VIESMANN

VITOVENT 300

Domestic ventilation system

Technical guide

Domestic ventilation system with heat recovery, for ventilating domestic homes subject to demand using purified and pre-heated outside air.

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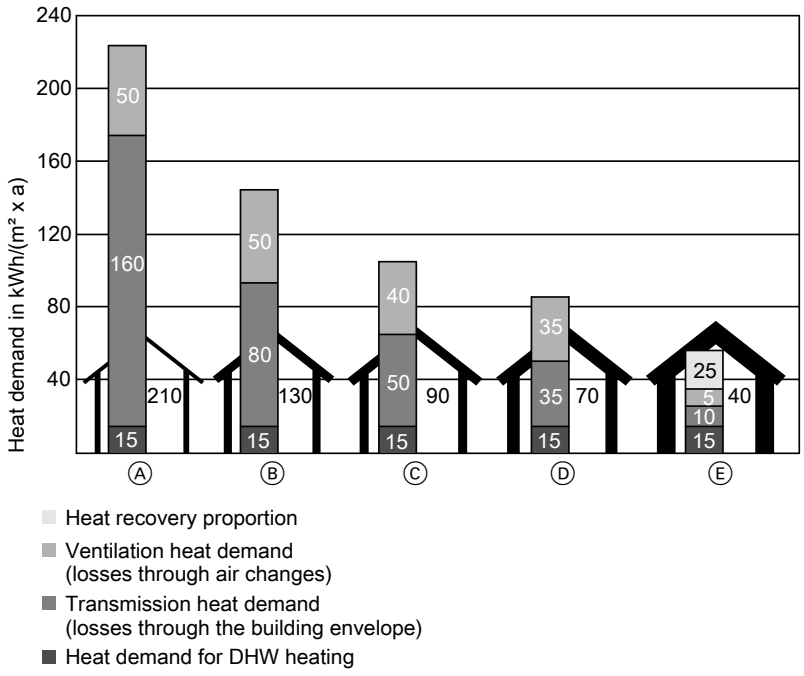
1.1 Heat demand



Development of heat demand subject to building standard (detached house, 3 to 4 occupants, 150 m² living space, A/V = 0.84)

Ⓐ Existing buildings
Ⓑ Buildings from 1984
Ⓒ Buildings from 1995
Ⓓ Low energy house (LEH)
Ⓔ Passive house

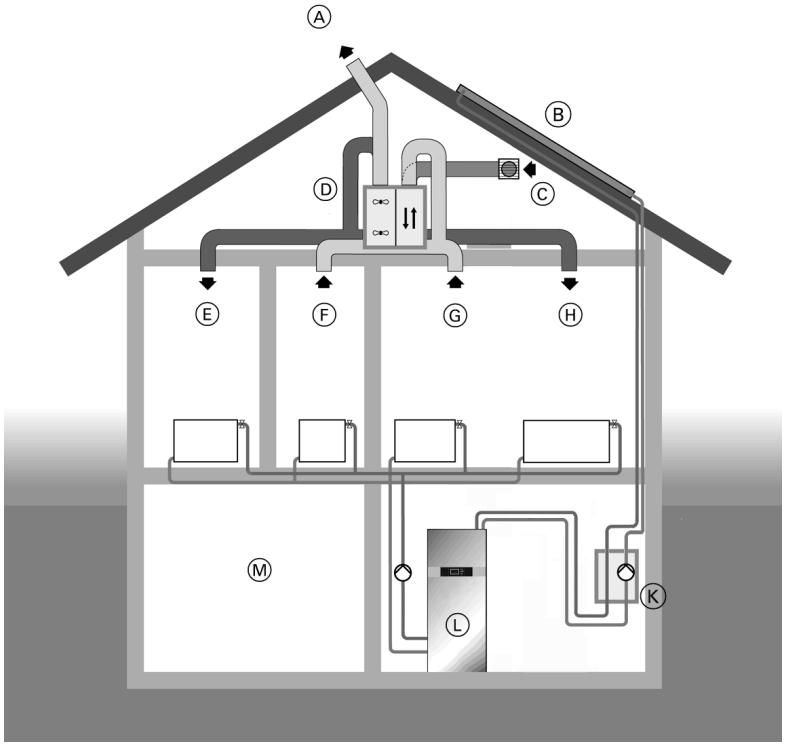
In recent years, the building sector has made significant progress in the area of energy savings. For example, the annual heat demand for an existing detached house is approx. 200 kWh/(m² × p.a.). For a comparable new house, built in accordance with the Energy Saving Ordinance (EnEV) [Germany], this demand drops to approx. 70 kWh/(m² × p.a.).
The heat demand of domestic accommodation is essentially the result of the transmission and ventilation heat demand. The significant reduction of the heat demand is achieved by rigorous thermal insulation and therefore a noticeably reduced transmission heat demand.

The lower the transmission heat demand the higher the ventilation heat demand as a percentage of the total heat demand of the building. Assuming that, in an existing house, the ventilation heat demand represents approx. 25 % of the total heat demand, then that proportion rises for a building constructed in accordance with the WSchV 1995 [Germany] to around 50 % of total demand.
It is therefore logical that comprehensive thermal insulation starts with a reduction of the ventilation heat demand. This requires a particularly airtight method of construction. However, this will reduce the level of air changes that is essential for comfort and health as well as for the prevention of building damage.

1.2 Controlled domestic ventilation

To keep the ventilation heat demand as low as possible, whilst affording optimum air changes, it would seem sensible to employ mechanical systems for room ventilation. These systems are designed to support occupants in their endeavour to ventilate in an energy efficient manner. Advanced ventilation systems avoid the need for windows to be opened and prevent uncontrolled heat losses, especially during the heating season.

2.1 Product description



Ⓐ Expelled air
Ⓑ Solar collector
Ⓒ Outside air
Ⓓ Vitovent 300
Ⓔ Bedroom
Ⓕ Bathroom/WC
Ⓖ Kitchen
Ⓗ Living room
Ⓚ Solar-Divicon
Ⓛ Heat pump with integral DHW cylinder, e.g. Vitocal 343-G
Ⓜ Cellar

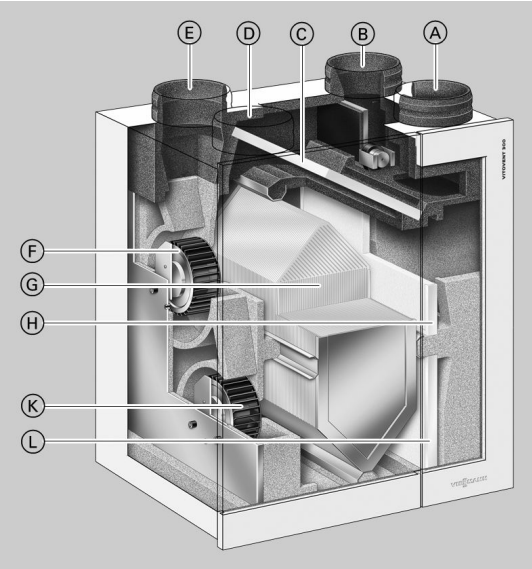
Fresh outside air is induced through a weather grille and an outside air duct. Upon entry into the ventilation system, this air is initially filtered, cleaned and then preheated by a countercurrent heat exchanger. Then the preheated outside air is channelled through a duct system to the rooms to be ventilated.
The extract air is withdrawn through a duct system from the areas where steam and odours are created (kitchen, bathroom, WC) and channelled to the ventilation equipment. Here, to protect the heat exchanger, the extract air is purified. Afterwards, the extract air preheats the cooler outside air in the countercurrent heat exchanger and is discharged from the building via the expelled air duct.
The constant flow rate control ensures a defined, constant flow rate on the ventilation and extract air side, independent of static air distribution pressure.

Subject to demand, various operating programs can be selected manually or programmed at the remote control.
The ventilation equipment must be switched on permanently to enable all unwanted humidity to be removed from low energy houses. Shutting down the system creates a risk of condensation inside the ventilation equipment and on the building substance (moisture damage).

Only for Vitovent 300 for max. air flow rate 300 m³/h or 400 m³/h
The integral bypass damper automatically switches between the operating modes with or without heat recovery. This changeover is made subject to temperature (for further details, see page 61).
The automatic function of the bypass damper can be switched ON or OFF by remote control.

Product information (cont.)

Benefits



Ⓐ Extract air
Ⓑ Outside air
Ⓒ Filter mat – outside air (bypass mode, only for Vitovent 300 for max. air flow rate 300 m^3/h or 400 m^3/h)
Ⓓ Expelled air
Ⓔ Ventilation air
Ⓕ Radial DC fan – ventilation air
Ⓖ Countercurrent heat exchanger
Ⓗ Filter mat – extract air
Ⓚ Radial DC fan – expelled air
Ⓛ Filter mat – outside air

- Ensures comfortable and healthy ambient conditions.
- Saves heating energy.
- Convenient operation of the Vitovent 300 via remote control.
- Heat recovery in excess of 90 % reduces the ventilation heat demand to a minimum and thus lowers heating costs.
- Economical DC motors with a constant flow rate and balance control maintain a constant air flow, independent of the static pressure.
- Filtering the outside air — important for those suffering from allergies.
- Reduced odour nuisance.
- Balanced humidity management prevents building damage.
- Closed windows — improved security against burglary and noise protection.
- Only for Vitovent with max. air flow rate up to 300 m^3/h or 400 m^3/h: Integral, temperature controlled bypass circumvents the heat recovery in summer (100 %) and enables ventilation with cool night air.

Delivered condition

Compact ventilation appliance.
- Air flow rate up to 180 m^3/h:
  Part no. 7373 372
- Air flow rate up to 300 m^3/h:
  Part no. 7373 373
- Air flow rate up to 400 m^3/h:
  Part no. 7373 374

- Casing made from white powder-coated sheet steel, with sound and thermal insulation.
- Including remote control with time switch, program selector and filter change indicator.
- Countercurrent heat exchanger, made from PETG plastic for heat recovery.
- Two DC fans with constant flow rate and balancing control.
- Four available connectors, without thermal bridges:
  – Air flow rate up to 180 m^3/h:
    DN 125
  – Air flow rate up to 300 m^3/h:
    DN 160
  – Air flow rate up to 400 m^3/h:
    DN 180
- Quick-change filter frame (incl. 1 set replacement filter mats).
- Outside air filter F6, extract air filter G4 (to DIN EN 779).
- Connecting cable with safety plug.
- Only Vitovent 300 for max. air flow rate 300 m^3/h or 400 m^3/h: Internal temperature controlled bypass damper.

2.2 Specification

Specification

Vitovent 300 for max. air flow rate	**m³/h**	**180**	**300**	**400**
Setting range, air flow rate (variable)				
Reduced ventilation	m³/h	50 to 170	50 to 290	50 to 390
Nominal ventilation (standard ventilation)	m³/h	50 to 175	50 to 295	50 to 395
Maximum ventilation	m³/h	50 to 180	50 to 300	50 to 400
Max. air flow rate	m³/h	180	300	400
External pressure drop at max. air flow rate	Pa	200	100	100
Factory settings				
Reduced ventilation				
– Air flow rate	m³/h	75	100	100
– External pressure drop	Pa	20	25	17
Standard ventilation				
– Air flow rate	m³/h	100	150	200
– External pressure drop	Pa	80	66	59
Maximum ventilation				
– Air flow rate	m³/h	150	225	300
– External pressure drop	Pa	140	138	128
Casing				
Material		Sheet steel		
Colour		White		
Sound and thermal insulation		EPP/EPS plastic mouldings		
Dimensions excluding connectors				
Length (depth)	mm	310	436	436
Width	mm	560	675	675
Height	mm	600	747	747
Weight	kg	25	31	32
Radial DC fans With constant flow rate control, inlet on one side only, with forward curved impeller vanes	Quantity		2	
Filter to DIN EN 779				
Ventilation air	Filter class		F6	
Extract air	Filter class		G4	
Countercurrent heat exchanger				
Heat recovery level	%	up to 92	up to 91	up to 91
Material			PETG plastic	
Rated voltage	V / Hz		230/50	
Max. power consumption	W	132	174	300

Power consumption with factory settings

Power consumption Vitovent 300 for max. air flow rate 180 m³/h

Operating mode		**Reduced ventilation**	**Standard ventilation**	**Maximum ventilation**
Air flow rate	m³/h	75	100	150
External pressure drop	Pa	18 to 40	30 to 69	60 to 150
Power consumption for both fans together	W	24 to 26	30 to 42	62 to 86

Power consumption Vitovent 300 for max. air flow rate 300 m³/h

Operating mode		**Reduced ventilation**	**Standard ventilation**	**Maximum ventilation**
Air flow rate	m³/h	100	150	225
External pressure drop	Pa	15 to 31	31 to 66	64 to 138
Power consumption for both fans together	W	18 to 20	32 to 38	70 to 90

Power consumption Vitovent 300 for max. air flow rate 400 m³/h

Operating mode		**Reduced ventilation**	**Standard ventilation**	**Maximum ventilation**
Air flow rate	m³/h	100	200	300
External pressure drop	Pa	8 to 17	31 to 59	67 to 128
Power consumption for both fans together	W	20 to 21	53 to 60	121 to 149

Product information (cont.)

Sound power level

Note
Measurement taken approx. 1.5 m from the ventilation appliance, to DIN 45635-01-KL1 or DIN 45635-02-KL1.
Different values may result in the installation areas (due to specific room conditions). Consequently, the measurement to DIN cannot replace the correct engineering of the overall system.

Sound power level Vitovent 300 for max. air flow rate 180 m³/h

Air flow rate and pressure drop in the air duct system	Sound power level [dB(A)]
75 m³/h and 20 Pa	29.0
100 m³/h and 40 Pa	35.5
150 m³/h and 80 Pa	45.0
180 m³/h and 160 Pa	49.0

Sound power level Vitovent 300 for max. air flow rate 300 m³/h

Air flow rate and pressure drop in the air duct system	Sound power level [dB(A)]
100 m³/h and 20 Pa	< 25.0
150 m³/h and 40 Pa	< 33.5
200 m³/h and 40 Pa	40.5
225 m³/h and 80 Pa	44.0
300 m³/h and 80 Pa	48.5

Sound power level Vitovent 300 for max. air flow rate 400 m³/h

Air flow rate and pressure drop in the air duct system	Sound power level [dB(A)]
100 m³/h and 20 Pa	< 30.5
150 m³/h and 40 Pa	36.0
200 m³/h and 40 Pa	39.5
225 m³/h and 80 Pa	43.5
300 m³/h and 80 Pa	49.5
400 m³/h and 160 Pa	55.0

Sound power level subject to the operating mode

Sound power level Vitovent 300 for max. air flow rate 180 m³/h

	Operating mode	Flow rate [m³/h]	Pressure drop air duct system [Pa]	Sound power level [dB] at octave centre frequency [Hz] 63	125	250	500	1000	2000	4000	8000	Total
Ventilation air connector	Reduced ventilation	75	40	45.8	45.3	43.1	46.8	46.5	37.2	28.7	19.8	49
	Standard ventilation	100	80	53.1	51.8	49.7	54.3	52.9	45.0	37.9	30.9	56
	Maximum ventilation	150	160	60.2	61.4	59.6	62.7	63.5	55.7	48.9	43.4	66
Extract air connector	Reduced ventilation	75	40	43.3	35.9	33.2	31.2	22.6	15.4	8.5	9.0	31
	Standard ventilation	100	80	50.7	41.5	38.5	37.4	29.1	22.2	15.5	9.2	37
	Maximum ventilation	150	160	58.0	51.2	46.4	45.3	39.2	32.5	26.4	12.7	45.5

Sound power level Vitovent 300 for max. air flow rate 300 m³/h

	Operating mode	Flow rate [m³/h]	Pressure drop air duct system [Pa]	Sound power level [dB] at octave centre frequency [Hz] 63	125	250	500	1000	2000	4000	8000	Total
Ventilation air connector	Reduced ventilation	100	20	44.9	39.4	39.0	39.8	39.2	29.3	21.6	15.1	42
	Standard ventilation	150	40	48.9	48.6	46.6	49.7	49.5	40.3	35.3	27.2	52
	Maximum ventilation	225	80	55.0	57.7	56.4	60.1	58.7	52.0	47.5	41.7	62
Extract air connector	Reduced ventilation	100	20	39.3	30.2	20.7	21.0	13.6	4.8	6.1	13.4	< 22
	Standard ventilation	150	40	45.4	38.3	28.6	29.1	23.8	13.9	10.3	14.2	< 30
	Maximum ventilation	225	80	49.3	47.3	39.6	38.5	33.0	25.6	21.9	15.6	39

Product information (cont.)

Sound power level Vitovent 300 for max. air flow rate 400 m³/h

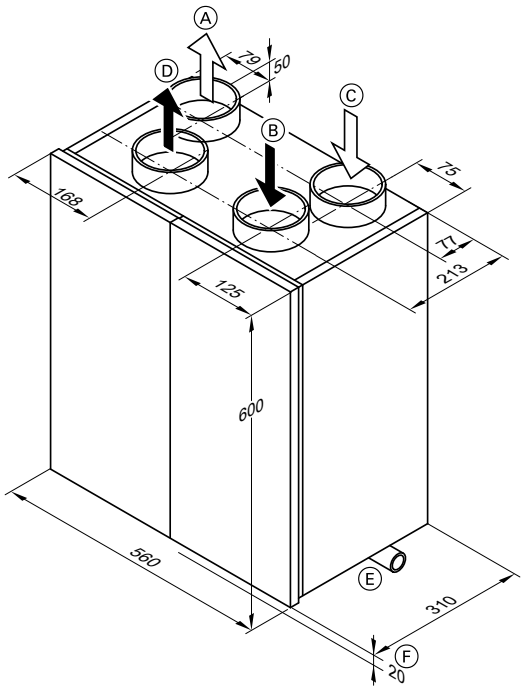
	Operating mode	Flow rate [m³/h]	Pressure drop air duct system [Pa]	Sound power level [dB] at octave centre frequency [Hz] 63	125	250	500	1000	2000	4000	8000	Total
Ventilation air connector	Reduced ventilation	100	40	50.0	51.8	48.2	48.6	49.3	40.9	34.2	23.9	51.5
	Standard ventilation	200	80	59.1	63.6	59.5	58.1	57.5	52.5	48.3	41.1	61.5
	Maximum ventilation	300	80	64.3	67.4	65.4	63.8	62.4	59.5	55.2	50.2	67.0
Extract air connector	Reduced ventilation	100	40	39.0	37.0	24.4	26.3	18.1	9.4	8.9	16.0	< 26.5
	Standard ventilation	200	80	47.7	51.8	36.4	35.3	32.1	25.1	19.2	14.3	38.0
	Maximum ventilation	300	80	51.8	55.7	46.1	42.9	38.0	33.6	28.6	21.5	44.5

Note

Higher pressure drop in the air duct system raises the sound power level, since the fan speed is adjusted accordingly.

Dimensions

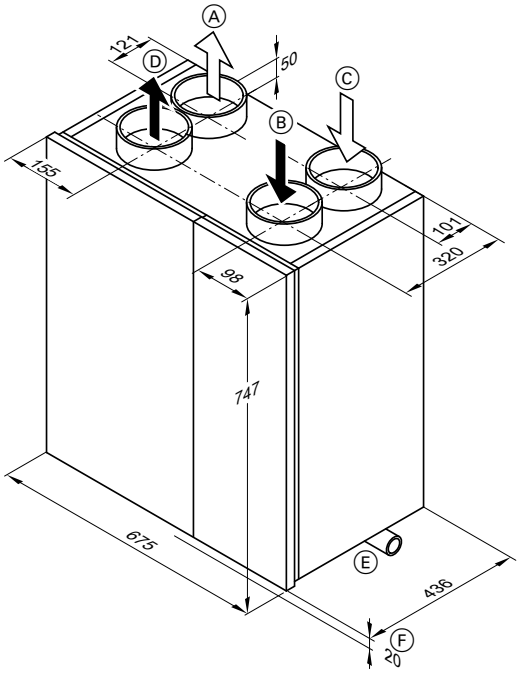
Dimensions Vitovent 300 for max. air flow rate 180 m³/h



Ⓐ Ventilation air (DN 125)
Ⓑ Extract air (DN 125)
Ⓒ Outside air (DN 125)
Ⓓ Expelled air (DN 125)
Ⓔ Condensate drain (hose connection internal Ø 12 mm)
Ⓕ Height of the adjustable feet

Product information (cont.)

Dimensions Vitovent 300 for max. air flow rate 300 m³/h or 400 m³/h



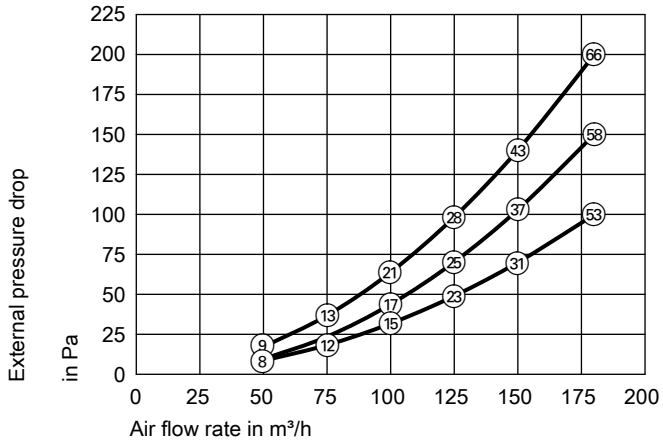
		300 m³/h	400 m³/h
Ⓐ	Ventilation air	DN 160	DN 180
Ⓑ	Extract air	DN 160	DN 180
Ⓒ	Outside air	DN 160	DN 180
Ⓓ	Expelled air	DN 160	DN 180
Ⓔ	Condensate drain (hose connection internal Ø 15 mm)		
Ⓕ	Height of the adjustable feet		

Fan curves

Neither on the ventilation air/fresh air nor on the extract air/expelled air side must the duct system exceed the external pressure drop according to the curves. For sizing of the Vitovent and calculating the air flow rate and pressure drop, see from page 46.

