

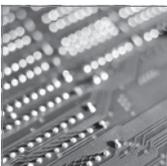
Hoval Indoor Climate Systems TopVent® gas

Recirculation units and supply air units with efficient air distribution
for heating and cooling with gas-fired heat exchanger
TopVent® DGV | NGV | GV | MG

Design handbook



Hoval

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Safety

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A

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 Operational safety

TopVent® gas units are state-of-the-art and safe to operate. Nevertheless, hazards may emanate from the units if they are used incorrectly or not used as intended. 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.
- Unauthorised reconfiguration or modification of the unit is not permitted.
- Follow the local safety and accident prevention regulations at all times.
- TopVent® gas units may only be installed, operated and maintained by authorized, 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.

3 Information for a user manual

According to the accident prevention regulations of some countries, the operator of equipment must meet certain requirements for the prevention of occupational accidents and instruct the operating personnel as to the hazards that may occur and how to prevent them. This can be done with the help of the user manual.

In addition to national regulations for accident prevention and environmental protection, a user manual should also include the most important items of the operating instructions.



TopVent® DGV
Gas-fired recirculation unit for heating high spaces

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1 Use

1.1 Intended use

TopVent® DGV units are heaters intended for heating high spaces operating with air recirculation.

Intended use also includes compliance with the operating instructions. Any use beyond this is considered improper use. 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.

1.3 Hazards

TopVent® DGV units are state-of-the-art and safe to operate. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Dangers when working with components of the gas circuit
- When working on the unit, objects (e.g. tools) could be dropped.
- Malfunctions as a result of defective parts
- Danger caused by coming in contact with hot components when carrying out work inside the unit or on the flue gas system

2 Construction and operation

TopVent® DGV has been specially developed for use in high spaces. It fulfils the following functions:

- Heating (with gas-fired heat exchanger)
- Recirculation operation
- Air distribution with Air-Injector
- Air filtration (optional)

The unit is mounted under the ceiling and draws in interior air. The air is heated in a gas-fired heat exchanger and injected back into the room through the Air-Injector.

Thanks to its high performance and efficient air distribution the TopVent® DGV covers a large area. Therefore, compared to other systems, fewer units are needed to achieve the required conditions.

2 different unit sizes and diverse output levels, as well as a broad range of accessories make possible solutions tailored to the requirements of each individual hall.

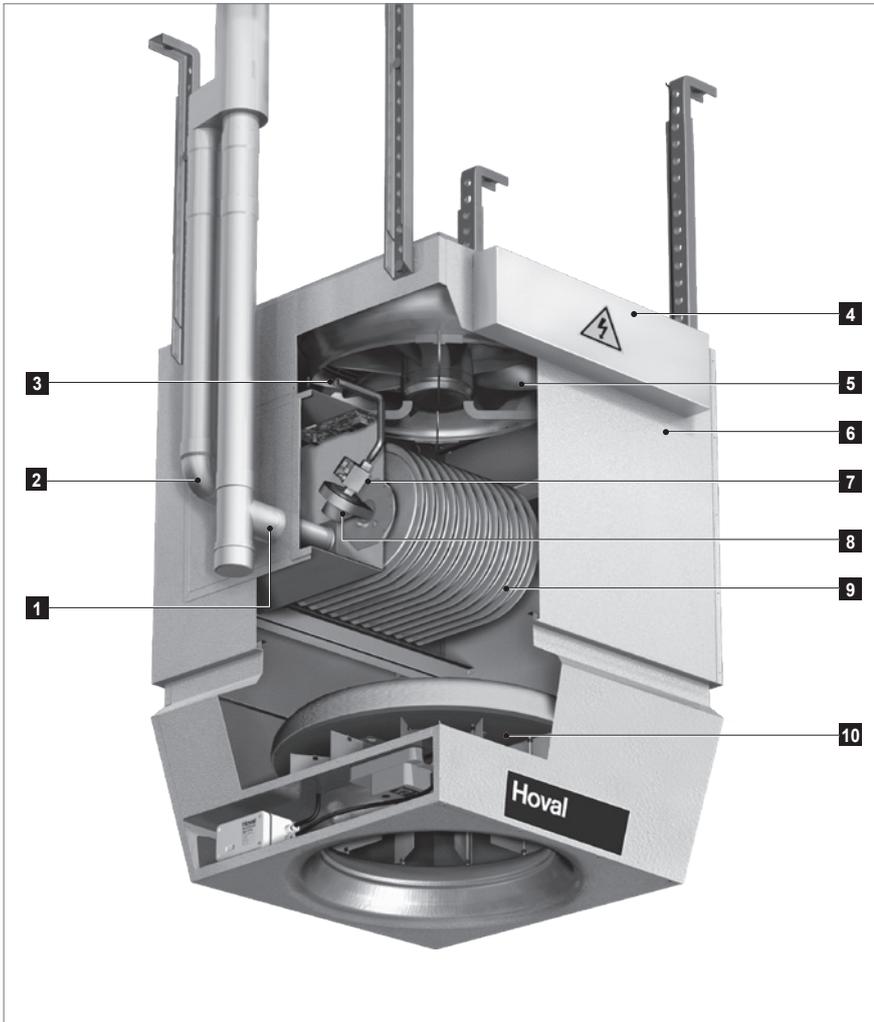
2.1 Unit construction

TopVent® DGV consists of the heater unit and the air injector. Both components are bolted together, but can be dismantled separately again.

2.2 Air distribution with the Air-Injector

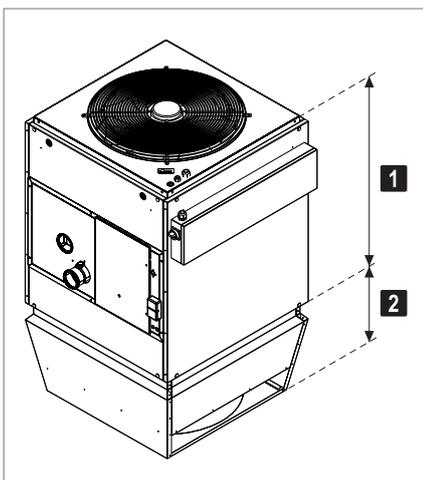
The patented air distributor – called the Air-Injector – is the core element. The air discharge angle is set by means of the adjustable guide vanes. It depends on the air flow rate, the mounting height and the temperature difference between the supply air and room air. The air is therefore blown into the room vertically downward, conically or horizontally. This ensures that:

- with each unit a large area of the hall can be covered,
- the occupied area is draught-free,
- the temperature stratification in the room is reduced, thus saving energy.



- 1 Flue gas connection
- 2 Combustion air connection
- 3 Gas connection
- 4 Terminal box with isolation switch
- 5 Fan
- 6 Casing
- 7 Gas control valve
- 8 Burner unit consisting of stainless steel gas blower and premix burner
- 9 Heat exchanger of stainless steel
- 10 Air-Injector

Fig. B1: TopVent® DGV structure



- 1 Heating section
- 2 Air-Injector

Fig. B2: TopVent® DGV components

2.3 Operating modes

TopVent® DGV operates in the following modes:

- Off
- Recirculation
- Recirculation night
- Recirculation speed 1

TempTronic regulates these modes of operation automatically.

Code	Operating mode	Description
OFF	Off The fan is switched off. Frost protection for the room remains active. There is no room temperature control.	Fanoff Heatingoff
REC	Recirculation On/off-operation: if heating is required, the unit draws in room air, heats it and returns the warm air back into the room. The room temperature set value day is active.	Fanspeed 1 / 2 ¹⁾ Heater60... 100 % ¹⁾ Depending on heat demand
RECN	Recirculation night like REC, but with room temperature set value night	
REC1	Recirculation speed 1 The same as REC, but the unit operates only at speed 1 (low air flow rate)	Fanspeed 1 ¹⁾ Heater60... 100 % ¹⁾ Depending on heat demand

Table B1: TopVent® DGV operating modes

3 Technical data

3.1 Type code

DGV - 6 / 30 / ...	
Unit type	TopVent® DGV
Unit size	6 or 9
Output in kW	30 or 60
Options	

Table B2: TopVent® DGV type code

3.2 Application limits

Ambient temperature	min.	°C	-15
	max.	°C	35
Supply air temperature	max.	°C	60
The units cannot be used in:			
<ul style="list-style-type: none"> ■ Damp locations ■ Places with a corrosive or aggressive environment ■ Spaces with a large amount of dust ■ Areas where there is danger of explosion 			

Table B3: TopVent® DGV application limits

3.3 Air flow rate, gas consumption

Unit type		DGV-6/30		DGV-6/60		DGV-9/60	
		1	2	1	2	1	2
Fan speed	min ⁻¹	720	900	910	1280	670	900
Nominal air flow rate ¹⁾	m ³ /h	4100	5700	5100	7000	6400	8200
Floor area reached ²⁾	m ²	337	502	437	661	585	826
Nominal heat input	max. kW	32.0		66.0		66.0	
Nominal heat output	max. kW	29.2		60.5		60.5	
Combustion efficiency ³⁾	%	min. 91		min. 91		min. 91	
Emissions of nitrogen oxides (GCV)	mg/kWh	35.0		42.0		42.0	
Emission efficiency	%	95.4		92.7		94.1	
Seasonal space heating energy efficiency	%	76.1		74.4		75.6	
Gas consumption							
Natural gas: G20, G27 (H, E, Lw)		m ³ /h	3.4	7.0		7.0	
Natural gas: G25, G25.3 (L, LL, K)		m ³ /h	3.8	7.9		7.9	

1) At an air temperature of 20 °C
 2) Mounting height H_{max} = 11 m for a temperature difference between supply air and room air of up to 30 K
 3) In accordance with EN 1020

Table B4: TopVent® DGV technical data

3.4 Electrical connection

Unit type		DGV-6/30	DGV-6/60	DGV-9/60
Supply voltage	V AC	400 3N	400 3N	400 3N
Permitted voltage tolerance	%	+10/-15	+10/-15	+10/-15
Frequency	Hz	50	50	50
Power consumption				
at rated heating capacity	W	694	1124	1014
at minimal capacity	W	514	654	714
in standby mode	W	5	5	5
Current consumption max.	A	1.7	2.7	2.2
Protection rating	–	IP 20	IP 20	IP 20

Table B5: TopVent® DGV electrical connections

3.5 Gas connection

Unit type	DGV-6/30	DGV-6/60	DGV-9/60
Gas appliance type ¹⁾	B ₂₃ , C ₁₃ , C ₃₃		
Gas connection	Rp ½" (internal)	R ¾" (external)	R ¾" (external)
Combustion air connection	DN 80	DN 100	DN 100
Flue gas connection	DN 80	DN 100	DN 100
Max. length of flue gas duct ²⁾	9 m	9 m	9 m
¹⁾ According to method of flue gas evacuation and combustion air supply ²⁾ Equivalent length of formed parts: – 90° elbow 2 m – 45° elbow 1 m – 90° T-piece ... 2 m			

Table B6: TopVent® DGV gas circuit connections

3.6 Sound levels

Unit type		DGV-6/30	DGV-6/60	DGV-9/60
Fan speed		1	2	1 2
Sound pressure level (at a distance of 5 m) ¹⁾	dB(A)	47	54	49 55 50 56
Total sound power level	dB(A)	69	76	71 77 72 78
Octave sound power level	63 Hz	72	80	77 82 78 83
	125 Hz	69	76	73 81 74 82
	250 Hz	72	78	73 79 74 80
	500 Hz	66	74	70 74 71 75
	1000 Hz	63	71	66 72 67 73
	2000 Hz	59	68	61 68 62 69
	4000 Hz	52	62	55 62 56 63
	8000 Hz	48	56	50 57 51 58

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

Table B7: TopVent® DGV sound power levels

3.7 Heat output

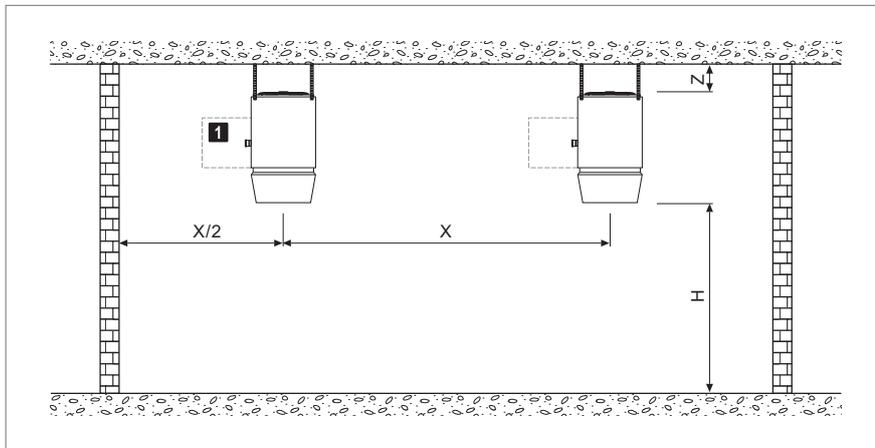
Room air temperature		16 °C			20 °C		
Unit type	Fan speed	Q	t _s	H _{max}	Q	t _s	H _{max}
		kW	°C	m	kW	°C	m
DGV-6/30	1	29.2	39.2	8.5	29.2	43.2	8.6
	2	29.2	33.2	13.2	29.2	37.2	13.2
DGV-6/60	1	60.5	53.2	8.4	60.5	57.2	8.4
	2	60.5	43.7	12.8	60.5	47.7	12.9
DGV-9/60	1	60.5	46.1	8.3	60.5	50.1	8.4
	2	60.5	39.9	11.5	60.5	43.9	11.6

Legend:
 Q = Nominal heat output
 t_s = Maximum supply air temperature
 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 B8: TopVent® DGV heat output, supply air temperatures and mounting height

3.8 Minimum and maximum distances

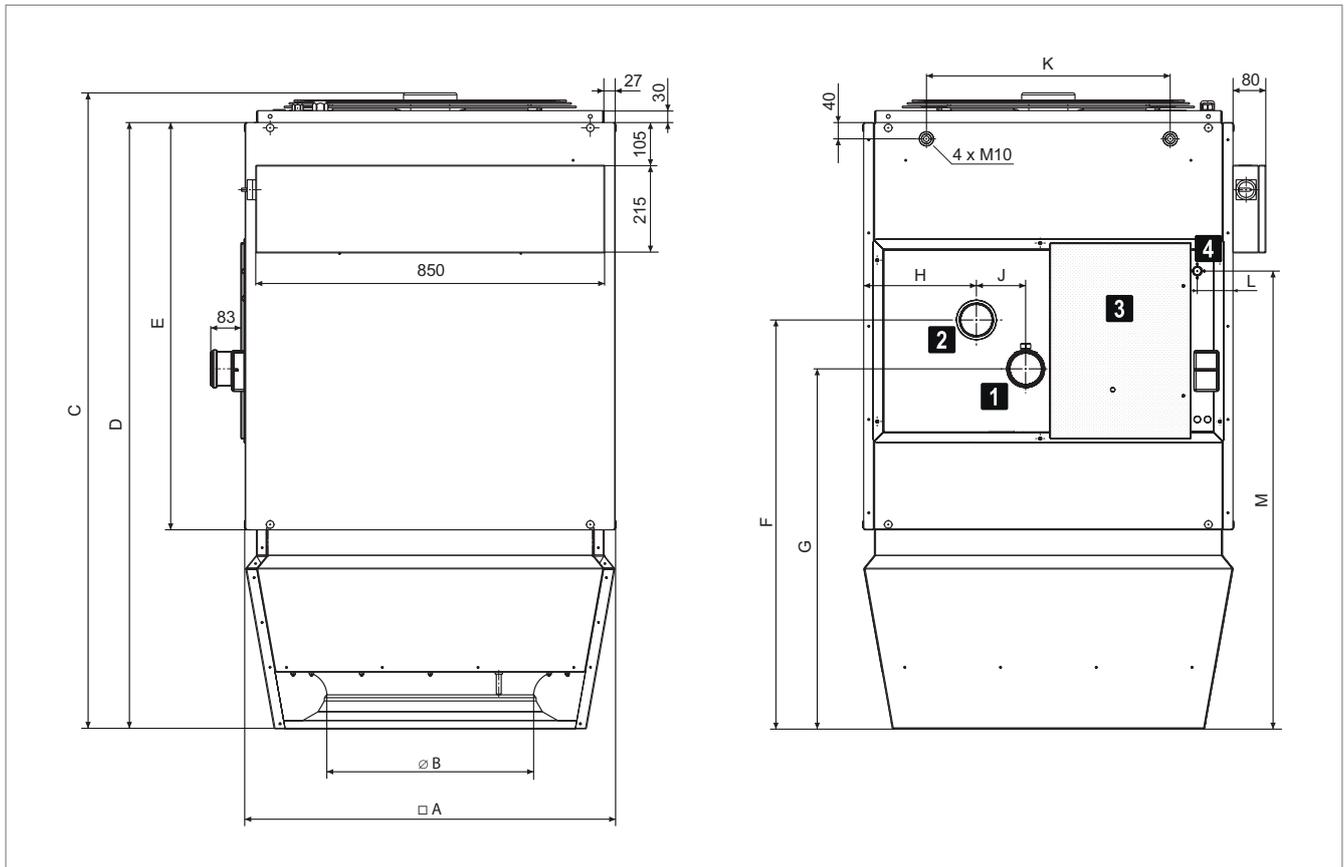


1 Allow a free space of 1.5 m for service and maintenance.

Unit type	DGV-6/30		DGV-6/60		DGV-9/60			
	1	2	1	2	1	2		
Fan speed	1	2	1	2	1	2		
	2	1	2	1	2	1		
Unit clearance X	min.	m	10	11	11	12	12	14
	max.	m	18	22	21	26	24	29
Mounting height H	min.	m	4.0	4.0	4.0	4.0	5.0	5.0
	max.	m	4.0	4.0	4.0	4.0	5.0	5.0
Distance from ceiling Z	min.	m	0.3	0.3	0.3	0.3	0.4	0.4
	max.	m	0.3	0.3	0.3	0.3	0.4	0.4

Table B9: TopVent® DGV minimum and maximum distances

4 Dimensions and weights



Unit type		DGV-6/30	DGV-6/60	DGV-9/60
A	mm	900	900	1100
B	mm	500	500	630
C	mm	1562	1562	1640
D	mm	1490	1490	1570
E	mm	1000	1000	1000
F	mm	946	974	1048
G	mm	836	834	908
H	mm	258	237	438
J	mm	110	140	140
K	mm	594	594	846
L	mm	87	73	172
M	mm	1057	1128	1203
Weight	kg	125	135	170

- 1** Flue gas connection with measuring opening
- 2** Combustion air connection
- 3** Inspection door with measuring opening for combustion air temperature
- 4** Gas connection

Fig. B3: TopVent® DGV dimensions and weights

5 Design example



Notice

Use the 'HK-Select' program to design Hoval Indoor Climate Systems. You can download it free of charge on the Internet.

