



AdiaVent®
Design handbook

Hoval

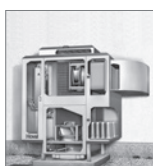
Responsibility for energy and environment

Air recirculation unit for cooling large spaces



Safety

3



AdiaVent® ADV

Air recirculation unit for cooling large spaces

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Safety

A

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1 Symbols



Caution

This symbol warns against risk of injury. Please heed all instructions designated by this symbol to prevent injuries and/or death.



Attention

This symbol warns against property damage. Please heed the respective instructions to prevent risk of damage to the unit and its functions.



Notice

This symbol denotes information about the economic use of the equipment or special tips.

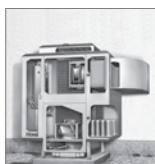
2 Operational safety

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

- Dangers when working with the electrical system.
- Parts (e.g. tools) can fall down below when working on the ventilation unit.
- Dangers from working on the roof.
- Damage of parts or components due to lightning
- Water entry into the unit if doors and/or ports are not properly closed.
- Malfunctions due to defective parts

Therefore:

- Please read the operating instructions before unpacking, installing, commissioning and before maintaining the equipment.
- Store the operating instructions so that they are easily accessible.
- Observe any attached information and warning signs.
- Follow the local safety and accident prevention regulations at all times.
- AdiaVent® units may only be installed, operated and maintained by authorized, trained and instructed skilled personnel. Specialists as defined by these operating instructions are those persons who, based on their training, knowledge and experience as well as their knowledge of the relevant regulations and guidelines, can carry out the work assigned to them and recognise potential hazards.
- Unauthorised reconfiguration or modification of the unit is not permitted.



AdiaVent® ADV

Air recirculation unit for cooling large spaces

B



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1 Use

1.1 Intended use

AdiaVent® units are for cooling large spaces. Also included under intended use are compliance with the installation, commissioning, operating and maintenance provisions (operating instructions).

Any usage over and above this use is considered to be not as intended. The manufacturer can accept no liability for damage resulting from improper use.

1.2 User group

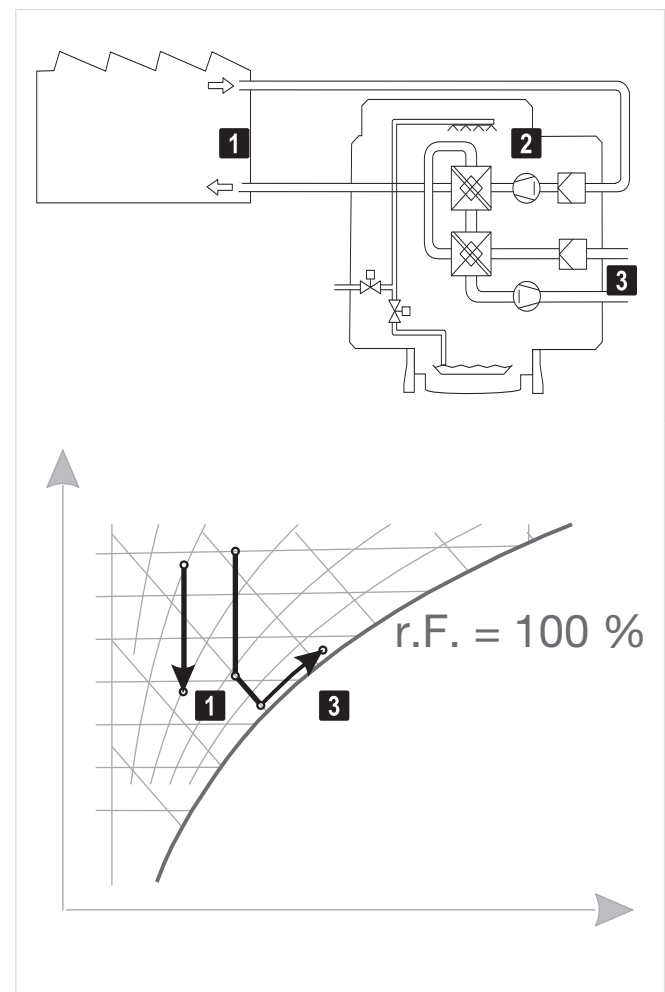
AdiaVent® units may only be installed, operated and maintained by authorized and trained specialists who are familiar with the equipment and have been informed about the hazards.

The design handbook is for English-speaking operating engineers and technicians as well as specialists in building, heating and air technology.

2 Construction and operation

The AdiaVent® system is intended for the cooling of large high spaces (e.g. factory halls, industrial halls, supermarkets, sport arenas etc.). It fulfills the following functions:

- Cooling (adiabatic)
- Recirculation operation
- Optional: Mixed air operation
- Air filtration



1 Supply and extract air

2 Humidifier circuit

3 Process air (fresh air)

Fig. B1: Function

The AdiaVent® draws in the extract air from the room and cools it indirectly adiabatic through the plate heat exchanger. The cooled and filtered supply air is blown back into the hall.

**Notice**

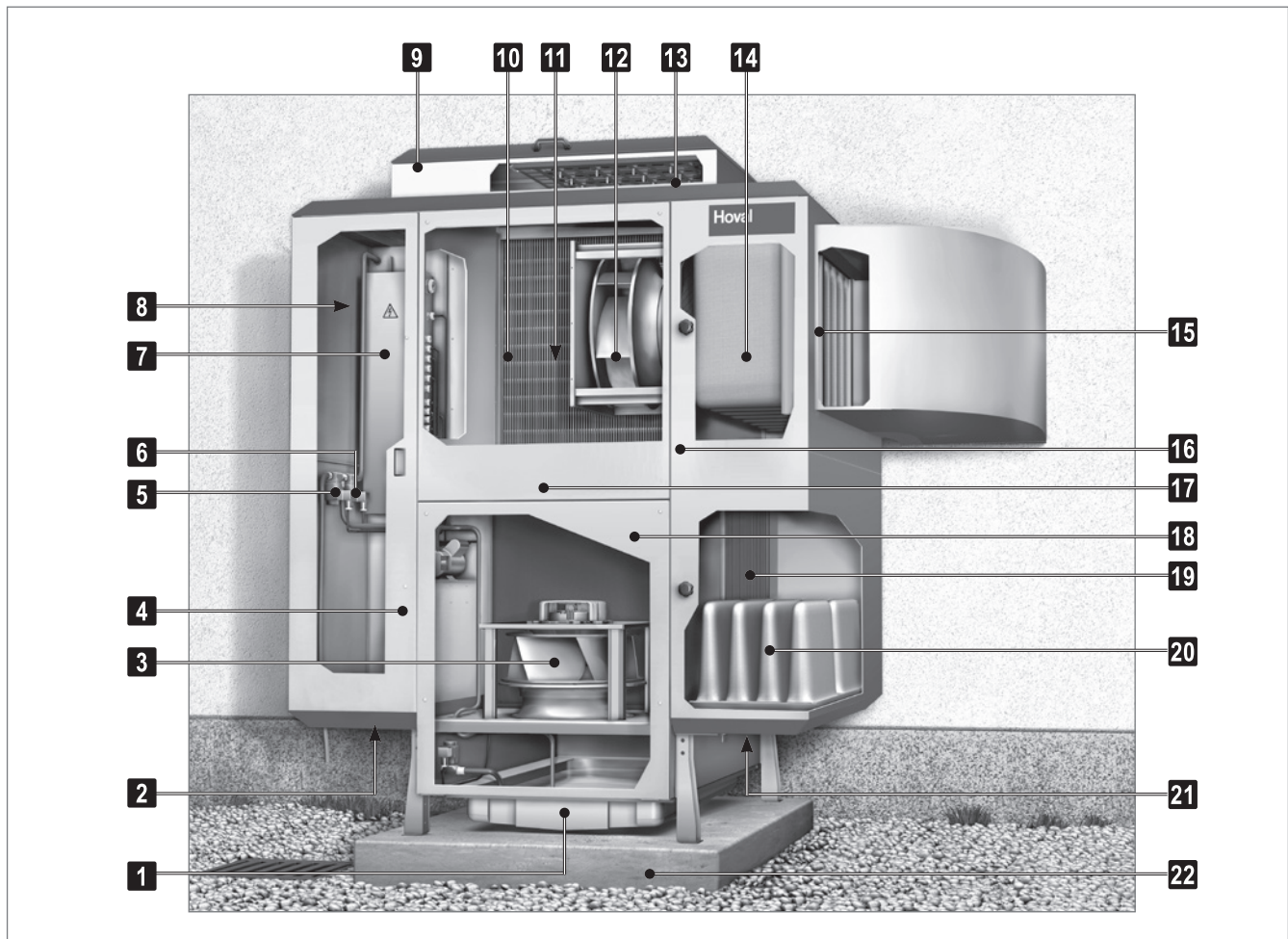
Indirect adiabatic cooling: The fresh air is humidified and indirectly cools the supply air via a plate heat exchanger. The supply air is not humidified – contamination can thus be ruled out completely.

