1 Use

1.1 Intended use

TopVent® TC 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® TC 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.

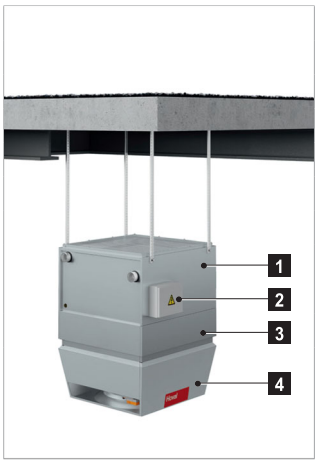
2 Construction and operation

2.1 Construction

The TopVent® TC unit consists of the following components:

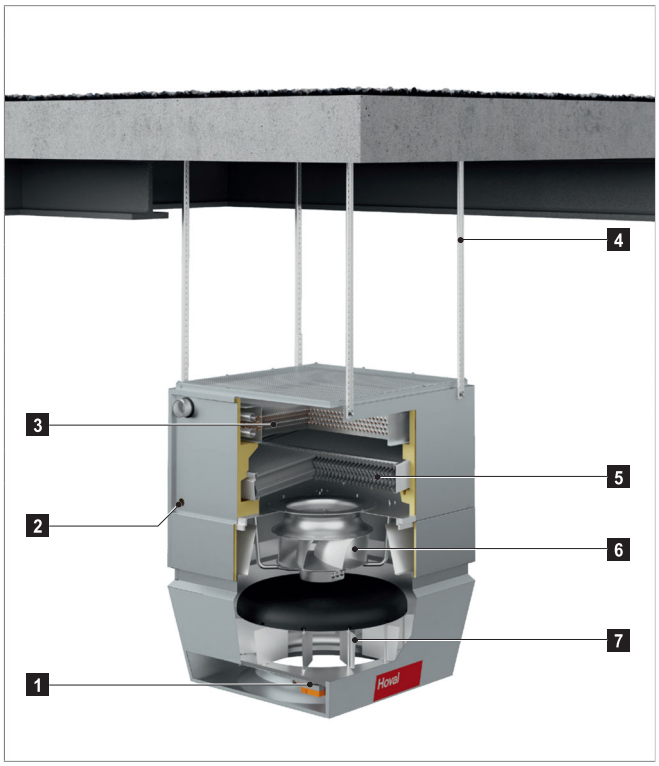
- Fan unit:
  Diagonal fan with energy-saving EC motor, maintenance-free and infinitely variable
- Heating/cooling section:
  Contains the heating/cooling coil for heating and cooling the supply air with hot water or cold water and the condensate separator for the condensate generated
- Air-Injector:
  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.



1	Heating/cooling section
2	Unit control box
3	Fan unit
4	Air-Injector

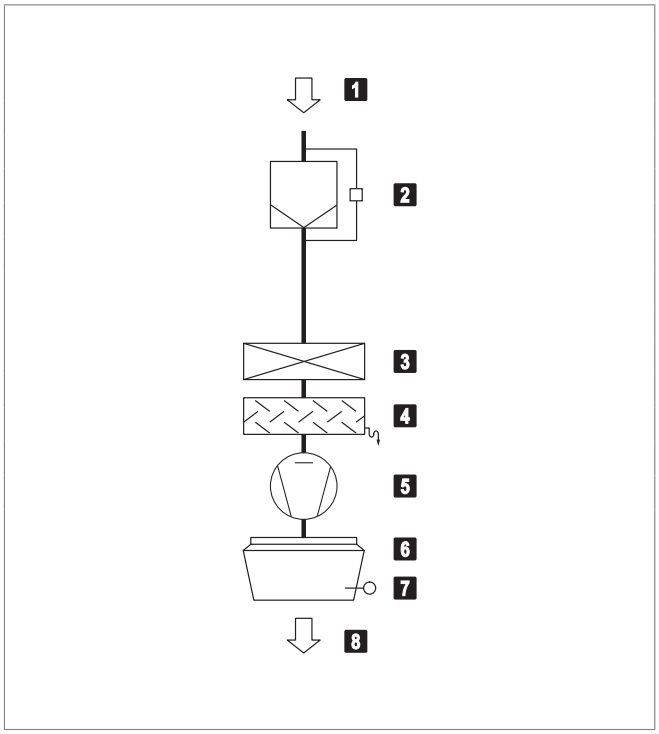
Fig. C1: TopVent® TC components



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

Fig. C2: TopVent® TC construction

2.2 Function diagram



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

Fig. C3: TopVent® TC function diagram

2.3 Operating modes

The TopVent® TC 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® TC 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 C1: TopVent® TC operating modes

3 Technical data

3.1 Type code

TC - 6 - C ...

