GB

# VEX250H

## Mechanical assembly
## EXact2 control

VEX200 RANGE ROTARY HEAT EXCHANGER

**Unit supplied with (factory fitted):**

- ☐ Rotor with standard temperature efficiency
- ☐ Rotor with high temperature efficiency
- ☐ Compact filters FP
- ☐ Bag filter FB
- ☐ Trim damper and blowout zone, TB250
- ☐ OD (roof for outdoor)
- ☐ Webserver
- ☐ MLON

**The following accessories are supplied separately:**

- ☐ HCW heating coil
- ☐ HCE heating coil
- ☐ CCW cold water coil
- ☐ DX cooling/heating coil
- ☐ Mounting base, MSVEX250H
- ☐ Closing damper, LS400-24, (LSA exhaust)
- ☐ Closing damper, LS400-24, (LSF outdoor)
- ☐ Closing damper, LSR400-24, with spring-return (LSFR outdoor)
- ___ pieces, Fire thermostat, BT40
- ___ pieces, Fire thermostat, BT50
- ___ pieces, Fire thermostat, BT70
- ___ pieces, Control panel, HMI
- ___ pieces, Motion sensor MIO-PIR
- ___ pieces, Constant pressure control, MPT-DUCT
- ☐ Humidity sensor, MIO-RH
- ☐ $CO_2$-sensor, MIO-CO2-DUCT
- ☐ $CO_2$-sensor, MIO-CO2-ROOM
- ☐ Temperature sensor, MIO-TS-DUCT
- ☐ Temperature sensor, MIO-TS-ROOM
- ☐ Control for external cooling unit, MXCU
- ☐ Control for external heating coil, MHCW
- ☐ Control for external cold water coil, MCCW
- ☐ _____

Serial no.: _____

Prod. order no.: _____

Sales order no.: _____



**Original instructions**


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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.

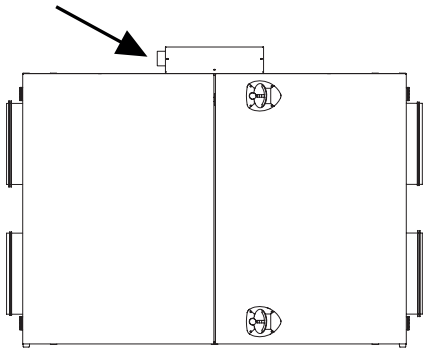
**NB**

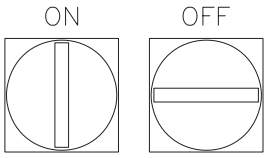
**When retrofitting EXHAUSTO accessories, please update the checklist on the front page.**

**Warnings:**

**Opening the unit**

**Do not open the service doors before the supply voltage has been disconnected at the isolation switch and the fans have stopped. The isolation switch is positioned on the left side of the connection box on top of the unit.**






RD12461-01

**Prohibited**

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

**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).**

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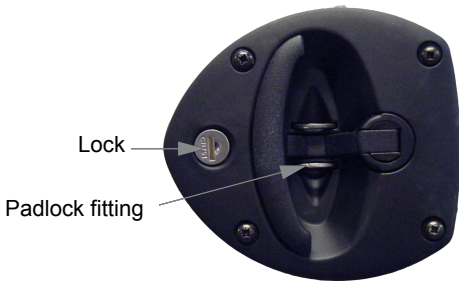
**Lock the air handling unit during operation**

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.

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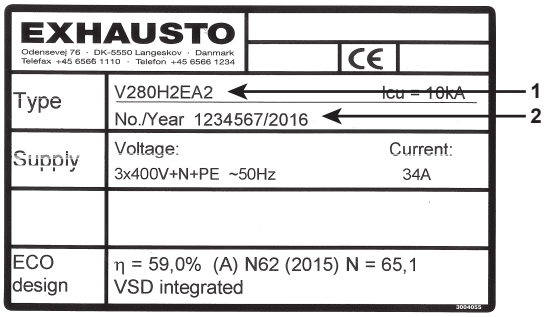
**Rating plate**

The VEX unit rating plate shows:

- VEX unit, type (1)
- production number (2)




**NB** **Always have the production number ready when contacting EXHAUSTO A/S.**

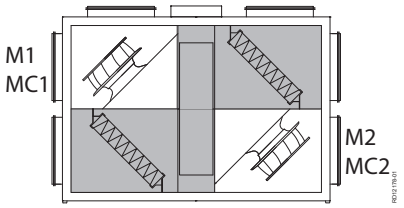
# 1. Product information

## 1.1 Model overview

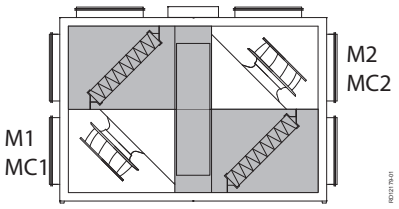
**Model overview**

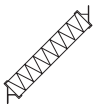
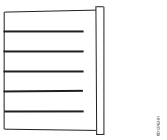
**Positioning of fan, motor (M) and motor control (MC)**

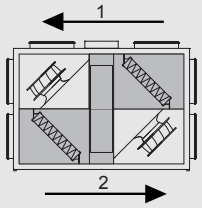
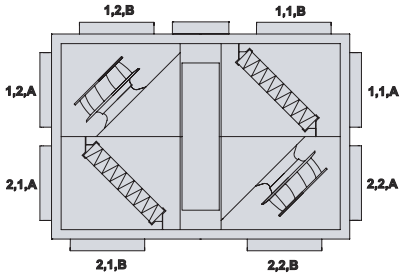
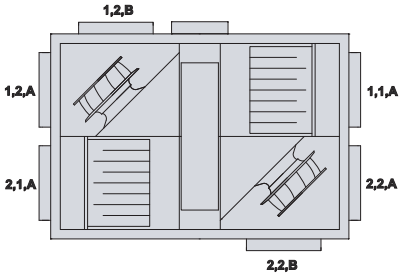
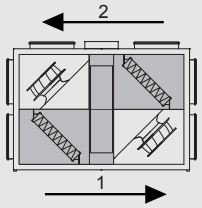
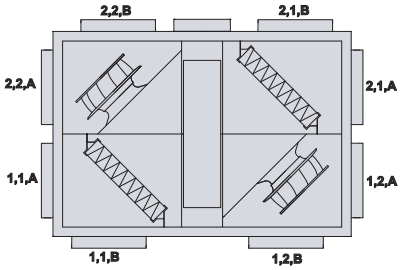
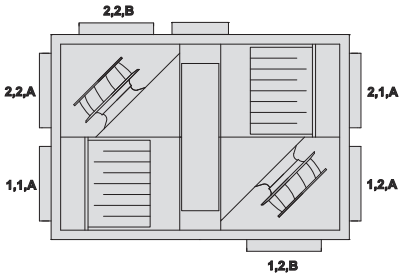
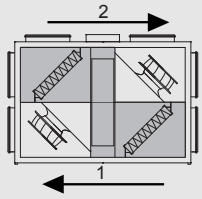
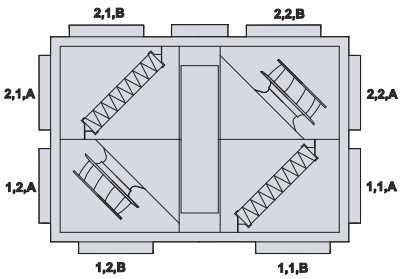
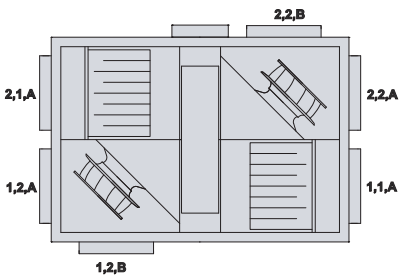
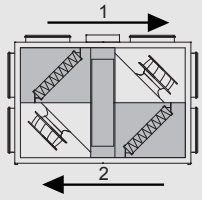
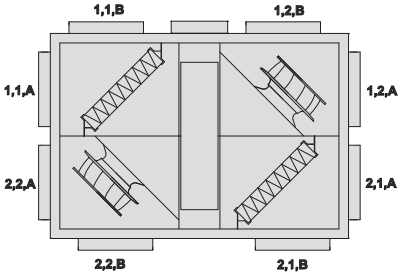
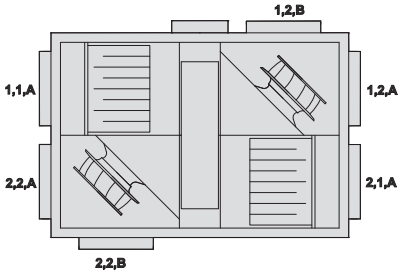
**Fan placement 1 (V1)**




