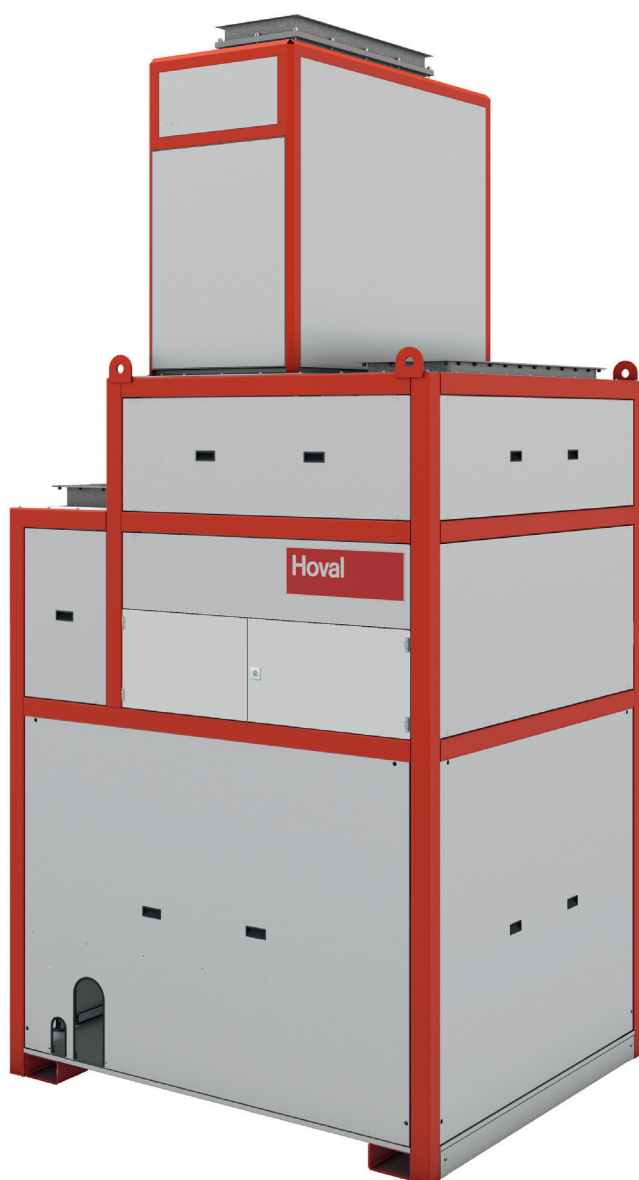


ProcessVent

Operating instructions



ProcessVent heat
ProcessVent cool
ProcessVent

PVH | PVC | PV

Original operating manual
4211883-en-05

Hoval

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1 Use

1.1 Intended use

The ProcessVent unit is used to recover heat from process air and supply fresh air to halls containing enclosed machine tools or welding plants. The extract air from the extract air purification plant flows through a plate heat exchanger in an oil-tight design and is routed to the outside via a duct; the heat it contains is transferred to the supply air.

ProcessVent heat

In addition, a heating coil is installed for supplemental heating of the supply air.

ProcessVent cool

In addition, a heating/cooling coil is installed for supplemental heating or cooling of the supply air.

Intended use also includes compliance with the operating instructions. Any usage over and above this use is considered to be not as intended. The manufacturer can accept no liability for damage resulting from improper use.

1.2 User group

The unit is only allowed to be installed, operated and maintained by authorised and instructed personnel who are well acquainted with the unit and are informed about possible dangers.

The operating instructions are for operating engineers and technicians as well as specialists in building, heating and ventilation technology.

2 Safety

2.1 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.

2.2 Operational safety

The unit is built to conform to the state-of-the-art and is operationally safe. Despite every precaution being taken, potential and not immediately obvious risks always remain, for example:

- Dangers when working with the electrical system
- Malfunctions as a result of defective parts
- Hazards from hot water when working on the hot water supply

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.
- The unit may only be installed, operated and serviced by authorised, 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.

3 Construction and operation

The ProcessVent unit forms one overall system with the extract air purification plant: The extract air purification plant draws off soiled air from machine tools or welding plants by means of a fan. It purifies this process air and transports it onwards through the extract air duct to the ProcessVent unit.

The ProcessVent unit fulfils the following functions:

- Fresh air supply
- Extract air removal (with air conveyance via the extract air purification plant)
- Recovery of heat from the process air
- Recirculation operation
- Air filtration

Additional functions depending on unit type:

- Heating with connection to a hot water supply
- Cooling with connection to a water chiller

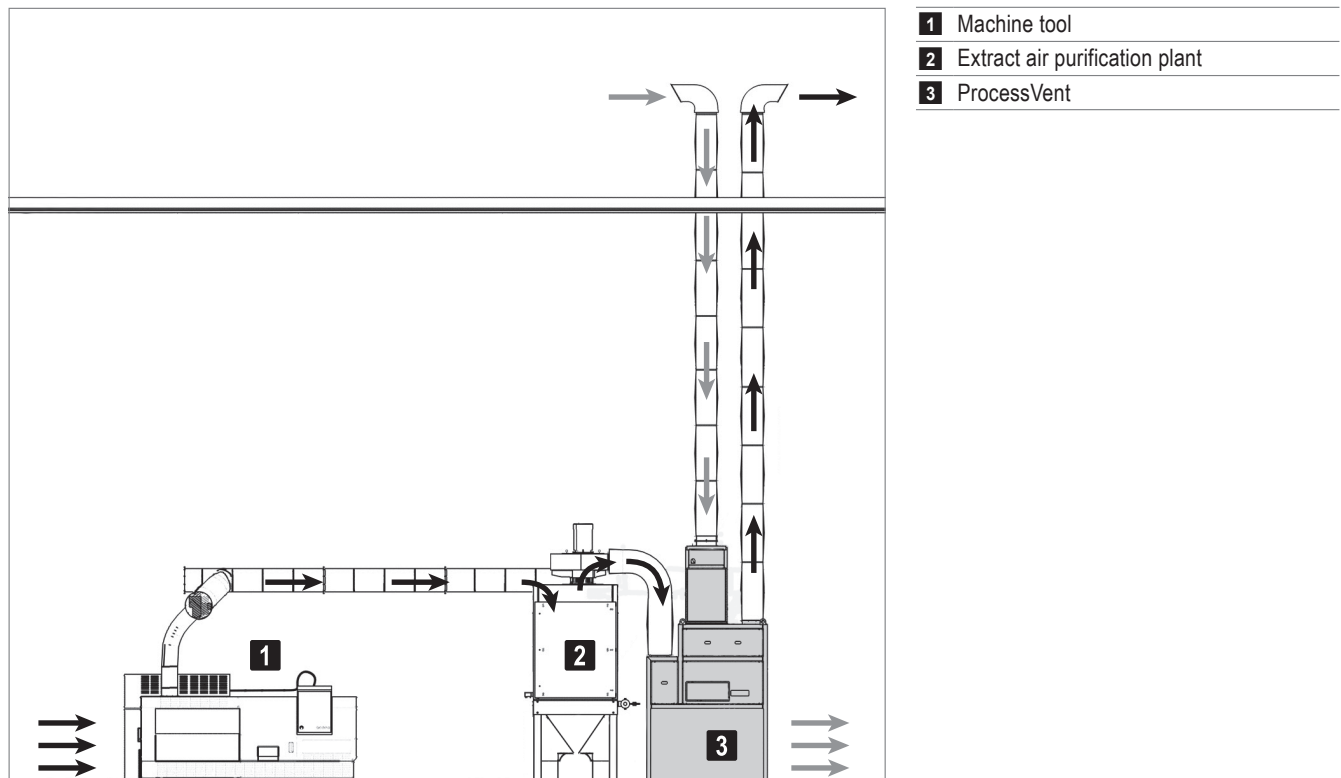
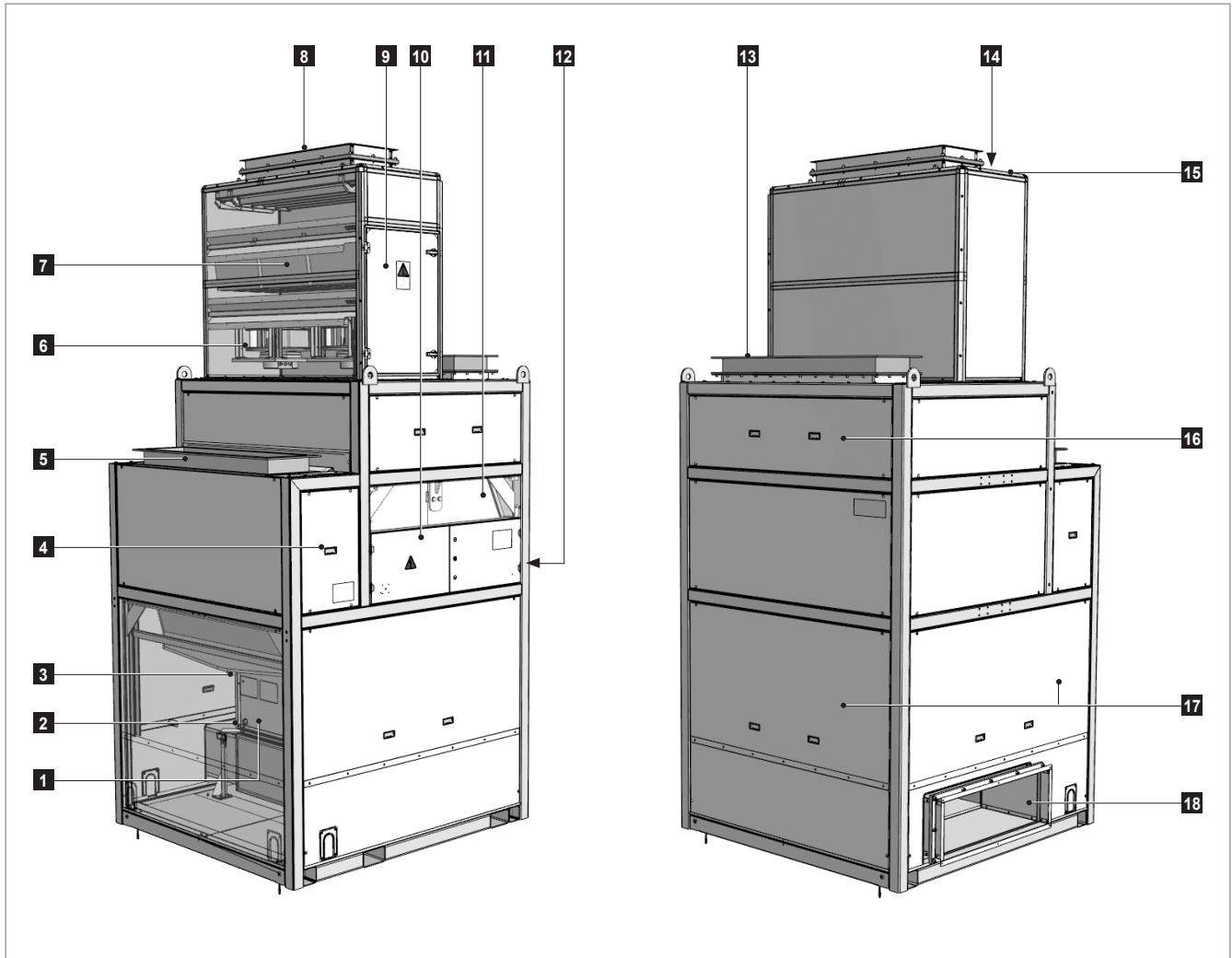


Fig. 1: The ProcessVent unit forms one overall system with the extract air purification plant.