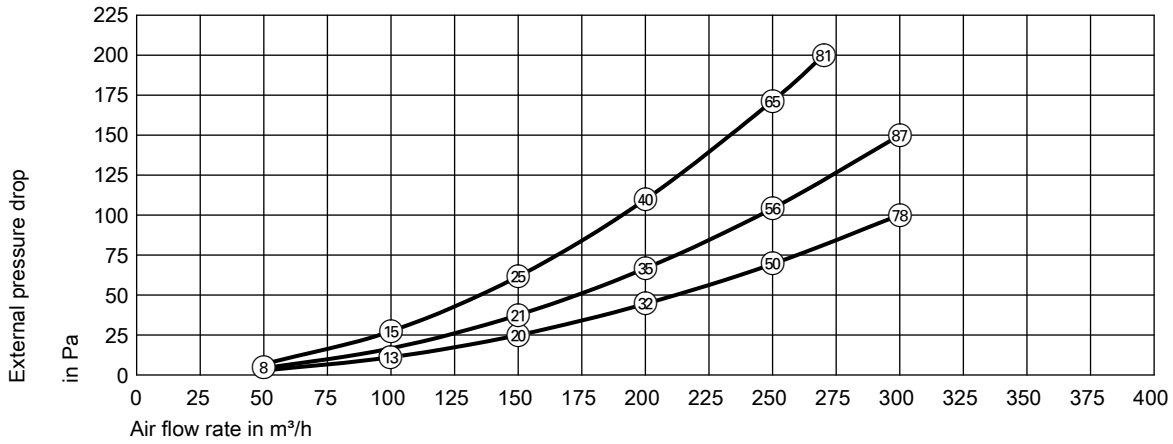
Note
The fan power consumption is variable, subject to operating mode and pressure drop.

Vitovent 300 for max. air flow rate 180 m³/h



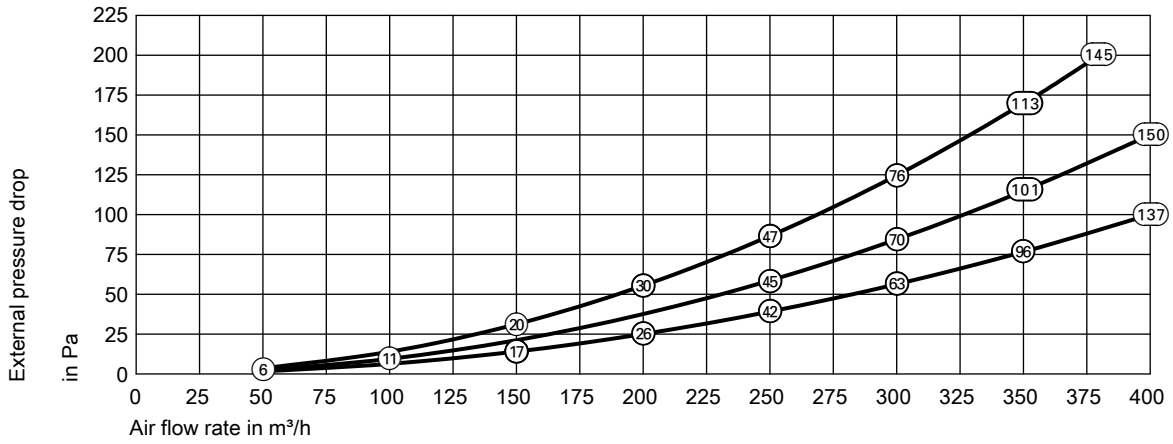
ⓧ Power consumption per fan in W at min. average or max. pressure drop

Vitovent 300 for max. air flow rate 300 m³/h



ⓧ Power consumption per fan in W at min. average or max. pressure drop

Vitovent 300 for max. air flow rate 400 m³/h



ⓧ Power consumption per fan in W at min. average or max. pressure drop

Installation accessories for outside air/expelled air

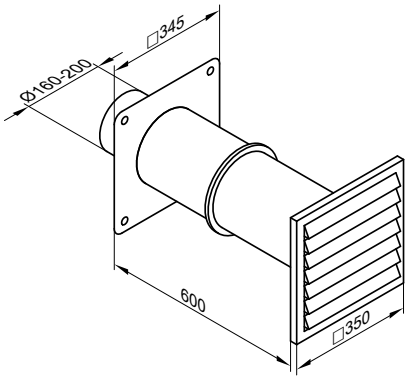
The components described in the following do not form thermal bridges and comply with the insulation standard required for passive houses.

3.1 Outside air

External wall connection

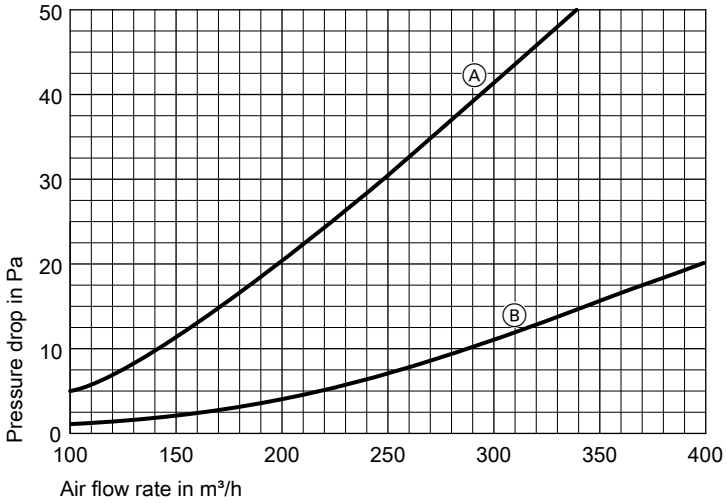
Nominal diameter	Vitovent 300 for maximum air flow rate	Part no.
DN 160	180 m³/h	9562 053
DN 160	300 m³/h	9562 053
DN 180	400 m³/h	7439 114

Installation accessories for outside air/expelled air (cont.)



- The external wall connection requires a wall outlet of at least Ø 300 mm for the EPP insulation sleeve (free of thermal bridges) and a structural seal.
- The duct connection to the external wall connection must be thermally insulated and vapour diffusion-proof.
- The Vitovent 300 for max. air flow rate 180 m³/h requires a reducer DN 160/125.

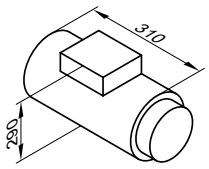
Pressure drop, external wall connection



Ⓐ Part no. 9562 053
Ⓑ Part no. 7439 114

Pre/reheater bank

Nominal diameter	Vitovent 300 for maximum air flow rate	Part no.
DN 125	180 m³/h	7160 135
DN 160	300 m³/h	7373 034
DN 180	400 m³/h	7373 035



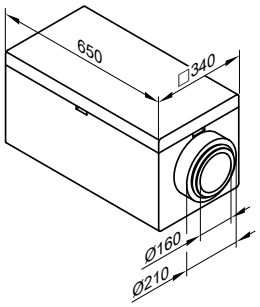
- Can be plugged onto the Vitovent 300 connector
- Fully wired
- With electronic control from 0.125 to 1 kW

Installation accessories for outside air/expelled air (cont.)

Note
The pressure drop represents the value for 1 m folded spiral-seam tube of the respective internal diameter (see page 28).

Outside air filter box

Part no. 7180 278
DN 160 for installation into the outside air duct.

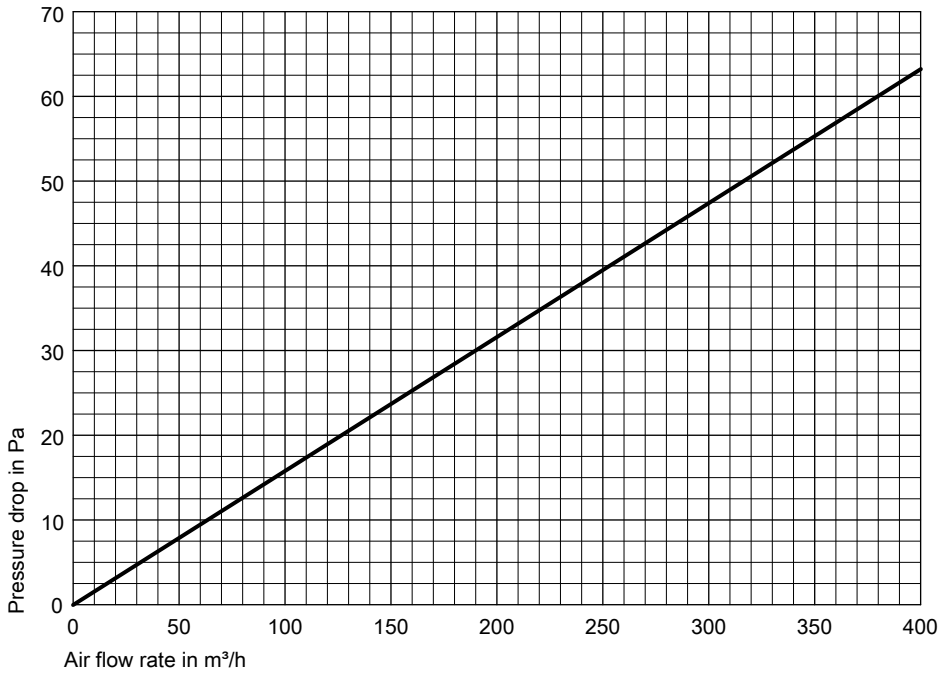


The internal ventilation air filter of the Vitovent can be removed if an outside air filter box is used.

Components:
- Thermally insulated plastic casing (EPP, black)
- Pocket filter (F7, pollen filter)

Note
Required reducers for the external wall connection:
- *2 pce DN 160/125 for Vitovent 300 for max. air flow rate 180 m³/h*
- *2 pce DN 180/160 for Vitovent 300 for max. air flow rate 400 m³/h*

Pressure drop, outside air filter box



Summer cassette

Part no. 7249 340
Only for Vitovent 300 for max. extract air flow rate **180 m³/h**
To replace the countercurrent heat exchanger (fitted in the delivered condition).

The summer cassette routes the extract air flow directly to the expelled air connector. This prevents the preheating of the outside air (appropriate for example in the early hours of the morning).

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Installation accessories for outside air/expelled air (cont.)

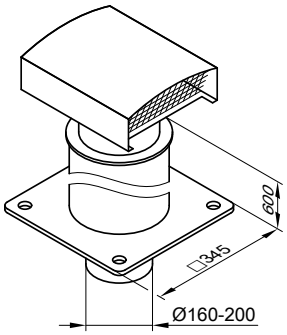
3.2 Expelled air

External wall connection

See page 12

Expelled air roof outlet

Part no. 9562 054

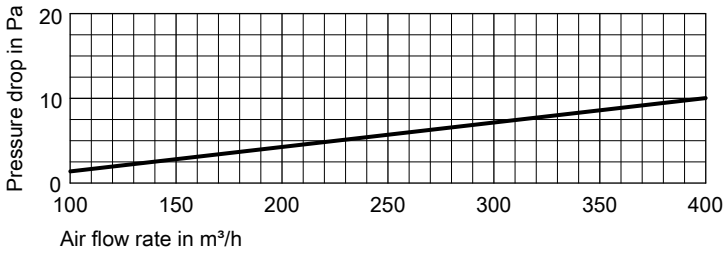


Components:
- Removable hood
- EPP insulating sleeve
- Connector
- Lead plate 600 x 600 mm (not shown).

Note
Required reducers for the external wall connection:
- *1 pce DN 160/125 for Vitovent 300 for max. air flow rate 180 m³/h*
- *1 pce DN 180/160 for Vitovent 300 for max. air flow rate 400 m³/h*

Made from stainless steel.

Pressure drop, expelled air roof outlet

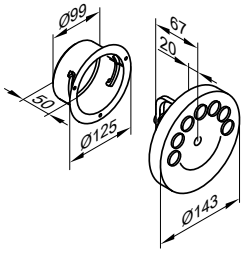


Installation accessories for ventilation air/extract air, metal duct system

4.1 Ventilation air apertures

Ventilation air valve for wall installation, DN 100

Part no. 9521 425
Flow rate up to 30 m³/h



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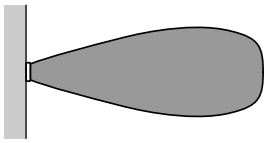
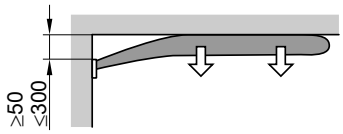
Installation accessories for ventilation air/extract air, metal duct system (cont.)

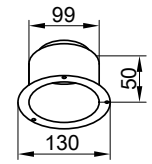
Ventilation air distribution at the air outlet

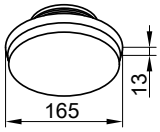




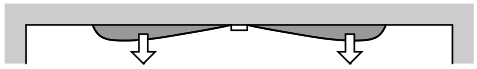
Ventilation valves for ceiling installation

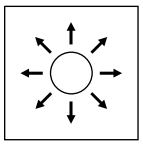
Nominal diameter	Flow rate	Part no.
DN 100	up to 45 m³/h	9523 956
DN 125	up to 60 m³/h	7440 229



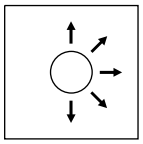


Ventilation air distribution at the air outlet





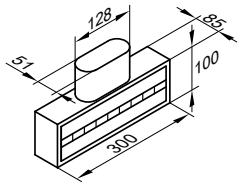
Air outlet angle 360° without fascia



Air outlet angle 180° with fascia, e.g. in case of ceiling installation near walls

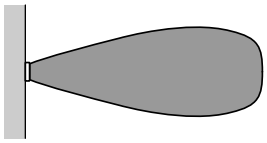
Slotted outlet with connecting chamber, system 100

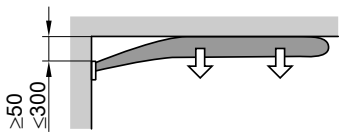
Part no. 9542 566



- Flow rate up to 35 m³/h
- For wall and ceiling installation
- With stainless steel casing

Wall installation: Ventilation air distribution at the air inlet





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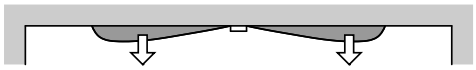
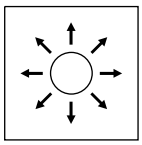
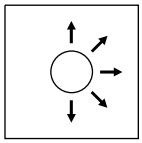
Installation accessories for ventilation air/extract air, metal duct system (cont.)

Ceiling installation: Ventilation air distribution at the air inlet





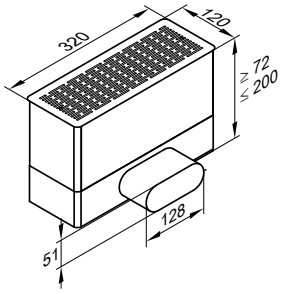
Air outlet angle 360° adjustable with adjusting wheels



Air outlet angle 180° adjustable with adjusting wheels, e.g. in case of ceiling installation near walls

Floor outlet, system 100

Part no. 9559 914



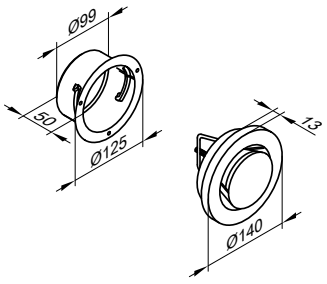
- Flow rate up to 35 m^3/h
- For floor installation and installation into the upper wall area
- With stainless steel casing and stainless steel grate
- Height adjustable

Note
For details regarding the floor construction, see page 45.

4.2 Extract air apertures

Extract air valves

Nominal diameter	Flow rate	Part no.
DN 100	up to 45 m^3/h	9521 448
DN 125	up to 60 m^3/h	7440 230



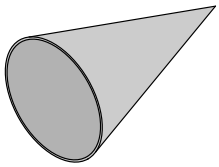
For installation in ceilings and walls in bathrooms, toilets, sanitary rooms and workrooms

Note
Ceiling and wall installation as for kitchen extract air valve (see page 18)

Installation accessories for ventilation air/extract air, metal duct system (cont.)

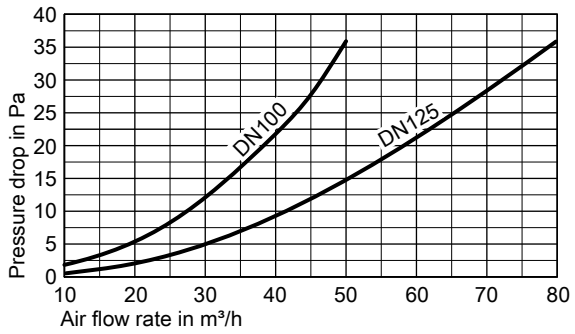
Extract air filter

Nominal diameter	Filter class	Part no.
DN 100	G3	9562 052
DN 125	G3	7440 232



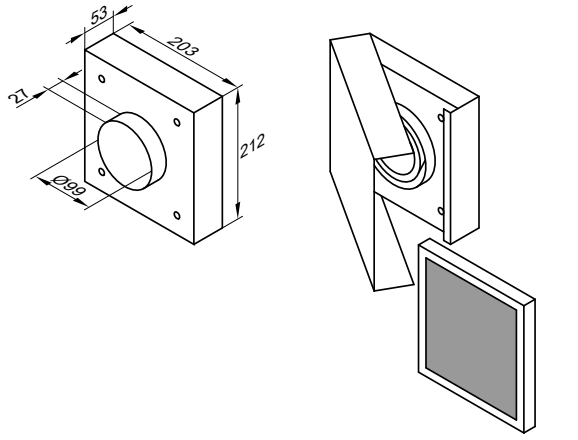
Pack containing 5 pce

Pressure drop



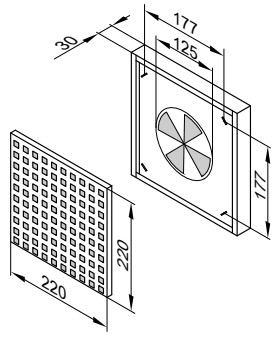
Kitchen extract air valve

Nominal diameter	Flow rate	Part no.
DN 100	60 m³/h	9542 601
DN 125	75 m³/h	7440 231



DN 100

With grease filter made from aluminium mesh



DN 125

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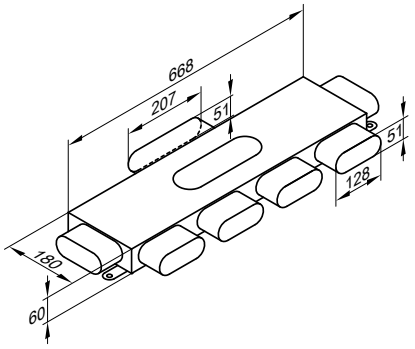
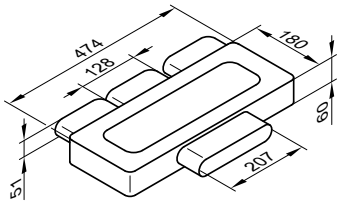
4.3 Air distribution boxes

Part no. 9542 586



For the connection of 4 flat ducts, system 100
- 1 connector, system 150, at the back
- 4 connectors, system 100, at the front
- 3 covers, system 100

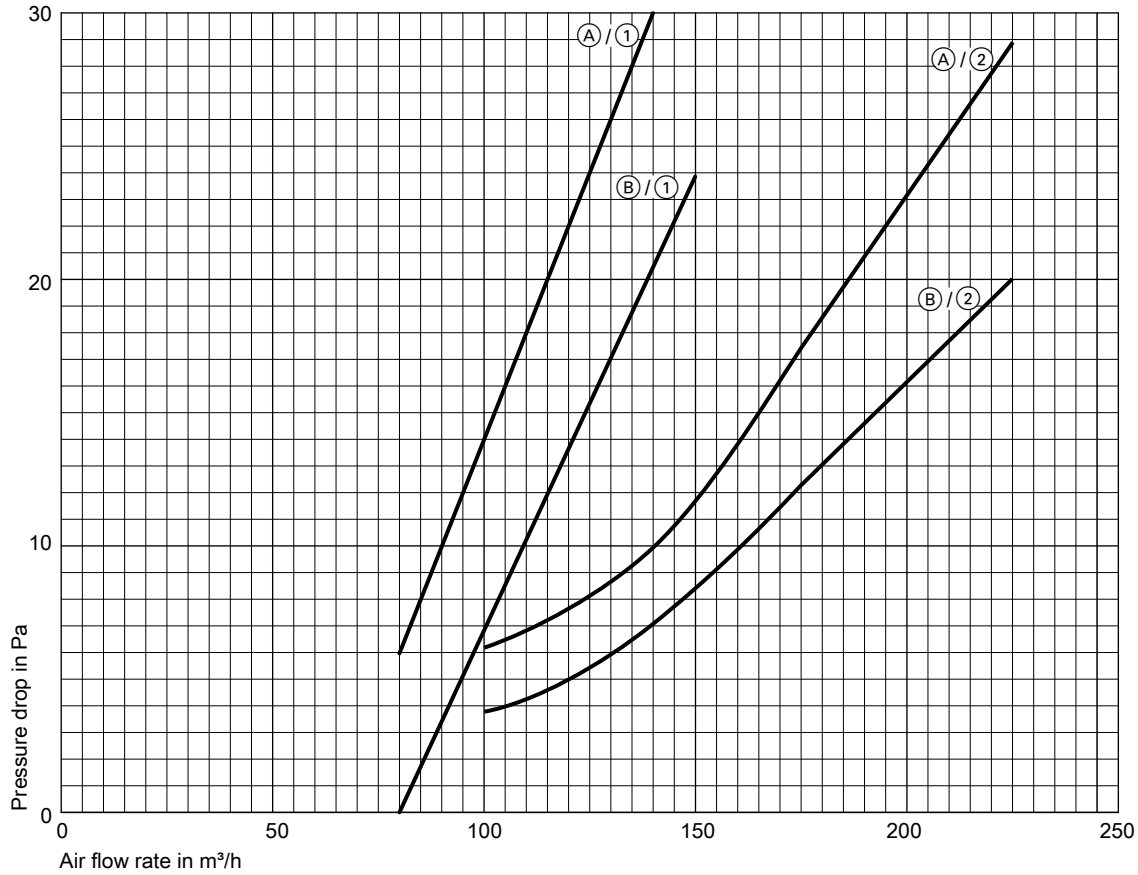
Part no. 9562 050



For the connection of 3 flat ducts, system 100
- 1 connector, system 150, at the back
- 3 connectors, system 100, at the front

Installation accessories for ventilation air/extract air, metal duct system (cont.)