**Fan placement 2 (V2)**

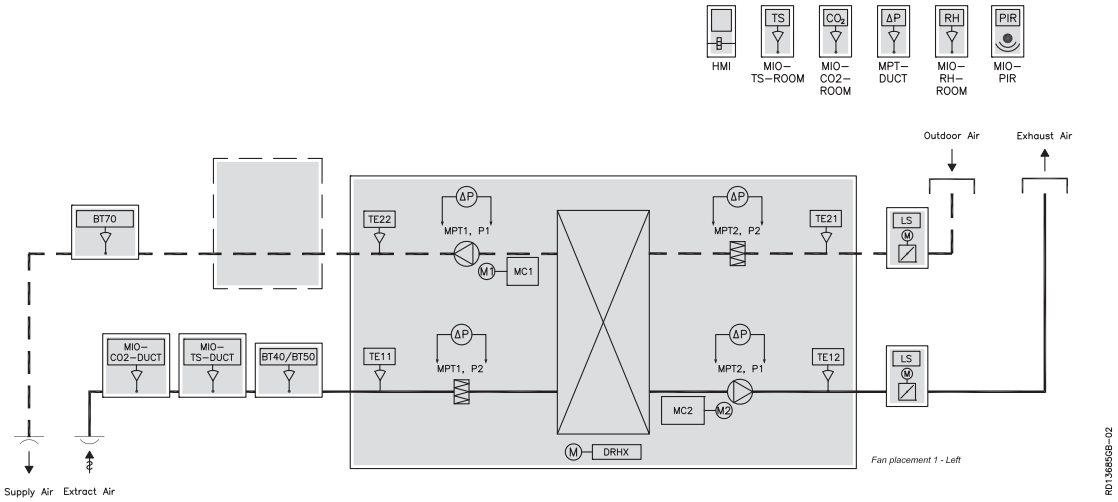



| Elements | Description |
|---|---|
|  | Fan |
|  | Compact filter |
|  | Bag filter |
| 1,1,A or B | Extract air spigot |
| 1,2,A or B | Exhaust air spigot |
| 2,1,A or B | Outdoor air spigot |
| 2,2,A or B | Supply air spigot |
|   | Air direction, extract air |
|   | Air direction, supply air |

| Optional spigot positions in relation to fan placement and filter type | | |
|---|---|---|
| **Fan placement and airflows** | **Compact filters**  | **Bag filters**  |
| Fan placement 1, Right   |   |   |
| Fan placement 1, Left   |   |   |
| Fan placement 2, Right   |   |   |
| Fan placement 2, Left   |   |   |

## 1.2 Designations used in these instructions

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




| Component | Function |
|---|---|
| BT40/BT50[1)] | Fire thermostat, 40°C/50°C (extract air) |
| BT70[1)] | Fire thermostat 70°C (supply air) |
| MC1 | Motor control, motor 1 (extract air) |
| MC2 | Motor control, motor 2 (supply air) |
| HMI[1)] | Control panel |
| LS[1)] | Closing damper, outdoor air/exhaust air |
| M1 | Fan motor 1 |
| M2 | Fan motor 2 |
| MIO-$CO_2$-DUCT[1)] | $CO_2$ sensor, duct |
| MIO-$CO_2$-ROOM[1)] | $CO_2$ sensor, room |
| MIO-PIR[1)] | PIR sensor |
| MIO-RH-ROOM[1)] | Humidity sensor |
| MIO-TS-ROOM[1)] | Temperature sensor, room |
| MIO-TS-DUCT[1)] | Temperature sensor, extract air (external) |
| MPT1, P1 | Airflow control, supply air |
| MPT1, P2 | Filter monitor, extract air |
| MPT2, P1 | Airflow control, extract air |
| MPT2, P2 | Filter monitor, outdoor air |
| MPTDUCT[1)] | Pressure transmitter, constant pressure regulation |
| DRHX | Control unit for the rotary heat exchanger |
| TE11 | Temperature sensor, extract air |
| TE12 | Temperature sensor, exhaust air |
| TE21 | Temperature sensor, outdoor air |
| TE22 | Temperature sensor, supply air |

[1)]Accessory. See checklist on the front page of these instructions.

## 1.3 Application

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

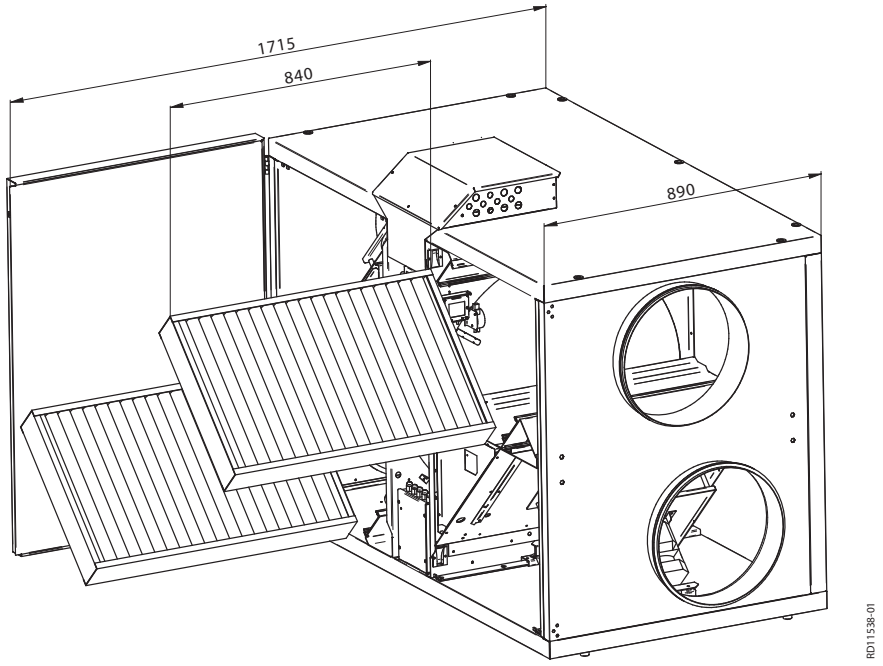
**Prohibited uses** The VEX unit is not to be used to transport solid particles or in areas where there is a risk of explosive gases.

