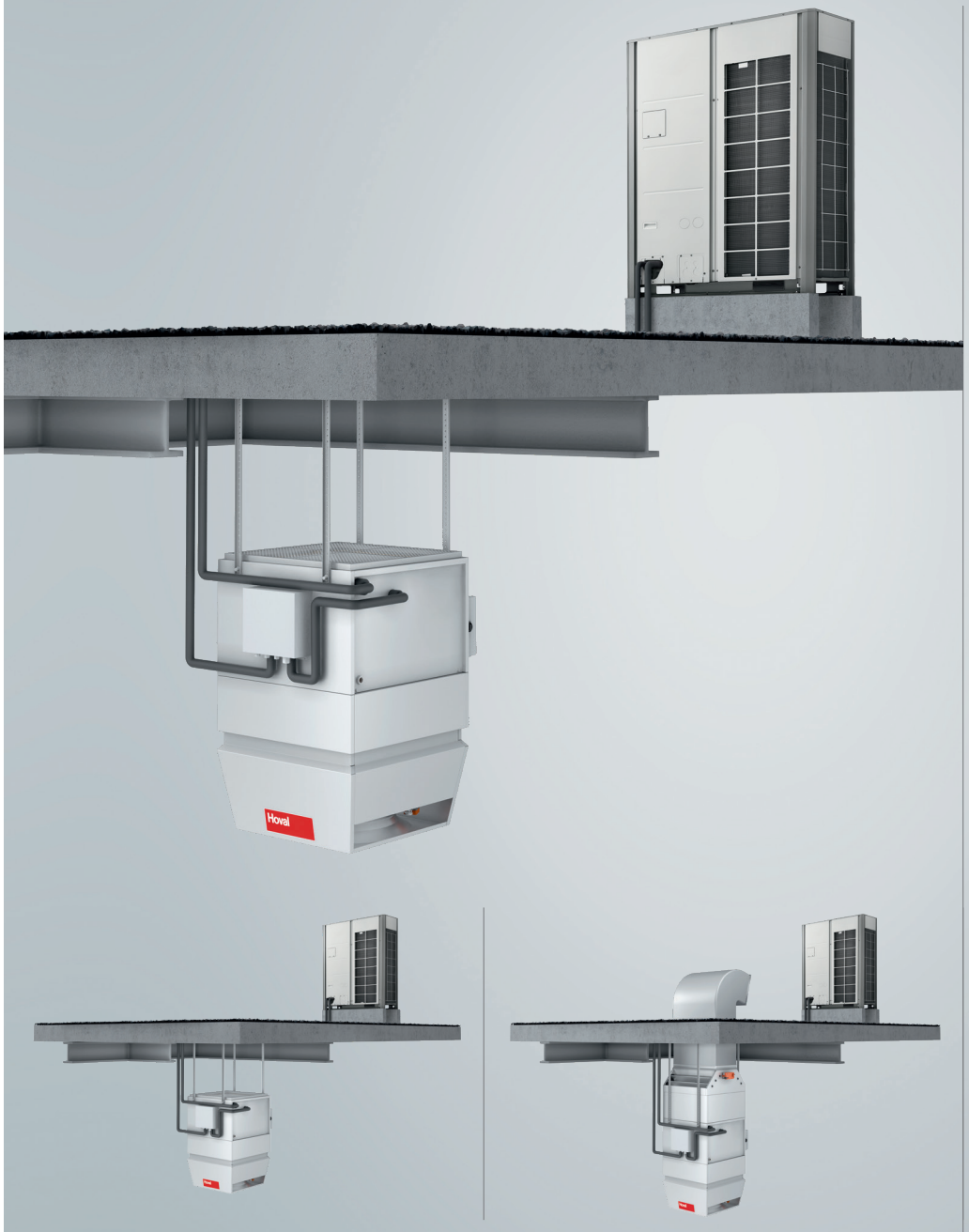
Hoval

Indoor Climate Systems

Hoval TopVent®

TP | MP

Operating instructions



Original operating manual

4 222 624-en-00

Hoval | Responsibility for energy and environment

1 Use

1.1 Intended use

TopVent® TP recirculation unit

TopVent® TP units are recirculation units intended for heating and cooling spaces up to 25 m in height with decentralised heat pump. They have the following functions:

- Heating and cooling with heat pump
- Recirculation operation
- Air distribution and destratification with adjustable Air-Injector
- Air filtration (option)

The TopVent® TP unit complies with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of ventilation systems. It is a system of the «fan coil unit» type, provided for in Commission Regulation (EU) 2016/2281.

TopVent® MP supply air unit

TopVent® MP units are supply air units intended for ventilation, heating and cooling spaces up to 25 m in height with decentralised heat pump. They have the following functions:

- Heating and cooling with heat pump
- Fresh air supply
- Mixed air operation
- Recirculation operation
- Air distribution and destratification with adjustable Air-Injector
- Air filtration

The TopVent® MP unit complies with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of ventilation systems. It is a system of the «fan coil unit» type, provided for in Commission Regulation (EU) 2016/2281.

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 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

TopVent® units are state-of-the-art and safe to operate. All control and safety valves are checked at the factory. Nevertheless, hazards may emanate from the units if they are used incorrectly or not used as intended. Therefore:

- 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.
- 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.
- Observe the particular dangers involved in working on the roof and on electrical systems.
- When working on the unit, objects (e.g. tools) could be dropped. Block off the area underneath the unit.
- Do not attach additional loads to the unit.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Wear suitable protective equipment (helmet, gloves, mouth protection, goggles).
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Replacement parts must comply with the technical requirements of the system manufacturer. Hoval recommends the use of original spare parts.
- Unauthorised reconfiguration or modification of the unit is not permitted.
- Shut down the unit immediately, if any defects are ascertained that limit the operational safety.

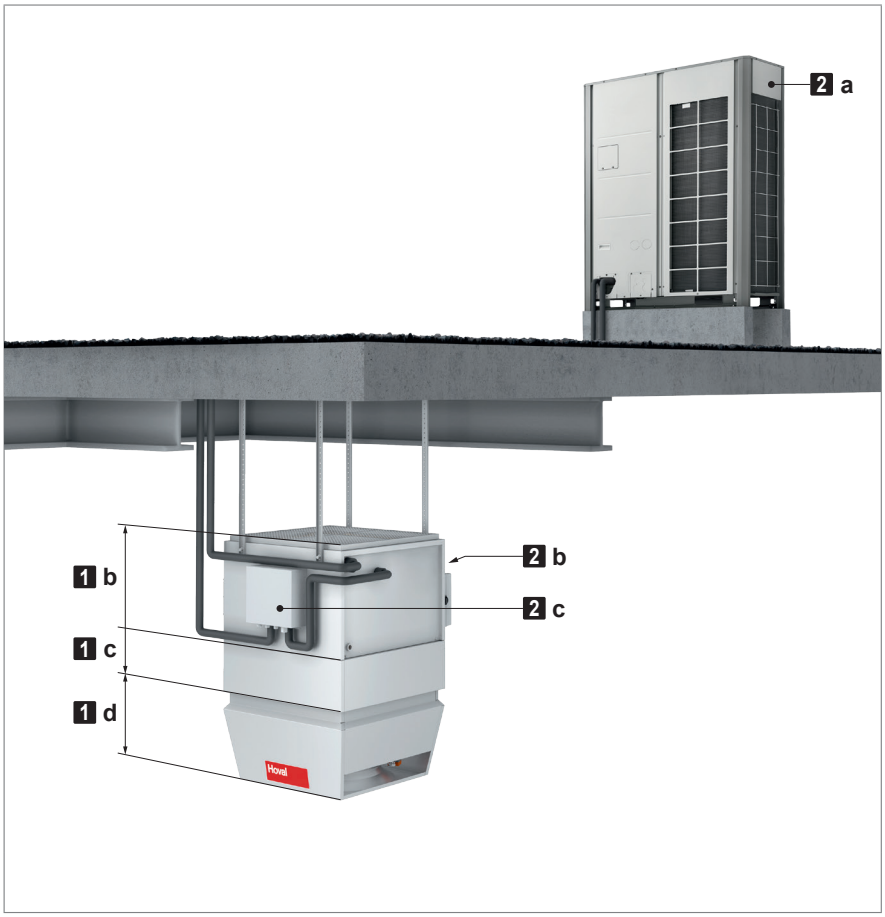
2.3 Decommissioning

Disconnect the power supply with the main switch in the control panel.

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.

3 Construction and operation

3.1 TopVent® TP construction

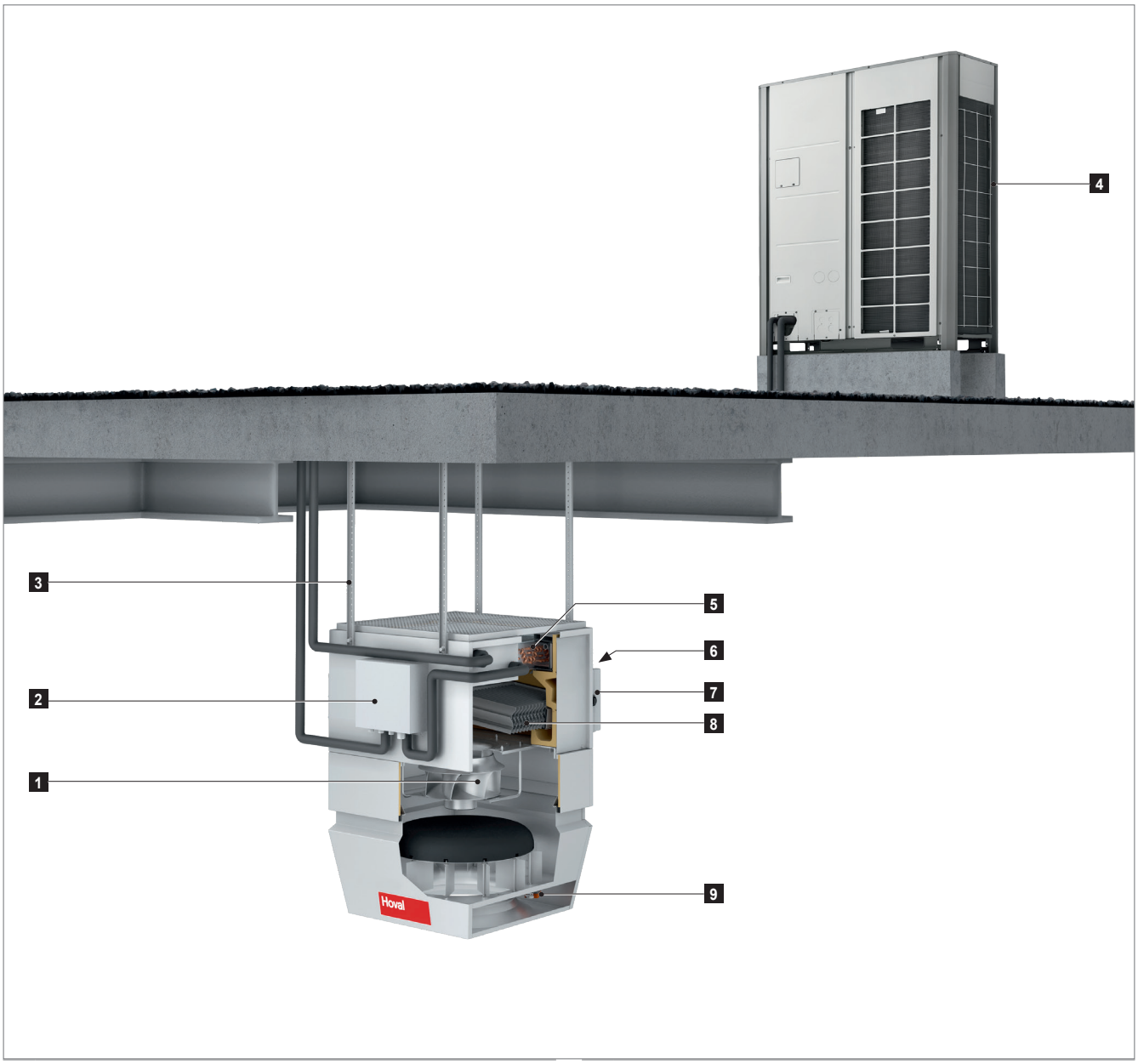


1 Recirculation unit
- **a** Filter box of flat filter box (not shown here)
- **b** Heating/cooling section
- **c** Fan unit
- **d** Air-Injector

2 Heat pump system
- **a** Heat pump
- **b** Communication kit
- **c** EEV kit

Fig. 1: TopVent® TP components

Notice
The picture only shows the schematic layout. In contrast to the illustration here, the EEV kit is located on the refrigerant connection side.



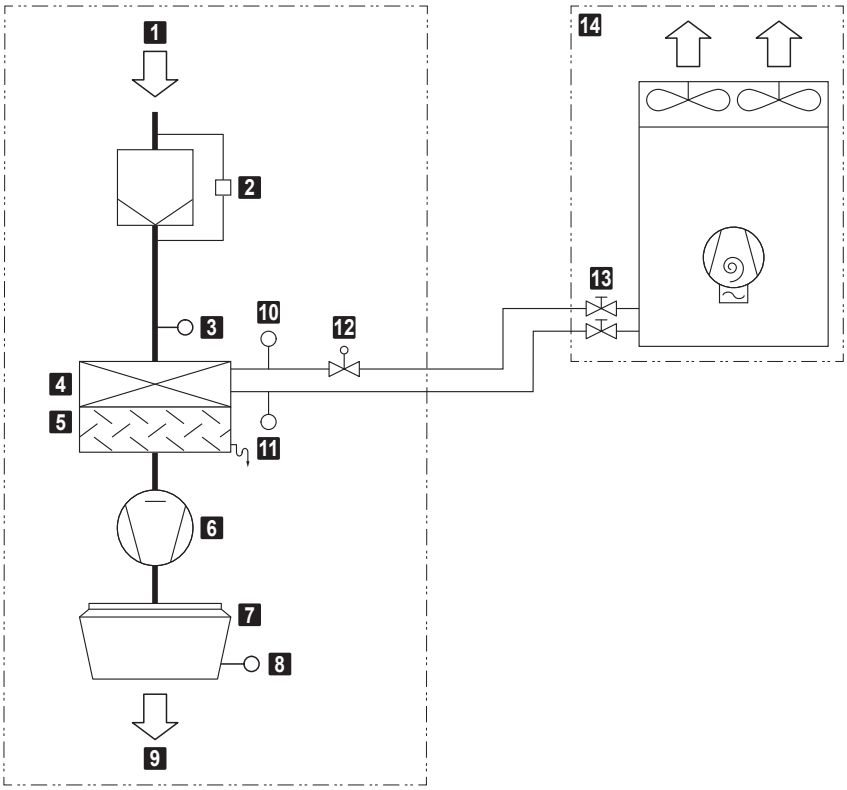
1	Fan	6	Communication kit
2	EEV kit with expansion valve	7	Unit control box
3	Suspension set	8	Condensate separator
4	Heat pump	9	Actuator Air-Injector
5	Heating/cooling coil		

Fig. 2: TopVent® TP construction

Notice
The picture only shows the schematic layout. In contrast to the illustration here, the EEV kit is located on the refrigerant connection side.

