

1 Use

1.1 Intended use

TopVent® THC units are recirculation units for heating and cooling spaces up to 25 m in height with central heat and cold supply. They have the following functions:

- Heating (with connection to a hot water supply)
- Cooling (with connection to a water chiller)
- Recirculation operation
- Air distribution and destratification with adjustable Air-Injector
- Air filtration (option)

TopVent® THC units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of energy-related products. It is a system of the 'fan coil unit' type.

The Hoval TopTronic® C integrated control system ensures energy-efficient, demand-based operation of Hoval indoor climate systems.

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.

2 Construction and operation

2.1 Construction

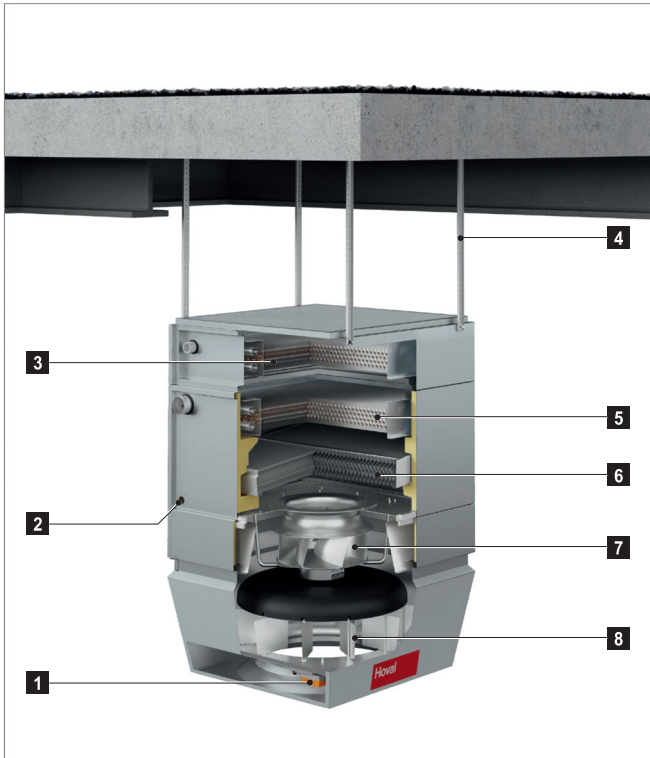
The TopVent® THC unit consists of the following components:

- Fan unit: Diagonal fan with energy-saving EC motor, maintenance-free and infinitely variable
- Heating section: Contains the heating coil for heating the supply air with hot water
- Cooling section: Contains the cooling coil for cooling the supply air with cold water and the condensate separator for the condensate generated
- Air-Injector: The Air-Injector is a patented, infinitely variable vortex air distributor for the draught-free introduction of air into the hall under changing operating conditions.

As part of the TopTronic® C control system, the unit control box is an integral component.



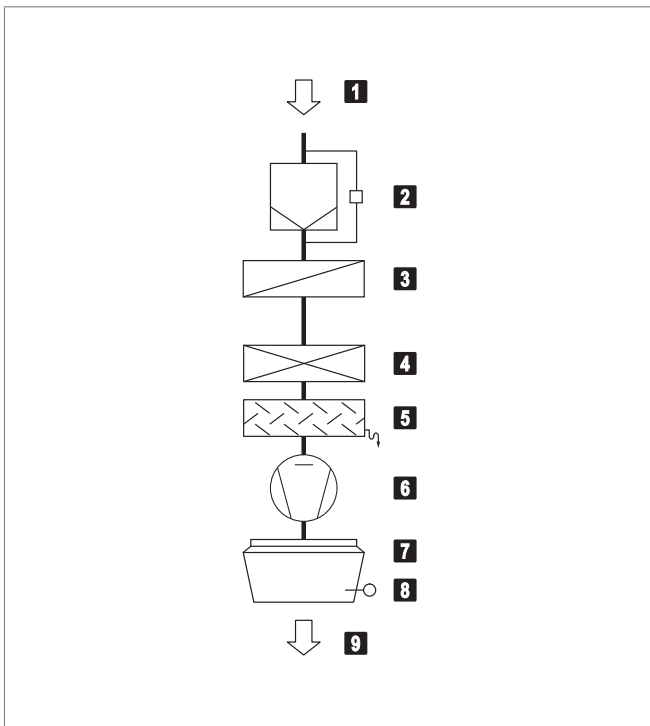
Fig. D1: TopVent® THC components



- 1 Actuator Air-Injector
- 2 Condensate connection
- 3 Heating coil
- 4 Suspension set
- 5 Cooling coil
- 6 Condensate separator
- 7 Fan
- 8 Air-Injector

Fig. D2: TopVent® THC structure

2.2 Function diagram



- 1 Extract air
- 2 Air filter with differential pressure switch (option)
- 3 Heating coil
- 4 Cooling coil
- 5 Condensate separator
- 6 Fan
- 7 Air-Injector with actuator
- 8 Supply air temperature sensor
- 9 Supply air

Fig. D3: TopVent® THC function diagram

2.3 Operating modes

The TopVent® THC has the following operating modes:

- 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® THC unit can operate individually in a local operating mode: Off, Recirculation, Recirculation speed 1.