Design data	Example																							
<ul style="list-style-type: none"> ■ Geometry of the room ■ Fabric heat losses ■ Room temperature ■ Extract air temperature ■ Comfort requirements (acoustic) 	Geometry 50 × 70 × 12 m Fabric heat losses 350 kW Room temperature 20 °C Extract air temperature 22 °C Comfort requirements Standard																							
<p>Comfort requirements</p> <p>Define the fan speed in accordance with the acoustic requirements:</p> <ul style="list-style-type: none"> ■ Low noise level → Fan speed 1 ■ Normal noise level → Fan speed 2 	Standard → Fan speed 2																							
<p>Mounting height</p> <ul style="list-style-type: none"> ■ Calculate the actual mounting height (= distance between the floor and the bottom edge of the units). <p style="background-color: #e0e0e0; padding: 2px;">$H = \text{Hall height} - \text{distance from ceiling} - \text{unit height}$</p> <ul style="list-style-type: none"> ■ Compare the actual mounting height with the minimum and maximum mounting height (see Table B9 and HK-Select). 	DGV-6/30 → OK DGV-6/60 → OK DGV-9/60 → OK																							
<p>Minimum number of units</p> <ul style="list-style-type: none"> ■ Determine the minimum number of units for each unit type. Take into account the following criteria: <ul style="list-style-type: none"> - Floor area covered - Heat output - Unit clearances <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="3">Required number</th> <th rowspan="2">Minimum number of units</th> </tr> <tr> <th>Floor area covered</th> <th>Heat output</th> <th>Unit clearances</th> </tr> </thead> <tbody> <tr> <td>DGV-6/30</td> <td>7</td> <td>12</td> <td>12</td> <td>12</td> </tr> <tr> <td>DGV-6/60</td> <td>6</td> <td>6</td> <td>6</td> <td>6</td> </tr> <tr> <td>DGV-9/60</td> <td>5</td> <td>6</td> <td>6</td> <td>6</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ■ Choose the final solution from the remaining possibilities, depending on the geometry of the hall and the costs. 		Type	Required number			Minimum number of units	Floor area covered	Heat output	Unit clearances	DGV-6/30	7	12	12	12	DGV-6/60	6	6	6	6	DGV-9/60	5	6	6	6
Type	Required number			Minimum number of units																				
	Floor area covered	Heat output	Unit clearances																					
DGV-6/30	7	12	12	12																				
DGV-6/60	6	6	6	6																				
DGV-9/60	5	6	6	6																				

6 Options

TopVent® DGV can be adapted to the requirements of a specific project thanks to a range of optional equipment. A detailed description of all optional components is found in the 'Options' part of this design handbook.

Option	Use
Flue gas accessories	for simple installation independently of room air
Paint finish	in the Hoval red or in any colour required
Suspension set	for mounting the unit on ceiling
Filter box	to filter recirculation air
Acoustic cowl	to reduce noise levels in the room (reduced noise radiation from Air-injector)
Recirculation silencer	to reduce noise levels in the room (reduced noise reflection from the ceiling)

Table B10: Availability of options for TopVent® DGV

7 Control system

TopVent® DGV units are controlled by TempTronic RC. This programmable control unit, developed especially for TopVent® gas units, offers the following advantages:

- Regulation of the room temperature
- Control of air distribution by means of the Hoval Air-Injector
- 3 set point values can be set (Room temperature day, Room temperature night and Frost protection temperature)
- Control of operating modes according to week programme and calendar
- Registration of unit malfunctions in an alarm list
- Password protection for user and service personnel
- Menu-guided operation via a 4-line display
- Integrated room temperature sensor

You will find a detailed description of TempTronic in the 'Control systems' part of this handbook.

8 Transport and installation

8.1 Installation



Caution

Risk of injury from incorrect handling. Have transport and assembly work carried out by trained specialists!

For the purposes of installation the units are provided with 4 M10 rivet nuts with hexagon bolts and washers. The following guidelines are important when preparing for assembly:

- Attach the TopVent® unit using a suspension set (option) or by means of steel flat, slotted steel flat, angles, steel cables, etc.
- Secure the unit only to ceilings of fireproof materials and with sufficient load-bearing capacity.
- Do not use eyebolts.
- Do not install any additional loads.
- The unit must be installed horizontally.
- Non-vertical suspensions are permissible up to a maximum angle of 45°.

8.2 Installation of the flue gas evacuation and the combustion air supply



Caution

Risk of injury from incorrect handling. Installation of the flue gas evacuation and the combustion air supply may only be carried out by specialists!

Observe national / local regulations when planning the flue gas evacuation and the combustion air supply. From an early stage, coordinate the installation with the responsible district chimney sweep authorities and obtain the necessary authorisation from the local building authority.

Please note the following:

- The units can be installed as room air dependent (Type B₂₃) or room air independent (Type C₁₃, C₃₃) appliances.
- If the unit is room air independent, equip it with the optional flue gas kit.
- For room air dependent operation the combustion air is taken directly from the room in which the unit is installed. Ensure the room is sufficiently ventilated and that the combustion air is free from pollutants and aggressive substances (halogens such as chlorides, fluorides, etc.).
- Observe the maximum lengths given in Table B6 (see chapter 3 'Technical data').

8.3 Gas connection

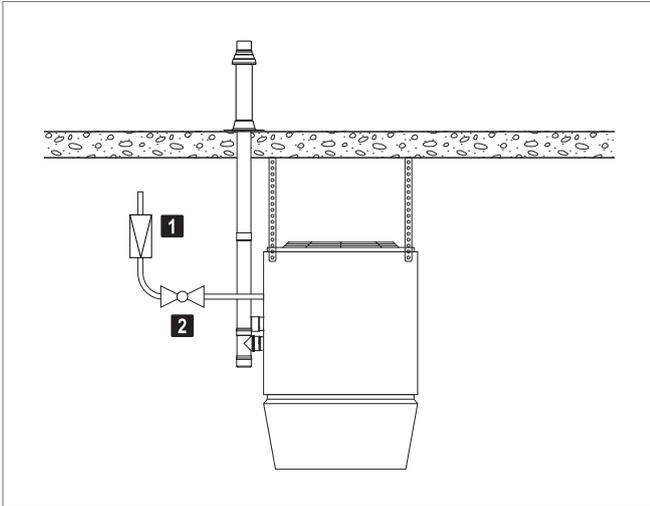


Caution

Risk of injury from incorrect handling. The gas connection may only be carried out by specialists authorised by the gas supply company!

Please note the following:

- The fuel used is natural gas. Check the type of gas the unit is set to work with and, if necessary, have Hoval Customer Service reset the unit to the type of gas supplied locally.
- During operation of the unit, the required quantity of gas and the necessary pressure of gas must be present constantly.
- Connect the gas supply line with appropriate bolted joints which can be loosened, tension-free and vibration-free.
- The connection of the unit to the gas supply line must be gas-tight.
- Ensure that a gas pressure regulator and a cut-off-valve (not part of the scope of supply) are installed directly before the unit.



1 Gas pressure regulator (20...50 mbar)

Recommended settings:

- Natural gas G20 20 mbar
- Natural gas G25 25 mbar

2 Cut-off valve

Fig. B4: Gas pressure regulator and cut-off valve in the gas supply line

8.4 Electrical installation



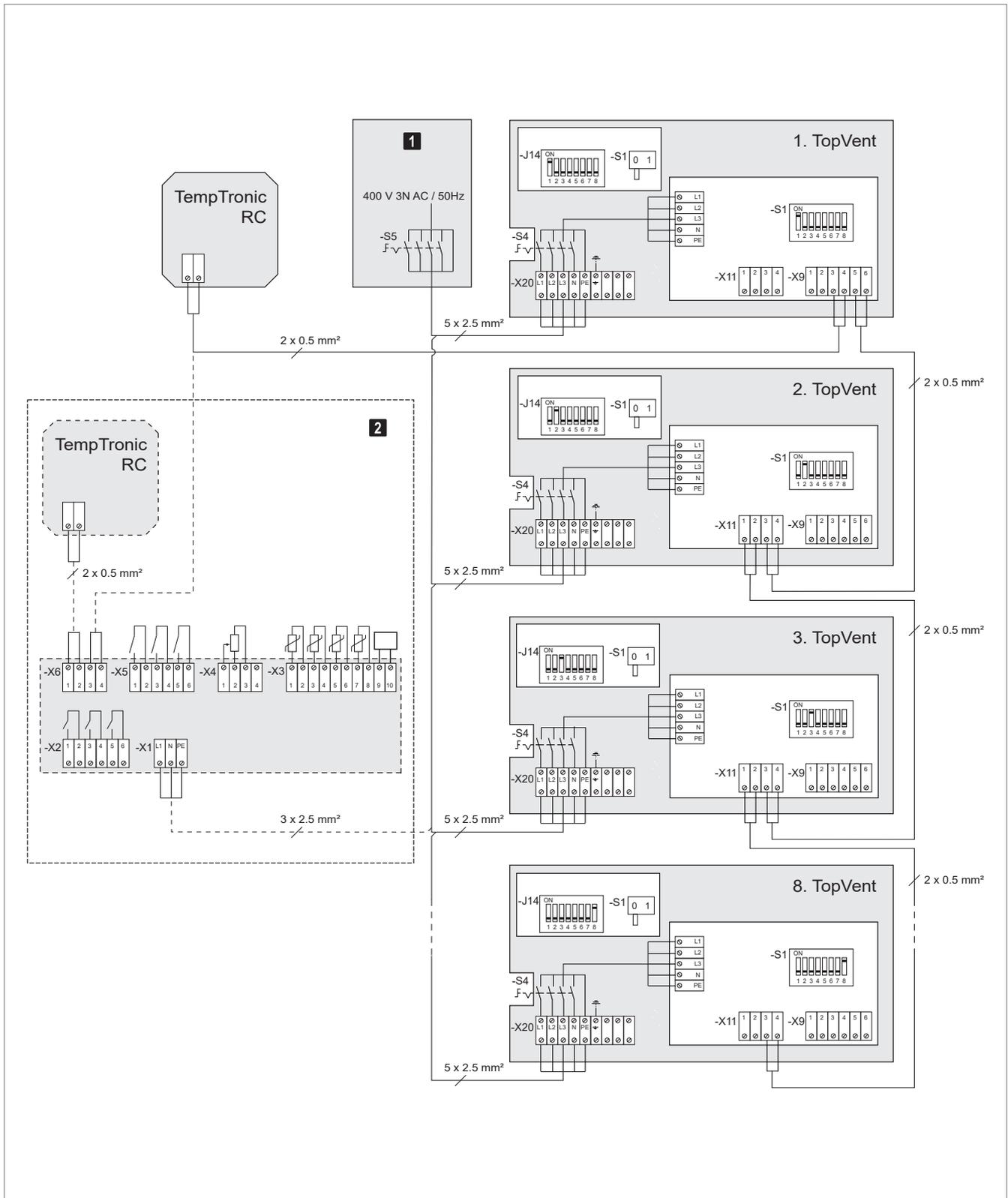
Caution

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

- Observe all relevant regulations (e.g. EN 60204-1).
- Check whether the local operating voltage, frequency and fuse protection match the data on the type plate. If there are any discrepancies, the unit must not be connected!
- Cable cross-sections must be selected according to technical regulations, e. g. VDE 0100.
- Electrical installation to be carried out according to wiring diagram.
- Do not forget the master switch for the complete installation.

A TempTronic can control up to 8 TopVent® units simultaneously:

- Connect TempTronic and the units to each other via a system bus.
- Assign a number to each unit:
 - Micro switch S1 on the power module
 - Micro switch J14 on the burner control



- 1 Control panel (on site)
- 2 Variant: connection for TempTronic RC and option module

Fig. B5: Connection diagram

9 Specification texts

9.1 TopVent® DGV

Gas-fired recirculation unit for heating high spaces

Corrosion-resistant aluzinc sheet metal housing with access panel and four M10 rivet nuts for installation of the optional suspension set for ceiling mounting.

Gas-fired heat exchanger of premium-quality stainless steel, fully-automatic premix burner for low-emission burning of natural gas.

Fan unit consisting of a 2-speed, 3-phase external rotor motor with pressure-resistant aluminium sickle-shaped blades, maintenance-free and quiet, with a high degree of efficiency. Motor protection through built-in thermal contacts. Mounted on side of the housing, a terminal box for the connection of the supply voltage and accessories.

Vortex air distributor with concentric outlet nozzle, 12 adjustable vanes and integrated sound attenuation cowl

TopVent® DGV units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of energy-related products. They are systems of the 'warm air heater' type, provided for in Commission Regulation (EU) 2016/2281.

9.2 Options

Flue gas kit AZF / AZS / AZW

for room air independent installation (flue gas evacuation and combustion air supply)

Individual components of flue gas accessories

for the adaptation of the flue gas kit to local conditions

Standard paint finish SL

in Hoval red (RAL 3000)

Paint finish as desired AL

in RAL colour No. _____

Suspension set AHS

for mounting the unit on ceiling, exterior paint finish matching the unit

Filter box FK

with 2 ISO coarse 60% bag filters (G4), with differential pressure switch for filter monitoring

Flat filter box FFK

with 4 pleated ISO coarse 60% cell filters (G4) with differential pressure switch for filter monitoring

Acoustic cowl AHD

Insertion attenuation 4 dB

Recirculation silencer USD

as an attachment to the unit, made of aluzinc sheet metal, lined with sound insulation matting, insertion attenuation 3 dB

9.3 Control systems

Programmable regulation system with menu-guided operation for fully automated operation of TopVent® units:

- TempTronic RC
- Option module OM
- Room temperature average value MRT4
- Room temperature sensor RF
- Actuator Air-Injector VT-G



TopVent® NGV

Gas-fired air recirculation unit for heating high spaces with lower comfort requirements (e.g. high rack storage areas)

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C

1 Use

1.1 Intended use

TopVent® NGV units are heaters intended for heating high spaces operating with air recirculation.

Intended use also includes compliance with the operating instructions. Any use beyond this is considered improper use. 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.

1.3 Hazards

TopVent® NGV units are state-of-the-art and safe to operate. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Dangers when working with components of the gas circuit
- When working on the unit, objects (e.g. tools) could be dropped.
- Malfunctions as a result of defective parts
- Danger caused by coming in contact with hot components when carrying out work inside the unit or on the flue gas system

2 Construction and operation

TopVent® NGV has been specially developed for use in high spaces. It fulfils the following functions:

- Heating (with gas-fired heat exchanger)
- Recirculation operation
- Air distribution via outlet nozzle
- Air filtration (optional)

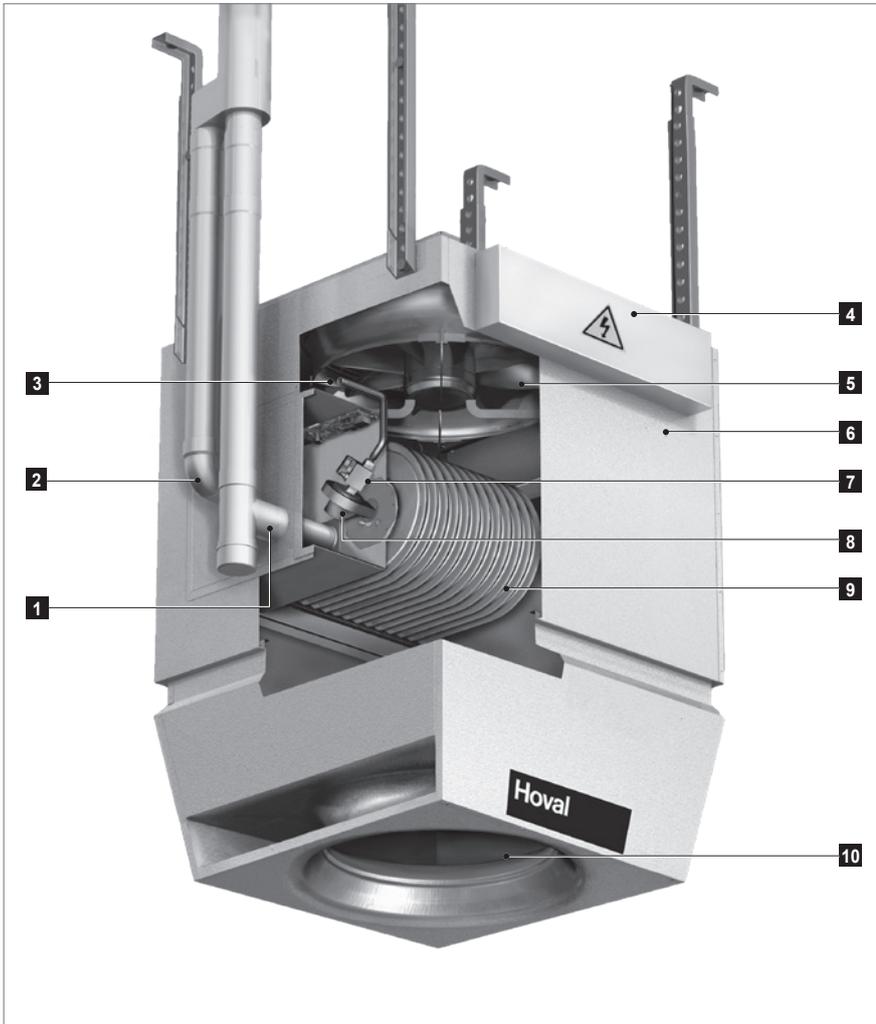
The unit is mounted under the ceiling and draws in room air. The air is heated in a gas-fired heat exchanger and blown back into the room through the outlet nozzle.

With its high performance and efficient air distribution, the TopVent® NGV covers a large area. Therefore, compared to other systems, fewer units are needed to achieve the required conditions.

2 different unit sizes and diverse output levels, as well as a broad range of accessories make possible solutions tailored to the requirements of each individual hall.

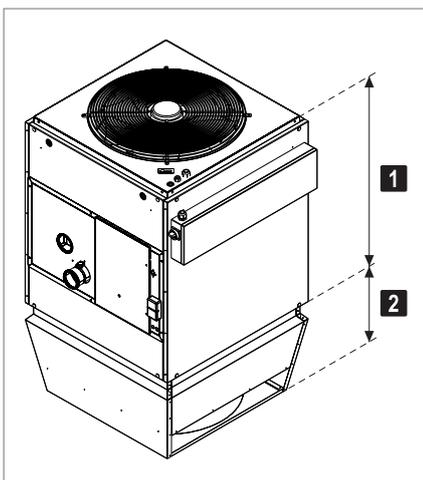
2.1 Unit construction

TopVent® NGV consists of the heater unit and the outlet nozzle. Both components are bolted together, but can be dismantled separately again.



- 1 Flue gas connection
- 2 Combustion air connection
- 3 Gas connection
- 4 Terminal box with isolation switch
- 5 Fan
- 6 Casing
- 7 Gas control valve
- 8 Burner unit consisting of stainless steel gas blower and premix burner
- 9 Heat exchanger of stainless steel
- 10 Outlet nozzle

Fig. C1: TopVent® NGV structure



- 1 Heating section
- 2 Outlet nozzle

Fig. C2: TopVent® NGV components

2.2 Operating modes

TopVent® NGV operates in the following modes:

- Off
- Recirculation
- Recirculation night
- Recirculation speed 1

TempTronic regulates these modes of operation automatically.