## 1.4 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).

### 1.4.1 Spatial requirements

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




**NB:** **A free height of at least 200 mm is required above the unit's connection box.**

### 1.4.2 Requirements for underlying surface

When fitting the unit directly to an existing surface - i.e. without using the mounting base (accessory) - the surface must be:

- level
- horizontal (±3 mm per metre
- hard
- vibration-resistant

### 1.4.3 Requirements for duct system

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

**Bends**

A duct bend may be fitted immediately after the unit, because the airflow in the spigot has a uniformly moderate speed profile, which results in negligible system pressure loss.

**Insulation**

**The duct system must be insulated against:**

- **condensation**
- **sound leakage**
- **heating/cooling losses**

**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**

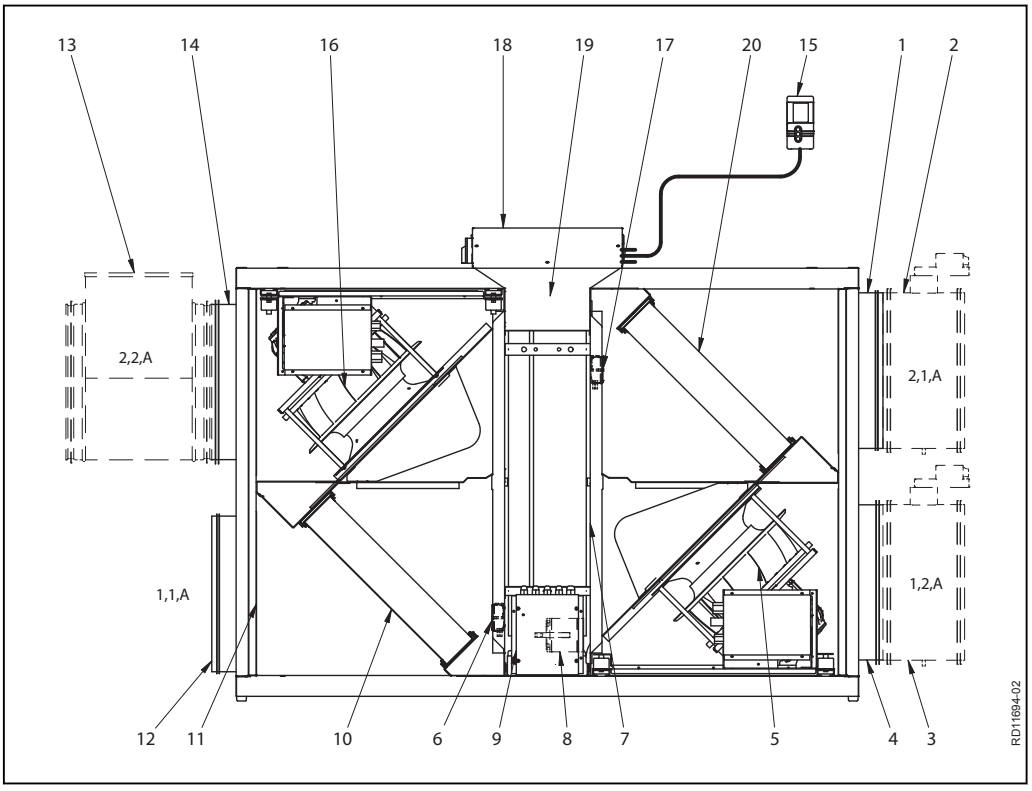
**If one or more of the spigots is not connected to a duct: Fit a protective net to the spigots with a maximum mesh width of 20 mm.**

## 1.5 Description

### 1.5.1 The VEX unit design

**VEX200L - V1**

The drawing below illustrates the construction of the unit (without service doors).



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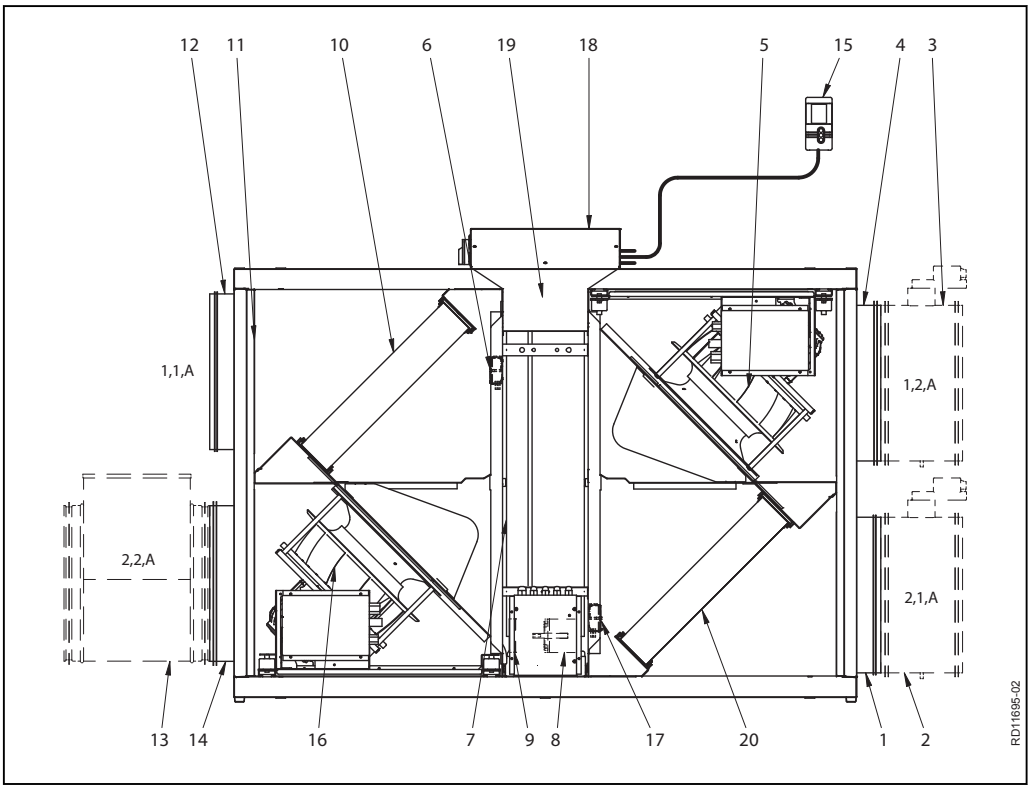
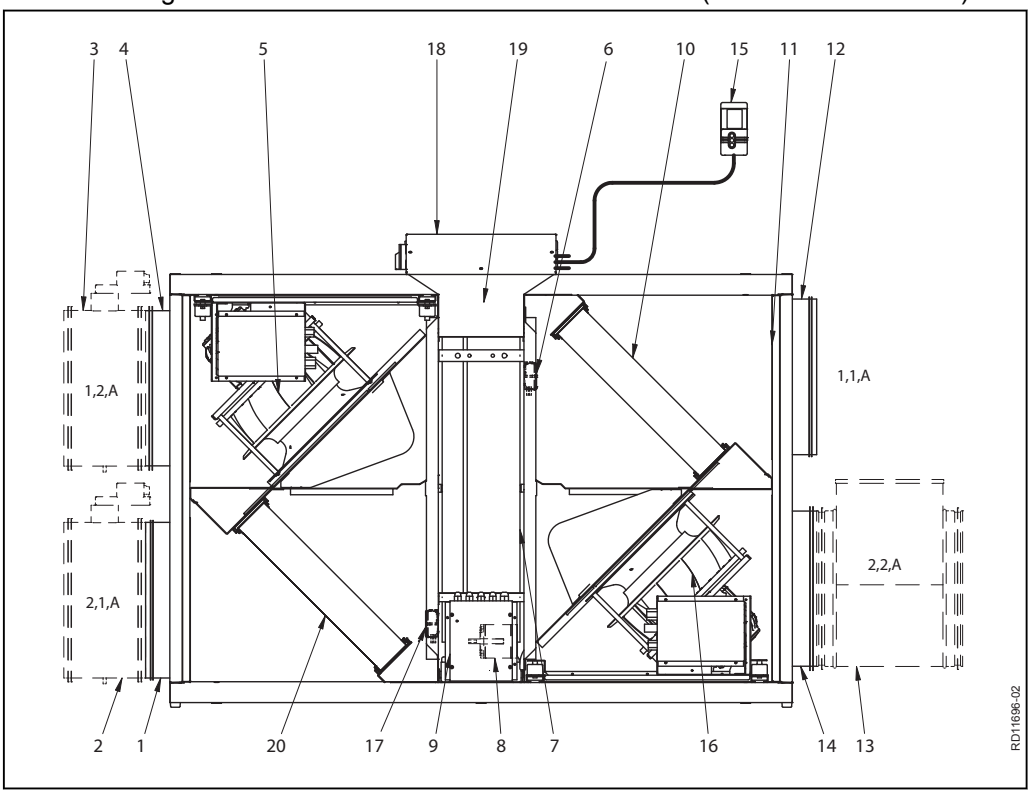
**VEX200L - V2**