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⁾ Heating/cooling on 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 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 ¹⁾ Heating/cooling on 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 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 Heating on
OPR	■ Overheating protection: If the room temperature rises above the set value for overheating protection, the unit cools down the room in recirculation operation.	Fan speed 2 Cooling on
L_OFF	Off (local operating mode) The unit is switched off.	Fan off Heating/cooling off
–	Forced heating The unit draws in room air, warms it and blows it back into the room. Forced heating is activated by connecting the unit to a power supply (only if there is no bus connection to the zone controller). For example, it is suitable for heating the hall before taking the control system into operation or if the controller fails during the heating period.	Fan speed 2 Heating on

Table D1: TopVent® THC operating modes

3 Technical data

3.1 Type code

	THC - 6 A C ...
Unit type	TopVent® THC
Unit size	6 or 9
Heating section	A with coil type A B with coil type B C with coil type C
Cooling section	C with coil type C D with coil type D
Further options	

Table D2: TopVent® THC type code

3.2 Application limits

Extract air temperature	max.	°C	50
Moisture content of extract air	max.	g/kg	15
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.	m³/h 3100
	Size 9:	min.	m³/h 5000
Condensate quantity	Size 6:	max.	kg/h 90
	Size 9:	max.	kg/h 150

The units cannot be used in:

- Damp locations
- Places with a corrosive or aggressive environment
- Spaces with a large amount of dust
- Areas where there is danger of explosion

¹⁾ Design for higher temperatures on request

Table D3: TopVent® THC application limits

3.3 Electrical connection

Unit type		THC-6	THC-9
Supply voltage	V AC	3 × 400	3 × 400
Permitted voltage tolerance	%	± 5	± 5
Frequency	Hz	50	50
Connected load	kW	1.9	3.6
Current consumption max.	A	3.0	5.9
Series fuse	A	13	13
Protection rating	-	IP 54	IP 54

Table D4: TopVent® THC electrical connections

3.4 Air flow rate

Unit type		THC-6	THC-9
Nominal air flow rate	m³/h	6000	9000
Floor area covered	m²	537	946

Table D5: TopVent® THC air flow rate

3.5 Sound level

Unit type		THC-6CC	THC-9CC
Sound pressure level (at a distance of 5 m) ¹⁾	dB(A)	59	60
Total sound power level	dB(A)	81	82
Octave sound power level	63 Hz	dB 42	47
	125 Hz	dB 56	66
	250 Hz	dB 65	69
	500 Hz	dB 70	74
	1000 Hz	dB 76	77
	2000 Hz	dB 76	76
	4000 Hz	dB 74	74
	8000 Hz	dB 68	67

¹⁾ with a hemispherical radiation pattern in a low-reflection room

Table D6: TopVent® THC sound level

3.6 Heat output

Heating medium temperature			80/60 °C					60/40 °C				
Size	Type	t _{room} °C	Q kW	H _{max} m	t _s °C	Δp _w kPa	m _w l/h	Q kW	H _{max} m	t _s °C	Δp _w kPa	m _w l/h
THC-6	A	16	32.8	13.4	34.2	7	1410	18.8	16.8	27.3	2	807
		20	30.3	14.0	37.0	6	1301	16.2	17.9	30.0	2	697
	B	16	47.0	11.6	41.3	13	2020	26.9	14.6	31.3	4	1157
		20	43.4	12.0	43.5	11	1864	23.3	15.5	33.5	3	1001
	C	16	76.0	9.4	55.6	18	3267	45.0	11.8	40.3	6	1935
		20	70.3	9.8	56.8	16	3022	39.3	12.5	41.5	5	1690
THC-9	A	16	55.5	13.6	36.3	8	2386	31.7	17.0	28.5	3	1364
		20	51.2	14.1	38.9	7	2201	27.4	18.1	31.1	2	1179
	B	16	71.2	12.2	41.5	12	3060	40.6	15.4	31.4	4	1746
		20	65.7	12.7	43.7	10	2823	35.1	16.5	33.6	3	1509
	C	16	117.9	9.8	56.9	18	5066	69.9	12.3	41.1	6	3003
		20	109.1	10.2	58.0	15	4686	61.0	13.1	42.1	5	2622