Fresh air is used for the cooling of the room air. The fresh air is drawn in through a filter and precooled in the first plate heat exchanger; this causes the boundary temperature of adiabatic cooling to sink. The fresh air is then blown downwards into the first plate heat exchanger (cooler) and then into the second plate heat exchanger (precooler). The fresh air and the plate heat exchangers are sprayed with specially designed spray nozzles and cooled by the evaporation of the water. After the precooler, the fresh air is blown back into the exterior.

2.1 Unit construction

The AdiaVent® ADV system is usually installed on a facade or on a roof. It requires:

- an electrical supply
- a water supply and drainage
- extract and supply air ducts



1 Water tank with liquid level switch and syphon

2 Exhaust air grille (process air)

3 Process air fan

4 DigiUnit terminal box access door

5 Feed valve

6 Drain valve

7 DigiUnit terminal box

8 Isolation switch

9 Humidifier access door

10 Cooler

11 Duct connection supply air

12 Supply air fan

13 Humidifier

14 Supply air filter with filter monitoring

15 Duct connection extract air

16 Filter access door

17 Supply air fan access panel

18 Process air fan access panel

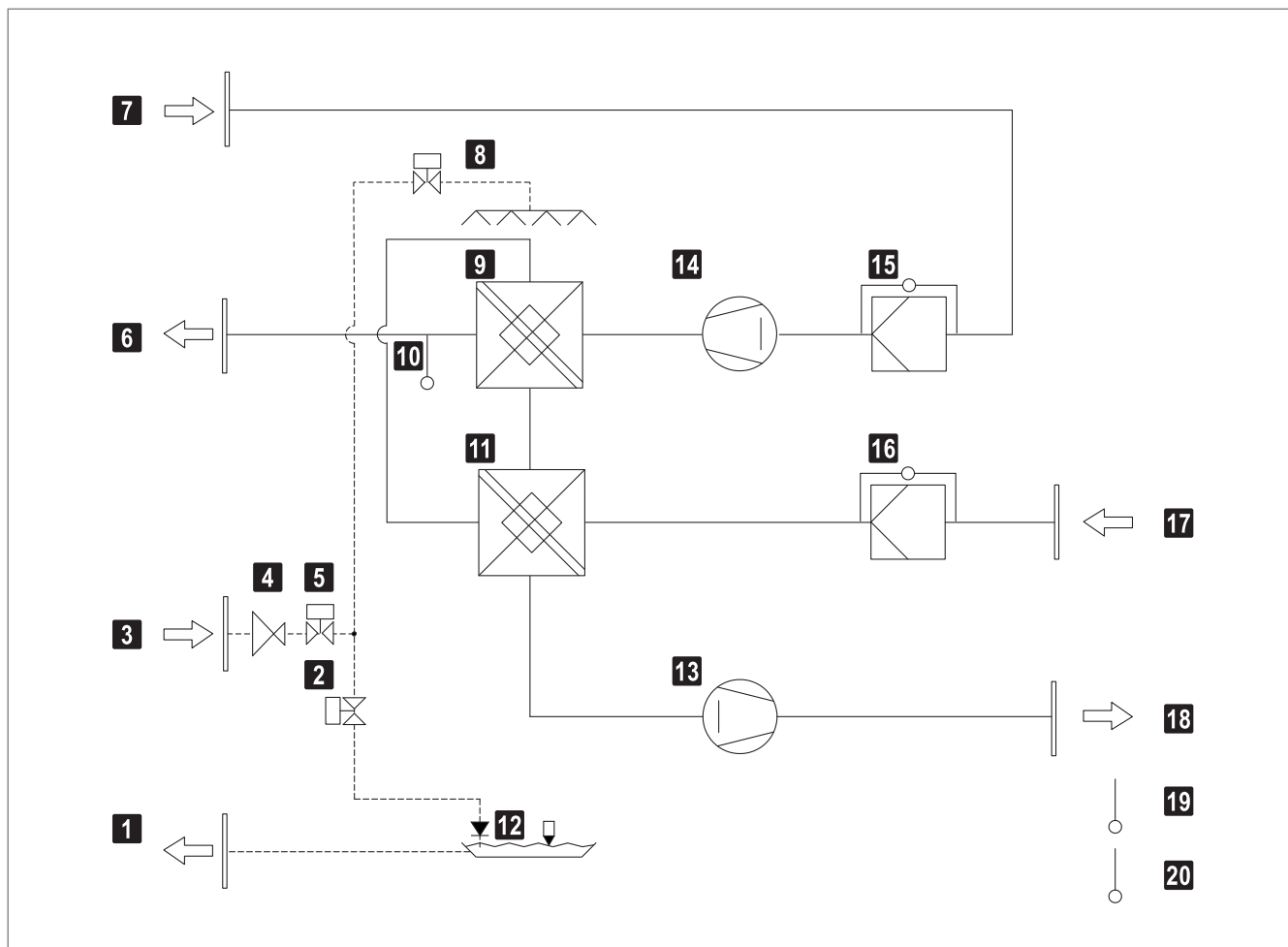
19 Precooler

20 Process air filter with filter monitoring

21 Fresh air intake grille (process air)

22 Base (by the installer)

Fig. B2: Components



1	Drain
2	Drain valve
3	Water supply
4	Pressure regulator (not included in the scope of delivery)
5	Feed valve
6	Supply air
7	Extract air
8	Humidifier with balancing valves
9	Cooler
10	Supply air sensor

11	Precooler
12	Water tank with liquid level switch
13	Process air fan
14	Supply air fan
15	Supply air filter with filter monitoring
16	Process air filter with filter monitoring
17	Fresh air (process air)
18	Exhaust air (process air)
19	Fresh air temperature sensor
20	Room air sensor

Fig. B3: Function diagram

2.2 Operating modes

AdiaVent® operates in the following modes:

- Off
- Cooling
- Night cooling summer

The DigiNet control system regulates these operating modes automatically for each control zone according to the switching schedule.

In addition, you can:

- manually switch the operating mode of a control zone,
- switch each individual AdiaVent® to the modes Off, Cooling, or Night cooling summer.

Code	Operating mode	Use	
OFF	Off The fans are off. Frost protection remains active. There is no room temperature control.	if the unit is not needed	Fans..... off Humidifier..... off
COOL	Cooling The AdiaVent® blows cool and filtered air into the room and suctions the warm extract air. Cooling capacity is regulated according to the cooling demand. The room temperature set value day is active.	during room use	Fans..... on ¹⁾ Humidifier..... on ¹⁾ ¹⁾ depending on temperature conditions
NCS	Night cooling summer The AdiaVent® blows cool and filtered air into the room and suctions the warm extract air. The humidifier is not in operation. The cooling capacity is not regulated. The room temperature set value night is active.	for energy-saving cooling during the night	Fans..... on ¹⁾ Humidifier..... off ¹⁾ depending on temperature conditions

Table B1: Operating modes

3 Technical data

3.1 Unit type reference

	ADV - 6 / DN5 / ...
Unit type	AdiaVent® ADV
Unit size	6
Controls	Design for DigiNet DN5
Options	

Table B2: Unit type reference

3.2 Application limits

Fresh air temperature	max.	50	°C
Water resting pressure	max.	2	bar
Electric conductivity	max.	1000	µS/cm
pH value		7.5 - 8.5	
Carbonate hardness	max.	4	°dH
Carbonate hardness with hardness stabilisers	max.	20	°dH
Chloride	max.	180	mg/l
KMnO ₄ consumption	max.	50	mg/l
Sulphate	max.	150	mg/l
Iron	max.	0.2	mg/l
Copper	max.	2	mg/l
Manganese	max.	0.05	mg/l
Nitrate	max.	50	mg/l
Sodium	max.	200	mg/l
Silicon dioxide	max.	10	mg/l
Bacterial count	max.	1000	CFU/ml
Legionella	max.	100	CFU/100 ml

Table B3: Application limits

3.3 Air flow rate, electrical connection

Air distribution	Nominal air flow rate	6080	m³/h
	with external pressure drop ■ Supply and extract air duct ■ Diffuser air outlet	50	Pa
Electrical connection	Supply voltage	3 x 400	VAC
	Permitted voltage tolerance	± 10	%
	Frequency	50	Hz
	Current consumption	max. 4.5	A
	Power consumption	max. 2.35	kW
Filter	Supply air	G4	
	Process air	F5	
Hydraulics	Water consumption (at 2 bar)	max. 40	l/h