3.2 Function TopVent® TP

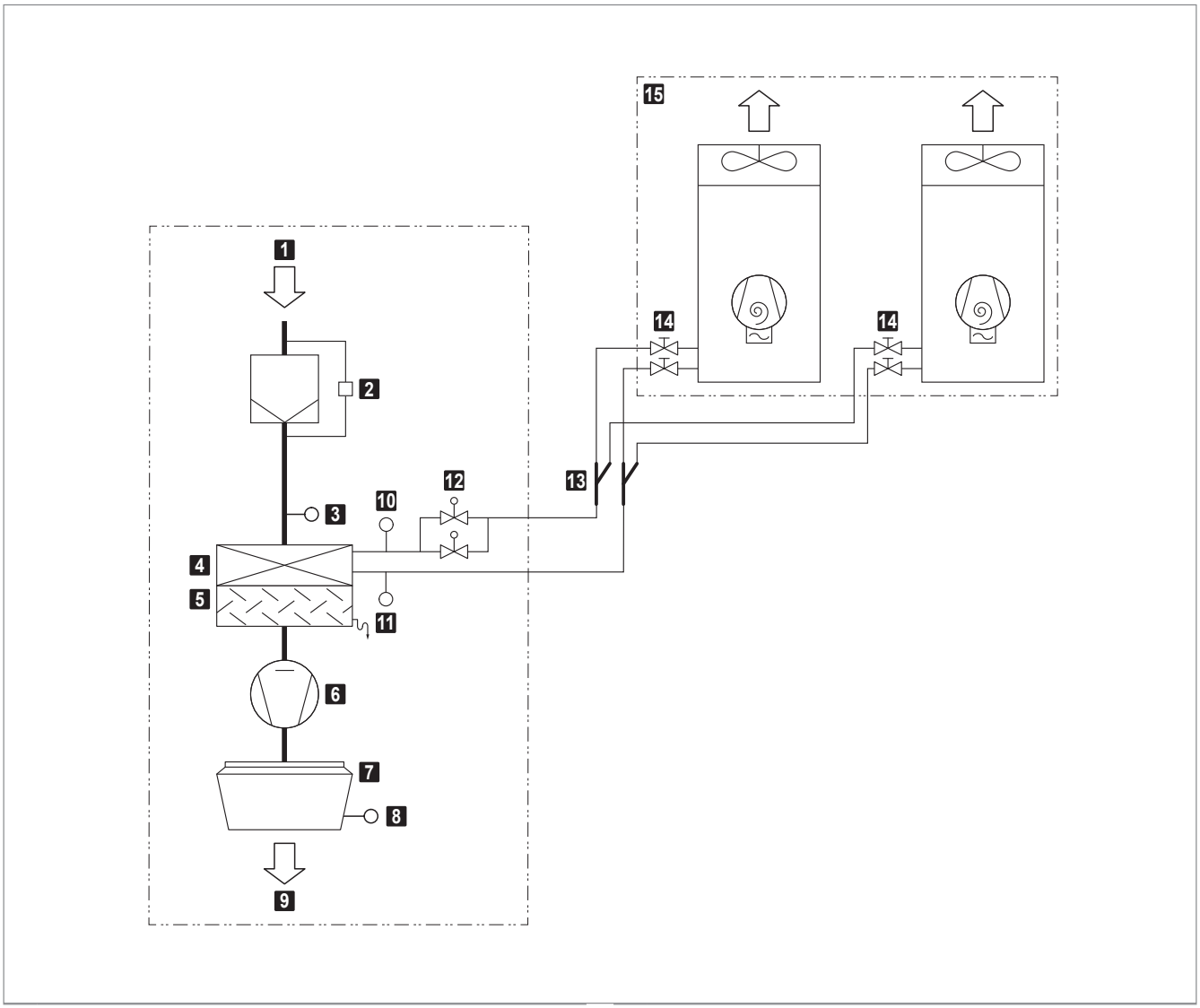
TopVent® TP-6-P | TopVent® TP-9-P



1	Extract air	8	Supply air temperature sensor
2	Air filter with differential pressure switch (optional)	9	Supply air
3	Air inlet temperature sensor heating/cooling coil	10	Liquid temperature sensor (supplied loose)
4	Heating/cooling coil	11	Gas temperature sensor (supplied loose)
5	Condensate separator	12	Expansion valve
6	Fan	13	Shut-off valves
7	Air-Injector with actuator	14	Heat pump P

Fig. 3: TopVent® TP-6-P | TopVent® TP-9-P function diagram

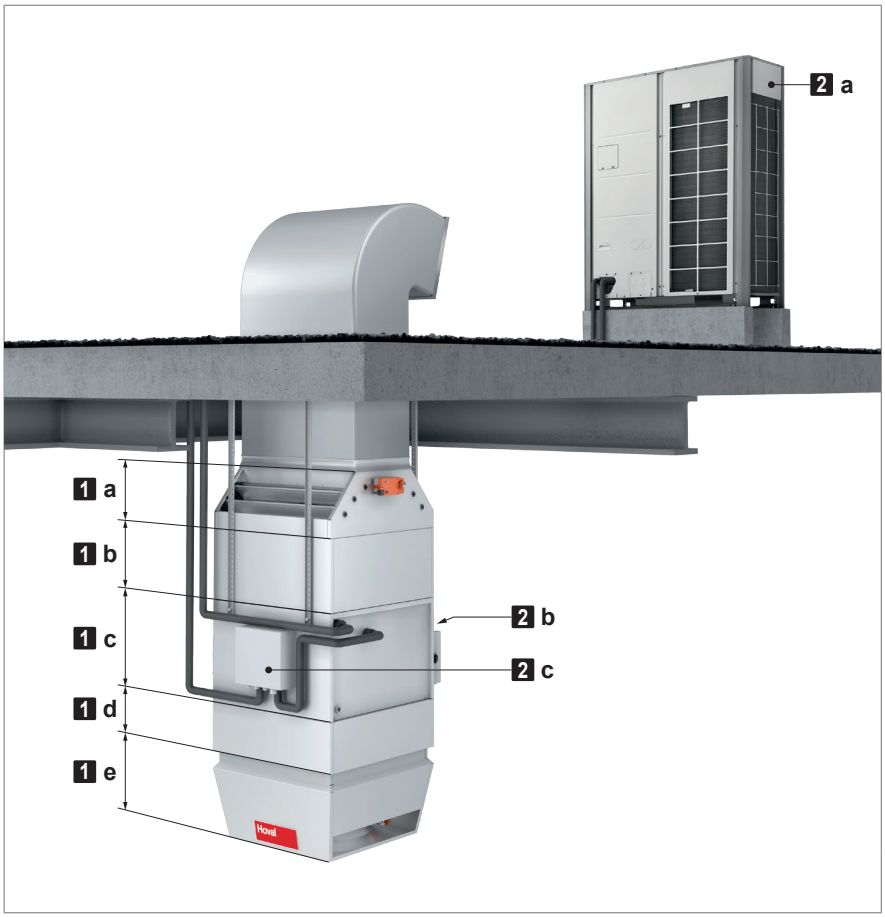
TopVent® TP-9-Q



1	Extract air	9	Supply air
2	Air filter with differential pressure switch (optional)	10	Liquid temperature sensor (supplied loose)
3	Air inlet temperature sensor heating/cooling coil	11	Gas temperature sensor (supplied loose)
4	Heating/cooling coil	12	Expansion valves (supplied loose in the EEV kit)
5	Condensate separator	13	Branch joint kit Q (supplied loose)
6	Fan	14	Shut-off valves
7	Air-Injector with actuator	15	Heat pump Q
8	Supply air temperature sensor		

Fig. 4: TopVent® TP-9-Q function diagram

3.3 TopVent® MP construction

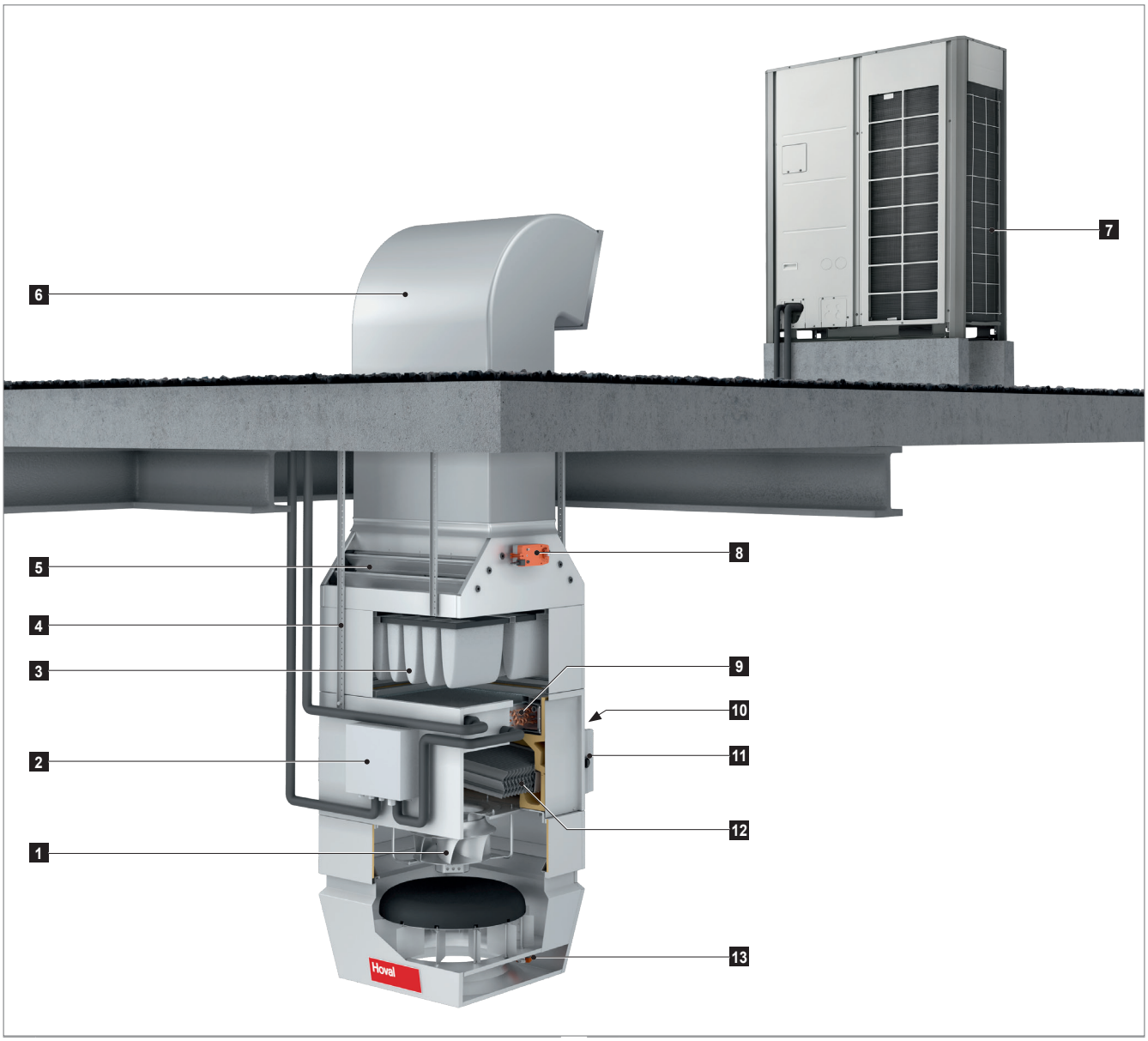


1 Supply air unit
- **a** Mixed air box
- **b** Filter box
- **c** Heating/cooling section
- **d** Fan unit
- **e** Air-Injector

2 Heat pump system
- **a** Heat pump
- **b** Communication kit
- **c** EEV kit

Fig. 5: TopVent® MP components

Notice
The picture only shows the schematic layout. In contrast to the illustration here, the EEV kit is located on the refrigerant connection side.



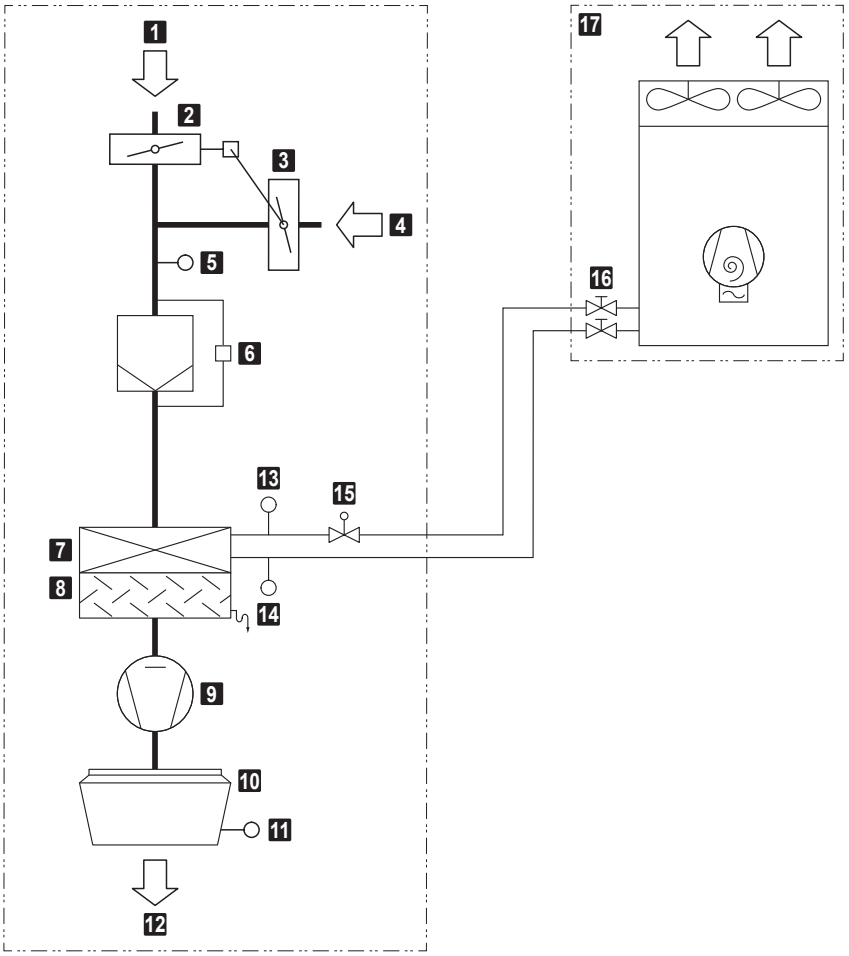
1	Fan	8	Fresh air damper actuator
2	EEV kit with expansion valve	9	Heating/cooling coil
3	Air filter	10	Communication kit
4	Suspension set	11	Unit control box
5	Recirculation damper	12	Condensate separator
6	Fresh air duct (on-site)	13	Actuator Air-Injector
7	Heat pump		

Fig. 6: TopVent® MP construction

Notice
The picture only shows the schematic layout. In contrast to the illustration here, the EEV kit is located on the refrigerant connection side.

3.4 Function TopVent® MP

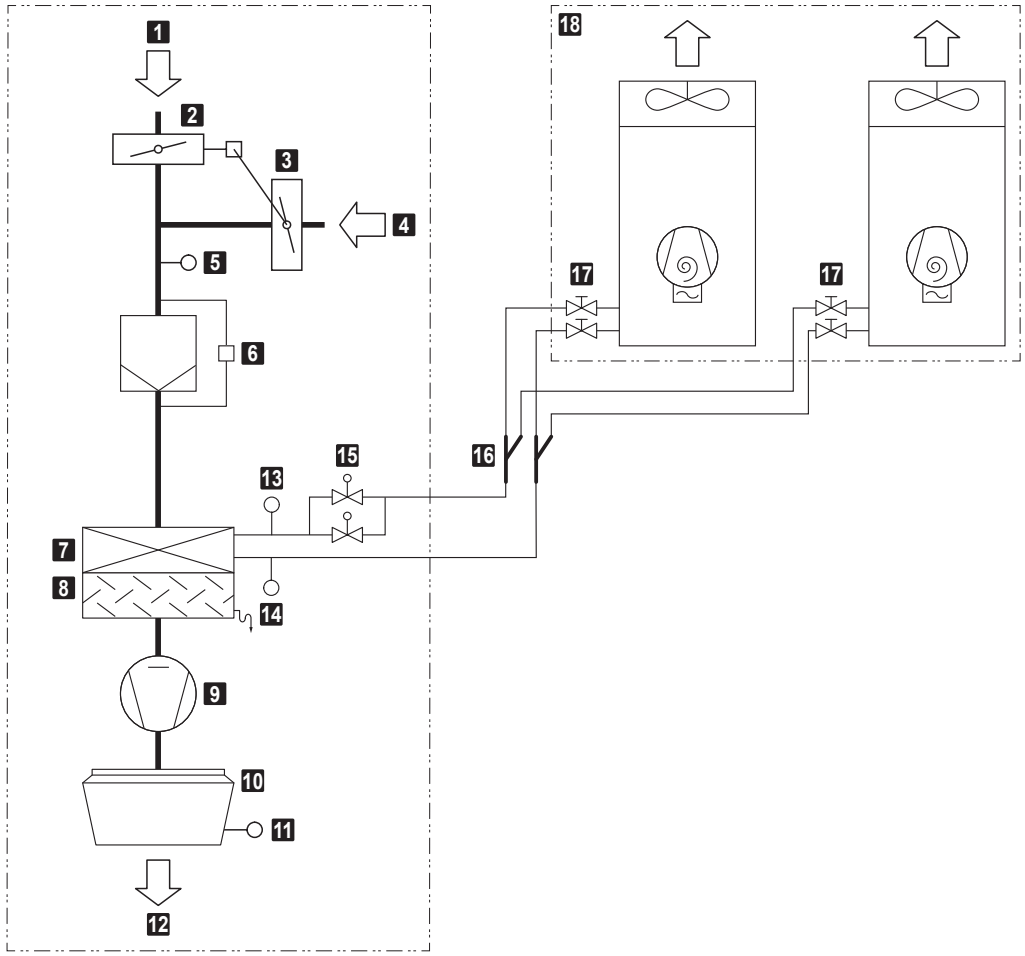
TopVent® MP-6-P | TopVent® MP-9-P



1	Fresh air	10	Air-Injector with actuator
2	Fresh air damper with actuator	11	Supply air temperature sensor
3	Recirculation damper (opposed to the fresh air damper)	12	Supply air
4	Extract air	13	Liquid temperature sensor (supplied loose)
5	Mixed air temperature sensor	14	Gas temperature sensor (supplied loose)
6	Air filter with differential pressure switch	15	Expansion valve
7	Heating/cooling coil	16	Shut-off valves
8	Condensate separator	17	Heat pump P
9	Fan		

Fig. 7: TopVent® MP-6-P | TopVent® MP-9-P function diagram

TopVent® MP-9-Q



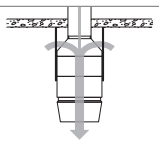
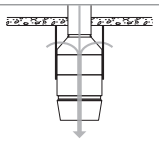
1	Fresh air	10	Air-Injector with actuator
2	Fresh air damper with actuator	11	Supply air temperature sensor
3	Recirculation damper (opposed to the fresh air damper)	12	Supply air
4	Extract air	13	Liquid temperature sensor (supplied loose)
5	Mixed air temperature sensor	14	Gas temperature sensor (supplied loose)
6	Air filter with differential pressure switch	15	Expansion valves (supplied loose in the EEV kit)
7	Heating/cooling coil	16	Branch joint kit Q (supplied loose)
8	Condensate separator	17	Shut-off valves
9	Fan	18	Heat pump Q

Fig. 8: TopVent® MP-9-Q function diagram

3.5 Operating modes

The units have the following operating modes:
- Supply air speed 2 (only TopVent® MP)
- Supply air speed 1 (only TopVent® MP)
- Recirculation
- Recirculation speed 1
- 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 TopVent® unit can operate individually in a local operating mode: Off, Supply air speed 2, Supply air speed 1, Recirculation, Recirculation speed 1 (depending on the unit type).

