GB

# Electrical installation guide

## VEX1000

## With EXcon+ control system


Original instructions

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## 1. Product information



## 2. Electrical installation



## 3. Electrical components

# 1. Product information

## 1.1 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.**

**Stop and wait symbol**

**After switching off the AHU, please wait 4 minutes for the system to de-energise.**

### 1.1.1 Use and designation of the manual

These instructions apply to the **electrical system** of an **EXHAUSTO VEX1000-series Air Handling Unit**. For accompanying accessories and additional equipment, please see the product guidelines for the specific item.
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The instruction manual must be fully observed to ensure personal safety and the safety of others, andto protect equipment and ensure correct operation. EXHAUSTO A/S accepts no liability for accidentscaused by a failure to use the product in accordance with the manual's instructions and specifications.

### 1.1.2 Terms

These instructions use the following names for airflows as specified in DS447-2013:

- Supply air
- Extract air
- Outdoor air
- Exhaust air

### 1.1.3 Warnings

**The work must be performed by an authorised electrician, in accordance with locally applicable regulations and legislation.**

**The equipment shall be connected to a TT or TN-S supply.**

**The equipment shall be supplied through additional protection with an RCD relaytype B.**

### 1.1.4 Opening the air handling unit

**Do not open the service doors before the supply voltage has been disconnected at the supply disconnecting switch (main switch).**

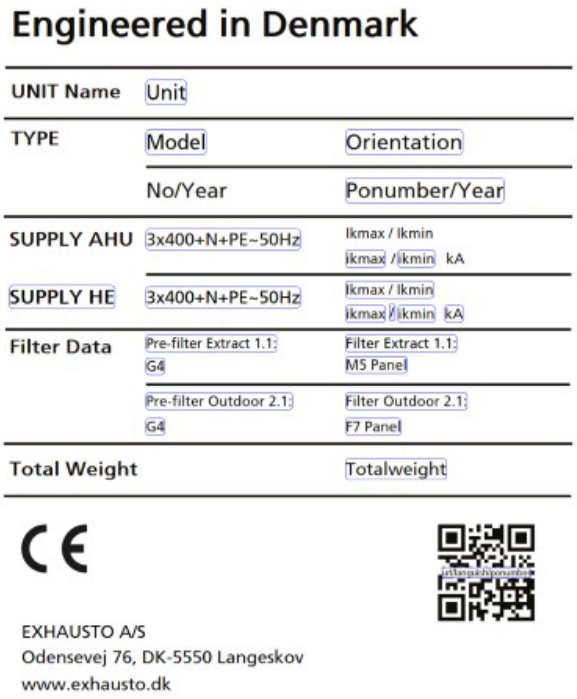
The supply disconnecting switch (main switch) is located on the control system panel for the air handling unit.


## 1.2 Data plates, location and serial/production number

### Data plate

The VEX unit data plate shows:

- VEX unit, type
- Production number
- Supply data
- Filter data
- Weight
- QR Code for documentation access
- EXHAUSTO contact information



