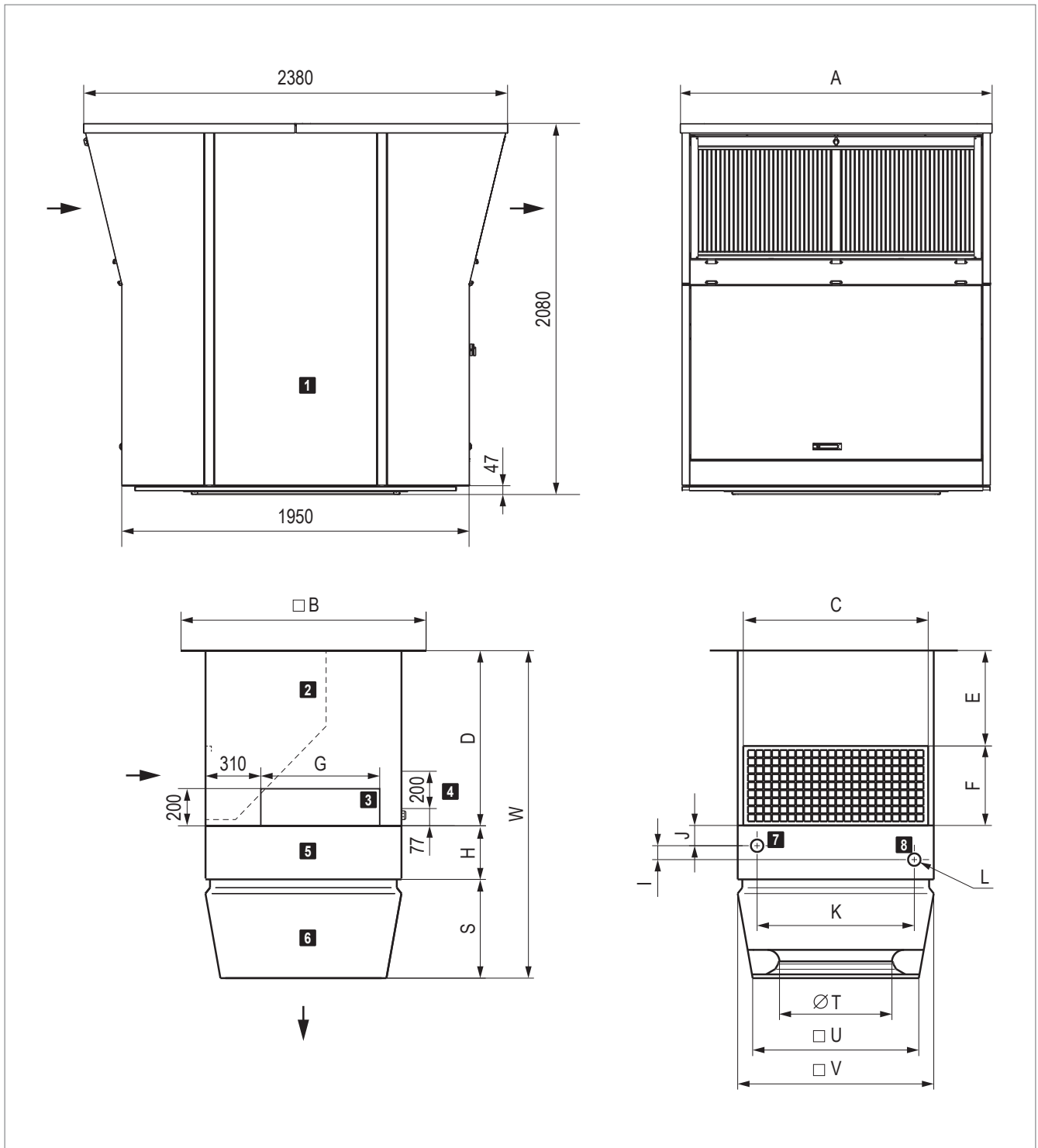
Size	Type	Q _{sen}	Q _{tot}	Q _{TG}	t _s	Δp _w	m _w	m _c
		kW	kW	kW	°C	kPa	l/h	kg/h
6	C	24.5	34.5	19.1	15.7	39	4943	14.7
9	C	36.0	49.6	28.2	15.5	36	7105	20.0
	D	44.2	66.6	36.4	12.5	40	9542	33.0

Legend:
 Type = Type of coil
 Q_{sen} = Sensible cooling capacity
 Q_{tot} = Total cooling capacity
 Q_{TG} = Output for coverage of transmission sensible gains (→ sensible cooling load)
 t_s = Supply air temperature
 Δp_w = Water pressure drop
 m_w = Water quantity
 m_c = Condensate quantity

Reference: Cooling medium: 6/12 °C | Fresh air: 32 °C / 40 %rh | Room air: 26 °C | Extract air: 28 °C / 50 %rh

Table 10: RoofVent® RC / RHC cooling capacity

5.9 RoofVent® RH dimensions and weights



1 Roof unit with energy recovery

2 Connection module

3 Access panel, coil

4 Access panel, connection box

5 Heating section

6 Air-Injector

7 Return

8 Flow

Fig. 4: RoofVent® RH dimensional drawing (dimensions in mm)

Unit type		RH-6				RH-9			
A	mm	1400				1750			
B	mm	1040				1240			
C	mm	848				1048			
F	mm	410				450			
G	mm	470				670			
H	mm	270				300			
S	mm	490				570			
T	mm	500				630			
U	mm	767				937			
V	mm	900				1100			
Connection module		V0	V1	V2	V3	V0	V1	V2	V3
D	mm	940	1190	1440	1940	980	1230	1480	1980
E	mm	530	780	1030	1530	530	780	1030	1530
W	mm	1700	1950	2200	2700	1850	2100	2350	2850

Table 11: RoofVent® RH dimensions

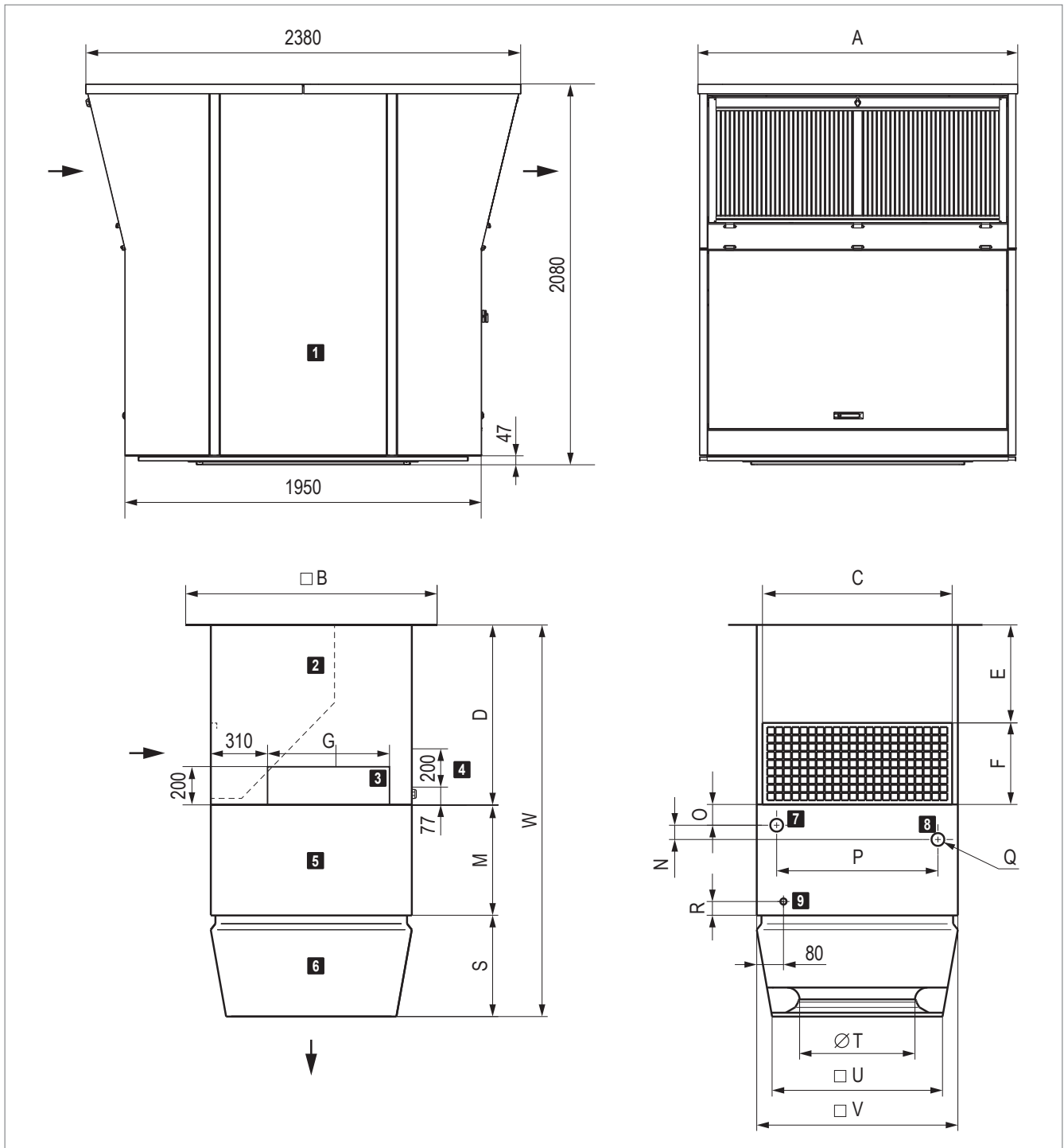
Unit type		RH-6B	RH-6	RH-9B	RH-9C	RH-9D
I	mm	78	78	78	78	95
J	mm	101	101	111	111	102
K	mm	758	758	882	882	882
L (internal thread)	"	Rp 1¼	Rp 1¼	Rp 1½	Rp 1½	Rp 2
Water content of the coil	l	4.6	7.9	7.4	12.4	19.2

Table 12: Dimensions for hydraulic connection

Unit type		RH-6B	RH-6	RH-9B	RH-9C	RH-9D
Total	kg	842	849	1094	1104	1123
Roof unit	kg	700	700	900	900	900
Below-roof unit	kg	142	149	194	204	223
Air-Injector	kg	37	37	56	56	56
Heating section	kg	30	37	44	54	73
Connection module V0	kg	75		94		
Additional weight V1	kg	+ 11		+ 13		
Additional weight V2	kg	+ 22		+ 26		
Additional weight V3	kg	+ 44		+ 52		

Table 13: RoofVent® RH weights

5.10 RoofVent® RC dimensions and weights



- 1** Roof unit with energy recovery
- 2** Connection module
- 3** Access panel, coil
- 4** Access panel, connection box
- 5** Heating/cooling section

- 6** Air-Injector
- 7** Return
- 8** Flow
- 9** Condensate connection G1" (external)

Fig. 5: RoofVent® RC dimensional drawing (dimensions in mm)

Unit type		RC-6				RC-9			
A	mm	1400				1750			
B	mm	1040				1240			
C	mm	848				1048			
F	mm	410				450			
G	mm	470				670			
M	mm	620				610			
S	mm	490				570			
T	mm	500				630			
U	mm	767				937			
V	mm	900				1100			
Connection module		V0	V1	V2	V3	V0	V1	V2	V3
D	mm	940	1190	1440	1940	980	1230	1480	1980
E	mm	530	780	1030	1530	530	780	1030	1530
W	mm	2050	2300	2550	3050	2160	2410	2660	3160

