GB

VEX340HX w/o a control system

VEX unit with counter flow heat exchanger

VEX300 RANGE
COUNTER FLOW HEAT EXCHANGER

Unit supplied with (factory fitted):

- ☐ VEX340H
- ☐ FP compact filte
- ☐ OD - roof for outdoor

The following accessories are supplied separately:

- ☐ HCW external heating coil (water)
- ☐ HCE external heating coil (electrical)
- ☐ CCW cold water coil
- ☐ Closing damper, LS400 (LSA exhaust air)
- ☐ Closing damper, LS400, (LSF outdoor air)
- ☐ Closing damper, LSR400, with spring-return (LSA exhaust air)
- ☐ closing damper, LSR400, with spring-return (LSF outdoor air)
- ☐ _____

Prod. order no.: _____

Sales order no.: _____

Original instructions

EXHAUSTO A/S
Odensevej 76
DK-5550 Langeskov

Tel. +45 65 66 12 34
Fax +45 65 66 11 10
exhausto@exhausto.dk
www.exhausto.dk

EXHAUSTO

1. Product information

2. Handling

3. Mechanical assembly

4. Electrical installation

5. Maintenance

6. Technical data

Symbols, terms and warnings

Prohibition symbol

Failure to observe instructions marked with a prohibition symbol may result in serious or fatal injury.

Danger symbol

Failure to observe instructions marked with a danger symbol may result in personal injury and/or damage to the unit.

Scope

This instruction manual is for use with EXHAUSTO VEX-type air handling units. Please refer to the product instructions regarding accessories and extra equipment.

The instructions must be fully observed to ensure personal safety and to protect the equipment and ensure its correct operation. EXHAUSTO A/S accepts no liability for accidents caused by equipment not used in accordance with the manual's instructions and recommendations.

Supply air/extract air

These instructions use the following terms as given in DS447-2013:

- Supply air (air blown in)
- Extract air (air removed)
- Outdoor air
- Exhaust air

Left/Right

The term R for Right, indicates the supply air is to the right of the cooling unit, as seen from the operating side. The term L for Left, indicates the supply air is to the left.

Front page: Accessories

The front page of the instruction manual contains a checklist, detailing the accessories delivered with the VEX unit.

NB

When retrofitting EXHAUSTO accessories, please update the checklist on the front page.

Warnings

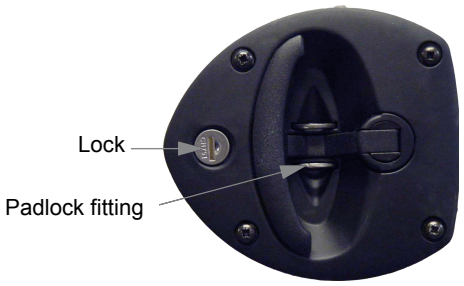
No duct connection

If one or more of the spigots is not connected to a duct: Fit a protective net to the spigots with a maximum mesh width of 20 mm (in accordance with EN294).

Lock the air handling unit during operation

The VEX unit must always be locked during operation:

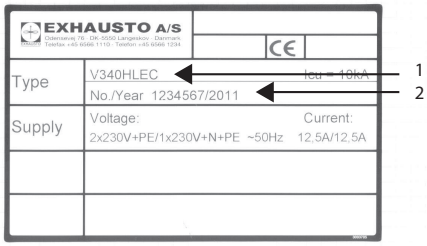
- Use the cylinder lock in the handle. **Remember** to remove the key from the lock.
- Or use a padlock. Use the handle's built-in padlock fixture.



Information plate

The VEX unit information plate shows:

- VEX model type (1)
- Unit production no. (2)

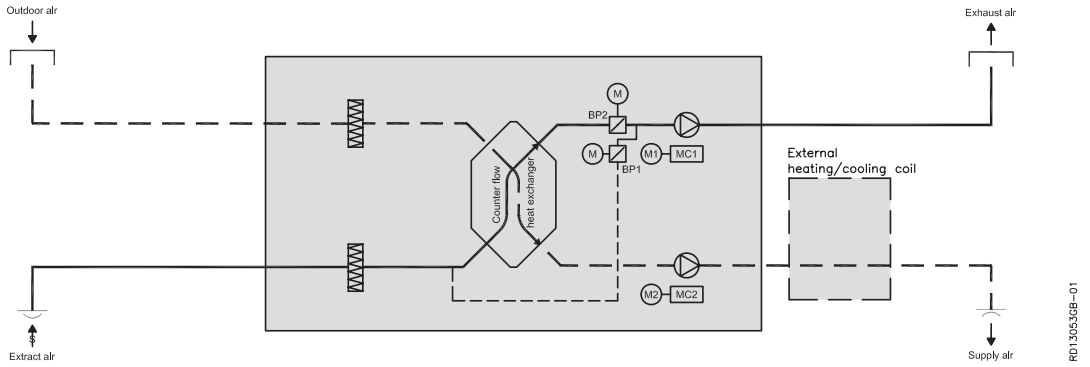


NB: **Have the production number ready at all times when contacting EXHAUSTO A/S.**

1. Product information

1.1 Designations used in these instructions

The simplified diagram shows a VEX unit with LEFT fan placement.



Component	Function
MC1	Motor control, motor 1 (exhaust air)
MC2	Motor control, motor 2 (supply air)
M1	Exhaust motor
M2	Supply air motor
BP1 M	Bypass damper with motor (rear)
BP2 M	Bypass damper with motor (bottom)

1.2 Application

Comfort ventilation EXHAUSTO VEX is used for comfort ventilation tasks. Operating temperature range for the unit – see section "Technical data".

Prohibited uses The VEX unit is not to be used to transport solid particles or in areas where there is a risk of explosive gases.

1.3 Location requirements

Positioning The air handling unit is designed for indoor fitting. The air handling unit can be ordered for outdoor installation (accessory Outdoor, OD).

1.3.1 Spatial requirements

The cabinet has two doors.

The table below indicates how much space is needed for servicing, replacing filters, cleaning, etc.

	Unit dimensions	Spatial requirements	Total
Height	1,907 mm	200 mm free height above the connection box	2,207 mm
Width	1,765 mm excl. spigots		1,765 mm
Depth	946 mm	900 mm space required to open doors	1,846 mm

See section "Principal dimensions VEX340H" for more details.

1.3.2 Requirements for underlying surface

When floor-mounting the unit, the surface must be:
- level (+/- 10 mm per metre)
- hard
- resistant to vibration

The VEX unit leg height can be adjusted: 55–110 mm.

1.3.3 Outlet

A condensation outlet must be installed in the immediate vicinity of the unit. See also “Mechanical fitting” section.