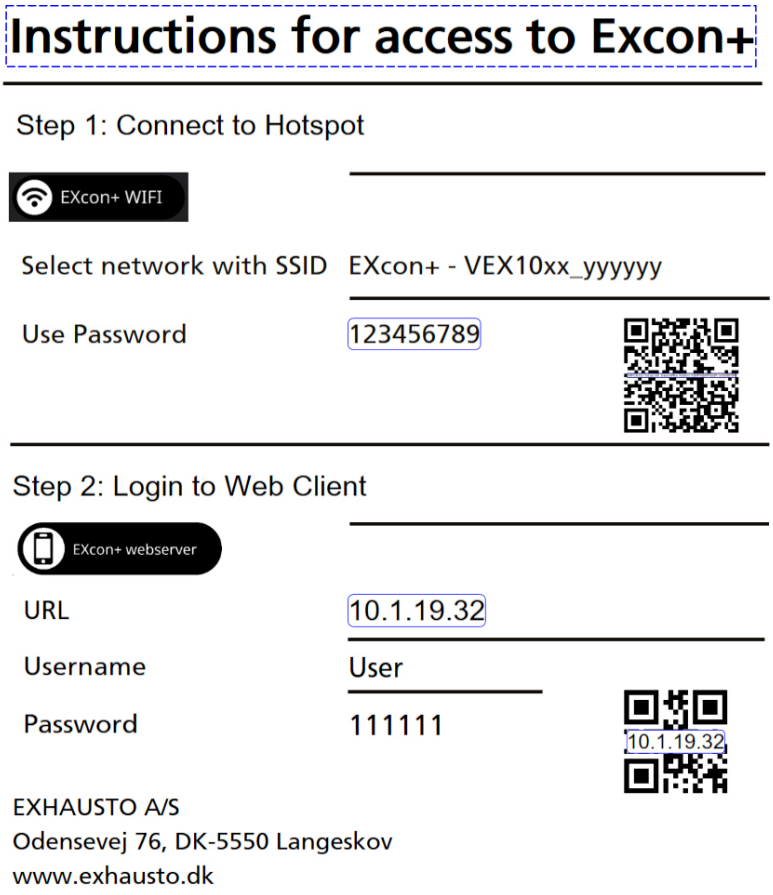

**NB** **Always have the production number ready when contacting EXHAUSTO A/S.**

**Latest version of the guidelines** **Important:** Always check whether the latest version of the manual is available.
**Scan the QR codes on the side of air handling unit to access any attached documentation.**

### 1.2.1 Latest version of the guidelines

**Important:** Always check whether the latest version of the manual is available.
**Scan the QR codes on the side of air handling unit to access any attached documentation.**

**EXcon+ data plate**




The EXcon+ data plate shows how to connect to a Wi-Fi hotspot using QR codes, and how to gain access to the EXcon+ web client. Follow the steps and log in with the usernames and passwords provided on the data plate.

**HMI panel or web interface**

Refer to the EXcon+ Instructions for the VEX1000 series for instructions on accessing "Menu 2 - Operating readings" via the technician menu in order to check the unit's operating status.

| Level | Username | Password |
|---|---|---|
| Facility manager | user | 111111 |
| Service technician | service | 333333 |

# 2. Electrical installation

## 2.1 Scope of installation

**The work must be performed by an authorised electrician, in accordance with locally applicable regulations and legislation.**

## 2.2 Dimensioning and installation

- The supply cable must be dimensioned and installed in accordance with applicable regulations and legislation.
- The earth terminal (PE) must always be connected.

### 2.2.1 Installation prerequisites

The installer must, in accordance with local applicable laws and regulations, install one line fuse and a supply cable.

### 2.2.2 Line fuse

The line fuse is used for:

- Short-circuit protection of the VEX1000 unit.
- Short-circuit protection of supply cable.
- Overload protection of supply cable.

### 2.2.3 Supply cable

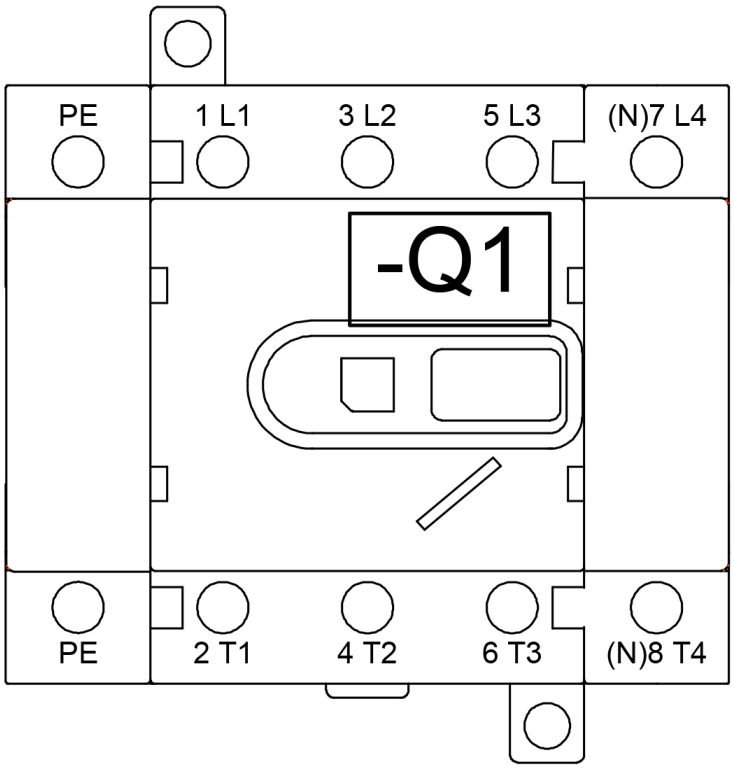
When dimensioning the supply cable, the conditions at the installation site, including temperature, cable layout and voltage drop must be taken into consideration.