Table 14: RoofVent® RC dimensions

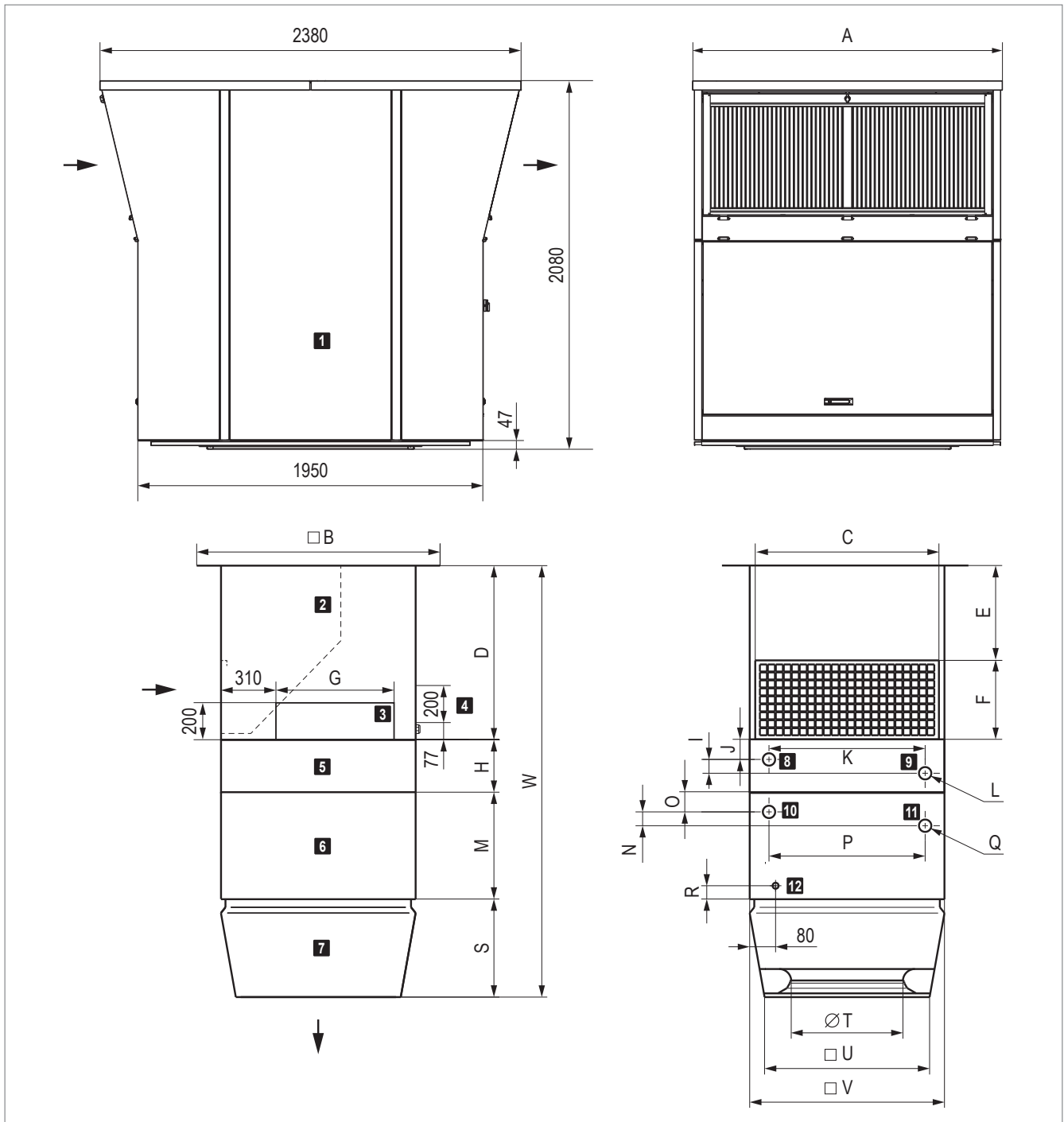
Unit type		RC-6-C	RC-9-C	RC-9-D
N	mm	78	78	95
O	mm	123	92	83
P	mm	758	882	882
Q (internal thread)	"	Rp 1¼	Rp 1½	Rp 2
R	mm	54	53	53
Water content of the coil	l	7.9	12.4	19.2

Table 15: Dimensions for hydraulic connection

Unit type		RC-6-C	RC-9-C	RC-9-D
Total	kg	882	1152	1171
Roof unit	kg	700	900	900
Below-roof unit	kg	182	252	271
Air-Injector	kg	37	56	56
Heating/cooling section	kg	70	102	121
Connection module V0	kg	75	94	
Additional weight V1	kg	+ 11	+ 13	
Additional weight V2	kg	+ 22	+ 26	
Additional weight V3	kg	+ 44	+ 52	

Table 16: RoofVent® RC weights

5.11 RoofVent® RHC dimensions and weights



- | | |
|---|--|
| 1 Roof unit with energy recovery | 7 Air-Injector |
| 2 Connection module | 8 Heating circuit return |
| 3 Access panel, coil | 9 Heating circuit flow |
| 4 Access panel, connection box | 10 Cooling circuit return |
| 5 Heating section | 11 Cooling circuit flow |
| 6 Cooling section | 12 Condensate connection G1" (external) |

Fig. 6: RoofVent® RHC dimensional drawing (dimensions in mm)

Unit type		RHC-6				RHC-9			
A	mm	1400				1750			
B	mm	1040				1240			
C	mm	848				1048			
F	mm	410				450			
G	mm	470				670			
H	mm	270				300			
M	mm	620				610			
S	mm	490				570			
T	mm	500				630			
U	mm	767				937			
V	mm	900				1100			
Connection module		V0	V1	V2	V3	V0	V1	V2	V3
D	mm	940	1190	1440	1940	980	1230	1480	1980
E	mm	530	780	1030	1530	530	780	1030	1530
W	mm	2320	2570	2820	3320	2460	2710	2960	3460

Table 17: RoofVent® RHC dimensions

Unit type		RHC-6		RHC-9		
Type of heating coil		B	C	B	C	D
I	mm	78	78	78	78	95
J	mm	101	101	111	111	102
K	mm	758	758	882	882	882
L (internal thread)	"	Rp 1¼	Rp 1¼	Rp 1½	Rp 1½	Rp 2
Water content of the coil	l	4.6	7.9	7.4	12.4	19.2

Table 18: Dimensions for hydraulic connection of the heating section

Unit type		RHC-6	RHC-9	
Type of cooling coil		C	C	D
N	mm	78	78	95
O	mm	123	92	83
P	mm	758	882	882
Q (internal thread)	"	Rp 1¼	Rp 1½	Rp 2
R	mm	54	53	53
Water content of the coil	l	7.9	12.4	19.2

Table 19: Dimensions for hydraulic connection of the cooling section

Unit type	RHC	6BC	6CC	9BC	9BD	9CC	9CD	9DC	9DD
Total	kg	912	919	1196	1215	1206	1225	1225	1244
Roof unit	kg	700	700	900	900	900	900	900	900
Below-roof unit	kg	212	219	296	315	306	325	325	344
Air-Injector	kg	37	37	56	56	56	56	56	56
Heating section	kg	30	37	44	44	54	54	73	73
Cooling section	kg	70	70	102	121	102	121	102	121
Connection module V0	kg	75		94					
Additional weight V1	kg	+ 11		+ 13					
Additional weight V2	kg	+ 22		+ 26					
Additional weight V3	kg	+ 44		+ 52					

Table 20: RoofVent® RHC weights

5.12 RoofVent® R dimensions and weights

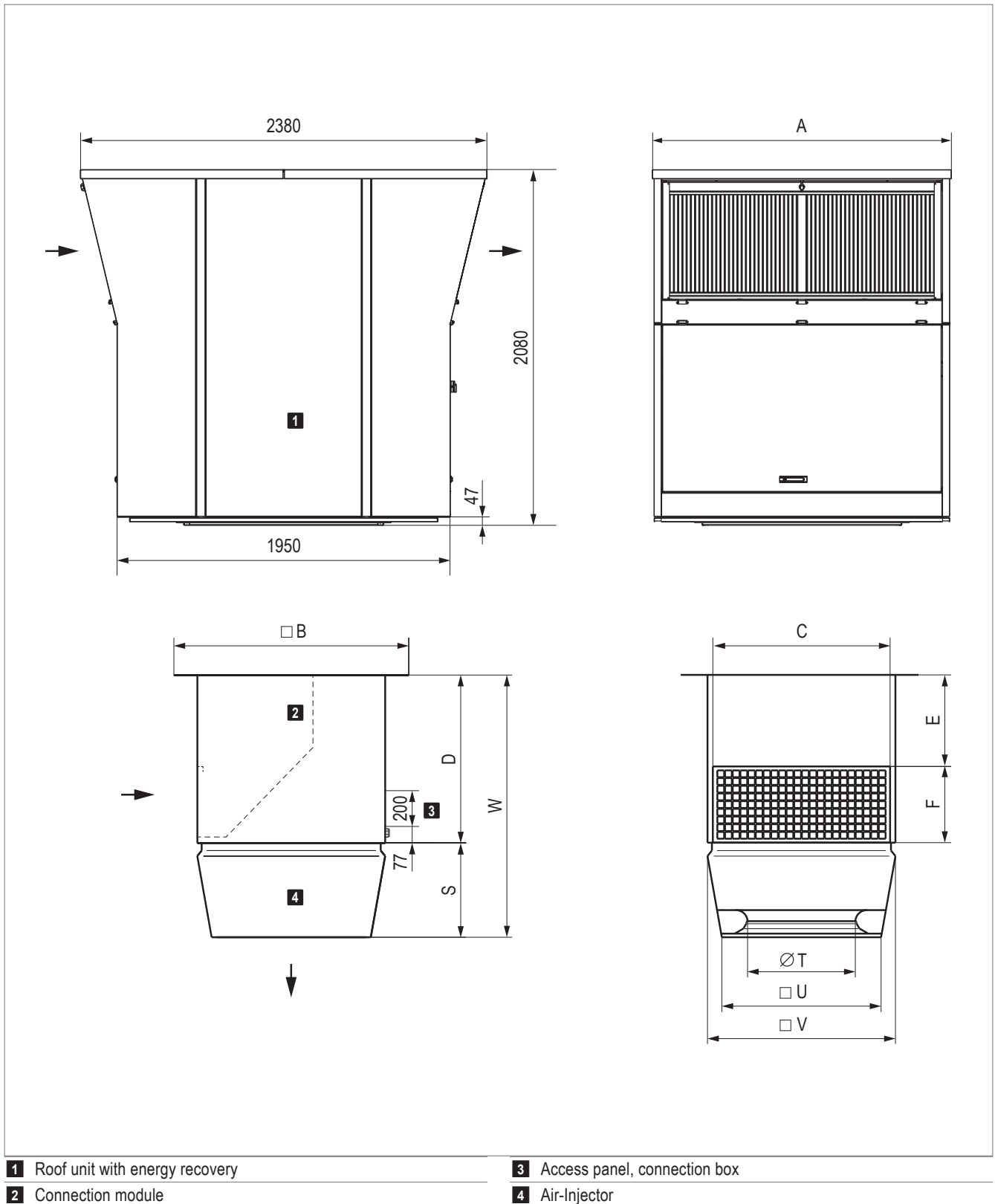


Fig. 7: RoofVent® R dimensional drawing (dimensions in mm)

Unit type		R-6				R-9			
A	mm	1400				1750			
B	mm	1040				1240			
C	mm	848				1048			
F	mm	410				450			
S	mm	490				570			
T	mm	500				630			
U	mm	767				937			
V	mm	900				1100			
Connection module		V0	V1	V2	V3	V0	V1	V2	V3
D	mm	940	1190	1440	1940	980	1230	1480	1980
E	mm	530	780	1030	1530	530	780	1030	1530
W	mm	1430	1680	1930	2430	1550	1800	2050	2550

Table 21: RoofVent® R dimensions

Unit type		R-6	R-9
Total	kg	812	1050
Roof unit	kg	700	900
Below-roof unit	kg	112	150
Air-Injector	kg	37	56
Connection module V0	kg	75	94
Additional weight V1	kg	+ 11	+ 13
Additional weight V2	kg	+ 22	+ 26
Additional weight V3	kg	+ 44	+ 52

Table 22: RoofVent® R weights

6 Options

6.1 Oil-proof design

RoofVent® units in oil-proof design are suitable for use in applications with oil-saturated extract air. The maximum oil load in the extract air is 10 mg/m³ air.