Code	Operating mode		Description
SA2	**Supply air speed 2** The fan runs at speed 2 (high air flow rate). The room temperature set value day is active. The unit blows fresh air into the room. The control of the fresh air ratio can be selected:		
	Fixed fresh air ratio: The unit operates continuously with the set fresh air ratio. The system controls the heating/cooling according to the heating/cooling demand.		Fan ..... speed 2 Fresh air damper..... 10 % open [1] Heating/cooling ..... 0-100 % [2] [1] Percentage is adjustable [2] Depending on heat or cool demand
	Variable fresh air ratio: ■ The system regulates the fresh air ratio depending on the temperature. The set fresh air ratio serves as a minimum value. If the temperature conditions permit, more fresh air is brought into the room and used for free heating or free cooling. Only when this potential is fully utilised is the heating/cooling switched on via the coil if required. ■ If a combination sensor for room air is installed (option), the system additionally controls the fresh air ratio depending on the air quality: – If there is no heat demand, the fresh air damper is opened 100% if the indoor air quality is too poor. – When the setpoint value for the CO_2 or VOC content of the room air is reached, the fresh air damper closes again to the set minimum value. **Notice** In order to save heating energy, the unit only operates with the set minimum fresh air rate when heat is required.		Fan ..... speed 2 Fresh air damper..... MIN-100 % open [1] Heating/cooling ..... 0-100 % [2] [1] A minimum value can be set [2] Depending on heat or cool demand
SA1	**Supply air speed 1** The same as SA2, but the fan operates at speed 1 (low air flow rate)		Fan ..... speed 1 Fresh air damper..... MIN-100 % open [1] Heating/cooling ..... 0-100 % [1] Fixed or variable (see above)

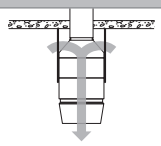
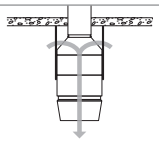
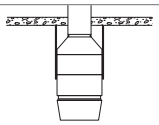
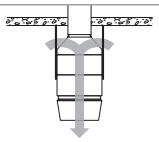
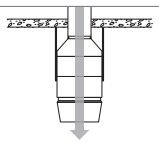
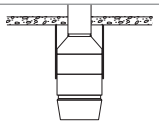
Code	Operating mode		Description
REC	**Recirculation** On/Off operation: during heat or cool demand, the unit draws in room air, heats or cools it and blows it back into the room. The room temperature set value day is active.		Fan ..... speed 1 / 2 [1] Fresh air damper..... closed Heating/cooling ..... on [1] [1] Depending on heat or cool demand
DES	■ Destratification: To avoid heat build-up under the ceiling, it may be appropriate to switch on the fan when there is no heat or cool demand (either in permanent operation or in on/off operation depending on the temperature stratification, as desired).		Fan ..... speed 2 Fresh air damper..... closed Heating/cooling ..... off
REC1	**Recirculation speed 1** The same as REC, but the unit operates only at speed 1 (low air flow rate)		Fan ..... speed 1 Fresh air damper..... closed Heating/cooling ..... on [1] [1] Depending on heat or cool demand
DES	■ Destratification: The same as for REC, but the unit operates only at speed 1		Fan ..... speed 1 Fresh air damper..... closed Heating/cooling ..... off
ST	**Standby** The unit is ready for operation; the following operating modes are activated if required:		
CPR	■ Cooling protection: If the room temperature drops below the set value for cooling protection, the unit heats up the room in recirculation operation.		Fan ..... speed 2 Fresh air damper..... closed Heating ..... on
OPR	■ Overheating protection: If the room temperature rises above the set value for over-heating protection, the unit cools down the room in recirculation operation.		Fan ..... speed 2 Fresh air damper..... closed 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.		Fan ..... speed 2 Fresh air damper..... open Heating/cooling ..... off
L_OFF	**Off** (local operating mode) The unit is switched off; frost protection for the unit remains active.		Fan ..... off Fresh air damper..... closed Heating/cooling ..... off

Table 1: Operating modes

4 Type code

4.1 Type code for recirculation units

TP - 6 - P / ST . D1 / S . FK . LH . U- / - . KP / TC . - . -- . --

Unit type
TopVent® TP

Unit size
6 or 9

Heating/cooling section
P with coil type P for heat pump P
Q with coil type Q for heat pump Q (only for size 9)

Design
ST Standard

Air outlet
D1 Design with Air-Injector
D0 Design without Air-Injector

Installation
- without
S Suspension set

Filter box
-- without
FK Filter box
FF Flat filter box

Paint finish
-- without
LH Standard paint finish
LU Paint finish as desired

Silencer
-- without
U- Recirculation silencer

Condensate pump
-- without
KP Condensate pump

Control system
TC TopTronic® C

Table 2: Type code for recirculation units

4.2 Type code for supply air units

MP - 6 - P / ST . D1 / S . -- . LH . - / - . KP / TC . -- . --

Unit type
TopVent® MP

Unit size
6 or 9

Heating/cooling section
P with coil type P for heat pump P
Q with coil type Q for heat pump Q (only for size 9)

Design
ST Standard

Air outlet
D1 Design with Air-Injector
D0 Design without Air-Injector

Installation
- without
S Suspension set

Paint finish
-- without
LH Standard paint finish
LU Paint finish as desired

Condensate pump
-- without
KP Condensate pump

Control system
TC TopTronic® C

Table 3: Type code for supply air units

5 Technical data

5.1 Application limits

Heating mode				
Fresh air temperature (WB)		min. max.	°C °C	−25 18
Air inlet temperature to the heating/cooling coil (DB)		min. max.	°C °C	5 24
Cooling mode				
Fresh air temperature (DB)		min. max.	°C °C	−10 48
Air inlet temperature to the heating/cooling coil (WB)		min. max.	°C °C	14 26
Extract air temperature		max.	°C	50
Moisture content of extract air [1]		max.	g/kg	15
Supply air temperature		max.	°C	45
Room temperature setpoint		min. max.	°C °C	12 26
Air flow rate	Size 6: Size 9:	min. min.	m³/h m³/h	3100 5000
Condensate quantity	Size 6: Size 9:	max. max.	kg/h kg/h	90 150
The units cannot be used in: ■ Damp locations ■ Rooms with mineral oil vapours in the air ■ Rooms with a high salt content in the air ■ Rooms with acidic or alkaline vapours in the air				
1) Units for applications where the humidity in the room increases by more than 2 g/kg are available on request.				

Table 4: Application limits

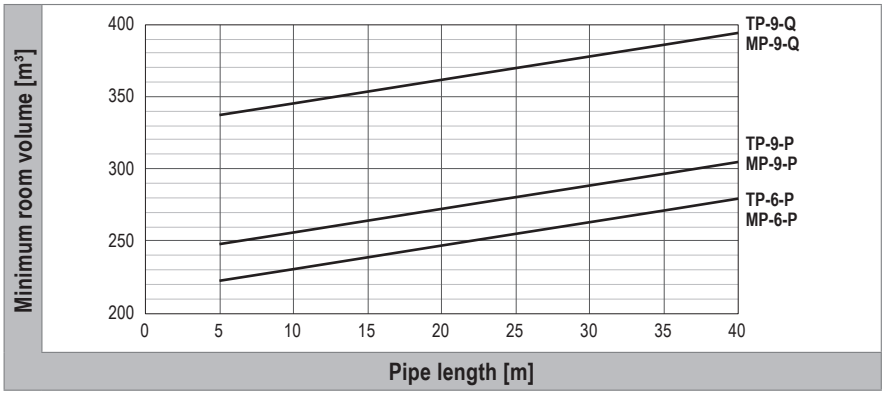


Fig. 9: Minimum room volume depending on the total refrigerant charge in accordance with EN 378

According to EN 378 (Refrigerating systems and heat pumps - Safety and environmental requirements), no additional safety measures for risk reduction are required for Hoval indoor climate units with heat pumps under the following conditions:

- The conditions according to EN 378 Annex C 3.1 are fulfilled.
- The room volume corresponds to the minimum values shown in Fig. 9 meaning that the permissible QLMV value is not exceeded.

5.2 Electrical connection

TopVent® TP, MP

Unit type		TP-6	TP-9	MP-6	MP-9
Supply voltage	V AC	3 × 400	3 × 400	3 × 400	3 × 400
Permitted voltage tolerance	%	± 5	± 5	± 5	± 5
Frequency	Hz	50	50	50	50
Connected load	kW	1.5	3.3	1.5	3.3
Current consumption max.	A	2.7	5.6	2.8	5.7
Series fuse	A	13.0	13.0	13.0	13.0
Protection rating	–	IP 54	IP 54	IP 54	IP 54

Table 5: Electrical connection TopVent® TP, MP

Heat pump

Heat pump		P	Q
Supply voltage	V AC	3 × 400	3 × 400
Permitted voltage tolerance	%	± 2	± 2
Frequency	Hz	50	50
Connected load	kW	16.8	2 × 15.9
Current consumption max.	A	26.9	2 × 25.5
Series fuse	A	32.0	2 × 32.0
Inrush current	A	5.9	2 × 5.9

Table 6: Heat pump electrical connections

5.3 Air flow rate

Unit type		TP-6	TP-9	MP-6	MP-9
Nominal air flow rate	m³/h	6000	9000	6000	9000
Floor area covered ■ for applications with higher comfort requirements (e.g. production halls, assembly halls, sports halls)	m²	537	946	537	946
■ for applications with low comfort requirements (e.g. warehouses, logistics centres)	m²	953	1674	–	–

Table 7: Air flow rate

5.4 Air filtration

Filter	Fresh air / Extract air
Class acc. to ISO 16890	ISO coarse 60 %
Class acc. to EN 779	G4
Factory setting of differential pressure switches	180 Pa

Table 8: Air filtration

5.5 Technical data of the heat pump

Heat pump			P	Q
Heating	Rated heat output [1]	kW	39.2	67.2
	Power consumption	kW	8.43	15.54
	COP	–	4.65	4.32
	$\eta_{s,h}$	–	204	197
	SCOP	–	5.17	4.99
Cooling	Rated cooling capacity [2]	kW	39.2	67.2
	Power consumption	kW	11.88	23.30
	EER	–	3.30	2.88
	$\eta_{s,c}$	–	339	315
	SEER	–	8.55	7.94
Refrigerant		–	R32	R32
Refrigerant fill volume		kg	11.4	2 × 8.5

1) With fresh air temperature 7 °C / extract air temperature 20 °C
2) With fresh air temperature 35 °C / extract air temperature 27 °C / 45 % rel. humidity

Table 9: Heat pump technical data

5.6 Heat output

			TopVent® TP recirculation units				TopVent® MP supply air units			
t_F	t_{room}	Type	Q	H_{max}	t_S	P_{WP}	Q	H_{max}	t_S	P_{HP}
°C	°C		kW	m	°C	kW	kW	m	°C	kW
-15	16	6-P	41.6	12.2	38.6	14.8	42.0	13.0	35.5	15.1
		9-P	41.6	15.3	31.7	14.8	42.0	15.1	28.6	15.1
		9-Q	71.2	12.2	41.5	28.9	71.8	13.0	38.4	29.3
	20	6-P	41.3	12.3	42.4	13.7	41.6	13.3	38.9	14.8
		9-P	41.3	15.4	35.6	13.7	41.6	17.4	32.0	14.8
		9-Q	70.6	12.3	45.3	26.5	71.2	13.2	41.8	28.9

Legend:
- t_F = Fresh air temperature
- t_{room} = Room air temperature
- Q = Heat output
- H_{max} = Maximum mounting height
- t_S = Supply air temperature
- P_{HP} = Power consumption of the heat pump

Reference:
- At room air temperature 16 °C: extract air temperature 18 °C
- At room air temperature 20 °C: extract air temperature 22 °C
- Fresh air ratio 10 % for TopVent® MP supply air units

Table 10: Heat output

5.7 Cooling capacity

				TopVent® TP recirculation units					TopVent® MP supply air units				
t_F	t_{room}	RH_{room}	Type	Q_{sen}	Q_{tot}	t_S	m_C	P_{WP}	Q_{sen}	Q_{tot}	t_S	m_C	P_{HP}
°C	°C	%		kW	kW	°C	kg/h	kW	kW	kW	°C	kg/h	kW
32	26	50	6-P	29.2	41.4	13.5	17.9	11.6	29.3	41.4	13.9	17.7	11.6
			9-P	29.1	41.4	18.4	18.0	11.6	29.3	41.4	18.7	17.7	11.6
			9-Q	49.5	70.3	11.7	30.6	22.7	50.3	71.0	11.8	30.5	23.0
		70	6-P	23.2	44.8	16.5	31.7	12.5	23.4	44.8	16.8	31.5	12.5
			9-P	23.2	44.8	20.3	31.8	12.5	23.4	44.8	20.7	31.4	12.5
			9-Q	39.7	76.8	14.9	54.4	25.0	40.1	76.8	15.2	53.9	25.0

Legend:
- t_F = Fresh air temperature
- t_{room} = Room air temperature
- RH_{room} = Relative humidity of the room air
- Q_{sen} = Sensible cooling capacity
- Q_{tot} = Total cooling capacity
- t_S = Supply air temperature
- m_C = Condensate quantity
- P_{HP} = Power consumption of the heat pump

Reference:
- At room air temperature 22 °C: extract air temperature 24 °C
- At room air temperature 26 °C: extract air temperature 28 °C
- Fresh air ratio 10 % for TopVent® MP supply air units

Table 11: Cooling capacity

5.8 Sound level

Unit type			TP-6	TP-9	MP-6		MP-9	
					Indoors	Outdoors	Indoors	Outdoors
Sound pressure level (at a distance of 5 m) [1]		dB(A)	59	61	61	55	62	55
Total sound power level		dB(A)	81	83	83	77	84	77
Octave sound power level	63 Hz	dB	42	48	42	38	49	46
	125 Hz	dB	56	68	53	48	67	62
	250 Hz	dB	65	70	68	62	71	67
	500 Hz	dB	70	75	72	68	75	70
	1000 Hz	dB	76	78	77	70	79	71
	2000 Hz	dB	76	76	78	72	77	71
	4000 Hz	dB	74	75	76	70	75	69
	8000 Hz	dB	68	68	70	64	69	64

1) With hemispherical radiation in a low-reflection environment

Table 12: Sound level TopVent® TP, MP

Heat pump			P		Q	
			Heating	Cooling	Heating	Cooling
Sound pressure level (at a distance of 5 m)		dB(A)	59.0	59.0	63.0	61.0
Total sound power level [1]		dB(A)	81.0	81.0	85.0	83.0
Octave sound pressure level [2]	63 Hz	dB	62.5	63.6	68.7	67.4
	125 Hz	dB	58.5	58.6	62.4	59.9
	250 Hz	dB	60.1	57.7	62.2	60.8
	500 Hz	dB	58.6	58.4	60.8	59.7
	1000 Hz	dB	54.3	52.2	57.6	56.4
	2000 Hz	dB	51.6	49.8	54.5	53.6
	4000 Hz	dB	53.0	52.8	49.9	50.4
	8000 Hz	dB	46.7	45.9	49.2	48.2

1) The values given are maximum values; the noise level is fluctuating due to scroll technology.
2) Measured at a distance of 1 m in front of the unit and 1 m above the floor in a semi-anechoic chamber.