Pressure drop, air distribution box



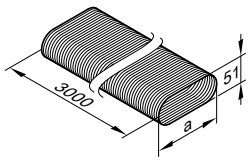
Ⓐ Extract air
Ⓑ Ventilation air

① Air distribution box for the connection of six flat ducts
② Air distribution box for the connection of three flat ducts

4.4 Flat duct

Flexible flat duct, system 100 and 150

System	Flow rate Ventilation air	Extract air	Dimension a	Length	Part no.
100	45 m³/h	60 m³/h	128 mm	3 m	9542 601
			207 mm	15 m (roll)	9559 070
150	210 m³/h	210 m³/h		3 m	9542 571



Made from zinc-plated sheet steel, ribbed inside.

Note
If the flexible flat duct, system 150, is routed within the insulation layer below the screed, e.g. as the supply pipe for the air distribution box, protect the duct with cover panels against deformation by concentrated loads.

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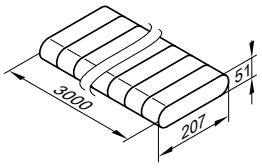
Installation accessories for ventilation air/extract air, metal duct system (cont.)

Rigid flat duct, system 150

Part no. 9542 572

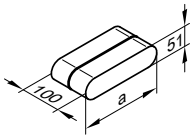


- Made from zinc-plated sheet steel, smooth inside
- Max. flow rate, ventilation and extract air 210 m^3/h

Connection piece

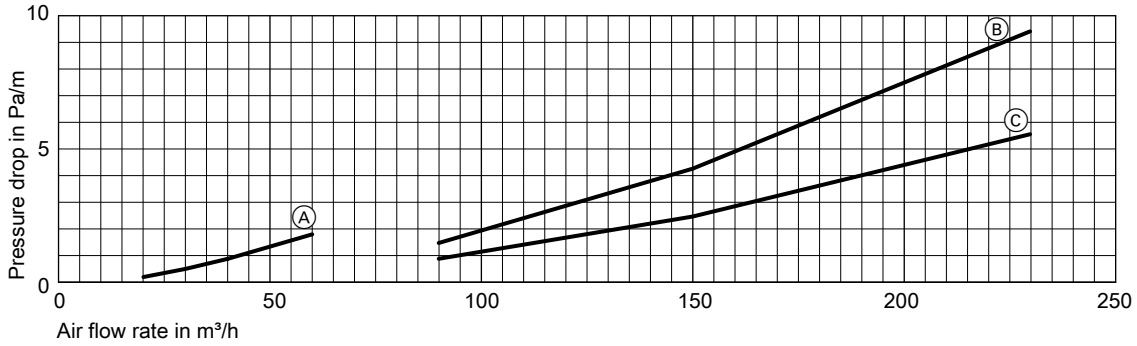
System	Cross-section	Part no.
100	128 x 51 mm	9542 575
150	207 x 51 mm	9542 576

Made from stainless steel.



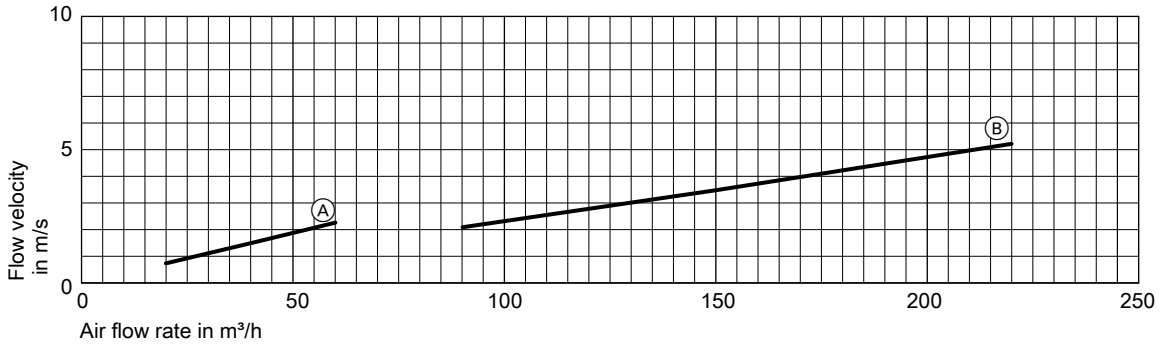
For joining flat duct elements (rigid or flexible).

Flat duct pressure drop



Ⓐ System 100, flexible
Ⓑ System 150, flexible
Ⓒ System 150, rigid

Flow velocity, flat duct



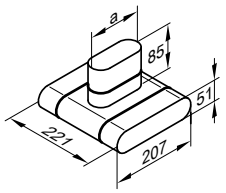
Ⓐ System 100
Ⓑ System 150

4.5 Flat duct: Tees, bends, reducer

Tee, broad side

System	Dimension a	Part no.
150/100	128 mm	9542 577
150/150	207 mm	9542 578

Note
Pressure drop: 5 Pa

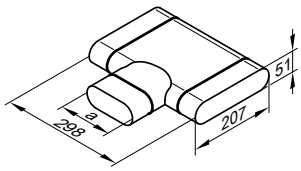


Made from stainless steel

Tee, narrow side

System	Dimension a	Part no.
150/100	128 mm	9542 579
150/150	207 mm	9542 580

Note
Pressure drop: 5 Pa

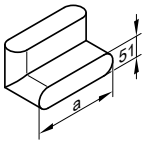


Made from stainless steel

Bend 90° broad side, 2 sections

System	Dimension a	Part no.
100	128 mm	9542 584
150	207 mm	9542 585

Installation accessories for ventilation air/extract air, metal duct system (cont.)

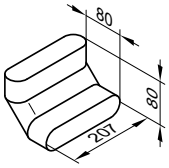


Note
Pressure drop: 5 Pa

Made from stainless steel

Bend 90° broad side, 3 sections

Part no. 9562 055
System 150

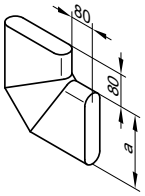


Note
Pressure drop: 5 Pa

Made from stainless steel

Bend 90° narrow side, 3 sections

System	Dimension a	Part no.
100	128 mm	9562 057
150	207 mm	9562 056

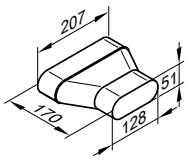


Made from stainless steel.

Note
Pressure drop: 5 Pa

Reducer

Part no. 9542 581
System 150/100.



Note
Pressure drop: 5 Pa

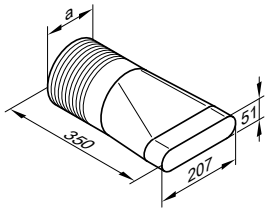
Made from stainless steel.

4.6 Adaptors — round to flat

Adaptor — round to flat

System	Dimension a	Part no.
DN 125 to system 150	125 mm	7249 111
DN 160 to system 150	160 mm	9542 582
DN 180 to system 150	180 mm	7373 032

Note
- ***Two*** *adaptors are required per Vitovent 300*
- *Pressure drop: 5 Pa*

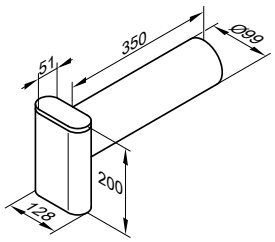


Made from stainless steel.

Diverter — round to flat

Part no. 9542 583

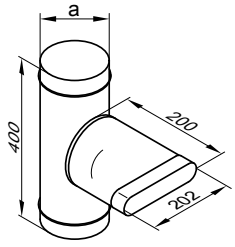
Note
Pressure drop: 5 Pa



Adaptor from round duct system (DN 100) to flat (system 100)
- Required for ventilation and extract air apertures
- Made from stainless steel

Branch (tee) — round to flat

System	Dimension a	Part no.
DN 125 to system 150	125 mm	7249 112
DN 160 to system 150	160 mm	9562 051
DN 180 to system 150	180 mm	7373 033



Adaptor from round ducts to flat (system 150).
Made from stainless steel.

Note
Pressure drop: 5 Pa

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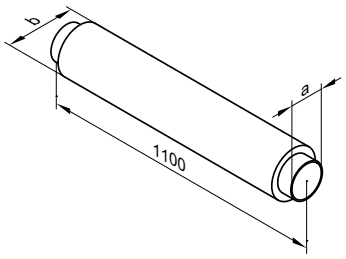
4.7 Silencers

Silencer components:
- Internal perforated aluminium pipe
- Drip guard
- Absorbent material
- External aluminium pipe
- Front closure: 2 aluminium caps

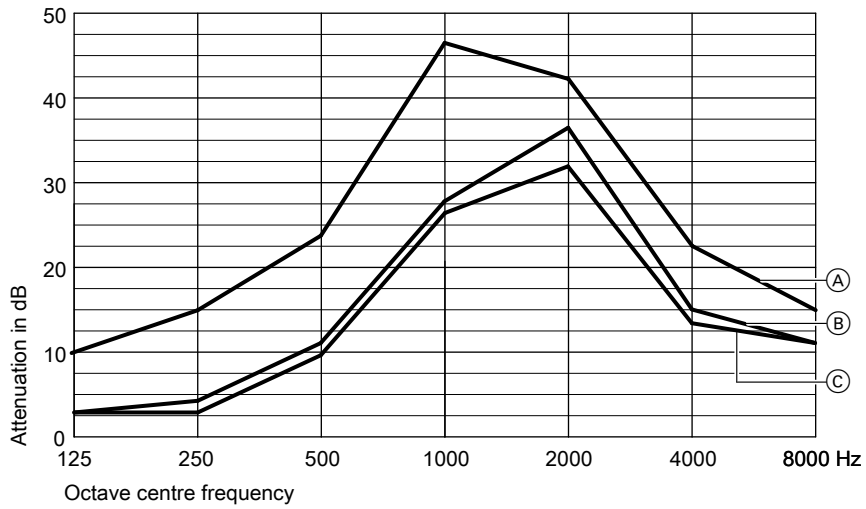
Silencer, round, flexible

Connection	Dimensions		Part no.
	a	b	
DN 125	125 mm	224 mm	7249 105
DN 160	160 mm	200 mm	9521 461
DN 180	180 mm	224 mm	7373 027



Note
Pressure drop:
Corresponds to the pressure drop of flexible pipe (see page 28).

Attenuation characteristics of silencers, round

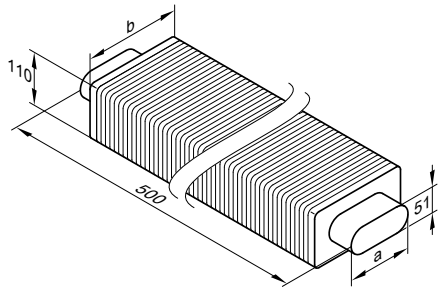


Ⓐ DN 125
Ⓑ DN 160
Ⓒ DN 180

Silencer, flat, flexible

System	Dimensions		Part no.
	a	b	
100	128 mm	202 mm	9542 573
150	207 mm	304 mm	9542 574

Installation accessories for ventilation air/extract air, metal duct system (cont.)

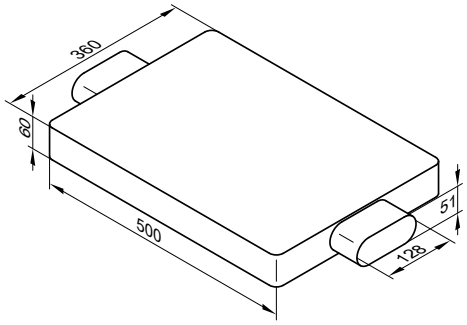


Note
Pressure drop:
Corresponds to the pressure drop of flat duct (see page 21).

Made from aluminium

Silencer, flat, crush-resistant version, system 100

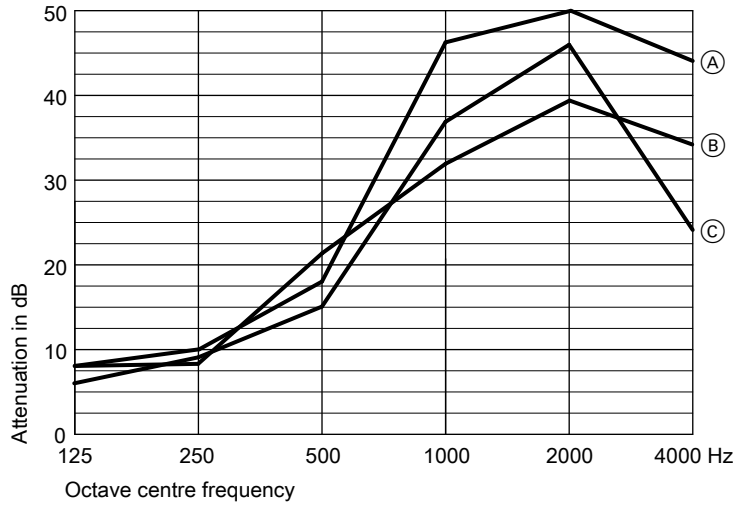
Part no. 9562 049



Note
Pressure drop:
Corresponds to the pressure drop of flat duct (see page 21).

For ventilation air areas with higher silencing requirements

Attenuation characteristics of silencers, flat



Ⓐ System 100, flexible
Ⓑ System 100, crush-resistant
Ⓒ System 150, flexible

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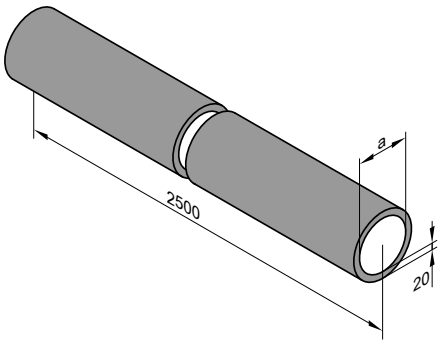
4.8 Pipes

Flexible pipe with thermal insulation

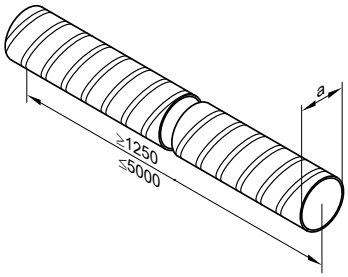
Connection	Dimension a	Part no.
DN 125	125 mm	7249 101
DN 160	160 mm	9521 450
DN 180	180 mm	7373 023

Thermal insulation made from resin-bonded mineral fibre



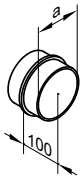
Flexible pipe with thermal insulation

Connection	Dimension a	Part no.
DN 125	125 mm	7249 102
DN 160	160 mm	9521 455
DN 180	180 mm	7373 024



Connection piece

Connection	Dimension a	Part no.
DN 125	125 mm	7249 103
DN 160	160 mm	9521 437
DN 180	180 mm	7373 025

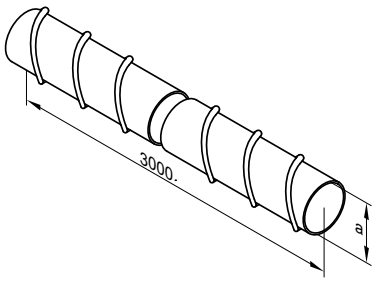


To join two flexible pipes.

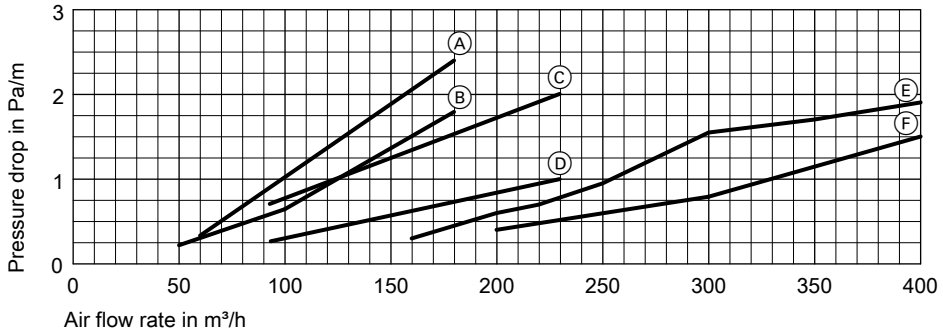
Folded spiral-seam tube

Connection	Dimension a	Part no.
DN 125	125 mm	7249 104
DN 160	160 mm	9521 428
DN 180	180 mm	7373 026

Installation accessories for ventilation air/extract air, metal duct system (cont.)

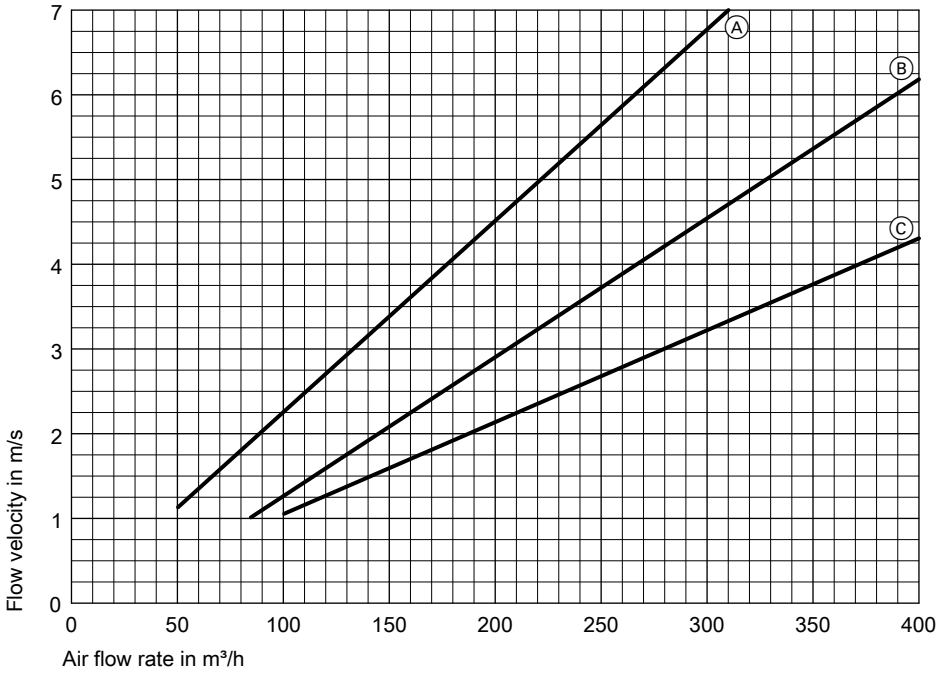


Pressure drop, pipes



Ⓐ Flexible pipe DN 125
Ⓑ Folded spiral-seam tube DN 125
Ⓒ Flexible pipe DN 160
Ⓓ Folded spiral-seam tube DN 160
Ⓔ Flexible pipe DN 180
Ⓕ Folded spiral-seam tube DN 180

Flow velocity

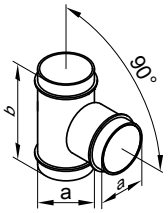


Ⓐ DN 125
Ⓑ DN 160
Ⓒ DN 180

4.9 Pipes: Tee, bends, reducers

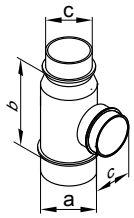
Tee

Connection	Dimensions		Part no.
	a	b	
DN 125	125 mm	200 mm	7249 110
DN 160	160 mm	240 mm	7190 179
DN 180	180 mm	240 mm	7373 031



Tee with reducer

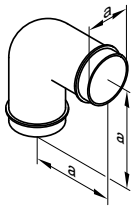
Connec-tion	Dimensions			Part no.
	a	b	c	
DN 125	125 mm	205 mm	100 mm	7299 292
DN 160	160 mm	230 mm	125 mm	7299 293



Installation accessories for ventilation air/extract air, metal duct system (cont.)