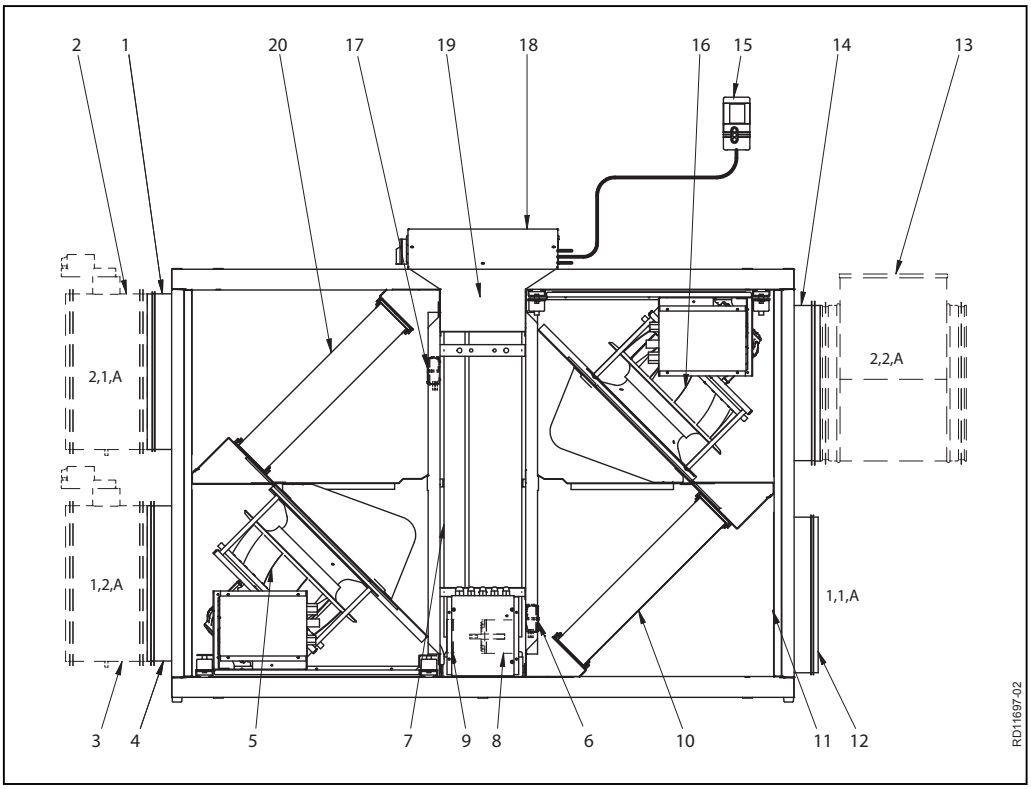



**VEX200R - V1**

The drawing below illustrates the construction of the unit (without service doors).



**VEX200R - V2**




| Pos. no. | Part | Function |
|---|---|---|
| 1 | Spigot 2.1.A | Outdoor air spigot The spigot can also be positioned on the top or in the bottom of the unit (2,1,B) – though only on units with compact filters |
| 2 | Closing damper LS | Closing damper, outdoor air, LSF (accessory) |
| 3 | Closing damper LS | Closing damper, exhaust air, LSA (accessory) |
| 4 | Spigot 1.2.A | Exhaust air spigot The spigot can also be positioned at the bottom of the air handling unit (1.2.B). |
| 5 | Fan unit | For extract air/exhaust air |
| 6 | MPT1 | Measurement of pressure in extract air duct |
| 7 | Rotary heat exchanger | Conducts heat from extract air to supply air |
| 8 | Step motor | Drives the rotary heat exchanger via the drive belt |
| 9 | Rotor control | Controls and monitors the step motor |
| 10 | Extract air filter | Filters extract air. |
| 11 | Trim damper | The trim damper (accessory) ensures there is pressure balance across the rotor and seals to prevent extract air from entering the supply air. Used with blowout zone (accessory) |
| 12 | Spigot 1.1.A | Extract air spigot The spigot can also be positioned in the bottom of the unit (1,1,B) – though only on units with compact filters. |
| 13 | Heating coil | Heats supply air if heat recovery is insufficient (accessory) |
| 14 | Spigot 2.2.A | Supply air spigot. The spigot can also be positioned on the top of the air handling unit (2.2.B) |
| 15 | HMI panel | Operation of the control system |
| 16 | Fan unit | For outdoor air/supply air |

| Pos. no. | Part | Function |
|---|---|---|
| 17 | MPT2 | Measures pressure in supply air duct |
| 18 | Connection box | Connection box for supply voltage, external ventilation components, HMI panel, BMS and Ethernet |
| 19 | Control system | Positioning of control system components |
| 20 | Outdoor air filter | Filters outdoor air |

**Cabinet** The inside and outside of the cabinet is made of Aluzinc® and insulated with 50 mm mineral wool.

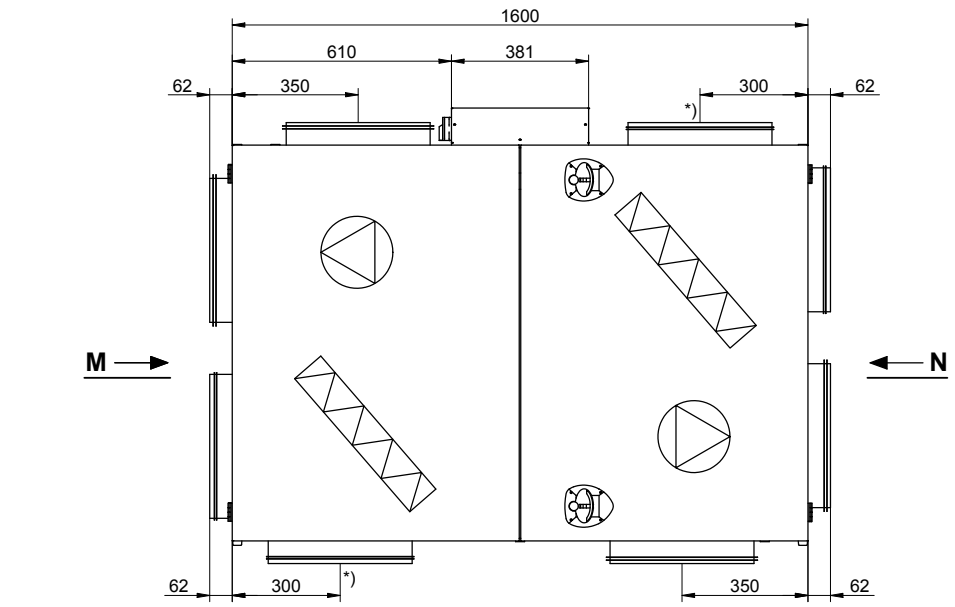
**Ventilators** The unit has a centrifugal fan for extract air and a centrifugal fan for supply air