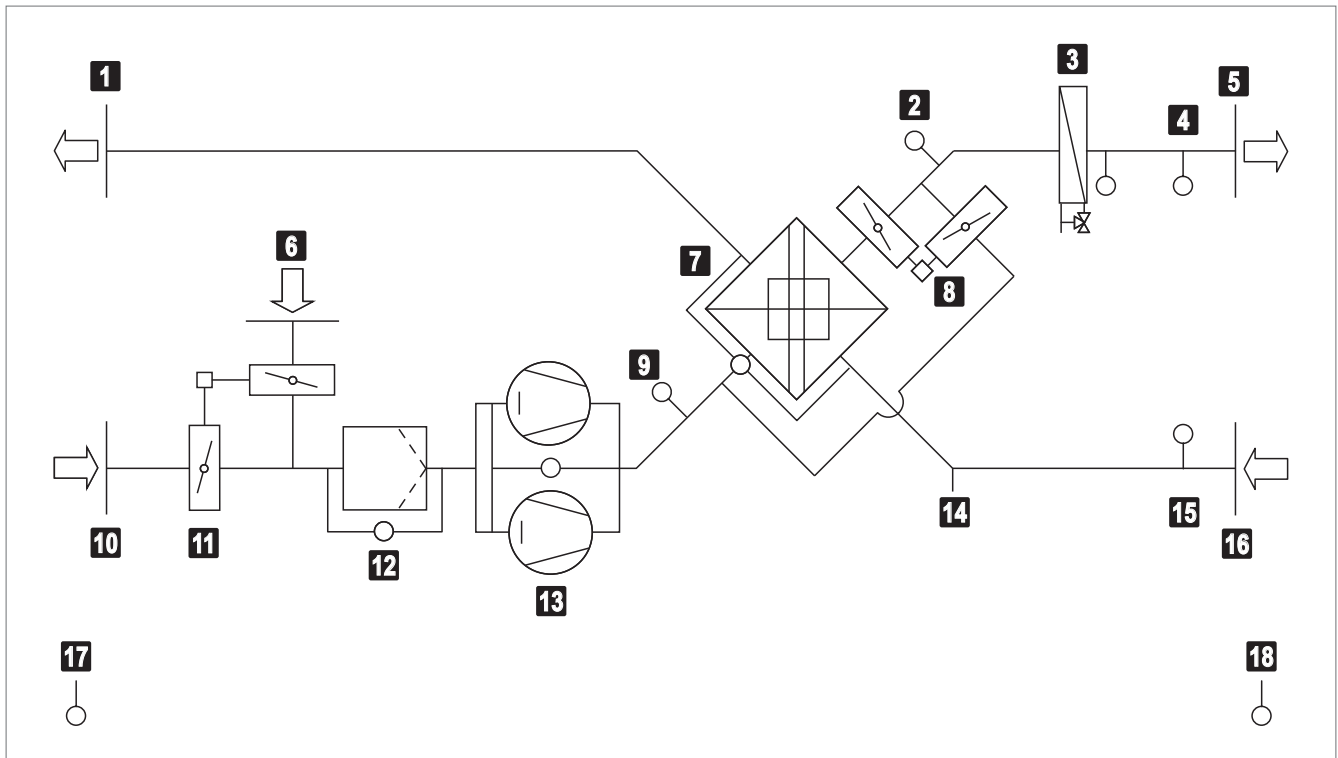
3.1 Structure



- | | |
|---|---|
| <ul style="list-style-type: none"> 1 Heating/cooling coil (depending on unit type) 2 Cooling coil condensate connection (depending on unit type) 3 Plate heat exchanger condensate connection 4 Extract air access door 5 Extract air duct connection 6 Supply air fans 7 Fresh air filter with filter monitoring 8 Fresh air duct connection 9 Fresh air access door | <ul style="list-style-type: none"> 10 Control box 11 Plate heat exchanger with frost monitoring 12 ER and bypass damper with continuous actuator 13 Exhaust air duct connection 14 Recirculation air inlet 15 Fresh air/recirculation damper with continuous actuator 16 Exhaust air access door 17 Supply air access panels (on all sides) 18 Supply air duct connection, rear |
|---|---|

Fig. 2: Unit construction

3.2 Function diagram



- | | |
|---|--|
| 1 Exhaust air | 10 Fresh air |
| 2 Temperature sensor energy monitoring (optional) | 11 Fresh air/recirculation damper with actuator |
| 3 Heating/cooling coil with frost controller (optional) | 12 Fresh air filter with differential pressure switch |
| 4 Supply air temperature sensor | 13 Supply air fans with flow monitoring |
| 5 Supply air | 14 Condensate connection |
| 6 Recirculation | 15 Extract air temperature sensor |
| 7 Plate heat exchanger with differential pressure switch | 16 Extract air |
| 8 ER/bypass damper with actuator | 17 Fresh air temperature sensor |
| 9 Mixed air temperature sensor | 18 Room temperature sensor |

Fig. 3: Function diagram

3.3 Operating modes

The unit has the following operating modes:

- Ventilation
- Supply air
- Recirculation
- Recirculation night
- Night cooling summer
- Off

The ProcessNet control system or the higher-level building management system controls the overall plant automatically. The operating mode of the ProcessVent units depends on the time programme and on the operating states of the machines from which the process air is to be drawn off. The following applies: When the machines are in operation, the ProcessVent unit always works in 'Ventilation' mode. The operating mode defined in the time programme is overridden.

You can also control the operating mode of the ProcessVent unit manually and thus independently of the overall plant (e.g. for maintenance activities).



Notice

Detailed information on function and operation are contained in the operating instructions for the control system.

Code	Operating mode	Description
VE	<p>Ventilation</p> <p>The unit blows fresh air into the room. The fresh air quantity is constant; it is dependent on the extract air volume flow. The extract air from the extract air purification plant flows through the plate heat exchanger into the open air.</p> <p>The room temperature set value day is active. Heating/cooling and energy recovery are controlled depending on the heat/cool demand and the temperature conditions.</p>	<p>Supply air fan on ¹⁾</p> <p>Energy recovery 0-100 %</p> <p>Fresh air damper open</p> <p>Recirculation damper closed</p> <p>Heating/cooling 0-100 %</p> <p>¹⁾ Nominal volume flow as per setting in the control system (adjusted to the extract air volume flow)</p>
SA	<p>Supply air</p> <p>The unit blows fresh air into the room. The fresh air quantity is constant. Room air flows into the open via open doors and windows or is drawn off via an external system.</p> <p>The room temperature set value day is active. Heating/cooling is controlled depending on the heat/cool demand.</p>	<p>Supply air fan on ¹⁾</p> <p>Energy recovery 0 %</p> <p>Fresh air damper open</p> <p>Recirculation damper closed</p> <p>Heating/cooling 0-100 %</p> <p>¹⁾ Nominal volume flow as per setting in the control system</p>
REC	<p>Recirculation</p> <p>If there is a heat demand, the unit draws in room air via the recirculation damper, warms it and blows it back into the room.</p> <p>The room temperature set value day is active. The recirculation volume flow depends on the heat/cool demand.</p>	<p>Supply air fan 0-100 % ¹⁾</p> <p>Energy recovery 0 %</p> <p>Fresh air damper closed</p> <p>Recirculation damper open</p> <p>Heating/cooling on ¹⁾</p> <p>¹⁾ Depending on heat demand</p>
RECN	<p>Recirculation night</p> <p>like REC, but with room temperature set value night</p>	
NCS	<p>Night cooling summer</p> <p>On/off operation with room temperature set value night</p> <ul style="list-style-type: none"> ■ If current temperatures permit, the unit blows cool fresh air into the room and thus uses it for free cooling. ■ If current temperatures do not permit free cooling, the unit switches off. 	<p>Supply air fan on ¹⁾²⁾</p> <p>Energy recovery 0 %</p> <p>Fresh air damper open ²⁾</p> <p>Recirculation damper closed ²⁾</p> <p>Heating/cooling off</p> <p>¹⁾ Volume flow set in the control system</p> <p>²⁾ Depending on temperature conditions</p>
OFF	<p>Off</p> <p>The unit is switched off. Frost protection remains active.</p>	<p>Supply air fan off</p> <p>Energy recovery 0 %</p> <p>Fresh air damper closed</p> <p>Recirculation damper open</p> <p>Heating off</p>

Table 1: Operating modes ProcessVent

4 Type codes

PVH - 10 A / SV . K1 . AS . SL / HY . U1 . RW / PN . IO . MR / EM . ES . ZK . FK / TP . LV

Unit type

- PV ProcessVent
- PVH ProcessVent heat (with heating coil)
- PVC ProcessVent cool (with heating/cooling coil)

Unit size

10

Coil

- A, B, C Heating coil type A, B or C
- C, D Heating/cooling coil type C or D
- Without

Fans

- SV Standard fans
- HV High-pressure fans

Air outlet

- K1 Supply air duct connection, rear (standard)
- K2 Supply air duct connection, left
- QL Diffuser air outlet

Fresh air module

- AS Fresh air module, upright (standard)
- AH Fresh air module, horizontal

Paint finish

- SL Standard paint finish
- AL Paint finish as desired
- HL Paint finish for frame as desired

Hydraulic assembly diverting system

- Without (standard)
- HY Hydraulic assembly diverting system

4-pipe switching

- Without (standard)
- U1 4-pipe switching, complete
- U2 4-pipe switching, only electrical components

Return pump station

- Without (standard)
- RW Return pump station water
- RO Return pump station oil
- R2 Return pump station water and oil

PVH - 10 A / SV . K1 . AS . SL / HY . U1 . RW / PN . IO . MR / EM . ES . ZK . FK / TP . LV

Control

PN Design for ProcessNet (standard)

Connection extract air purification

IO Connection via external signals (standard)

Room temperature average value

-- Without (standard)

MR Room temperature average value

Energy monitoring

-- Without (standard)

EM Energy monitoring

Injection system

-- Without (standard)

ES Design for injection system

Control of supply air damper

-- Without (standard)

ZK Control of supply air damper

Control of exhaust air damper

-- Without (standard)

FK Control of exhaust air damper

Visualisation

TP Touchpanel on the unit

Power supply

LV Power supply (standard)

Table 2: Type codes

5 Technical data

5.1 Application limits

Extract air temperature	max.	°C	50
Extract air relative humidity (incl. oil vapours)	max.	%	100
Dust content of extract air	max.	mg/m ³	5
Oil content of extract air ¹⁾	max.	mg/m ³	10
Fresh air temperature	min.	°C	-30
Ambient temperature		°C	4 ... 40
Heating medium temperature	max.	°C	120
Operating pressure	max.	kPa	800
Supply air temperature	max.	°C	60
Condensate quantity ²⁾	max.	m ³ /h	1.2
Differential pressure fresh air/extract air	max.	Pa	2500
Pressure difference to outside	max.	Pa	1500
<ul style="list-style-type: none"> ■ The unit is not suitable for use in potentially explosive atmospheres. ■ The unit is not suitable for use in rooms with active humidification. ■ The unit is corrosion-protected, but only suitable for use in applications where the extract air contains very aggressive substances (sulphur, methanol, acetone, toluene, etc.) to a limited extent. Please contact Hoval application consulting. 			
1) Conventional mineral, synthetic and ester oils and emulsions from the field of machining			
2) at up to 10 m delivery head			

Table 3: Application limits

5.2 Heat recovery system

Temperature efficiency, dry	%	61
Temperature efficiency, wet (max.)	%	95
Factory setting of differential pressure switch	Pa	250

Table 4: Heat recovery system

5.3 Air filtration

Fresh air filter	
Filter class according to ISO 16890	ePM ₁ 55 %
Filter class according to EN 779	F7
Factory setting of differential pressure switch	250 Pa

Table 5: Air filtration

5.4 Air flow rate

Unit type		PV	PVH			PVC	
Coil		-	A	B	C	C	D
Nominal air flow rate	m ³ /h	10 000					
Available fan pressure to compensate for external pressure drops	Pa	570	530	520	460	420	320