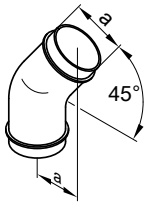
Bend 90°

Connection	Dimension a	Part no.
DN 125	125 mm	7249 106
DN 160	160 mm	9521 431
DN 180	180 mm	7373 028



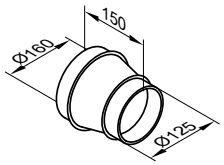
Bend 45°

Connection	Dimension a	Part no.
DN 125	125 mm	7249 107
DN 160	160 mm	9521 725
DN 180	180 mm	7373 029



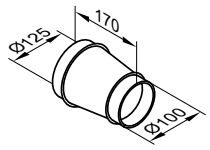
Reducer 160/125

Part no. 7249 108



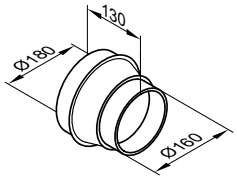
Reducer 125/100

Part no. 7249 109



Reducer 180/160

Part no. 7373 030



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Installation accessories for ventilation air/extract air, plastic duct system

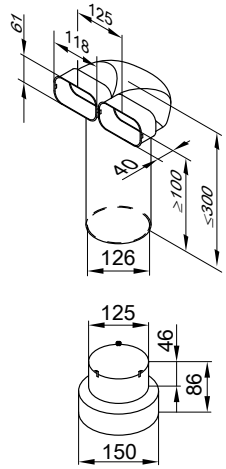
On plastic duct systems, the flow rate is adjusted for part sections by means of the restrictors (see page 33).

For calculating the pressure drop, a calculation program can be downloaded at www.viessmann.de.

5.1 Ventilation air apertures

Ventilation air valve DN 125 with diverter for wall and ceiling installation

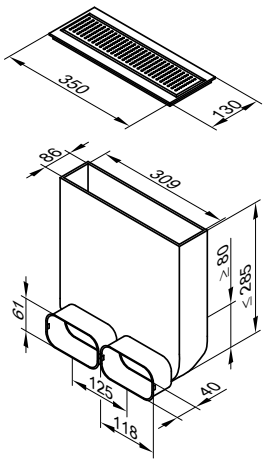
Components	Flow rate	Part no.
Ventilation air valve	up to 60 m^3/h	7440 228
Diverter with cap	up to 2 x 30 m^3/h	7440 214



Floor outlet with grate

Components	Flow rate	Part no.
Floor-level outlet with cap	up to 2 x 30 m^3/h	7440 219
Grate, white	up to 60 m^3/h	7440 225
Grate, stainless steel	up to 60 m^3/h	7440 226

- Optional connection of up to 2 flat ducts, system 100
- With caps



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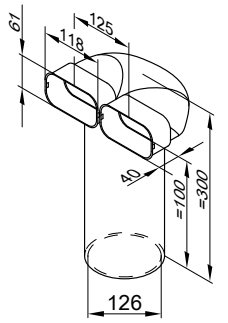
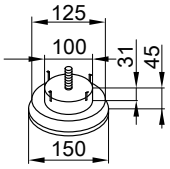
5.2 Extract air apertures

Extract air valve DN 125 with diverter

Components	Flow rate	Part no.
Extract air valve with cap	up to 60 m^3/h	7440 227
Diverter	up to 2 x 30 m^3/h	7440 214



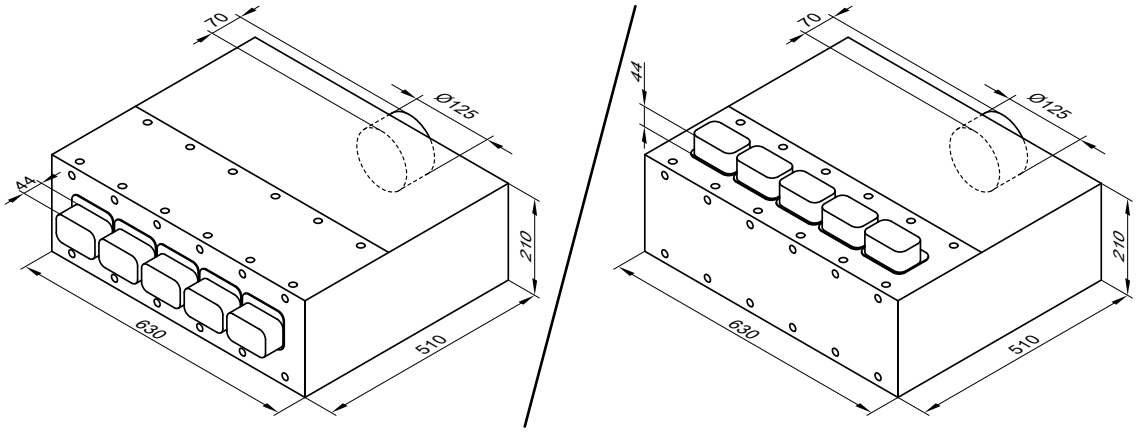


5.3 Air distribution boxes

Flat duct, system 100

Connection, round duct with integral sound insulation	Max. number of flat ducts	Part of the standard delivery		Part no.
		Number of caps	Number of restrictors	
DN 125	5	2	5	7440 222
DN 160	10	5	10	7440 223
DN 180	15	5	15	7440 224

In the delivered condition, the connectors are fitted pointing forward.
If required, the connectors can be fitted pointing upwards.



DN 125

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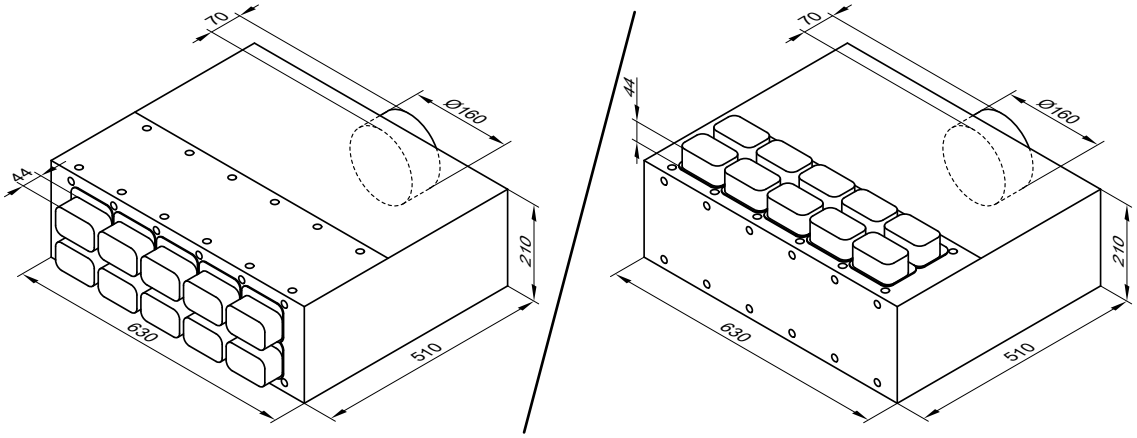
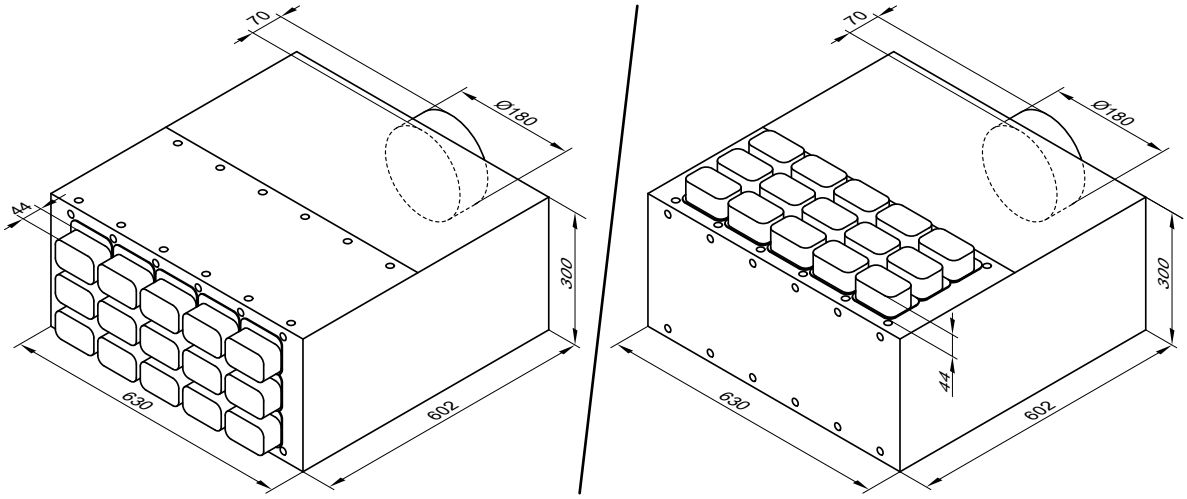
Installation accessories for ventilation air/extract air, plastic duct system (cont.)



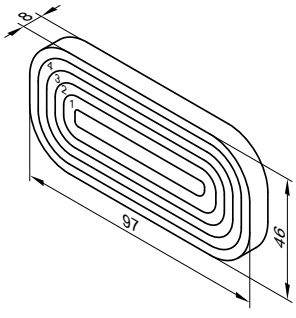
DN 160



DN 180

Restrictor

Individual rings are knocked out of the restrictors to adjust the flow rate. How many rings need to be knocked out depends on the pressure drop calculation. A calculation program can be downloaded at www.viessmann.de.

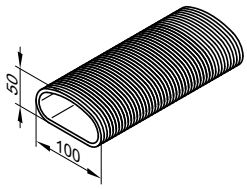


5.4 Flat duct, system 100

Flat duct

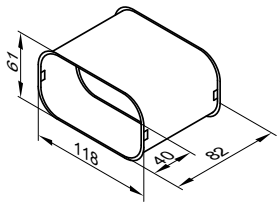
Part no: 7440 212

- Internally smooth with anti-bacterial coating
- Max. flow rate, ventilation air/extract air: 30 m^3/h
  2 flat ducts can be connected in parallel to the floor outlet or the diverter to achieve higher flow rates (up to 60 m^3/h).
- 50 m roll



Connection piece

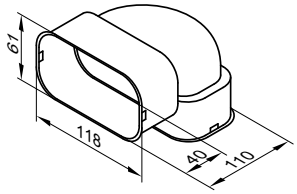
Part no: 7440 218



5.5 Flat duct: Bends

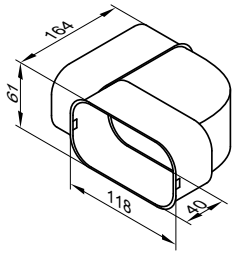
Bend 90°, broad side

Part no: 7440 215



Bend 90°, narrow side

Part no. 7440 216



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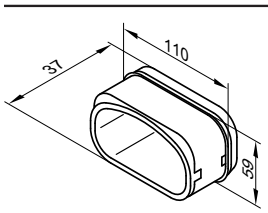
5.6 Lip seal

Part no: 7440 213

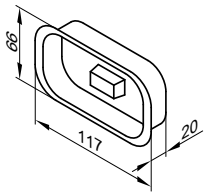
For an airtight seal of the joints in the flat duct system 100 (e.g. for bends, connectors, connections at the air distribution box).



5.7 Locking cap

Part no: 7440 217

Air-tight locking tab for surplus connections at the ventilation air/extract air apertures (diverter, floor outlet, distribution box).



Design information

6.1 Positioning

Application

The central domestic ventilation system Vitovent 300 may only be used in a **single** self-contained residential unit (e.g. in a detached family home or flat). Only one remote control can be connected to the Vitovent 300, enabling the ventilation to be adapted to the user patterns in only one residential unit. Ventilating several smaller flats or apartments is therefore not permitted according to the Thermal Insulation Ordinance [Germany].

The Vitovent 300 is not designed for rooms with commercial use (e.g. restaurant, shop etc.).
Its use as a ventilation system in swimming pools, garages or special accommodation is not permitted.

Fire protection

There is no special requirement for fire safety in detached houses.

Where fire protection sections and fire walls are penetrated in buildings with more than 2 floors, observe DIN 4102 (fire dampers, duct design) [or local regulations].

Airtight building

The air in domestic accommodation should ideally be changed at a rate of 0.5. This means that the total air volume within the building will be changed every 2 hours.
The building envelope should be as airtight as possible to ensure a defined air change solely by adjusting the ventilation equipment.

Whether a building is airtight can be verified by the "blower door test". During this test, a fan creates a pressure differential of 50 Pa (0.5 mbar) between the inside and the outside of the building.
For domestic ventilation systems with heat recovery, an air change of $\leq$ 1.5 should be sought according to the EnEV [Germany].

Installation room requirements

- Preferably install the ventilation device inside the airtight and thermally insulated building envelope.
- The Vitovent 300 can be installed floorstanding or wall mounted.
- Install the ventilation appliance in a dry room **free from the risk of frost**.
- Keep pipework to the extract air and ventilation air areas as short as possible.
- Thermally insulate those ducts that pass through unheated areas of the house with material (min. 50 mm) that is safe from the diffusion of vapour.
- A standard safety socket is required for the power supply.
- Install the remote control in a central location, e.g. living room, kitchen or hallway.
  Install a 2-core control cable for connecting the remote control to the ventilation equipment.

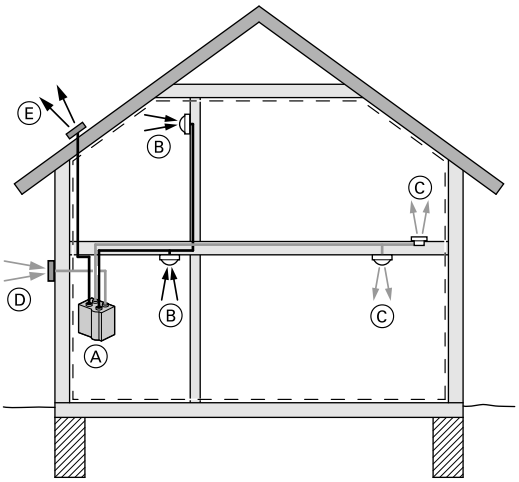
Design information (cont.)

- Connect the condensate drain to a sewer.
- The ventilation appliance must be accessible for maintenance purposes.

Possible installation locations:
- Storeroom or utility room on the ground floor
- Cellar
- Thermally insulated long pane attic room.

Installation options

Vitovent 300 within the sealed building envelope



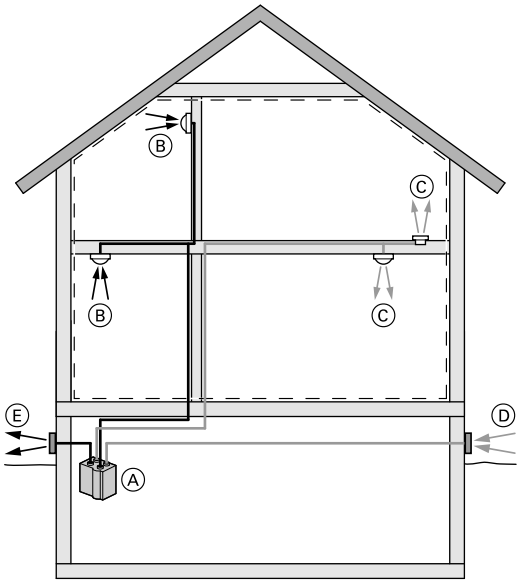
- Flat duct in the upper floor screed
- Ventilation and extract air for the ground floor via ceiling valves
- Ventilation air at the upper floor via floor-level outlets
- Extract air from the upper floor via extract ducts installed in intermediate walls

Benefits
- No unnecessary penetration of the sealed building envelope
- Only one installation level for the air distribution

Ⓐ Vitovent 300
Ⓑ Extract air
Ⓒ Ventilation air
Ⓓ Outside air
Ⓔ Expelled air

Design information (cont.)

Vitovent 300 in an unheated cellar



- Flat duct in the upper floor screed
- Ventilation and extract air for the ground floor via ceiling valves
- Ventilation air at the upper floor via floor-level outlets
- Extract air from the upper floor via extract ducts installed in intermediate walls

Benefit

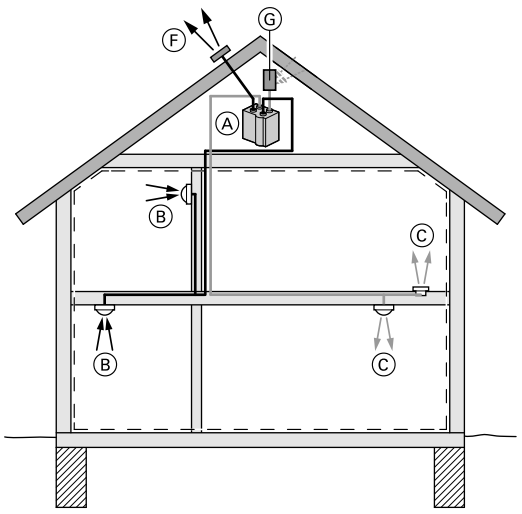
- Only one installation level for the air distribution

Disadvantages

- All ducts in unheated areas must be thermally insulated with diffusion-proof material.
- Ventilation and extract air ducts from the Vitovent 300 to the air distribution box: max. 5 m on account of the pressure drop.
  Possibly route the ventilation air and extract air ducts through a conduit DN 160 or DN 180.
- Minimum distance between outside air/expelled air 3 m
- The cellar must be free from the risk of frost.

Ⓐ Vitovent 300
Ⓑ Extract air
Ⓒ Ventilation air
Ⓓ Outside air
Ⓔ Expelled air

Vitovent 300 in an unheated pitched roof attic



- Flat duct in the upper floor screed
- Ventilation and extract air for the ground floor via ceiling valves
- Ventilation air at the upper floor via floor-level outlets
- Extract air from the upper floor via extract ducts installed in intermediate walls
- Outside air via the ridge, expelled air via the roof.

Benefit

- Only one installation level for the air distribution

Disadvantages

- All ducts in unheated areas must be thermally insulated with diffusion-proof material.
- Ventilation and extract air ducts from the Vitovent 300 to the air distribution box max. 5 m on account of the pressure drop.
  Possibly route the ventilation air and extract air ducts through a round conduit DN 160 or DN 180.
- The attic must be free from the risk of frost.

Ⓐ Vitovent 300
Ⓑ Extract air
Ⓒ Ventilation air
Ⓕ Expelled air via the roof
Ⓖ Outside air via the roof ridge

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Open flue combustion equipment and ventilation equipment

The simultaneous operation of open flue combustion equipment (e.g. an open fireplace) and the Vitovent in the same combustion air interconnection will result in dangerous **negative pressure** inside the room. The negative pressure can result in a return of **flue gases** into the room interior.

- **Never** operate the Vitovent simultaneously with **open** flue combustion equipment (e.g. open fireplace).
- Only operate solid fuel combustion equipment in **balanced** flue mode with its independent outside air and expelled air duct.
- Doors to heating rooms where the combustion air supply is not interconnected with the living space must be airtight and must be kept shut.

Information regarding the operation of the Vitovent 300 in conjunction with open flue combustion equipment

- ***Always** install an interlock system on site. In case of negative pressure inside the room, the interlock system (e.g. air pressure limiter "P4" made by Erich Huber, www.luftdruckwaechter.de) must switch off the Vitovent.*
- *The relevant flue gas inspector **must** give his approval [check local regulations].*
- *The ice guard circuit **must** be disabled (remote control) and the ice guard must be ensured through an electric pre-heater bank (accessory) or a geothermal heat exchanger (on-site provision).*

Extractor hoods, tumble dryers and Vitovent

The simultaneous operation of extractor hoods or tumble dryers and the Vitovent in interconnected rooms results in negative pressure inside the room.

- **Never** link extractor hoods and tumble dryers into the Vitovent duct system.
- Set up extractor hoods in the kitchen either to recirculate air or to expel the air to the outside.
  Recommendation: Recirculating extractors offer a better energy balance.

6.2 Electrical connection

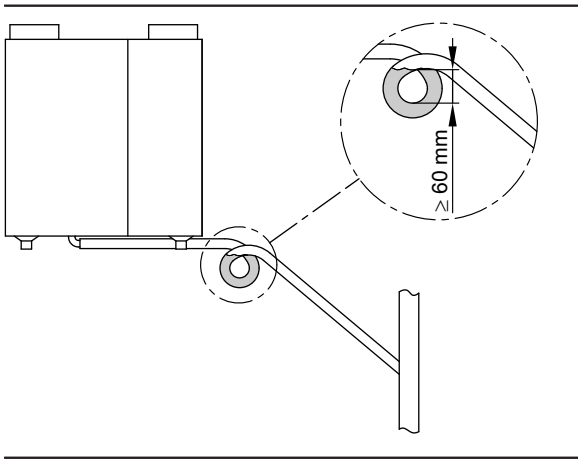
The Vitovent 300 is delivered fully wired.
Connection to a safety socket 230 V/50 Hz.
Install a second standard socket of the same specification, if an electrical preheater bank is to be installed.
When working on the power supply observe the connection conditions of your local power supply company as well as local wiring regulations.