Code	Operating mode	Description
OFF	Off The fan is switched off. Frost protection for the room remains active. There is no room temperature control.	Fanoff Heatingoff
REC	Recirculation On/off-operation: if heating is required, the unit draws in room air, heats it and returns the warm air back into the room. The room temperature set value day is active.	Fanspeed 1 / 2 ¹⁾ Heater60... 100 % ¹⁾ Depending on heat demand
RECN	Recirculation night like REC, but with room temperature set value night	
REC1	Recirculation speed 1 The same as REC, but the unit operates only at speed 1 (low air flow rate)	Fanspeed 1 ¹⁾ Heater60... 100 % ¹⁾ Depending on heat demand

Table C1: TopVent® NGV operating modes

3 Technical data

3.1 Type code

NGV - 6 / 30 / ...	
Unit type	TopVent® NGV
Unit size	6 or 9
Output in kW	30 or 60
Options	

Table C2: TopVent® NGV type code

3.2 Application limits

Ambient temperature	min.	°C	-15
	max.	°C	35
Supply air temperature	max.	°C	60
The units cannot be used in:			
<ul style="list-style-type: none"> ■ Damp locations ■ Places with a corrosive or aggressive environment ■ Spaces with a large amount of dust ■ Areas where there is danger of explosion 			

Table C3: TopVent® NGV application limits

3.3 Air flow rate, gas consumption

Unit type		NGV-6/30		NGV-6/60		NGV-9/60	
		1	2	1	2	1	2
Fan speed	min ⁻¹	720	900	910	1280	670	900
Nominal air flow rate ¹⁾	m ³ /h	4200	5900	5300	7200	6800	8800
Floor area reached ²⁾	m ²	347	525	458	687	635	915
Nominal heat input	max. kW	32.0		66.0		66.0	
Nominal heat output	max. kW	29.2		60.5		60.5	
Combustion efficiency ³⁾	%	min. 91		min. 91		min. 91	
Emissions of nitrogen oxides (GCV)	mg/kWh	35.0		42.0		42.0	
Emission efficiency	%	95.5		93.0		94.5	
Seasonal space heating energy efficiency	%	76.2		74.7		75.9	
Gas consumption							
Natural gas: G20, G27 (H, E, Lw)	m ³ /h	3.4		7.0		7.0	
Natural gas: G25, G25.3 (L, LL, K)	m ³ /h	3.8		7.9		7.9	

1) At an air temperature of 20 °C
 2) Mounting height H_{max} = 11 m for a temperature difference between supply air and room air of up to 30 K
 3) In accordance with EN 1020

Table C4: TopVent® NGV technical data

3.4 Electrical connection

Unit type		NGV-6/30	NGV-6/60	NGV-9/60
Supply voltage	V AC	400 3N	400 3N	400 3N
Permitted voltage tolerance	%	+10/-15	+10/-15	+10/-15
Frequency	Hz	50	50	50
Power consumption				
at rated heating capacity	W	690	1120	1010
at minimal capacity	W	510	650	710
in standby mode	W	4	4	4
Current consumption max.	A	1.6	2.5	2.1
Protection rating	–	IP 20	IP 20	IP 20

Table C5: TopVent® NGV electrical connections

3.5 Gas connection

Unit type	NGV-6/30	NGV-6/60	NGV-9/60
Gas appliance type ¹⁾	B ₂₃ , C ₁₃ , C ₃₃		
Gas connection	Rp ½" (internal)	R ¾" (external)	R ¾" (external)
Combustion air connection	DN 80	DN 100	DN 100
Flue gas connection	DN 80	DN 100	DN 100
Max. length of flue gas duct ²⁾	9 m	9 m	9 m
¹⁾ According to method of flue gas evacuation and combustion air supply ²⁾ Equivalent length of formed parts: – 90° elbow 2 m – 45° elbow 1 m – 90° T-piece ... 2 m			

Table C6: TopVent® NGV gas circuit connections

3.6 Sound levels

Unit type		NGV-6/30		NGV-6/60		NGV-9/60	
Fan speed		1	2	1	2	1	2
Sound pressure level (at a distance of 5 m) ¹⁾	dB(A)	47	54	49	55	50	56
Total sound power level	dB(A)	69	76	71	77	72	78
Octave sound power level	63 Hz	72	80	77	82	78	83
	125 Hz	69	76	73	81	74	82
	250 Hz	72	78	73	79	74	80
	500 Hz	66	74	70	74	71	75
	1000 Hz	63	71	66	72	67	73
	2000 Hz	59	68	61	68	62	69
	4000 Hz	52	62	55	62	56	63
	8000 Hz	48	56	50	57	51	58

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

Table C7: TopVent® NGV sound power levels

3.7 Heat output

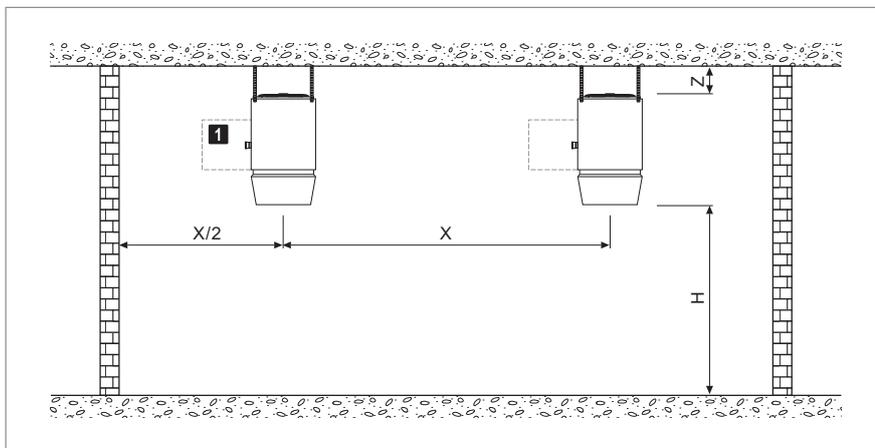
Room air temperature		16 °C			20 °C		
Unit type	Fan speed	Q	t _s	H _{max}	Q	t _s	H _{max}
		kW	°C	m	kW	°C	m
NGV-6/30	1	29.2	38.7	8.8	29.2	42.7	8.9
	2	29.2	32.7	13.8	29.2	36.7	13.9
NGV-6/60	1	60.5	51.9	8.8	60.5	55.9	8.9
	2	60.5	43.0	13.3	60.5	47.0	13.4
NGV-9/60	1	60.5	44.4	9.0	60.5	48.4	9.1
	2	60.5	38.4	12.7	60.5	42.4	12.8

Legend:
 Q = Nominal heat output
 t_s = Maximum supply air temperature
 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 C8: TopVent® NGV heat output, supply air temperatures and mounting height

3.8 Minimum and maximum distances

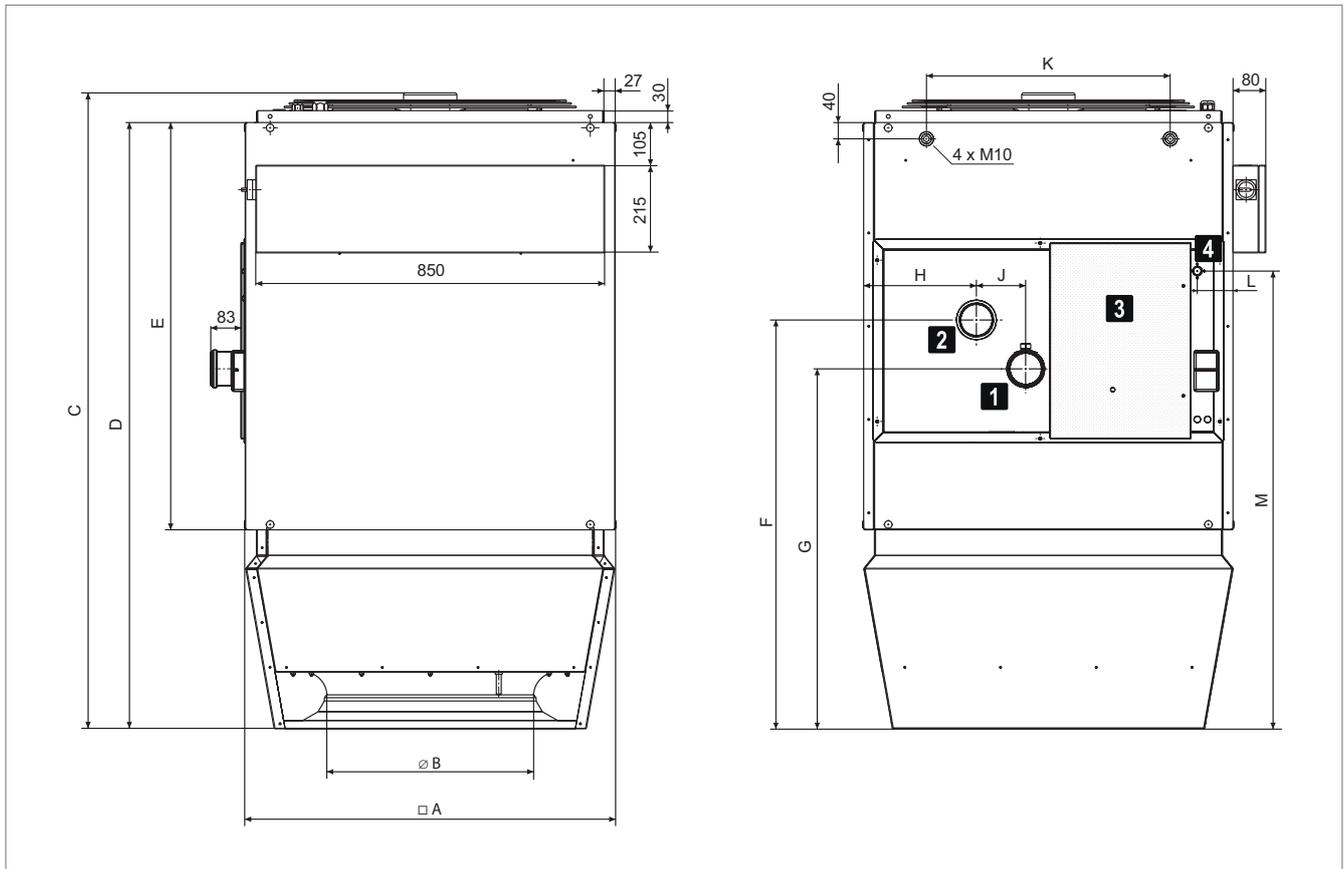


1 Allow a free space of 1.5 m for service and maintenance.

Unit type			NGV-6/30		NGV-6/60		NGV-9/60	
	Fan speed		1	2	1	2	1	2
Unit clearance X	min.	m	10	11	11	13	12	14
	max.	m	19	23	21	26	25	30
Mounting height H	min.	m	4.0	4.0	4.0	4.0	5.0	5.0
Distance from ceiling Z	min.	m	0.3	0.3	0.3	0.3	0.4	0.4

Table C9: TopVent® NGV minimum and maximum distances

4 Dimensions and weights



Unit type		NGV-6/30	NGV-6/60	NGV-9/60
A	mm	900	900	1100
B	mm	500	500	630
C	mm	1562	1562	1640
D	mm	1490	1490	1570
E	mm	1000	1000	1000
F	mm	946	974	1048
G	mm	836	834	908
H	mm	258	237	438
J	mm	110	140	140
K	mm	594	594	846
L	mm	87	73	172
M	mm	1057	1128	1203
Weight	kg	117	127	160

- 1** Flue gas connection with measuring opening
- 2** Combustion air connection
- 3** Inspection door with measuring opening for combustion air temperature
- 4** Gas connection

Fig. C3: TopVent® NGV dimensions and weights

5 Design example



Notice

Use the 'HK-Select' program to design Hoval Indoor Climate Systems. You can download it free of charge on the Internet.

Design data	Example																							
<ul style="list-style-type: none"> ■ Geometry of the room ■ Fabric heat losses ■ Room temperature ■ Extract air temperature ■ Comfort requirements (acoustic) 	Geometry 50 × 70 × 12 m Fabric heat losses 350 kW Room temperature 20 °C Extract air temperature 22 °C Comfort requirements Standard																							
<p>Comfort requirements</p> <p>Define the fan speed in accordance with the acoustic requirements:</p> <ul style="list-style-type: none"> ■ Low noise level → Fan speed 1 ■ Normal noise level → Fan speed 2 	Standard → Fan speed 2																							
<p>Mounting height</p> <ul style="list-style-type: none"> ■ Calculate the actual mounting height (= distance between the floor and the bottom edge of the units). <p style="background-color: #e0e0e0; padding: 2px;">$H = \text{Hall height} - \text{distance from ceiling} - \text{unit height}$</p> <ul style="list-style-type: none"> ■ Compare the actual mounting height with the minimum and maximum mounting height (see Table C9 and HK-Select). 	NGV-6/30 → OK NGV-6/60 → OK NGV-9/60 → OK																							
<p>Minimum number of units</p> <ul style="list-style-type: none"> ■ Determine the minimum number of units for each unit type. Take into account the following criteria: <ul style="list-style-type: none"> - Floor area covered - Heat output - Unit clearances <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="3">Required number</th> <th rowspan="2">Minimum number of units</th> </tr> <tr> <th>Floor area covered</th> <th>Heat output</th> <th>Unit clearances</th> </tr> </thead> <tbody> <tr> <td>NGV-6/30</td> <td>7</td> <td>12</td> <td>12</td> <td>12</td> </tr> <tr> <td>NGV-6/60</td> <td>6</td> <td>6</td> <td>6</td> <td>6</td> </tr> <tr> <td>NGV-9/60</td> <td>4</td> <td>6</td> <td>6</td> <td>6</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ■ Choose the final solution from the remaining possibilities, depending on the geometry of the hall and the costs. 		Type	Required number			Minimum number of units	Floor area covered	Heat output	Unit clearances	NGV-6/30	7	12	12	12	NGV-6/60	6	6	6	6	NGV-9/60	4	6	6	6
Type	Required number			Minimum number of units																				
	Floor area covered	Heat output	Unit clearances																					
NGV-6/30	7	12	12	12																				
NGV-6/60	6	6	6	6																				
NGV-9/60	4	6	6	6																				

6 Options

TopVent® NGV can be adapted to the requirements of a specific project thanks to a range of optional equipment. A detailed description of all optional components is found in the 'Options' part of this design handbook.

Option	Use
Flue gas accessories	for simple installation independently of room air
Paint finish	in the Hoval red or in any colour required
Suspension set	for mounting the unit on ceiling
Filter box	to filter recirculation air
Recirculation silencer	to reduce noise levels in the room (reduced noise reflection from the ceiling)

Table C10: Availability of options for TopVent® NGV

7 Control system

TopVent® NGV units are controlled by TempTronic RC. This programmable control unit, developed especially for TopVent® gas units, offers the following advantages:

- Regulation of the room temperature
- 3 set point values can be set (Room temperature day, Room temperature night and Frost protection temperature)
- Control of operating modes according to week programme and calendar
- Registration of unit malfunctions in an alarm list
- Password protection for user and service personnel
- Menu-guided operation via a 4-line display
- Integrated room temperature sensor

You will find a detailed description of TempTronic in the 'Control systems' part of this handbook.

8 Transport and installation

8.1 Installation



Caution

Risk of injury from incorrect handling. Have transport and assembly work carried out by trained specialists!

For the purposes of installation the units are provided with 4 M10 rivet nuts with hexagon bolts and washers. The following guidelines are important when preparing for assembly:

- Attach the TopVent® unit using a suspension set (option) or by means of steel flat, slotted steel flat, angles, steel cables, etc.
- Secure the unit only to ceilings of fireproof materials and with sufficient load-bearing capacity.
- Do not use eyebolts.
- Do not install any additional loads.
- The unit must be installed horizontally.
- Non-vertical suspensions are permissible up to a maximum angle of 45°.

8.2 Installation of the flue gas evacuation and the combustion air supply



Caution

Risk of injury from incorrect handling. Installation of the flue gas evacuation and the combustion air supply may only be carried out by specialists!

Observe national / local regulations when planning the flue gas evacuation and the combustion air supply. From an early stage, coordinate the installation with the responsible district chimney sweep authorities and obtain the necessary authorisation from the local building authority.

Please note the following:

- The units can be installed as room air dependent (Type B₂₃) or room air independent (Type C₁₃, C₃₃) appliances.
- If the unit is room air independent, equip it with the optional flue gas kit.
- For room air dependent operation the combustion air is taken directly from the room in which the unit is installed. Ensure the room is sufficiently ventilated and that the combustion air is free from pollutants and aggressive substances (halogens such as chlorides, fluorides, etc.).
- Observe the maximum lengths given in Table C6 (see chapter 3 'Technical data').

8.3 Gas connection

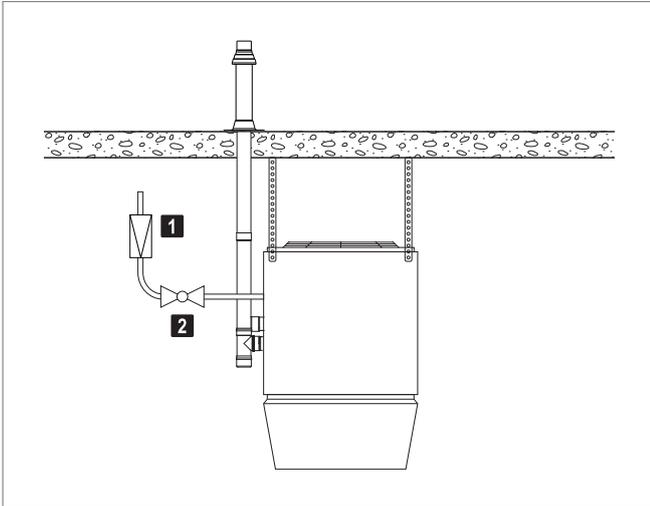


Caution

Risk of injury from incorrect handling. The gas connection may only be carried out by specialists authorised by the gas supply company!

Please note the following:

- The fuel used is natural gas. Check the type of gas the unit is set to work with and, if necessary, have Hoval Customer Service reset the unit to the type of gas supplied locally.
- During operation of the unit, the required quantity of gas and the necessary pressure of gas must be present constantly.
- Connect the gas supply line with appropriate bolted joints which can be loosened, tension-free and vibration-free.
- The connection of the unit to the gas supply line must be gas-tight.
- Ensure that a gas pressure regulator and a cut-off-valve (not part of the scope of supply) are installed directly before the unit.