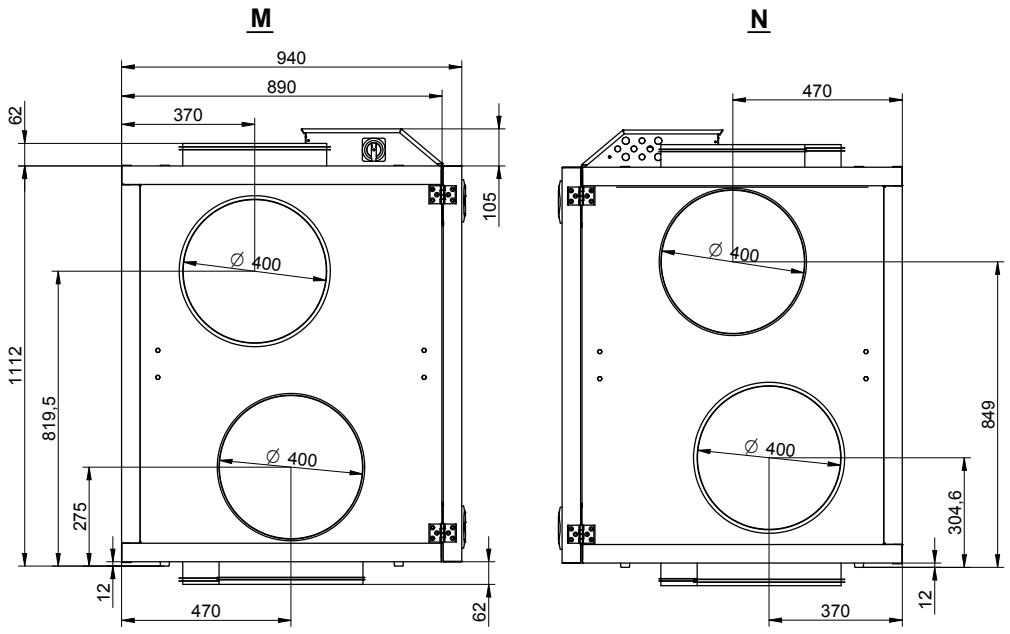
**Rotary heat exchanger** The rotary heat exchanger is driven by a step motor with rotor control, which controls the rotor's speed.

**Filters** There are built-in compact filters (as shown on the drawings on the previous pages) or bag filters on both the extract air and supply air side.

## 1.6 Principal dimensions

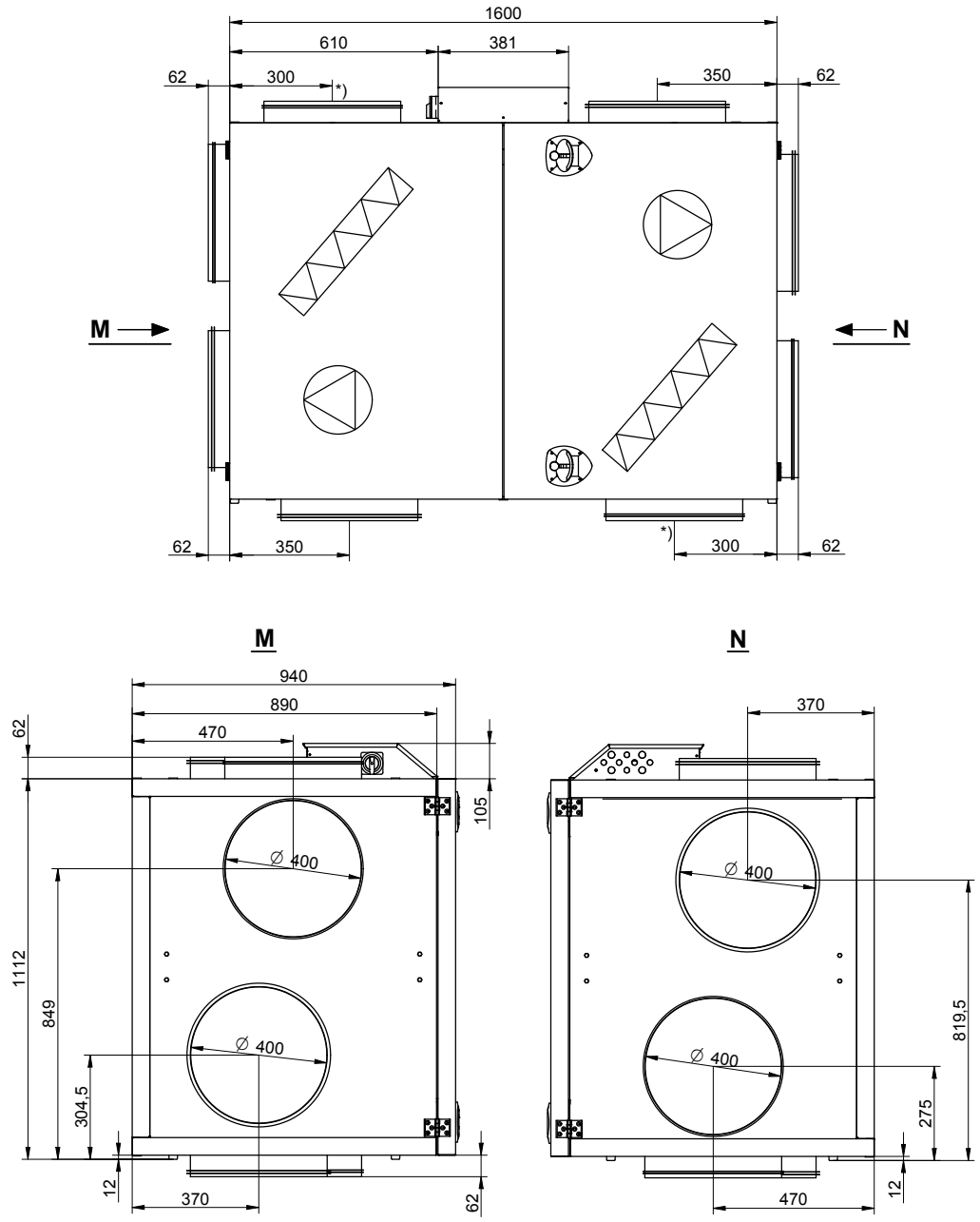
**VEX250, V1**




**NB** **The drawing shows all of the spigot positioning options. Spigot positioning marked with * is not available for VEX units with a bag filter.**

**VEX250, V2**




**NB** **The drawing shows all of the spigot positioning options. Spigot positioning marked with * is not available for VEX units with a bag filter.**