Table 6: Air flow rate

5.5 Electrical connection

Supply voltage	V AC	3 x 400
Permitted voltage tolerance	%	±10
Frequency	Hz	50
Nominal power consumption	kW	2 x 2.4
Current consumption	A	2 x 3.9

Table 7: Electrical connection

5.6 Sound level

Position		Sound power level	Sound pressure level
Fresh air duct connection	dB(A)	71	–
Supply air duct connection	dB(A)	66	–
Displacement flow diffuser	dB(A)	75	59 ¹⁾

1) Applies at a distance of 1 m from the unit, measuring surface sound pressure level according to DIN 45636

Table 8: Sound level

5.7 Heat output

Type	Q	t _s	Δp _w	m _w
	kW	°C	kPa	l/h
A	41	24	3	1764
B	53	27	5	2270
C	89	38	5	3818
D	113	45	6	4846

Legend: Type = Type of coil
Q = Heat output
t_s = Supply air temperature
Δp_w = Water pressure drop
m_w = Water quantity

Reference: Fresh air: -15 °C / 90 % relative humidity
Extract air: 25 °C / 40 % relative humidity
Heating medium: 60/40 °C

Table 9: Heat outputs ProcessVent heat PVH / ProcessVent cool PVC

5.8 Cooling capacity

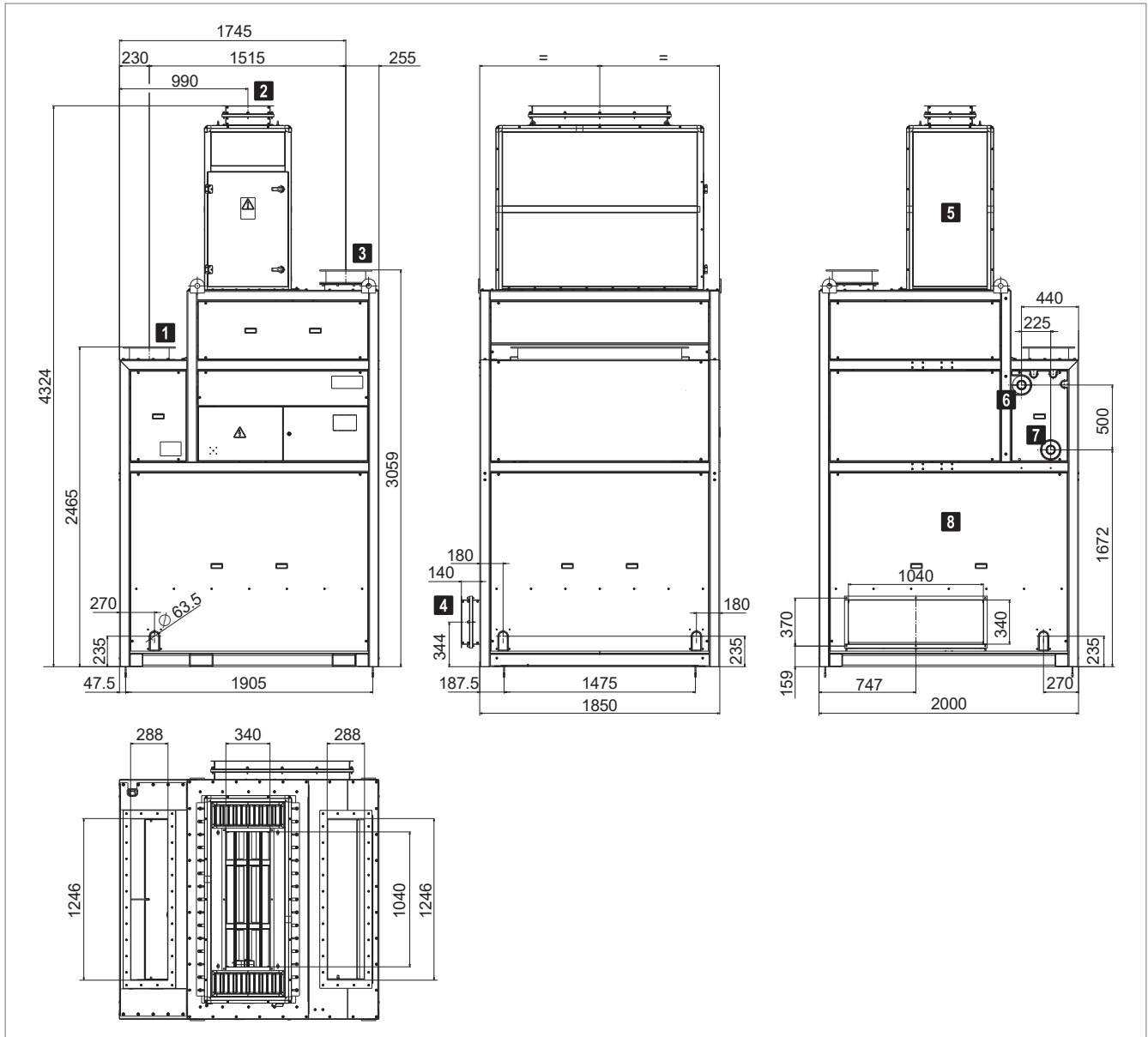
Type	Q _{sen}	Q _{tot}	t _s	Δp _w	m _w	m _c
	kW	kW	°C	kPa	l/h	kg/h
C	45	60	16	30	8632	22
D	54	77	13	38	11078	33

Legend: Type = Type of coil
Q_{sen} = Sensible cooling capacity
Q_{tot} = Total cooling capacity
t_s = Supply air temperature
Δp_w = Water pressure drop
m_w = Water quantity
m_c = Condensate quantity

Reference: Fresh air: 32 °C / 40 % relative humidity
Cooling medium: 6/12 °C
without energy recovery

Table 10: Cooling capacities of ProcessVent cool PVC

5.9 Dimensions and weights



- | | |
|---|---|
| 1 Extract air duct connection | 5 Fresh air module |
| 2 Fresh air duct connection | 6 Return pipe feedthrough (depending on unit type) |
| 3 Exhaust air duct connection | 7 Flow pipe feedthrough (depending on unit type) |
| 4 Supply air duct connection, rear | 8 Base unit |

Fig. 4: Dimensional drawing (dimensions in mm)

Unit type			PV-10	PVH-10A	PVH-10B	PVH-10C	PVC-10C	PVC-10D
Components	Base unit	kg	1417	1449	1449	1459	1495	1514
	Fresh air module	kg	240	240	240	240	240	240
	Total	kg	1657	1689	1689	1699	1735	1754
Options	Hydraulic assembly diverting system	kg	–	32	32	32	32	38
	4-pipe switching	kg	–	–	–	–	48	54

Table 11: Weights

6 Options

6.1 High-pressure fans (HV)

High-pressure fans are EC fans with a higher available pressure to compensate for external pressure drops (e.g. through air ducts). They replace the standard fans.

Air flow rate

Unit type		PV	PVH			PVC	
Coil		-	A	B	C	C	D
Nominal air flow rate	m ³ /h	12 000					
Available fan pressure to compensate for external pressure drops	Pa	810	760	740	670	580	500

Table 12: Air flow rate of the units with high-pressure fans

Electrical connection

Supply voltage	V AC	3 x 400
Permitted voltage tolerance	%	±10
Frequency	Hz	50
Nominal power consumption	kW	2 x 4.1
Current consumption	A	2 x 6.5

Table 13: Electrical connection of the units with high-pressure fans

Sound level

Position		Sound power level	Sound pressure level
Fresh air duct connection	dB(A)	81	-
Supply air duct connection	dB(A)	88	-
Displacement flow diffuser	dB(A)	87	65 ¹⁾

1) Applies at a distance of 1 m from the unit, measuring surface sound pressure level according to DIN 45636

Table 14: Sound level of the units with high-pressure fans

6.2 Air outlet

Supply air duct connection, left (K2)

The compensator for the supply air duct is mounted on the left side of the unit.

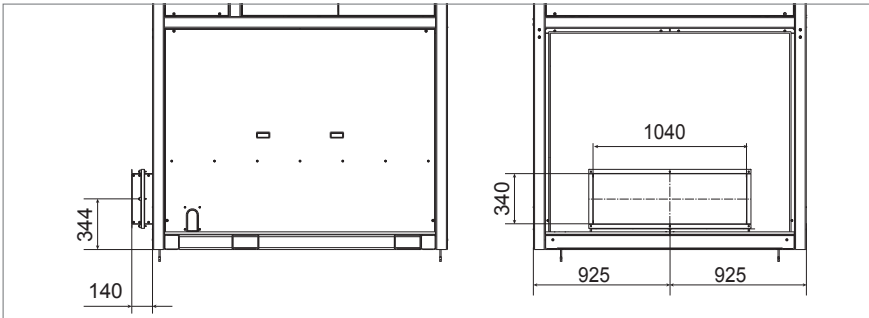


Fig. 5: Dimensional drawing for supply air duct connection, left (dimensions in mm)

Displacement flow diffuser (QL)

Units with a displacement flow diffuser introduce the supply air into the occupied area in a low-pulse, duct-free manner. The bottom section of the base unit is covered with perforated sheets on all sides. Behind these sheets is a fabric mat, which is attached with spring rods, for air distribution.

6.3 Fresh air module, horizontal (AH)

For reasons of space, it can make sense to install the fresh air module on the base unit horizontally, rather than upright. To achieve this, the unit can be supplied complete with a connection duct and a support made of sheet steel.

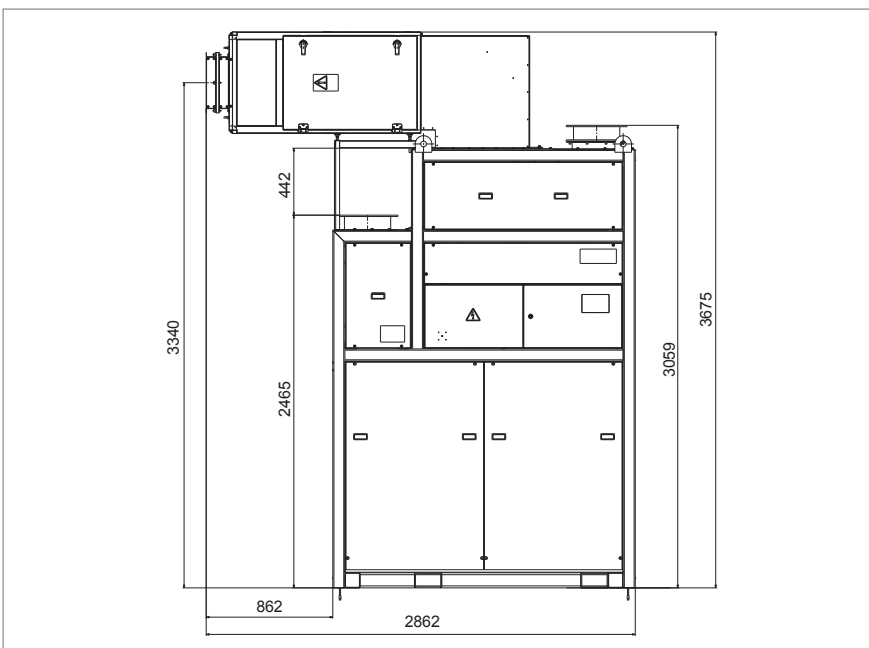


Fig. 6: Dimensional drawing for fresh air module, horizontal (dimensions in mm)

6.4 Paint finish

Paint finish as desired

The following components are painted in the RAL colour of the customer's choice:

- Fresh air module and base unit (framework construction and covering panels)
- Bottom tray
- Side walls of the plate heat exchanger
- Extract air and exhaust air duct section