Table B4: Technical data

3.4 Air flow rate with additional pressure drops

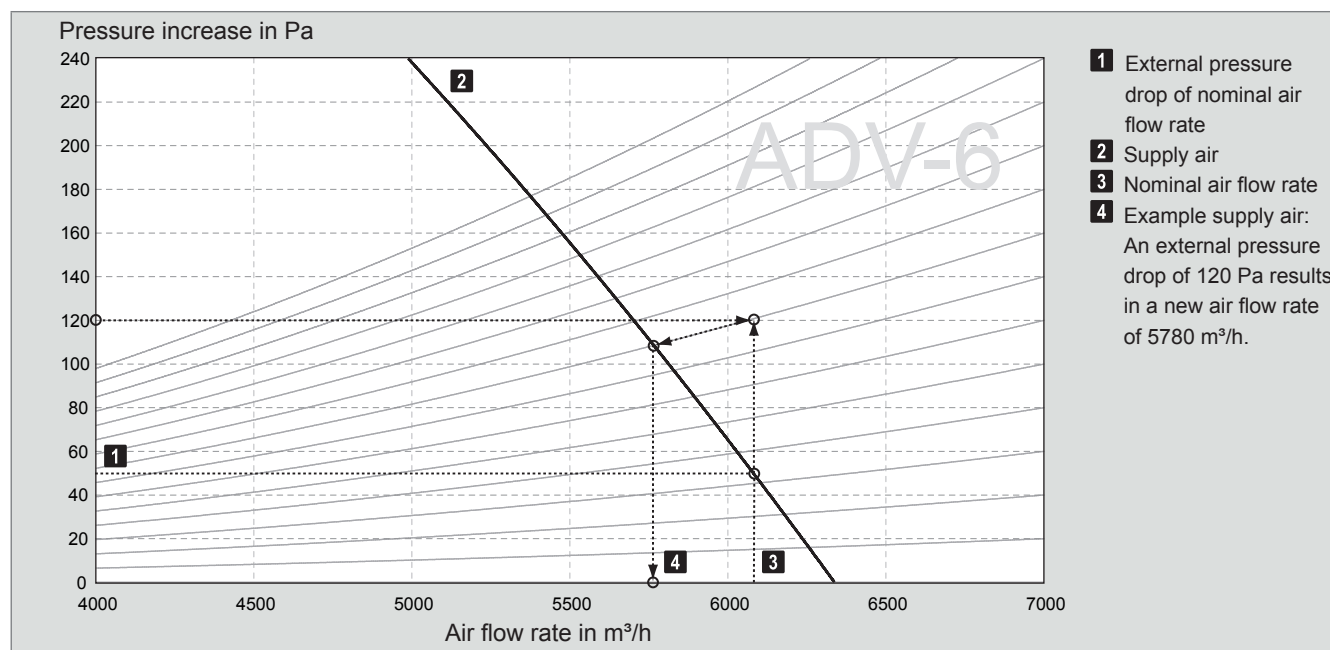
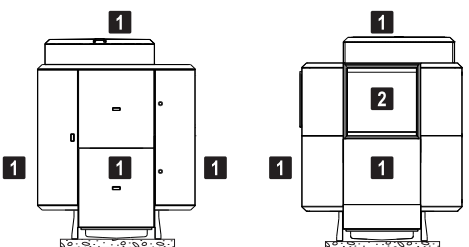


Diagram B1: Air flow rate with additional pressure drops

3.5 Sound level

			1	2
Sound pressure level (at a distance of 5 m) ¹⁾		dB(A)	57.9	–
Total sound power level		dB(A)	79.9	79.1
<div style="display: flex; align-items: center;">  </div>	63 Hz	dB	82.8	87.0
	125 Hz	dB	84.8	89.0
	250 Hz	dB	75.0	80.3
	500 Hz	dB	73.3	77.7
	1000 Hz	dB	71.8	72.3
	2000 Hz	dB	72.4	59.9
	4000 Hz	dB	73.1	51.7
	8000 Hz	dB	71.5	42.8

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

Table B5: Sound levels

3.6 Cooling capacity, supply air temperature

Temperature and relative humidity of the fresh air														
		26			28			30			32			°C
		30	40	50	30	40	50	30	40	50	30	40	50	%
Temperature of the extract air	24 °C	16.8	14.0	11.0	14.7	11.3	7.8	12.3	8.6	4.5	9.9	5.4	0.7	kW
		15.8	17.1	18.6	16.8	18.4	20.2	17.9	19.8	21.8	19.2	21.4	23.7	°C
	26 °C	19.2	16.9	14.3	17.6	14.6	11.5	15.5	12.2	8.6	13.3	9.3	5.1	kW
		16.6	17.7	19.0	17.4	18.8	20.4	18.4	20.0	21.8	19.5	21.4	23.5	°C
	28 °C	21.3	19.4	17.2	19.9	17.4	14.7	18.2	15.3	12.2	16.3	12.8	9.1	kW
		17.6	18.5	19.6	18.2	19.5	20.8	19.1	20.5	22.0	20.0	21.7	23.5	°C

Table B6: Cooling capacity and supply air temperature at: nominal air flow rate 6080 m³/h, atmospheric pressure 1013 mbar, density of extract air 1.2 kg/m³

3.7 Minimum and maximum distances

Unit clearance X	min.	4	m	1	The intake and exhaust air grille must be freely accessible.
Installation height H	min.	3	m	2	Allow a free space of 1.5 m for service and maintenance.
Distance from wall W	min.	1	m		
Base height S	min.	200	mm		