1.3.4 Requirements for duct system

Connection to duct system

To achieve maximum performance and minimal energy consumption, the unit should be connected to a straight duct at least 750 mm long, before and after the unit.

Silencers

The duct system must be fitted with silencers specified by the Project Manager, which meet the requirements of the operating area.

Insulation

The duct system must be insulated against:
- **condensation**
- **sound**
- **thermal loss**

Condensation

Condensation in the ducts may occur when the exhaust/outdoor air has high humidity. EXHAUSTO recommends a condensation outlet is also fitted at the lowest point in the ducts.

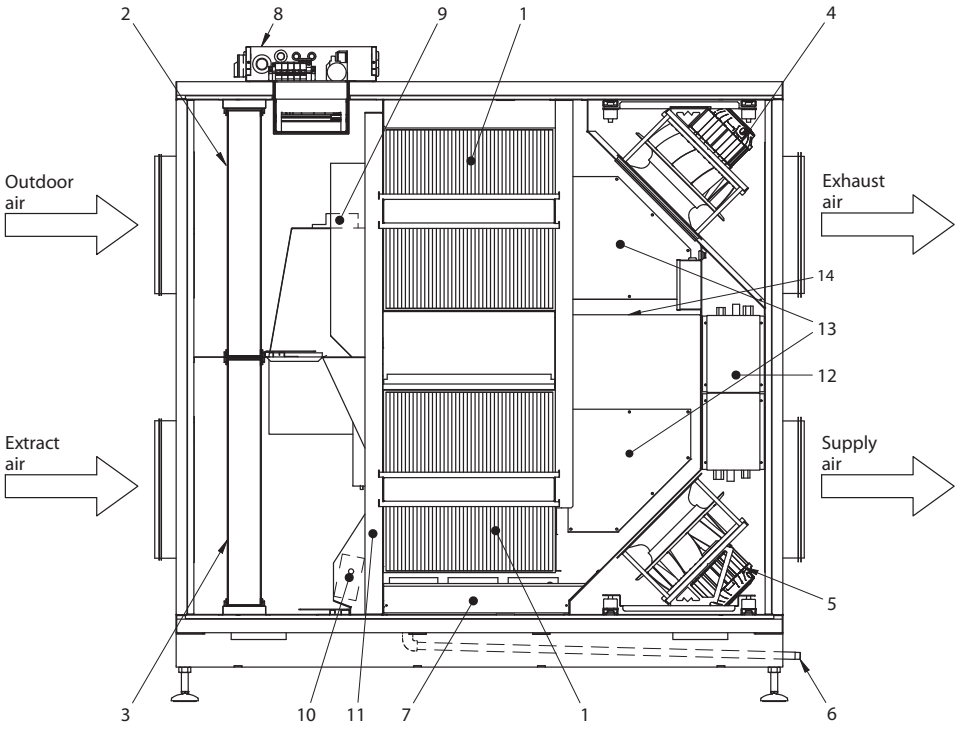
No duct connection

If one or more of the spigots is not connected to a duct: Fit a protective net to the spigots with a maximum mesh width of 20 mm.

1.4 Description

1.4.1 Design

Layout drawing The drawing below shows the unit's design (VEX340H-R with doors open):