Remote control
A two-core lead with a cross-section of at least 0.5 mm^2 is required for the remote control connection. For further details regarding the remote control, see page 60.

6.3 Condensate drain

The heat recovery creates condensate in the countercurrent heat exchanger.
A frost-free sloping connection to a sewer is required for draining the condensate.

Condensate drain via water seal



Where necessary in floorstanding installations, install a plinth to prevent condensate backing up.

Note
Because of the risk of backpressure, connecting the condensate drain to foul water pipes is not permissible.

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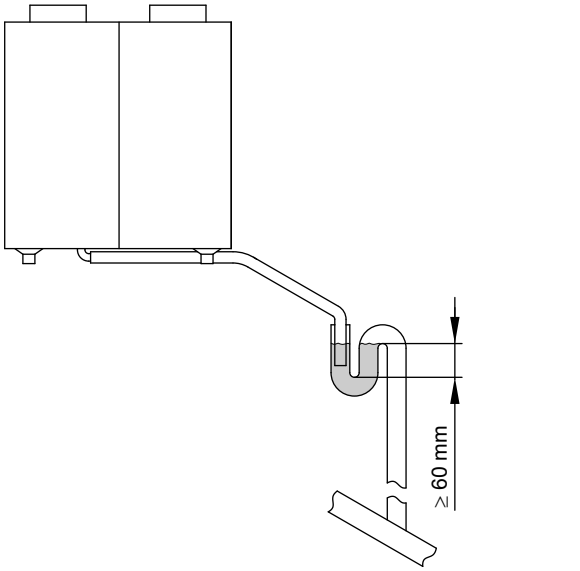
Condensate drain via siphon with stench trap



6.4 Operating mode

Note
The installed domestic ventilation system must operate ***continuously****, at the least with reduced ventilation.*
Shutting down *the ventilation equipment creates a* ***risk*** *of condensation inside the ventilation equipment and on the building substance* ***(moisture damage)****.*

Air flow rate

The air flow rate $\dot{V}_L$ for basic ventilation of a residential unit will be determined by its size, use and occupancy rate. This requires detailed floor plans and a sectional view of the residential unit, both with dimensions.
Sizing should take the EnEV [Germany], DIN 1946 and particularly DIN 1946-6 and DIN 4701 into account.

Recommended air flow rates without consideration of windowless rooms (kitchen, bathroom, WC):

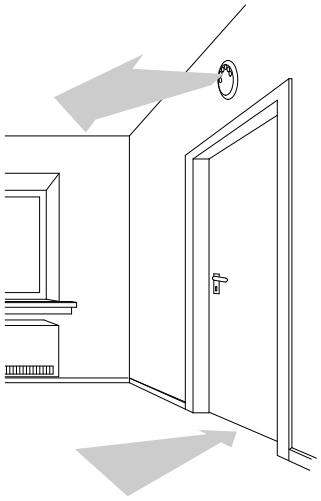
Intended occupancy	Residential unit size	Nominal ventilation	
		Subject to residential unit size	Subject to occupancy
[occupants]	[m²]	[m³/h]	[m³/h]
up to 2	< 50	60	60
up to 4	< 80	90	120
up to 6	> 80	120	180

Example for calculating the air flow rate, see from page 46.

Recommended air change:
0.5 per hour Nominal ventilation (standard ventilation)
0.3 per hour Reduced ventilation
0.7 per hour Maximum ventilation

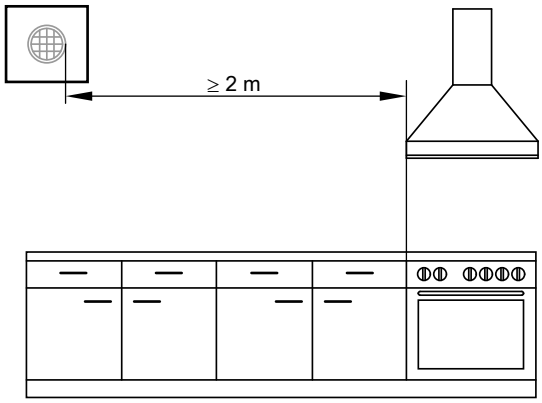
Standard value for required air flow rate per person: 20 to 30 m³/h

Air routing between rooms



Create an interconnection for air flow from the ventilation air areas to the extract air areas.
A gap of 0.8 to 1.2 cm under the door leaves of the apartment door is adequate. Where internal doors are tightly sealed, provide noise attenuated overflow apertures in the internal walls or in part of the door (on-site).

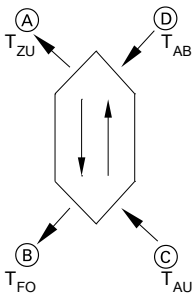
Cooker hood: Recirculating air/extract air



For reasons of energy efficiency, we would therefore recommend the use of **recirculating cooker hoods** with grease filters.
We therefore recommend that **extract air hoods** are **not** connected to the Vitovent 300 extract air duct for the following reasons:
- Hygiene, contamination:
  Grease deposits in the extract air system.
- Noise from the ventilation air valves:
  Cooker hoods are generally designed for substantially greater flow rates (> 300 m^3/h).
  The additional, substantially greater extract air flow rate would short circuit the system, since the corresponding differential air volume created by the negative pressure would have to be balanced largely via the domestic ventilation system.

Connect extractor hoods via a coaxial expelled air system that will allow the corresponding differential air volume to replenish the air extracted. This prevents the domestic ventilation system being impaired by short circuits.
Provide an interlock for the extractor when using an extractor hood in conjunction with open flue combustion equipment (see page 38).

Operation with heat recovery



Ⓐ Ventilation air (T_{ZU})
Ⓑ Expelled air (T_{FO})
Ⓒ Outside air (T_{AU})
Ⓓ Extract air (T_{AB})

The outside air is preheated by the heat recovered from the extract air. In standard mode, the temperature-related heat recovery level η_{WRG} of the Vitovent 300 is in excess of 91 % (according to tests carried out by TZWL Dortmund [Germany]).

$\eta_{WRG} = ((T_{ZU} - T_{AU}) / (T_{AB} - T_{AU})) \cdot 100$ [%]
This results in the following:
$T_{ZU} = \eta_{WRG} \cdot (T_{AB} - T_{AU}) + T_{AU}$

Example:
T_{AB} = +21 °C
T_{AU} = +5 °C
$T_{ZU} = 0.9 \cdot (+21 - (+5)) + (+5) = 19.4$ °C

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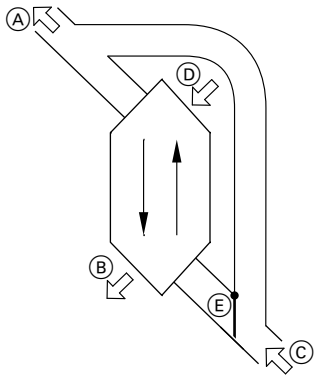
Operation without heat recovery (e.g. in summer)

Vitovent 300 for max. air flow rate 180 m³/h
By replacing the countercurrent heat exchanger fitted in the delivered condition with a summer cassette (see page 14), the extract air flow is routed directly to the expelled air connector. This prevents the preheating of the outside air.

Vitovent 300 for max. air flow rate 300 m³/h or 400 m³/h



Ⓐ Ventilation air
Ⓑ Expelled air
Ⓒ Outside air
Ⓓ Extract air
Ⓔ Bypass damper

By closing the bypass damper, 100 % of the volume flow is routed past the heat exchanger, and filtered fresh air at outside temperature is supplied to the ventilation air areas.

Ice guard

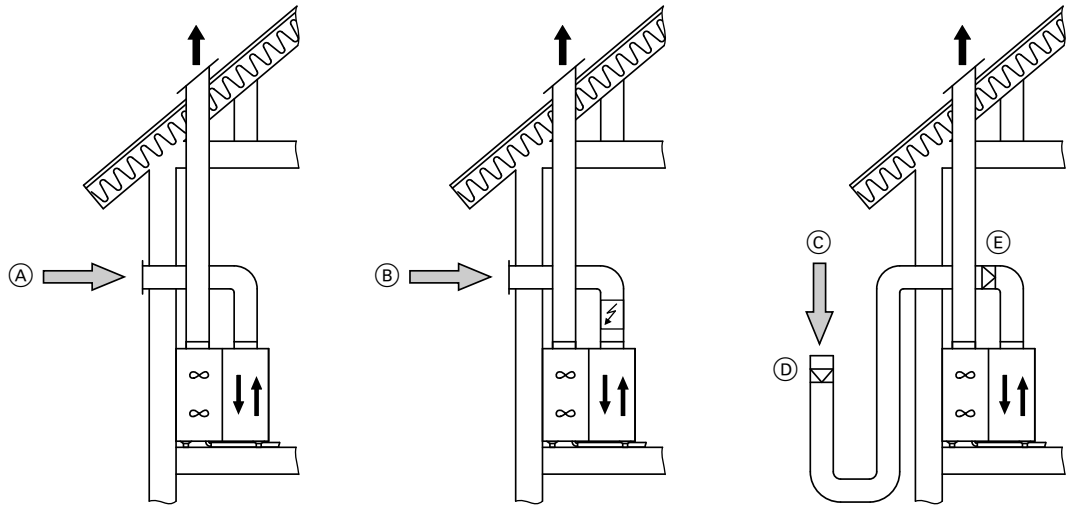
An ice guard circuit has been integrated into the Vitovent 300 to prevent the condensate in the heat exchanger (extract air side) from freezing when outside temperatures are low.

With ice guard circuit for the Vitovent 300
Air flow rates are regulated subject to the outside air temperature and the pressure drop at the countercurrent heat exchanger. From an outside air temperature of 0 °C the speed of the ventilation air fan is progressively reduced, possibly until it stops completely. This allows the heat in the extract air to protect the countercurrent heat exchanger from icing up. Every 10 min the control unit checks the speed at which the ventilation air fan can be operated.

Without ice guard circuit for the Vitovent 300
If the Vitovent should operate without ice guard circuit, the outside air must be preheated by an electrical preheater bank (accessory) or a geothermal heat exchanger.

Note
- *For a passive house, we generally recommend using a geothermal heat exchanger.*
- *The ice guard must be assured by means of an electric preheater bank (accessory) or a geothermal heat exchanger (on-site), if the system is operated simultaneously with open flue combustion equipment (for information regarding interlocking the Vitovent, see page 38).*

Design information (cont.)



Ⓐ With ice guard circuit:
Outside air via weather grille
Ⓑ Without ice guard circuit
Outside air via weather grille and electric preheater bank (accessory)
or
Ⓒ Outside air via geothermal heat exchanger (on-site)
Ⓓ Coarse filter
Ⓔ Outside air filter box

Geothermal heat exchanger for the Vitovent 300

In wintertime, the ventilation air can be preheated via a geothermal heat exchanger, which provides limited cooling in summer.

- The length of the geothermal heat exchanger is subject to the type of soil, the depth of installation and the flow rate:
  Generally between 20 m and 40 m.
- It should be laid at least below the frost level:
  Approx. 1.2 to 1.5 m
- Clean geothermal heat exchangers if they become contaminated.

General installation notes for geothermal heat exchangers:

- Use KG, PE or other pipes
- Sizing:
  Min. DN 200 or 2 x DN 150 parallel at a distance of 1 m, symmetrical lines
- Keep the pressure drop inside the geothermal heat exchanger as low as possible:
  For example 2 x 45° bends instead of 1 x 90° bend
- Provide a supporting fan (on site) in case of excessive pressure drop.
- Install the geothermal heat exchanger with a slope towards the building:
  2 to 3 %
- Provide cleaning apertures
- Install a condensate drain at the lowest point (where necessary, install a condensate pump).
- Consolidate the soil around the geothermal heat exchanger
- Air velocity within the geothermal heat exchanger:
  Max. 1.5 m/s
- Air intake via pre-filter
- Ventilation air intake:
  At least 1.2 m above ground level
- Make the geothermal heat exchanger watertight

Note

As an alternative, some manufacturers offer complete systems. Sizing and purchase from builders merchants.

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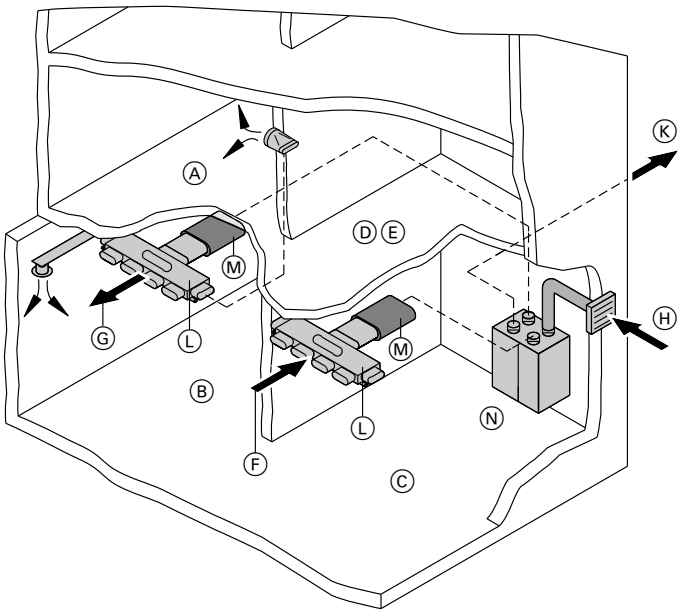
6.5 Duct system

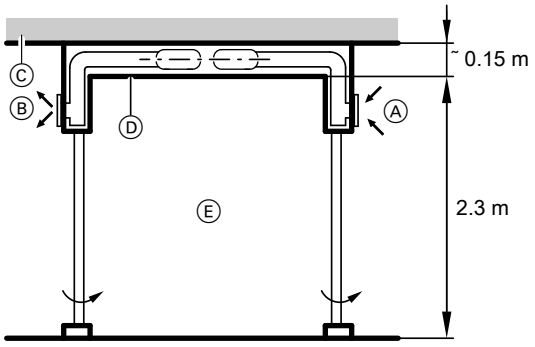
Example of routing ducts behind suspended ceilings



Example of a metal duct system

Ⓐ Bedroom
Ⓑ Living room
Ⓒ Kitchen
Ⓓ WC
Ⓔ Bathroom
Ⓕ Extract air
Ⓖ Ventilation air
Ⓗ Outside air
Ⓚ Expelled air
Ⓛ Air distribution box
Ⓜ Flat duct
Ⓝ Vitovent 300

Note
Overflow area:
In case of tightly sealed doors, provide a gap of at least 4 to 8 mm or sound-insulated overflow apertures in an internal wall or inside the door itself.



Sectional view

Ⓐ Extract air (system 100)
Ⓑ Ventilation air (system 100)
Ⓒ Ceiling
Ⓓ Suspended ceiling
Ⓔ Overflow area (hallway, entrance)

Outside air supply and expelled air aperture

The outside air supply for the Vitovent 300 is provided by air intake through the external wall.

The expelled air is routed via the roof or through the external wall.

The intake aperture for the outside air and the discharge outlet for expelled air should be as far apart from each other as possible to prevent an air "short circuit" (minimum distance 3 m). Observe the wind direction to avoid any influence from wind pressure.

External wall connection:
- Induce the outside air at a point where the lowest outside air contamination can be expected.
- The external wall connection requires a wall outlet of at least Ø 300 mm for the EPP insulation sleeve (free of thermal bridges) and a structural seal.
- The connection from the Vitovent to the external wall connection must be thermally insulated and diffusion-proof.

Ventilation air and extract air duct

The air is distributed from the ventilation appliance to the living spaces (ventilation air) or from the wet areas to the ventilation appliance (extract air) via air distribution boxes with flat ducts, connection elements, silencers, ventilation air and extract air apertures.

Note
Routing the ventilation ducts takes priority over the heating, DHW and drainage networks to avoid complicated pipe runs.

To prevent flow noises and pressure drop, observe the following:
- Symmetrical layout of the ventilation air and extract air lines.
- Short runs, few bends.
- Flat duct, system 150:
  Max. duct length between the ventilation air and extract air ducts of the ventilation appliance and the air distribution box: 5 m
- Position air distribution box near the ventilation appliance.
- Where necessary, construct the central riser and penstock with flexible pipe DN 160 or DN 180 to reduce the pressure drop in the ducts.

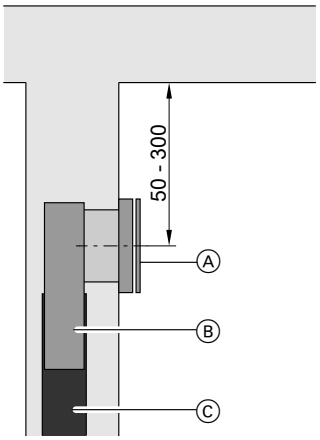
Pipes:
- Use smooth pipes.
  Smooth pipes prevent dust accumulation and unnecessary pressure drop.
- The pipe material should be corrosion-resistant and non-hygroscopic.

Join all components with adaptors and cold sealing tape or lip seals to make them airtight.

Ventilation and extract air apertures:
- Arrange the valves in the room geometry so that the air is routed as directly as possible between ventilation and extract air areas. At the same time, as comprehensive a flow as possible through the entire room must be ensured.
- Max. distance to the ceiling: 300 mm.

Installation versions, ventilation air/extract air apertures

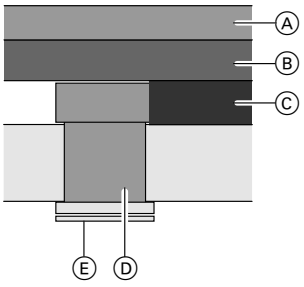
Wall installation



Ⓐ Ventilation air valve, extract air valve, kitchen extract air valve or slotted outlet
Ⓑ Diverter — round to flat (not required for slotted outlet)
Ⓒ Flat duct

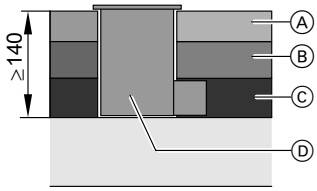
Note
With ventilation valves, clearance of approx. 200 to 300 mm to the ceiling improves the mixing of air in the room.

Ceiling installation



Ⓐ Screed
Ⓑ Impact sound insulation
Ⓒ Flat duct
Ⓓ Diverter — round to flat (not required for slotted outlet)
Ⓔ Ventilation air valve, extract air valve, kitchen extract air valve or slotted outlet

Floor installation



Ⓐ Screed
Ⓑ Impact sound insulation
Ⓒ Flat duct with compensating insulation: 60 mm
Ⓓ Floor outlet

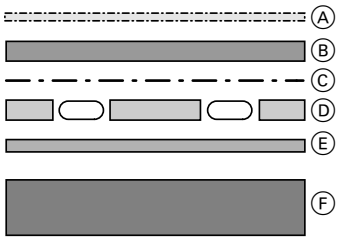
Flat duct system

Note

- *If **system 150** flexible flat ducts are routed within the insulation layer below the screed, e.g. as the supply pipe for the air distribution box, protect these with cover panels (on-site provision) against deformation by concentrated loads (impact protection).*
- *In connection with the floor construction, also observe the manufacturer's details regarding the underfloor heating system.*
  When using the Viessmann underfloor heating system, observe the details in the technical guide "Vitoset pipe system and underfloor heating system".

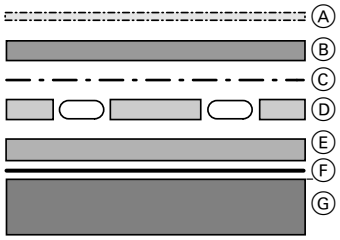
Floor construction

Upper floor



Ⓐ Floor covering
Ⓑ Cement screed
Ⓒ Screed or damp-proof membrane
Ⓓ Flat duct with compensating insulation: 60 mm
Ⓔ Impact sound insulation
Ⓕ Unfinished concrete

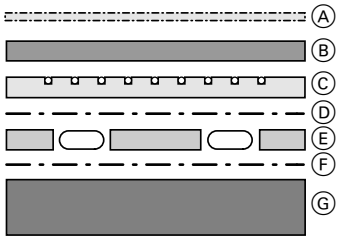
Ground floor



Ⓐ Floor covering
Ⓑ Cement screed
Ⓒ Screed or damp-proof membrane
Ⓓ Flat duct with compensating insulation: 60 mm
Ⓔ Additional insulation
Ⓕ Bituminous waterproof membrane
Ⓖ Unfinished concrete

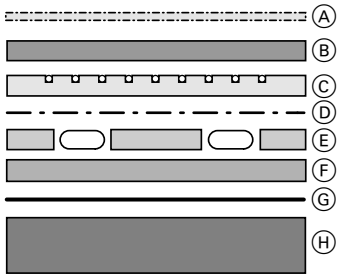
Floor construction with underfloor heating

Upper floor



Ⓐ Floor covering
Ⓑ Cement screed
Ⓒ Underfloor heating system
Ⓓ Screed or damp-proof membrane
Ⓔ Flat duct with compensating insulation: 60 mm
Ⓕ Impact sound insulation
Ⓖ Unfinished concrete

Ground floor



Ⓐ Floor covering
Ⓑ Cement screed
Ⓒ Underfloor heating system
Ⓓ Screed or damp-proof membrane
Ⓔ Flat duct with compensating insulation: 60 mm
Ⓕ Additional insulation
Ⓖ Bituminous waterproof membrane
Ⓗ Unfinished concrete

Sound insulation and silencer

In every ventilation air and extract air duct, install one silencer each (directly on the Vitovent connector).
In areas where greater attenuation is required, provide additional silencers between adjacent living and sleeping accommodation and toilets.