Table 13: Heat pump sound level

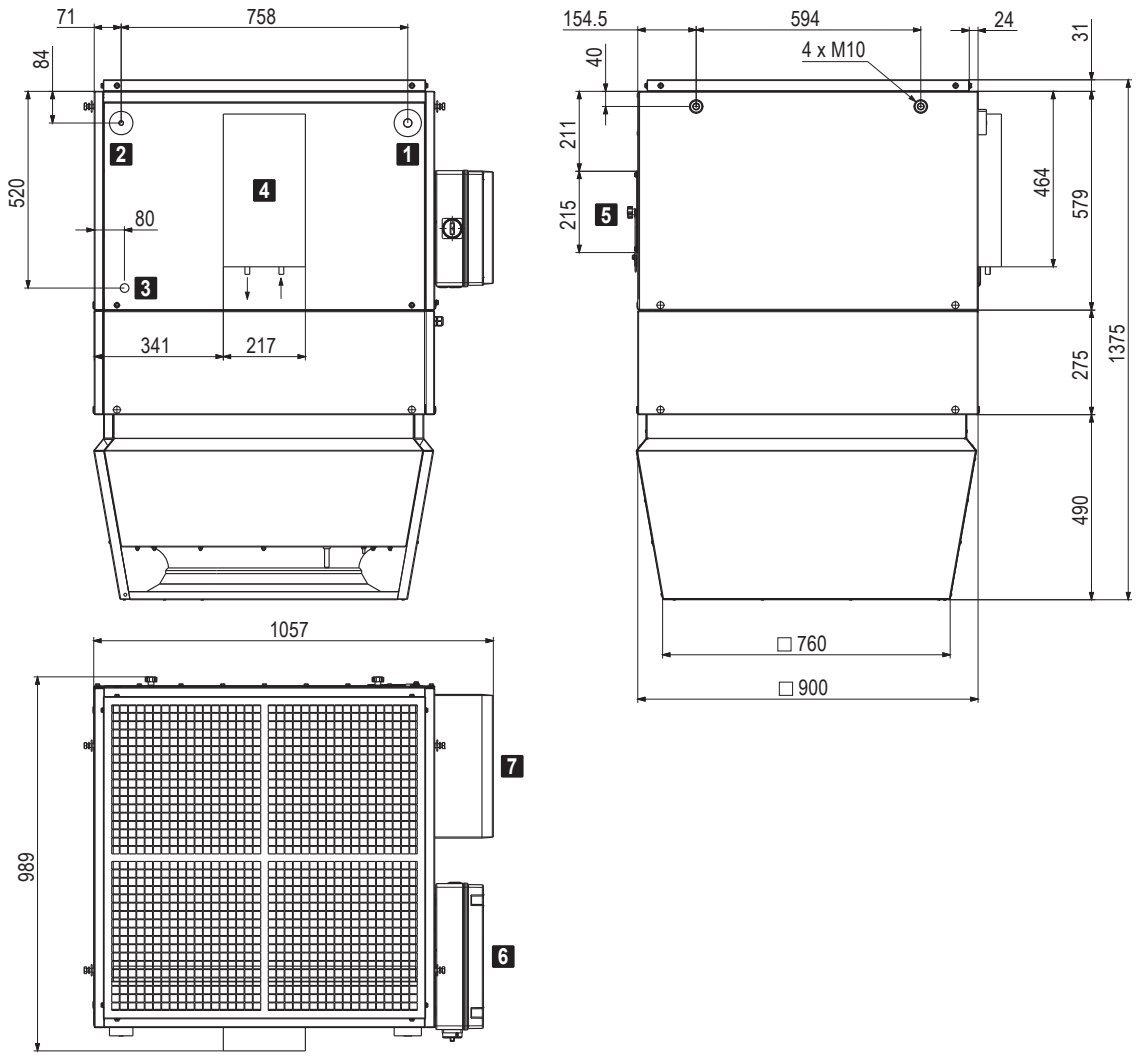
For particularly quiet unit operation (e.g. during the night), the heat pump can be operated in silent mode. It then runs at a reduced speed of the compressor and/or fan, which also leads to a reduced capacity output depending on the setting parameters.

Silent mode	Noise reduction	Capacity level	
		Heat pump P	Heat pump Q
Level 1	− 3 dB	100 %	100 %
Level 2	− 6 dB	95 %	80 %
Level 3	− 9 dB	75 %	55 %

Table 14: Noise reduction and capacity output in silent mode

5.9 Dimensions and weights

TopVent® TP-6-P

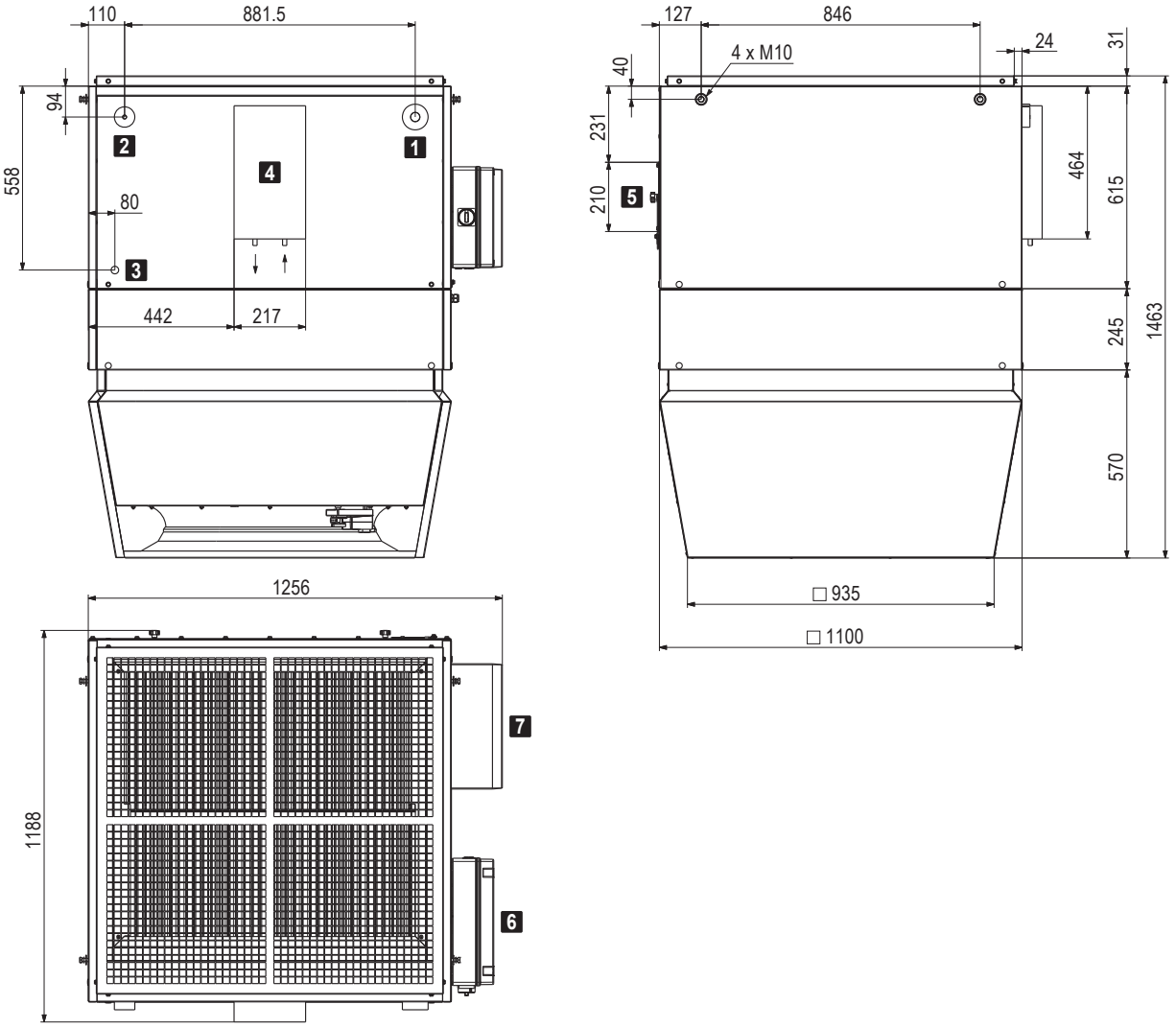


1	Gas line connection (Ø 22 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV kit P (connection Ø 12.7 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		TP-6-P
Weight	kg	223

Fig. 10: TopVent® TP-6-P dimensions and weights

TopVent® TP-9-P

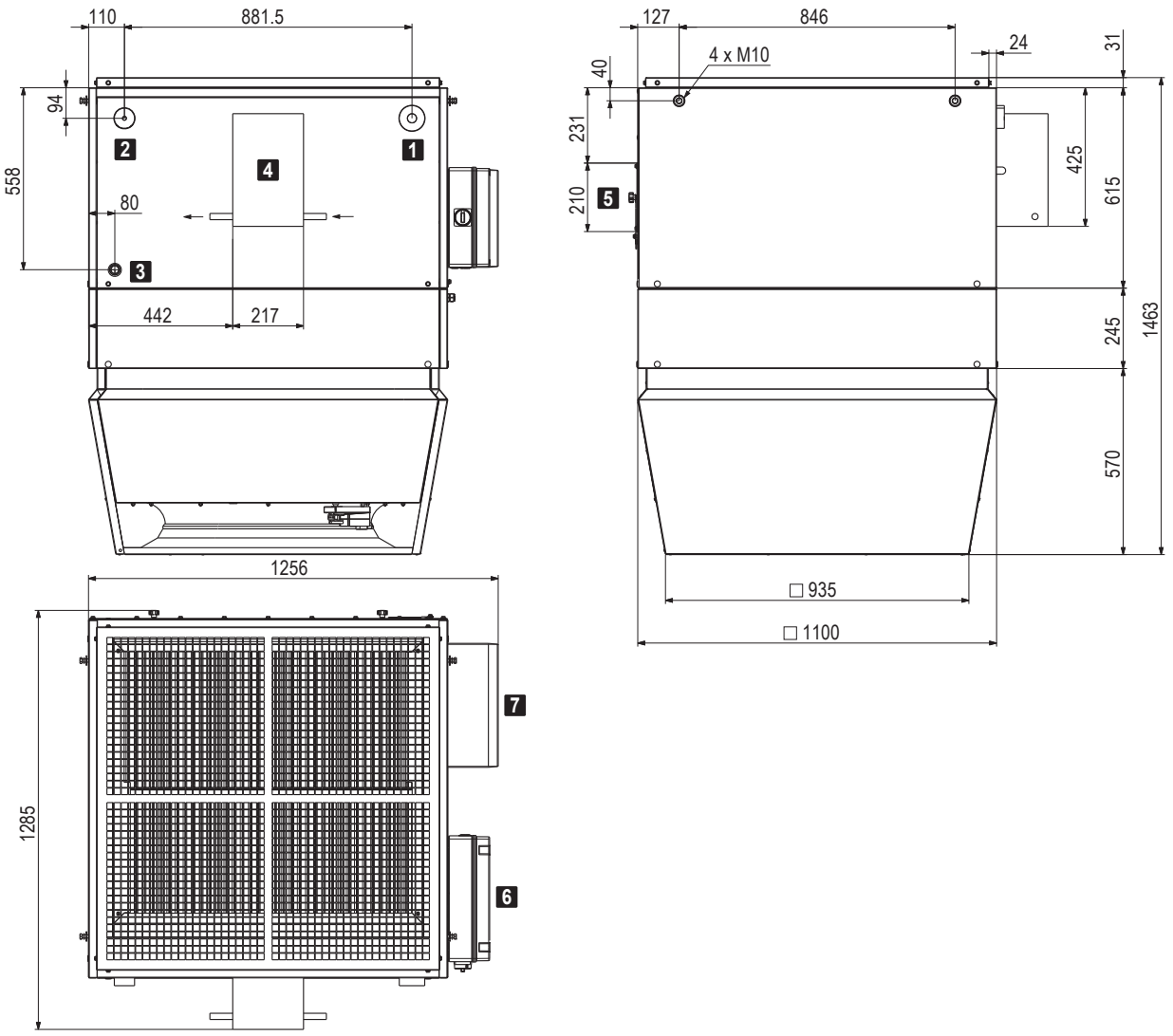


1	Gas line connection (Ø 28 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV kit P (connection Ø 12.7 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		TP-9-P
Weight	kg	316

Fig. 11: TopVent® TP-9-P dimensions and weights

TopVent® TP-9-Q

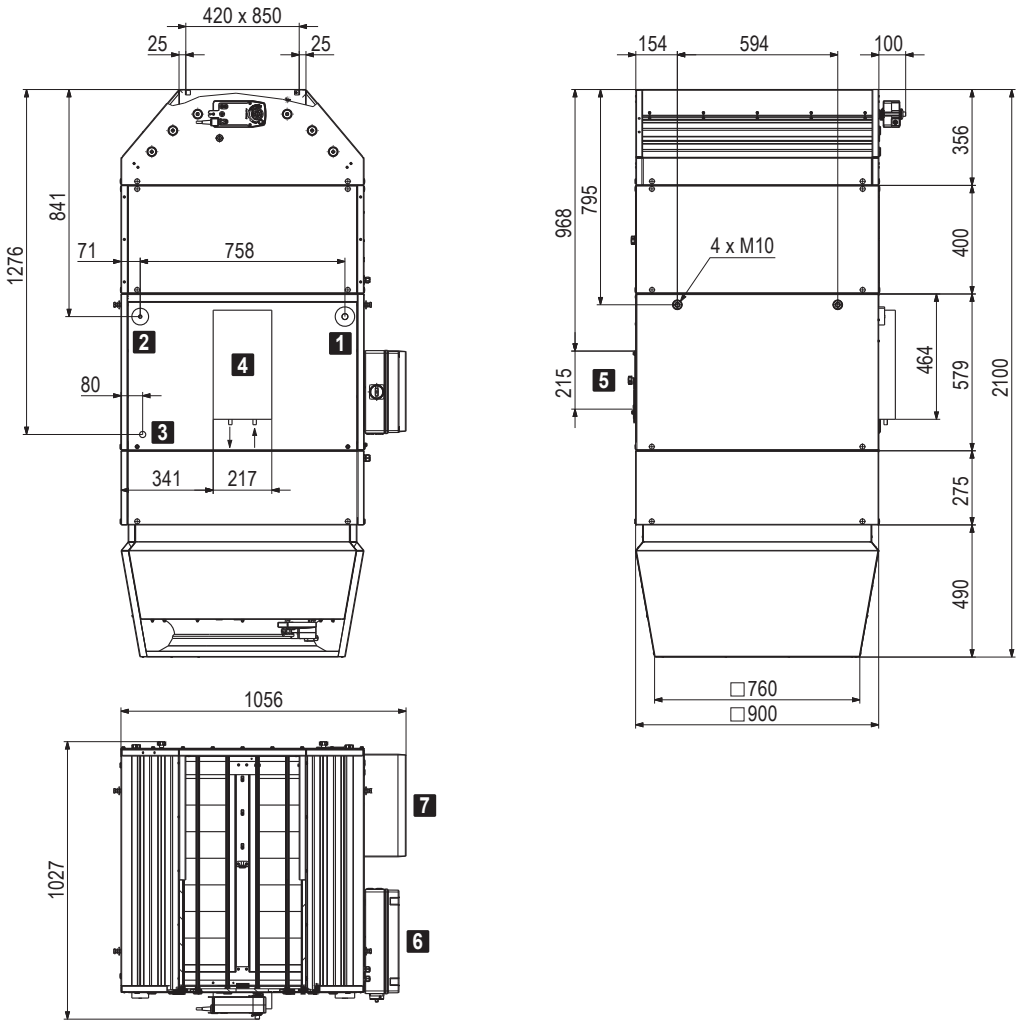


1	Gas line connection (Ø 28 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV-Kit Q (connection Ø 19.05 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		TP-9-Q
Weight	kg	316