6.2 Corrosion-protected design for high extract air humidity

RoofVent® units in corrosion-protected design for high extract air humidity are suitable for use in applications with an increased corrosion risk and high increase in humidity in the room, such as:

- Car wash plants
- Applications in the paper industry
- Applications in the electronics industry
- Applications in the food industry

6.3 Connection module

The connection module is available in 4 lengths for adapting the RoofVent® unit to local conditions.

6.4 Design with 2 Air-Injectors

A supply air duct can be connected to the RoofVent® unit for distributing the supply air over a very wide area. 2 Air-Injectors can be installed on this.

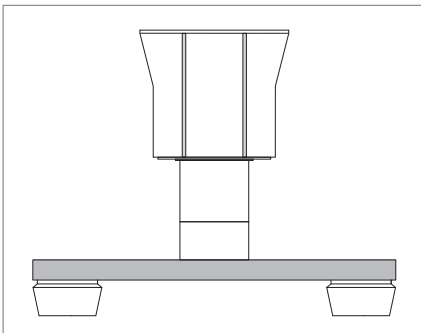


Fig. 8: RoofVent® unit with supply air duct and 2 Air-Injectors

6.5 Design without Air-Injector

RoofVent® units in the design without Air-Injector are suitable for connecting to an air distribution system supplied by the client.

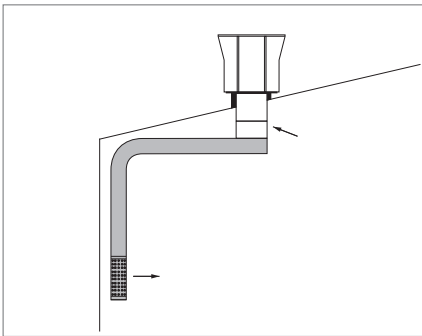


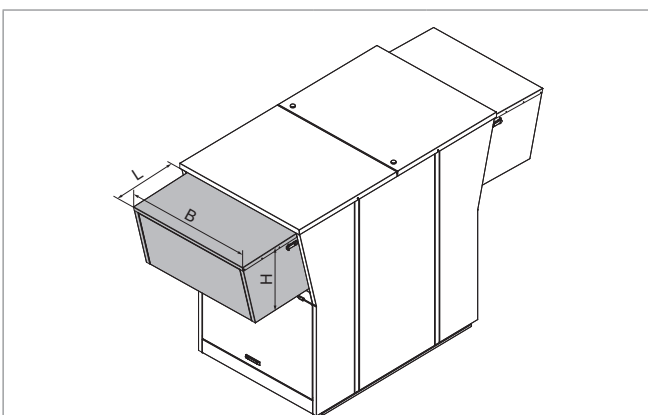
Fig. 9: Connection to an air distribution system supplied by the client

6.6 Paint finish of below-roof unit

The entire below-roof unit is painted in any colour. If the below-roof unit is equipped with a supply air silencer, this is also painted.

6.7 Fresh air and exhaust air silencers

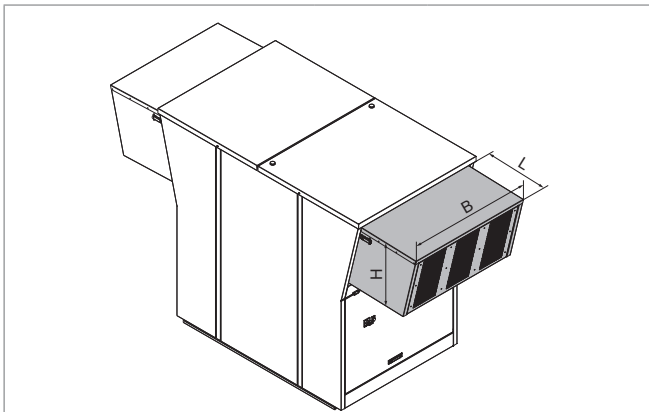
The fresh air silencer reduces noise emissions from RoofVent® units on the fresh air side. It consists of an aluminium casing with a bird screen and acoustic insulation lining and is configured as an add-on part for the roof unit which can be folded downwards.



Size		6	9
L	mm	625	625
B	mm	1280	1630
H	mm	650	650
Weight	kg	30	42
Pressure drop	Pa	10	10

Table 23: Technical data fresh air silencer

The exhaust air silencer reduces noise emissions from RoofVent® units on the exhaust air side. It consists of an aluminium casing with a bird screen and sound attenuation splitters and is configured as an add-on part for the roof unit which can be folded downwards.

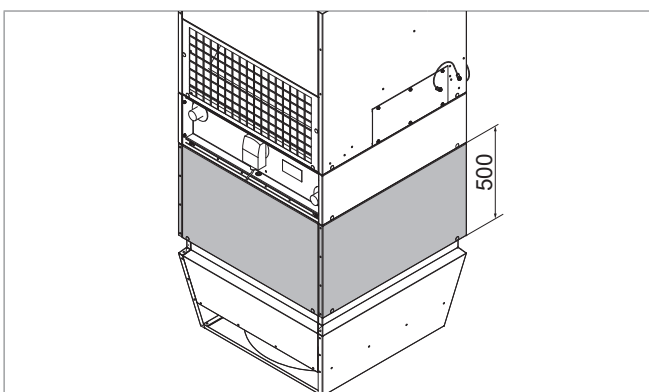


Size		6	9
L	mm	625	625
B	mm	1280	1630
H	mm	650	650
Weight	kg	52	68
Pressure drop	Pa	50	53

Table 24: Technical data exhaust air silencer

6.8 Supply air and extract air silencers

Supply air and extract air silencers reduce the noise from RoofVent® units within the room. The supply air silencer is designed as a separated component and is installed above the Air-Injector. The extract air silencer consists of acoustic insulation lining in the connection module.



Size		6	9
Weight	kg	53	80
Supply air pressure drop	Pa	22	26
Extract air pressure drop	Pa	0	0

Fig. 10: Technical data supply air and extract air silencers

6.9 Hydraulic assembly diverting system

An assembly for the hydraulic diverting system is included in the delivery. It consists of the following components:

- Automatic air vent
- Coil screw joint
- Control valve
- Distributor circuit screw joint
- Flow
- Mixing valve
- Ball valve
- Return

6.10 Mixing valve

Mixing valves which are optimally matched to the units are available for easy installation of RoofVent® units. They have the following specifications:

- 3-way mixing valve with modulating rotary actuator (run time 90 s)
- Flow characteristic:
 - Equal percentage control path
 - Linear bypass
- Integrated position control and response

6.11 Condensate pump

The condensate pump is installed directly under the condensate drain connection; the supplied container is prepared for installation on the Air-Injector. It pumps the condensate through a flexible hose to a delivery head of 3 m, thus enabling discharge of the condensate

- through waste water pipes directly below the ceiling,
- onto the roof.

6.12 Socket

For maintenance work, a socket (1-phase, 230 V AC, 50 Hz) can be installed in the roof unit, next to the control block.

6.13 Energy monitoring

Energy monitoring makes it possible to display the energy saved by heat and cool recovery. For this purpose, 2 additional temperature sensors are installed in the RoofVent® units; they record the air inlet and air outlet temperatures of the plate heat exchanger.

6.14 Return temperature sensor

The return temperature sensor monitors the return temperature of the heating medium. If necessary, it triggers frost pre-control at the heating valve to prevent the system possibly being shut down due to frost.

6.15 Pump control for mixing or injection system

Instead of the diverting system, a mixing or injection circuit can also be installed in the load circuit.

Please note the following:

- Not only the mixing valves but also the pumps in the load circuit are controlled directly by the control block.
- Terminals for wiring the mixing valves and the pumps in the load circuit are located in the connection box.
- Make sure that valves and pumps which meet the following requirements are provided on site.

Requirements for mixing valves

- Use 3-way mixing valves with the following flow characteristics:
 - Equal percentage control path
 - Linear bypass
- The valve authority must be ≥ 0.5 .
- The maximum run time of the valve actuator is 90 s.
- The valve actuator must be continuous, i.e. the stroke changes in proportion to the control voltage (0...10 VDC or 2...10 VDC).
- The valve actuator must be designed with a position response (0...10 VDC or 2...10 VDC).
- The maximum power consumption is 20 VA.
- Install the valve close to the unit (max. distance 2 m).

Requirements on changeover valves

Use changeover valves conforming to the following specification:

- 3-way changeover valves
- Supply voltage 24 V AC
- 1-wire control (0/24 V AC)
- Position response via limit switches (0°/90°)
- Power consumption max. 44 VA

Requirements for pumps

- Voltage 230 V AC
- Current up to 4.0 A

7 Transport and installation



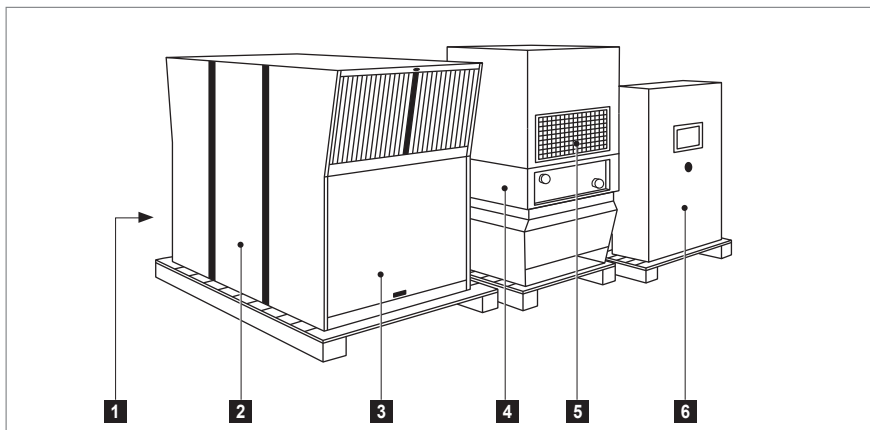
Caution

Risk of injury from incorrect handling. Transport, assembly and installation work may only be performed by specialists. Observe safety and accident prevention regulations.