# 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.**

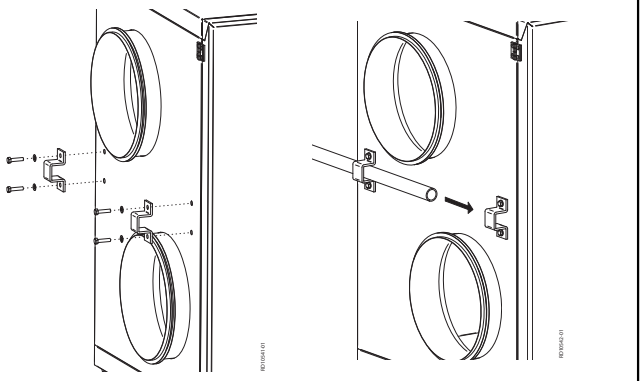
**The unit should be cleaned before it is used.**

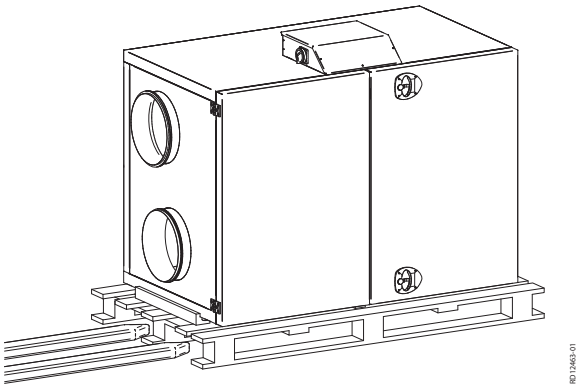
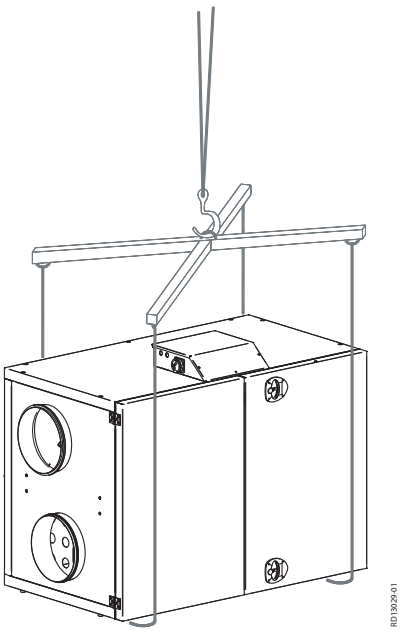
Once the VEX unit is fitted, it must be checked and thoroughly cleaned. All dust, debris and metal shavings must be vacuumed up.

## 2.2 Transport

**Transport equipment**

Transport the VEX unit in one of the following ways:

| Method | Drawing |
|---|---|
| **Manual transport:** Lifting brackets for manual transport can be fitted as shown on the drawing: |  |

| Method | Drawing |
|---|---|
| **Using pallet truck or fork-lift truck:**<br>Lift the VEX unit on the disposable pallet.<br>**IMPORTANT**: If the disposable pallet cannot be used, the forks on the lifting equipment must be long enough to prevent damage to the bottom of the unit. |  |
| **Crane:**<br>**Never lift the VEX unit with the lifting brackets by using a crane.**<br>Use straps and lifting yokes to prevent damage to the unit. |  |

### 2.2.1 Weight

The unit weighs 277 kg

### 2.2.2 Passage through openings

**Height** The unit's height is 1,217 mm.

**Width** The list (below) shows how wide 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 948 mm | remove doors, see relevant section |
| Greater than 948 mm | The unit can pass through |

* Measurements are based on the exact dimensions of the air handling unit

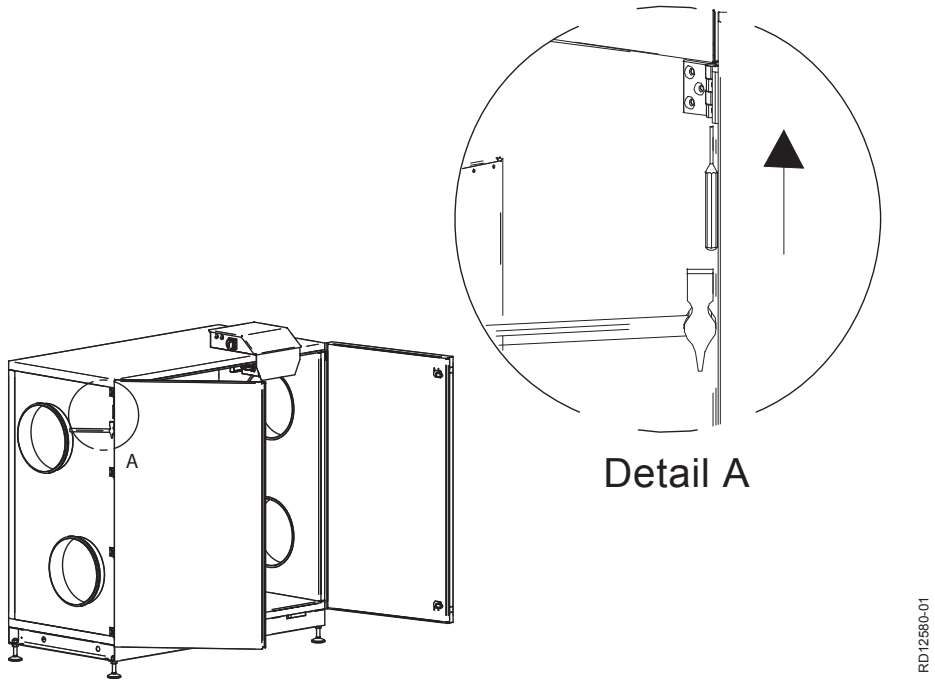
### 2.2.3 Internal transport with reduced weight

**Weight reduction**

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

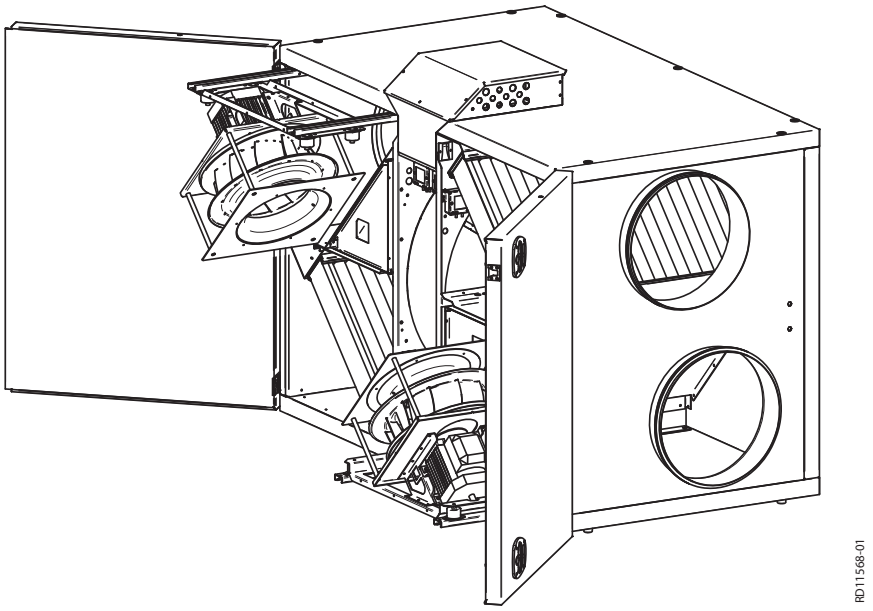
**Removing the service doors**

To remove the service doors:




| | |
|---|---|
| **A** | ● Open both doors<br>● Tap the hinge door pin out using a small pin bolt or similar<br>● 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 bindings 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 and modbus cable in the motor control box |
| 5 | Remove the measuring hose which is fixed to the intake |
| 6 | Remove the two end-stop screws (one on each rail). The fan unit can now be lifted off.<br><br>**NB: A single fan unit weighs 26 kg.** |