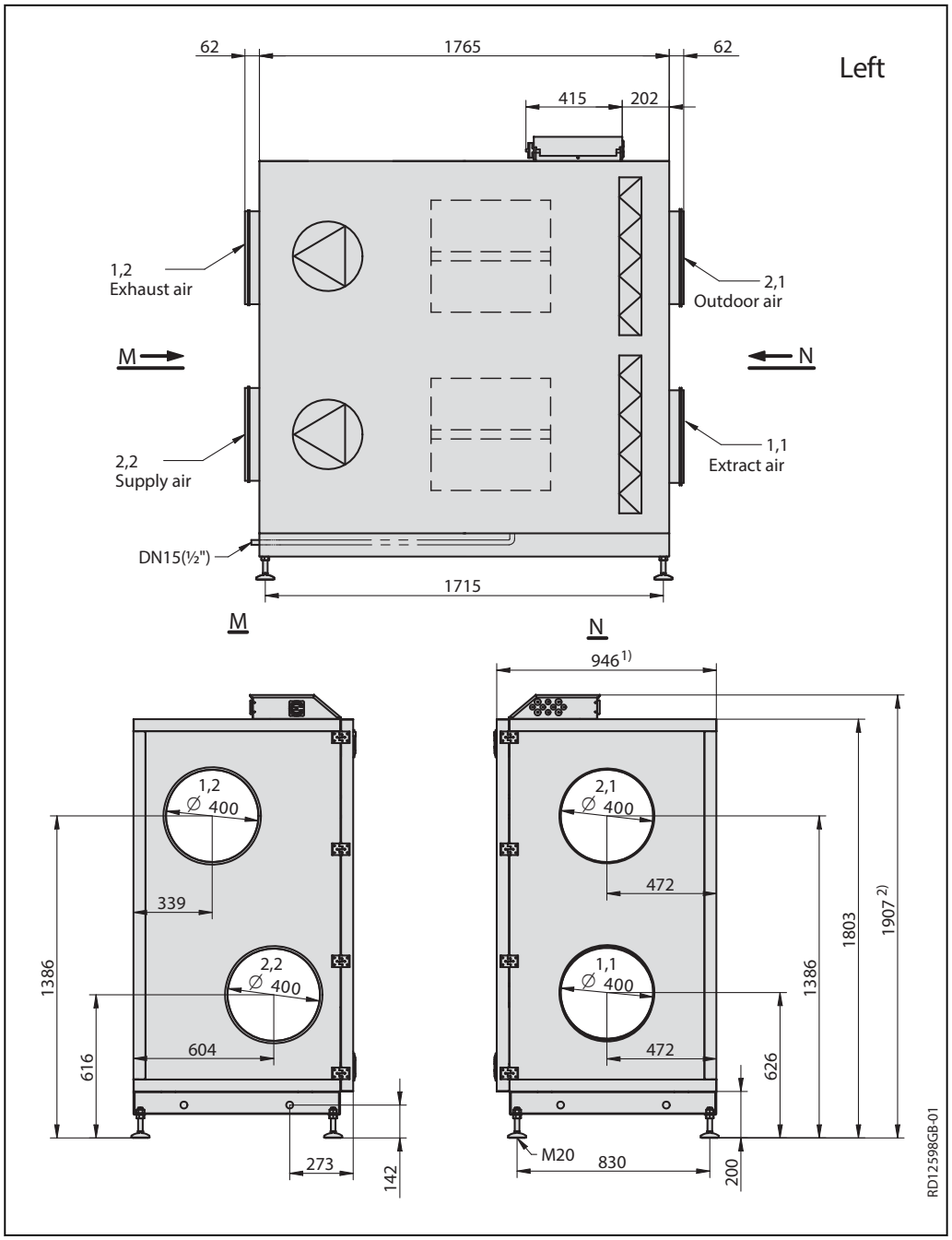


Pos. no.	Part	Function
1	Counter flow heat exchanger	Conducts heat from extract air to supply air
2	Outdoor air filter	Filters outdoor air
3	Extract air filter	Filters extract air
4	Exhaust air fan	Removes "used" air
5	Supply air fan	Blows air into the room
6	Condensation outlet spigot	Conducts condensate away from the condensation tray
7	Condensation tray	Collects the condensate and drains it away from the cross-flow heat exchanger to the condensation outlet
8	Connection box	Connection terminal board
9	Damper motor, rear bypass	Opens and closes rear bypass damper
10	Damper motor, lowest bypass	Opens and closes lowest bypass damper
11	Bypass section	Part of the bypass construction
12	Box with motor controls	Variably adjusts fans
13	Inspection access	Allows access for monitoring and cleaning
14	Return air damper	Blocked in closed position

Cabinet	The inside and outside of the cabinet is made of Aluzinc® The cabinet is insulated with 50 mm mineral wool.
Fans	The unit contains two centrifugal fans for exhaust air and supply air.
Counter flow heat exchangers	The unit's counterflow heat exchangers are made of aluminium and are highly efficient. The counterflow heat exchangers can be taken out and cleaned. See section "Servicing".
Filters	There are integral panel filters on both the extract air and outdoor air sides.
Bypass design	The unit has a built-in, variably regulated, bypass function to ensure that the combination of outdoor air and heat exchange is correct.

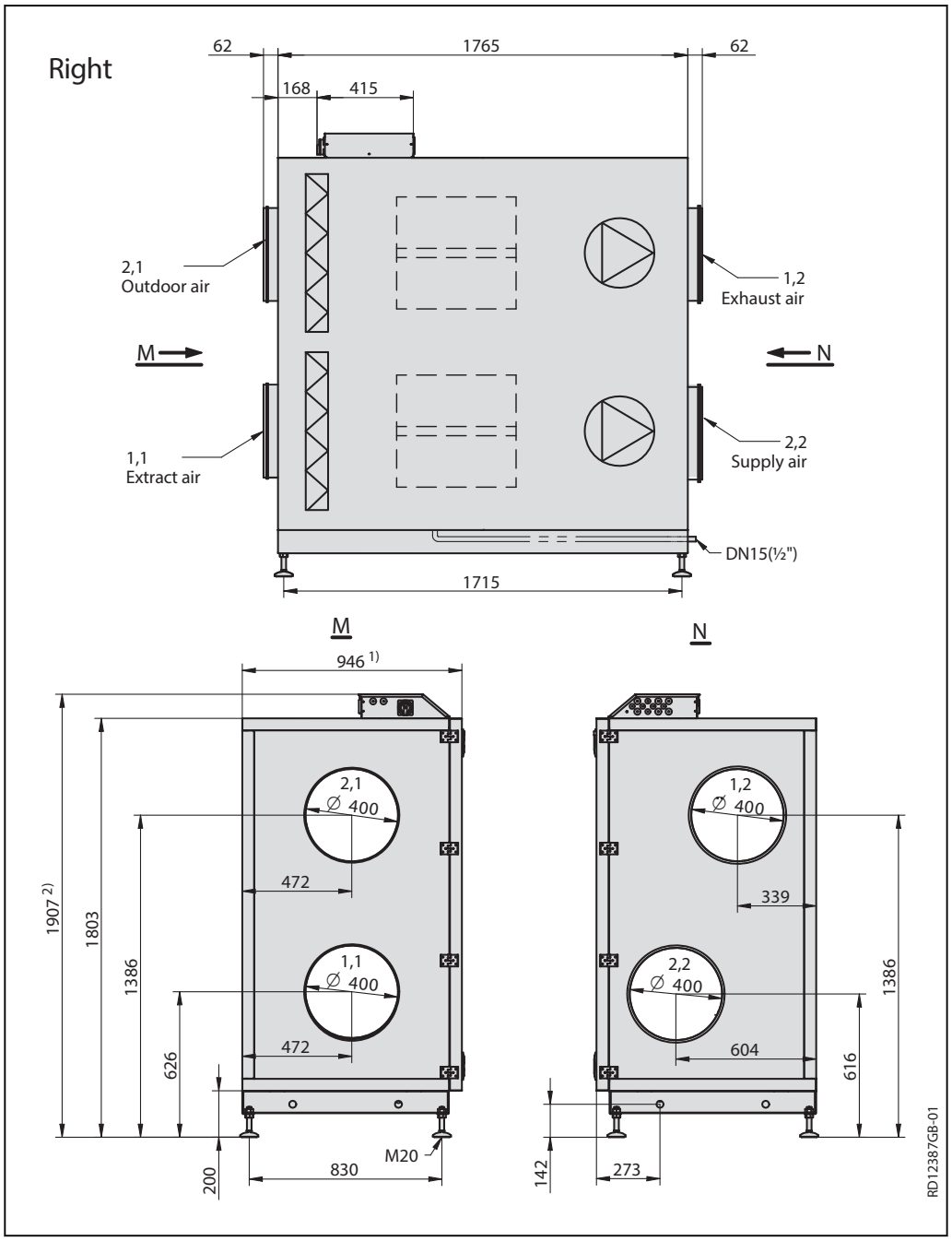
1.5 Main aim

VEX340H, Left



1) Ensure there is space in front of the VEX to open the doors
2) Ensure there is enough free height above the VEX so the connection box can be serviced (see also "Space Requirements")

VEX340H, Right



1) Ensure there is space in front of the VEX to open the doors
2) Ensure there is enough free height above the VEX so the connection box can be serviced (see also "Space Requirements")

2. Handling

2.1 Unpacking

Supplied components

The following components are supplied:
- VEX unit
- Supplied with accessories (as indicated in the checklist on the front page of the instructions)

Packaging

The unit is delivered attached to a disposable pallet and packed in clear plastic.

NB

Once the plastic has been removed, the unit must be protected against dirt and dust:
- **The covers on the spigots must not be removed until the spigots are connected to the ventilation ducts.**
- **Whenever possible, keep the unit closed during fitting.**

The unit should be cleaned before it is used.

Once the VEX unit is fitted, it must be checked and thoroughly cleaned. All dust, debris and metal shavings must be vacuumed up.

2.2 Transport

Transport equipment

Move the VEX unit using a lifting or fork-lift truck or crane, as described in the instructions "Manual - transport of VEX340”.