7.1 Scope of delivery

- The scope of delivery includes:
 - RoofVent® unit, delivered as standard in 2 parts on pallets (roof unit, below-roof unit)
 - Accessories
 - Optional components
 - Zone control panel

Associated parts are labelled with the same unit number and serial number. Depending on the unit size, the below-roof unit can also be delivered in multiple parts.



- | | |
|---|---------------------------|
| 1 | Supply air access door |
| 2 | RoofVent® roof unit |
| 3 | Extract air access door |
| 4 | RoofVent® below-roof unit |
| 5 | Extract air grille |
| 6 | Zone control panel |

Fig. 11: Delivery of the components on pallets

Accessories

The following accessories are supplied separately:

- Transport eyes for lifting the below-roof unit and the roof unit (2 each, attached to the pallet of the first roof unit)
- Screws for assembling the units and for fixing the fan protecting plate (attached to the pallet of the roof unit)
- If the below-roof unit is delivered in multiple parts: Screws for assembling the below-roof unit (behind the extract air grille)
- Extract air filter (behind the extract air access door)
- PG screw joint for electrical connection (behind the connection box access panel)
- Trap (only for RoofVent® RC, RHC; behind the extract air grille)
- Electrical diagram and 2 keys for the access doors (behind the supply air access door)
- Fresh air temperature sensor and room air temperature sensor (in the zone control panel)

Options

The following optional components are supplied separately:

- Fresh air and exhaust air silencer (on separate pallet; bolts, hinges and screws enclosed)
- Mixing valve (behind the extract air grille)
- Condensate pump (behind the extract air grille)
- Return temperature sensor (behind the extract air grille)
- Hydraulic assembly (on separate pallet)
- Additional room air temperature sensors, combination sensor room air quality, temperature and humidity (in zone control panel)
- Version with 2 Air-Injectors or without Air-Injector: A supply air temperature sensor is enclosed behind the extract air grille.

Preparation

- Use a forklift with a sufficiently long fork to unload (at least 1.8 m).
- Check the consignment against the delivery documents and the order confirmation to ensure that it is complete. Report missing parts and any damage immediately in writing.

7.2 Storage

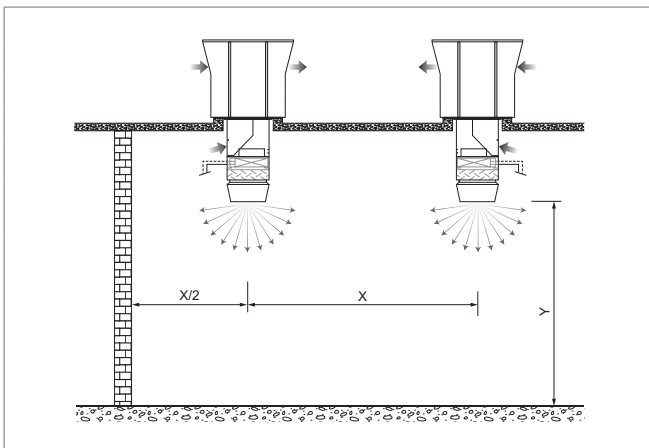
If you do not install the unit immediately:

- Remove the packaging film to avoid water vapour condensation.
- Store the unit in a dry, dust-free room.
- Keep the storage temperature between -30°C and $+50^{\circ}\text{C}$.
- Avoid too long storage periods. After a storage period of more than 1 year:
 - Check that the bearings of the fans move smoothly before installing the unit.

7.3 Requirements for the installation site

RoofVent® unit

- Make sure that the roof has sufficient load-bearing capacity and that the roof frames correspond to the specifications in the design handbook.
- Position the units according to the system layout. In doing so, ensure that the units are aligned to one another, the minimum and maximum distances are observed and that the correct coil connections are correctly positioned. Units must not draw in exhaust air from other units as fresh air.
- All air inlet and air outlet openings must be freely accessible. The supply air jet must be free to spread out unhindered.
- The access doors in the roof unit and the access panels in the below-roof unit must be easily accessible.
- The Air-Injector must be easily accessible.
- Clearance of at least 0.9 m is required for maintenance work around the heating/cooling section.



Size			6	9
Distance X	min.	m	11	13
	max.	m	22	28
Mounting height Y	min.	m	4	5
	max. ¹⁾	m	Approx. 9...25	

1) The maximum mounting height varies depending on the boundary conditions (for values, see table of heat outputs or calculation with the 'HK-Select' selection program)

Table 25: Minimum and maximum distances

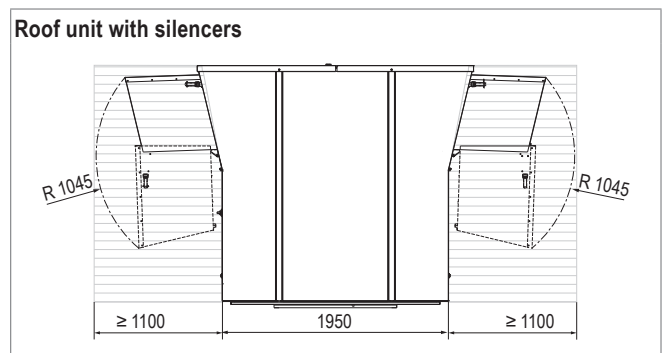
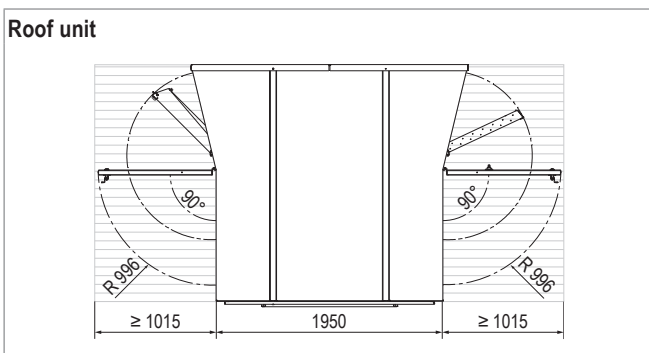


Fig. 12: Space requirements for maintenance on the roof (dimensions in mm)



Notice

If side access is not possible, proportionally more space is required for opening the access doors.

7.4 Installation



Caution

Risk of injury caused by falling load and improper handling.

During installation:

- Wear personal protective equipment.
- Do not stand under suspended loads.
- Use cranes or forklifts with sufficient load-bearing capacity.



Caution

Provide suitable protective devices and make sure the units can be accessed easily. The maximum roof load of the RoofVent® units is 80 kg.

Preparation

- The units are assembled from roof level. Make sure that the following items are on hand for the assembly:
 - Crane for installing the below-roof unit
 - Crane or helicopter for assembly on the roof
 - Lifting gear (minimum length of the lifting ropes: 2 m for the below-roof unit, 3 m for the roof unit)
 - Sealing compound for the roof frame (e.g. PU foam)
 - Adhesive for securing screws (e.g. Loctite 243, medium strength, soluble)
- Below-roof unit:
 - Remove the below-roof unit from the packaging film.
 - Remove the mounting bracket or wooden slats with which the below-roof unit is fixed to the pallet.
- Roof unit:
 - Remove the roof unit from the packaging film.
 - Open the extract air access door.
 - Behind this, loosen what is fixing the unit to pallet (2 screws).
 - Open the supply air access door.
 - Unscrew the fan protecting plate; this is only reattached when the unit is installed on the roof.
 - Behind the fan protecting plate, loosen what is fixing the unit to the pallet (2 screws).



- 1 Extract air access door
- 2 Supply air access door
- 3 Fan protecting plate

Fig. 13: The fan protecting plate is temporarily attached with 4 screws during delivery.

Assembling the below-roof unit

The below-roof unit must only be assembled at the building site if it must be delivered in multiple parts due to the unit version. Proceed as follows:

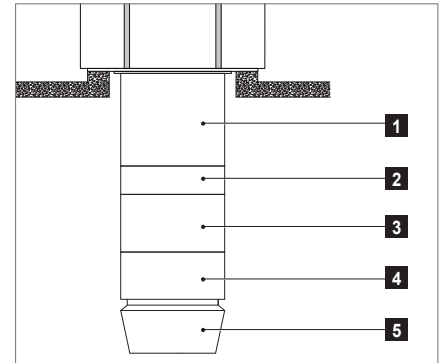
- Make sure that the correct unit components match up (observe the unit number and RoofVent® serial number).
- Loosen the cable fastening on the connection module frame.
- Screw in the transport eyes into the connection module frame and attach the lifting gear.
- Lift the connection module complete with mounted components and rotate it into the correct position.
 - The standard position of the coil connections is underneath the extract air grille. If another orientation is required, you can mount the heating or cooling section turned round on the connection module.



Notice

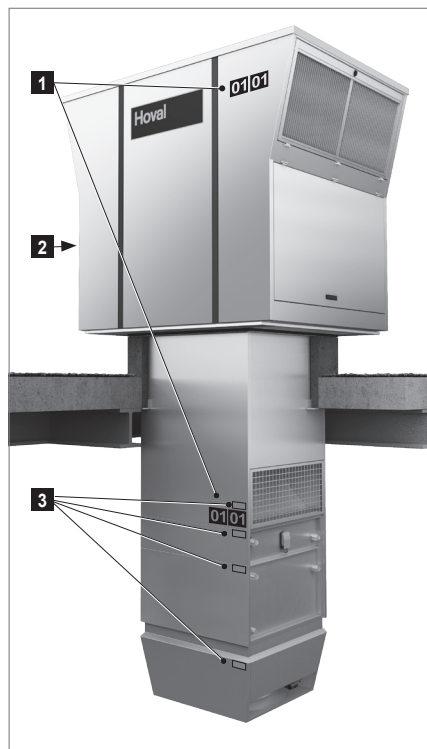
Never change the orientation of the supply air silencer (option) relating to the component above it. The correct position is marked on the unit.

- Place the connection module on the bottom part.
- Screw the components together; use the supplied screws and protective plugs to do so.



- 1 Connection module
- 2 Heating section
- 3 Cooling section
- 4 Supply air silencer (option)
- 5 Air-Injector

Fig. 14: The components of the below-roof unit vary depending on unit type.