1 Gas pressure regulator (20...50 mbar)

Recommended settings:

- Natural gas G20 20 mbar
- Natural gas G25 25 mbar

2 Cut-off-valve

Fig. C4: Gas pressure regulator and cut-off valve in the gas supply line

8.4 Electrical installation



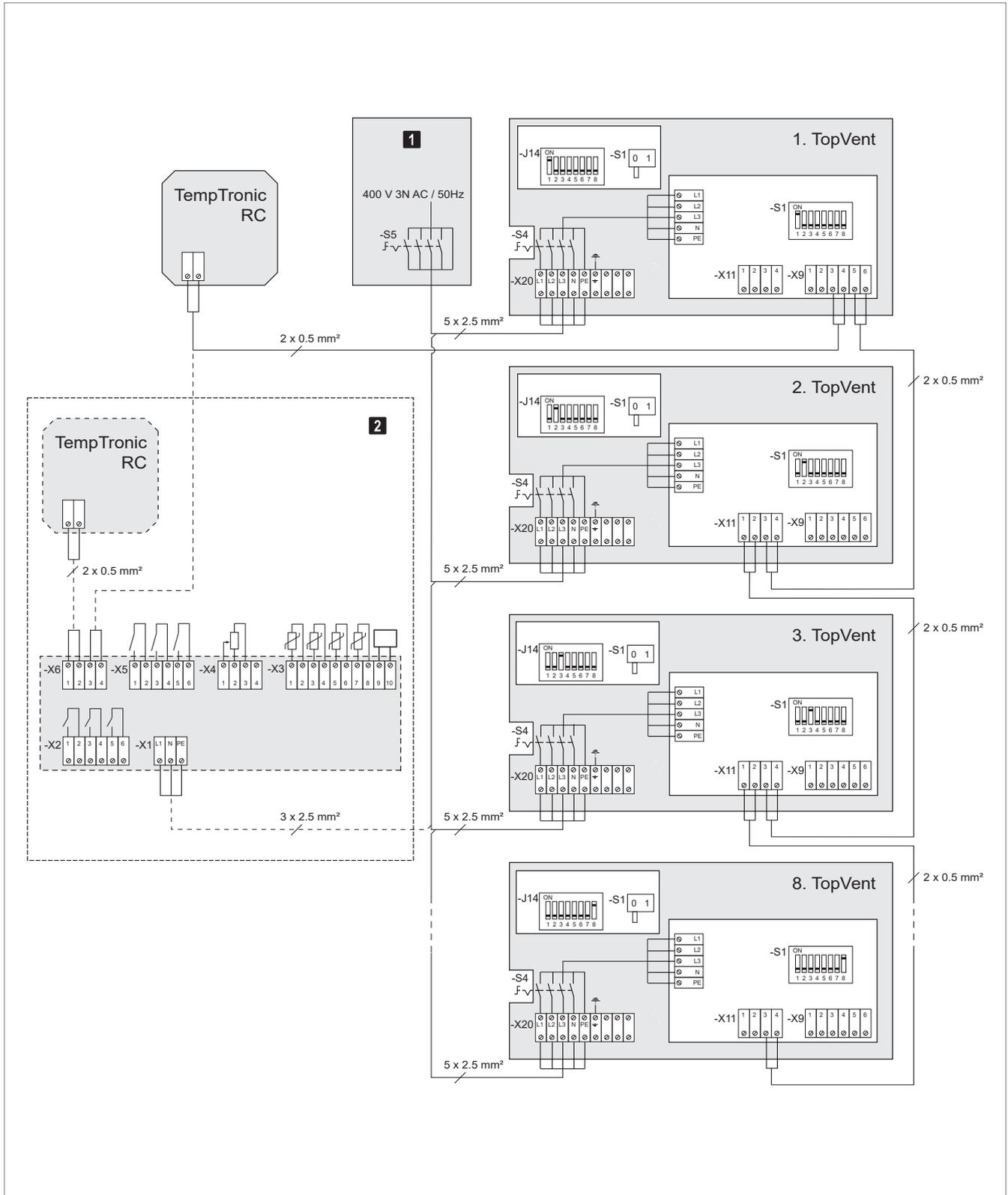
Caution

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

- Observe all relevant regulations (e.g. EN 60204-1).
- Check whether the local operating voltage, frequency and fuse protection match the data on the type plate. If there are any discrepancies, the unit must not be connected!
- Cable cross-sections must be selected according to technical regulations, e. g. VDE 0100.
- Electrical installation to be carried out according to wiring diagram.
- Do not forget the master switch for the complete installation.

A TempTronic can control up to 8 TopVent® units simultaneously:

- Connect TempTronic and the units to each other via a system bus.
- Assign a number to each unit:
 - Micro switch S1 on the power module
 - Micro switch J14 on the burner control



- 1 Control panel (on site)
- 2 Variant: connection for TempTronic RC and option module

Fig. C5: Connection diagram

9 Specification texts

9.1 TopVent® NGV

Gas-fired recirculation unit for heating high spaces

Corrosion-resistant aluzinc sheet metal housing with access panel and four M10 rivet nuts for installation of the optional suspension set for ceiling mounting.

Gas-fired heat exchanger of premium-quality stainless steel, fully-automatic premix burner for low-emission burning of natural gas.

Fan unit consisting of a 2-speed, 3-phase external rotor motor with pressure-resistant aluminium sickle-shaped blades, maintenance-free and quiet, with a high degree of efficiency. Motor protection through built-in thermal contacts. Mounted on side of the housing, a terminal box for the connection of the supply voltage and accessories. Concentric outlet nozzle.

TopVent® NGV units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of energy-related products. They are systems of the 'warm air heater' type, provided for in Commission Regulation (EU) 2016/2281.

9.2 Options

Flue gas kit AZF / AZS / AZW

for room air independent installation (flue gas evacuation and combustion air supply)

Individual components of flue gas accessories

for the adaptation of the flue gas kit to local conditions

Standard paint finish SL

in Hoval red (RAL 3000)

Paint finish as desired AL

in RAL colour No. _____

Suspension set AHS

for mounting the unit on ceiling, exterior paint finish matching the unit

Filter box FK

with 2 ISO coarse 60% bag filters (G4), with differential pressure switch for filter monitoring

Flat filter box FFK

with 4 pleated ISO coarse 60% cell filters (G4) with differential pressure switch for filter monitoring

Recirculation silencer USD

as an attachment to the unit, made of aluzinc sheet metal, lined with sound insulation matting, insertion attenuation 3 dB

9.3 Control systems

Programmable regulation system with menu-guided operation for fully automated operation of TopVent® units:

- TempTronic RC
- Option module OM
- Room temperature average value MRT4
- Room temperature sensor RF



TopVent® GV

Gas-fired air recirculation unit for heating low-ceiling spaces

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2 Construction and operation	34
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1 Use

1.1 Intended use

TopVent® GV units are used for the heating of low spaces, operating with air recirculation.

Intended use also includes compliance with the operating instructions. Any use beyond this is considered improper use. 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.

1.3 Hazards

TopVent® GV units are constructed in accordance with the state of the art and are safe to operate. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

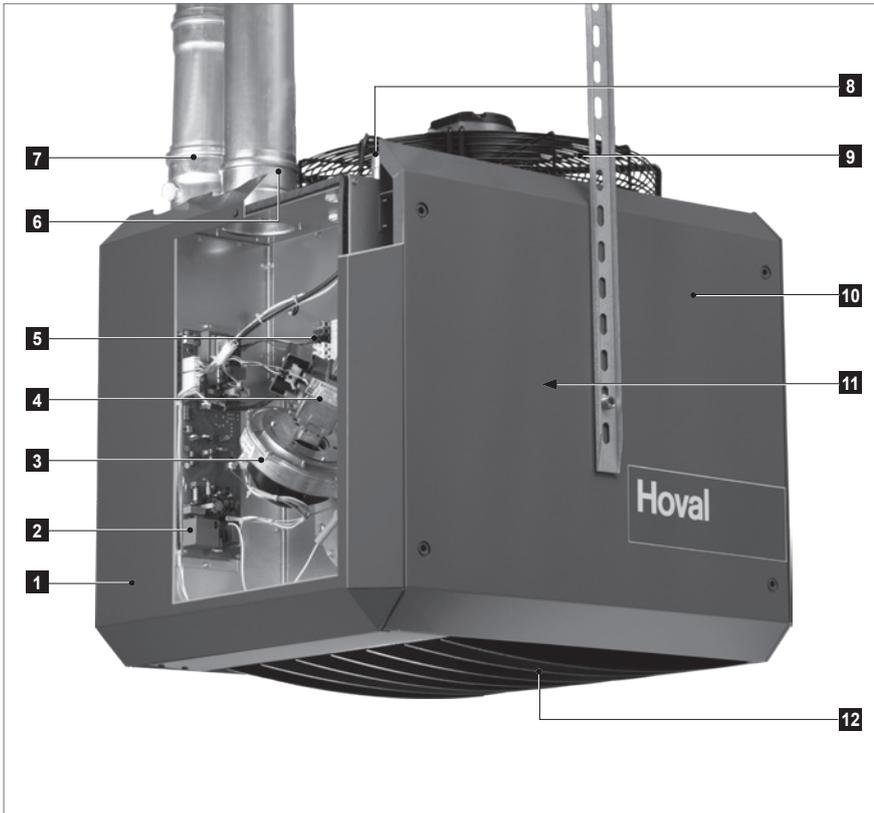
- Dangers when working with the electrical system
- Dangers when working with components of the gas circuit
- When working on the unit, objects (e.g. tools) could be dropped.
- Malfunctions as a result of defective parts
- Danger caused by coming in contact with hot components when carrying out work inside the unit or on the flue gas system

2 Construction and operation

TopVent® GV was especially developed for cost-efficient heating of low-ceiling spaces. It fulfils the following functions:

- Heating (with gas-fired heat exchanger)
- Recirculation operation
- Air distribution via air outlet louvre

The unit is mounted under the ceiling or on a wall and draws in room air. The air is heated in a gas-fired heat exchanger and injected back into the interior through the air outlet louvre.



- 1 Access panel
- 2 Burner control
- 3 Burner unit consisting of stainless steel gas blower and premix burner
- 4 Gas control valve
- 5 Terminal strip
- 6 Combustion air connection
- 7 Flue gas connection
- 8 Gas connection
- 9 Fan
- 10 Casing
- 11 Heat exchanger of stainless steel
- 12 Air outlet louvre

Fig. D1: TopVent® GV structure

2.1 Operating modes

TopVent® GV operates in the following modes:

- Off
- Recirculation
- Recirculation night

TempTronic regulates these modes of operation automatically.

Code	Operating mode	Description
OFF	Off The fan is switched off. Frost protection for the room remains active. There is no room temperature control.	Fanoff Heatingoff
REC	Recirculation On/off-operation: if heating is required, the unit draws in room air, heats it and returns the warm air back into the room. The room temperature set value day is active.	Fanmodulated ¹⁾ Heatermodulated ¹⁾
RECN	Recirculation night like REC, but with room temperature set value night	¹⁾ Depending on heat demand

Table D1: TopVent® GV operating modes

3 Technical data

3.1 Type codes

GV - 3 / 30 / ...	
Unit type	TopVent® GV
Unit size	3 or 5
Output in kW	30 or 50
Options	

Table D2: TopVent® GV unit type reference

3.2 Application limits

Ambient temperature	min.	°C	-15
	max.	°C	35
Supply air temperature	max.	°C	60
The units cannot be used in:			
<ul style="list-style-type: none"> ■ Damp locations ■ Places with a corrosive or aggressive environment ■ Spaces with a large amount of dust ■ Areas where there is danger of explosion 			

Table D3: TopVent® GV application limits

3.3 Air flow rate, gas consumption

Unit type		GV-3/30	GV-5/50
Nominal air flow rate ¹⁾	m ³ /h	2600	5150
Floor area reached ²⁾	m ²	70	115
Nominal heat input	max. kW	32.0	54.9
Nominal heat output	max. kW	29.2	49.9
Combustion efficiency ³⁾	%	min. 91	min. 91
Emissions of nitrogen oxides (GCV)	mg/kWh	35.0	41.0
Emission efficiency	%	90.6	91.2
Seasonal space heating energy efficiency	%	72.8	74.1
Gas consumption			
Natural gas: G20, G27 (H, E, Lw)	m ³ /h	3.4	5.8
Natural gas: G25, G25.3 (L, LL, K)	m ³ /h	3.8	6.6

1) at an air temperature of 20 °C
 2) with vertical air flow
 3) in accordance with EN 1020

Table D4: TopVent® GV technical data

3.4 Electrical connection

Unit type		GV-3/30	GV-5/50
Supply voltage	V AC	230	230
Permitted voltage tolerance	%	+10/-15	+10/-15
Frequency	Hz	50	50
Power consumption			
at rated heating capacity	W	250	450
at minimal capacity	W	250	450
in standby mode	W	4	4
Current consumption max.	A	1.1	2.0
Protection rating	–	IP 00B	IP 00B

Table D5: TopVent® GV electrical connection

3.5 Gas connection

Unit type	GV-3/30	GV-5/50
Gas appliance type ¹⁾	B ₂₃ , C ₁₃ , C ₃₃	
Gas connection	Rp ½" (internal)	R ¾" (external)
Combustion air connection	DN 80	DN 100
Flue gas connection	DN 80	DN 100
Max. length of flue gas duct ²⁾	9 m	9 m

1) according to method of flue gas evacuation and combustion air supply
 2) Equivalent length of formed parts:
 – 90° elbow 2 m
 – 45° elbow 1 m
 – 90° T-piece ... 2 m

Table D6: TopVent® GV gas circuit connections

3.6 Sound levels

Unit type		GV-3/30	GV-5/50
Sound pressure level (at a distance of 5 m) ¹⁾	dB(A)	49	51
Total sound power level	dB(A)	71	73
Octave sound power level	63 Hz	34	36
	125 Hz	47	49
	250 Hz	65	67
	500 Hz	65	67
	1000 Hz	64	66
	2000 Hz	64	66
	4000 Hz	59	61
	8000 Hz	53	55

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

Table D7: TopVent® GV sound power levels

3.7 Heat output

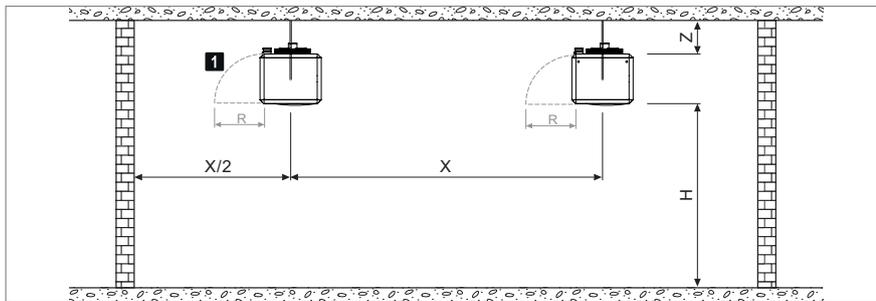
Air entry temperature	16°C			20°C		
	Q	t _s	H _{max}	Q	t _s	H _{max}
Unit type	kW	°C	m	kW	°C	m
GV-3/30	29.2	49.0	4.4	29.2	53.0	4.4
GV-5/50	49.9	45.0	5.5	49.9	49.0	5.5

Legend:
 Q = Nominal heat output
 t_s = Maximum supply air temperature
 H_{max} = Maximum mounting height (with vertical air flow)

Table D8: TopVent® GV heat output, supply air temperatures and mounting height

3.8 Minimum and maximum distances

Vertical air flow

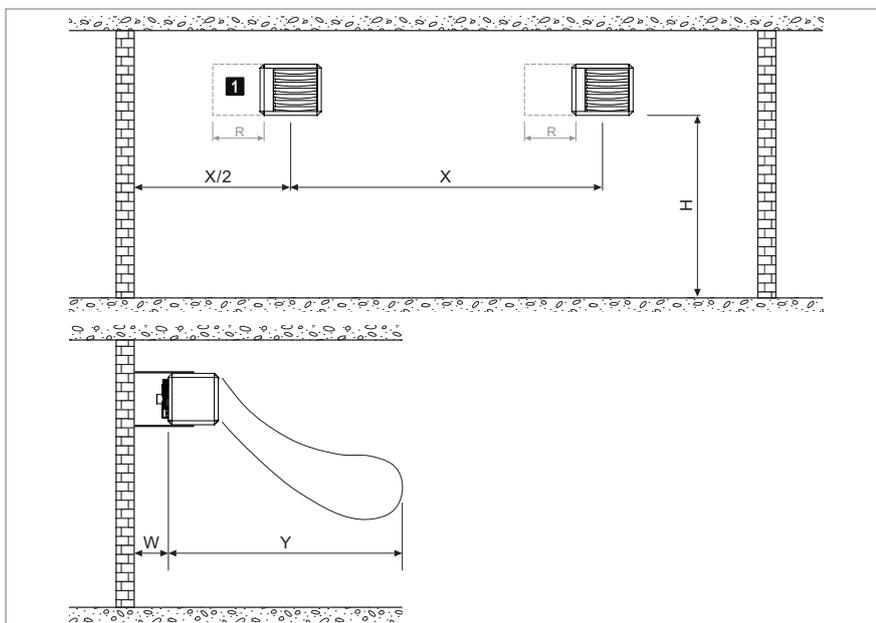


1 Allow sufficient free space to open inspection door.

Unit type			GV-3/30	GV-5/50
Unit clearance X	min.	m	6.0	8.5
	max.	m	7.5	10.5
Mounting height H	min.	m	2.0	2.4
	max.	m	4.4	5.5
Distance from ceiling Z	min.	m	0.5	0.5

Table D9: TopVent® GV minimum and maximum distances for vertical air flow (ceiling mounting)

Horizontal air flow



1 Allow sufficient free space to open inspection door.

Unit type			GV-3/30	GV-5/50
Unit clearance X	min.	m	8.0	10.0
	max.	m	12.0	14.0
Mounting height H	min.	m	1.7	1.7
	max.	m	3.0	3.5
Distance from wall W ¹⁾	min.	mm	400...640	420...560
Reach Y	max.	m	23.0	28.8

1) The effective distance from wall depends on the method of flue gas evacuation chosen.

Table D10: TopVent® GV minimum and maximum distances for horizontal air flow (wall mounting)

4 Dimensions and weights

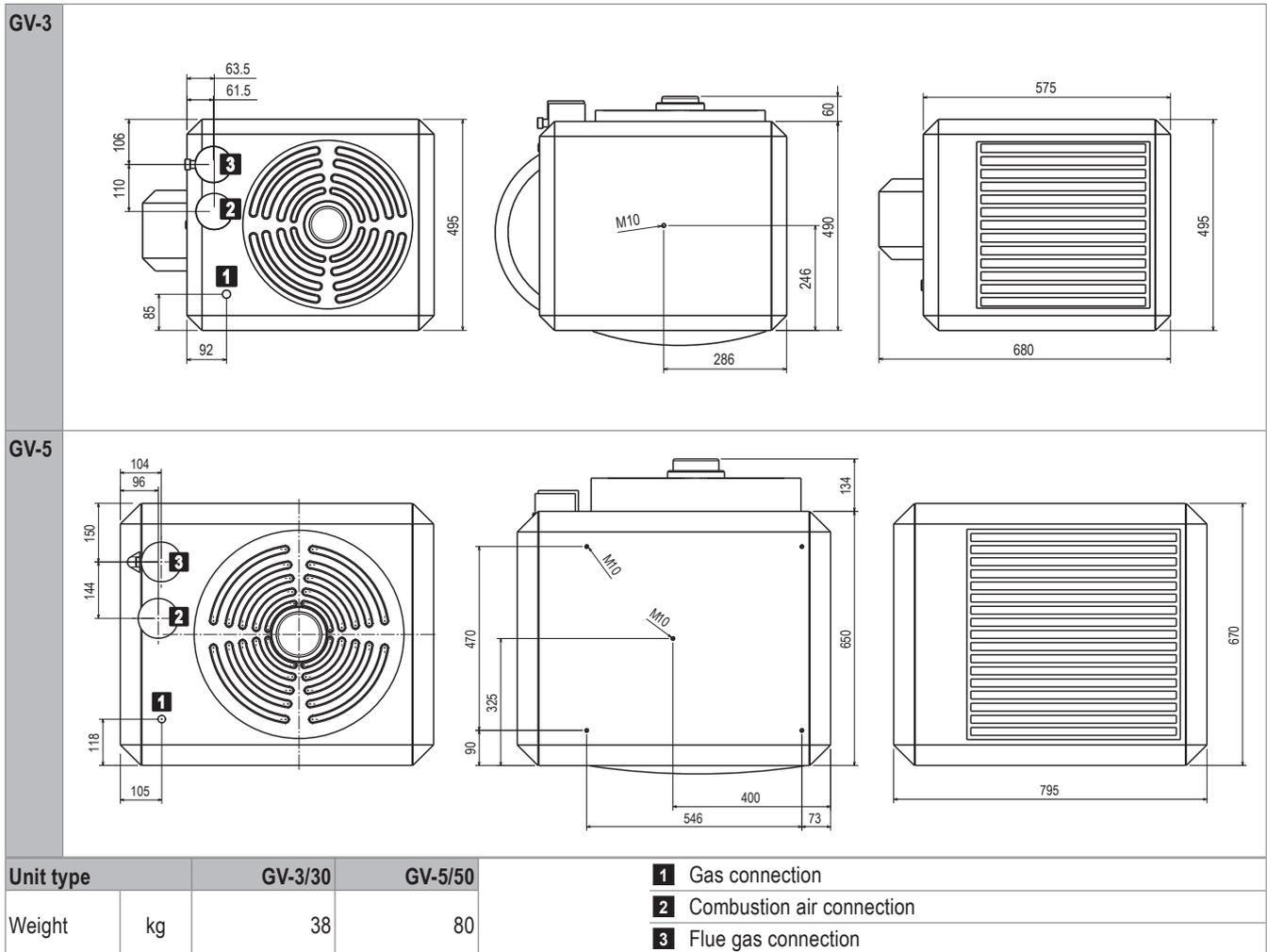


Fig. D2: TopVent® GV dimensions and weights

5 Design example

i Notice
Use the 'HK-Select' program to design Hoval Indoor Climate Systems. You can download it free of charge on the Internet.

i Notice
As a general principle, Hoval recommends vertical air flow, that is, that the units be ceiling-mounted. Use horizontal air flow if ceiling-mounting is not possible due to the particular conditions (added constructions, mounting height).