# 3. Mechanical assembly

## 3.1 Installing the unit

**Description** The VEX unit is installed so that it is horizontal.

### 3.1.1 Installed directly onto the floor

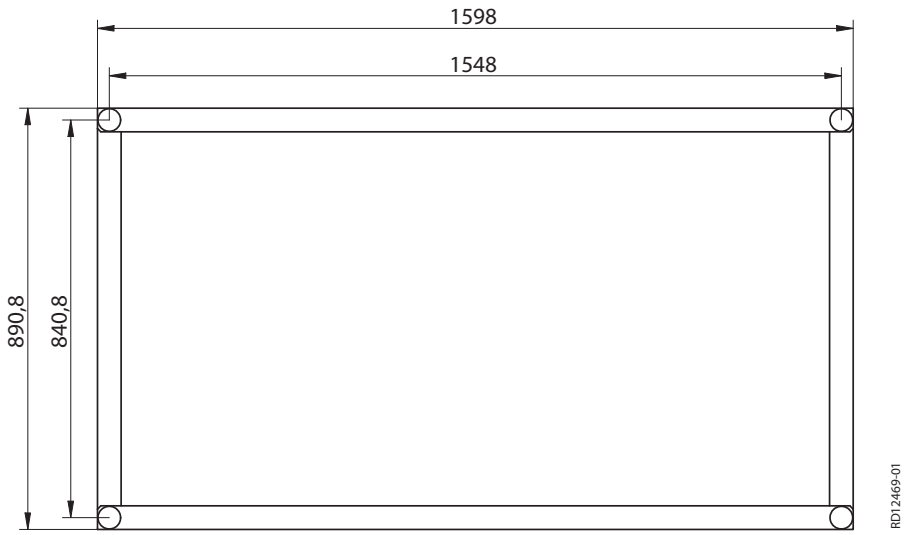
The requirements for the floor surface must be met, see the section entitled "Requirements for underlying surface", chapter 1.

**NB** **After installation, check the VEX unit is completely level.**

### 3.1.2 Installing on mounting base

The EXHAUSTO mounting base enables the air handling unit to be installed correctly. The base is equipped with adjustable levelling screws, so that the air handling unit can be fitted horizontally on a surface that is not level ( +/- 20 mm per metre). See diagram no. 3002646 for installing on the mounting base.

**Diagram showing levelling screw positions**



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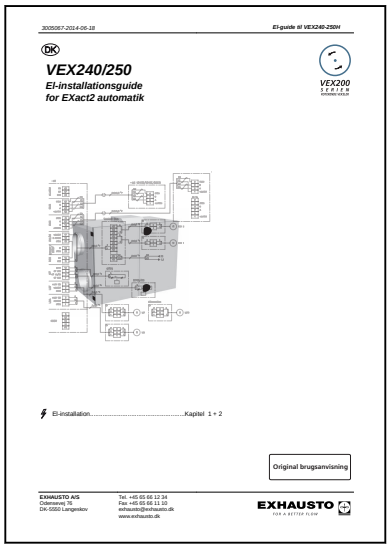
# 4. Electrical installation

## 4.1 Electrical installation

See the attached instructions “VEX240-250 Electrical installation guide for EXact2 control system”:



3005067-2014-06-18 *El-guide til VEX240-250H*

DK

**VEX240/250**

***El-installationsguide***
***for EXact2 automatik***

VEX200 SERIES

El-installation.....Kapitel 1 + 2

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# 5. Maintenance

## 5.1 Operating readings via the HMI panel

**HMI panel**

Refer to the “EXact2 Control System Basic Instructions for the VEX200 series” for instructions on accessing Menu 2 Operating readings via the technician menu (access code 1111) to check the unit’s operating status.

## 5.2 Maintenance chart

**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 |
|---|---|---|---|
| **Filters*** | **Change when the display shows the filter alarm**. Recommended that both filters are replaced at the same time.<br><br>**NB:** The control system will give an ‘early warning’ when a filter is becoming soiled, so that there is time to obtain a new filter before the filter has to be changed.<br><br>The filter should be changed at least | | 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<br>Removal of fan unit. See section "Internal transport with reduced weight"<br>Cleaning. See next section | X | |
| **Rotary heat exchanger** | Check<br>Cleaning, as required, see next section | X | |
| **Safety functions check** | Fire thermostats<br>Temperature sensors on heating pipe (accessories) | X | |
| **Closing damper** | Function inspection | X | |
| **Motor valve and circulation pump (accessories)** | Function inspection | X | |

***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

## 5.3 Service

### 5.3.1 Filter change

**Use original filters**

**Only use original filters. See section "Maintenance chart".**

**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.
Discarded filters must be stored immediately in sealed plastic bags and disposed of responsibly.

**Filter change in menu 8.1**

**After filter change (timer operation only):** Go to menu 8.1 in the EXact control system and select "Yes" next to filter change to reset the operating days counter.

### 5.3.2 Servicing and cleaning

**Cleaning motor/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 before opening the doors |
| 2 | Clean the fan impellers with a vacuum cleaner and wipe down with a damp cloth if necessary |
| 3 | Clean the impeller blades carefully, so as not to disturb the balance |
| 4 | Once re-fitted, check the unit operates without vibrating |
| **Inspection of measuring points hoses** | |
| 5 | Remove the hoses at the connection box |
| 6 | Blow air through the hoses to remove any impurities |

**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 cold water coil/heating coil |
| 3 | Cold water coil: clean the condensation tray |
| 4 | Check the fins on the exchanger are not deformed.<br>**The fins are sharp.** |

**Cleaning rotary exchanger**

| Step | Action |
|---|---|
| 1 | Switch off the power supply to the unit at the isolation switch before opening the doors |
| 2 | Vacuum clean the exchanger with caution, ideally using a soft brush vacuum nozzle.<br>⚠ **Avoid touching the fins in the exchanger with sharp or hard objects – the fins are very soft and can easily be deformed, which will diminish the performance of the VEX.** |
| 3 | Check the fins on the exchanger are not deformed.<br>⚠ **The fins are sharp.** |

# 6. Technical data

## 6.1 Weight, corrosion class, temperature ranges, etc.

**Weight**

| | |
|---|---|
| Doors | 2 x 15 kg |
| Fan section | 2 x 26 kg |
| Unit without doors and fan section (for internal transport) | 195 kg |
| The total weight of the unit | 277 kg |

**Corrosion class**

| | |
|---|---|
| Corrosion class | Corrosion class C4 in accordance with EN ISO 12944-2 |

**Temperature range**

| | |
|---|---|
| Outdoor air temperature | -40ºC to +35°C |
| Ambient temperature | -30ºC to +50ºC |

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

**HMI-panel**

| | |
|---|---|
| Ingress protection | IP20 |
| Ambient temperature | 0°C - +50°C |

At temperatures below 0˚C the display may react more slowly than usual.