- 1 Unit number
- 2 Type plate with serial number (behind the access door)
- 3 Serial number

Fig. 15: Identification of the unit components

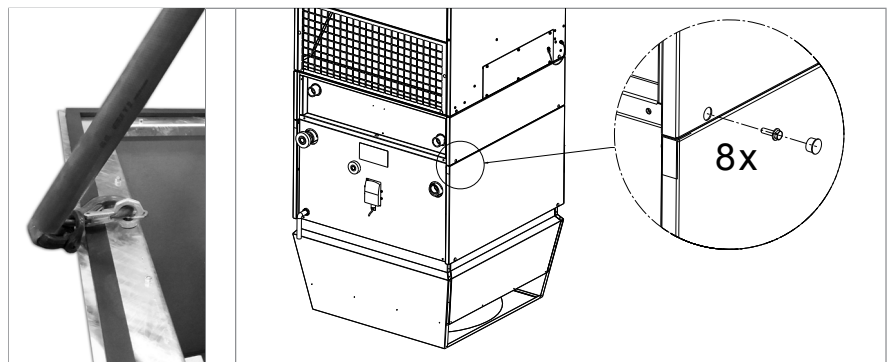


Fig. 16: Transport eye in the connection module

Fig. 17: Below-roof unit screw connection with M6 x 20 screws and protective plugs (8 per component)

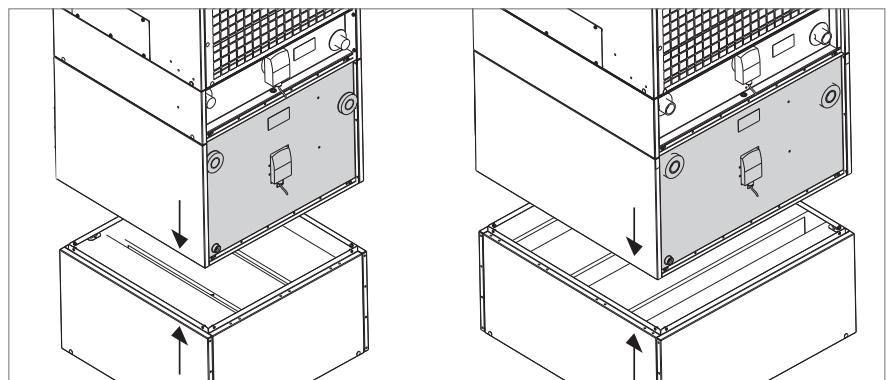


Fig. 18: Correct orientation of the supply air silencer:
For size 6: Sound attenuation splitters cross to coil connection side (or to the extract air grille for unit type R)
For size 9: Sound attenuation splitters parallel to coil connection side (or to the extract air grille for unit type R)

Installing fresh air and exhaust air silencers

Fresh air and exhaust air silencers (optional) are supplied separately and must be installed on the roof unit at the building site. The installation material is provided. Proceed as follows:

- Fresh air silencer
 - Lift the silencer and position it on the air inlet opening of the unit.
 - Insert the bolts into the hinges and insert the safety washers.
 - Fold the silencer up and hook the clamping lock in on both sides.
 - Secure the clamping locks with cotter pins.
- Exhaust air silencer
 - Lift the silencer and position it on the air outlet opening of the unit.
 - Insert the bolts into the hinges and insert the safety washers.
 - Fold the silencer up and hook the clamping lock in on both sides.
 - Secure the clamping locks with screws.

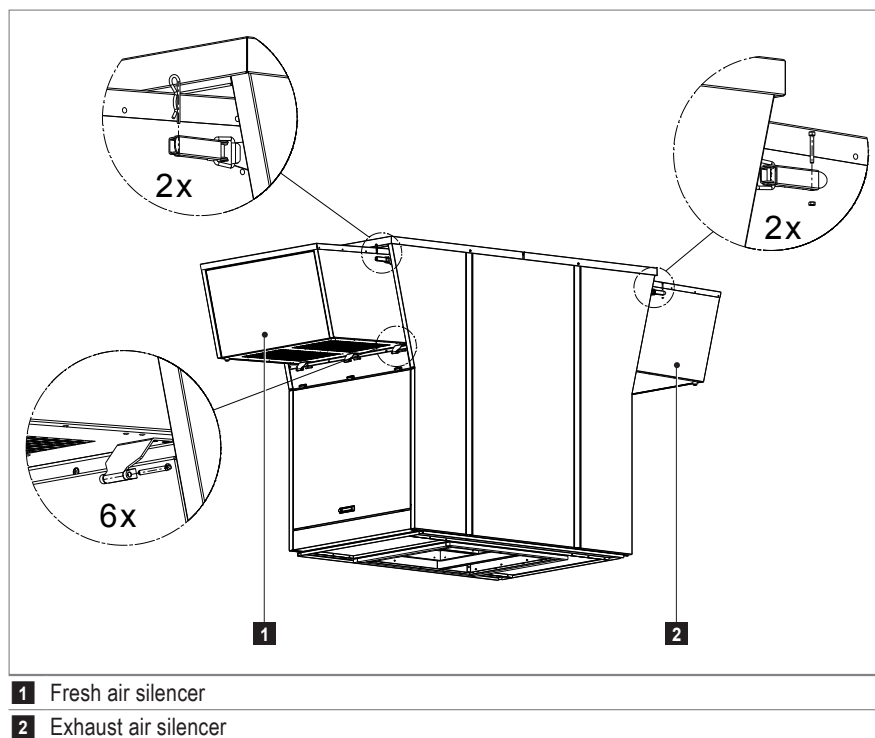


Fig. 21: Installing fresh air and exhaust air silencers

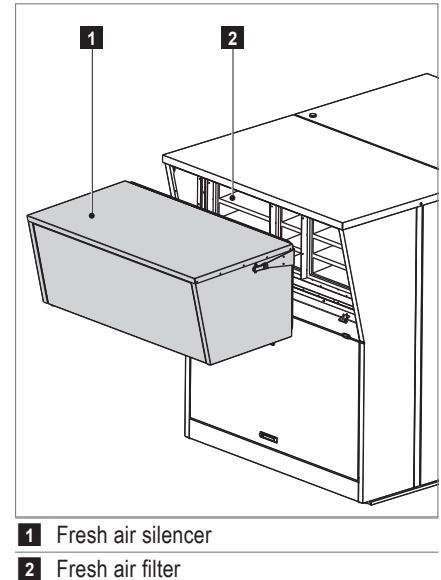


Fig. 19: Air inlet opening

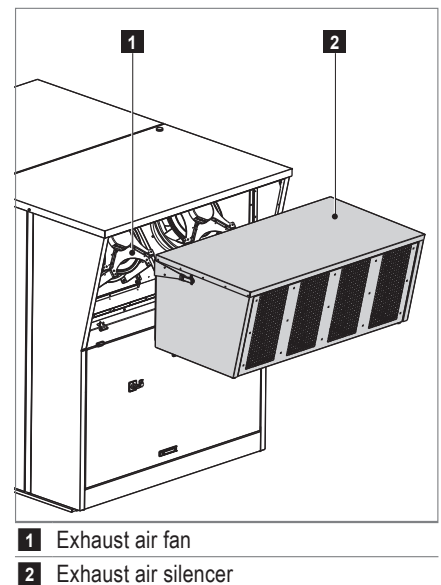


Fig. 20: Air outlet opening

Installing the below-roof unit

- Apply sealing compound to the roof frame.
- Release the cable fastening on the below-roof unit frame and carefully insert the cable into the unit.



Attention

Danger of damaging the unit: Dropping the cable may damage the heating or cooling coil. Put the cable down carefully.

- Screw in the transport eyes into the connection module frame and attach the lifting gear.
 - Heed the minimum length of the lifting ropes (see Fig. 22).
- Transport the below-roof unit to the roof frame using a helicopter or crane.
- Turn the below-roof unit to the desired position.
- Hang the below-roof unit into the roof frame from above.
- Check the sealing strip on the connection module flange. Improve the seal if necessary.
- Remove the transport eyes.

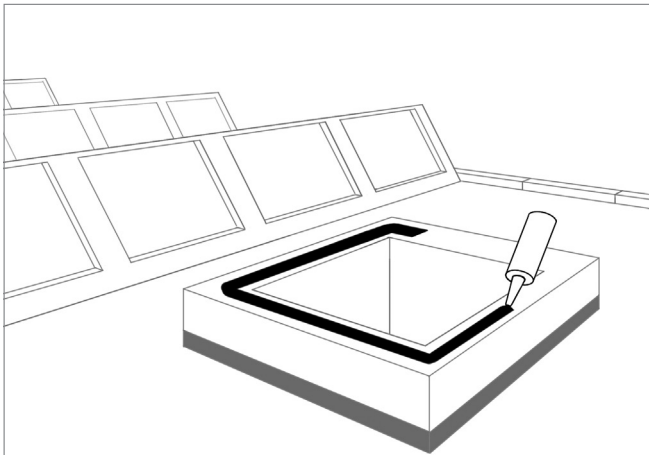


Fig. 23: Applying sealing compound to the roof frame

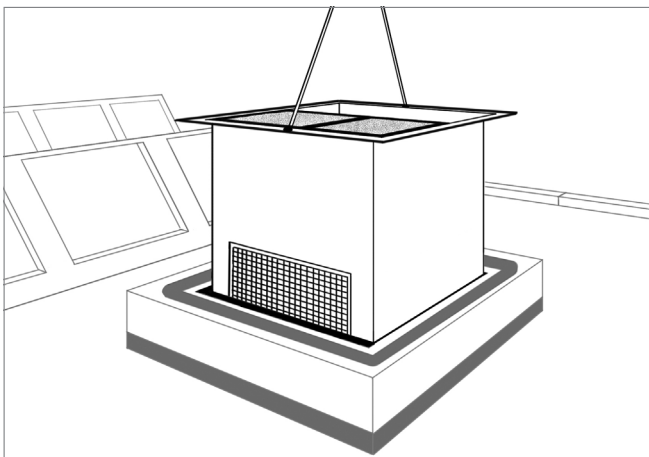


Fig. 24: Hanging the below-roof unit

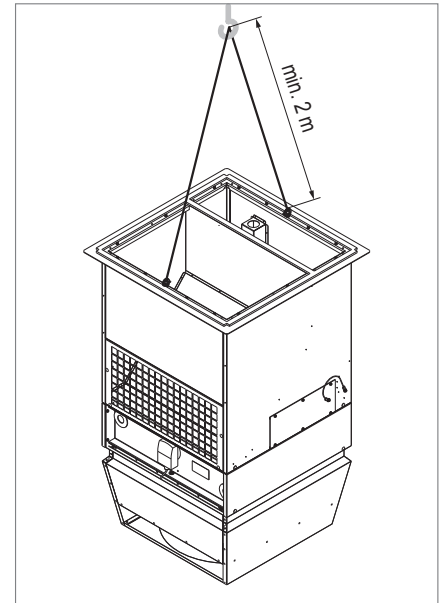


Fig. 22: Minimum length of the lifting ropes

Installing the roof unit

- Remove the cover caps on the unit roof.
- Screw in the transport eyes and attach the lifting gear.
 - Heed the minimum length of the lifting ropes (see Fig. 25).
- Transport the roof unit onto the roof.
- Open the supply air access door and the exhaust air access door and position the roof unit correctly in relation to the below-roof unit, placing the roof unit on top of the below-roof unit. The centring bolts on the connection module support the correct positioning.
- Screw the the roof unit to the below-roof unit:
 - To do this, use the supplied M6 x 30 screws.
 - Secure the screw connection using medium-strength, soluble adhesive (e.g. Loctite 243).
- Remove the transport eyes and attach the cover caps.
 - Keep the transport eyes for when disassembling the units at a later date at the end of their service life.
- Reattach the fan protecting plate on the supply air side:
 - Temporarily screw the protecting plate tight using 4 M5 x 16 screws; it must be removed again for electrical installation later.
- In units in oil-proof design or in corrosion-protected design for high extract air humidity (option) the condensate is drained to the drip tray in the connection module.

Join the hose in the connection module to the condensate drain of the plate heat exchanger. Attach it using a hose clamp.