2.2.1 Passage through openings

Width

The list (below) shows the unit’s dimensions, and is intended to indicate how large an opening has to be for the unit to pass through:

If the opening width is*	Then
Less than 900 mm	The unit will not pass through
Between 900 and 955 mm	Remove the doors as described in the section "Internal transport with reduced weight"
Greater than 955 mm	The unit can pass through

*Measurements are based on the exact dimensions of the VEX unit.

2.2.2 Internal transport with reduced weight

Weight reduction

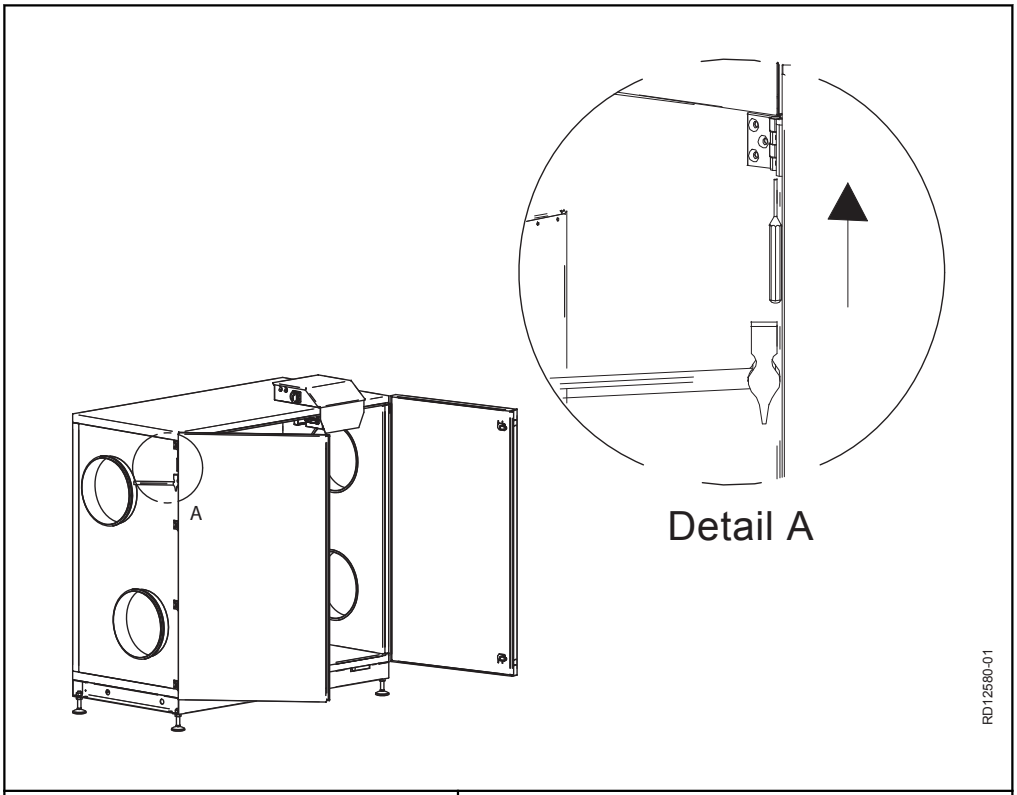
The weight can be reduced during transport by removing the service doors and fan units.

The table below shows how much weight is reduced when the service doors and fan units are removed.

Weight, subcomponents	VEX340H
Total weight	450 kg
Reduced weight - internal transport Doors, counter flow heat exchanger, motor sections and filters removed	284 kg
Bypass section	32 kg
Doors	2 x 23.5 kg
Counter flow heat exchangers	2 x 22 kg
Motor sections	2 x 16.5 kg
Filters	2 x 5 kg

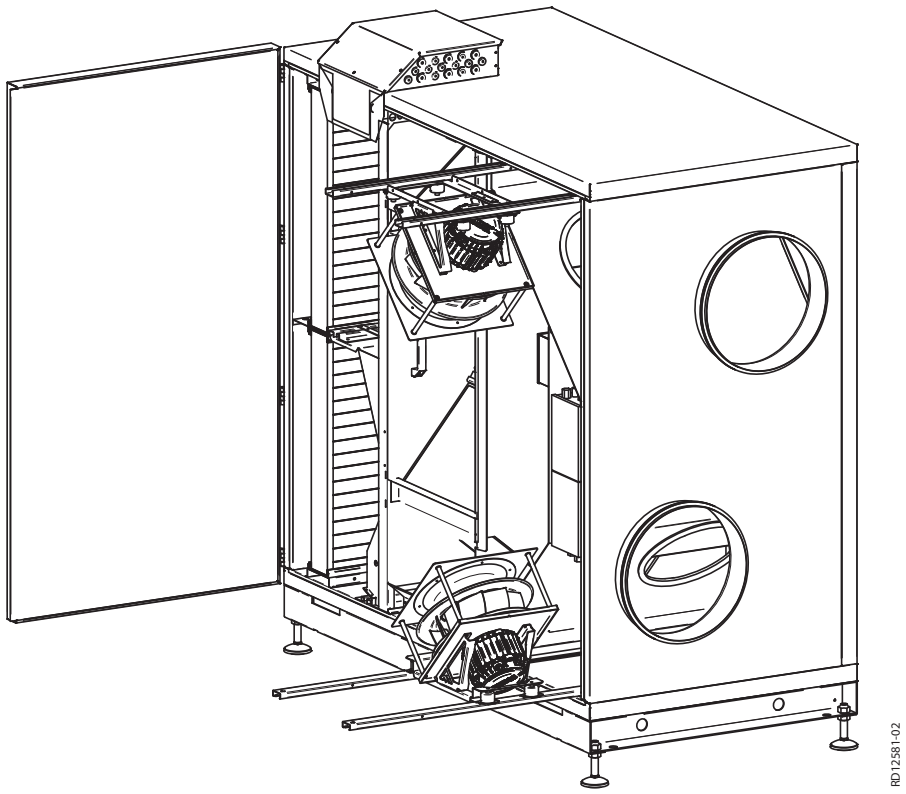
Removing the service doors

To remove the service doors:



A	● Open both doors ● Tap the hinge door pin out from below using a small pin bolt or similar ● Lift the doors off

To remove the fan unit



Step	Action
1	Remove the fixing screws on the sliding rail (out towards the operating side)
2	Loosen the ties on the motor cable and the measuring hose
3	Pull the fan unit out to the end-stop (a screw on each rail acts as a stop)
4	Remove the supply cable from the motor terminal box
5	Remove the two end-stop screws (one on each rail). The fan unit can now be lifted off. **NB: A single fan unit weighs 16.5 kg.**

Removing the counter flow heat exchangers

See section "Servicing"

3. Mechanical assembly

3.1 Installing the unit

NB Floors must meet the requirements in section "Requirements for underlying surface".