Paint finish for frame as desired

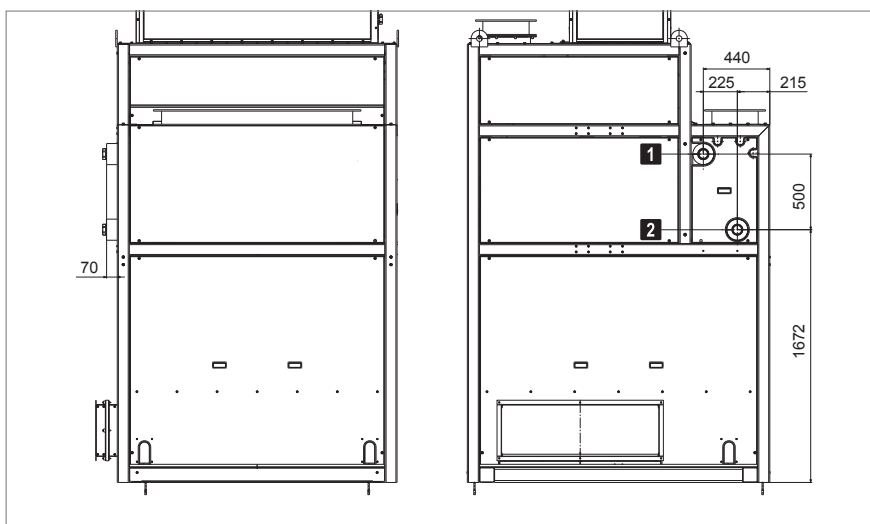
The following components are painted in the RAL colour of the customer's choice:

- Framework construction of the base unit
- Bottom tray
- Side walls of the plate heat exchanger
- Extract air and exhaust air duct section

6.5 Hydraulic assembly diverting system (HY)

There is an assembly for the hydraulic diverting system installed in the unit. It is fully insulated and comprises the following components:

- 3-way control ball valve
- Balancing valve STAD
- Ball valve
- Pipes
- Screw joints for easy connection to the on-site distributor circuit (on the back of the unit)



1 Return

2 Flow

Fig. 7: Dimensional drawing for hydraulic connections (dimensions in mm)

6.6 4-pipe switching

4-pipe switching, complete (U1)

An assembly for automatic switch-over is attached to the unit. It is fully insulated and comprises the following components:

- 2-way switching valves with auxiliary switch
- Shut-off ball valves
- Piping to the hydraulic assembly for diverting system
- Screw joints for easy connection to the on-site distributor circuit

The electrical components for automatic switch-over are installed and prewired in the control box.

4-pipe switching, only electrical components (U2)

The electrical components for automatic switch-over are installed in the terminal box (4-pipe switching assembly and wiring on-site; see electrical schematic for connections).

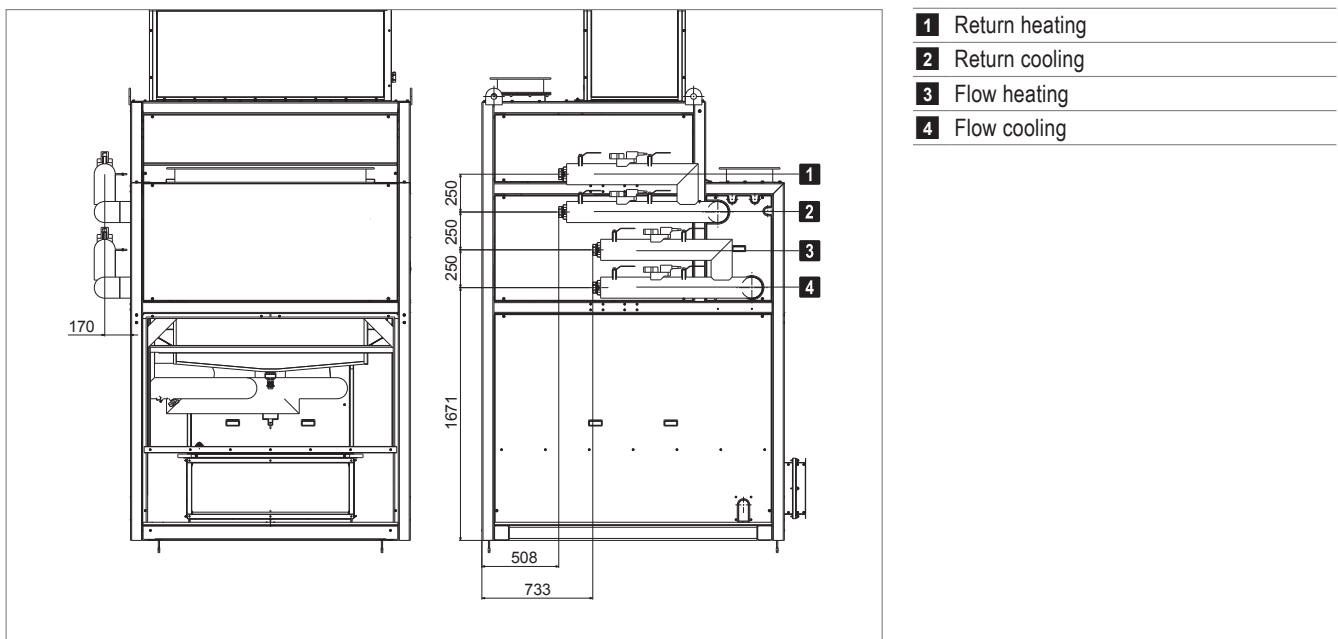


Fig. 8: Dimensional drawing for 4-pipe switching (dimensions in mm)

6.7 Return pump station

Return pump station water (RW)

The return pump station water is used for the removal of condensate in applications where connection to the waste water system via a simple condensate line is not possible. It drains the following media or returns them to the process for recycling

- Water-emulsion mixtures from the plate heat exchanger (with an upstream emulsion separator, wet separator or dry filter)
- Condensate from the cooling coil

The return pump station is installed and prewired in the unit.

Return pump station oil (RO)

The return pump station oil is used for the removal of condensate in applications where connection to the waste water system via a simple condensate line is not possible. It drains the following media or returns them to the process for recycling

- Oily condensate from the plate heat exchanger (with an upstream oil separator)

The return pump station is installed and prewired in the unit.

Pump output	l/min	25
Delivery head	m	8
Supply voltage	V AC	3 x 400
Frequency	Hz	50
Condensate drain connection	¾" (internal thread)	

Fig. 9: Technical data of the return pump stations (water and oil)

6.8 Room temperature averaging (MR)

4 room air sensors for averaging in the occupied area are supplied (wiring to be provided on-site).

6.9 Energy monitoring (EM)

Energy monitoring determines the amount of energy recovered in the plate heat exchanger (separate counters for heating and cooling energy) and displays it on the operator terminal. For this reason, there is an additional temperature sensor installed and prewired in the unit.

6.10 Design for injection system (ES)

Instead of a diverting system, an injection system can also be installed in the load circuit. In the design for injection system, additional components for control of the pumps in the load circuit are installed in the control box.

Requirements for the pump in the load circuit:

- Power supply: 230 VAC
- Power consumption: max. 1 kW
- Current consumption: max. 4 A
- Input signal for activation of control of pump ON
- Output signal for pump alarm

6.11 Control of supply air damper (ZK)

Hoval ProcessNet can control an on-site supply air damper. This control is performed dependent on an adjustable threshold value for the supply air volume flow.

6.12 Control of exhaust air damper (FK)

Hoval ProcessNet can control an on-site exhaust air damper. This control is performed dependent on the operating state of the extract air purification plant(s).

7 Transport and installation



Caution

Risk of injury from incorrect handling. Transport, assembly and installation work may only be performed by specialists!

7.1 Delivery

The unit is delivered in 2 or 3 sections on pallets:

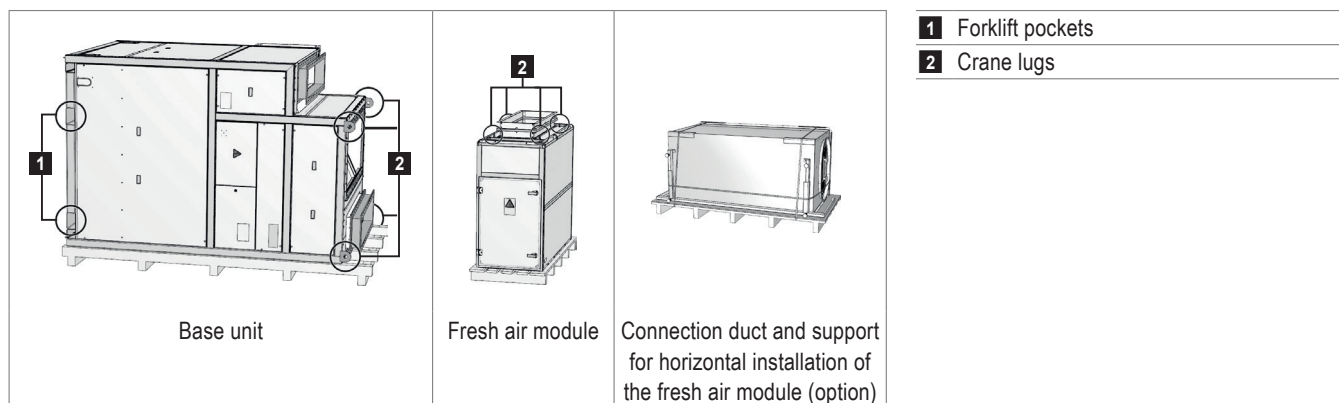


Fig. 10: Position of forklift pockets and lifting eyes

Accessories

The following accessories are supplied separately (behind the supply air access panel):

- Fixing plates and fixing anchors for attaching the unit to the floor
- Compensators and bolts for connecting the air ducts
- Cables for electrical installation (depending on the configuration)

Preparation

To allow safe transport, the unit is equipped with forklift pockets and lifting eyes:

- Lifting the unit with a crane:
 - Hook the snap hooks of the lifting gear into the lifting eyes.
- Lifting the unit with a forklift:
 - Use a heavy-duty forklift truck (load capacity 2000 kg, fork length 1.50 m) and insert the fork into both forklift pockets.
- Check the consignment against the delivery documents and the order confirmation to ensure that it is complete. Report missing parts and any damage immediately in writing.

7.2 Installation site

- The unit must be erected at an inside location that is protected against frost.
- Install the unit horizontally.
- Ensure that the installation surface is of sufficient load-bearing capacity. The weight of the unit is distributed over 4 points (see Fig. 12).
- Position the unit in accordance with the position of the air ducts.
- If the unit is equipped with a displacement flow diffuser, ensure unhindered dispersion of the supply air stream (approx. 1 m clear space all-round, up to 1.8 m height).
- The unit must be accessible and connecting lines must be able to be dismantled for maintenance and servicing work.