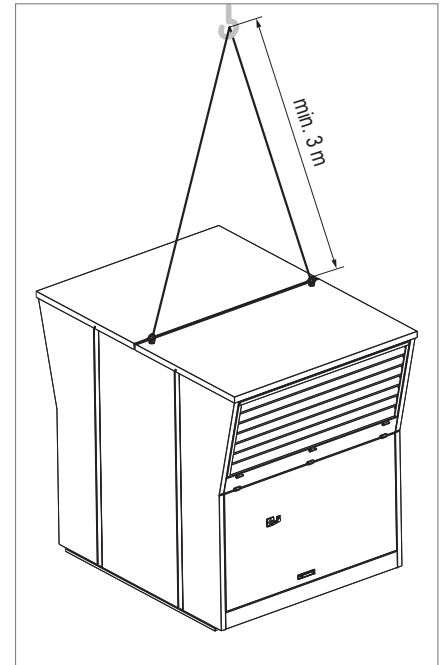
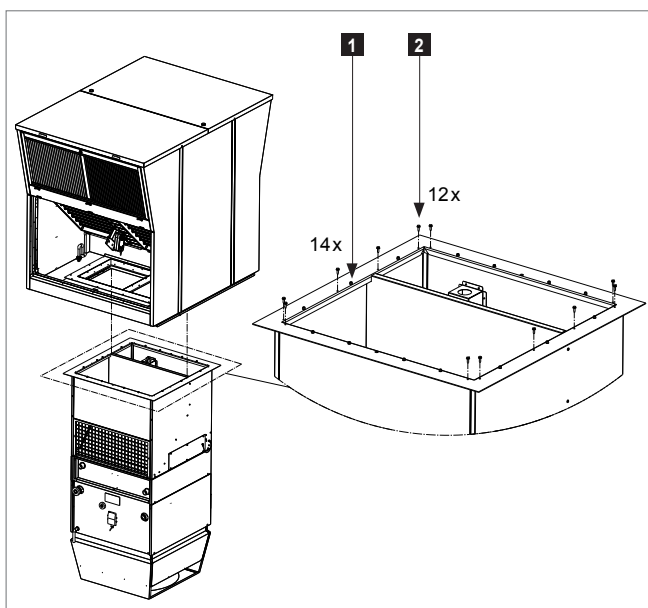
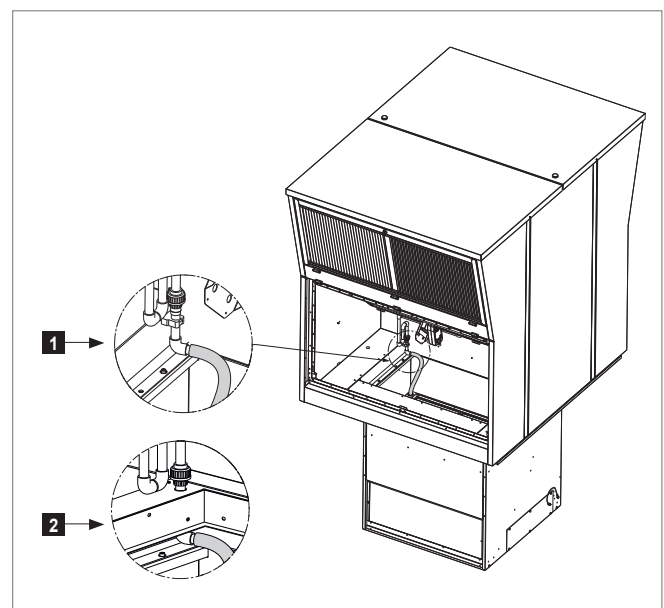


Fig. 25: Minimum length of the lifting ropes



- 1 Centring bolts
- 2 M6 x 30 screws

Fig. 26: Placing and screwing the roof unit



- 1 Oil-proof design
- 2 Corrosion-protected design for high extract air humidity

Fig. 27: Connecting the condensate line

- Install the extract air filter and attach the elements using the filter brackets.



Caution

Danger of hazardous emissions from damaging the filters:

- Only hold the compact filters on the black filter frame.
- Never touch the white filter medium.
- Replace damaged filter elements immediately.



Fig. 28: Extract air filter installed in the unit

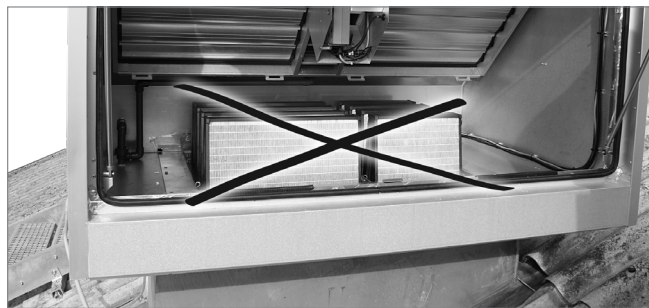


Fig. 30: Incorrect extract air filter position

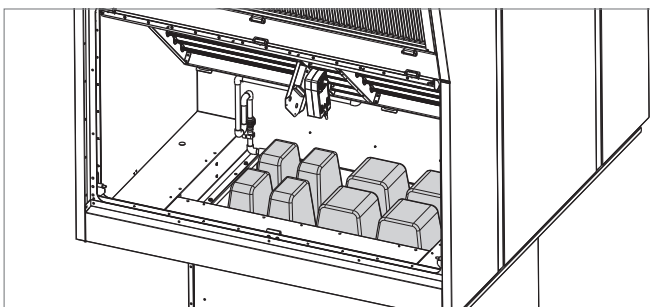


Fig. 29: Extract air filter for oil and dust separation in units in oil-proof design

7.5 Connecting air ducts and Air-Injectors



Attention

Danger of damaging the units. The unit must not be subjected to the weight of the ducts. Suspend the ducts from the ceiling or support them on the floor.

Connecting the supply air duct

- Connect RoofVent® units without Air-Injectors or with 2 Air-Injectors to a on-site air duct.
- For units with 2 Air-Injectors: Install the two Air-Injectors on the supply air duct:
 - Stick the compression tape onto the Air-Injectors.
 - Attach the Air-Injectors to the supply air duct with a perforated angle plate and blind rivet nuts.
 - Do not install any add-ons or fittings in the direct outlet area. The supply air jet must be free to spread out unhindered.

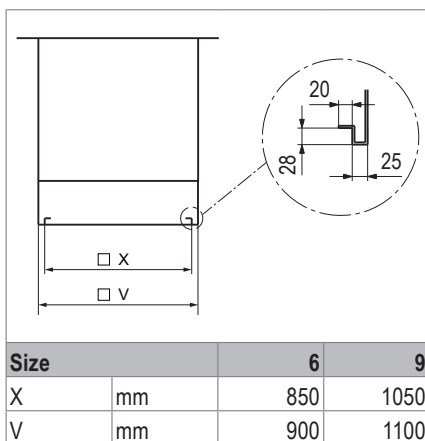


Table 26: Connection dimensions supply air duct (in mm)

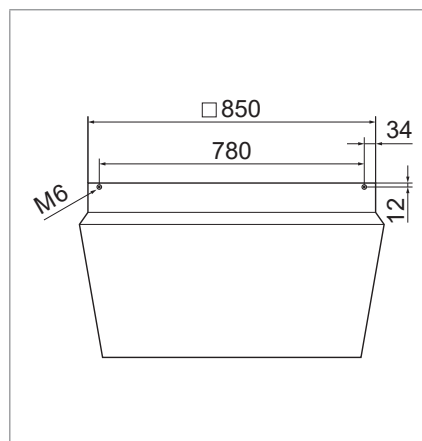
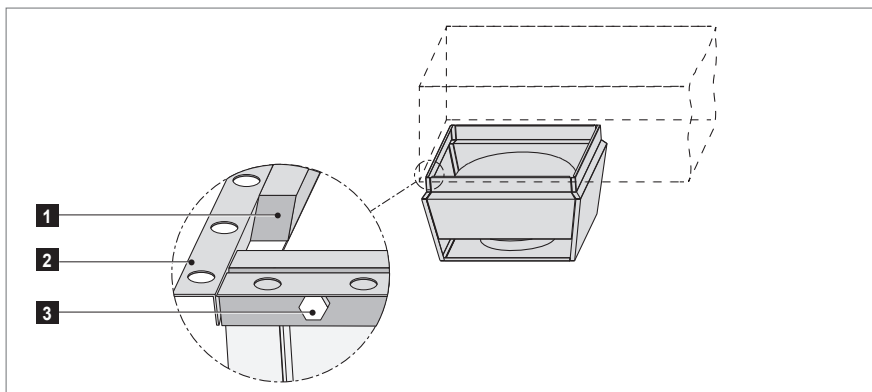


Table 27: Hole pattern for Air-Injector (dimensions in mm)



- 1 Compression tape (on site)
- 2 Perforated angle plate (on site)
- 3 Blind rivet nuts (on site)

Fig. 31: Installing the Air-Injectors on the supply air duct

7.6 Hydraulic installation

- Connect the heating coil according to the hydraulic circuit diagram.
- Depending on local conditions, check whether compensators for linear expansion are required for the supply and return lines and/or articulated connections are required for the units.
- Insulate the hydraulic lines.
- Hydraulically balance the pipework for the the individual units within a control zone to ensure even distribution.



Attention

Danger of damaging the units. Do not fasten any loads to the coil, e.g. by means of the flow or return lines.



Attention

Danger of malfunctions. The condensate separator in cooling units only functions while the fan is running. No coolant must be allowed to circulate in the coil when the unit is switched off.

Hydraulic installation of units with hydraulic assembly for diverting system (option)

- Connect the heating coil to the on-site hydraulic network using the hydraulic assembly:
 - Install the assembly horizontally.
 - Mount the assembly so that its weight does not need to be absorbed by the coil.
 - Insulate the assembly.
- Read off the default settings for the hydraulic alignment from the diagrams below. The curves 1.0 to 4.0 correspond to the revolutions of the valve spindles of the balancing valve; they are shown on the turning knob:
 - 0.0Valve closed
 - 4.0Valve completely open
- The coil and the hydraulic assembly are already included in the specified pressure drops. Thus, only consider the pressure drops of the distributor circuit up to the screw connections.