Table B7: Minimum distances

3.8 Dimensions and weights

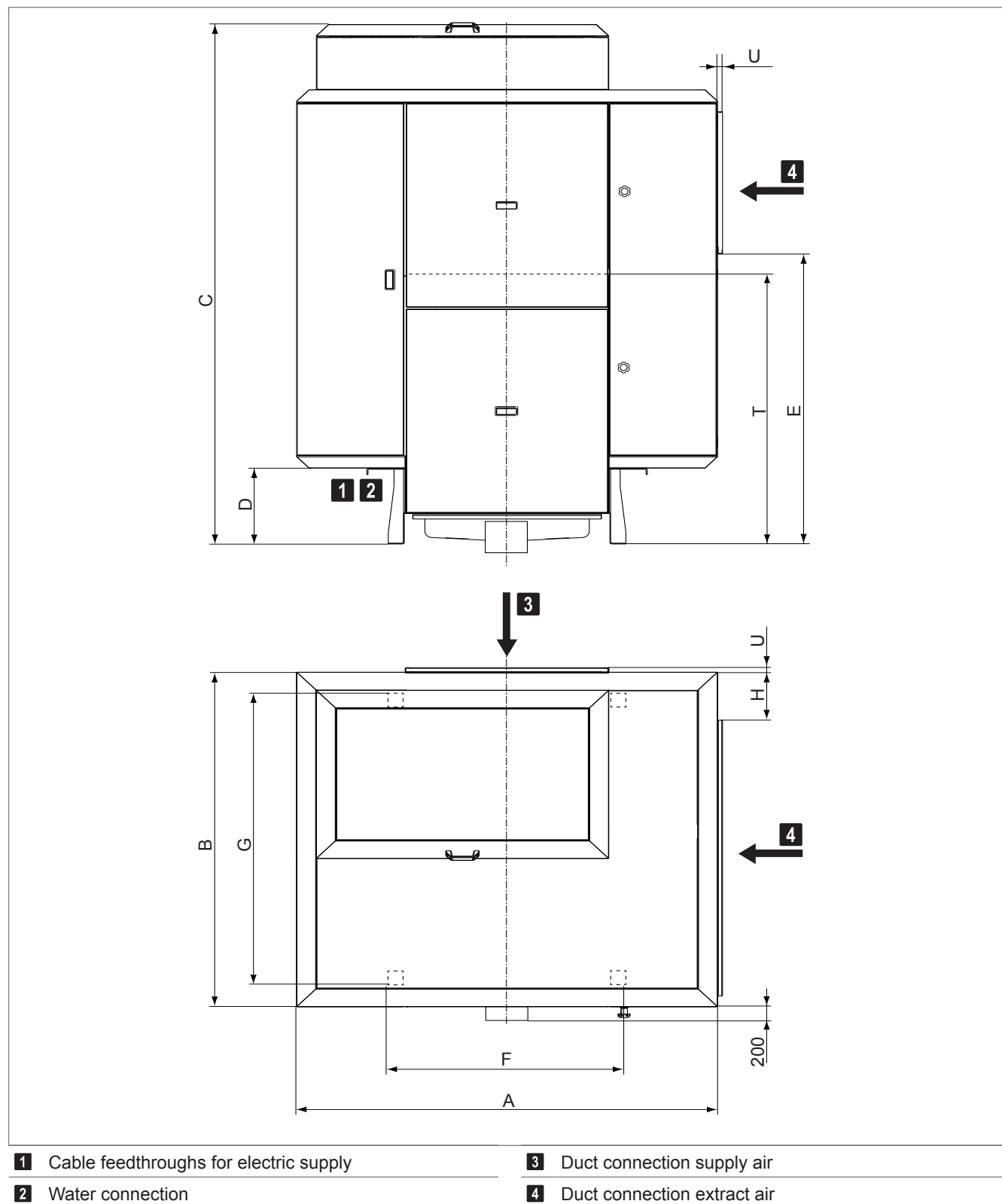


Table B8: Dimensional drawing

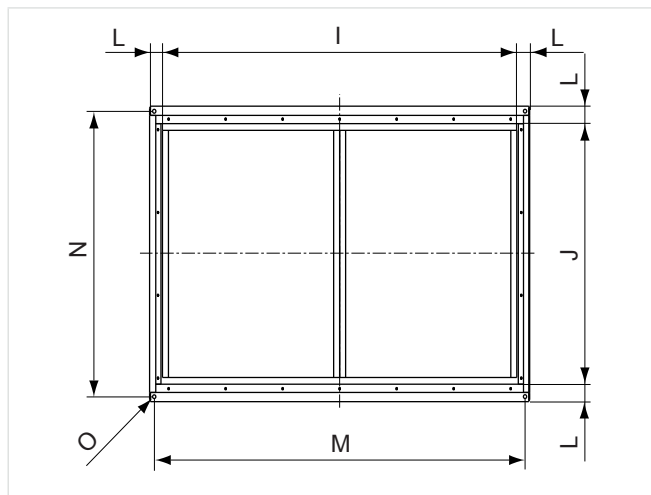


Fig. B4: Hole pattern for supply air duct connection

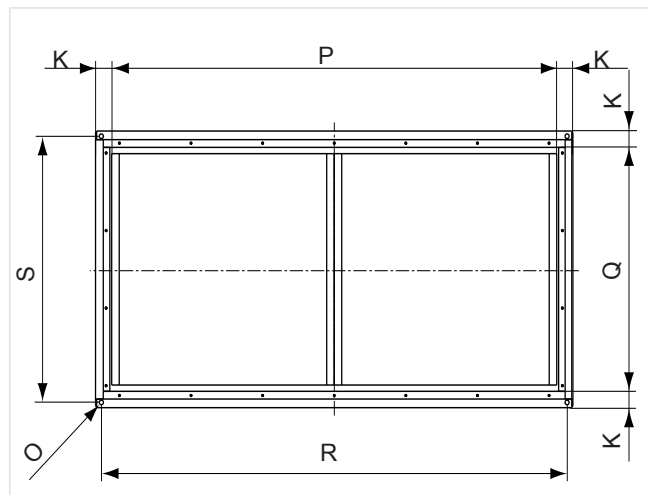


Fig. B5: Hole pattern for extract air duct connection

Dimensions	A	1766	mm
	B	1533	mm
	C	2391	mm
	D	348	mm
	E	1326	mm
	F	997	mm
	G	1398	mm
	H	217	mm
	I	785	mm
	J	805	mm
	K	38	mm
	L	35	mm
	M	830	mm
	N	850	mm
	O	M8 (blind rivet nut)	
	P	1194	mm
	Q	582	mm
	R	1239	mm
	S	635	mm
	T	1195	mm
	U	21	mm
Water connection		Rp 3/8" (female)	
Weight		520	kg

Table B9: Dimensions and weights

4 Design example

Design data

- Sensible cooling load
To be considered:
 - Transmitted heat
 - Solar radiation
 - Internal heat sources (machines, lighting, etc.)
- Standard fresh air conditions
- Desired room temperature (in the occupied area)
- Extract air temperature ¹⁾
- External pressure drop (applied to the nominal air flow rate)
- Additional pressure drop

¹⁾ The extract air temperature is generally higher than the temperature in the occupied area. This is due to the inevitable temperature stratification in high spaces.

Air flow rate for the additional pressure drops V_i

The supply air flow rate depends on the external pressure drop of the

- supply and extract air ducts
- diffuser air outlets

Cooling capacity per AdiaVent® unit Q_i

Depending on

- the extract air temperature and
- the standard fresh air conditions

the cooling capacity of the AdiaVent® units is determined.



Notice

The cooling capacity decreases in a linear manner with the air flow rate.

$$Q_i = Q_n \cdot \frac{V_i}{V_n}$$

V_i = Air flow rate in m³/h as a function of additional pressure drop

V_n = Nominal air flow rate in m³/h

Q_n = Cooling capacity according to Table B6 in kW

Example

Cooling load..... 190 kW

Standard fresh air conditions..... 28 °C / 30 % RH

Desired room temperature..... 20 °C

Extract air temperature 28 °C

External pressure drop 120 Pa

From Diagram B1 there results an air flow rate of 5780 m³/h, depending on the pressure drop.

From Table B6 there results a cooling capacity of 19.9 kW referred to a nominal air flow rate of 6080 m³/h.

$$Q_i = 19.9 \cdot \frac{5780}{6080}$$

$$Q_i = 18.9$$

Required number of units n_{req}

$$n_{\text{req}} = \frac{Q_C}{Q_i}$$

Q_C = Total required cooling capacity in kW
 Q_i = Cooling capacity per AdiaVent® unit in kW

$$n_{\text{req}} = \frac{190}{18.9}$$

$$n_{\text{req}} = 10.1$$

Selected: 10 ADV-6 units.

5 Options

AdiaVent® ADV units can be adapted to the specific requirements of each project by means of a range of options. A detailed description of all optional components is found in the 'Options' part of this design handbook.

Option	Use
Fresh air box	For use as air mixing unit
Paint finish	Paint finish as desired
Aftercooler	For constant cooling capacity
Supply air filter	To optimise the filtering of the supply air

Table B10: Availability of options

6 Control system

AdiaVent® ADV are controlled by the Hoval DigiNet system. This control system, developed specifically for Hoval indoor climate systems, provides the following advantages:

- DigiNet utilises the full potential of the decentralised systems. It controls each ventilation unit individually, depending on local conditions.
- DigiNet allows for maximum flexibility of operation with respect to the control zones, unit combinations, operating modes and operating times.
- The ready-to-connect units with integrated control components are easy to design with and install.
- Commissioning of the DigiNet is quick and easy thanks to the plug & play components and pre-addressed control modules.

A detailed description of the DigiNet is found in the 'Control System' part of this design handbook.

7 Transport and installation

7.1 Installation



Caution

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

- The units can be mounted on the facade or on the roof.
- A fork lift will be required to mount the unit on the facade.
- In order to mount the unit on the roof a crane or a helicopter and 4 hoisting slings (length approx. 10 m) are required.
 If steel cables or chains are used, the AdiaVent® unit must be adequately protected.
- Supply and extract air ducts are required.
- Air distribution within the building is necessary.
- Provisions for openings in the walls for the supply and extract air ducts must be made.
- Make sure that the base corresponds with the specifications in the 'System design' part.
- Observe the installation instructions provided.

7.2 Hydraulic installation

- Design the water piping with appropriate bolted joints which can be loosened, tension-free and vibration-free.
- Provide a water filter (filter fineness 200 µm) and a pressure regulator (2 bar) in the water supply.

7.3 Electrical installation



Caution

Danger from electric current. The electrical installation is to be carried out only by a qualified electrician.

- Observe all applicable regulations (e.g. EN 60204-1).
- For long supply lines, select cable cross-sections in accordance with the technical regulations.
- Electrical installation to be carried out according to wiring diagram.
- Install the system bus for the control system separately from the mains cable.
- Make sure there is onsite overload protection equipment for the mains connection line of the zone control panel (short circuit resistance 10 kA).