After installation, check the VEX unit is completely level.

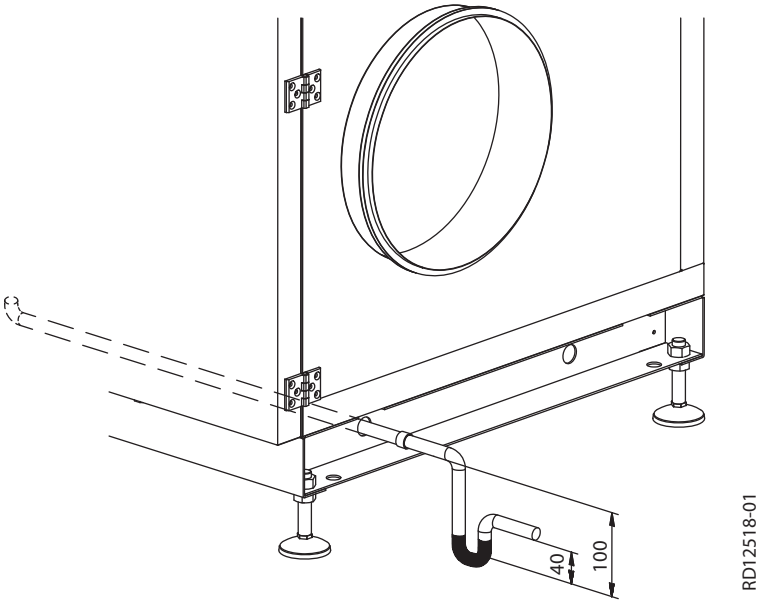
3.2 Condensation drain

3.2.1 Condensation outlet

Connection ⚠ **Drain the condensation outlet into a floor gully or similar. The condensation outlet must be fitted with a water trap.**

Risk of frost ⚠ **<u>Where there is a risk of frost:</u> Insulate the condensation outlet and protect it against frost - if necessary, using a heating cable. Both the condensation pipe under the VEX unit and the condensation outlet need insulating.**

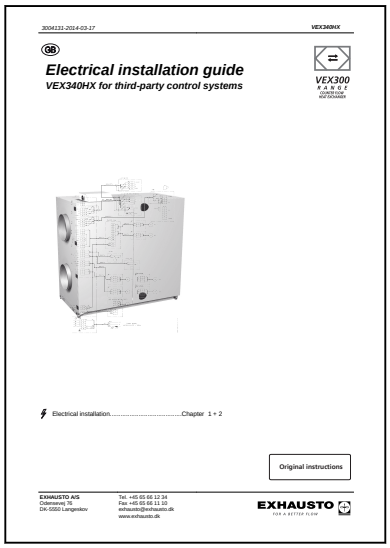
Dimensioning See the correct dimensions for the water trap on the drawing below.



4. Electrical installation

4.1 Electrical installation

See the attached instructions “Electrical Installation Guide of VEX340HX for third-party control system”.



3004131-2014-03-17 VEX340HX

GB

Electrical installation guide

VEX340HX for third-party control systems

VEX300 RANGE COVERS FOR MAT.EXHAUSTO

Electrical installation.....Chapter 1 + 2

Original instructions

EXHAUSTO A/S
Odinsvej 76
DK-5550 Langeskov

Tel. +45 65 66 12 34
Fax +45 65 66 11 10
exhausto@exhausto.dk
www.exhausto.dk

EXHAUSTO
FOR A BETTER FLOW

5. Maintenance

5.1 Maintenance Schedule

Recommended intervals

The following chart details the recommended maintenance intervals, under normal operating conditions. EXHAUSTO recommends maintenance is adjusted to suit the actual operating requirements.

Component	Procedure	Once a year	Twice a year
Compact/bag filters*	The filter should be changed at least... Recommended that both filters are replaced at the same time.		X
Filter monitor	Check that all the seals in the filter monitor are tight.	X	
Seals and sealing strips	Check that all the seals are tight.	X	
Fans and heating coil (accessories)	Check Dismantling of fan unit, see section "Internal transport with reduced weight" Cleaning, see following sections	X	
Counter flow heat exchanger	Check	X	
Closing damper	Function check	X	
Motor valve and circulation pump (accessories)	Function check	X	

As and when required

Following parts are cleaned as and when required

Component	As and when required
Condensation tray	Cleaning and inspection of outlet and water trap
Counterflow heat exchanger	Cleaning. See next sections.

***Filters**

Only use original filters

- The provided filter data and pressure loss graphs (section "Technical data") are based on the use of original filters
- EUROVENT certification is only valid if original filters are used
- Use of non-original filters may cause leakage in the VEX and impair filter function
- EXHAUSTO recommends that you register the filter replacement date to ensure filters are replaced at the correct intervals

5.2 Hygiene

VDI6022 air hygiene standard

To ensure that the VEX300 meets the requirements of the VDI 6022 hygiene standard, its design ensures that:

- bacterial growth and dirt accumulation are minimal
- conditions for cleaning are optimum

Filter F7

The outdoor air side of the unit must be fitted with a F7 filter to meet VDI 6022 requirements.

5.3 Service

5.3.1 Filter change

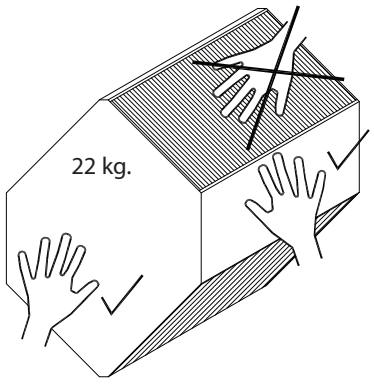
⚠ **Disconnect power at the isolation switch before opening the door.**

Pull the filters out. Remember to check the flow direction - see the arrows on the filter.
Redundant filters must be stored immediately in sealed plastic bags and disposed of responsibly.