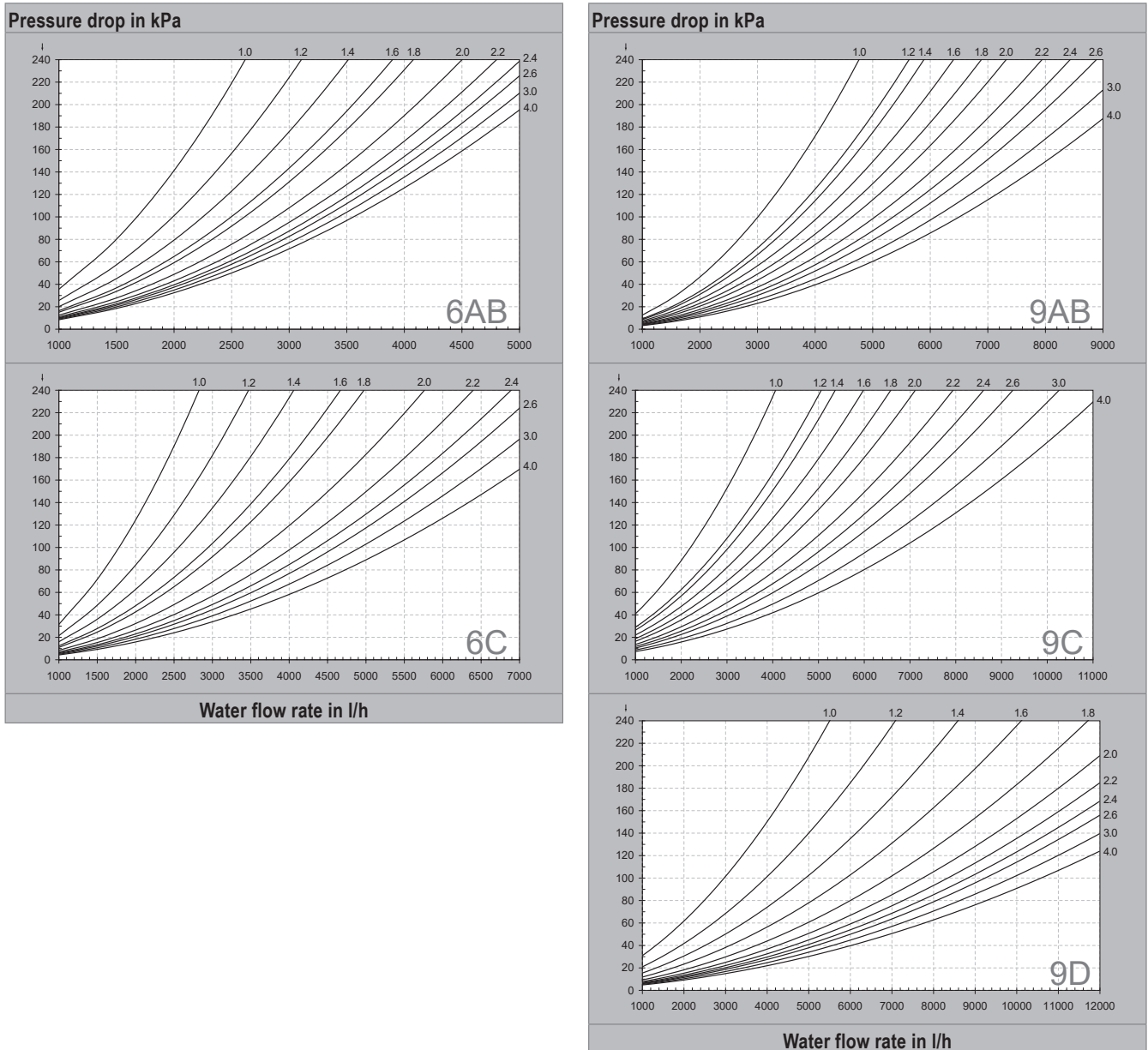


Fig. 32: Default settings for the balancing valves

Return temperature sensor (option)

- Install the return temperature sensor on the return line, directly after the screw connection.
- Attach the sensor with the clamping band.
- Insulate the sensor.

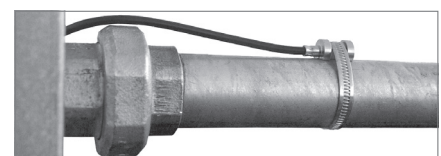


Fig. 33: Return temperature sensor

7.7 Condensate connection

Condensate arising in cooling units must be removed via a condensate-proof line.

- Install and insulate the supplied trap on the condensate connection of the unit.
- Dimension the slope and cross-section of the condensate line so that no condensate backflow takes place.
- Make sure that the condensate produced is drained in compliance with local regulations.

Condensate pump (option)

- Remove the transport locking device from the condensate pump.
- Install the condensate pump directly under the condensate drain connection; the supplied container is prepared for installation on the Air-Injector.
- Connect the condensate pump to a condensate-resistant waste water pipe. To do this, use a hose and attach it using a hose clamp or use a pipe with an inner diameter of 9 mm.
- Route the condensate line from the pump directly upwards.



Notice

This line must not exceed the delivery head of the pump:
 – head of 3 m up to a condensate quantity of max. 150 l/h
 – head of 4 m up to a condensate quantity of max. 70 l/h
 Consider the condensate quantity expected in your application. (It can be calculated with the selection program HK-Select).

- Install an odour trap at the highest point.
- Route the line with a constant incline downwards and then vertically downwards, and if possible down to below the condensate pump. This will create a siphon effect and thus improve the effectiveness of the condensate pump.
- Make sure that the condensate produced is drained in compliance with local regulations.

Units in oil-proof design / in corrosion-protected design for high extract air humidity (option)

Install an oil/condensate drain with trap in accordance with the local provisions to remove these types of emulsions.

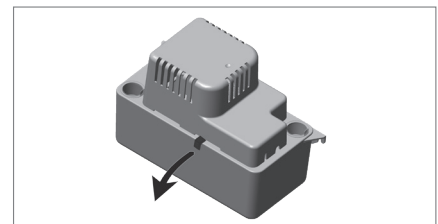


Fig. 34: Removal of the transport locking device

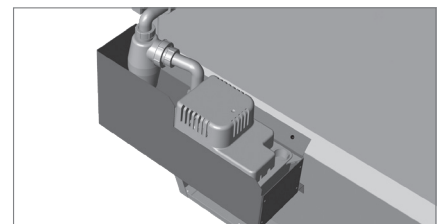


Fig. 35: Installation on the Air-Injector

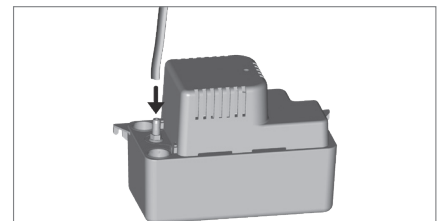


Fig. 36: Connection of the condensate pump

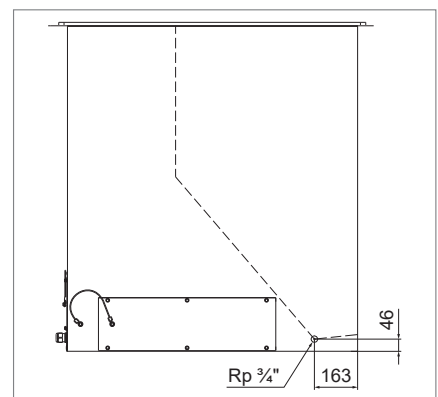


Fig. 37: Dimensional drawing for oil/condensate drain (in mm)

7.8 Electrical installation



Caution

Danger of electric shocks. The electrical installation is to be carried out only by a qualified electrician.

Please note the following:

- Observe all relevant regulations (e.g. EN 60204-1).
- Choose the dimensions of the cable cross sections in line with the applicable regulations.
- Route signal and bus lines separately from mains cables.
- Make sure the lightning protection system for the units or for the entire building is planned and carried out by professionals.
- Provide overload protection equipment on site in the mains connection line of the zone control panel.



Attention

Use an all-pole sensitive residual current circuit breaker for a leakage current protective circuit.

- Carry out the electrical installation according to the wiring diagram.
- Secure all connections against working loose.
- When installing cables, observe the following points:
 - Fasten the cables in place with cable mounts and cable ties or with cable conduits/ducts.
 - Use blind rivets.
 - Drill holes with a maximum diameter of 5 mm Ø.
 - The maximum drilling depth is 10 mm. Use a drill bit with a depth stop.
 - The maximum load resulting from cable holders and cable guides is 10 kg.
 - All access panels must be easily removable.
 - Do not drill any holes in the connection module around the connection box and cable duct leading to the roof unit.

Proceed as follows:

- Connect the the connection box in the below-roof unit to the control block in the roof unit:
 - Unscrew the fan protecting plate.
 - Pull out upwards the laced wiring harness from the connection module and fasten it using a cable bushing and a cable clamp.
 - Depending on the length of the connection module, the wiring harness has a little excess length. Fix it with the cable clamps in the roof unit (see Fig. 38).
 - Connect the cable to the control block according to wiring diagram.
 - Screw the fan protecting plate tightly again. To do this, use the supplied M5 x 16 screws.
- Connect the power supply to the connection box.
- Connect the zone bus to the connection box.
- Connect the unit frame with the foundation earth electrode and attach an earthing label.
- Connect the electrical components of the below-roof unit to the connection box (see Fig. 39).
- Wire up the mixing valve to the connection box.

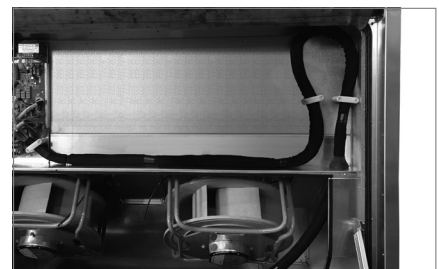
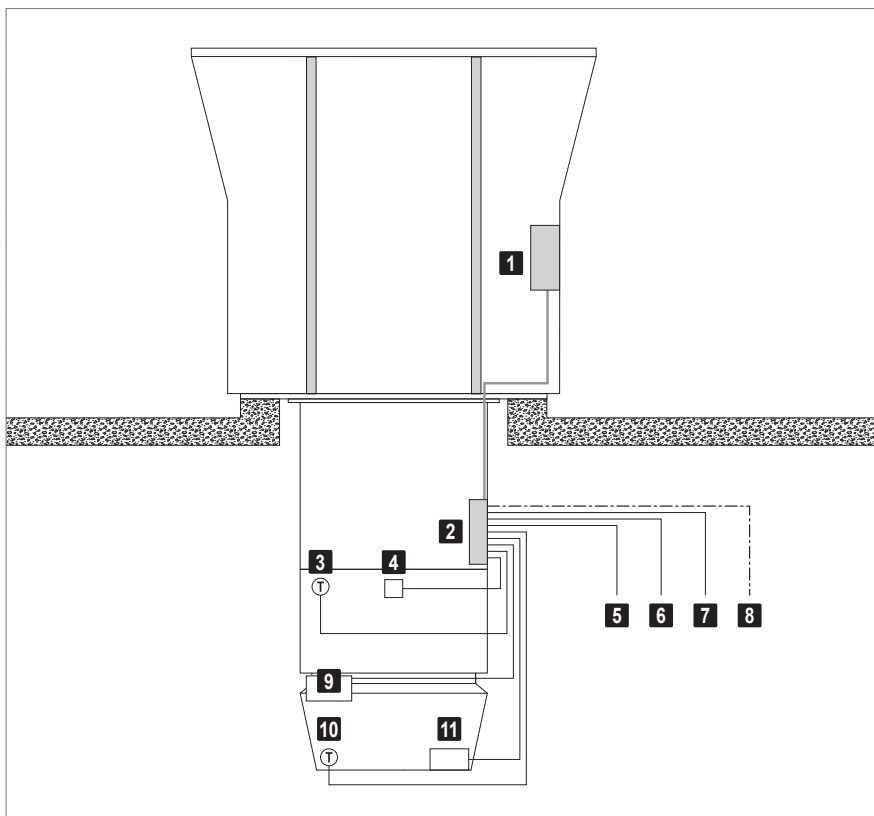


Fig. 38: Fixing the wiring harness in the roof unit

Options

- Wire up the condensate pump to the connection box.
- Wire up the return temperature sensor to the connection box.
- Injection system:
 - Wire up the pump and mixing valve to the connection box.
- Design with 2 Air-Injectors:
 - Install the enclosed supply air temperature sensor in the supply air duct and wire it up to the connection box.
 - Wire up both actuators to the connection box.
- Design without Air-Injector:
 - Install the enclosed supply air temperature sensor in the supply air duct and wire it up to the connection box.