Legend: Type = Type of coil t_s = Supply air temperature
t_{room} = Room air temperature Δp_w = Water pressure drop
Q = Heat output m_w = Water quantity
H_{max} = Maximum mounting height

Reference: ■ At room air temperature 16 °C: extract air temperature 18 °C
■ At room air temperature 20 °C: extract air temperature 22 °C

Table D7: TopVent® THC heat output

3.7 Cooling capacity

Cooling medium temperature				6/12 °C						8/14 °C					
Size	Type	t _{room} °C	RH _{room} %	Q _{sen} kW	Q _{tot} kW	t _s °C	Δp _w kPa	m _w l/h	m _c kg/h	Q _{sen} kW	Q _{tot} kW	t _s °C	Δp _w kPa	m _w l/h	m _c kg/h
THC-6	C	22	50	20.4	20.4	13.9	15	2925	0.0	20.4	20.4	13.9	15	2925	0.0
			70	18.5	27.7	14.9	28	3960	13.5	16.0	21.4	16.1	17	3064	7.9
		26	50	25.2	31.1	15.5	36	4448	8.6	22.7	24.8	16.7	23	3552	3.0
			70	23.2	43.7	16.5	71	6263	30.2	20.8	37.5	17.7	52	5367	24.6
THC-9	C	22	50	31.4	31.4	13.6	15	4496	0.0	31.4	31.4	13.6	15	4496	0.0
			70	28.4	44.7	14.6	31	6401	23.9	24.6	28.2	15.9	12	4031	5.2
		26	50	38.8	49.9	15.2	38	7149	16.3	35.0	35.0	16.4	19	5013	0.0
			70	35.9	69.8	16.2	75	9989	49.8	32.0	53.2	17.4	44	7619	31.1
	D	22	50	37.1	37.1	11.8	13	5307	0.0	37.1	37.1	11.8	13	5307	0.0
			70	34.6	56.7	12.6	30	8118	32.5	29.7	45.1	14.2	19	6459	22.6
		26	50	46.4	62.4	12.7	36	8941	23.5	41.6	50.9	14.3	24	7282	13.6
			70	43.9	87.4	13.5	70	12513	63.9	39.1	75.8	15.1	53	10854	54.0

Legend: Type = Type of coil t_s = Supply air temperature
t_{room} = Room air temperature Δp_w = Water pressure drop
RH_{room} = Relative humidity of the room air m_w = Water quantity
Q_{sen} = Sensible cooling capacity m_c = Condensate quantity
Q_{tot} = Total cooling capacity

Reference: ■ At room air temperature 22 °C: extract air temperature 24 °C
■ At room air temperature 26 °C: extract air temperature 28 °C

Table D8: TopVent® THC cooling capacity

3.8 Product information according to ErP

Model	TopVent® THC									Unit
	6-AC	6-BC	6-CC	9-AC	9-BC	9-CC	9-AD	9-BD	9-CD	
Cooling capacity (sensible) ($P_{rated,c}$)	26.5	26.5	26.5	41.0	41.0	41.0	48.6	48.6	48.6	kW
Cooling capacity (latent) ($P_{rated,c}$)	5.6	5.6	5.6	7.3	7.3	7.3	15.2	15.2	15.2	kW
Heating capacity ($P_{rated,h}$)	13.2	18.9	29.8	22.6	28.5	46.2	22.6	28.5	46.2	kW
Total electric power input (P_{elec})	1.38	1.41	1.5	1.37	1.49	1.42	1.54	1.56	1.68	kW
Sound power level (L_{WA})	80	80	81	81	81	82	82	82	82	dB
Contact details	Hoval Aktiengesellschaft Austrasse 70, 9490 Vaduz, Liechtenstein www.hoval.com									

Table D9: Product information according to Commission Regulation (EU) 2016/2281, Table 13