5.3.2 Removing the exchanger

⚠ **Disconnect power at the isolation switch before opening the door.**

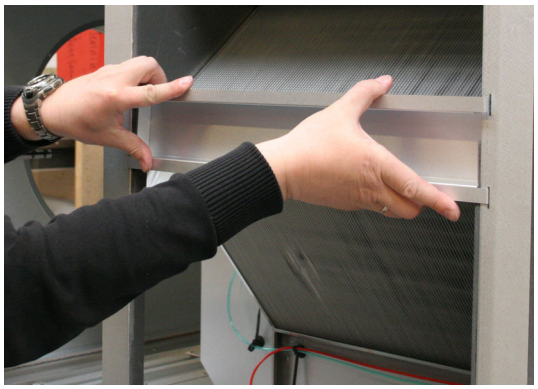
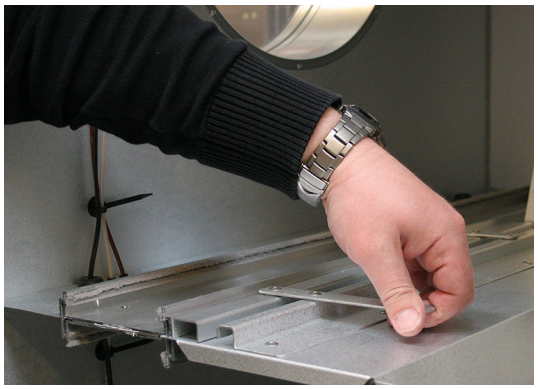
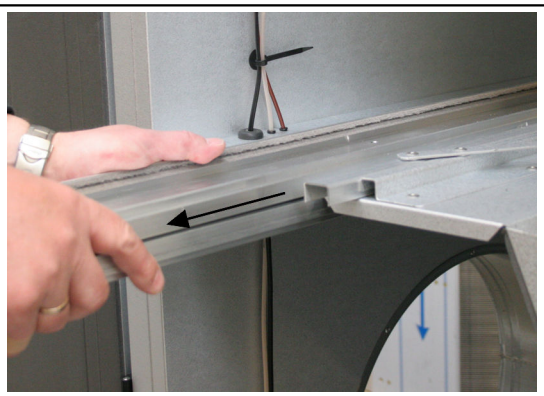
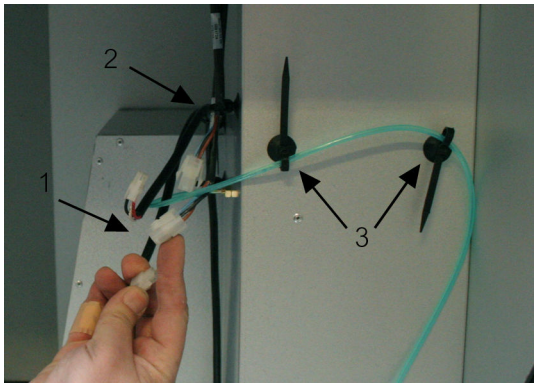
⚠ **The counter flow heat exchanger fins can be easily damaged - avoid contact with the fins.**

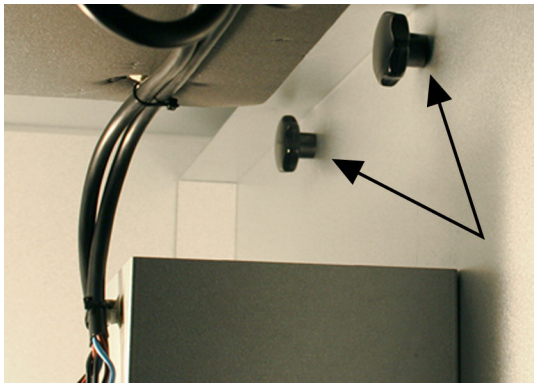
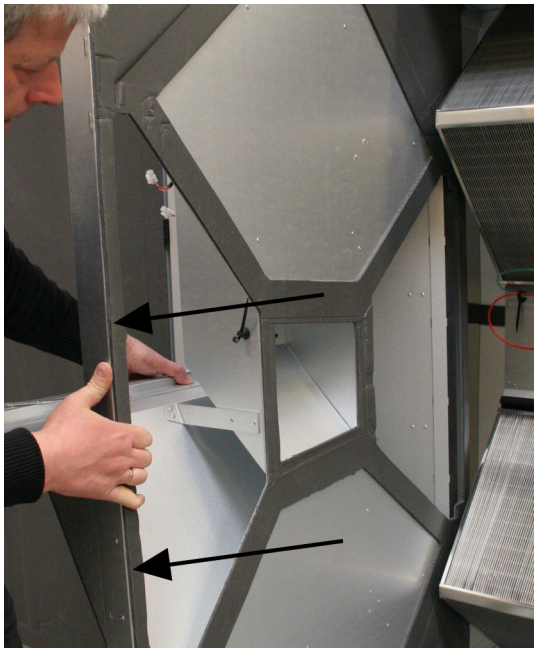


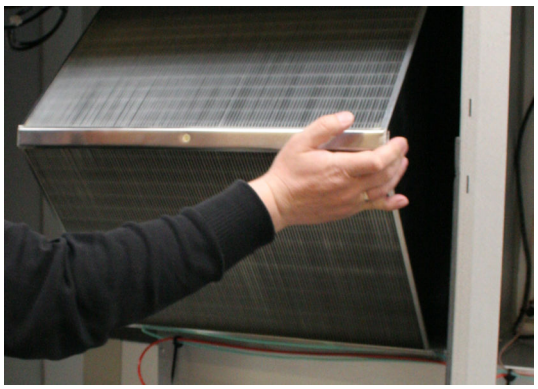
How to remove the counter flow heat exchanger

Before removing the counter flow heat exchanger:

- remove the filters
- remove the sealing bar in front of the heat exchanger (photo 1)
- extract the bypass section (photos 2 - 7)

Step		Action
1.		• Remove the sealing bar in front of the top and bottom counter flow heat exchanger by squeezing and pulling
2.		• Loosen the centre slide lock by pushing it inwards
3.		• Pull out the alumini-um rail
4.		• Unplug connector from socket (1) • Loosen the cable tie from the cabinet (2) • Pull the hose back through the holders (3) past the bypass section

Step		Action
5.		• Loosen the finger screws (positioned between the connection box and the bypass section) • Remove the finger screws
6.		• Loosen the bottom slide lock by pushing it inwards
7.		• Pull the bypass section out **NB: Bypass section weighs 32 kg**

Step		Action
8.		• Now carefully remove the top and bottom counter flow heat exchangers **NB: A single counter flow heat exchanger weighs 22 kg**.

To refit the counter flow heat exchanger

	Follow steps 1 to 8 in reverse order Once the counter flow heat exchanger is in place: • Push the exchanger in using both hands to ensure it is put back correctly

5.3.3 Servicing and cleaning

Cleaning the counter flow heat exchanger:

- Clean the exchanger by flushing with hot water
- Water temperature max. 90ºC.

How to clean the fan

See section "Internal transport with reduced weight" for details on how to remove the fan units.