Fig. 12: TopVent® TP-9-Q dimensions and weights

TopVent® MP-6-P

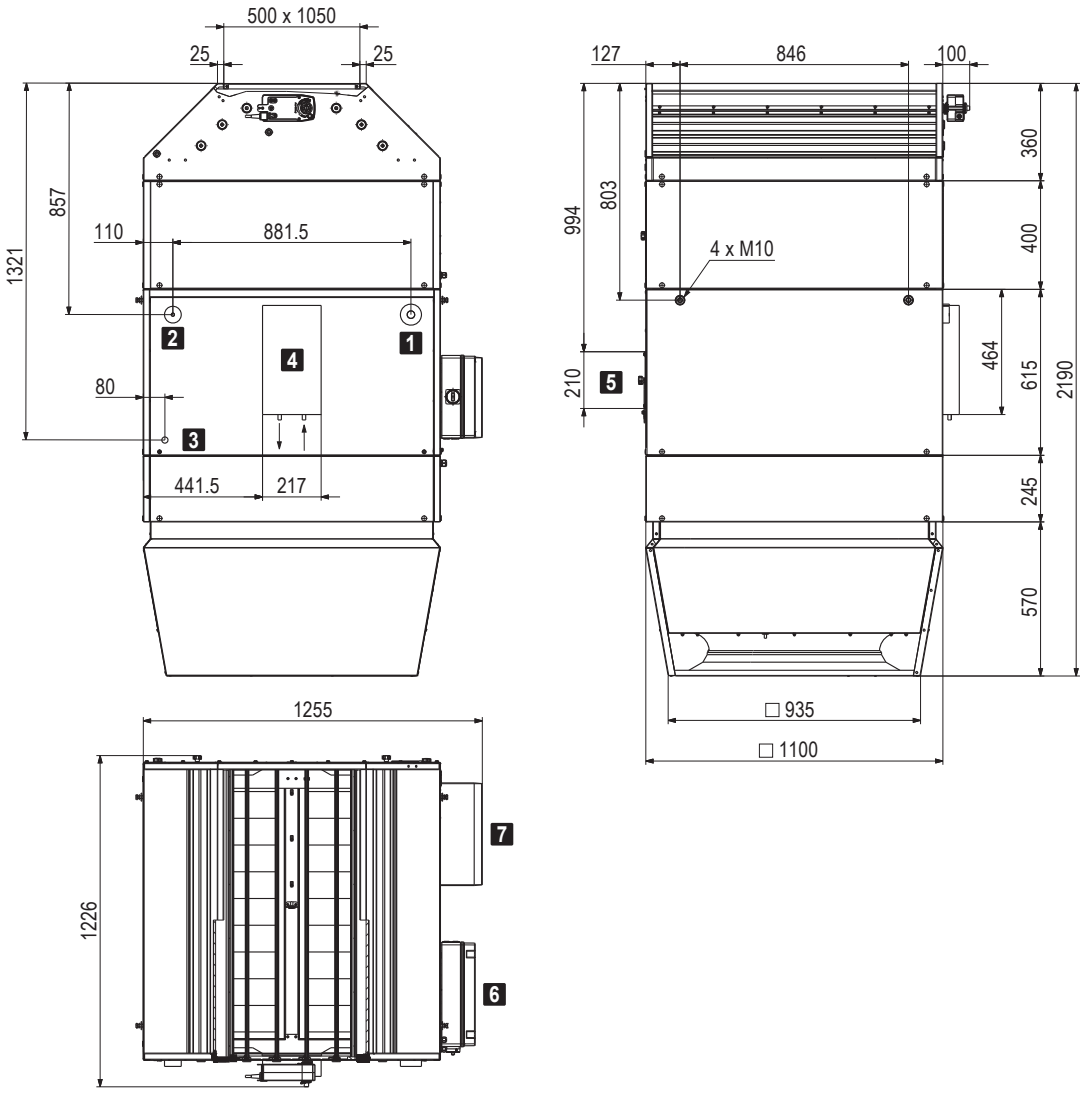


1	Gas line connection (Ø 22 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV kit P (connection Ø 12.7 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		MP-6-P
Weight	kg	282

Fig. 13: TopVent® MP-6-P dimensions and weights

TopVent® MP-9-P

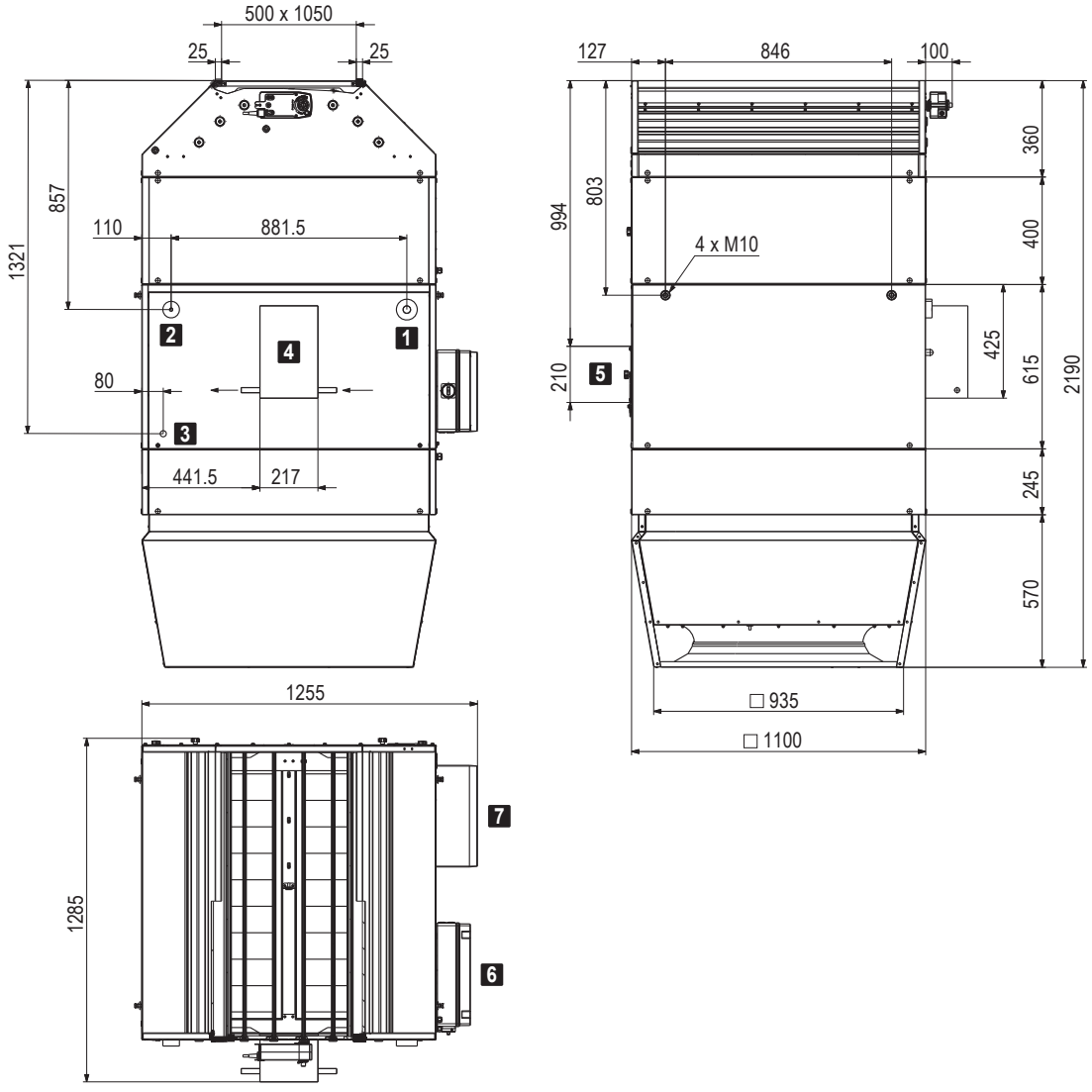


1	Gas line connection (Ø 28 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV kit P (connection Ø 12.7 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		MP-9-P
Weight	kg	380

Fig. 14: TopVent® MP-9-P dimensions and weights

TopVent® MP-9-Q

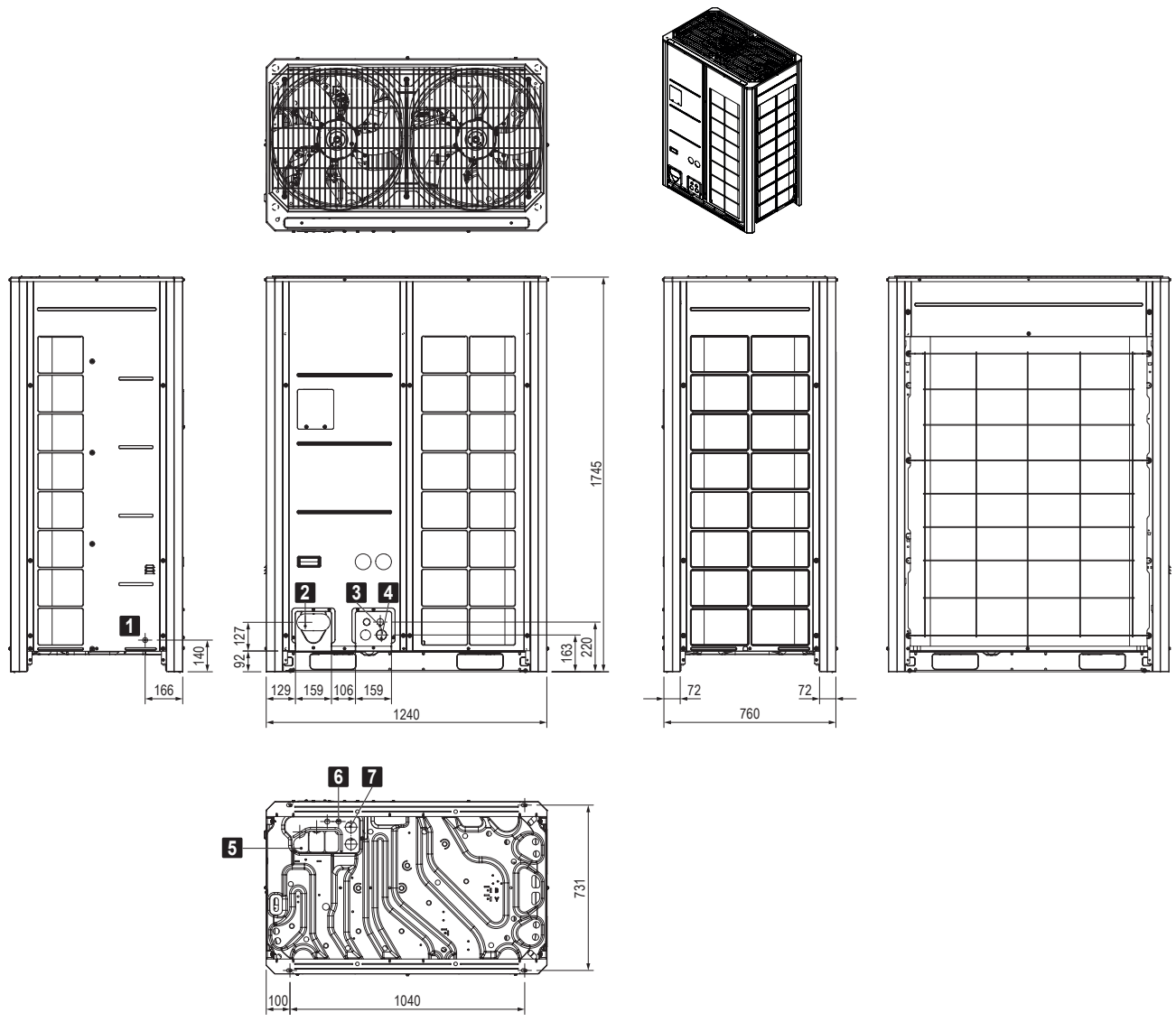


1	Gas line connection (Ø 28 mm)
2	Liquid line connection (Ø 12 mm)
3	Condensate connection (G 1" external)
4	EEV-Kit Q (connection Ø 19.05 mm)
5	Access panel, condensate separator
6	Unit control box
7	Communication kit PQ

Unit type		MP-9-Q
Weight	kg	380

Fig. 15: TopVent® MP-9-Q dimensions and weights

Heat pump P

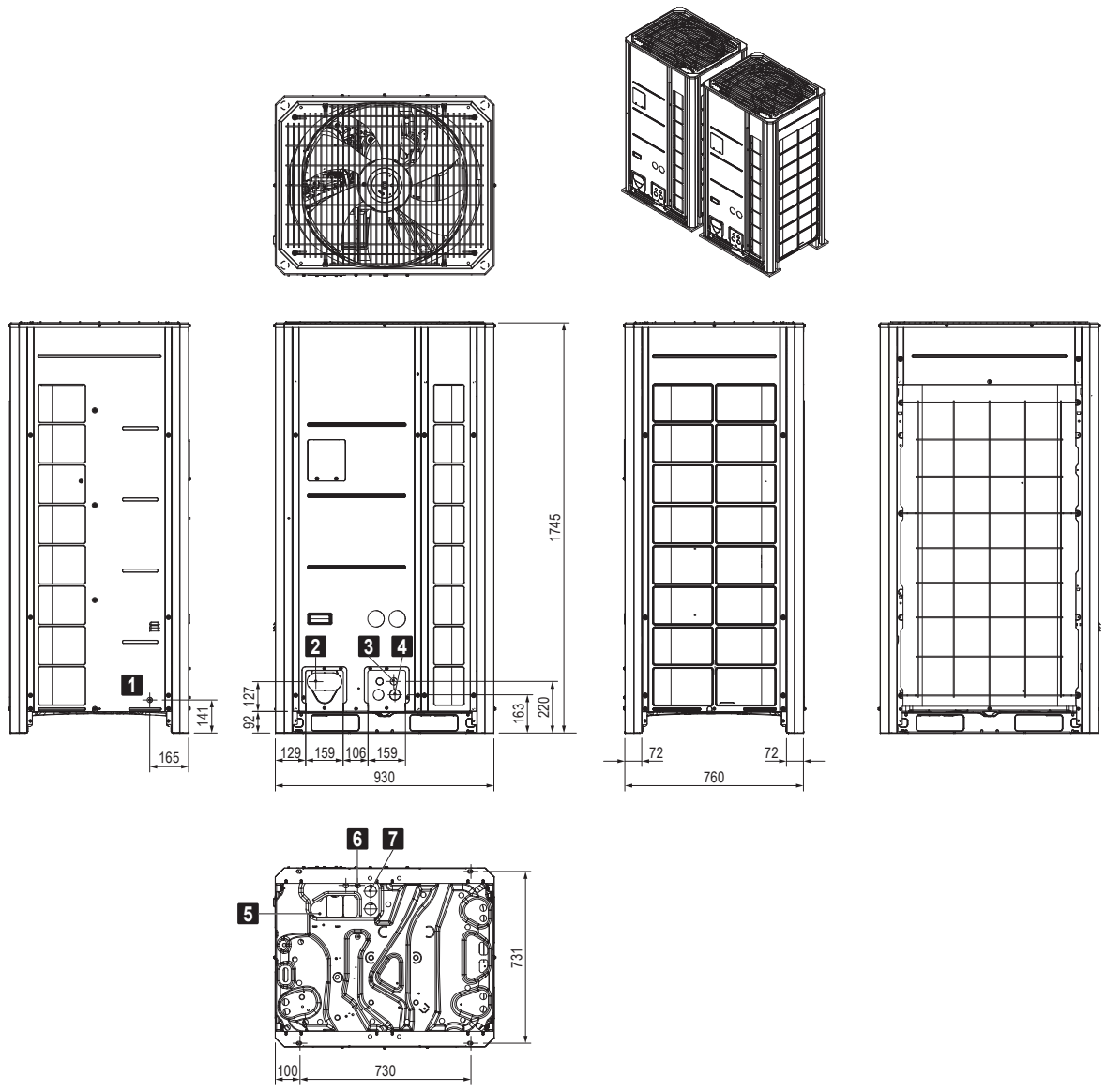


1	Opening for leak-tightness test	
2	Opening for refrigerant pipes (front)	
	■ Liquid line connection	Ø 12.7 mm
	■ Gas line connection	Ø 22.2 mm
3	Opening for signal lines (front)	
4	Opening for mains cable (front)	
5	Opening for refrigerant pipes (bottom)	
6	Opening for signal lines (bottom)	
7	Opening for mains cable (bottom)	

Heat pump		P
Weight	kg	255

Fig. 16: Heat pump P dimensions and weights

Heat pump Q



1	Opening for leak-tightness test	
2	Opening for refrigerant pipes (front)	
	■ Liquid line connection	Ø 12.7 mm
	■ Gas line connection	Ø 22.2 mm
3	Opening for signal lines (front)	
4	Opening for mains cable (front)	
5	Opening for refrigerant pipes (bottom)	
6	Opening for signal lines (bottom)	
7	Opening for mains cable (bottom)	

Heat pump		Q
Weight	kg	2 × 215

Fig. 17: Heat pump Q dimensions and weights

6 Options

6.1 Design without Air-Injector

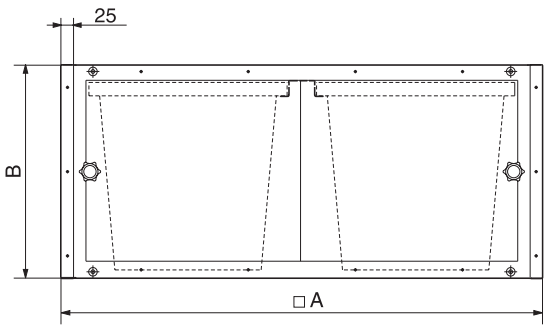
TopVent® units in the design without Air-Injector are suitable for connecting to an air distribution system supplied by the client.