5.1 Vertical air flow

Design data	Example																		
<ul style="list-style-type: none"> ■ Geometry of the room ■ Fabric heat losses ■ Room temperature ■ Extract air temperature <i>(Because of the low height, room temperature = extract air temperature is used in this example.)</i> ■ Distance from ceiling 	<p>Geometry 15 × 20 × 4 m Fabric heat losses 38 kW Room temperature 20 °C Extract air temperature 20 °C</p> <p>Distance from ceiling 0.6 m</p>																		
<p>Mounting height</p> <ul style="list-style-type: none"> ■ Calculate the actual mounting height (= distance between the floor and the bottom edge of the units). <p style="margin-left: 20px;">$H = \text{Hall height} - \text{distance from ceiling} - \text{unit height}$</p> <ul style="list-style-type: none"> ■ Compare the actual mounting height with the minimum and maximum mounting height (see Table D9 and HK-Select). 	<p>GV-3/30 → OK GV-5/50 → OK</p>																		
<p>Minimum number of units</p> <ul style="list-style-type: none"> ■ Determine the minimum number of units for each unit type. Take into account the following criteria: <ul style="list-style-type: none"> – Floor area covered – Heat output – Unit clearances 																			
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="3">Required number</th> <th rowspan="2">Minimum number of units</th> </tr> <tr> <th>Floor area covered</th> <th>Heat output</th> <th>Unit clearances</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0e0e0;">GV-3/30</td> <td style="text-align: center;">5</td> <td style="text-align: center;">2</td> <td style="text-align: center;">6</td> <td style="text-align: center; background-color: #e0e0e0;">6</td> </tr> <tr> <td style="background-color: #e0e0e0;">GV-5/50</td> <td style="text-align: center;">3</td> <td style="text-align: center;">1</td> <td style="text-align: center;">4</td> <td style="text-align: center; background-color: #e0e0e0;">4</td> </tr> </tbody> </table>		Type	Required number			Minimum number of units	Floor area covered	Heat output	Unit clearances	GV-3/30	5	2	6	6	GV-5/50	3	1	4	4
Type	Required number			Minimum number of units															
	Floor area covered	Heat output	Unit clearances																
GV-3/30	5	2	6	6															
GV-5/50	3	1	4	4															
<ul style="list-style-type: none"> ■ Choose the final solution from the remaining possibilities, depending on the geometry of the hall and the costs. 																			

5.2 Horizontal air flow

Design data	Example														
<ul style="list-style-type: none"> ■ Geometry of the room ■ Fabric heat losses ■ Room temperature ■ Extract air temperature <i>(Because of the low height, room temperature = extract air temperature is used in this example.)</i> ■ Distance from ceiling 	<p>Geometry 15 × 20 × 3 m Fabric heat losses 38 kW Room temperature 20 °C Extract air temperature 20 °C</p> <p>Distance from ceiling 0.6 m</p>														
<p>Mounting height</p> <ul style="list-style-type: none"> ■ Calculate the actual mounting height (= distance between the floor and the bottom edge of the units). <p style="background-color: #d3d3d3; padding: 2px;">$H = \text{Hall height} - \text{distance from ceiling} - \text{unit height}$</p> <ul style="list-style-type: none"> ■ Compare the actual mounting height with the minimum and maximum mounting height (see Table D10). 	<p>GV-3/30 → OK GV-5/50 → OK</p>														
<p>Minimum number of units</p> <ul style="list-style-type: none"> ■ Determine the minimum number of units for each unit type. Take into account the following criteria: <ul style="list-style-type: none"> - Heat output - Unit clearances and reach <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">Type</th> <th colspan="2">Required number</th> <th rowspan="2">Minimum number of units</th> </tr> <tr> <th>Heat output</th> <th>Unit clearances and reach</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">GV-3/30</td> <td>2</td> <td>2</td> <td style="background-color: #d3d3d3;">2</td> </tr> <tr> <td style="background-color: #d3d3d3;">GV-5/50</td> <td>1</td> <td>2</td> <td style="background-color: #d3d3d3;">2</td> </tr> </tbody> </table> <ul style="list-style-type: none"> ■ Choose the final solution from the remaining possibilities, depending on the geometry of the hall and the costs. 		Type	Required number		Minimum number of units	Heat output	Unit clearances and reach	GV-3/30	2	2	2	GV-5/50	1	2	2
Type	Required number		Minimum number of units												
	Heat output	Unit clearances and reach													
GV-3/30	2	2	2												
GV-5/50	1	2	2												

- When positioning the units consider the following:
- Do not direct the air current directly at persons.
 - Do not install the units at too great a distance from the ceiling, in order to avoid the formation of warm air pockets.
 - The units can also be arranged opposite each other or opposite and offset.

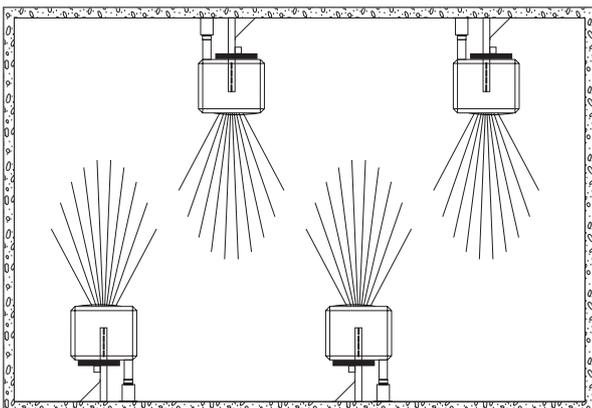


Fig. D3: Offset arrangement of the units on opposing walls

6 Options

TopVent® GV can be adapted to the requirements of a specific project thanks to a range of optional equipment. A detailed description of all optional components is found in the 'Options' part of this design handbook.

Option	Use
Flue gas accessories	for simple installation independently of room air
Suspension set	for mounting the unit on ceiling

Table D11: Availability of options for TopVent® GV

7 Control system

TopVent® GV units are controlled by TempTronic RC. This programmable control unit, developed especially for TopVent® gas units, offers the following advantages:

- Regulation of the room temperature
- 3 set point values can be set (Room temperature day, Room temperature night and Frost protection temperature)
- Control of operating modes according to week programme and calendar
- Registration of unit malfunctions in an alarm list
- Password protection for user and service personnel
- Menu-guided operation via a 4-line display
- Integrated room temperature sensor

You will find a detailed description of TempTronic in the 'Control systems' part of this handbook.

8 Transport and installation

8.1 Installation



Caution

Risk of injury from incorrect handling. Have transport and assembly work carried out by trained specialists!

For their installation the units are equipped as follows:

GV-3:	■ 2 M10 blind rivet nuts on 2 opposite sides
GV-5:	■ 2 M10 blind rivet nuts on 2 opposite sides ■ 4 M10 blind rivet nuts on one side

For positions, see Fig. D2

Table D12: TopVent® GV securing points

The following guidelines are important when preparing for assembly:

- Attach the TopVent® unit using a suspension set (option) or by means of steel flat, slotted steel flat, angles, steel cables, etc.
- Secure the unit only to ceilings or walls of fireproof materials and with sufficient load-bearing capacity.
- Do not use eyebolts.
- Do not install any additional loads.
- Non-vertical suspensions are permissible up to a maximum angle of 45°.
- The appliance is not suited for additional pressure drop; do not tamper with the appliance to carry out any modifications on your own authority (e.g. duct connections), as these are not permitted.

8.2 Installation of the flue gas evacuation and the combustion air supply



Caution

Risk of injury from incorrect handling. Installation of the flue gas evacuation and the combustion air supply may only be carried out by specialists!

Observe national / local regulations when planning the flue gas evacuation and the combustion air supply. From an early stage, coordinate the installation with the responsible district chimney sweep authorities and obtain the necessary authorisation from the local building authority.

Please note the following:

- The units can be installed as room air dependent (Type B₂₃) or room air independent (Type C₁₃, C₃₃) appliances.

- If the unit is room air independent, equip it with the optional flue gas kit.
- For room air dependent operation the combustion air is taken directly from the room in which the unit is installed. Ensure the room is sufficiently ventilated and that the combustion air is free from pollutants and aggressive substances (halogens such as chlorides, fluorides, etc.).
- Observe the maximum lengths given in Table D6.

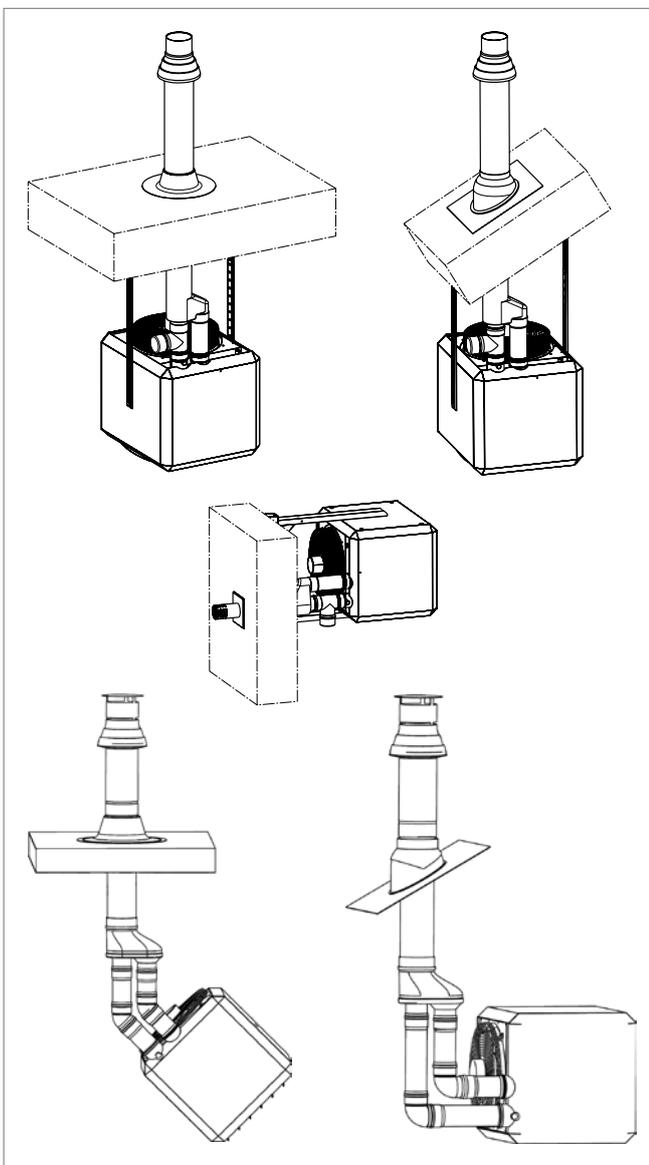


Fig. D4: Installation examples

8.3 Gas connection

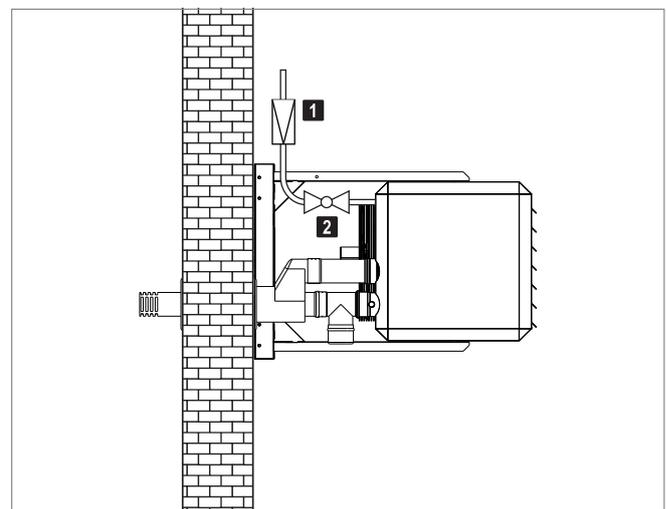


Caution

Risk of injury from incorrect handling. The gas connection may only be carried out by specialists authorised by the gas supply company!

Please note the following:

- The fuel used is natural gas. Check the type of gas the unit is set to work with and, if necessary, have Hoval Customer Service reset the unit to the type of gas supplied locally.
- During operation of the unit, the required quantity of gas and the necessary pressure of gas must be present constantly.
- Connect the gas supply line with appropriate bolted joints which can be loosened, tension-free and vibration-free.
- The connection of the unit to the gas supply line must be gas-tight.
- Ensure that a gas pressure regulator and a cut-off-valve (not part of the scope of supply) are installed directly before the unit.



1 Gas pressure regulator (20...50 mbar)

Recommended settings:

- Natural gas G20 20 mbar
- Natural gas G25 25 mbar

2 Cut-off-valve

Fig. D5: Gas pressure regulator and cut-off-valve in the gas supply line

8.4 Electrical installation

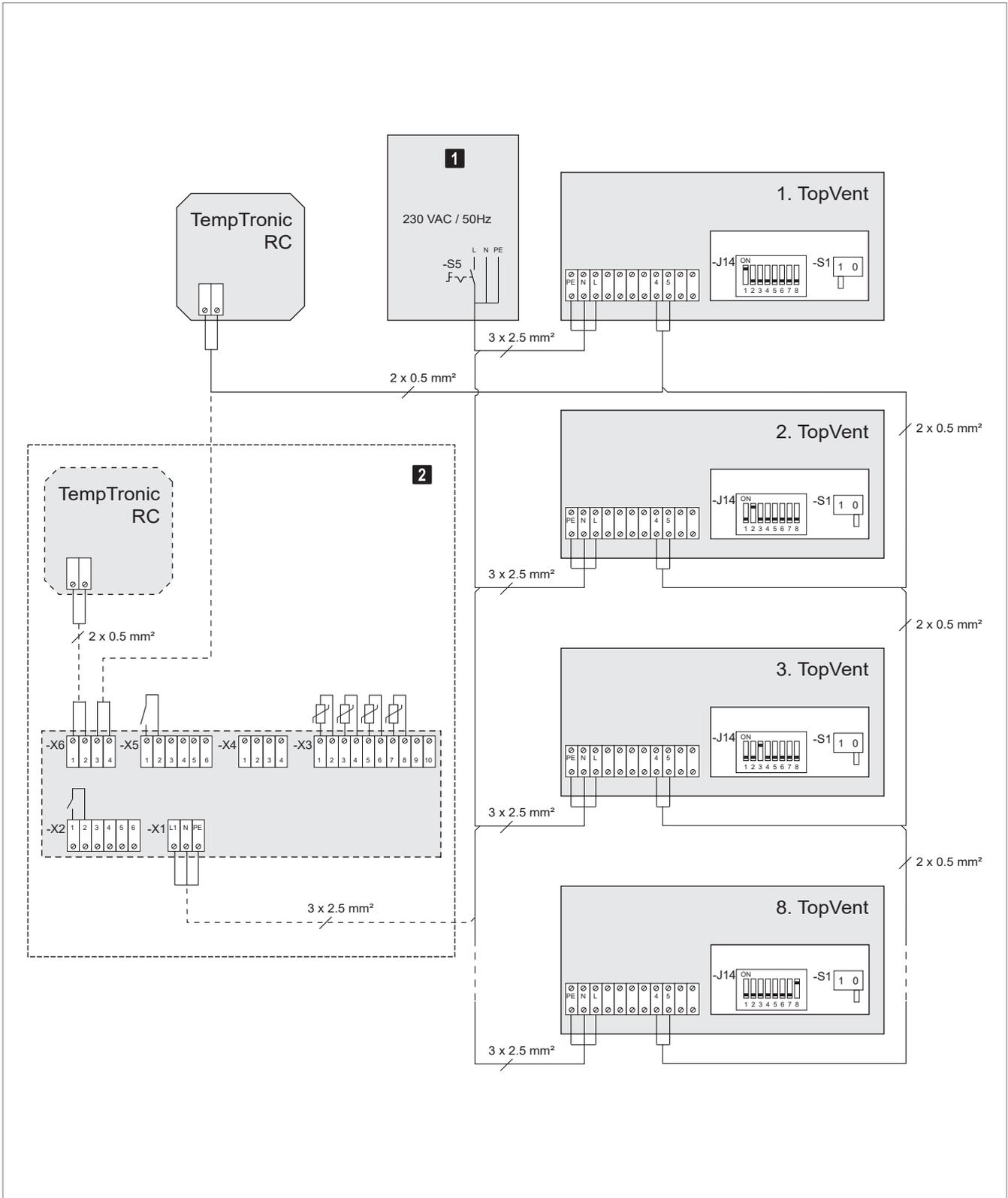
**Caution**

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

- Observe all relevant regulations (e.g. EN60204-1).
- Check whether the local operating voltage, frequency and fuse protection match the data on the type plate. If there are any discrepancies, the unit must not be connected!
- Cable cross-sections must be selected according to technical regulations, e. g. VDE 0100.
- Electrical installation to be carried out according to wiring diagram.
- Do not forget the master switch for the complete installation.

A TempTronic can control up to 8 TopVent® units simultaneously:

- Connect TempTronic and the units to each other via a system bus.
- With micro switch J14 on the burner control, assign to each unit a number of its own.
- Set switch S1 on the pilot unit burner control in position '1', and in the other units in position '0'.



1 Control panel (on site)

2 Variant: connection for TempTronic RC and options module

Table D13: Connection diagram

9 Specification texts

9.1 TopVent® GV

Gas-fired air recirculation unit for heating low-ceiling spaces

Galvanised sheet steel housing, painted in flame red (RAL 3000), with inspection door and two M10 blind rivet nuts for installation of the optional suspension set for ceiling or wall mounting.

Gas-fired heat exchanger of premium-quality stainless steel, fully-automatic premix burner for low-emission burning of natural gas.

Fan unit consisting of a high-efficiency, infinitely variable axial-flow fan with a capacitor motor, maintenance-free and low-noise.

Terminal box integrated in the housing for connection to electricity supply.

Air outlet louvre with manually-adjustable air flow louvres.

TopVent® GV units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of energy-related products. They are systems of the 'warm air heater' type, provided for in Commission Regulation (EU) 2016/2281.