Step	Action
1	Switch off the power supply to the unit at the isolation switch
2	Clean the fan impellers with a vacuum cleaner and by wiping with a damp cloth **NB: Clean the impellers carefully to avoid disturbing the balance**
3	Once re-fitted, check the unit operates without vibrating

Cleaning cold water coil/heating coil

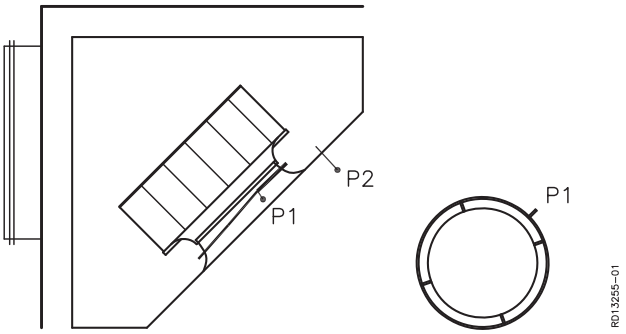
Step	Action
1	Switch off the power supply to the unit at the isolation switch
2	Vacuum clean the heating coil
3	Cold water coil: clean the condensation tray

5.4 Airflow measurement

5.4.1 Determination of airflow

Airflow in the unit can be determined by pressure measurements. In each ventilator inlet there are measurement spigots for use in pressure measurements, see drawing below:

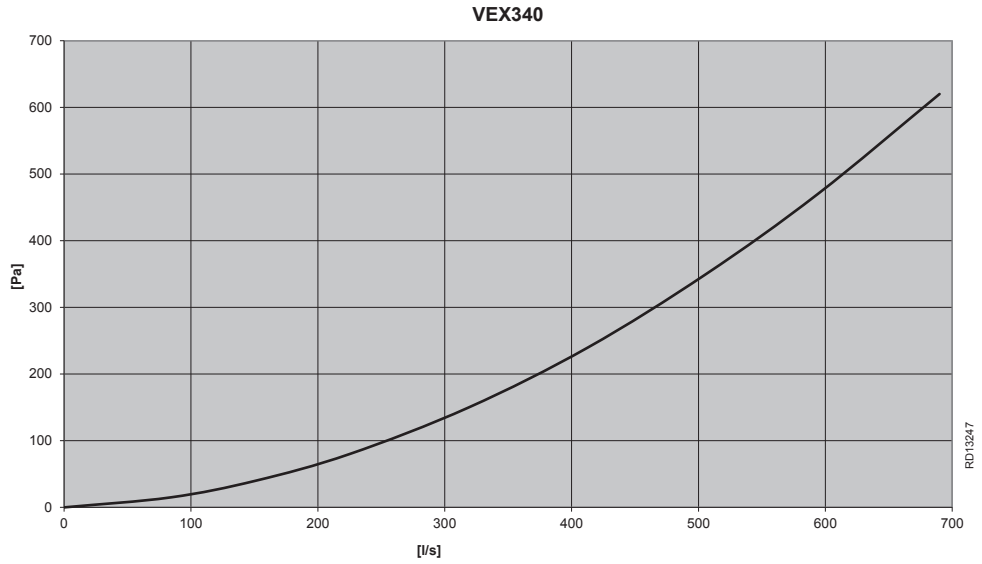
- Connect the inlet spigots to a measurement point P1
- Measure reference pressure P2
- Calculate Δp: P1 - P2 = Δp



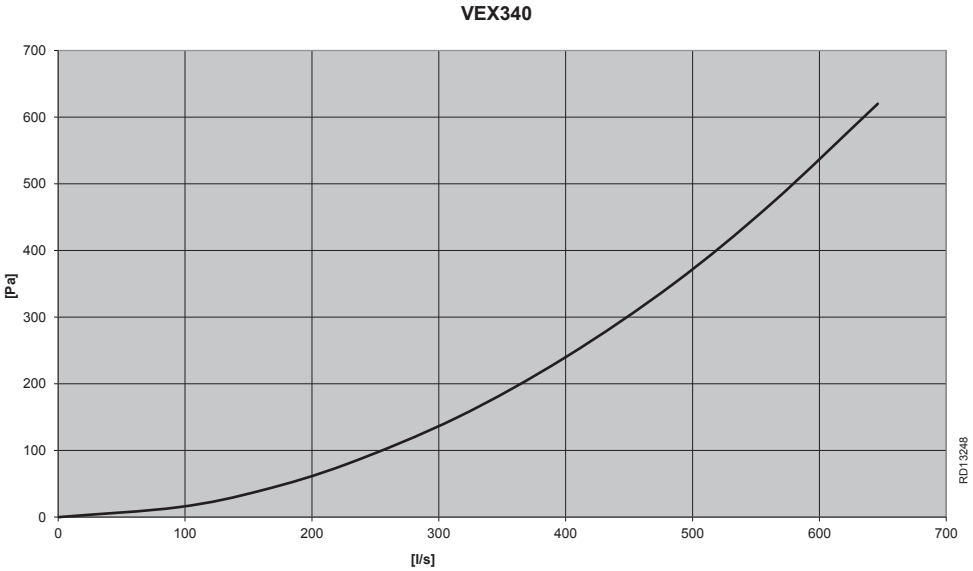
By using the value for Δp in the relevant diagram (either supply air or extract air), the airflow can be read off.

Pressure curves

Supply air:



Extract air:


VEX340
700
600
500
400
300
200
100
0
[Pa]
0
100
200
300
400
500
600
700
[l/s]
RD13248

6. Technical data

6.1 Weight, corrosion class, temperature ranges, etc.

Weight

Weight	450 kg

Corrosion class

Corrosion class	Corrosion class C4 in accordance with EN ISO 12944-2 Environmental class M3 in accordance with VVS AMA 98

Temperature ranges (without pre-heating)

Fluid temperature (air)	-40ºC to +40°C
Ambient temperature (operating)	-30ºC to +40ºC
Ambient temperature (short term operation, less than six hours)	-30ºC to +50ºC
Ambient temperature when not in operation (storage, transport)	-40ºC to +60ºC

The temperature ranges given are dependent on the type of installation, humidity, airflow, the balance between airflows, ducts and insulation and room temperature. If using pre-heating coils, the ambient temperature can be reduced.

At temperatures below -25˚C (with outdoor installation), use of a thermostatically controlled heater in automated control box is recommended.