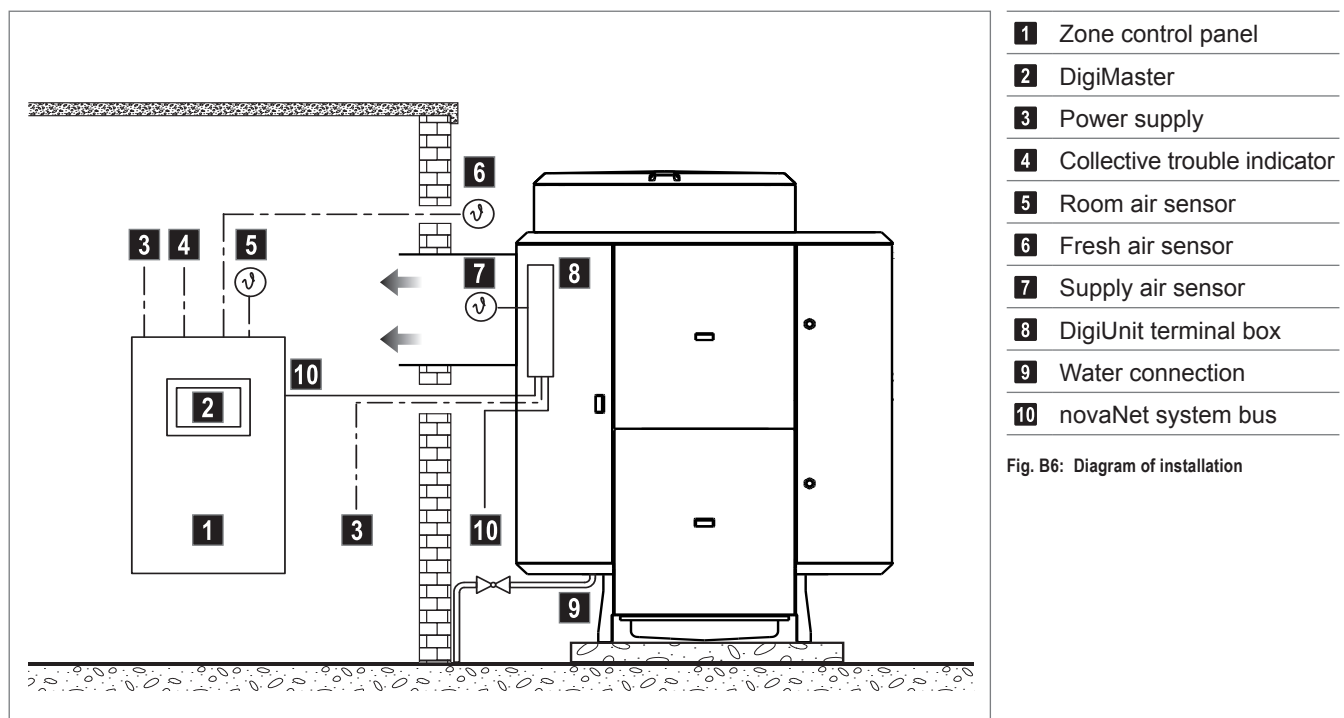


Fig. B6: Diagram of installation

Component	Designation	Voltage	Cable	Option	Remark
DigiUnit terminal box	Power supply	3 x 400 V	5 x 2.5 mm ²		
	novaNet system bus	12 V	2 x 0.8 mm ²		For bus cable specifications, see part D, section 2.4
	Supply air sensor	10 V	2 x 1.5 mm ²		max. 170 m
Zone control panel 3-phase	Power supply	3 x 400 V	5 x ... mm ²		
	novaNet system bus	12 V	2 x 0.8 mm ²		For bus cable specifications, see part D, section 2.4
	Room air sensor	10 V	2 x 1.5 mm ²		max. 170 m
	Fresh air temperature sensor	10 V	2 x 1.5 mm ²		max. 170 m
	Enable cooling	Volt-free max. 230 V	3 x 1.5 mm ²		max. 2 A per zone
	Trouble input cooling	24 V	3 x 1.5 mm ²		per zone
	Collective trouble indicator	Volt-free max. 230 V	3 x 1.5 mm ²		max. 6 A per zone
	Power supply for AdiaVent®	3 x 400 V	5 x 2.5 mm ²	o	per AdiaVent® ADV
Variant: Zone control panel 1-phase	Power supply	1 x 230 V	3 x ... mm ²		
	novaNet system bus		2 x 0.8 mm ²		For bus cable specifications, see part D, section 2.4
	Room air sensor		2 x 1.5 mm ²		max. 170 m
	Fresh air temperature sensor		2 x 1.5 mm ²		max. 170 m
	Enable cooling	Volt-free max. 230 V	3 x 1.5 mm ²		max. 2 A per zone
	Trouble input cooling	24 V	3 x 1.5 mm ²		per zone
	Collective trouble indicator	Volt-free max. 230 V	3 x 1.5 mm ²		max. 6 A per zone

Table B11: Cable list

8 Specification texts

8.1 AdiaVent® ADV

Self-supporting, weatherproof aluzinc sheet steel housing, internally insulated (fire protection class B1), with access door for easy access to filter, DigiUnit terminal box and humidifier, with access panel for easy access to fans, and isolation switch on the outside for cutting off high-power current.

AdiaVent® comprises:

- Supply air filter (bag filter, class G4) with differential pressure switch for filter monitoring
- Process air filter (bag filter, class F5) with differential pressure switch for filter monitoring
- 2 aluminium plate heat exchangers
- Maintenance-free, direct-drive supply air fan
- Maintenance-free, direct-drive process air fan
- Humidifier with balancing valves
- DigiUnit terminal box with DigiUnit controller as part of the Hoval DigiNet control system.

DigiUnit controller

Control module, fully wired to the components of the ventilation unit (fans, temperature sensors, valves, filter pressure switch):

- Controls the AdiaVent® unit according to the individual control zone commands
 - Controls the supply air temperature using cascade control
- Type: DU5

High-voltage section

- Mains power terminals
- Isolation switch (can be operated from the outside)
- Motor contactor for each fan
- Fuse for the electronics
- Transformer for the DigiUnit controller and the valves
- Connection terminals for temperature sensors
- Control box heating

Type	ADV-6 / DN5
Nominal air flow rate	6080 m³/h
Power consumption	2.35 kW
Supply voltage	AC 3 x 400 V
Frequency	50 Hz
Fresh air	___ °C / ___ %
Supply air	___ °C
Cooling capacity	___ kW

8.2 Options

Fresh air box

- Insulated aluzinc sheet steel housing
- Fresh air damper with actuator
- Fresh air filter, class F7, with differential pressure switch for filter monitoring

Type: AUK

Supply air filter

Supply air filter, class F5 instead of class G4

Type: ZF5

Paint finish

Paint finish as desired

Type: AL-ADV

Aftercooler

Aftercooler for constant cooling capacity

8.3 Control system

Digital control system for the energy-optimised operation of decentralised indoor climate systems:

- System set up according to OSI reference model
- Onsite connection to the individual control modules using novaNet system bus in a free topology (by electrical installer)
- Cross-communication with equal priority (peer-to-peer/multipeer) using novaNet log
- Fast reaction times due to data transmission on an events basis
- Control modules pre-addressed in the factory with integrated lightning protection and battery-buffered RAM modules
- No onsite engineering (binding) required

DigiNet operator terminals

DigiMaster

Preprogrammed Plug-&-Play operator terminal with graphic user interface consisting of a touch panel with colour display, installed in the door of the zone control panel.

- Monitoring and setting the DigiNet system (operating modes, temperature values, scheduler, calendar, alarm handling, control parameters)

Type: DM5

DigiCom

Package consisting of operating software, novaNet router and connection cables for using the Hoval DigiNet with a PC:

- Monitoring and setting the DigiNet system (operating modes, temperature values, scheduler, calendar, alarm handling and forwarding, control parameters)
- Trend function, data storage and logbook
- Differentiated password protection

Type: DC5

Options

- Window for DigiMaster
- IP65 framework
- novaNet socket
- novaNet router

DigiNet zone control panel

The zone control panel (coated sheet steel, RAL 7035) contains:

- 1 fresh air temperature sensor
- 1 transformer 230/24 V
- 2 circuit breakers for transformer (1-pin)
- 1 relay
- 1 safety relay (2-pin, external)
- Input and output terminals (top)
- 1 wiring diagram of the system
- 1 DigiZone controller, 1 relay, 1 room air sensor (loose) and 3 supply air sensors (loose) for each control zone

DigiZone controller

Control unit for each control zone, integrated in the zone control panel:

- Processes the room and fresh air temperature inputs, as well as special functions (optional)
- Controls the operating modes according to the scheduler
- Sets the outputs for the 'enable cooling' requirement message and the collective trouble indicator.

Type: DZ5

Options

- Alarm lamp
- Socket
- 2-pin circuit breakers
- Room temperature average value



Options



- 1 Fresh air box _____ 26
- 2 Paint finish _____ 27
- 3 Aftercooler _____ 27
- 4 Supply air filter _____ 27

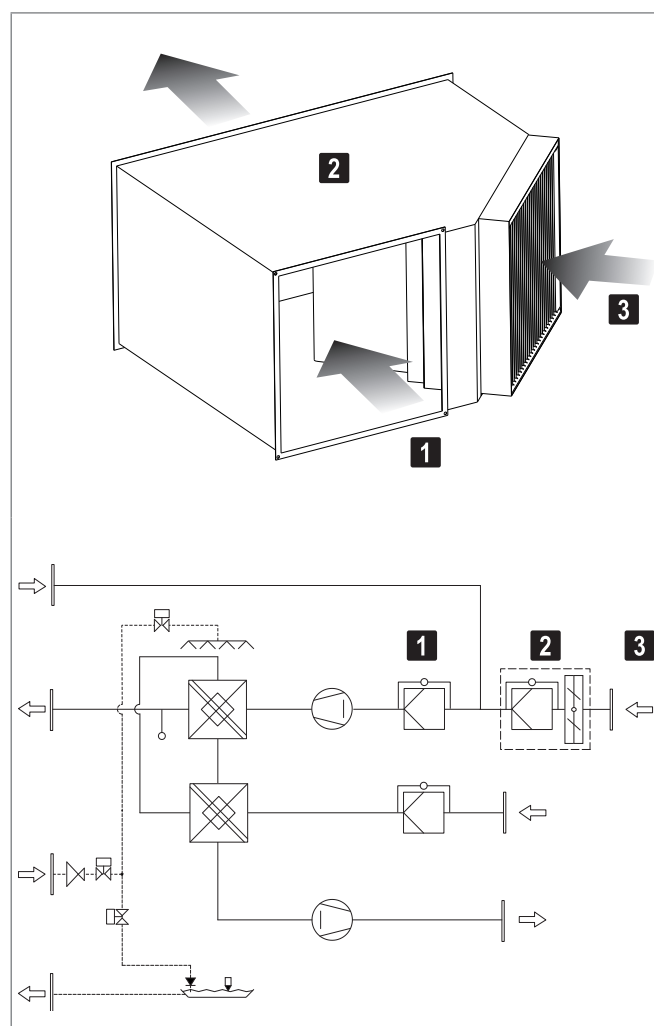
1 Fresh air box

The AdiaVent® with fresh air box can be operated as an air mixing unit. It can be adjusted to take in a proportion of up to 20% fresh air.

The fresh air box is connected to the extract air duct and comprises:

- Fresh air damper with actuator
- Fresh air filter (class F7) with filter monitoring

Type: AUK



1 Extract air

2 Fresh air box

3 Fresh air

Fig. C1: Function diagram

Dimensions	A	1231	mm
	B	1000	mm
	C	642	mm
	D	620	mm
	E	9.1	mm
	F	622	mm
	G	599	mm
	H	640	mm
Weight		76	kg
Filter		F7	

Table C1: Dimensions and technical data

2 Paint finish

Upon request, AdiaVent® units (standard aluzinc) may be painted. Indicate the desired RAL number on your order.