9.2 Options

Flue gas kit AZF / AZS / AZW

for room air independent installation (flue gas evacuation and combustion air supply)

Individual components of flue gas accessories

for the adaptation of the flue gas kit to local conditions

Suspension set AH / AW

for mounting appliances on ceiling or on wall

9.3 Control systems

Programmable regulation system with menu-guided operation for fully automated operation of TopVent® units:

- TempTronic RC
- Option module OM
- Room temperature average value MRT4
- Room temperature sensor RF



TopVent® MG

Gas-fired supply air handling unit for ventilating and heating high spaces

1 Use	48
2 Construction and operation	48
3 Technical data	51
4 Dimensions and weights	54
5 Design example	55
6 Options	57
7 Control system	57
8 Transport and installation	57
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1 Use

1.1 Intended use

TopVent® MG units are used for the heating of high spaces, operating with fresh air, mixed air or recirculating air.

Intended use also includes compliance with the operating instructions. Any use beyond this is considered improper use. 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.

1.3 Hazards

TopVent® MG units are state-of-the-art and safe to operate. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Dangers when working with components of the gas circuit
- When working on the unit, objects (e.g. tools) could be dropped.
- Malfunctions as a result of defective parts
- Danger caused by coming in contact with hot components when carrying out work inside the unit or on the flue gas system

2 Construction and operation

TopVent® MG has been specially developed for use in high spaces. It fulfils the following functions:

- Heating (with gas-fired heat exchanger)
- Fresh air supply
- Mixed air operation
- Recirculation operation
- Air distribution with Air-Injector
- Air filtration

The unit is installed under the ceiling and connected to a fresh air duct. According to the position of the dampers, it draws in fresh air and/or interior air, filters it, heats it in the gas-fired heat exchanger and injects it into the interior through the Air-Injector.

Thanks to its high performance and efficient air distribution the TopVent® MG covers a large area. Therefore, compared to other systems, fewer units are needed to achieve the required conditions.

2 different unit sizes and diverse output levels, as well as a broad range of accessories make possible solutions tailored to the requirements of each individual hall.

2.1 Unit construction

TopVent® MG consists of the following components:

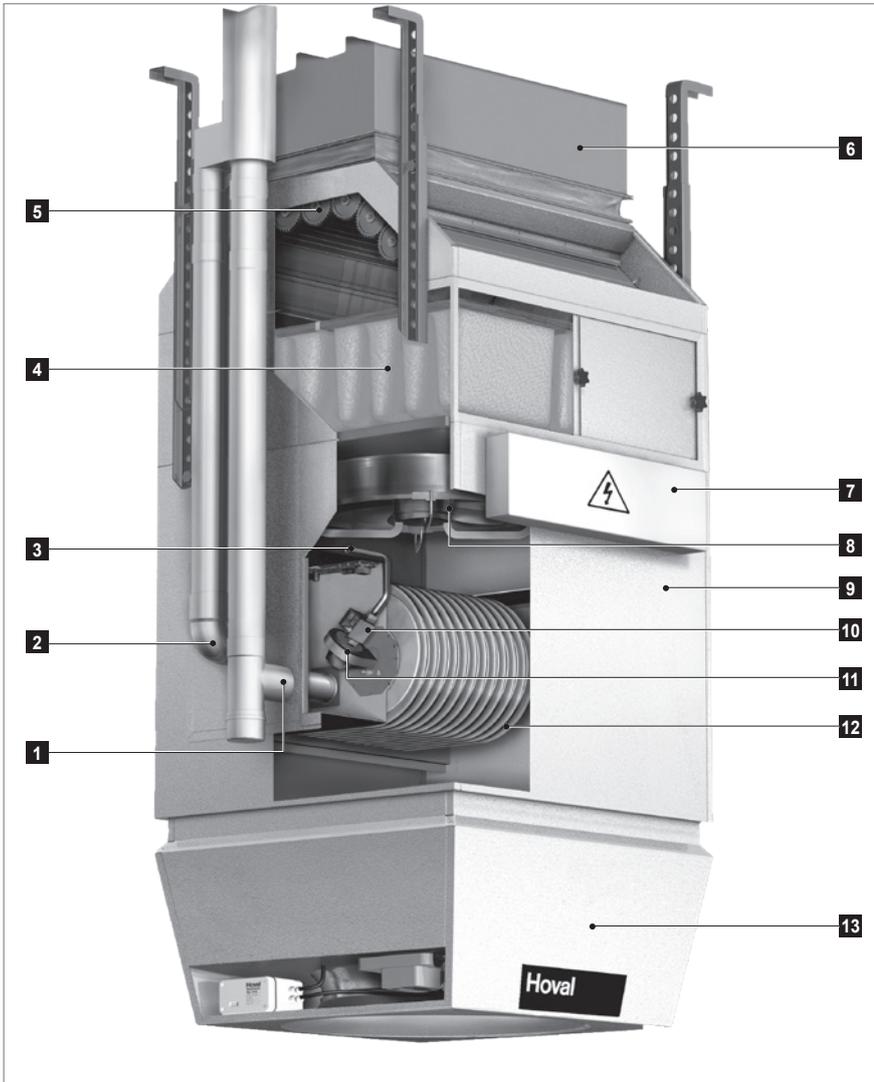
- Mixed air box
- Filter box
- Heating section
- Air-Injector

The components are bolted together, but can be dismantled separately again.

2.2 Air distribution with the Air-Injector

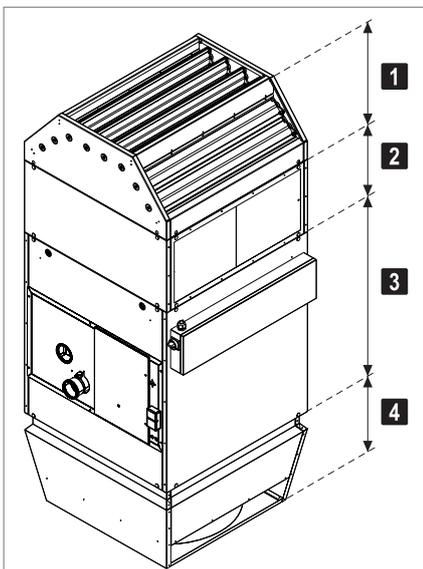
The patented air distributor – called the Air-Injector – is the core element. The air discharge angle is set by means of the adjustable guide vanes. It depends on the air flow rate, the mounting height and the temperature difference between the supply air and room air. The air is therefore blown into the room vertically downward, conically or horizontally. This ensures that:

- with each unit a large area of the hall can be covered,
- the occupied area is draught-free,
- the temperature stratification in the room is reduced, thus saving energy.



- 1 Flue gas connection
- 2 Combustion air connection
- 3 Gas connection
- 4 Filter box
- 5 Mixed air box
- 6 Fresh air duct (not included in the Hoval scope of supply)
- 7 Terminal box with isolation switch
- 8 Fan
- 9 Casing
- 10 Gas control valve
- 11 Burner unit consisting of stainless steel gas blower and premix burner
- 12 Heat exchanger of stainless steel
- 13 Air-Injector

Fig. E1: TopVent® MG structure



- 1 Mixed air box
- 2 Filter box
- 3 Heating section
- 4 Air-Injector

Fig. E2: TopVent® MG components

2.3 Operating modes

TopVent® MG operates in the following modes:

- Off
- Supply air speed 2
- Supply air speed 1
- Recirculation
- Recirculation night
- Recirculation speed 1

TempTronic regulates these modes of operation automatically.

Code	Operating mode	Description
OFF	Off The fan is switched off. Frost protection for the room remains active. There is no room temperature control.	Fanoff Fresh air damper.....closed Heatingoff
SA2	Supply air speed 2 The TopVent® unit blows fresh air into the room. A fixed fresh air ratio is set. The heating is regulated according to the heat demand. The room temperature set value day is active. The unit operates at speed 2 (high air flow rate).	Fanspeed 2 Fresh air damper.....20 % open ¹⁾ Heater60...100 % ²⁾ ¹⁾ Percentage is adjustable ²⁾ Depending on heat demand
SA1	Supply air speed 1 the same as SA2, but the unit operates only at fan speed 1 (low air flow rate)	Fanspeed 1 Fresh air damper.....20 % open ¹⁾ Heater60...100 % ²⁾ ¹⁾ Percentage is adjustable ²⁾ Depending on heat demand
REC	Recirculation On/off-operation: if heating is required, the unit draws in room air, heats it and returns the warm air back into the room. The room temperature set value day is active.	Fanspeed 1 / 2 ¹⁾ Fresh air damper.....closed Heater60...100 % ¹⁾ Depending on heat demand
RECN	Recirculation night like REC, but with room temperature set value night	
REC1	Recirculation speed 1 The same as REC, but the unit operates only at speed 1 (low air flow rate)	Fanspeed 1 ¹⁾ Fresh air damper.....closed Heater60...100 % ¹⁾ Depending on heat demand

Table E1: TopVent® MG operating modes

3 Technical data

3.1 Type code

MG - 6 / 30 / ...	
Unit type	TopVent® MG
Unit size	6 or 9
Output in kW	30 or 60
Options	

Table E2: TopVent® MG type code

3.2 Application limits

Ambient temperature	min.	°C	-15
	max.	°C	35
Supply air temperature	max.	°C	60
The units cannot be used in:			
<ul style="list-style-type: none"> ■ Damp locations ■ Places with a corrosive or aggressive environment ■ Spaces with a large amount of dust ■ Areas where there is danger of explosion 			

Table E3: TopVent® MG application limits

3.3 Air flow rate, gas consumption

Unit type		MG-6/30		MG-6/60		MG-9/60	
		1	2	1	2	1	2
Fan speed							
Fan speed	min ⁻¹	720	900	910	1280	910	1280
Nominal air flow rate ¹⁾	m ³ /h	3100	4200	4200	5900	5300	7000
Floor area reached ²⁾	m ²	251	347	347	525	458	661
Nominal heat input	max. kW		32.0		66.0		66.0
Nominal heat output	max. kW		29.2		60.5		60.5
Combustion efficiency ³⁾	%		min. 91		min. 91		min. 91
Emissions of nitrogen oxides (GCV)	mg/kWh		35.0		42.0		42.0
Emission efficiency	%		93.6		91.2		92.9
Seasonal space heating energy efficiency	%		73.6		72.0		73.5
Envelope loss factor	%		0.6		0.6		0.6
Gas consumption							
Natural gas: G20, G27 (H, E, Lw)	m ³ /h		3.4		7.0		7.0
Natural gas: G25, G25.3 (L, LL, K)	m ³ /h		3.8		7.9		7.9

1) At an air temperature of 20 °C
 2) Mounting height H_{max} = 11 m for a temperature difference between supply air and room air of up to 30 K
 3) In accordance with EN 1020

Table E4: TopVent® MG technical data

3.4 Electrical connection

Unit type		MG-6/30	MG-6/60	MG-9/60
Supply voltage	V AC	400 3N	400 3N	400 3N
Permitted voltage tolerance	%	+10/-15	+10/-15	+10/-15
Frequency	Hz	50	50	50
Power consumption				
at rated heating capacity	W	697	1127	1127
at minimal capacity	W	517	657	657
in standby mode	W	7	7	7
Current consumption max.	A	1.7	2.7	2.7
Protection rating	–	IP 20	IP 20	IP 20

Table E5: TopVent® MG electrical connection

3.5 Gas connection

Unit type	MG-6/30	MG-6/60	MG-9/60
Gas appliance type ¹⁾	B ₂₃ , C ₁₃ , C ₃₃		
Gas connection	Rp ½" (internal)	R ¾" (external)	R ¾" (external)
Combustion air connection	DN 80	DN 100	DN 100
Flue gas connection	DN 80	DN 100	DN 100
Max. length of flue gas duct ²⁾	9 m	9 m	9 m
¹⁾ According to method of flue gas evacuation and combustion air supply ²⁾ Equivalent length of formed parts: – 90° elbow 2 m – 45° elbow 1 m – 90° T-piece ... 2 m			

Table E6: TopVent® MG gas circuit connections

3.6 Sound levels

Unit type		MG-6/30		MG-6/60		MG-9/60	
Fan speed		1	2	1	2	1	2
Sound pressure level (at a distance of 5 m) ¹⁾	dB(A)	46	53	48	54	49	55
Total sound power level	dB(A)	68	75	70	76	71	77
Octave sound power level	63 Hz	71	79	76	81	77	82
	125 Hz	68	75	72	80	73	81
	250 Hz	71	77	72	78	73	79
	500 Hz	65	73	69	73	70	74
	1000 Hz	62	70	65	71	66	72
	2000 Hz	58	67	60	67	61	68
	4000 Hz	51	61	54	61	55	62
	8000 Hz	47	55	49	56	50	57

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

Table E7: TopVent® MG sound power levels

3.7 Heat output

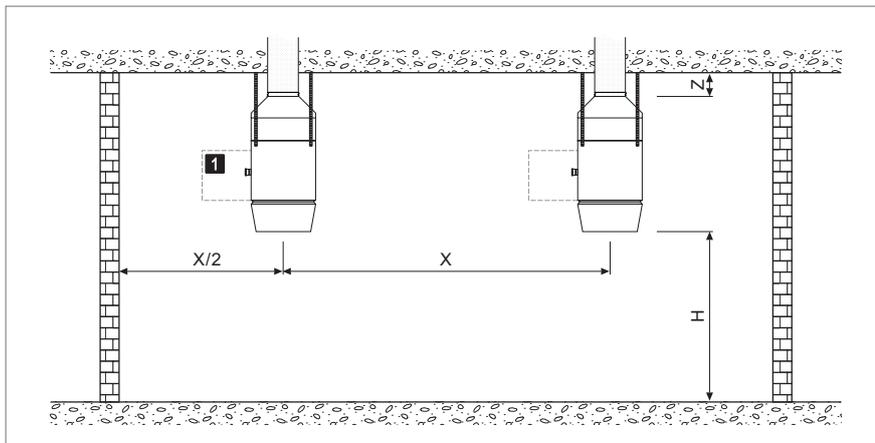
Fresh air temperature		-5 °C			-15 °C		
Unit type	Fan speed	Q	t _s	H _{max}	Q	t _s	H _{max}
		kW	°C	m	kW	°C	m
MG-6/30	1	29.2	45.5	6.3	29.2	44.5	6.3
	2	29.2	38.2	9.3	29.2	37.2	9.5
MG-6/60	1	60.5	60.0	6.7	60.5	59.3	6.8
	2	60.5	48.0	10.6	60.5	47.0	10.7
MG-9/60	1	60.5	51.4	6.8	60.5	50.4	6.9
	2	60.5	43.2	9.8	60.5	42.2	10.0

Legend:
 Q = Nominal heat output
 t_s = Maximum supply air temperature
 H_{max} = Maximum mounting height

Reference: Room air 18 ° / Extract air 20 °C / 10 % Fresh air ratio

Table E8: TopVent® MG heat output, supply air temperatures and mounting height

3.8 Minimum and maximum distances

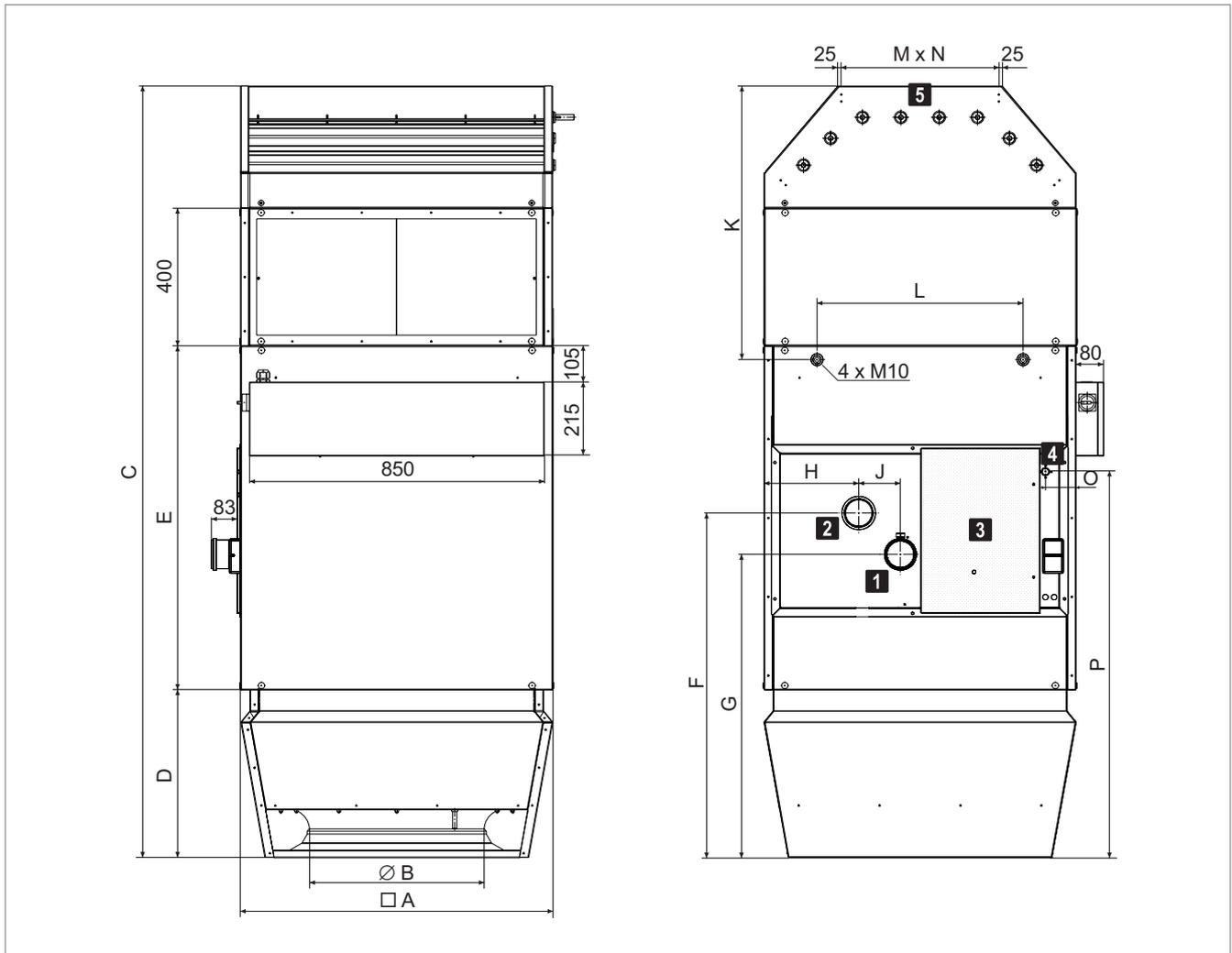


1 Allow a free space of 1.5 m for service and maintenance.

Unit type		MG-6/30		MG-6/60		MG-9/60		
Fan speed		1	2	1	2	1	2	
Unit clearance X	min.	m	9	10	10	11	12	
	max.	m	16	19	19	23	21	26
Mounting height H	min.	m	4.0	4.0	4.0	4.0	5.0	5.0
Distance from ceiling Z	min.	m	0.3	0.3	0.3	0.3	0.4	0.4

Table E9: TopVent® MG minimum and maximum distances

4 Dimensions and weights



Unit type		MG-6/30	MG-6/60	MG-9/60
A	mm	900	900	1100
B	mm	500	500	630
C	mm	2245	2245	2330
D	mm	490	490	570
E	mm	1000	1000	1000
F	mm	946	974	1048
G	mm	836	834	908
H	mm	258	237	438
J	mm	110	140	140
K	mm	795	795	800
L	mm	594	594	846
M x N	mm	420 x 850	420 x 850	500 x 1050
O	mm	87	73	172
P	mm	1057	1128	1203
Weight	kg	175	185	230

- 1** Flue gas connection with measuring opening
- 2** Combustion air connection
- 3** Inspection door with measuring opening for combustion air temperature
- 4** Gas connection
- 5** Fresh air duct connection

Fig. E3: TopVent® MG dimensions and weights

5 Design example



Notice

Use the 'HK-Select' program to design Hoval Indoor Climate Systems. You can download it free of charge on the Internet.