Irrespective of the building location, according to VDI Directive 2058 the following standard values apply to air-borne and structure-borne noise transmission within buildings and for living areas:
- Day: 35 dB (A)
- Night: 25 dB (A)

Short term noise peaks should not exceed these standard values by more than 10 dB (A).

The VDI Directive 2058 sheet 1 [or local regulations] applies to noise emissions and to measuring noise.

Measures against structure-borne noise
No additional measures are required, if ventilation appliance is mounted on concrete or screed floors and on solid walls, since the Vitovent is equipped with plastic anti-vibration mounts.
When a device is installed on wooden ceilings, the device should additionally be insulated against vibration by a concrete plate or anti-vibration mounts.
Never position the ventilation appliance in the centre of a ceiling if the ceiling is constructed with wooden beams. Connect the ventilation appliance with flexible conduit to the duct system.

Thermal insulation for the duct system

- **In all cases**, thermally insulate the outside air and expelled air ducts (min. 20 mm) against condensation and provide them with an external vapour barrier.
- Thermal losses from the duct system **must** be kept to a minimum to ensure optimum heat recovery with the Vitovent 300.
  Thermally insulate all ducts in unheated areas with diffusion-proof material (min. 50 mm).
- Suitable insulation material could be, for example, Armaflex.

Insulation measures:
- Insulate carefully and in accordance with current standard practice.
- Seal joints well with adhesive tape.
- Isolate [thermal bridge] ceiling and wall outlets with insulation strips.
- Avoid gaps.

Sizing

7.1 Overview of engineering procedure

The detailed design work requires a cross-section and floor plan of the building project, both with dimensions.

Recommended engineering procedure according to EnEV or DIN 1946:
1. Separating the rooms into those to be ventilated and those from which air should be extracted:
   See page 47
2. Calculating the air flow rates
   See page 49 and the form on page 62
3. Selecting the Vitovent 300:
   See page 50
4. Determining the number of ventilation and extract air apertures per room:
   See page 50 and the form on page 62
5. Determining the installation location of the Vitovent and the duct system:
   See page 51 and the form on page 63
6. Identifying part sections, ventilation and extract air apertures:
   See page 52 and the form on page 63
7. Calculating the external pressure drop for a metal duct system:
   See page 54 and the form on page 63 and 64
   or
8. Calculating the external pressure drop for a plastic duct system:
   See page 55
9. Positioning the required components:
   See the checklist from page 65

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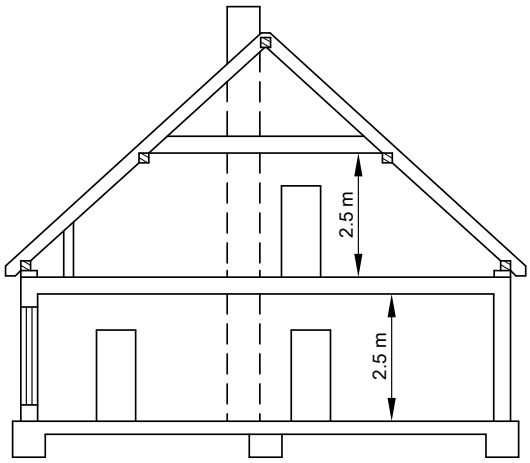
7.2 Separating the rooms into those to be ventilated and those from which air should be extracted

The total air volume flow must be split over the individual rooms to be ventilated and those from where air is to be extracted.

Rooms for the ventilation air area	Rooms for the extract air area
Living rooms	Kitchen
Bedroom	Bathroom
Children's room	WC
Dining room	Utility room

Sizing (cont.)

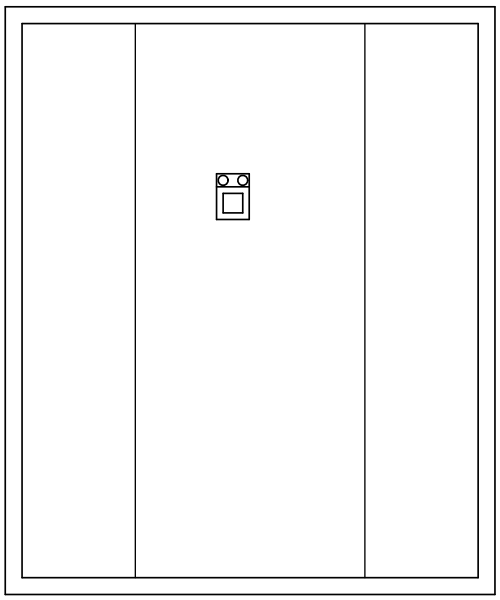
Example: Detached house, total available area 138.9 m²



Detached house
(average)

Extracted air section

Ventilation air section



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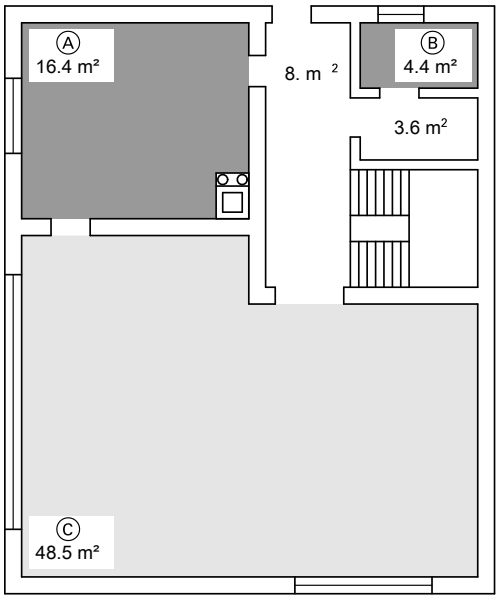
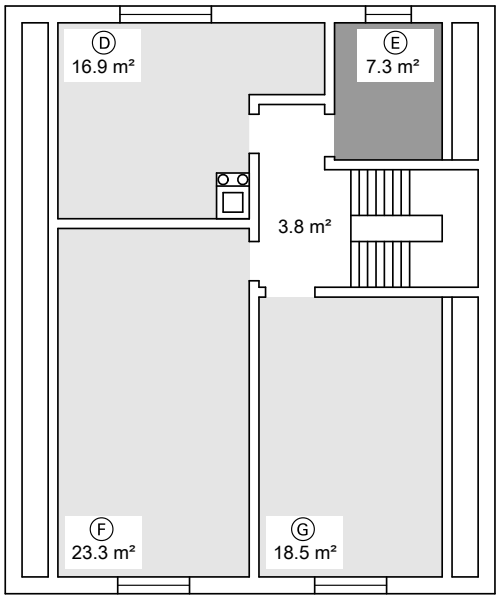


Ground floor



Attic

Ventilation air section	Extract air section
Ⓒ Living rooms	Ⓐ Kitchen
Ⓓ Bedroom	Ⓑ WC
Ⓕ Child's room 1	Ⓔ Bathroom
Ⓖ Child's room 2	

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7.3 Calculating the air flow rates

The distribution of air flow rates among individual rooms is subject to their size.

The following applies to every room "i":

Ventilation air area "ZUL"

$$\dot{V}_{ZUL,i} = \frac{V_{ZUL,i}}{V_{ZUL}} \cdot \dot{V}_L \left[\frac{m^3}{h}\right]$$

Extract air area "ABL"

$$\dot{V}_{ABL,i} = \frac{V_{ABL,i}}{V_{ABL}} \cdot \dot{V}_L \left[\frac{m^3}{h}\right]$$

$\dot{V}_{ZUL,i}$ / $\dot{V}_{ABL,i}$	Air flow rate for the individual room
$V_{ZUL,i}$ / $V_{ABL,i}$	Volume of the individual room
V_{ZUL} / V_{ABL}	Total volume of all ventilation air areas / total volume of all extract air areas
$\dot{V}_L$	Air flow rate for basic ventilation (standard ventilation)

Air flow rate for basic ventilation:

$\dot{V}_L = n \cdot V_W$

n	Air change [1/h] Recommended air change: 0.5/h
V_W	Heated volume less hallways ≙ the volume to be ventilated.

Apply the minimum flow rate if the calculation of flow rates for the extract air area results in lesser values than the minimum flow rate to DIN 1946-6.

For designing air flow rate patterns, use the pre-printed forms on page 62 or 63.

Minimum flow rate to DIN 1946-6

Room	Minimum flow rate for operation > 12 h [m³/h]	for any length of operation [m³/h]
Kitchen	40 (intermittent ventilation 200)	60 (intermittent ventilation 200)
Kitchenette	40	60
Bathroom (also with WC)	40	60
WC	20	30

Calculating air flow rates for the example on page 48

Room volume

Ventilation air areas "i"				Extract air areas "i"			
Room description	Room area [m²] x Room height [m]	Room volume $V_{ZUL,i}$ [m³]	Proportion of the total volume of the ventilation air areas $V_{ZUL,i}$ /V_{ZUL}	Room description	Room area [m²] x Room height [m]	Room volume $V_{ABL,i}$ [m³]	Proportion of the total volume of the extract air areas $V_{ABL,i}$ /V_{ABL}
Living room	48.5 x 2.5	121	0.45	Kitchen	16.4 x 2.5	41	0.58
Bedroom	16.9 x 2.5	42	0.16	WC (GF)	4.4 x 2.5	11	0.16
Child's room 1	23.3 x 2.5	58	0.22	Bathroom	7.3 x 2.5	18	0.26
Child's room 2	18.5 x 2.5	46	0.17				

Total volume of the ventilation air areas $V_{ZUL} = \Sigma V_{ZUL,i}$ [m³]	267	Total volume of the extract air areas $V_{ABL} = \Sigma V_{ABL,i}$ [m³]	70

Air flow rate for basic ventilation $\dot{V}_L$ [m³/h]

Total volume of the ventilation air areas $V_{ZUL} = \Sigma V_{ZUL,i}$ [m³]	267
Total volume of the extract air areas $V_{ABL} = \Sigma V_{ABL,i}$ [m³]	70
Heated volume $V_W = \Sigma V_{ZUL,i} + \Sigma V_{ABL,i}$ [m³] = 267 + 70 =	337
Air change n [1/h] (standard ventilation)	0.5
Air flow rate for basic ventilation $\dot{V}_L = n \cdot V_W$ [m³/h] = 0.5 x 337 =	168.5

Air flow rate, rooms

Ventilation air areas "i"			Extract air areas "i"		
Room description	Air flow rate for ventilation air area "i" $\dot{V}_{ZUL,i} = (V_{ZUL,i} / V_{ZUL}i \times \dot{V}_L$ [m³/h]		Room description	Air flow rate for extract air area "i" $\dot{V}_{ABL,i} = (V_{ABL,i} / V_{ABL}) \times \dot{V}_L$ [m³/h]	
	calculated	rounded		calculated	rounded
Living room	76	75	Kitchen	98	100
Bedroom	27	30	WC	27	30
Child's room 1	37	35	Bathroom	44	40
Child's room 2	29	30			
Total volume of the ventilation air areas, rounded $\dot{V}_{ZUL} = \Sigma \dot{V}_{ZUL,i}$ [m³/h]		170	Total volume of the extract air areas, rounded $\dot{V}_{ABL} = \Sigma \dot{V}_{ABL,i}$ [m³/h]		170

Note

The total flow rate for extract air areas must be equal to the total volume of ventilation air areas.

7.4 Selecting the Vitovent

The established air flow rates for ventilation air areas are adjusted with the flow rate settings of the Vitovent 300 (see "Specification").

Selection for the example on page 48

- Heated volume V_W = 337 m³
- Calculated required total flow rate for extract/ventilation air areas $\dot{V}$ = 169 m³/h
- **Selected appliance version:** Vitovent 300 for max. air flow rate **300 m³/h**

Explanations regarding the device selection:

- The basic air change rate can be achieved with standard ventilation: Setting range 50 m³/h to 175 m³/h (see Specification)
- The ventilation appliance has sufficient reserves for comfort mode.

Required settings at the Vitovent 300 for the following operating modes:

- Standard ventilation (0.5 air changes/h):
  V_W x 0.5 = 337 x 0.5 = 170 m³/h (rounded)
- Reduced ventilation (0.3 air changes/h):
  V_W x 0.3 = 337 x 0.3 = 100 m³/h (rounded)
- Maximum ventilation (0.7 air changes/h):
  V_W x 0.7 = 337 x 0.7 = 225 m³/h (rounded)

7.5 Determining the number of ventilation and extract air apertures per room

The required number of ventilation air and extract air apertures depends on the calculated flow rate for each room as well as on the permissible flow rate for the valve or air outlet (see from page 15).

- For up to 45 m³/h respectively, allow for an air vent with DN 100 connection.
- For the extract air aperture in the kitchen approx. 60 m³/h are permissible.

Number of ventilation air and extract air valves for the sample on page 48

Ventilation air areas "i"			Extract air areas "i"		
Room description	Calculated air flow rate for ventilation air area "i" $\dot{V}_{ZUL,i}$ [m³/h]	Number of valves	Room description	Calculated air flow rate for extract air area "i" $\dot{V}_{ABL,i}$ [m³/h]	Number of valves
Living room	75	3	Kitchen	100	2
Bedroom	30	1	WC	30	1
Child's room 1	35	1	Bathroom	40	1
Child's room 2	30	1			

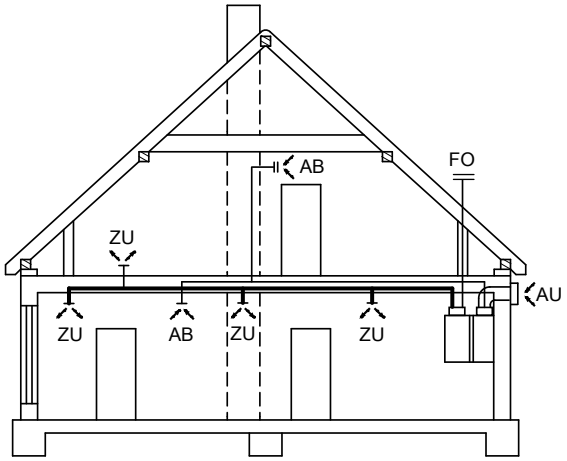
7.6 Determining the installation location of the Vitovent and the duct system

The installation location for the Vitovent and the duct system is drawn into the floor plan and possibly into the sectional view of the building:

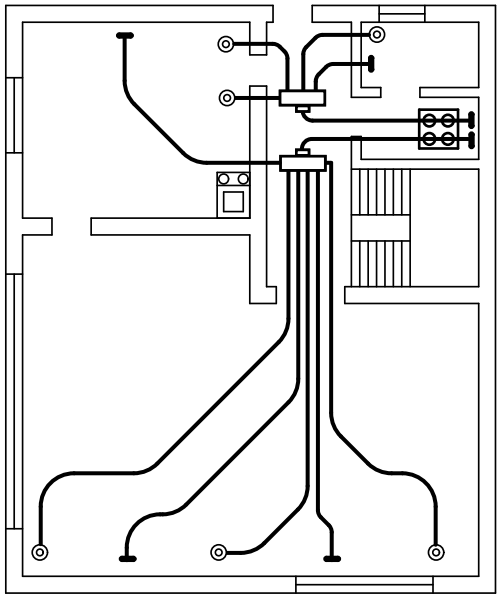
- Draw the Vitovent into the intended installation room drawing.
- Position the ventilation and extract air apertures (consider the calculated number) into the rooms.
- Arrange the air distribution boxes as near as possible to the Vitovent (pressure drop).
- Draw the ducts between the ventilation and extract apertures and the corresponding air distribution box; avoid cross-over points.
- Draw in the outside air and the expelled air ducts.
- Draw in the part sections.
- Determine the duct system for the part section (flat duct, system 100/150, flexible pipe DN 125/160/180).

Installation location of the Vitovent and the duct system for example on page 48

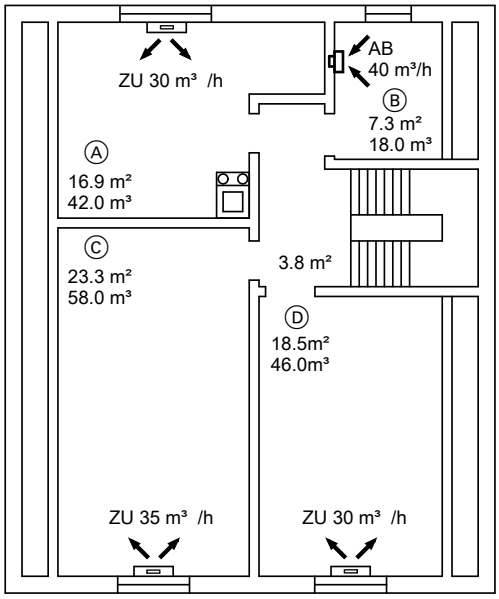
In the example shown, the Vitovent 300 is installed inside a cupboard in the hallway. Air distribution is provided through flat ducts in the intermediate ceiling/floor void (for information regarding the floor construction, see from page 45).



Detached house



Ground floor



Attic floor

EA Extract air
OA Outside air
EX Expelled air
VA Ventilation air

Ⓐ Bedroom
Ⓑ Bathroom
Ⓒ Child's room 1
Ⓓ Child's room 2

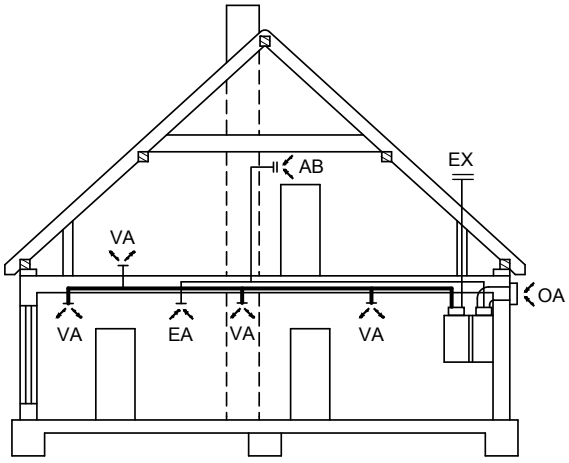
7.7 Identifying part sections, ventilation and extract air apertures

In the ventilation and the extract air areas, the individual part sections are numbered from the air vents to the Vitovent.

Conventional identification for a part section:
- Number (no.)
- Air flow rate ($\dot{V}$ [m³/h])
- Flow velocity (option, from diagram page 22, v [m/s])
- Internal diameter or flat duct system (DN / system [mm])

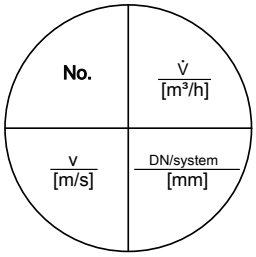
Sizing (cont.)

Identifying part sections, ventilation and extract air apertures for example on page 48

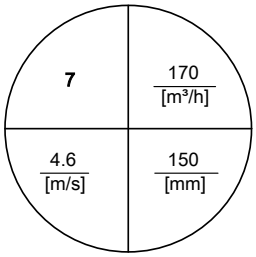


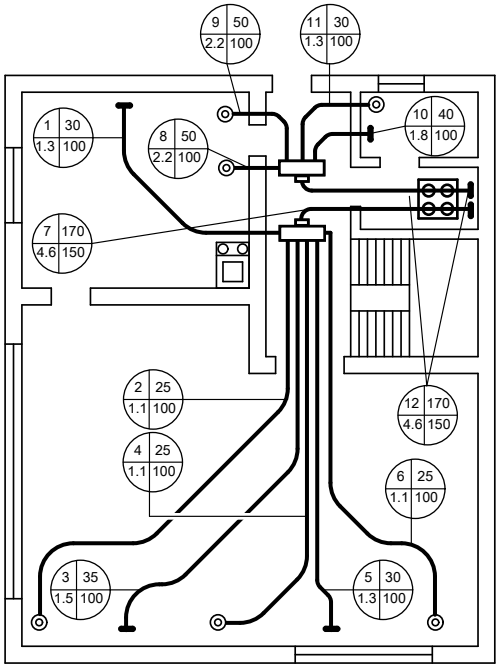
Detached house

Section markings

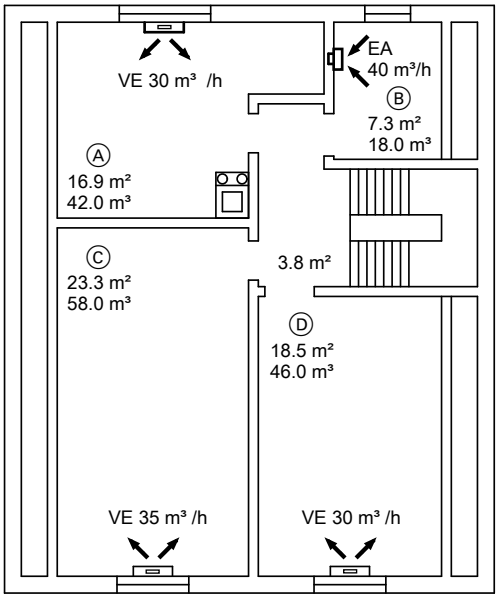


Example for section 7





Ground floor



Attic floor

EA Extract air
OA Outside air
EX Expelled air
VA Ventilation air

Ⓐ Bedroom
Ⓑ Bathroom
Ⓒ Child's room 1
Ⓓ Child's room 2

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Part sections of the rooms in example on page 48

Ventilation air areas "i"				Extract air areas "i"			
Room description	Calculated air flow rate for ventilation air area "i" $\dot{V}_{ZUL,ij}$ [m³/h]	Number of valves	Part section number	Room description	Calculated air flow rate for extract air area "i" $\dot{V}_{ABL,i}$ [m³/h]	Number of valves	Part section number
Living room	75	3	2, 4, 6	Kitchen	100	2	8, 9
Bedroom	30	1	1	WC	30	1	11
Child's room 1	35	1	3	Bathroom	40	1	10
Child's room 2	30	1	5				

Part section 7: Part section from the Vitovent to the ventilation air distribution box
Part section 12: Part section from the Vitovent to the extract air distribution box

7.8 Calculating the external pressure drop

The selected Vitovent must not only deliver the calculated air flow rate but must also overcome the pressure drop inside the duct system (external pressure drop). As a control, the max. pressure drop inside the duct system for outside air + ventilation air and for extract air + expelled air are calculated separately.