6.2 Suspension set

A suspension set is available to make it easy to install the units on the ceiling. The set consists of 4 pairs of U-profiles made of magnesium zinc sheet and is height-adjustable up to 1300 mm.

6.3 Air filtration

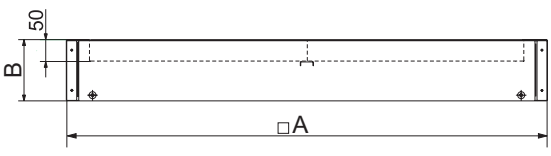
Filter box
A filter box with 2 bag filters can be installed for the purpose of filtering the recirculation air. The modular construction made of magnesium zinc sheet with 2 sliding doors makes it easy to replace the filters.
A differential pressure switch is installed for automatic monitoring of the filter. It shows when the filters have to be changed.



Size		6	9
A	mm	900	1100
B	mm	400	400
Filter class		ISO coarse 60 % (G4)	
Weight	kg	20	24
Factory setting of differential pressure switches	Pa	180	180

Table 15: Filter box technical data

Flat filter box
A flat filter box with 4 pleated cell filters can be installed for the purpose of filtering the recirculation air.
A differential pressure switch is installed for automatic monitoring of the filter.
It shows when the filters have to be changed.



Size		6	9
A	mm	900	1100
B	mm	140	165
Filter class		ISO coarse 60 % (G4)	
Weight	kg	10	12.5
Factory setting of differential pressure switches	Pa	180	180

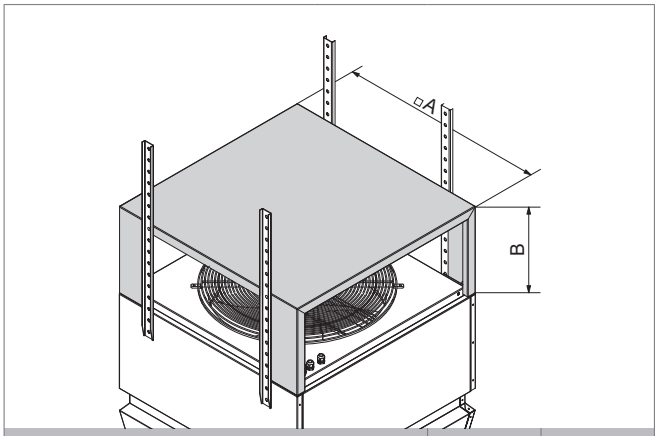
Table 16: Flat filter box technical data

6.4 Paint finish

If the customer wishes, the units can be provided with an exterior paint finish.

6.5 Recirculation silencer

The recirculation silencer is mounted on the appliance and thus reduces the sound reflection from the ceiling. Insertion attenuation is 3 dB compared with the total sound power level of each TopVent® unit.



Size		6	9
A	mm	900	1100
B	mm	380	485
Weight	kg	15	20

Table 17: Recirculation silencer dimensions and weights

6.6 Condensate pump

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

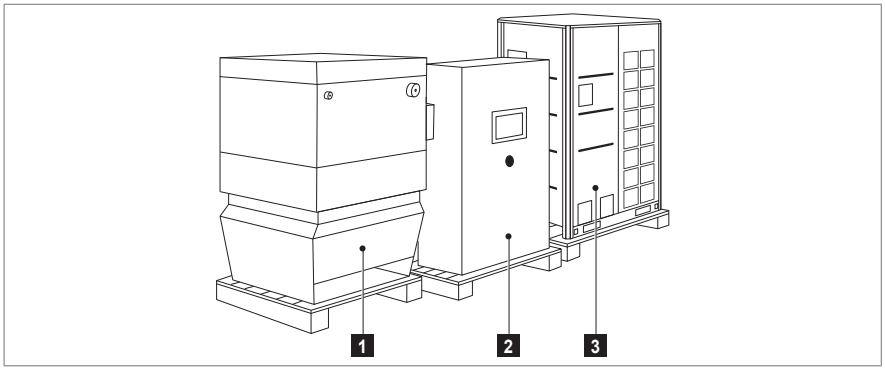
- through waste water pipes directly below the ceiling,
- onto the roof.

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 Delivery

The scope of delivery includes:
- TopVent® unit
- Heat pump
- Accessories
- Optional components
- Zone control panel



1 TopVent® unit
2 Zone control panel
3 Heat pump

Fig. 18: Delivery of the components on pallets

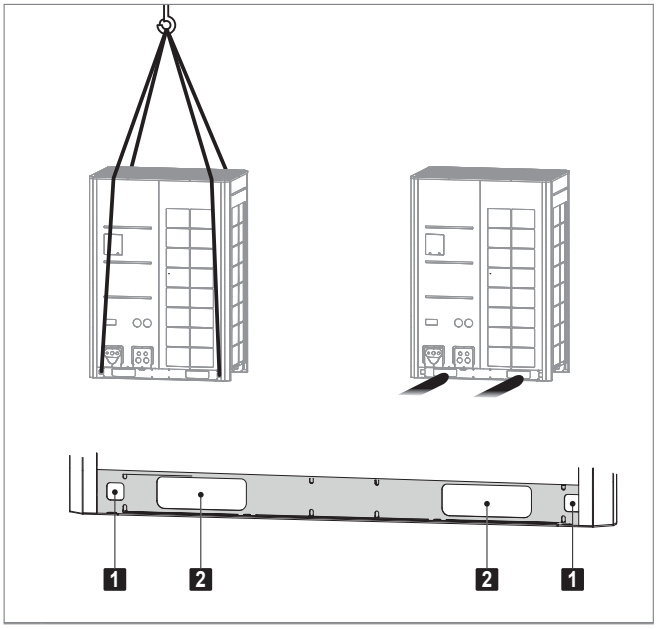
Accessories
The following accessories are supplied separately:
- Trap (in separate cardboard box)
- Fresh air temperature sensor and room temperature sensor (in the zone control panel)
- Liquid temperature sensor and gas temperature sensor (inside the communication kit)
- For units with heat pump Q:
  – Branch joint kit Q (in separate cardboard box)
  – EEV kit Q (in separate cardboard box)
- Wiring diagram (in the unit control box)

Options
The following optional components are supplied separately:
- Suspension set (in separate cardboard box)
- Condensate pump (in separate cardboard box)
- Additional room temperature sensors, combination sensor room air quality, temperature and humidity (in zone control panel)
- Design without Air-Injector:
  – Supply air temperature sensor (attached to the unit control box)

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.

Heat pump

- Lifting the heat pump with a crane:
  - Lift the unit at 4 suspension points.
  - Use 2 straps at least 8 m in length.
  - Pass the straps through the openings at the bottom of the unit.
  - Use cloths or boards to protect the points where the unit comes into contact with the straps.
- Lifting the heat pump with a forklift:
  - Transport to the installation site: Lift the unit under the pallet.
  - Unloading from the pallet: Guide the forklift tines into the large rectangular openings under the device.



1 Openings for straps
2 Openings for forklift

Fig. 19: Lifting the heat pump

7.2 Storage

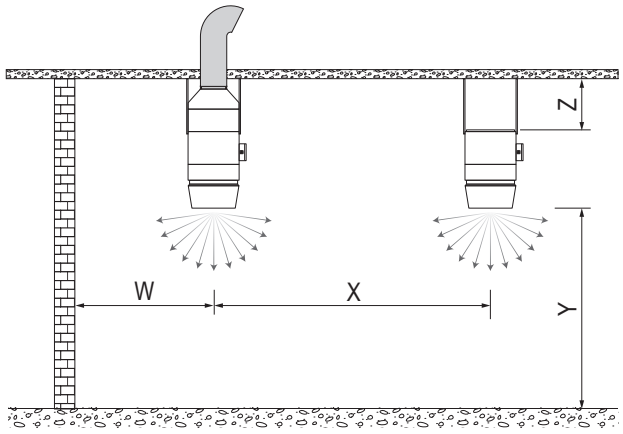
If you do not install the unit immediately:

- 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 °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

TopVent® unit

- Comply with the minimum and maximum distances.
- Only secure the unit to ceilings with sufficient load-bearing capacity.
- All air inlet and air outlet openings must be freely accessible. The supply air jet must be free to spread out unhindered.
- The access panels in the unit must be freely accessible.
- Clearance of at least 0.9 m is required for maintenance work around the heating/cooling section.
- Make sure that supply air units draw in fresh air via the fresh air duct:
  - Intake opening at approx. 1.5 m height above the roof
  - Not impaired by exhaust air openings, flues or the like



Unit type			TP-6	TP-9	MP-6	MP-9
Distance from ceiling Z	min.	m	0.3	0.4	0.3	0.4
Mounting height Y	max. 1)	m	Approx. 9…25			
	min.	m	4	5	4	5
Applications with higher comfort requirements						
■ Distance from wall W	max.	m	12	15	12	15
	min.	m	6	7	6	7
■ Unit clearance X	max.	m	23	31	23	31
	min.	m	12	14	12	14
Applications with low comfort requirements						
■ Distance from wall W	max.	m	15	20	–	–
	min.	m	6	7	–	–
■ Unit clearance X	max.	m	30	41	–	–
	min.	m	12	14	–	–

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 18: Minimum and maximum distances

Heat pump

- Place the heat pump as close as possible to the indoor climate unit, in a well ventilated location.

> **Notice**
> Excessively long refrigerant lines reduce the efficiency of the system. Place the heat pump as close as possible to the indoor climate unit.

- Note the following when choosing a location:
  - Not in potentially explosive atmospheres
  - Not in the vicinity of machines emitting electromagnetic waves
  - Not in locations where there is a fire hazard due to the escape of flammable gases
  - Not near a heat source with high temperature
  - Not in locations where dust or dirt can affect the heat exchangers
  - Not in locations with mineral oil vapours in the air
  - Not in locations with acidic or alkaline vapours in the air
  - Not in locations with a high salt content in the air

> **Caution**
> Risk of damage to health. Corrosion of refrigerant pipes causes leaks and refrigerant can escape.

- Heat pump Q: Place the two single units as close to each other as possible.
  - The maximum length of the refrigerant pipes between the two single units is 10 m.

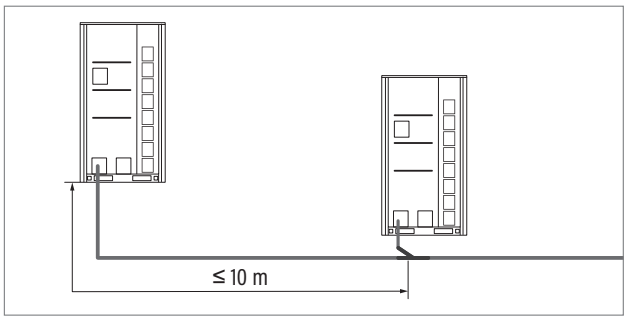


Fig. 20: Maximum length of the refrigerant pipes

- Observe the minimum distances for sufficient air flow through the heat pump.
- Place the heat pump on a solid base with sufficient load-bearing capacity to avoid vibrations and noise.

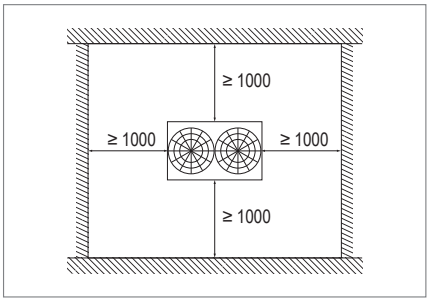


Fig. 21: Minimum distances for the heat pump P (dimensions in mm)

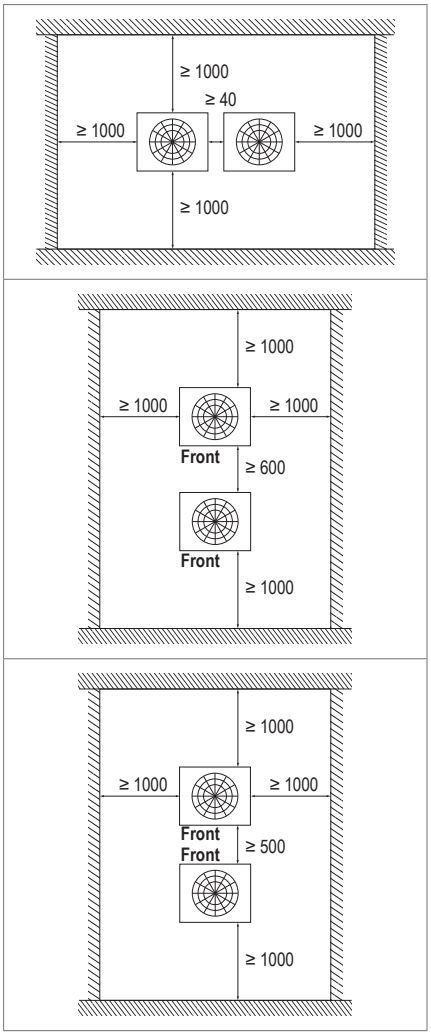


Fig. 22: Minimum distances for the heat pump Q (dimensions in mm)

- Install the heat pump on a solid base or on support blocks made of concrete or steel:
  - The base must be at least 200 mm high to allow sufficient space for the installation of the refrigerant pipes.
  - The support blocks must be at least 100 mm wide and they must also support the unit in the centre.
  - The supporting surface must be flat and level (max. inclination ± 0.2 %). The support points must bear the weight evenly.
  - Water must be free to drain through the base plate of the heat pump.
- Align the heat pump in such a way that the front faces the prevailing wind direction.
- In areas with heavy snowfall:
  - Increase the base height to ensure that the unit operation is not affected by snow.
  - Remove the rear grille from the unit to prevent snow accumulation.