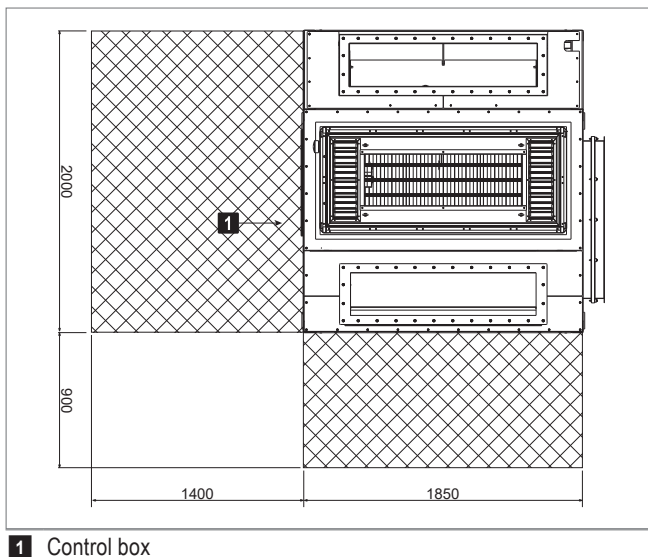


Fig. 11: Space requirements for maintenance and servicing (dimensions in mm)

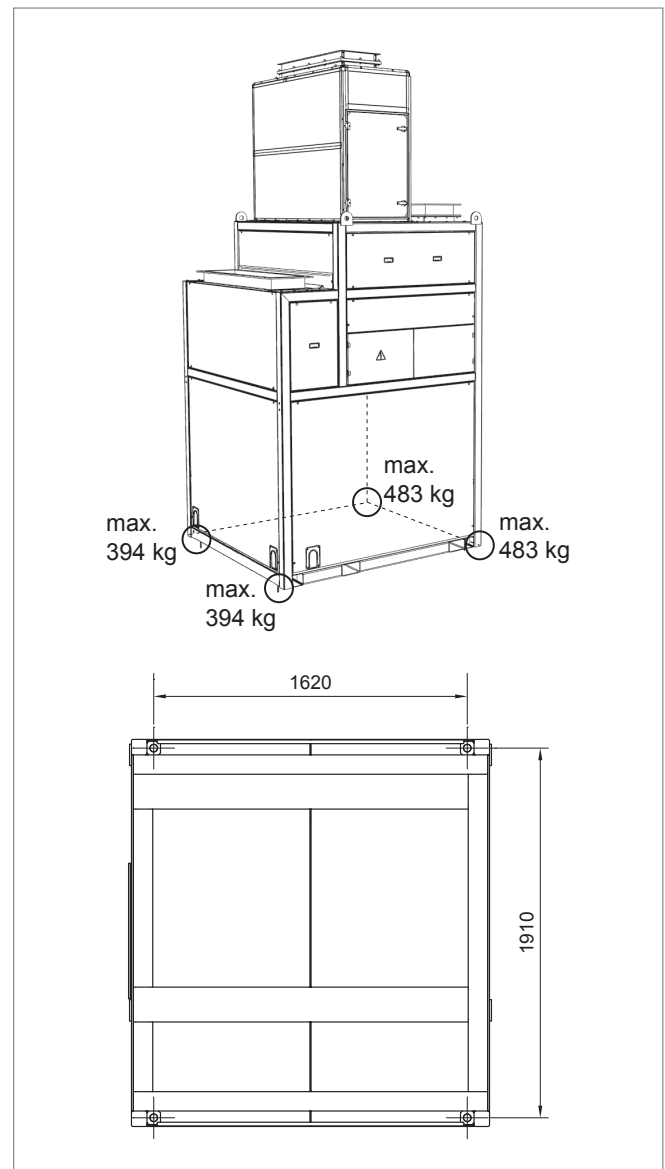


Fig. 12: Load distribution

7.3 Installation



Caution

Risk of injury caused by falling load and improper handling. During installation:

- Do not stand under suspended loads.
- Use cranes or forklifts with sufficient load capacity.
- Wear protective equipment (helmet, safety shoes).

Installing the base unit

- Use a crane or forklift truck to transport the unit to the installation site.
- Dismantle the bottom cover plates on the right and left to gain access to the adjustable feet (see Fig. 13).
- Align the unit horizontally with the help of the 4 adjustable feet (see Fig. 14):
 - Release grub screws.
 - Unscrew the adjustable feet.
 - Align the unit horizontally.
 - Tighten grub screws.
- Remove the fixing plates and fixing anchors from the unit.
- Drill anchor holes.
- Attach the unit to the floor using the fixing plates and fixing anchors.



Fig. 13: Position of the adjustable feet

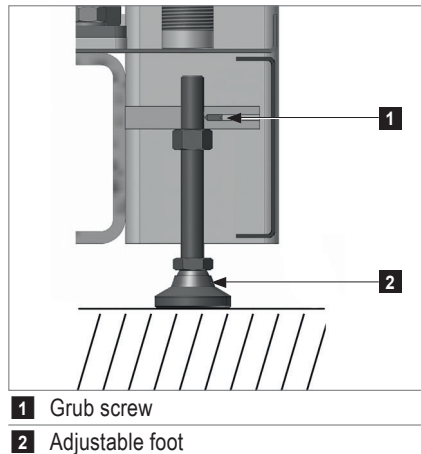


Fig. 14: Detailed view of adjustable foot

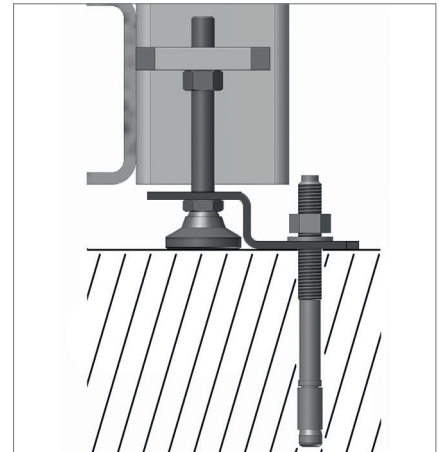


Fig. 15: Attaching the unit to the floor

Installing the fresh air module, upright (standard)

- Use a work platform.
- When installing several units, assign the correct fresh air module to each base unit:
 - Compare the serial number with the information on the type label.
- Release the screws on the mounting flanges and push the flanges apart.
- Lift the fresh air module using a crane and turn it to the correct position:
 - Make sure that the fresh air access door is on the same side as the control box (see Fig. 16).
- Set the fresh air module down on the base unit.
- Push the mounting flanges together and screw them tight.

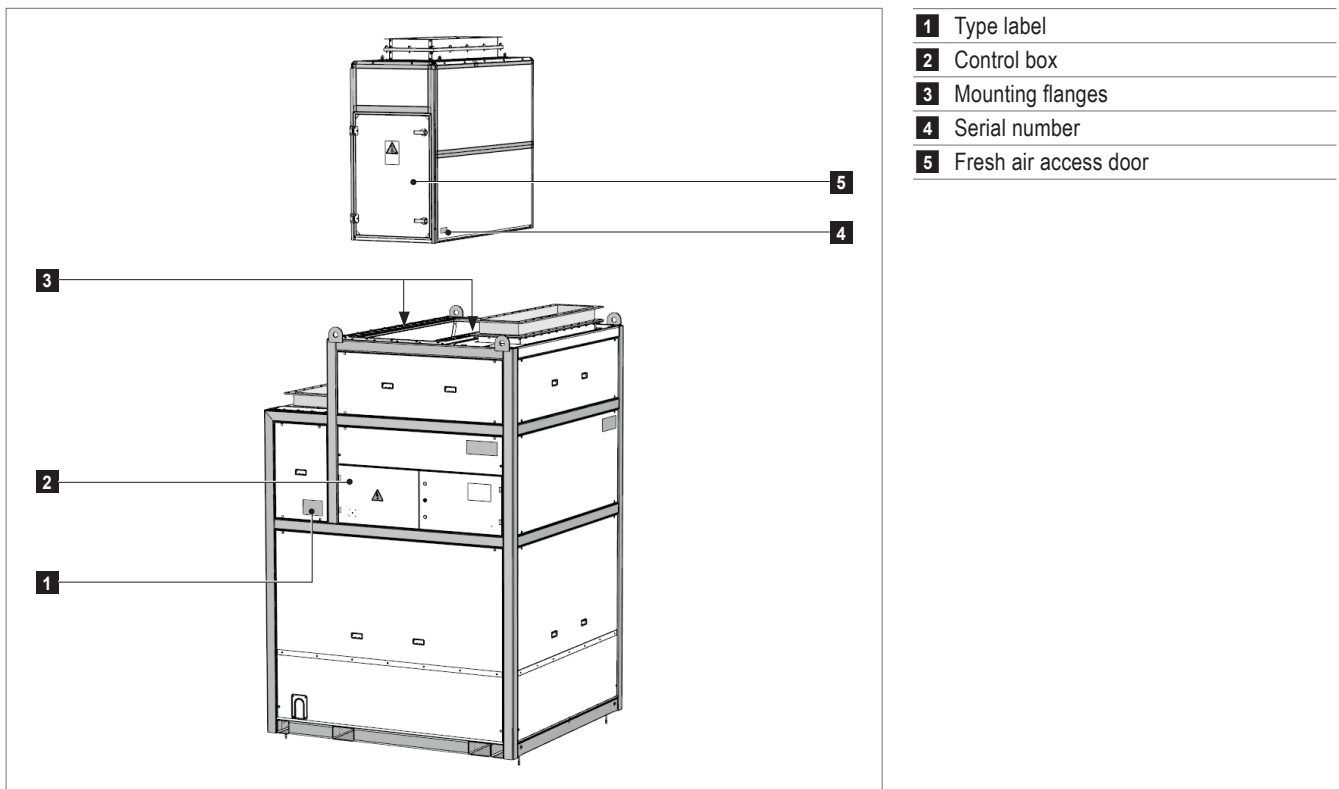
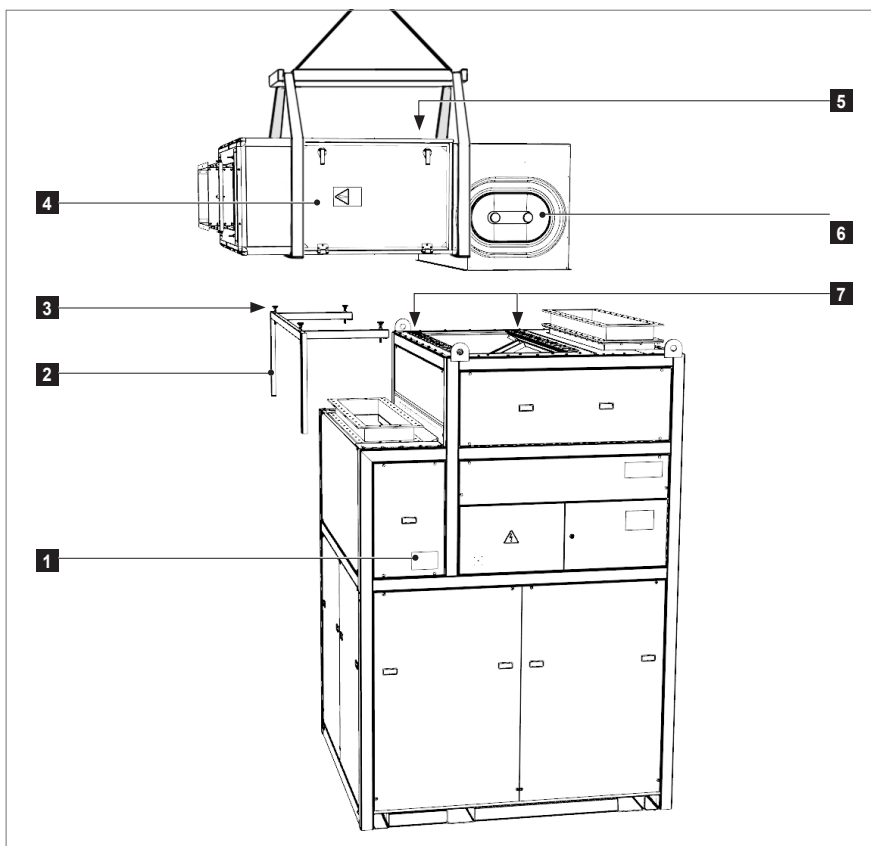


Fig. 16: Installing the fresh air module, upright

Installing the fresh air module, horizontally

- Use a work platform.
- When installing several units, assign the correct fresh air module to each base unit:
 - Compare the serial number with the information on the type label.
- Set the support down on the base unit and screw it tight.
- Preset the 4 adjustable feet on the support to a height of 47 mm.
- Bring the connection duct and fresh air module into the correct position relative to one another and screw them together to form an assembly:
 - Make sure that the fresh air access door is on the same side as the connection duct access panel.
- Release the screws on the mounting flanges and push the flanges apart.
- Install the assembly for the connection duct and fresh air module:
 - Remove the access panel for the connection duct.
 - Attach the slings. Ensure that the handles for the fresh air access door are not damaged.
 - Lift the assembly with a crane and set down on the base unit.
 - Push the mounting flanges together and screw them tight.
 - If required, readjust the adjustable feet so that the fresh air module lies horizontally on the support.
 - Insulate the connection duct (30 mm with heat transfer coefficient $\lambda = 0.04 \text{ W/mK}$).
 - Replace the access panel for the connection duct.