Design data	Example
<ul style="list-style-type: none"> ■ Geometry of the room ■ Internal heat gains ■ Fabric heat losses ■ Fresh air temperature ■ room temperature ■ Extract air temperature ■ Comfort requirements (acoustic) ■ People in the room ■ Improvement of air quality, fresh air supply for the people in the room (fresh air flow rate per person = 30 m³/h) 	<p>Geometry 50 × 60 × 12 m Internal heat gains 28 kW Fabric heat loss 350 kW Fresh air temperature 15 °C Room temperature 18 °C Extract air temperature 20 °C Comfort requirements Standard 20 people</p>
<p>Comfort requirements Define the fan speed in accordance with the acoustic requirements:</p> <ul style="list-style-type: none"> ■ Low noise level → Fan speed 1 ■ Normal noise level → Fan speed 2 	<p>Standard → Fan speed 2</p>
<p>Fresh air supply</p> <ul style="list-style-type: none"> ■ Required fresh air flow rate in total: ■ Fresh air ratio of supply air units: max. 10 % of the nominal air flow rate <p><i>The fresh air ratio can be adjusted from 0...100 %. Where EU Regulation 1253/2014 applies, it must be restricted to max. 10 % in the design conditions.</i></p> <ul style="list-style-type: none"> ■ Calculate the required number of supply air units from the nominal air flow rate. 	<p>20 × 30 = 600 m³/h</p> <p>MG-6/30: max. 420 m³/h fresh air MG-6/60: max. 590 m³/h fresh air MG-9/60: max. 700 m³/h fresh air</p> <p>→ 1 TopVent® MG-9/60 unit</p>
<p>Mounting height</p> <ul style="list-style-type: none"> ■ Calculate the actual mounting height (= distance between the floor and the bottom edge of the TopVent® unit). <p>H = Hall height – distance from ceiling – unit height</p> <ul style="list-style-type: none"> ■ Compare the actual mounting height with the minimum and maximum mounting height (see Table E9 and HK-Select). 	<p><u>Supply air units:</u> Size 6 → OK Size 9 → OK</p> <p><u>Recirculation units:</u> Size 6 → OK Size 9 → OK</p>
<p>Required performance for covering fabric heat losses</p> <ul style="list-style-type: none"> ■ Required heat output for coverage of fabric heat losses in total <p>$Q_{H_req} = \text{Fabric heat losses} - \text{internal heat loads}$</p>	<p>350 – 28 = 322 kW</p>

Required heat output of recirculation units

- Determine the required heat output of the recirculation units based on the output of the supply air unit.

$$Q_{H_Recirculation} = Q_{H_req} - Q_{H_Supply\ air}$$

For the supply air unit, take into account only the share of capacity that is used for coverage of fabric heat losses (separately shown in HK-Select).

Type	Q _{H_Supply air}	Q _{H_Recirculation}
MG-9/60	52.7	322 – 52.7 = 269.3

(values in kW)

Minimum number of recirculation units

- Determine the minimum number of recirculation units depending on the available supply air units. Take into account the following criteria:
 - Floor area covered
 - Heat output
 - Unit clearances

Supply air unit	Recirculation units	Required number of recirculation units			Minimum number of recirculation units
		Type	Floor area covered	Heat output	
1 unit MG-9/60	DGV-6/30	6	10	9	10
	DGV-6/60	5	5	6	6
	DGV-9/60	4	5	6	6

- Choose the final solution from the remaining possibilities, depending on the geometry of the hall and the costs.

6 Options

TopVent® MG can be adapted to the requirements of a specific project thanks to a range of optional equipment. A detailed description of all optional components is found in the 'Options' part of this design handbook.

Option	Use
Flue gas accessories	for simple installation independently of room air
Paint finish	in the Hoval red or in any colour required
Suspension set	for mounting the unit on ceiling
Acoustic cowl	to reduce noise levels in the room (reduced noise radiation from Air-injector)

Table E10: Availability of options for TopVent® MG

7 Control system

TopVent® MG units are controlled by TempTronic RC. This programmable control unit, developed especially for TopVent® units, offers the following advantages:

- Regulation of the room temperature
- Control of air distribution by means of the Hoval Air-Injector
- 3 set point values can be set (Room temperature day, Room temperature night and Frost protection temperature)
- Control of operating modes according to week programme and calendar
- Registration of unit malfunctions in an alarm list
- Password protection for user and service personnel
- Menu-guided operation via a 4-line display
- Integrated room temperature sensor

You will find a detailed description of TempTronic in the 'Control systems' part of this handbook.

8 Transport and installation

8.1 Installation



Caution

Risk of injury from incorrect handling. Have transport and assembly work carried out by trained specialists!

For the purposes of installation the units are provided with 4 M10 rivet nuts with hexagon bolts and washers. The following guidelines are important when preparing for assembly:

- Attach the TopVent® unit using a suspension set (option) or by means of steel flat, slotted steel flat, angles, steel cables, etc.
- Secure the unit only to ceilings of fireproof materials and with sufficient load-bearing capacity.
- Do not use eyebolts.
- Do not install any additional loads.
- The unit must be installed horizontally.
- Non-vertical suspensions are permissible up to a maximum angle of 45°.
- Provide for a fresh air duct.

8.2 Installation of the flue gas evacuation and the combustion air supply



Caution

Risk of injury from incorrect handling. Installation of the flue gas evacuation and the combustion air supply may only be carried out by specialists!

Observe national / local regulations when planning the flue gas evacuation and the combustion air supply. From an early stage, coordinate the installation with the responsible district chimney sweep authorities and obtain the necessary authorisation from the local building authority.

Please note the following:

- The units can be installed as room air dependent (Type B₂₃) or room air independent (Type C₁₃, C₃₃) appliances.
- If the unit is room air independent, equip it with the optional flue gas kit.
- For room air dependent operation the combustion air is taken directly from the room in which the unit is installed. Ensure the room is sufficiently ventilated and that the combustion air is free from pollutants and aggressive substances (halogens such as chlorides, fluorides, etc.).
- Observe the maximum lengths given in Table E6 (see chapter 3 'Technical data').

8.3 Gas connection

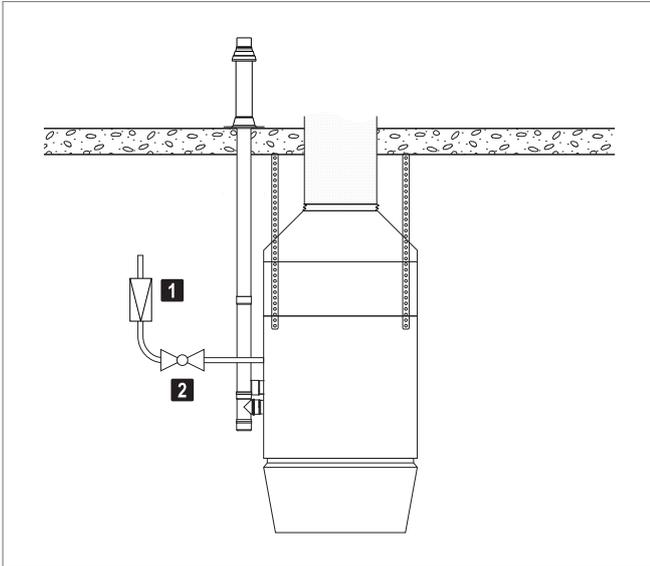


Caution

Risk of injury from incorrect handling. The gas connection may only be carried out by specialists authorised by the gas supply company!

Please note the following:

- The fuel used is natural gas. Check the type of gas the unit is set to work with and, if necessary, have Hoval Customer Service reset the unit to the type of gas supplied locally.
- During operation of the unit, the required quantity of gas and the necessary pressure of gas must be present constantly.
- Connect the gas supply line with appropriate bolted joints which can be loosened, tension-free and vibration-free.
- The connection of the unit to the gas supply line must be gas-tight.
- Ensure that a gas pressure regulator and a cut-off-valve (not part of the scope of supply) are installed directly before the unit.



1 Gas pressure regulator (20...50 mbar)

Recommended settings:

- Natural gas G20 20 mbar
- Natural gas G25 25 mbar

2 Cut-off-valve

Fig. E4: Gas pressure regulator and cut-off valve in the gas supply line

8.4 Electrical installation



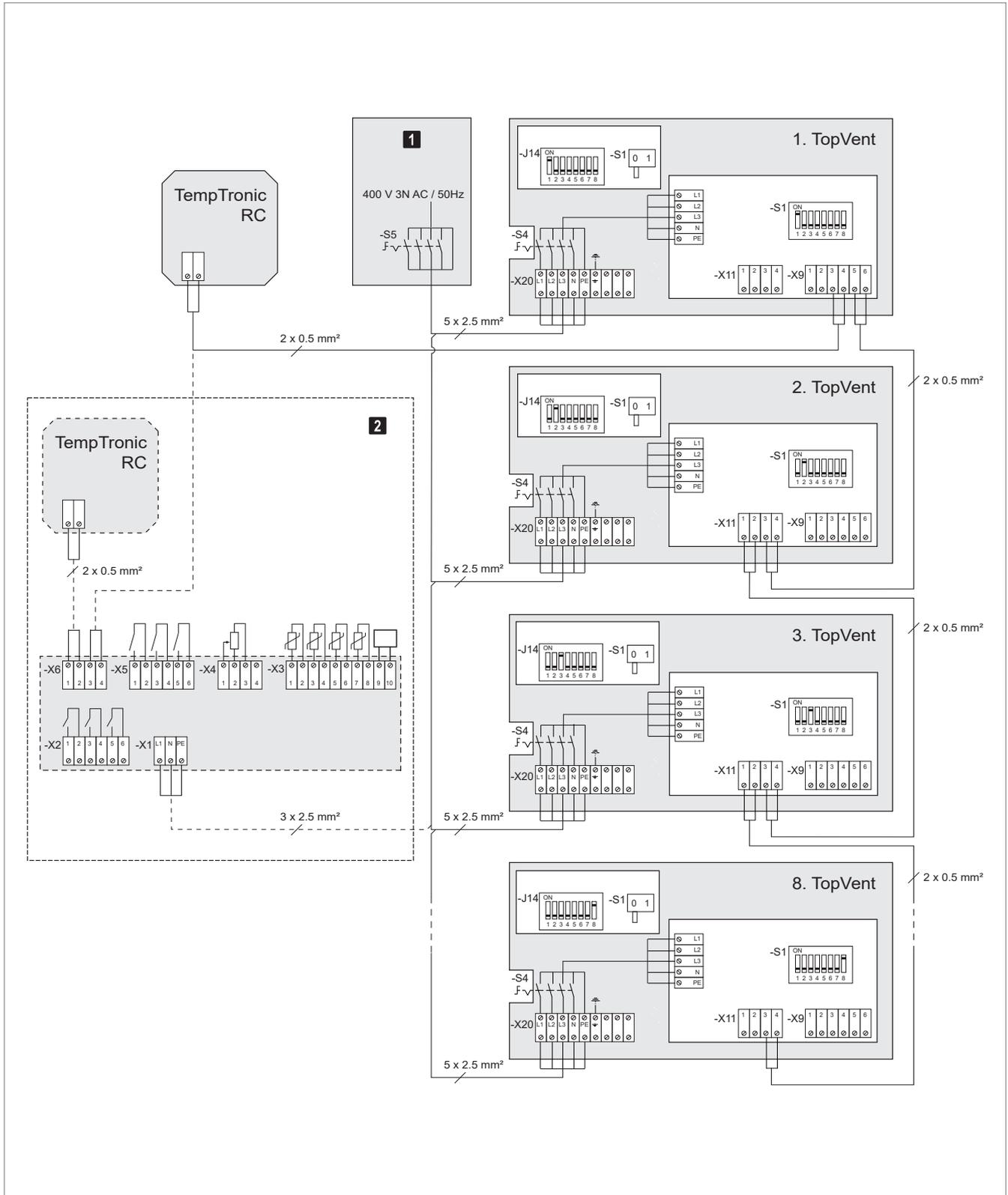
Caution

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

- Observe all relevant regulations (e.g. EN 60204-1).
- Check whether the local operating voltage, frequency and fuse protection match the data on the type plate. If there are any discrepancies, the unit must not be connected!
- Cable cross-sections must be selected according to technical regulations, e. g. VDE 0100.
- Electrical installation to be carried out according to wiring diagram.
- Do not forget the master switch for the complete installation.

A TempTronic can control up to 8 TopVent® units simultaneously:

- Connect TempTronic and the units to each other via a system bus.
- Assign a number to each unit:
 - Micro switch S1 on the power module
 - Micro switch J14 on the burner control



- 1 Control panel (on site)
- 2 Variant: connection for TempTronic RC and option module

Fig. E5: Connection diagram

9 Specification texts

9.1 TopVent® MG

Gas-fired supply air handling unit for ventilating and heating high spaces

Corrosion-resistant aluzinc sheet metal housing with access panel and four M10 rivet nuts for installation of the optional suspension set for ceiling mounting.

Gas-fired heat exchanger of premium-quality stainless steel, fully-automatic premix burner for low-emission burning of natural gas.

Fan unit consisting of a 2-speed, 3-phase external rotor motor with pressure-resistant aluminium sickle-shaped blades, maintenance-free and quiet, with a high degree of efficiency. Motor protection through built-in thermal contacts. Mounted on side of the housing, a terminal box for the connection of the supply voltage and accessories.

Vortex air distributor with concentric outlet nozzle, 12 adjustable vanes and integrated sound attenuation cowl, incl. actuator.

Filter box insulated on the inside with 2 bag filters ISO Coarse 60 % (G4), with filter pressure switch.

Aluzinc sheet metal mixed air box, insulated on inside, with fresh air damper and recirculation air damper linked to move in opposite directions; includes actuator.

TopVent® MG units comply with all the requirements of the Ecodesign Directive 2009/125/EC relating to environmentally friendly design of energy-related products. They are systems of the 'warm air heater' type, provided for in Commission Regulation (EU) 2016/2281.

9.2 Options

Flue gas kit AZF / AZS / AZW

for room air independent installation (flue gas evacuation and combustion air supply)

Individual components of flue gas accessories

for the adaptation of the flue gas kit to local conditions

Standard paint finish SL

in Hoval red (RAL 3000)

Paint finish as desired AL

in RAL colour No. _____

Suspension set AHS

for mounting the unit on ceiling, exterior paint finish matching the unit

Acoustic cowl AHD

Insertion attenuation 4 dB

9.3 Control systems

Programmable regulation system with menu-guided operation for fully automated operation of TopVent® units:

- TempTronic RC
- Option module OM
- Room temperature average value MRT4
- Room temperature sensor RF



Options

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6 Acoustic cowl	65
7 Recirculation silencer	66

1 Availability

The following optional components are available for the various types of unit:

	Flue gas accessories	Paint finish	Suspension set	Filter box	Flat filter box	Acoustic cowl	Recirculation silencer
TopVent® DGV	○	○	○	○	○	○	○
TopVent® NGV	○	○	○	○	○	-	○
TopVent® GV	○	-	○	-	-	-	-
TopVent® MG	○	○	○	●	-	○	-
Legend:	○ = Optional ● = Standard equipment - = Not available						

Table F1: Availability of options

2 Flue gas accessories

2.1 Flue gas kits

For simple, room air independent installation of TopVent® units flue gas kits are available. There are different versions according to the following criteria:

- where the unit is installed (flat roof, pitched roof, wall)
- power output of the units (different nominal diameters will be required, depending on the power level of the unit).

The flue gas kits consist of the following components:

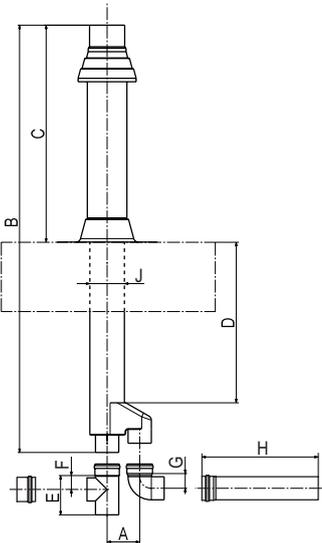
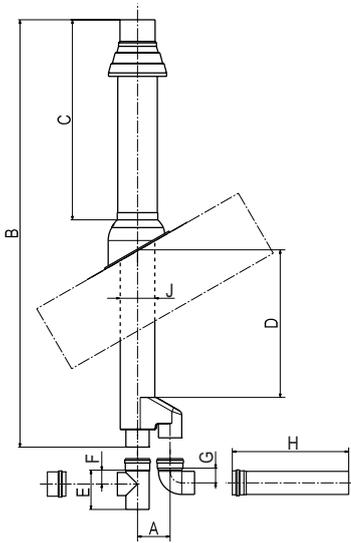
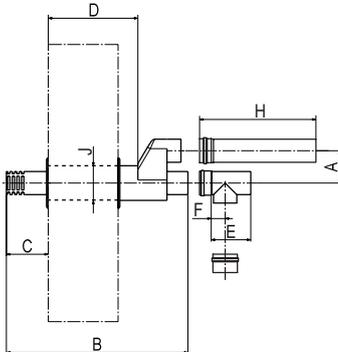
Components	Flat roof	Pitched roof	Wall
Roof bushing	●	●	-
Flange for flat roof	●	-	-
Lead basin with tray	-	●	-
Wall bushing	-	-	●
Flue gas pipes (2 pieces)	●	●	●
T-piece	●	●	●
Condensate cap	●	●	●
Elbow bend 90°	●	●	-

Table F2: Components of the flue gas kits

The roof bushings and the wall bushings are painted grey (RAL 7021).

Unit type		Type of flue gas kit			Nominal diameter	Material
		Flat roof	Pitched roof	Wall		
GV	3/30	AZF-80	AZS-80	AZW-80	DN 80	Die-cast aluminium
DGV, NGV, MG	6/30					
GV	5/50	AZF-100	AZS-100	AZW-100	DN 100	
DGV, NGV, MG	6/60, 9/60					

Table F3: Specifications of the flue gas kits

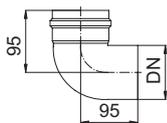
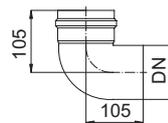
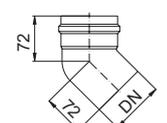
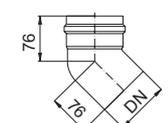
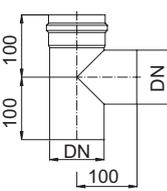
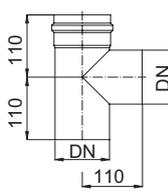
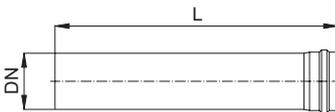
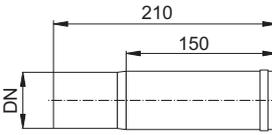
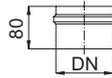
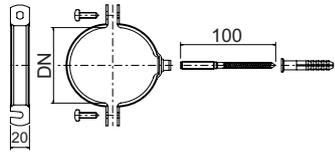
		Flat roof		Pitched roof		Wall	
							
Type	AZF		AZS ¹⁾		AZW		
	80	100	80	100	80	100	
A	110	140	110	140	110	140	
B	1850	1850	1850	1850	780	780	
C	939	940	865	865	180	180	
D ²⁾	716	695	660	634	405	385	
E	150	170	150	170	150	170	
F	50	60	50	60	50	60	
G	45	55	45	55	–	–	
H	250	450	250	450	250	450	
J	125	150	125	150	125	150	

1) appropriate for roof inclinations between 25° and 45°
2) The installer can shorten the roof bushing or the wall bushing (concentric pipe) as appropriate in order to adapt it to the particular conditions required.