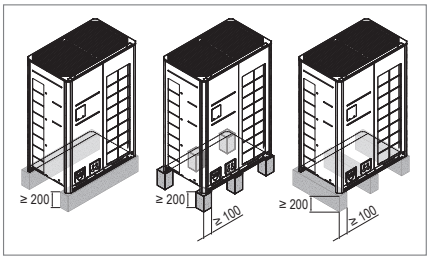
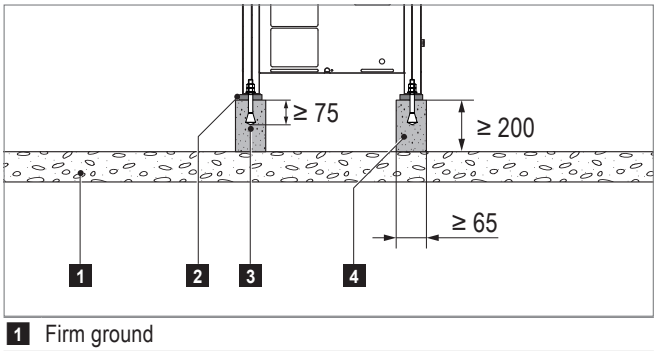


Fig. 23: Base for the heat pump

7.4 Installing the heat pump

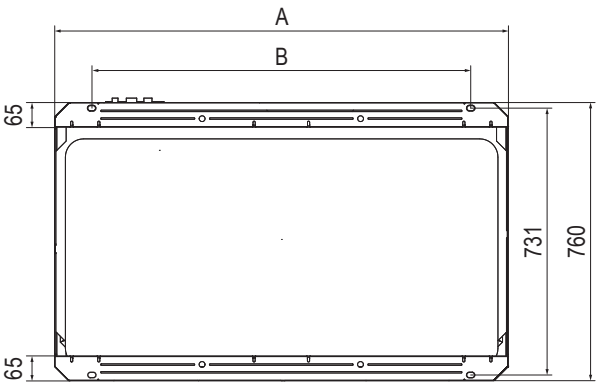
Caution
Risk of injury caused by falling load and improper handling. During installation:
- Wear personal protective equipment.
- Do not stand under suspended loads.
- Use cranes or forklifts with sufficient load-bearing capacity.

- Transport the heat pump to the installation site.
- Drill holes for the anchor bolts in the prepared base (dimensions see Table 19).
- Mount the heat pump on the base using vibration dampers and 4 anchor bolts Ø 10 mm.



1	Firm ground
2	Vibration damper
3	Anchor bolt Ø 10 mm
4	Base made of concrete or steel

Fig. 24: Installing the heat pump



Heat pump	P	Q (2 single units)
A	1240	930
B	1040	730

Table 19: Position of the screw connections (dimensions in mm)

7.5 Installing the TopVent® unit

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.

Preparation
- Make sure that a lifting platform is available.
- Remove the packaging film.
- For mounting, use the enclosed rivet nuts and
  – the optionally available suspension set or
  – flat irons, perforated irons, angle profiles, steel cables or similar

Installing the EEV kit Q
For units with heat pump Q, the EEV kit is supplied loose for transport reasons.
- Screw the EEV kit Q to the TopVent® unit as shown in Fig. 25.

Attention
Risk of malfunctions due to incorrect installation position: It is essential that the expansion valve is installed in a vertical position with the connection pipes at the bottom.

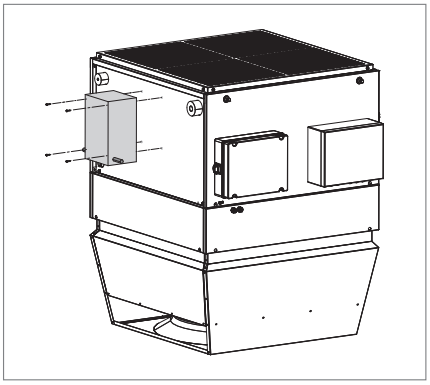


Fig. 25: Installing the EEV kit Q

TopVent® installation
- Transport the unit to the installation site.
- Mount the suspension set on the designated suspension points.

Caution
Risk of injury from falling parts. Only fasten the unit at the designated suspension points. Do not place any suspension points on the optional components (filter box, recirculation silencer).

- Rotate the unit to the correct position (position of the refrigerant connections).
- Attach the unit to the ceiling.
- Install the device horizontally.
- Do not attach any additional loads.
- Do not use eyebolts.
- Non-vertical suspensions are permissible up to a maximum angle of 45°.
- TopVent® MP:
  – Connect supply air units to the fresh air duct via a canvas connection and connect both flanges with an earth wire.

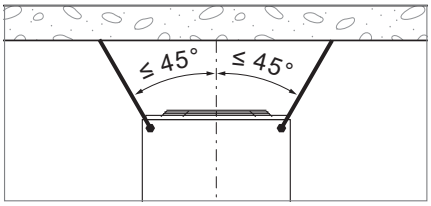


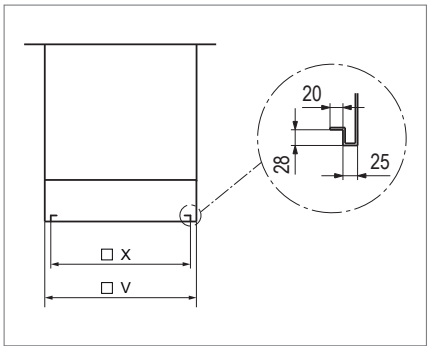
Fig. 26: Non-vertical suspension

7.6 Connecting air ducts

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.

TopVent® units in the design without Air-Injector

- Connect TopVent® units in the design without Air-Injector to a on-site air duct.



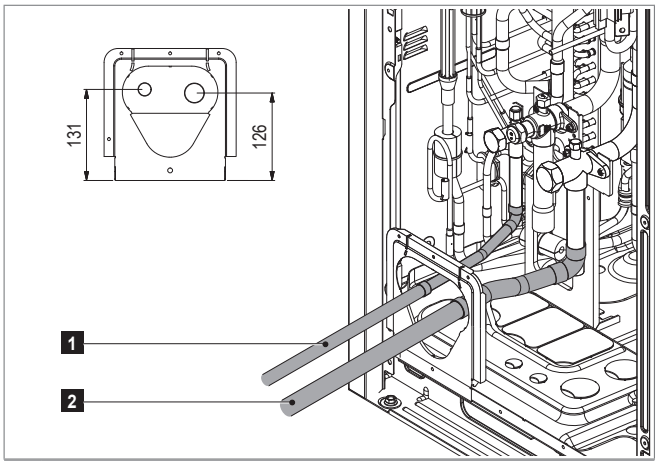
Size		6	9
X	mm	850	1050
V	mm	900	1100

Table 20: Supply air duct connection dimensions

7.7 Refrigeration system installation

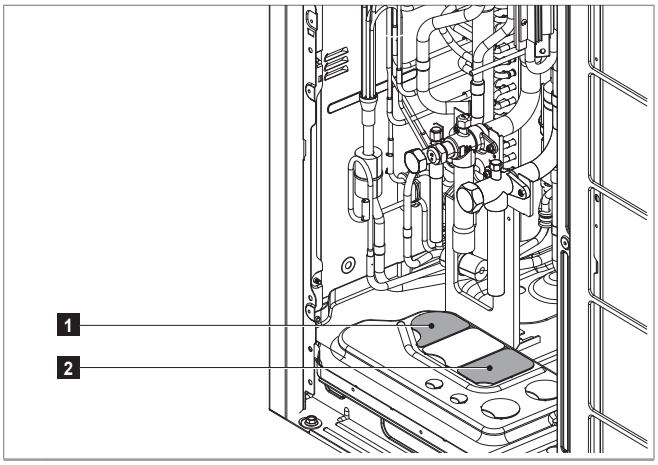
Caution
The refrigerant pipes must be installed by a qualified refrigeration technician in line with the local regulations.

Connection points on the heat pump



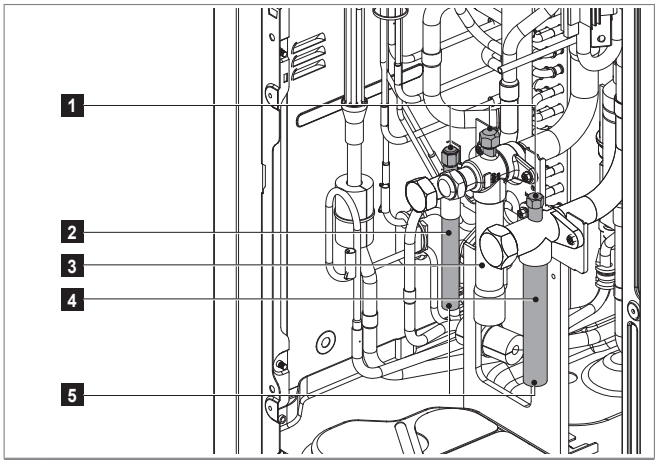
1 Liquid line
2 Gas line

Fig. 27: Opening for refrigerant pipes in the front



1 Knockout for liquid line
2 Knockout for gas line

Fig. 28: Opening for refrigerant pipes in the bottom

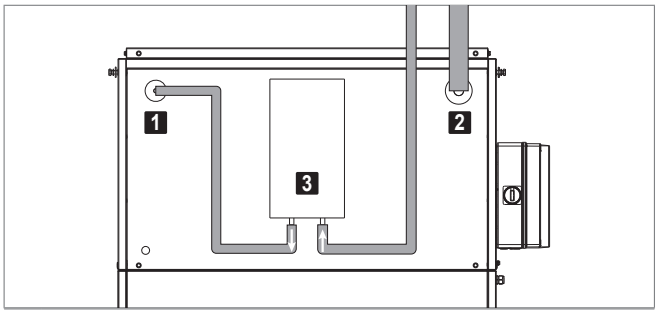


1 Service ports
2 Liquid line connection
3 Connection not in use (keep closed)
4 Gas line connection
5 Leakage prevention caps

Fig. 29: Refrigerant pipe connections

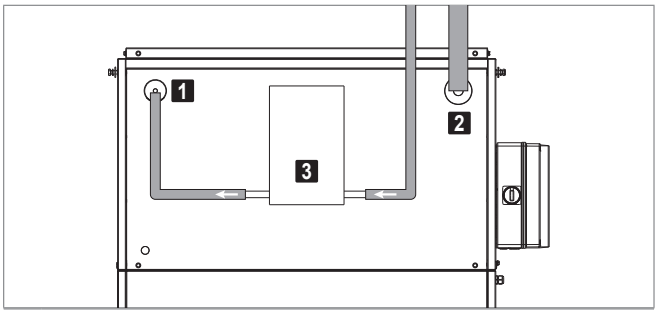
Before installing the refrigerant pipes, remove the leakage prevention caps:
- Ensure that all pipes are closed.
- Drain any refrigerant or air in the system via the service port.
- Remove the leakage prevention cap.

Connection points on the TopVent® unit



1	Liquid line connection
2	Gas line connection
3	EEV kit P

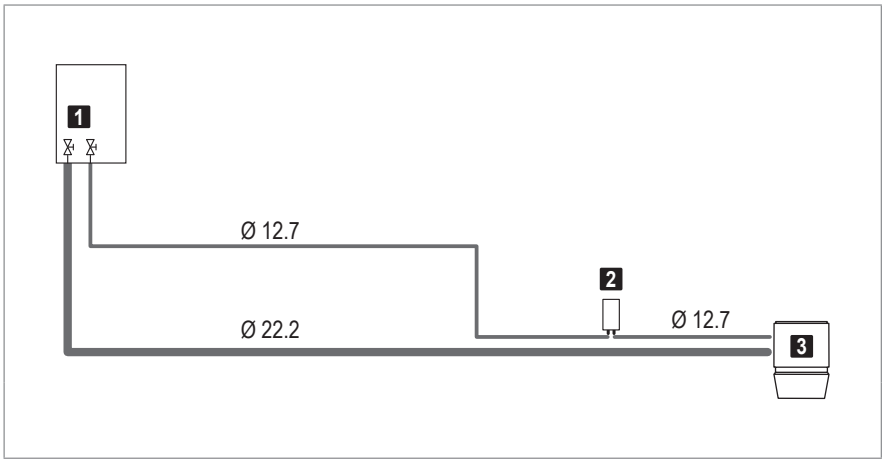
Fig. 30: Opening for refrigerant pipes in the front



1	Liquid line connection
2	Gas line connection
3	EEV kit Q

Fig. 31: Opening for refrigerant pipes in the bottom

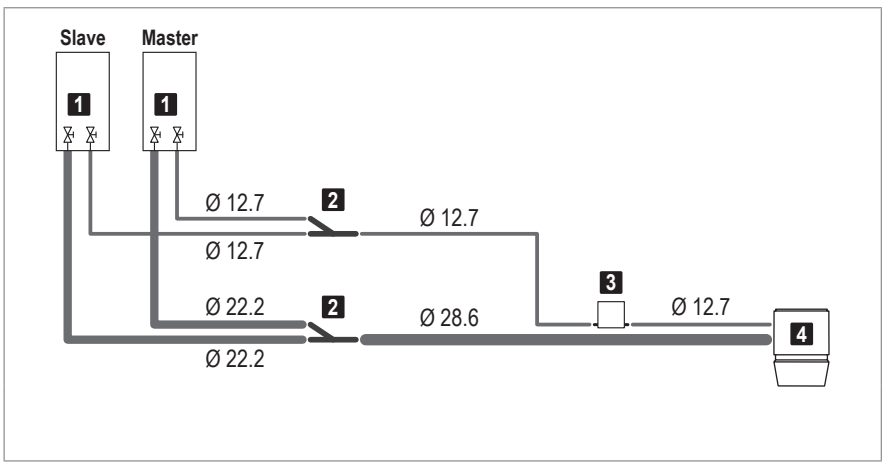
Refrigerant pipes for heat pump P



1	Connections on the heat pump ■ Liquid line . . . . . Ø 12.7 mm ■ Gas line . . . . . Ø 22.2 mm
2	EEV kit P, mounted on the indoor climate unit, connection Ø 12.7 mm
3	Connections on heating/cooling coil: **Unit size 6:** ■ Liquid line . . . . . Ø 12 mm ■ Gas line . . . . . Ø 22 mm **Unit size 9:** ■ Liquid line . . . . . Ø 12 mm ■ Gas line . . . . . Ø 28 mm

Fig. 32: Refrigerant pipes for heat pump P (pipe diameters in mm)

Refrigerant pipes for heat pump Q

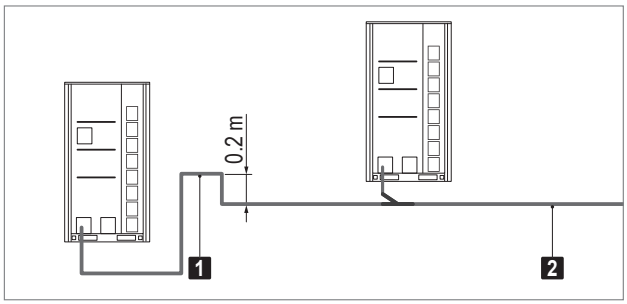


1	Connections on the heat pump ■ Liquid line . . . . . Ø 12.7 mm ■ Gas line . . . . . Ø 22.2 mm
2	Branch joint kit, supplied loose
3	EEV kit Q, supplied loose, connection Ø 19.05 mm
4	Connections on heating/cooling coil: ■ Liquid line . . . . . Ø 12 mm ■ Gas line . . . . . Ø 28 mm

Fig. 33: Refrigerant pipes for heat pump Q (pipe diameters in mm)

Notes on installation

- To avoid damaging the unit:
  - Do not use any flux.
  - Ensure there is a nitrogen supply when soldering.
  - Protect the unit against excessive heat with a wet cloth.
- Install the refrigerant pipes as shown in Fig. 32 and Fig. 33 schematically according to the local conditions.
- The maximum length of the liquid line is 40 m.
- The maximum height difference between the heat pump and the indoor climate unit is ± 30 m.
- The maximum length between the two single units of heat pump Q is 10 m.
- If the heat pump is placed lower than the main pipe: Install an oil return trap in the gas line.



1 Oil return trap
2 Main pipe

Fig. 34: Oil return trap

Heat pump Q

- The heat pump Q consists of 2 single units. Use the branching kit supplied for branching the pipeline.
  - Install the 2 Y branch joints as close as possible to the master unit.
  - Install the 2 Y branch joints horizontally so that the two branch pipes are in one plane.
- If the distance between the 2 single units is more than 2 m: Install an oil return trap in the gas line.