The following steps are required:
- Determine the length of part sections subject to the duct system.
- Number of the relevant components (bends, branches, silencers etc.) for the part section.
- Determine the pressure drop for the individual components using the appropriate pressure drop diagrams.

Note
- *For all tees, bends, reducers and adaptors, a pressure drop of 5 Pa is assumed.*
- *For silencers, the pressure drop of an equivalent length of pipe/flat duct (flexible or rigid) is assumed.*

- Add the pressure drop values of the components in each part section.
- Determine the part sections to the ventilation air area "i" or extract air area "i" with the highest pressure drop.
- Add the following pressure drop values:
  - Pressure drop of the part section to ventilation air area "i" or extract air area "i" with the highest pressure drop
  - Pressure drop of the part section from the Vitovent to the distribution box
  - Pressure drop of the part section for outside air or expelled air to the Vitovent
- With the fan curve, check whether the total pressure drop (ventilation air + outside air or extract air + expelled air) lies within the possible range of the selected Vitovent.

Calculation of the external pressure drop for a metal duct system for example on page 48

Pressure drop ventilation air + outside air

Part section number	Ventilation air aperture			Metal duct			Bends		Distributor		Part section pressure drop [Pa]
	Room	Air flow rate [m³/h]	Pressure drop [Pa]	System	Length [m]	Pressure drop [Pa]	Quantity	Pressure drop [Pa]	Quantity	Pressure drop [Pa]	
Ventilation air											
1	Bedroom	30	10	100 flat	4	2.0	2	10.0	—	—	22.0
2	Living room	25	10	100 flat	9	4.5	3	15.0	—	—	29.5
3	Child's room 1	35	10	100 flat	8	4.0	3	15.0	—	—	29.0
4	Living room	25	10	100 flat	7	3.5	2	10.0	—	—	21.5
5	Child's room 2	30	10	100 flat	7	3.5	2	10.0	—	—	23.5
6	Living room	25	10	100 flat	8	4.0	4	20.0	—	—	34.0
7	—	170	—	100 flat	3	16.5	1	5.0	1	10.5	32.0
Outside air		170	15	160 round	1	1.5	1	5.0	—	—	21.5

Highest pressure drop for part sections of ventilation air areas "i" (part section 6) [Pa]	34.0
Part section from the Vitovent to the ventilation air distribution box (part section 7) [Pa]	32.0
Part section outside air to the Vitovent [Pa]	21.5
Total pressure drop ventilation air + outside air [Pa]	87.5

Determine the total pressure drop for extract air + expelled air in the same way.

The total pressure drop for ventilation air + outside air lies within the permissible range (< 100 Pa, see Specification).

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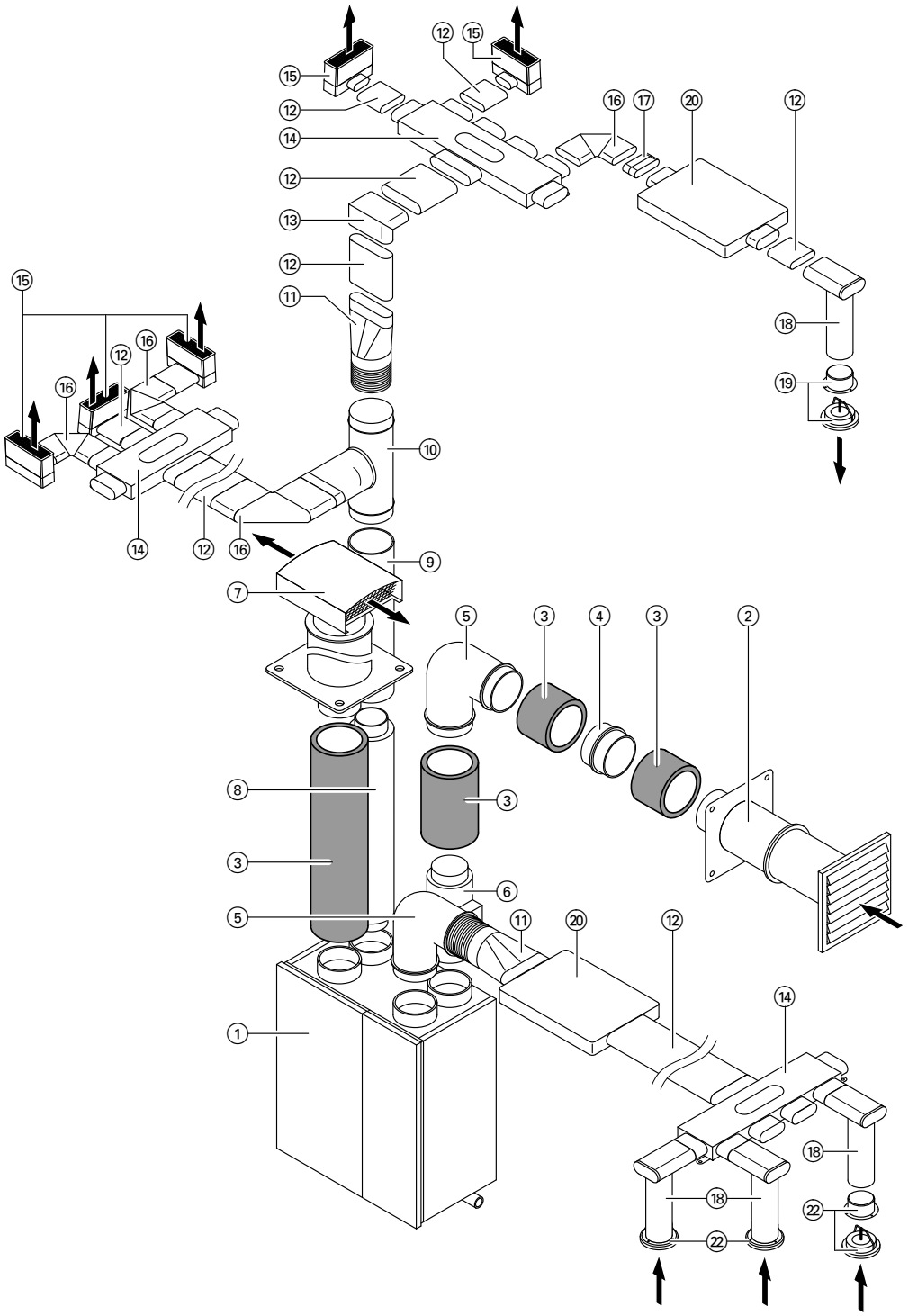
7.9 Calculating the external pressure drop for a plastic duct system

On plastic duct systems, the flow rate is adjusted for part sections by means of the restrictors (see page 33).

For calculating the pressure drop, a calculation program can be downloaded at www.viessmann.de.

7.10 Overview of components

System illustration, metal duct system



System illustration, metal duct system

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Sizing (cont.)

Metal duct system

Pos.	Components	System/DN	Part no.
①	Vitovent 300	180 m³/h: DN 125 300 m³/h: DN 160 400 m³/h: DN 180	7373 372 7373 373 7373 374
②	External wall connection	DN 125 and DN 160 DN 180	9562 053 7439 114
③	Flexible pipe with thermal insulation	DN 125 DN 160 DN 180	7249 101 9521 450 7373 023
④	Pipe connection piece	DN 125 DN 160 DN 180	7249 103 9521 437 7373 025
⑤	Bend 90° **or**	DN 125 DN 160 DN 180	7249 106 9521 431 7373 028
	Bend 45°	DN 125 DN 160 DN 180	7249 107 9521 725 7373 029
⑥	Pre/reheater bank	DN 125 DN 160 DN 180	7160 135 7373 034 7373 035
⑦	Expelled air roof outlet **and poss.**	DN 160	9562 054
	Reducer (not shown)	DN 160/DN 125 DN 125/DN 100 DN 180/DN 160	7249 108 7249 109 7373 030
⑧	Silencer, round, flexible	DN 125 DN 160 DN 180	7249 105 9521 461 7373 027
⑨	Flexible pipe with thermal insulation **or**	DN 125 DN 160 DN 180	7249 102 9521 455 7373 024
	Folded spiral-seam tube	DN 125 DN 160 DN 180	7249 104 9521 428 7373 026
⑩	Tee — round to flat	DN 125/System 150 DN 160/System 150 DN 180/System 150	7249 112 9562 051 7373 033
⑪	Adaptor — round to flat	DN 125/System 150 DN 160/System 150 DN 180/System 150	7249 111 9542 582 7373 032
⑫	Flat duct, rigid **or**	System 150	9542 572
	Flat duct, flexible	System 100 System 150	9542 601/9559 070 9542 571
⑬	Flat duct: Bend 90° broad side, 2 sections **or**	System 100 System 150	9542 584 9542 585
	Flat duct: Bend 90° broad side, 3 sections	System 150	9562 055
⑭	Air distribution box	System 150/100 for 4 flat ducts for 3 flat ducts	 9542 586 9562 050
⑮	Floor-level outlet	DN 100	9558 914
⑯	Flat duct: Bend 90° narrow side, 3 sections	System 100 System 150	9562 057 9562 056
⑰	Flat duct: Connection piece	System 100 System 150	9542 575 9542 576
⑱	Diverter — round to flat	DN 100/System 100	9542 583
⑲	Ventilation valve for ceiling installation **or**	DN 100 DN 125	9523 956 7440 229
	Ventilation air aperture for wall mounting **or**	DN 100	9521 425
	Slotted outlet with connecting chamber	DN 100	9542 566
⑳	Silencer, flat, rigid **or**	System 100	9562 049
	Silencer, flat, flexible	System 100 System 150	9542 573 9542 574

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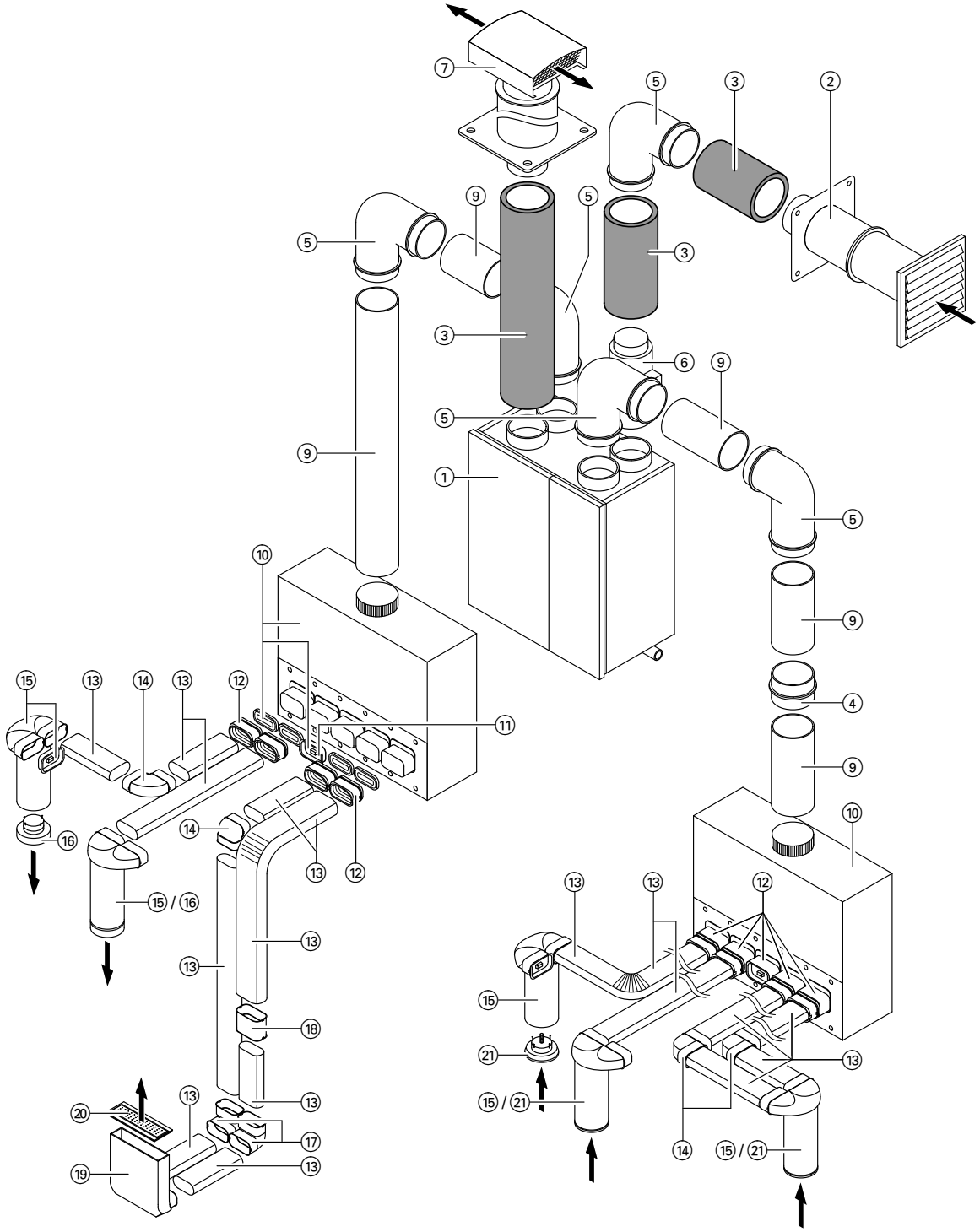
Sizing (cont.)

Pos.	Components	System/DN	Part no.
㉒	Extract air valve **with**	DN 100 DN 125	9521 448 7440 230
	Extract air filter **or**	DN 100 DN 125	9521 448 7440 232
	Kitchen extract air valve (with filter)	DN 100 DN 125	9542 601 7440 231
Further components (not shown)			
Outside air filter box		DN 160	7180 278
Summer cassette		Vitovent 300 for max. air flow rate 180 m^3/h	7249 340
Flat duct: Reducer		System 150/100	9542 581
Flat duct: Tee, narrow side		System 150/100 System 150/150	9542 579 9542 580
Flat duct: Tee, broad side		System 150/100 System 150/150	9542 577 9542 578
Tee		DN 125 DN 160 DN 180	7279 110 7190 179 7373 031
Tee with reducer		DN 125/100/100 DN 160/125/125	7299 292 7299 293

Sizing (cont.)

System illustration, plastic duct system



System illustration, plastic, metal

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Sizing (cont.)

Plastic duct system

Pos.	Components	System/DN	Part no.
① to ⑨	See metal duct system		
⑩	Air distribution box with restrictor and cap	DN 125/System 100 DN 160/System 100 DN 180/System 100	7440 222 7440 223 7440 224
⑪	Locking cap	System 100	7440 217
⑫	Lip seal	System 100	7440 213
⑬	Flat duct	System 100	7440 212
⑭	Flat duct: Bend 90° narrow side	System 100	7440 216
⑮	Diverter for ventilation air/extract air valve with cap	System 100/DN 125	7440 214
⑯	Ventilation air valve	DN 125	7440 228
⑰	Flat duct: Bend 90° broad side	System 100	7440 215
⑱	Connection piece	System 100	7440 218
⑲	Floor-level outlet with cap	System 100	7440 219
⑳	Grille for floor outlet	—	7440 225 7440 226
㉑	Extract air valve	DN 125	7440 227

Control unit / Remote control

8.1 Construction and function

Install the control unit/remote control in the main living room on an internal wall opposite radiators, but not inside shelf units, recesses, immediately by a door or heat source (e.g. direct sunlight, fireplace, TV set, etc.).
The control system comprises electronic modules and the remote control.

Remote control:
- With digital time switch
- Backlit display with plain text support
- Fan operating display
- Display of time, room temperature and fault messages
- Indication that the air filter should be replaced
- With rotary selector for the following settings:
  - Standard ventilation
  - Reduced ventilation
  - Maximum ventilation
  - 1 fixed time program
  - One individually adjustable time program

Time switch

Digital time switch
- Individual and seven-day program
- Automatic summer/winter time changeover
- Time, day and standard switching times are factory-set
- Switching times are individually programmable, i.e. up to four switching periods per day

Shortest switching interval: 10 minutes
Power reserve: 14 days

Operating programs

All operating programs of the ventilation appliance can be adjusted immediately at the program selector of the remote control.

Standard ventilation ✺
Continual ventilation e.g. during the day with an air change rate of 0.5/h, i.e. a complete air change every two hours.

Reduced ventilation ☽
Constant ventilation with an air change rate of 0.3/h, e.g. nights.

Maximum ventilation
For heavier air loads (e.g. through smoking, cooking or showering) with an air change rate of 0.7/h.

Program 1 (P1)

Ventilation with fixed set time program:
- Monday to Friday
  - 06:00 to 22:00
    Standard ventilation
  - 22:00 to 06:00
    Reduced ventilation
- Saturday and Sunday
  - 07:00 to 23:00
    Standard ventilation
  - 23:00 to 07:00
    Reduced ventilation

Program 2 (P2)
Ventilation with an individually set time program.

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Bypass

The Vitovent 300 with 300 m^3/h or 400 m^3/h is equipped with a bypass damper that can bypass up to 100 % of the volume flow past the heat exchanger. The bypass can be programmed using the Vitovent 300 remote control. Factory setting 1 (automatic).
The bypass damper is opened and closed subject to the outside and inside temperatures.

Note
To prevent condensation, the ventilation air temperature should be at least 18 °C.

Temperature settings bypass

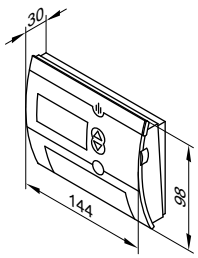
The bypass damper closes for heat recovery when **all** of the following conditions are met:
- The outside temperature is lower than the inside temperature.
- The outside temperature exceeds 10 °C (factory setting, setting range 5 to 20 °C)
- The inside temperature exceeds 22 °C (factory setting, setting range 18 to 30 °C)

When the bypass damper is closed, 100 % of the volume flow bypasses the heat exchanger, and cool, filtered outside air is channelled directly into the rooms.

The bypass damper opens for heat recovery when **one** of the following conditions has been met:
- The outside temperature exceeds the inside temperature.
- The outside temperature is lower than 10 °C (factory setting, setting range 5 to 20 °C)
- The inside temperature is lower than 22 °C (factory setting, setting range 18 to 30 °C)

Heat recovery is enabled when the bypass damper is open.

8.2 Specification, remote control



Specification

Connection to the Vitovent 300	– 2-core cable – Cables cross-section of 0.5 mm^2 – Max. cable length 50 m
Protection class	III to EN 60730-1 ensure through appropriate design/installation
IP rating	IP 20 to EN 60529-1 ensure through appropriate design/installation
Function	RS Type 1B to EN 60730-1
Permissible ambient temperature	
– during operation	0 to +50 °C
– during storage and transport	–20 to +65 °C
Measuring range, room temperature	0 to 30 °C
Power reserve (after minimum 6 h operation)	> 4 h
Weight	approx. 0.24 kg

Appendix

9.1 Form for designing air flow rate patterns for the Vitovent 300

Project:

Air flow rates can be selected at the ventilation equipment subject to the residential unit size.

Ventilated accommodation volume [m^3]	up to 260	260 to 325	325 to 390	390 to 450
Adjustable air flow rate (basic air change rate) [m^3/h]	135	160	190	205

Air flow rates subject to residential unit size and occupancy, without considering windowless rooms (e.g. kitchen, bathroom, WC) to DIN 1946-6.

Intended occupancy [occupants]	Residential unit size [m^2]	Basic ventilation [m^3/h]	Total ventilation [m^3/h]
up to 2	< 50	60	60
up to 4	< 80	90	120
up to 6	> 80	150	180

Air flow rates for rooms without windows to DIN 1946-6.