- | | |
|---|--------------------------------------|
| 1 | Type label |
| 2 | Support |
| 3 | Adjustable feet |
| 4 | Fresh air access door |
| 5 | Serial number |
| 6 | Access panel for the connection duct |
| 7 | Mounting flanges |

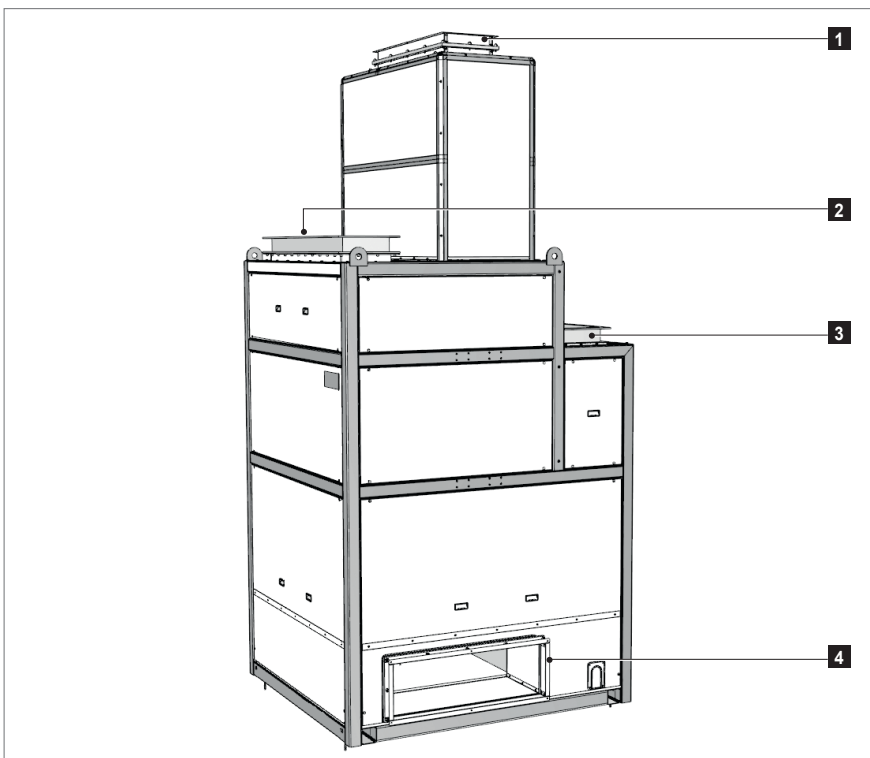
Fig. 17: Installing the fresh air module, horizontally

7.4 Connecting the air ducts



Notice

Air ducts can limit access during installation. Do not connect air ducts until you have finished installing the units.



- 1 Compensator for fresh air duct connection
- 2 Compensator for exhaust air duct connection (media-resistant)
- 3 Compensator for extract air duct connection (media-resistant)
- 4 Compensator for supply air duct connection

Fig. 18: Connecting the air ducts



Attention

Danger of damaging the units. The unit must not be subjected to the weight of the ducts. Suspend the ducts from the ceiling or support them on the floor.

- Remove the supplied compensators from the unit and screw them to the duct connections.
- The extract air and exhaust air duct is designed according to plant-specific conditions:
 - In plants with an upstream oil/emulsion separator or with minimal quantity lubrication (MQL), the ducts must have an oil-tight design.
 - In plants with an upstream dry filter or wet separator, the ducts must be designed in galvanised sheet steel.
- Connect the air ducts via the compensators so they are free of tension and vibrations.
- Insulate the fresh air and exhaust air duct, including the compensator, right up to the point where it leaves the building (30 mm with heat transfer coefficient $\lambda = 0.04 \text{ W/mK}$).
- Arrange the fresh air suction and the exhaust air outlet via the roof in the opposite direction to prevent a short circuit.

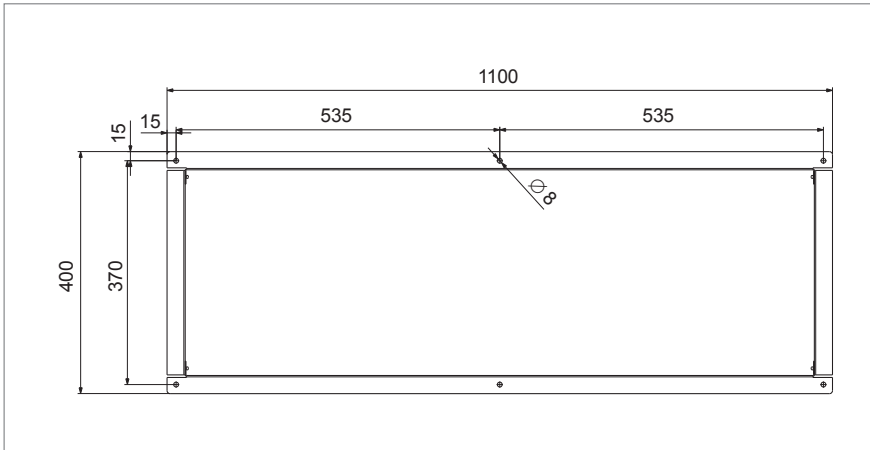


Fig. 19: Dimensional drawing for fresh air and supply air duct (dimensions in mm)

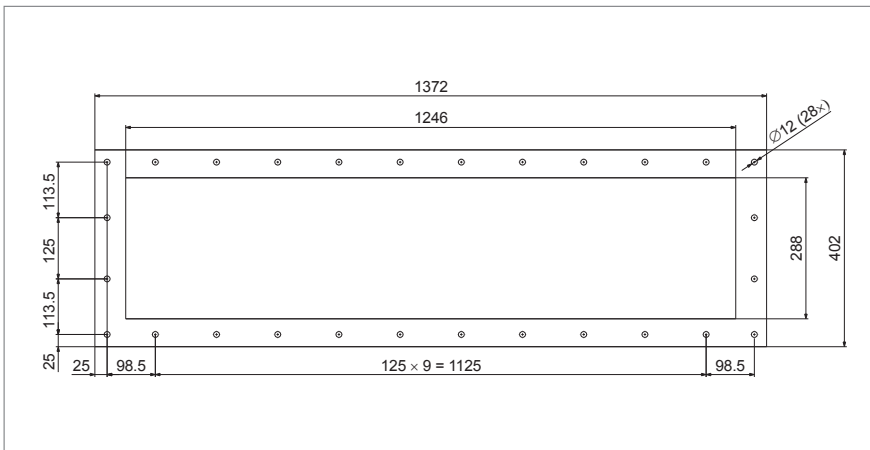
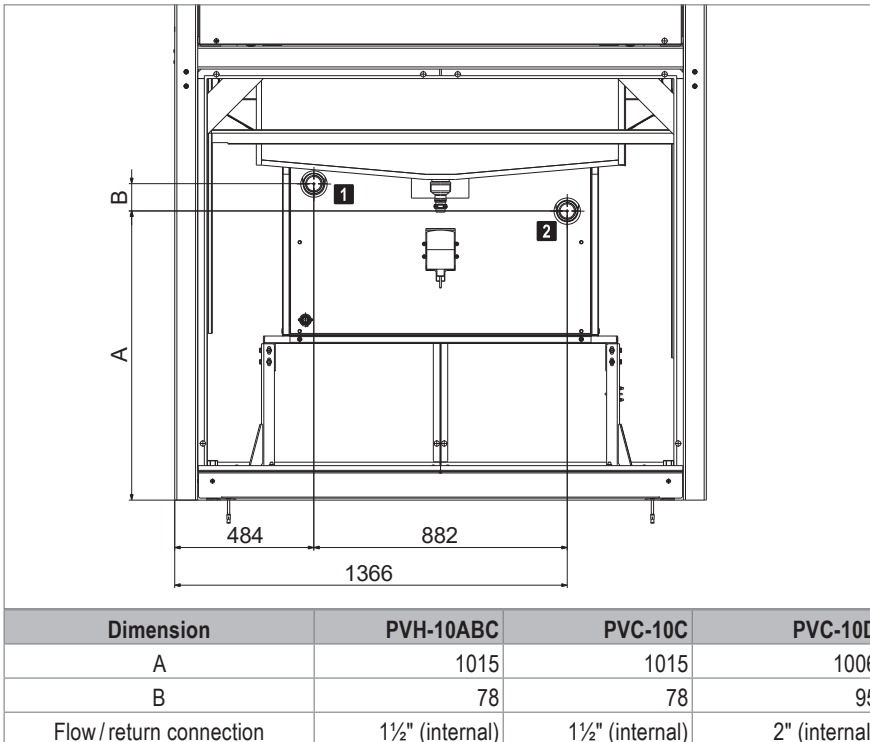


Fig. 20: Dimensional drawing for extract air and exhaust air duct (dimensions in mm)

7.5 Hydraulic installation

Only the unit types ProcessVent heat PVH and ProcessVent cool PVC are equipped with a coil for post-heating or cooling of the supply air.



- 1 Return
- 2 Flow

Fig. 21: Dimensional drawing for hydraulic connections (dimensions in mm)

- Connect the heating/cooling coil in accordance with the hydraulic diagram.



Attention

Danger of damaging the unit as a result of twisting the pipe connection. When attaching threaded flanges to the flow and return lines, apply counter-pressure by means of a suitable tool.

- Depending on local conditions, check whether compensators for linear expansion are required for the supply and return lines and/or articulated connections are required for the units.
- Insulate the hydraulic lines.
- Hydraulically balance the individual units with one another within the control group to ensure uniform pressure admission.



Attention

Danger of damaging the units. Do not fasten any loads to the coil, e.g. by means of the flow or return lines.



Attention

Danger of malfunctions. The condensate separator in cooling units only functions while the fan is running. No coolant must be allowed to circulate in the heating/cooling coil when the unit is switched off.

Hydraulic installation of units with hydraulic assembly for diverting system (option)

There is an assembly for the hydraulic diverting system installed in the unit. The connections for connecting the unit to the on-site hydraulic system can be found on the back of the unit.

- Read off the default settings for the hydraulic alignment from Fig. 22. The curves 1.0 to 4.0 correspond to the revolutions of the valve spindles of the balancing valve; they are shown on the turning knob:
0.0 Valve closed
4.0 Valve completely open
- The coil and the hydraulic assembly are already included in the specified pressure drops. For this reason, only take into account pressure drops in the distributor circuit as far as the connections.