Type: AL-ADV

3 Aftercooler

If constant cooling capacities are required, an aftercooler can be integrated in the supply air duct. Your Hoval advisor will gladly provide you with any further information you may need.

4 Supply air filter

A class G4 supply air filter is installed as standard. If air is extracted from and blown into different rooms, or in cases of heavily polluted air, a class F5 supply air filter must be installed.

Type: ZF5



Notice

Because of the additional pressure drop the output figures of the AdiaVent® unit will decrease.

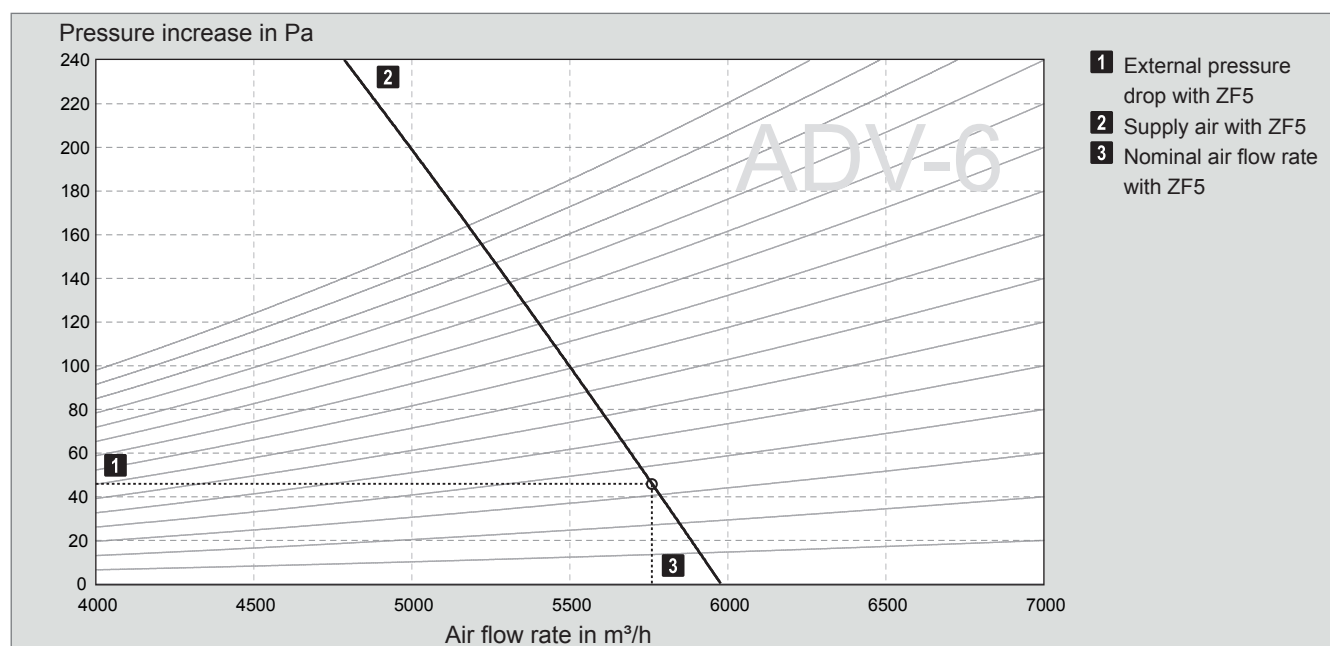
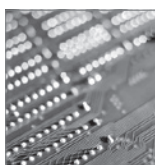


Diagram C1: Air flow rate with additional pressure drops



Control systems



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3 Operating options	31
4 Zone control panel	33
5 Control components in the units	34
6 Options	35

1 General

Hoval's DigiNet is a control system that was specially developed for decentralised indoor climate units. The system was developed together with Fr. Sauter AG, a company also supplying the hardware components.

2 System structure

Hoval's DigiNet is divided into three hierarchical levels that are connected by a novaNet system bus.

2.1 Operator level

This is where the user operates the system. Different operational options are available according to project-specific requirements.

2.2 Zone level

AdiaVent® units operating under the same conditions are grouped into control zones. The criteria concerning how the zones are created can be, for example, operating times, room temperature set values and so on. In the zone control panel there is a DigiZone controller system for each control zone. There is one DigiZone controller for each control zone in the zone control panel.

Control zones	max. 2
AdiaVent® units per control zone	max. 9

Table D1: Application limits of Hoval DigiNet

	Notice For larger projects, special solutions may be possible.
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2.3 Unit level

In every AdiaVent® unit there is a DigiUnit controller, which controls the unit individually in accordance with the local conditions.

2.4 novaNet system bus

The individual Hoval DigiNet components are connected via a novaNet system bus (analogously to the OSI layer model). Data transfer takes place in an event-oriented manner, this reduces data traffic and ensures short reaction times.

novaNet system bus	
Cable type	1 twisted core wire pair shielded category 5 or above
Topology	serial
Length	max. 1900 m For longer bus lengths: Include a repeater or divide the system into several networks.
Communication	Cross-communication with equal priority (peer-to-peer/multipeer)
Loop resistance	max. 300 Ω
Capacity	max. 200 nF

Table D2: novaNet system bus specifications

Example – bus cable

Type _____ G51
Dimension (n x n x mm²) _____ 1 x 2 x 0.8
Loop resistance at 20 °C _____ 37.5 Ω/km
Operating capacity _____ 60 nF/km
Use _____ Category 5e / class D
Properties _____ shielded, halogen-free

3 Operating options

3.1 DigiMaster operator terminal

The DigiMaster is a touch panel with a colour display, making it simple to operate the system. It gives trained users access to all information and settings that are necessary for normal operation:

- Display and setting of operating modes
- Display of temperatures and setting of the room temperature set values
- Display and program the scheduler and the calendar
- Display and handling of alarms
- Display and setting of control parameters

The DigiMaster is installed in the door of the zone control panel.

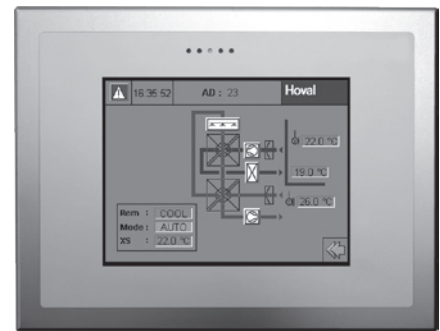


Fig. D1: Operation via Touchpanel with the DigiMaster

Electrical supply	
Supply voltage	230 VAC, 50 Hz
Permitted voltage tolerance	+10 % / -15 %
Rated power input	max. 7 W
Communication	
1x RJ-11 jack	novaNet
1x RJ-45 jack	Ethernet 10 Base T (application download)
Ambient conditions	
Ambient temperature	0...45°C
Storage and transport temperature	-25...70 °C
Ambient humidity	10...80 % RH without condensation
Protection class	IP 20 optional: IP 65 on the front
Protection class	II
Environment class	IEC 60721 3k3
Dimensions	
W x H x D	240 x 156 x 46 mm
Active surface (W x H)	140 x 105 mm

Table D3: DigiMaster DM5 technical data



Fig. D2: DigiMaster installed in the door of the zone control panel (shown here with window for DigiMaster)

3.2 Operation using PC and DigiCom

The system can be operated easily using a PC and DigiCom. The operating software clearly displays the system on the PC. It offers the following functions to competent users:

- Display and setting of operating modes
- Display of temperatures and setting of the room temperature set values
- Display and program the scheduler and the calendar
- Display and handling of alarms and maintaining an alarm log
- Display and setting of control parameters
- Trend function for the graphic display of current data
- Display tables and graphics of historic data
- Logbook for logging all system actions
- Differentiated password protection

The DigiCom package consists of the operating software, the novaNet router and the connection cables.

3.3 Integration with management level with DigiBac

An automation station with BACnet communication card – known as DigiBac – allows you to integrate the Hoval DigiNet at management level. Communication takes place over BACnet/IP on an Ethernet basis.

For detailed information about integrating with the management level, contact Hoval customer service.

3.4 Remote control over the internet using DigiWeb

The DigiWeb web server allows you to access Hoval DigiNet systems over the Internet. Remote control is possible from any PC with an Internet browser. A novaNet router is required to connect to the DigiNet system. For detailed information about remote control, contact Hoval customer service.



Fig. D3: Operation via PC

Hardware	
Processor	Intel Pentium III 800 MHz
Hard disk	9 GB
DVD drive	yes
Interfaces	1 serial, 1 mouse, 1 USB
Software	
Operating system	Windows XP, Vista, 7

Table D4: Requirements of PC used

4 Zone control panel

AdiaVent® units are summarised into control zones, which are controlled from the zone control panel. The DigiZone controller:

- controls operating modes,
- transmits the fresh air and room temperature to the individual units,
- sets the outputs for enable cooling and the collective trouble indicator.