Room	Air change rates for operational duration > 12 h/d [m^3/h]	Air change rates for any operational duration [m^3/h]
Kitchen	40 (intermittent ventilation 200)	60 (intermittent ventilation 200)
Kitchenette	40	60
Bathroom (also with WC)	40	60
WC	20	30

Ventilated accommodation volume V_W = _____ m^3

Air flow rate for basic ventilation $\dot{V}_L$: _____ m^3/h ($\dot{V}_L = V_W \times 0.5 \times 1/h$)

Ventilation air areas

Ventilation air areas i	Volume = floor area x room height $V_{ZUL,i}$ [m^3]	Proportional volume $V_{ZUL,i} / V_{ZUL}$	Proportional ventilation air flow rate $\dot{V}_{ZUL,i} = (V_{ZUL,i} / V_{ZUL}) \times \dot{V}_L$ [m^3/h]		No. of required valves (observe the max. flow rate acc. to page 15 - 16)
			calculated	rounded	
Living room					
Bedroom					
Dining room					
Study					
Child's room 1					
Child's room 2					
Total volume of ventilation air areas V_{ZUL} [m^3]			Σ =		

Extract air areas

Extract air areas j	Volume = floor area x room height $V_{ABL,j}$ [m^3]	Proportional volume $V_{ABL,j} / V_{ABL}$	Proportional extract air flow rate $\dot{V}_{ABL,j} = (V_{ABL,j} / V_{ABL}) \times \dot{V}_L$ [m^3/h]		No. of required valves (observe the max. flow rate acc. to page 15 - 16)
			calculated	rounded	
Kitchen					
Bathroom					
WC					
Utility room					
Total volume of the extract air areas V_{ABL} [m^3]			Σ =		

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9.2 Form for designing the Vitovent 300 sections

Project:

Outside air/ventilation air area

Section No.	Flow rate ($\dot{V}$) [m^3/h]	Duct system	Velocity (v) [m/s]	Length [m]	Number of bends 45°	Number of bends 90°	Number of silencers	Number of tees	Pressure drop [P_a]

Extract air/expelled air area

Section No.	Flow rate ($\dot{V}$) [m^3/h]	Duct system	Velocity (v) [m/s]	Length [m]	Number of bends 45°	Number of bends 90°	Number of silencers	Number of tees	Pressure drop [P_a]

Information regarding pressure drop

- *A value of 5 Pa per bend or branch is assumed for a rough estimate of the pressure drop with metal duct systems.*
- *For silencers, the pressure drop of an equivalent length of pipe/flat duct (flexible or rigid) is assumed.*

9.3 Form for determining the total pressure drop

Determining the total pressure drop for design flow rate, ventilation air

Pressure drop, outside air intake (determine from the flow rate according to the diagram on page 15)	_____	Pa
Pressure drop from the outside air inlet to the Vitovent 300: (determine from the length, cross-section and flow rate according to the diagram on page 21; when using geothermal heat exchangers/preheater bank, take the additional pressure drop into consideration)	_____	Pa
Pressure drop from the Vitovent 300 to the distribution box: (determine from the length, cross-section and flow rate according to the diagram on page 21)	_____	Pa
Pressure drop, distribution box: (determine from the flow rate according to the diagram on page 20)	_____	Pa
Highest pressure drop – section from the distributor to the ventilation air aperture: (from the table on page 63, when using a valve add 10 Pa as rough estimate)	_____	Pa
Estimated total pressure drop, outside air/ventilation air:	_____	Pa

Determining the total pressure drop for the design extract air flow rate

Pressure drop, expelled air roof outlet: (determine from the flow rate according to the diagram on page 15)	_____	Pa
Pressure drop from the expelled air discharge to the Vitovent 300: (determine from the length, cross-section and flow rate according to the diagram on page 21)	_____	Pa
Pressure drop from the distribution box to the Vitovent 300: (determine from the length, cross-section and flow rate according to the diagram on page 21)	_____	Pa
Pressure drop, distribution box: (determine from the flow rate according to the diagram on page 20)	_____	Pa
Highest pressure drop – section from the extract air valve to the distribution box: (from the table on page 63, when using a valve add 10 Pa as rough estimate)	_____	Pa
Estimated total pressure drop, extract air/expelled air:	_____	Pa

Assessment

Pressure drop, outside air/ventilation air line:	_____	Pa	< 100 Pa: permissible > 100 Pa: modify the air duct system (cross-section, length)
Pressure drop, extract air/expelled air line:	_____	Pa	< 100 Pa: permissible > 100 Pa: modify the air duct system (cross-section, length)

Note

If the pressure drop in standard mode approaches the limits for the permissible total pressure drop of 100 Pa, check that the limit of 100 Pa (see Specification) can still be maintained for maximum ventilation (higher flow rate).

9.4 Checklist for a quotation request for the Vitovent 300

Customer:	Account no:	Company:
Date of despatch:		Street:
Type of despatch:	km:	Postal code/location:
Order no.:		System:
		Street:
		Postal code/location:
Checked:	Date/N/A:	Consign. no.:
Comments:		Information:

Standard set for a metal duct system

Domestic ventilation system with Vitovent 300	Part no.	Quantity
Air flow rate **300 m³/h** Basic set for a detached house with all modern conveniences (for 4 occupants with living/dining room, bedroom, 2 bedrooms for children, kitchen, 2 bathrooms, guest WC and utility room). Components: 1 Vitovent 300 for max. air flow rate **300 m³/h** 4 Extract air valves DN 100 2 Silencers, system 150 3 Ventilation air valves for ceiling installation DN 100 1 Kitchen extract air valve DN 100 1 Expelled air roof outlet 1 External wall connection 2 Flexible pipes, thermally insulated DN 160 (2.5 m long) 2 Adaptors (round to flat) 2 Air distribution boxes 5 Diverters 3 Floor outlets 60 m Flat duct – flexible, (system 100) on 4 rolls of 15 m each 1 roll Cold shrink tape (15 m)	Z008 959	

Metal duct system

Pos.	Components	System/DN	Part no.	Quantity
①	Vitovent 300	180 m³/h: DN 125 300 m³/h: DN 160 400 m³/h: DN 180	7373 372 7373 373 7373 374	
②	External wall connection	DN 125 and DN 160 DN 180	9562 053 7439 114	
③	Flexible pipe with thermal insulation	DN 125 DN 160 DN 180	7249 101 9521 450 7373 023	
④	Pipe connection piece	DN 125 DN 160 DN 180	7249 103 9521 437 7373 025	
⑤	Bend 90° **or**	DN 125 DN 160 DN 180	7249 106 9521 431 7373 028	
	Bend 45°	DN 125 DN 160 DN 180	7249 107 9521 725 7373 029	
⑥	Pre/reheater bank	DN 125 DN 160 DN 180	7160 135 7373 034 7373 035	

Appendix (cont.)

Pos.	Components	System/DN	Part no.	Quantity
⑦	Expelled air roof outlet **and poss.**	DN 160	9562 054	
	Reducer (not shown)	DN 160/DN 125 DN 125/DN 100 DN 180/DN 160	7249 108 7249 109 7373 030	
⑧	Silencer, round, flexible	DN 125 DN 160 DN 180	7249 105 9521 461 7373 027	
⑨	Flexible pipe with thermal insulation **or**	DN 125 DN 160 DN 180	7249 102 9521 455 7373 024	
	Folded spiral-seam tube	DN 125 DN 160 DN 180	7249 104 9521 428 7373 026	
⑩	Tee — round to flat	DN 125/System 150 DN 160/System 150 DN 180/System 150	7249 112 9562 051 7373 033	
⑪	Adaptor — round to flat	DN 125/System 150 DN 160/System 150 DN 180/System 150	7249 111 9542 582 7373 032	
⑫	Flat duct, rigid **or**	System 150	9542 572	
	Flat duct, flexible	System 100 System 150	9542 601/9559 070 9542 571	
⑬	Flat duct: Bend 90° broad side, 2 sections **or**	System 100 System 150	9542 584 9542 585	
	Flat duct: Bend 90° broad side, 3 sections	System 150	9562 055	
⑭	Air distribution box	System 150/100 for 4 flat ducts for 3 flat ducts	 9542 586 9562 050	
⑮	Floor-level outlet	DN 100	9558 914	
⑯	Flat duct: Bend 90° narrow side, 3 sections	System 100 System 150	9562 057 9562 056	
⑰	Flat duct: Connection piece	System 100 System 150	9542 575 9542 576	
⑱	Diverter — round to flat	DN 100/System 100	9542 583	
⑲	Ventilation valve for ceiling installation **or**	DN 100 DN 125	9523 956 7440 229	
	Ventilation air aperture for wall mounting **or**	DN 100	9521 425	
	Slotted outlet with connecting chamber	DN 100	9542 566	
⑳	Silencer, flat, rigid **or**	System 100	9562 049	
	Silencer, flat, flexible	System 100 System 150	9542 573 9542 574	
㉒	Extract air valve **with**	DN 100 DN 125	9521 448 7440 230	
	Extract air filter **or**	DN 100 DN 125	9521 448 7440 232	
	Kitchen extract air valve (with filter)	DN 100 DN 125	9542 601 7440 231	
Further components (not shown)				
Outside air filter box		DN 160	7180 278	
Summer cassette		Vitovent 300 for max. air flow rate 180 m^3/h	7249 340	
Flat duct: Reducer		System 150/100	9542 581	
Flat duct: Tee, narrow side		System 150/100 System 150/150	9542 579 9542 580	
Flat duct: Tee, broad side		System 150/100 System 150/150	9542 577 9542 578	

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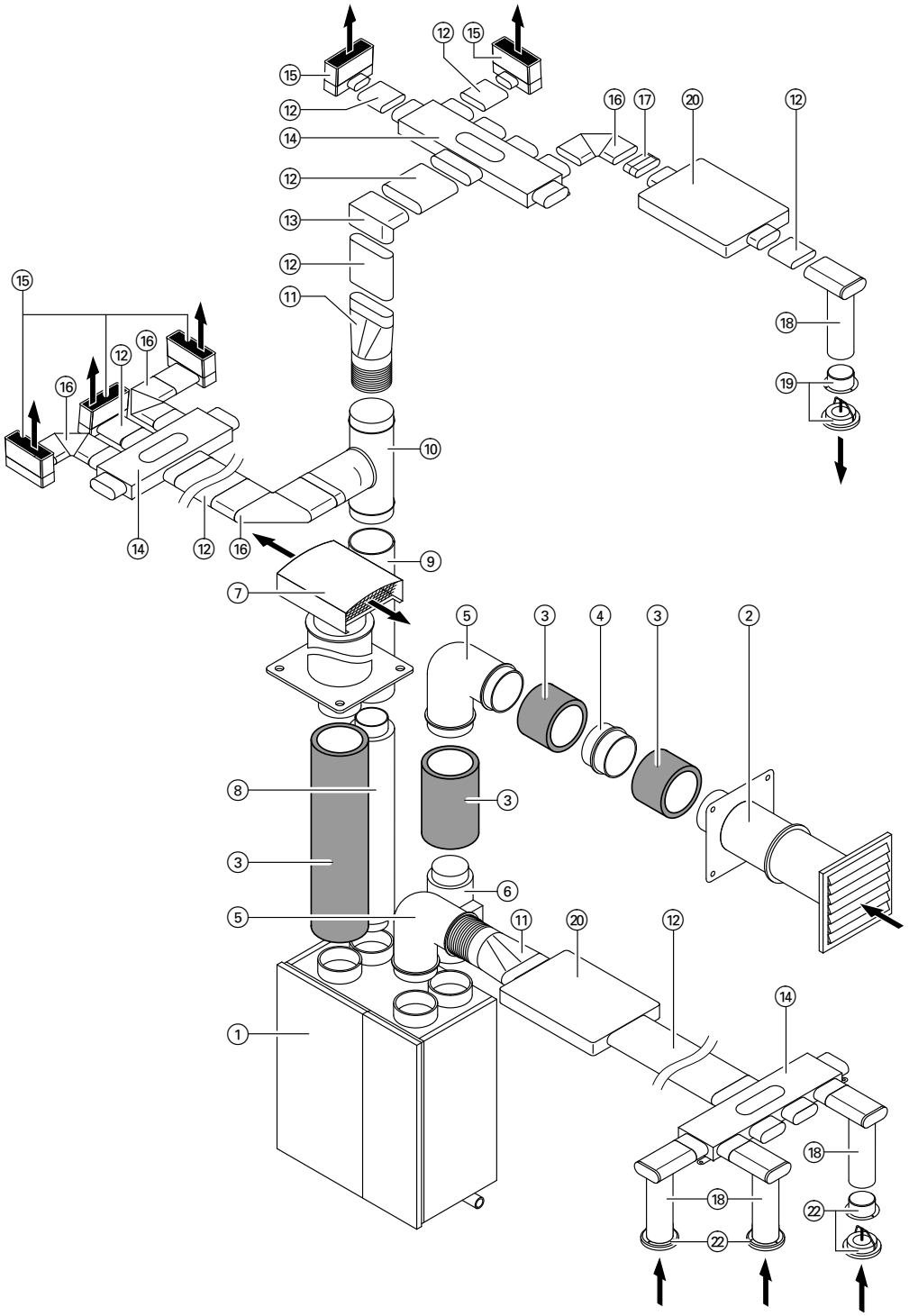
Appendix (cont.)

Pos.	Components	System/DN	Part no.	Quantity
Tee		DN 125 DN 160 DN 180	7279 110 7190 179 7373 031	
Tee with reducer		DN 125/100/100 DN 160/125/125	7299 292 7299 293	



System illustration, metal duct system

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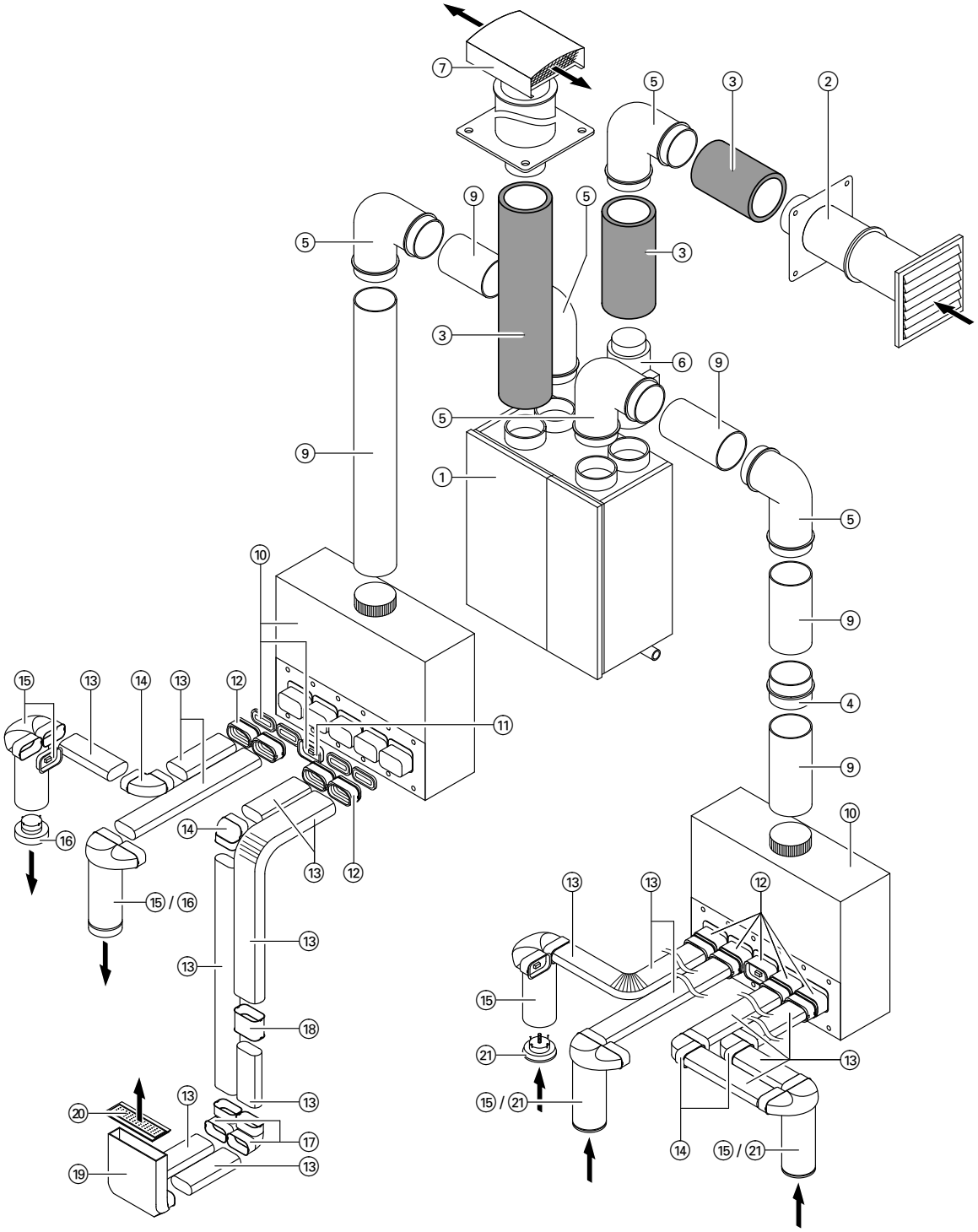
Appendix (cont.)

Standard set for a plastic duct system

Domestic ventilation system with Vitovent 300	Part no.	Quantity
Air flow rate **300 m³/h** as basic set for a detached house with luxury equipment (for 4 occupants with living/dining room, bedroom, 2 bedrooms for children, kitchen, 2 bathrooms, guest WC and utility room). Components: 1 Vitovent 300 for max. air flow rate **300 m³/h** 4 Extract air valves 3 Ventilation air valves 1 Kitchen extract air valve DN 125 1 Expelled air roof outlet 1 External wall connection 2 Flexible pipes, thermally insulated DN 160 (2.5 m long) 2 Air distribution boxes 5 Diverters 3 Floor outlets 3 Grates for floor outlets 100 m Flat duct – flexible, (system 100) on 2 rolls of 50 m each 20 Lip seals (2 packing units of 10 pce each)	Z008 658	

Plastic duct system

Pos.	Components	System/DN	Part no.	Quantity
① to ⑨	See metal duct system			
⑩	Air distribution box with restrictor and cap	DN 125/System 100 DN 160/System 100 DN 180/System 100	7440 222 7440 223 7440 224	
⑪	Locking cap	System 100	7440 217	
⑫	Lip seal	System 100	7440 213	
⑬	Flat duct	System 100	7440 212	
⑭	Flat duct: Bend 90° narrow side	System 100	7440 216	
⑮	Diverter for ventilation air/extract air valve with cap	System 100/DN 125	7440 214	
⑯	Ventilation air valve	DN 125	7440 228	
⑰	Flat duct: Bend 90° broad side	System 100	7440 215	
⑱	Connection piece	System 100	7440 218	
⑲	Floor-level outlet with cap	System 100	7440 219	
⑳	Grille for floor outlet	—	7440 225 7440 226	
㉑	Extract air valve	DN 125	7440 227	



System illustration, plastic, metal

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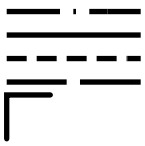
9.5 Symbols


Ventilation appliance


Silencer

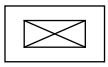

Outside air
Ventilation air
Extract air
Expelled air
Bend


Tee


Air grille


Extract air aperture


Ventilation air aperture


Cleaning aperture

9.6 Regulations and Directives

Observe the following standards and regulations regarding design and implementation.

General current regulations and Directives:
- TA Lärm [Germany]
- DIN 4701
- EN 12831
- DIN 4108 + 9
- DIN 1946 /6
- DIN 1946 /10
- VDI 6022
- EnEV [Germany]
- EN 13134

Electrical regulations
- EN 60335
- DIN VDE 0730
- VDE 0100

9.7 Glossary

Extract air
Air extracted from the room by the ventilation system.

Extract air aperture
See extract air valve

Extract air valve
Aperture through which extract air is removed from the room.

Outside air
All air drawn in from the outside.

Blower door test
Procedure for testing the air tightness of buildings.

Infiltrating air
Uncontrolled free ventilation through gaps in the building structure, e.g. at windows and doors.

Window ventilation
Air changes resulting from windows being opened (uncontrolled air change).

Filters
Separation of contamination from air streams.

Expelled air
Air discharged outdoors.

Ventilation heat demand
Ventilation extracts heat from the flat, and cold air is induced from outside into the flat. The ventilation heat demand is the amount of heat that is required to heat up the induced outside air to room temperature.

Air change rate
The measurement for air changes, identifying how often air in a building is completely replaced every hour.

Maximum ventilation
The air change rate required for maintaining hygienic conditions and the quality of ambient air with high occupancy rates or high levels of air contamination (e.g. through smoking).

Standard ventilation
The air change rate required to maintain hygienic conditions and ambient air quality for the normal activities of occupants.

Party ventilation
See maximum ventilation

Reduced ventilation
The air change rate required to maintain hygienic and ambient air quality for low level activities or during the absence of occupants.

Heat recovery
Measure for using the thermal energy from the air that is extracted from a room.
The latent energy that would otherwise be wasted is recovered from the extract air and transferred to the ventilation air.

Ventilation air
The total air flowing into a room.

Ventilation air aperture
Aperture through which ventilation air is supplied into a room.

Keyword index

Subject to technical modifications.

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