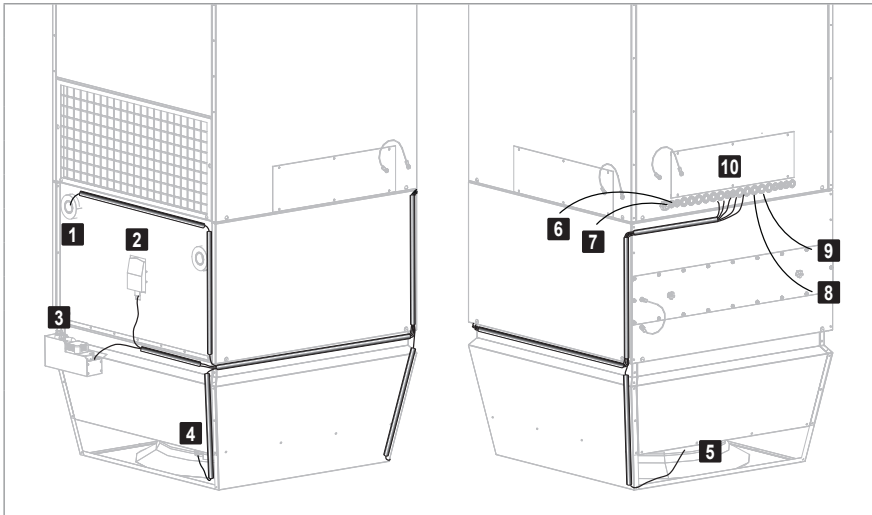
1	Control block
2	Connection box
3	Return temperature sensor (option)
4	Frost controller
5	Mixing valve
6	Pump (option)
7	Zone bus
8	Power supply RoofVent®
9	Condensate pump (option)
10	Supply air temperature sensor
11	Actuator Air-Injector

Fig. 39: On-site electrical connection
(components vary depending on unit type)

Temperature sensors

The room air sensor and the fresh air temperature sensor are supplied loose in the control panel:

- Install the room air temperature sensor at a representative position in the occupied area at a height of about 1.5 m. Its measured values must not be distorted by the presence of sources of heat or cold (machines, direct sunlight, windows, doors, etc.).
- Install the fresh air temperature sensor at least 3 m above the ground on a north-facing wall, so that it is protected from direct sunlight. Provide cover for the sensor and thermally insulate it from the building.



- 1 Return temperature sensor (option)
- 2 Frost controller
- 3 Condensate pump (option)
- 4 Actuator Air-Injector
- 5 Supply air temperature sensor
- 6 Power supply RoofVent®
- 7 Zone bus
- 8 Mixing valve
- 9 Pump (option)
- 10 Connection box

Fig. 40: Cable routing on the below-roof unit
(components vary depending on unit type)

8 Operation

8.1 Initial commissioning



Attention

Risk of damage to property as a result of performing initial commissioning on your own authority. Initial commissioning must be performed by the manufacturer's customer service technicians.

Preparing for initial commissioning:

Checklist:

- Have all the media connections been made (electric cabling, water piping, condensate drain and air duct connections)?
- Is the heating medium or cooling medium available?
- Are the hydraulics aligned and balanced?
- Are all the control components installed and wired?
- Are all of the respective trade groups (installer, electrician, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

8.2 Operation

The system runs fully automatically depending on the programmed operating times and temperature conditions.

- Observe the operating instructions for the control system.
- Check alarm displays daily.
- Correct changes to operating times in the programming accordingly.
- Ensure free air outlet and unhindered dispersion of the supply air.

Applications with oil-saturated extract air:

- In the 'Air quality' operating mode RoofVent® units in oil-proof design always work in pure ventilation operation (AQ_VE). Recirculation operation (AQ_REC) and mixed air operation (AQ_ECO) are locked.



Attention

Danger of damaging the units due to supply air containing oil. Do not operate the units in 'Recirculation' mode (REC) unless there is no oil pollution in the room.

Applications with high extract air humidity:



Attention

Danger of damaging the units due to ice formation. Do not operate the units unless icing protection is provided. It is essential to have a humidity sensor for this.

9 Maintenance and repair



Caution

Risk of injury from incorrect work. Maintenance work must be carried out by trained personnel.

9.1 Safety

Before performing any work on the unit:

- Turn the isolation switch on the unit to the 'Off' position and secure it against being switched back on.



Caution

Danger of electric shocks. The unit controller and the service socket are still live.

- Wait at least 3 minutes after switching the unit off.



Caution

The use of condensers can pose a danger of fatal injury from directly touching live parts even after the unit is switched off. Only open the access doors after waiting 3 minutes.

- Observe the accident prevention regulations.
- Observe the particular dangers involved when working on electrical systems.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Replacement parts must comply with the technical requirements of the unit manufacturer. Hoval recommends the use of original spare parts.

9.2 Maintenance

Maintenance schedule

Activity	Interval
Changing the fresh air and extract air filter	When the filter alarm is displayed, at least annually
Comprehensively checking function; cleaning and possibly repairing the unit	Annually by Hoval customer service

Table 28: Maintenance schedule

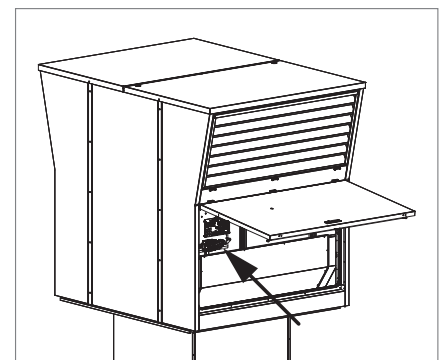


Fig. 41: Position of the isolation switch behind the supply air access door

Filter sets

Size	Filter set	Mat. no.
6	Fresh air	6046475
	Extract air	6046477
	Extract air, oil-proof	6046478
9	Fresh air	6046474
	Extract air	6046476
	Extract air, oil-proof	6046479

Table 29: Material numbers for filter sets

Changing the filter



Caution

- Danger of hazardous emissions from damaged filters:
- Only hold the filters on the black filter frame.
 - Never touch the white filter medium.
 - Replace damaged filter elements immediately.



Caution

Crushing hazard from closing dampers. Only open the access doors when the 'Filter change' illuminated button is constantly illuminated (waiting period of approx. 2 minutes).

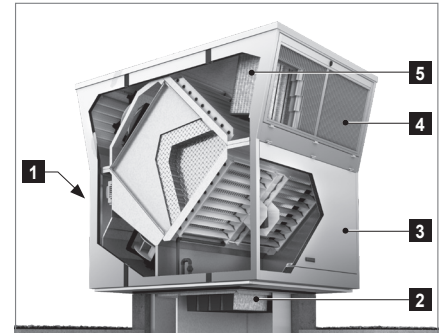
- Press the 'Filter change' illuminated button.
- Wait until the button is constantly illuminated.
 - The button flashes whilst the speed of rotation of the fans is reduced and the dampers close; it illuminates constantly as soon as the access doors may be opened.
- Changing the extract air filter:
 - Open the extract air access door.
 - Release the filter brackets and remove the filter elements.
 - Insert the new filter elements. When doing this, only hold the frame.
 - Fix the filter elements in place with the filter brackets.
 - Close the access door.
- Changing the fresh air filter:
 - Open the fresh air access door. Release the safety loops and fold the access door down completely.
 - Release the filter brackets and remove the filter elements.
 - Insert the new filter elements. When doing this, only hold the frame.
 - Fix the filter elements in place with the filter brackets.
 - Fold the access door up and reattach the safety loops. Close the access door.
- Changing the fresh air filter when a fresh air silencer is installed:
 - Open the clamping lock of the fresh air silencer on both sides. Fold the silencer down.
 - Release the filter brackets and remove the filter elements.
 - Insert the new filter elements. When doing this, only hold the frame.
 - Fix the filter elements in place with the filter brackets.
 - Fold the silencer up and hook the clamping lock in on both sides. Secure the clamping locks with cotter pins.
- Press the 'Filter change' illuminated button again to set the unit back to normal operation. The button goes out.



Notice

If the 'Filter change' illuminated button is not pressed again, the unit automatically switches back to normal operation after 30 minutes. The button goes out.

- Dispose of the filters in accordance with local regulations.
 - The filters are fully incinerable; the disposal of used filters depends on the contents.



- 1 'Filter change' illuminated button
- 2 Extract air filter
- 3 Extract air access door
- 4 Fresh air access door
- 5 Fresh air filter

Fig. 42: Changing the filter



Fig. 43: Extract air filter

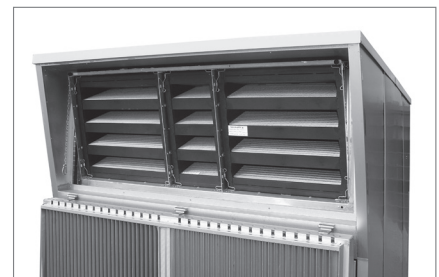


Fig. 44: Fresh air filter

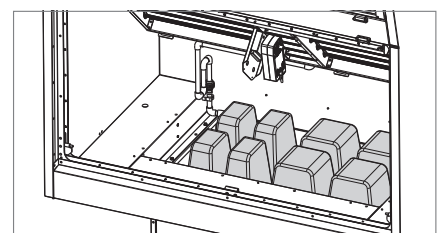


Fig. 45: Extract air filter for oil and dust separation in units in oil-proof design

9.3 Repair

If repairs are necessary, contact Hoval customer service.

Product service life

Component	Service life
EC motors of the supply air and exhaust air fans	approx. 30'000 to 40'000 hours depending on the application and environmental conditions
Damper actuators with spring return	at least 60'000 emergency positions

Table 30: Product service life

10 Dismantling



Caution

- Risk of injury caused by falling load and improper handling.
- Wear protective equipment (fall protection, helmet, safety shoes).
 - Do not stand under suspended loads.
 - Use cranes or helicopters with sufficient load-bearing capacity.
 - Do not lift the two-part unit in one piece.

- Disconnect the power supply to the unit.
- Wait at least 3 minutes after switching the unit off.



Caution

The use of condensers can pose a danger of fatal injury from directly touching live parts even after the unit is switched off. Only open the access doors after waiting 3 minutes.

- Drain the heating or cooling circuit.
- Dismantle all media connections.
- Disconnect the unit from any fastenings.
- Open the supply air access door and the extract air access door.
- Unscrew the fan protecting plate.
- Disconnect the screw connection between the roof unit and below-roof unit.
- Remove the cover caps on the unit roof.
- Screw in the transport eyes and attach the lifting gear.
- Remove the roof unit.
- Screw in the transport eyes into the connection module frame and attach the lifting gear.
- Remove the below-roof unit.

11 Disposal

- Recycle metal components.
- Recycle plastic parts.
- Dispose of electric and electronic parts via hazardous waste.
- Dispose of oil-fouled parts in accordance with local regulations.
- Dispose of the filters in accordance with local regulations.
 - The filters are fully incinerable; the disposal of used filters depends on the contents.

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