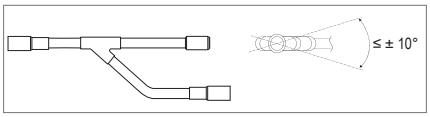
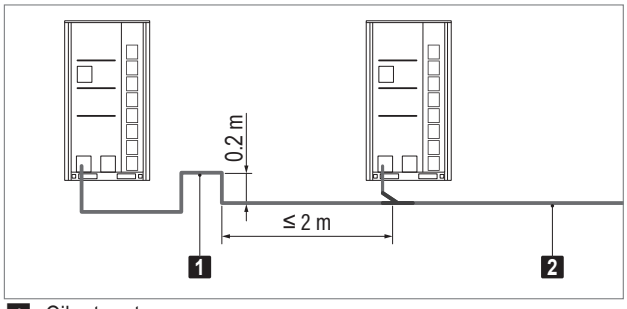


Fig. 35: Installation of the branch joint kit



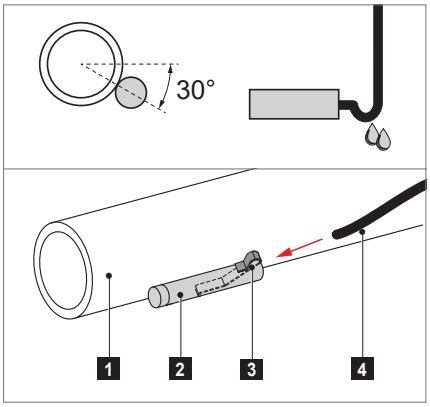
1 Oil return trap
2 Gas line to the indoor climate unit

Fig. 36: Oil return trap

Installation of the temperature sensors

Install the liquid temperature sensor (Ø 6.3 mm) and the gas temperature sensor (Ø 8.2 mm):

- Solder the sleeve for the sensor to the gas line:
  - as close as possible to the heating/cooling coil.
  - on the lower side of the pipe, as shown in Fig. 37
- Use thermal paste to ensure a good conductivity between the sleeve and the refrigerant pipe.
- First insert the clamp and then the sensor into the sleeve.
- Install the sensor so that no condensate accumulates in the sleeve.
- Insulate the sensor and the refrigerant pipe.
- Seal the refrigerant connections on the heating/cooling section:
  - Spray PU foam around the connections.
  - Apply the enclosed self-adhesive insulating mat around the connections.



1 Liquid line / gas line
2 Sleeve
3 Clamp
4 Temperature sensors

Fig. 37: Installation of the temperature sensors

Insulation of the refrigerant pipes

- The thickness of the insulation depends on the pipe diameter. Minimum thicknesses are given in Table 21. Thicker insulation is required in hot, humid environments.

Ø	Minimum thickness [1)]	Material
12.7 mm	15 mm	Closed-cell foam, fire protection class B1, temperature-resistant up to 120 °C, outer insulation UV-resistant
22.2 mm	20 mm	
28.6 mm	20 mm	

1) Increase the thickness of the insulation in hot, humid environments (> 80% relative humidity).

Table 21: Insulation of the refrigerant pipes

- Insulate the refrigerant pipes completely and without gaps.
- Insulate branch joints and weld seams only after the leak-tightness test.
- Insulate the liquid line and gas line separately.

Attention
Danger of unit damage due to condensation. Insulate the refrigerant pipes and connections with appropriate care to prevent condensation forming and dripping into the hall.

Filling with refrigerant

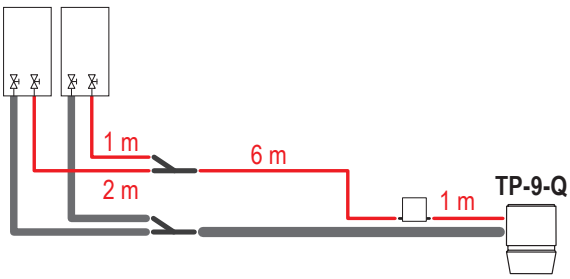
- Carry out a leak-tightness test and vacuum drying before charging refrigerant.
  - Leak-tightness test with 3.8 MPa test pressure
  - Vacuum drying with −100.7 kPa negative pressure
- Calculate the additional refrigerant fill.

The heat pump is filled with R32 refrigerant at the factory. Depending on the length of the liquid line and depending on the size of the unit, refrigerant must also be topped up:

- 0.103 kg refrigerant per metre of liquid line length (from the heat pump to the heating/cooling coil)
- Heating/cooling coil top-up volume:

Unit size		6	9
Refrigerant	kg	2.1	3.7

Table 22: Top-up volume for the heating/cooling coil



(10 m × 0.103 kg/m) + 3.7 kg = **4.73 kg**

Fig. 38: Calculation example

7.8 Condensate connection TopVent®

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 unit.
- 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.

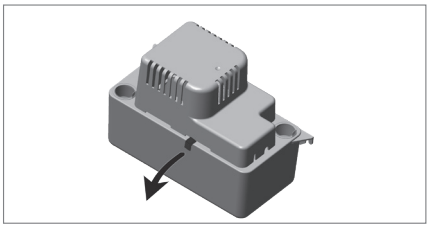


Fig. 39: Removal of the transport locking device

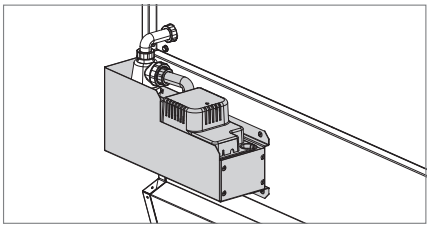


Fig. 40: Installation on the unit

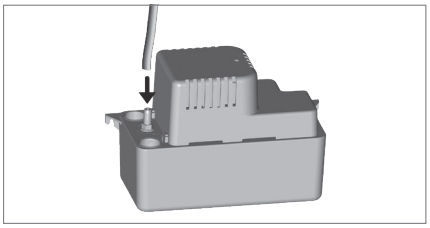


Fig. 41: Connection of the condensate pump

7.9 Heat pump condensate connection

- Make sure that the heat pump is not damaged by pooling water or ice formation:
  – Make sure that water is free to drain through the bottom plate of the heat pump.

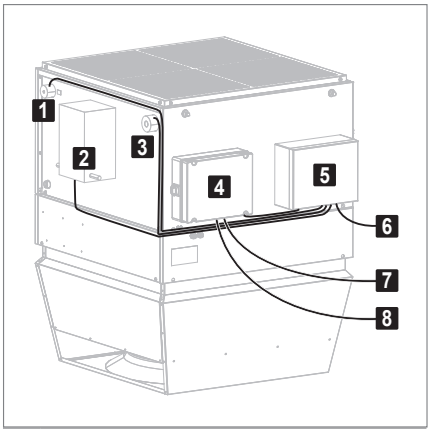
7.10 Electrical installation

Caution
Danger of electric shocks. The electrical installation must only be carried out 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.
- 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.

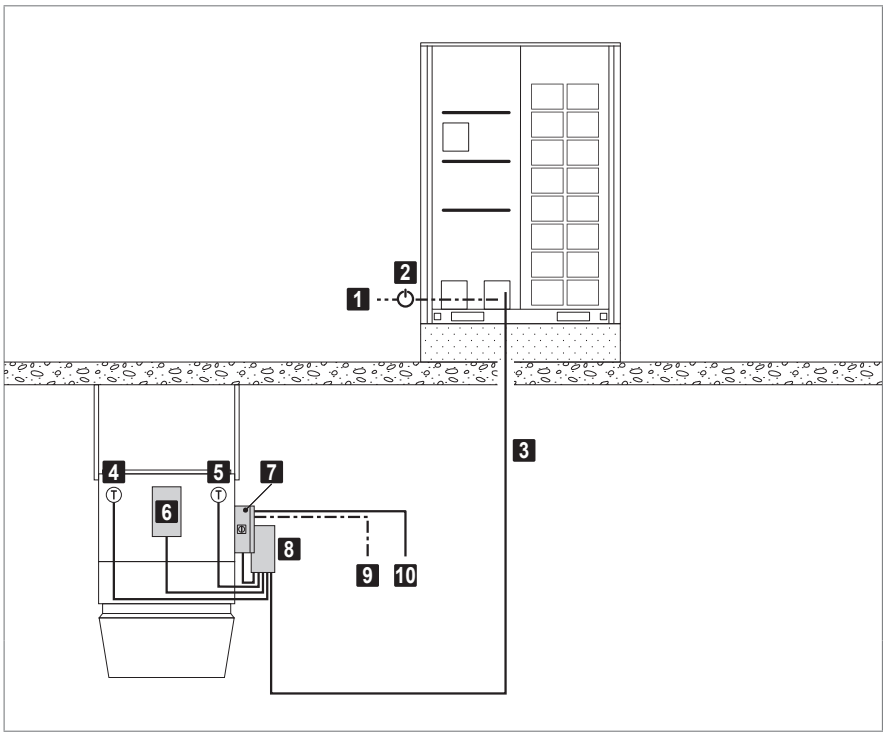
TopVent® unit
- Connect the power supply to the unit control box.
- Connect the zone bus to the unit control box.
- Connect the electrical components of the heat pump system (see Fig. 43 and Fig. 44).
- TopVent® MP:
  – Make sure that the ground cable is installed in the flange of the fresh air duct.

TopVent® options
- Condensate pump:
  – Wire up the condensate pump to the unit control box.
- Forced off for TopVent® MP:
  – Wire up the signal for emergency shut-off (Forced off) to the unit control box.
- Design without Air-Injector:
  – Install the enclosed supply air temperature sensor in the supply air duct and wire it up to the unit control box.



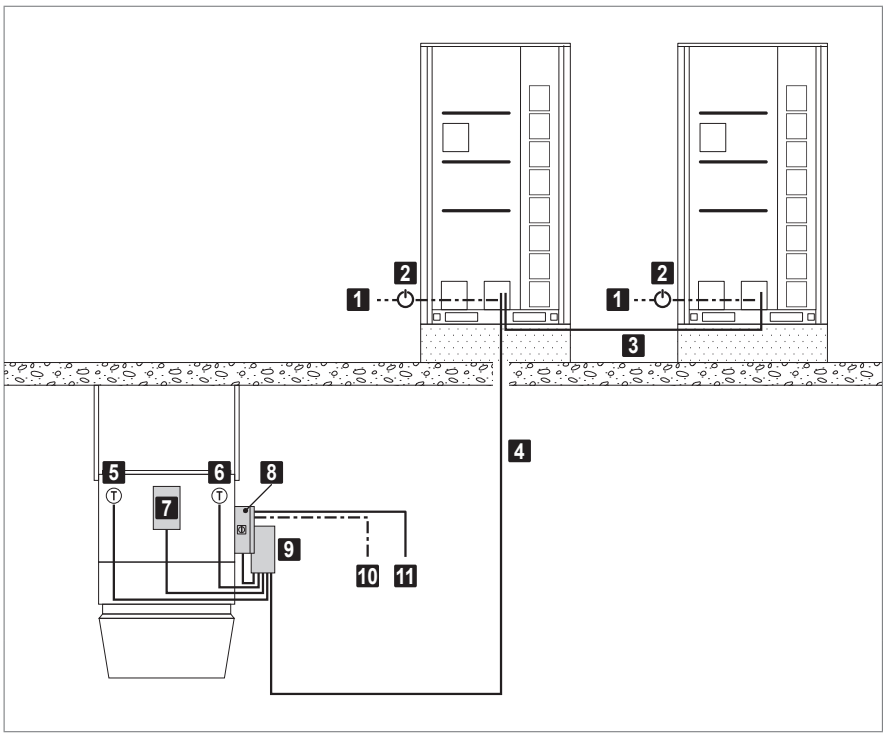
1	Liquid temperature sensor
2	EEV kit
3	Gas temperature sensor
4	Unit control box
5	Communication kit
6	Communication TopVent®
7	Power supply TopVent®
8	Zone bus

Fig. 42: Cable routing for TopVent® TP | MP



1	Power supply heat pump
2	Heat pump main switch (on-site)
3	Communication TopVent®
4	Liquid temperature sensor (supplied loose)
5	Gas temperature sensor (supplied loose)
6	EEV kit P
7	Unit control box
8	Communication kit PQ
9	Power supply TopVent®
10	Zone bus

Fig. 43: Electrical connection of the heat pump system for heat pump P



1	Power supply heat pump
2	Heat pump main switch (on-site)
3	Communication master–slave
4	Communication TopVent®
5	Liquid temperature sensor (supplied loose)
6	Gas temperature sensor (supplied loose)
7	EEV kit Q (supplied loose)
8	Unit control box
9	Communication kit PQ
10	Power supply TopVent®
11	Zone bus

Fig. 44: Electrical connection of the heat pump system for heat pump Q

Heat pump

- Install a leakage current protective circuit for the heat pump power supply.
- Install a main switch in view of the heat pump.
  – Heat pump Q: Install a separate main switch for each of the two single units.
- Connect the cable for the power supply to the main switch and from there route it to the connection terminals of the heat pump.
- Install the signal lines:
  – Communication TopVent® (from the communication kit to the heat pump)
  – Heat pump Q: Communication master–slave

Temperature sensors

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

- 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.
- Install room temperature sensors at a representative position in the occupied area at a height of about 1.5 m. The measured values must not be distorted by the presence of sources of heat or cold (machines, windows etc.). Mount the sensors on a heat-insulating base so that the measured value is not distorted by the temperature of the wall.
- Option «Combination sensor room air IP20»:
  – Protect the sensor from soiling during the construction phase by masking it with a protection film.

Attention
Risk of malfunctions due to dust deposits. Protect the sensor from soiling during the construction phase.

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.

Checklist to prepare for commissioning:

- Mechanical installation
  - Indoor climate units
  - Heat pump system
  - Zone control panels
  - Operator terminals
- Refrigeration system installation
  - Heat pump system (filled and documented)
- Hydraulic installation
  - Indoor climate units (condensate connection)
- Electrical installation
  - Power supply for indoor climate units, heat pumps, zone control panels
  - Wiring of Air-Injector actuator, supply air temperature sensor, condensate pump, forced off and components of the heat pump system to the unit control box
  - Laying of bus cables conforming to wiring diagram
  - Installation and wiring of all sensors (room temperature sensor, fresh air temperature sensor, ...)
  - Wiring of external operator terminals
  - Wiring of external inputs and outputs
- Organisational matters
  - Access to all system components during commissioning (indoor climate units, operator terminals, valves, ...)
  - Provision of a suitable working platform
  - Organisation of commissioning and training (date, presence of all of the respective trade groups and of the operating personnel)

The unit is checked at the factory and preset according to the specifications on the type label.

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.

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 unit 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.

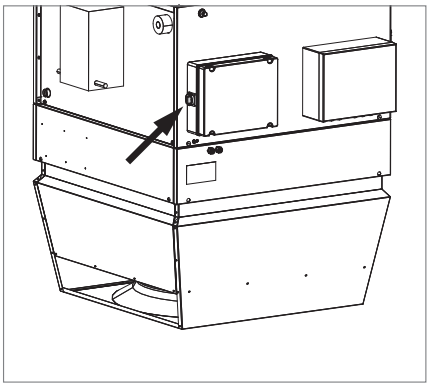


Fig. 45: Position of the isolation switch

Notice
The main switch for the heat pump is installed on site.

9.2 Maintenance

Maintenance schedule

Activity	Procedure	Interval
Clean unit	■ Clean the TopVent® unit and the heat pump. ■ Remove the siphon, clean it and rinse the condensate drain.	1 × annually
Functional check	■ Check function of the fan and actuators. ■ Check function of the Air-Injector. ■ Check function of the heat pump. ■ Check function of the control system.	1 × annually
Changing the filter	■ Renew air filter. Filter set / Use / Mat. no.: TopVent® 6 FK / MP-6, TP-6 with filter box / 6049725 TopVent® 6 FF / TP-6 with flat filter box / 6049726 TopVent® 9 FK / MP-9, TP-9 with filter box / 6049727 TopVent® 9 FF / TP-9 with flat filter box / 6049728	When the filter alarm is displayed, at least 1× annually

Table 23: Maintenance schedule

Changing the filter

- Changing the air filter in the filter box:
  - Open the sliding door of the filter box.
  - Loosen the adjusting screw.
  - Remove the filter elements.
  - Insert the new filter elements.
  - Tighten the adjusting screw.
  - Close the sliding door of the filter box.
- Changing the air filter in the flat filter box:
  - Remove the filter elements from above.
  - Insert the new filter elements.
- Dispose of the filters in accordance with local regulations.
  - The disposal of used filters depends on the contents.

9.3 Repair

If required, contact Hoval customer service.

Product service life

Component	Service life
EC motors of the 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 24: 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.

- 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 unit after waiting 3 minutes.

- Drain the refrigerant circuit.
- Dismantle all media connections.
- Support the unit.
- Disconnect the unit from the ceiling.
- Remove the unit.

11 Disposal

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

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