Unit type
TopVent® TC

Unit size
6 or 9

Heating/cooling section
C with coil type C
D with coil type D

Further options

Table C2: TopVent® TC 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 C3: TopVent® TC application limits

3.3 Electrical connection

Unit type		TC-6	TC-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 C4: TopVent® TC electrical connection

3.4 Air flow rate

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

Table C5: TopVent® TC air flow rate

3.5 Sound level

Unit type			TC-6-C	TC-9-C
Sound pressure level (at a distance of 5 m) [1]		dB(A)	58	59
Total sound power level		dB(A)	80	81
Octave sound power level	63 Hz	dB	43	49
	125 Hz	dB	58	67
	250 Hz	dB	64	70
	500 Hz	dB	69	73
	1000 Hz	dB	74	75
	2000 Hz	dB	74	75
	4000 Hz	dB	73	74
	8000 Hz	dB	67	68

[1] with a hemispherical radiation pattern in a low-reflection room

Table C6: TopVent® TC sound level

3.6 Heat output

Heating medium temperature			80/60 °C					60/40 °C				
Size	Type	t_{room}	Q	H_{max}	t_S	Δp_W	m_W	Q	H_{max}	t_S	Δp_W	m_W
		°C	kW	m	°C	kPa	l/h	kW	m	°C	kPa	l/h
TC-6	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
TC-9	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
	D	16	140.7	9.1	64.4	15	6045	85.4	11.3	46.2	5	3670
		20	130.4	9.5	65.0	13	5600	75.1	12.0	46.8	4	3225

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

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

Table C7: TopVent® TC heat output

3.7 Cooling capacity

Cooling medium temperature				6/12 °C						8/14 °C					
Size	Type	t_{room}	RH_{room}	Q_{sen}	Q_{tot}	t_S	Δp_W	m_W	m_C	Q_{sen}	Q_{tot}	t_S	Δp_W	m_W	m_C
		°C	%	kW	kW	°C	kPa	l/h	kg/h	kW	kW	°C	kPa	l/h	kg/h
TC-6	C	22	50	20.4	20.4	13.9	15	2925	0.0	18.0	18.0	15.1	12	2573	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
TC-9	C	22	50	31.4	31.4	13.6	15	4496	0.0	27.6	27.6	14.9	12	3947	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	32.2	32.2	13.4	10	4613	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_{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
Δp_W = Water pressure drop
m_W = Water quantity
m_C = Condensate quantity