For each panel
1 Fresh air temperature sensor (cable length max. 170 m)
1 Transformer 230/24 V
2 Circuit breakers for transformer (1-pin)
1 Relay
1 Safety relay (2-pin, external)
Connecting terminals for:
■ Fresh air sensor
■ Mains supply
For each control zone
1 DigiZone controller
1 Room air sensor (included)
1 Relay
Connecting terminals for:
■ Room air sensor
■ Enable cooling
■ Trouble input cooling
■ Collective trouble indicator
■ novaNet system bus

Table D5: Content of the zone control panel



Caution

Danger of electric shocks. Ensure that overcurrent protection equipment is installed on site for the power supply cable.



Fig. D4: A look in the zone control panel

Design	
Control panel	Coated sheet steel (RAL No. 7035)
Short circuit resistance I_{CW}	10 kA _{eff}
Connection terminals	top
Installation	Floor or wall installation
Ambient conditions	
Use	Indoors
Ambient temperature	5...40 °C
Storage and transport temperature	-25...55 °C
Ambient humidity	max. 50 % RH at 40 °C max. 90 % RH at 20 °C

Table D6: Technical data for the zone control panel

Size	Type	Dimensions in mm (W x H x D)					
1	SDZ1	380	x	600	x	210	
2	SDZ2	600	x	600	x	210	
3	SDZ3	600	x	760	x	210	
4	SDZ4	760	x	760	x	210	
5	SDZ5	800	x	1000	x	300	
6	SDZ6	800	x	1200	x	300	
7	SDZ7	800	x	1800	x	400	
8	SDZ8	1000	x	1800	x	400	
9	SDZ9	1200	x	1800	x	400	

Table D7: Available sizes and dimensions of zone control panel

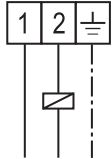
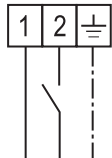
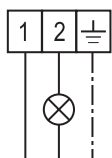
Enable cooling	
Volt-free signal that reports the cooling requirement to the cold production on site	 <p>3 x 1.5 mm² max. AC 230 V, 2 A</p>
Trouble input cooling	
Alarm input signal that informs the DigiNet system that the cold supply is not working	 <p>3 x 1.5 mm² AC 24 V</p>
Collective trouble indicator	
Volt-free signal for the external display of a collective alarm	 <p>3 x 1.5 mm² max. AC 230 V, 6 A</p>

Table D8: External connections

5 Control components in the units

In every AdiaVent® unit the following is installed:

- A DigiUnit terminal box (with DigiUnit controller and high-voltage section)

The DigiUnit controller regulates the individual unit according to the settings of the control zone and regulates supply air temperature by means of cascade control.

The high-voltage section contains:

- Mains power terminals
- Isolation switch (can be operated from the outside)
- Motor contactor for each fan
- Fuse for the electronics
- Transformer for the DigiUnit controller and the actuators
- Relay for emergency operation
- Connecting terminals for actuators and temperature sensors
- Control box heating



Attention

If the power supply for the DigiUnit terminal box is interrupted, frost protection and monitoring are not guaranteed. You can only tell that a DigiUnit controller has broken down because it is no longer displayed on the operator terminal. You should therefore check regularly that the display is complete.

Design	
Control box	Coated sheet steel cover screwed down
Protection class	IP 65
Electrical supply	
Supply voltage	3 x AC 400 V, 50 Hz
Permitted voltage tolerance	± 10 %
Power consumption	max. 2.35 kW
Series fuse	T 20 A

Table D9: Technical data of the DigiUnit terminal box

Power supply for AdiaVent® unit

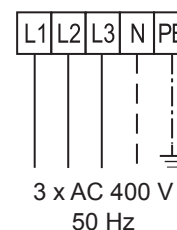


Table D10: Mains supply

6 Options

6.1 Options for operating DigiNet

Window for DigiMaster

The window for DigiMaster (350 x 400 mm) protects the DigiMaster that is integrated in the panel door from unauthorized use and dirt. It consists of an aluminium anodised framework with a seal and a lock.

Type: FDM

IP65 framework

The IP65 framework is used to integrate the DigiMaster in the panel door and to make it water and dust-proof. It guarantees a front-side protection level of IP 65.

Type: IP65

novaNet socket

The novaNet socket is used to connect a DigiCom easily to the novaNet system bus. The plastic housing contains two RJ-11 jacks and the terminals for wiring the bus input.

Type: NS

novaNet router

The novaNet router is used to connect an operator PC to the novaNet system bus via a COM interface or modem.

Type: NR5

6.2 Options for the zone control panel

Alarm lamp

A lamp for displaying alarms of priority A is installed in the door of the zone control panel.

Type: SSL

Socket

A 1-phase socket with a 2-pin circuit breaker is installed in the zone control panel. This socket serves for connecting maintenance tools. Its circuit is not cut out by the safety relay.

Type: SST

2-pin circuit breakers

The circuit breakers for the transformer have 2 pins.

Type: 2PS

Power supply

The power supply for AdiaVent® units is integrated in the zone control panel in those units with DigiUnit controller installed.

Type: SIA

The following are integrated in the panel:

- the necessary circuit breakers and output terminals for each unit
- the safety relay (external)

The size of the safety relay depends on the rated current. It replaces the zone control safety relay.

Type	Power supply
SIA3	with 3-pin circuit breakers
SIA4	with 4-pin circuit breakers

Table D11: Power supply

Rated current ¹⁾		Type 3-pin	Type 4-pin
0 – 25 A		NT-3/40	NT-4/40
26 – 35 A		NT-3/60	NT-4/60
36 – 50 A		NT-3/80	NT-4/80
51 – 65 A		NT-3/100	NT-4/100
66 – 75 A		NT-3/125	NT-4/125
76 – 100 A		NT-3/160	NT-4/160
101 – 155 A		NT-3/250	NT-4/250

¹⁾ = Nominal current consumption of all AdiaVent® units in the system

Table D12: Size of circuit breakers, without neutral wire switch-off (3-pin) and with neutral wire switch-off (4-pin)

Room temperature average value

Instead of only one room air sensor, four sensors are delivered to provide the average value; the corresponding connecting terminals are integrated.

Type: MRT



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System design



1 Base

For the installation of the AdiaVent® unit a base is required. Please consider the following in the design process:

- Access doors and access panels, air intake and exhaust air grille must be freely accessible.
- The base must be perfectly flat and level (with a maximum inclination of 1%).
- The base height must be min. 200 mm.
- The load-bearing capacity of the base are to be in accordance with Table B9.
- Base borehole diagram:

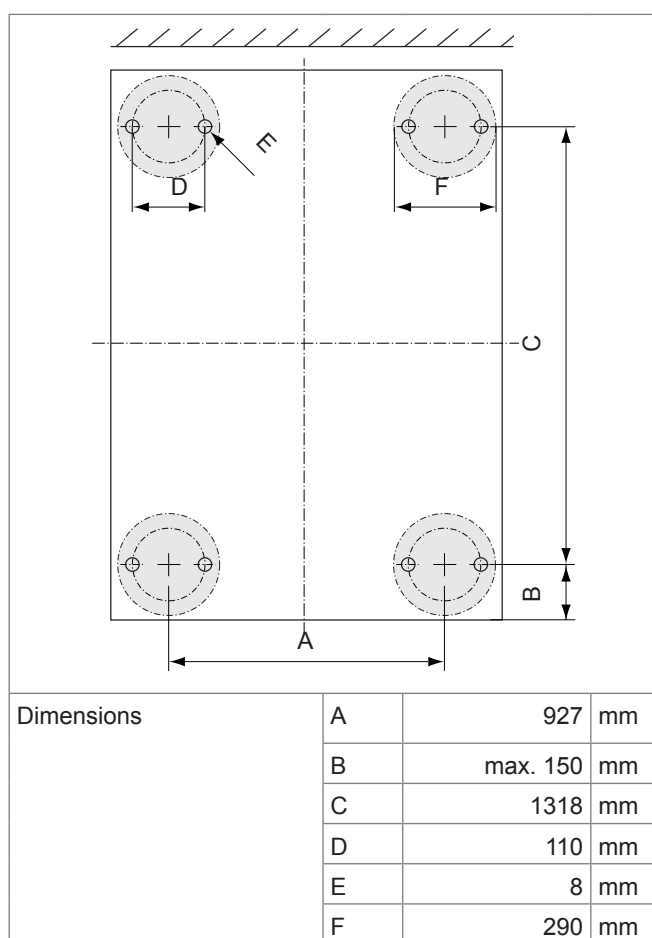


Table E1: Base borehole diagram

- Minimum distances (see 'Technical data' chapter) must be observed.
- The included dowels are hard-designed for torn and untorn concrete and natural stone
- Compliance with the dimension 'F' is required to avoid concrete and edge blowouts

2 Hydraulic connection

When making the connection to the water system observe the following:

- Protect the water pipes against freezing.
- Limit the water resting pressure to 2 bar.
- Ensure a permanent water supply and drainage.

3 Location of the temperature sensors

3.1 Room air sensor

Install the sensor at a height of about 1.5 m at a representative location in the occupied area. Its measured values must not be distorted by the presence of sources of heat or cold (machines, direct sunlight, windows, doors, etc.). Normally there is one room air sensor per control zone. It is also possible to install 4 sensors in order to provide an average value.