### 2.2.4 Electrical connection/data

The unit's described power consumption can be found in the supplied configuration from the calculation program ExSelectPro. See unit data.

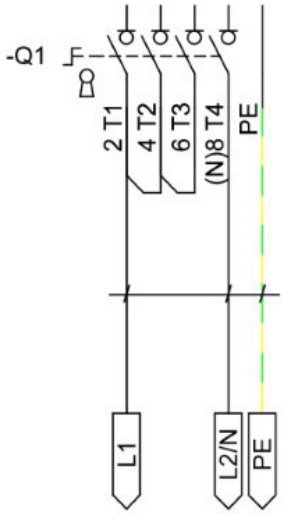
### 2.2.5 Main power

The main power supply cable should be connected directly to the main switch, tagged -Q1, as seen in the illustration below.



### 2.2.6 Supply connections

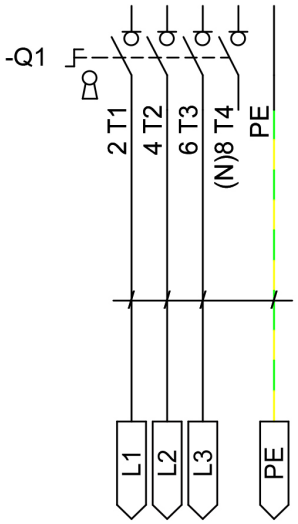
VEX1000 - Control panel 230 VAC, 50 Hz/50 Hz with one (1) heater.
These connections apply to 230 VAC, TT and TN-S power grid.
**Wiring diagrams: 0440681/0440682**




230VAC

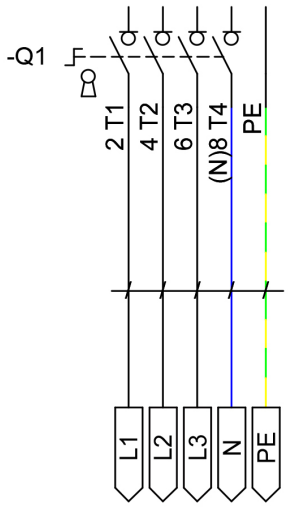
**In Denmark and Germany, a three-phase installation is legally required due to local legislation that stipulates a maximum current consumption of 16 A for single-phase installations.**

VEX1000 - Control panel 3x230 VAC, 50 Hz.
These connections apply to 3x230 VAC, TT and TN-S power grid.
**Wiring diagrams: 0440683**




3x230VAC

VEX1000 - Control panel 3x400 VAC + N, 50 Hz.
These connections apply to 3x400 VAC, TT and TN-S power grid.
**Wiring diagrams: 0440684**




3x400VAC

### 2.2.7 Installation requirements and recommendations

**Main switch and mini circuit breaker protection**

The main switch (-Q1) and automatic fuses are built into the unit to provide internal overload and short-circuit protection.

**Additional main switch for VEX1000 unit with electric heating coil**

**A separate main switch is built into the electric heating coil, if applicable**

**As such, when a heating coil is supplied separately, both switches must be disconnected in order to de-energise the system**

### 2.2.8 Transport/Storage

The Control System Panel must always be protected against mechanical and environmental hazards.
**Storage conditions**

| Supply system | Conditions |
|---|---|
| Temperature | -50…70 °C |
| Relative humidity | 5….95% |
| Environment | Clean area |

**Storage conditions with power analyser installed**

| Supply system | Conditions |
|---|---|
| Temperature | -10…50 °C |
| Relative humidity | 5….95% |
| Environment | Clean area |

## 2.2.9 Control system panel installation

The Control Panel should be installed on a surface with sufficient mechanical strength and protection against mechanical and environmental hazards.

**Installation conditions**

| Supply system | Conditions |
|---|---|
| Temperature | -35…50 °C |
| Relative humidity | 5….95% |
| Environment | Particle size > 0,5 mm |

**Installation conditions with power analyser installed**

| Supply system | Conditions |
|---|---|
| Temperature | -10…50 °C |
| Relative humidity | 5….95% |
| Environment | Particle size > 0,5 mm |

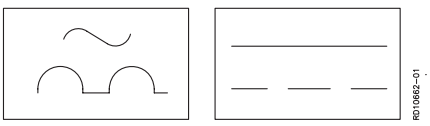
### Residual Current Device

- **The unit must have protection against indirect contact.**

If RCD protection is fitted in the installation, they must be of a type that meets the following requirements:

### VEX1000

**PFI type B switch that breaks the circuit on registering a fault current with DC content (pulsating DC) or smooth vagrant current in accordance with EN 61008. The fault current switches must be marked with the following symbol:**




- **Disconnection time must be max. 0.3 s.**

### Current leakage

RCD protection of 300 mA is recommended, as leakage currents of more than 30 mA can occur.