3.9 Dimensions and weights

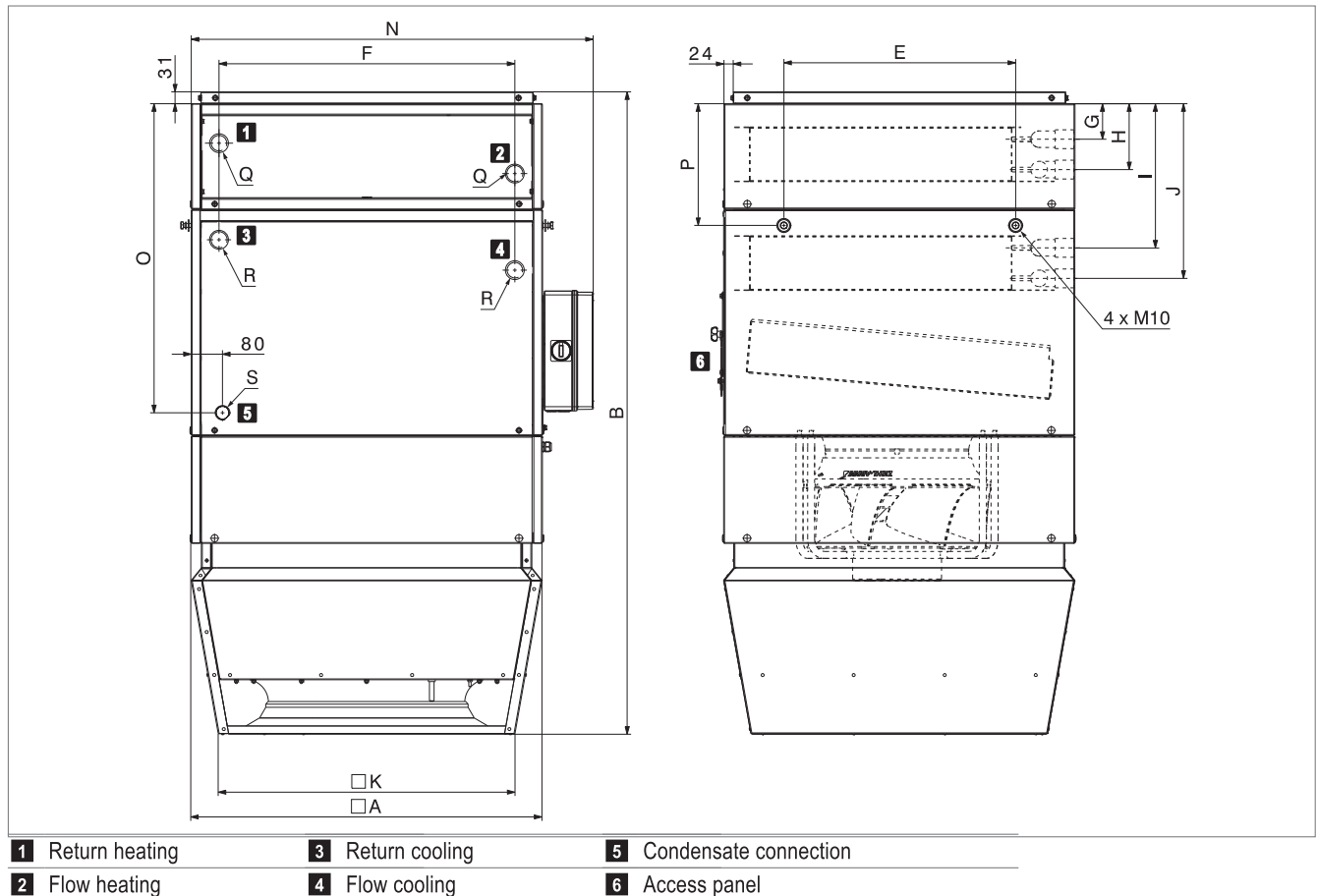


Fig. D4: TopVent® THC dimensional drawing

Unit size		THC-6			THC-9			THC-9			
		AC	BC	CC	AC	BC	CC	AD	BD	CD	
Coil type	A	mm		900			1100			1100	
	B	mm		1647			1765			1765	
	E	mm		594			846			846	
	F	mm		758			882			882	
	G	mm		101			111			111	
	H	mm		179			189			189	
	I	mm		349			395			386	
	J	mm		427			473			481	
	K	mm		760			935			935	
	N	mm		1030			1230			1230	
	O	mm		792			860			860	
	P	mm		312			342			342	
	Q	"		Rp 1¼ (internal)			Rp 1½ (internal)			Rp 1½ (internal)	
	R	"		Rp 1¼ (internal)			Rp 1½ (internal)			Rp 2 (internal)	
	S	"		G 1 (external)			G 1 (external)			G 1 (external)	
Water content of heating coil	l		4.6	4.6	7.9	7.4	7.4	12.4	7.4	7.4	12.4
Water content of cooling coil	l		7.9	7.9	7.9	12.4	12.4	12.4	19.2	19.2	19.2
Weight	kg		226	230	296	318	318	329	329	329	340

Table D10: TopVent® THC dimensions and weights