Table F4: Dimensions of the flue gas kit components (in mm)

2.2 Individual parts

The following individual parts are also available for the adaptation of the flue gas kit to the particular situation:

	DN 80	DN 100
Elbow bend 90° ¹⁾		
Elbow bend 45° ¹⁾		
T-piece ¹⁾		
Flue gas pipe ¹⁾	L = 250 / 500 / 1000	L = 250 / 450 / 950
		
Length adjustment piece		
Condensate cap		
Pipe clamp		

¹⁾ Insertion depth of pipe collar = 50 mm

Table F5: Flue gas kit components (dimensions in mm)

3 Paint finish

If the customer wishes, the TopVent® units can be provided with an exterior paint finish. There are 2 possibilities:

3.1 Standard paint finish

The individual unit components are painted in Hoval red (RAL 3000) at no extra cost. (exception: flue gas accessories)

3.2 Paint finish as desired

In order for them to harmonise with the room colour, the units can be delivered with a paint finish in any colour required (at an additional cost, when ordering quote RAL number).

4 Suspension set

For ease of installation of the units on ceiling or wall, there are suspension sets available (complete with nuts and bolts). There are 3 variants:

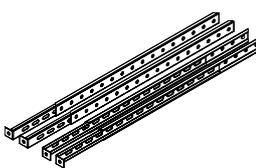
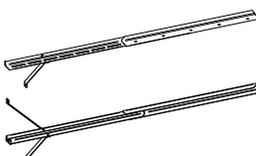
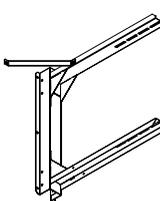
Type	Use	Description
AHS	DGV, NGV, MG	<ul style="list-style-type: none"> of aluzinc sheet steel height adjustable to a maximum of 1300 mm 
AH	GV ceiling installation	<ul style="list-style-type: none"> of galvanised sheet steel height adjustable to a maximum of 1650 mm 
AHW	GV wall installation	<ul style="list-style-type: none"> of galvanised sheet steel painted black adjustable to the wall distances from table D10 (see part D 'TopVent® GV') 

Table F6: Suspension sets

5 Air filtration

For hygiene reasons, Hoval recommends always fitting TopVent® gas units with a filter.

5.1 Filter box

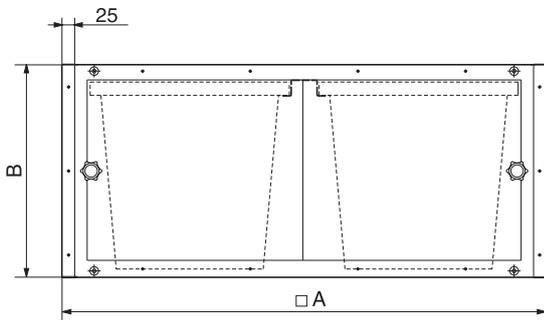
A filter box with 2 bag filters can be installed for the purpose of filtering the recirculation air. The modular construction made of Aluzinc sheet metal with 2 sliding doors makes it easy to replace the filters.



Notice

In the planning phase make sure there is enough space in front of the sliding doors so that the filters can be replaced with ease.

A pressure difference control device is installed for automatic monitoring of the filter. It shows when the filters have to be cleaned or changed.



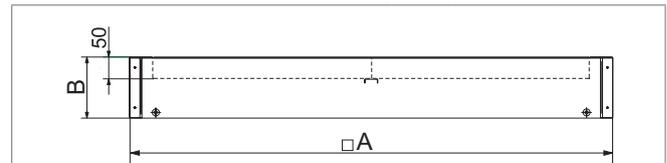
Size		6	9
A	mm	900	1100
B	mm	400	400
Filter class		ISO coarse 60 % (G4)	
Weight	kg	20	24
Factory setting of differential pressure switches	Pa	180	180

Table F7: Filter box technical data

5.2 Flat filter box

A flat filter box with 4 pleated cell filters can be installed for the purpose of filtering the recirculation air.

A pressure difference control device is installed for automatic monitoring of the filter. It shows when the filters have to be cleaned or 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	50	50

Table F8: Flat filter box technical data

6 Acoustic cowl

The acoustic cowl reduces the noise level in the room; it is installed in the Air-Injector. This does not change the outside dimensions of the Air-Injector.

Insertion attenuation is 4 dB compared with the total sound power level of each TopVent® unit.

7 Recirculation silencer

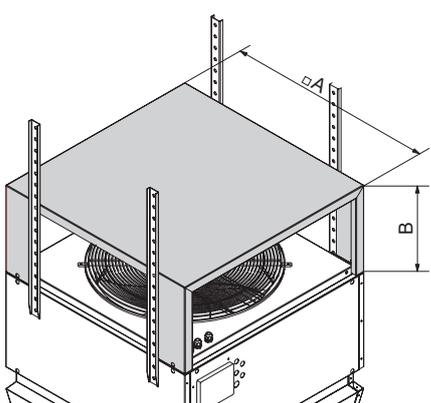
The use of a recirculation silencer for noise reduction is recommended especially for the cases where the TopVent® units are installed under level, hard ceilings (e.g. of concrete or sheet steel). The recirculation silencer is mounted on the appliance and thus reduces the sound reflection from the ceiling. Insertion attenuation is 3 dB compared with the total sound power level of each TopVent® unit.

Mount the recirculation units as usual via the 4 fastening points in the heating section (for example, using the optional suspension set).



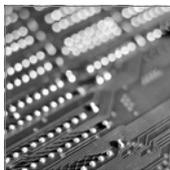
Caution

Risk of injury from falling parts. The silencer cannot bear the weight of the appliance. Do not locate any suspension points on the silencer.



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

Table F9: Dimensions and weights of the recirculation silencers



Control system

TempTronic RC

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1 Use and function

The TempTronic RC is a programmable control system for TopVent® gas units. A maximum of 8 units can be connected to 1 controller.



Fig. G1: Room temperature controller TempTronic RC

Function

The TempTronic RC is connected to the units via a system bus and fulfils the following functions:

- Recording the room temperature with the integrated temperature sensor
- Regulation of the room temperature
- Control of air distribution by means of the Hoval Air-Injector
- 3 set point values can be set (Room temperature day, Room temperature night and Frost protection temperature)
- Control of operating modes according to week programme and calendar
- Registration of unit malfunctions in an alarm list
- Password protection for user and service personnel
- Menu-guided operation via a 4-line display

Location

Install the room temperature controller with the integrated temperature sensor at a height of about 1.5 m at a representative location in the occupied area. Its measured values must not be distorted by the presence of sources of heat or cold (machines, windows, sunlight, etc.).

2 Regulation of the room temperature

TempTronic RC controls up to 8 TopVent® gas units in accordance with heating requirements. In fresh air operating mode the units are constantly in operation; the fresh air ratio for supply air units can be regulated (0 – 100 %). In recirculation mode the system operates in the energy-saving on/off mode. The fuzzy-logic-based regulating algorithm switches the units according to criteria different from those of conventional 2-point regulators; the deviations are thus smaller. The TempTronic RC system comprises an automatic frost protection switching function:

- If the room temperature drops below frost protection temperature, the units are switched on.
- Once the temperature has risen by 2 °C the units switch off again.

The frost protection temperature can be regulated.

3 Control of the air distribution

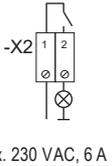
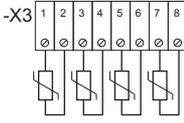
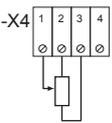
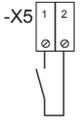
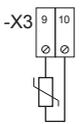
The patented air distributor – the so-called Air-Injector – delivers varying volumes of supply air at different temperatures draught-free to the occupied area of high spaces. This is made possible by the vortex device, by means of which the blow-out direction of the air can be adjusted infinitely variably from vertical to horizontal. It depends on:

- the mounting height
- the air flow rate (→ fan speed)
- the temperature difference between supply air and room air

In certain cases the Air-Injector can be set to a fixed value when commissioning takes place. For the TempTronic RC to automatically adapt the delivery direction of the air to changing operating conditions, an Air-Injector actuator is required.

4 External connections

By means of an optional module, the following additional functions can be controlled:

Collective alarm	
In case of a malfunction a collective alarm can be displayed by means of a volt-free contact.	 <p>max. 230 VAC, 6 A</p>
Room temperature average value ¹⁾	
Instead of the integrated room air sensor, 4 sensors can be installed for calculation of the mean value in the occupied area.	
Fresh air ratio ¹⁾	
The proportion of fresh air of supply air units can be regulated externally (e.g. via a building master control system).	
External switching ¹⁾	
The appliances can be switched to the operating mode 'Off' (e.g. from a control centre).	
External room temperature sensor ¹⁾	
Instead of the room temperature sensor that is integrated into the TempTronic RC an external sensor can be connected.	

¹⁾ Recommended cable type: J-Y(ST)Y 2 × 2 × 0.8 mm

Table G1: External connections of the option module

5 Technical data

Technical data	
Feed voltage	Low voltage via system bus
Dimensions (W × H × D)	119 × 119 × 28 mm
Ambient temperature	0...50 °C
Protection rating	IP 20

Table G2: Technical specifications of the TempTronic RC

System bus	
Cable type	1 pair of conductors, twisted, shielded, category 5 or better
Topology	Line bus
Length	Max. 250 m
Capacity	approx. 50 pF/m

Table G3: Specification of the bus cable

6 Alarms and monitoring

The system monitors itself. All the alarms are registered in the alarm list and displayed by TempTronic RC. Priority A alarms are also displayed via the collective trouble indicator.

Alarm	Priority	Cause	System reaction	Benefit
Gas burner	A	There is a burner malfunction.	The affected unit switches to operating mode 'Off'.	prevents damage to the burner
Fresh air damper	A	The fresh air/recirculation air damper is jammed or its actuator is defective.	The affected unit switches to operating mode 'Off'.	Avoids loss of energy / undefined states of operation.
Filter	B	The pressure difference for filter monitoring was exceeded for more than 5 minutes.	–	Informs the user of the necessity of maintenance work
Isolation	B	The isolation switch on the unit has been in the 'Off' position for more than 30 minutes.	–	Avoids unintentional switching off.
Supply air sensor	B	The supply air sensor is defective.	The plant operates with the minimum heat output until the fault is eliminated.	Avoids interruptions of plant operation.
Fan	A	A fan motor has overheated.	The affected unit switches to operating mode 'Off'.	Avoids damage to the fan motor.

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System design

H

1 Installation site

- Position the unit in such a way that no one is endangered by flue gas and radiant heat and no fires can break out.
- The supply air jet must be free to spread out unhindered (consider beams and lights).
- The unit must be accessible for maintenance and servicing work. The connecting lines must be able to be dismantled.

2 Flue gas evacuation

- In all cases, use only the original flue gas accessories approved for use with the units for the installation. Do not combine systems from different manufacturers.
- Observe national / local regulations when planning the flue gas evacuation and the combustion air supply.
- Provide suitable openings for the roof and wall bushings of the flue gas ducts (for the dimensions of the flue gas accessories, see part F 'Options').
- Use flue pipes with the same diameter as the combustion air and flue gas connections on the unit.
- Observe the maximum length of the flue gas duct:
 - 9 m in horizontal or vertical direction
 - A 90° elbow or a T-piece reduces the maximum length by 2 m.
 - A 45° elbow reduces the maximum length by 1 m.
- Condensation may form in horizontal flue gas ducts > 4 m long or in ducts through cool rooms:
 - Insulate the pipes using temperature-resistant, non-flammable material.
 - Insert a condensate cap.
- Install horizontal flue gas ducts with at least 3° inclination (50 mm/m) towards the unit so that condensate can flow to the air heater.
- The surface temperature of the flue gas pipes amounts to 200 °C. During the planning process, please observe the regulations of the responsible fire protection authorities.
- For the flue gas path test, Hoval recommends installing an inspection T-piece (included in the flue gas kit).
- For all diversions, install an inspection T-piece in the flue gas pipe as well.
- In some countries, an annual inspection and emission measured by the responsible authorities is legally required. For this purpose, measurement openings have been provided in the exhaust spout and the access panel.
- In some countries (e.g. in Germany), an emission measurement from the roof is also permissible. For this purpose, provide measurement openings in the flue gas pipe and in the combustion air pipe directly above the roof (on-site installation in 3-shell pipe).
- In case of room air dependent installation (Type B₂₃), close off the combustion air connection using a protective screen.

3 General notices

- The flue gas temperature is automatically limited to 200 °C. It is thus guaranteed that the combustion efficiency of 91% is always achieved.
- The safety temperature limiter switches off the burner when a temperature of 100 °C is exceeded and thus prevents an overheating of the heat exchanger.
- In the order, enter the gas category and the gas supply pressure.
- For combustion with liquid gas, special unit designs are available. Detailed information can be obtained from Hoval's application consulting service.

4 Location of the temperature sensors

4.1 Room temperature sensor

Install the sensor (integrated into the TempTronic RC) 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.). Normally, there is 1 room air sensor for each control zone. It is also possible to install 4 sensors to determine the average temperature value.

4.2 Supply air temperature sensor

A supply air sensor has been integrated into each TopVent® gas unit.

5 Division of the control zones

Combine units that work under the same operating conditions into control zones. The TempTronic RC controls up to 8 TopVent® gas units of the same type.

6 General checklist

- Can the roof support the units?
- Is the access panel accessible without obstructions?
- Are there any installation obstacles in the hall, such as craneways, machinery, etc.?
- For emission measurements from the roof: is the roof accessible in the vicinity of the units?
- Are the application limits complied with?
- Which gas category is used?
- How high is the gas supply pressure?
- Are unit options required?
- Are control system options required?
- How are the control zones subdivided?
- Which operating options are to be used?
- Where are the operating options to be located?

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Operation

1 Operation

1.1 Initial commissioning



Attention

Risk of damage to property as a result of performing initial commissioning on your own authority. Commissioning must be performed by Hoval customer service only!

Checklist to prepare for commissioning:

- Have all media connections been established (flue gas accessories, electrical wiring, gas connection and, if required, condensate drain and air duct connection)?
- Are all the control components installed?
- Are all of the respective trade groups (installer, electrician, designer, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

1.2 Operation



Caution

Mortal danger in case of escaping gas. If you smell gas:

- Do not smoke.
- Avoid open fire and sparks.
- Disconnect the gas and power supply to the unit.
- Open windows and doors.
- Call Hoval customer service.

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

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

1.3 Decommissioning

- Switch the unit to the 'OFF' mode.
- Close the cut-off valve in the gas supply line.
- Let the unit cool off. The fan continues to run to cool down the heat exchanger.
- When the fan comes to a stop: switch off the plant on the main switch.

1.4 Putting into operation again

- Open the shutoff valve in the gas supply line.
- Switch on the plant on the main switch.
- Select the desired operating mode on the control units.

2 Maintenance and repair

2.1 Safety during maintenance

- Before all work: switch the unit to the 'OFF' mode.
- Close the cut-off valve in the gas supply line.
- Let the unit cool off. The fan continues to run to cool down the heat exchanger.



Attention

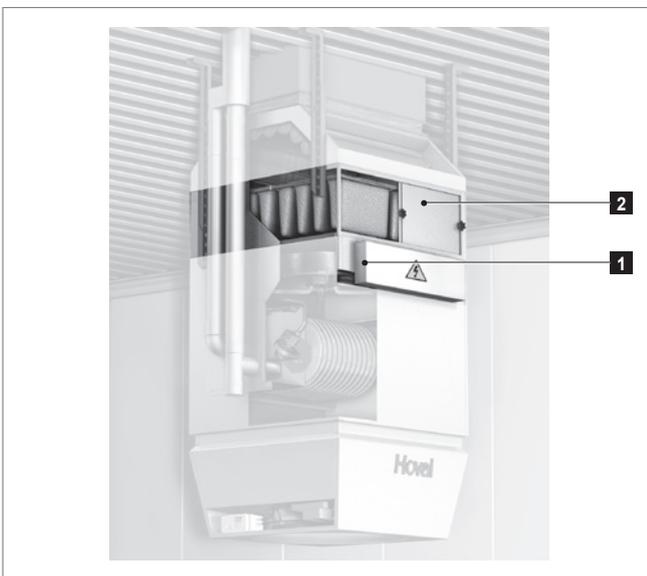
Danger of burning due to hot components. Do not switch off the power supply until the fan comes to a complete stop!

- Switch the isolation switch to the 'Off' position.
- Observe the accident prevention regulations.
- 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).
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Unauthorised reconfiguration or modification of the unit is not permitted.
- Replacement parts must comply with the technical requirements of the system manufacturer. Hoval recommends the use of original replacement parts.

2.2 Filter change

Caution
Risk of injury from incorrect work. Filters must be changed by trained personnel!

In TopVent® gas units that are equipped with a filter, a pressure difference monitor has been installed for the monitoring of the filter. Change the filter if the 'Filter' alarm appears on the control unit:



1 Isolation switch

2 Sliding doors

Fig. 11: Position of the filters

Changing the filters – TopVent® DGV, NGV, MG

- Switch the isolation switch (Item **1**) to the 'Off' position and wait until the fan comes to a stop.
- Open both sliding doors in the filter box (Item **2**) one after the other, change the filters, and reclose the sliding doors.
- Switch the isolation switch to the 'On' position again.

2.3 Inspection and maintenance work

Caution
Risk of injury from incorrect work. Annual inspection to be carried out only by Hoval customer service!

The following work is carried out during the annual inspection:

- Emission measurement
- Flue gas path test
- Visual inspection of the heat exchanger
- Function test
- Check of the settings

2.4 Repair

Caution
Risk of injury from incorrect work. Repair work to be carried out only by Hoval customer service!

Please contact Hoval customer service if needed.

3 Dismantling

**Caution**

Risk of injury from incorrect work. Dismantling must be carried out by specialists!

Make sure that a lifting platform is available for the disassembly. Proceed as follows:

- Shut down the TopVent® gas unit.
- Disconnect all media connections from the unit (flue gas accessories, electrical wiring, gas connection and air duct connection).
- Secure, disassemble, and remove the unit from the installation site.

4 Disposal

When disposing of components of TopVent® gas units, please observe:

- Recycle metal components.
- Recycle plastic parts.
- Dispose of electric and electronic parts via hazardous waste.

Hoval quality. You can count on us.

As a specialist in heating and air-conditioning technology, Hoval is your experienced partner for system solutions. For example, you can heat water with the sun's energy and the rooms with oil, gas, wood or a heat pump. Hoval ties together the various technologies and also integrates room ventilation into this system. You can be sure to save both energy and costs while protecting the environment.

Hoval is one of the leading international companies for indoor climate solutions. More than 70 years of experience continuously motivates us to design innovative system solutions. We export complete systems for heating, cooling and ventilation to more than 50 countries.

We take our responsibility for the environment seriously. Energy efficiency is at the heart of the heating and ventilation systems we design and develop.

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The Hoval logo, consisting of the word 'Hoval' in a bold, white, sans-serif font, set against a red rectangular background.