**Fire thermostats**

| | |
|---|---|
| Cut-out temperature, BT70 | 70°C |
| Cut-out temperature, BT50 | 50°C |
| Cut-out temperature, BT40 | 40°C |
| Max. ambient temperature, sensor | 250°C |
| Ambient temperature, thermostat housing | 0°C - +80°C |
| Sensor length | 125 mm |
| Ingress protection | IP40 |

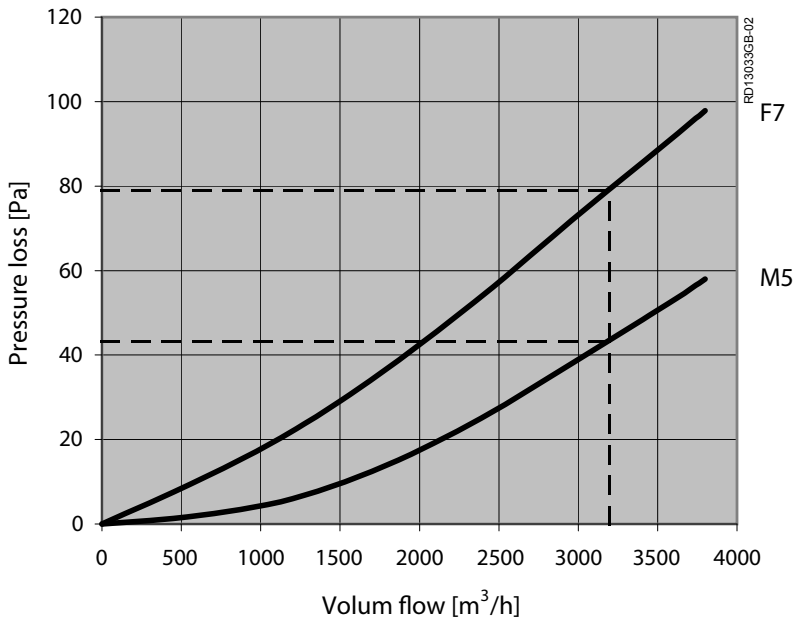
**Motor damper**

| Motor damper type | LS400-24 | LSR400-24 |
|---|---|---|
| Designation | LSA/LSF | LSFR |
| Motor type | NM24-F | AF-24 |
| Rotation time | 75–150 s | open: 16 s<br>close: 150 s |
| Ingress protection | IP42 | IP42 |
| Ambient temperature | -20ºC to +50ºC | -30ºC to +50ºC |
| Damper depth (LS rail system) | 100 mm | 100mm |

There may be a maximum of two LSR dampers or four LS dampers.

## 6.2 Compact filters

**Pressure loss curves for M5 and F7 filters**




| Filter data | FP250M5 | FP250F7 |
|---|---|---|
| Panel filter h x w | 520 x 835 mm | 520 x 835 mm |
| Panel filter thickness | 96 | 96 |
| Filter area | 5 m² | 15.7 m² |
| Filter class | M5 | F7 |
| Retention efficiency in accordance with EN779 | 96 % | > 99 % |
| Efficiency | 45 % | 85 % |
| Volume flow rate | 3,200 m³/h | 3,200 m³/h |
| Initial pressure drop | 43 Pa | 79 Pa |
| Recommended final pressure drop at normal volume flow rate | 143 Pa | 179 Pa |
| Temperature resistant to | 70°C | 70°C |

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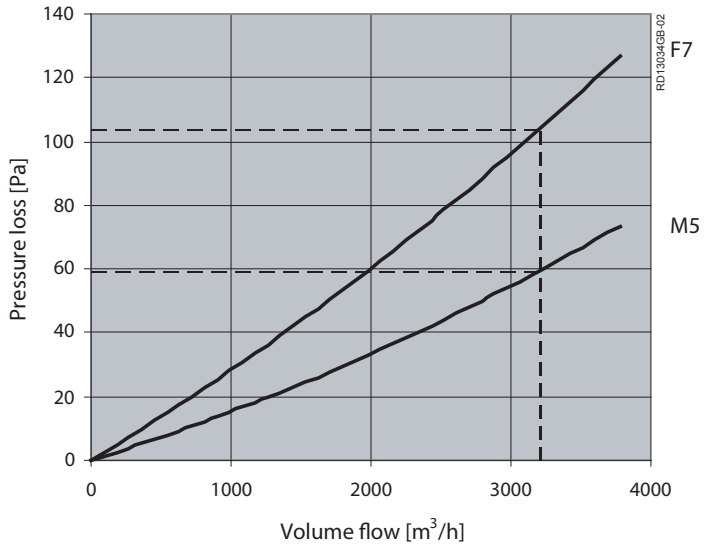
EUROVENT certification is only valid if original filters are used. For more details about original filters, see section "Maintenance".

## 6.3 Bag filters

**Pressure loss curves for M5 and F7 filters**




| Filter data | FB250M5 | FB250F7 |
|---|---|---|
| Filter area | 4.84 m² | 5.96 m² |
| Face area h x b | 490 x 835 mm | 490 x 835 mm |
| Total number bags x depth | 13 x 380 mm | 16 x 380 mm |
| Filter class | M5 | F7 |
| Retention efficiency in accordance with EN779 | 96 % | > 99 % |
| Efficiency | 45 % | 85 % |
| Volume flow rate | 3,200 m³/h | 3,200 m³/h |
| Initial pressure drop | 59 Pa | 104 Pa |
| Recommended final pressure drop at normal volume flow rate | 159 Pa | 200 Pa |
| Temperature resistant to | 70°C | 70°C |

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

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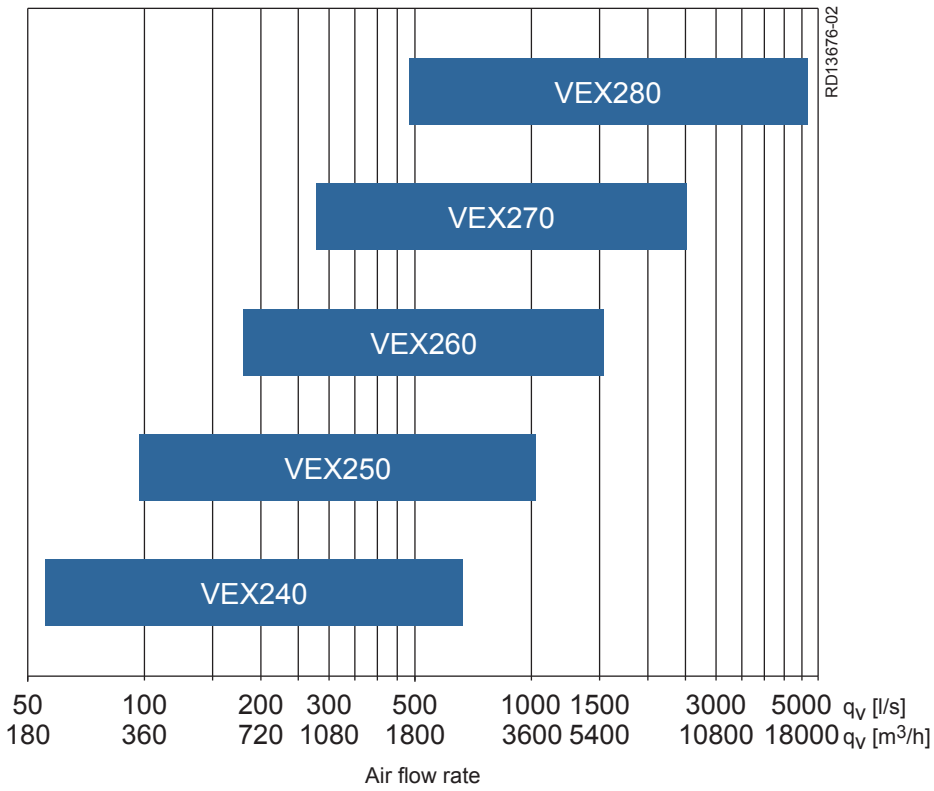
## 6.4 Capacity diagram




**Recommendation**

You are recommended to make a more precise calculation of the unit's capacity with the EXselect calculation program, available on the EXHAUSTO web-site.

## 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

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