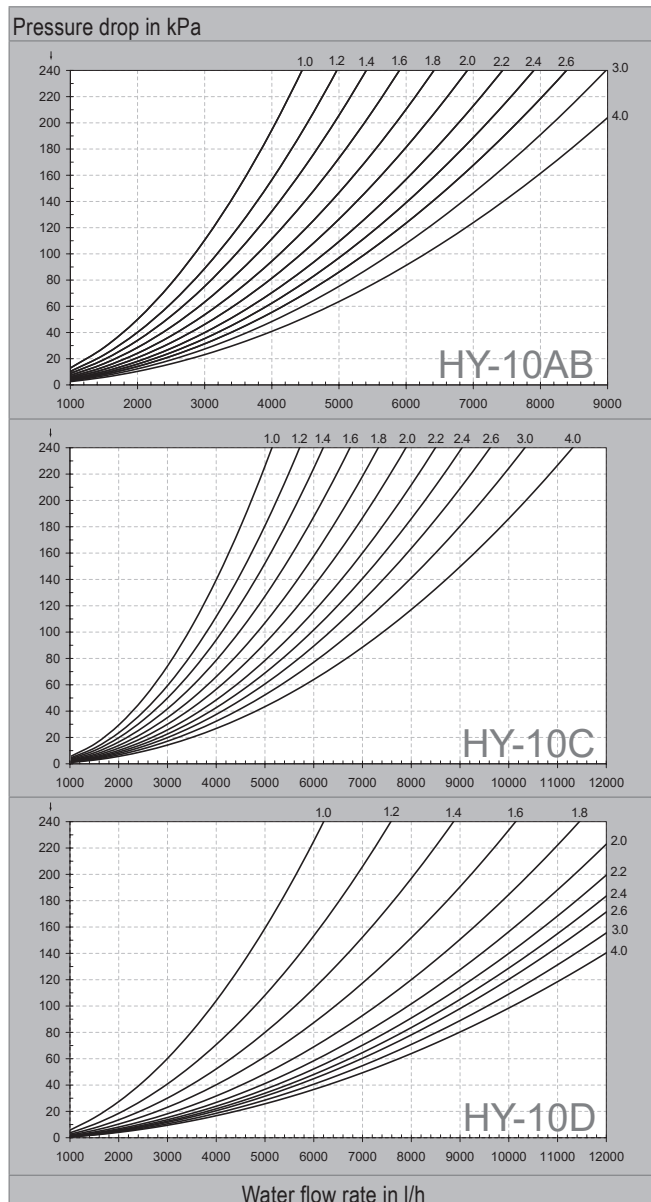
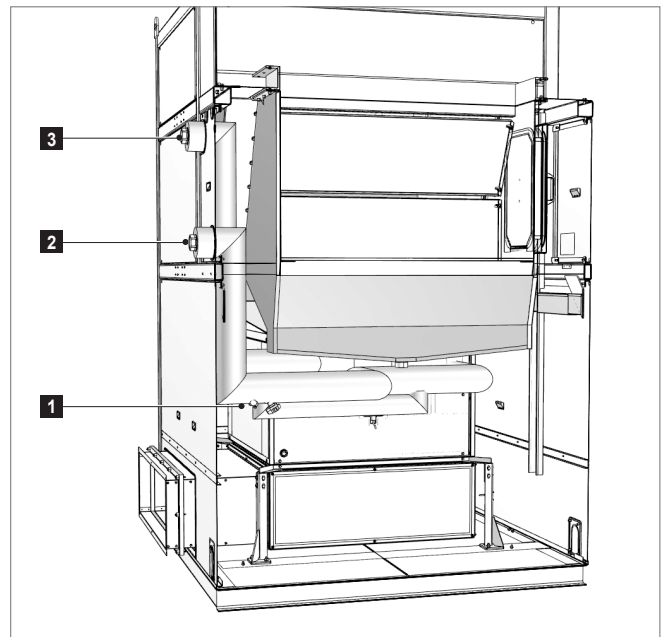


Fig. 22: Default values for the balancing valves



- 1 Control valve
- 2 Flow
- 3 Return

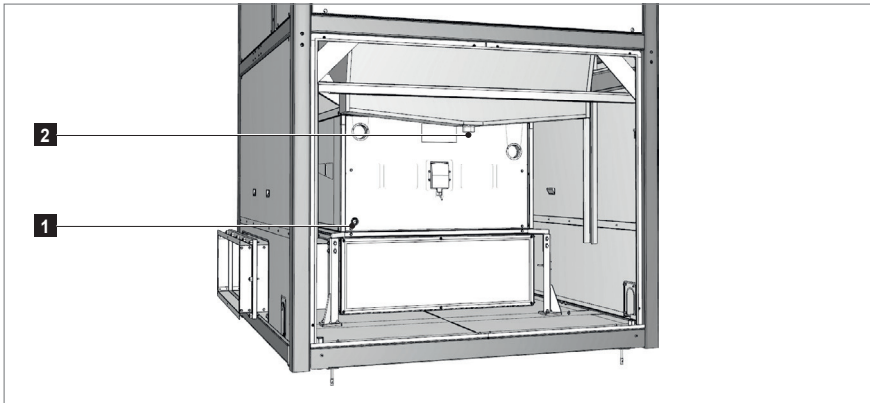
Fig. 23: Unit with hydraulic assembly diverting system

Coil	Flow /return connection
A B C	Internal thread 1½ "
D	Internal thread 2 "

Table 15: Dimensions for hydraulic connection

7.6 Condensate connection

Condensate arising in the plate heat exchanger and possibly in the cooling section must be removed via a condensate line.



- 1 Cooling coil condensate connection 3/4"
- 2 Plate heat exchanger condensate connection 2"

Fig. 24: Position of the condensate connections

- Adequately size the slope and cross section of the condensate line to prevent a condensate backwash.
- Make sure that the condensate can drain off freely.
- Depending on the specific application, the condensate may contain residue of oil, emulsions and cooling lubricants. Ensure that the condensate is disposed of or recycled in accordance with local regulations.

To prevent air escaping via the condensate line, the line must be connected via a trap (pipe trap or hose trap). The height of the trap depends on the maximum overpressure of the extract air purification plant fan (p_{max}):

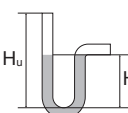
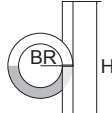
Pipe trap	Hose trap
 $H = 0.1 \cdot p_{max}$ $H_u = H + 75$	 $BR = 0.1 \cdot p_{max} + 25$ $H_u = 0.2 \cdot p_{max} + 150$
<p><i>Example:</i></p> $p_{max} = 1000 \text{ Pa}$ $H = 0.1 \cdot 1000 = 100 \text{ mm}$ $H_u = 100 + 75 = 175 \text{ mm}$	<p><i>Example:</i></p> $p_{max} = 1000 \text{ Pa}$ $BR = 0.1 \cdot 1000 + 25 = 125 \text{ mm}$ $H_u = 0.2 \cdot 1000 + 150 = 350 \text{ mm}$
<p>Legend: p_{max} = Fan overpressure in Pa BR = Bending radius of the hose in mm (depending on the hose used)</p>	

Table 16: Calculation of the effective height for the trap

- Connect the trap directly at the condensate connection.
- Fill the trap with water before commissioning, after each cleaning operation and after an extended downtime.

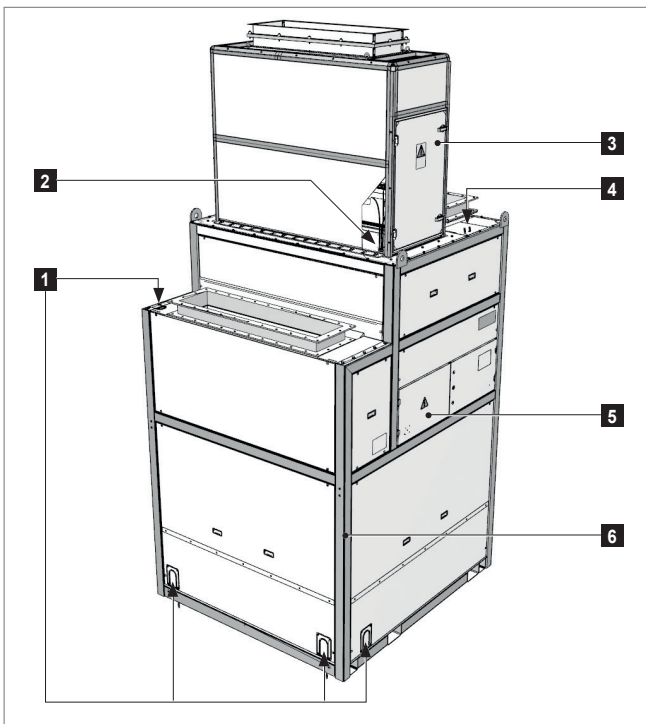
7.7 Electrical installation



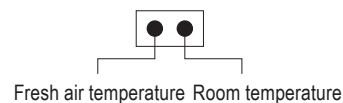
Caution

Danger of electric shocks. 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.
- Route the cables for the control systems separately from mains cables.
- Establish the plug-in connection between the base unit and the fresh air module:
 - Open the fresh air access door.
 - (In the case of a horizontal fresh air module, open the access panel for the connection duct).
 - Establish plug-in connections as shown in the wiring diagram.
- The room air and the fresh air temperature sensor are supplied loose in the control box:
 - Install the room air sensor at a representative position in the occupied area at a height of about 1.5 m. Its measured values must not be distorted by the presence of sources of heat or cold (machines, direct sunlight, windows, doors, etc.).
 - Install the fresh air sensor at least 3 m above the ground on a north-facing wall, so that it is protected from direct sunlight. Provide additional cover for the sensor and thermally insulate it from the building
 - Wire the sensors to the plug-in connections on the unit.
- Connect the unit frame with the foundation earth electrode and label it with an earthing label.
- Secure all connections against working loose.



- 1 Cable feedthroughs ¹⁾
- 2 Plug-in connection, base unit – fresh air module
- 3 Fresh air access door
- 4 Plug-in connections, temperature sensors



- 5 Control box
- 6 Equipotential bonding on the unit frame

1) On the unit design with a displacement flow diffuser, no cable feedthroughs are provided at the bottom near to the floor.

Fig. 25: Electrical installation

8 Operation

8.1 Initial commissioning



Attention

Risk of damage to property as a result of performing initial commissioning on your own authority. Initial commissioning must be performed by the manufacturer's customer service technicians!

Preparing for initial commissioning:

Checklist:

- Have all the media connections been made (electric cabling, water piping, condensate drain and air duct connections)?
- Is the heating medium or cooling medium available?
- Are the hydraulics aligned and balanced?
- Are all the control components installed and wired?
- Are all of the respective trade groups (installer, electrician, etc.) present at the scheduled time?
- Are the system operating personnel present for training at the scheduled time?

8.2 Operation

The system runs fully automatically in accordance with the extract air purification plant, the programmed operating times and temperature conditions.

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

8.3 Decommissioning

- Disconnect the power supply:
 - The main switch is located in the control box.
- To avoid frost damage to the hydraulic circuit, have it drained by professional personnel or frostproofed with antifreeze.

9 Maintenance and repair



Caution

Risk of injury from incorrect work. Maintenance work must be carried out by trained personnel!

9.1 Safety

Before performing any work on the unit:

- Switch the unit manually to operating mode 'Off' (LOCAL / OFF).
- Turn the main switch to the 'Off' position and secure it against being switched back on.
 - The main switch is located in the control box.
- Wait for the fans to stop.
- Observe the accident prevention regulations.
- Observe the particular dangers involved when working on electrical systems.
- When working in the unit, take precautions against unprotected, sharp metal edges.
- Immediately replace damaged or removed informational and warning signs.
- Following maintenance work, professionally reassemble all dismantled protective devices.
- Replacement parts must comply with the technical requirements of the system manufacturer. The manufacturer recommends the use of original spare parts.