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

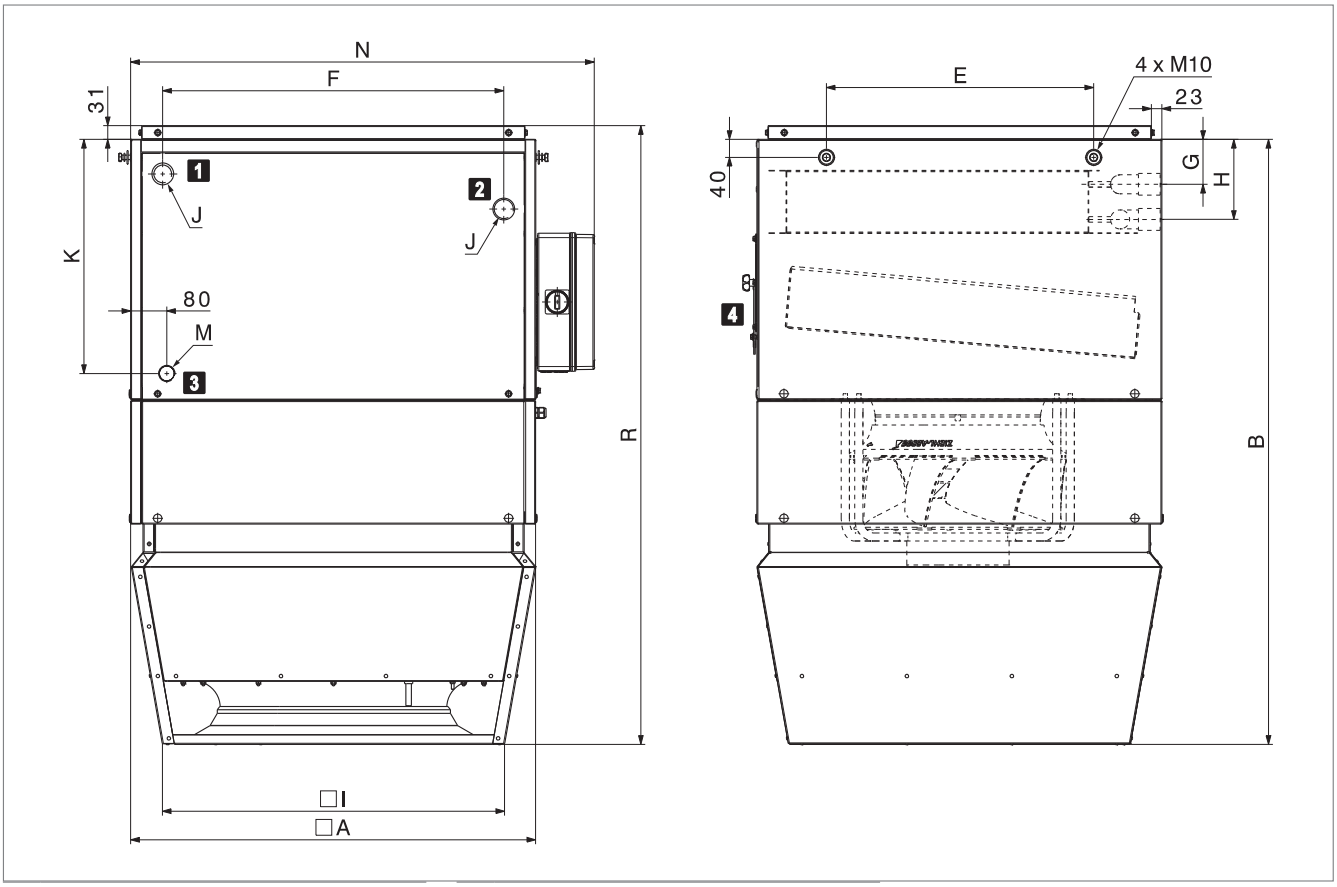
Table C8: TopVent® TC cooling capacity

3.8 Product information according to ErP

Model	TopVent® TC			Unit
	6-C	9-C	9-D	
Cooling capacity (sensible) ($P_{rated,c}$)	26.5	41.0	48.6	kW
Cooling capacity (latent) ($P_{rated,c}$)	5.6	7.3	15.2	kW
Heating capacity ($P_{rated,h}$)	29.8	46.2	54.2	kW
Total electric power input (P_{elec})	1.43	1.23	1.34	kW
Sound power level (L_{WA})	80	81	81	dB
Contact details	Hoval Aktiengesellschaft Austrasse 70, 9490 Vaduz, Liechtenstein www.hoval.com			

Table C9: Product information according to Commission Regulation (EU) 2016/2281, Table 13

3.9 Dimensions and weights



1 Return heating/cooling	3 Condensate connection
2 Flow heating/cooling	4 Access panel

Fig. C4: TopVent® TC dimensional drawing

Unit size		TC-6	TC-9	TC-9
Coil type		C	C	D
A	mm	900	1100	1100
B	mm	1344	1430	1430
E	mm	594	846	846
F	mm	758	882	882
G	mm	77	93	85
H	mm	155	171	180
I	mm	760	935	935
K	mm	521	558	558
N	mm	1030	1230	1230
R	mm	1375	1463	1463
J	"	Rp 1¼ (internal)	Rp 1½ (internal)	Rp 2 (internal)
M	"	G 1 (external)	G 1 (external)	G 1 (external)
Water content of heating/ cooling coil	l	7.9	12.4	19.2
Weight	kg	194	265	276

Table C10: TopVent® TC dimensions and weights