## 2.2.10 Short-circuit current

The minimum and maximum short-circuit current IKmin and IKmax is stated in the supplied electrical documentation from EXselect Pro, on the data plate, as well as the electrical heating coil if included.

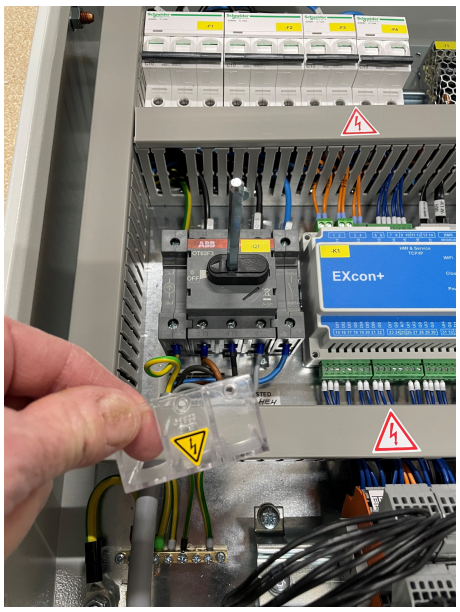
## 2.3 Control system panel

For location of electrical components in the control system panel, see the panel overview in the supplied VEX1000 electrical diagrams.

## 2.4 Connections in the control system panel

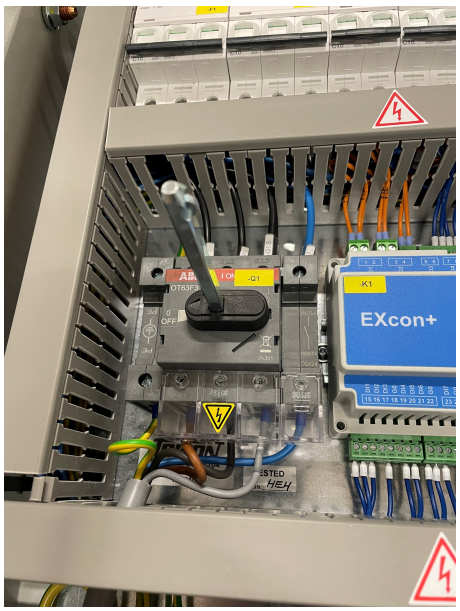
### 2.4.1 Connections in the control system panel

**1)** Connect other accessories and options in accordance with the supplied electrical diagrams.




**2)** Finally, connect the supply voltage to the main switch.

⚠ **Terminal covers on the main switch MUST be fitted.**



# 3. Electrical components

## 3.1 Terminal overview

### 3.1.1 Terminal overview

**Aggregate power & signal terminals**

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X1:01 | -M1.2 | Exhaust air fan | L1 |
| -X1:02 | -M1.2 | Exhaust air fan | L2 |
| -X1:03 | -M1.2 | Exhaust air fan | L3 |
| -X1:04 | -M2.2 | Supply air fan | L1 |
| -X1:05 | -M2.2 | Supply air fan | L2 |
| -X1:06 | -M2.2 | Supply air fan | L3 |
| -X1:07 | -M3 | Rotor | L |
| -X1:08 | -M3 | Rotor | N |
| -X1:09 | -MB | Modbus | 0V |
| -X1:10 | -MB | Modbus | 24V |
| -X1:11 | -MB | Modbus | B- |
| -X1:12 | -MB | Modbus | A+ |
| -X1:13 | -E4 | Electric post-heating | 0-10V |
| -X1:14 | -E4 | Electric post-heating | GND |
| -X1:15 | -E4 | Electric post-heating | Fire |
| -X1:16 | -E4 | Electric post-heating | Fail |
| -X1:17 | -E4 | Electric post-heating | Run OK |
| -X1:18 | -E4 | Electric post-heating | Run OK |
| -X1:19 | -B3 | Temperature sensor | Signal |
| -X1:20 | -B3 | Temperature sensor | Signal |
| -X1:PE | -PE | Protective Earth | PE |