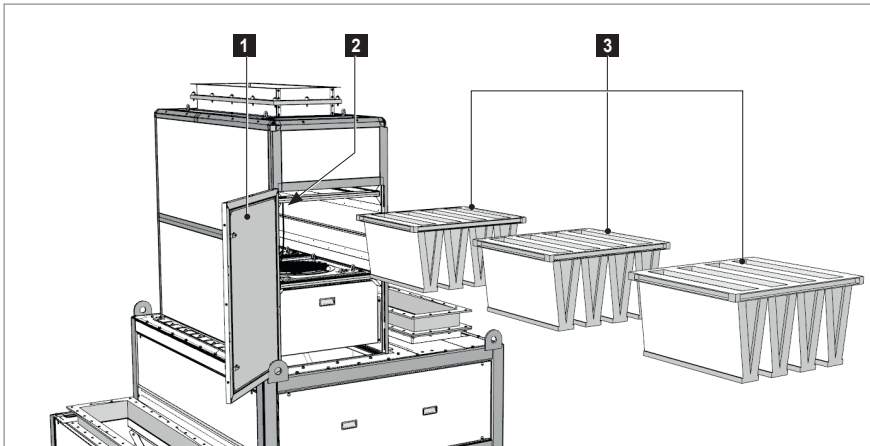
9.2 Maintenance

Maintenance schedule

Activity	Interval
Changing the filter	When the 'Filter' alarm is displayed, at least annually
Clean the plate heat exchanger and condensate drip tray	When the 'PHE dirty' alarm is displayed
Visually check the heating/cooling coil for dirt build-up and clean if necessary (PVH and PVC unit types only)	Every 3 months
Clean the return pump station (option)	Every 3 months
Comprehensive functional check and cleaning of the unit	Annually by the manufacturer's customer service technicians

Table 17: Maintenance schedule

Changing the filter

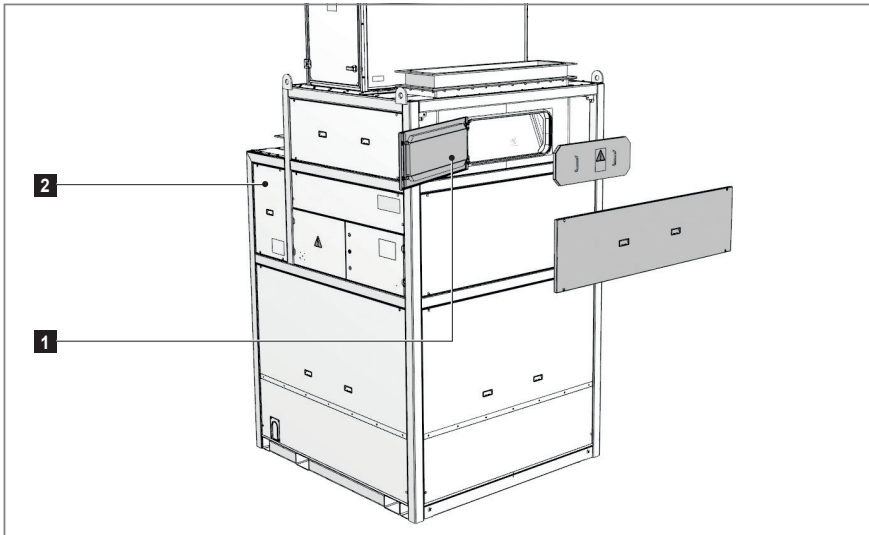


- 1 Fresh air access door
- 2 Differential pressure hose
- 3 Filter elements

Fig. 26: Changing the filter

- Use a work platform.
- Open the fresh air access door.
- Remove the filter monitoring differential pressure hose from the connection nipple.
- Pull out the filter frame.
- Remove the filter elements individually and replace them with new ones.
- Reconnect the differential pressure hose.

Cleaning the plate heat exchanger and condensate drip tray

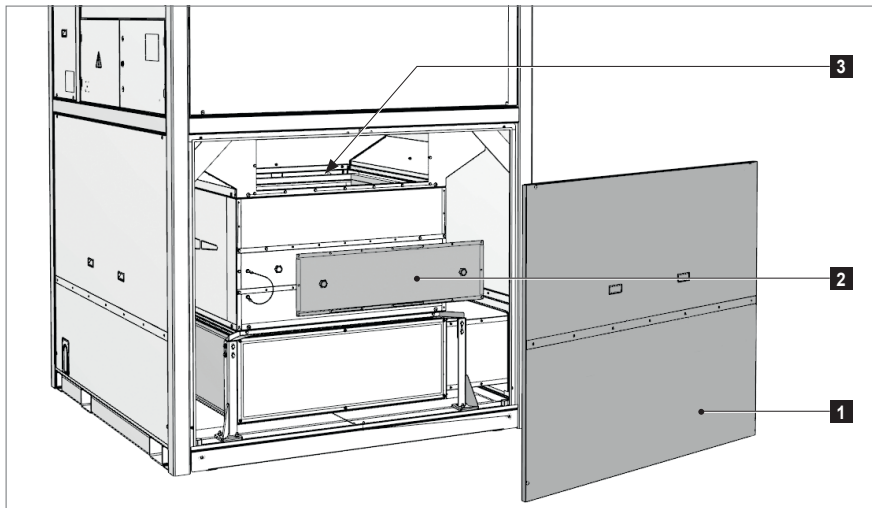


- 1 Exhaust air access door
- 2 Extract air access door

Fig. 27: Cleaning the plate heat exchanger.

- Use a work platform.
- Open the exhaust air access door.
- Clean the plate heat exchanger:
 - Remove oils, solvents etc. with hot water or a degreasing cleansing agent.
 - When blow-cleaning with compressed air:
 - max. air pressure 6 bar, maintain a distance of at least 100 mm
 - When using a high-pressure cleaner:
 - Use 40° flat nozzle, maintain a distance of at least 100 mm
- Open extract air access door.
- Clean condensate drip tray (as for plate heat exchanger).

Checking and cleaning the heating/cooling coil



- | | |
|---|--------------------------|
| 1 | Supply air access panels |
| 2 | Coil access panel |
| 3 | Heating/cooling coil |

Fig. 28: Access to the heating/cooling coil and to the return pump station

- Remove supply air access panel.
- Unscrew coil access panel.
- Carefully remove dust deposits using a vacuum cleaner.

Cleaning the return pump station

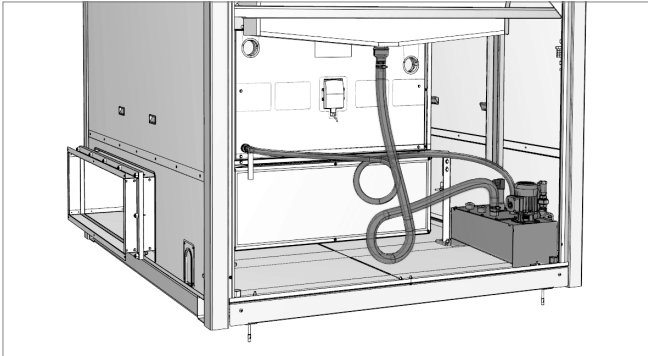


Fig. 29: Return pump station in the unit

- Remove supply air access panel (see Fig. 28).
- Ensure the container is ready to collect any condensate which may flow out.
- Carefully remove condensate hoses from the return pump station.
- Unscrew the cover for the pump and clean the pump.

9.3 Repair

If repairs are necessary, contact the manufacturer's customer service department.

10 Dismantling



Caution

Risk of injury caused by falling load and improper handling. During dismantling:

- Do not stand under suspended loads.
- Use cranes or forklifts with sufficient load capacity.
- Wear protective equipment (helmet, safety shoes).
- Do not lift the two-part unit in one piece.

- Drain the hydraulic circuit.
- Dismantle all media connections.
- Release the screws on the mounting flanges of the fresh air module.
- Hook the snap hooks of the lifting gear into the lifting eyes and transport the fresh air module away using the crane.
- Transport the base unit away.

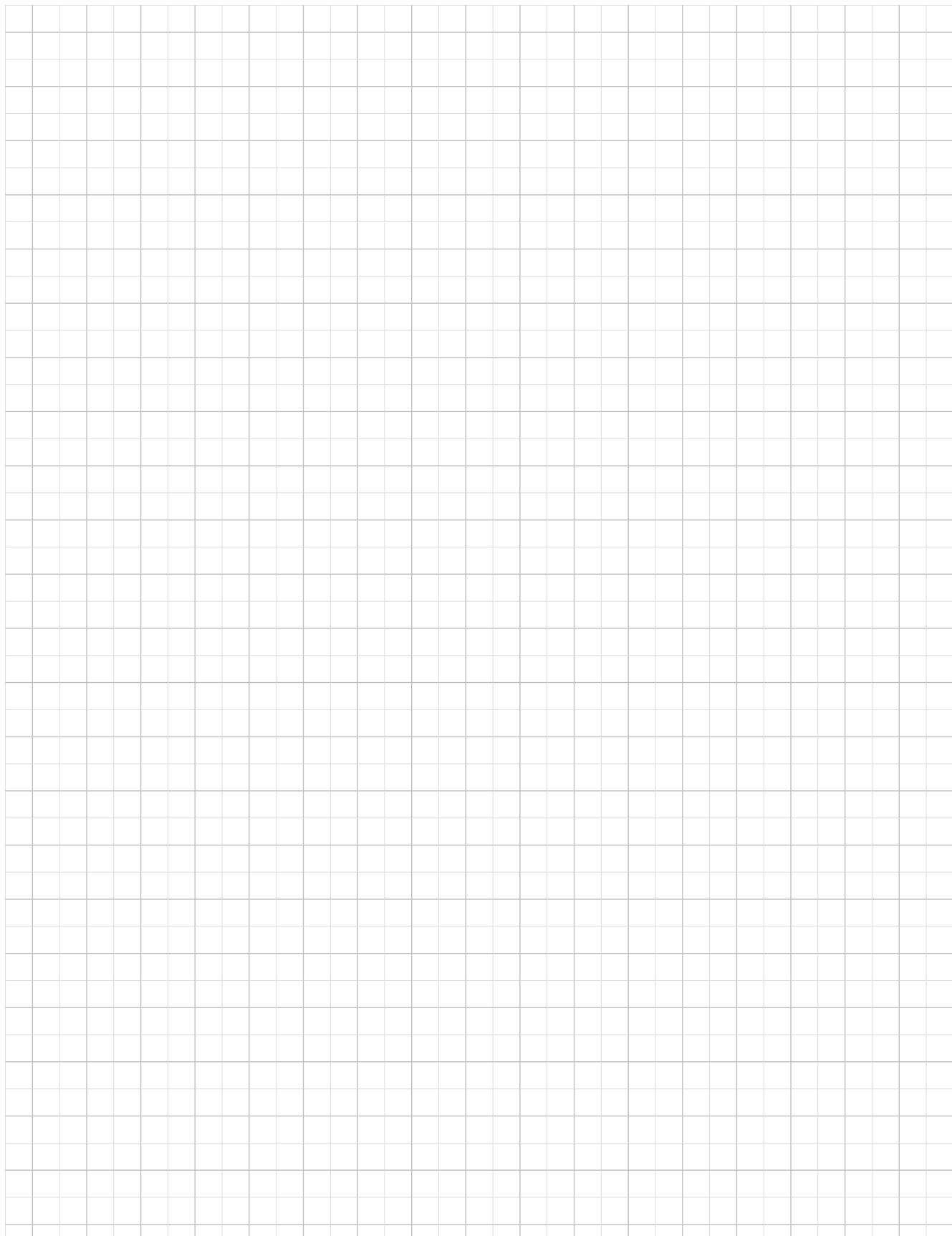
11 Disposal

- Recycle metal components.
- Recycle plastic parts.
- Dispose of electric and electronic parts via hazardous waste.
- Dispose of oil-fouled parts in accordance with local regulations.

12 Spare parts

Designation	Mat.No.
Fresh air/recirculation filter	2054 385
Flow straightener fabric for displacement flow front 840 x 1388	5030 981
Flow straightener fabric for displacement flow front 915 x 1388	5030 983
Spring for displacement flow front	5030 982
Temperature sensors for fresh air/room air	2001 094
Connection nipple for pressure monitor	239 547
Connection nipple for pressure monitor 6 x 1	2044 958
Connection nipple for pressure monitor 8 x 1	2052 655
Fabric hose D 32.4 x 4.8	1004 547
Fabric hose D 19.4 x 3.7	1004 546

Fig. 30: Spare parts



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