Motor damper

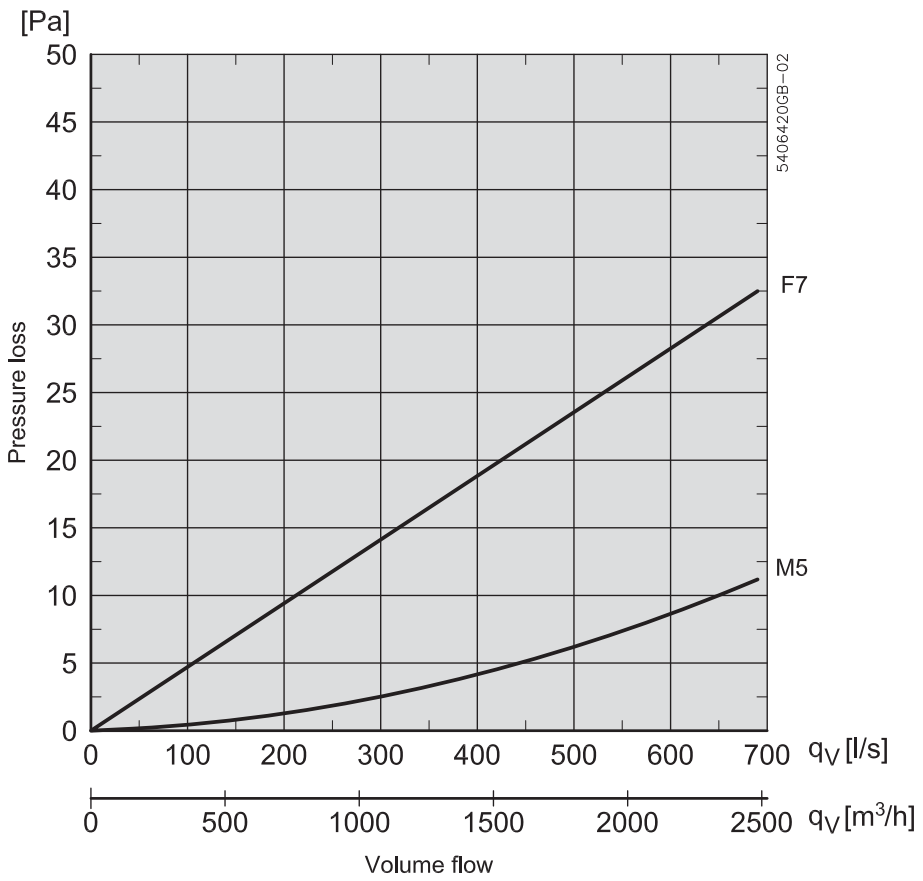
Motor damper type	LS400-24	LSR400-24
Designation	LSA/LSF	LSFR
Motor type	NM24-F	AF-24
Rotation time	75–150 s	open/close: 50 s
Ingress protection	IP42	IP42
Ambient temperature	-20ºC to +50ºC	-30ºC to +50ºC

Motor data

Voltage	1 x 230 V/ 2 x 230 V
Moment	1.8 Nm
Max. rpm	2,900
Motor class in accordance with IEC TS 60034-30-2	As IE5 (Ultra Premium efficiency)

6.2 Compact filters

Pressure loss curves for M5 and F7 filters



Filter data	M5	F7
Panel filter h x w	716 x 836 mm 2 x 1	716 x 836 mm 2 x 1
Panel filter thickness	96	96
Filter area	6.9 m^2	21.6 m^2
Filter class	M5	F7
Retention efficiency in accordance with EN779	96 %	> 99 %
Efficiency	45 %	85 %
Volume flow rate	2,200 m³/h	2,200 m³/h
Initial pressure drop	9 Pa	29 Pa
Recommended final pressure drop at normal volume flow rate	109 Pa	129 Pa
Temperature resistant to	70 ℃	70 ℃

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

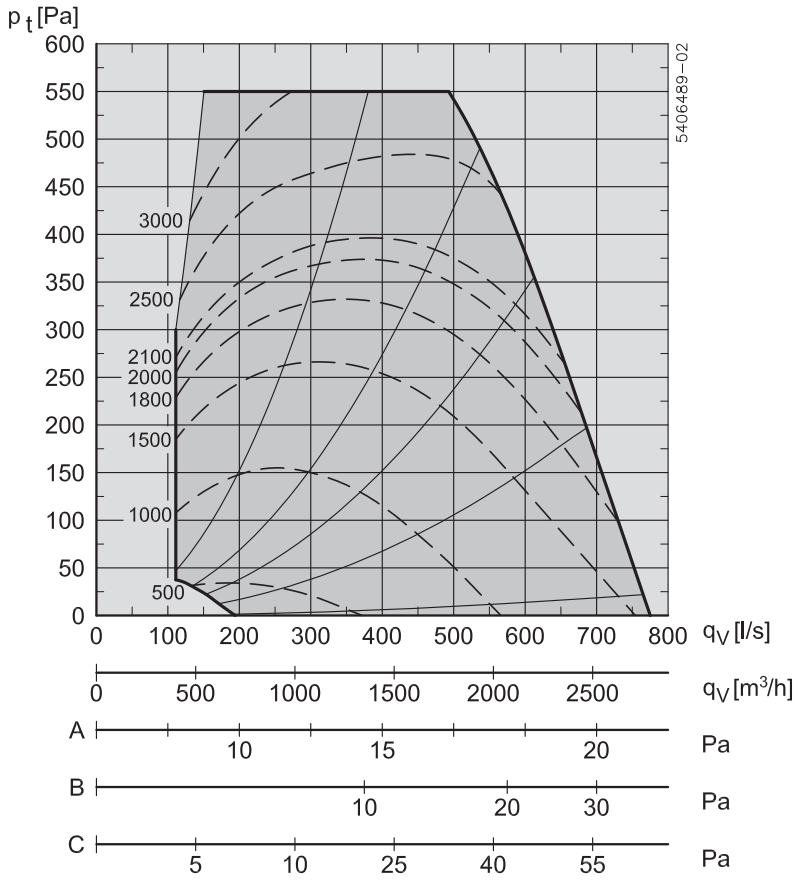
EUROVENT certification is only valid if original filters are used. For more details about original filters, see section "Maintenance".

6.3 Bag filters

EUROVENT certification is only valid if original filters are used. For more details about original filters, see section "Maintenance".

6.4 Capacity diagram

Capacity diagram for VEX340H



——— Capacity diagram with M5 filters

- - - - - SFP-curve (J/m^3)

——— Operating curves

A: Pressure supplement with F7 filters
B: Pressure supplement with heating coil (HCE/HCW)
C: Pressure supplement with CCW

6.5 Ordering spare parts

Find production number

When ordering spares, please state the relevant production part number. This will ensure that the correct parts are delivered. The production number is given on the front of the VEX guidelines and on the VEX rating plate.

Contact:

Contact your local EXHAUSTO office service department to order a spare part. Contact information is given on the back cover of these instructions. See also the "Layout" section for an overview of the position and designation of parts in the VEX.

Scan code and go to addresses at
www.exhausto.com

EXHAUSTO