3.2 Fresh air temperature sensor

Install the sensor at least 3 m above the floor on a north facing wall so that it is protected from direct sunlight. Protect the sensor and thermally insulate it from the building. Only one fresh air sensor is needed per system.

3.3 Supply air sensor

3 supply air sensors are provided. Upon commissioning the supply air sensors are installed

4 Lightning protection system

Make sure you obtain professional planning and design of a lightning protection system for the units and/or for the entire building.

5 Socket

For maintenance work, a socket (1-phase, AC 230V, 50 Hz) can be installed in the AdiaVent® unit next to the DigiUnit terminal box.

6 Duct connection

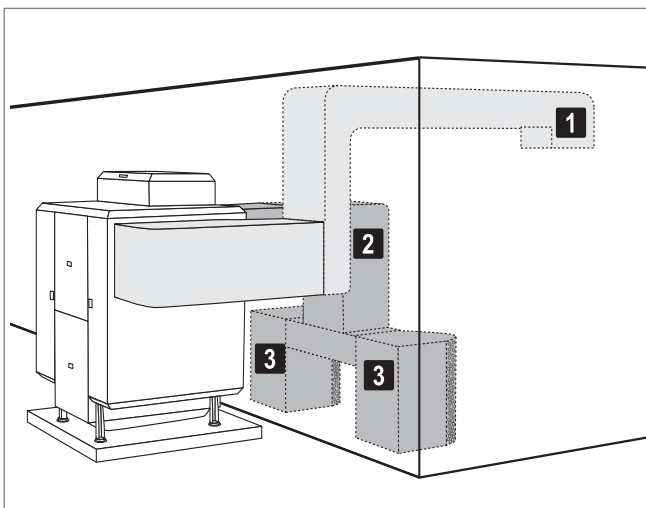
Note the following with regard to the extract air and supply air ducts:

- Insulate external ducts.
- Install an air extraction opening above the work area (approx. height 3 - 4 m).
- Provide diffuser air outlets to avoid draughts.



Caution

Risk of illness through exposure to draughts. The air diffuser must be designed according to the air flow rate and the maximum permissible speed of the air.



1 Extract air duct

2 Supply air duct

3 Diffuser air outlet

Fig. E1: Example duct connection

7 General checklist

- Are base and roof strong enough to support the units?
- Is there enough space in the area around the AdiaVent® unit for servicing and maintenance work?
- Are the access doors and access panels accessible without hindrance?
- Has frost protection been provided for the water piping?
- Is the air volume balanced?
- Is it possible to drain completely the water piping system?
- Are the application limits complied with?
- Are unit options required?
- Are control system options required?
- How are the control zones subdivided?
- Which operating options are to be used?
- Where are the operating options to be located?



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Operation

1 Operation

1.1 Initial commissioning



Caution

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

Checklist to prepare for commissioning:

- Have all the connections to utilities been made (electric cabling, water piping and air duct connections)?
- Are all control components installed and connected to the novaNet system bus?
- Are all of the respective trade groups (installer, electrician, designer, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

1.2 Operation

The system runs fully automatically depending on the programmed operating times and temperature conditions. When operating observe the following:

- Operating instructions of the DigiNet operator terminals.
- Check alarm displays daily.
- Correct changes to operating times in the automatic programming.
- Ensure free air outlet and unhindered dispersion of the supply air.
- Should there be a water leakage shut off the AdiaVent® unit and contact Hoval customer service.

1.3 Decommissioning



Attention

Risk of property damage from frost. When decommissioning take adequate measures to protect the humidifier circuit against frost damage.

- Turn isolation switch to the 'Off' position and wait until the fans stop running.
- Turn off water supply, open valves and empty the supply line.
- Check if there is water in the humidifier circuit and, if necessary, empty it.
- Remove the syphon cover and store it.



Fig. F1: Syphon

- Clean the AdiaVent® unit.
- AdiaVent® is now out of operation.

1.4 Putting into operation again

- Screw on the syphon cover.
- Turn on water supply.
- Turn isolation switch to the 'On' position.
- Select operating mode 'COOL' at operating terminal.
- AdiaVent® is now in operation.

2 Maintenance and repair

2.1 Safety during maintenance

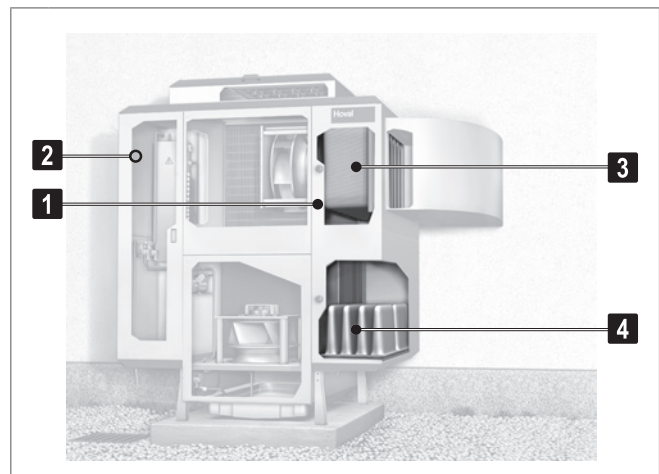
- Before undertaking any work on the unit: turn the isolation switch to the 'off' position. Wait for the fans to stop.
- Observe the accident prevention regulations.
- Maintenance work to be carried out by trained personnel only.
- Observe the particular dangers involved in working on the roof and on electrical systems.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Secure doors and doors against inadvertent closing.
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Unauthorised reconfiguration or modification of the unit is not permitted.
- Replacement parts must comply with the technical requirements of the system manufacturer. Hoval recommends the use of original replacement parts.

2.2 Filter change



Caution

Risk of poisoning from incorrect work. Filters must be replaced by qualified personnel only.



1 Filter access door

2 Isolation switch

3 Supply air filter

4 Process air filter

Fig. F2: Filter change

Changing the supply air filter

- Turn isolation switch to the 'off' position and wait until the fans stop running.
- Open filter access door.
- Change the supply air filter.
- Close filter access door and turn isolation switch to the 'On' position again.

Changing the process air filter

- Turn isolation switch to the 'off' position and wait until the fans stop running.
- Open filter access door.
- Change the process air filter.
- Close filter access door and turn isolation switch to the 'On' position again.

2.3 Inspection and maintenance work



Caution

Danger of poisoning through failure to perform maintenance work. Perform the work within the prescribed intervals.

The following work should be provided by Hoval customer service each year:

- The AdiaVent® unit is cleaned
- Check and adjust jet spray pattern
- Control system function test
- Operation of pump and fans checked
- Check for leakages

2.4 Repair

Please contact Hoval customer service if needed.

3 Dismantling



Caution

Risk of injury from incorrect work. Dismantling to be carried out by specialists only.

Make sure that the following items are on hand:

- A fork-lift if the unit is mounted on the facade, or a crane or helicopter if the unit is mounted on the roof.
- For installation with a crane or helicopter: 4 straps (strap length approx. 10 m each; carrying power of the belts according to Table B9 and 1 safety cable.

Proceed as follows:

- Put AdiaVent® out of operation.
- Remove all the connections to utilities of the unit (electric cabling, water piping and air duct connections).
- Loosen AdiaVent® from its connections to lightning protection system, mounting on base, etc.
- Secure AdiaVent®, lift and remove.

4 Disposal

Observe the following when disposing of components from the AdiaVent®:

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

Verantwortung für Energie und Umwelt

Die Marke Hoval zählt international zu den führenden Unternehmen für Raumklima-Lösungen. Mehr als 70 Jahre Erfahrung befähigen und motivieren immer wieder zu außergewöhnlichen Lösungen und technisch überlegenen Entwicklungen. Die Maximierung der Energieeffizienz und damit die Schonung der Umwelt sind dabei Überzeugung und Ansporn zugleich. Hoval hat sich als Komplettanbieter intelligenter Heiz- und Lüftungssysteme etabliert, die in über 50 Länder exportiert werden.



Hoval Heiztechnik

Als energieneutraler Anbieter mit einem Vollsortiment berät Hoval bei der Auswahl innovativer Systemlösungen für die verschiedensten Energiequellen wie Wärmepumpen, Biomasse, Solar, Gas, Öl und Fernwärme. Der Leistungsbereich erstreckt sich von der privaten Wohneinheit bis zum industriellen Großprojekt.



Hoval Komfortlüftung

Mehr Luftkomfort und eine effiziente Nutzung der Heizenergie vom Eigenheim bis zu Gewerberäumen: frische, saubere Luft für Lebens- und Arbeitsräume schaffen die Komfortlüftungsgeräte. Das innovative System für ein gesundes Raumklima arbeitet mit Wärme- und Feuchterückgewinnung, schont dabei Ressourcen und fördert die Gesundheit.



Hoval Hallenklima-Systeme

Hallenklima-Systeme sorgen für beste Luftqualität und wirtschaftliche Nutzbarkeit. Seit vielen Jahren setzt Hoval auf dezentrale Systeme. Dahinter stecken Kombinationen von mehreren – auch unterschiedlichen – Klimageräten, die individuell geregelt, aber gemeinsam gesteuert werden. So reagiert Hoval flexibel auf unterschiedlichste Anforderungen zum Heizen, Kühlen und Lüften.

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