**Air damper terminals**

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X2:01 | -R1.1 | Extract air damper | 0V |
| -X2:02 | -R1.1 | Extract air damper | 24V |
| -X2:03 | -R1.1 | Extract air damper | B- |
| -X2:04 | -R1.1 | Extract air damper | A+ |
| -X2:05 | -R2.2 | Supply air damper | 0V |
| -X2:06 | -R2.2 | Supply air damper | 24V |
| -X2:07 | -R2.2 | Supply air damper | B- |
| -X2:08 | -R2.2 | Supply air damper | A+ |

### Pre-HE signal terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X3:01 | -E3 | Electric pre-heating | 0-10V |
| -X3:02 | -E3 | Electric pre-heating | GND |
| -X3:03 | -E3 | Electric pre-heating | Fire |
| -X3:04 | -E3 | Electric pre-heating | Fail |
| -X3:05 | -E3 | Electric pre-heating | Run OK |
| -X3:06 | -E3 | Electric pre-heating | Run OK |

### Post-HE power terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X4:01 | -E4 | PWR Electric heating | L1 |
| -X4:02 | -E4 | PWR Electric heating | L2 |
| -X4:03 | -E4 | PWR Electric heating | L3 |
| -X4:04 | -E4 | PWR Electric heating | N |
| -X4:PE | -E4 | PWR Electric heating | PE |

### HW-power & signal terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X5:01 | -R1 | Valve HW | 0V |
| -X5:02 | -R1 | Valve HW | 24V |
| -X5:03 | -R1 | Valve HW | Signal |
| -X5:04 | -R1 | Valve HW | Not used |
| -X5:05 | -G1 | HW circulation pump | NC |
| -X5:06 | -G1 | HW circulation pump | COM |
| -X5:07 | -G1 | HW circulation pump | L |
| -X5:08 | -G1 | HW circulation pump | N |
| -X5:PE | -G1 | HW circulation pump | PE |

### CW/CO-power & signal terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X6:01 | -R2 | Valve CW/CO | 0V |
| -X6:02 | -R2 | Valve CW/CO | 24V |
| -X6:03 | -R2 | Valve CW/CO | Signal |
| -X6:04 | -R2 | Valve CW/CO | Not used |
| -X6:05 | -G2 | CW/CO circulation pump | NC |
| -X6:06 | -G2 | CW/CO circulation pump | COM |
| -X6:07 | -G2 | CW/CO circulation pump | L |
| -X6:08 | -G2 | CW/CO circulation pump | N |
| -X6:PE | -G2 | CW/CO circulation pump | PE |

### Temperature & CO2 sensor terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X7:01 | -B5 | Pre-heater temperature sensor | Signal |
| -X7:02 | -B5 | Pre-heater temperature sensor | Signal |
| -X7:03 | -B6 | CO2 sensor | GND |
| -X7:04 | -B6 | CO2 sensor | OUT |
| -X7:05 | -B6 | CO2 sensor | +VCC |
| -X7:06 | - | Spare terminal | |
| -X7:07 | -B7 | Duct temperature sensor | Signal |
| -X7:08 | -B7 | Duct temperature sensor | Signal |

## Customer connection terminals

| Terminal | Connected to | Connection name | Connection type |
|---|---|---|---|
| -X8:0V | - | Customer connections | 24V power supply |
| -X8:24V | - | Customer connections | 24V power supply |
| -X8:01 | - | Customer connections | Fire alarm input |
| -X8:02 | - | Customer connections | Fire alarm input |
| -X8:03 | - | Customer connections | Option input 1 |
| -X8:04 | - | Customer connections | Option input 1 |
| -X8:05 | - | Customer connections | Option input 2 |
| -X8:06 | - | Customer connections | Option input 2 |
| -X8:07 | - | Customer connections | Option input 3 |
| -X8:08 | - | Customer connections | Option input 3 |
| -X8:09 | - | Customer connections | Option input 4 |
| -X8:10 | - | Customer connections | Option input 4 |
| -X8:11 | - | Customer connections | A alarm output |
| -X8:12 | - | Customer connections | A alarm output |
| -X8:13 | - | Customer connections | Option input 1 |
| -X8:14 | - | Customer connections | Option input 1 |
| -X8:15 | - | Customer connections | Option input 2 |
| -X8:16 | - | Customer connections | Option input 2 |
| -X8:17 | - | Customer connections | BMS - RS485 |
| -X8:18 | - | Customer connections | BMS - RS485 |

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